

EU-Type Examination Certificate

Issued by FORCE Certification A/S, Denmark
EU-notified body number 0200

Issued to: **Flonidan A/S**
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In accordance with: Annex II Module B of the Directive 2014/32/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments (MID).

Type of instrument: Diaphragm Gas Meter

Type designation: NaFlo G4

Certificate No.: 0200-MID-02813

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Valid until: 27-03-2028

Number of pages: 7, including appendix

Version: Original

Approved by

Certification Manager

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The conformity markings may only be affixed to the above type approved equipment. The manufacturer's EU-Declaration of Conformity may only be issued and the notified body identification number may only be affixed on the instrument when the production/product assessment module (D or F) of the Directive is fully complied with and controlled by a written inspection agreement with a notified body. This EU-type examination certificate may not be reproduced except in full, without written permission by FORCE Certification A/S.

FORCE Certification references:

Task no.: 117-20887.01.02 and ID. No.: 0200-MID-02813

History of the Certificate:

Revision	Issue date	Changes
0200-MI002-02813	27-03-2018	Original certificate

Conclusion of the examination:

For the instrument mentioned in this certificate, the following essential requirements of Directive 2014/32/EU apply:

- Annex I "Essential Requirements"
- Annex IV "Gas meters and Volume conversion devices (MI-002)"

For the instruments, the following harmonized standards will be applied:

- EN 1359:1998+A1:2006 Gas meters – Diaphragm gas meters.
- EN 12405-1:2005+A2:2010 Gas meters – Conversion devices.

For the instruments, the following technical specifications will be applied additionally:

- WELMEC Guide 7.2, Issue 2015. Software Guide
The software fulfils the basic requirements for type P
The software fulfils the requirements for extension S and I2
- WELMEC Guide 11.1, Issue 2017: Common application for utility meters
- WELMEC Guide 11.3, Issue 1, May 2012: Guide for sealing of Utility meters

The measuring instrument's technical design which is described below complies with the above-mentioned essential requirements. With this certificate, permission is given to attach the number of this certificate to the instruments that have been manufactured in compliance with this certificate.

The instruments must meet the following provisions:

1. Design of the instrument

1.1 Construction

Naflo G4 is a diaphragm gas meter with electronic index. The mechanical measuring unit is mounted in steel plate housing with two-pipe connections.

The measuring unit's movement is transmitted via an optical scanning to the electronic index. The calculator in the index registers the measured gas volume and calculate a volume corrected for the meter error determined by factory calibration. The index is fitted with a display showing the corrected volume.

Reverse flow is registered electronically by the index

The meter is equipped with an integrated valve.

1.2 Sensor

The electronic consists of a transmitting LED's and a gray-code wheel, which together with the corresponding optical receivers forms an optical encoder which transforms the mechanical movement of the meter output axle to electric signals, which can be processed by the microcontroller.

1.3 Measurement value processing

The volume is measured and calculated by the index with use of the electrical signals from the optical encoder, and is corrected for the meter error determined in production.

1.4 Indication of the measurement results

The display shows the meter reading in m³ in a range from 0 to 99999.9999 m³

1.5 Optional equipment and functions

None

1.6 Technical documents

Electronic index: FORCE Certification A/S File no. 117-20887.01

Gas meter: FORCE Certification A/S File no. 117-20887.01
EC type examination certificate no. I-2142-MI002-TG002

1.7 Integrated equipment and functions not subject to MID requirements

The gas meter has a function for prepayment where an "Unique Transactions Reference Number" locally can be entered.

There is an integrated valve in the gas meter which can be opened and closed in combination with the prepayment.

2. Technical data

2.1 Rated operating conditions

Measurand:

The diaphragm gas meter measures the corrected volume at measuring condition. A correction factor for the meter error curve found by manufacture calibration is programmed into the meter.

Measurement range:

Maximum flow rate, Q _{max} :	6,0	m ³ /h
Minimum flow rate, Q _{min} :	0,04	m ³ /h
Transitional flow rate, Q _t :	0,6	m ³ /h
Overload flow rate, Q _r :	7,2	m ³ /h
Cyclic volume, V:	1,2	dm ³

Accuracy class:

The diaphragm meter is accuracy class: 1,5

Environmental conditions/influence quantities:

Protection class: IP 65

Climatic:

Ambient temperature: -25°C to +55°C, condensing, closed outdoor location
Gas temperature: -25°C to +55°C
Storage temperature: -20°C to +60°C

Mechanical:

Mechanical class: M1

Electromagnetic:

Electromagnetic class: E2

Connections:

Two pipe connection DN25 with a distance of 110 mm between the connections.

2.2 Other operating conditions

Maximum pressure, p_{max} : 0,5 barg
 Gas family: Fuel gasses of 1st, 2nd and 3rd family (EN 437:2003)
 Power supply: 3.6 V Lithium battery, AA, double AA or C-cell, ER 6 / ER20 according to IEC 86-1, "Primary batteries"
 High ambient temperature resistant

3. Interfaces and compatibility conditions

The calculator is supplied with an IR communication interface which may be used for reading, parameterizing and upload of new software for the non-metrological software in the calculator.
 Upload of the metrological software is not possible without removing the verification seal, which again is not possible without leaving visible damage the index.
 The Metrological software is protected by an electrical connection (jumper) which has to be mounted on the printed circuit board. The printed circuit board is protected by the metrological cover, which again is secured by a verification seal.

4. Requirements on production, putting into use, and utilization

The manufacturing and the configuration of the gas meter must be in accordance with the documentation described in the manufactures quality system according to the D module.

