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Type Approval Certificate

No. 0111-CS-A025-15

Revision 3

Czech Metrology in accordance with the Law of metrology No. 505/1990 Coll. as amended

approved

dispenser for compressed natural gas (CNG)
type OCEAN BMP 40xx.Oxx/CNG

under observation of technical data referred to in Annex of this Certificate.
This revision replaces all previous versions in full wording.

Type approval mark: **TCM 143/15 - 5321**

Applicant: **TATSUNO EUROPE a.s.**
Pražská 2325/68
678 01 Blansko
Czech Republic
ID: 26221454

Manufacturer: **TATSUNO EUROPE a.s.**
Czech Republic

Valid until: **17 September 2025**

Information on judicial remedies:
The judicial remedies against this decision are available to the applicant through Czech Metrology Institute to Czech Office for Standardization, Metrology and Testing within 15 days since the receipt of this Certificate.

Description:
Essential characteristic, approved conditions special conditions, examination results including technical drawings and schemas are set out in the technical test report appertaining to this certificate. The certificate comprises the front page and the technical test report. Certificate totally has 12 pages.

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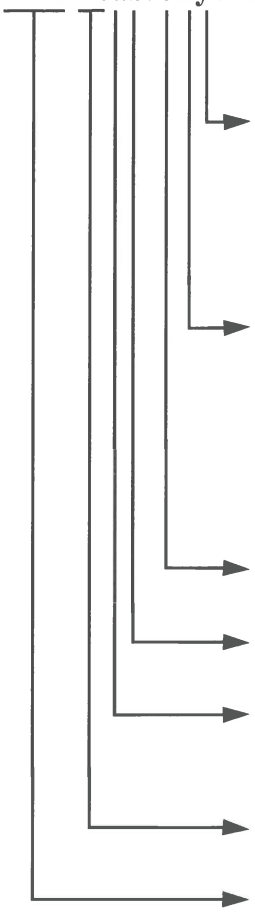
Brno, 15 March 2021

RNDr. Pavel Klenovský
Director General

1 Measuring device description

CNG dispenser type OCEAN BMP 40xx.Oxx/CNG is designed for measurement of quantities of the natural compressed gas as legal measuring device in the sense of the Act of Czech Parliament No. 505/1990 Coll., as amended and is used for the refuelling tanks of motor vehicles.

BMP40ab.Oxy /CNG



y... dispenser orientation on refuge island from incoming vehicle viewpoint:

D… double-sided dispenser,
R… single-sided dispenser, right
L… single-sided dispenser, left

x... dispenser design:
E (EURO)
S (SMART)
W (TOWER)

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

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

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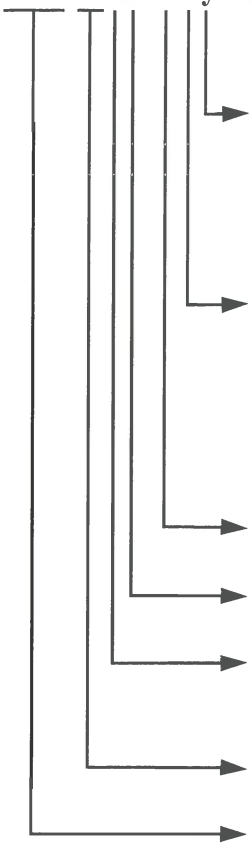
MOD40ab.Oxy /CNG



y... module orientation on refuge island from incoming vehicle viewpoint:

D... double-sided dispenser,
R... single-sided dispenser, right
L... single-sided dispenser, left

x... dispenser design:
E (EURO)
W (TOWER)

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 and may be equipped by preset function.
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, 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.

