Czech Metrology Institute

Member state
Czech Republic

OIML Certificate No.
R139/2014-CZ-16.01

OIML BASIC CERTIFICATE OF CONFORMITY

Issuing Authority

Name: Czech Metrology Institute
Address: Okružní 31,
638 00 Brno, CZ
Person responsible: Jan Kalandra

Applicant

Name: **TATSUNO EUROPE a.s.**
Address: **Pražská 2325/68**
678 01 Blansko
Czech Republic

Manufacturer of the certified type
Name: **TATSUNO EUROPE a.s.**
Address: **Pražská 2325/68**
678 01 Blansko
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Identification of the certified type

Dispenser for compressed natural gas type OCEAN BMP 40xx.Oxx/CNG

Further characteristics see page 3

This certificate attests the conformity of above identified type (represented by the sample (s) identified in the OIML Basic Type Evaluation Report) with the requirements of the following Recommendation of the International Organization of Legal Metrology (OIML):

OIML R 139, Edition 2014

Member state
Czech Republic

OIML Certificate No.
R139/2014-CZ-16.01

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

This 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 Basic Type Evaluation Report(s)
No. **6015-PT-P3011-16** dated **23rd May 2016** that includes **9 pages**.

Dispenser description:

CNG dispenser type OCEAN BMP 40xx.Oxx/CNG is designed for measurement of quantities of the natural compressed gas. CNG dispenser may be designed for one to three sequential filling and consists of shut off valves, a strainers, electromagnetic valves, back valves, mass meters, pressure transducers, manometers, hoses with break away couplings, delivery nozzles with three way valve, measurement transducers with electronic transmitters, electronic calculator and indicating devices.

Certificate history:

Issue no.	Date	Description of the modification

Český metrologický institut
-3-

The OIML Issuing Authority
Pavel Klenovský

31 May 2016

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 Basic Type Evaluation Report(s) is not permitted, although either may be reproduced in full.

1. Dispenser characteristic:

BMP40ab.Oxy /CNG

y... dispenser orientation:
D… double-sided dispenser,
R… single-sided dispenser, right
L… single-sided dispenser, left

x... dispenser design:
E (EURO) is a model with hose column height 1900 mm
S (SMART) is a model with hose columm heigh 1900 mm

O... marks OCEAN model dispenser line

b... number of dispensing hoses located in dispenser

a... number of pressure banks connected to dispenser input

40... marks OCEAN dispenser line

BMP... marks all dispensers of the company TATSUNO EUROPE.

MOD40ab.Oxy /CNG

y... module orientation:
D… double-sided dispenser,
R… single-sided dispenser, right
L… single-sided dispenser, left

x... dispenser design:
x = E (EURO) is a model with hose column height 1900 mm

O... marks OCEAN model dispenser line

b... number of dispensing hoses located in dispenser

a... number of pressure banks connected to dispenser input (a = 1,2 or 3)

40... marks OCEAN dispenser line

MOD... marks additional dispensing module

CNG dispenser type OCEAN MOD 40xx.OEx/CNG is only module which is incorporated into standard liquid dispenser and/or LPG dispenser. In this case calculator(s) and indicating device(s) of CNG dispenser are moved beside the indicating device of main dispenser. Indicating devices of CNG dispenser and main dispenser are clearly identified by label.
CNG dispenser may be designed for one to three sequential filling.
CNG dispenser consist of shut off valves, a strainers, electromagnetic valves, back valves, mass meters, pressure transducers, manometers, hoses with break away couplings, delivery nozzles with three way valve, measurement transducers with electronic transmitters, electronic calculator and indicating devices.

