



PETROL DISPENSERS

TATSUNO EUROPE

User's Manual

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INTRODUCTION

This manual is intended for users of all types of TATSUNO EUROPE electronic dispensers intended for pumping liquid fuels and for the owners of filling stations on which these dispensers are installed and operated. TATSUNO EUROPE a.s. recommends her careful study. Keep this manual together with the appendices throughout the operation of the device

- Make it available to other owners and users.
- Update manuals. You can find a detailed **Installation and User Guide (IN040)**, including **Installation Plans (IN041)**, here https://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

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Revision 03 / 9. 11. 2022	Added OCEAN HERO dispensers + using of 12 buttons keyboard for operator/manager mode	Milan Berka
Revision 04 / 24. 2. 2023	Added handling of the OCEAN HERO dispenser using hanging eyes – see 3.2.1	Milan Berka
Revision 05 / 19. 5. 2023	Modified pictures of the standard models OCEAN HERO	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 and SHARK type series, are designed for stationary or mobile placement for the delivery of gasoline, diesel oil, biodiesel, light fuel oil, kerosene, aircraft fuel (AVGAS) and a mixture of ethanol and gasoline (max. E85) in a given amount from a fuel tank 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

1.2.1. LIST OF SAFETY FACTORS

- It is necessary that all work at the fuel station, especially construction and repairs, is performed in compliance with this list.
- It is the obligation of the constructor that all his employees comply with all laws, directives, and other regulations.
- All liquid fuels (gasoline, diesel, E85, ...) may only be stored in tanks and containers compatible with these liquids and gases.

Locations requiring higher carefulness

- The interior of a tank, pipes, shafts of storage tanks, filling shafts, relief shafts, containers, and dispensers.
- All locations where accumulation of fuel vapours may occur and when these vapours are heavier than air, such as in drainage shafts, low-lying rooms, cellars, trenches, etc.
- The surroundings of tank ventilation, especially during filling.
- Any locations nearby deliveries, truck tanks and other vehicles during deliveries, especially in windless conditions.
- A radius of 1 m around the pipes transporting gasoline or containing gasoline vapours.
- The filters.

1.2.2. 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.

1.2.3. 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.*

1.2.4. 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.
- Work on bearings is only allowed using standard tools allowed for this type of work.
- 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.

Device design safety

DEVICE DESIGN SAFETY IS GUARANTEED BY THE MANUFACTURER

The dispenser design meets the requirements of EN 13617-1 and EN 60079-0 standards and is designed for operation in environments designated by symbols  II 2G IIA T3 stated on the type label of the dispenser.

Operating safety

The operator is responsible for the operation of the filling station and is obliged to entrust its operation only to trained personnel with the appropriate authorization. The task of the operator is to check the condition of the dispenser at regular intervals and to keep the prescribed operating records.

Attendant's responsibilities:

- Keep the operated devices in a safe and proper condition.
- 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 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.

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.).

2. TATSUNO EUROPE DISPENSERS

2.1. DESCRIPTION OF DISPENSERS

All TATSUNO EUROPE dispensers are equipped with high quality Japanese hydraulics from TATSUNO Corporation (hereinafter referred to as TATSUNO) and a powerful reliable electronic counter of the Czech company TATSUNO EUROPE (hereinafter referred to as TE). 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 litres or kilograms and the fuel unit price. Displays of the fuel dispensers specified for private use display only the dispensed fuel volume in litres. The standard colour of TATSUNO EUROPE dispensers is white (RAL9016), silver (RAL 9006) and black (RAL9005).

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.*

Dispensers and modules for dispensing gasoline, diesel, biodiesel, E85, kerosene, light fuel oils and aircraft fuel are equipped with hydraulic (pumping monoblock, piston meter, pulse generator ... etc.) from a Japanese company TATSUNO Corporation. This is a time-tested and worldwide accredited type of hydraulics with a high reliability and a long service life. The pumping monoblock is equipped with an input and output washable stainless-steel filter (100µm/70µm), vapour and gas separator, check valve and rotary pump with operating pressure control. The four-piston high precision meter can be controlled by a single piston. Each flow meter contains a non-explosive pulse generator (pulser) that senses the meter shaft speed and sends impulses to the electronic counter. The delivery hoses are made of high-quality gas-resistant rubber in an antistatic design and are finished with automatic delivery stop-nozzles. The delivered medium (gasoline, diesel ...) is sucked out of the fuel storage tank by the dispenser and passes through the flexible connection bellows and the check valve into the pumping monoblock where it is filtered and the air is separated. The separated air is freely discharged from the pump into the hydraulic part of the dispenser. Clean fuel flows from the monoblock by a check valve to the piston meter and from there through a solenoid valve controlling the fuel flow into the delivery hose and through the delivery nozzle it is transported to the vehicle storage tank. In the case of pumping diesel, biodiesel and mixed diesel, a sensor measuring the flow of the separated air is at the output of the monobloc separator. In case of a high amount of air in the fuel (cracked piping, lack of fuel in the tank ... etc.) the sensor activates and causes the delivery to stop. In the case of gasoline and ethanol (E85) delivery, the hydraulic module of the dispenser is supplemented with a gasoline vapour recovery system consisting of a pump, pipe and control valve. Gasoline vapour is sucked out of the vehicle tank by a vacuum pump and transported through the DN8 pipeline out of the dispenser into the return pipe into the fuel storage tank. The exhausted vapour flow is regulated in the dispenser to match the fuel flow rate (95% to 105%).

2.2. BASIC TECHNICAL PARAMETERS

Table 1 – Dispensers and modules (gasoline, diesel, biodiesel, mixed diesel, E85, aircraft fuel)

Pumping performance	Standard	Increased (/H)	Very high (/UH)
Maximum flow rate Q_{max} [L/min]	30 to 50	70 to 80	120 to 170
Minimum flow rate Q_{min} [L/min]	3 to 5*	5	10
Lowest metering MMQ [L]	2	5	10
Maximum pressure [MPa] - suction version	0.18	0.25	0.25
- pressure version	0.35		
Minimum pressure [MPa]	0.16		
Maximum unit price (number of digits)	9999(4) or 99999(5) **		
Maximum amount to pay (number of digits)	999999(6) or 9999999(7) **		
Maximum volume (number of digits)	999999(6) or 1999999(6.5) **		
Scale interval [L]	0.01		
Display type	Electronic		
Type of delivered fluid	Gasoline, diesel, biodiesel, mixed diesel, ethanol (E85), aircraft fuel (AVGAS)		
Liquid dynamic viscosity range [mPa.s]	0,5 to 10		
Filtration of mechanical particles	Pump inlet filter > 100µm; pump outlet filter > 70µm		
Fluid temperature range [°C]	-20° to +50**		
Ambient temperature range [°C]	-20 to +40 (standard dispenser version); -40 to +55 (special dispenser version)		
Accuracy class	0.5		
Mechanical class	M1, M2 for counters PDEX5 and TBELTx		
Electromagnetic class	E1, E2 for the counter PDEX5		
Humidity	Condensing		
Location	Open		
Measured unit	Volume [L] or volume at 15 °C [L]		
Electronic counter	TBELTx	PDEX	PDEX5
Program version (W&M check sum)	1.01 (8CA4)	1.03 (20260)	1.01 (4573), 1.02 (dbd2FFA4)
Calculator powering	230V ± 10 %; 50Hz; max. 300VA		
Pump electric motor	3x400V/230V; 50Hz; 0.75kW; 1410 rpm		
Electro-magnetic valves	Proportional; +24V DC/max. 1A		

*Flow rate range Q_{max} : Q_{min} must be 10:1

** 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)

***The temperature range of the liquid is defined by the range of the measuring temperature sensor

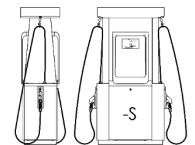
2.3. DISPENSER MODEL IDENTIFICATION

The basic design of the OCEAN and SHARK series business branding is:

1	2	3	4	5	6	7
BMP	40	4	8	.	OWD	/H/VR2

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

Field	Values	Description
1	-----> BMP	Device type Dispenser. Standalone dispenser.
2	-----> 5 40	Series of dispensers SHARK. Simple single-product to two-product dispensers of the SHARK JUNIOR and SHARK ECONOMY series. OCEAN. Single to five-product dispensers of the OCEAN EURO, OCEAN TALL, OCEAN SMART, OCEAN TOWER series.
3	-----> 1.2 to 5	Number of products. Number of fuel pumps or number of fuel inputs for pressure dispensers.
4	-----> 1, 2 to 10	Number of delivery hoses. It corresponds to the number of measuring systems.
5	-----> S SX OE* OS OW OH	Dispenser design. SHARK JUNIOR dispensers. Single-product, one- to two-hose dispensers with a height of 1400 mm. SHARK ECONOMY dispensers. Two-product, one- to two-hose dispensers with a height of 1400 mm. OCEAN EURO dispensers. Multi-product, one- to ten-hose dispensers with a height of 1900 mm. OCEAN SMART dispensers. Single-product, one- to four-hose dispensers with a height of 1900 mm. OCEAN TOWER dispensers. Multi-product, one- to ten-hose dispensers with a height of 1900 mm. OCEAN HERO dispensers. Multi-product, one- to eight-hose dispensers with a height of 2194 mm.
6	-----> D L R	Dispenser orientation Double-sided dispenser. Single-sided dispenser – left. Single-sided dispenser – right.
7	-----> - without - -ZV1 -ZV2 /H /UH /VRx /S3 /MAS /SAT -HS; -HR -SC -NC -2C -4C -S	Specifying abbreviation The dispenser or module for pumping liquid fuels (gasoline, diesel, ...). The dispenser where the hose exits from the rear cover and the nozzle is also located on the rear cover, see figure. The dispenser where the hose exits from the rear cover and the nozzle is located on the front of the dispenser Increased power of one fuel pump (80L/min) or increased filling power of one CNG hose (<70 kg/min). If several pumps with increased power are used in the rack, use /H/H or /H/H/H. Ultra-high performance of one delivery hose (120 to 150L/min). For two hoses in the dispenser, the /UH/UH is used. The number of exhausted products in the fuel dispenser where x = 1, 2, 3, 4 or 5. Pressure dispenser. The dispenser does not contain a pump. The submersible pump is located in the tank. A dispenser with one output for a satellite stand. If two satellite outlets are in the dispensers, /MAS/MAS is used. A dispenser with a satellite delivery hose. If two satellite hoses are used in the dispenser, /SAT/SAT is used. A spring hose holder (SHARK); hose reel (OCEAN) Simultaneous delivery of hoses on a two-hose dispenser. Non-simultaneous delivery of hoses on a two-hose dispenser. Simultaneous delivery of two delivery hoses on one side of the multi-product dispenser. Simultaneous pumping of four delivery hoses on a double-sided multi-product dispenser. Nozzle position on side of dispenser (OCEAN HERO)



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

1.4.1. DISPENSER PARTS MARKING CONVENTIONS

Figure 1 illustrates the TATSUNO EUROPE dispenser marking and sorting system. In dispensers where it is not clear if the left or right side of the dispenser concerns SHARK ECONOMY), the location of the nameplate which is always closest to product No. 1 and nozzle No. 1 (1A) is decisive. 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.

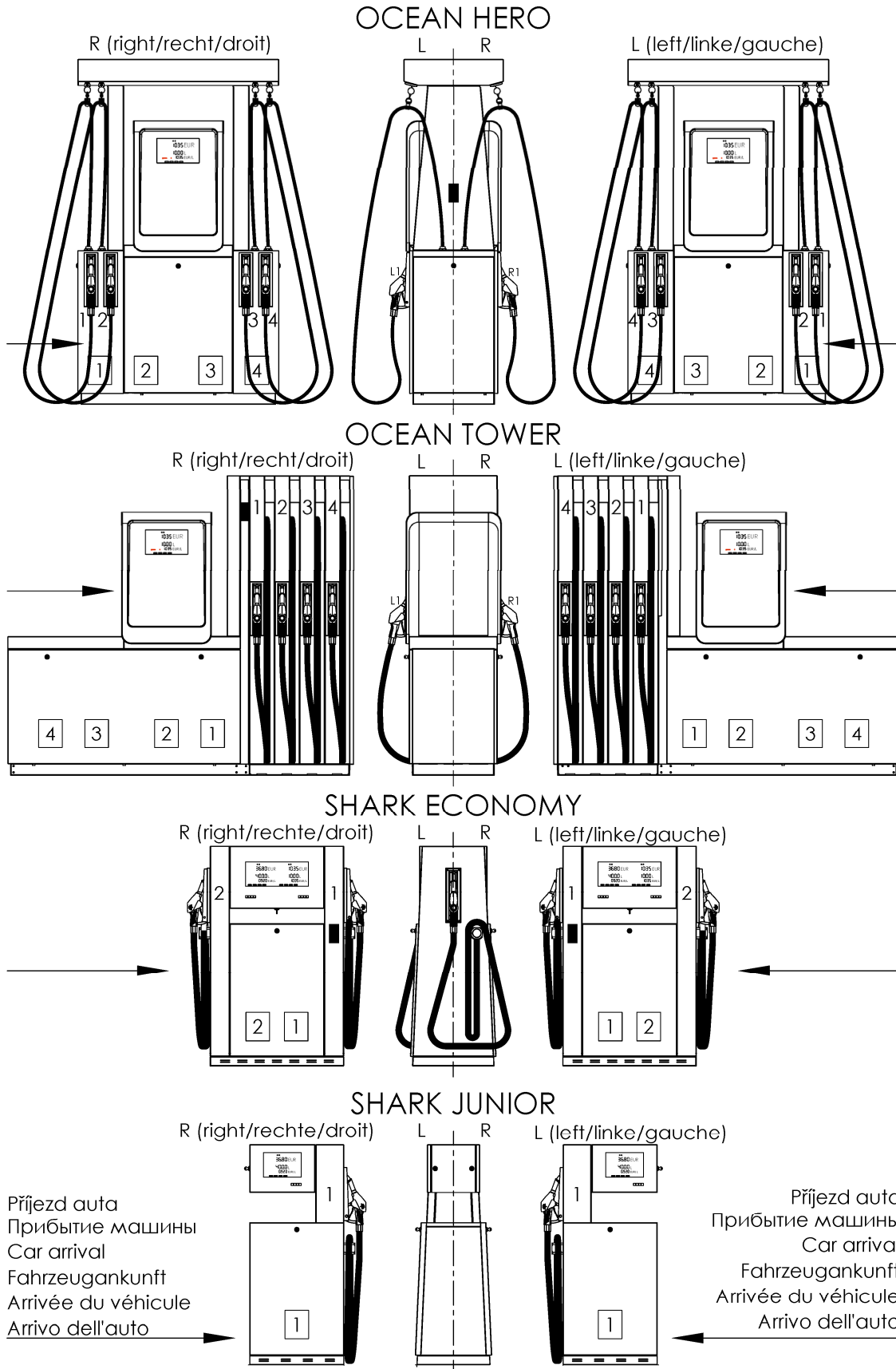


Figure 1 - Dispenser marking system with the recommended arrival direction

2.4. STANDARD MODELS OF DISPENSERS

2.4.1. SHARK JUNIOR DISPENSERS

List of standard SHARK JUNIOR models:

Dispenser model	Access to dispenser (2-double-sided, 1-single-sided)	Number of products (number of pumps or inputs)	Number of meters (number of measuring systems)	Number of delivery nozzles (number of delivery hoses)	Number of displays	Pumping performance (L/min)
BMP511.SL	1	1	1	1	1	40
BMP511.SR	1	1	1	1	1	40
BMP511.SD	2	1	1	1	2	40
BMP511.SL /H	1	1	1	1	1	80
BMP511.SR /H	1	1	1	1	1	80
BMP511.SD /H	2	1	1	1	2	80
BMP521.SL /UH	1	2	2	1	1	130
BMP521.SR /UH	1	2	2	1	1	130
BMP521.SD /UH	2	2	2	1	2	130

Notes: Special models (see chap. 2.3) can also be produced in a pressure version without pumps (/S3), can be equipped with a vapour recovery system (/VR) of the 2nd level and optionally with an electronic system that monitors the correct function and efficiency of the recovery system. For each dispenser model it is possible to provide a hose for diesel delivery. This allows one delivery (one transaction) from two hoses at a time. The dispenser with an output for the satellite hose is supplemented with /MAS abbreviation and the dispenser with a satellite hose with /SAT abbreviation.

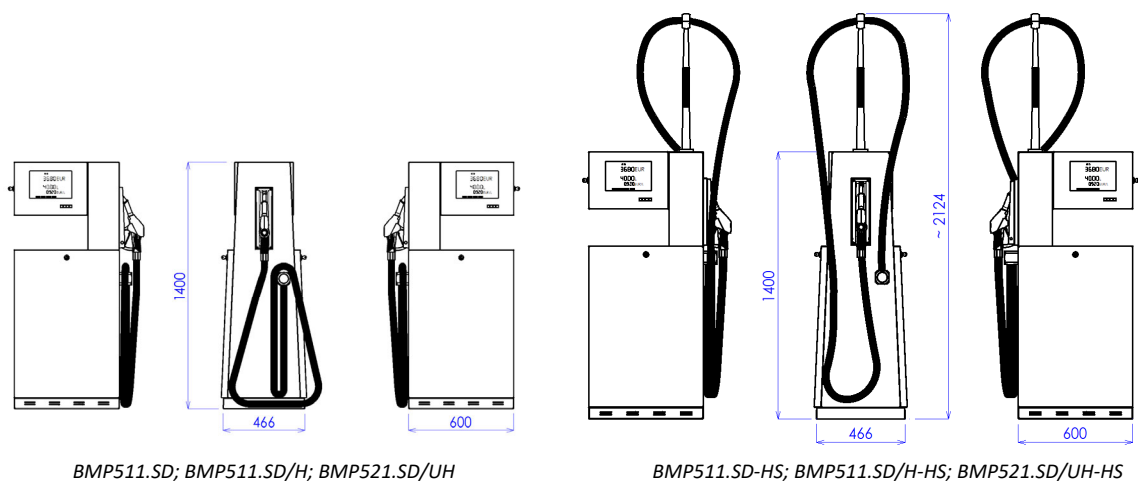
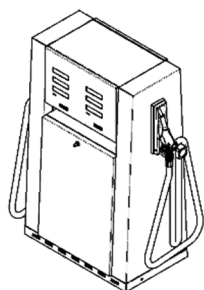


Figure 2- Standard SHARK JUNIOR dispenser models

2.4.2. SHARK ECONOMY DISPENSERS

List of standard SHARK ECONOMY models:



Dispenser model	Access to dispenser (1-single-sided, 2-double-sided)	Number of products (number of pumps or inputs)	Number of meters (number of measuring systems)	Number of delivery nozzles (number of delivery hoses)	Number of displays	Pumping performance (L/min)
BMP522.SXL	1	2	2	2	2	40+40
BMP522.SXL-NC	1	2	2	2	1	40+40
BMP522.SXD	2	2	2	2	4	40+40
BMP522.SXD-NC	2	2	2	2	2	40+40
BMP522.SXL /H	1	2	2	2	2	80+40
BMP522.SXL /H-NC	1	2	2	2	1	80+40
BMP522.SXD /H	2	2	2	2	4	80+40
BMP522.SXD /H-NC	2	2	2	2	2	80+40
BMP522.SXL /UH	1	2	3	2	2	130+40
BMP522.SXL /UH-NC	1	2	2	2	1	130+40
BMP522.SXD /UH	2	2	3	2	4	130+40
BMP522.SXD /UH-NC	2	2	2	2	2	130+40
BMP522.SXL /UH/H	1	2	3	2	2	130+80
BMP522.SXL /UH/H-NC	1	2	2	2	1	130+80
BMP522.SXD /UH/H	2	2	3	2	4	130+80
BMP522.SXD /UH/H-NC	2	2	2	2	2	130+80

Notes: Special models (see chap. 2.3) can also be produced in a pressure version without pumps (/S3), can be equipped with a vapour recovery system (/VR) of the 2nd level and optionally with an electronic system that monitors the correct function and efficiency of the recovery system. For each dispenser model it is possible to provide a hose for diesel delivery. This allows one delivery (one transaction) from two hoses at a time. The dispenser with an output for the satellite hose is supplemented with /MAS abbreviation and the dispenser with a satellite hose with /SAT abbreviation.