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1.1. Measurement transducer

Into CNG dispenser can be installed 2 different measurement transducers. In the double-sided dispenser, 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:	M2 / 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 +55
Environment classes:	M2 / E2
SW version:	V1.00.00 / CRC 0xE3C94248 V01.01.00 / CRC 0 X13BD2D46

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:	M2 /E1 /H3
SW version:	1.01/CRC 4092 1.02/ CRC 24AD

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), TK16 (NGV1)
OPW, types CT1000 (NGV1), CT5000 (NGV2), PG32P30 (NGV1)
or other corresponding type.

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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 / 5*	
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:	M2 / E1	

* 5 kg when dispenser is equipped by preset function and/or Q_{max} > 30 kg/min.

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:

- Near indication of price to be paid unit **Kč**;
- Near indication of mass either sign **kilogram** or unit **kg**;
- Near indication of unit price sign either **Kč / kilogram** or **Kč / kg**;
- Information about minimum measured quantity.

All information must be presented in Czech language.

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4 Test

Technical tests of the CNG dispenser type OCEAN BMP 40xx.Oxx/CNG were performed according to OIML R139:2014. It was taken account of following certificates and test reports:

- EC type examination certificate no. T10020 rev. 8 issued by NMI;
- Certifikát o schválení typu měřidla addition 2 no. TCM 141/13 – 5026 issued by CMI;
- Type approval certificate under German law no. PTB-1.5-4029117 issued by PTB;
- Evaluation certificate no. ZR 141/15 – 0119 issued by CMI;
- OIML Certificate No. R139/2015-B-CZ1-2018.01 issued by CMI.

The results of the measurement and checklist according to OIML R139:2014 are written in Test report no. 6015-PT-P3016-15 and 6015-PT-P3005-16. These Test reports are enclosed as annexes of this Type approval.

CNG dispenser type OCEAN BMP 40xx.Oxx/CNG is in compliance with the Act of Czech Parliament No. 505/1990 Coll., as amended. CNG dispenser is able to perform the function for which it's intended.

5 Verification

CNG dispenser type OCEAN BMP 40xx.Oxx/CNG is verified according to "OOP CNG".

After verification with positive result CNG dispenser has to be secured as follows:

- The security switches on the electronic calculator have 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(s) of the measurement transducer(s).
- The type plate of the CNG dispenser.

6 Validity time of the verification

In the Czech Republic the period of verification validity is done by a decree of Ministry of industry and trade.

