TATSUNO EUROPE a.s.

CNG DISPENSERS

TATSUNO EUROPE

Quick User Guide

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INTRODUCTION

This Quick User Guide is intended for the users of TATSUNO EUROPE electronic CNG dispensers and owners of service station where dispensers are installed and operated. TATSUNO EUROPE a.s. recommends thorough reading of this manual. The manual must be available to the dispenser attendant during operation and regular maintenance of dispensers.

- Make it available to other owners and users.
- Perform updates of regulations and manuals. This Quick User Guide together with Installation and User Guide is possible to view and download here: http://www.tatsuno-europe.com/_en/download/

The contents of the manual at the time of its release corresponds to reality. The manufacturer reserves the right to alter the technical specifications of the device or its properties without a written notice, due to its development and continuous improvement. All rights are reserved. No part of this manual may be reproduced or transferred without a written approval of TATSUNO EUROPE a.s.

Document revisions

Revision No. / Date	Changes	Made by
Revision 00 / 5. 9. 2018	Basic version of the document	Milan Berka
Revision 01 / 31. 3. 2022	Update of technical data, error messages, dispenser settings (PDEX5), Ocean Tower CNG	Milan Berka

1. INTRODUCTORY INFORMATION

Symbols used in this manual:

Warning

Explosion hazard

Attention! Electrical device

Smoking forbidden

Open flame use forbidden

Use of mobile phones forbidden

Terms used in this manual requiring special attention:

CAUTION *Failure to meet the requirements stated together with this term may create conditions leading to a personal injury or death or to extensive loss of property.*

WARNING *Failure to meet the requirements stated together with this term may lead to a personal injury and/or may cause dispenser damage.*

NOTICE *Items stated together with this term draw reader's attention to legal and/or statutory requirements that regulate the assembly and use of dispensers. Failure to meet these requirements may create a dangerous situation and/or result in dispenser damage.*

NOTE *Items stated together with this term are to draw reader's attention to assembly procedures, techniques, and operating methods etc. that are important to ensure correct assembly and proper operation of dispensers and which, if not observed, may result in damage, failure or poor performance of dispensers.*

1.1. PERMITTED USE

TATSUNO EUROPE dispensers, OCEAN CNG type series, are designed for stationary or mobile placement for refuelling motor vehicles with compressed natural gas (CNG) in a given amount from a gas storage to a tank of a motor vehicles.

CAUTION *Dispensers are complex devices that must secure a whole range of difficult functions.* ***Therefore, tanks and pipelines must be cleaned and fuel must be checked for cleanliness before commissioning (Filter clogging in a dispenser cannot be considered a reason for warranty repair!). An inspection of wiring and a check of connection correctness must be performed before commissioning to prevent any electric shock injuries and to ensure safety against explosion (fuels are combustibles of class I).***

NOTICE ***Any modification of the dispenser may invalidate the device certification. Refer to certification documents and manufacturer instruction manuals if any modification of the wiring and/or device is considered.***

Each dispenser is properly tested in the factory in terms of its function, safety, and metrology. The delivery of each dispenser also contains certification documents that must be submitted by the operator on demand.

1.2. HEALTH AND SAFETY

1.1.1. LIST OF SAFETY FACTORS

- Any odour of CNG (methane) must be immediately reported.
- It is necessary that all work at the fuel station, especially construction and repairs, is performed fill yin compliance with this list.
- It is the obligation of the constructor that all his employees comply with all laws, directives, and other regulations.
- Gas (CNG) may only be stored in tanks and containers compatible with.

Locations requiring higher carefulness

- Pressure containers, supply pressure pipes and dispensers.
- Any places near dispensers and pressure tanks during filling, especially in still air.
- 1 meter circuit around the gas pipes.
- The filters.

1.1.2. OBLIGATIONS OF EMPLOYEES

- To ensure optimum prevention of injuries, in addition to general rules for employee protection it is necessary to consider also national legislation about employee protection and actively support all measures improving safety standards.
- An employee is obliged to observe all company guidelines about accident prevention except for the cases when these guidelines are assessed as illegitimate.
- Employees must not act according to any instruction that violate safety rules.
- Employees may use designed tools only for their original purposes that are defined by the company itself.
- If an employee detects a tool unsuitable in terms of safety, he/she must immediately remove the defect. If the defect removal is not within the employee`s job content or if an employee does not have enough knowledge for its removal, he/she must immediately inform his/her superordinate.

The same applies also to the following:

- **Working materials** that are not properly packed or correctly described so that they correspond to safety requirements.

- **Working methods and processes** that are not correctly coordinated or checked so that they correspond to safety requirements.
- **If dangerous procedures are performed by several persons**, permanent flawless communication between them is necessary to prevent hazardous situations. In such a case a person must be appointed and authorized to perform overall supervision.

1.1.3. DANGER

Before starting work, the dispenser must be insulated (i.e., completely disconnected from the power supply) and the main switch must be switched off. The submersible pump (if used) and the control signals from the dispenser must also be insulated. This ensures technician safety. As a further precaution, turn off the main power supply in the fuel station booth and place there a clear warning to prevent it from being accidentally switched on. It is not allowed to turn on the dispenser before it is checked and approved by an authorized technician. This authorization is subject to the relevant national legislation. Removed packaging and facing material must be stored in such a way as to prevent damage to parts and personal injury. Covers that can be opened, such as the counter box, should be handled with care. Ensure that the fuse is in the correct position to prevent the lid from falling off on the head of the service technician or another person. For unmanned fuel stations, the Installation and User Manual must be available to all end-users. It should be placed visibly on the notice board and illuminated enough to be readable at night. For unmanned fuel stations, breakaway couplings must also be used to reduce the risk in the case of departure after the delivery nozzle has been forgotten in the vehicle tank.

WARNING ***Only qualified personnel authorized to do so may perform connecting and disconnecting to/from the electrical system. Work in hazardous areas must be ensured by complying with all applicable legal standards.***

1.1.4. PERSONAL PROTECTIVE EQUIPMENT

Protective clothing

The following clothing must always be worn during dispenser installation and maintenance:

- Protective helmet.
- Protective footwear (conductive).
- Protective leather gloves.
- Anti-static clothing.
- Eye protection.

Protective equipment for work in a hazardous environment

The following safety equipment is required to work in a hazardous environment:

- Only spark-free tools are permitted when working on the dispenser.
- It is strictly forbidden to use electric tools.
- Only explosion-protected working lights are permitted.
- It is strictly forbidden to use telecommunication tools in hazardous areas.

Safety instructions

The following safety instructions must be observed during installation and maintenance:

- Wear suitable protective clothing and gloves.
- Smoking and open fire are forbidden.
- Long hair and ties can be trapped in moving parts. Hair must be reasonably covered.

While refilling motor vehicles with compressed natural gas (CNG) is if forbidden to smoke and use open flame within a radius of 10 m – applies also to passengers inside the vehicle. This ban must be located in a visible place. Safety labels and symbols are used according to ČSN 018013. A visible notice about switching off the engine of the refilled vehicle and its auxiliary heating with a combustion chamber must be located at the dispenser. The vehicle must be

secured against spontaneous setting in motion. A carbon-dioxide extinguisher or dry-powder extinguisher with a filling of at least 6 kg must be located at each device. The device that is out of order must be secured against its misuse by an unauthorized person.

Device design safety

DEVICE DESIGN SAFETY IS GUARANTEED BY THE MANUFACTURER

The dispenser design meets the requirements of EN ISO 80079-36 and EN IEC 60079-0 standards and is designed for operation in environments designated by symbols Ex II 2G IIA T3 stated on the type label of the dispenser. With regard to the operation safety in the potentially explosive environment, dispenser compliance assessment was performed and documentation archiving was carried out according to article 10, par. 1b(2) of the Government Decree No. 116/2016 Coll. (article 13, par. 1b(ii) of the European Parliament and Council Directive No. 2014/34/EU) in a Physical-Technical Testing Institute in Ostrava – Radvanice, notified body No. 1026 with the archive number A484 -16. In terms of pressure safety, EU verification of the unit (Procedure G) was performed at the CNG dispenser according to the Appendix No. 3, point 11 of the Government Decree No. 26/2003 Coll. as amended (Appendix No. III, point 10 of the European Parliament and Council Directive No. 2014/68/EU) by the notified body No. 1017 TÜV SUD Czech s.r.o., Novodvorská 994, 142 21 Prague 4.

Operating safety

The operator is responsible for the fuel station operation and is obliged to entrust its operation only to trained employees having relevant authorization. The task of the attendant is, while observing all safety regulations, competently refill CNG pressure storage tanks of refilled motor vehicles and check the condition of dispensers, reservoirs, machinery operation, gas pressure and keep prescribed operating records in regular intervals.

Attendant's responsibilities

- Keep the operated devices in a safe and proper condition.
- Observe operating rules and regulations and operating instructions of gas devices.
- Immediately inform the operator about each failure, defect or abnormality during the gas device operation and immediately decommission the device in case of danger of delay.
- Permanently keep the gas device tidy and clean and ensure that no unauthorized persons are nearby the device.
- Immediately inform the operator about circumstances that impede the device operation for the attendant (in case of sudden indisposition).
- Write down the records into the operation logbook about the shift start and finish, inspections performed by the attendant and maintenance work, repairs, inspections, and audits.
- The fuel station and CNG dispenser attendant must not perform any repairs of the machinery and modify the settings of safety fittings on his/her own.

A special case is performing service interventions

- **A service worker must not violate the operating safety during repairs and other activities.** He/she must pay special attention to removing the covers of the dispenser not to cause any injury of him nor a casual customer.
- **While handling of electrical components, he/she must ensure safe disconnecting of electrical energy supply.**
- **Only approved components may be used for part replacements.** All parts subject to approval must be always put into condition which is prescribed by technical documentation (airtightness, grounding, electrostatically conductive delivery hoses, etc.).

Environmental safety

The CNG dispenser and the filling unit may be fitted with sensors of the gas leak detector (they are not a standard part of the dispenser delivery) which can be connected to the evaluation unit. In case of gas leak (low concentration) the unit

shall automatically signal the leak and in case of danger (higher concentration) it shall immediately decommission the whole system. In case of a small gas leak the attendant of the fuel station shall check the system and if he/she does not find any defect, leaked gas shall be ventilated and the system shall be put again into operation (small leak while connecting and disconnecting the delivery hose, influence of exhaust fumes). In case of higher concentrations of leaked gas, the evaluation unit shall disconnect the electrical system from operation. The fuel station attendant shall decommission the fuel station and announce the defect to a specialized company that shall perform the repair.

2. TATSUNO EUROPE DISPENSERS

2.1. DESCRIPTION OF DISPENSERS

All TATSUNO EUROPE dispensers are equipped with high quality hydraulics and a powerful reliable electronic counter. All dispensers work in the manual mode – independently, offline – as well as the automated mode, when they are controlled remotely from the kiosk of a fuel station and connected to the cash register (POS) via a data line. All dispensers have body parts (covers, doors, lids, etc.) made of steel painted sheet metal or stainless-steel sheet metal. Supporting parts of dispenser frames are made of steel painted sheet metal of a thickness 0.8 to 2.5 mm, or stainless-steel sheet metal. Each dispenser is equipped with an electronic counter with its own diagnostics and displays showing the delivered amount of money in the currency of the country of installation, the amount of fuel in kilograms and the fuel unit price. Displays of the fuel dispensers specified for private use display only the dispensed fuel quantity in kilograms.

NOTICE ***Standard painted versions of TATSUNO EUROPE dispensers are not intended for use in high humidity, chemical and saltwater areas. For such applications TATSUNO EUROPE supplies options using stainless steel materials.***

The compressed natural gas (CNG) dispensing module has a pressure part fitted with certified components made of stainless steel or galvanized steel. The access to the CNG pressure system is fitted with a lever-closable ball valve, then 25µm input particle filters to protect pressure component and equipment. Gas filling is regulated by valves and secured with check valves. The amount of gas flown through is measured with a mass meter the input of which is fitted with an electronic pressure sensor and mechanical pressure gauge (manometer). All such pressure connections are performed by using stainless or galvanized steel pipes with a high-quality connection system (two rings). All fixtures and brackets in the pressure section are made of galvanized sheet metal. The output of the pressure module and fixture of delivery hoses is secured with a fixed connection to which a delivery hose is connected which is fitted with a safety breakaway coupling that shuts the gas flow through the delivery hose on both sides in forcible tension stress with following disconnection. The delivery hose ends with a delivery nozzle. The pressure section of the CNG dispenser may be further equipped with a heat sensor for measuring the ambient temperature. Installation of the heat sensor allows activation of the filling temperature compensation function Filling with temperature compensation ensures that the vehicle storage tank is always filled with a maximum amount of gas while observing the condition of maximum pressure in the tank of 20 MPa at 15 °C.

2.2. BASIC TECHNICAL PARAMETERS

Table 1 - CNG (compressed natural gas) dispensers and modules

Mass meter	CNG050	CNGmass
Maximum flow rate Q_{max} [kg/min]	30 / 70	30 / 70
Minimum flow rate Q_{min} [kg/min]	2	0.8
Lowest metering MMQ [kg]	2	2
Fluid temperature range [°C]	-25 to +55	-50 to +80
Ambient temperature range [°C]	-40 to +55	-40 to +60
Maximum tank pressure P_{st} [MPa]	30.0	
Maximum gas pressure P_{max} [MPa]	30.0	
Minimum gas pressure P_{min} [MPa]	2.0	
Maximum delivering gas pressure P_v [MPa]	20.0 @ 15°C / 26.5	
Maximum unit price (number of digits)	9999(4) or 99999(5) *	
Maximum amount to pay (number of digits)	999999(6) or 9999999(7) *	
Maximum quantity (number of digits)	999999(6) or 1999999(6.5) *	
Scale interval [kg]	0.01 or 0.001	
Display type	Electronic	
Type of medium	Compressed natural gas	
Filtration of mechanical particles	Input filter >25µm	
Accuracy class	1.0 (1.5 OIML certificate)	
Mechanical class	M2	
Electromagnetic class	E1	
Humidity	Condensing	
Location	Open	
Measured unit	Mass [kg]	
Electronic counter	TBELTM	
Program version (W&M check sum)	1.01 (4092), 1.02 (24AD)	
Calculator powering	230V ± 10%; 50Hz; max. 300VA	
Electro-magnetic valves	Two-state; +24VDC/max.1A	

** Data transmission of the entire contents of the display with the number of digits 7/6.5/5 is only possible using the extended communication protocol (8/8/6)*

2.3. DISPENSER MODEL IDENTIFICATION

The basic design of the OCEAN CNG series business branding is:

1	2	3	4		5	6	7
BMP	4 0	3	2	.	O W	D	/CNG

A stand-alone dispenser always starts with a BMP abbreviation followed by a clarification of the dispenser configuration and design.