5. Checking of instruments which are in operation

Instruments which are in operation shall be checked according to the national regulations.

5.1 Documents required for the test

User manual for the meter

5.2 Special test facilities or software

The instruments can be verified and calibrated at the same facilities as for a new meter.
 The meter can be read by use of a special Software called "DuoMeter" and by use of an IR transmitter.

5.3 Identification

– **Hardware**

PCB number	
Index	6030070-06-vv
Gray code	6030040-06-vv

Where:

The first number is a unique number
 06 is a version number including metrological changes
 vv are versions that do not include changes to metrology

– **Software**

The Software identification is described as a software version and a checksum according to the following. The software version can be found in the meter by pressing the rightmost button and chose device info. Then the "FW. 04.XX.YY" Will appear in the display.

Software version	Metrological Cheksum
04.XX.YY	29812

where:

04: Is the metrological version
 2400: Is a product group number
 XX: Is a non-metrological SW version number
 YY: Is a non-metrological SW subversion number

5.4 Calibration/adjustment procedure

Maximum permissible errors (MPE) according to Directive 2014/32/EU of the European Parliament and Council of February 26, 2014 on measuring instruments (MID), Annex MI-002.

Unconverted volume:

Ambient temperature t_{am} : -25 °C to +55 °C
 Maximum permissible errors $\pm 3 \%$ for $Q_{min} \leq Q < Q_t$
 $\pm 1,5 \%$ for $Q_t \leq Q \leq Q_{max}$

Verification is carried out at laboratory conditions. It is permitted to use air as verification gas. The verification is valid only for the display reading of corrected volume V_c .

6. Security measures

The sealing of the meter consists of a metrological seal and a battery seal.

6.1 Mechanical seals

Metrological seal

The Metrological seal in the Gray code unit is made by a steel pin which, after the gray code unit is inserted in the house, is pressed into the house in the front direction (downwards on Figure 1 where the front is facing down).

After the steel pin is pressed into the house, it cannot be removed again without leaving visible damage to the gearbox and index house.

The Index PCB is sealed by ultrasound welding the front plate to the Index house.

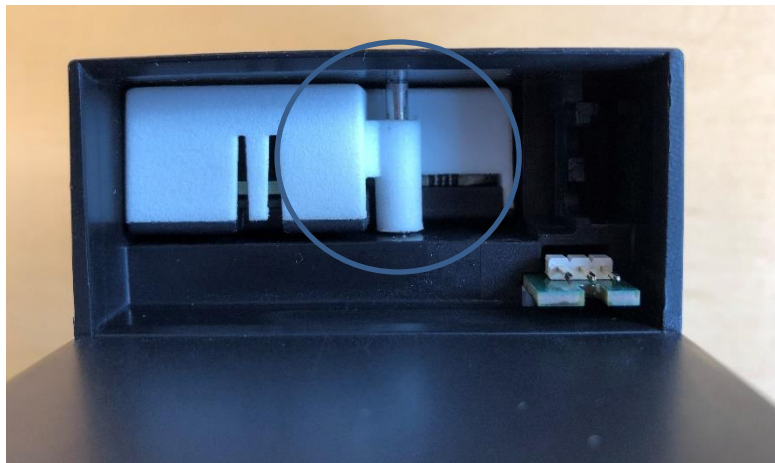


Figure 1: Metrological seal of the gray code unit

Battery seal

The battery is sealed by placing a locking pin in the hole in the front. In Figure 2 it is shown before mounting, and in Figure 3 it is shown after mounting = sealed.



Figure 2: Battery seal before mounting



Figure 3: Battery seal after mounting

6.2 Software seals

The metrological Software is protected by passwords and use of a metrological switch (jumper) which must be mounted on the printed circuit board (PCB) before programming. The PCB is protected by the metrological seal, which cannot be removed without damage to the index after installed.

7. Labelling and inscriptions

7.1 Information to be enclosed with the instrument

Rated operating conditions not included on the label:

- Transitional flow rate: $Q_t = 0,1 Q_{max}$
- Overload flow rate: $Q_r = 1,2 Q_{max}$
- Climatic class: condensing, closed outdoor location
- Mechanical and electromagnetic environment classes: M1, E2
- Gas family: Fuel gasses of 1st, 2nd and 3rd family (EN 437:2003)
- Power supply: Lithium battery, 3 or 3.6 V DC
- Software version number: 04.2400.XX-YY
- Legal software checksum: 29812

Instructions for installation and maintenance.

Instructions for correct operation and any special conditions of use.

7.2 Markings and inscriptions

According to Directive 2014/32/EU Article 21 and 22, and Annex I paragraph 9 and EN1359, the following inscriptions must appear on the label.

Conformity marking (CE + M + Year of affixing + NB no.)
EU-type examination certificate number
Manufacturer designation or logo and address
Type, production year and serial number

Applied European Standard	: EN 1359:1998/A1:2006
Class	: 1,5
Metersize	: G4
Maximum flow rate: Q_{max}	: 6 m ³ /h (Label or device info)
Minimum flow rate: Q_{min}	: 0,04 m ³ /h (Label or device info)
Ambient and gas temperature: t_m	: -25 °C ... +55 °C (Label or device info)
Maximum working pressure: p_{max}	: 0,5 barg (Label or device info)
Corrected Volume: V_c	: m ³
Cyclic volume: V	: 1,2 dm ³ (Label or device info)
High ambient temperature resistant	: T

8. Figures



Figure 4: Label



Figure 5: Meter