TATSUNO EUROPE a.s.

ELECTRONIC FUEL DISPENSERS

OCEAN EURO & OCEAN TALL

Installation and User Manual

BMP 4000

OCEAN

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INTRODUCTION

This manual is for users of TATSUNO dispensers of the OCEAN EURO and OCEAN TALL series as well as for designer studios who design fuel stations. The company TATSUNO EUROPE a. s. recommends thorough studying of the manual including all of its appendices. The manual must be available to the dispenser operators during installation and regular maintenance of dispensers.

- Keep this manual along with its appendices over the whole life time of the dispenser
- Make it available to other owners and users as well
- Perform updates of regulations (see www.tatsuno-europe.com)

The appendices properly reflect reality at the time of publishing. The producer reserves the right to change technical conditions of the equipment or its attributes without written notice, due to continuous development and improvements.

Document revisions

Revision No. / Date	Change description	Made by
3. 3. 2011	Basic version of the document	Ing. Milan Berka
Revision 01 / 8. 9. 2011	FTZÚ requirements added	Ing. Milan Berka
Revision 02 / 5. 10. 2011	FTZÚ requirements added	Ing. Milan Berka
Revision 03 / 6. 4. 2012	Change of cable types to EU harmonized H05VV5-F and H05VVC4V5-K	Ing. Milan Berka
Revision 04 / 1. 4. 2013	Added dispensers in series OCEAN TALL and variants CUBE, FIN, WAVE	Ing. Milan Berka
Revision 05 / 1. 8. 2014	New connection boxes, description of flexible pipe connection	Ing. Milan Berka
Revision 06 / 13. 11. 2014	Translation	Bc. Karel Viktorin

1. INTRODUCTORY INFORMATION

Symbols used in this manual:

Warning

Explosion hazard

Beware – electric appliance

No smoking

No open fires

No mobile phones

Terms used in this manual requiring special attention:

CAUTION *The violation of these conditions may create conditions that lead to injury or death of persons or to substantial damage to property.*

WARNING *The violation of these conditions may lead to injury of persons and/or damage to the dispenser.*

NOTICE *This text informs about legal and/or statutory requirements concerning the installation and use of the dispenser. Violation of these requirements may create a hazardous situation and/or lead to damage of the dispenser.*

NOTE *This text informs about installation procedures, techniques and operation methods etc., which are important for securing proper installation and correct operation of the dispenser and which, if violated, may lead to damage, failure or bad performance of the dispenser.*

1.1. STUDY THE MANUAL FIRST

Before installation or operation of the dispenser, first study the relevant parts of the Installation and User Manual. Consider all the hazards, warnings and notes in the manual.

The producer provides this Installation and User Manual in order to present all the necessary information and instructions for full and efficient installation, use and maintenance of our combined dispensers of the OCEAN type series.

This manual was created by the producer and forms an inseparable part of the dispenser accessories.

The use of this manual is done at the full responsibility of the user; any operations not described here must be considered forbidden. Any operator who performs such operations will take all responsibility for the results of such actions.

The manual is organized into individual sections, which have their subsections, so each topic is independent and also corresponds to operational logic (learn – prepare – use – maintain).

The manual properly reflects the technical situation at the moment of sale of the dispenser and it cannot be deemed inadequate as a result of any subsequent changes and updates according to the latest circumstances.

NOTICE *Keep this manual and enclosed documents over the whole service life of the appliance for future reference!*

1.2. AUTHORIZED USE

The dispensers of the OCEAN series are intended for stationary use for dispensing of gasoline, motor diesel, biodiesel, light fuel oils, kerosene and ethanol-gasoline mixtures (max. E85) in specified quantities from the storage tank into motor vehicles.

ATTENTION *The dispenser is a complicated appliance that carries out a number demanding functions.* ***Before commissioning, the tanks and pipes must therefore be cleaned and the cleanliness of the fuel must be verified (dirty filters in the dispenser cannot be considered as a reason for warranty repairs!). Before commissioning, the electrical wiring and proper connections must be reviewed to prevent electric shock injury and to ensure explosion protection (the fuel is class I flammable material).***

NOTICE ***Any changes to the dispenser may revoke the validity of the device certification. See the certification documents and the manufacturer's instructions every time when considering any modification of the electrical wiring and/or the whole device.***

Every fuel dispenser is tested at the production plant concerning its function, safety and metrology. The delivery of each fuel dispenser includes certificates which the producer must provide to relevant authorities upon request.

2. OCEAN LINE DISPENSERS

2.1. DISPENSER DESCRIPTION

OCEAN dispensers serve for pumping of liquid fuels and oil, ethanol and petrol mixtures (maximum E85) into vehicles and for commercial purposes. The dispensers are equipped with high quality Japanese hydraulics made by the TATSUNO Corporation (herein also referred to as TATSUNO) and an efficient and reliable electronic counter of the Czech company TATSUNO EUROPE. All fuel dispensers can operate in the manual mode (individually, off-line) or in the automated mode, remotely controlled from the fuel station kiosk and connected to the cash desk (POS) via a data line.

Fuel dispensers of the OCEAN EURO series have their enclosure (cover, door, lid etc.) made of a varnished steel sheet, stainless metal sheet or non-flammable laminate approved for this use by the state testing authority (Statement of FTZÚ 04ST 0083). The supporting elements of the dispenser framework are made of varnished steel sheets of 0.8 - 2.5 mm thickness or of stainless metal sheet. The standard color of the OCEAN dispensers is white. Every dispenser is equipped with **hydraulics** (pumping mono block + piston measurement transducer) of the Japanese company TATSUNO. It is a worldwide-proven type of hydraulics with a high reliability and a long service life. The pumping monoblock is equipped with an intake and output filter, a gas and vapor separator, a check valve, and a rotation pump capable of operation pressure regulation. The four piston measuring transducer can be regulated by adjusting of a single piston. Each measuring transducer includes a highly reliable explosion-proof **pulse generator**. Each fuel dispenser has a highly reliable explosion-proof **electronic counter** with own diagnostics and **displays** showing the pumped amount in various currency units, fuel quantity in liters and the fuel unit price in currency unit per liters. Displays of dispensers for non-public sale show only the dispensed fuel quantity in liters. The **dispenser hoses** are made of high quality gasoline-resistant rubber with antistatic protection. As a standard, the dispensers are delivered with an automated stop-nozzle.

The main advantages of the OCEAN combined dispensers are:

- high performance and ensured quality
- High variability – a low-cost basic version can, through the addition of a wide range of accessories and additional modules, be turned into a comfortable dispenser with a personalized design
- Easy maintenance and service – simple construction
- possibility for temperature compensation of the dispensed medium to the reference temperature 15°C (20°C)
- wide temperature range of operation (-20°C / +50°C)
- possible temperature volume compensation of the dispensed fuel to the reference temperature of 15°C (20°C)
- controlled vapor recovery with possibility for monitoring its functionality and dispenser blocking in case of malfunction of the vacuum pumps (vapor flow sensors)

- control of dispensing by proportional electromagnetic valves +24Vss with possible continuous regulation of maximum flow rate Q_{max}.

2.2. CERTIFICATES AND APPROVALS

OCEAN EURO combined dispensers are in conformity with all European regulations related to metrology and safety.

2.2.1. METROLOGY

The appliance has been certified by the Czech Metrology Institute in Brno, notified body No. 1383. The assessment of appliance conformity used the procedure "B" (type testing) + "D" (ensuring production quality) according to government decree No. 464/2005 Coll., which sets technical requirements for measuring apparatuses and implements in the Czech Republic the directive of the European Parliament and European Council No. 2004/22/ES. A new **ES type certificate (MID certificate)** has been issued for fuel dispensers (gasoline, diesel, ethanol and their mixtures), TCM No. 141/07-4491. Type tests were carried out in accordance with OIML R117-1, OIML R118 and OIML D11.

The company TATSUNO EUROPE a. s. received a **Certificate of the Quality Management System No.** 0119-SJ-C006-07 from the Czech Metrology Institute and thus met the requirement of qualification for declarations of conformity of type, based on ensuring measuring apparatus production quality according to attachment No. 2, procedure "D" (Chapter 6) of the government decree No. 464/2005 Coll. The validity of the certificate is reviewed by audits in one-year intervals.

2.2.2. SAFETY

The dispensers have been certified by the authorized entity No. 210 – The Physics-Technical Testing Institute in Ostrava – Radvanice, notified body No. 1026, for the use in areas with an explosion hazard according to the directive 94/9/ES. The fuel dispensers are confirmed to comply with the European norm on the construction of fuel dispensers no. EN 13617-1. A new **ES type certificate (ATEX certificate)** for fuel dispensers No. FTZÚ 14 ATEX 0065X has been issued. All parts of dispensers located in areas with an explosion hazard comply with the European directive ATEX no. 94/9/ES.

The company TATSUNO EUROPE a. s. has received an **Acknowledgement of quality insurance** No. FTZÚ 02 ATEX Q030 from the Physical Technical Testing Institute in Ostrava – Radvanice for fuel dispensers and accessories. The validity of this certificate is reviewed by audits on a yearly basis.

2.2.3. ELECTROMAGENTIC COMPATIBILITY (EMC)

The dispensers have been tested by the Czech Metrology Institute in Brno, notified body No. 1383. The assessment of appliance conformity was carried out according to the directive of the European Parliament and European Council No. 2004/108/ES and in accordance with OIML R117-1, OIML R118.

2.3. BASIC TECHNICAL DATA

2.3.1. HYDRAULIC UNIT OF FUEL DISPENSERS

Pumping output:	- standard	40 L/min (30 – 50 L/min)
	- increased /H	80 L/min (70 – 90 L/min)
	- very high /UH	130 L/min (120 – 150 L/min), when using piston meter
		150 L/min (140 – 170 L/min), when using LOBE meter
Accuracy class:		0.5%
Maximum operating pressure:		0.18 MPa (1.8bar); 0.25 MPa (2.5bar) for /H or /UH
Electromotor of the pump:		three-phase, 3x400V; 0.75 kW; 1395 RPM
Solenoid valves:		+24VDC / max. 1A, or possibly 230V AC; 50 Hz; 5W

2.3.2. ELECTRONIC COUNTER

Power supply:		230 VAC; +10% -15%; 50 Hz ± 5 Hz
Output:		max. 300 VA
Displaying units (displays):	- volume	from 0.01 to 9999.99 L
	- monetary sum	from 0.01 to 9999.99 EUR
	- unit price	from 0.001 to 9.999 EUR/L

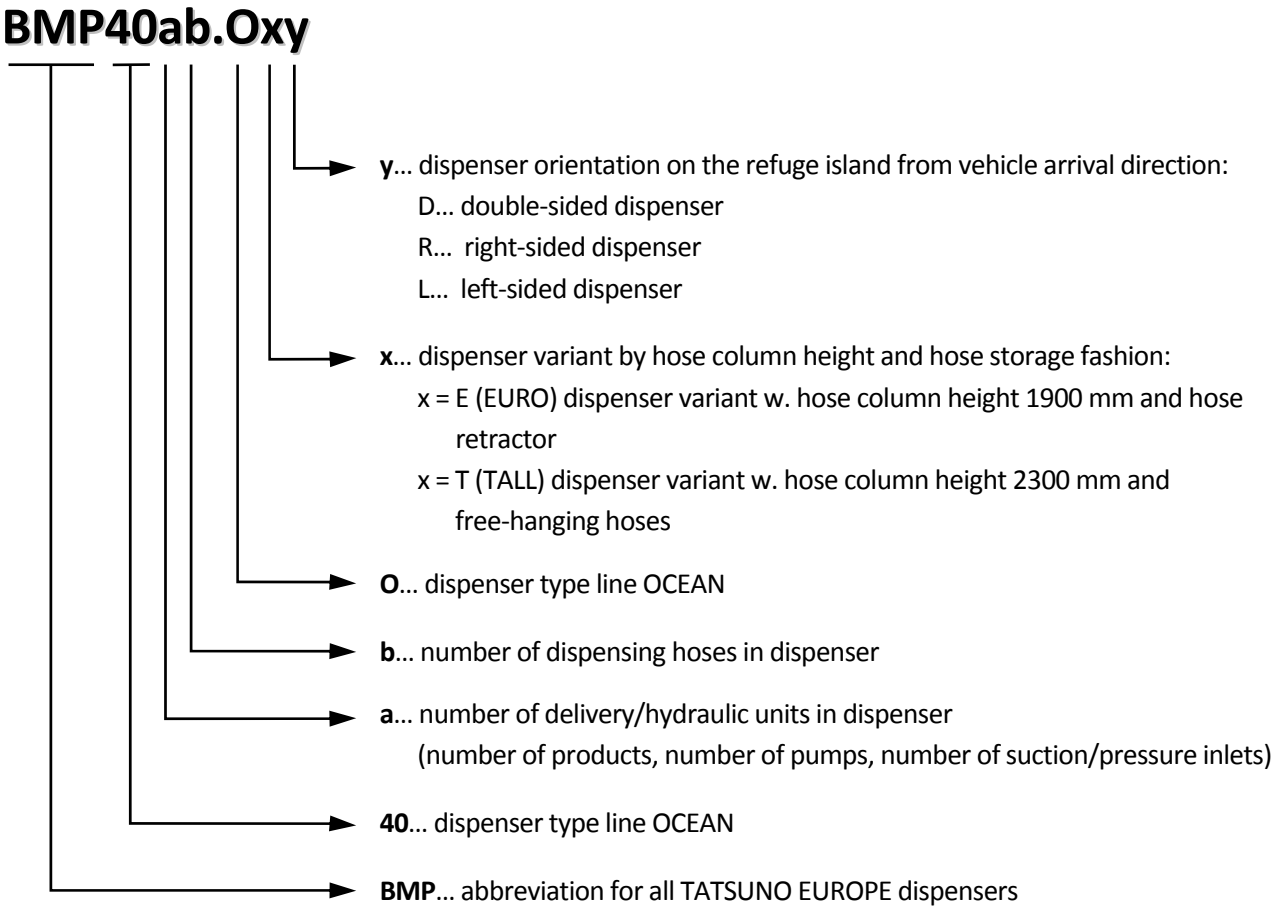
2.3.3. AMBIENT CONDITIONS

Operating temperature:	from -20°C to +40°C for standard dispenser model
	from -40°C to +50°C special model with heating
Temperature range of medium:	from -40°C to +50°C
Type of dispensed medium:	gasoline, motor diesel, biodiesel, gasoline x ethanol mixture (max. E85), oils
Dispensed medium dynamic viscosity range:	0.5 - 10 mPa.s (0.5 - 10 cp)
Mechanic environment class:	M1
Electromagnetic environment class:	E1
Relative humidity:	from 5% to 95%, non-condensing

2.4. DISPENSER MODEL IDENTIFICATION

The following section explains the marking (coding) system of the combined fuel dispensers OCEANEURO & OCEAL TALL.

The basic form of the commercial marking of the dispenser is:



Examples:

- BMP4022.OEL is a two-product, two-hose, single-sided, left-sided dispenser with hose retractors of the type series OCEAN EURO
- BMP4048.OTD is a four-product, eight-hose, double-sided dispenser with free-hanging hoses of the type series OCEAN TALL

2.4.1. ADDITIONAL ABBREVIATIONS IN DISPENSER MARKING

There may be additional abbreviations after the basic dispenser code:

Abbreviation	Description
/CUBE, /FIN, /WAVE	Dispenser with decorative elements
/S3	Dispenser in the pressure model without suction pumps
/VR, /VR2, /VR3, /VR4	Vapor recovery of one, two, three or four fuel products
/H, /H2, /H3, /H4	Higher performance of one, two, three or four diesel pumps 70 – 90 l/min
/UH, /UH2	High pumping performance of one or two diesel hoses 120 – 150 l/min
/MAS, /MAS2	The main dispenser (MASTER) has an outlet leading to one or two satellite dispensers (SLAVE)
/SAT	A satellite dispenser connected to the MASTER dispenser (without its own hydraulics)
/LON, /DART, /LOG	Data line with the interface IFSF-LON, DART or Logitron PUMALAN
/ER4, /TATPL, /ATCL	Data line with the interface Kienzle ER4, TATSUNO Party Line or Autotank ATCL
/TA2331	Outlet of pulses, nozzle and RELEASE signal to connect to Tankautomat TA2331
/ALX	Outlet of pulses and nozzle signal to connect to the terminal ALX (ALX-308)
-ZV1	Hose exit from dispenser side / Delivery nozzle positioned on side of dispenser
-ZV2	Hose exit from dispenser side / Delivery nozzle positioned on front of dispenser
-2C	Two simultaneous deliveries in single-sided dispenser (two displays, same side)
-4C	Four simultaneous deliveries in double-sided dispenser (four displays)
-C1x	LED site number, 1 digit (0 to 9), x is a color (č-red, b-white, m-blue, ž-yellow, z-green)
-C2xx	LED site number, 2 digits (10 through 29), x is a color (č-red, b-white, m-blue, ž-yellow, z-green)

2.4.2. CONVENTIONAL MARKING OF THE DISPENSER PARTS

Fig. 1 shows the system of marking of the displays, dispenser nozzles, hoses, pumps, meters, and the system of ordering the products in an OCEAN EURO fuel dispenser.

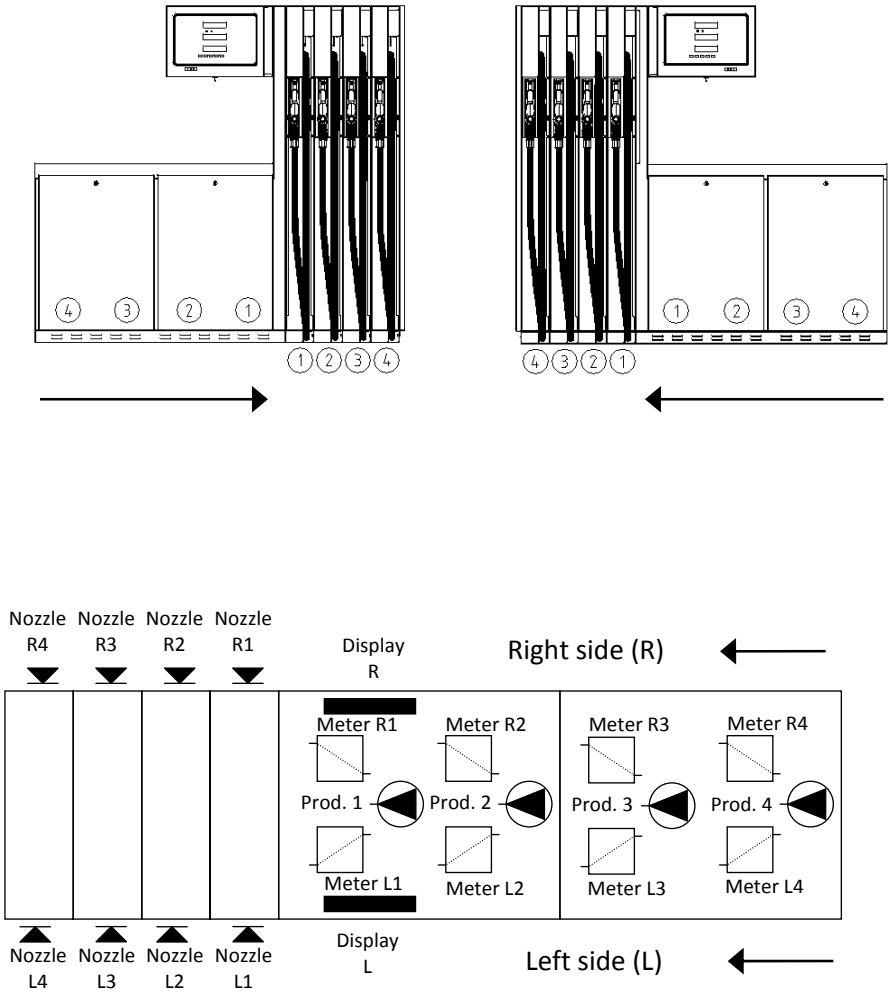


Fig. 1 – System of marking and order of products in OCEAN dispensers

2.5. STANDARD MODELS OF OCEAN DISPENSERS

All models of fuel dispensers OCEAN can be categorized into two main groups, depending on the height of the basic model and the method of hose storage:

- **OCEAN EURO dispensers**; with hose retractors and basic model height 1900 mm
- **OCEAN TALL dispensers**; with fre—hanging hoses and basic model height 2300 mm

The individual models of OCEAN dispensers are further are differentiated by the following properties:

a) method of pumping
- **suction**; dispensers are equipped with suction pumps
- **pressure** (REMOTE); dispensers do not include suction pumps, only filters – marking /S3

b) number of dispensing points
1 to 4 independent dispensing points

Note: A dispensing point means the part of the dispensers where a customer can independently pump fuel. Depending on the type of the dispenser, every dispensing point is equipped with one to five dispensing hoses, where the customer may choose the desired type of fuel product, and at least one display. It is possible to dispense only one type of fuel product in one dispensing point at any given moment. OCEAN dispensers are equipped with one or two dispensing points as a standard. On special request from the customer, it is possible to equip the dispensers with up to four dispensing points (4 independent deliveries, 4 displays).

c) access to dispenser
- **two-sided dispensers**; access to dispenser from two sides (TWO-SIDED)
- **one-sided dispensers**; access to dispenser from one side (ONE-SIDED)

d) number of fuel products
Depending on the type, a dispenser can dispense **one to five fuel products**.

e) number of dispensing hoses
1 to 10 dispensing hoses
- Every dispensing point of a dispenser is equipped with one to five dispensing hoses fitted with dispensing nozzles. A dispenser can have 1 to 10 dispensing hoses/nozzles.

f) dispensing nozzle placement
- **nozzle placed from the dispenser front** (LANE ORIENTED dispensers)
- **nozzle placed from the dispenser side** (ISLAND ORIENTED dispensers) - ZV1

g) pumping performance
- **dispensers with standard pumping performance** (40L/min)
- **dispensers with heightened pumping performance** (/H; 80L/min)
- **dispensers with high pumping performance** (/UH; 130-170L/min)

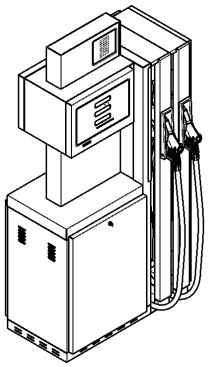
Note: Pumping performance means the maximum possible flow rate through the dispensing nozzle. It is given in liters per minute. OCEAN dispensers provide three basic pumping performances. The actual pumping performance, however, depends on the actual conditions at the fuel station – quality and lengths of suction piping, suction height etc.

h) type of displays
- **dispensers with displays for public pumping** (amount/volume/price)
- **dispensers with displays for private pumping** (amount - only liter display)

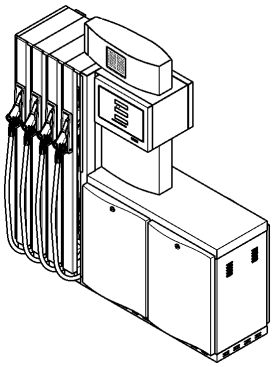
Note: Depending on the displayed values, it is possible to divide all displays into liter displays and displays for public pumping. Liter displays contain only information about the pumped volume of fuel in centiliters and are used in dispensers specified for private dispensing (i.e. for business internal fuel stations). In addition to the volume information, displays for public pumping also contain the monetary amount in EUR and the unit price of the fuel product. Depending on the type of the displaying unit, it is possible to divide displays into standard LCD and proportional (graphic) LCD. Proportional displays can, unlike standard displays, also display text information for customers, for example advertisement texts, when pumping isn't taking place.

i) dispenser design
- **design model BASE;** basic dispenser model design without decorative elements
- **design model WAVE**; dispenser with elements in the shape of a wave - marking /WAVE
- **design model CUBE**; dispenser with elements in the shape of a cube - marking /CUBE
- **design model FIN**; dispenser with elements in the shape of a sail/fin - marking /FIN

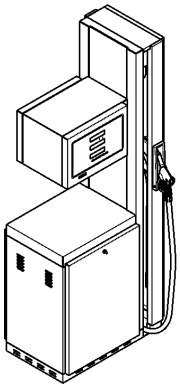
Examples of dispensers:



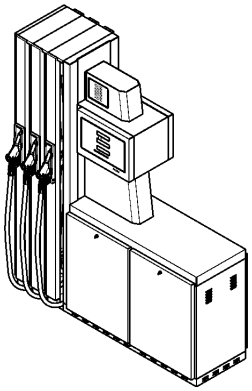
OCEAN BMP4022.OER /H
(right-sided, two-product, two-hose dispenser OCEAN EURO with hose retractors, design model CUBE, with pumping performance 1 x 40 L/min + 1 x 80 L/min)



OCEAN BMP4048.OER
(two-sided, four-product, eight-hose dispenser OCEAN EURO with hose retractors, design model WAVE, with pumping performance 4 x 40 L/min)



OCEAN BMP4021.OTR/UH
(right-sided, single-product, single-hose dispenser OCEAN TALL with free-hanging hose design model BASE, with maximum pump performance 130 L/min)



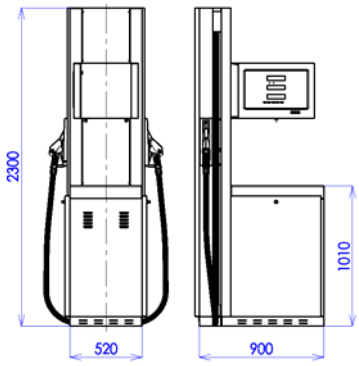
OCEAN BMP4033.OTL
(left-sided, three-product, three-hose dispenser OCEAN TALL with free-hanging hoses design model FIN, with pumping performance 2 x 40 L/min + 1 x 80 L/min)

2.5.1. OCEAN TALL DISPENSERS

OCEAN TALL are 1- to 5-product dispensers with a total height of 2300 mm, equipped with free-hanging hoses. They are made in both suction and pressure variants (/S3).

List of standard OCEAN TALL models:

Dispenser model	**Pumping method** *(S-suction, R-pressure/remote)*	**Access to dispenser** *(2-double sided, 1-single sided)*	**Nozzle placement** *(L-lane, I-island)*	**Number of pumps** *(number of products)*	**Number of meters**	**Number of nozzles** *(number of hoses)*	**Number of main displays** *(i.e. number of simultaneous deliveries)*	**Standard performance** [L/min]	**High performance (/H)** [L/min]
BMP4011.OTL(R)	S	1	L	1	1	1	1	40	80
BMP4011.OTL(R) /S3	R	1	L	1	1	1	1	40	80
BMP4011.OTD -ZV1	S	1	I	1	1	1	1	40	80
BMP4011.OTD /S3 -ZV1	R	1	I	1	1	1	1	40	80
BMP4012.OTD	S	2	L	1	2	2	2	40	80
BMP4012.OTD /S3	R	2	L	1	2	2	2	40	80
BMP4022.OTL(R)	S	1	L	2	2	2	1	40	80
BMP4022.OTL(R) /S3	R	1	L	2	2	2	1	40	80
BMP4022.OTL(R) -2C	S	1	L	2	2	2	2	40	80
BMP4022.OTL(R) /S3 -2C	R	1	L	2	2	2	2	40	80
BMP4024.OTD	S	2	L	2	4	4	2	40	80
BMP4024.OTD /S3	R	2	L	2	4	4	2	40	80
BMP4024.OTD -4C	S	2	L	2	4	4	4	40	80
BMP4024.OTD /S3 -4C	R	2	L	2	4	4	4	40	80
BMP4033.OTL(R)	S	1	L	3	3	3	1	40	80
BMP4033.OTL(R) /S3	R	1	L	3	3	3	1	40	80
BMP4033.OTL(R) -2C	S	1	L	3	3	3	2	40	80
BMP4033.OTL(R) /S3 -2C	R	1	L	3	3	3	2	40	80
BMP4036.OTD	S	2	L	3	6	6	2	40	80
BMP4036.OTD /S3	R	2	L	3	6	6	2	40	80
BMP4036.OTD -4C	S	2	L	3	6	6	4	40	80
BMP4036.OTD /S3 -4C	R	2	L	3	6	6	4	40	80
BMP4044.OTL(R)	S	1	L	4	4	4	1	40	80
BMP4044.OTL(R) /S3	R	1	L	4	4	4	1	40	80
BMP4044.OTL(R) -2C	S	1	L	4	4	4	2	40	80
BMP4044.OTL(R) /S3 -2C	R	1	L	4	4	4	2	40	80
BMP4048.OTD	S	2	L	4	8	8	2	40	80
BMP4048.OTD /S3	R	2	L	4	8	8	2	40	80
BMP4048.OTD -4C	S	2	L	4	8	8	4	40	80
BMP4048.OTD /S3 -4C	R	2	L	4	8	8	4	40	80
BMP4055.OTL(R)	S	1	L	5	5	5	1	40	80
BMP4055.OTL(R) /S3	R	1	L	5	5	5	1	40	80
BMP4055.OTL(R) -2C	S	1	L	5	5	5	2	40	80
BMP4055.OTL(R) /S3 -2C	R	1	L	5	5	5	2	40	80
BMP40510.OTD	S	2	L	5	10	10	2	40	80
BMP40510.OTD /S3	R	2	L	5	10	10	2	40	80
BMP40510.OTD -4C	S	2	L	5	10	10	4	40	80
BMP40510.OTD /S3 -4C	R	2	L	5	10	10	4	40	80



BMP4012.OTD
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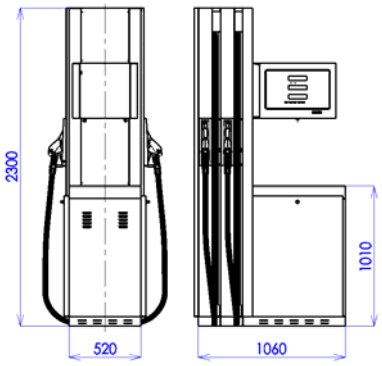

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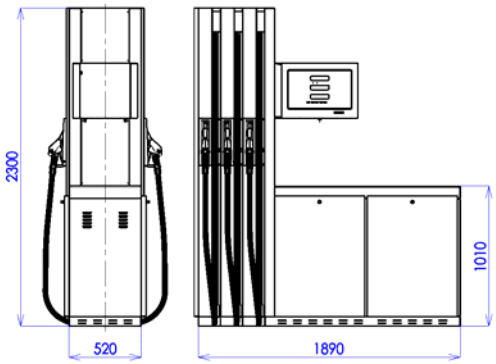

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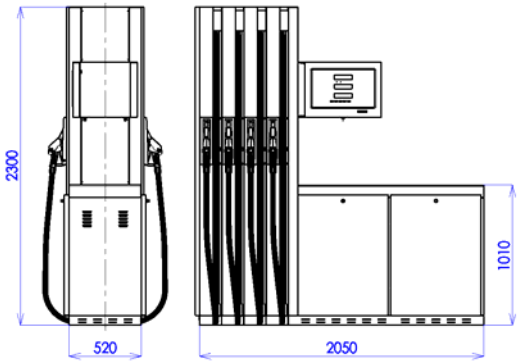

BMP4048.OTD
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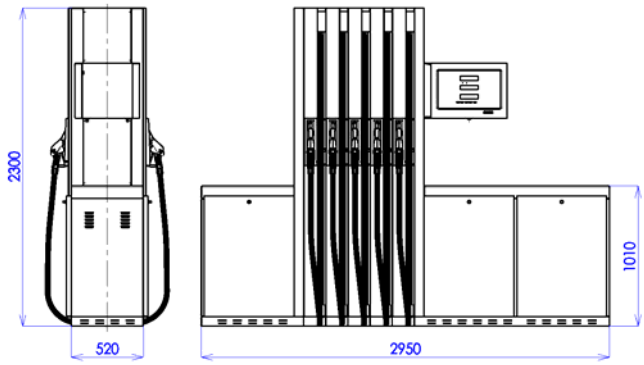

BMP40510.OTD
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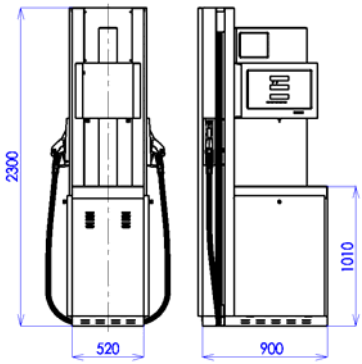
Fig. 2 – Overview of standard OCEAN TALL dispenser models in BASE design without decorative elements with recommended vehicle arrival direction to dispenser (<----------)



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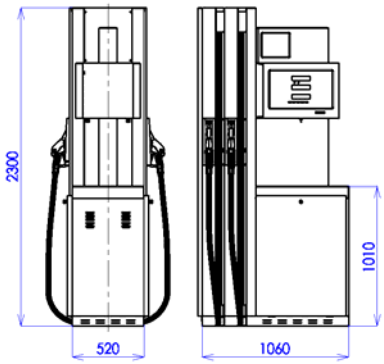

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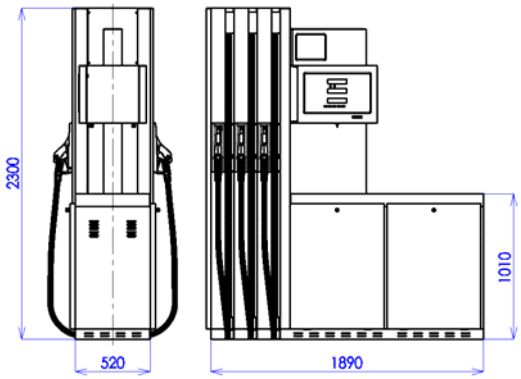

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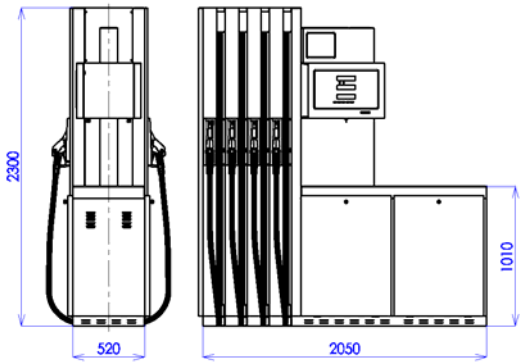

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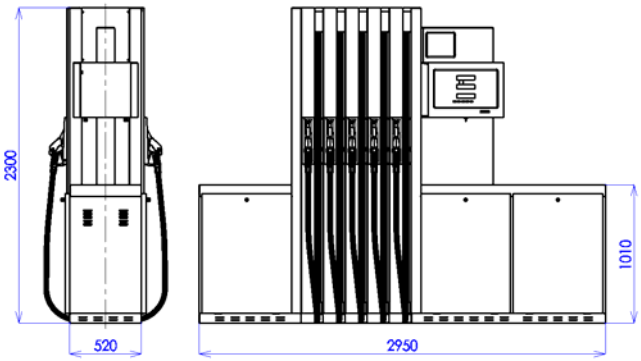

BMP40510.OTD /CUBE
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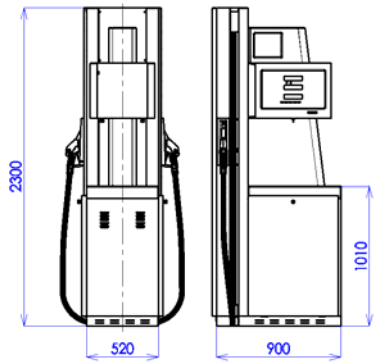
Fig. 3 – Overview of standard OCEAN TALL dispenser models in CUBE design with recommended vehicle arrival direction to dispenser (<----------)



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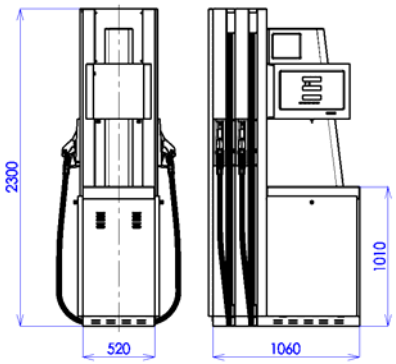

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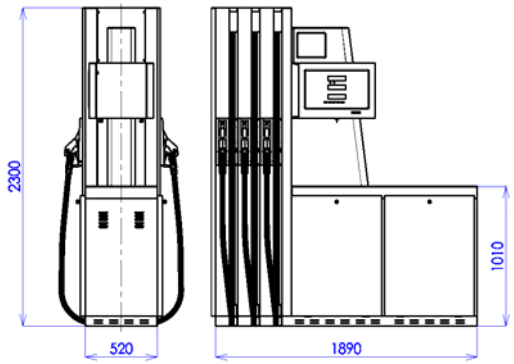

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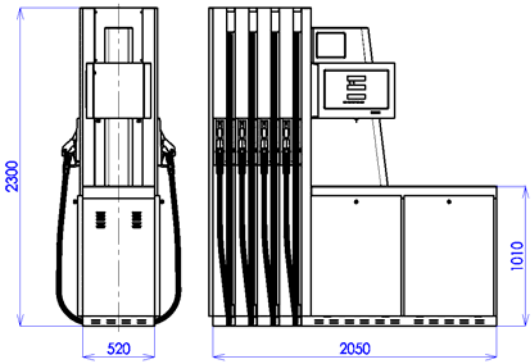

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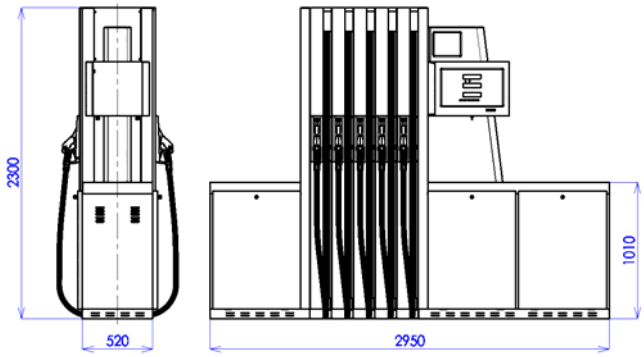

BMP40510.OTD /FIN
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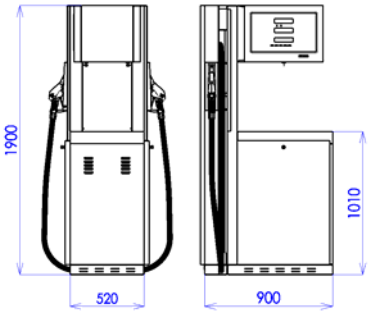
Fig. 4 – Overview of standard OCEAN TALL dispenser models in FIN design with recommended vehicle arrival direction to dispenser (<----------)

2.5.2. OCEAN EURO DISPENSERS

OCEAN EURO are 1- to 5-product fuel dispensers with total height 1900 mm in the BASE model, equipped with dispensing hose retractors. They are made in the suction and pressure models (/S3).

List of standard OCEAN EURO dispenser models:

Dispenser model	**Pumping method** *(S-suction, R-pressure/remote)*	**Access to dispenser** *(2-double sided, 1-single sided)*	**Nozzle placement** *(L-lane, I-island)*	**Number of pumps** *(number of products)*	**Number of meters**	**Number of nozzles** *(number of hoses)*	**Number of main displays** *(i.e. number of simultaneous deliveries)*	**Standard performance** [L/min]	**High performance (/H)** [L/min]
BMP4011.OEL(R)	S	1	L	1	1	1	1	40	80
BMP4011.OEL(R) /S3	R	1	L	1	1	1	1	40	80
BMP4011.OED -ZV1	S	1	I	1	1	1	1	40	80
BMP4011.OED /S3 -ZV1	R	1	I	1	1	1	1	40	80
BMP4012.OED	S	2	L	1	2	2	2	40	80
BMP4012.OED /S3	R	2	L	1	2	2	2	40	80
BMP4022.OEL(R)	S	1	L	2	2	2	1	40	80
BMP4022.OEL(R) /S3	R	1	L	2	2	2	1	40	80
BMP4022.OEL(R) -2C	S	1	L	2	2	2	2	40	80
BMP4022.OEL(R) /S3 -2C	R	1	L	2	2	2	2	40	80
BMP4024.OED	S	2	L	2	4	4	2	40	80
BMP4024.OED /S3	R	2	L	2	4	4	2	40	80
BMP4024.OED -4C	S	2	L	2	4	4	4	40	80
BMP4024.OED /S3 -4C	R	2	L	2	4	4	4	40	80
BMP4033.OEL(R)	S	1	L	3	3	3	1	40	80
BMP4033.OEL(R) /S3	R	1	L	3	3	3	1	40	80
BMP4033.OEL(R) -2C	S	1	L	3	3	3	2	40	80
BMP4033.OEL(R) /S3 -2C	R	1	L	3	3	3	2	40	80
BMP4036.OED	S	2	L	3	6	6	2	40	80
BMP4036.OED /S3	R	2	L	3	6	6	2	40	80
BMP4036.OED -4C	S	2	L	3	6	6	4	40	80
BMP4036.OED /S3 -4C	R	2	L	3	6	6	4	40	80
BMP4044.OEL(R)	S	1	L	4	4	4	1	40	80
BMP4044.OEL(R) /S3	R	1	L	4	4	4	1	40	80
BMP4044.OEL(R) -2C	S	1	L	4	4	4	2	40	80
BMP4044.OEL(R) /S3 -2C	R	1	L	4	4	4	2	40	80
BMP4048.OED	S	2	L	4	8	8	2	40	80
BMP4048.OED /S3	R	2	L	4	8	8	2	40	80
BMP4048.OED -4C	S	2	L	4	8	8	4	40	80
BMP4048.OED /S3 -4C	R	2	L	4	8	8	4	40	80
BMP4055.OEL(R)	S	1	L	5	5	5	1	40	80
BMP4055.OEL(R) /S3	R	1	L	5	5	5	1	40	80
BMP4055.OEL(R) -2C	S	1	L	5	5	5	2	40	80
BMP4055.OEL(R) /S3 -2C	R	1	L	5	5	5	2	40	80
BMP40510.OED	S	2	L	5	10	10	2	40	80
BMP40510.OED /S3	R	2	L	5	10	10	2	40	80
BMP40510.OED -4C	S	2	L	5	10	10	4	40	80
BMP40510.OED /S3 -4C	R	2	L	5	10	10	4	40	80



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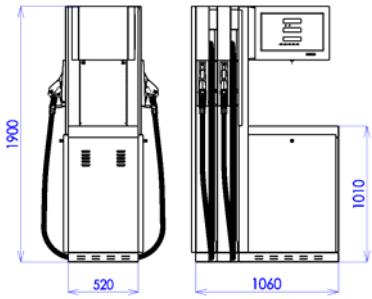

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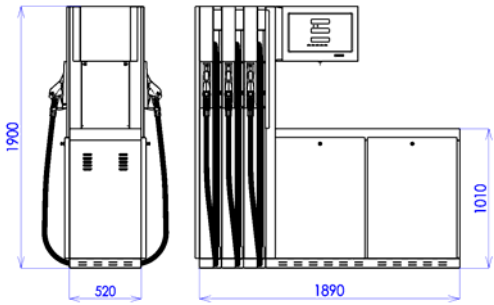

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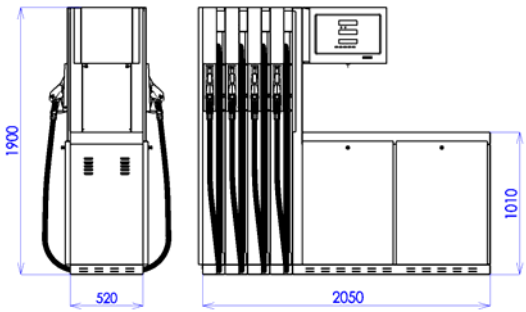

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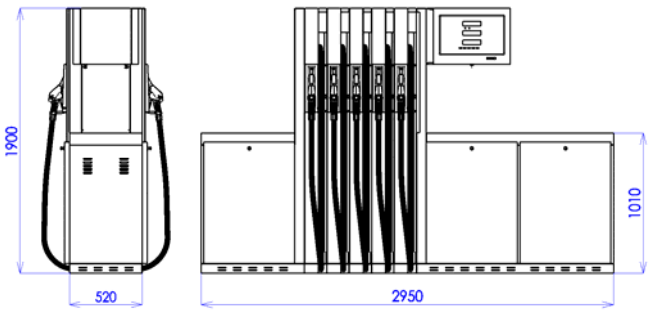

BMP40510.OED
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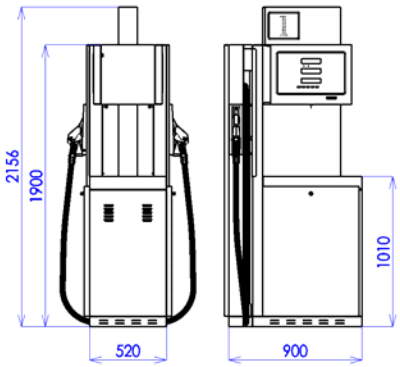
Fig. 5 – Overview of standard OCEAN EURO dispenser models in BASE design without decorative elements with recommended vehicle arrival direction to dispenser (<----------)



BMP4012.OED /CUBE
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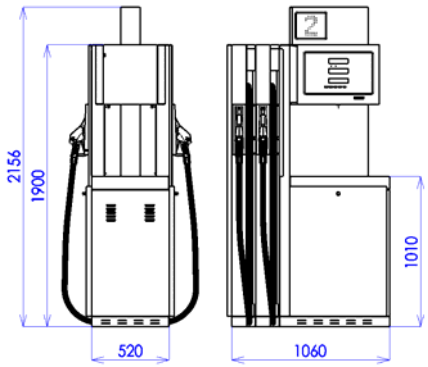

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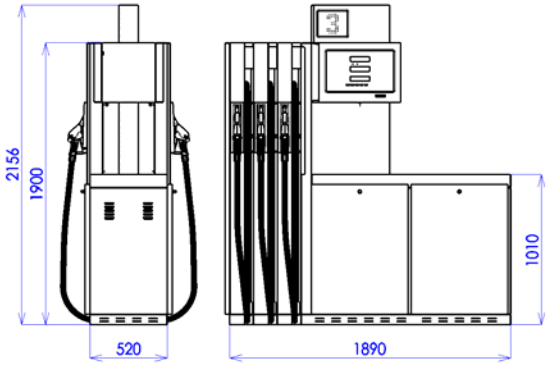

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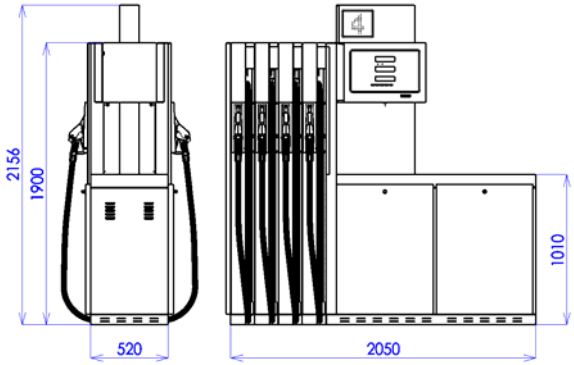

BMP4048.OED /CUBE
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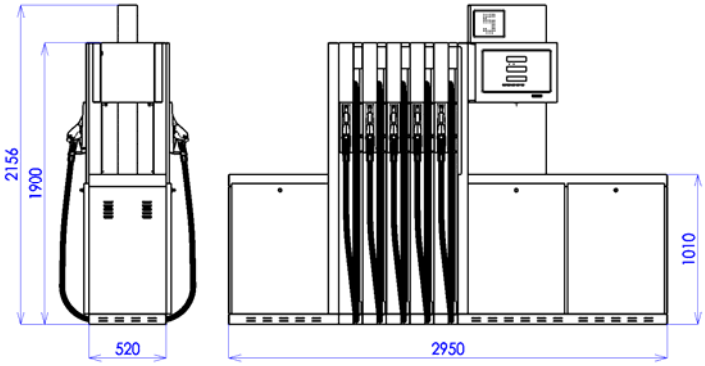

BMP40510.OED /CUBE
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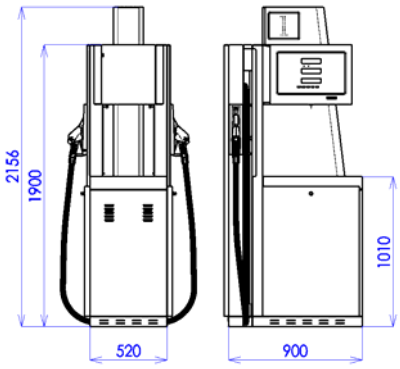
Fig. 6 – Overview of standard OCEAN EURO dispenser models with CUBE design with recommended vehicle arrival direction to dispenser (<----------)



BMP4012.OED /FIN
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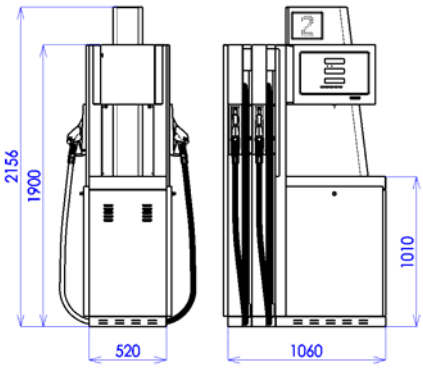

BMP4024.OED /FIN
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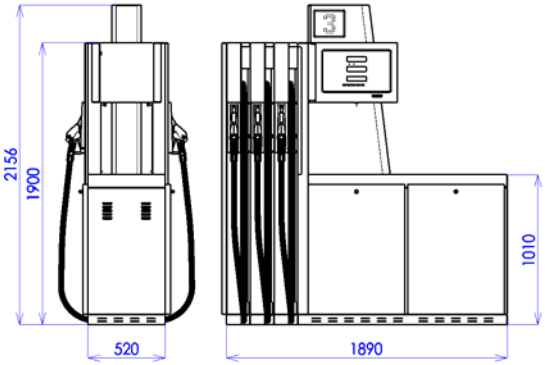

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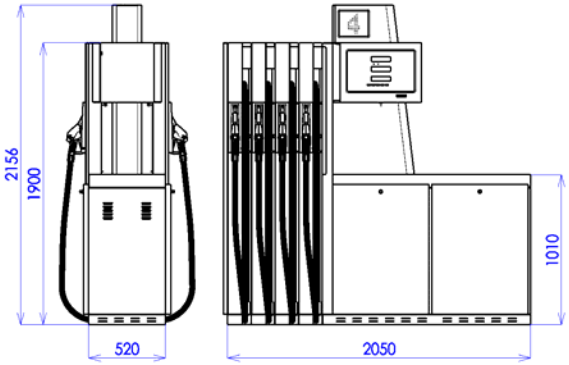

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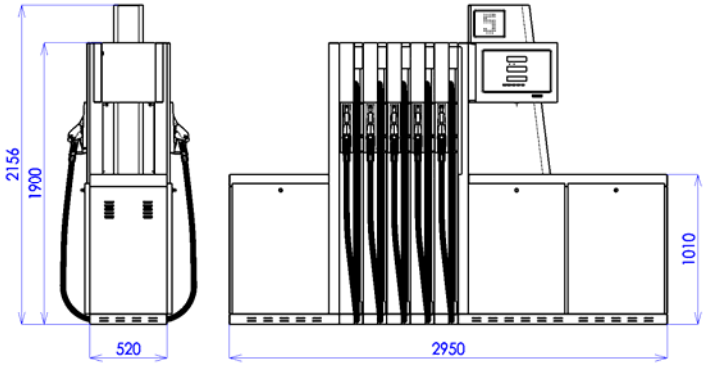

BMP40510.OED /FIN
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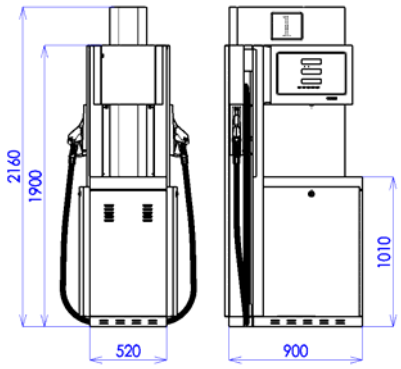
Fig. 7 – Overview of standard OCEAN EURO dispenser models with FIN design with recommended vehicle arrival direction to dispenser (<----------)



BMP4012.OED /WAVE
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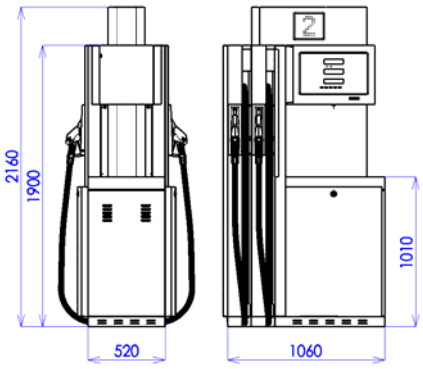

BMP4024.OED /WAVE
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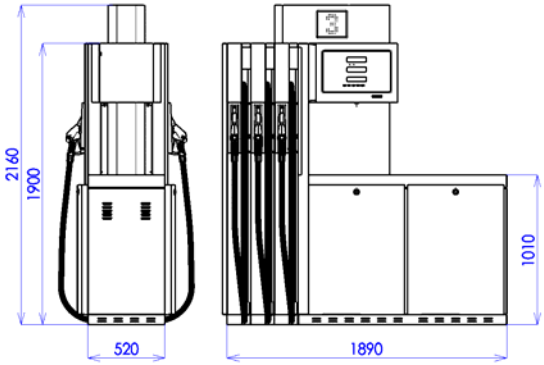

BMP4036.OED /WAVE
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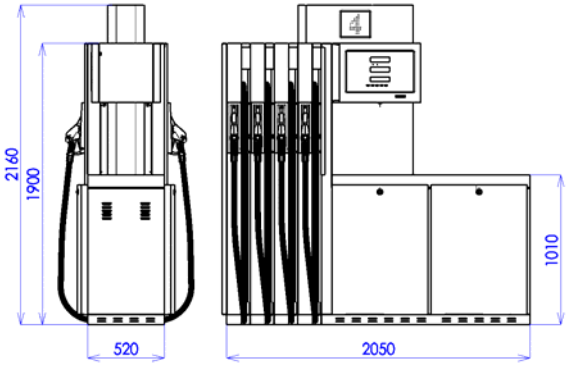

BMP4048.OED /WAVE
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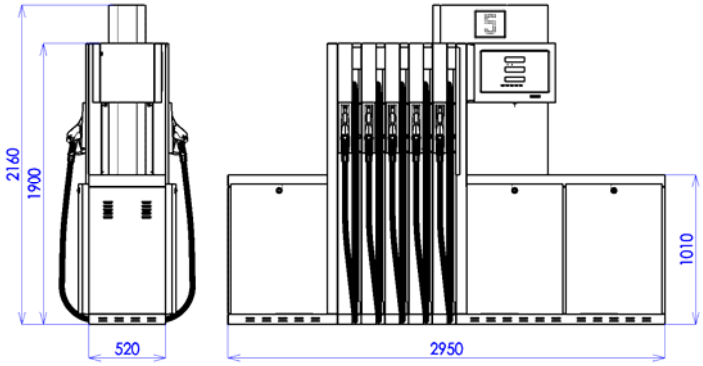

BMP40510.OED /WAVE
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Fig. 8 – Overview of standard OCEAN EURO dispenser models with WAVE design with recommended vehicle arrival direction to dispenser (<----------)

2.6. NAMING OF THE BASIC ELEMENTS OF DISPENSERS

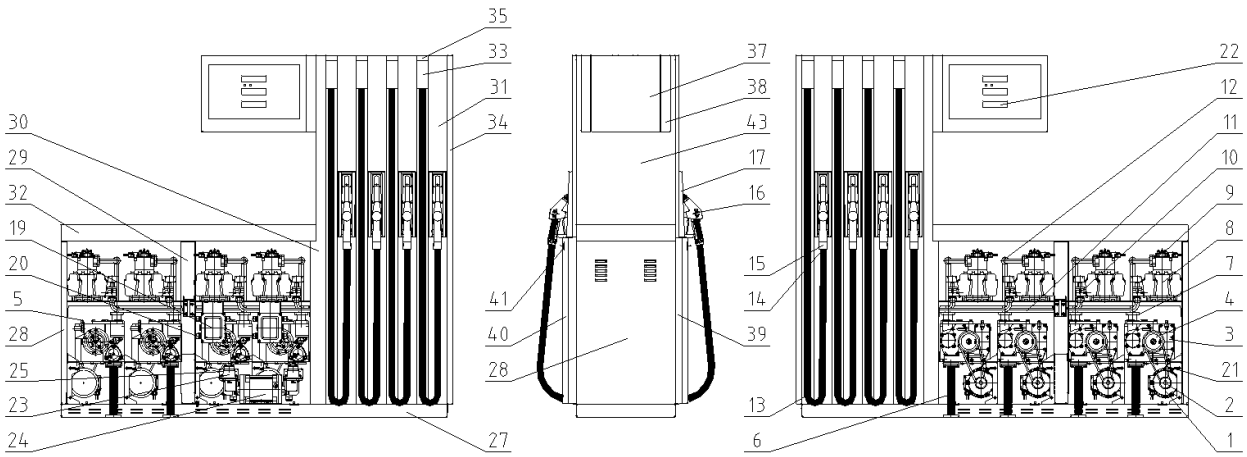


Fig. 9 – Basic parts of an OCEAN dispenser

Position	Device	Position	Device	Position	Device
1	Pump motor	**15**	Cylinder sight glass	**30**	Internal column
2	Motor pulley	**16**	Dispenser nozzle	**31**	Hose retractor column
3	Pumping monoblock	**17**	Nozzle cover (“boot”)	**32**	Hydraulics roof
4	Pump pulley	**(18)**	Magnetic sensor of dispensing nozzle position (in nozzle cover)	**33**	Roof of columns
5	Air separator sensor	**19**	Distribution box	**34**	Rear lid
6	Connection element – flex. pipe	**20**	Cable bushing - IP67	**35**	Roof lid
7	Output pipe	**21**	V-belt (antistatic)	**36**	Hose reel holder
8	Meter	**22**	Electronic counter	**37**	Counter head
9	Pulser – impulse generator	**23**	Vapor recovery pump	**38**	Mask + display mask metal sheet
10	Solenoid valve	**24**	Vapor recovery motor	**39**	Right door
11	Fuel pipe	**25**	Vapor flow sensor	**40**	Left door
12	Temperature sensor Pt100	**27**	Dispenser foundation	**41**	Latch lock
13	Dispenser hose	**28**	Front column		
14	Break-away Coupling	**29**	Central column		

2.7. PRODUCTION LABELS

Each OCEAN dispenser is equipped with a type label and an orientation label. These labels are merged into one on single-product dispensers. The type label contains all data about the dispenser concerning its metrology and safety according to the standard WELMEC 10.5 and the norm EN 13617-1, article 7.4. The orientation label serves metrology inspection for attachment of official metrology labels which affirm that the measurement system was reviewed.

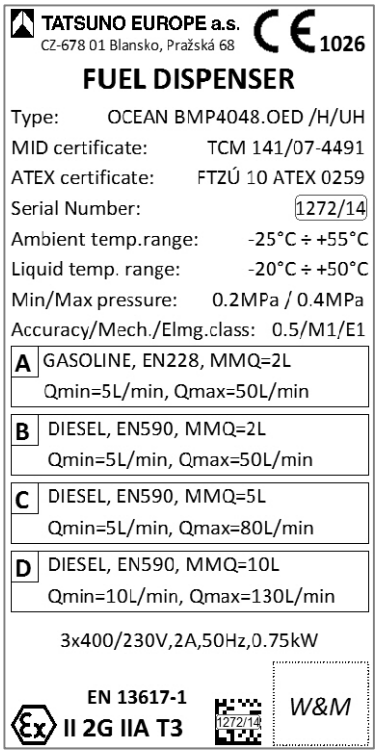


Fig. 11 – Type label

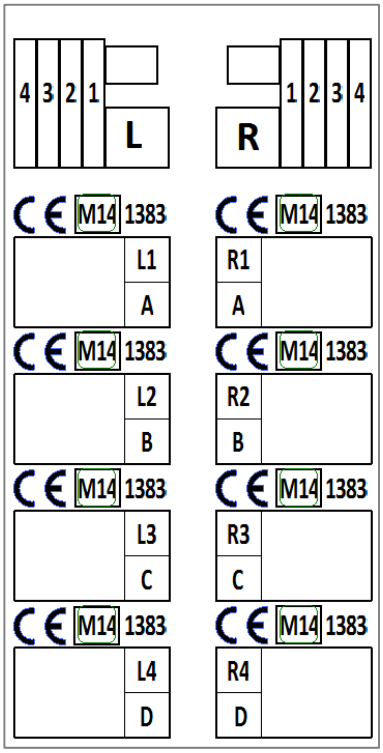


Fig. 10 – Orientation label

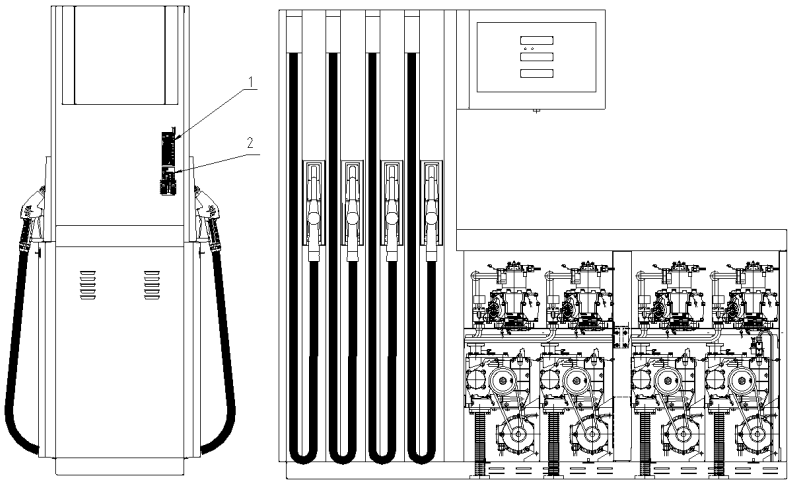


Fig. 12 – Placement of production labels on the dispenser (1 - type, 2 - orientation)

Table 1 – Information on the dispenser type label

TATSUNO EUROPE a.s.	Name and address of the fuel dispenser producer
CE 1383	This dispenser marking means that it was designed, produced and marked in compliance with directives of the European Commission. The dispenser is subject to certification and type testing according to Directive 2004/22/EC – MID, performed by the notified body No. 1383 – ČMI Brno
CE 1026	This dispenser marking means that it was designed, produced and marked in compliance with directives of the European Commission. The dispenser is subject to certification and type testing according to Directive 1994/9/EC – ATEX, performed by the notified body No. 1026 – FTZÚ Ostrava Radvanice
FUEL DISPENSER	Type of device
Type	Marking of the dispenser type (see chapters 2.5.1 and 2.5.2)
MID certificate	No. of the metrological ES certificate of the measurement appliance type approval – ČMI
ATEX certificate	No. of the EC type certificate (ATEX certificate) – FTZÚ
Serial number	Production number of the dispenser (serial No. / year of production)
Liquid temp. range	Temperature range of the pumped liquid for which the dispenser was designed and approved
Ambient temp. range	Temperature range of the environment for which the dispenser was designed and approved
Min/Max pressure	Minimum and maximum operating pressure
Accuracy/mech/elmg class	Accuracy class / Mechanical class / Electromagnetic class
A, B, C, D, E, F, G, H, I, J	Types of measuring systems – metrology parameters: A – Gasoline; EN 228; max. performance Q_{max}=50L/min; min. delivery MMQ = 2L B – Diesel; EN 590; max. performance Q_{max}=50L/min; min. delivery MMQ = 2L C – Diesel; EN 590; max. performance Q_{max}=80L/min; min. delivery MMQ = 5L D – Diesel; EN 590; max. performance Q_{max}=130L/min; min. delivery MMQ = 10L E – Diesel; EN 590; max. performance Q_{max}=160L/min; min. delivery MMQ = 10L F – Ethanol; CEN/TS 15293; max. performance Q_{max}=50L/min; min. delivery MMQ = 2L G – Biodiesel; EN 590/EN 14214; max. performance Q_{max}=50L/min; min. delivery MMQ = 2L H- Biodiesel; EN 590/EN 14214; max. performance Q_{max}=80L/min; min. delivery MMQ = 5L I – Biodiesel; EN 590/EN 14214; max. performance Q_{max}=130L/min; min. delivery MMQ = 10L J – Biodiesel; EN 590/EN 14214; max. performance Q_{max}=160L/min; min. delivery MMQ = 10L
Ex II 2G IIA T3	Marking of the non-explosive electric appliance protection method: **II 2** – equipment for areas with explosion hazards except underground mines, probability of explosive atmosphere formation – zone 1 **G** – explosive atmosphere formed by gases, vapors or fog **IIA** – group of gases – the least dangerous **T3** – max temperature of the electric appliance, which might cause ignition of the ambient atmosphere (200°C)
EN 13617-1	No. of the European norm, according to which the dispenser was approved
Motor power supply	Motor power supply: 3x400/230V; 2A; 50Hz; 0,75kW

3. INSTALLATION

3.1. INSTRUCTIONS FOR SAFE WORK

CAUTION

- *This appliance must be installed only by qualified authorized staff in compliance with relevant norms, directives and local limitations and according to this manual.*
- *In the immediate vicinity of the dispenser it is forbidden to smoke or use open fire.*
- *Always follow the procedures set for manipulation with gasoline and diesel.*
- *Monitor any leakage in the dispenser. In case of fuel leakage resulting from insufficient tightness, disconnect the power supply and contact the service organization.*
- *Electric installation must be performed by qualified experts.*
- *Make sure that a properly working fire extinguisher is available.*
- *When manipulating with the equipment, use proper protection aids.*

3.2. RECEIPT, TRANSPORT, UNPACKING

The customer concludes a contract with the producer to organize the dispenser delivery. If the delivery is ensured by the company TATSUNO EUROPE a. s., the company will transport the product to the agreed location. The producer has sufficient experience with manipulation and transportation. If the delivery is ensured by the customer in another manner, the producer will ensure professional loading, but will not be responsible for the transport. In general, the dispenser must be transported properly packed and always fixed to the frame. In the transport vehicle the dispenser must be secured against damage (covers, paints), motion and tipping. Any manipulation and transport must be done in a vertical position; the dispenser must not be placed on its covers.

WARNING *During manipulation, only forklift vehicles may be used. If other manipulation methods are used, TATSUNO EUROPE a. s. does not provide warranty for any sustained damage!*

3.3. DISPENSER PLACEMENT

3.3.1. GENERALLY

The producer recommends placing the dispensers on the refuge islands of the fuel station in such a way that the direction of the vehicle arrival matches the arrows in Fig. 1, which also shows the numbering of products at the dispenser.

3.3.2. SINGLE-SIDED DISPENSER ORIENTATION

Single-sided dispensers are marked with the letter "L" and "R" ("L" – left, "R" – right) following the dispenser type designation (e.g. BMP4022.OE**L** is a left-, single-sided, single-product dispenser and BMP4022.OE**R** is a right-, single-sided, single-product dispenser). The dispenser orientation is described from the point of view of the incoming vehicles – see Fig. 13 and Fig. 14.

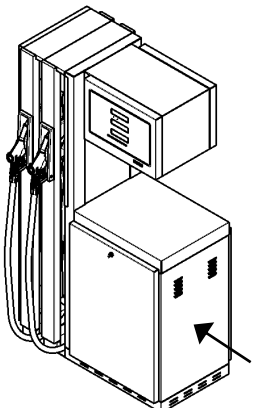


Fig. 13 – Left-sided dispenser BMP4022.OEL
(arrow indicates recomended direction of vehicle arrival)

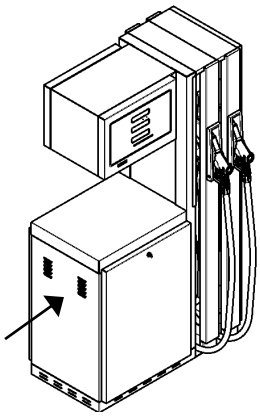


Fig. 14 – Right-sided dispenser BMP4022.OER
(arrow indicates recomended direction of vehicle arrival)

3.3.3. DISTANCE OF THE DISPENSER FROM THE TANK

The producer recommends that the maximum distance of the dispensers from the fuel tank should be **50 meters** and the maximum suction height **5.5 meters**. Otherwise, suction performance of the dispenser may be hindered, which leads to lowering of the fuel suction pump performance (nominal flow rate) and/or increased noise levels. All technical requirements for the fuel station must be governed by a professionally prepared and duly approved fuel station project consulted with the dispenser producer.

The manufacturer recommends that the minimum distance of a single-sided dispenser from the kiosk wall should be **1 m**.

3.3.4. STATION FUEL TANK TYPE

Combined dispensers OCEAN EURO can be connected to underground fuel tanks or aboveground fuel tanks.

A steel base frame is installed horizontally and cemented to the shaft that connects to the suction piping of the storage (underground) tank. This base frame is not part of the dispenser supply. The dispenser is attached

to this frame. The following supply cables must lead to the shaft under the dispenser in addition to the grounding conduits:

- **4-wire cable for powering the three-phase electromotors of fuel**
  (a harmonized cable of type H05VV5-F 4x1,5 is recommended)
- **3-wire cable powering the electronic counter and switching circuits**
  (a harmonized cable of type H05VV5-F 3x1,5 is recommended)
- **5-wire shielded cable for data line**
  (a harmonized shielded cable of type H05VVC4V5-K 5x0,5 is recommended)

CAUTION ***As a supply cable, only a cable that complies with the requirements of the European standard EN 13617-1:2012 may be used. Among the basic attributes of these cables is their resistance to oil, gasoline and gasoline vapors (according to HD21 13S1).***

CAUTION ***Due to safety and environmental protection it is necessary to install a leakage tray to catch any leakage of fuel.***

Next, the dispenser is connected to the suction pipe via a flexible pipe, which is part of the dispenser delivery along with a check valve. The assembly is described in Appendix 1.1.6. and Appendix 1.1.7. Foundation plans of dispensers in the suction model are in Appendices 1.1.1. to 1.1.5. of the Installation Instructions.

NOTICE ***The connections to the dispenser must be sealed in such a way that no flammable liquids or their vapors can get inside. In the shafts under the dispenser, only cable connectors resistant to flammable liquids may be used.*** *Cable glands may only be used for one cable, unless they are glands designed for more cables.*

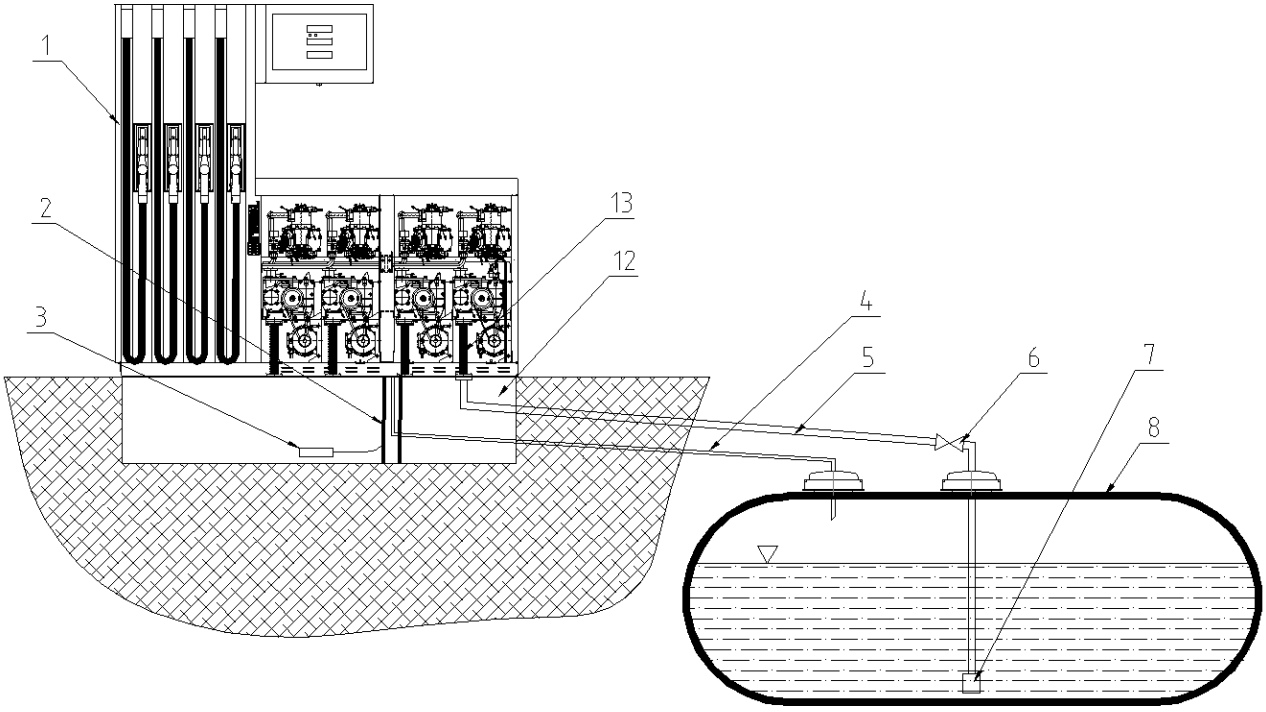


Fig. 15 – Example of connection of the dispenser and the underground tank

Legend: 1 – dispenser, 2 – electric supply cables and data line, 3 – sensor of liquids located on the bottom of the leakage tray, 4 – piping for vapor recovery (recuperation), 5 – suction fuel piping, 6 – check valve, 7 – strainer (without check valve), 8 – underground fuel tank, 12 – leakage ECO tray with dispenser base frame, 13 – connection element (flexible pipe) with flange

CAUTION *If the dispenser is connected to an **underground tank**, it is necessary to insert a **check valve** into the suction piping, to secure that when the dispenser is idle, the fuel column is not broken, because this would lead to the suction of air after commencing the next fuel delivery. **An independent check valve may not be installed if the suction basket is already equipped with a check valve (see Fig. 15).***

CAUTION

*If the dispenser is connected to a surface tank, due to safety reasons the suction piping must involve an **overpressure (check) valve** to prevent product leakage from the tank caused by gravity. The valve simultaneously serves to free the overpressure in the suction piping back into the tank. We recommend the **OPW 199ASV (Anti-Siphon Valve)**. The valve type needs to be chosen depending on the difference between the maximum height of the fuel in the tank and the minimum point of the fuel piping - see Fig. 16, height A.*
*At the lowest point of the piping, a **stop and bleed valve** should be installed, which should be closed by the operator whenever the dispenser is idle. If there aren't such valves, any leakage in the fuel system may cause **uncontrolled fuel leakage (see Fig. 16).***

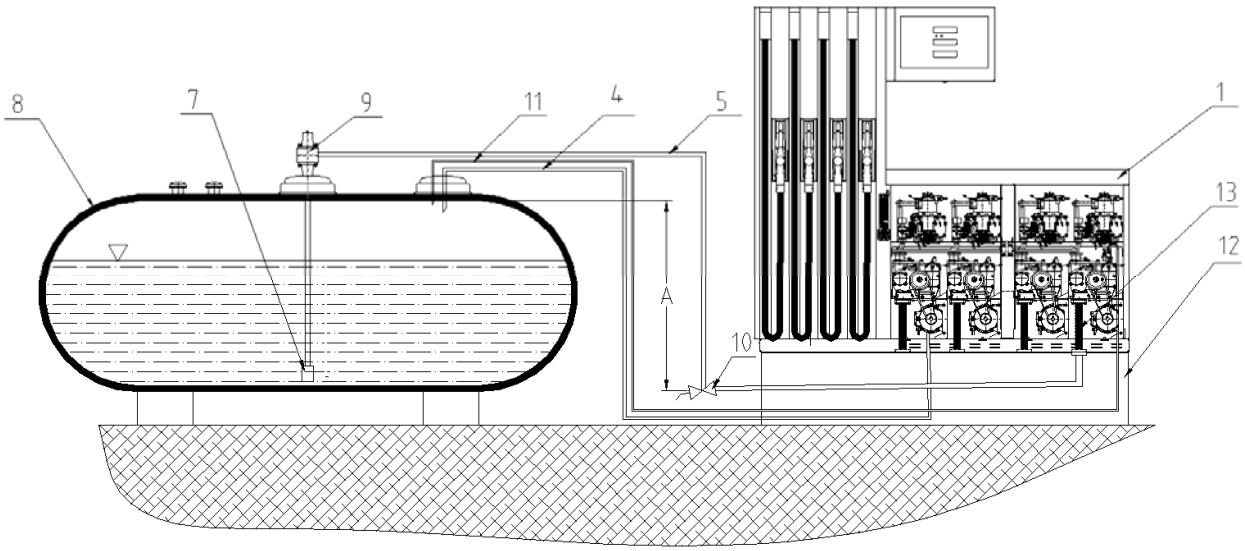


Fig. 16 – Example of connection of the dispenser and a surface tank

Legend: 1 – dispenser, 4 – piping for vapor recovery (recuperation), 5 – suction fuel piping, 7 – strainer (without check valve), 8 – surface fuel tank, 9 – overpressure check valve (OPW 199ASW), 10 – stop and bleed valve, 11 – return piping from the dispenser separator, 12 – ECO leakage container with dispenser base frame, 13 – connecting flexible pipe with flange

NOTICE ***Surface tanks**. The pumping monoblock of fuel dispensers is structurally designed with a permanently open air separator into the venting chamber created by the space in the monoblock body and the space of the monoblock lid. In the top wall of the lid, there is an opening containing a connector DN6 for connecting air venting*

pipes. To prevent overpressure of the venting chamber of the monoblock in the dispenser's idle stage in case of insufficient air-tightness or blocking of the check valve, and to prevent the ensuing leakage of the medium into the inner space of the dispenser and subsequently into its surroundings, ***it is necessary to interconnect the output of the pumping monoblock and the storage tank****. The connection can be made using a pipe Ø 10 x 1 (DN8) connected to the pipe connector DN8. The pipe connector is screwed over a seal in the opening M12x1,5 in the top wall of the monoblock lid. The outlet of the pipe must be led into the lid of the storage tank using a pipe corner connector DN8.*

3.3.5. DISTRIBUTION PIPES

The dispenser manufacturer recommends installing distribution pipes in the standard manner, with each dispenser pump having a separate pipe to the respective fuel tank.

NOTE *There is also the option of a "backbone" fuel distribution system, where several dispensers (pumps) are connected to a single supply pipe from the tank. The dispenser manufacturer* ***does not recommend*** *this backbone distribution type due to the risk of instability in the fuel suction from the tanks. If the designer should decide to use the backbone distribution type anyway, the dispenser producer requires inserting* ***disc valves*** *in the suction piping, to functionally isolate individual dispensers. Disc valves such as C09 DN32 are produced by the company Armatury Group a.s., Kravaře.*

3.3.6. DISPENSER LOCATION IN RELATION TO EXTERNAL INFLUENCES

CAUTION *Hazardous areas are defined according to ČSN EN 60079-10-1:2009 in the surroundings of the fuel dispenser.* ***Fuel dispenser of the OCEAN EURO series must not be located in explosion hazard areas****, i.e. in hazardous areas defined by the norm ČSN EN 60079-10-1:2009. Electronic counters used in these dispensers do not have any cover, are located in areas with no risk of explosion and are separated from other areas with a partition of type 1 according to ČSN EN 13617-1:2013.*

3.3.7. PRESSURE SYSTEM

OCEAN dispensers can be connected not only to a classical suction system, where the fuel is sucked out of the fuel tank via the pumps located in the dispensers, but it can also be connected to a **pressure system**, where the fuel is "pushed" in the dispensers directly out of the tanks, which have central submersible pumps (such as the RED JACKET system). The advantage of the pressure system is very low noise operation of the dispensers, but the disadvantage is high demand for the quality and sealing of the fuel piping. In the pressure system the dispenser has no pumping monoblock. The fuel piping is connected via an emergency breakaway valve, which is under the fuel dispenser and is firmly attached to its base frame. From there the fuel goes to the filter and is distributed via meters and control valves to the dispensing hoses and nozzles.

CAUTION ***According to the European norm EN 13617-1:2012, OCEAN EURO dispensers connected to a pressure system must have an emergency breakaway valve, which will shut off the pressure intake in case the***

dispenser is broken off! *The breakaway coupling is not part of the standard equipment of fuel dispensers. The dispenser producer recommends using the valve OPW 10BF. The fuel intake to the dispensers is through a pipe with a cap nut with an internal thread G1". The position of the intake piping is shown in Appendix 1, where you also can see the recommended connection to the pressure piping.*

CAUTION ***It is necessary to ensure that the maximum pressure at the fuel intake to the dispenser does not exceed 0.35 MPa.***

The following supply cables must be led to the shaft under the dispenser in addition to the grounding conduits:

- **4-wire cable for powering the three-phase electromotors**
  (A harmonized cable of type H05VV5-F 4x1,5 is recommended)
  This cable is only necessary for fuel dispensers that have the vapor recovery system installed – the cable powers the vacuum pump electromotors
- **7-wire cable for switching of pumps located in the tanks**
  (a harmonized cable of type H05VV5-F 7x1,0 is recommended)
- **3-wire cable for powering the electronic counter and switching circuits**
  (a harmonized cable of type H05VV5-F 3x1,5 is recommended)
- **5-wire shielded cable for data line**
  (a harmonized shielded cable of type H05VVC4V5-K 5x0,5)

CAUTION ***Only cables that meet the requirements of the European norm EN 13617-1:2012 may be used as the supply cables. Among the basic attributes of these cables is the resistance to oil, petrol and petrol vapors (according HD21 13S1).***

3.3.8. SATELLITE DISPENSER

A “satellite” dispenser can be attached to all OCEAN type fuel dispensers. It is an extra dispensing site – a column with a dispensing hose and nozzle placed on the other side of the refuge island. A satellite can be used to refuel trucks, having the hoses of the main dispenser and the satellite fill both side tanks in one truck at the same time. The satellite dispenser has no own control electronics or hydraulics and it is fully dependent on the master dispenser. An image of a satellite, its layout and base frame can be found in Appendix 1.

3.4. MECHANICAL ATTACHMENT OF THE DISPENSER

The dispensers are attached to special base frames with anchoring bolts supplied along with the dispensers. The dispenser’s base frame is not part of the standard dispenser equipment, but it can be ordered additionally. The base frame is set in concrete to the refuge island, then the front and rear covers of the dispenser are removed, the dispenser is placed on the base frame and fixed with bolts.

CAUTION ***Due to safety and environmental protection it is necessary to install a leakage tray under the dispenser to avoid leakage of fuel.***

Subsequently, the dispenser is connected to the suction piping using a flexible pipe (suction piece), which is part of the dispenser delivery. Appendix 1 shows the base frames and layouts of all dispenser types with marking of the location of the suction piping and gasoline vapor recovery pipes from the dispensers. The delivery piping of vapor recuperation is connected to the piping with a lid G 1".

NOTE *The G 1" lid is part of the dispenser delivery.* ***The recuperation piping must end with an internal thread G1".***

3.5. ELECTRIC WIRING OF THE DISPENSER

Electric wiring of the OCEAN fuel dispensers requires protection against contact voltage (according to the norm ČSN 33 2000-4-41 "Electro-technical regulations - Electrical equipment - Part 4: Safety - Chapter 41: Protection against electrical shock", published: August 2007, which complies with the international norm HD 60364-4-41:2007) and also requires that appropriate electrical cables must be connected to each dispenser.

It is imperative that all fuel dispensers at the station be interconnected with a grounding conduit and connected to a grounding system. For the grounding conduit, a green-yellow conduit of at least **4 mm^2** cross-section or a special flat conduit may be used. The grounding conduit must be connected to a central grounding clamp of the fuel dispenser located in its base (M10 bolt), identified with a ground mark.

ATTENTION *All the electrical cables must be resistant to gasoline vapors and must have good insulation attributes, because they will be under long-term influence of an aggressive, explosive environment. For these purposes, the manufacturer recommends using harmonized cables of type H05VV5-F and H05VVC4V5-K, resistant to gasoline vapors. Examples of electric wiring of fuel dispensers in suction and pressure models are shown in Appendix 2.*

NOTE *To allow for easy installation (cable ending in a distribution box) it is required that all cable terminations entering the fuel dispenser have sufficient length – each end at least* ***3 m*** *above the ground.*

Concerning the used voltage and function, the cables can be divided into power (supply) cables and signal cables.

Power cables:

- powering of electromotors of pumps and vacuum pumps
- powering of counters and switching elements

Signal cables:

- communication line (data line)
- additional service lines (pulse outputs, motor blocking, tank fuel level probes etc.)

NOTE *Examples of electrical wiring of OCEAN dispensers in suction and pressure models, including distribution box descriptions, are shown in Appendix 2.*

3.5.1. POWERING OF ELECTROMOTORS OF PUMPS AND VACUUM PUMPS

a) Suction version dispensers

When the dispenser is equipped with a fuel pump (i.e. suction version dispensers), the pump and vacuum pump electromotor powering is carried out in all types of dispensers by a **4-core cable H05VV5-F 4x1,5** (see Table 2), which leads from the main distributor in the kiosk to each fuel dispenser to its distribution supply box XP01. In the distributor this cable is connected to circuit breakers and a switch. Switching of individual motors of pumps and vacuum pumps is done by means of contactors inside the fuel dispenser. All OCEAN fuel dispensers are equipped with contactors and each motor in the dispensers is protected with a thermal residual current device. Switching of motors of pumps and vacuum pumps is made so that at any given moment, no more than two motors of pumps and two motors of vacuum pumps are connected to the power supply cable - see Table 3.

Table 2 – Marking of wires in cables powering the electromotors of pumps and vacuum pumps

Marking of wires in the cable H05VV5-F 4x1,5		
marking	color	description
L1	black 1	phase 1
L2	black 2	phase 2
L3	black 3	phase 3
PE	green-yellow	protective

NOTICE *For the termination of the supply cable 3x400V in the distributor we recommend using a special engine circuit breaker, type **PKZM 0-10**, from the company Moeller Klöckner. This circuit breaker serves as a switch and also contains short circuit and thermal protection. After installation in the distributor's door this circuit breaker can be complemented with a control head (IP65) with an extended spindle – type RH-PKZO.*

NOTE *For switching of motors of pumps and vacuum pumps in the dispensers, there are motor contactors **DIL EEM-10** and **DIL EM-10-GI** with thermal residual current protection of type **ZE-2.4** and **ZE-0.6** from the company Moeller Klöckner, or motor circuit breakers of type **PKZM 0-0.4** from the same producer. Fig. 17 shows the reaction times of the used residual current devices of type ZE.*

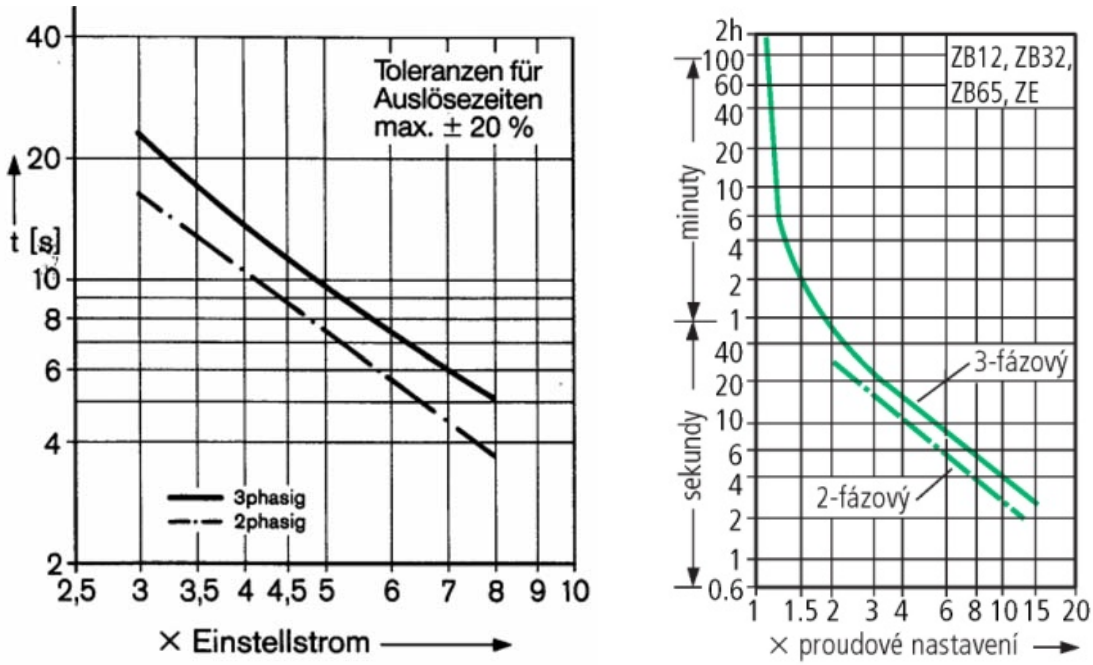


Fig. 17 – Reaction times of the motor residual current devices of the ZE type

Electromotor parameters

Table 3 provides basic parameters of two electromotor types used in OCEAN fuel dispensers.

Table 3 – Electromotor parameters

Pump electromotor	Vacuum pump electromotors
1MA7083-4BA10-8N51	BA240TRII AR-R
asynchronous motor	asynchronous motor
230/400V; 50Hz	230/400V; 50Hz
current 2.05 A	current 1.1 A
consumption 0.75 kW	consumption 0.37 kW
1395 RPM	2840 RPM
Ia/In = 4,8	with internal thermal protection
IP 55	IP 54
T3, t_E = 16 sec	T3
cos ϕ = 0,75	cos ϕ = 0,8
Ex II 2 G Ex e II T3	Ex II 2G Ex d IIB T3 Gb
PTB 01 ATEX 3335X/03	ISSeP 08 ATEX 041X

NOTICE *After connecting the power supply to the electromotor, check the proper direction of its turning! The proper direction is marked by the arrow on the pump's belt – see Fig. 18.*

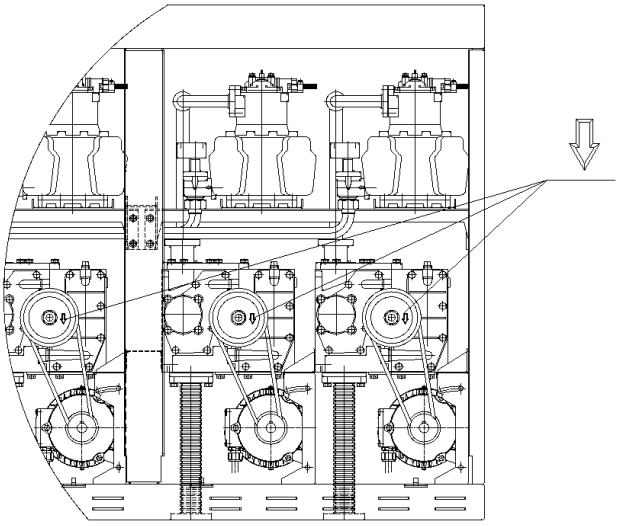


Fig. 18 – Checking the direction of the pump motor revolution – see the arrow

b) Pressure version dispensers

When submersible fuel pumps are located outside the dispenser in the fuel tank and are powered directly by the distributor in the kiosk (i.e. pressure version dispensers), the switching of these pumps is carried out from the dispenser via a 7-core cable type **H05VV5-F 7x1,0** (see Table 4), which leads from the main distributor to the fuel dispenser to the distribution supply box XPxx – XP04 box for 1 product, XP06 box for 2 products, XP07 box for 3 products, XP05 box for 4 products and XP11 for 5 products. In the distributor this cable is connected to the switching circuits of the submersible pumps. The switching in the dispenser is carried out via power relays (max. 250V / 12A) located in the calculator case.

NOTE *For switching of submersible pumps of a single-product OCEAN dispenser, it would be sufficient to use a 3-core cable type H05VV5-F 3x1,0 would be sufficient, for switching of submersible pumps of a two-product OCEAN dispenser a 4-core cable type H05VV5-F 4x1,0, and so on. However, because of possible future changes on the dispenser configuration, we recommend using a 7-core cable type H05VV5-F 7x1,0.*

If the dispenser is equipped with a vapor recovery system, i.e. it dispenses other products than just diesel or biodiesel, it is necessary to power the electromotor of the suction pump by a **4-core cable H05VV5-F 4x1,5** (see Table 2), which is led from the main distributor in the kiosk to each powering dispenser into the distribution box XPxx. In the distributor box this cable is connected to the curcuit breaker and switch. In the dispenser, motor switching is carried out by a contactor with current protection in the counter case.

Table 4 – Marking of wires in cables switching the submersible pumps (pressure system)

Marking of wires in the cable H05VV5-F 7x1,0		
marking	color	description
SC	black 6	shared conduit
S5	black 5	pump switch phase 5
S4	black 4	pump switch phase 4

S3	black 3	pump switch phase 3
S2	black 2	pump switch phase 2
S1	black 1	pump switch phase 1
PE	green-yellow	protective conduit

3.5.2. POWER SUPPLY TO THE ELECTRONIC COUNTER AND SWITCHING ELEMENTS

For all types of dispensers, the counter and the switching circuits are powered by a **3-core power cable type H05VV5-F 3x1,5** (see Table 5), which leads from the main distributor in the kiosk to the first module of the fuel dispenser, in its power supply distribution box XPxx. From the distribution box the power is led to the dispenser's counter case, where it ensures stabilized power supply to the electronic counter, switching elements and any heating units.

Table 5 – Marking of conductors in the cable of the counter and switching elements power supply

Marking of conductors in the cable H05VV5-F 3x1,5		
marking	color	description
L	black	phase
N	blue	neutral
PE	green-yellow	protective

Powering for the counter is lead from the dispenser to the main distributor, where it is connected through a circuit breaker 230V (230V, 6A) to a bus shared by all the fuel dispensers. From there the power for all dispensers is lead to a stabilized backup power source, which can power the dispenser's counter for 3-5 minutes in case of a power blackout.

NOTICE *To ensure trouble-free operation of the fuel dispensers, the producer recommends to backup the stabilized power supply for the dispensers with a backup power source UPS (Uninterruptible Power Supply). Power blackouts, strong interference or voltage drops during voltage peaks are frequent phenomena in the electricity grid (especially in winter). All these problems can be eliminated by the use of a proper power backup UPS. There are essentially two types of power backups suitable to provide backup power for the dispensers:* ***UPS of the line-interactive type*** *and* ***UPS of the on-line type****. Fuel stations connected to a stable electricity grid (without voltage drops and interference) can do with the line-interactive UPS type to stabilize their power supply. In other cases there must be used the on-line UPS type. Interference, voltage drops or blackouts can cause frequent blocking of the dispensers, errors in the communication between the computer and the dispensers, computer errors (data loss) etc.*

3.5.3. DATA (COMMUNICATION) LINE

The data line serves to control the fuel dispenser and to transfer data from the dispenser remotely, when the dispenser is in the automated mode. The dispenser is controlled with a single purpose console, a station controller, or directly by a computer in the fuel station kiosk. If the dispenser operates in manual mode only, this data line doesn't need to be installed. To install a data line it is necessary to lead a 5-core **shielded communication cable H05VVC4V5-K 5x0.5** (see Table 6) to each fuel dispenser. The data cable must lead radially from the fuel station control room (kiosk, control panel) to the first

module of each fuel dispenser, into its communication distribution box XSxx. From the communication distribution box, the data line is lead into the head of the dispenser's electronics and connected to its counter.

Table 6 – Marking of conduits in the data line

Marking of conductors in the cable H05VVC4V5-K 5x0.5		
marking	color	description
A	black 1	data A
B	black 2	data B
-	black 3	reserved
-	black 4	reserved
-	black 5	reserved
ST	shielding	shielding

NOTICE *For the communication line the manufacturer recommends using at least a **4-core shielded data line with a minimum conductor cross-section of 0.5 mm^2**. The cable jacket must be self-extinguishing and resistant to gasoline vapors. For these purposes, the manufacturer recommends using harmonized cables type H05VVC4V5-K.*

NOTE *For the standard data line with PDE communication, a **2-core shielded cable H05VVC4V5-K 2x0,5** would suffice. However, to account for possible future changes in the dispenser configuration, e.g. the change of the communication protocol type, signals for tank level sensors etc., we recommend using the maximum variant, i.e. a 5-core sielded cable H05VVC4V5-K 5x0,5.*

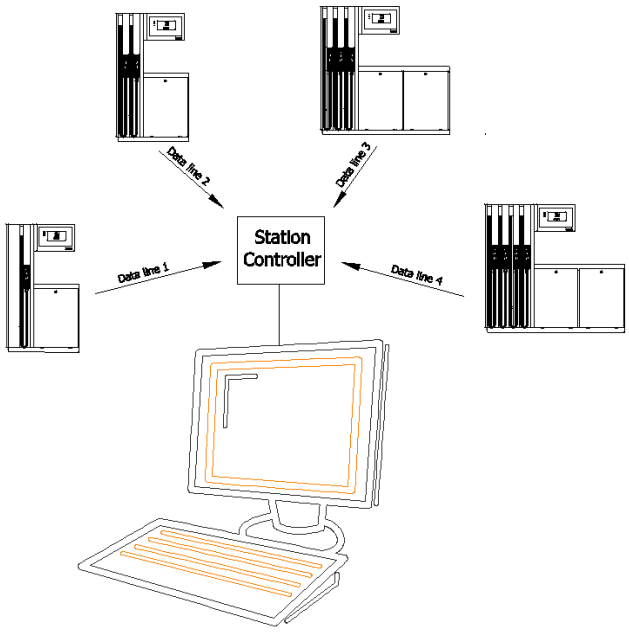


Fig. 19 – Radial layout of data lines from dispensers

As a standard, OCEAN dispensers are equipped with a PDE data line, which is an RS485 line with the PDE communication protocol; see Appendix 2.3.7. Wiring of Data Distribution Box XS01. At the customer's request it is possible to complement the dispenser's counter with a data converter, which converts the

PDE data line to a line of a different type and different communication protocol, such as PUMA LAN, ER4, IFSF-LON, TATSUNO Party Line etc. This also changes the purpose of conduits in the data line. The markings of conductors in the most common data line types are shown in Table 7.

Table 7 - Označení vodičů pro různé typy datových linek

Marking of conductors in the cable H05VVC4V5-K 5x0.5 for various kinds of data lines							
data line	PDE	Easy Call	PUMA LAN	PUMA LAN + probes	ER4	DART	ACTL
distribution box	XS01	XS05	XS05	XS02	XS05	XS01	XS05
black 1	A	D(-)	TX	TX	YA	A	Tx+
black 2	B	D(+)	RX	RX	ZA	B	Tx-
black 3	reserved	0V	AM	GND	YB	reserved	Rx+
black 4	reserved	reserved	0V	LL0	ZB	reserved	Rx-
black 5	reserved	reserved	reserved	LL1	reserved	reserved	reserved
shielding	ST	ST	ST	ST	ST	ST	ST

NOTE *All distribution boxes XPxx and signal boxes XSxx are of the type RK003/6 or RK002/6. They are in models of Ex II 2G Ex e II T6 Gb and are the recipients of the European type certificates FTZÚ12ATEX0152 and FTZÚ02ATEX0021. The maximum load on a single connecting clip is 2A/550V with conduit cross-section 0.5 mm^2 or 12A/550V with cross-section 2.5 mm^2. The allowed cross-sections of conduits are between 0.5 and 2.5 mm^2. The length of the uninsulated part of the conduit is min. 9 mm and max. 10 mm. The cable glands M12 x 1.5, M16 x 1.5 or M20 x 1.5 are in the model IP66/68. The description of the connector of the data distribution box depends on the type of the data line. As a standard, a data line with the PDE protocol is used. A description of all boxes can be found in Appendix 2.*

3.5.4. SERVICE LINES

Service lines are for special purposes. These lines are **not necessary** for the own operation of the dispenser, but are used in situations when selected functions of the dispensers are to be controlled remotely or when some signals need to be transmitted out of the dispenser. Always consult the technicians of TATSUNO EUROPE a. s. whether the service line installation is necessary. For service lines we recommend using multi core shielded cables type H05VVC4V5-K (0,5 mm^2).

3.5.5. CABLE CHARACTERISTICS

For the installation, it is necessary to use cables that are resistant to common chemicals, oils and which have sufficient thermal and mechanical resistance. These are attributes are met for instance by H05VV5-F and H05VVC4V5-K harmonized cables. The main characteristics of cables are listed in Table 8.

Table 8 – Cable characteristics

Cable type	Function	No. of cores	D_{Anom} [mm]
H05VV5-F 4x1,5	motor powering	4	8.2 – 10.2
H05VV5-F 7x1,0	Switching of tank pumps (in pressure system)	7	9.5 – 11.8

H05VV5-F 3x1,5	Counter powering	3	7.4 – 9.4
H05VVC4V5-K 5x0,5	Data line	5	10.1

Legend: D_{Anom} – cable outer diameter

NOTICE *Impulse surges can form in any conduit as a result of lightning within a distance up to several kilometers or due to industrial activities. The strength of the impulses due to induction from lightning is enough to completely destroy an electronic apparatus. Consequently, dispensers contain surge protection that leads the overvoltage impulse energy to a grounding conductor and thus protects the given electric appliance. The producer of the dispensers* ***recommends*** *protecting the main distributor (or the secondary distributor), which powers the dispensers, electronic equipment (computer, cash desk etc.) and data lines with overvoltage protections and lightning arresters.* ***The producer does not provide any warranty for damage caused due to insufficient protection of the cables!***

NOTICE *For trouble-free operation of the fuel dispensers it is* ***necessary*** *to separate signal cables from power supply cables. If there are power cables near the signal cables, interference and undesirable parasite phenomena arise and this may cause problems with the control of the dispensers or even destroy the electronic appliances installed in the dispensers and in the kiosk. Any crossing or shared installation (in a single cluster) of signal and power cables must therefore be avoided. This can be solved by putting signal cables and power cables into their own "channels" (metal pipes).* ***The producer does not provide any warranty for damage caused due by improperly solved cable connections!***

4. BASIC FUNCTIONS AND SETTINGS OF DISPENSERS

The setup of fuel dispensers is carried out by means of a set of setup parameters of the electronic counter that regulate the functional parameters of the dispenser and which can change the mode and behavior of the dispenser in various situations. Depending on the type of the installed electronic counter, parameter values can be viewed and changed by a remote IR (infrared) controller, a service keyboard or by the keys on a pre-set keyboard on the dispenser.

The setup method of the dispenser differs depending on the counter in the head of the dispenser. The following chapter describes the basic functions and setup procedures for the counters PDEX and TBELTx.

4.1. PDEX COUNTER

The electronic counter PDEX for fuel dispensers made by the company TATSUNO EUROPE a.s. is set up by a remote IR controller. Service technicians authorized by the dispenser producer use the yellow service remote controller PDERT-5S, which allows full setup of all parameters of the dispenser. Managers of fuel stations use the white remote controller PDERT-5O, which enables:

- reading of non-resettable liter totalizers of all dispensing hoses
- reading and reset of daily electronic liter and currency totalizers of all hoses
- setting of individual product prices (in case of manual operation)
- reading and setup of the dispenser's operating parameters

The setup mode can be triggered in the dispenser by the above method only while the fuel dispenser is idle – i.e. when fuel pumping has been completed, all nozzles are hung in their nozzle boots and all sales (transactions) have been completed. There are two access modes:

- ***Operator mode***, intended for fuel station staff – allows only reading of values from the electronic totalizers and values of the basic parameters of the dispenser. The values cannot be changed nor reset.
- ***Manager mode***, intended for the fuel station manager – allows not only reading of values from the dispensers, but also resetting the daily totalizers and setting basic operational parameters of the dispensers. Access to the manager mode is protected by a password.

4.1.1. PDERT REMOTE CONTROLLER DESCRIPTION

Dispensers with a PDEX counter must be controlled by an IR remote controller to read values from the dispenser's displays (totalizers), to change the dispenser's operating mode or to set various parameters of the counter. The keyboard of the remote controller has the following keys and layout (see Fig. 20):

Fig. 20 – Description of keys on the remote controller PDERT-5O

When using the IR remote controller, the controller must be approx. 1 meter from the centre of the fuel dispenser display – see Fig. 21. The setup mode is triggered by the <R> key (manager mode), or by the consequent pressing of the keys <S> and <R> (operator mode). The values to be set or read are shown on the display. During reading of the electronic totalizers, the dispenser parts marking rules described in Fig. 21 apply.

Apart from setting and reading of parameter values of the electronic counter, it is also possible to use the remote controller for the following functions:

- **Delivery amount/volume preset.** The <A1>, <A2>, <L1>, <L2> and <CLEAR> buttons can be used in the same way as the preset button keyboard for presetting the dispensed volume/amount on the dispenser.
- **Display heating test.** The <ON> button enables tensting the function of the display heating. After pressing it, the display heating (if installed) is turned on. The heating is automatically turned off if the teperature is higher than 0°C.
- **Unblocking the dispenser after delivery.** If the dispenser is in the manual mode with blocking after each delivery, it is possible to unblock the dispenser with the <0> button. The <C> button unblocks a single side of the dispenser.
- **Unblocking the dispenser after an error.** If the dispenser is in the manual mode and an error on the dispenser occurs, it is possible to cancel the error state by pressing the <0> button or by removing and replacing the delivery nozzle.

- **Vapor recovery suction pump test.** When the dispenser is idle and all its nozzles are securely hung, it is possible to test the function of the vapor recovery suction pump by pressing the <8> button. The suction pump is activated for the time defined in parameter 11. Removing a nozzle stops the suction pump test.

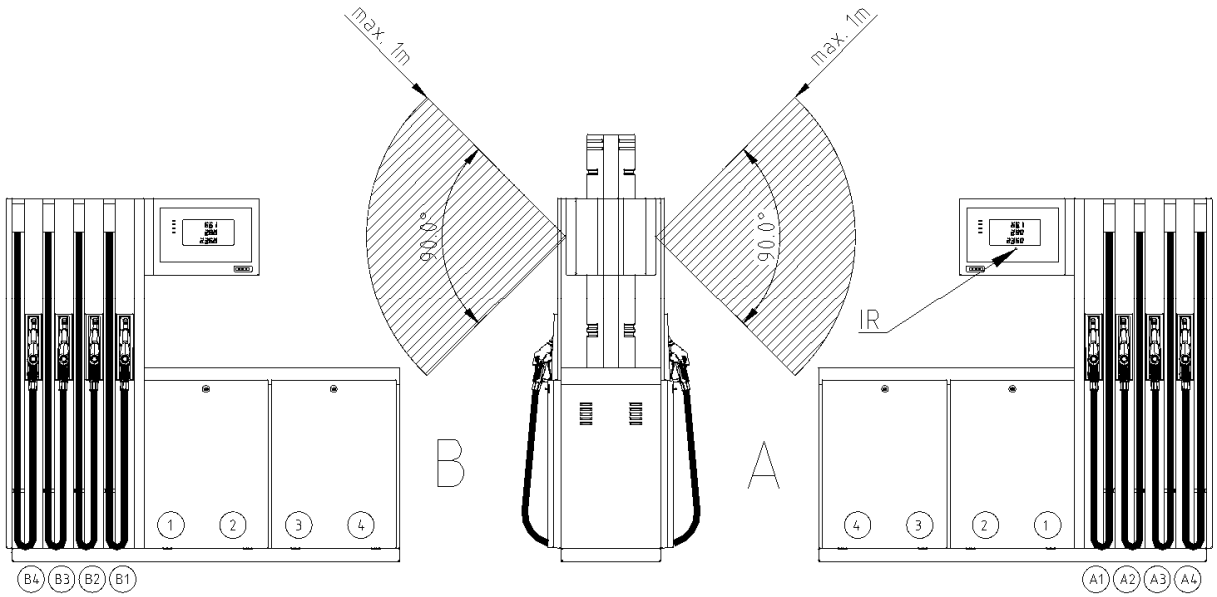
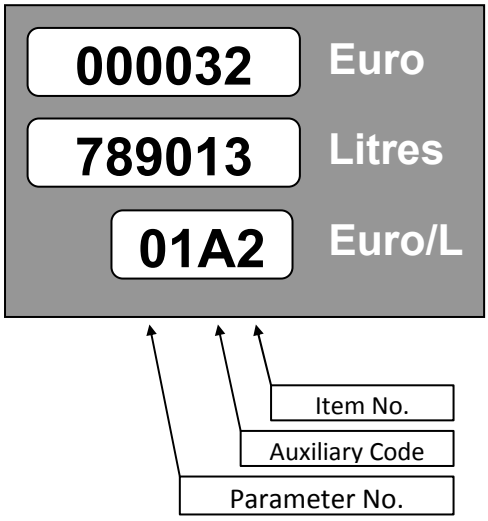


Fig. 21 – Range of the remote control and marking of hoses and products of the dispenser

4.1.2. DISPLAYING DATA IN THE SETUP MODE

All data in the Setup mode are displayed in the fuel dispenser's display. When using the remote control, the data is shown in the display of the side from which the setup mode was triggered. The individual parameters are shown in the display as follows:



Parameter No.: 01
Item No.: 2 (dispensing hose order)
Auxiliary Code: A (dispenser side)
Parameter Value: 327890 13 (volume in centiliters)

4.1.3. OPERATOR MODE

The Operator mode is triggered by pointing the IR remote controller at the fuel dispenser's display (at a distance approx. 1 m from the dispenser's display centre) and pressing the <**S**> and consequently <**R**> buttons. **All nozzles of the dispenser must be hanged in the nozzle boots and the sale at the dispenser must be completed (paid) before triggering.**

After initializing the Operator mode, the value of the first parameter is displayed. To navigate to the following parameters and their items, use the keys <**>**> and <**+**> (see Fig. 20).

The Operator mode allows displaying, **but not changing**, the values of all parameters shown in Table 9.

Table 9 – List of parameters for the Operator mode setup

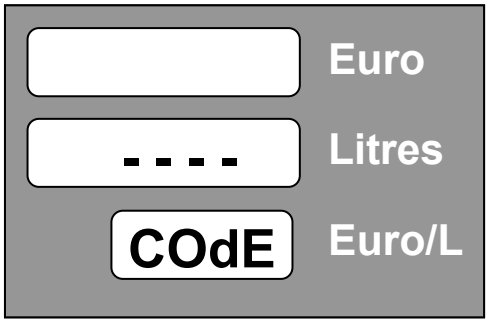
Parameter	Description
01	Non-resettable volume totalizers
02	Daily volume and amount totalizers (resettable)
03	Unit price of products (in manual mode)
04	Current time and date
05	Program version and check sums
06	Error message history
07	Latest deliveries history

Individual parameters will be described in the following chapter.

The operator mode can be terminated by pushing the <**R**> button. The mode also gets terminated automatically if no remote controller button is pushed in 60 seconds.

4.1.4. MANAGER MODE

The Operator mode is triggered by pointing the IR remote controller at the fuel dispenser's display (from a distance of approx. 1 m from the dispenser's display centre) and push the button <**R**>. **All nozzles of the dispenser must be hanged in their nozzle boots and the sale at the dispenser must be completed (paid) before starting.** After triggering the Manager mode, the display will ask for a 4-digit access password.



In order to keep the password secret, the input numbers are displayed as dashes only. The factory-set default access password is "1111".

Example:

Press the keys <**1**><**1**><**1**><**1**> and <**ENT**>.

NOTE *If the valid password is forgotten, the only remedy is calling an authorized service technician in order to set a new password.*

After entering a valid access password, the display will show the value of the first parameter 01. It is then possible to scroll through the parameters using the <**>**> key or by entering the **search parameter number** and confirming with the key <**ENT**> to directly move to the desired parameter.

The manager mode allows displaying and changing the value of parameters listed in Table 10.

Table 10 – List of parameters in the Manager mode

Parameter	Description
01	Non-resettable volume totalizers
02	Daily volume and amount totalizers (resettable)
03	Unit price of products (in manual mode)
04	Current time and date
05	Program version and check sums
06	Error message history
07	Latest deliveries history
08	Manager mode access password
09	Maintenance history
10	- unused -
11	Vapor recovery suction pump test
12	Fuel dispenser control mode
13	Error statistics
14	Current operating temperature
15	Reset of the daily totalizers
16	Manufacturer's check number
17	Display backlight intensity
18	Text messages
19	Display segment error

The Manager mode can be terminated by pushing the <**R**> button. The mode also gets terminated automatically when no remote controller button is pushed over 60 seconds.

4.1.5. NON-RESETTABLE VOLUME TOTALIZERS (CODE 01)

Electronic totalizers for all dispensing hoses (nozzles) are stored in the electronic counter memory. These totalizers are ***not resettable*** and they store data about the total volume drawn by the individual hoses.

Table 11 – P01 parameter values description

Parameter	Description
011A	Fuel volume drawn by hose 1 on side A in centiliters (x 0.01L)
012A	Fuel volume drawn by hose 2 on side A in centiliters (x 0.01L)
…	…
015A	Fuel volume drawn by hose 5 on side A in centiliters (x 0.01L)
011B	Fuel volume drawn by hose 1 on side B in centiliters (x 0.01L)
012B	Fuel volume drawn by hose 2 on side B in centiliters (x 0.01L)
…	…
015B	Fuel volume drawn by hose 5 on side B in centiliters (x 0.01L)

NOTE *The number of totalizers shown in parameter P01 depends on the dispenser configuration. The system of hose and product marking in the dispenser is defined in Fig. 21.*

4.1.6. DAILY TOTALIZERS (CODE 02)

The electronic daily totalizers for all dispensing hoses (nozzles) are stored in the memory of the electronic counter. **These totalizers can be reset at any time using the P15 parameter** (see description

below). They show the total volume and total amount of money drawn by the individual hoses since their latest reset.

Table 12 – P02 parameter value description

Parameter	Description
02L1 (A)	Fuel volume drawn by hose 1 on side A in centiliters (x 0.01L)
02C1 (A)	Amount drawn by hose 1 on side A in the currency unit
…	…
02L5 (A)	Fuel volume drawn by hose 5 on side A in centiliters (x 0.01L)
02C5 (A)	Amount drawn by hose 5 on side A in the currency unit
02L1 (B)	Fuel volume drawn by hose 1 on side B in centiliters (x 0.01L)
02C1 (B)	Amount drawn by hose 1 on side B in the currency unit
…	…
02L5 (B)	Fuel volume drawn by hose 5 on side B in centiliters (x 0.01L)
02C5 (B)	Amount drawn by hose 5 on side B in the currency unit

NOTE *The number of daily totalizers shown in parameter P02 depends on the dispenser configuration. The system of hose and products marking in the dispenser is defined in Fig. 21.*

4.1.7. UNIT PRICES OF FUEL PRODUCTS (CODE 03)

This function enables displaying and setting of the current unit price (i.e. the price of one liter of fuel) for all fuel products. These fuel unit prices are set on the display after the nozzle is lifted and the display is reset, in case the dispenser works in **manual mode**.

Setup is carried out by pushing the <**Ent**> key, entering the price in the PPPP format and confirming with the <**Ent**> key again. A decimal point is not used. For instance, the price 1.03 Euro/L will be written as 0103, etc.

Table 13 – P03 parameter value description

Parameter	Description	Default setting
03 1	Unit price of fuel product 1	0,000 EUR / L
03 2	Unit price of fuel product 2	0,000 EUR / L
03 3	Unit price of fuel product 3	0,000 EUR / L
03 4	Unit price of fuel product 4	0,000 EUR / L
03 5	Unit price of fuel product 5	0,000 EUR / L

NOTE *The number of fuel products listed in parameter 03 depends on the dispenser configuration. The system of fuel product marking is described in Fig. 21. When the unit price setting is changed, it will take effect only after the subsequent lifting of the nozzle.*

NOTICE *The values set in the P03 parameter are valid **only in the dispenser's manual mode**. If the fuel dispenser is connected to the station's central control system, the fuel unit price is set directly by the control system prior to every fuel delivery. The P03 parameter value is not functional in this case.*

NOTICE *The fuel dispenser **does not allow dispensing for zero value of the unit price**. In such a case, after lifting the dispensing nozzle, the display of the dispenser will show the error message E30 and will not start pumping.*

4.1.8. CURRENT TIME AND DATE (CODE 04)

This function allows displaying and setting the current time and date. The first line of the display shows the time in the format "HHMMSS" (hours, minutes, seconds), the second line shows the date in the format „DDMMYY" (date, month, year) – in the example: 15:35:11, 24. 12. 2011. Setting is made by pressing the <**Ent**> key, entering the time/date in the proper format and confirming by pushing <**Ent**> again.

Table 14 – Description and setting of the P04 parameter value

Parameter	Description	Default setting
04 1	Setting the date – format DDMMYY (e.g. 241211 = 24. 12. 2011)	1.1.2001
04 2	Setting the time – format HHMMSS (e.g. 153511 = 15:35:11)	0:00:00

NOTE *The time and date is displayed in the graphic proportional display and it is used in the parameters P06 and P07 to record the time of errors and time of fuel pumping completion.*

NOTICE *48 hours after an interruption of power supply to the fuel dispenser, the internal clock is reset. The time and date values will change to the default setting and must be set to the current date again!*

4.1.9. DISPLAYING THE PROGRAM VERSION AND CHECK SUMS (CODE 05)

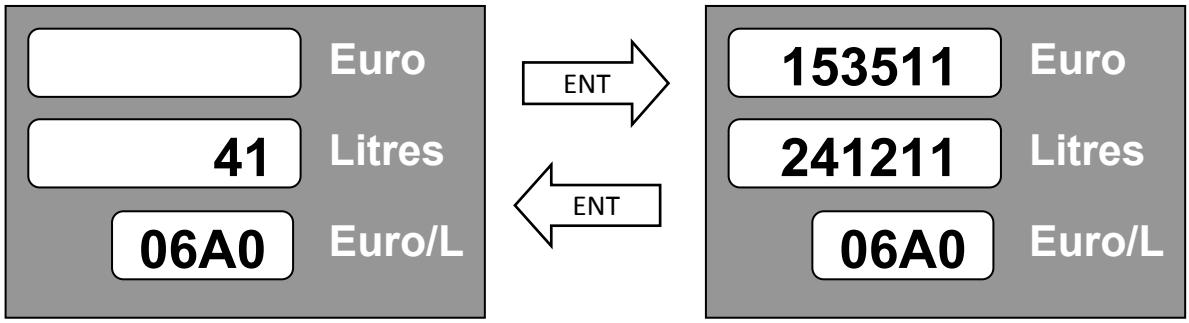
This function shows the dispenser counter program version number and various check sums. These values serve for inspecting metrology authorities and authorized service technicians.

Table 15 – P05 parameter values description

Parameter	Description
05 1	Program version + edition (e.g. 1.03 + 7)
05 2	Check sum W&M (20260)
05 3	Check sum of the program (e.g. 52359)
05 4	Check sum of the memory of parameters P20-P99 (e.g. 34567)
05 5	Check sum of the appliance for thermal compensation (e.g. 47644)
05 6	Time and date of program creation (e.g. 19. 07. 2011, 07:56:17)

4.1.10. ERROR MESSAGE HISTORY (CODE 06)

This function serves to show the history of the last ten error messages for malfunctions of the fuel dispenser. The error message table can be found in Chapter 6.2.1.



After opening the parameter P06, the display will show the code of the last error message on side A of the dispenser (e.g. 41 - E41 hose 1A pulser error, see Error message table in Chapter 6.2.1.). After pushing the <**ENT**> key time and date of error occurrence is displayed. After pushing the <**+**> key, the display shows the code of the last error message of side B of the dispenser. See more in Table 16.

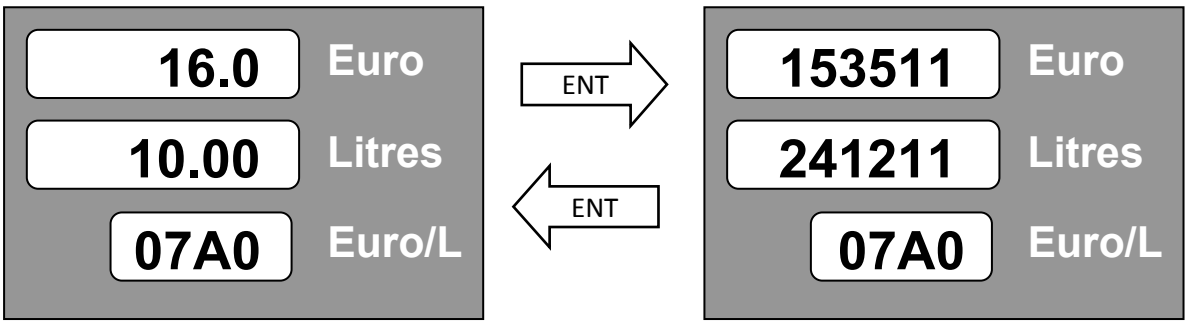
Table 16 – P06 error messages history

Parameter	Description
06A0	Code of the last error of the dispenser on side A
06B0	Code of the last error of the dispenser on side B
…	…
06A9	Code of the tenth most recent error of the dispenser on side A
06B9	Code of the tenth most recent error of the dispenser on side B

NOTE *If there are two errors of the same type and error code immediately after one another, only the last one will be stored in the counter memory.*

4.1.11. LATEST DELIVERY HISTORY (CODE 07)

This function serves to show the history of the last 10 fuel deliveries (transactions) on each side of the dispenser. This parameter has the following data layout on the display:



After opening the parameter P07, the display will show the code of the latest fuel delivery on side A of the dispenser (example: 16 EUR / 10 L). The price per liter alternates in the display with the parameter number. After pushing the <**ENT**> key the time and date of fuel delivery completion is displayed. After pushing the <**+**> key, the display shows the code of the last error message of side B of the dispenser. See more in Table 17.

Table 17 – P07 last fuel deliveries history

Parameter	Description
07A0	Last fuel delivery on side A of the dispenser
07B0	Last fuel delivery on side B of the dispenser
…	…
07A9	Tenth most recent fuel delivery on side A of the dispenser
07B9	Tenth most recent fuel delivery on side B of the dispenser

NOTE *If the memory bank for fuel deliveries history is empty, i.e. there is no data stored in the memory, the display will only show "------".*

4.1.12. ACCESS PASSWORD TO THE MANAGER MODE (CODE 08)

This function allows displaying and/or changing the access password to the Manager mode.

The default access password set from the factory is "1111".

4.1.13. MAINTENANCE HISTORY (CODE 09)

This function allows displaying the codes of the latest 10 service remote controllers used to set parameters of the counter.

4.1.14. VAPOR RECOVERY SYSTEM TEST (CODE 11)

This function allows setting of the duration of the vapor recovery system test in seconds. The test can be initiated by pressing the <**8**> button on the remote controller if all delivery nozzles on the dispenser are hung in their nozzle boots. Removing a nozzle terminates the test.

Table 18 – Description and setting of P11 parameter values

Parameter	Description
11 = 0	Vapor recovery system test is non-functional
11 = 1, 2, …, 999	Test duration after pressing <**8**> button, in seconds

The standard factory setting of the parameter is 120.

4.1.15. OPERATING MODE OF THE FUEL DISPENSER (CODE 12)

This function defines the type of the operating mode of the dispenser.

Table 19 – Operating mode of the dispenser P12

Parameter	Description
12 = 0	Automated mode with remote control
12 = 3	Manual mode

The parameter can have a value of either 0 or 3:

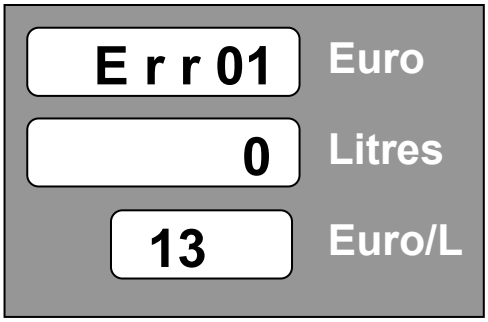
- If the parameter **P12 value is 0**, the dispenser operates in a purely automatic mode, i.e. is connected to the control computer via a data line. The dispenser is fully controlled by a remote control unit (counter, control panel, etc.) – release of the dispenser for fuel pumping, blocking of the dispenser, setting the fuel price and the maximum amount/volume for each pumping etc. Shortly after interruption of communication between the computer and the dispenser, the display will show the error message E18. Once the communication is restored, the E18 error message disappears.
- If the parameter **P12 value is 3**, the dispenser operates in a purely manual mode. The dispenser is fully independent – not remotely controlled. The data line is blocked. The unit price of the fuel is controlled by the P03 parameter. Unless a special manual mode with blocking after fuel drawing or a mode with the RELEASE signal controlling is set, the fuel pumping starts immediately after the nozzle is lifted and the display reset.

4.1.16. ERROR STATISTICS (CODE 13)

This function displays the statistics about the errors that occurred on the dispenser since its initialization or counter reset. This parameter has a different data layout in the display:

The first line of the display shows the dispenser error code – 01 through 59, the second line shows the frequency of the error occurrence since the dispenser was commissioned or since a reset of the statistics made by a service technician.

Scrolling through error statistics is possible via the keys <+> and <->. A table showing error messages can be found in Chapter 6.2.1.



4.1.17. CURRENT OPERATING TEMPERATURE (CODE 14)

This function shows the current temperature measured by the thermal sensor located in the processor board of the counter, or the current temperatures of the thermal sensors Pt100 located in the dispenser's hydraulics, if installed.

This parameter has the following data layout on the display:

The first line of the display shows the temperature on the counter's processor board in tenths of degrees Celsius (26.8°C). The second line shows the temperature of the fuel product No. 1 in the dispenser's hydraulic system in tenths of degrees Celsius (14.6°C).

Scroll through the fuel products is carried out by using the <+> and <-> keys.

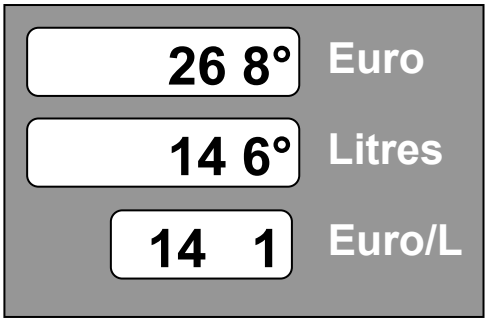


Table 20 – Current operating temperature P14

Parameter	Description
14 1	Ambient temperature around the counter's processor and temperature of fuel product No. 1
14 2	Ambient temperature around the counter's processor and temperature of fuel product No. 2
14 3	Ambient temperature around the counter's processor and temperature of fuel product No. 3
14 4	Ambient temperature around the counter's processor and temperature of fuel product No. 4
14 5	Ambient temperature around the counter's processor and temperature of fuel product No. 5

NOTE *The number of fuel products listed in parameter P14 depends on individual fuel dispensers' configurations. The marking system of fuel hoses and products is described in Fig. 21.*

4.1.18. RESETTING DAILY TOTALIZERS (CODE 15)

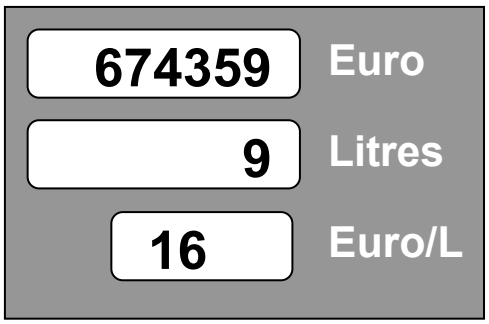
This function serves for resetting all daily totalizers of dispensing hoses/nozzles.

After setting the value of the parameter to **1** and confirming it (<**ENT**> + <**1**> + <**ENT**>), all electronic totalizers that are part of parameter P02 are **reset to zero**.

4.1.19. MANUFACTURER'S LOCK CODE (CODE 16)

This function allows displaying a 6 digit code and entering the manufacturer's lock code, if the dispenser is locked or if it is started in a trial period.

This parameter has the following layout of data in the display:



The first line of the display shows a numeric code (Manufacturer's Lock Code) necessary for unlocking the dispenser remotely. The second line shows the number of days in trial operation, after which the dispenser will be locked.

If the first line is empty and there is 0 on the second line, the dispenser is in standard operating mode.

4.1.20. DISPLAY BACKLIGHT INTENSITY (CODE 17)

This function allows adjusting the intensity of the LED backlight of the graphic proportional display PDEDCU. This parameter does not work with other types of displays.

Table 21 – Display backlight intensity P17

Parameter	Description
17 = 0	Display backlight intensity not regulated
17 = 1-100	PWM value of the display backlight intensity

The standard default setting of the parameter is 70.

4.1.21. GRAPHIC DISPLAY TEXT MESSAGES (CODE 18)

If the dispenser has the graphic proportional display PDECPU, this function allows adjusting the duration of text messages that appear on the screen. Text messages can be classified in two groups:

- display descriptions
- advertising messages

The parameters reserved for the description of the display can have values of 0 or 1. When the value is 0, the message is not shown on the display. When the parameter value is 1, the message is shown.
The parameters reserved for advertising texts can have the values 0, 1, 2 through 9. When the parameter value is 0, the advertising message is not shown on the display, when the value is 1, 2, 3 through 9, the advertising message remains on the screen for 1, 2, 3 through 9 seconds (according to the parameter value). The advertising messages are shown on the display in the order 1, 2, 3 through 9, but only during the time

when the dispenser is idle, after the last delivery has been paid. The advertising message disappears as soon as the dispensing nozzle is lifted and delivery starts.
The list of used parameters and their meaning can be seen in Table 22.

Table 22 – Graphic display text messages P18

Parameter	Description	Default setting
18 6	Description of the amount display (e.g. “Euro”)	0 - nezobrazovat
18 7	Description of the volume display (e.g. “Litres”)	0 - nezobrazovat
18 8	Description of the unit price display (e.g. “Euro/L”)	0 - nezobrazovat
18 11	Advertising message No. 1	0 - nezobrazovat
18 12	Advertising message No. 2	0 - nezobrazovat
18 13	Advertising message No. 3	0 - nezobrazovat
18 14	Advertising message No. 4	0 - nezobrazovat
18 15	Advertising message No. 5	0 - nezobrazovat
18 16	Advertising message No. 6	0 - nezobrazovat
18 17	Advertising message No. 7	0 - nezobrazovat
18 18	Advertising message No. 8	0 - nezobrazovat
18 19	Advertising message No. 9	0 - nezobrazovat
18 20	Description in case of amount pre-selection (e.g. “Eu”)	0 - nezobrazovat
18 21	Description in case of volume pre-selection (e.g. “L”)	0 - nezobrazovat

NOTE *Parameter 18 is functional only for the graphic proportional display PDEDCU. For the other types of displays it does not work.*

4.1.22. DISPLAYING THE DISPLAY SEGMENT ERROR (CODE 19)

This function allows switching on/off the displaying of a display segment error (Er1) by the processor.

Table 23 – Displaying a display segment error P19

Parameter	Description
19 = 0	The display segment error E1 will not be shown
19 = 1	The display segment error E1 will be shown

The default setting of the parameter value is 1.

4.2. TBELTX COUNTER

The electronic counter TBELTx for fuel dispensers produced, made by the company TATSUNO EUROPE a. s., is setup by means of a 4-key keyboard, or by a pre-set keyboard, if it is installed on the dispenser. This allows the following:

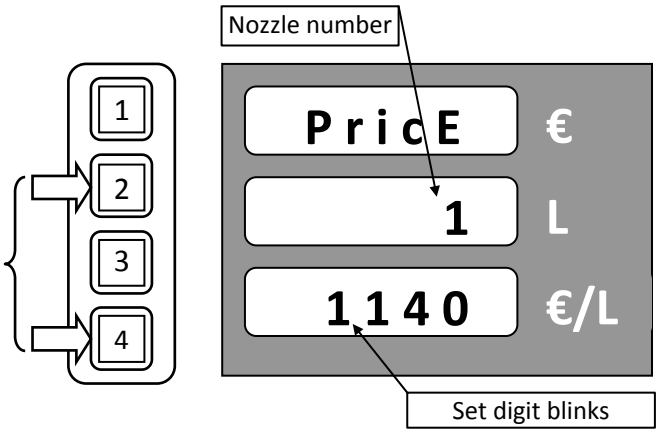
- setup of unit prices of fuel products (in manual operation)
- reading of non-resettable electronic liter totalizers of all dispensing hoses
- dispenser operating mode change

4.2.1. FUEL UNIT PRICE SETTING

If the dispenser is in manual mode, the spent amount calculation uses unit prices of the products stored in the counter memory, where each pump is matched to a single fuel unit price. Any change in the unit price of fuel on the counter's display comes into effect only after the dispensing nozzle is lifted. The factory setting is zero for all fuel products. A non-zero price must be set, otherwise the error message "E30" – "zero price" will be displayed and the fuel delivery will not start. If the dispenser is in the automated mode, the calculation of the drawn amount uses the product unit prices, which are sent by the station's control computer, when releasing every fuel drawing. The prices stored in the P03 parameter of the counter's memory are not functional in this case.

Fuel price setting procedure (manual mode):

The fuel unit price can be changed only in the time between switching the counter's power on and the first fuel delivery from the dispenser.



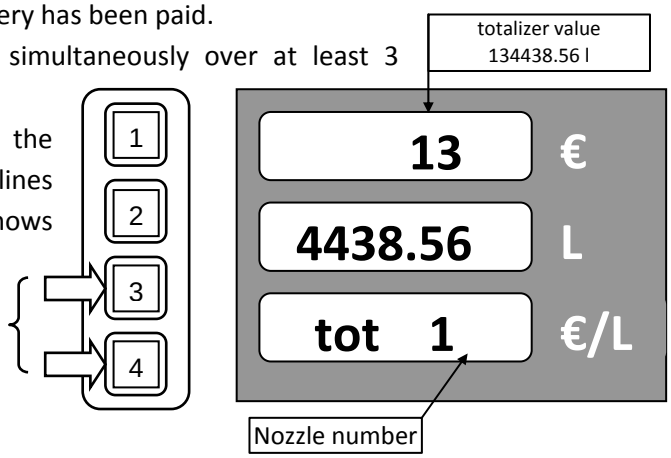
1. Switch the counter power off and on again.
2. Press and hold button 2 along with button 4 over at least 3 seconds.
3. The middle line will display the number of the nozzle (product) being adjusted, the bottom line will display the unit price. The price is set digit by digit. The currently adjusted digit is blinking.
4. Button 1 changes the value of the blinking digit.
5. Button 2 moves from one digit to another.
6. Button 3 allows changing the nozzle number for which the price is adjusted.
7. Price setup is terminated by pushing the button 4.

4.2.2. READING THE ELECTRONIC TOTALIZERS

The TBELTx counter is equipped with electronic volume totalizers for each dispensing nozzle/hose. The value of these totalizers can be found using the pre-set keyboard or by a command sent via the communication line. The totalizers can be reset to zero by means of the P18 configuration parameter. The totalizers can be zeroed only if the SW1-1 switch is in the OFF position.

Electronic totalizers reading procedure:

1. The value of the meters can be shown on the counter's display, only if all nozzles are in their nozzle boots and once the last fuel delivery has been paid.
2. Press and hold the 3 and 4 buttons simultaneously over at least 3 seconds.
3. The bottom display line will display the nozzle number. The top and bottom lines show the totalizer values (the top line shows higher digits).
4. The 1(+) and 2(-) buttons allow changing the nozzle number.
5. Totalizer reading is terminated by pushing the 4 (Cancel) button.

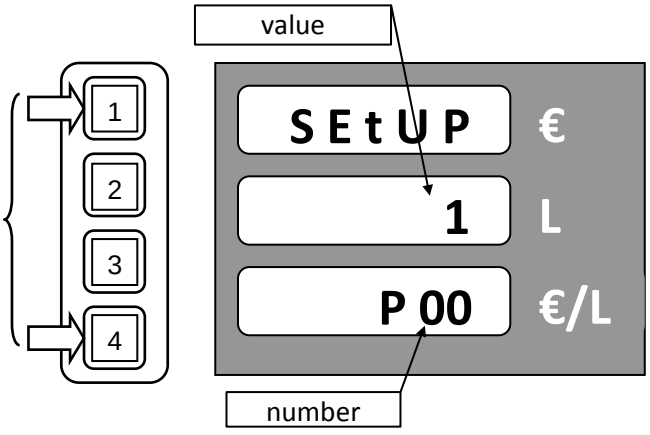


4.2.3. CHANGING THE OPERATING MODE

The fuel dispenser operating mode must be changed when the dispenser needs to be disconnected from the control system (e.g. in case of control system malfunctions), when the dispensers must be operated manually, or vice-versa when the dispenser was operating in the manual mode and needs to be connected to the remote control system.

Operating mode change procedure:

1) Switch the counter power off and on again.
2) During the counter test (countdown to zero) push and hold the 1 and 4 buttons simultaneously until the letter "P" starts blinking on the bottom line. This signals initialization of the setup mode.
3) After finishing the counter test, the P00 parameter number will appear on the bottom line.
4) The middle line displays the current value of this parameter.
5) The parameter is opened for editing by the 3 (Enter) key.
6) After opening the parameter, its value starts blinking.
7) The parameter value can be changed by keys 1 and 2 to the value 0 – automated mode, or to 1 – manual mode.
8) The new parameter value can be stored by pushing the 3 (Enter) key.
9) The parameter setting mode is terminated by holding the key 4 for at least 2 seconds (Cancel).



5. OPERATION

5.1. INSTRUCTIONS FOR SAFE OPERATION

A fuel dispenser is a piece of complicated equipment that must perform many demanding functions. Consequently, before commissioning, cleaning of tanks and pipes must be carried out and the cleanliness of the fuel must be verified. Before commissioning the dispenser, the electric wiring and connections must be reviewed to avoid electric shock and to avoid the risk of explosion.

No smoking

No open fire

Use of cell phones prohibited

Fig. 22 – Recommended placement of the info label

Fig. 23 – Info label – Liquid fuels

CAUTION

- ⚠ ***Smoking and open fires are prohibited in the immediate vicinity of the dispenser.***
- ⚠ ***No smoking inside cars.***
- ⚠ ***The use of cell phones is prohibited in the immediate vicinity of the dispenser.***
- ⚠ ***Dispensing into a vehicle with the engine running is prohibited.***

WARNING *Dispensers are hygienically safe for the customer and for the operator. During normal maintenance and during fuel delivery it is appropriate to protect the hands for example with gloves made of ecological foil. In case of skin contamination, wash the affected area with soap and water immediately. In case of eye contamination etc., seek medical attention. Avoid inhalation of vapors during dispensing.*

5.2. PUTTING THE DISPENSER INTO OPERATION

Fuel dispensers are switched on and off at the main distribution box of the fuel station, where the power to the dispensers leads. Each fuel dispenser has two power supply points from the main distribution box:

- Power supply of the fuel and vacuum pump electromotors (3x400V)
- Power supply of the electronic counter and switching circuits (230V stabilized)

Both of these supply points are protected with adequate circuit breakers that switch the dispensers off and on.

RECOMMENDATION *Turning the dispenser on should be carried out as follows:*

1) *Turn on the backup power source (UPS) located in the kiosk (a green light will come up on the UPS).*
2) *Turn on the 230V circuit breaker for stabilized power supply to the electronic counter of the fuel dispenser (an automatic test of all display segments will be carried out and the dispenser's display show the values of the last delivery).*
3) *Turn on the 3x400V circuit breakers of fuel and vacuum pump motors.*

The fuel dispenser is now ready to start dispensing.

5.3. OPERATION OF THE FUEL DISPENSER

NOTICE *The operation of the fuel station falls under the responsibility of its operator, who must monitor the progress of dispensing. If a customer at a self-service dispenser violates the required procedures, the operator must inform the customer about the proper manipulation rules. The operator must also mark the fuel station caution zones with warning symbols (no smoking, no open fire, direction of arrival to the dispenser etc.). There must be openly accessible fuel station operation rules on display for the customer, should he or she need any info about the basic requirements.*

The activation of the dispenser is carried out by taking the delivery nozzle out of the nozzle boot, which also automatically triggers a reset of the data on the electronic counter. After that, the pump electromotor is activated and dispensing can commence. The delivery speed is controlled by the delivery nozzle. The delivery is terminated by closing the nozzle (releasing the control lever) and its subsequent hanging in the nozzle boot, which also switches off the pump electromotor. The dispensed volume is showed until the next time the nozzle is taken out, or until payment is carried out.

5.3.1. DELIVERY OF FUEL

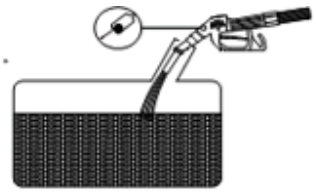
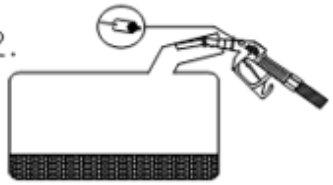
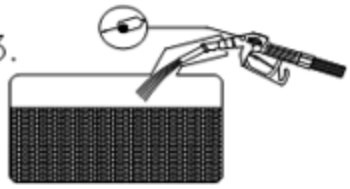
The liquid measured by the meter is led to the dispensing hose and dispensing nozzle attached to its end. For self-service fuel stations there are stop-nozzles with a safety shut-off.

A control level allows regulating the flow rate up to a complete stop. In the basic version the dispensing nozzle is delivered with a lever arrest. At the customer's request it is possible to supply a dispensing nozzle without

the arrest. In this case the lever must be pressed constantly during dispensing. When the lever is released or when the dispensing stop-nozzle falls out of the car fuel tank opening, the flow of fuel stops.

The stop-function also activates when the car tank is full when the sensor opening in the nozzle is filled with fuel; the flow will stop even when the control lever is pressed. The safety function also helps against improper handling of the nozzle, i.e. when the outflow extension is pointed more than 15 degrees off the horizontal level, the flow stops even when the lever is pressed. After the application of the stop-function and safety function, the control lever must be released to automatically revert to its default position.

Table 24 – Positions of the dispensing nozzle during dispensing

1. 	**Proper position of the dispensing nozzle during dispensing** The dispensing nozzle is in an almost horizontal position; the ball does not prevent the flow of air and the fuel flows.
2. 	**Improper position of the dispensing nozzle** The dispensing nozzle is diverted from the horizontal position, the ball stops the flow of air and the fuel stops flowing.
3. 	Since the orifices of fuel tanks of various cars differ, you must find the optimum position for the dispensing nozzle when the fuel still flows. The fuel flow may be turned off also when the fuel stream flowing out of the nozzle hits the wall of the car fuel tank orifice. In that case you need to find a different position.

5.3.2. ELECTROMECHANICAL LITER TOTALIZERS

Upon request, OCEAN dispensers can be equipped with electromechanical totalizers to monitor the total consumed fuel in each dispensing hose. The meters are on the display of the fuel dispenser. For each dispensing hose or nozzle there is one seven-digit electromechanical totalizer that states the quantity of whole liters pumped through the given hose. For multi-product dispensers the electromechanical totalizers are listed on the display from top down or from left to right and are numbered with the hose numbers. Variants of the layout of the electromechanical meters on the fuel dispenser display masks are shown in Fig. 24.

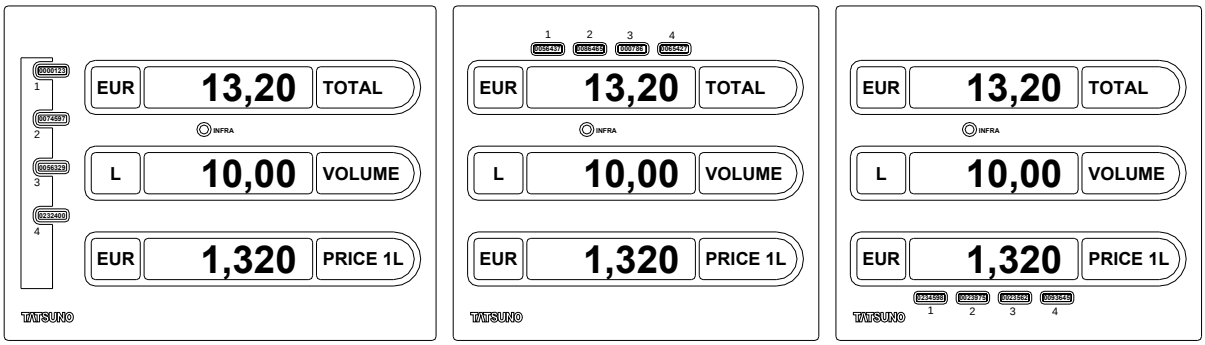


Fig. 24 – Variants showing the location of the electromechanical totalizers and IR receivers on the display

NOTE *On display A the electromechanical meters are marked with numbers 1, 2, 3, 4 corresponding to hoses 1A, 2A, 3A and 4A. On display B the electromechanical meters are also marked with numbers 1, 2, 3, 4 corresponding to hoses 1B, 2B, 3B and 4B. The system of marking the hoses and fuel products is described in Fig. 21.*

5.3.3. GASOLINE VAPOR RECOVERY

Upon the customer's request, combined OCEAN dispensers can be equipped with a vapor recovery system, where a vacuum pump sucks the vapors of fuels except diesel oil and bio diesel out of the dispensing nozzle's outlet back to the fuel tank.

In case of vapor recovery in a single-product dispenser, the vacuum pump is powered directly by the electromotor of the dispenser's pump. In case of multi-product dispensers, each side of the dispenser has its own vacuum pump powered by an electromotor.

The quantity of recovered vapors is regulated according to the fuel flow rate. This means that if fuel is not being pumped into the tank, the vapor recovery function is off.

The correct function of the vapor recovery system is monitored by a vapor flow meter VRS1.M, which is installed at the outlet of each exhaust vacuum pump. The flow of vapors through the system is signaled either by a green diode lit on the display panel or by lit display segments on the first symbol of the unit price display.

As long as the vapor recovery mechanism is set properly, the signaling of the exhaust activity is activated whenever fuel is being dispensed and when the vapors go through the exhaust pipes, i.e. the vapor flow sensor VRS1.M is active. A part of the hydraulic module of the OCEAN dispenser with the electromotor, two exhaust vacuum pumps and VRS1.M sensors is shown in Fig. 25.

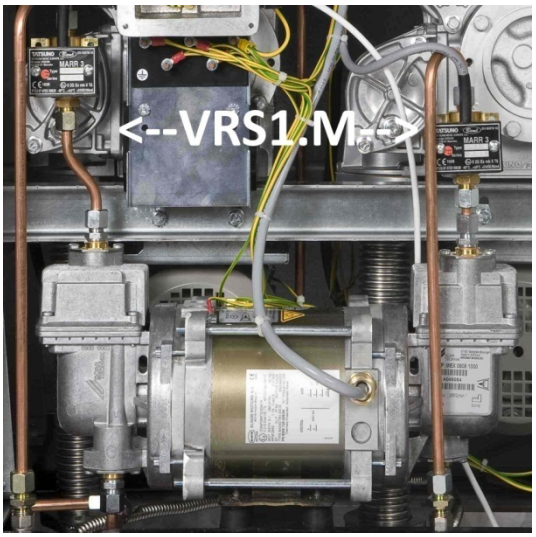


Figure 26 – Vapor recovery with vapor flow sensor VRS1.M

Fuel station operation conditions (Directive 355/2002 Coll. - Attachment 12)

„All fuel dispensers must have a clear label informing the customers about the need to fully insert the dispensing nozzle into the filling orifice of the motor vehicle petrol tank.“

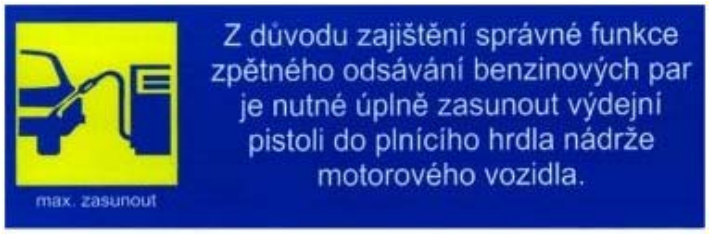


Fig. 27 – Example of an info label about vapor recovery according to Directive 355/2002 Coll.

Fuel station operation conditions (Directive 355/2002 Coll. - Attachment 12)

„The functionality of the vapor recovery system in fuel dispensers is checked by the operator of the fuel station in regular intervals, at least once every shift. In dispensers with optical signaling of the vacuum pump functionality, the operator checks the functionality of the signal light during dispensing.“

NOTICE *If suspicion arises that the vapor recovery system isn't working or that its signaling is broken, the operator must immediately inform the service organization and an inspection must be carried out and any malfunctions repaired.*

5.3.4. DISPENSER OPERATING MODES

The fuel dispenser has two basic operation modes:

1) manual mode
2) automatic (remote) mode

The **Manual mode** is a mode when the dispenser works independently, separately, without remote control.

Delivery process: The customer comes to the dispenser and takes the dispensing nozzle of the desired product. The display resets (ca 1.5 seconds) and the pump engine switches on – now the dispenser is ready to start dispensing. After refueling the vehicle's tank, the customer puts the nozzle back and pays for the fuel to the operator. The dispenser is ready for the next customer immediately. Because in the manual mode the dispenser is not controlled in any way, the fuel unit price must be set manually at the dispenser (see chapters 4.1.7 and 4.2.1. 4.1.7 a 4.2.1. The quantity of pumped liters per work shift is measured as the difference between the electronic (or electromechanical) totalizers status at the beginning and at the end of the shift.

The **Automatic mode** is a mode when the dispenser is remotely controlled (via PC program, control console, station controller etc.). The Automatic mode allows remote regulation of pumping from the fuel station kiosk. The kiosk contains a control device that is used by the operator to release pumping at a dispenser and after the end of the pumping collects information about the quantity of the consumed fuel and its price.

Delivery process: The customer comes to the dispenser and takes out the dispensing nozzle of the desired product. The dispenser asks the control center in the kiosk for a release. The control centre sends to the dispenser the unit price of fuel, the maximum amount/volume for delivery and allows dispensing. The display is reset (approx. 2 seconds after the nozzle is lifted) and the pump engine starts. After filling the vehicle's tank, the customer puts the nozzle back and goes into the kiosk to pay the price and receives a tax document (receipt) for the payment. The dispenser is immediately ready for the next customer. Because in the automated mode the dispenser is remotely controlled, the fuel unit price does not need to be set manually. The proper unit price is automatically set by the controlling computer for all dispensers of the station.

NOTE ***The display reset only happens after the delivery is authorized by the control center.*** *The time from lifting the nozzle to the display reset and pump startup can differ significantly depending on the used control system and fuel station configuration; it can range from 2 to 5 seconds.*

Switching from automated mode to manual mode. By default, dispensers are installed and set according to the expected mode used at the individual fuel station, i.e. if the fuel station has a control system, the dispensers are set in the automatic mode; if the fuel station does not have a control system, dispensers are set in the manual mode.

In case it is necessary to switch the dispensers from the automatic mode to the manual mode – e.g. due to a malfunction of the control system – proceed as follows:

- ***Counter PDEX.*** Using the IR controller, change the P12 parameter value from 0 to 3 and set the unit prices in parameter P03, see chapter 4.1.15.
- ***Counter TBELTx.*** Using the 4-key keyboard, change the P00 parameter value from 0 to 1 and set the unit prices, see chapter 4.2.3.

NOTICE *Switching from the automated mode to the manual mode must always be consulted with a service technician in advance! In the manual mode, delivery history data are not backed up – only the 10 most recent deliveries are saved.*

5.3.5. PRE-SETTING KEYBOARD

OCEAN dispensers can be equipped with a "pre-set keyboard", which allows the customer to pre-set the desired amount or quantity of fuel right at the dispenser. Before starting the delivery, the customer can set the volume of fuel or amount of money to be dispensed.

The pre-set value can be cancelled by pushing the <**Zruš**> (i.e. Cancel) button before the delivery starts. Then it is possible to choose a different pre-set value or dispense fuel normally without a pre-set.

NOTE *If the pre-set keyboard is used, the dispensers must be equipped with slow-down valves that ensure safe slowdown of the fuel flow rate in advance before reaching the pre-set target value.*

a) Example of pre-set in Czech crowns

- The customer comes to the dispenser and wants to spend 250 CZK on fuel.
- On the pre-set keyboard the customer uses the keys to enter the value 250 (by pushing the <**100 CZK**> key twice and the <**10 CZK**> key five times).
- The customer chooses the desired product, takes the nozzle off the dispenser and inserts it into the vehicle's fuel tank.

- The dispenser pumps fuel worth exactly the pre-set amount and then stops automatically.
- The customer puts the nozzle back in the dispenser and goes to pay.

b) Example of pre-set in liters

- The customer comes to the dispenser and wants to get 20 liters of fuel.
- On the pre-set keyboard the customer enters 20 (by pushing the button <**10 liters**> twice).
- The customer chooses the desired product, takes the nozzle off the dispenser and inserts it into the vehicle's fuel tank.
- The dispenser pumps fuel in the pre-set volume and then stops automatically.
- The customer puts the nozzle back in the dispenser and goes to pay.

***c) Example of pumping into a full tank with additional pumping to a rounded amount**

- The customer comes to the dispenser and wants to get a full tank of fuel.
- The customer chooses the desired product, takes the dispensing nozzle and inserts it in the vehicle's fuel tank.
- When the tank is almost full, the customer takes the nozzle out and on the pre-set keyboard pushes the key with the financial amount to whose multiple the customer wants to round (<**10 CZK**>).
- The customer triggers the nozzle and lets the dispenser finish dispensing to a rounded monetary amount (e.g. 320.0 CZK or 400.0 CZK)
- The customer puts the nozzle back in the dispenser and goes to pay.

***d) Example of pumping into a full tank with additional pumping to a rounded volume**

- The customer comes to the dispenser and wants to get a full tank of fuel.
- The customer chooses the desired product, takes the dispensing nozzle and inserts it in the vehicle's fuel tank.
- When the tank is almost full, the customer takes the nozzle out and on the pre-set keyboard pushes the key with the volume to whose multiple the customer wants to round (e.g. <**1 L**>).
- The customer restarts the nozzle and lets the dispenser pump more fuel to reach the rounded volume (e.g. 25.00 L or 128.00 L).
- The customer puts the nozzle back to the dispenser and goes to pay.

NOTE *Examples c) and d) are only possible in OCEAN dispensers with the electronic counter PDEX and an activated pre-set keyboard function during fuel pumping.*

5.3.6. TURNING FUEL DISPENSERS OFF

RECOMMENDATION ***When turning a dispenser off, the producer recommends proceeding as follows:***

- ***Turn off the 3x400V circuit breakers of the pump and vacuum pump motor power supply.***
- ***Turn off the 230V circuit breakers of the stabilized power supply to the dispenser's electronic counter.***
- ***Turn off the UPS backup power source located in the kiosk using the switch on its rear panel (the green light on the UPS will go out).***

6. MAINTENANCE AND SERVICE

6.1. KEY PRINCIPLES FOR THE MAINTENANCE OF DISPENSERS

- Keep all functional units of the dispenser clean so that any malfunction can easily be seen and repaired.
- Check regularly all connections to monitor any leakage. Tighten the connections or change the sealing if necessary.
- Check the proper strain on the V-belt and adjust it if necessary using the engine's tilting console.
- Check the screws connecting the electromotor to the console. Tighten if necessary.
- Regularly check the dispensing nozzle condition. In case of a defect, decide on a repair or replacement according to its severity and type.
- Regularly check the condition of dispensing hoses. In case of mechanical damage of the dispensing hose coating, ensure its immediate replacement.
- Check the function of locks and mechanisms for hanging the dispensing nozzle.
- Maintain outer cleanliness of the dispenser, take special care to clean the glass of the counter.
- Regularly use a sludge pump to remove sludge, water and other impurities from the fuel station's fuel storage tanks.

CAUTION ***Before performing any maintenance on the mechanical, hydraulic or electrical elements, the power supply must always be turned off and it is necessary to ensure that the power does not get restarted!***

CAUTION **DO NOT REMOVE THE COVERS OF THE DISPENSER WHILE IT IS IN OPERATION!**

Fig. 28 – Dispenser without cover, side B

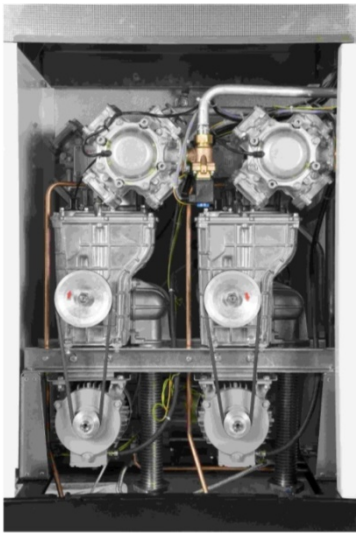


Fig. 29 – Dispenser without cover, side A

CAUTION THE BELT BETWEEN THE ENGINE AND THE PUMP (OR VACUUM PUMP) IS ANTISTATIC AND MAY NOT BE REPLACED WITH A DIFFERENT TYPE!

CAUTION DO NOT OPEN THE DISTRIBUTION BOX COVER IF THE DISPENSER IS UNDER POWER!

Fig. 30 – Distribution box cover

6.1.1. MAINTENANCE OF DISPENSER COVERS

The covers of the dispenser (the "bodywork") made of laminate, varnished steel or stainless steel require regular maintenance. Special attention must be paid to them during the winter season, when chloride aerosols from road sprinkling salts can permanently damage the bodywork varnish if it is not treated properly. Covers made of stainless steel can undergo inter-crystalline corrosion. Regular maintenance of bodywork elements is done with water or a solution of detergent and with normally available automotive cosmetics.

6.2. DISPENSER TROUBLESHOOTING

In case of any problems with the fuel dispenser, first study **What to do when …** (see Table 25), which contains frequently asked questions of dispenser users concerning problems occurring at fuel stations.

In case of dispenser malfunction, the electronic counter controlling the dispenser will show an error message in the form of a numerical code. The error codes for the individual counter types are listed in Chapter 6.2.1.

Table 25 – What to do when…

The dispenser is unresponsive to lifting a nozzle from its holder and the display fails to show an error message.
This can mean that the dispenser is without electric power, the dispensing nozzles are improperly hung or the dispenser is blocked by the control system.. ➢ Check the proper hanging of all nozzles. ➢ Check if the fuel delivery at the dispenser has been paid at the cash desk. ➢ If the dispenser is in Manual mode, try unblocking it with the remote IR controller (press the <**0**> key). ➢ Turn the dispenser counter power off and on. ➢ Check the power supply to the dispenser – after switching the power on, the display must undergo a test sequence. ➢ Check the position of the single phase 230 V power circuit breaker of the dispenser at the main distributor of the station. ➢ If the dispenser is connected to a controlling computer, the blocking of the dispenser may be caused by the control system, which fails to release the dispenser to allow delivery or blocks the dispenser. Turn the power of the dispenser off and on and change its mode from Automatic to Manual mode – see Chapter 4.1.15 or 4.2.3. If the dispenser operates in the Manual mode, the problem is likely to be in the controlling computer.
After lifting the dispensing nozzle, the display is reset but the pump fails to start up.
This means the electromotor of the dispenser has not started. This can be due to a circuit breaker in the electromotor's power supply, which is located on the main distributor, being turned off. Alternately, the protection of the electromotor inside the dispenser may be disconnected. ➢ In the main distribution box of the station, check the position of the circuit breaker of the three-phase power supply to the dispenser motor.
The dispenser's display shows the error code "**E18**".
This is an error message of the dispenser that informs about loss of communication between the dispenser and the control unit (computer, station controller, control console etc.). ➢ Check the proper function of the control unit (turn on the computer, turn on the data converter etc.). ➢ Check the connection of the data cable.
At the beginning of delivery, the dispensing nozzle is lifted but doesn't start pumping immediately (e.g. due to opening the vehicle's fuel tank). After a moment the dispenser's pump turns off. The display shows the message "**STOP**".
This message means that fuel delivery was terminated due to an interruption longer than 60 seconds. Hang the nozzle back and start a new delivery.
Delivery is interrupted for some time (e.g. to change canisters); after a moment the pump turns off. The displays show the message "**STOP**".
This message means that fuel drawing was terminated due to an interruption longer than 60 seconds. Hang the nozzle back and start a new delivery.
After lifting the dispensing nozzle, the dispenser's display shows the error message "**E30**".
This error code means that the unit price of the fuel is zero. ➢ If the dispenser is operating in the Manual mode with no remote control, then the unit price is set incorrectly. Set the fuel's unit price – see Chapters 4.1.7 and 4.2.1. ➢ If the dispenser operates in a remote controlled mode, check the setting of individual fuel unit prices in the control unit of the station (computer, controller). Before every delivery, the fuel unit price is automatically transmitted to the dispenser.

6.2.1. DISPENSER ERROR MESSAGES

After each error in a dispenser with a PDEX or TBELTX counter, fuel delivery is suspended and the display shows an error ("E" + error code). Based on the message type, either the whole dispenser gets blocked (fatal error) or only one part where the error occurred is blocked.

Important error messages are recorded in the counter's memory, where they can be recalled using the P06 (Error history) and P13 (Error statistics) parameters.

Table 26 – Types of error messages of PDEX and TBELTX counters

Message type	Manner of dispenser blocking	Method of dispenser unblocking
LOCK (operational blocking)	Blocks a part of the dispenser.	The message disappears from the display after hanging the dispensing nozzle back
ALERT (warning)	Blocks only the part of the dispenser where the error occurred. The message code is recorded in the history and statistics.	The message disappears from the display as soon as the cause of the error is repaired.
NFAT (non-fatal error)	Blocks only the part of the dispenser where the error occurred. The message code is recorded in the history and statistics.	The message disappears from the display after hanging the dispensing nozzle back. It is possible to unblock the dispenser and cancel the error by means of a remote controller, or via the data line.
FATAL (fatal error)	Blocks the whole dispenser and the message code is recorded in the history and statistics.	The cause of the error must be repaired. The power supply to the dispenser's counter must be turned off and on.

Table 27 – Error message codes in dispensers with PDEX or TBELTX counter

Message code	Message type	Cause of the error message	Error message removal method
OFF	FATAL	Supply power outage. Supply power outage longer than approx. 3-5 periods, t > 100ms.	The power supply to the dispenser's counter must be turned off for approx. 10 seconds and turned back on.
STOP	LOCK	Maximum time for pumping suspension exceeded.	The message disappears after hanging the dispensing nozzle back in its holder.
E 1	NFAT	Display error – malfunctioning LCD display segment or an error of an electromechanical display reel.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.
E 2	FATAL	Display error – the real quantity of displays is different from the quantity set in the P31 parameter.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.
E 3	NFAT	Vapor recovery system error. Vapor flow sensor error on side A.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.
E 4	NFAT	Vapor recovery system error. Vapor flow sensor error on side B.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.

Message code	Message type	Cause of the error message	Error message removal method
E 5	ALERT	Display error – error in communication with the display or with an electromechanical totalizer.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.
E 6	NFAT	Error of an electromechanical totalizer.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.
E10	NFAT	Error of the thermal sensor.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.
E11	NFAT	Invalid value of fuel density.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.
E12	FATAL	Error of the thermal compensation device. The PDEINP unit is disconnected or its check sum is wrong.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.
E13	FATAL	Program error – error of the metrology or program checksum.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.
E16	ALERT	Credit unit error. Error in the communication between the counter and the PDECRE credit unit.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.
E17	NFAT	Data line error. Error in the serial communication line, wrong communication data. The control computer fails to send <ACK> confirmation in time.	Check that no two dispensers have the same address. Check the mechanical connection of the data line. Check the function and setting of the data converter. Use the monitor to check the communication progress.
E18	ALERT	Data line error. Error in the serial communication line, loss of communication.	Controlling computer not connected or the communication cable is not connected properly. Check the setting of parameter P76. Check the data converter function. Use the monitor to check the communication progress.
E20	NFAT	Loss of power supply during delivery. The latest fuel drawing was terminated unexpectedly due to a power outage or due to a processor reset caused by interference.	Check the power supply of the dispenser and possible interference (in power supply).
E21	NFAT	Incorrect position of the switches SW1-1 & SW1-4	Call the authorized service company.
E22	FATAL	Data initialization. Faulty data in the RAM and EEPROM memory – invalid check sum.	Call the authorized service company.
E25	FATAL	Error of electronic totalizers. Electronic totalizers are wrong. The checksum is wrong.	Call the authorized service company.
E26	ALERT	The TOTAL STOP key is pressed.	The message disappears once the button is unblocked.
E27	FATAL	The manufacturer has blocked the fuel dispenser.	In parameter 16 enter the authorization code. Turn the power supply to the dispenser off and on. If the error persists, call the authorized service.
E29	NFAT	Wrong password. A wrong password was used to enter the manager mode.	Enter the correct manager password. If the error persists, call the authorized service.
E30	LOCK	The fuel unit price is zero.	Set the fuel unit price at the cash desk (P12=0), or in parameter P3 (P12=3).

Message code	Message type	Cause of the error message	Error message removal method
E31	NFAT	Pulser error – error in channel of pulser #1 (1A).	Lift and replace the nozzle several times. Turn the dispenser power off and on. If the error persists, call the authorized service.
E32	NFAT	Pulser error – error in channel of pulser # 2 (2A).	
E33	NFAT	Pulser error – error in channel of pulser # 3 (3A).	
E34	NFAT	Pulser error – error in channel of pulser # 4 (4A).	
E35	NFAT	Pulser error – error in channel of pulser # 5 (1B / 5A).	
E36	NFAT	Pulser error – error in channel of pulser # 6 (2B / 6A).	
E37	NFAT	Pulser error – error in channel of pulser # 7 (3B / 7A).	
E38	NFAT	Pulser error – error in channel of pulser # 8 (4B).	
E41	NFAT	Pulser error – error in connection of pulser # 1 (1A).	Lift and replace the nozzle several times. Turn the dispenser power off and on. If the error persists, call the authorized service.
E42	NFAT	Pulser error – error in connection of pulser #2 (2A).	
E43	NFAT	Pulser error – error in connection of pulser #3 (3A).	
E44	NFAT	Pulser error – error in connection of pulser #4 (4A).	
E45	NFAT	Pulser error – error in connection of pulser #5 (1B / 5A).	
E46	NFAT	Pulser error – error in connection of pulser #6 (2B / 6A).	
E47	NFAT	Pulser error – error in connection of pulser #7 (3B / 7A).	
E48	NFAT	Pulser error – error in connection of pulser #8 (4B).	
E51	NFAT	Pump filled with air. The aeration sensor of the pump is active.	Check the fuel level in the storage tank and check for any leakage of the supply fuel pipe. If the error persists, call the authorized service.
E52	NFAT	Pump filled with air. The maximum quantity of tests of separation exceeded.	Check the fuel level in the storage tank and check for any leakage of the supply fuel pipe. If the error persists, call the authorized service.
E54	ALERT	The effectiveness of the vapor recovery system is beyond the allowed scope. If the fault is not corrected within 72 hours, the dispenser is blocked (see the error message E55).	Correct the fault of the vapor recovery system. Call the authorized service.
E55	NFAT	Vapor recovery system error.	Correct the fault of the vapor recovery system. Unblock the VAPORIX system using a service adaptor. Call the authorized service.

6.3. SERVICE OF OCEAN DISPENSERS

- ⚠ Service is carried out in accordance with the fuel station's rules of operation.
- ⚠ Before commencing service, the dispenser must be put out of operation, fitted with a clearly visible "OUT OF ORDER" sign, and the access road must be marked with a "NO ENTRY" sign.
- ⚠ The serviced dispenser must be disconnected from the power source (turn off the main switch).
- ⚠ The valves on the supply pipe must be fully closed.
- ⚠ During service, passage of vehicles in the area of 5 m around the dispenser must be prevented.
- ⚠ A fire extinguisher must be available at all times.
- ⚠ Service may only be carried out by authorized personnel of the service company.

The service of TATSUNO EUROPE a. s. dispensers is ensured by:

SPEED CZECH SERVICE, s.r.o.
Pražská 2325/68
678 01 Blansko, Czech Republic
info@speedcz.com, www.speedcz.com
HOT-LINE: +420 602 562 277

6.3.1. WARRANTY AND CLAIMS

The standard contractual warranty is provided for the supplied equipment for a period of 2 years or 1 million liters of delivered fuel. This warranty does not cover consumables. When filing a claim, the following information has to be provided:

- Serial number and name – see the type label
- Exact description of the fault and the circumstances under which it formed

A claim is invalid if the sealing is broken or there was any unauthorized manipulation with the device. Defects and deficiencies which arise as a result of incorrect or unauthorized using or maintenance are outside the scope of the warranty (i.e. problems that arise because of the presence of water and impurities in the tank and hydraulic system). During operation, it is necessary to regularly check for the presence of water and impurities, and clean the systems if necessary.

6.3.2. ATTACHMENTS

- Installation and User Manual
- Certificate of the Quality and Completeness of the Product
- ES Declaration of Conformity
- Base Certificate
- Base Certificates of all meters installed in the dispenser
- IR controller for operation and setup of the calculator
  (upon request for dispensers equipped with the PDEX counter)
- Base frame (upon request)

POZNÁMKY:

POZNÁMKY:

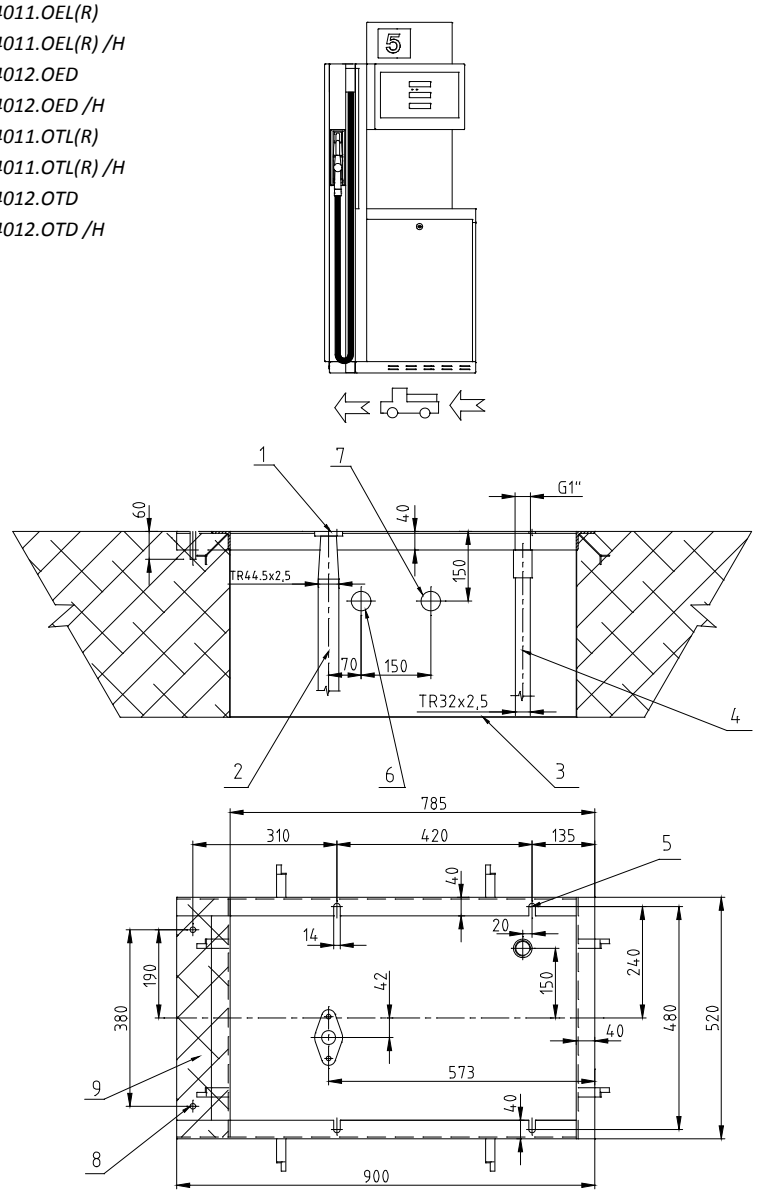
APPENDIX 1 – FOUNDATION PLANS

APPENDIX 1.1. – FOUNDATION PLANS FOR DISPENSERS IN SUCTION MODEL

APPENDIX 1.1.1. FOUNDATION PLANS OF BMP4011.O AND BMP4012.O DISPENSERS

The plan is valid for models OCEAN EURO and OCEAN TALL in the suction model as well as their variants:

- *BMP4011.OEL(R)*
- *BMP4011.OEL(R) /H*
- *BMP4012.OED*
- *BMP4012.OED /H*
- *BMP4011.OTL(R)*
- *BMP4011.OTL(R) /H*
- *BMP4012.OTD*
- *BMP4012.OTD /H*

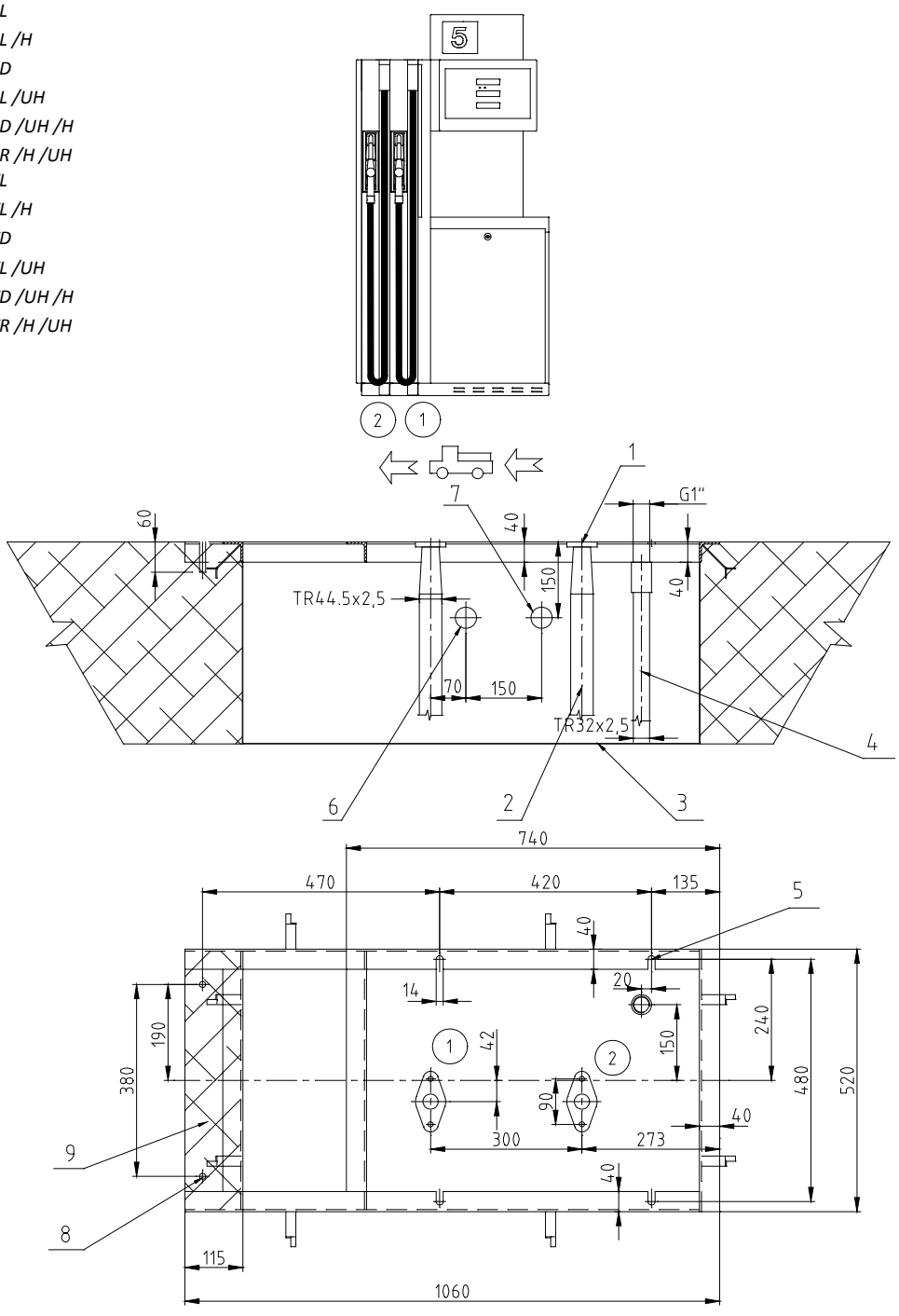


Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	6	Outlet of electrical cables for dispenser powering
2	Suction piping - TR 44.5 x 2.5	7	Output of electrical cables for data transmission
3	Leak catcher tray	8	2x fastener for use in concrete Ø12
4	Vapor recovery piping TR 32 x 2.5 terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	9	This surface must be on the same level as the foundation plan!
5	Anchoring holes	⇦	Recommended arrival direction of vehicles to the dispenser

APPENDIX 1.1.2. FOUNDATION PLANS OF BMP4022.O AND BMP4024.O DISPENSERS

The plan is valid for models OCEAN EURO and OCEAN TALL in the suction model as well as their variants:

- *BMP4022.OEL*
- *BMP4022.OEL /H*
- *BMP4024.OED*
- *BMP4021.OEL /UH*
- *BMP4022.OED /UH /H*
- *BMP4022.OER /H /UH*
- *BMP4022.OTL*
- *BMP4022.OTL /H*
- *BMP4024.OTD*
- *BMP4021.OTL /UH*
- *BMP4022.OTD /UH /H*
- *BMP4022.OTR /H /UH*

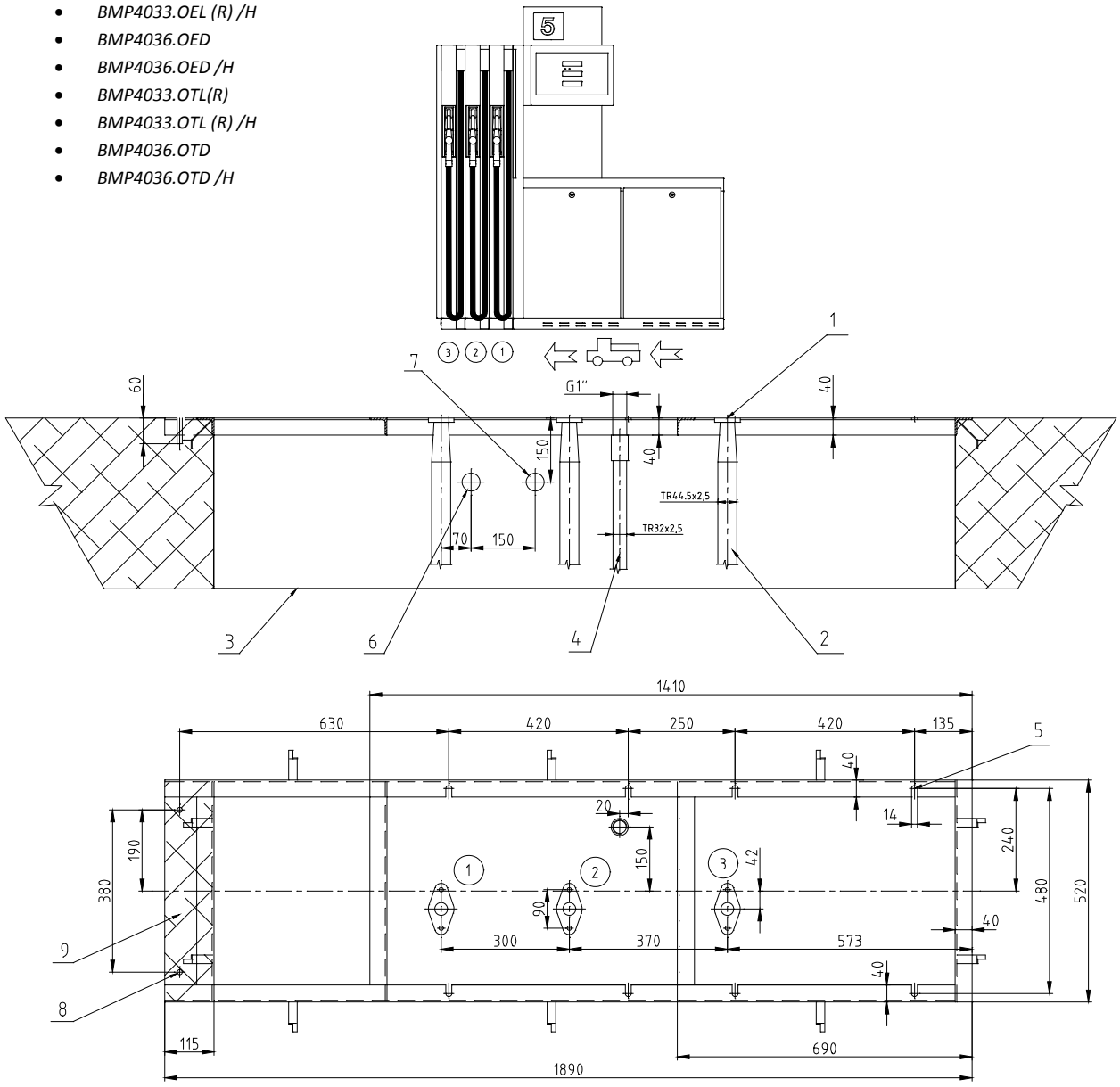


Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	7	Output of electrical cables for data transmission
2	Suction piping - TR 44.5 x 2.5	8	2x fastener for use in concrete Ø12
3	Leak catcher tray	9	This surface must be on the same level as the foundation plan!
4	Vapor recovery piping TR 32 x 2.5 terminated by an internal thread G1" (not in dispensers for dispensing diesel)	⇦	Recommended arrival direction of vehicles to the dispenser
5	Anchoring holes	①②	Order of fuel products
6	Outlet of electrical cables for dispenser powering		

APPENDIX 1.1.3. FOUNDATION PLANS OF BMP4033.O AND BMP4036.O DISPENSERS

The plan is valid for models OCEAN EURO and OCEAN TALL in the suction model as well as their variants:

- *BMP4033.OEL(R)*
- *BMP4033.OEL (R) /H*
- *BMP4036.OED*
- *BMP4036.OED /H*
- *BMP4033.OTL(R)*
- *BMP4033.OTL (R) /H*
- *BMP4036.OTD*
- *BMP4036.OTD /H*

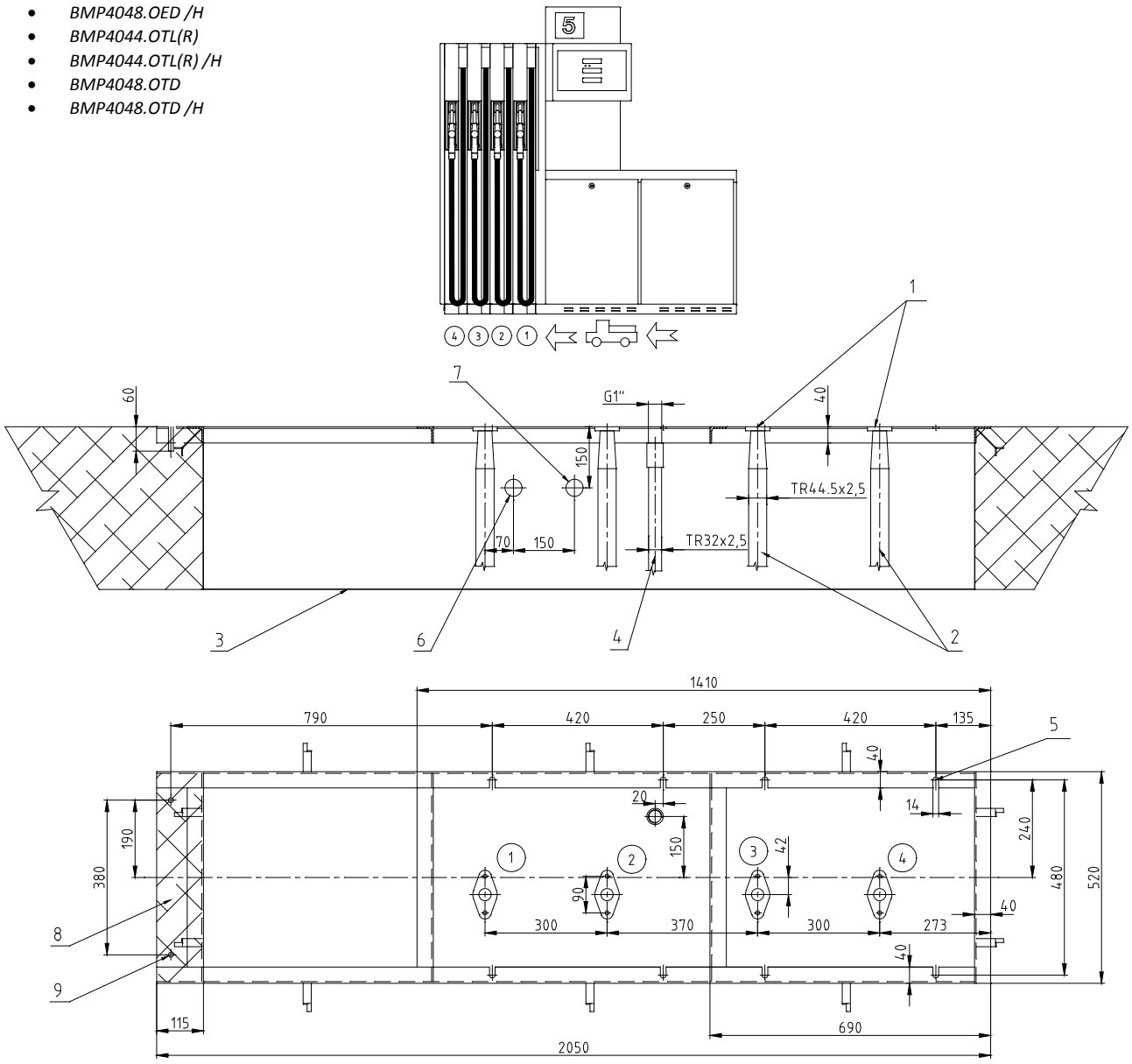


Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	7	Output of electrical cables for data transmission
2	Suction piping - TR 44.5 x 2.5	8	2x fastener for use in concrete Ø12
3	Leak catcher tray	9	This surface must be on the same level as the foundation plan!
4	Vapor recovery piping TR 32 x 2.5 terminated by an internal thread G1" (not in dispensers for dispensing diesel)	⇦	Recommended arrival direction of vehicles to the dispenser
5	Anchoring holes	①②③	Order of fuel products
6	Outlet of electrical cables for dispenser powering		

APPENDIX 1.1.4. FOUNDATION PLANS OF BMP4044.O AND BMP4048.O DISPENSERS

The plan is valid for models OCEAN EURO and OCEAN TALL in the suction model as well as their variants:

- *BMP4044.OEL(R)*
- *BMP4044.OEL(R) /H*
- *BMP4048.OED*
- *BMP4048.OED /H*
- *BMP4044.OTL(R)*
- *BMP4044.OTL(R) /H*
- *BMP4048.OTD*
- *BMP4048.OTD /H*

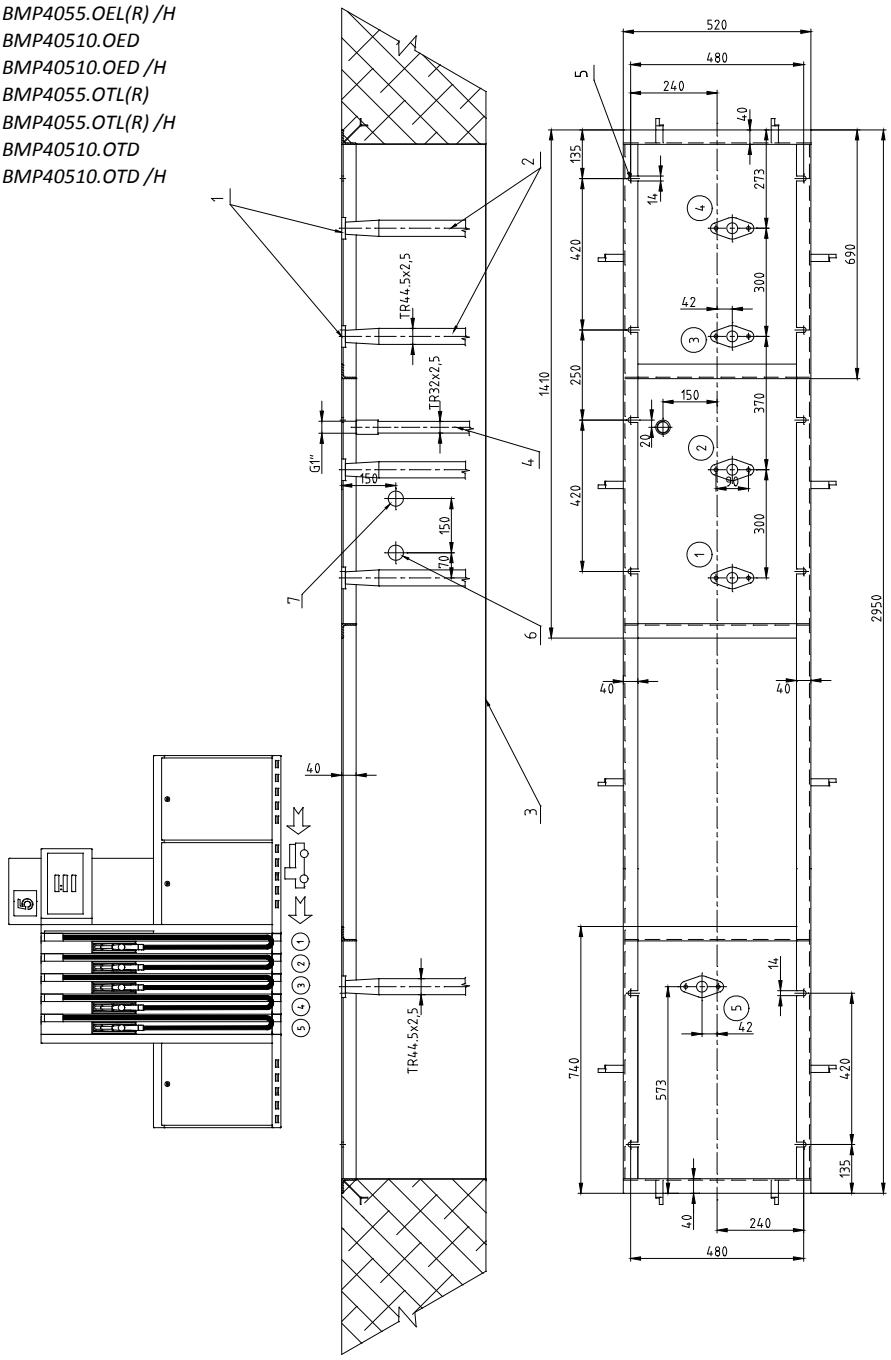


Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	7	Output of electrical cables for data transmission
2	Suction piping - TR 44.5 x 2.5	8	2x fastener for use in concrete Ø12
3	Leak catcher tray	9	This surface must be on the same level as the foundation plan!
4	Vapor recovery piping TR 32 x 2.5 terminated by an internal thread G1" (not in dispensers for dispensing diesel)	⇦	Recommended arrival direction of vehicles to the dispenser
5	Anchoring holes	①② ③④	Order of fuel products
6	Outlet of electrical cables for dispenser powering		

APPENDIX 1.1.5. FOUNDATION PLANS OF BMP4055.O AND BMP40510.O DISPENSERS

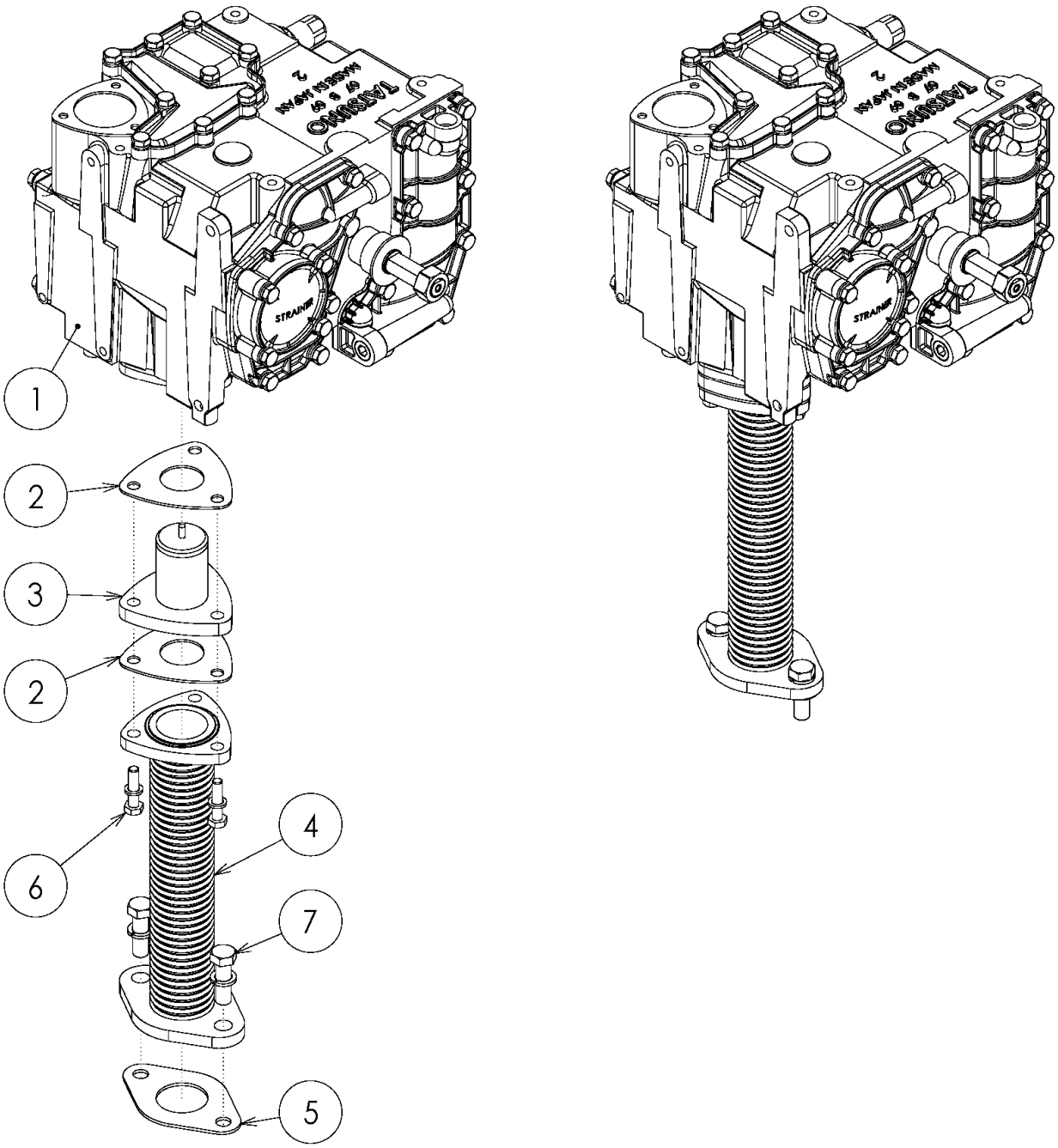
The plan is valid for models OCEAN EURO and OCEAN TALL in the suction model as well as their variants:

- *BMP4055.OEL(R)*
- *BMP4055.OEL(R) /H*
- *BMP40510.OED*
- *BMP40510.OED /H*
- *BMP4055.OTL(R)*
- *BMP4055.OTL(R) /H*
- *BMP40510.OTD*
- *BMP40510.OTD /H*



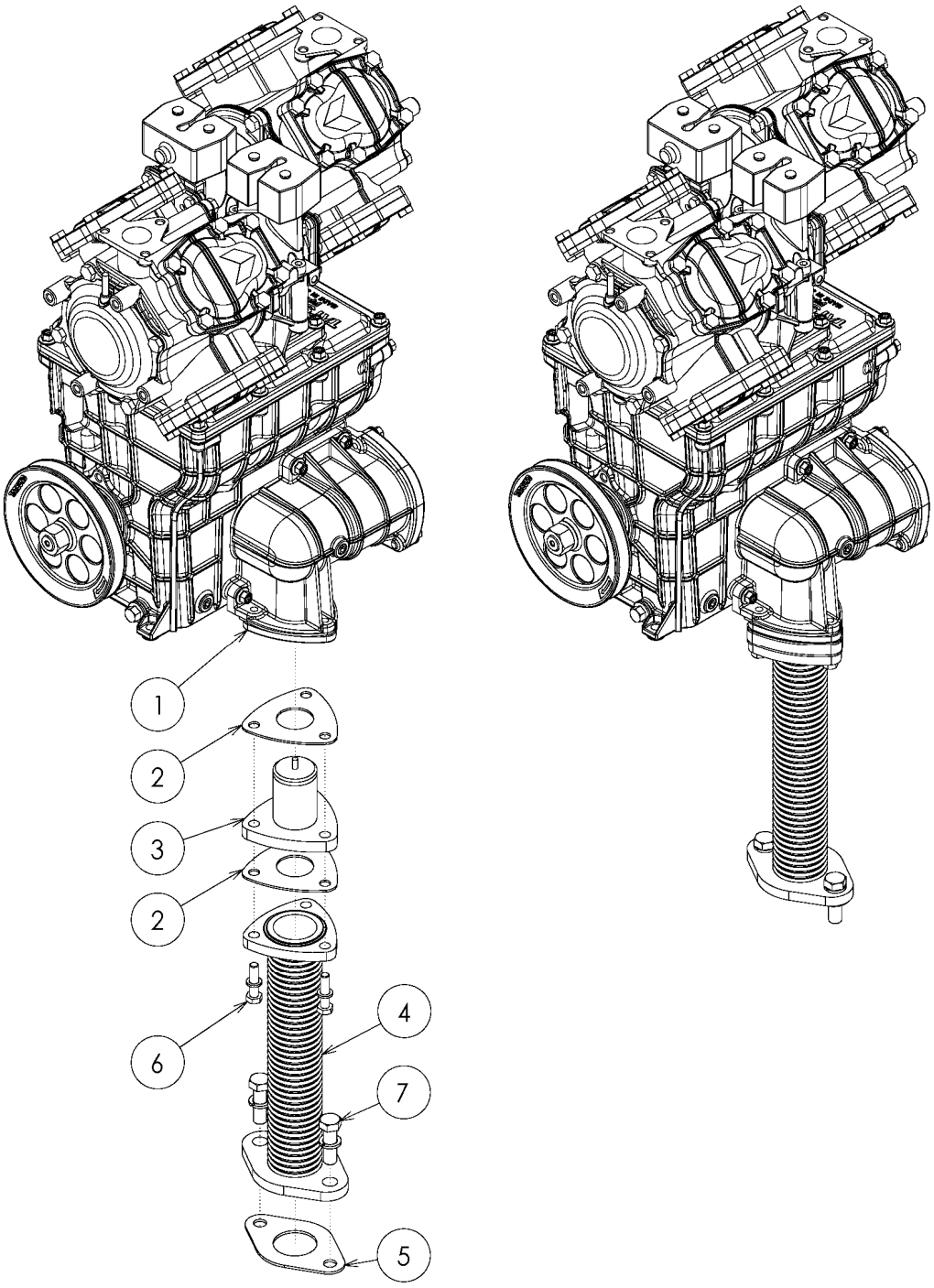
Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	7	Output of electrical cables for data transmission
2	Suction piping - TR 44.5 x 2.5	8	2x fastener for use in concrete Ø12
3	Leak catcher tray	9	This surface must be on the same level as the foundation plan!
4	Vapor recovery piping TR 32 x 2.5 terminated by an internal thread G1" (not in dispensers for dispensing diesel)	⇦	Recommended arrival direction of vehicles to the dispenser
5	Anchoring holes	①②③④⑤	Order of fuel products
6	Outlet of electrical cables for dispenser powering		

APPENDIX 1.1.6. ATTACHMENT OF THE CHECK VALVE AND FLEXIBLE PIPE TO FP-1001 PUMP



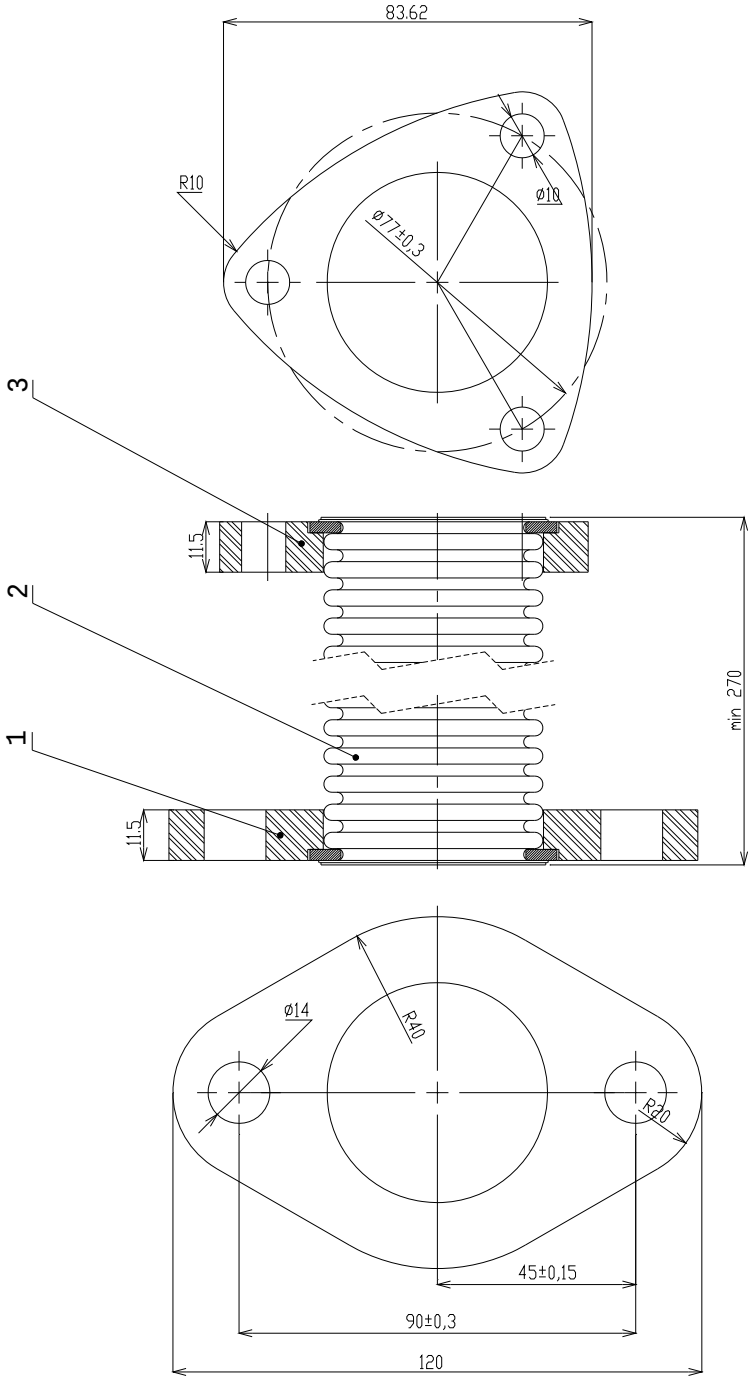
Pos.	Description	Pos.	Description
1	Pumping monoblock TATSUNO FP-1001	5	Flat cork seal of the oval flange
2	Flat cork seal of the monoblock (2 pcs)	6	Bolt M8x35 (DIN912) + spring washer M8 - 3 pcs
3	Check valve TATSUNO FV-1037 A#002	7	Bolt M12x50 (DIN 933) + spring washer M12 (DIN 127) – 2 pcs
4	Flexible pipe of standard length 270mm terminated by rotary flange T90		

APPENDIX 1.1.7. ATTACHMENT OF THE CHECK VALVE AND FLEXIBLE PIPE TO FP-1022 PUMP



Pos.	Description	Pos.	Description
1	Pumping monoblock TATSUNO FP-1001	5	Flat cork seal of the oval flange
2	Flat cork seal of the monoblock (2 pcs)	6	Bolt M8x35 (DIN912) + spring washer M8 - 3 pcs
3	Check valve TATSUNO FV-1037 A#002	7	Bolt M12x50 (DIN 933) + spring washer M12 (DIN 127) – 2 pcs
4	Flexible pipe of standard length 270mm terminated by rotary flange T90		

APPENDIX 1.1.8. DRAWING OF STANDARD CONNECTING (FLEXIBLE) PIPE



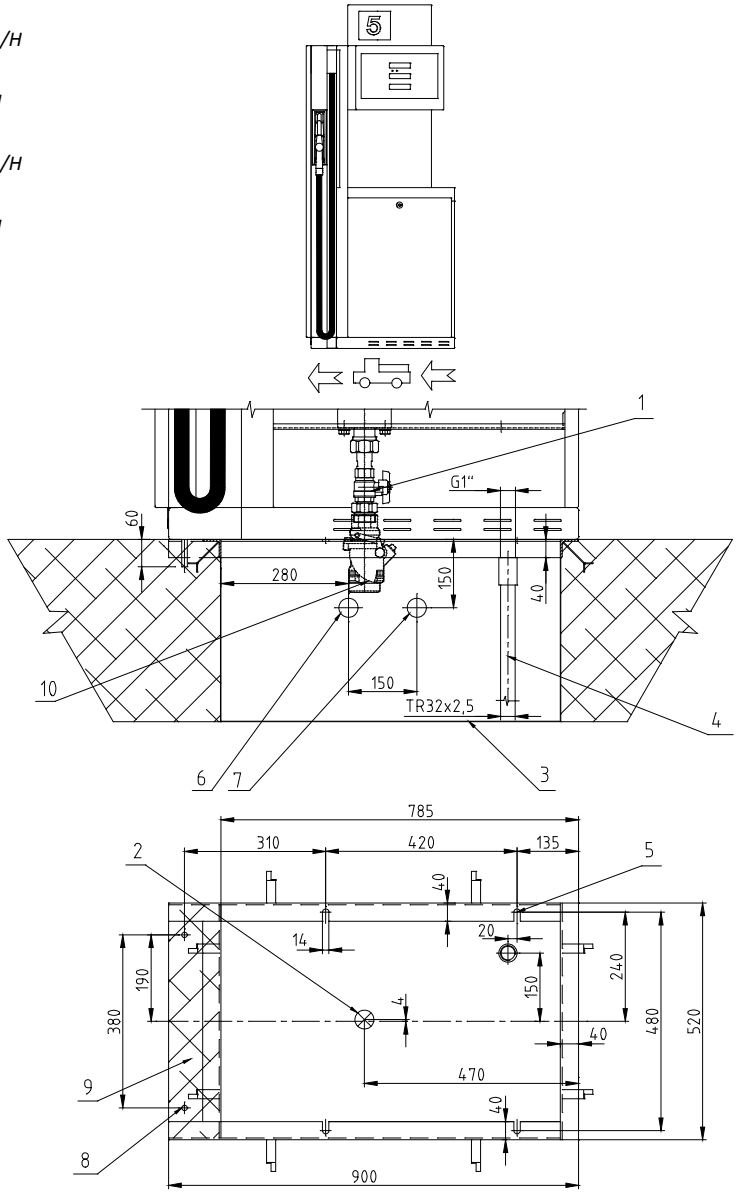
Pos.	Description	Pos.	Description
1	Oval flange T90 for connection to the suction piping	3	Flange for connection to the inlet of the pumping monoblock and check valve
2	Flexible pipe		

APPENDIX 1.2. FOUNDATION PLANS FOR DISPENSERS IN PRESSURE MODEL WITHOUT PUMPS

APPENDIX 1.2.1. FOUNDATION PLANS OF BMP4011.O AND BMP4012.O DISPENSERS

The plan is valid for models OCEAN EURO and OCEAN TALL in the pressure model (/S3) as well as their variants:

- *BMP4011.OEL(R)*
- *BMP4011.OEL(R) /H*
- *BMP4012.OED*
- *BMP4012.OED /H*
- *BMP4011.OTL(R)*
- *BMP4011.OTL(R) /H*
- *BMP4012.OTD*
- *BMP4012.OTD /H*

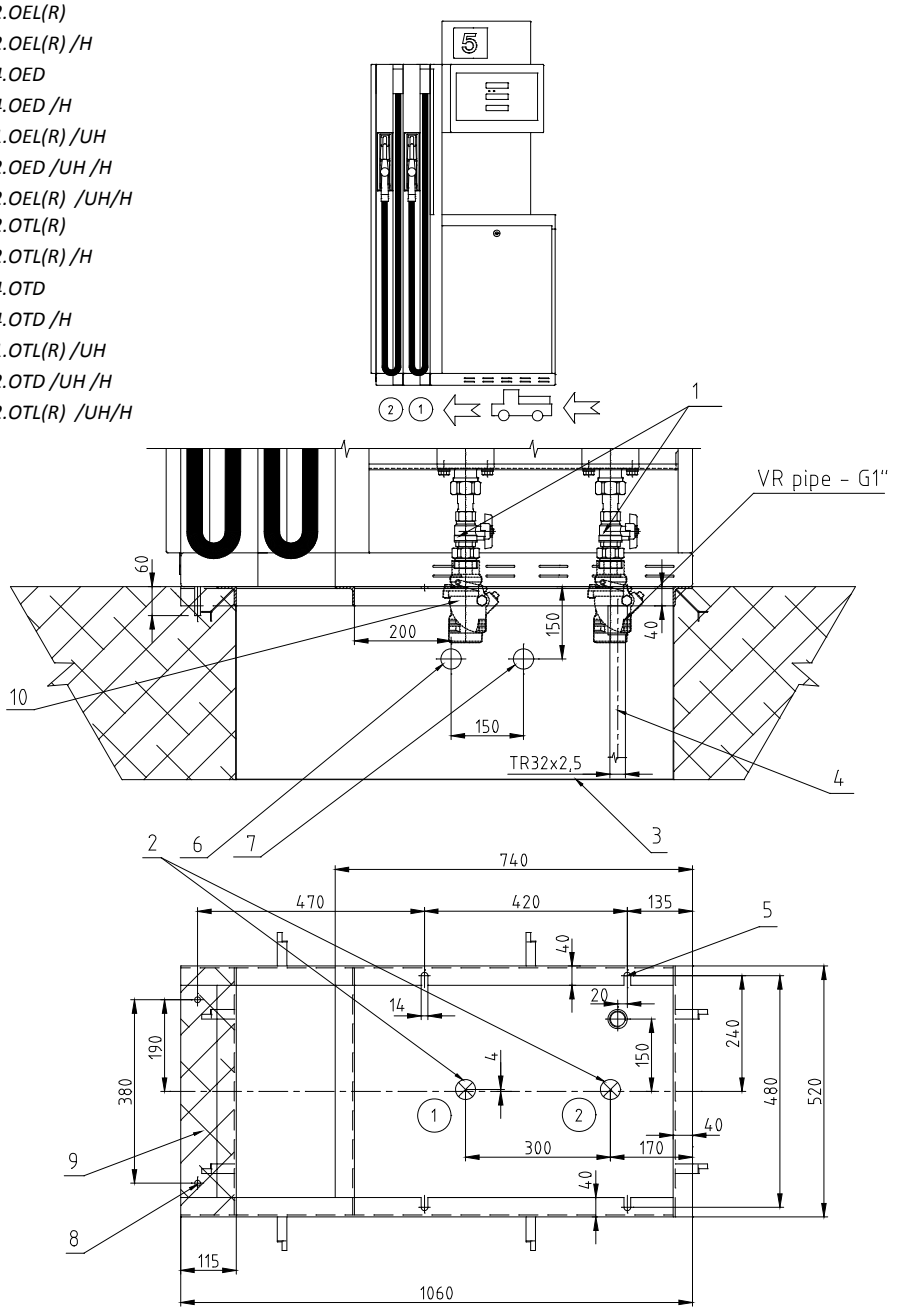


Pos.	Description	Pos.	Description
1	Inlet piping with adjustable height terminated by a ball valve and a reducer from G1" to G1 ½" (detail in Appendix 1.2.6. Detailed Connection of the Inlet Piping)	7	Output of electrical cables for data transmission
2	Axis of inlet pressure piping	8	2x fastener for use in concrete Ø12
3	Leak catcher tray	9	This surface must be on the same level as the foundation plan!
4	Vapor recovery piping terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	10	Breakaway valve OPW 10BF firmly connected to the foundation (not part of standard dispenser equipment)
5	Anchoring holes	⇦	Recommended arrival direction of vehicles to the dispenser
6	Outlet of electrical cables for dispenser powering		

APPENDIX 1.2.2. FOUNDATION PLANS OF BMP4022.O AND BMP4024.O DISPENSERS

The plan is valid for models OCEAN EURO and OCEAN TALL in the pressure model (/S3) as well as their variants:

- *BMP4022.OEL(R)*
- *BMP4022.OEL(R) /H*
- *BMP4024.OED*
- *BMP4024.OED /H*
- *BMP4021.OEL(R) /UH*
- *BMP4022.OED /UH /H*
- *BMP4022.OEL(R) /UH/H*
- *BMP4022.OTL(R)*
- *BMP4022.OTL(R) /H*
- *BMP4024.OTD*
- *BMP4024.OTD /H*
- *BMP4021.OTL(R) /UH*
- *BMP4022.OTD /UH /H*
- *BMP4022.OTL(R) /UH/H*

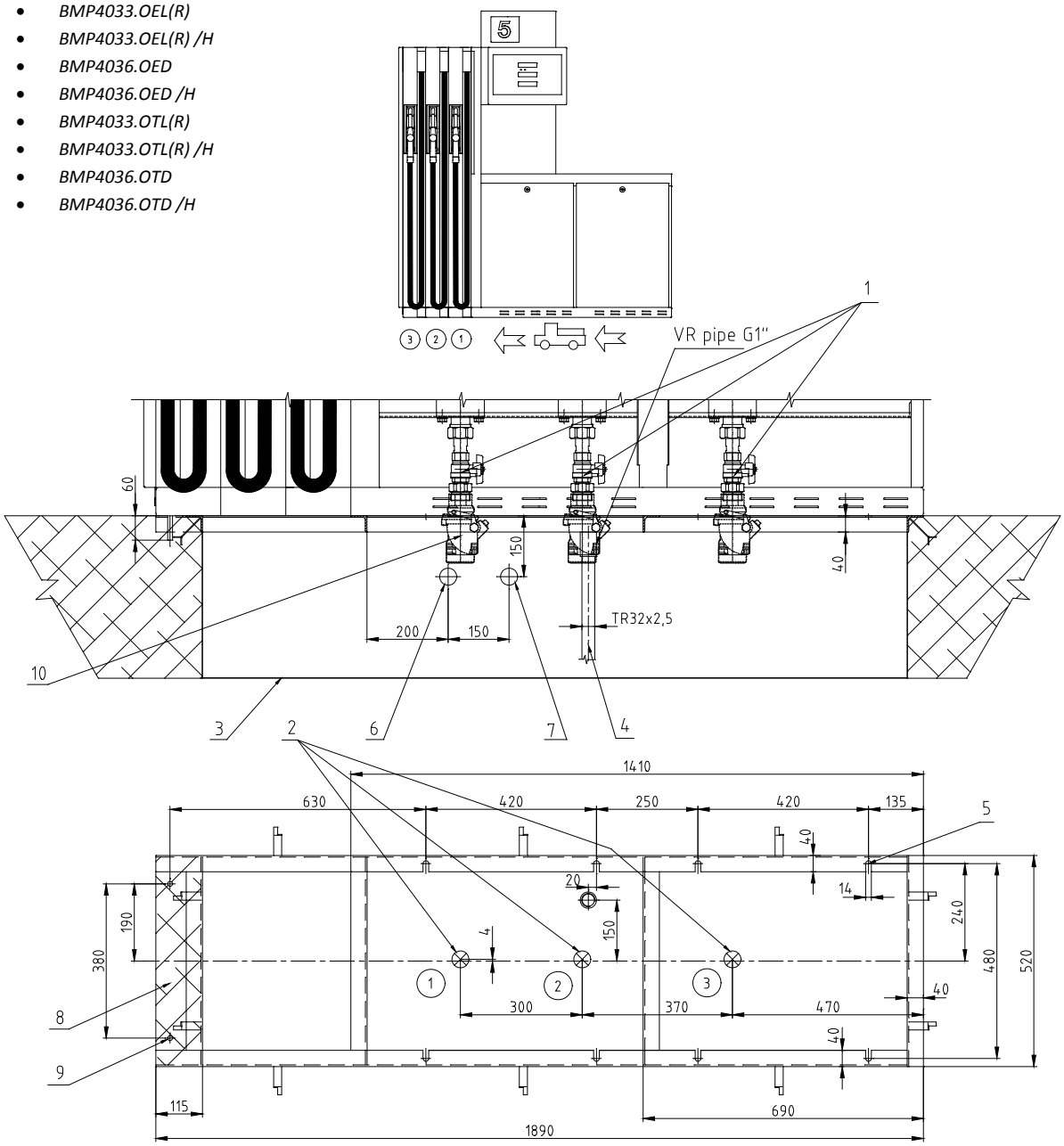


Pos.	Description	Pos.	Description
1	Inlet piping with adjustable height terminated by a ball valve and a reducer from G1" to G1 ½" (detail in Appendix 1.2.6. Detailed Connection of the Inlet Piping)	7	Output of electrical cables for data transmission
2	Axis of inlet pressure piping	8	2x fastener for use in concrete Ø12
3	Leak catcher tray	9	This surface must be on the same level as the foundation plan!
4	Vapor recovery piping terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	10	Breakaway valve OPW 10BF firmly connected to the foundation (not part of standard dispenser equipment)
5	Anchoring holes	⇦	Recommended arrival direction of vehicles to the dispenser
6	Outlet of electrical cables for dispenser powering	①②	Order of fuel products

APPENDIX 1.2.3. FOUNDATION PLANS OF BMP4033.O AND BMP4036.O DISPENSERS

The plan is valid for models OCEAN EURO and OCEAN TALL in the pressure model (/S3) as well as their variants:

- *BMP4033.OEL(R)*
- *BMP4033.OEL(R) /H*
- *BMP4036.OED*
- *BMP4036.OED /H*
- *BMP4033.OTL(R)*
- *BMP4033.OTL(R) /H*
- *BMP4036.OTD*
- *BMP4036.OTD /H*

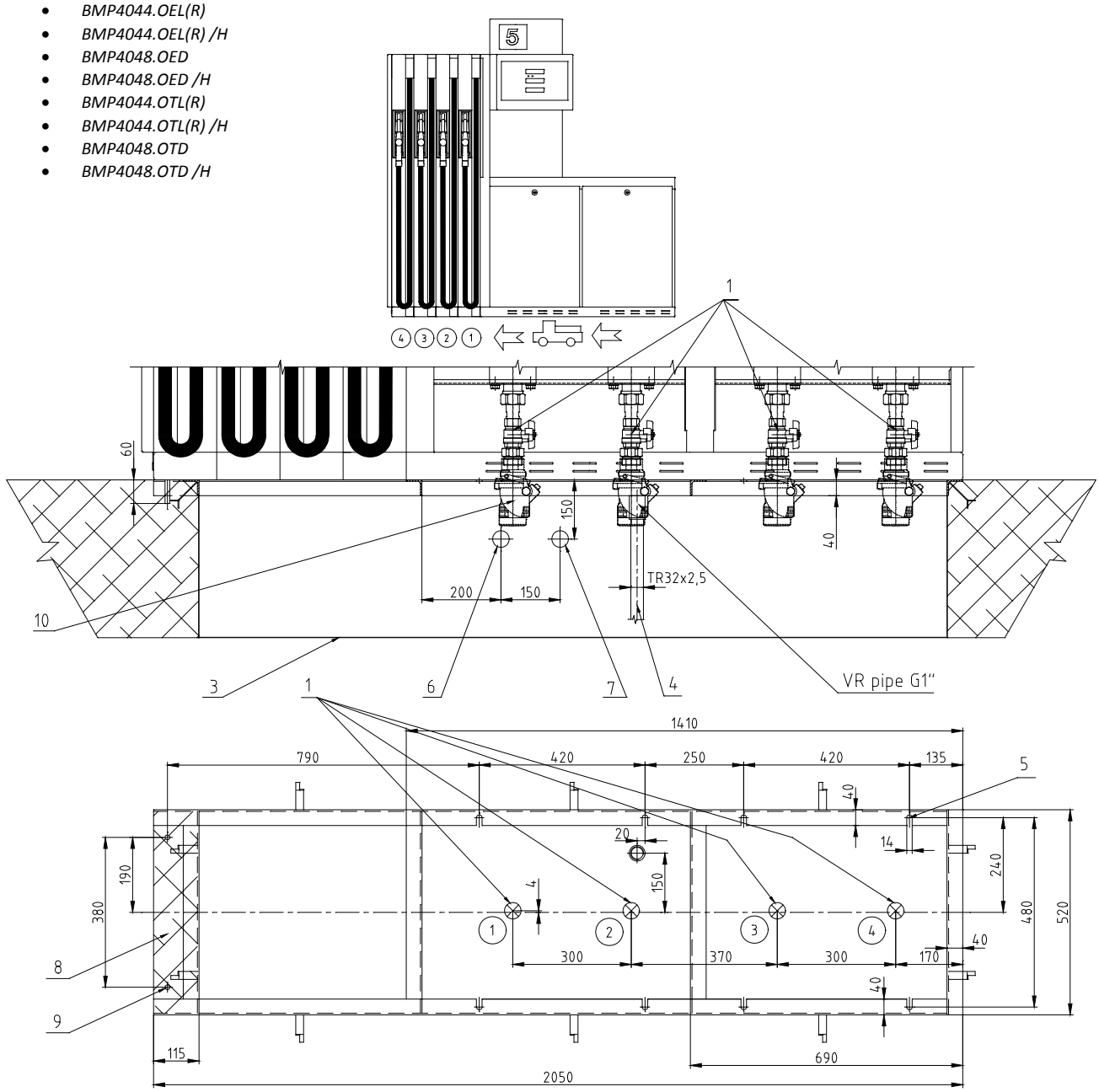


Pos.	Description	Pos.	Description
1	Inlet piping with adjustable height terminated by a ball valve and a reducer from G1" to G1 ½" (detail in Appendix 1.2.6. Detailed Connection of the Inlet Piping)	7	Output of electrical cables for data transmission
2	Axis of inlet pressure piping	8	2x fastener for use in concrete Ø12
3	Leak catcher tray	9	This surface must be on the same level as the foundation plan!
4	Vapor recovery piping terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	10	Breakaway valve OPW 10BF firmly connected to the foundation (not part of standard dispenser equipment)
5	Anchoring holes	⇦	Recommended arrival direction of vehicles to the dispenser
6	Outlet of electrical cables for dispenser powering	①② ③	Order of fuel products

APPENDIX 1.2.4. FOUNDATION PLANS OF BMP4044.O AND BMP4048.O DISPENSERS

The plan is valid for models OCEAN EURO and OCEAN TALL in the pressure model (/S3) as well as their variants:

- *BMP4044.OEL(R)*
- *BMP4044.OEL(R) /H*
- *BMP4048.OED*
- *BMP4048.OED /H*
- *BMP4044.OTL(R)*
- *BMP4044.OTL(R) /H*
- *BMP4048.OTD*
- *BMP4048.OTD /H*

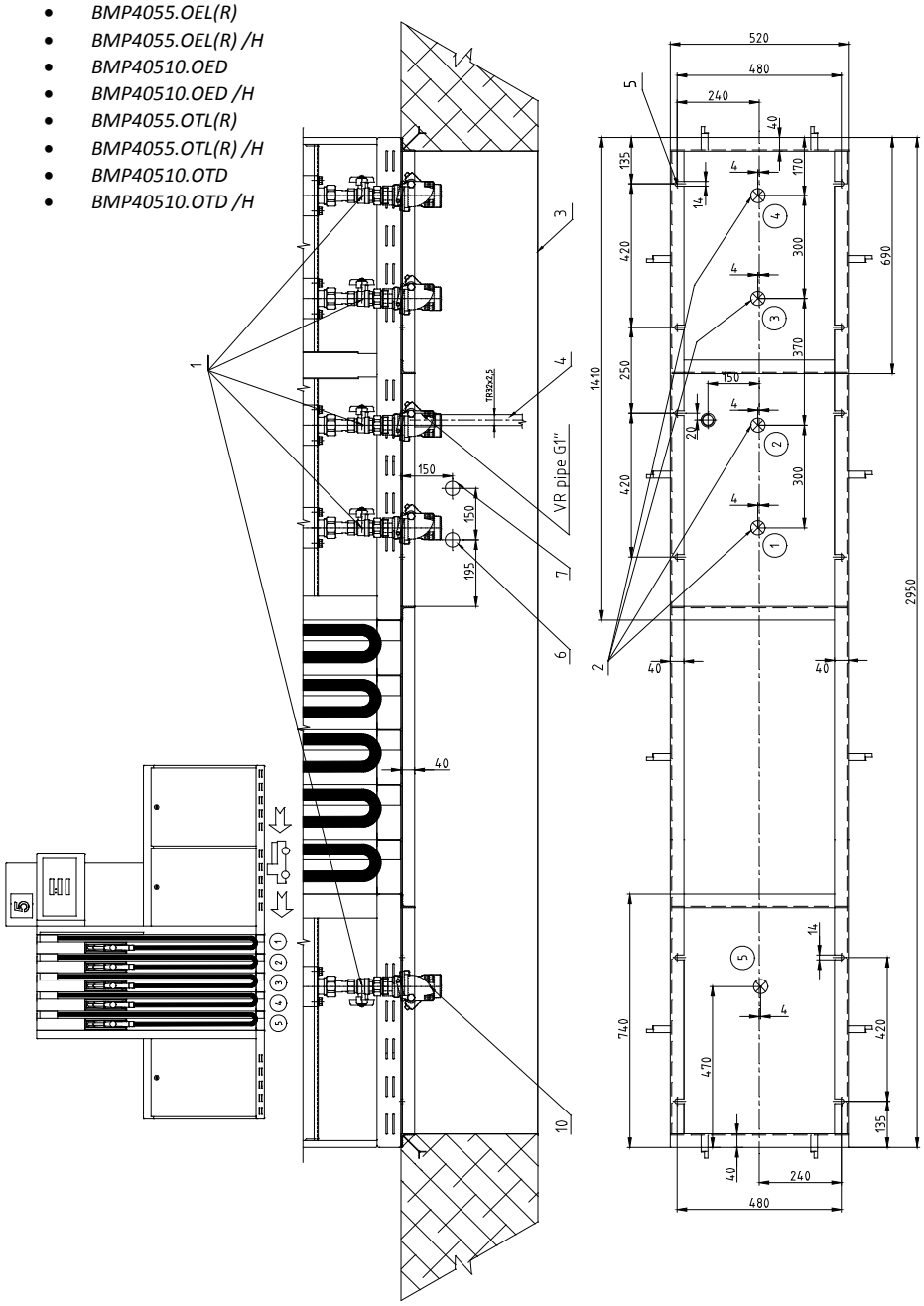


Pos.	Description	Pos.	Description
1	Inlet piping with adjustable height terminated by a ball valve and a reducer from G1" to G1 ½" (detail in Appendix 1.2.6. Detailed Connection of the Inlet Piping)	7	Output of electrical cables for data transmission
2	Axis of inlet pressure piping	8	2x fastener for use in concrete Ø12
3	Leak catcher tray	9	This surface must be on the same level as the foundation plan!
4	Vapor recovery piping terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	10	Breakaway valve OPW 10BF firmly connected to the foundation (not part of standard dispenser equipment)
5	Anchoring holes	⇦	Recommended arrival direction of vehicles to the dispenser
6	Outlet of electrical cables for dispenser powering	①② ③④	Order of fuel products

APPENDIX 1.2.5. FOUNDATION PLANS OF BMP4055.O AND BMP40510.O DISPENSERS

The plan is valid for models OCEAN EURO and OCEAN TALL in the pressure model (/S3) as well as their variants:

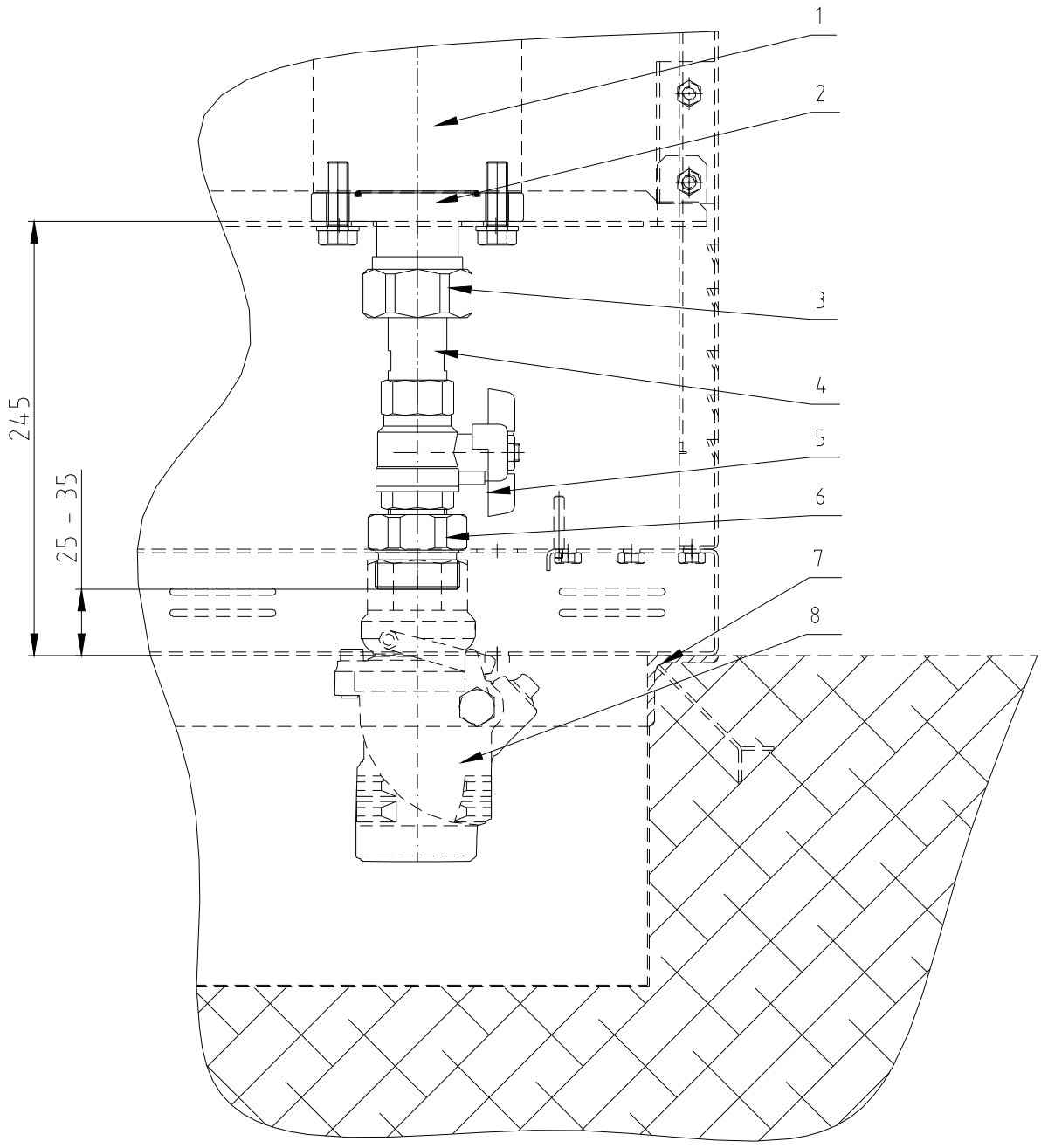
- *BMP4055.OEL(R)*
- *BMP4055.OEL(R) /H*
- *BMP40510.OED*
- *BMP40510.OED /H*
- *BMP4055.OTL(R)*
- *BMP4055.OTL(R) /H*
- *BMP40510.OTD*
- *BMP40510.OTD /H*



Pos.	Description	Pos.	Description
1	Inlet piping with adjustable height terminated by a ball valve and a reducer from G1" to G1 ¼" (detail in Appendix 1.2.6. Detailed Connection of the Inlet Piping)	7	Output of electrical cables for data transmission
2	Axis of inlet pressure piping	8	2x fastener for use in concrete Ø12
3	Leak catcher tray	9	This surface must be on the same level as the foundation plan!
4	Vapor recovery piping terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	10	Breakaway valve OPW 10BF firmly connected to the foundation (not part of standard dispenser equipment)
5	Anchoring holes	⇦	Recommended arrival direction of vehicles to the dispenser

6	Outlet of electrical cables for dispenser powering	①② ③④⑤	Order of fuel products

APPENDIX 1.2.6. DETAILED CONNECTION OF THE INLET PIPING



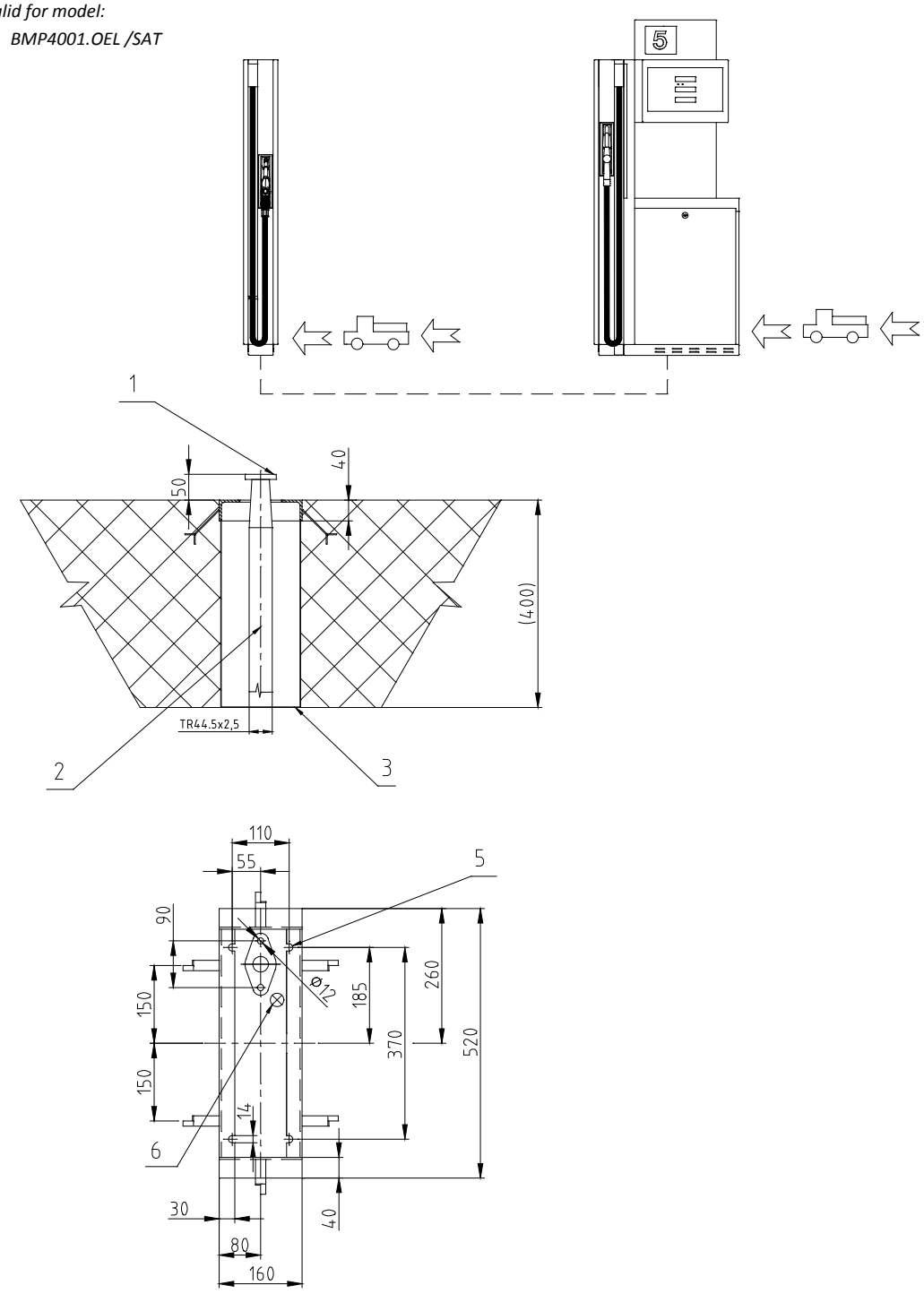
Pos.	Description	Pos.	Description
1	Inlet filter	5	Ball shutoff valve
2	Flange	6	Reducer from G1" to G1 ½"
3	Swivel nut with sealing ring	7	Foundation frame
4	Connecting pipe enabling adjustment of the height setting of the inlet piping in the range of 25mm to 45mm	8	Breakaway valve OPW 10BF firmly connected to the foundation (not part of standard dispenser equipment)

APPENDIX 1.3. FOUNDATION PLANS OF SPECIAL VERSIONS OF DISPENSERS

APPENDIX 1.3.1. FOUNDATION PLAN OF SATELLITE DISPENSER BMP4001.OEL /SAT

The plan is valid for model:

- *BMP4001.OEL /SAT*

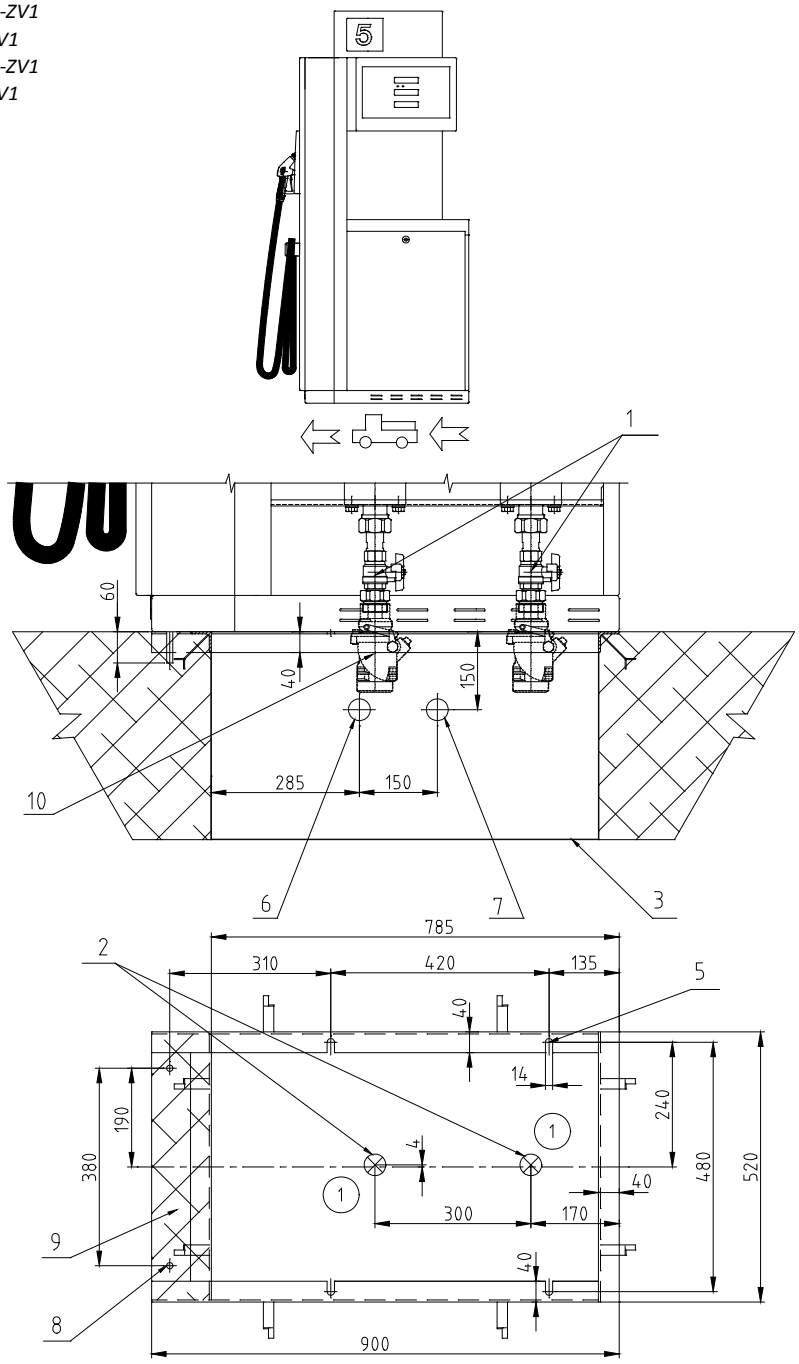


Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	5	Anchoring holes
2	Inlet pressure piping - TR 44.5 x 2.5	6	Outlet of electrical cables for dispenser powering (min. 2 m)
3	Leak catcher tray	⇦	Recommended arrival direction of vehicles to the dispenser

APPENDIX 1.3.2. FOUNDATION PLAN OF BMP4021.O /UH-ZV1 DISPENSER, PRESSURE VERSION

The plan is valid for models OCEAN EURO and OCEAN TALL in the pressure model (/S3) as well as their variants:

- *BMP4011.OEL(R) /UH-ZV1*
- *BMP4011.OED /UH-ZV1*
- *BMP4011.OTL(R) /UH-ZV1*
- *BMP4011.OTD /UH-ZV1*

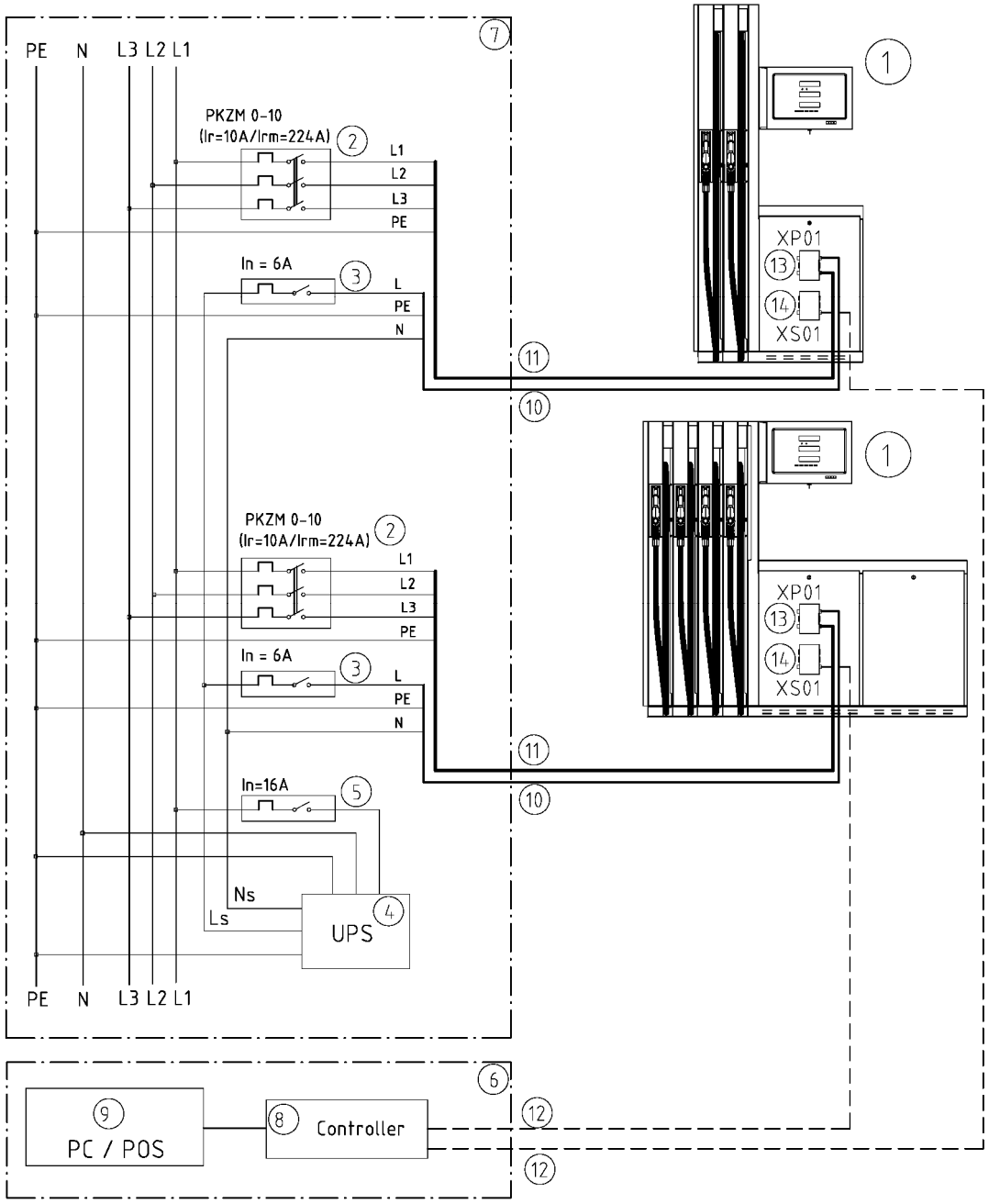


Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	7	Output of electrical cables for data transmission
2	Suction piping - TR 44.5 x 2.5	8	2x fastener for use in concrete Ø12
3	Leak catcher tray	9	This surface must be on the same level as the foundation plan!
5	Anchoring holes	10	Outlet piping for satellite dispenser – TR 44.5 x 2.5
6	Outlet of electrical cables for dispenser powering	⇦	Recommended arrival direction of vehicles to the dispenser

APPENDIX 2. ELECTRICAL WIRING

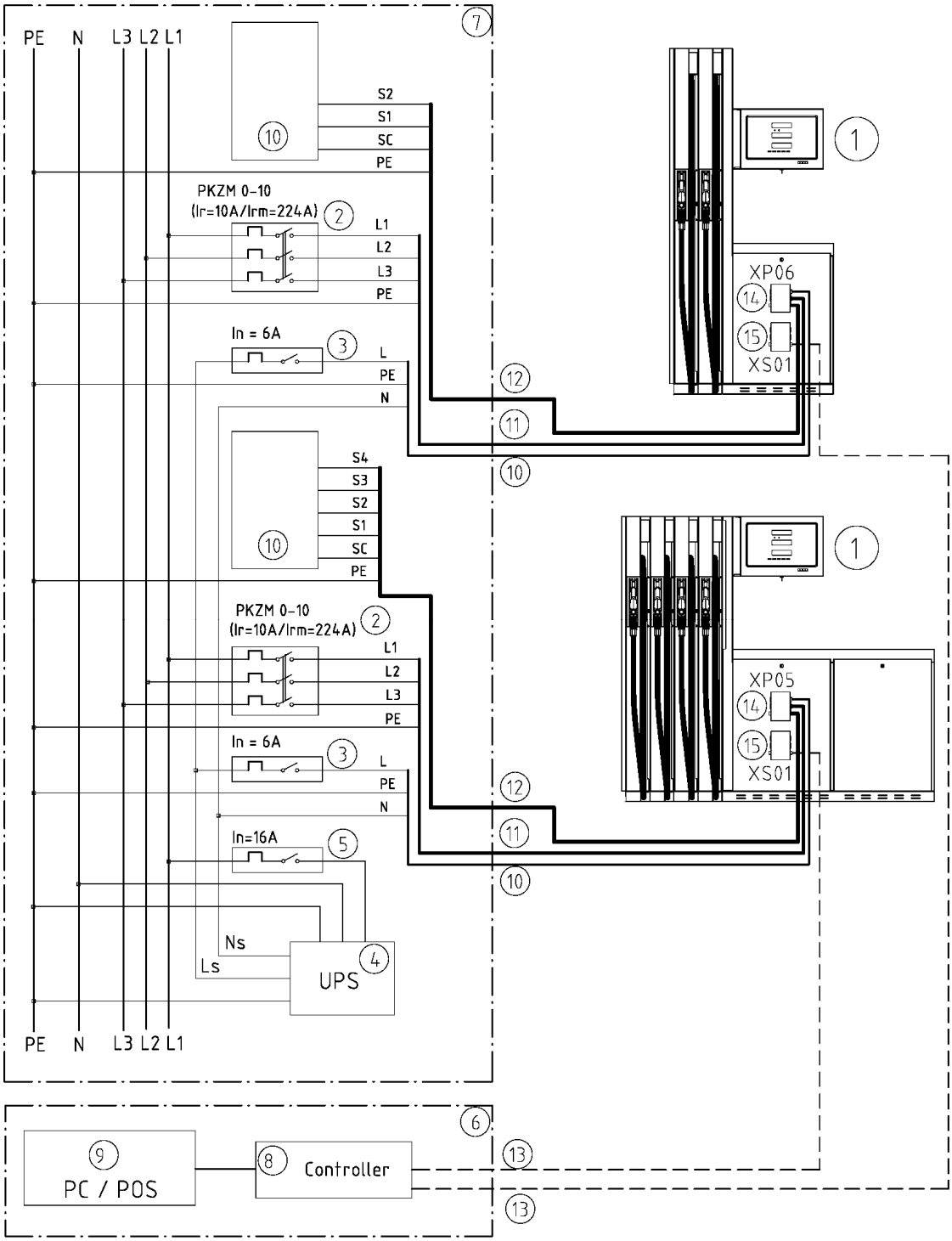
APPENDIX 2.1. ELECTRICAL WIRING SCHEMES

APPENDIX 2.1.1. EXAMPLE OF ELECTRICAL WIRING OF DISPENSERS IN SUCTION MODEL



Pos.	Description	Pos.	Description
1	OCEAN TALL & OCEAN EURO dispenser in suction model	8	Data converter (RS485 / RS232) or controller
2	Motor circuit breaker with short-circuit and thermal trigger	9	Controlling device (PC, payment terminal, POS, console, …)
3	Current circuit breaker for counter powering – In=6A	10	Cable for counter powering – H05VV5-F 3x1,5
4	Backup power source UPS with powering stabilization	11	Cable for motor powering – H05VV5-F 4x1,5
5	Current circuit breaker of the UPS	12	Communication line – H05VVC4V5-K 5x0,5
6	Workplace of the staff (kiosk)	13	Powering distribution box XP10
7	Fuel station technology main distribution box	14	Communication distribution box XS01 (RS485 with PDE protocol)

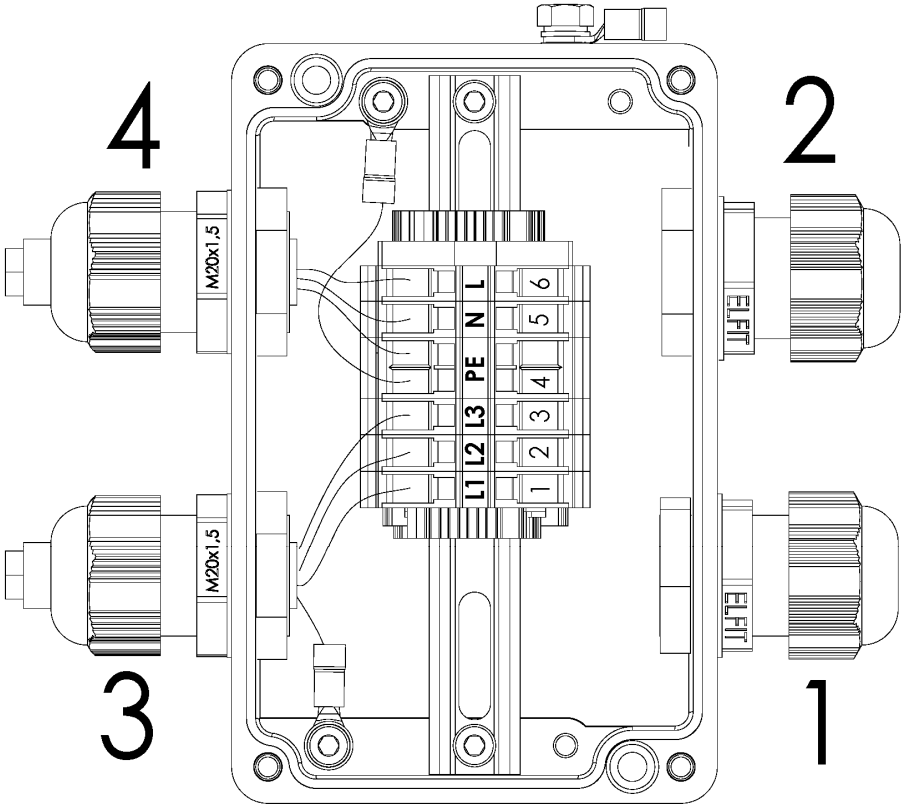
APPENDIX 2.1.2. EXAMPLE OF ELECTRICAL WIRING OF DISPENSERS IN PRESSURE MODEL



Pos.	Description	Pos.	Description
1	OCEAN TALL & OCEAN EURO dispenser in pressure model	9	Controlling device (PC, payment terminal, POS, console, …)
2	Motor circuit breaker with short-circuit and thermal trigger	10	Cable for counter powering – H05VV5-F 3x1,5
3	Current circuit breaker for counter powering – In=6A	11	Cable for suction pump motor powering – H05VV5-F 4x1,5
4	Backup power source UPS with powering stabilization	12	Cable for fuel pump switching – H05VV5-F 7x1,0
5	Current circuit breaker of the UPS	13	Communication line – H05VVC4V5-K 5x0,5
6	Workplace of the staff (kiosk)	14	Powering distribution box XP04 (1 product), XP06 (2 products), XP07 (3 products), XP05 (4 products), XP11 (5 products).
7	Fuel station technology main distribution box		
8	Data converter (RS485 / RS232) or controller	15	Communication distribution box XS01 (RS485 with PDE protocol)

APPENDIX 2.2. ELECTRICAL DISTRIBUTION BOXES

APPENDIX 2.2.1. WIRING OF POWERING BOX XP01 (SUCTION VERSION)



Output

6	**Powering cable for dispenser electronic counter** Type: H05VV5-F 3x1.5 Wiring: XP04 ---> dispenser counter box	
L	phase	black
N	neutral conduit	blue
PE loop M4	protective conduit	green-yellow

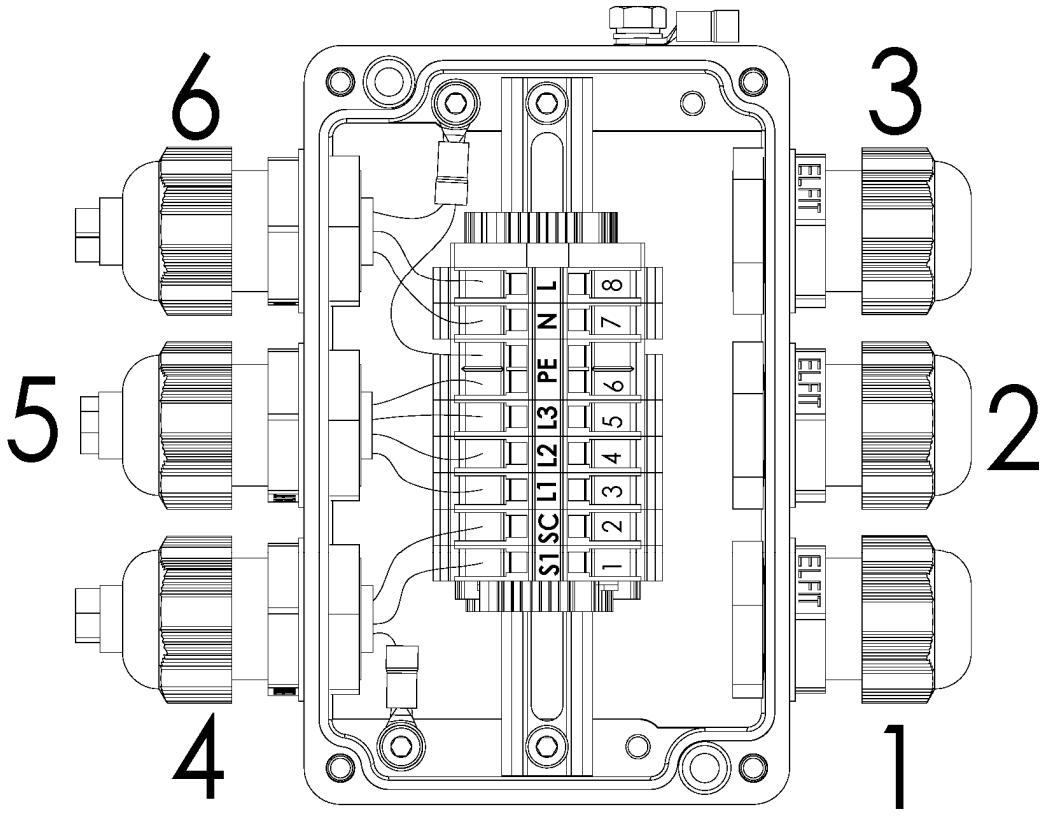
5	**Powering cable for pump and vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP04 ---> dispenser counter box	
L3	phase 3	black 3
L2	phase 2	black 2
L1	phase 1	black 1
PE loop M4	protective conduit	green-yellow

Input

3	**Powering cable for dispenser electronic counter** Type: H05VV5-F 3x1.5 Wiring: XP04 <---> station distribution box	
6	phase	black
5	neutral conduit	blue
4	protective conduit	green-yellow

2	**Powering cable for pump and vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP04 <---> station distribution box	
3	phase 3	black 3
2	phase 2	black 2
1	phase 1	black 1
4	protective conduit	green-yellow

APPENDIX 2.2.2. WIRING OF POWERING BOX XP04 (PRESSURE VERSION; 1 PRODUCT)



Output

6	**Powering cable for dispenser electronic counter** Type: H05VV5-F 3x1.5 Wiring: XP04 ---> dispenser counter box	
L	phase	black
N	neutral conduit	blue
PE loop M4	protective conduit	green-yellow

5	**Powering cable for pump and vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP04 ---> dispenser counter box	
L3	phase 3	black 3
L2	phase 2	black 2
L1	phase 1	black 1
PE	protective conduit	green-yellow

4	**Powering cable for fuel pump switching** Type: H05VV5-F 3x1.5 Wiring: XP04 <---> dispenser counter box	
SC	shared conduit	black 2
S1	switched phase of pump 1	black 1
PE loop M4	protective conduit	green-yellow

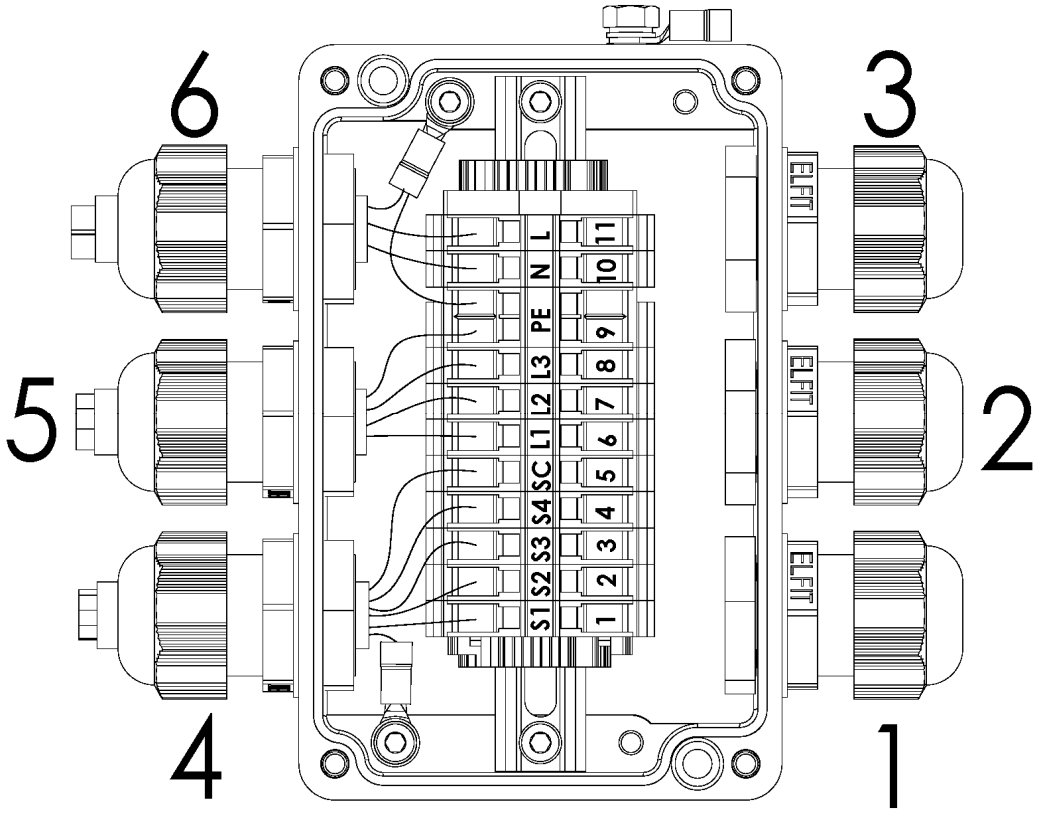
Input

3	**Powering cable for dispenser electronic counter** Type: H05VV5-F 3x1.5 Wiring: XP04 <---> station distribution box	
8	phase	black
7	neutral conduit	blue
6	protective conduit	green-yellow

2	**Powering cable for pump and vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP04 <---> station distribution box	
5	phase 3	black 3
4	phase 2	black 2
3	phase 1	black 1
6	protective conduit	green-yellow

1	**Cable for fuel pump switching** Type: H05VV5-F 3x1.5 Wiring: XP04 <---> station distribution box	
2	shared conduit	black 2
1	switched phase (LPG/WSE)	black 1
PE loop M4	protective conduit	green-yellow

APPENDIX 2.3.3. WIRING OF POWERING BOX XP05 (PRESSURE VERSION; 4 PRODUCTS)



Output

6	**Powering cable for dispenser electronic counter** Type: H05VV5-F 3x1.5 Wiring: XP05 ---> dispenser counter box	
L	phase	black
N	neutral conduit	blue
PE loop M4	protective conduit	green-yellow

5	**Powering cable for vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP05 ---> dispenser counter box	
L3	phase 3	black 3
L2	phase 2	black 2
L1	phase 1	black 1
PE	protective conduit	green-yellow

4	**Cable for switching of fuel pumps** Type: H05VV5-F 7x1.0 Wiring: XP05 <---> dispenser counter box	
SC	shared conduit	black 5
S4	switched phase 4	black 4
S3	switched phase 3	black 3
S2	switched phase 2	black 2
S1	switched phase 1	black 1
PE loop M4	protective conduit	green-yellow

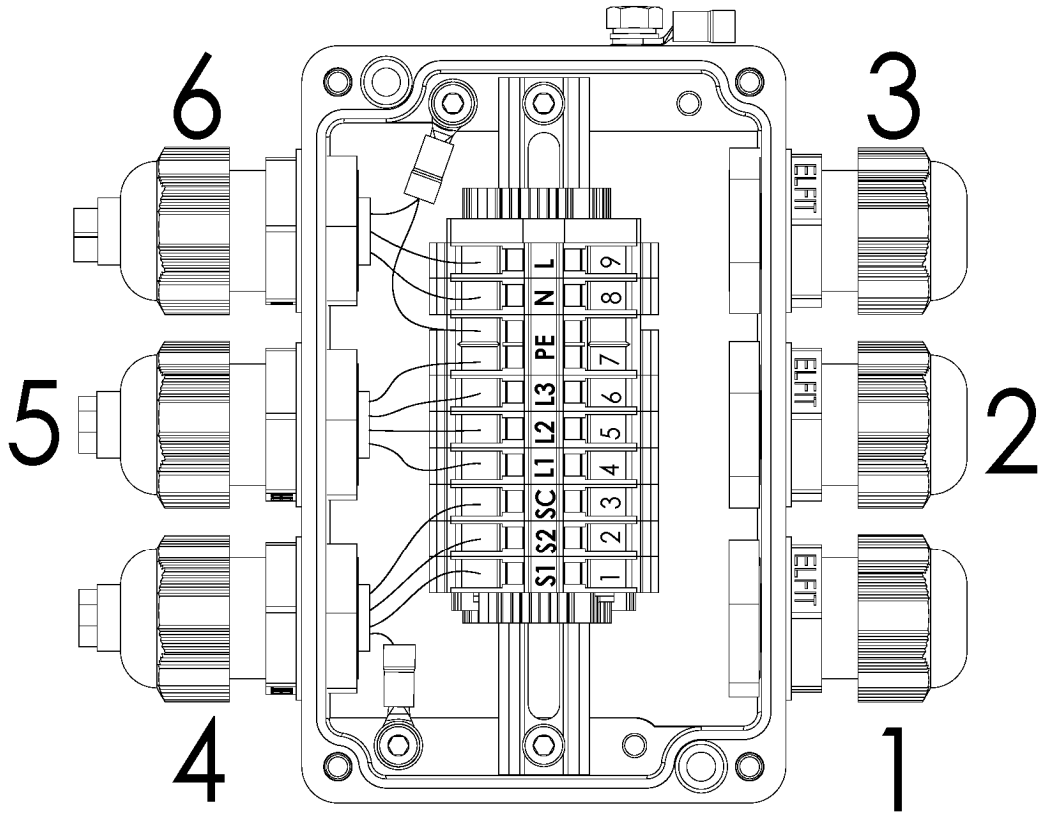
Input

3	**Powering cable for dispenser electronic counter** Type: H05VV5-F 3x1.5 Wiring: XP05 <---> station distribution box	
11	phase	black
10	neutral conduit	blue
9	protective conduit	green-yellow

2	**Powering cable for vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP05 <---> station distribution box	
8	phase 3	black 3
7	phase 2	black 2
6	phase 1	black 1
9	protective conduit	green-yellow

1	**Cable for switching of fuel pumps** Type: H05VV5-F 7x1.0 Wiring: XP05 <---> station distribution box	
5	shared conduit	black 5
4	switched phase 4	black 4
3	switched phase 3	black 3
2	switched phase 2	black 2
1	switched phase 1	black 1
PE loop M4	protective conduit	green-yellow

APPENDIX 2.3.4. WIRING OF POWERING BOX XP06 (PRESSURE VERSION; 2 PRODUCTS)



Output

6	**Powering cable for dispenser electronic counter** Type: H05VV5-F 3x1.5 Wiring: XP06 ---> dispenser counter box	
L	phase	black
N	neutral conduit	blue
PE loop M4	protective conduit	green-yellow

5	**Powering cable for suction pump motors** Type: H05VV5-F 4x1.5 Wiring: XP06 ---> dispenser counter box	
L3	phase 3	black 3
L2	phase 2	black 2
L1	phase 1	black 1
PE	protective conduit	green-yellow

4	**Cable for switching of fuel pumps** Type: H05VV5-F 4x1.5 Wiring: XP06 <---> dispenser counter box	
SC	shared conduit	black 3
S2	switched phase 2 (LPG/WSE)	black 2
S1	switched phase 1	black 1
PE loop M4	protective conduit	green-yellow

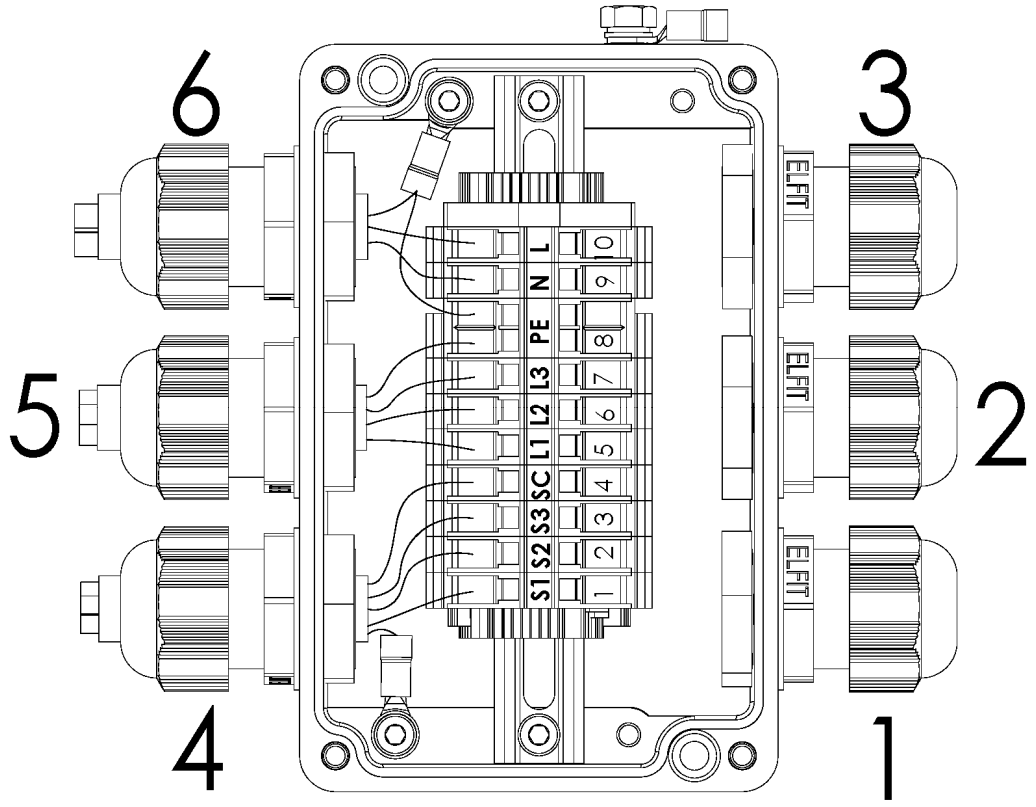
Input

3	**Powering cable for dispenser electronic counter** Type: H05VV5-F 3x1.5 Wiring: XP06 <---> station distribution box	
9	phase	black
8	neutral conduit	blue
7	protective conduit	green-yellow

2	**Powering cable for suction pump motors** Type: H05VV5-F 4x1.5 Wiring: XP06 <---> station distribution box	
6	phase 3	black 3
5	phase 2	black 2
4	phase 1	black 1
7	protective conduit	green-yellow

1	**Cable for switching of fuel pumps** Type: H05VV5-F 7x1.0 (recommended) Wiring: XP06 <---> station distribution box	
3	shared conduit	black 3
2	switched phase 2 (LPG/WSE)	black 2
1	switched phase 1	black 1
PE loop M4	protective conduit	green-yellow

APPENDIX 2.3.5. WIRING OF POWERING BOX XP07 (PRESSURE VERSION; 3 PRODUCTS)



Output

6	**Powering cable for dispenser electronic counter** Type: H05VV5-F 3x1.5 Wiring: XP07 ---> dispenser counter box	
L	phase	black
N	neutral conduit	blue
PE loop M4	protective conduit	green-yellow

5	**Powering cable for vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP07 ---> dispenser counter box	
L3	phase 3	black 3
L2	phase 2	black 2
L1	phase 1	black 1
PE	protective conduit	green-yellow

4	**Cable for switching of fuel pumps** Type: H05VV5-F 5x1.5 Wiring: XP07 <---> dispenser counter box	
SC	shared conduit	black 4
S3	switched phase 3 (LPG/WSE)	black 3
S2	switched phase 2	black 2
S1	switched phase 1	black 1
PE loop M4	protective conduit	green-yellow

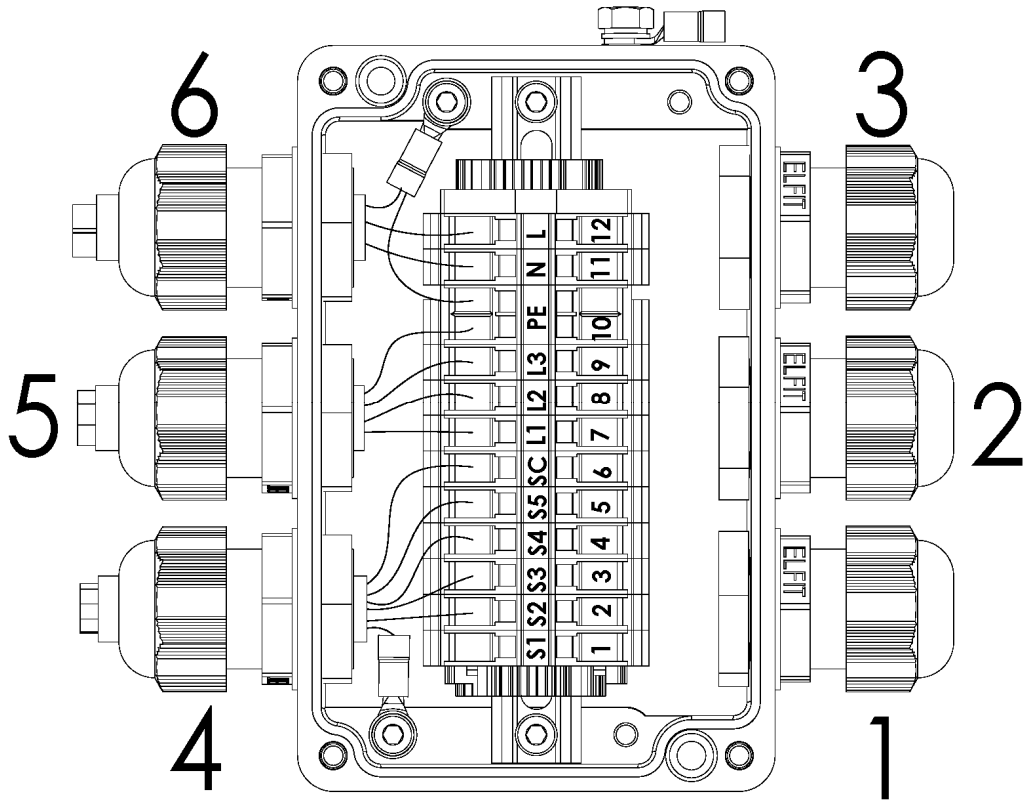
Input

3	**Powering cable for dispenser electronic counter** Type: H05VV5-F 3x1.5 Wiring: XP07 <---> station distribution box	
10	phase	black
9	neutral conduit	blue
8	protective conduit	green-yellow

2	**Powering cable for vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP07 <---> station distribution box	
7	phase 3	black 3
6	phase 2	black 2
5	phase 1	black 1
8	protective conduit	green-yellow

1	**Cable for switching of fuel pumps** Type: H05VV5-F 7x1.0 (recommended) Wiring: XP07 <---> station distribution box	
4	shared conduit	black 4
3	switched phase 3 (LPG/WSE)	black 3
2	switched phase 2	black 2
1	switched phase 1	black 1
PE loop M4	protective conduit	green-yellow

APPENDIX 2.3.6. WIRING OF POWERING BOX XP11 (PRESSURE VERSION; 5 PRODUCTS)



Output

6	**Powering cable for electronic counter** Type: H05VV5-F 3x1.5 Wiring: XP11 ---> dispenser counter box	
L	phase	black
N	neutral conduit	blue
PE oko M4	protective conduit	green-yellow

5	**Powering cable for vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP11 ---> dispenser counter box	
L3	phase 3	black 3
L2	phase 2	black 2
L1	phase 1	black 1
PE	protective conduit	green-yellow

4	**Power cable for switching fuel and LPG/WSE pumps** Type: H05VV5-F 7x1.0 Wiring: XP11 <---> dispenser counter box	
SC	shared conduit	black 6
S5	switched phase of pump 5	black 5
S4	switched phase of pump 4	black 4
S3	switched phase of pump 3	black 3
S2	switched phase of pump 2	black 2
S1	switched phase of pump 1	black 1
PE loop M4	protective conduit	green-yellow

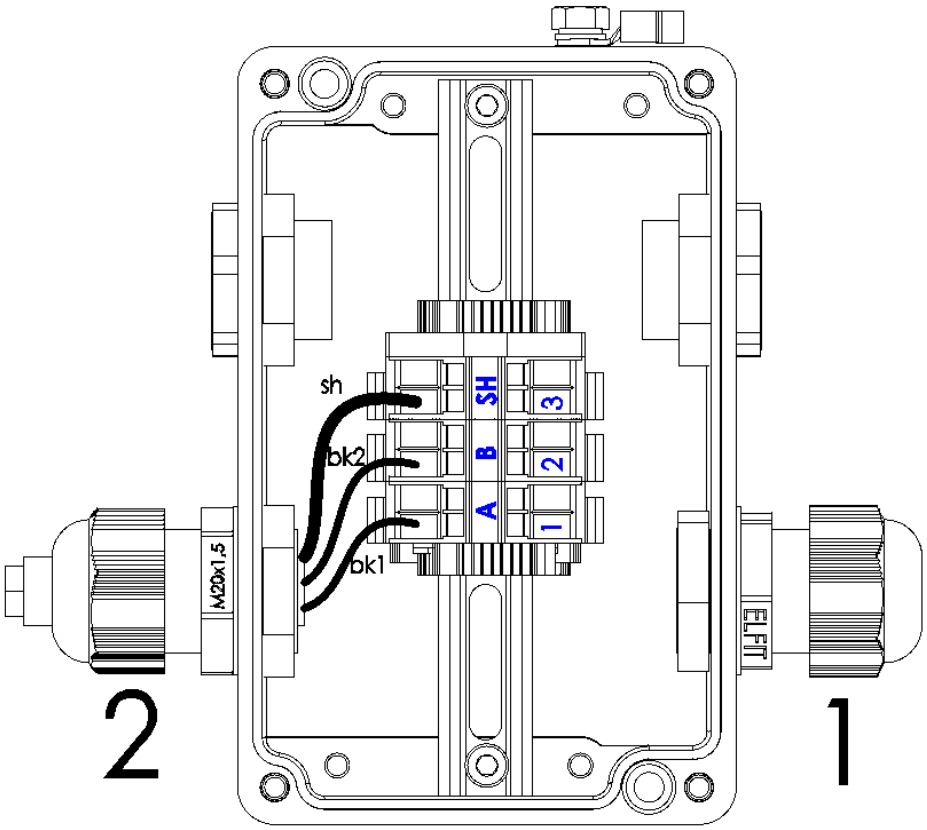
Input

3	**Powering cable for electronic counter and heating** Type: H05VV5-F 3x1.5 Wiring: XP11 <---> station distribution box	
12	phase	black
11	neutral conduit	blue
10	protective conduit	green-yellow

2	**Powering cable for vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP11 <---> station distribution box	
5	phase 3	black 3
4	phase 2	black 2
3	phase 1	black 1
6	protective conduit	green-yellow

1	**Cable for switching of fuel and LPG/WSE pumps** Type: H05VV5-F 7x1.0 Wiring: XP11 <---> station distribution box	
6	shared conduit	black 6
5	switched phase of pump 5	black 5
4	switched phase of pump 4	black 4
3	switched phase of pump 3	black 3
2	switched phase of pump 2	black 2
1	switched phase of pump 1	black 1
PE loop M4	protective conduit	green-yellow

APPENDIX 2.3.7. WIRING OF DATA DISTRIBUTION BOX XS01



Output

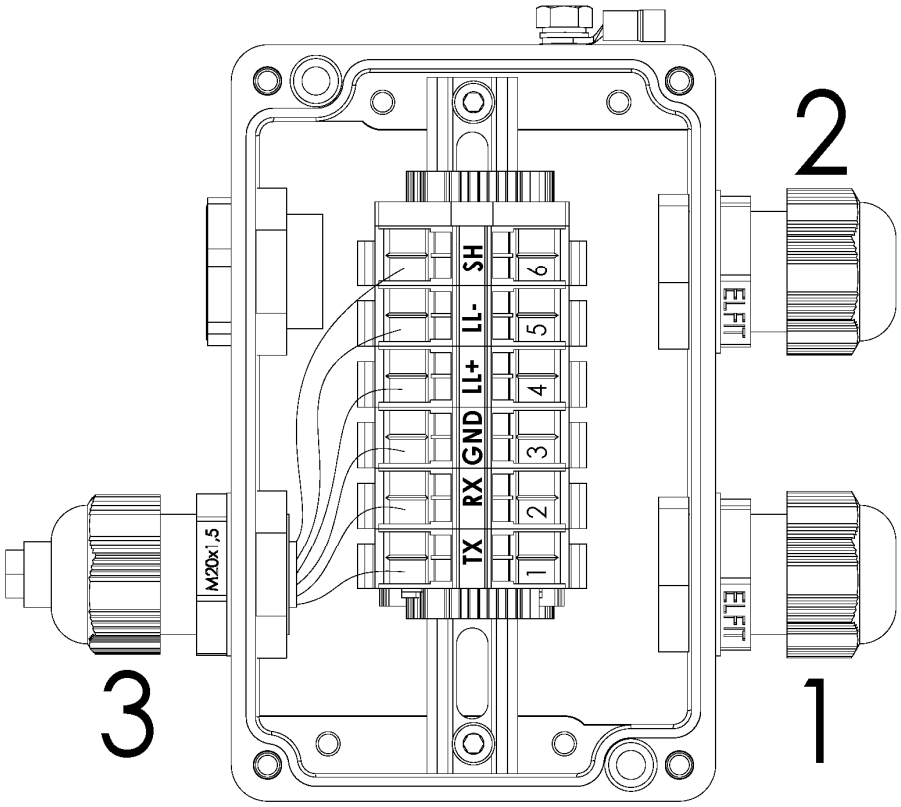
3	**Communication cable for data line (PDE line)** Type: H05VVC4V5-K 2x0.5 Wiring: XS01 <---> dispenser counter box	
SH	shielding	SH
B	signal B	black 2
A	signal A	black 1

Input

1&2	**Communication cable for data line** Type: H05VVC4V5-K 2x0.5 (recommended) Wiring: XS01 <---> kiosk – service point	
3	shielding	shielding (sh)
2	signal B	black 2 (bk2)
1	signal A	black 1 (bk1)

NOTE *The distribution box XS01 is used for data communication RS485 with the protocols PDE (TATSUNO EUROPE) or DART (Dresser Wayne).*

APPENDIX 2.3.8. WIRING OF DATA DISTRIBUTION BOX XS02



Output

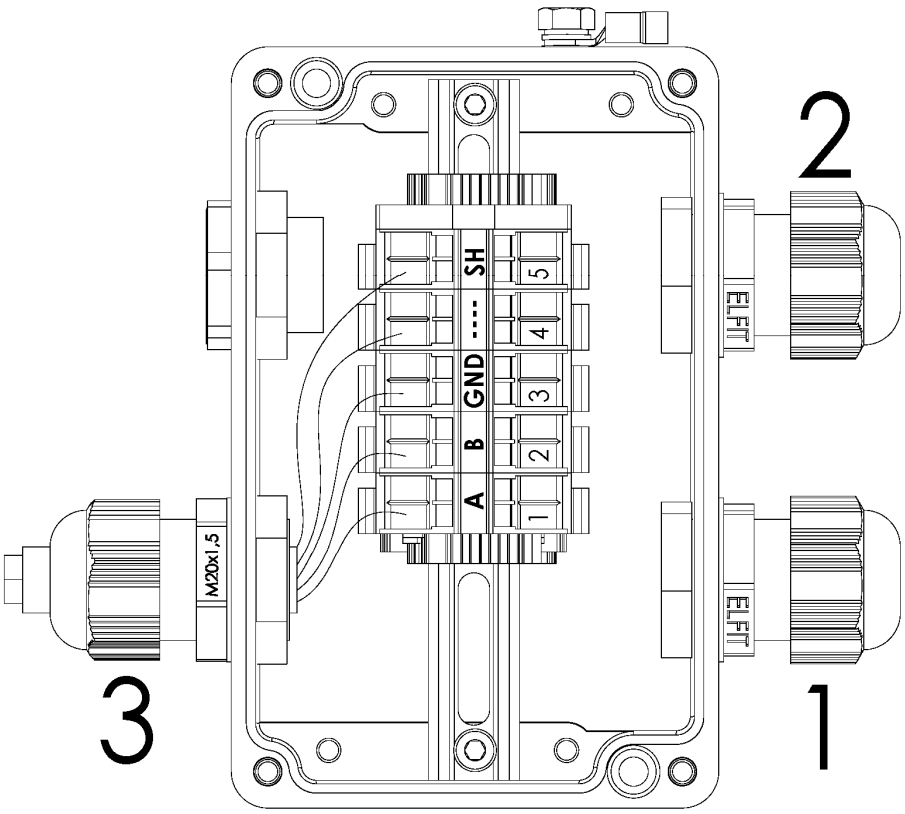
3	**Communication cable for data line (PDE line)** Type: H05VVC4V5-K 5x0.5 Wiring: XS02 <---> dispenser counter box	
SH	shielding	shielding
LL-	low level signal -	black 5
LL+	low level signal +	black 4
GND	signal ground	black 3
B	signal RX	black 2
A	signal TX	black 1

Input

1&2	**Communication cable for data line** Type: H05VVC4V5-K 5x0.5 (recommended) Wiring: XS02 <---> kiosk – service point	
6	shielding	shielding
5	low level signal -	black 5
4	low level signal +	black 4
3	signal ground	black 3
2	signal RX	black 2
1	signal TX	black 1

NOTE *The distribution box XS02 is used for data communicaiton through a current loop with the protocols PUMA LAN (GILBARCO /LOGITRON) and connected probes for controlling the minimum level of fuel in the tank.*

APPENDIX 2.3.9. WIRING OF DATA DISTRIBUTION BOX XS05



Output

3	**Communcation cable for data line (PDE line)** Type: H05VVC4V5-K 4x0.5 Wiring: XS05 <---> dispenser counter box	
SH	shielding	shielding
----	reserved	black 4
GND	signal grounding	black 3
B	signal B	black 2
A	signal A	black 1

Input

1&2	**Sdělovací kabel pro datovou linku** Type: H05VVC4V5-K 5x0.5 (recommended) Wiring: XS05 <---> kiosk – service point	
5	shielding	shielding
4	reserved	black 4
3	signal grounding	black 3
2	signal B	black 2
1	signal A	black 1

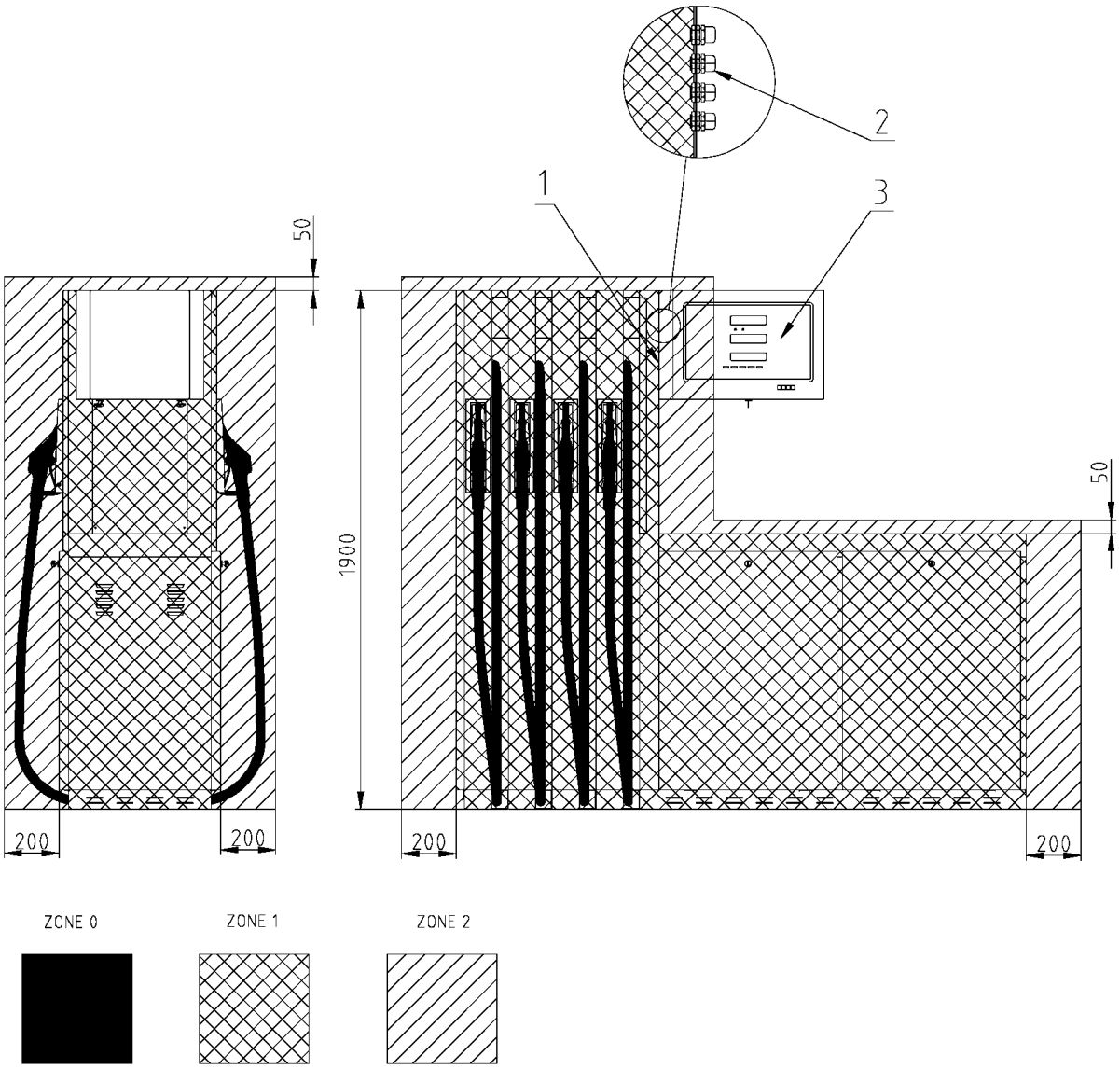
NOTE *The distribution box XS05 is multifunctional. With various descriptions, it can be used for data communication through a current loop with the protocol ER4 (HECTRONIC/KIENZLE) or PUMA LAN (GILBARCO/LOGITRON), or alternately for data communication RS485 with the protocol EASY CALL (BETA CONTROL) or ACTL (AUTOTANK). In all cases, only the terminal clip marking varies.*

NOTE *All distribution boxes RK003/6 and RK002/6 are in the model Ex II 2G Ex e II T6 Gb and have been issued with European Type Certificates FTZÚ12ATEX0152 and FTZÚ02ATEX0021. The maximum load of one connecting pin is 2A/550V with conduit cross-section 0.5 mm^2 or 12A/550V with cross-section 2.5 mm^2. The allowed cross-sections of conduits are between 0.5 and 2.5 mm^2. The length of the uninsulated part of the conduit is min. 9 mm and max. 10 mm. Cable glands M12 x 1.5, M16 x 1.5 or M20 x 1.5 are in the model IP66/68. The description of the connector in the data distribution box depends on the type of the data line. A data line with the PDE protocol is used as a standard.*

APPENDIX 3. DISPENSER ZONES CLASIFICATION ACC. EN 13617-1 & EN 60079-10-1

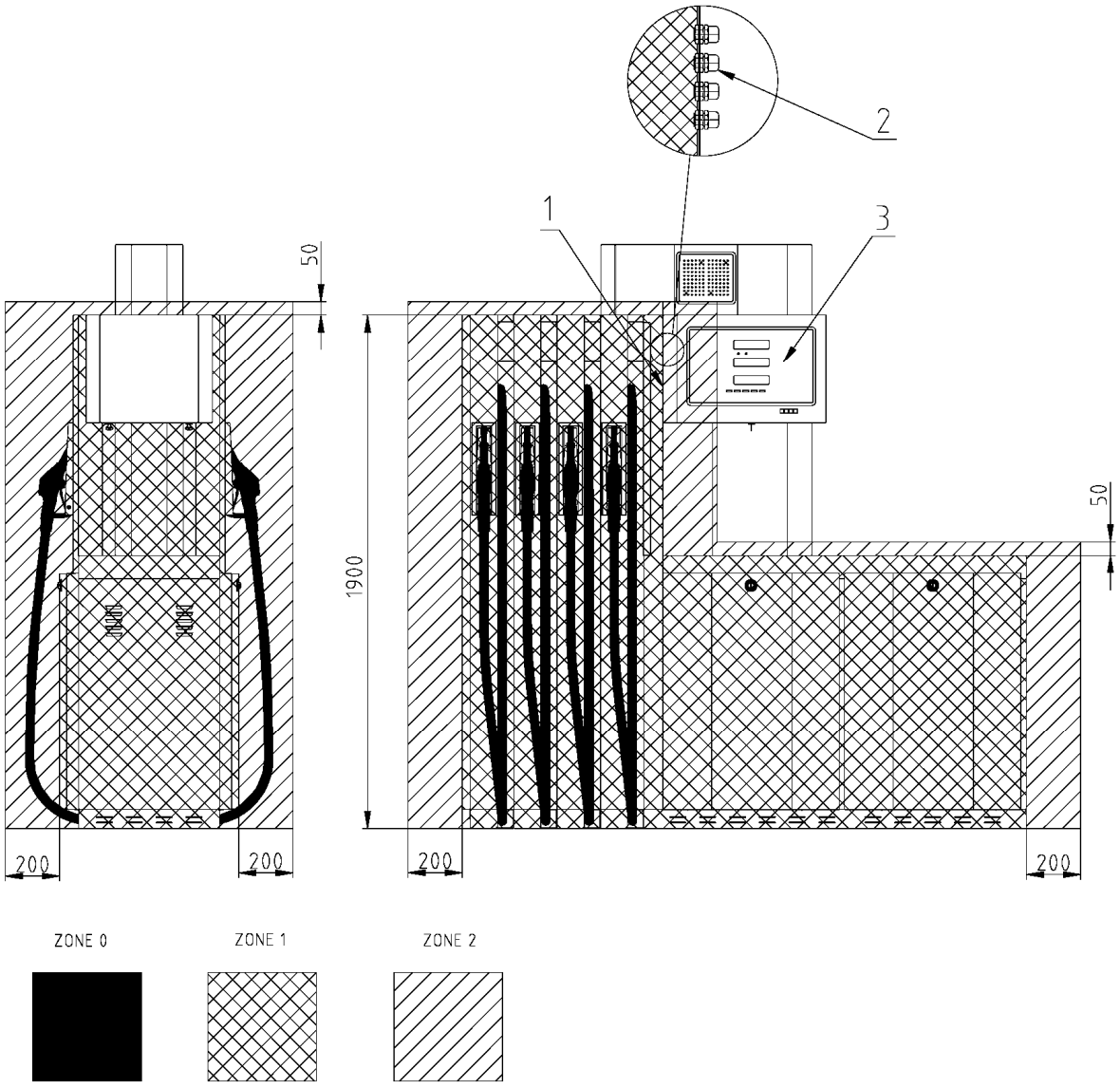
APPENDIX 3.1. OCEAN EURO ZONES

APPENDIX 3.1.1. OCEAN EURO ZONES, BASIC DESIGN



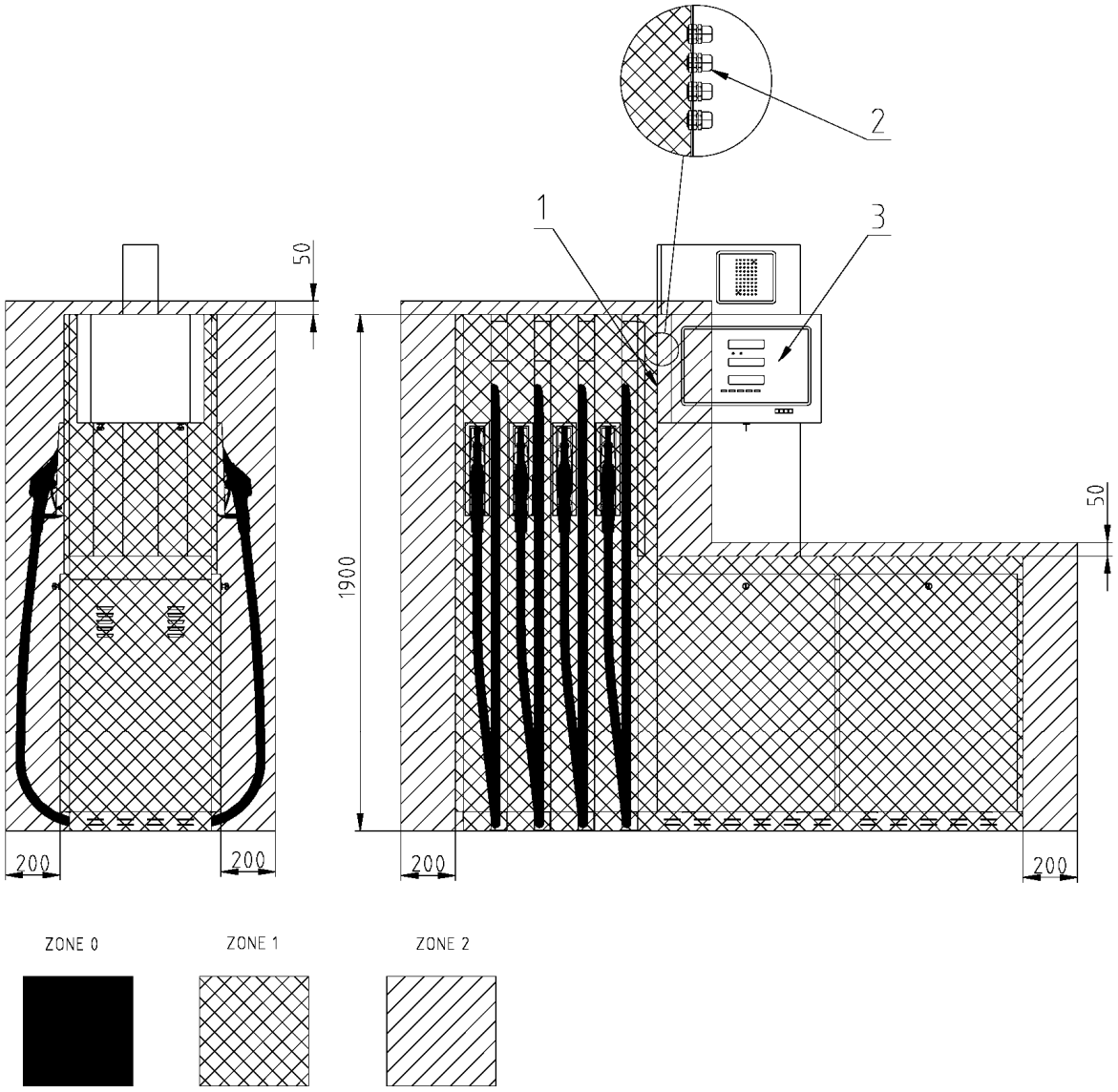
Pos.	Popis/*Description*	Pos.	Popis/*Description*
1	Vertikální přepážka - typ 1 (detail) *Vertical vapour barrier - type 1 (according EN 13 617-1)*	3	Prostor bez nebezpečí výbuchu (IP54) *Non-hazardous area (IP54)*
2	Nevýbušná kabelová vývodka Ex e II (IP67) *Cable bushing Ex e II (IP67)*		

APPENDIX 3.1.2. OCEAN EURO ZONES, DESIGN VARIATION WAVE



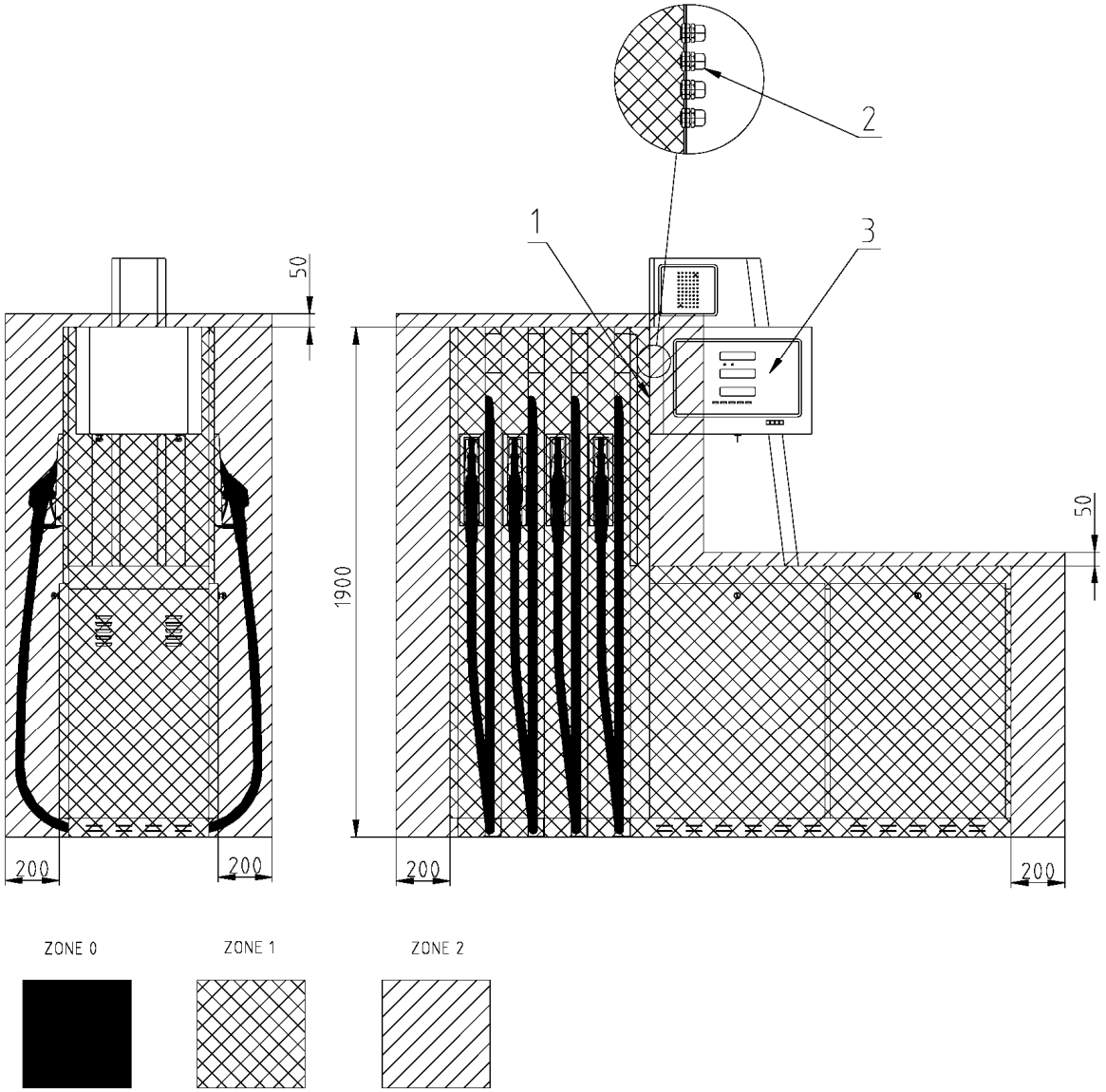
Pos.	Popis/*Description*	Pos.	Popis/*Description*
1	Vertikální přepážka - typ 1 (detail) *Vertical vapour barrier - type 1 (according EN 13 617-1)*	3	Prostor bez nebezpečí výbuchu (IP54) *Non-hazardous area (IP54)*
2	Nevýbušná kabelová vývodka Ex e II (IP67) *Cable bushing Ex e II (IP67)*		

APPENDIX 3.1.3. OCEAN EURO ZONES, DESIGN VARIATION CUBE



Pos.	Popis/*Description*	Pos.	Popis/*Description*
1	Vertikální přepážka - typ 1 (detail) *Vertical vapour barrier - type 1 (according EN 13 617-1)*	3	Prostor bez nebezpečí výbuchu (IP54) *Non-hazardous area (IP54)*
2	Nevýbušná kabelová vývodka Ex e II (IP67) *Cable bushing Ex e II (IP67)*		

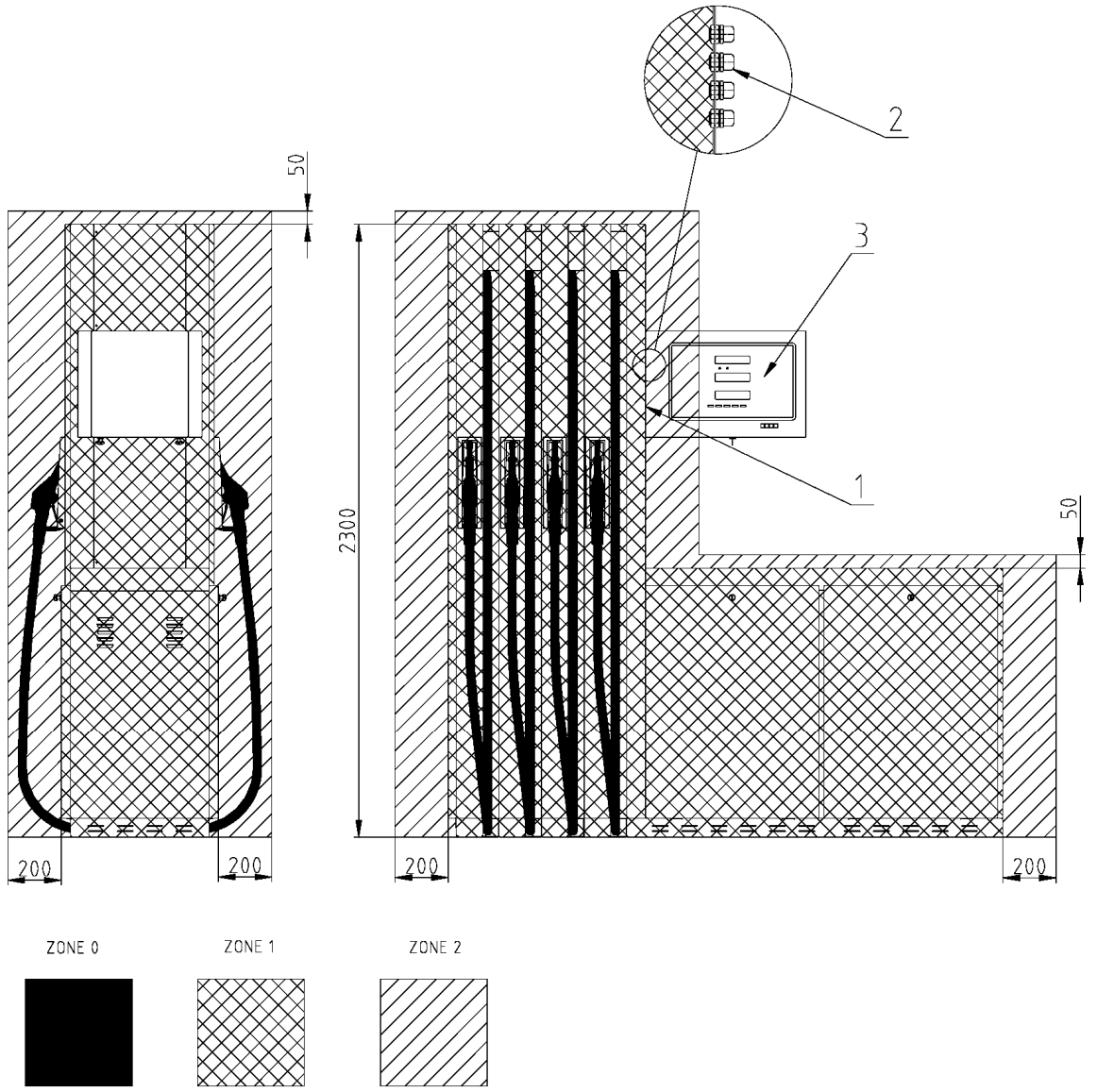
APPENDIX 3.1.4. OCEAN EURO ZONES, DESIGN VARIATION FIN



Pos.	Popis/*Description*	Pos.	Popis/*Description*
1	Vertikální přepážka - typ 1 (detail) *Vertical vapour barrier - type 1 (according EN 13 617-1)*	3	Prostor bez nebezpečí výbuchu (IP54) *Non-hazardous area (IP54)*
2	Nevýbušná kabelová vývodka Ex e II (IP67) *Cable bushing Ex e II (IP67)*		

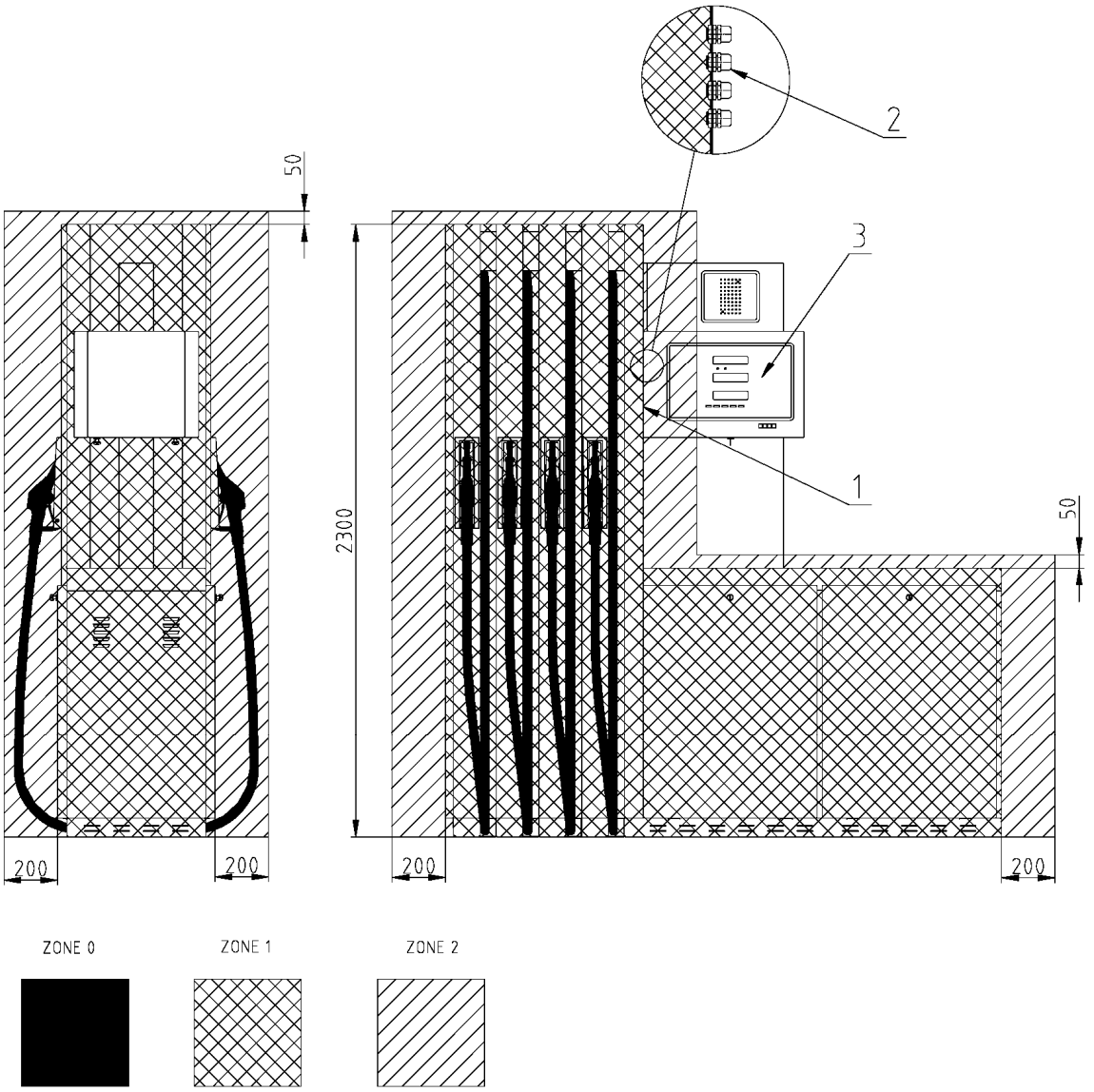
APPENDIX 3.2. OCEAN TALL ZONES

APPENDIX 3.2.1. OCEAN TALL ZONES, BASIC DESIGN



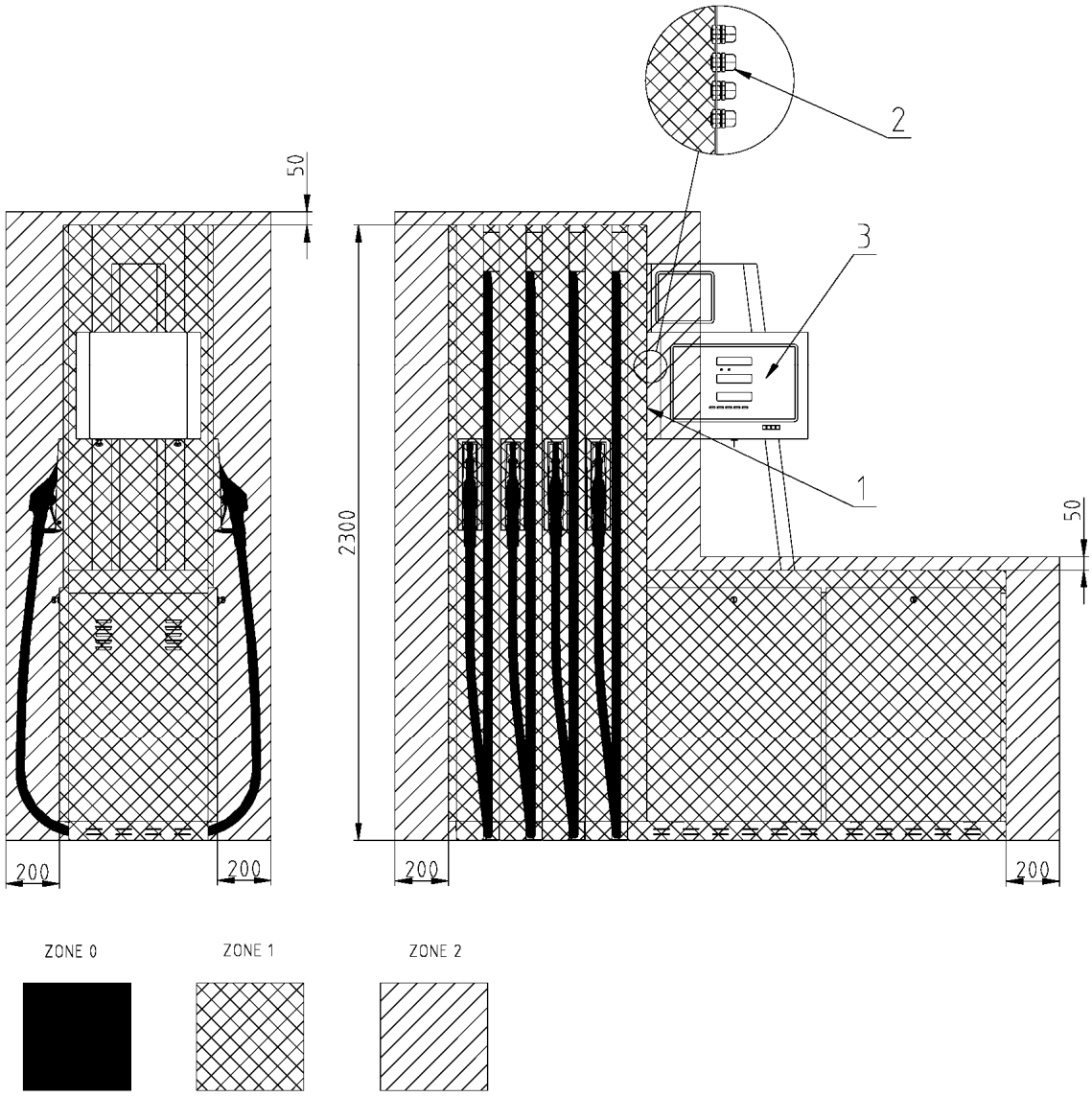
Pos.	Popis/*Description*	Pos.	Popis/*Description*
1	Vertikální přepážka - typ 1 (detail) *Vertical vapour barrier - type 1 (according EN 13 617-1)*	3	Prostor bez nebezpečí výbuchu (IP54) *Non-hazardous area (IP54)*
2	Nevýbušná kabelová vývodka Ex e II (IP67) *Cable bushing Ex e II (IP67)*		

APPENDIX 3.2.2. OCEAN TALL ZONES, DESIGN VARIATION CUBE



Pos.	Popis/*Description*	Pos.	Popis/*Description*
1	Vertikální přepážka - typ 1 (detail) *Vertical vapour barrier - type 1 (according EN 13 617-1)*	3	Prostor bez nebezpečí výbuchu (IP54) *Non-hazardous area (IP54)*
2	Nevýbušná kabelová vývodka Ex e II (IP67) *Cable bushing Ex e II (IP67)*		

APPENDIX 3.2.3. OCEAN TALL ZONES, DESIGN VARIATION FIN



Pos.	Popis/*Description*	Pos.	Popis/*Description*
1	Vertikální přepážka - typ 1 (detail) *Vertical vapour barrier - type 1 (according EN 13 617-1)*	3	Prostor bez nebezpečí výbuchu (IP54) *Non-hazardous area (IP54)*
2	Nevýbušná kabelová vývodka Ex e II (IP67) *Cable bushing Ex e II (IP67)*		