Field	Values	Description
1	---------->	**Device type**
	BMP	Dispenser. Standalone dispenser.
2	---------->	**Series of dispensers**
	40	**OCEAN.** Dispensers of the OCEAN EURO, OCEAN SMART, OCEAN TOWER series.
3	1.2 to 3	**Number of products.** Number of pressure gas inputs.
4	1, 2 to 4	**Number of delivery hoses.** It corresponds to the number of measuring systems.
5	---------->	**Dispenser design.**
	OE*	OCEAN EURO dispensers
	OS	OCEAN SMART dispensers
	OW	OCEAN TOWER dispensers
6	---------->	**Dispenser orientation**
	D	Double-sided dispenser.
	L	Single-sided dispenser – left.
	R	Single-sided dispenser – right.
7	---------->	**Specifying abbreviation**
	/CNG	CNG (compressed natural gas) dispenser or module.
	/H	Increased filling performance of one CNG hose (<70 kg/min).
	-2C	Simultaneous delivery of two delivery hoses on one side of the dispenser.
	-4C	Simultaneous filling of four delivery hoses on a dispenser.

/ Note: Serial production of the OCEAN EURO and OCEAN TALL series dispensers was terminated in October 2020.*

2.3.1. DISPENSER PARTS MARKING CONVENTIONS

Figure 1 illustrates the TATSUNO EUROPE dispenser marking and sorting system. In the case of a double-sided dispenser, the right side of the dispenser is also referred to as side A and the left side is referred to as side B. For a one-sided left or one-sided right dispenser, it is always only side A.

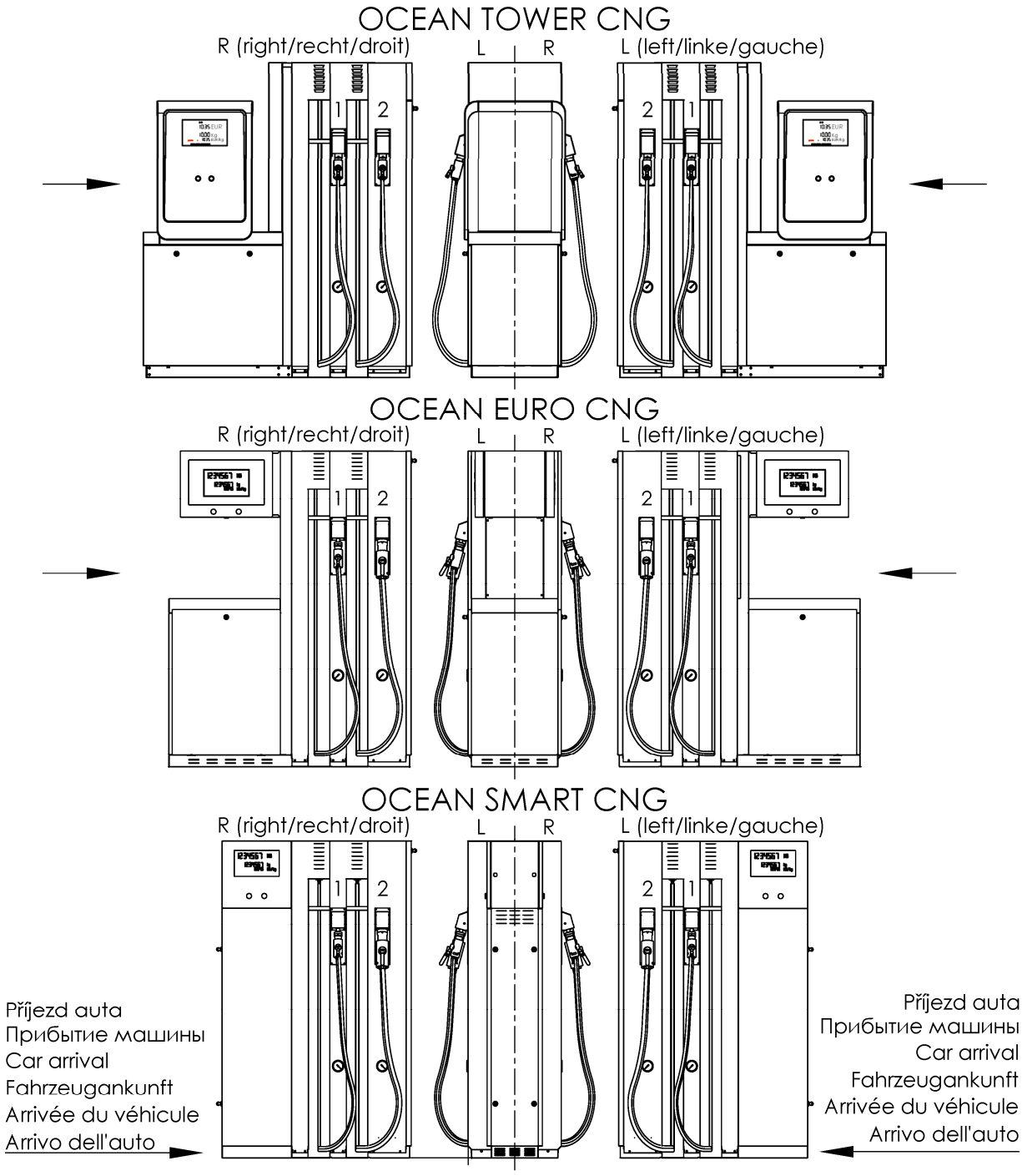


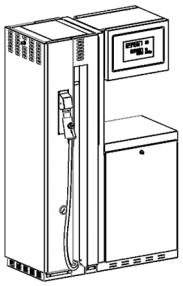
Figure 1 - Dispenser marking system with the recommended arrival direction

2.4. STANDARD MODELS OF DISPENSERS

2.4.1. OCEAN EURO CNG DISPENSERS

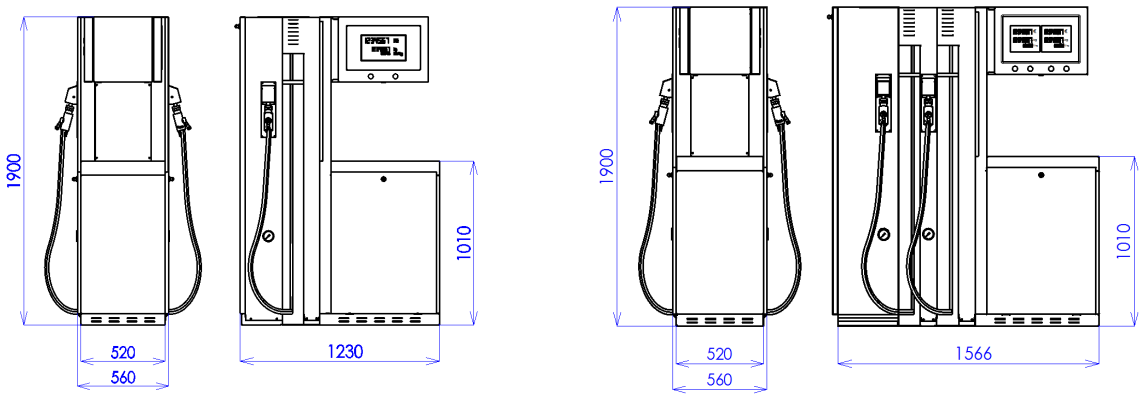
Dispensers for filling cars with compressed natural gas of the OCEAN EURO CNG series are standardly produced in single-sided left (L), single-sided right (R) or double-sided (D) versions with one to four free-hanging pressure filling hoses. The maximum filling capacity is 30 kg / min. with NGV1 filling nozzle for passenger cars or 70 kg / min. with NGV2 filling nozzle for filling trucks.

List of standard models of OCEAN EURO CNG dispensers:



Model of dispenser	**Access to dispenser** *(1-single-sided, 2-double-sided)*	**Number of pressure inputs**	**Number of meters** *(number of measuring systems)*	**Number of filling hoses**	**Number of main displays** *(number of simultaneous deliveries)*	**Filling performance** *[kg/min]*
BMP40x1.OEL(R) /CNG	1	x	1	1	1	1x30
BMP40x1.OEL(R) /CNG/H	1	x	1	1	1	1x70
BMP40x2.OED /CNG	2	x	2	2	2	2x30
BMP40x2.OED /CNG/H	2	x	2	2	2	1x30+1x70
BMP40x2.OED /CNG/H/H	2	x	2	2	2	2x70
BMP40x2.OEL(R) /CNG/H	1	x	1	2	1	1x30 + 1x70
BMP40x4.OED /CNG/H/H	2	x	2	4	2	2x30 + 2x70
BMP40x4.OED /CNG-4C/HE	2	x	4	4	4	4 x 30

Notes: x… is the number of CNG inputs (CNG pressure tanks) x = 1, 2 or 3 depending on the station technology. The filling capacity depends on the real conditions at the filling station - quality and length of piping, working pressure, volume and number of pressure tanks, compressor, length, and cross-section of filling piping in the vehicle, etc. The standard filling capacity is 30 kg/min. The filling capacity can be increased to 70 kg/min (/H). In the case of the /H /H marking, there are two filling hoses with a capacity of 70 kg/min in the dispenser. Pictures (PNG, DWG) with dimensions of all models can be downloaded here: https://www.tatsuno-europe.com/_en/download/



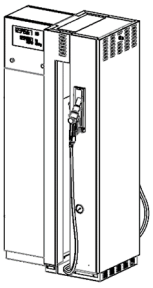
BMP40x2.OED /CNG *BMP40x4.OWD /CNG*

Figure 2 – Overview of standard OCEAN EURO CNG dispensers

2.4.2. OCEAN SMART CNG DISPENSERS

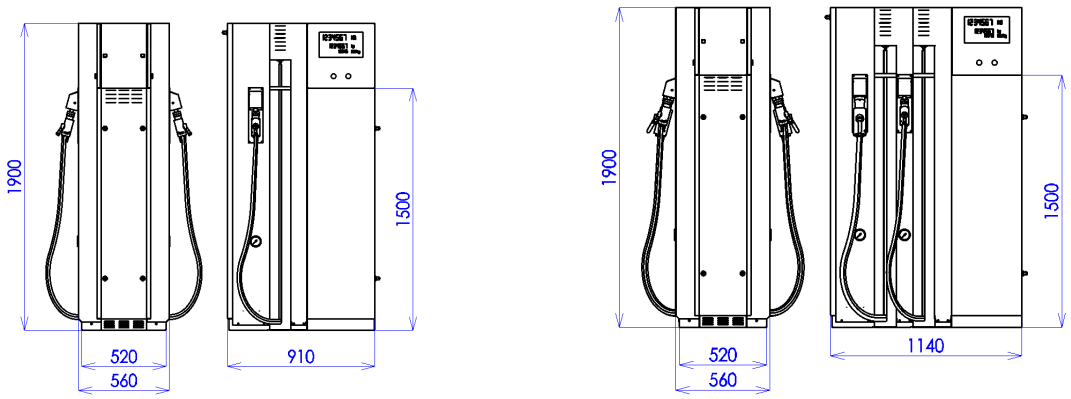
Dispensers for filling cars with compressed natural gas of the OCEAN SMART CNG series are standardly produced in single-sided left (L), single-sided right (R) or double-sided (D) versions with one to four free-hanging pressure filling hoses. The maximum filling capacity is 30 kg/min. with NGV1 filling nozzle for passenger cars or 70 kg/min. with NGV2 filling nozzle for filling trucks.

List of standard OCEAN SMART CNG stand models:



Model of dispenser	**Access to dispenser** *(1-single-sided, 2-double-sided)*	**Number of pressure inputs**	**Number of meters** *(number of measuring systems)*	**Number of filling hoses**	**Number of main displays** *(number of simultaneous deliveries)*	**Filling performance** *[kg/min]*
BMP40x1.OSL(R) /CNG	1	x	1	1	1	1x30
BMP40x1.OSL(R) /CNG/H	1	x	1	1	1	1x70
BMP40x2.OSD /CNG	2	x	2	2	2	2x30
BMP40x2.OSD /CNG/H	2	x	2	2	2	1x30+1x70
BMP40x2.OSD /CNG/H/H	2	x	2	2	2	2x70
BMP40x2.OSL(R) /CNG/H	1	x	1	2	1	1x30 + 1x70
BMP40x4.OSD /CNG/H/H	2	x	2	4	2	2x30 + 2x70

Notes: x… is the number of CNG inputs (CNG pressure tanks) x = 1, 2 or 3 depending on the station technology. The filling capacity depends on the real conditions at the filling station - quality and length of piping, working pressure, volume and number of pressure tanks, compressor, length, and cross-section of filling piping in the vehicle, etc. The standard filling capacity is 30 kg/min. The filling hose output can be increased to 70 kg/min (/H). In the case of the /H /H marking, there are two filling hoses with a capacity of 70 kg/min in the dispenser. Pictures (PNG, DWG) with dimensions of all models can be downloaded here: https://www.tatsuno-europe.com/_en/download/



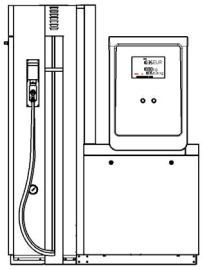
BMP40x2.OSD /CNG *BMP40x4.OSD /CNG*

Figure 3 – Overview of standard OCEAN SMART CNG models

2.4.3. OCEAN TOWER CNG DISPENSERS

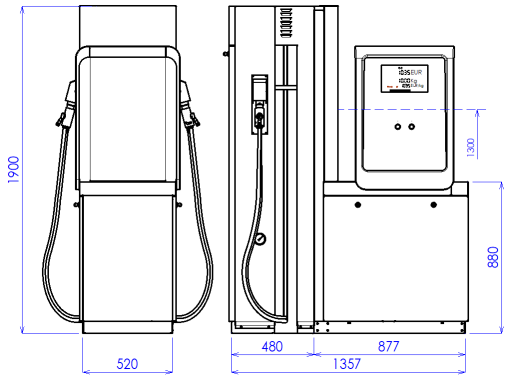
The OCEAN TOWER CNG series dispensers for filling cars with compressed natural gas are standardly produced in single-sided left (L), single-sided right (R) or double-sided (D) versions with one to four free-hanging pressure filling hoses. The maximum filling capacity is 30 kg/min. with NGV1 filling nozzle for passenger cars or 70 kg/min. with NGV2 filling nozzle for filling trucks & buses.

