



OIML Member State
Denmark

OIML Certificate No.
R139/2018-B-DK2-2020.01 revision 2

OIML CERTIFICATE ISSUED UNDER SCHEME B

OIML Issuing Authority

Name: FORCE Certification A/S
Address: Park Allé 345, 2605 Brøndby Denmark
Person responsible: Niels Ovesen

Applicant

Name: NEL Hydrogen A/S
Address: Vejlevej 5, 7400 Herning Denmark

Manufacturer

Name: NEL Hydrogen A/S
Address: Vejlevej 5, 7400 Herning Denmark

Identification of the certified type (*the detailed characteristics will be defined in the additional pages*)

MM-001

Designation of the module (*if applicable*)

Metering module to be used in a NEL hydrogen refuelling dispenser up to 70 MPa.

This OIML 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):

OIML R 139-1, Edition (year): 2018

For accuracy class (if applicable): 2

OIML Certificate No.

R139/2018-B-DK2-2020.01 revision 2

This OIML Certificate relates only to metrological and technical characteristics of the type of measuring instrument covered by the relevant OIML Recommendation identified above.

This OIML Certificate does not bestow any form of legal international approval.

The conformity was established by the results of tests and examinations provided in the associated OIML type evaluation report:

No. 120-25720.01.04 dated 17/06/2020 – 30/11/2020 that includes 58 pages

No. 122-21341.01.04 dated 17/01/2022 that includes 4 pages

No. 122-21341.01.05 dated 20/09/2022 that includes 20 pages

The technical documentation relating to the identified type is contained in documentation file:

Task no. 120-25720 and 122-21341

OIML Certificate History

Revision No.	Date	Description of the modification
Revision 0	07-12-2020	Original certificate
Revision 1	20-01-2022	Transmitter UMC4 added.
Revision 2	20-09-2022	New revision of calculator and indicating device SK700-2 added

This revised version 2 of the certificate replaces the previous version.

Identification, signature and stamp

The OIML Issuing Authority

Date: 28-09-2022.

Lars Parmo
Certification manager

The certificate is only valid with one digital signature from FORCE Certification. The original version of the certificate is archived in FORCE Certifications database and is sent in electronic duplicate to the customer. The stored version of the certificate at FORCE Certification prevails as documentation for its contents and validity.

Important note: Apart from the mention of the Certificate's reference number and the name of the OIML Member State in which the Certificate is 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.

Descriptive annex

Flow tests is done according to OIML R139:2018-2 table 9 which do not include determination of the actual flowrate range but the dispensed mass. Due to the construction and the function of the measuring system it is not possible to adjust the flow before and during the measurement. Therefore, the flowrate is not determined and verified.

Characteristics

Type:	MM-001
Type of gas to be measured:	Hydrogen
Accuracy class:	2
Nominal maximum capacity, Q _{max} :	3,6 [kg/min]
Nominal minimum capacity, Q _{min} :	0,133 [kg/min]
Minimum measured quantity, MMQ:	1 [kg]
Maximum pressure of the gas, P _{max} :	87,5 [MPa]
Gas temperature:	-40°C...0°C
Ambient temperature:	-25°C...+55°C
Environmental class:	M1

The metering module consists of a Hydrogen flow sensor and transmitter, a calculating/indicating device and a pressure control valve.

Due to the venting procedure the maximum length of the hose is 2.5 meter.

Essential parts of the measuring system:

Flow sensor:	Manufacture:	Heinrichs messtechnik GmbH
	Type:	TMU-W004
	Report:	120-24446-1 120-25720-1
	Maximum capacity, Q _{max} :	4 [kg/min]
	Minimum capacity, Q _{min} :	0,133 [kg/min]
	Environmental class:	M2
	Ambient temperature:	-40...+55 °C
Gas temperature:	-40...0 °C	
Flow transmitter:	Manufacture:	Heinrichs messtechnik GmbH
	Type:	UMC4-RM
	Report:	120-24446-1 120-25720-1
	Environmental class:	M2
	Ambient temperature:	-40...+55 °C

Software version: 5.241
CRC Checksum: D2D5

Alternative Flow transmitter: Manufacture: Heinrichs messtechnik GmbH
Type: UMC4
Report: 120-24446-1
122-21341.01.04
Environmental class: M2
Ambient temperature: -40...+55 °C
Software version: 5.241
CRC Checksum: D2D5

Calculating/indicating device: Manufacture: Gilbarco GmbH
Type: SK700-2
Report: 120-29653-1
120-25720-1
(Revised version) 122-21341.01.05
Environmental class: M1
Ambient temperature: -25...+55 °C
Software version: A30.2.09
CRC Checksum: F7E9
Measurement unit: Kg
Minimum increment of registration : 0,001 Kg
Maximum capacity: 999,999 Kg

Other essential components: Piping, valves, pressure control valve, breakaway valve, safety valve, hose and nozzle.

Interfaces:

The calculating/indicating device communicate to POS system using one of the following protocols when initialising the measurements.

- TW (Gilbarco Two wire)

TW is a point to point communication.

- IFSF (Epsilon LonWorks)

IFSF is using an Epsilon local operating network.

Sealing:

The calculating/indicating device is sealed by a physical seal behind a cover plate.

The flow sensor and the transmitter are sealed by a physical seal according to manufacture sealing plan.

Name plate and type plate shall be sealed or by other means permanently attached.

Identification plate:


The measuring system, shall bear a permanent, non-transferable, and easily readable identification plate or label giving the following information:

- manufacturer's trade mark/corporate name;
- year of manufacture;
- type designation / model number;
- accuracy class;
- type approval number and (area allowed for) verification marks, according to national legislation;
- serial number of the measuring system;
- The minimum measured quantity (MMQ) (shall be permanently visible on the front of the indicating device.)



The following metrological and technical characteristics, where applicable, shall be provided either on the identification plate, or may be visible either permanently, or on demand on the indicating device, as appropriate:

- measuring range (minimum flow rate, Q_{min} , and maximum flow rate, Q_{max});
- maximum pressure of the gas in the refueling station gas storage, P_{st} ;
- maximum fast fill pressure of the gas-fuelled vehicle, P_v ;
- maximum pressure of the gas, P_{max} ;
- type of the gas to be measured (hydrogen);
- maximum temperature of the gas, T_{max} ;
- minimum temperature of the gas, T_{min} .
- ambient temperature range;
- the applicable environmental class M1 for the metering system MM-001.

Example of an identification plate(s).

		Nel Hydrogen A/S Denmark nelhydrogen.com	
Metering Module Accuracy Class			
Dispenser metering:	MM-001		
Metering Module serial number	MM-001-??????		
Accuracy Class:	2		
MMQ: (minimum measured quantity)	1 kg		
Q _{max}	3.6 kg/min		
Q _{min}	0.133 kg/min		
P _{min} Vehicle	1.5 MPa		
P _{max} Storage	100 MPa		
P _v max (APPR _{max})	28.5 MPa		
Gas Temperature	-40°C to 0°C		
National certificate number:			
Environmental Class	M1		
Control Marks			

Metering module name plate

		Nel Hydrogen A/S Denmark nelhydrogen.com	
ASSEMBLY	D1006		
SERIAL NUMBER	D1006-????		
YEAR	??????????		
VOLTAGE	230VAC		
FLUID	HYDROGEN	CO2	AIR
FLUID GROUP	1	2	2
PS-MAX [Bar]	875	40	6.8
TS-MIN/MAX [°C]	-40/40	-60/40	-20/40
 0062			

Dispenser Name plate