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

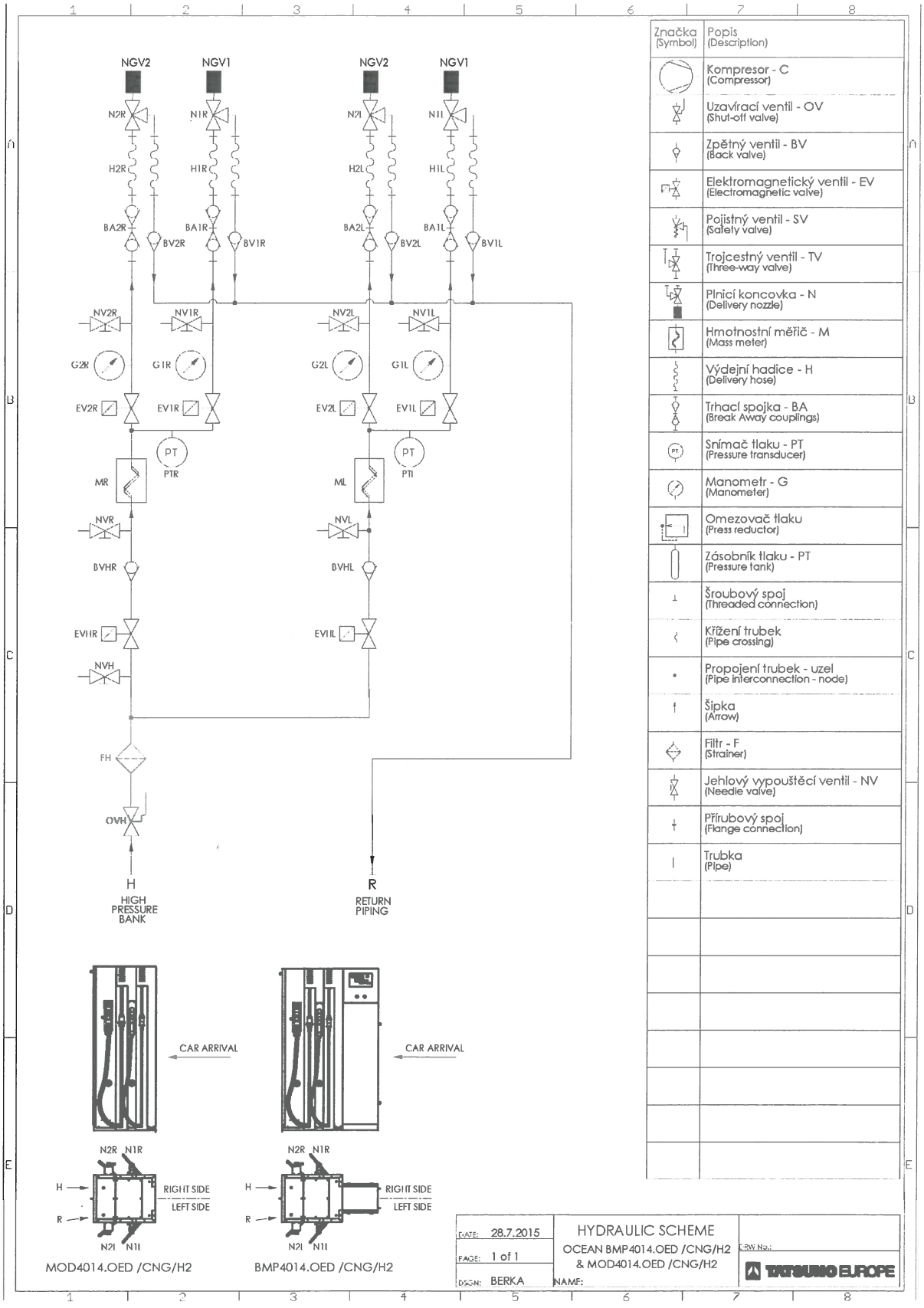


Figure 2: Hydraulic scheme for CNG dispenser with 2 banks:

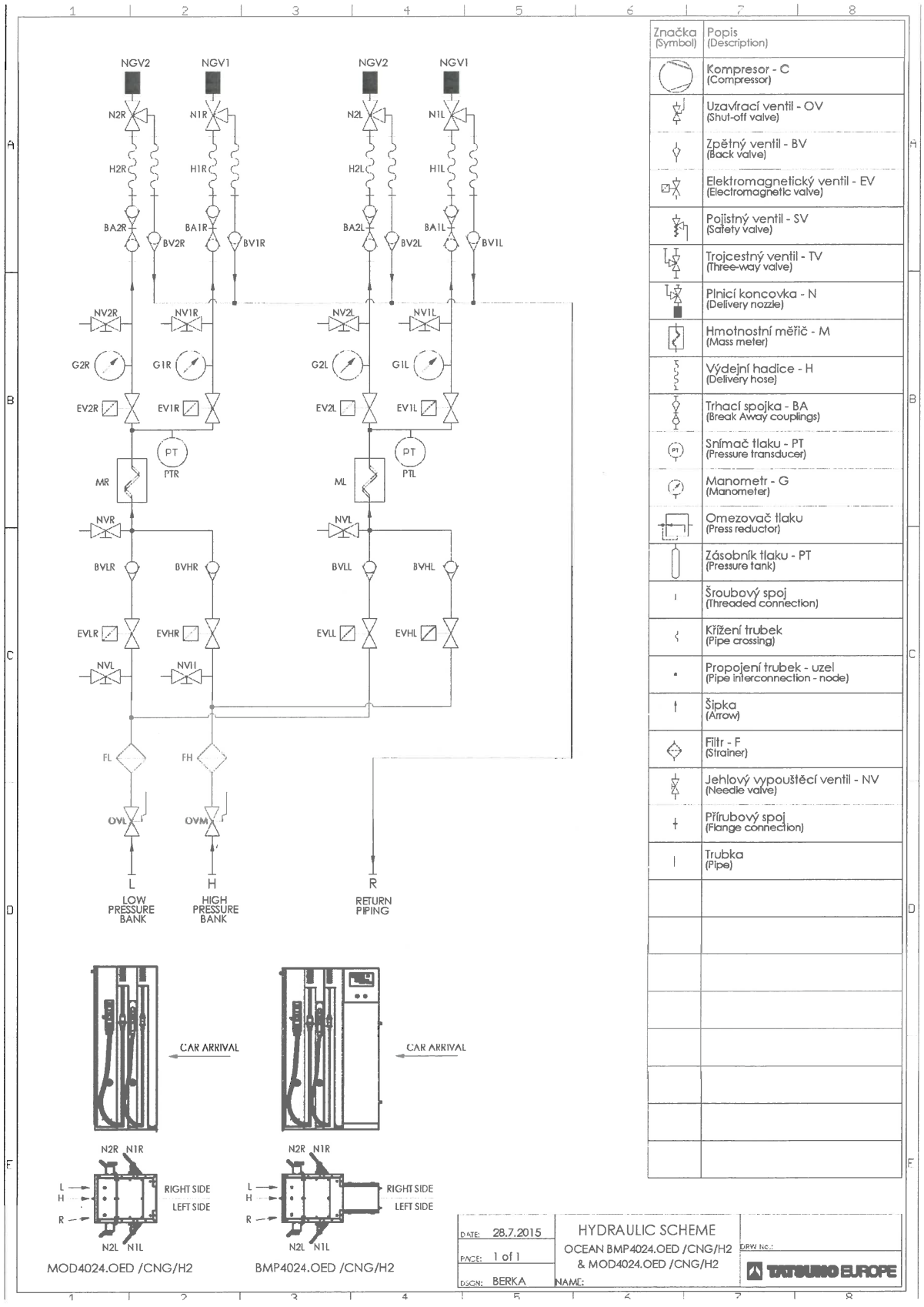
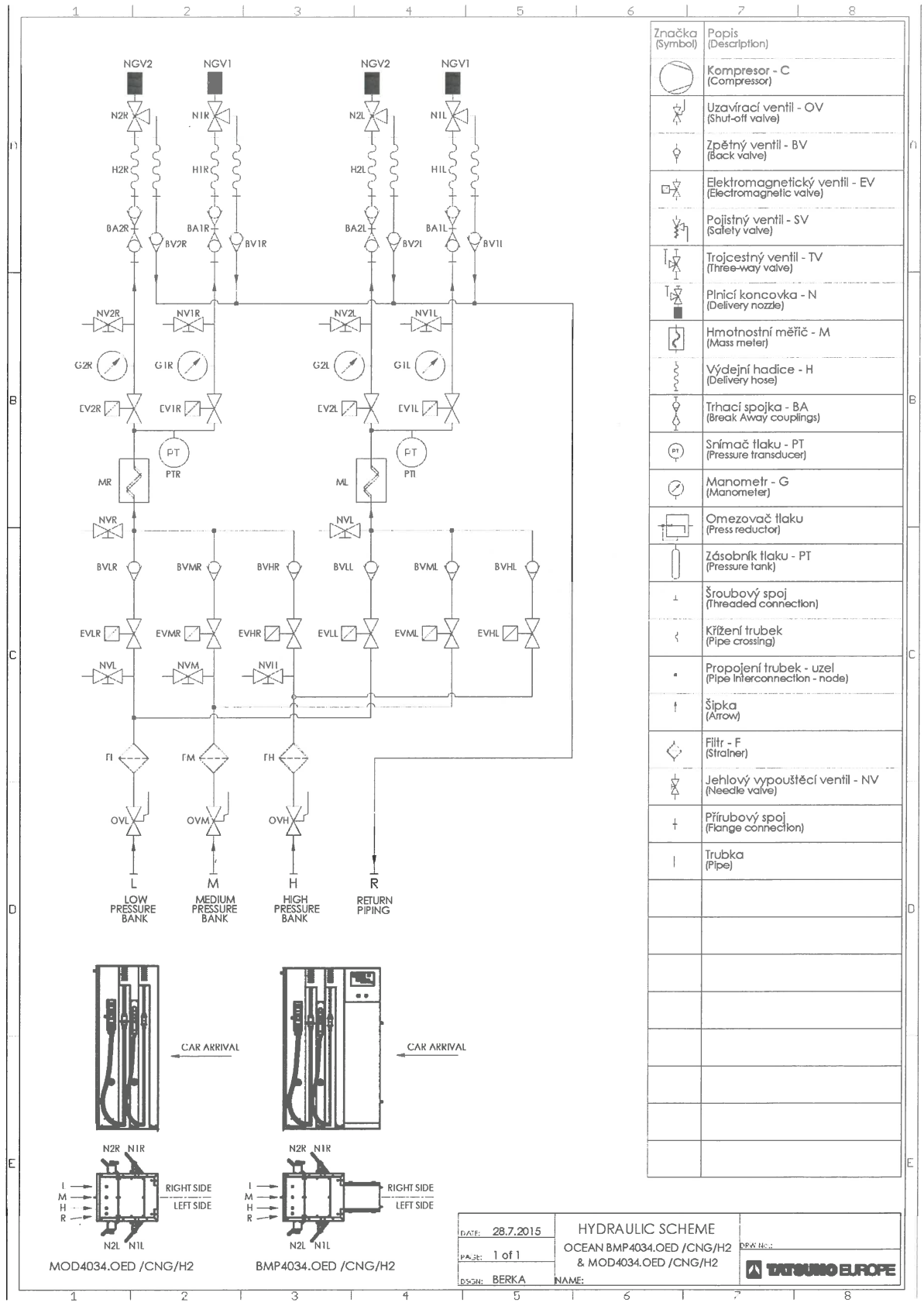


Figure 3: Hydraulic scheme for CNG dispenser with 3 banks:



Značka (Symbol)	Popis (Description)
	Kompresor - C (Compressor)
	Uzavírací ventil - OV (Shut-off valve)
	Zpětný ventil - BV (Back valve)
	Elektromagnetický ventil - EV (Electromagnetic valve)
	Pojistný ventil - SV (Safety valve)
	Trojcestný ventil - TV (Three-way valve)
	Plnicí koncovka - N (Delivery nozzle)
	Hmotnostní měřič - M (Mass meter)
	Výdejní hadice - H (Delivery hose)
	Trhací spojka - BA (Break Away couplings)
	Snímač tlaku - PT (Pressure transducer)
	Manometr - G (Manometer)
	Omezovač tlaku (Press reductor)
	Zásobník tlaku - PT (Pressure tank)
	Šroubový spoj (Threaded connection)
	Křížení trubek (Pipe crossing)
	Propojení trubek - uzel (Pipe interconnection - node)
	Šipka (Arrow)
	Filtr - F (Strainer)
	Jehlový vypouštěcí ventil - NV (Needle valve)
	Přírubový spoj (Flange connection)
	Trubka (Pipe)

Figure 4: Sealing of the electronic calculator and location of security DIP switches SW1:

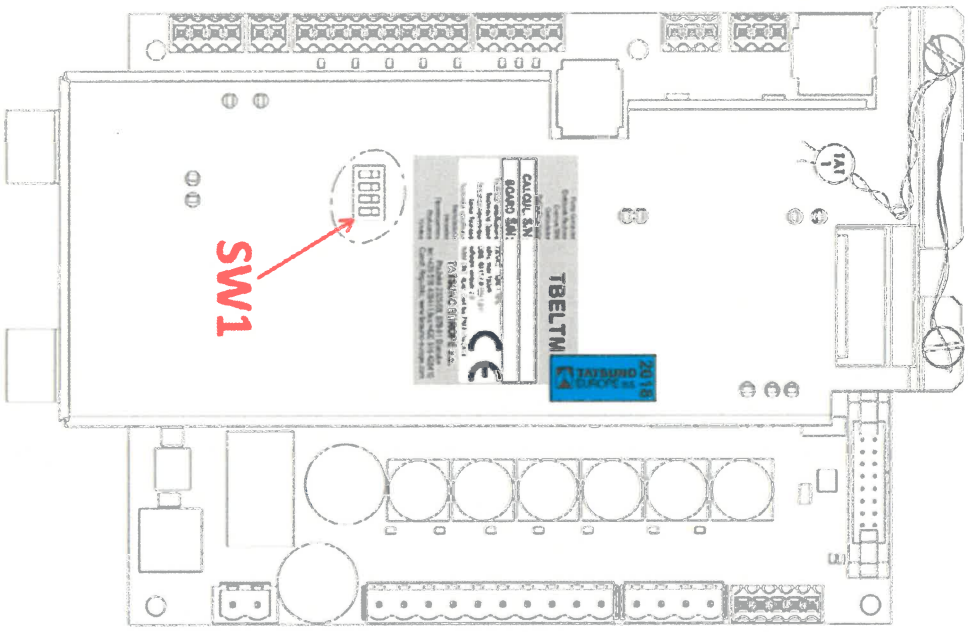


Figure 5: Type plate of the CNG dispenser

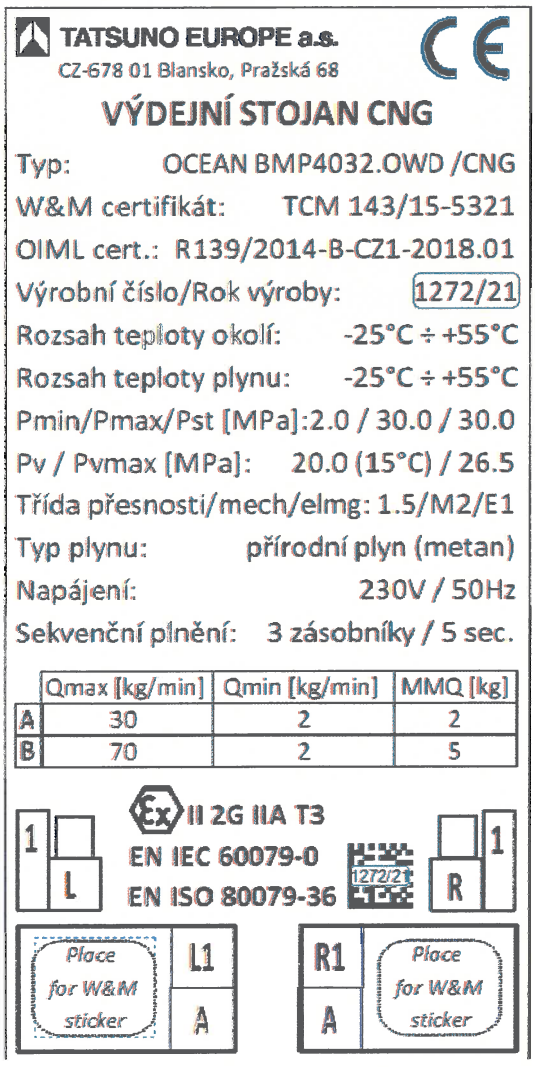


Table 1: Metrological parameters/registers of mass meter Micro Motion CNG050

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

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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

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