List of standard OCEAN TOWER CNG stand models:

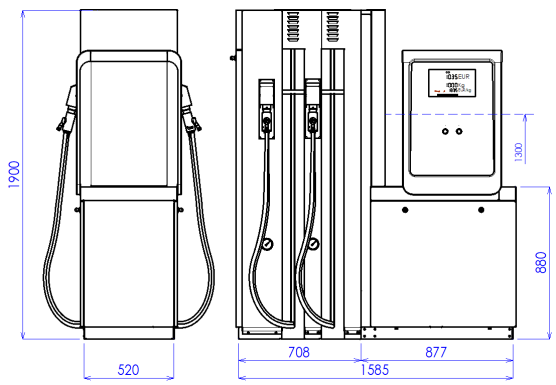


Model of dispenser	**Access to dispenser** *(1-single-sided, 2-double-sided)*	**Number of pressure inputs** *(number of pressure tanks)*	**Number of meters** *(number of measuring systems)*	**Number of filling hoses**	**Number of main displays** *(number of simultaneous deliveries)*	**Filling performance** *[kg/min]*
BMP40x1.OWL(R) /CNG	1	x	1	1	1	1x30
BMP40x1.OWL(R) /CNG/H	1	x	1	1	1	1x70
BMP40x2.OWD /CNG	2	x	2	2	2	2x30
BMP40x2.OWD /CNG/H	2	x	2	2	2	1x30+1x70
BMP40x2.OWD /CNG/H/H	2	x	2	2	2	2x70
BMP40x2.OWL(R) /CNG/H	1	x	1	2	1	1x30 + 1x70
BMP40x4.OWD /CNG/H/H	2	x	2	4	2	2x30 + 2x70
BMP40x4.OWD /CNG4C-HE	2	x	4	4	4	4x30

Notes: x… is the number of CNG inputs (CNG pressure tanks) x = 1, 2 or 3 depending on the station technology. The filling capacity depends on the real conditions at the filling station - quality and length of piping, working pressure, volume and number of pressure tanks, compressor, length, and cross-section of filling piping in the vehicle, etc. The standard filling capacity of the hose is 30 kg/min. The filling hose output can be increased to 70 kg/min (/ H). In the case of the /H /H marking, there are two filling hoses with a capacity of 70 kg/min in the dispenser. Pictures (PNG, DWG) with dimensions of all models can be downloaded here: https://www.tatsuno-europe.com/_en/download/.

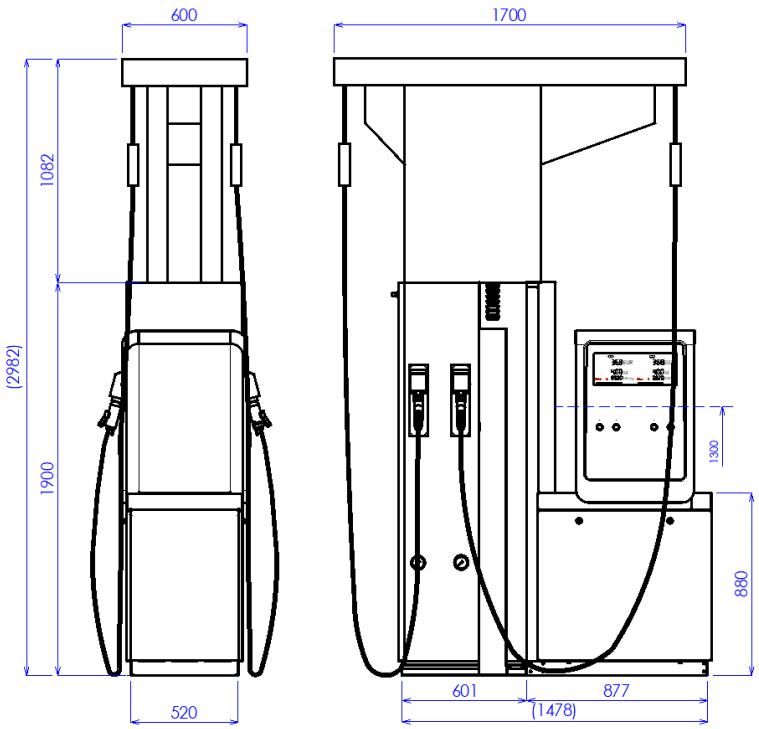


BMP40x2.OWD /CNG



BMP40x4.OWD /CNG

Figure 4 – OCEAN TOWER CNG standard models



BMP4024.OWD /CNG-4C--HE

Figure 5 – OCEAN TOWER CNG dispenser with four independent dispensing hoses NGV1 and hose extender (-HE)

2.5. TERMINOLOGY OF BASIC PARTS OF THE DISPENSER

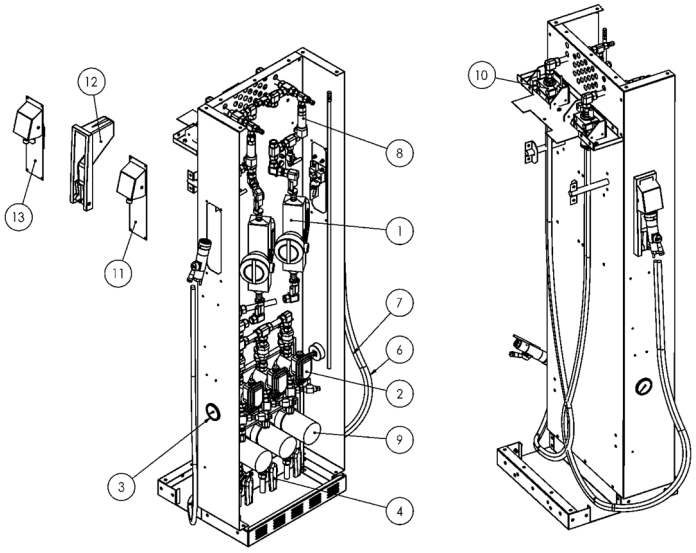


Figure 6 - Basic parts of the WSE dispensing module and its cover

Position	Device	Position	Device	Position	Device
1	CNG mass meter	**6**	CNG hose, filling	**11**	Nozzle cover, stainless, without a switch
2	CNG electromagnetic valve	**7**	CNG hose, ventilating	**12**	Nozzle cover, plastic, with a switch
3	Manometer 400 bar	**8**	Pressure sensor	**13**	Nozzle cover, stainless with a switch
4	Input ball valve	**9**	CNG filter		
5	CNG nozzle (filling end)	**10**	Breakaway coupling		

2.6. NAMEPLATES

Each dispenser is equipped with one, see Figure 7, or in the case of a combined dispenser, with several nameplates for individual fuels, see **Chyba! Nenalezen zdroj odkazů.**. If the number of delivery hoses is higher than two then the dispenser is supplemented with the so-called orientation label, see Figure 9, where it is schematically indicated what kind of fuel is pumped and with what hose. All data on the dispenser in terms of metrology and safety according to WELMEC 10.5 and European standards for equipment located in potentially explosive areas (EN 13617-1, EN 14678-1, EN IEC 60079-0 and EN ISO 80079-36) is contained in the nameplate. At the same time, the orientation label serves to metrology inspection for sticking the safety metrology labels stating the execution of measuring system verification.

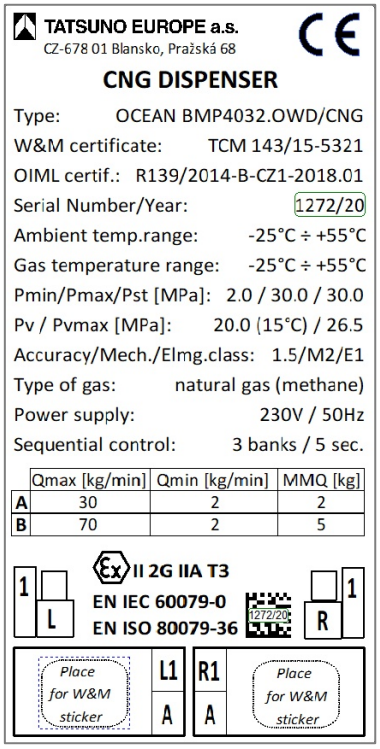


Figure 7 - Nameplate of a two-hose CNG dispenser

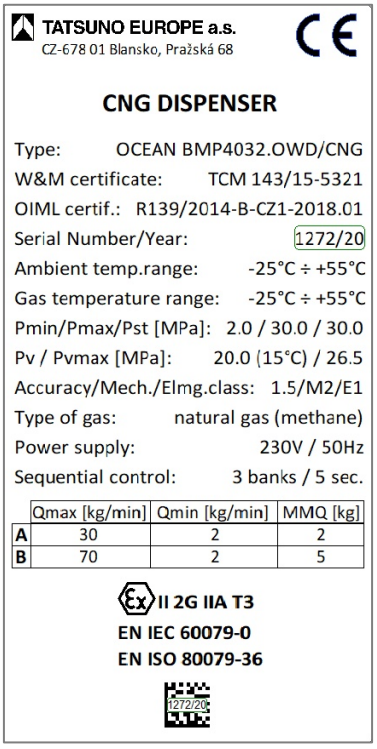


Figure 8 - Nameplate of the multi-hose CNG dispenser

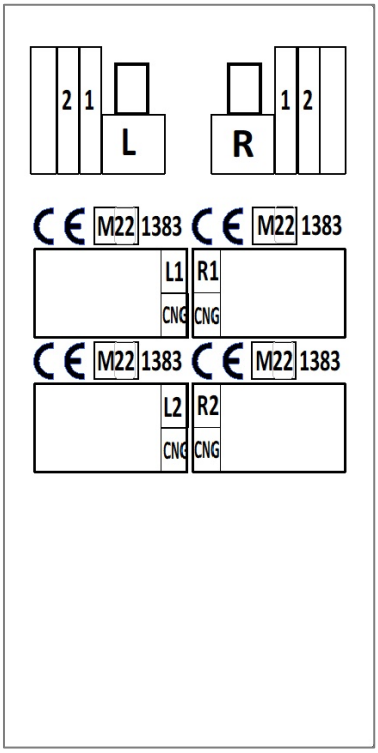


Figure 9 - Orientation label for multiple hose CNG dispensers

Table 2 - Label information on the dispenser and module

TATSUNO EUROPE a.s.	Name and address of dispenser manufacturer
CE	Dispenser labelling means that it is designed, manufactured and labelled in accordance with European Commission directives.
CNG DISPENSER	Device identification
Type of	Marking of the dispenser type (see section 2.3)
OIML certificate	Number of the OIML certificate
Serial number	Serial number of the dispenser (seq. number / year of production)
Gas temperature range	Range of gas temperature for which the dispenser was designed and approved
Ambient temperature range	Range of ambient temperature for which the dispenser was designed and approved
Pressure min/max	Minimum and maximum working pressure
Accuracy class/mech/elm.	Accuracy class / Mechanical class / Electromagnetic class
CNG	Type of gas for which the dispenser was designed and approved
Q_{max}	Maximum pumping / filling flow rate in kg/min
Q_{min}	Minimum pumping / filling flow rate in kg/min
MMQ	Minimum consumption in kg
II 2G IIA T3	Identification of the protection of a non-explosive electrical device: **II 2** – device for environment with an explosion hazard other than subsurface mines, probability of explosive atmosphere occurrence – zone 1 **G** – explosive atmosphere is formed by gases, vapours or mists **IIA** – gas group – the least dangerous **T3** – maximum temperature of an electrical device that could cause ignition of the ambient atmosphere (200°C)
EN 60079-0; EN 80079-36	Number of the European standard under which the dispenser was approved

3. INSTALLATION

3.1. INSTRUCTIONS FOR OCCUPATIONAL SAFETY




CAUTION

- *The installation of this appliance must be carried out by qualified personnel according to the relevant standards, rules and regulations and local restrictions and according to these instructions.*
- *It is forbidden to smoke or use open fire in the immediate vicinity of the dispenser.*
- *Always follow the measures for handling of gasoline, diesel, LPG, AdBlue®, WSE and CNG*
- *Observe all leaks in the dispenser. If any leakage of fuel, media or gas occurs due to any untightens, disconnect the supply voltage, and contact a service organization.*
- *The electrical installation must be carried out by qualified specialists.*
- *Ensure that a properly functioning fire extinguisher is available.*
- *When handling of the appliance, use suitable protective equipment.*

3.2. RECEIPT, TRANSPORT, UNPACKING

The customer shall contractually ensure the method of dispenser shipping. If the transport is ensured by TATSUNO EUROPE, a.s., it shall transport the product to an agreed place. The manufacturer has sufficient knowledge about the method of handling and transport. If the transport is ensured by the customer in another way, the manufacturer shall ensure professional loading. However, the manufacturer is not responsible for the method of transport. It is generally stated that the dispenser must be transported properly packed, always attached to the frame. The dispenser must be secured on the means of transport against damage (covers, paint), shifting and overturning. All handling and transport shall be totally performed in a vertical position. The dispenser must not be laid on covers.

WARNING *Only forklift trucks may be used during handling. In case of use of other handling equipment TATSUNO EUROPE, a.s. is not responsible for damage suffered.*

Packaging of dispensers is performed differently, according to the destination.

NOTICE

- *In case of packing the dispenser into a bubble wrap the maximum storage period under shelter is 3 months, 1 month in case of outdoor storage.*
- *In case of packing the dispenser into cardboard packaging the maximum storage period under shelter is 6 months.*

3.2.1. DISPENSER HANDLING

The following rules must be observed when loading, unloading and setting up the dispenser.

- Use a forklift to handle the fuel dispenser firmly attached to the wooden pallet. Follow the safety rules described by the forklift manufacturer.

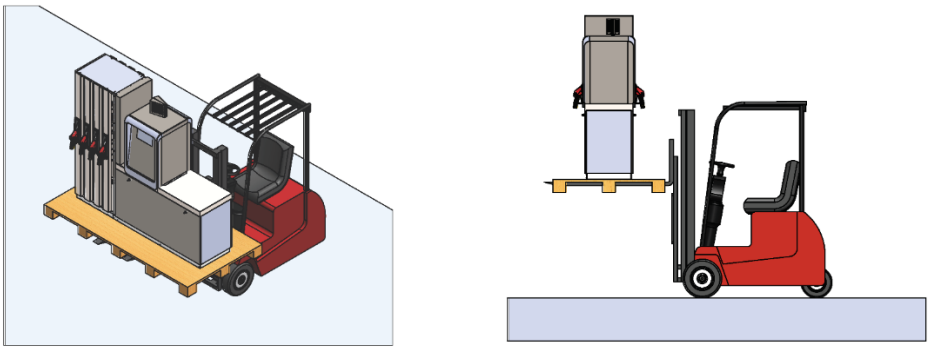


Figure 10 – Using of a forklift during loading and unloading

- When unloading and loading the fuel dispenser from or into the transport vehicle, use the direction from the side of the vehicle. Loading from the rear of the vehicle is dangerous and can damage the vehicle, the stand and injure people (see figure below).