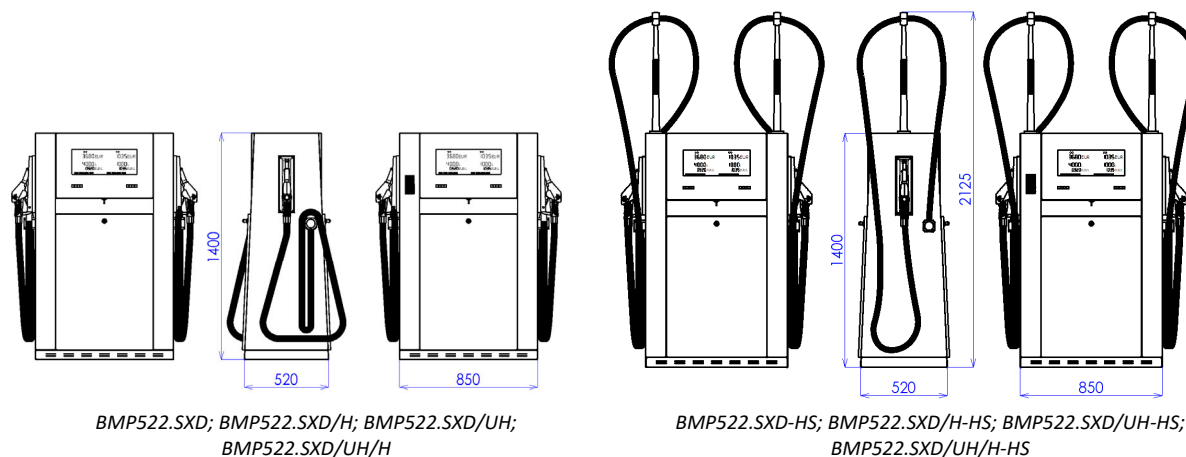
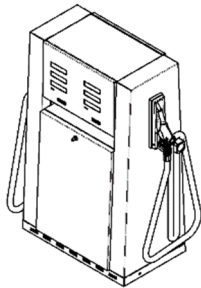


Figure 3 - Standard models of SHARK ECONOMY dispensers

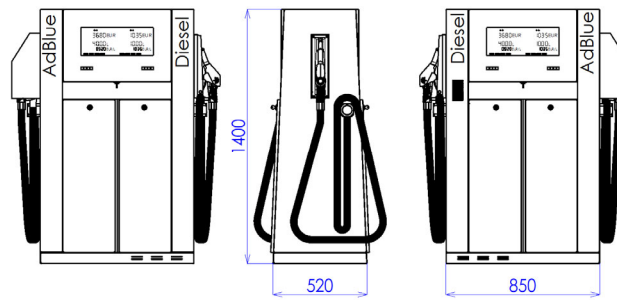
2.4.3. COMBINED SHARK ECONOMY DISPENSERS FOR DIESEL AND ADBLUE® DELIVERY

List of standard COMBINED SHARK ECONOMY models:

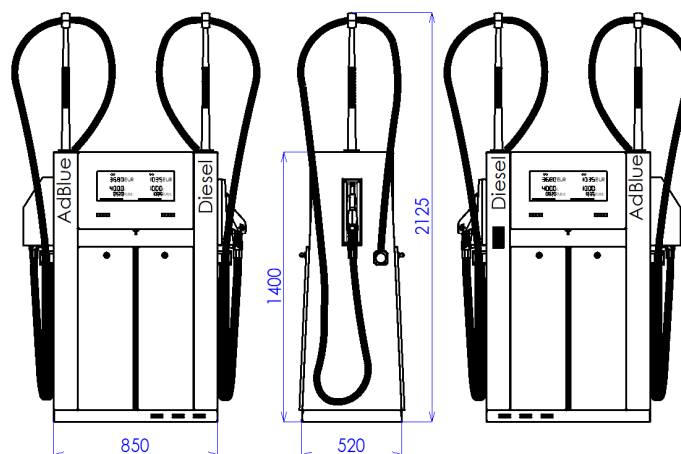


Dispenser model	Access to dispenser (1-single-sided, 2-double-sided)	Number of products (number of pumps or inputs)	Number of meters (number of measuring systems)	Number of delivery nozzles (number of delivery hoses)	Number of displays	Pumping performance (L/min)
BMP522.SXL /AdB&Die	1	2	2	2	2	40 + 40/10
BMP522.SXL /H/AdB&Die	1	2	2	2	2	80 + 40/10
BMP522.SXD /AdB&Die	2	2	2	2	4 (2+2)	40 + 40/10
BMP522.SXD /H/AdB&Die	2	2	2	2	4 (2+2)	80 + 40/10

Notes: COMBINED SHARK ECONOMY dispensers are not standardly equipped with heating. For the installation of dispensers in an environment where the temperature drops below -5 °C, it is necessary to equip the AdBlue® module of dispenser by heating. For dispensers with heated hoses, it is also recommended to use spring hose hinges (abbreviation "HS") to avoid hose contact with the ground and hence reduce heating efficiency.



BMP522.SXD /AdB&Die



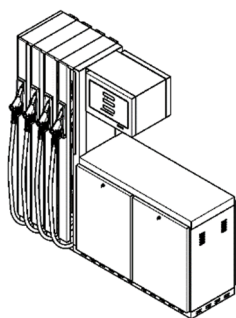
BMP522.SXD/AdB&Die-HS

Figure 4 - Standard COMBI SHARK ECONOMY models

2.4.4. OCEAN EURO DISPENSERS

Multi-product OCEAN EURO dispensers are standardly manufactured in a suction version in a single-sided left (L), single-sided right (R) or double-sided (D) design with one to ten delivery hoses for liquid fuel (gasoline, diesel, E85 ...) located on the front of the dispenser. The hoses are wound on a reel in the dispenser. The design of dispensers can be basic or one of the specific variants CUBE, FIN or WAVE.

List of standard OCEAN EURO models:



Dispenser model	Access to dispenser (1-single-sided, 2-double-sided)	Total number of products (i.e. number of pumps or inputs)	Number of meters (i.e. number of measuring systems)	Number of delivery hoses (dispenser hose + module hose)	Number of main displays (i.e. number of simultaneous deliveries)
BMP4011.OEL(R)	1	1	1	1	1
BMP4012.OED	2	1	2	2	2
BMP4022.OEL(R)	1	2	2	2	1
BMP4024.OED	2	2	4	4	2
BMP4033.OEL(R)	1	3	3	3	1
BMP4036.OED	2	3	6	6	2
BMP4044.OEL(R)	1	4	4	4	1
BMP4048.OED	2	4	8	8	2
BMP4055.OEL(R)	1	5	5	5	1
BMP40510.OED	2	5	10	10	2

Notes: The pumping performance is strongly dependent on the conditions at the station (distance from the tank, suction height, pipe inner diameter... etc.). The standard pumping performance is within the range of 35 to 50 L/min. For special models (see chapter 2.3), the performance of the diesel hoses can be increased to a high performance of 70 to 90 L/min (/H) or ultra-high performance from 120 to 150 L/min (/UH). When using a special meter (LOBE), the pumping performance can be increased up to 170 L/min and in a pressure version up to 200 L/min, depending on the submersible pump power. Special models marked -2C and -4C can simultaneously deliver two liquid fuels on one side of the dispenser. Dispensers can also be produced in a pressure version without pumps (/S3) where the central submersible pump is located in the storage tank and pushes the fuel into the dispenser via a pressure line. According to the number of gasoline products, dispensers can be equipped with a vapour recovery system (/VR, /VR2, /VR3...) of the 2nd level and optionally with an electronic system that monitors the correct function and efficiency of the recovery system. Delivery nozzles are standardly placed on the front of the dispenser. In the case of a single-product diesel model, it is also possible to have a version with a side-mounted nozzle (-ZV1). For each dispenser model it is possible to provide one or two hoses for diesel delivery. This allows one delivery (one transaction) from two hoses at a time. The dispenser with an output for the satellite hose is supplemented with /MAS abbreviation and the dispenser with a satellite hose with /SAT abbreviation.

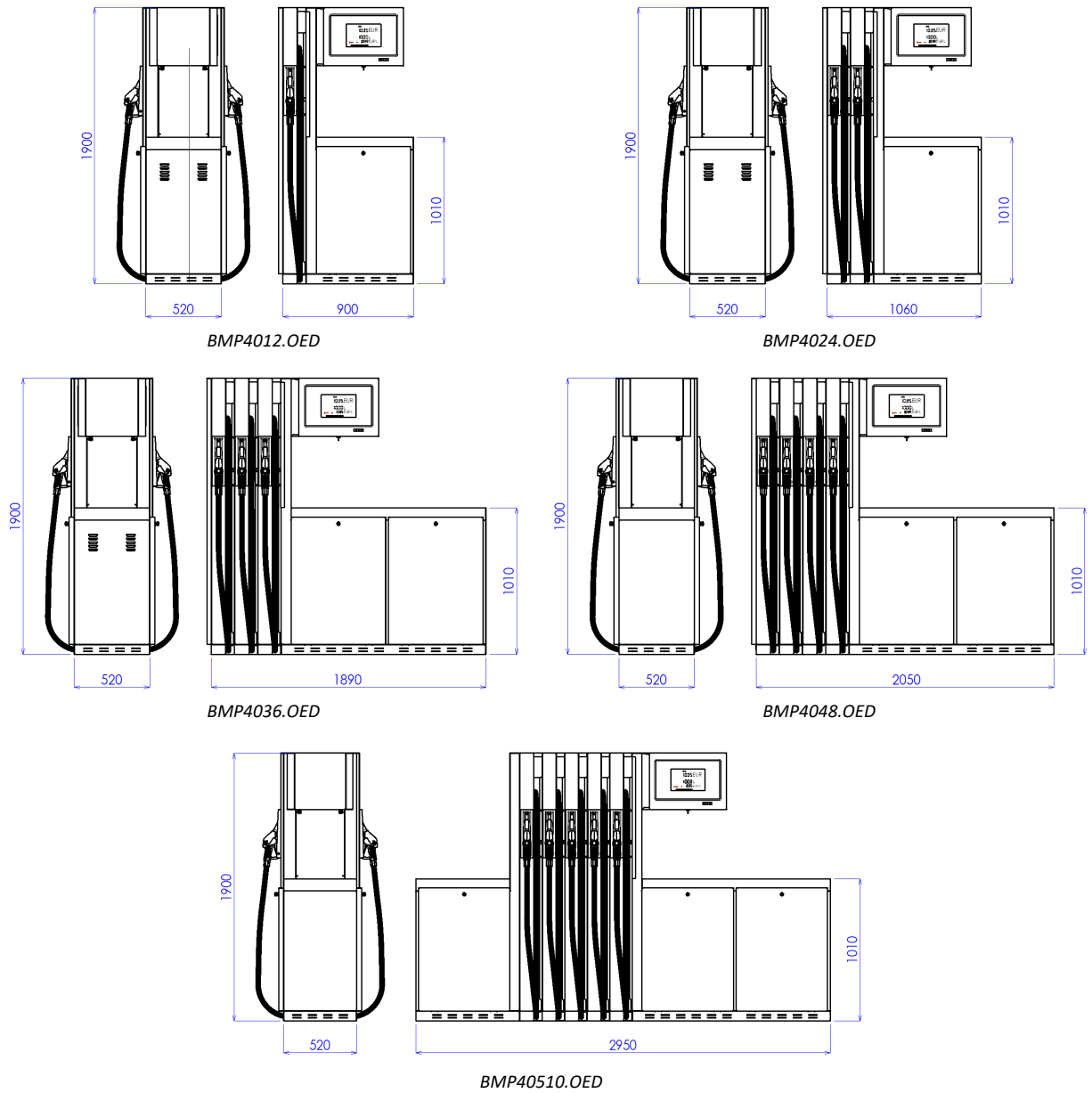


Figure 5 - Overview of standard OCEAN EURO models in basic design

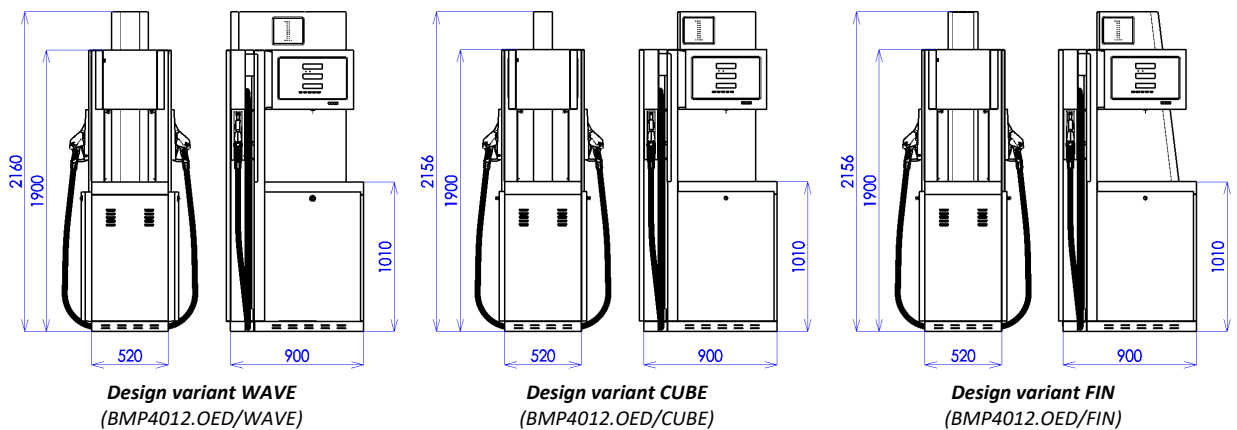
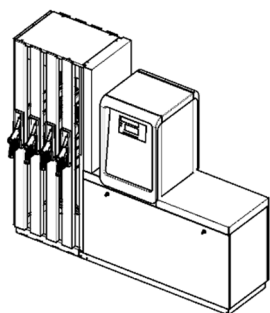


Figure 6 - Design variants of OCEAN EURO dispensers

2.4.5. OCEAN TOWER DISPENSERS

Multi-product OCEAN TOWER dispensers are standardly manufactured in a suction version in a single-sided left (L), single-sided right (R) or double-sided (D) design with one to ten delivery hoses for liquid fuel (gasoline, diesel, E85 ...) located on the front of the dispenser. The dispensers are equipped with hose retractor system.

List of standard OCEAN TOWER models:



Dispenser model	Access to dispenser (1-single-sided, 2-double-sided)	Total number of products (i.e., number of pumps or inputs)	Number of meters (i.e., number of measuring systems)	Number of delivery hoses (dispenser hose + module hose)	Number of main displays (i.e., number of simultaneous deliveries)
BMP4011.OWL(R)	1	1	1	1	1
BMP4012.OWD	2	1	2	2	2
BMP4022.OWL(R)	1	2	2	2	1
BMP4024.OWD	2	2	4	4	2
BMP4033.OWL(R)	1	3	3	3	1
BMP4036.OWD	2	3	6	6	2
BMP4044.OWL(R)	1	4	4	4	1
BMP4048.OWD	2	4	8	8	2
BMP4055.OWL(R)	1	5	5	5	1
BMP40510.OWD	2	5	10	10	2

Notes: The pumping performance is strongly dependent on the conditions at the station (distance from the tank, suction height, pipe inner diameter... etc.). The standard pumping performance is within the range of 35 to 50 L/min. For special models (see chapter 2.3), the performance of the diesel hoses can be increased to a high performance of 70 to 90 L/min (/H) or ultra-high performance from 120 to 150 L/min (/UH). When using a special meter (LOBE), the pumping performance can be increased up to 170 L/min and in a pressure version up to 200 L/min, depending on the submersible pump power. Special models marked -2C and -4C can simultaneously deliver two liquid fuels on one side of the dispenser. Dispensers can also be produced in a pressure version without pumps (/S3) where the central submersible pump is in the storage tank and pushes the fuel into the dispenser via a pressure line. According to the number of gasoline products, dispensers can be equipped with a vapour recovery system (/VR, /VR2, /VR3...) of the 2nd level and optionally with an electronic system that monitors the correct function and efficiency of the recovery system. Delivery nozzles are standardly placed on the front of the dispenser. In the case of a single-product diesel model, it is also possible to have a version with a side-mounted nozzle (-ZV1). For each dispenser model it is possible to provide one or two hoses for satellite delivery. This allows one delivery (one transaction) from two hoses at a time. The dispenser with an output for the satellite hose is supplemented with /MAS abbreviation and the dispenser with a satellite hose with /SAT abbreviation.