CNG dispenser is equipped with an ambient temperature sensor to compensate maximum filling pressure, which doesn't affect the metrological characteristics of measuring system.
CNG dispenser can be equipped up to four measurement systems. Each measurement system must be connected to his own electronic calculator. CNG dispenser can fill up to four cars simultaneously.
During first putting the CNG dispenser into the operation, electronic calculator match measurement sensor up. Electronic calculator download metrological important parameters/registers of connected measurement sensor to calculator's memory before each delivery and then dispenser compare the values from calculator's memory against parameters downloaded from the measurement sensor. If there is any difference dispenser show an error on the display. Parameters which are compared are shown in the Table 1 and Table 2. Due to the comparison of the parameters is not necessary to seal Modbus communication between calculator and measurement sensor and dismantling of the measurement sensor from CNG dispenser.
Under the metrological seal could be directly set up zero flow rate and calibration factor through the CNG dispenser.
CNG dispenser can be connected to the Payment terminal for local and public credit card or independent point of sale system (POS), which doesn't affect the metrological characteristics of the measuring system. POS only read the displayed data from the dispenser, status of the dispenser and change the price per unit displayed on the dispenser.

1.1. Measurement transducer

Into CNG dispenser can be installed 2 different measurement transducers. In the double sided dispenser the both measurement transducers should be the same type.

The Micro Motion measurement sensor type CNG050 and core processor types 700 or 800 were separately certified by NMI in EC type examination certificate no. T10020 rev. 8 and by CMI in Certifikát o schválení typu měřidla addition 2 no. TCM 141/13 – 5026. Basic technical data of Micro Motion measurement transducer:

Type of flow sensor:	CNG050
Diameter [mm]:	12
Flow rate [kg/min]:	1,92 – 77,00
Maximum pressure [bar]:	345
Gas temperature range [°C]:	-25 to +55
Ambient temperature range [°C]:	-40 to +55
Environment classes:	M3 / E3
SW versions 700 / 800:	See actual Evaluation certificate TC7057

The Endress + Hauser measurement sensor type CNGmass was separately certified by PTB in Type approval certificate under German law no. PTB-1.5-4029117. Basic technical data of CNGmass measurement transducer:

Type of flow sensor:	CNGmass
Diameter [mm]:	15
Flow rate [kg/min]:	0,8 – 80,0
Maximum pressure [bar]:	350
Gas temperature range [°C]:	-50 to +125
Ambient temperature range [°C]:	-40 to +60
Environment classes:	B / C
SW version:	V1.00.00 / CRC 0xE3C94248

1.2. Electronic calculator

The Tatsuno Europe electronic calculator type TBELTM was separately certified by CMI in Evaluation certificate no. ZR 141/15 – 0119. Basic technical data of TBELTM electronic calculator:

Type of electronic calculator:	TBELTM
Display type:	Electronic LCD
Scale interval:	0,01 or 0,001
Minimum measured quantity [kg]:	2

Ambient temperature range [°C]:	-40 to +55
Environment classes:	M1 /E1 /H3
SW version:	1.01 / CRC 4092

1.3. Delivery hose

Delivery hose PARKER 5CNG or 5PGH, max. length 6 m or other corresponding type with maximum length 6 m.

1.4. Delivery nozzle

STÄUBLI, type GMV 06 (NGV1), GMV09 (NGV1), GMV12 (NGV2),
WEH, type TK17 (NGV1), TK26 (NGV2),
OPW, types CT1000 (NGV1), CT5000 (NGV2),
or other corresponding type.

2. Basic technical data

Used measurement transducer:	CNG050	CNGmass
Max. flowrate: Q_{max} [kg/min]	30 / 70	30 / 70
Min. flowrate: Q_{min} [kg/min]	2	0,8
Gas temperature range [°C]:	-25 to +55	-50 to +80
Ambient temperature range [°C]:	-40 to +55	-40 to +60
Min. measured quantity: MMQ [kg]	2	
Scale interval, mass display: [kg]	0,01 or 0,001	
Max. storage pressure of the gas P_{st} [MPa]:	30,0	
Max. pressure of the gas P_{max} [MPa]:	30,0	
Min. pressure of gas P_{min} [MPa]:	2,0	
Max. filling pressure of the gas P_v [MPa]:	20,0 @ 15 °C / 26,5	
Environment classes:	M1 / E1	
Accuracy class	1,5	

3. The measuring device data

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

- Manufacturer's trade mark / corporate name;
- Type designation / model number;
- Serial number and year of manufacture.