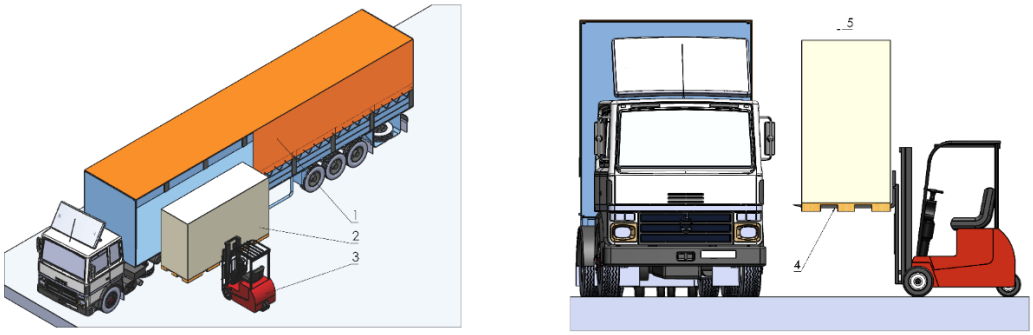


Figure 11 – Permitted and forbidden direction of loading and unloading of the dispenser
(1-transport vehicle, 2-dispenser on a pallet, 3-forklift, 4-wooden pallet, 5-permitted direction of loading and unloading)

3.3. DISPENSER LOCATION

3.3.1. IN GENERAL

The manufacturer recommends placing dispensers on safety islands of fuel stations in such a way that the direction of arrival of the vehicles to the dispenser corresponds to the orientation of the arrow, see Figure 1. The same figure shows the numbering of the dispenser products. The space for dispenser installation must be structurally secured so that the possibility of dispenser damage by an incoming car and following medium leakage into atmosphere is avoided as best as possible. Therefore, it is suggested to:

- Secure the access to the refilling position in straight direction
- Install the dispenser onto an elevated refuge with the following parameters
  - refuge elevation above the surrounding road at least 150 mm
  - refuge width at least 1,500 mm / refuge length at least 4,000 mm
- In case of dispenser installation directly onto the surface without a refuge it is necessary to secure the dispenser against collision with a vehicle by using a tube guard with the following parameters:
  - guard width at least 1,500 mm (refuge width) / length 2,000 mm
  - height of the upper edge of the tube above the road at least 450 mm

Example of the dispenser location at the fuel station – see Figure 13. If there is any fixed obstacle (column, wall, etc.) nearby the dispenser, the minimum separation distance of the dispenser from such obstacles must be observed due to safe operation and maintenance – see Figure 12.

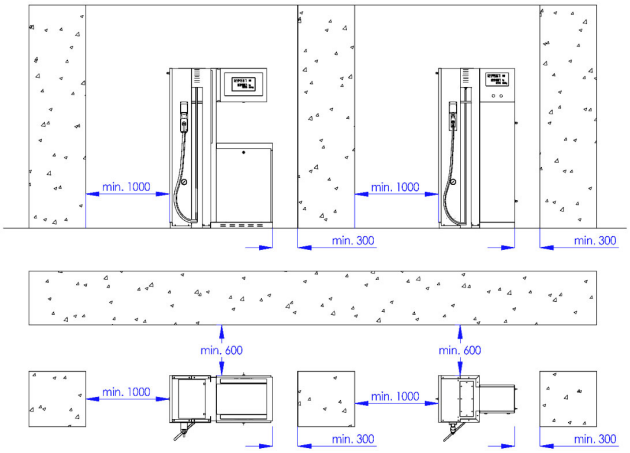


Figure 12 – Minimum recommended separation distance of the dispenser from a fixed obstacle

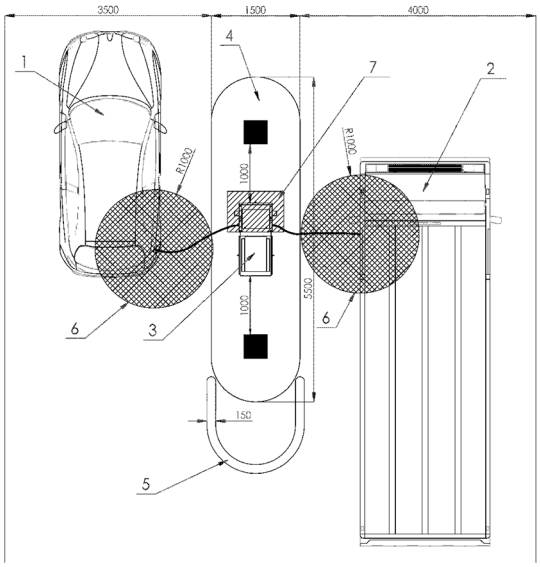


Figure 13 – Example of the CNG dispenser location at the fuel station
(1-refilling position for passenger cars, 2- refilling position for trucks and buses, 3-dispenser CNG dispenser, 4-dispenser refuge, 5-tube guard, 6-projection of the dangerous zone border (zone 1) of the filling end piece during delivery, 7- projection of the dangerous zone border (zone 2) of the CNG dispenser)

3.3.2. INSTALLATION OF THE DISPENSERS IN TERMS OF EXTERNAL INFLUENCES (DANGER ZONES)

Dispensers for gaseous fuel (CNG) create dangerous areas at the installation site - zones where under certain conditions (high surface temperature, flame, electric spark… etc.) the fuel or fuel vapor could ignite or explode. Before installing the dispenser at the filling station, the following must be taken into account in particular:

- what danger zones the dispenser creates with its operation
- what danger zones are created by the surrounding equipment (adjacent dispenser, storage tank, etc …)

Hazardous areas (zones, areas with a risk of explosion) are determined according to EN 60079-10-1. For CNG dispensers the dispenser zones are also regulated by the EN ISO 16923. Drawings of the zones created by the dispenser are part of the mandatory documentation of the dispenser manufacturer, see documents *IN041-ML Installation plans I* and *IN043 ML Installation plans II*. The drawing of the zones must define the spatial distribution of the hazardous areas inside and outside the dispenser - see the example in the figure below, where hazardous zone 2 (simply hatched) occurs up to a distance of **20 cm vertically and 5 cm horizontally** from the contour of the dispenser. Inside the dispenser, in addition to the meter housing, there is zone 1 or zone 0 (inside the vapour

recovery pipes). All electrical and non-electrical equipment located in these zones must be designed and approved for this hazardous environment (ATEX certificate, documentation archiving…).

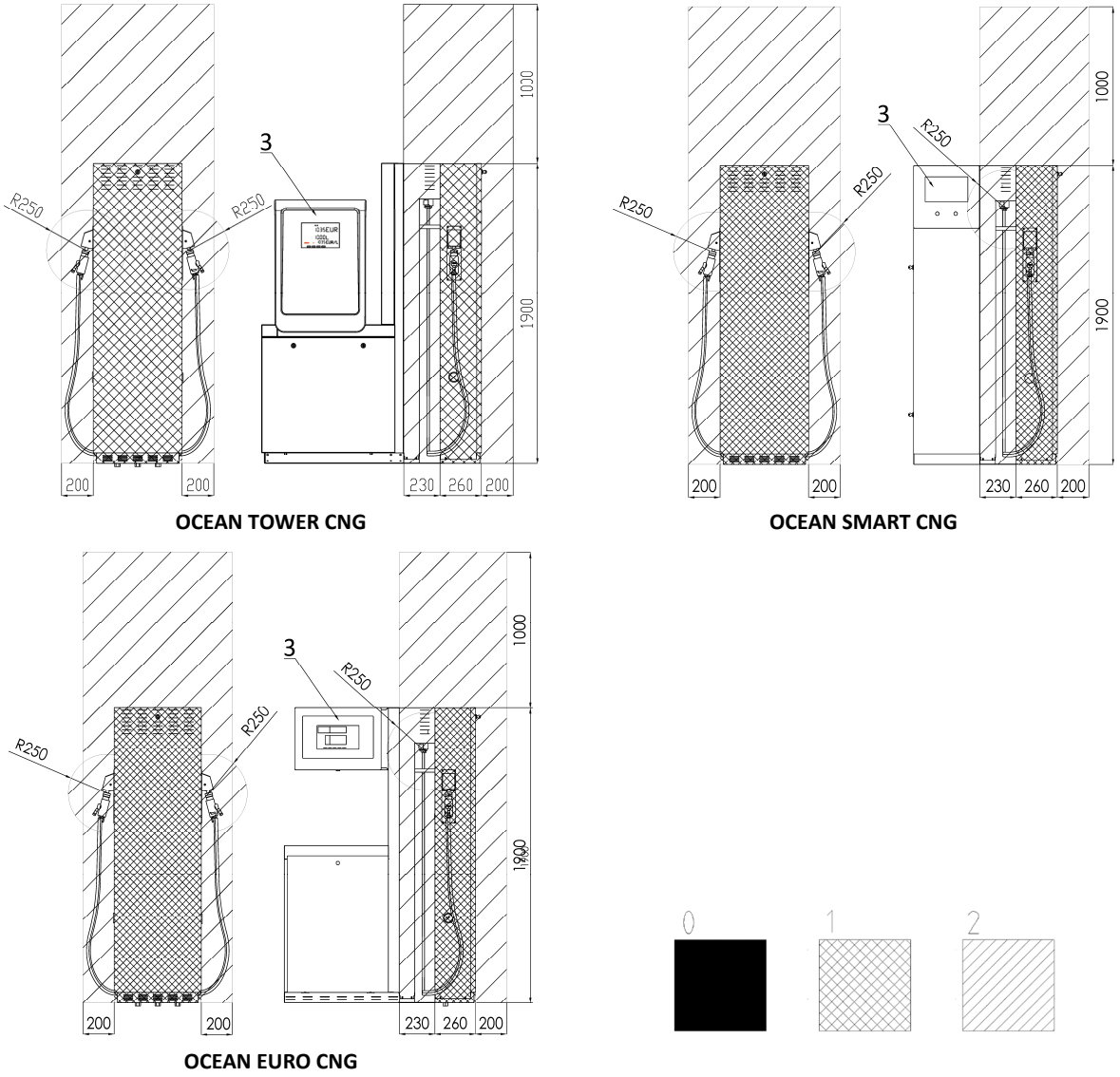


Figure 14 – Example of drawing the danger zones of the OCEAN CNG dispenser according to EN 60079-10-1 a EN ISO 16923
(0 - zone 0; 1 - zone 1, 2 - zone 2; 3 - non-explosive area)

CAUTION *TATSUNO EUROPE liquid or gaseous fuel dispensers must not be located in the danger zone. The electronic counters used in these dispensers are separated from other areas by a type 1 partition according to EN 13617-1, they are in an uncovered design (IP54 / IP55) and must therefore be located in a non-explosive area.*

3.3.3. ORIENTATION OF A SINGLE-SIDED DISPENSER

Single-sided dispenser stands are labelled "L" and "R" ("L" left/left-sided and "R" right/right-sided) after the dispenser type designation, e.g., BMP4011.OWL/CNG**,** see section 2.3. Dispenser orientation is determined by a view of the dispenser from the vehicle arrival direction, see Figure 1.

3.4. MECHANICAL ATTACHMENT OF THE DISPENSER

Dispensers are attached to special foundation frames by using anchor bolt supplied with the dispenser. The foundation frame of the dispenser is not a past of dispenser standard equipment but may be ordered separately.

The foundation frame is concreted into the safety island, then the front and rear covers of the dispenser are removed, the dispenser is placed onto the foundation frame and attached by anchor bolts. Then the dispenser is connected to the pressure pipeline with. Document *IN041-ML Installation plans I* shows the foundation frames and foundation plans of all types of dispensers with the indicated position of the pressure pipeline and the pipeline for extracting gas from dispenser nozzles. In the case of the CNG dispenser/module, the inlet pipeline of the outer diameter ø12 mm (standard delivery) or ø16 mm (higher delivery /H) is inserted to the interconnecting threaded joint with a screw ring located under the ball shut-off valve on the dispenser and then the threaded joint is tightened. **The inlet pipeline must be fitted with shut-off valves before its entrance to the shaft space under the dispenser for potential disassembly of the dispenser.**

CAUTION ***Joint design must ensure perfect tightness up to the pressure of 400 bar.***

CAUTION ***The inlet pipeline of the dispenser must be secured by overpressure protection (overpressure valve, etc.) against pressure higher than the permissible maximum operating pressure.***

3.5. ELECTRICAL CONNECTION OF THE DISPENSER

For electrical connection of TATSUNO EUROPE dispensers, it is necessary to perform protection against touch voltage according to an international standard HD 60364-4-41:2017, and applicable electrical cables must be then routed to each dispenser. It is necessary that all dispensers at the fuel station are interconnected by a grounding wire and connected to the grounding system. As a grounding wire you can use a yellow-green cable with a section of at least **4 mm^2** or a special grounding strap. The grounding wire must be connected to a central grounding terminal of the dispenser located on the foundation (bolt M10) marked with a mark for grounding.

CAUTION ***Only cables complying with the requirements of European standard EN 13617-1:2012 may be used as supply cables. The essential properties of these cables include resistance to oils, gasoline, and gasoline vapour (according to HD21 13S1).*** *Examples of electrical wiring are given in IN041 – Connection plans.*

In terms of used voltage and function the cables may be divided into power (supply) and signal cables.

Power cables:

- supply of counters, switching circuits
- switching of valves located outside the dispenser (control of pressure section valves)

Signal cables:

- communication line
- additional service and safety lines (STOP signal, collective error signal, etc.)

Table 3 – Cable characteristics

Cable type	Function	Number of wires	D_{Anom} [mm]
H05VV5-F 3x1.5	counter power supply	3	7.4 – 9.4
H05VVC4V5-K 5x0.5	data line	5	10.1
H05VV5-F 2X0.5	collective error signal	2	5.9
H05VV5-F 5G1.5	control of pressure section valves	5	9.1 – 11.4

Legend: D_{Anom} - cable outer diameter

NOTICE *Cable bushings M20 x 1.5 and M25 x 1.5 in an explosion-proof design with protection Ex II 2G Ex e II and IP65 are used in the dispenser distribution boxes. These bushings have a cable diameter range (D_{anom}) of* ***7.0 mm to 13.0 mm (M20) and 11.0 mm to 17.0 mm (M25). It is forbidden to use cables that have a diameter outside of the permitted bushing range!***

NOTICE *Pulse overvoltage may occur in any line due to the strike of lightning up to the distance of several kilometres or due to any industrial activity. The size of pulses formed by lightning induction is sufficient to a total damage of electrical equipment.*

For these reasons the overvoltage protection is used which diverts energy of the overvoltage pulse to the grounding wire, thus protecting the device. The dispenser manufacturer ***recommends*** *protecting the main switchboard (or the secondary switchboard) supplying the dispensers, electronic devices (computer, payment terminal, etc.) and data lines by overvoltage protection and lightning arresters.* ***The manufacturer is not responsible for damage caused by insufficient protection of cable connections!***

NOTICE *For trouble-free operation of dispensers,* ***it is necessary to consistently separate signal cables from power supply cables.*** *When power cables are in the vicinity of signal cables, the interference and undesirable parasitic phenomena occur that can cause problems with controlling the dispensers or even destruction of electronic devices placed in dispensers and in the booth. Therefore, any intersection or joint routing (in one harness) of signal and power cables must be avoided. This can be solved so that power and signal cables have their own "channels" (storage, metal pipes).* ***The manufacturer is not responsible for damage caused by improperly performed cable connections!***

4. DISPENSER SETTING AND BASIC FUNCTIONS

Dispenser setting is performed by the set of setting parameters via which it is possible to control functional parameters of the dispenser, totally change the mode and behaviour of the dispenser in different situations. Depending on the type of an electronic counter installed the parameter values can be viewed and changed using the remote IR (infrared) controller, the service keypad, or the pre-set keypad buttons located on the dispenser. The basic control unit of the dispenser is an electronic counter, which is stored together with the display units inside the lockable counter cabinet in a non-explosive environment. The TBELTM type counter is used in the CNG dispensers.