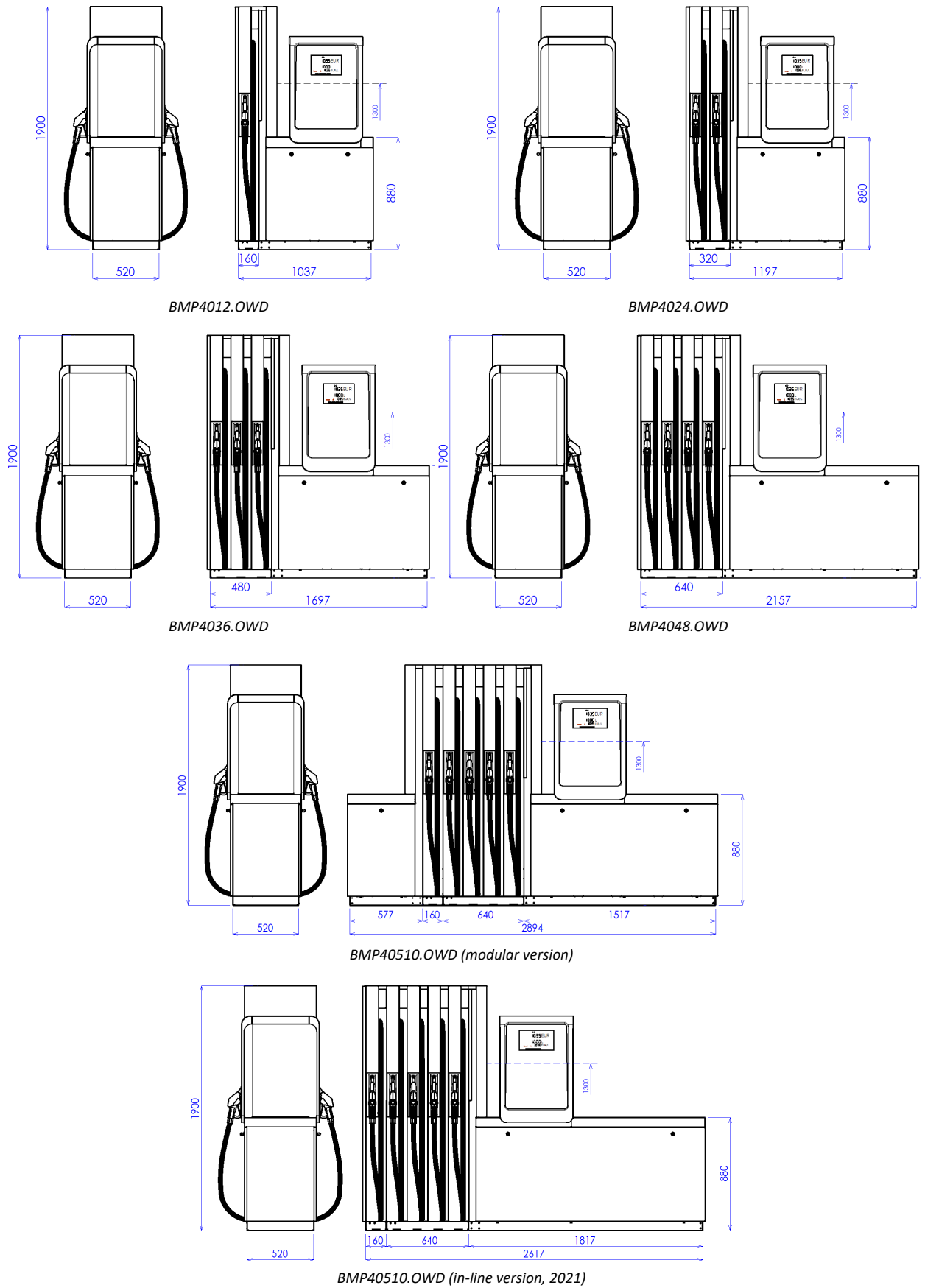
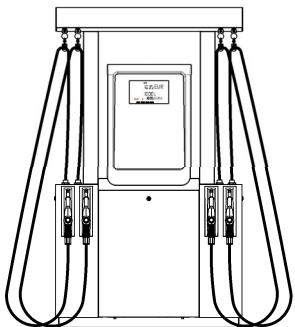


Figure 7 - Overview of standard OCEAN TOWER models

2.4.6. OCEAN HERO DISPENSERS

Multi-product OCEAN TOWER dispensers are standardly manufactured in a suction version in a single-sided left (L), single-sided right (R) or double-sided (D) design with one to eight delivery hoses for liquid fuel (gasoline, diesel, E85 ...) located on the front of the dispenser. Single-sided right version can be obtained by turning the the single-sided left dispenser by 180°.The dispensers are equipped with free hanging hoses or hose retractor system. There are two basic versions – a narrow variant (1080 mm) for 1 or 2 hydraulic systems and a wide variant (1280 mm) designed for 3 or 4 hydraulic systems.

List of standard OCEAN HERO models:



Dispenser model	Access to dispenser (1-single-sided, 2-double-sided)	Total number of products (i.e., number of pumps or inputs)	Number of meters (i.e., number of measuring systems)	Number of delivery hoses (dispenser hose + module hose)	Number of main displays (i.e., number of simultaneous deliveries)
BMP4011.OHL	1	1	1	1	1
BMP4012.OHD (-S)	2	1	2	2	2
BMP4022.OHD (-S)	1	2	2	2	1
BMP4024.OHD	2	2	4	4	2
BMP4033.OHL	1	3	3	3	1
BMP4036.OHD	2	3	6	6	2
BMP4044.OHL	1	4	4	4	1
BMP4048.OHD	2	4	8	8	2
BMP4021.OHD/UH-S	2	2	2	1	1
BMP4042.OHD/UH/UH	2	4	4	2	2
BMP4042.OHD/UH/UH-S	2	4	4	2	2

Notes: The pumping performance is strongly dependent on the conditions at the station (distance from the tank, suction height, pipe inner diameter... etc.). The standard pumping performance is within the range of 35 to 50 L/min. For special models (see chapter 2.3), the performance of the diesel hoses can be increased to a high performance of 70 to 90 L/min (/H) or ultra-high performance from 120 to 150 L/min (/UH). When using a special meter (LOBE), the pumping performance can be increased up to 170 L/min and in a pressure version up to 200 L/min, depending on the submersible pump power. Special models marked -2C and -4C can simultaneously deliver two liquid fuels on one side of the dispenser. Dispensers can also be produced in a pressure version without pumps (/S3) where the central submersible pump is in the storage tank and pushes the fuel into the dispenser via a pressure line. According to the number of gasoline products, dispensers can be equipped with a vapour recovery system (/VR, /VR2, /VR3...) of the 2nd level and optionally with an electronic system that monitors the correct function and efficiency of the recovery system. Delivery nozzles are standardly placed on the front of the dispenser. For the single-product, two-product model and the high-performance dispenser (/UH), a side nozzle option (-S) is also possible.

Pictures (PNG, DWG) with dimensions of all models can be downloaded here: <https://www.tatsuno-europe.com/en/download/>.

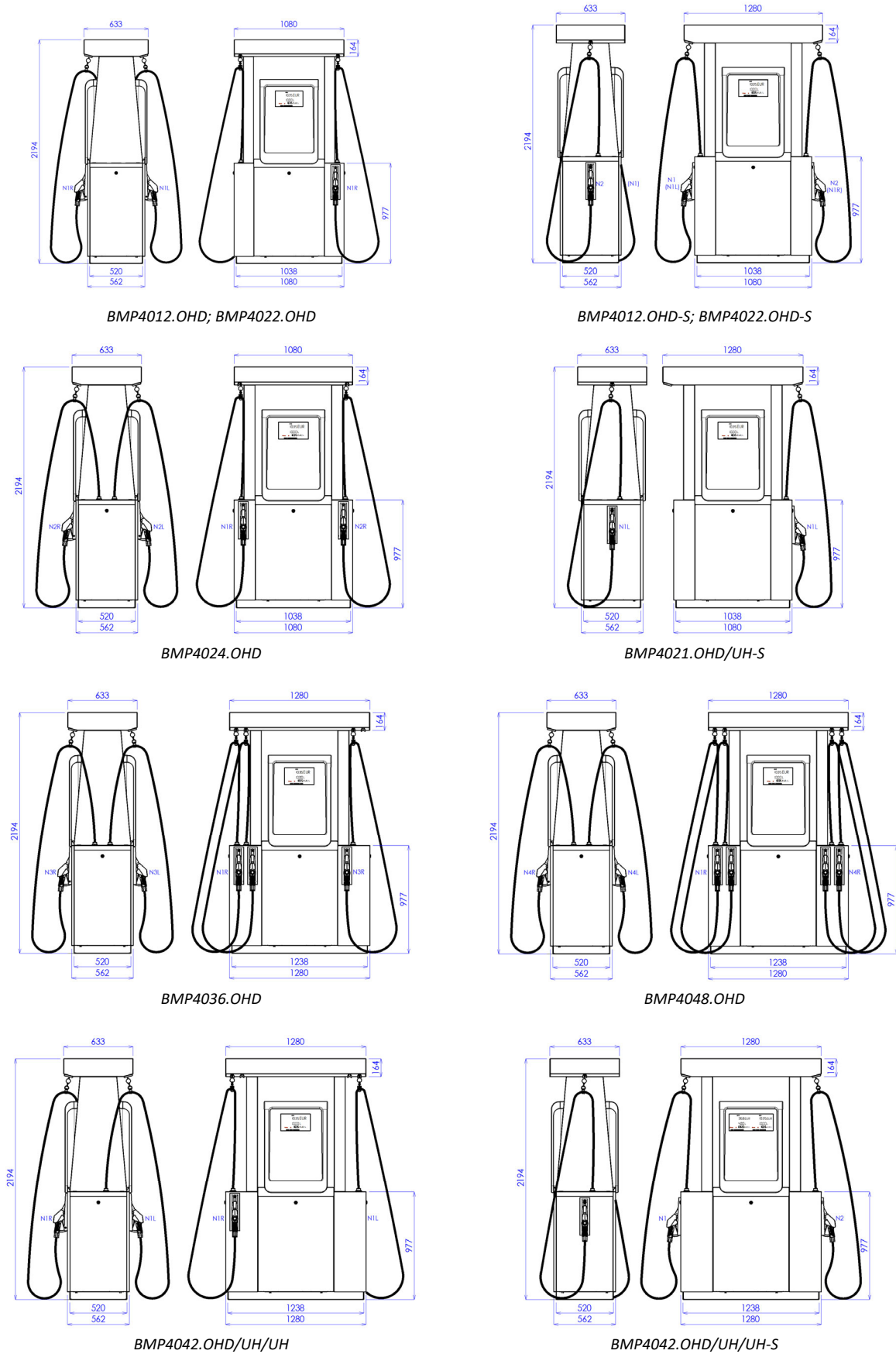
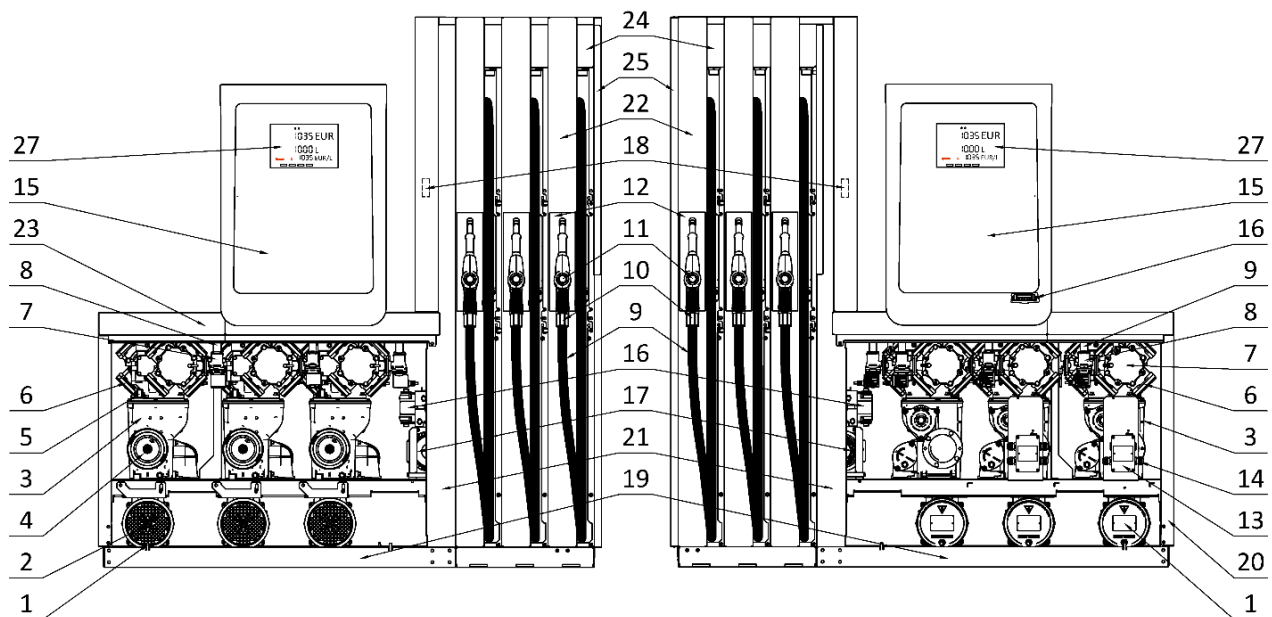
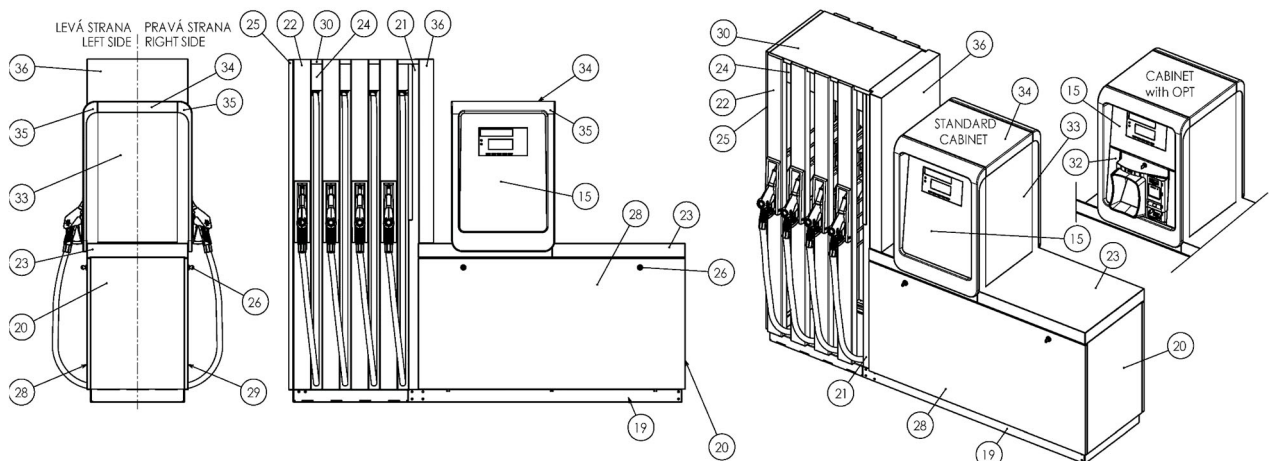


Figure 8 - Overview of standard OCEAN HERO models

2.5. TERMINOLOGY OF BASIC PARTS OF THE DISPENSER



Picture 9 - Basic parts of the OCEAN TOWER dispenser



Picture 10 - Covers of the OCEAN TOWER dispenser

Position	Device	Position	Device	Position	Device
1	Pump motor	13	Distribution box	25	Back Cover
2	Motor pulley	14	Cable bushing – IP66/ IP67	26	Lock
3	Pumping monoblock	15	Display mask plate	27	Display
4	Pump pulley	16	Vapour recovery pump	28	Door – left
5	Air separation sensor	17	Vapour recovery pump motor	29	Door – right
6	Pulser – pulse generator	18	Vapour flow sensor	30	Roof cover
7	Electro-magnetic valve	19	Dispenser foundation	31	-
8	Piping	20	Dispenser cabinet	32	OPT mask plate
9	Dispensing hose	21	Inner column	33	Cabinet with OPT
10	Breakaway coupling	22	Hose column	34	STANDARD CABINET
11	Dispensing nozzle	23	Hydraulics roof	35	Plastic cabinet frame
12	Nozzle boot	24	Column's roof	36	Inner column cover

2.6. NAMEPLATES

Each dispenser is equipped with one, see Figure 11, or in the case of a combined dispenser, with several nameplates for individual fuels, see Figure 14. If the number of delivery hoses is higher than two then the dispenser is supplemented with the so-called orientation label, see Figure 13, 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) 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.

TATSUNO EUROPE a.s. CE 1026
CZ-678 01 Blansko, Pražská 68

FUEL DISPENSER

Type: OCEAN BMP4012.OWD/H
MID certificate: TCM 141/07-4491
ATEX certificate: FTZÚ 10 ATEX 0259
Serial Number/Year: 1272/16
Ambient temp.range: -40°C ÷ +50°C
Liquid temp. range: -20°C ÷ +50°C
Min/Max pressure: 0.20MPa/0.35MPa
Accuracy/Mech./Elmg.class: 0.5/M1/E1
Liquid: petroleum, (bio)diesel, E85
Viscosity range: 0.5 ÷ 10.0 mPa.s

	Qmax [L/min]	Qmin [L/min]	Vmin [L]
A	50	5	2
B	80	5	5
C	130	10	10

3x400/230V,2A,50Hz,0.75kW

II 2G IIA T3 EN 13617-1

CE M21 1383 CE M21 1383

Place for W&M sticker L1 R1 A A

Figure 11 - Nameplate of a two-hose gasoline/diesel dispenser

TATSUNO EUROPE a.s. CE 1026
CZ-678 01 Blansko, Pražská 68

FUEL DISPENSER

Type: OCEAN BMP4048.OWD
MID certificate: TCM 141/07-4491
ATEX certificate: FTZÚ 10 ATEX 0259
Serial Number/Year: 1272/16
Ambient temp.range: -40°C ÷ +50°C
Liquid temp. range: -20°C ÷ +50°C
Min/Max pressure: 0.20MPa / 0.35MPa
Accuracy/Mech./Elmg.class: 0.5/M1/E1
Viscosity range: 0.5 ÷ 10.0 mPa.s
Liquid: petroleum, diesel, ethanol (E85), biodiesel, kerosene, aviation fuel

	Qmax [L/min]	Qmin [L/min]	Vmin [L]
A	50	5	2
B	80	5	5
C	130	10	10

3x400/230V,2A,50Hz,0.75kW

EN 13617-1 II 2G IIA T3 W&M

Figure 12 - Nameplate of the multi-hose gasoline/diesel combined

4 3 2 1 L R

CE M21 1383 CE M21 1383

L1 R1 A A

CE M21 1383 CE M21 1383

L2 R2 A A

CE M21 1383 CE M21 1383

L3 R3 A A

CE M21 1383 CE M21 1383

L4 R4 A A

Figure 13 - Orientation label for multiple hose dispensers

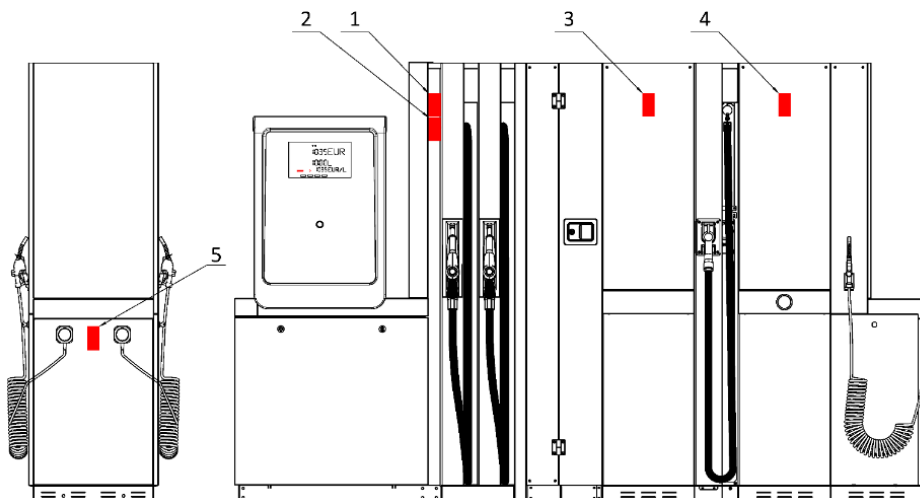





Figure 14 - Nameplate location on the combined dispenser

(1- nameplate of main gasoline/diesel dispenser, 2 - orientation label of main dispenser, 3, 4, 5 - nameplate of AdB, LPG, WSE modules)

Table 2 - Label information on the dispenser and module








TATSUNO EUROPE a.s.	Name and address of dispenser manufacturer
	Dispenser labelling means that it is designed, manufactured and labelled in accordance with European Commission directives. The dispenser is subject to a type examination certification in accordance with Directive 2014/32/EU - MID which was carried out by a notified body No. 1383 - ČMI Brno
	Dispenser labelling means that it is designed, manufactured and labelled in accordance with European Commission directives. The dispenser is subject to the type-examination certification in accordance with Directive 2014/34/EU - ATEX which has been carried out by a notified body No. 1026 - FTZÚ Ostrava Radvanice
LIQUID FUEL DISPENSER	Device identification
Type of	Marking of the dispenser type (see section 2.3)
MID certificate	Number of the metrology EU certificate approving the meter type – ČMI
ATEX certificate	Number of the EU certificate of type examination (ATEX certificate) – FTZÚ
Serial number	Serial number of the dispenser (seq. number / year of production)
medium temperature range	Range of delivered liquid, medium or 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
diesel, gasoline, LPG, AdBlue...	Type of liquid, medium or gas for which the dispenser was designed and approved
Q _{max}	Maximum pumping / filling flow rate in L/min or kg/min
Q _{min}	Minimum pumping / filling flow rate in L/min or kg/min
MMQ	Minimum consumption in L or kg
	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 13617-1	Number of the European standard under which the dispenser was approved
motor power supply	3x400/230V; 2A; 50Hz; 0,75kW

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.