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;
- Type designation / model number;
- Serial number and year of manufacture;
- Type approval number and area allowed for verification marks;
- Measuring range ($Q_{min} - Q_{max}$);
- Maximum pressure of the gas in the refueling station gas storage P_{st};
- Maximum fast fill pressure of the gas-fuelled vehicle P_v;
- Minimum pressure of the gas P_{min};
- Maximum pressure of the gas, P_{max};
- Type of the measured gas;
- Temperature range of the gas;
- Ambient temperature range;

- Nominal mains voltage and frequency;
- Identification of software (shall be provided on demand on the indicating device);
- Presence of a sequential control device and operational mode;
- Environment class.

Each face indicating device shall bear by the following information:

- Indication of price to be paid;
- Near indication of mass either sign **kilogram** or unit **kg** (for other specific units of measurement check OIML R139-1 e14 in chapter 5.1.1);
- Indication of price per unit;
- Information about minimum measured quantity.

All information must be presented in national language where CNG dispenser operates or in English language.

4. Sealing

Basic sealing points:

- The security switches on the electronic calculator has to be switched to position ON (locked) and sealed according to the Figure No. 5.
- The type plate of the electronic calculator.
- The type plate of measurement transducer.
- The type plate of the CNG dispenser.

Additional sealing points beyond the requirements of OIML R 139 e14 and WELMEC 10.6 can be used on special request of the local W&M authority.

Figure 1: Hydraulic scheme for CNG dispenser with 1 bank:

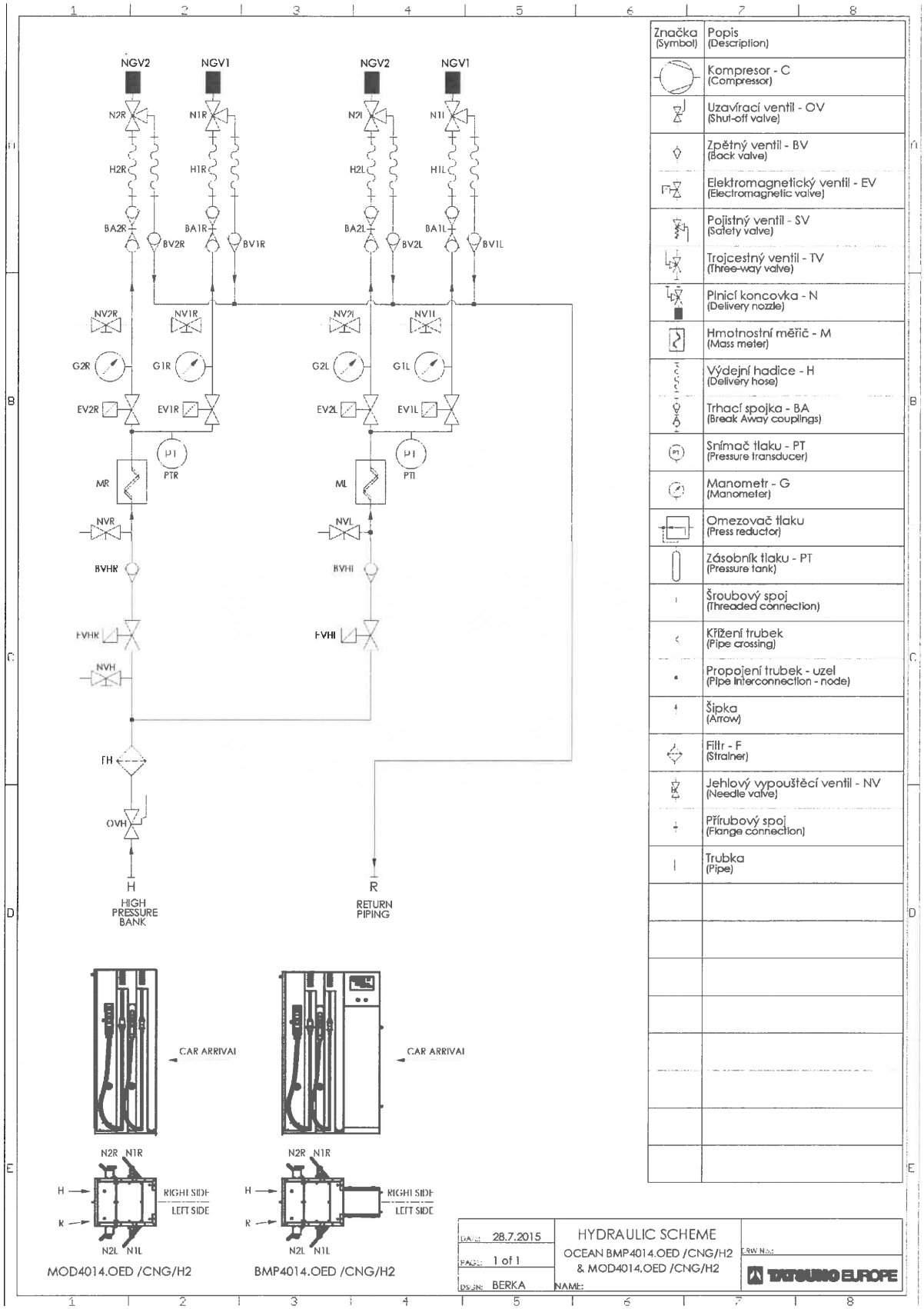

Figure 2: Hydraulic scheme for CNG dispenser with 2 banks:

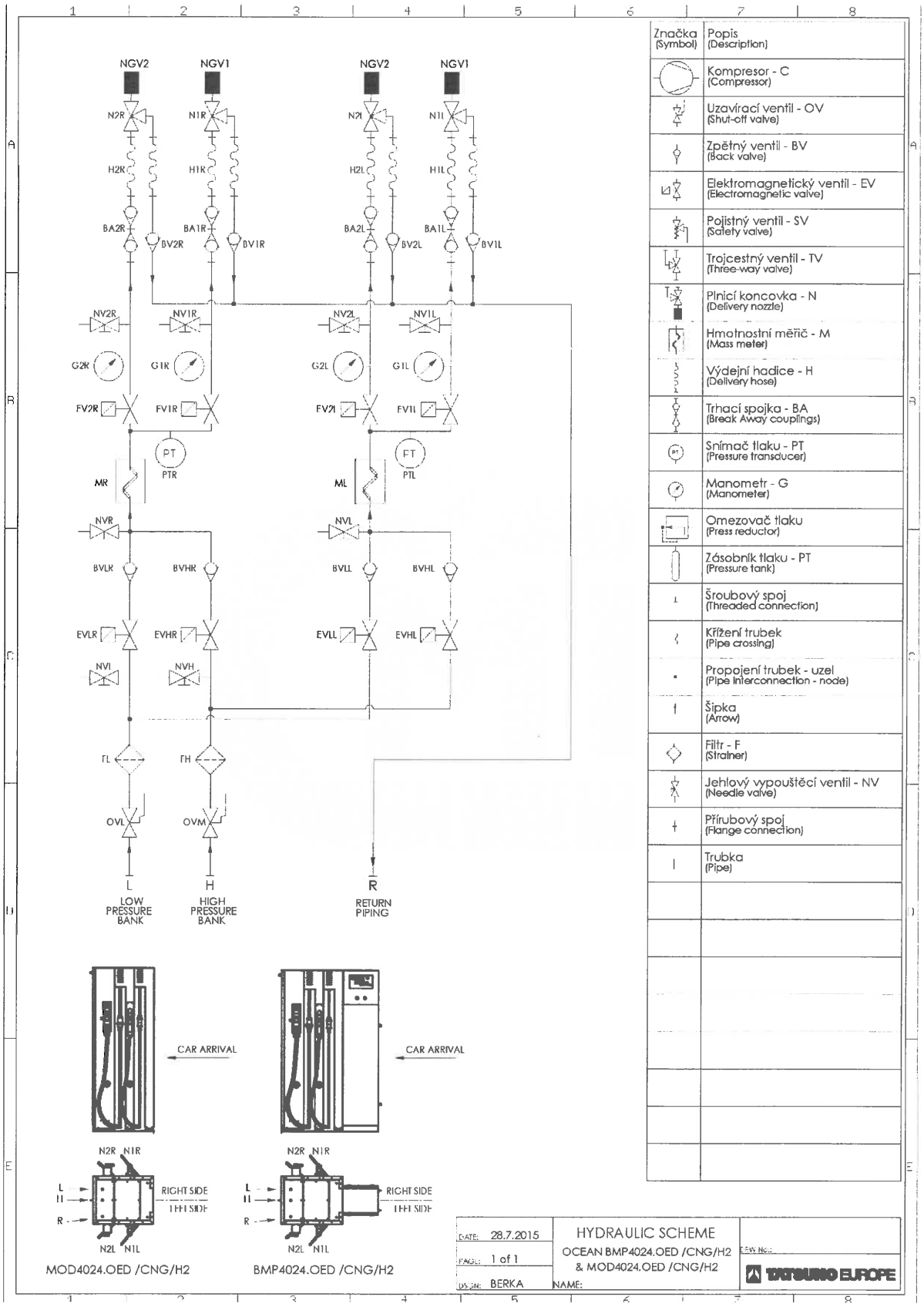

Figure 3: Hydraulic scheme for CNG dispenser with 3 banks:

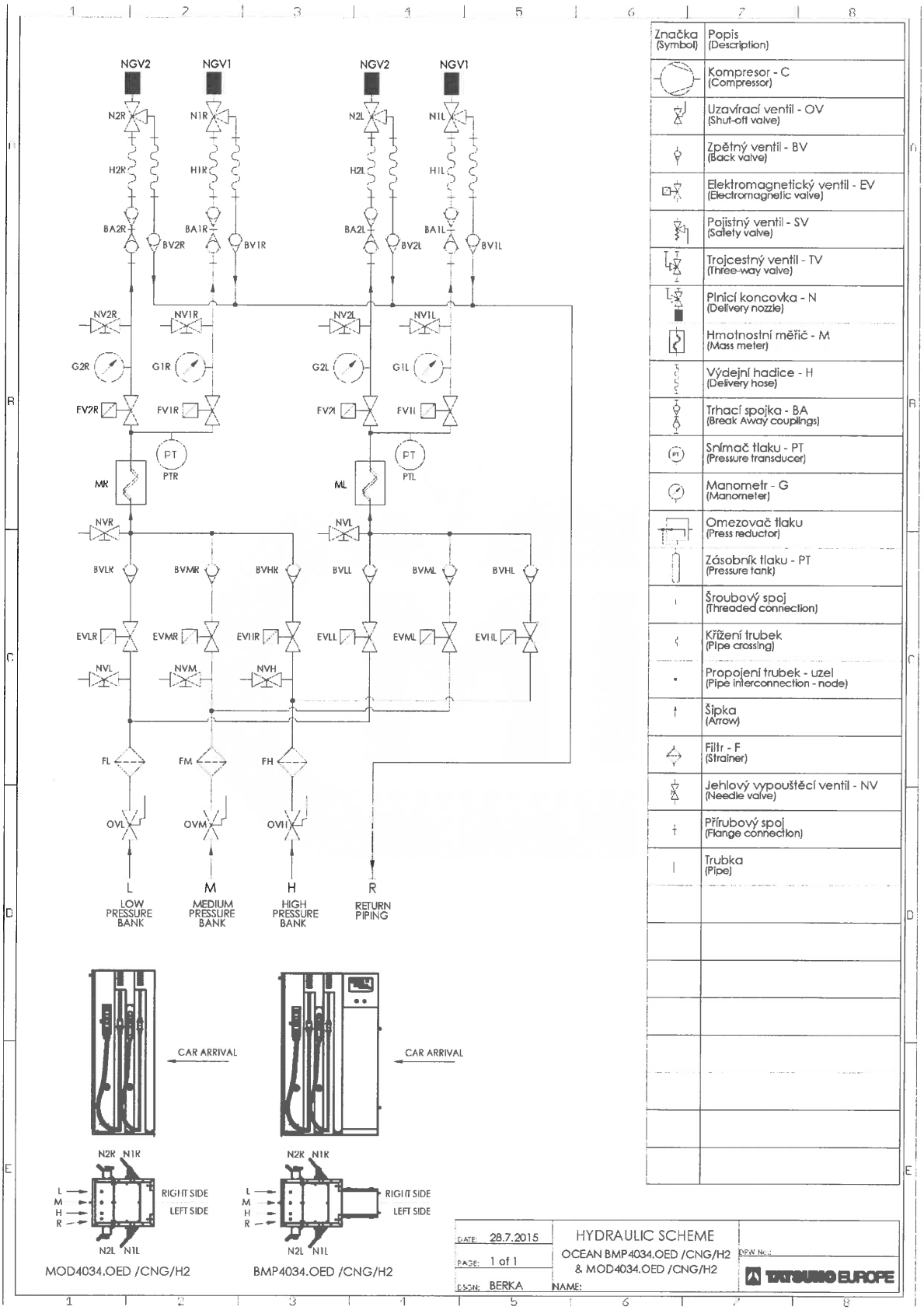

Figure 4: Location of security switches and programing connector of the electronic calculator:

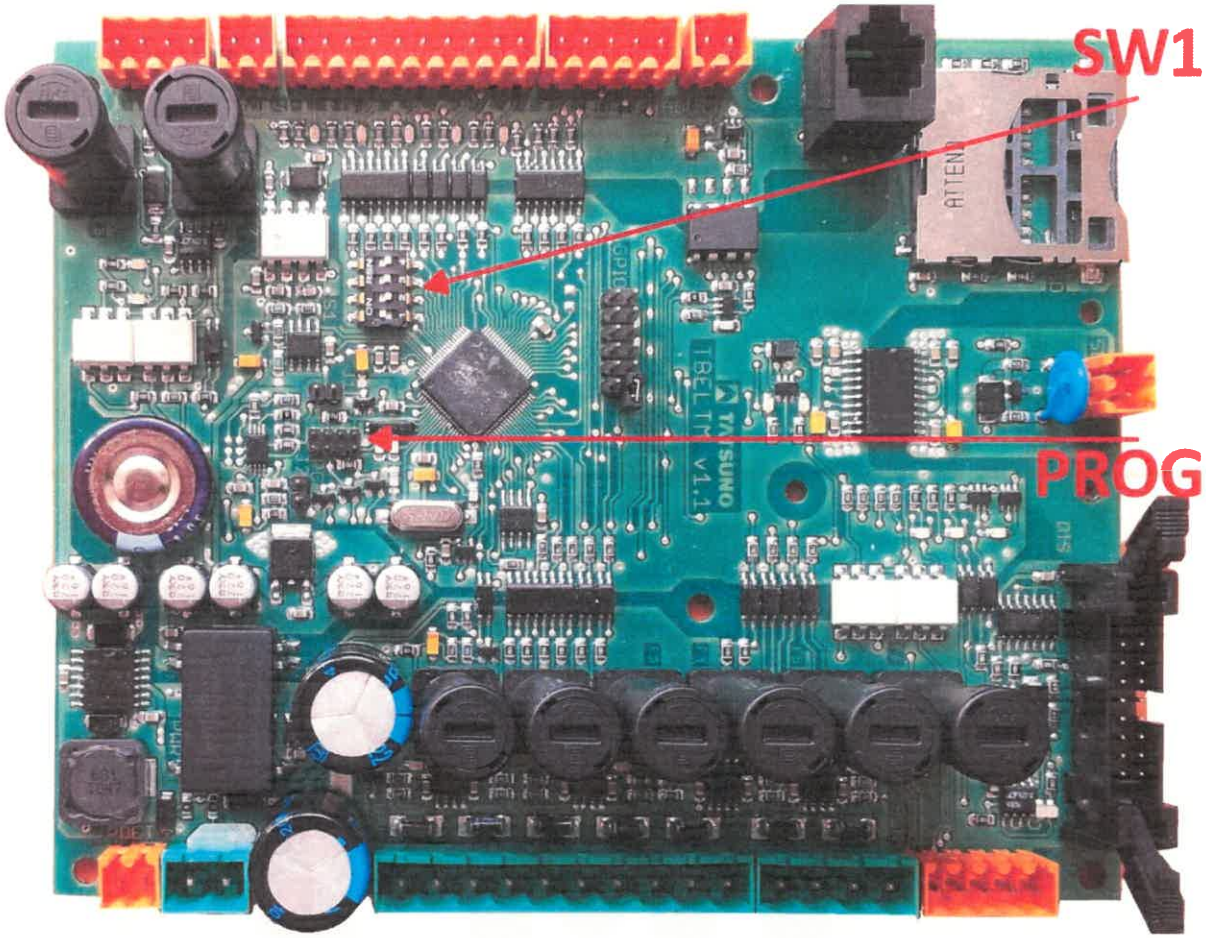

Figure 5: Sealing of the electronic calculator:

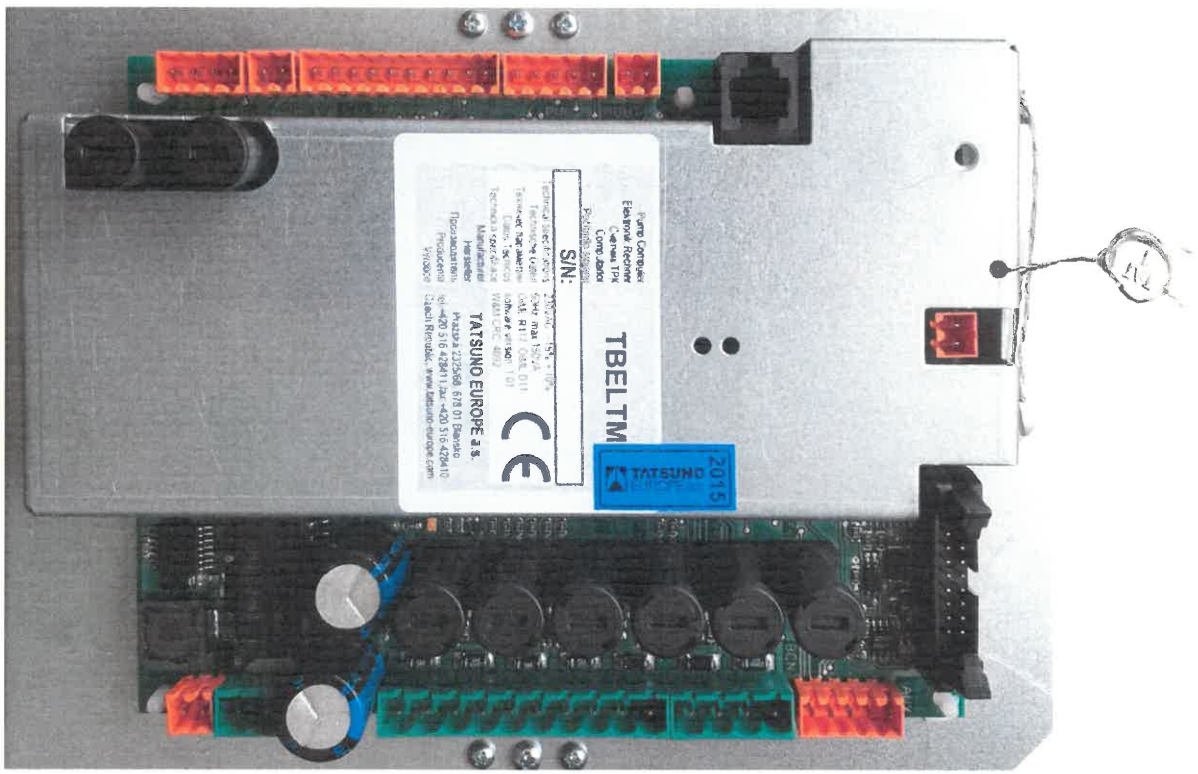

Figure 6: Type plate example of the CNG dispenser

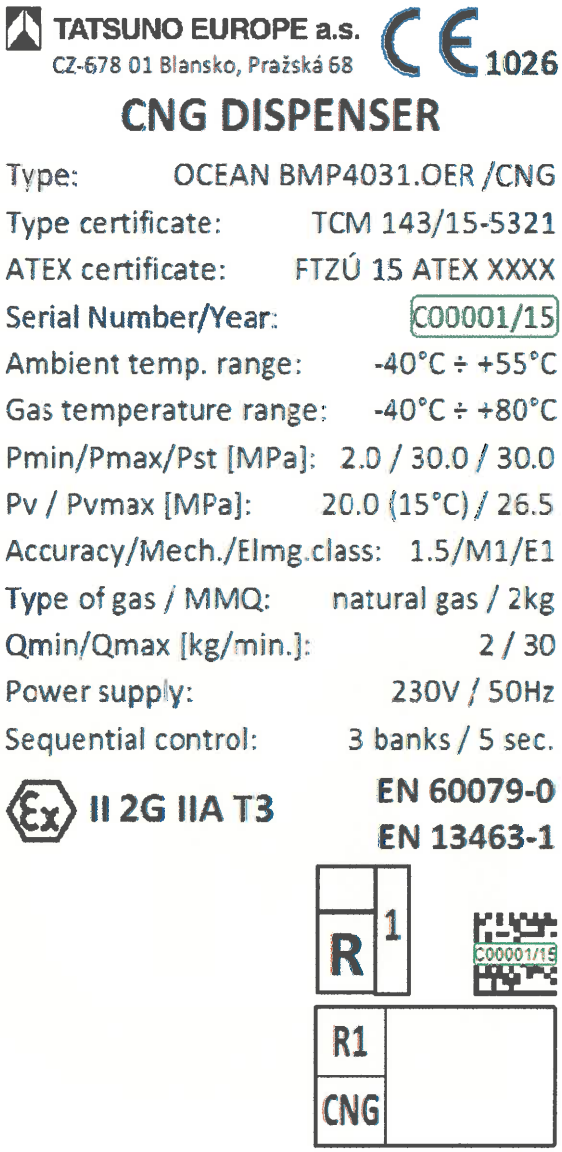

Table 1: Metrological parameters/registers of mass meter Micro Motion CNG050

Register	**Value**
Measurement unit for mass total	kg
Measurement unit for volume total	L
Measurement unit for mass flow	kg/min
Measurement unit for volume flow	L/min
Density measurement unit	kg/m^3
Temperature measurement unit	°C
Flow direction	bidirectional
Mass flow scale factor	according parameter P44
Volume flow scale factor	according parameter P44
Mass flow cut off	0,055 kg/min
Volume flow cut off	0,01 L/min
Flow dumping	0 s
Update rate	100 Hz
Slot address register	Addresses of registers in order: - mass flow - volume flow - density - temperature - mass total - volume total - diagnostic integer register 0001 - diagnostic integer register 0125 - diagnostic integer register 0419 - diagnostic integer register 0420 - diagnostic integer register 0421 - diagnostic integer register 0422 - diagnostic integer register 0423
Present flow signal offset at zero flow	Value stored after Zero point adjustment procedure
Sensor serial number	Number stored during Serial number storage procedure

Table 2: Metrological parameters/registers of mass meter Endress & Hauser CNGmass

Register	**Value**
Totalizer 1 assign	Mass flow
Totalizer 2 assign	Volume flow
Totalizer 1 unit mass	kg
Totalizer 2 unit volume	L
Totalizer 1 measuring mode	forward
Totalizer 2 measuring mode	forward
Unit mass	kg
Unit volume	L
Unit mass flow	kg/min
Unit volume	L/min
Unit density	kg/m^3
Unit temperature	°C
Inst. dir. sensor	forward
M. factor mass flow	according parameter P44
M. factor volume flow	according parameter P44
m. offset mass flow	0
M. offset volume flow	0
M. factor density	1
M. offset density	0
M. factor temperature	1
M. offset temperature	0
Assign low flow cut off	mass flow
On value low flow cut off	0,055 kg/min
Flow dumping	0 s
Auto scan buffer	Addresses registers in order: - mass flow - volume flow - density - temperature - totalizer 1 sum - totalizer 1 overflow - totalizer 2 sum - totalizer 2 overflow
Zero point	Value stored after Zero point adjustment procedure
Serial number	Number stored during Serial number storage procedure