4.1. TBELTM COUNTER

The TBELTM electronic counter is set using the remote controller. The yellow service remote controller PDERT-5S is intended for service engineers authorized by the dispenser manufacturer. This remote controller allows to perform complete settings of all dispenser parameters. The silver remote controller PDERT-5O is intended for fuel station managers and this remote controller allows them to perform:

- reading non-resettable electronic litre totalizers of all delivery hoses
- reading and resetting daily electronic litre and financial totalizers of all hoses
- setting of unit prices of products (in manual operation)
- reading and setting of operating parameters of the dispenser

The setting mode may be called up at the dispenser by a below stated procedure only in the condition when the dispenser is at rest - i.e., in the condition of “finished delivery”, all nozzles hung, all sales finished. There are two access modes:

- The ***operator mode*** is designed for the operators of the fuel station. It only allows you to read the values of the electronic totalizers and values of the basic parameters of the dispensers. It does not allow you to reset or change the parameter values.
- The ***manager mode*** is designed for the manager of the fuel station. It allows you to read the values of the electronic totalizers and set the basic operating parameters of the dispenser. The access to

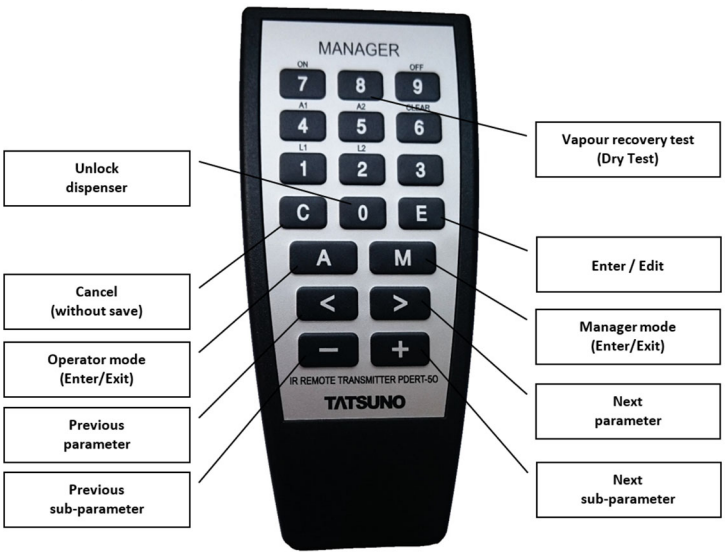


Figure 15 – Description of keys of the PDERT-5O remote controller

the Manager mode is protected by password.

4.1.1. DESCRIPTION OF PDERT-5O REMOTE CONTROLLER

The keyboard of the PDERT-5O remote manager`s controller is described on previous page picture. While using the remote controller it is necessary to move the remote controller closer to the distance of approx. 1 meter from the centre of the dispenser display. The manager mode is started by pressing the **<M>** button, the operator mode by the **<A>** button. The set and read values are displayed on the display. During the reading of the electronic totalizers, the convention of marking the parts of the dispenser applies which is described in picture below. In addition to setting and reading parameter values of the electronic counter of the dispenser, the remote controller can also be used for the following operating functions:

- **Pre-selection of the delivered amount/volume.** Keys <0>, <1>, …. <9> can be used just like the pre-set keypad to set the volume/amount pre-selection on the dispenser.
- **Unlocking the dispenser after delivery.** If the dispenser is in the manual mode with the blocking after delivery, you can unlock the dispenser with the <0> key, or only one side with the <C> key.
- **Unlocking the dispenser after an error.** When the dispenser is in the manual mode and an error occurs on the dispenser, the error status can be cancelled by pressing the <0> key or by lifting and hanging the nozzle.

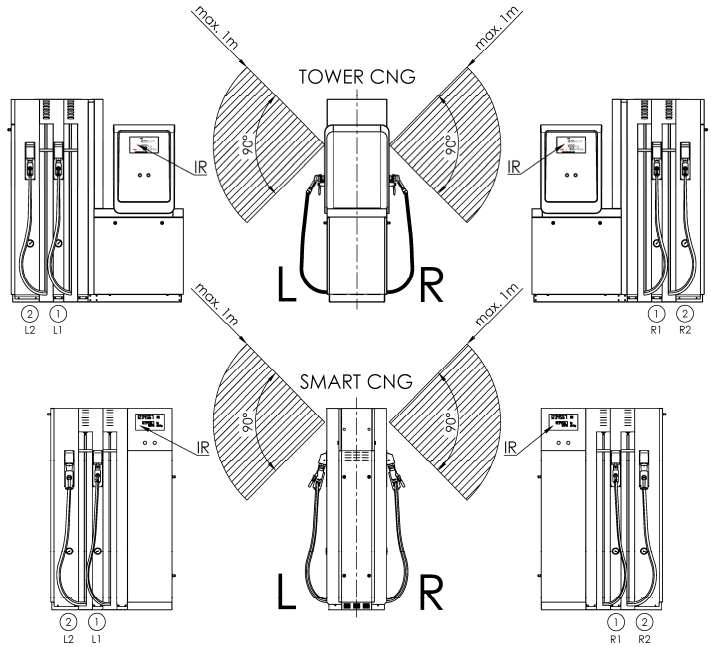
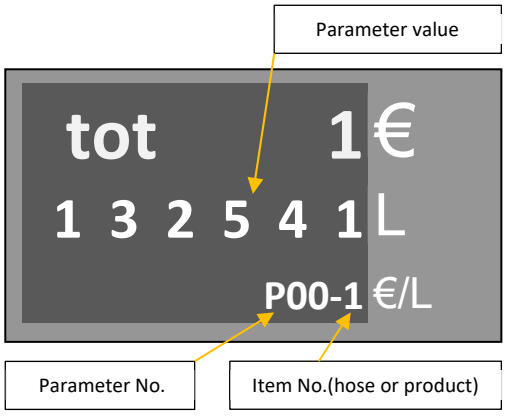


Figure 16 – Range of operation of the remote controller and marking of hoses and products in electronic counter
(IR - position of infrared receiver on the display; ①,②,③ … - nozzle position in calculator)

4.1.2. DISPLAYING DATA IN THE SETTING MODE

All data is displayed on the dispenser display in setting modes. While controlling using the remote controller the data is displayed on the display of that side where the setting mode was called up from by the remote controller. Individual parameters are shown as follows on the display:

No. of parameter: P00
Item No.: 1 (dispensing hose order)
Parameter value: 1132541 (quantity in grams)



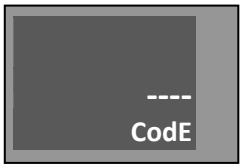
4.1.3. OPERATOR MODE

The operator mode of the TBELTM counter is started by pointing the manager`s remote controller on the dispenser display from the distance of approx. 1 m from the dispenser display centre and by pressing the <**A**> button. **All delivery nozzles on the dispenser must be hung in advance and the sale on the dispenser must be finished (paid).** After calling up the Attendant mode the value of the first parameter is displayed. Parameters and their items may be switched by using the <**>**> and <**+**> keys. The operator mode allows to view **but not change** the values of all parameters listed below, see table below. Individual parameters will be described further. The operator mode is finished by pressing **<M>** or **<A>** keys. The mode is finished automatically if no remote controller button is pressed for 60 seconds.

Parameter	Description
P00	Non-resettable totalizers
P01	Daily totalizers (resettable)
P03	Product unit prices (in manual mode)
P04	Current time and date
P05	Counter program version and check sums
P06	Error message history
P07	Latest delivery history

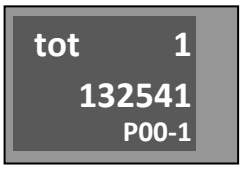
4.1.4. MANAGER MODE

The manager mode is started by pointing the manager`s remote controller at the dispenser display from the distance of approx. 1 m from the dispenser display centre and by pressing the <**M**> button. **All delivery nozzles on the dispenser must be hung in advance and the sale on the dispenser must be finished (paid).** After calling up the manager mode the dispenser display shows a prompt for entering the 4-digit access password: Due to keeping the password confidential the digits entered are shown as dashes. The following default access password is set in the factory: "1111". ***Example:*** *Gradually press* ***<M>*** *and* ***<1111>*** *and* ***<E>*** *keys.*



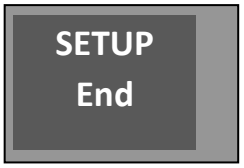
NOTE If the fuel station manager forgets the valid access password, then he/she must contact the authorized service staff who can set a new one.

After entering the valid access password, the display shows the value of the first parameter P00-1. Now it is possible to browse parameters by using the **<>>** key or by entering the **number of searched parameter** and confirm with the **<E>** key to go directly to the desired parameter. The Manager mode allows to view and change the values of parameters listed below, see table below.



Parameter	Description	Parameter	Description
P01	Non-resettable totalizers	P09	Maintenance history
P02	Daily totalizers (resettable)	P10	Serial numbers of connected electronic units
P03	Product unit prices (in manual mode)	P11	- reserved -
P04	Current time and date	P12	Dispenser controlling mode
P05	Counter program version and check sums	P13	Defects statistics
P06	Error message history	P14	Current operating temperature
P07	Latest delivery history	P15	Resetting daily totalizers
P08	Access password for the Manager mode		

The manager mode is finished by pressing **<M>** or **<A>** keys. The mode is also finished automatically if no remote controller button is pressed for 60 seconds. When leaving the setting mode, the message **SETUP End** appears on the display, and then the last fuelling transaction is displayed (the last state of the display before entering the manager mode).



4.1.5. NON-RESETTABLE TOTALIZERS (P01)

Non-resettable electronic totalizers for all dispensing hoses (nozzles) are saved in the memory of the electronic counter. These totalizers state what total volume was delivered by individual delivery hoses. **These totalizers cannot**

be modified in any way.

Parameter	Meaning
P01-1	quantity of gas flown through the hose 1 in hundredths of kilogram (x 0.01kg)
P01-2	quantity of gas flown through the hose 2 in hundredths of kilogram (x 0.01kg)

NOTE *Number of totalizers of delivery hoses shown in the P01 parameter is conditioned by the configuration of the dispenser.*

4.1.6. DAILY QUANTITY TOTALIZERS (P02)

Electronic daily quantity totalizers for all dispensing hoses are stored in the electronic counter's memory. They indicate how much fuel has been delivered by the individual dispensing hoses after the last reset (e.g., after the start of the shift). **These totalizers can be reset at any time using parameter P15** (see description below).

Parameter	Meaning
P02-1	quantity of gas flown through the hose 1 in hundredths of kilogram (x 0.01kg)
P02-2	quantity of gas flown through the hose 2 in hundredths of kilogram (x 0.01kg)

4.1.7. FUEL PRODUCT UNIT PRICES (P03)

This feature allows you to view and set current unit prices (i.e., one kilo of gas) of all fuel products. These fuel unit prices are set on the display at the first lift of the delivery nozzle and reset of the display if the dispenser works in the **manual mode**. Setting is made by pressing the **<E>** key and entering the price in the **<PPPP>** format and confirming by the **<E>** key. The decimal point is not entered. E.g., unit price 1.03 €/kg is entered as number 0103, price 34.15 CZK/kg as number 3415, etc.

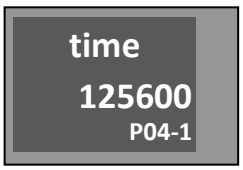
Parameter	Meaning	Factory setting
P03-1	product unit price hose 1	0.00 Euro / kg
P03-2	product unit price hose 2	0.00 Euro / kg

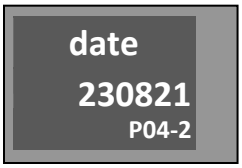
NOTE *Number of fuel products shown in the P03 parameter is conditioned by the configuration of the dispenser. If you change the unit price, such change will be reflected after a subsequent lift of the delivery nozzle.*

NOTICE *Values set in the P03 parameter are valid **in the dispenser manual mode only.** If the dispenser is connected to the central control system of the fuel station, then the fuel unit price is set directly by the control system before each delivery. In such case the values of the P03 parameter are non-functional.*

NOTICE The dispenser does **not enable deliveries with a zero value of the unit price.** *In such case, after lifting the delivery nozzle the dispenser display shows the error message E30 and the delivery does not start.*

4.1.8. CURRENT TIME AND DATE (P04)





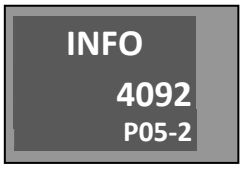
This function allows to view and set the current time and date. The setting is made by pressing the **<E>** key by entering the time/date in the correct format and confirming with the **<E>** key.

Parameter	Meaning	Factory setting
P04-1	Time setting, format HHMMSS (i.e., 125600 = 12:56:00)	0:00:00
P04-2	Date setting, format DDMMYY (i.e., 230821 = 23. 08. 2021)	1.1.2001

NOTE *The time/date information is used by parameters P07 and P07 to record the exact moment of the fault and end of delivery. The date/time data has only an informative function, it does not affect the process of fuel delivery.*

NOTICE *The internal clock is reset at least 48 hours after the power supply off. Time and date values will switch to factory setting and must be set again!*

4.1.9. DISPLAYING THE PROGRAM VERSION AND CHECK SUMS (P05)



This function shows the number of the program version of the dispenser counter and different check sums. These values are intended for metrology authorities and authorized service engineers. The meaning of the individual parameters is described in the table below.

Parameter	Meaning	Parameter	Meaning
P05-1	Version of program's metrology parts	P05-5	Check sum (CRC) of the parameter memory
P05-2	Metrology check sum (CRC) of the program	P05-6	Check sum (CRC) of the device for temperature compensation
P05-3	Release number (C + number), program version	P05-7	Time and date of program creation (e.g., 07:56:17, 19. 07. 2011)
P05-4	Total check sum (CRC) of the program		

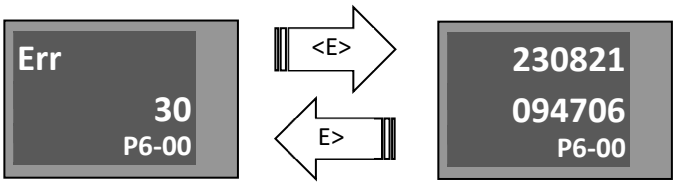
NOTE *Metrologically relevant data P05-1 and P05-2 also appear on the display for a while after the power on.*

NOTE *The calculated CRC (cyclic redundancy sum) values are checked after switching on. If the calculated checksum is different from the stored correct sum, the dispenser is blocked and error message E13 is displayed. Higher cyclic checksum orders are displayed on the amount line, lower orders on the quantity line. The CRC of the peripheral unit programs (PDEINP and PDEDPS) is checked before each delivery is enabled. If the calculated value of the peripheral unit checksum does not match the correct value, delivery (fuelling, pumping) is not started and the corresponding error message is displayed.*

4.1.10. ERROR MESSAGE CODES HISTORY (P06)

The function is used to display the history of the last 100 error message codes that have occurred and displayed on the dispenser. The table of error messages codes is given in chapter 6.2.1. After switching to parameter P06, the display shows the code of the last error message (e.g., E30 zero unit price). After pressing the **<E>** key, the date and time of the fault will be displayed. After pressing the **<+>** key, the code of the penultimate error message code, etc. appears on the display.