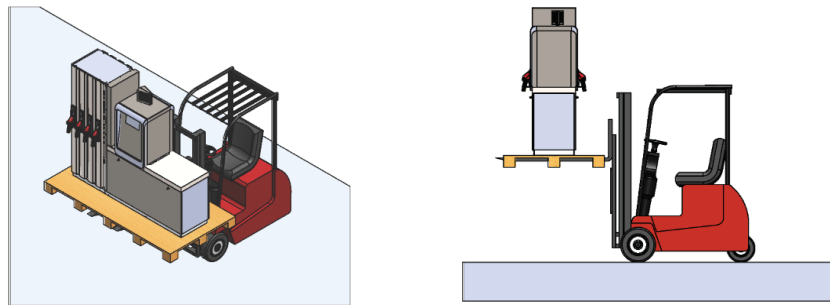
Packaging of dispensers is performed differently, according to the destination.

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

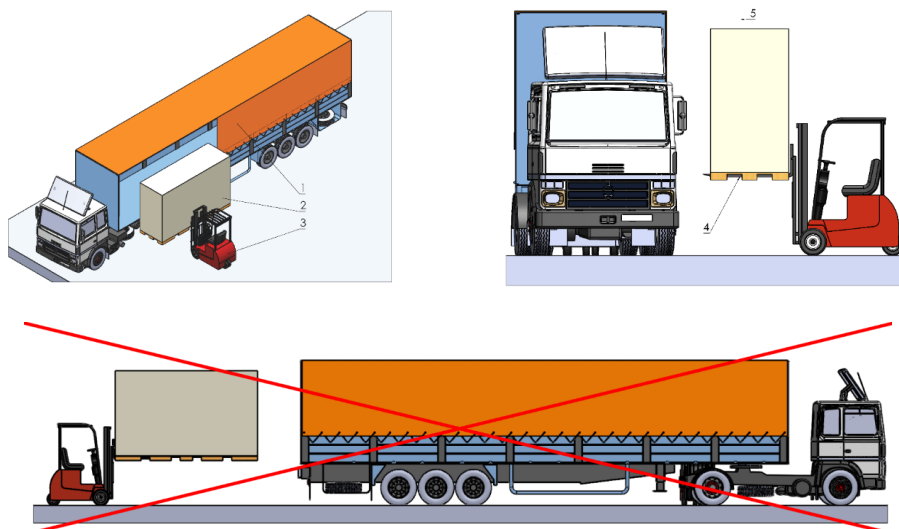
The following rules must be observed when loading, unloading and setting up the dispenser:

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



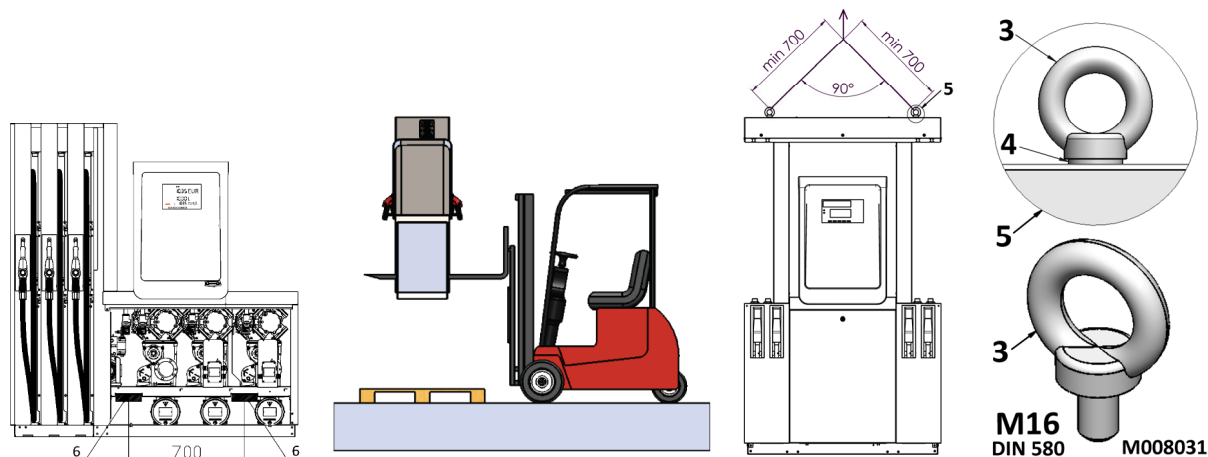
Picture 15 – Using of a forklift during loading and unloading

- 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).



Picture 16 – 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)

- When installing the dispenser on the site, first remove the dispenser covers (doors) and loosen the anchor bolts between the wooden pallet and the dispenser. Then pick up the dispenser from a wooden pallet and place it on the prepared base frame on the site. Use the holes in the dispenser for the 100 x 40 mm load forks to lift (OCEAN TOWER) or two hanging eyes attached to the holes in the dispenser canopy (OCEAN HERO) – see Picture below.



Picture 17 – Lifting the dispenser from the wooden transport pallet

(3-hanging eye M16, DIN580, 4-Plastic washer; 5-using of hanging eye; 6-transport holes for support fork 100mm x 40mm)

NOTE M16 hanging eyes (DIN580) are not part of the delivery of the dispenser. However, they can be ordered, no.: M008031.

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 19.

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 18.

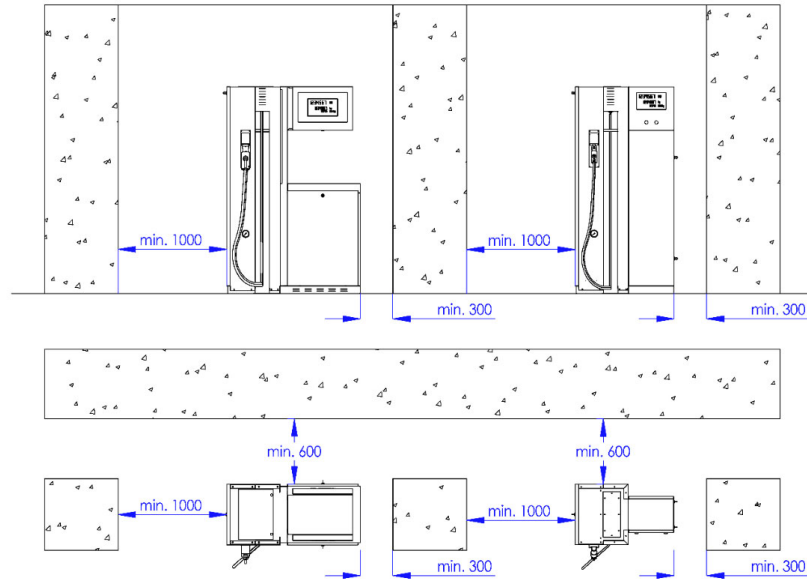


Figure 18 – Minimum recommended separation distance of the dispenser from a fixed obstacle

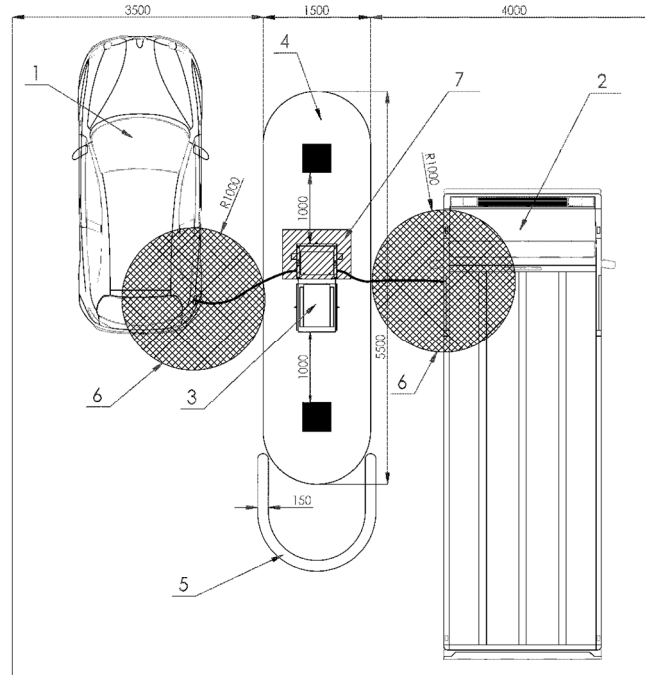


Figure 19 – Example of the dispenser location at the fuel station

(1-refilling position for passenger cars, 2- refilling position for trucks and buses, 3-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 dispenser)

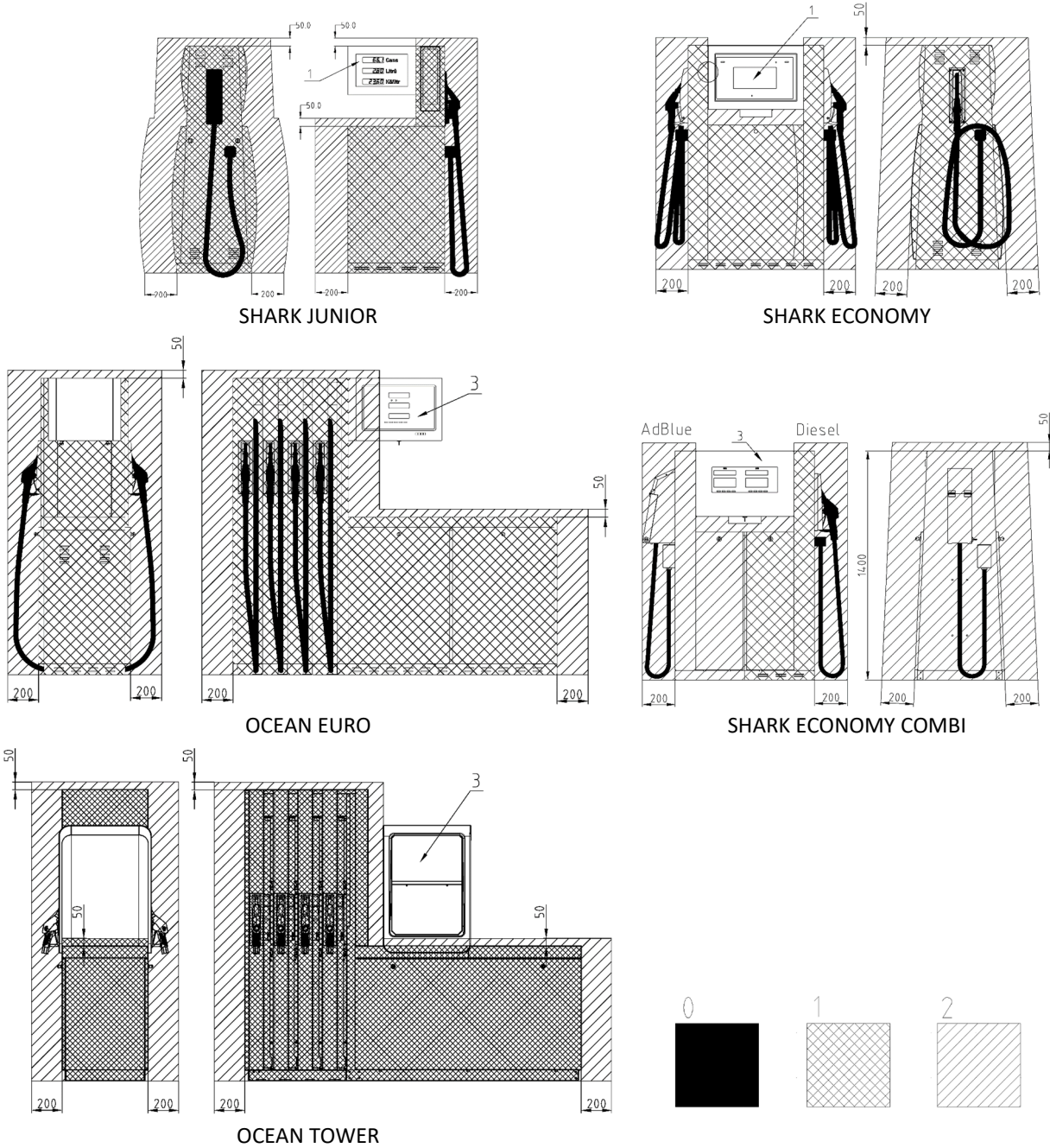
3.3.2. INSTALLATION IN TERMS OF EXTERNAL INFLUENCES (DANGER ZONES)

Dispensers for liquid (petrol, diesel, LPG) or 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. For dispensers for liquid fuels such as petrol, diesel, E85, kerosene, aviation gasoline, etc., the dispenser zones are also regulated by the EN 13617-1 standard. Drawings of the zones created by the dispenser are part of the mandatory documentation of the dispenser manufacturer, see documents *INO41-ML Installation plans I* and *INO43 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 200 mm vertically and 50 mm 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...).



Picture 20 – Danger zones drawings according to EN 13617-1
(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

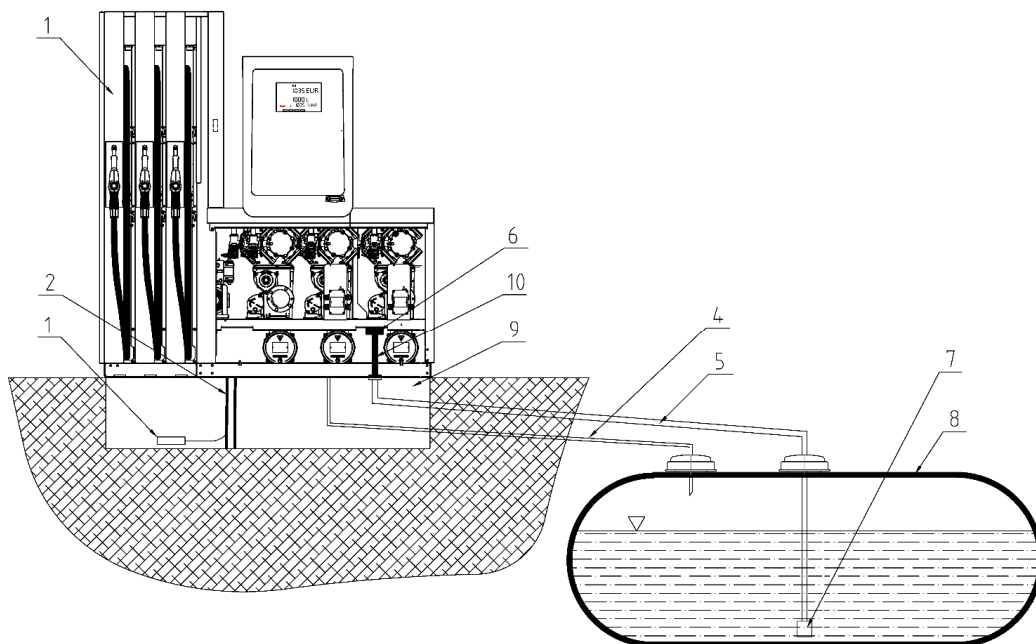
Single-sided dispenser stands are labelled "L" and "R" ("L" left/left-sided and "R" right/right-sided) after the dispenser type designation, e.g., BMP4011.OWL, see section 2.3. Dispenser orientation is determined by a view of the dispenser from the vehicle arrival direction, see Figure 1.

3.3.4. DISPENSER DISTANCE FROM A TANK–FUEL TANK

The manufacturer recommends that the maximum distance of dispensers from storage tanks (gasoline, diesel, LPG, WSE and AdBlue®) should be **50 meters** and the suction height up to **5.5 meters**. Under other conditions, the suction capacity of dispensers equipped with pumps may be impaired, resulting in a reduction in pumping performance (rated flow) or an increase in the noise level of the dispenser. All technological requirements for the fuel station must be solved in a professionally designed and approved fuel station project consulted with the dispenser manufacturer.

3.3.5. LIQUID FUEL TANK TYPE

Dispensers for pumping liquid fuels and technical liquids (diesel, gasoline, AdBlue, WSE...) can be connected to both underground and over ground storage tanks.