Parameter	Meaning
P6-00	code of the last error
P6-01	code of the penultimate error
…	…
P6-98	99th error code in the sequence
P6-99	100th error code in the sequence



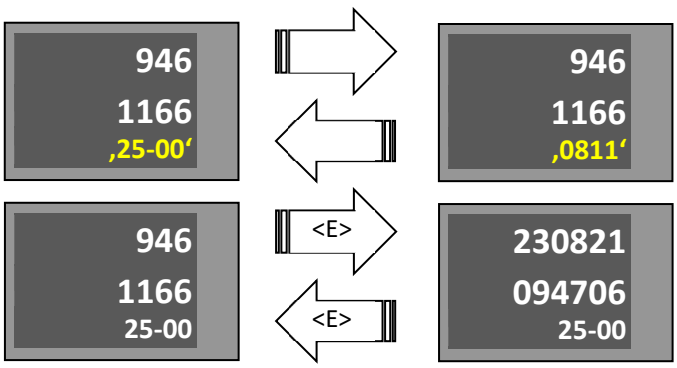
NOTE *If two identical error message code occur in a row, then only the last one is displayed.*

4.1.11. LAST FUELLING HISTORY (P07)

The parameter is used to display the last 50 fuellings (deliveries). After switching to parameter P07 the display shows the last fuelling transaction. The transaction price with the parameter number flashes on the unite price display. After pressing the **<+>** key, the penultimate fuelling…, etc. appears. After pressing the **<E>** key, the date and time of the end of the saved fuelling will appear on the display.

Parameter	Meaning
P6-00	Last fuelling
P6-01	Penultimate fuelling
…	…
P6-48	49th last fuelling in the sequence
P6-49	50th last fuelling in the sequence

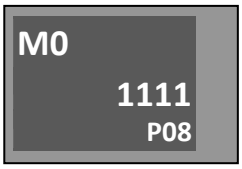
<u>Example:</u> Last fuelling at filling point A had a value of 11.66 L, 9.46 €, 0.811 €/L and was terminated 23.8.2021 at 9:47:06



4.1.12. MANAGER MODE ACCESS PASSWORD (P08)

This function allows to view and change the password to the manager mode. The setting is made by pressing the **<E>** key by entering a new password in **<PPPP>** format and confirming **<E>**.

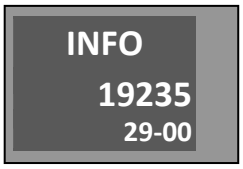
Parameter	Meaning	Factory setting
P08 = 1 to 9999	Manager mode access password	1111



4.1.13. MAINTENANCE HISTORY (P09)

The parameter allows you to display the identification codes of the last 50 service remote controllers that entered into service mode of the counter. After switching to parameter P09, the code of the last service remote controller (e.g., 19235) appears on the quantity display line. After pressing the **<+>** key, the penultimate remote controller code will appear. After pressing the **<E>** key, the date and time of entering the service controller into the setting mode of the dispenser counter will appear on the display (e.g., 24.8.2021 at 12:51:01).

Parameter	Meaning
P7-00	Code of the last remote controller
P7-01	Code of penultimate service controller
…	…
P7-49	Code of the 50th service controller in the sequence



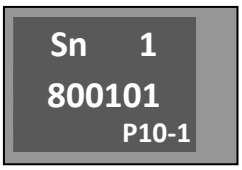
NOTE ***The yellow service remote controllers PDERT-5S*** *are used by authorized service personnel of TATSUNO EUROPE dispensers. The service controllers each have their own internal identification code, which is written into the memory of the dispenser counter when entering the service mode. Using parameter P09, it is therefore possible to find out who entered the service mode of the counter and when, i.e., to identify the service technician and the time of the service intervention.*

4.1.14. SERIAL NUMBERS OF THE PERIPHERAL UNITS (P10)

The parameter is used to display the serial numbers of the connected peripheral units. The actual serial numbers of the peripheral units are compared with the numbers stored in the processor unit memory. If a mismatch is detected, an error message is displayed and fuel delivery is not allowed. The list of periphearal units is below.

Parameter	Peripheral unit
P10-1	Serial number of the processor unit
P10-2	Serial number of the main displaying unit (master display)
P10-3	Serial number of the auxiliary displaying unit (slave display)
P10-4	Serial number of the unit of electromechanical totalizers
P10-5	Serial number of the heat sensor unit (PDEINP)
P10-6	Serial number of the mass meter

Example: Parameter P10-1, serial number of the main processor unit SN: 18-00101 (see picture)



4.1.15. DISPENSER CONTROL MODE (P12)

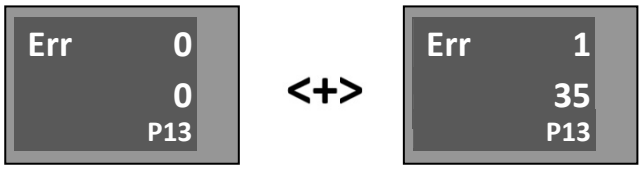
The parameter defines how the dispenser is controlled.

Parameter	Meaning	Factory Setting
12 = 0	Automatic mode with remote control The dispenser is remotely controlled by a computer or station controller via a data line. It starts fuel delivery only when an authorization command from the the control system (POS) is received. The authorization command includes the unit price of fuel for each refuelling, preset maximum price or quantity, and the product number. Fuel delivery will not start at zero fuel price, zero preset amount/volume or if the product number does not match. In the event of a communication failure, the dispenser locks up with error E18. Error E18 always occurs if no communication is detected for more than 3 seconds. After communication is established, the error disappears automatically.	0
12 = 3	Manual mode The dispenser is completely independent, not remote controlled. The data line is blocked. Unit fuel prices are controlled by parameter P03. If a special manual mode with locking after delivery or a mode with	

Parameter	Meaning	Factory Setting
	RELEASE signal control is not set, pumping will start immediately after the dispensing nozzle is picked up and the display is reset. Switching from automatic to manual mode can be blocked by switch SW1-2.	

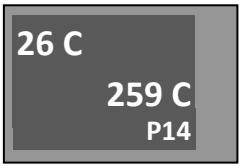
4.1.16. ERROR MESSAGE CODE STATISTICS (P13)

The parameter is used to display the cumulative numbers of individual error messages. The first line of the display shows the error message code and the second line the frequency of the error. After switching to parameter P13, the display shows the fault frequency for error message code E0. After pressing the **<+>** key, the frequency of the error message code E1... etc... appears on the display. The table of error message codes is given in chapter 6.2.1.



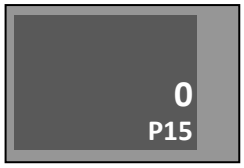
4.1.17. CURRENT PRODUCT TEMPERATURE (P14)

This function shows current operating temperature measured by the heat sensor located on the processor board of the counter, possibly a current temperature of the heat sensor Pt100 located in the dispenser pressure module. This parameter has the following arrangement of data on the display - the first line of the display shows the temperature on the processor unit of the counter in tenths of Celsius degrees (26°C). The second line shows an average ambient temperature in the dispenser pressure module in tenths of Celsius degrees (25.9°C).



4.1.18. DAILY TOTALIZERS RESET (P15)

The parameter is used to reset all daily totalizers of dispensing hoses. After setting the parameter value to **<1>** and confirming (**<E> + <1> + <E>**), all totalizers that are part of parameters P01 and P02 will be reset to 0. The message "done" appears and the parameter value goes to 0.



Parameter	Meaning	Factory setting
P15=0	Idle status	0
P15=1	Daily totalizers P01 and P02 reset to 0	

5. OPERATION

5.1. INSTRUCTIONS FOR SAFE OPERATION

Dispensers are complex devices that have to secure a whole range of difficult functions. Therefore, cleaning of the storage tanks, piping systems and inspection of the pumped medium cleanliness must be carried out before commissioning. An inspection of wiring and a check of connection correctness must be performed before commissioning in order to prevent any electric shock injuries and to ensure safety against explosion.

Smoking forbidden

Open flame use forbidden

Use of mobile phones forbidden

CAUTION

- ⚠ *It is forbidden to smoke and use open fire in the immediate vicinity of the dispenser.*
- ⚠ *The smoking ban applies also to passengers inside the vehicle.*
- ⚠ *It is forbidden to use mobile phones in the immediate vicinity of the dispenser.*
- ⚠ *It is forbidden to pump into the vehicle tank while the engine is running.*

CAUTION

- ⚠ *The attendant must not perform any repairs of the device and change setting of safety fittings. Regular maintenance and service may only be performed by an authorized service company.*
- ⚠ *The attendant must keep the device in proper and safe order, immediately inform the service organization about the defect of abnormality during operation and immediately decommission the device in case of danger of default.*

CAUTION

- ⚠ *Technical and technological devices must correspond to approved conditions together with regulations for safe operation and maintenance as well as solutions of emergencies. The device must be fitted with carbon-dioxide extinguishers according to the fire-safety solution.*
- ⚠ *The CNG fuel station may only be operated by demonstrably trained persons.*
- ⚠ *The dispenser is equipped with the "STOP button" for emergencies. The procedure in case of fire or emergency is precisely defined in local operating rules and regulations – the attendant must be demonstrably trained with regard to this.*
- ⚠ *It is necessary to observe defined terms to perform regular checks and inspections of all installed technical devices. Do not allow persons without appropriate professional qualification to tamper the installed technology including the gas devices.*

CAUTION

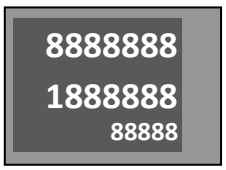
- ⚠ *It is forbidden to smoke and use open fire in the immediate vicinity of the dispenser.*
- ⚠ *The smoking ban applies also to passengers inside the vehicle.*
- ⚠ *It is forbidden to use mobile phones in the immediate vicinity of the dispenser.*

NOTICE ***Each CNG dispenser must be secured with an electrical device equipped with the STOP function according to category 0 or 1 in EN 60204-1. The fuel station attendant must be familiar with the device function.***

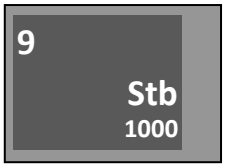
5.2. DISPENSER COMMISSIONING

Switching ON and OFF of CNG dispensers is carried out in the main switchboard of the fuel station where the power supply of the dispensers is provided:

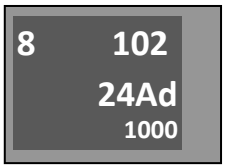
- **test of display units (displays).** The backlight of the displays lights up and then all display segments (eights) are displayed for approx. 1 second



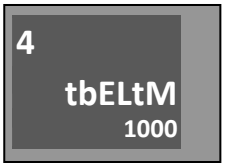
- **processor unit test.** Ten-second test (countdown 9, 8, … 1), in which all functions and memory of the processor unit are checked. During the test, the following is displayed in sequence:
  - (9) type of counter restart - STB (service data) and status of metrological switches SW1-1 to SW1-4 located on the processor board. The switches are protected against unauthorized switching by a cover fitted with a metrological seal. (standard state is **1000** → SW1-1=ON, SW1-2,3,4=OFF)

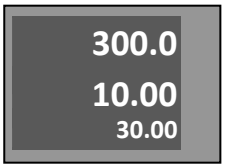


  - (8) (7) (6) (5) version and checksum of the metrologically relevant part of the program (1.02 and 24AD).
  - (4) (3) (2) (1) processor board type - TBELTM or CLEAR message, in case of parameter initialization with switch SW1-4 = ON



- **setting the counter status before switching it off.** The information that would appear on the display before the counter was last turned off is displayed. If the counter was operating in manual mode, then it is possible to start pumping immediately after picking up the nozzle. If the counter was operating in automatic mode, it waits for communication with the control computer to be established and, if necessary, for the transaction to be terminated (payment), if it was not terminated regularly before switching off.





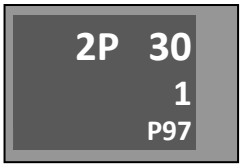
Now the dispenser is ready for delivery.

5.2.1. CNG DISPENSER COMMISSIONING

Setting of mass flow meter zero-point

All CNG mass flow meters based on the principle of the Coriolis effect are sensitive to the setting of zero (zero flow rate) because with a decreasing flow rate the measuring error increases. The setting of zero must be carried out after every dispenser installation and every meter exchange. The dispenser counter allows carrying out the procedure of setting the zero-point using the service remote controller. The following procedure is intended for authorized service engineers or metrology officials only:

- Close the inlet ball valves at the dispenser inlet and hang the filling nozzles in the dispenser (all filling nozzles must be hung up during zero point setting)
- Break the seal, remove the counter plate cover and set the calibration switch SW1-1 to the OFF position.
- Use the PDERT-5S service remote controller to enter the counter service mode (<R> + password).
- Setting parameter P97 to 1 activates the zero point setting function. The counter sends a command to set the zero point to the mass meter and then waits for a response. It then sends information that the zero point was set with the message "DONE" or that it was not set with the message "FAIL". Do not finish the setting until the setting function displays the message "DONE"!



NOTICE *If the zero-point value is not correct, or the process of zero-point not passed correctly then new filling is not allowed and error message E74 is appeared).*

NOTICE *The amount display (€) shows the current value of the zero-point. The quantity display (kg) shows the course of the zero-point setting procedure.*

NOTICE *In the CNGmass (Endress&Hauser) meter, the course of the procedure is signaled by an increasing number 1 - 99. After reaching the value 99, the process is terminated, and the message "done" is shown.*

- Exit service mode by pressing <R> on yellow service remote transmitter change position of switch SW 1-1 to ON (PROTECTED)
- Open ball valves valves at the dispenser inlet.

Mass meter configuration

When the mass meter is installed into new dispenser or when the mass meter is changed to another one, it must be configured by the calculator TBELTM. This configuration is necessary to perform via parameter P99 = 4444. Function is enabled only in case when switch SW1-1 is in position OFF only (NOT PROTECTED). Switch SW1-1 is placed in the centre of the TBELTM processor unit and protected by the sealed metal cover. After start of function P99 = 4444 the counter sends the necessary parameters to the mass meter.

NOTICE *After start-up of calculator TBELTM and before every delivery transaction are checked values of the registers inside mass meter if they are equal with values saved in calculator memory. If not, error code E74 is appeared on display and delivery is not allowed. To disable the error is necessary to perform function P99 = 4444 again.*

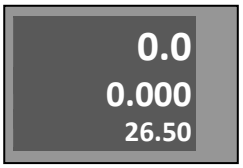
NOTICE *To run function mass meter configuration is necessary to press <R> on yellow service remote transmitter PDERT-5S, enter service password (factory setting 11111111) followed by key <E>. In Service mode of calculator is necessary to press 99 with <E> to go on parameter 99 and after press <E> again, enter value 4444 and <E>. If function passed OK then message „done "appeared for a while.*

5.3. DISPENSER OPERATION

NOTICE ***The operator is responsible for the operation of the fuel station*** *and it is his duty to monitor the delivery of fuel and, in the event that the customer performs unauthorized operations at the self-service dispensers, he must instruct the customer about proper handling. The operator is also obliged to mark the risk area of the fuel station with warning symbols (smoking ban, ban on open fire, direction of arrival to the dispenser, etc.). The fuel station operating instructions must be freely accessible to the customer for any information on basic obligations.*

5.3.1. CNG DELIVERY TO MOTOR VEHICLES

Delivery start



Before the delivery starts, the dispenser attendant checks whether the storage tank in a vehicle has a homologation mark, the vehicle engine and all electrical devices are turned off. Then he/she visually inspects the condition or wear of the filling neck/connector that could be the reason for leaks. If he/she finds serious deficiencies, he/she is entitled to refuse storage tank filling. In case of gas leak or danger the attendant shall finish the delivery.

The operation of the dispenser itself is ensured by the employee of the fuel station who lifts the delivery nozzle from the dispenser and connects it to the storage tank of the vehicle which must be secured against moving. Immediately after the nozzle is lifted the display test is performed – displaying all segments – and then it is reset and the product unit price is displayed.

After pressing the START button located on the counter case the electromagnetic valve opens at the inlet of the first pressure section and the pressure storage tank of the vehicle is filled with compressed natural gas. In the moment when the delivery speed decreases under the defined limit, the electronic counter automatically switches delivery to the second section and then potentially to the third pressure section – depending on the dispenser and fuel station configuration.

NOTE *Some dispensers, especially non-public - company dispensers, are not fitted with the sensors of delivery nozzle lifting. At such dispensers, the display test is performed after pressing the START button.*

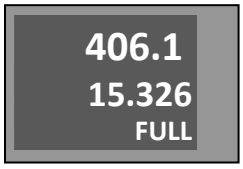
Delivery termination

The delivery may be terminated for various causes. Possible causes of delivery termination and corresponding messages shown on the display are mentioned in table below

Table 4 - Causes for delivery termination

Event	Indication on display
1. Pressing the STOP button by the customer/attendant during the delivery	**STOP**
2. Attaining the pre-set sum, quantity, or limit values of the dispenser	**STOP**
3. STOP command received from the superior system (payment terminal)	**STOP**
4. Gas flow rate drop under the value set on the dispenser (e.g., < 2kg/min)	**FULL**
5. Attaining the maximum possible mass calculated by temperature compensation	**FULL**
6. Detection of an error event.	**Exx**

The most frequent delivery termination is during filling the full storage tank when the gas flow rate drops under the set value (4) at dispensers without temperature compensation and delivery termination by attaining the maximum possible gas mass calculated by temperature compensation (5). In both cases delivery termination is signalled by the "FULL" message on the product unit price display. Delivery is finished by hanging the delivery nozzle to the dispenser.



NOTE *Delivery with temperature compensation performed so that the dispenser shall verify the situation in the vehicle storage tank by a small amount of gas at the beginning of delivery and calculates the maximum gas mass which it is able to deliver under given ambient temperature. After attaining the maximum mass, it finishes the delivery and shows the "FULL" message. According to technical rules of TPG 304 02 art. 4.5.4 the limit values in the Czech Republic for calculating maximum gas mass in the vehicle are as follows:*

a) maximum gas pressure converted to 15 °C – 20.0 MPa

b) attain maximum overpressure in a vehicle 26.5 MPa

c) attaining maximum gas temperature in a vehicle 82 °C

NOTE *According to ISO/DIS 16923, par. 7.5 CNG dispensers must be equipped with a breakaway coupling located between the delivery nozzle and the dispenser. This breakaway coupling disconnects the gas flow rate at both ends in case of emergency. The force that causes breaking the coupling must be higher than 220N and lower than 600N. OCEAN CNG dispensers are standardly equipped with a breakaway coupling with a magnetic sensor of breaking. After breaking the hose, the delivery is immediately terminated (magnetic valves are closed) and the display shows the error message E67.*

RESPONSIBILITIES OF CNG DISPENSER ATTENDANTS

- **Observe operating rules and regulations and operating instructions of gas devices.**
- **Keep the operated devices in a safe and proper condition.**
- **Immediately inform the operator about each defect, failure, or abnormality during operation.**
- **Immediately decommission the device in case of gas leak or danger.**
- **Keep tidiness and cleanliness and ensure that no unauthorized persons are nearby the device.**
- **Inform the operator about circumstances that impede the device operation for the attendant.**
- **Properly write records to the logbook about the shift start and finish, inspections, repairs, and audits.**
- **The dispenser and reservoir attendant must not perform any repairs or change the device and safety fittings setting on his/her own.**
- **Regularly check the condition of delivery hoses, their correct position in the dispenser and protect them from damage.**

EQUIPMENT OF ATTENDANTS

- **soap (foaming) solution + brush for detecting leaks**
- **leather gloves**
- **the fuel station booth must contain a first-aid kit, log book, writing materials, operating and safety regulations, fittings diagram and extinguisher**

Occupational safety while working with the CNG dispensing module

The operator is responsible for the fuel station operation and is obliged to entrust its operation only to trained employees having relevant authorization. The attendant shall competently perform filling the CNG storage tanks of refilled vehicles, checks the conditions of the dispenser and other devices in regular intervals as well as the operation of the entire device, and keeps operating records. The smoking ban and ban on using open fire within a radius of 10 m must be located a visible place nearby the dispenser. There must be also a notice on switching off the engine and securing the vehicle against spontaneous setting in motion.

In terms of structure, all dispenser components that could be sources of explosion initiation are approved according to the European standard ATEX. After detecting possible gas leak the detector sensors may be located in the dispenser area. However, these sensors are not included in the basic offer. In terms of hygiene, the given device is harmless for attendants and operators. While performing operation and maintenance it is advisable to protect your hands by wearing gloves and wear safety goggles.

5.3.2. ELECTROMECHANICAL TOTALIZERS

On demand, TATSUNO EUROPE dispensers are equipped with electromechanical totalizers for monitoring the total amount of fuel flown through each delivery hose. Totalizers are located on the dispenser display. Each delivery hose or nozzle has one seven-digit electromechanical totalizer that shows the **number of complete kilograms delivered through the appropriate delivery hose.** For multiple product dispensers, the electromechanical totalizers on the display are ordered from top to bottom or from left to right and are marked with delivery hose numbers.

NOTE *On display A, the electromechanical totalizers are numbered 1, 2, 3, 4. The numbers of the totalizers correspond to the delivery hoses 1A, 2A, 3A and 4A. On the display B, the electromechanical totalizers are also numbered 1, 2, 3, 4. The numbers of totalizers correspond to the delivery hoses 1B, 2B, 3B and 4B.*

5.3.3. DISPENSER OPERATING MODES

There are two basic dispenser operating modes:
1) manual mode
2) automatic (remote) mode

The **manual mode** is a status when the dispenser works independently of any remote control.
Delivery progress: The customer arrives at the dispensers takes the delivery nozzle (connector), inserts it into car and presses button START. The display resets (approx. 1.5 seconds) and the gas filling starts. Once the fuel has been delivered, the customer disconnects delivery nozzle from the car, hangs up the nozzle into dispenser and pays for the delivered fuel to the station operator. The dispenser is immediately ready for next delivery. Since the dispenser is not controlled in any way in the manual mode, it is necessary to manually set the fuel unit price on the dispenser – see sections 4.1.7. The number of delivered litres per shift is determined by the difference between the electronic (or electromechanical) totalizers at the start and end of the shift.
The **automatic mode** is a status when the dispenser is remotely controlled by a control device (program in PC, control device, station controller, etc.). The automatic mode allows remotely control deliveries from the fuel station booth. The booth contains a control device by which the fuel station attendant releases the dispenser for delivery and collects information about the delivered fuel amount and price after the delivery is finished.
Delivery progress: The customer arrives at the dispensers, takes the delivery nozzle, inserts it into car and presses button START. The dispenser requires filling authorization from the control unit in the booth. The control unit sends authorisation command together with fuel unit price and maximum amount/quantity of delivery. The display of the dispenser resets (*approx. 2 seconds after removing the nozzle) and the gas filling starts. Once the fuel has been delivered, the customer disconnects delivery nozzle from the car, hangs up the nozzle into dispenser and pays the required amount to the booth where he receives the tax receipt (receipt) for the delivered fuel. The dispenser is immediately ready for next delivery. Since the dispenser is remotely controlled in the automatic mode, it is not necessary to manually set the fuel unit price on the dispenser. The correct unit price is automatically set by the control computer to all dispensers at the fuel station.
Switch from the automatic to the manual mode. By default, the dispensers are connected and set as it is expected they should work at the fuel station, i.e., if the fuel station is equipped with a control system, the dispensers will be set to the automatic mode; if the fuel station is without the control system, the dispensers are set to the manual mode by default.
In case you have to switch the dispensers from automatic to manual mode - e.g., because of a crash in the control system, you have to change the value of parameter M0-P12 from value 0 to value 3 using the IR remote control and to check the setting of unit prices in parameter M0-P03 – see chapters 4.1.7.

NOTICE *The switch from the automatic to manual mode must be discussed with the service engineer in advance!*

5.3.4. PRESET KEYPAD

TATSUNO EUROPE dispensers may be equipped with a so-called preselection keypad enabling preset the delivered amount or quantity (volume or weight) by the customer directly on the dispenser. The customer may decide before he/she starts

the delivery what quantity or for what sum of money he/she wants to refill the storage tank. The pre-selected value may be cancelled by pressing the <**Cancel**> button at the moment when the delivery has not started yet. It is then possible to set another pre-selected value or deliver in a classic way without using the pre-selection. The dispensers can be equipped with the following two types of preselection keypads (see pictures below):

- 4-key preset keypad with 3 fixed amount or quantity values (3 values of the buttons can be freely set using the service parameters of the counter)
- 12-key preset keypad that allows to enter any value for a preset amount or quantity

Figure 17 – 4buttons preset keypad

Figure 18 – 12buttons preset keypad

NOTE *In case the pre-selection keyboards are used, it is necessary that the dispensers ate equipped with throttle valves (slow down) that ensure safe deceleration of fuel flow rate before the target preset value.*

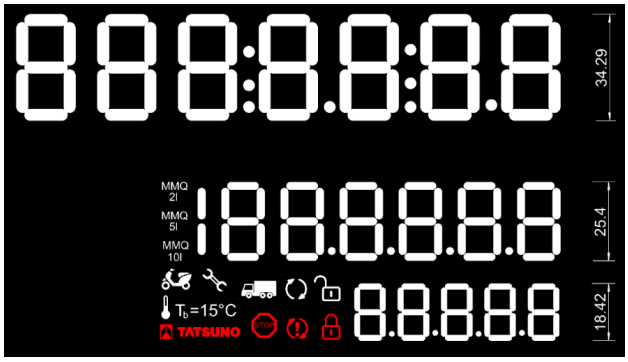
a) Example of entering the pre-selection in Euros

- The customer arrives to the dispenser and wants to deliver fuel for €10.
- a) Press the **<5€> key twice** on the 4-key preset keypad
  b) Press the **<1> <0> keys** on the 12-key preset keypad
- He/she lifts the delivery nozzle from the dispenser, puts it in the car tank and presses button START
- The dispenser delivers exactly the amount he/she has chosen and then stops automatically.
- The customer hangs the delivery nozzle back into the dispenser and goes to pay the sum.

b) Example of entering pre-selection in kilos

- The customer arrives to the dispenser and wants to refill 20 kg of gas.
- a) Press the **<10kg> key twice** on the 4-key preset keypad
  b) Press the **<2> <0> <#> keys** on the 12-key preset keypad
- He/she lifts the delivery nozzle from the dispenser, puts it in the car tank and presses button START.
- The dispenser delivers exactly the volume he/she has chosen and then stops automatically.
- The customer hangs the delivery nozzle back into the dispenser and goes to pay the volume.

5.3.5. DESCRIPTION OF THE PDEDIL V6 DISPLAY

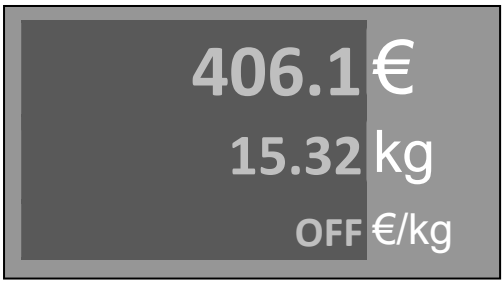


The LCD display consists of the following parts:

Display segment	Function	Note
	Amount delivered	- for P12=0 it can display the value from € 0 to 99999.9 - for P12=1 it can display the value from € 0 to 999999.9
	Volume delivered	- for P12=0 it can display the value from 0 to 9999.99 kg - for P12=1 it can display the value from 0 to 99999.99 kg
	Delivered fuel unit price	- for P12=0 it can display the value from 0 to 99.99 €/kg - for P12=1 it can display the value from 0 to 999.99 €/kg
	Dispenser status indication - released for delivery / blocked	- it appears automatically when the dispenser status changes
	Signalling of forced termination of delivery	- it appears after the STOP command has been received from the booth, after the preset number / preset amount has been reached or after the allowed time without delivery has been exceeded
	Fault signalling or maintenance required.	- it will be displayed at each fault indication together with the fault code (see 6.2.1)

5.3.6. DISPENSER OPERATION TERMINATION

After switching off the power supply of the electronics in the fuel station switchboard, the "OFF" message is displayed on the unit price display and the display illumination switches off. The last data is shows on the display for at least 15 minutes after the power supply disconnection. After elapsing this period and "erasing" the display the display status is saved into the counter memory and will be shown after the power supply is connected again – see the previous section.



Now the dispenser is out of order.