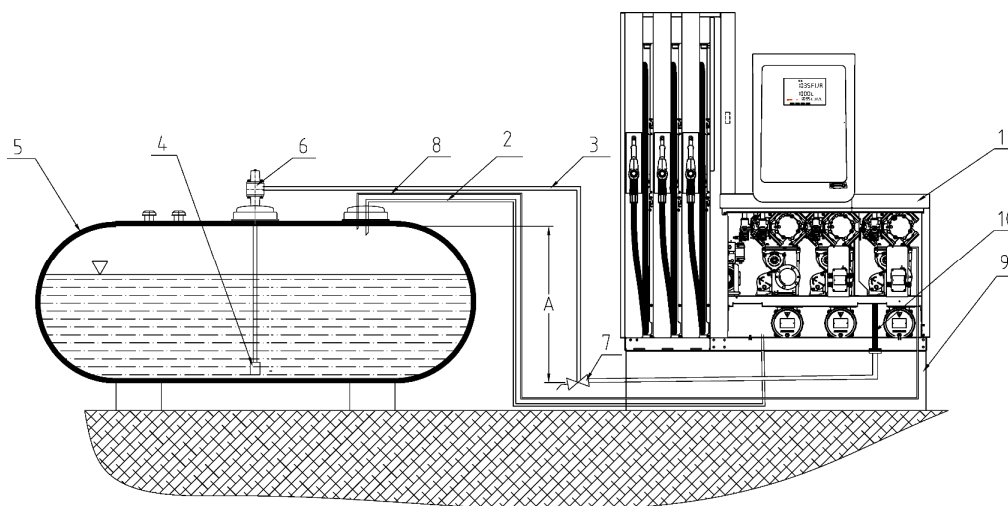


Picture 21– Example of connection of the dispenser with suction pumps to an underground tank

Legend: 1 – dispenser, 2 – electrical supply cables and data line, 3 – liquid sensor located at the bottom of the drip tray, 4 – vapor return pipe (recuperation), 5 – suction fuel pipe, 6 – check valve at the pump inlet, 7 – suction basket (without non-return valve), 8 – underground fuel tank, 9 – drip tray with dispenser base frame, 10 – connection piece (bellows) with flange

CAUTION If the dispenser is connected to an **underground storage tank**, it is necessary to include a **backflow valve** in the suction pipeline to ensure that if the dispenser is stationary and does not pump, the fuel column will not be spontaneously interrupted and the air will not be sucked in after pumping starts. **A separate check valve must not be installed if a suction basket has been already equipped with a check valve (see Picture 21)**

CAUTION If the dispenser is connected to an aboveground storage tank, it is necessary for the safety reasons to include a **pressure relief valve** in the suction pipeline which prevents the product from escaping from the tank by gravity during a malfunction. The valve also serves to release overpressure in the suction pipeline back into the storage tank. We recommend the **OPW 199ASV (Anti-Siphon Valve)** valve. The valve type must be selected according to the difference between the maximum fuel level in the storage tank and the lowest point of the fuel line, see Picture 22, height A. At the lowest point of the pipeline, a **shut-off and drain valve** should be installed which should be closed by the fuel station operator whenever the dispenser is not in operation. **In the absence of these valves, uncontrolled leakage of fuel can occur in the event of any leak in the piping system! (see Picture 22).**



Picture 22 – Example of connection of the dispenser with suction pumps to the aboveground storage tank

Legend: 1 – dispenser, 2 – vapor return line (recuperation), 3 – suction fuel line, 4 – suction basket (without non-return valve), 5 – above-ground fuel tank, 6 – overpressure non-return valve (OPW 199ASV), 7 – Drain and shut-off valve, 8 – return line from the dispenser pump separator, 9 – drip tray with base frame of the dispenser, 10 – connection piece (bellows) with flange

NOTICE **Overground storage tank.** The pumping monoblock of dispensers is designed with a permanently open-air separator into the venting chamber formed by the space in the monoblock body and the monoblock lid space. A hole with an integrated DN6 connection for connecting the air exhaust pipe is in the top of the lid. To prevent overfilling of the pumping monoblock venting chamber and leakage of the medium into the dispenser interior and then into its surroundings in case of leakage or blockage of the check valve when the dispenser is out of operation, **it is necessary to connect the outlet of the pumping monoblock separator to the storage tank.** This connection can be made using a pipe $\varnothing 10 \times 1$ (DN8) connected to the DN8 pipe connection. The pipe connection is screwed through the seal in the M12x1.5 hole in the top of the monoblock lid. The pipe outlet must be inserted into the storage tank lid using the DN8 corner connection.

3.3.6. DESIGN OF PIPELINES

The dispenser manufacturer recommends conducting piping in a standard way where a separate pipeline runs from each pump in the dispenser to a relevant fuel tank.

NOTE There is also a so-called backbone piping system where several dispensers (pumps) are connected to one supply pipeline from the storage tank. The dispenser manufacturer **does not recommend** this backbone piping system due to possible instability of the fuel suction from storage tanks. If the designer decides for the backbone piping system, the dispenser manufacturer requires to include **disk valves** in the suction pipeline which will functionally separate the dispensers from one another.

3.3.7. SUCTION SYSTEM

In the case of a **suction system**, the suction pump is located directly in the dispenser. The pump is connected to the storage tank by a suction line, which draws fuel from the storage tank into the tank of the car. Examples of connection of suction line to pump are described in document IN041 - Installation plans.

NOTICE *The dispensers are designed to be connected to a 44.5 x 2.5 mm suction fuel line terminated by oval flange PN6 DN32 (G1/4") according to EN 13 365. If another type of inlet pipe and flange is used then is necessary to discuss it with the dispenser manufacturer. The dispenser manufacturer is not responsible for the problems associated with inlet pipe leaks and poor connection to the suction pump.*

3.3.8. PRESSURE SYSTEM

TATSUNO EUROPE dispensers can be connected not only to the system with conventional suction where the fuel is sucked in by pumps located in dispensers, but also to the **pressure system** where the fuel is “pushed” into the dispenser directly from storage tanks where submersible (diesel, gasoline, AdBlue, WSE) or external (LPG) pumps are located. The advantage of the pressure system is a very quiet operation of dispensers, the disadvantage is high demands on the quality and tightness of the fuel line. In the case of a pressure system, the dispenser is not equipped with a pumping monoblock. The inlet pipeline is connected via a breakaway valve located under the dispenser and is firmly connected to its base frame. From there, the liquid flows into a filter and is distributed through gauges and control valves into delivery hoses and nozzles.

CAUTION *According to the European standard EN 13617-1, the dispenser connected to the pressure system must be equipped with a breakaway valve that closes the pressure supply in the event of the dispenser being pulled down! The breakaway valve is not a part of the standard delivery of the dispenser. The dispenser manufacturer recommends using the OPW 10BF valve. The fuel inlet to the dispenser is made by a pipe with a compression nut with a G1" internal thread. The position of the inlet pipeline is shown in Appendix 1 where the recommended connection to the pressure pipeline is also indicated.*

CAUTION *It is necessary to ensure that the maximum allowed pressure of 0.35 MPa is not exceeded at the fuel inlet to the dispenser.*

The base plans of dispensers in a pressure design are shown in document IN041.

3.3.9. SATELLITE TO THE DISPENSER

All dispensers of the OCEAN series can be equipped with a so-called satellite. This is an additional delivery point – a column with a delivery hose and a delivery nozzle which is placed on the other side of the safety island. In particular, the satellite can be used to fill trucks where it is possible to fill with delivery hoses of the main dispenser and satellite into both side tanks of the truck at the same time. The satellite column has no control electronics and hydraulics and is completely dependent on the main dispenser. The satellite image, foundation plan and foundation frame are shown in document IN041 – Installation plans.

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 part 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.

CAUTION *Where required by local regulations, for the sake of safety and environmental protection, a drip tray is installed under the dispenser. It prevents the leakage of fuel or technical liquid into soil due to possible leakage of the hydraulic system. The leaked liquid appears at a defined location outside the dispenser where the operator quickly identifies it and ensures a repair of the leakage of the hydraulic system.*

Then the dispenser is connected to the suction pipeline with a bellows (suction piece) that is included in the dispenser delivery. Appendix 1 shows the foundation frames and foundation plans of all types of dispensers with the

indicated position of the suction pipeline and the pipeline for extracting gasoline vapour from dispensers. The vapour recovery pipeline is connected to the G 1" lid of the pipeline.

NOTE The G 1" lid is included in the dispenser delivery. **The suction line must be terminated by the G1" internal thread.**

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 mm² 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 – Foundation plans.

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

Power cables:

- supply of pump and vacuum pump electric motors located in the dispenser
- supply of counters, switching circuits and heating
- switching of pumps located outside the dispenser (pressure version of the dispenser)

Signal cables:

- communication line
- additional service and safety lines (STOP signal, pulse outputs, motor blocking, level gauges, etc.)

Table 3 – Cable characteristics

Cable type	Function	Number of wires	D _{Anom} [mm]
H05VV5-F 4x1.5	motor power supply	4	8.2 – 10.2
H05VV5-F 7x1.0	pump switching	7	9.5 – 11.8
H05VV5-F 3x1.5	counter power supply, module pump switching, security line	3	7.4 – 9.4
H05VV5-F 5x1.5	power supply for the counter with heating	5	9.1 – 11.4
H05VVC4V5-K 5x0.5	data line	5	10.1

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.

4.1. PDEX5 COUNTER

The PDEX5 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 the Manager mode is protected by password.

NOTE If the dispenser is equipped with a 12-button preset keyboard, then it can be used to enter the operator and manager mode of the dispenser counter - see chapter 5.3.9

4.1.1. DESCRIPTION OF PDERT-5O REMOTE CONTROLLER

The keyboard of the PDERT-5O remote manager's controller is described on Figure 24. 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. In the electronic counter, the dispensing hoses (L1...L5, R1...R5) and the products (P1...P5) are marked with the numbers 1, 2, 3... 9, 10, see Figure 23. 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 Figure 23. 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.

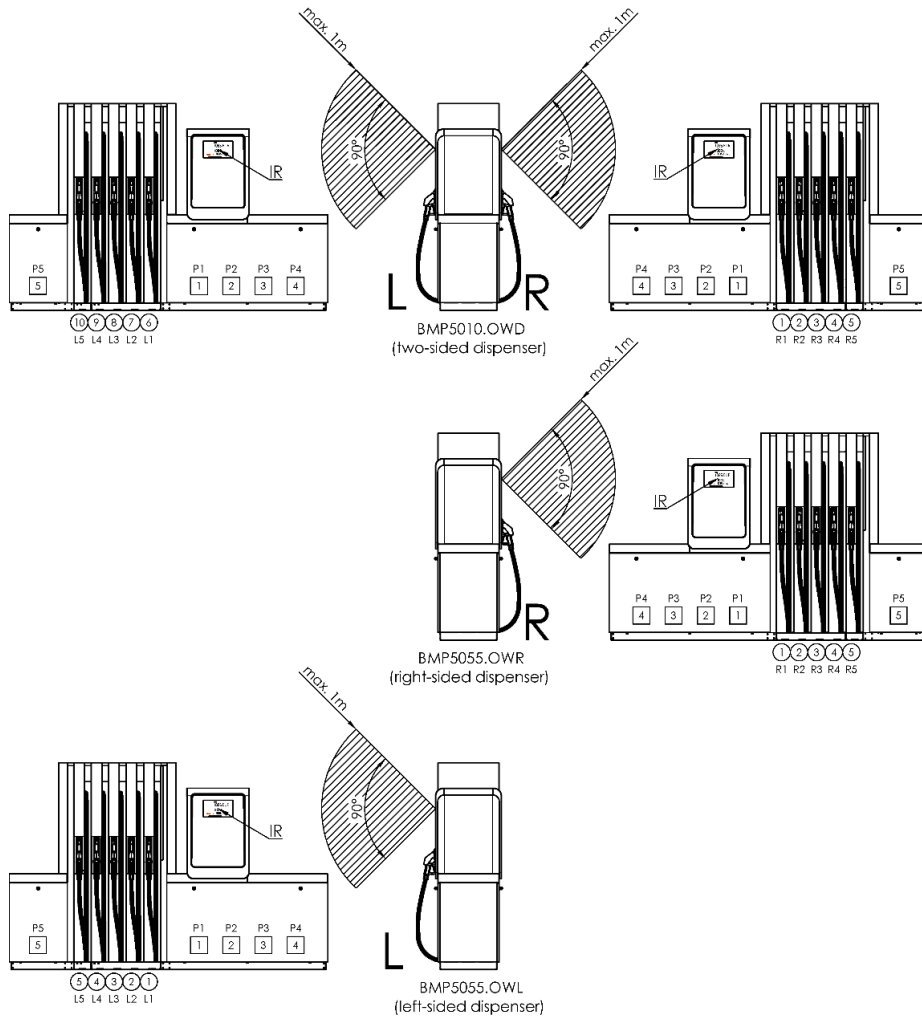


Figure 23 – Range of operation of the remote controller and marking of hoses (Lx, Rx) and dispenser products (Px) (IR - position of infrared receiver on the display)



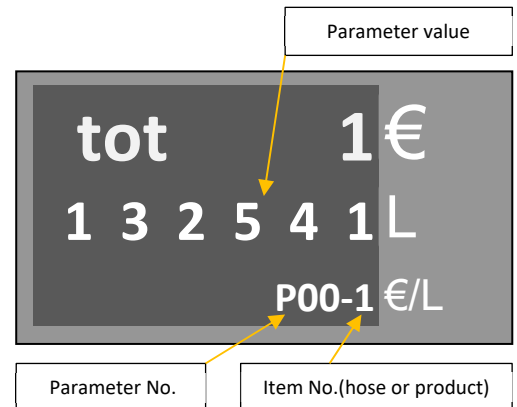
Figure 24 – Description of keys of the PDERT-50 remote controller PDERT-50

- ▲ **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.
- ▲ **Vapour recovery system test (so-called "Dry Test").** If the dispenser is at idle status and all delivery nozzles have been hung, pressing the <8> key can test the vacuum pump function. The vapour recovery vacuum pump is started for the time defined by parameter 11. Lifting the nozzle stops the vacuum pump test.

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 (volume in centilitres)



4.1.3. OPERATOR MODE

The operator mode of the PDEX5 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 (see Figure 24). 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 <R> or <A> keys. The mode is finished automatically if no remote controller button is pressed for 60 seconds.

Parameter	Description
P00	Non-resettable quantity totalizers - volume or weight
P01	Daily quantity totalizers - volume or weight
P02	Daily amount totalizers – in currency unit

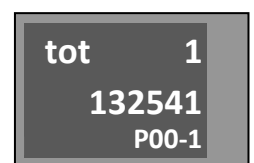
4.1.4. MANAGER MODE

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.



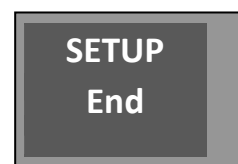
NOTE If the fuel station manager forgets the valid access password, then he/she must contact the authorized service staff who can set a new one.

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
P00	Non-resettable quantity totalizers, volume or weight	P20	Error message codes history
P01	Daily quantity totalizers - volume or weight	P21	Error message codes statistics of filling point A
P02	Daily amount totalizers – in currency unit	P22	Error message codes statistics of filling point B
P03	Unit price (manual/standalone mode)	P23	Error message codes statistics of filling point C
P04	Date and Time	P24	Error message codes statistics of filling point D
P05	Program version + checksums	P25	Last fuelling history of filling point A
P06	Modbus interface activation (licence status)	P26	Last fuelling history of filling point B
P07	not used	P27	Last fuelling history of filling point C
P08	Manager mode access password	P28	Last fuelling history of filling point D
P09	not used	P29	Maintenance history
P10	Serial numbers of peripheral units (processor, ...)	P30	Correction factors history
P11	Vapour recovery user test duration (Dry Test)	P31	Number of events
P12	Dispenser control mode	P32	Control mode changes history
P13	Export of parameters	P33	Vapour recovery history of filling point A
P14	Current product temperature	P34	Vapour recovery history of filling point B
P15	Daily totalizers reset (P01 and P02)	P35	Average value of vapour/fuel ration of filling point A and B
P16-P19	not used	P36	Average value of VR feedback factor of filling point A and B

The manager mode is finished by pressing <R> 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 VOLUME TOTALIZERS (P00)

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
P00-1	quantity of the fuel delivered by hose 1 in centilitres (x 0.01L)
P00-2	quantity of the fuel delivered by hose 2 in centilitres (x 0.01L)
...	...
P00-10	quantity of the fuel delivered by hose 10 in centilitres (x 0.01L)

NOTE Number of totalizers of delivery hoses shown in the P00 parameter is conditioned by the configuration of the dispenser. The identification system of delivery hoses and products is described in Figure 23.

4.1.6. DAILY QUANTITY TOTALIZERS (P01)

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
P01-1	quantity of the fuel delivered by hose 1 in centilitres (x 0.01L)
P01-2	quantity of the fuel delivered by hose 2 in centilitres (x 0.01L)
...	...
P01-10	quantity of the fuel delivered by hose 10 in centilitres (x 0.01L)

4.1.7. DAILY AMOUNT TOTALIZERS (P02)

Electronic daily amount totalizers for all dispensing hoses are stored in the electronic counter's memory. They indicate total amount of the fuel that 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
P01-1	amount of the fuel delivered by hose 1 in centilitres (x 0.01L)
P01-2	amount of the fuel delivered by hose 2 in centilitres (x 0.01L)
...	...
P01-10	Amount of the fuel delivered by hose 10 in centilitres (x 0.01L)

4.1.8. FUEL PRODUCT UNIT PRICES (P03)

This feature allows you to view and set current unit prices (i.e., one litre of fuel) 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 €/L is entered as number 0103, price 34.15 CZK/L as number 3415, etc.

Parameter	Meaning	Factory setting
P03-1	fuel product unit price 1	0,00 €/L
P03-2	fuel product unit price 2	0,00 €/L
P03-3	fuel product unit price 3	0,00 €/L
P03-4	fuel product unit price 4	0,00 €/L
P03-5	fuel product unit price 5	0,00 €/L

NOTE Number of fuel products shown in the P03 parameter is conditioned by the configuration of the dispenser. The identification system of delivery hoses and products is described in Figure 23. if you change the unit price, such change will be reflected after a subsequent lift of the delivery nozzle.

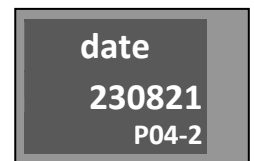
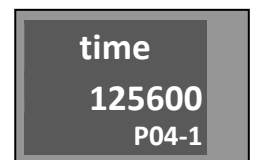
NOTICE Values set in the P03 parameter are valid **in the dispenser manual mode only**. If the dispenser is connected to the central control system of the fuel station, then the fuel unit price is set directly by the control system before each delivery. In such case the values of the P03 parameter are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

4.1.9. 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

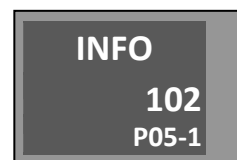


NOTE The time/date information is used by parameters P20 to P34 to record the exact moment of the fault, end of delivery, change of dispenser control mode..., etc. The date/time data has only an informative function, it does not affect the process of fuel delivery.

NOTICE The internal clock is reset at least 5 days after the power supply off. Time and date values will switch to factory setting and must be set again!

4.1.10. 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
P05-1	Version of the metrologically relevant part of the program. It is specified in the type certificate (e.g., 102 = version V1.02)
P05-2	CRC (check sum) of metrologically relevant part of the program. It is specified in the type certificate (e.g., dbd2 FFA4)
P05-3	Version and release of the whole program (e.g., 1.02 release 14)
P05-4	CRC (check sum) of the whole program (e.g., 27E6 622d)
P05-5	CRC (check sum) of the temperature sensors unit PDEINP1 program (for temp. sensors 1 to 4). If not present „----“ is displayed
P05-6	CRC (check sum) of the temperature sensors unit PDEINP1 program (for temp. sensors 5 to 8). If not present „----“ is displayed
P05-7	Date and time the program compilation. The first line shows the time (hhmmss) and the second the date (DDMMYY).
P05-8	CRC of the program of the pressure sensors unit PDEDPS with address 1. If not present, "----" is displayed
P05-9	CRC of the program of the pressure sensors unit PDEDPS with address 2. If not present, "----" is displayed
P05-10	CRC of the program of the pressure sensors unit PDEDPS with address 3. If not present, "----" is displayed
P05-11	CRC of the program of the pressure sensors unit PDEDPS with address 4. If not present, "----" is displayed

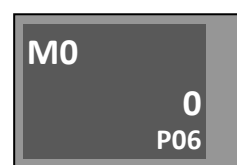
NOTE Metrologically relevant data P05-1 and P05-2 also appear on the display for a while after the power on.

NOTE The calculated CRC (cyclic redundancy sum) values from sub-parameters 1 and 3 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.

4.1.11. MODBUS INTERFACE ACTIVATION (P06)

The modbus interface (diagnostic data line) allows service organizations to remotely diagnose dispensers. Parameter P06 allows to activate the Modbus interface by entering a valid key (eight-digit code).

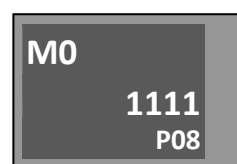
Parameter	Meaning	Factory setting
P06=0	The Modbus license is not valid. Modbus interface is not active	0
P06=1	The Modbus license is valid. Modbus interface is active	



4.1.12. MANAGER MODE ACCESS PASSWORD (P08)

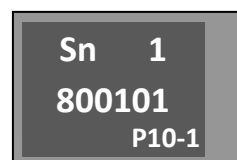
This function allows to view and change the password to the manager mode. The setting is made by pressing the <E> key by entering a new password in <PPPP> format and confirming <E>.

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



4.1.13. 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 peripheral units is below.



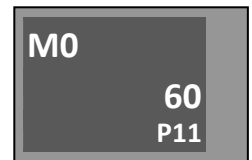
Example: Parameter P10-1, serial number of the main processor unit SN: 18-00101 (see picture)

Parameter	Peripheral unit	Error message in case of detected mismatch
P10-1	Main processor unit	
P10-2	Main temperature sensors unit PDEINP1 (for temp. sensors 1 to 4)	E83-1
P10-3	Auxiliar temperature sensors unit PDEINP2 (for temp. sensors 5 to 8)	E83-2
P10-4	Mass meter A	E84-1
P10-5	Mass meter B	E84-2
P10-6	Main displaying unit (Master) of filling point A	E80-1
P10-7	Auxiliar displaying unit (Slave) of filling point A	E80-2
P10-8	Main electromechanical totalizers unit (Master) of filling point A	E82-1
P10-9	Auxiliar electromechanical totalizers unit (Slave) of filling point A	E82-2
P10-10	Main displaying unit (Master) of filling point B	E80-1
P10-11	Auxiliar displaying unit (Slave) of filling point B	E80-2
P10-12	Main electromechanical totalizers unit (Master) of filling point B	E82-1
P10-13	Auxiliar electromechanical totalizers unit (Slave) of filling point B	E82-2
P10-14	Main displaying unit (Master) of filling point C	E80-1
P10-15	Auxiliar displaying unit (Slave) of filling point C	E80-2
P10-16	Main electromechanical totalizers unit (Master) of filling point C	E82-1
P10-17	Auxiliar electromechanical totalizers unit (Slave) of filling point C	E82-2
P10-18	Main displaying unit (Master) of filling point D	E80-1
P10-19	Auxiliar displaying unit (Slave) of filling point D	E80-2
P10-20	Main electromechanical totalizers unit (Master) of filling point D	E82-1
P10-21	Auxiliar electromechanical totalizers unit (Slave) of filling point D	E82-2
P10-22	Pressure sensors unit PDEDPS with address 1	E85
P10-23	Pressure sensors unit PDEDPS with address 2	E85
P10-24	Pressure sensors unit PDEDPS with address 3	E85
P10-25	Pressure sensors unit PDEDPS with address 4	E85

4.1.14. VAPOUR RECOVERY USER TEST DURATION – DRY TEST (P11)

The parameter specifies the test duration in seconds for which the vapour recovery system vacuum pump will start after pressing the <8> button. The setting is made by pressing the <E> key by entering the test time in <SS> format and confirming with the <E> key.

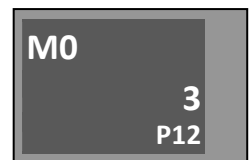
Parameter	Meaning	Factory setting
P11 = 5, 6...300	Dry Test duration in seconds	60 seconds



4.1.15. DISPENSER CONTROL MODE (P12)

The parameter defines how the dispenser is controlled.

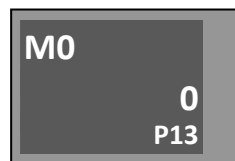
Parameter	Meaning	Factory setting
12 = 0	<u>Automatic mode with remote control</u> The dispenser is remotely controlled by a control computer/controller via a data line. It starts fuel delivery only when an authorization command from the the control system (POS) is received. The authorization command 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	<u>Manual mode</u> 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 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. EXPORT OF PARAMETERS (P13)

To export the counter parameters from the memory to the memory card (SD card), press the <E> key, enter <1> and confirm with the <E> key. Before running the test, make sure that an SD card is inserted in the processor board. If the parameter export was successful, the message "done" will appear on the display. The file containing the parameters is saved on the card in the \CONFIG\EXPORT directory. When the data export is complete, the value of the parameter goes to the value 0.

Parameter	Meaning	Factory setting
P13=0	Idle status	0
P13=1	Export of parameters	

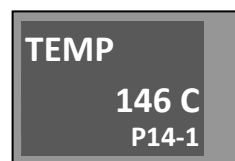


4.1.17. CURRENT PRODUCT TEMPERATURE (P14)

The function displays the current temperature of the fuel products measured by the temperature sensors in the hydraulic of the dispenser. The subparameter number corresponds to the nozzle/hose number, not the temperature sensor number. The update of the temperature values takes place continuously approximately once per second. The temperature is displayed to one decimal place, e.g., 146 = 14,6 °C.

Parameter	Meaning
P14-1	Temperature of the product assigned to nozzle/hose 1
P14-2	Temperature of the product assigned to nozzle/hose 2
...	...
P14-10	Temperature of the product assigned to nozzle/hose 10

The number, not the temperature sensor number. The update of the temperature values takes place continuously approximately once per second. The temperature is displayed to one decimal place, e.g., 146 =

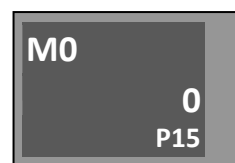


NOTE The number of nozzles/hoses displayed in parameter P14 is conditional on the set dispenser configuration. The system for marking dispensing hoses and products is described in Figure 77. If the temperature sensor is not connected, "- -" will appear on the display.

4.1.18. DAILY TOTALIZERS RESET (P15)

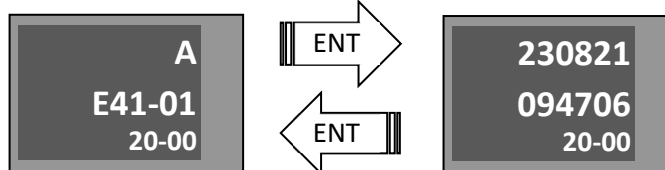
The parameter is used to reset all daily totalizers of dispensing hoses. After setting the parameter value to <1> and confirming (<E> + <1> + <E>), all totalizers that are part of parameters P01 and P02 will be reset to 0. The message "done" appears and the parameter value goes to 0.

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



4.1.19. ERROR MESSAGE CODES HISTORY (P20)

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 0. After switching to parameter P20, the display shows the code of the last error message and the



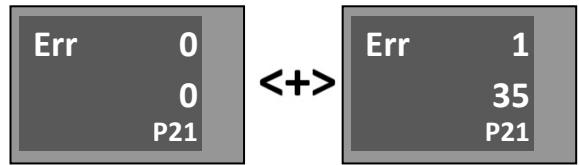
Parameter	Meaning
(P)20-00	code of the last error
(P)20-01	code of the penultimate error
...	...
(P)20-98	99th error code in the sequence
(P)20-99	100th error code in the sequence

designation for the filling point where the error occurred A, B, C or D (e.g., E41-01 pulse generator connection error at input PUL1 for filling point A). 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.

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

4.1.20. ERROR MESSAGE CODE STATISTICS OF FILLING POINT (P21, P22, P23, P24)

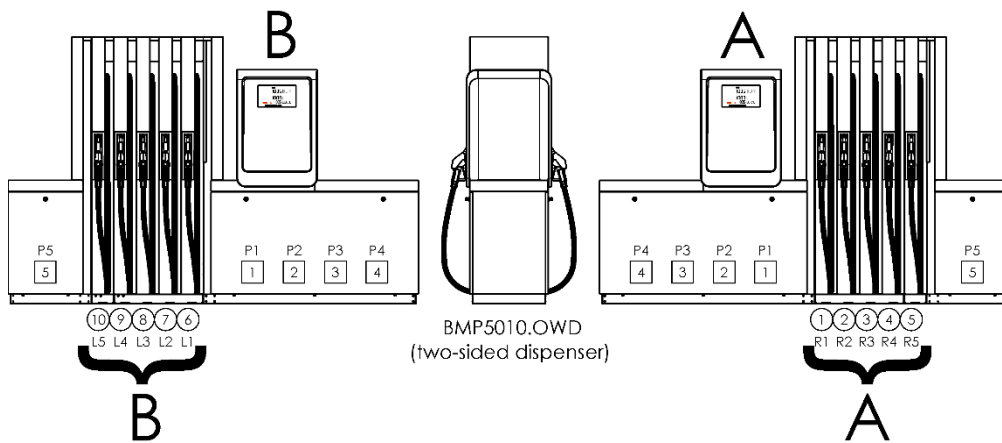
The parameter is used to display the cumulative numbers of individual error messages for a given filling point. The first line of the display shows the error message code and the second line the frequency of the error. After switching to parameter P21 (error message code statistics for filling point A), the display



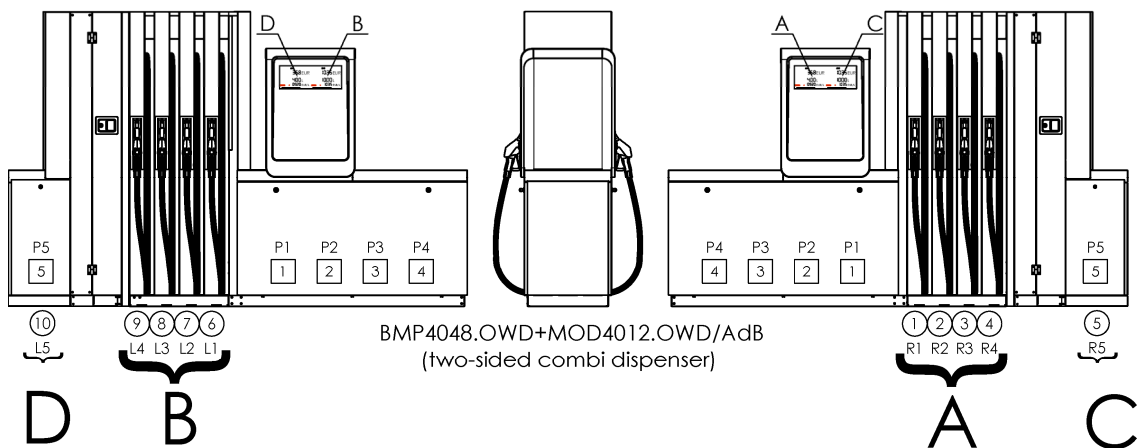
shows the fault frequency for error message code E0. After pressing the <+> key, the frequency of the error message code E1... etc... appears on the display. The table of error message codes is given in chapter 0.

Parameter	Meaning
P21	Error message code statistics of filling point A
P22	Error message code statistics of filling point B
P23	Error message code statistics of filling point C
P24	Error message code statistics of filling point D

NOTE A filling point (dispensing site, dispensing point) is defined as a place where one independent fuel dispensing (one pumping) can be performed. By default, a double-sided dispenser has two filling points - A and B (see Figure 79), a single-sided dispenser has one filling point - A. However, there are variants of dispensers, especially combined dispensers, where two simultaneous pumping can be performed on one side of the dispenser (diesel + AdBlue). The double-sided dispenser then has four filling points A, B, C and D (see Figure 80) and the single-sided dispenser has two filling points A and B. Each filling point must have one main display and can serve one to five dispensing hoses.



Picture 25 – Example of a standard dispenser with two filling points A and B (two simultaneous deliveries, two main displays)

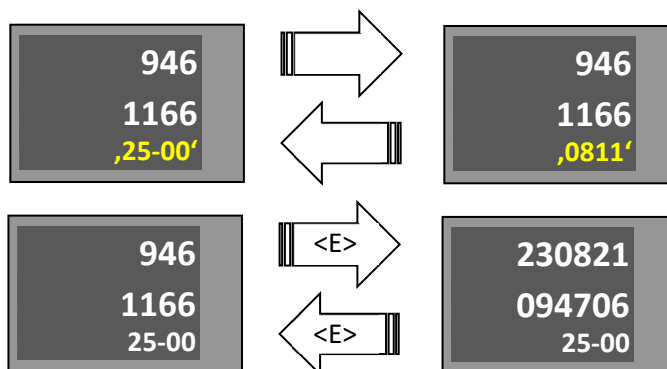


Picture 26 – Example of a combined dispenser with four filling points A, B, C and D (four simultaneous deliveries, four main displays)

4.1.21. LAST FUELLING HISTORY (P25, P26, P27, P28)

The parameter is used to display the last 100 fuellings (deliveries) for a given filling point. After switching to parameter P25 (last fuelling history at filling point A), 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
(P)25	Last fuelling history at filling point A
(P)26	Last fuelling history at filling point B
(P)27	Last fuelling history at filling point C
(P)28	Last fuelling history at filling point D

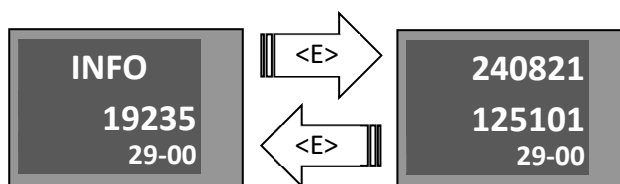


Example: Last fuelling at filling point A had a value of 11.66 L, 9.46 €, 0.811 €/L and was terminated 23.8.2021 at 9:47:06

4.1.22. MAINTENANCE HISTORY (P29)

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 P29, 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
P(29)-00	Code of the last remote controller
P(29)-01	Code of penultimate service controller
...	...
P(29)-49	Code of the 50th service controller in the sequence

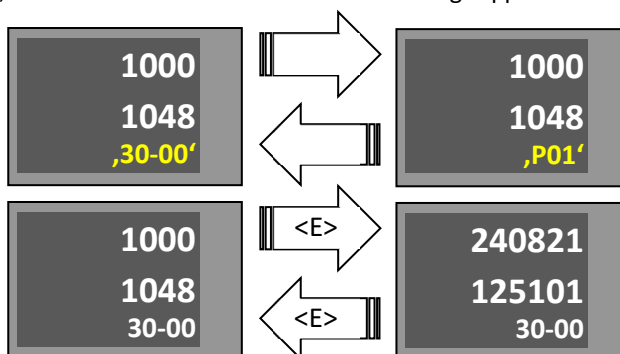


NOTE The yellow service remote controllers PDERT-5S are used by authorized service personnel of TATSUNO EUROPE dispensers. The service controllers each have their own internal identification code, which is written into the memory of the dispenser counter when entering the service mode. Using parameter P29, 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.



Correction factor changes history (P30)

The parameter allows you to display the last 50 records of changes in the setting of correction factors of measuring devices (meters, pulse generators). After switching to parameter P30, the last record of the correction factor change appears on the display - the original correction factor appears on the amount display line, the new changed correction factor appears on the quantity display line, the measuring device number (P01, P02, ... P10) appears on the unit price display line and flashes with the parameter number and the sequence number of the correction factor change record. After pressing the <+> key, the penultimate record of the change of the correction factor..., etc. appears. After pressing the <E> key, the date and time of the correction factor change will appear on the display.



Parameter	Meaning
(P)30-00	Last record of the correction factor changes
(P)30-01	Penultimate record of the correction factor changes
...	...
P(30)-49	50th record of the correction factor changes

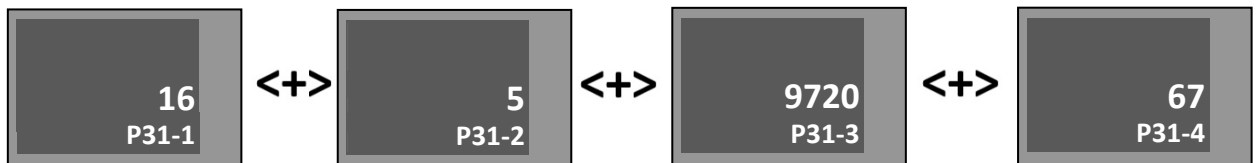
Example: Last record (00) of the change of the correction factor of the measuring device P01, the original correction factor = 1,000, the new correction factor = 1,048, the date and time of the change of the correction factor = 24.8.2021 at 12:51:01)

NOTE The correction factor (of meter, pulse generator ...) is used in the metrological setting of the measuring device. Authorized service or legal metrology personnel will adjust it so that the measuring equipment complies with local regulations in terms of accuracy (MID guidelines, ...). The change of the correction factor is preceded by a removal of the metrological seal or sticker. After setting the factor, a new seal must be installed in the presence of a metrologist. Parameter P30 is used to check station owners and metrology officers.

4.1.23. NUMBER OF EVENTS (P31)

The parameter is used to display the cumulative numbers of some important events, such as the number of correction factor changes, the number of peripheral unit serial numbers stored (i.e., the number of configuration saves), the number of counter starts (i.e., the number of power off), the number of service mode entries. After switching to parameter P31, the display shows the number of changes in the correction factors. After pressing the <+> key, the frequency of serial numbers..., etc. will appear on the display.

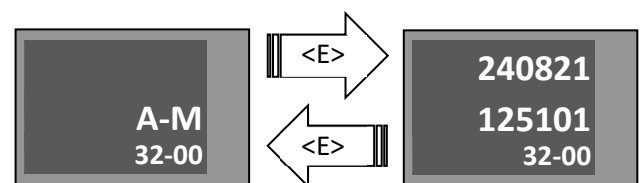
Parameter	Meaning
P31-1	Cumulative number of performed manual and automatic changes of the correction factor
P31-2	Cumulative number of peripheral unit serial number stores (= number of counter configuration stores)
P31-3	Cumulative number of power on counters (= number of power outages)
P31-4	Cumulative number of entries in configuration mode at the service level.



NOTE The serial numbers of the peripheral units are stored during the installation and recovery of the new electronic counter of the dispenser, or after the replacement of some of its important parts (display, temperature sensor unit....). Entry into the service mode and removal of the metrological seal is necessary for storage.

4.1.24. CONTROL MODE CHANGES HISTORY (P32)

The parameter allows to display the last 20 records about the change of the dispenser control mode, i.e., the change from manual to automatic mode and vice versa (see parameter P12). After switching to parameter P32, the last record of the change of the operating mode appears on the display - the amount display shows M-A (change from manual to automatic mode) or A-M (change from automatic to manual mode). After pressing the <+> key, the penultimate record of the change appears. After pressing the <E> key, the date and time of the mode change will appear on the display.



Parameter	Meaning
(P)33-00	Last change of the control mode
(P)33-01	Penultimate change of the control mode
...	...
P(33)-19	20 th change of the control mode in the sequence

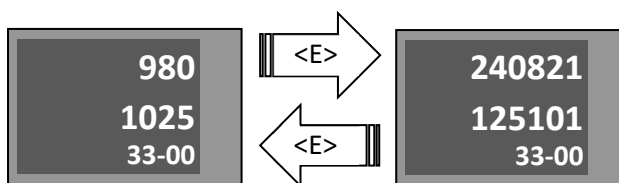
After pressing the <+> key, the penultimate record of the change appears. After pressing the <E> key, the date and time of the mode change will appear on the display.

Example: According to the last record (00), the change from automatic to manual mode (A-M) took place on 24.8.2021 at 12:51:01.

NOTE Monitoring of the change from automatic to manual mode is important. When fuel is fuelled in manual mode, POS-independent unit fuel prices are used and fuel dispensing data is not transmitted to the cash register. The transition from automatic to manual mode can be disabled by toggling switch SW1-2, which is protected by a seal.

4.1.25. VAPOUR RECOVERY SYSTEM HISTORY (P33, P34)

The parameter is used to display the last 40 fillings on nozzles with activated vapour recovery for filling point A (P33) or B (P34). Records are only stored if the internal vapour recovery monitoring system is activated. After switching to parameter P33 (vapour recovery system history for filling point A), the display shows the vapour recovery values for the last delivery. The amount display line shows the



percentage feedback factor value to one decimal place (see

Parameter	Meaning
(P)33	Vapour recovery system history for filling point A
(P)34	Vapour recovery system history for filling point B

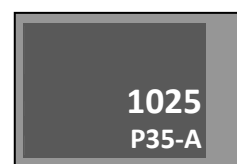
P36 for more information). The quantity display line shows the vapour/fuel ratio in percent with one decimal place. After

pressing the <+> key, the penultimate filling appears. After pressing the <E> key, the date and time of the end of the saved delivery will appear on the display. *Example:* According to the last record (00), fuel delivery took place on 24.8.2021 at 12:51:01, during which the vapor recovery feedback factor was 98.0% and the ratio of the volume of extracted vapours to the volume of flowed fuel was 102.5%

4.1.26. AVERAGE VALUE OF VAPOUR/FUEL RATION (P35)

The parameter is used to display the average value of the ratio of the volume of extracted vapors to the volume of fuel dispensed. The average is calculated from the last 40 fillings for filling points A and B. After switching to parameter P35, the display shows the average volume ratio value for filling point A (P35-A). The quantity display line shows the vapour/fuel ratio in percent with one decimal place. After pressing the <+> key, the average ratio value for filling point B (P35-B) appears.

Parameter	Meaning
P35-A	Average value of vapour/fuel ration for filling point A
P35-B	Average value of vapour/fuel ration for filling point A



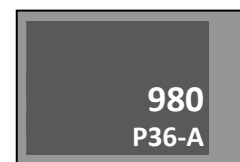
Example: The average value of the ratio of the volume of extracted vapours to the volume of dispensed fuel for filling point A is 102.5%

NOTE The average value should be between 95% and 105%. If the value is lower than 95%, it probably means a problem with the vapor recovery vacuum pump or dirt in the VR piping. If the value is higher than 105%, then the regulation (VR solenoid valve) may not work properly.

4.1.27. AVERAGE VALUE OF VAPOUR RECOVERY FEEDBACK FACTOR (P36)

The parameter is used to display the average feedback factor of the vapour recovery system. The average is calculated from the last 40 fillings for filling points A and B. After switching to parameter P36, the display shows the average value of the feedback factor for filling point A (P36-A). On the quantity display line, there is a percentage factor with one decimal place. After pressing the <+> key, the average factor value for filling point B (P36-B) appears.

Parameter	Meaning
P36-A	Average value of vapour recovery feedback factor for filling point A
P36-B	Average value of vapour recovery feedback factor for filling point B



Example: The average value of the vapour recovery feedback factor for filling point A is 98.0%

NOTE If the factor value is less than 100%, it means that the feedback has reduced the flow of petrol vapor. Without feedback, the vapour/fuel ratio achieved would then be greater than 100%. If the value is higher than 100%, it means that the feedback increased the flow of gasoline vapours. Without feedback, the vapour/fuel ratio achieved would then be less than 100%.

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.*

5.2. DISPENSER COMMISSIONING

ON/OFF switching of fuel dispensers is carried out in the main switchboard of the fuel station where the power supply of the dispensers is provided. Each dispenser has two power points in the main switchboard:

- The power supply of pump electric motors and suction vacuum pumps if included in the dispenser
- Power supply of the dispenser electronic counter, switching and heating circuits

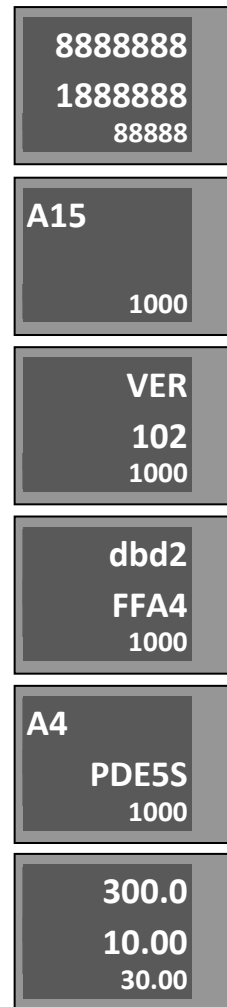
Both power points are secured by the circuit breakers that enable the dispenser to be switched on/off.

RECOMMENDATION We recommend that you turn on the dispenser as follows:

- ⚠ *Turn on the backup UPS located in the kiosk (the green LED on the UPS turns on)*
- ⚠ *Switching on the 230 V circuit breaker for stabilized power supply of the dispenser counter (all segments of the display are automatically tested and the last delivered values are displayed)*
- ⚠ *Switching on the 3x400 V the power supply circuit breaker for electric motors of pumps and vacuum pumps*

The following processes occur when the power of the PDEX5 counter is turned on:

- **test of display units** (displays). The backlight of the displays lights up and then all display segments are displayed (eights)) for approx. 1 second
- **time delay** when the counter is switched on. Time required to start the multimedia display. During the time delay, the displays show the filling point to which the display is connected A, B, C or D and the time in seconds remaining until the electronic dispenser counter is activated. The length of the time delay (15) can be set by the counter parameter, by default it is without delay. The positions of switches SW1-1, SW1-2, SW1-3 and SW1-4 are displayed on the unit price line (1=ON; 0=OFF). If switch SW1-1 is in position 1, then the selected metrological parameters cannot be set on the counter.
- **processor unit test.** Ten-second test in which all functions and memory of the processor unit are checked. During the test, the side of the counter to which the display is connected (A, B, C or D) is displayed, and:
 - version of the metrologically relevant part of the program (VER 1.02),
 - checksum of the metrologically relevant part of the program (dbd2 2FA4).
 - processor board type PDE5S or PDE5L
- **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 gun. 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 fuel delivery.

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.*

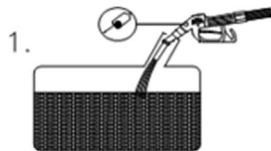
5.3.1. FUEL DELIVERY

Starting the dispenser is carried out by lifting the delivery nozzle from the nozzle cover which simultaneously automatically resets the electronic counter data. Then the pump electric motor is started and the fuel can be delivered. The delivering speed is controlled by the delivery nozzle. Ending the delivery is performed by closing the delivery nozzle (by releasing the control lever) and its subsequent hanging in the nozzle cover which shuts down the pump electric motor. The quantity delivered remains unchanged until the delivery nozzle is lifted again or until the payment.

Fuel delivery. The fluid measured by the meter is delivered into the delivery hose and the delivery nozzle bolted to the end of the hose. Self-service fuel stations use delivery stop-nozzles with a safety shutter. Using the control lever, the flow rate can be controlled until it stops. In the basic version, the delivery nozzle is supplied with a lever lock. At customer's request, a delivery nozzle is provided without a lock where the lever must still be pressed during delivery. When releasing the lever

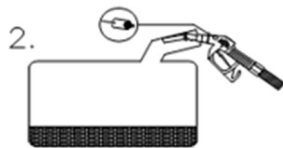
or dropping the delivery stop-nozzle out of the tank opening, the fuel flow stops. The stop function occurs when the tank is full after the sensor has detected the fluid level, the flow stops even when the control lever is depressed. The safety function works, for example, when the delivery nozzle is not properly handled, i.e., the discharge attachment is higher than 15 degrees from the horizontal plane upwards, the flow stops even when the control lever is depressed. After the stop function and the safety function it is necessary to release the control lever to automatically return to the basic position.

Table 4 - Delivery nozzle positions during delivery



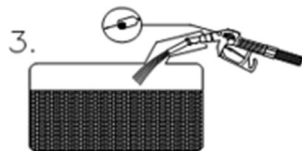
Correct position of the delivery nozzle during delivery

The delivery nozzle is almost vertical, the ball does not prevent the passage of air and the fuel flows.



Incorrect delivery nozzle position

The delivery nozzle is diverted from the horizontal position, the ball prevents the passage of air and the fuel does not run



In various designs of fuel tank inlet ports, it is necessary to find the optimal position of the delivery nozzle when the fuel still flows. Flow shut-off may also occur when the fuel flow from the delivery nozzle hits the wall of the tank neck. In that case, it is also necessary to find the optimal position.

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 litres 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. GASOLINE VAPOUR RECOVERY

TATSUNO EUROPE dispensers for gasoline or gasoline/ethanol mixture (max. E85) can be (on customer demand) equipped with a gasoline vapour recovery system where fuel vapours, except for diesel and biodiesel, are extracted from the delivery nozzle outlet point through the coaxial delivery hose, the vacuum pump located in the dispenser via a return pipe into the fuel storage tank. In the case of vapour recovery at a single-product dispenser, the vacuum pump is driven directly by the dispenser pump electric motor. For multi-product dispensers, each side of the dispenser has its own vacuum pump powered by an electric motor. The recovery function and the volume of exhausted vapours are regulated according to the fuel flow. This means that if the fuel is not delivered into the tank, the vapour recovery is switched off and if the fuel is delivered, then the vapour volume must be equal to the volume of fuel pumped. According to European Directive 2009/126/EC art. 4 par. 2, the vapour/gasoline ratio must be equal to or greater than 0.95 but less than or equal to 1.05. The actual operation of the vapour recovery system is indicated on the display of the dispenser depending on the type of display used either by the display segment or by the green LED or by the two-arrow pictogram lit.

A malfunctioning vapour recovery system or faulty system may be signalled:

- ▲ an unlit LED or display segment
- ▲ non-illuminated pictogram with white arrows 
- ▲ lit pictogram with red arrows and an exclamation mark 
- ▲ the error message E54, E55 or E56 on the display, see the article 0

The operation of the vapour recovery system can be automatically monitored by a control unit coupled to a vapour flow sensor located on the return pipe in the dispenser, e.g., VAPORIX (FAFNIR) or Vareco Plus (TST). The vapour monitoring system compares the volume of extracted vapours with the volume of filled fuel at each delivery and stores the data in the control unit. If the vapour/gasoline ratio is not within the specified limits (95% to 105%), it sends a signal to the counter of the dispenser which, if the defect is not removed within 72 hours, does not allow gasoline to be delivered from the dispenser. According to European Directive 2009/126/EC Art. 5, the vapour recovery system must be officially inspected at least once a year. If the dispenser is equipped with monitoring of the vapour recovery system, the official examination is necessary at least every three years.

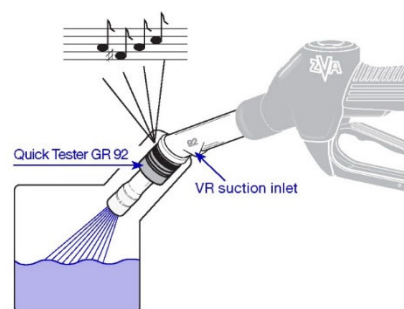
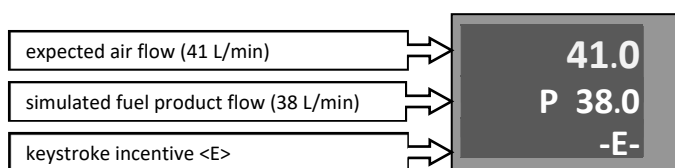
NOTICE In case of suspicion of malfunctioning of the recovery or detection of malfunctioning of the signalling, the operator is obliged to notify this fact immediately to the service organization to carry out the inspection and to remedy the defect.

5.3.4. VAPOUR RECOVERY SYSTEM TEST

The PDEX5 dispenser counter allows you to perform a **simple functional test** without delivering fuel or shutting down the dispenser communication with the POS. It is therefore a so-called dry test, in which the fuel flow is only simulated. Only a manager service remote controller is required to run the test.

Procedure for a simple function test of the vapour recovery system:

- All nozzles on the tested part of the dispenser are hung up and the filling point has a completed and paid filling (transaction). Pick up the nozzle for which is necessary to verify the functionality of the vapour recovery and instead quickly insert a spare nozzle or magnet so that the delivery does not start and the dispenser remains at idle status.
- Attach an adapter - whistle (Quick Tester GR92 - see Picture 26) to the picked-up dispensing nozzle. Then hang the dispensing nozzle downwards with the outlet spout to open the internal ON/OFF vapour recovery valve.
- Press the <8> key on the manager or service remote controller. The screen will appear on the display.
- Press the <E> key. The vacuum pump starts for the time set in parameter P11 (factory setting = 60 seconds). At the same time, the corresponding proportional valve (VRA or VRB) opens and air flows through the dispensing nozzle. The set time up to 0 will be counted down on the unit price display line.
- At the end of the test period, the test ends, i.e., the vacuum pump is switched off and the valve is closed. The new test can be started again by pressing the <E> key.



Picture 27 – Functional recuperation test with Quick Tester GR 92 adapter

Test evaluation. The vapour recovery system is functional if a whistling sound is heard from the adapter during the test, see Picture 26 - which is proof of the air flowing through the entire recuperation system.

NOTE The Quick Tester GR 92 adapter is manufactured by ELAFLEX (Germany). If an adapter is not available, the functionality of the recuperation system can also be verified with a plastic bag, which is wrapped around the neck of the nozzle and which deforms (vacuums) during the test.

5.3.5. TEMPERATURE VOLUME COMPENSATION (ATC).

The TATSUNO EUROPE dispensers for delivering gasoline and diesel allow conversion of the volume of dispensed fuel at a given temperature to a corrected volume corresponding to the reference temperature of 15°C. A precise calibrated temperature sensor Pt100 which measures the current temperature of dispensed fuel with the accuracy of $\pm 0.15^\circ\text{C}$ is incorporated in the dispenser hydraulic system before the flow meter. Temperature data from all temperature sensors are collected with the PDEINP unit located in the counter case and the data is transmitted to the dispenser counter. The electronic counter automatically recalculates and displays the delivered volume on the display – see table below.

Table 5 - Volume values for selected liquid fuels at temperature T and dispensed volume $V_n = 100\text{ L}$

Liquid	ρ_0 [kg/m ³]	T = -20 °C	T = -10 °C	T = 0 °C	T = +15 °C	T = +30 °C	T = +50 °C
Natural 91 / Regular Unleaded	737	104.26	103.05	101.84	100.00	98.14	95.63
Natural 95 / Super Unleaded	749	104.15	102.98	101.79	100.00	98.19	95.74
Natural 98 / Super Plus Unleaded	752	104.13	102.96	101.78	100.00	98.20	95.77
Diesel oil	837	102.94	102.11	101.27	100.00	98.72	97.00
Biodiesel (RME)	831	102.98	102.14	101.29	100.00	98.70	96.96
Naphtha	716	104.44	103.19	101.92	100.00	98.06	95.43
Kerosene	799	103.23	102.31	101.39	100.00	98.60	96.71
Jet fuel	801	103.21	102.30	101.38	100.00	98.60	96.73
Fuel oil	846	102.90	102.08	101.25	100.00	98.74	97.05
EKOPAL / Testing fluid	742	104.21	103.02	101.82	100.00	98.16	95.68

Fuel density at 15 °C is set in the parameter of the dispenser counter and must be within the range <700; 1200>. The temperature sensor state, PDEINP unit state and density value are checked before each dispensing. If an error is present, dispensing is not permitted and the error message E10 (sensor), E11 (density) or E12 (PDEINP) is displayed. The actual fuel temperature measured by the temperature sensor can be displayed in parameter P14.

5.3.6. DISPENSER OPERATING MODES

There are two basic dispenser operating modes:

- manual mode
- 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 and takes the delivery nozzle of the product he/she wants to deliver. The display will reset (approx. 1.5 seconds) and then the pump motor switches on and the dispenser is ready for delivery. Once the fuel has been delivered, the customer hangs up the delivery nozzle and pays for the delivered fuel to the 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 4.1.8 and **Chyba! Nenalezen z droj odkazů.** 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 and takes the delivery nozzle of the product he/she wants to deliver. The dispenser will require authorization from the control unit in the booth. The control unit sends a fuel unit price, a maximum amount/volume of delivery, and allows delivery. The display of the dispenser will reset (*approx. 2 seconds after removing the nozzle) and the pump motor switches on. Once the fuel has been delivered, the customer hangs the nozzle 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.

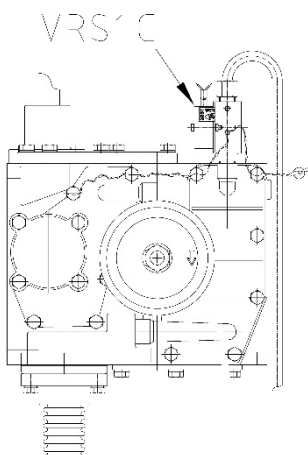
NOTE Immediately after the delivery is enabled, the dispenser display is reset. The time after removal of the nozzle after resetting the display and starting the pump may vary significantly depending on the control system used and the fuel station configuration from 2 to 5 seconds

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 (P12) from value 0 to value 3 using the IR remote control and to check the setting of unit prices in parameter M0-P03 (P03) – see chapters 4.1.8

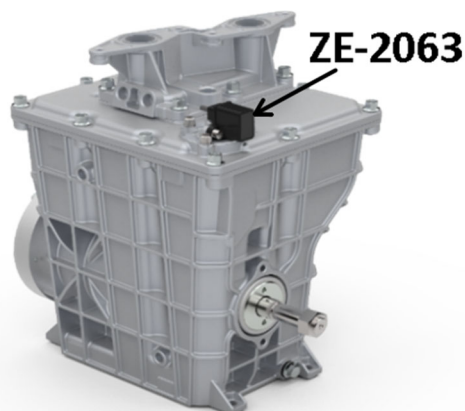
NOTICE The switch from the automatic to manual mode must be discussed with the service engineer in advance!

5.3.7. AIR SEPARATION SENSOR (VRS1.G & ZE-2063)

According to type certificate TCM 141/07-4491, all TATSUNO pumps for diesel and biodiesel must be equipped with air separation sensor. The VRS1.G flow sensor is mounted on the air separator of the TATSUNO FP-1001 pumping monoblock, the ZE-2063 flow sensor is a part of the TATSUNO FP-1022 monoblock. If the volume of separated air is higher than the volume that the pump monoblock is able to safely separate, then the air flow sensor and subsequently the corresponding input (BL1... BL4) on the counter processor unit are activated. The counter interrupts delivery (pumping) and error E51 appears on the display.



Picture 28 - Pumping monoblock FP-1001 with air flow sensor VRS1.G



Picture 29 – Pumping monoblock FP-1022 (MVP-X) with air flow sensor ZE-2063

The procedure of dispenser locking and declaring an error is as follows:

A critical amount of air is sucked into the pump monoblock (e.g., if the suction line is broken). The VRS1.G sensor is activated and the BL input goes to the active state, then for a test time of 1 to 50 seconds (standard 10 sec.) the counter performs the first test cycle, i.e., closes the valve as when pumping to the preselected volume (flow approx. 2 to 5 L / min) and monitors the status of the BL input when the pump motor is running. If the BL input goes to the inactive state during the T_{test} time, then the valve opens fully and pumping continues. If the sensor status does not change during the T_{test} time and remains active, then the pumping is stopped and error message code E51 is displayed. The number of "successful" cycles, i.e., cycles where no error E51 occurs, is limited to 3 by default during one filling. After exceeding the maximum number of test cycles, the pump is terminated and error message code E52 occurs.

NOTICE In the case of errors E51/E52, it is necessary to check the tightness of the supply line, the tightness of the suction line in the tank and the fuel level in the tank.

5.3.8. 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 volume 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 volume 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 volume



Picture 30 – 4buttons preset keypad



Picture 31 – 12buttons preset keypad

NOTE In case the pre-selection keyboards are used, it is necessary that the dispensers are 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 selects the product he/she wants to deliver, lifts the delivery nozzle from the dispenser and puts it in the car tank.
- 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 litres

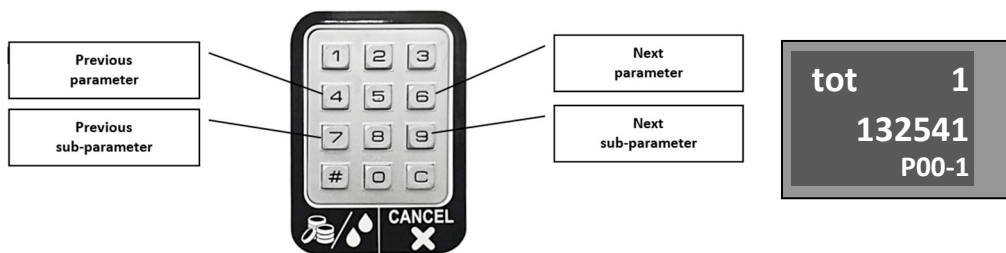
- The customer arrives to the dispenser and wants to refill 20 litres of fuel.
- a) Press the <10L> key twice on the 4-key preset keypad
- b) Press the <2> <0> <#> keys on the 12-key preset keypad
- He/she selects the product he/she wants to deliver, lifts the delivery nozzle from the dispenser and puts it in the car tank.
- 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.

5.3.9. USING THE 12-KEY PRESET KEYPAD TO DISPLAY AND SET PARAMETERS

If the dispenser is equipped with a 12-button preset keypad, then it is possible to enter the operator or manager mode of the dispenser and read or set parameters in the M0 menu.

Operator mode

- Hang all dispensing nozzles. The dispenser must be in the "idle" state.
- Press the <1>, <2> and <3> buttons simultaneously and hold them down for at least 3 seconds.



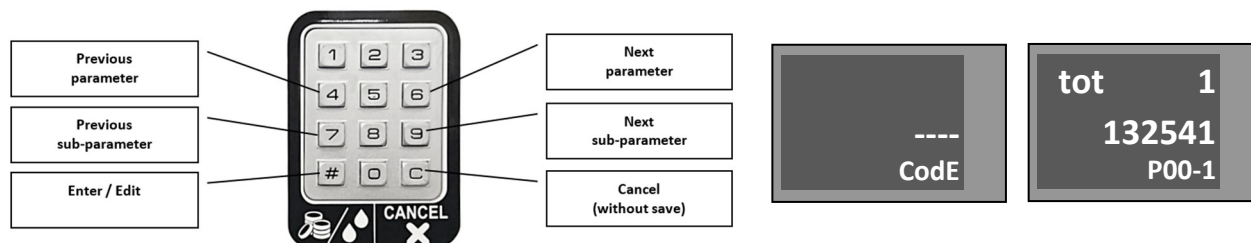
The the value of non-reset quantity totalizer for nozzle #1 will appear on the display.

- Select the parameter number using the <4> or <6> key.
- Select a sub-parameter (nozzle number, product number...) using the <7> or <9> key.
- Read the value of the required parameter.
- To exit the configuration mode, press and hold the <1>, <2> and <3> keys.

NOTE To use the 12-key keypad to enter the operator or manager mode of the dispenser, it is necessary to set the service parameter P9-23 to the value 1. Details on setting the dispenser parameters are in chapter 4.1

Manager mode

- Hang all dispensing nozzles. The dispenser must be in the "idle" state.
- Press the <3>, <5> and <7> buttons simultaneously and hold them down for at least 3 seconds.



A prompt to enter the manager access password will appear on the display

- Enter the 4-digit management password and confirm with the <#> key. Dashes will appear on the display instead of the password. After successfully entering the password, the dispenser counter will go to the M0 management menu, and the value of the non-reset quantity totalizer parameter for nozzle #1 will appear on the display.
- Select the parameter number using the <4> or <6> key.
- Select a sub-parameter (nozzle number, product number...) using the <7> or <9> button.
- Open the parameter for editing by pressing the <#> key.
- Enter a new parameter value and confirm with the <#> key.
- To exit management mode, press and hold the <3>, <5> and <7> keys

5.3.10. "MAX" BUTTON FOR DELIVERY CONTROL

For gasoline and diesel dispensers, the "MAX" button on the display of the dispenser is used to control the maximum fuel flow in the delivery hose, especially when pumping diesel alternately to passenger cars ($Q_{lim} = 40$ L/min) and trucks ($Q_{max} = 80$ L/min).



to
to

Functional principle:

- When lifting the delivery nozzle and pumping without using the "MAX" button, the fuel runs through the hose with a preset **limited flow rate** Q_{lim} which prevents frequent switching off of the nozzle due to the resulting foam, especially for diesel.
- If the "MAX" button is pressed before or during the delivery operation, the letter "H" or the pictogram of the truck appears on the display and the fuel with the **maximum flow** Q_{max} given by the pump used flows through the delivery hose.

The limited flow value Q_{lim} can be set for each delivery hose using the counter parameter.

5.3.11. "MIN" BUTTON FOR DELIVERY CONTROL

For fuel dispensers, the "MIN" button on the display of the dispenser is used to control the fuel flow in the delivery hose, especially when pumping fuel into small motorcycles or small containers ($Q_{min} = 4 - 6$ L/min).



Functional principle:

- Upon lifting up the delivery nozzle and delivering without the "MIN" button, the fuel flows through the hose with the **preset limited flow** Q_{min} .
- If the "MIN" button is pressed before or during the delivery operation, the letter "L" or the motorcycle pictogram appears on the display and the fuel with the set **minimum flow** Q_{min} flows through the delivery hose.
- When the "MIN" button is pressed again, the letter "L" disappears on the display and the dispenser delivers with a higher flow rate again.

The limited flow value Q_{lim} can be set for each delivery hose using the counter parameter.

5.3.12. 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 L - for P12=1 it can display the value from 0 to 99999.99 L
	Delivered fuel unit price	- for P12=0 it can display the value from 0 to 99.99 €/L - for P12=1 it can display the value from 0 to 999.99 €/L
	Minimum Measured Quantity	- the display is set by parameter P91 for each delivery hose
	Temperature volume compensation (ATC)	- it appears automatically during delivery if the temperature compensation function is activated for the delivered product
	High and low output signals (fuel flow)	- it appears automatically before or during delivery when the MAX button is pressed (see 5.3.10) or the MIN button is pressed (see 5.3.11).
	Function and fault indication of the vapour recovery system	- it appears when vapour recovery is activated or a vapour recovery system error has occurred (see 5.3.3)
	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 0)

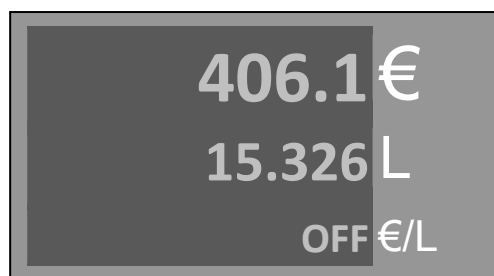
5.3.13. DISPENSER OPERATION TERMINATION

RECOMMENDATION The manufacturer recommends disabling the dispenser in the following order:

- Switch off the 3x400 V the power supply circuit breaker for electric motors of pumps and vacuum pumps.
- Switch off the 230 V circuit breaker for stabilized power supply of the electronic counter of the dispenser.
- Switch off the backup UPS located in the booth by a switch located at the rear panel (the green LED on the UPS turns off).

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 shown 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
- ⚠ check and, if necessary, correct tensioning of the V-belt with the engine bracket
- ⚠ check and, if necessary, tighten the screws that secure the electric motor to the bracket
- ⚠ 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
- ⚠ regularly carry out sludge, water and other impurities removal by using a sludge pump from tanks (fuel tanks)

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 *The belt between the motor and the pump (e.g., suction vacuum pump) is antistatic and cannot be replaced by another type!*

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

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.

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!!!

6.2. 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 0.

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. <ul style="list-style-type: none"> ➤ 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 stand is in a manual mode, there is a fault on the control computer side.
When the delivery nozzle is lifted, the display is reset but the pump does not start
This means that the dispenser electric motor has not been started. The cause may be the power supply circuit breaker that is located in the main switchboard or the electrical motor protection disconnected inside the dispenser. <ul style="list-style-type: none"> ➤ Check the position of the circuit breaker of three-phase supply of the dispenser motors in the main switchboard of the fuel station
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. <ul style="list-style-type: none"> ➤ check the correct operation of the control unit (turning on the counter, turning on the data converter) ➤ check the data cable connection
At the beginning of the delivery, the customer removes the delivery nozzle and does not deliver (e.g., because of opening the fuel tank of the car). After a while the pump turns off. The display shows "STOP".
This is a dispenser report that states that the delivery has been terminated due to interrupting the delivery for longer than 60 seconds. Hang the delivery nozzle and re-deliver.
During delivery the delivery is interrupted (e.g., changing the canisters), the pump switches off after a while. The display shows "STOP".
This is a dispenser report that states that the delivery has been terminated due to interrupting the delivery for longer than 60 seconds. Hang the delivery nozzle and re-deliver.
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. <ul style="list-style-type: none"> ➤ 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 4.1.8. ➤ 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, 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	
OFF	FATAL	Power failure Power failure longer than 3-5 periods, $t > 100\text{ms}$	It is necessary to turn off the counter power source for approx. 10 seconds and then turn the source back on.	
STOP	LOCK	Maximum time to interrupt delivery exceeded	Hang up the nozzle.	
E1	NFAT	Display failure.	Turn the power supply of the dispenser off and on. If the fault persists, call an authorized service centre.	
E2	FATAL	Display failure.		
E3	NFAT	Vapour recovery system failure		
E4	NFAT	Vapour recovery system failure		
E5	ALERT	Display failure		
E6	NFAT	Electromechanical totalizer failure		
E7	NFAT	Leakage in the hydraulic system		
E8	ALERT	Low fuel level in the storage tank		After refuelling the storage tank, the error disappears.
E9	FATAL	Repeated leakage of the hydraulic system		Turn the power supply of the dispenser off and on. If the fault persists, call an authorized service centre.
E10	NFAT	Error of temperature measuring sensor		
E11	NFAT	Invalid value of fuel density		
E12	FATAL	Temperature correction unit error		
E13	FATAL	Program error, metrological or program checksum error		
E15	NFAT	Maximum product flow exceeded		
E16	ALERT	Credit unit error		
E17	NFAT	Data line error	Controlling computer is not connected, or communication cable not connected correctly.	
E18	ALERT	Data line error		
E20	NFAT	Power failure during delivery	Check the dispenser power supply (power source).	
E21	NFAT	Incorrect position of switches SW1-1 and/or SW1-4	Check the position of the switches on the processor unit. Switch SW1-1 must be in the ON position and switch SW1-4 in the OFF position. If the fault persists, call an authorized service centre.	
E22	FATAL	Data initialization.	Turn the power supply of the dispenser off and on.	
E23	NFAT	Corrupted values in FRAM memory	If the fault persists, call an authorized service centre.	

Code of message	Type of message	Cause of error message	Removing error message
E24	FATAL	Corrupted values in FRAM memory	
E25	FATAL	Damaged values of electronic totalizers in FRAM memory	
E26	ALERT	TOTAL STOP button pressed	Unlock the TOTAL STOP button, turn the dispenser power off and on again.
E27	FATAL	Blocking the dispenser by the manufacturer	Call an authorized service centre.
E28	NFAT	Unauthorized service remote controller	The service remote controller identification number is out of allowed range. Use a permitted remote controller.
E29	NFAT	Wrong password	Enter the correct manager or service password.
E30	LOCK	Product unit price is zero	If the dispenser is operating in automatic mode, set a non-zero unit price at the POS. If the dispenser operates in manual mode, set the non-zero fuel price in parameter P03
E31-40	NFAT	Pulse generator channel error	Raise and hang up the delivery nozzle several times.
E41-50	NFAT	Connection error or internal pulse generator error	Turn the power supply of the dispenser off and on. If the fault persists, call an authorized service centre.
E51	NFAT	Pump aeration	Check the intake manifold and the fuel level in the storage tank. Turn the stand power off and on.
E52	NFAT	Pump aeration - repeatedly	If the fault persists, call an authorized service centre.
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.
E54	ALERT	Vapour recovery system fault – warning	Eliminate a fault on the vapour recovery system. Call an authorized service centre.
E55	FATAL	Vapour recovery system fault – filling is blocked.	
E56	NFAT	Vapour recovery system fault	
E70	NFAT	Mass meter failure	Turn the dispenser power off and on.
E71	NFAT	Communication error with mass meter	If the fault persists, call an authorized service centre.
E72	NFAT	Internal mass meter error	Follow the documentation for the mass meter used.
E73	NFAT	Mass meter reset error	Turn the power supply of the dispenser off and on. If the fault persists, call an authorized service centre.
E74	NFAT	Mass meter configuration error	
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 auxiliary display does not match.	
E82	NFAT	The serial number of the totalizer unit does not match.	
E83	NFAT	The serial number of the PDEINP unit does not match.	
E84	NFAT	The serial number of the mass meter does not match	
E87	NFAT	Electromechanical totalizer coil failure	
E90	NFAT	Flow in the auxiliary meter detected during calibration of the main meter	
E91	NFAT	Flow detected in the main meter during calibration of the auxiliary meter	

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 or 1 million litres of delivered fuels. 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

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

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

6.3.3. EU DECLARATION OF CONFORMITY

 <h2 style="margin: 0;">EU DECLARATION OF CONFORMITY</h2> 															
1. Product model:	<u>BMP 4022.OWL</u>														
Serial number:	<u>12345/21</u>														
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 fuel dispenser type series SHARK BMP5xx.Sxx, OCEAN BMP40xx.Oxx or SUNNY-XE EURO Sxx xxxx.E														
Purpose and scope of product use:	The equipment serves for dispensing of liquid fuels - gasoline, diesel, biodiesel, aviation gas (AVGAS) and ethanol/petrol mixtures till E85														
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 2014/32/EU (MID), issued 26.2.2014 Directive 2009/126/EU (VR2), issued 21.10.2014														
6. References to relevant harmonised standards used or references to other technical specifications in relation to which conformity is declared:	EN 13617-1:2012 - Petrol filling stations - Part 1: Safety requirements for construction and performance of metering pumps, dispensers and remote pumping units Protection type:  EN 16321-1:2013 - Petrol vapour recovery during refuelling of motor vehicles at service stations - Part 1: Test methods for the type approval efficiency assessment of petrol vapour recovery systems OIML R117-1:2019 - Dynamic measuring systems for liquids other than water														
7. Notified body:	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Name, number and address</th> <th style="width: 30%;">Performed:</th> <th style="width: 30%;">Issued certificate:</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Physical-Technical Testing Institute, s.p. NB 1026, Pikartská 1337/7, 716 07 Ostrava-Radvanice, Czech Republic</td> <td>EU Type Examination Certificate in acc. Module B of Directive 2014/34/EU</td> <td>FTZÚ 03 ATEX 0022 (type SHARK) FTZÚ 10 ATEX 0259 (type OCEAN) FTZÚ 11 ATEX 0246 (type SUNNY)</td> </tr> <tr> <td>Quality Assurance Notification in acc. Article 21 and Annex IV and VII of Directive 2014/34/EU</td> <td>FTZÚ 02 ATEX Q030</td> </tr> <tr> <td rowspan="2">Czech Metrology Institute, NB 1383, Okružní 31, 638 00 Brno, Czech Republic</td> <td>EU Type Examination Certificate in acc. Module B of directive 2014/32/EU</td> <td>TCM 141/07-4491</td> </tr> <tr> <td>Certificate Of Quality System in acc. Module D of Directive 2014/32/EU</td> <td>0119-SJ-A006-07</td> </tr> </tbody> </table>		Name, number and address	Performed:	Issued certificate:	Physical-Technical Testing Institute, s.p. NB 1026, Pikartská 1337/7, 716 07 Ostrava-Radvanice, Czech Republic	EU Type Examination Certificate in acc. Module B of Directive 2014/34/EU	FTZÚ 03 ATEX 0022 (type SHARK) FTZÚ 10 ATEX 0259 (type OCEAN) FTZÚ 11 ATEX 0246 (type SUNNY)	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	EU Type Examination Certificate in acc. Module B of directive 2014/32/EU	TCM 141/07-4491	Certificate Of Quality System in acc. Module D of Directive 2014/32/EU	0119-SJ-A006-07
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8. Additional information	Signed for on behalf of: Milan Berka, QMS manager Place and date of issue: Blansko, 21.08.2021 														
Form Version: 06/2020 Document No.: DC 12345/21															

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