6. MAINTENANCE AND SERVICE

6.1. MAIN PRINCIPLES OF DISPENSER MAINTENANCE

- keep all functional units of the dispenser clean so that any potential unexpected defect may be easily identified and quickly removed
- continuously check all connections if the leakage of the fuel occurs, tighten and reinforce joints
- inspect the condition of the delivery nozzle and decide on repair or replacement of the delivery nozzle, if necessary, according to the type and size of the defect
- regularly check the condition of the delivery hoses. In case of mechanical damage to the delivery hose, ensure its immediate replacement.
- check the function of the door locks and the mechanism for hanging the delivery nozzle
- care for external cleanliness of the dispenser, pay special attention to counter window cleanliness

CAUTION ***It is necessary to always switch off electricity and take reliable measures against its reconnection before performing all maintenance work at mechanical, hydraulic or electrical parts.***

CAUTION ***Do not remove the dispenser covers during operation!***

CAUTION ***Do not open the distribution box lid if the dispenser is live!***

CAUTION ***The interventions into electrical and electronic parts may only be performed by a specialist who is responsible for device safety. The wires must be repositioned to their original position after finishing the service intervention. Proper fitting of wires must prevent contact with the movable parts of the reel module.***

CAUTION ***Any modification to the dispenser may invalidate the equipment's certification. Consult the manufacturer's certification documents and instructions if any modifications to the electrical installation and / or equipment are being considered.***

THE OPERATOR OF THE DISPENSER IS OBLIGED TO:

- Appoint an employee responsible for the operation and technical condition of the dispenser.
- Ensure inspections, testing, repairs, and maintenance in a professional way.
- Register documents and keep records on operation.
- All activities related to attending, operation and servicing the CNG dispensing module may only be performed by employees with appropriate authorization.

PRINCIPLES OF CNG DISPENSER INSPECTIONS

Inspections of devices, reservoirs, pipeline systems and dispensers are performed on dates defined by the operating rules and regulations of the fuel station according to applicable regulations.

- Review of dispenser pressure system tightness by soap solution.
- The inspection, calibration, and official verification of the CNG dispenser is performed by the National Metrology Institute according to applicable regulations

The inspection is preceded by cleaning the entire device from dust, removal of water and other impurities from tanks.

6.1.1. MAINTENANCE OF DISPENSER COVERS

Covers of the dispenser ("body parts") made of painted steel or stainless steel require regular maintenance. Pay special attention to the maintenance of such parts particularly in winter season when, due to the activity of aerosols from chloride agents created from salts used for road maintenance, the paint of unprotected body parts may be permanently damaged, or inter-crystal corrosion may appear in case of stainless-steel covers.

Recommended maintenance of painted covers:

- ⚠ Wash them with warm water at least twice per month (according to the level of fouling)
- ⚠ At least once a month or after each higher surface fouling with fuels – wash them with detergent, thoroughly clean the covers from salt residues, dust, and grease (according to the level of fouling) + restore the protective coating on design parts (car cosmetics).

WARNING ***It is forbidden to clean the painted parts of the dispenser with chlorine-based products!!! Chlorine-containing products (disinfectants such as SAVO) cause corrosion of metal parts of the dispenser.***

Recommended maintenance of stainless covers:

- ⚠ Wash them with warm water at least twice per month (according to the level of fouling)
- ⚠ At least once a month or after each higher surface fouling with fuels – wash them with warm water, thoroughly clean the covers from salt residues, dust, and grease (according to the level of fouling) + restore the protective coating on design parts by using a special agent for stainless sheet metal.

RECOMMENDATION *We recommend the following protective agents and detergents for stainless sheet metal:* ***ULTRAPUR – d*** *(producer: MMM-Group, Germany);* ***NEOBLANK spray*** *(producer: Chemische Fabrik GmbH, Hamburg, Germany);* ***ANTOX Surface Care 800 S*** *(producer: Chemetall AG, Switzerland)*

WARNING ***Do not wash stainless steel covers with detergent and chlorine-based products!!!***

6.1.2. MAINTENANCE OF THE CNG DISPENSER/MODULE

The maintenance schedule for the CNG dispenser/module is described in the table below:

Table 5 - Maintenance schedule for the CNG dispenser/module (according to ISO 16923)

Maintenance activity	weekly	monthly	6 months
Inspection of filling end piece damage		X	
Inspection of hose damage	X		
Visual inspection of the breakaway coupling		X	
Tightness test of the filling end piece		X	
Tightness test of the breakaway coupling		X	
Tightness test of pipeline systems and threaded joints		X	
Conductivity test of the set of breakaway coupling-hose-end piece			X

6.2. TROUBLESHOOTING AND SOLVING DISPENSER DEFECTS

When you encounter a problem, first read the **"What to do if ..." table** (see Table 6) where the most frequently asked questions of the dispenser users about the problems encountered at the fuel station are described. In the event of a dispenser defect, the electronic counter that controls the dispenser displays a fault message in the form of a numeric code. The fault codes for the individual types of electronic counters are listed in the chapter 6.2.1.

Table 6 - What to do if ...

The dispenser does not respond to the removal of the delivery nozzle and there is no fault message on the display
This means that the dispenser is without the power supply, or the delivery nozzle on the dispenser is poorly hinged, or that the dispenser is blocked by the control system. ➢ Check proper hanging of all delivery nozzles ➢ Check whether pumping made on the dispenser is paid at the cash desk ➢ If the dispenser is in manual mode, try unlocking the dispenser with the IR remote controller (press "0") ➢ Turn the power supply of dispenser counter off and on. ➢ Check the power supply of dispenser, i.e., when the power is turned on the display must pass the test ➢ Check the position of the circuit-breaker for the single-phase power supply 230V of the dispenser in the main switchboard of the fuel station ➢ If the dispenser is connected to the control computer, the dispenser blocking may be coupled to a control system that does not release the dispenser for pumping or blocks the dispenser. Turn the power dispenser off and on and change the dispenser mode from automatic to manual. If the dispenser is in a manual mode, there is a fault on the control computer side.
An error message "**E18**" will appear on the display of the dispenser
This is a dispenser fault message that indicates that communication between the dispenser and the control unit (computer, station controller, control console, etc.) has been lost. ➢ check the correct operation of the control unit (turning on the counter, turning on the data converter) ➢ check the data cable connection
After picking up the delivery nozzle an error message **"E30"** appears on the display of the dispenser.
This is a fuel dispenser failure report that states that the fuel unit price is zero. ➢ If the dispenser is operating in a manual mode without the remote control, then the unit price is incorrectly set. Set the fuel unit price, see chapter 4.1.7 and **Chyba! Nenalezen zdroj odkazů.**. ➢ If the dispenser is controlled remotely, then check the fuel unit price settings in the station controller (computer, controller). Before each delivery, the fuel price is automatically sent to the dispenser.

6.2.1. ERROR MESSAGES OF THE DISPENSER

In every defect of the dispenser equipped with the PDEX5, PDEX, TBELTM or TBELTX counter, delivery is interrupted and the display shows an error message ("E" + error code). Depending on the message type, either the whole dispenser is blocked (fatal error), or only the part where the fault appeared is blocked.

Important error messages are saved in the counter memory, where they can be shown using parameter Error message code history and Error message code statistics.

Table 7 - Error message types

Message type	Method of dispenser blocking	Method of dispenser unblocking
LOCK (operational blocking)	Only part of the dispenser is blocked	Hanging the dispensing nozzle clears the message from the display
ALERT (alert message)	Only the faulty part of the dispenser is blocked and the error message code is saved in the history and statistics	Removing the cause of the error clears the message from the display
NFAT (non-fatal error)	Only the faulty part of the dispenser is blocked and the error message code is saved in the history and statistics	Hanging and lifting the dispensing nozzle clears the message from the display Possible to unblock the dispenser and clear the error by a remote controller or unblocking the dispenser over the data line.
FATAL (fatal error)	Blocks entire dispenser and the error message is saved in the history and statistics	The cause of the error must be removed and the dispenser counter power source must be switched off/on.

Table 8 – Error message codes of the dispenser equipped with the PDEX5, PDEX, TBELTM or TBELTX counter

Code of message	Type of message	Cause of error message	Removing error message
E1, E5	NFAT	**Display failure.**	Turn the power supply of the dispenser off and on. If the fault persists, call an authorized service centre.
E6	NFAT	**Electromechanical totalizer failure**	
E7	NFAT	**Electromechanical totalizer coil failure**	
E9	FATAL	**Repeated leakage of the hydraulic system**	
E10	NFAT	**Error of temperature measuring sensor**	
E12	FATAL	**Temperature correction unit error**	
E13	FATAL	**Program error, metrological or program checksum error**	
E15	NFAT	**Maximum product flow exceeded**	
E17	NFAT	**Data line error**	
E18	ALERT	**Data line error – lost POS communication**	Controlling computer not connected, or communication cable not connected correctly.
E20	NFAT	**Power failure during delivery**	Check the dispenser power supply. If the fault persists, call an authorized service centre.
E21	NFAT	**Incorrect position of switches SW1-1 and/or SW1-4**	Turn the power supply of the dispenser off and on. If the fault persists, call an authorized service centre.
E22	FATAL	**Data initialization.**	
E23-E25	NFAT	**Damaged data in memory**	
E26	ALERT	**TOTAL STOP button pressed**	Unlock the TOTAL STOP button, turn the dispenser power off and on again.
E28	NFAT	**Unauthorized service remote controller**	Use a permitted remote controller.
E29	NFAT	**Wrong password**	Enter the correct manager or service password. If the fault persists, call an authorized service centre.
E30	LOCK	**Product unit price is zero**	Set non-zero product unit price
E53	NFAT	**The dispenser door (cover) was opened**	Close all dispenser doors and covers and clear errors by entering manager or service level setup mode by the remote controller.
E60	NFAT	**Leakage of the pressure system**	Check the pressure system for leaks. If the fault persists, call an authorized service centre.
E61	NFAT	**Insufficient pressure rises during leak test**	
E64	NFAT	**Insufficient pressure rises during temperature compensation test filling.**	
E66	NFAT	**Disconnected or defective pressure sensor**	Check the connection of the pressure sensor. If the fault persists, call an authorized service centre
E67	FATAL	**CNG: Dispensing hose break** Hose breakaway sensor is active	It is necessary to repair the hose breakaway and/or adjust the position of the breakaway magnetic sensor. To clear the error message, it is necessary to turn the counter power off and on. Call an authorized service centre.
E70	NFAT	**Mass meter failure**	Turn the power supply of the dispenser off and on. If the fault persists, call an authorized service centre.
E71	NFAT	**Communication error with mass meter**	
E72	NFAT	**Internal mass meter error**	
E73	NFAT	**Mass meter reset error**	

Code of message	Type of message	Cause of error message	Removing error message
E74	NFAT	**Mass meter configuration error**	Turn the power supply of the dispenser off and on. If the fault persists, call an authorized service centre.
E75	NFAT	**Mass meter zero point setting error**	
E76	NFAT	**Damaged stored value of the meter zero point**	
E80	NFAT	**The display serial number does not match**	
E81	NFAT	**The serial number of the auxiliar display does not match**	
E82	NFAT	**The serial number of the electromechanical totalizer unit**	
E83	NFAT	**The serial number of the PDEINP temperature sensors unit does not match.**	
E84	NFAT	**The serial number of the mass meter does not match**	
E85	NFAT	**The serial number of the PDEDPS pressure sensors unit does not match.**	
E86	NFAT	**Insufficient LPG pressure difference**	
E87	NFAT	**Electromechanical totalizer coil failure**	

6.3. SERVICE OF DISPENSERS

- service work is carried out in accordance with the operating rules at the fuel station
- before starting the service, the dispenser must be shut down, marked visibly with the "OUT OF SERVICE" sign and the driveway must be marked with the "NO ENTRY" sign
- the dispenser must be disconnected from the power supply (switch off by the main switch on the switchboard)
- the valves on the supply line must be fully closed
- during service work, vehicles must be prevented from passing within 5 meters around
- a fire extinguisher must be available to workers
- service work may only be performed by an authorized service agent

6.3.1. WARRANTY AND COMPLAINTS

The contractual warranty is determined – by default, the manufacturer provides warranty for provided devices for 2 years. This warranty does not cover consumables. In case of any complaints the following information must be specified:

- Serial number and type – see the type label
- Exact description of the defect and circumstances of its occurrence

The complaint shall be invalid if the safety seals are broken or the device has been tampered with. Defects and deficiencies caused by incorrect or unauthorized use or maintenance are not covered by the warranty (e.g., problems caused due to the water content and impurities in the tank and hydraulic system). During operation, it is necessary to regularly check water and impurities presence and perform cleaning if necessary.

6.3.2. ACCESSORIES

- Quick User Guide
- Certificate on product quality and completeness & EU Declaration of conformity
- Data sheet of the dispenser & Logbook of all meters installed in the dispenser
- Pressure test protocol
- IR controller for counter operation and setting & Foundation frame (may be ordered)

Spare parts catalogue. The document is intended for service companies and service engineers only.

6.3.3. EU DECLARATION OF CONFORMITY

EU DECLARATION OF CONFORMITY

1. Product model: BMP4032.OED /CNG

   Serial number: 12345/18

2. Name and address of the manufacturer: TATSUNO EUROPE a.s., Pražská 2325/68, Blansko, 678 01, Czech Republic, Reg.No.: 26221454, Tax Reg.No.: CZ26221454, www.tatsuno-europe.com

3. This declaration of conformity is issued under the sole responsibility of the manufacturer

4. Object of the declaration: **Electronic CNG dispenser type series OCEAN BMP40xx.Oxx/CNG**

   Purpose and scope of product use: The equipment serves for dispensing of compressed natural gas.

5. The object of the declaration described above is in conformity with relevant Union harmonisation legislation:
   Directive 2014/34/EU (ATEX), issued 26.2.2014
   Directive 2014/30/EU (EMC), issued 26.2.2014
   Directive 2014/68/EU (PED), issued 15.5.2014

6. References to relevant harmonised standards used or references to other technical specifications in relation to which conformity is declared:
   EN ISO 16923:2018 - Natural gas fuelling stations - CNG stations for fuelling vehicles
   EN IEC 60079-0:2018 - Explosive atmospheres - Part 0: Equipment - General requirements
   EN ISO 80079-36:2016 - Non-electrical equipment for potentially explosive atmospheres - Part 1: Basic method and requirements
   Protection type: Ex II 2G IIA T3
   OIML R139-1:2018 - Compressed gaseous fuel measuring systems for vehicles - Part 1: Metrological and technical requirements

7. Notified body:

Name, number and address	Performed:	Issued certificate:
Physical-Technical Testing Institute, s.p. NB 1026, Pikartská 1337/7, 716 07 Ostrava-Radvanice, Czech Republic	Documentation receipt acknowledge-ment in acc. article 13(1), point (b)(ii) of Directive 2014/34/EU	A484-16
	Quality Assurance Notification in acc. Article 21 and Annex IV and VII of Directive 2014/34/EU	FTZÚ 02 ATEX Q030
Czech Metrology Institute, NB 1383, Okružní 31, 638 00 Brno, Czech Republic	OIML Basic Certificate of Conformity in acc. OIML R139-1:2014	R139/2014-B-CZ1-2018.01
	Type Approval Certificate in acc. Czech Law of metrology No. 505/1990 Coll.	0111-CS-A025-15 TCM 143/15-5321

8. Additional information

Signed for on behalf of: Milan Berka, QMS manager
Place and date of issue: Blansko, 20.08.2018

Form Version: 12/2020 *Document No.: DC 12345/18*

NOTES: