USER´S MANUAL

Instructions for Operation, Maintenance and Installation

Fuel Dispenser with Suction or Pressure Pumping System

ADAST POPULAR
ADAST MINOR

V-line 899x.xxx

CE 1383
1026

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1. INTRODUCTION

The instructions for attendance, maintenance and installation serve the user to gain information on the design, correct attendance, maintenance and safe installation.

The information included in the present instructions are mandatory and the manufacturer does not accept any responsibility for any damage due to their non-observance.

The manufacturer reserves the right to make technical modifications without further notice due to constant product development and improvement.

Keep the instructions accessible to users throughout the dispenser operation!

1.1. Used symbols

Smoking forbidden	Open flame use forbidden	Use of mobile phones forbidden

Warning	Attention! Electrical device	Explosion hazard	Toxic substances

Forklift	Recyclable packaging	Recyclable material - steel	Recyclable material - aluminum

1.2. Marking of important information

ATTENTION!

Failure to comply with the requirements in this table may result in personal injury or death, or extensive property damage.

WARNING!

Failure to meet the requirements in this table may result in personal injury or damage to the dispenser.

NOTICE!

The requirements in this table are based on laws, standards and regulations that deal with the design, installation and operation of dispensers. Failure to meet these requirements may cause a dangerous situation or cause damage to the dispenser.

NOTE

Best practices, techniques, and methods to ensure correct installation, maintenance and operation of the dispenser. Failure to do so may cause damage or poor performance of the dispenser.

1.3. Operating, maintenance and installation instructions

Before installing, putting the dispenser into service or servicing, read this manual. Instructions must be carefully read and understood before any manipulation of the product begins.

Pay special attention to warnings!

This document is a guideline compiled by the manufacturer of the dispenser for users, service personnel and designers.

The information contained in this manual is binding and the manufacturer is not liable for any damages caused by non-compliance.

The manufacturer reserves the right to make technical modifications without further notice due to constant product development and improvement.

NOTICE!

Instructions are an integral part of the product and must be accessible to users throughout the service life of the dispenser!

2. IMPORTANT NOTICE

ATTENTION!

- **The dispenser is a complex device that has to provide a variety of demanding functions.**
- **Prior to commissioning, clean the tanks, piping and clean the fuel. A clogged filter can not be considered as a reason for warranty service.**
- **Must be revised electrical distribution and control correct wiring to prevent electrical shock and ensure the safety of explosion - fuels are flammable liquids I. and II. hazard classes!**

The instructions for attendance, maintenance and installation serve the user to gain information on the design, correct attendance, maintenance and safe installation.

The information included in the present instructions are mandatory and the manufacturer does not accept any responsibility for any damage due to their non-observance.

The dispenser is complicated equipment providing many important functions.

Prior to putting into operation tanks and the piping system shall be cleaned and fuel purity shall be checked. Also el. power distribution and correct wiring shall be inspected to prevent injury by el. current and to provide explosion proofness – fuels are flammable liquids of the 1st and 2nd danger class!

The manufacturer tests each dispenser considering the function, safety and metrology. Each delivery shall include the instructions for attendance, maintenance and installation, EC declaration of conformity and a service book identifying dispenser components. The dispenser, produced with high precision and care, secures reliable and safe operation. Principal safety regulations protecting the user against injury shall be kept during operation and maintenance and the dispenser shall be prevented from damage.

ATTENTION!

No modifications of the dispenser equipment are allowed without producer's written approval!

Important instructions for installation and operation:

a) Study the instructions for attendance, maintenance and installation and other manufacturer's documents included within dispenser accessories before you start to handle the equipment.

b) Check the dispenser delivery completeness and inform the manufacturer immediately in case of any discrepancies or damage.

c) The dispenser shall be stored in a dry and protected room before it is installed at the filling station.

d) Prior to dispenser installation check the completeness of the filling station technology according to the valid design, check the connecting dimensions of the foundation frame including the piping system outlet.

e) Rinse the process equipment (piping) through the filtration equipment until impurities are removed.

f) The dispenser requires the connection of the vapour return piping of min. DIN 16 – we recommend DN 25.

g) Wiring and inspection of the dispenser shall be carried out.

h) When putting the dispenser into operation, proceed according to the point 7 of the present instructions.

i) A metrology authority specialist shall perform function test and metrology checking.

j) Being these conditions fulfilled, after the approval of a state supervision authority and the verification of a metrological office representative, usual operation can be started.

k) Only qualified and trained staff of a service company can perform service and installation. Service procedures shall be performed in compliance with the operation regulations of the filling station. The manufacturer is not responsible for damages due to the incompetence of the staff.

l) The owner can only start dispensing when the filling station inspection is finished and a metrology authority carries out metrological verification of the dispensers.

m) When fuels are pumped, basic hygienical precautions shall be adhered. The owner shall enable the customer to use protective gloves.

SAVE FOR FUTHER USE!

3. USE

Fuel dispensers type series V-line 899x.xxx with electronic counter used for the dispensing of liquid petroleum products - automotive petrol, diesel, kerosene, etc., of alternative liquid fuels (biofuels) - biodiesel (B 10 - B 100) - a mixture of diesel fuel with FAME (Fatty Acid Methyl Ester) and a mixture of automotive petrol with bioethanol (E10 - E 85) (flammable liquids I. to IV. hazard class and group explosivity IIA) with dynamic viscosity up to 20 mPa.s and with flow rate optional 40, 60, 70, 80, 110, 120, 130, 150 dm^3. min^{-1}.

Special modification dispensers type series V-line 89xx.xxx/OIL are determined to dispensing liquid fuels on the base of vegetable oil (rape oil, sunflower oil, soya oil, which are modified for internal combustion in diesel engines) and mineral oils with maximum dynamic viscosity up to 1000 mPa.s and with flow rate optional 40, 60, 70, 80 dm^3. min^{-1}.

They have been designed for the installation at road filling stations and a fleet of vehicles, etc.
By means of a communication line the dispensers are connected to the control system of self-service operation or serviced operation.

The dispensers are equipment with special requirements concerning safety, metrology and ecology.

The dispensers are equipped to exhaust vapours; thus ecological operation of filling stations is provided, i.e. the prevention of harmful petrol vapours leakage into atmosphere.

ATTENTION!

The V-line 899x.xxx dispensers and their hydraulic system must not be used to dispense other than the manufacturer's specified liquid fuels without the manufacturer's approval!

ATTENTION!

The dispenser shall not be installed in an explosion danger zone 0, 1, 2 in compliance with zones specified in the EN 60079-10-1!

3.1. The environment of use

The dispenser has been designed for outdoor installation	
Environmental class	H3 according to OIML D11 - outdoor - stationary (natural environment with the exception of those which are in extreme climatic zone conditions such as polar and desert environment.
Machanical class	M 2 - with ADPxxx electronic calculator
	M 1 - with CDC electronic calculator
Elektromagnetická třída	E 2 - with ADPxxx electronic calculator
	E 1 - with CDC electronic calculator
Humidity	Condensing

3.2. Marking of liquid fuels

Marking of liquid fuels on fuel dispensers according to EN 16942 "Fuels - Identification of vehicle compatibility - Graphical expression of information for consumers".

3.2.1. Gasoline-type fuels

"E" stands for specific biocomponents (ethanol) present in petrol (5 % bio-components - bioethanol):

"E" stands for specific biocomponents (ethanol) present in petrol (10 % bio-components - bioethanol):

"E" stands for specific biocomponents (ethanol) present in petrol (85 % bio-components - bioethanol):

3.2.2. Diesel-type fuels

Diesel fuel according to EN 590 + A1:2018 (7 % of bio-components – FAME):

Diesel fuel according to EN 590 + A1:2018 (10 % of bio-components – FAME):

Diesel fuel according to EN 590 + A1:2018 (20 % of bio-components – FAME)

Diesel fuel according to EN 590 + A1:2018 (30 % of bio-components – FAME):

FAME according to EN 14214+A1:2014 (100 % bio-components - FAME):

4. INSTRUCTIONS FOR THE SAFETY OF WORK

ATTENTION!

Any handling open flame is prohibited during fuel filling and smoking is prohibited even in vehicles interior. Also filling vehicle tanks with running motor and any other activities possibly initiating explosion are prohibited!

4.1. Safety of the equipment design

<u>The manufacturer guarantees safety of the equipment design.</u> **The dispenser design complies with the EN 13617-1 requirements and it is homologated for the operation in environment specified by Ex II2G IIAT3 symbols shown on the dispenser plate.** **Considering operation safety in environs with explosion danger the dispensers have been EC - type examination (certification) according to the Annex III of the Directive 2014/34/EU - ATEX by an authorised body FTZÚ, Pikartská 7, 716 07 Ostrava - Radvanice - Notified body no. 1026.** **EC - Type Examination Certificate: No. FTZÚ 05 ATEX 0185**
Regular inspection of production quality assurance according to Annexes IV and VII of the Directive 2014/34/EU executes FTZÚ, s.p., Ostrava - Radvanice, Notified body no. 1026. **Notification of quality assurance: No. FTZÚ 02 ATEX Q 020.**
Considering legal metrology the dispensers have been EC - type examination (certification) according to the Annex B of the Directive 2014/32/EU - MID by an authorised body Český metrologický institut, Okružní 31, 638 00 Brno - Notified body no. 1383. **EC - Type Examination Certificate: No. TCM 141/07 - 4505**
The producer performed a conformity examination for the fuel dispenser with the type described in EC - Type Examination Certificate No. TCM 141/07 - 4505 and technical requirements according to the Directive of European Parliament and the Council 2014/32/EU. **The producer is competent for "The Declaration of Conformity" with the type based on production quality assurance of measuring units according to the Directive Supplement D of European Parliament and the Council 2014/32/EU.** **Certificate of the Quality Management System for production, check-out and testing:** **No. 0119-SJ-C007-07.**
Regular inspection of production quality assurance, check-out and testing according to the Directive Supplement D of European Parliament and the Council 2014/32/EU executes authorised body Český metrologický institut, Okružní 31, 638 00 Brno - Notified body no. 1383.

4.2. Operation safety

NOTICE!

- **The owner is responsible for the filling station operation and is obliged to follow the course of fuel pumping. In case a customer uses the dispenser incorrectly, the owner shall instruct him about proper use.**
- **The owner shall also identify the hazard zone of the filling station by warning symbols (smoking prohibited, open flame prohibited, direction of arrival to dispensers, etc.).**
- **Operation regulations of the filling station shall be accessible for the customer, which enables him to get information on principal obligations.**

Operator's obligation:

– Keep the equipment in safe and proper condition.
– Follow the operation regulations and attendance instructions of the filling station.
– Report immediately any failure to the owner and put the equipment out of operation in case of delay.
– Keep order permanently.
– The dispenser and storage tank operators are not allowed to repair the equipment and to reset any safety valves.

Performance of service work is a special case. **Servicemen are not allowed to break operation safety during repairs and other activities.** When dispenser covers are removed, they shall be very careful to protect both them and customers against injury.

El. current supply shall be disconnected when handling el. components. Only approved components shall be used to replace any parts.

All parts subject to approval shall be always in conditions required by the technical documentation (leakproofness, earthing, electrostatic belts, electrostatically conductive filling hoses, etc.).

4.3. Ecological safety

In accordance with the **„DIRECTIVE 2009/126/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 October 2009 on Stage II petrol vapour recovery during refuelling of motor vehicles at service stations"**must be filling station for dispensing gasoline equipped according to the national legislative regulations of the country of destination (installation and operation of fuel dispensers) Decree recovery system (reverse drain stage II petrol vapor - Equipment recuperate (consultation draft) petrol vapor displaced from the fuel tank of a motor vehicle during refueling and carrying gasoline vapors to the storage tank at the service station.

IMPORTANT NOTICE!

Terms of service stations and control petrol vapor recovery system stage II is drived by the "Directive 2009/126/EC of the European Parliament and Council" and the relevant national legal regulations in force in the countries of destination (installation and operation of fuel dispensers).

Fuel dispensers ADAST V-line 899x.xxx for dispensing of petrol are equipped with an efficient recovery system (reverse exhaust vapor) that meets the requirements of the "Directive 2009/126/EC of the European Parliament and Council": Volumetric efficiency of vapor recovery shall be between 95-105% - the rate of the volume of recovered vapor at atmospheric pressure to total dispensed gasoline into the fuel tank of a motor vehicle is equal to or greater than 0,95 but less than or equal to 1,05.

4.3.1. Check of petrol vapor control system – by the Directive 2009/126/EC

Check of petrol vapor recovery system Stage II at the dispenser shall be in accordance with Directive 2009/126/ES under the relevant national legislation and regulations applicable in the countries of destination (installation and operation of fuel dispensers).

Regular checks under Directive 2009/126/EC

1. **Checking the operating efficiency of petrol vapor recovery system Stage II must be performed at least once per year. Checks whether the ratio is the ratio of the volume of paid vapor at atmospheric pressure to the total volume of gasoline fished into the fuel tank of a motor vehicle is equal to or greater than 0,95 but less than or equal to 1,05.**
2. **If the dispensers installed automatic monitoring system, the efficacy of petrol vapor recovery stage II tested at least once every three years. Any such automatic monitoring system shall automatically detect faults in the proper function of petrol vapor recovery system Stage II and in the automatic monitoring system, indicate faults to the service station and automatically stop the flow of petrol from the faulty dispenser if the fault is not rectified within seven days.**

IMPORTANT NOTICE!

All fuel dispensers used for dispensing gasoline must be equipped with clearly labeled, indicating the need for customers to fully insert the nozzle into the filler neck of the vehicle tank.

Check of petrol vapor recovery system Stage II at fuel dispensers ADAST POPULAR V-line 899x.xxx.

To check the operating efficiency of petrol vapor recovery system Stage II are two procedures:

1. **Procedure for dispensers where the pump driven by an electric pump without electronic control system vapor recovery:**

   The test is performed for pumping petrol into a suitable volumetric container at 50% and 100% of the nominal flow of petrol. Measuring the effectiveness of this system is carried out solely for the purpose meter designated as a special meter Bürkert G4-RF1 connected to the suction nozzle attachment with a universal connector UMAX 2 companies ELAFLEX).

2. **Procedure for dispensers with electronically controlled petrol vapor recovery system Stage II, which allows to perform the test without using gasoline:**

   The test is carried out so-called "dry way" apparatus approved for this purpose - eg special meter Bürkert G4-RF1 connected to the suction nozzle attachment with a universal connector UMAX 2 companies ELAFLEX). Gas meter Bürkert G4-RF1 is via pulse output is connected through a special cable to enter the electronic counter. Linking meter counter and must be done at a gas station through the reduction of RP/M/EX, which contains zener barrier for intrinsic safety.

4.4. Hygiene

The dispensers are hygienically harmless for customers and the owner. But protective gloves are advised to be used during maintenance or filling fuel. In case skin comes to contact with fuel or impurities, wash the spot with water and soap as soon as possible. When eyes come to contact, medical treatment is necessary. Do not inhale harmful vapours when filling fuel.

5. DESCRIPTION

The fuel dispensers V-line 899x.xxx with electronic counter are used to the dispensing of liquid oil products (inflammable liquids the I. to IV. of danger class.

These dispensers enable one-sided or two-sided simultaneous output of 1 or 2 kinds of products.

With respect to the application the dispensers of the V-line 899x.xxx type series are supposed to be installed at the following filling stations:

- **V-line 899x.xxx/S – for filling stations with the suction system of pumping**
- **V-line 899x.xxx/P – for filling stations with central pressure distribution system**

Fuel dispensers **V-line 899x.xxx/S** are in the suction design with own pumping aggregate in the fuel dispenser for each product.

Fuel dispensers **V-line 899x.xxx/P** are in the pressure design for central pressure system which is made by the help of submersible pump in the storage tank of the filling station.

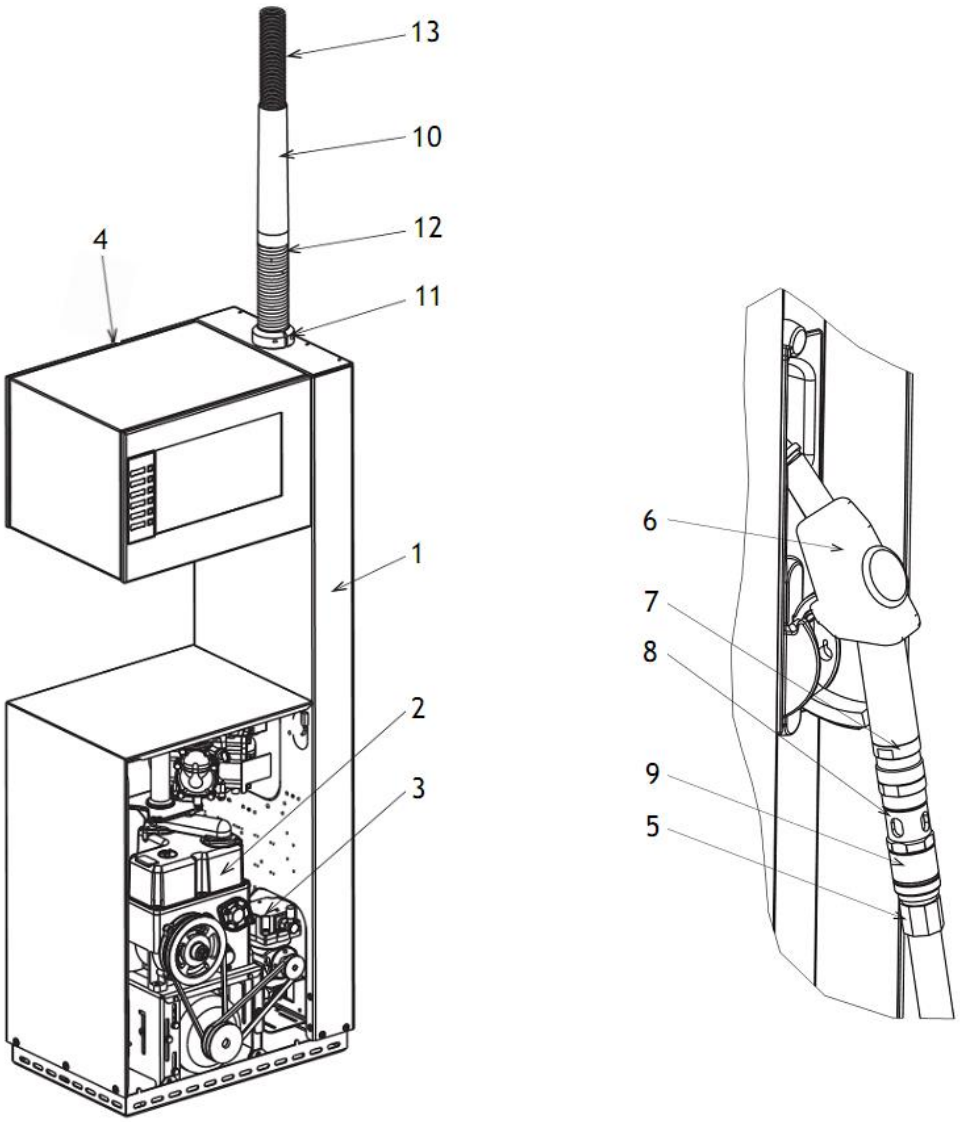
The dispensers have been designed for the installation at road filling stations and a fleet of vehicles, etc. By means of a communication line the dispensers are connected to the control system of self-service operation or serviced operation (V-line 899x.614 dispensers fitted with mechanical counter can only be operated in service mode).

V-line 899x.xxx/S, V-line 899x.xxx/P fuel dispensers are designed as self-contained sectional contruction.

Two-space body is designed in the 3 styl variants – with one column for one product or with two columns for two products, 3. modification is two-space body without column. A special modification with one-space body is determinated for metering unit with the mechanical counter.

Construction of V-line 899x.xxx fuel dispensers consist from following basic modules:

Position number	Name of the part of dispenser V-line 899x.xxx
1	Skeleton
2	Integrated hydraulic unit
3	Vapour recovery system
4	Control electronic
5	Dispensing hose ADAST, ELAFLEX, GOODYEAR, TRELLEBORG
6	Dispensing nozzle ELAFLEX, OPW , ABR, RAKORD
7	Safety Swivel Break ELAFLEX, OPW
8	Sight glass ADAST, ELAFLEX
9	Reducer
10	Transit socket
11	Safety socket
12	Spring
13	Spring



5.1. Skeleton

Skeleton – a self-supporting structure consisting of parts with high anticorrosive resistance. The base of the dispenser is made of steel sheet, zinc-coated and varnished. Internal parts of the skeleton are made of galvanised sheet. Parts of the body with the exception of the door of the hydraulic module and the electronic counter case are made of stainless brushed sheet as a standard.

High resistance acrylurethane enamel is applied on the hydraulic module door and the electronic counter case. The colour shade of the door including the logo can be optional.

Both doors are lockable; being unlocked, swing out and with earth wire disconnected they can be removed and thus the hydraulic part is accessible. Connect the earth wires when the door is fitted back. A junction box is built-in into the supporting column and is accessible after dismounting the side cover of the column.

5.1.1. Case of the electronic counter

A case of the electronic counter or ADAMAT electronics is bolted to the column. The counter case space is closed with lockable covers. The covers are provided with transparent glass. Indicators with integrated large-area display of dispensed volume, total price, price for one unit and unresetable electromechanical total counters (totalizers) are connected from the case interior to the covers. The set of these elements represents all necessary information for the customer.

The covers of the case are hung up on hinges enabling tilting upwards after unlocking and thereby easy access in the case interior. The user's local preselection keyboard (if required) is located on the case cover as well - an independent keyboard for each dispensing point.

5.1.2. Case of the electronic counter – design 2017 (see fig.)

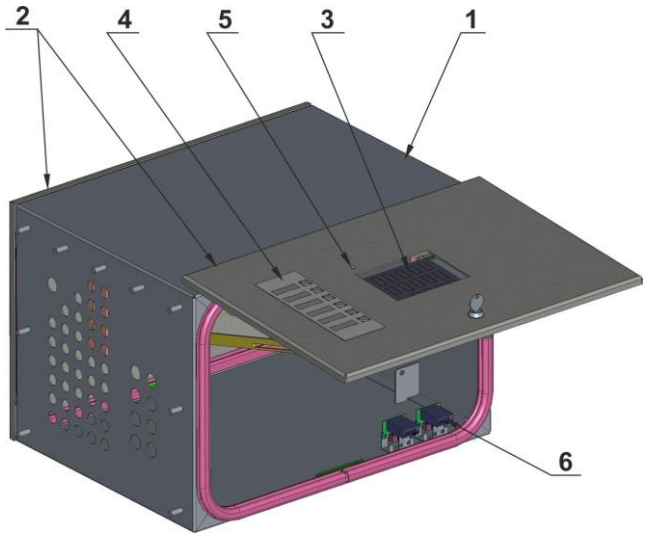
A case (1) of the electronic counter or ADAMAT electronics is bolted to the hose module column. The counter case space is closed with lockable covers (2). The covers are provided with transparent glass.

On the inside cover of the case is mounted under glass large-area display (3) issued volume and total price, which displays all necessary information for the customer.

Above the display is placed IR sensor (5) for controlling and adjusting the dispenser calculator manager or servicing keyboard.

On the outer side of the case cover is placed (optional) keyboard local user preferences (4) - an independent keyboard for each dispensing point.

On request they can be built in a case unresetable electromechanical total counters – totalizers (6), which are accessed by opening the cover.



ATTENTION !

Before opening the covers, it is always necessary to disconnect power to the dispenser and perform a reliable hedge against its re-connection.

The dispensing nozzles are seated in covers in the „V" form pressed shape of the column. When the dispenser is out of operation the dispensing nozzles in covers can be locked.

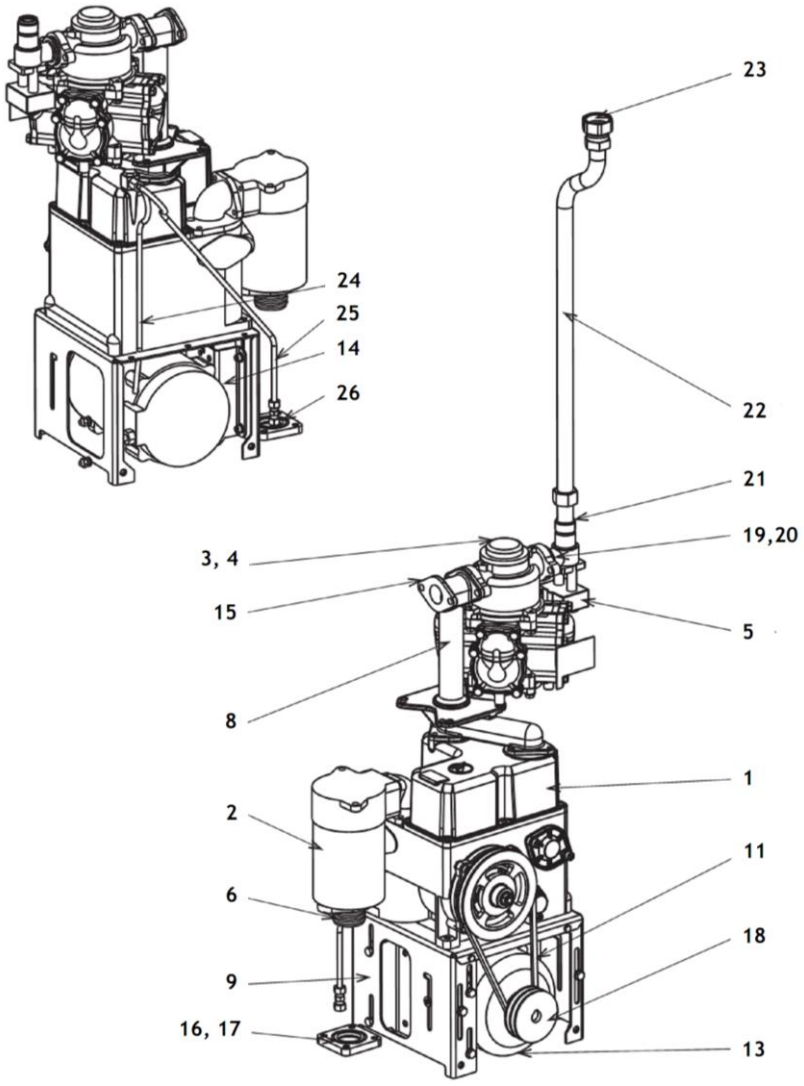
5.2. Hydraulic system of the fuel dispenser

The integrated hydraulic unit consists from following basic modules:

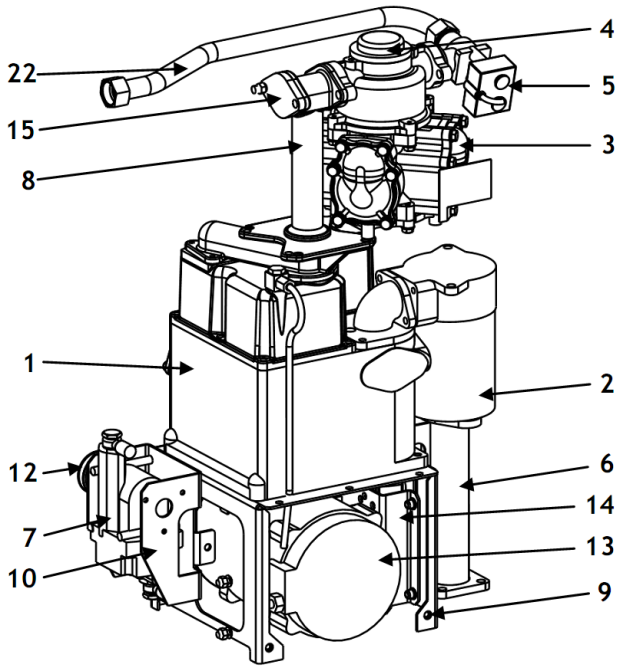
Position number	Name of the part of the integrated hydraulic unit - dispenser V-line 899x.xxx/S
1	Pumping monoblock ADAST P64x.50 or P64x.100
2	Filter
3	Four-piston all-aluminium meter and an integrated magnetic pulse transmitter ADAST M 403.25P, M 403.32P, M 403.25EP, M 403.32EP, 403.25P/1, M 403.32P/1, M 403.25EP/1, M 403.32EP/1
4	Magnetic pulse transmitter Eltomatic ME 01-05 or ME 01-05-05 or METRA MTX 075 or ADAST 40
5	Electromagnetic proportional valve or ON/OFF valve
6	Connection piece 250-CP
7	Vacuum pump
8	Tree-weldment - joining piece
9	Monoblock bracket
10	Vacuum pump bracket

11	V-belt ELECTROOIL of Pumping monoblock
12	V-belt ELECTROOIL of Vacuum pump
13	Electric motor Motor bracket
14	Motor bracket
15	Blind flange
16	Flange PS G 1 ½"
17	Ring NBR 70 50 x 3
18	Belt pulley
19	Valve flange
20	Safety ring
21	ELAFLEX Gasket VD 33/24
22	Tube – assy MONO
23	ELAFLEX Gasket VD 42/29
24	Deaeration tube
25	Deaeration tube
26	Coupling DN 8

Hydraulic system of the fuel dispenser V-line 899x.4x2



Hydraulic system of the fuel dispenser V-line 899x.6x2



The integrated hydraulic unit consists of a pumping monoblok (pos. 1) with an integrated large-surface filter (pos. 2), a meter (pos. 3) with integrated magnetic pulse transmitter (pos. 4) connected with the pumping monoblok (pos. 1) through a special joining piece (pos. 8) and a driving el. motor (pos. 13) of the pump.

Pumping monoblock type series P 64x.xxx/x (pos. 1) – is an independent unit for one kind of the pumped fuel. An integrated compact structure contains an efficient filter (pos. 2), sliding vane pump, control and non-return valves, safety relief valve with continual control of the operating pressure, cyclone (centrifugal) gas separator and a venting chamber with a float valve. Progressive design provides 100 % separation of gaseous components and automatic blocking of filling when excessive amount is identified in the product pumped.

The large-surface filter with an integrated non-return valve and standard filtration efficiency 30 µm for petrol and optional 30 µm or 60 µm for Diesel oil (winter operation in extreme low temperatures).

The pumped liquid passes through the filter (pos. 2) and the non-return valve to the pump and the separator where gases and vapours are separated and pass to the float chamber. Condensed liquid is discharged to the suction part of the pump and gases are exhausted to the vented part of the dispenser base. The liquid is discharged from the non-return valve to the meter (pos. 3), then through an electromagnetic valve (pos. 5) into the dispensing hose with a dispensing nozzle at its end. The dispensing nozzle lever controls the rate flow. A tube sight glass can be installed between the dispensing hose and the nozzle for visual checking.

A three-phase asynchronous motor (pos. 13) drives the pump by means of an antistatic V-belt (pos. 11).

Special modifications of the pumping monoblok of P 64x.xxx/x/BIO series is intended to measure the volume of biofuel - a mixture of automotive petrol with bioethanol (E10 - E 85).
It has a special surface protection, which ensures their high resistance against aggressive biofuels.

Dispensers V - line 899x.xxx/P series (pressure design) differ from suction dispensers because they are not equipped with the pumping monoblock. A safety breaking valve shall be fitted in the connection. The valve prevents fuel leakage in case of the dispenser damage. This valve is not a part of the dispenser, as well as the pump, which is located in the underground tank. The pressure dispensers are equipped with an inlet spherical valve for closing the liquid input in case of repairs.

The pumped liquid is supplied from the central submerged pump located directly in the fuel storage tank through the safety breaking valve, spherical check valve and the filter with filtering property of 30 µm for petrol and 30 or 60 µm for Diesel oil. Liquid is discharged from the filter through the meter and the electromagnetic valve to the dispensing hose with the dispensing nozzle at its end. The dispensing nozzle lever controls the rate of flow. The tube sight glass can be fitted between the dispensing hose and the nozzle for visual checking.

Meter type series M 403xxxx/x is composed of a four-piston all-aluminium meter and an integrated **magnetic pulse transmitter**. **The original meter ensures metering accuracy within a wide range of flow rates 4 - 150 $dm^3.min^{-1}$ and fuel operating temperatures -20 °C to +50°C (-10 °C to +50°C for biodisel B 70 to B 100) and ambient temperatures -40 °C to +60°C for nominal pressure up to 0,32 MPa**. The new design made of special materials considerably improves the accuracy and reliability. The universal design for both mechanical and electronic calibration is an advantage. A two-channel integrating impulse generator is a part of the meter. The number of impulses is proportional to the swivelling angle of the shaft and the runoff volume of fuel.

The impulser generates 2 x 100 impulses per 1 dm^3. The meter is electronic calibrated by an el. meter processor with the help of the service keyboard.

Meters are supplied with optional integrated magnetic pulse transmitter Eltomatic ME 01-05 or ME 01-05-05 - type designation M 403.25P, M 403.32P, M 403.25EP, M 403.32EP or with a magnetic pulse transmitter METRA MTX 075 or ADAST 40 - type designation M 403.25P/1, M 403.32P/1, M 403.25EP/1, M 403.32EP/1.
Special modifications to the type of meters M 403.25xP/B, M 403.25xP/B/1, M 403.32xP/B, M 403.32xP/B/1 is intended to measure the volume of biofuel - a mixture of automotive petrol with bioethanol (E10 - E 85).
Meters with the designation /B have special surface protection, which ensures their high resistance against aggressive biofuels.
Meters with the designation of EP in electronic calibration, indicating P mechanical calibration

For the pumping of biodiesel (B 10 - B 100) - a mixture of diesel fuel with FAME (Fatty Acid Methyl Ester) fully complies with standard hydraulic system of the dispenser!

Electric motors - el. motors 0,75 kW, 1,1 kW are used in the V-line 899x.xxx/S suction dispensers.

El. motors 0,37 kW, or 0,18 kW h for vapour exhaustion are used in the V-line 899x.xxx/P pressure dispensers.

The number of the pumping monoblocks, meters and el. motors is specified according to the dispenser type.

Dispensing hoses - single and coaxial dispensing hoses meet the requirements of the **EN 1360.** The dispensing hose is located in a cover, which ensures the safekeeping of the hose when the dispenser is out of operation. Depending on the dispenser type the dispensing hose is anchored either in a spring hinge or in a special angle piece at the dispenser side.

For pumping biodiesel (B 10 - B 100) - a mixture of diesel fuel with FAME (Fatty Acid Methyl Ester) must use a special hose for biodiesel - Elaflex Slimline BIO!!

Dispensing nozzles - are supplied according to the Client's option. The nozzles are automatic, fitted with a swivelling joint and an effective STOP system used in case of the tank overfilling or in emergency situation. The nozzles can be fitted with safety disconnecting joints according to the Client's option. The dispensing nozzle is hung in the nozzle cover and it is lockable when the dispenser is out of operation**. Dispensing nozzles meet the requirements of the EN 13012.**
For the dispensing of vegetable and mineral oils are used nozzles without the "STOP" function of the main valve.

The dispensers are equipped with **electromagnetic (solenoid) valves ON/OFF** (double stage)**, or electromagnetic proportional valves as a standard.**

5.3. Electronics

The dispenser control shall meet the exacting requirements of simplicity and convenience and depends on the hanging up and lifting of the dispensing nozzle.

ADP1/T, ADP2/T, ADP1/L electronic counter of an up-to-date design with central processor board equipped with a high efficient microprocessor. The configuration of the counter and its modes of operation are adjusted by more than seventy parameters. The counter is provided with a self-diagnostic system. The counter outlets control the motors, valves, signalling circuits and vapours exhaustion. The electronic counter processes the impulses coming from the impulse sensor and transmits them to the display, which displays the dispensed volume, its price and a price per a volume unit. In case of power failure or voltage drop the data displayed remain for 30 minutes at least.

Counters ADP1/T, ADP2/T, ADP1/L are standardly equipped for electronic meter calibration **(Electronic Calibration of Meters – EC)** and per request by **ATC – (Automatic Temperature Compensation)**

Electronic Calibration of Meters (EC) enable to correct measured volume by designed declination in operation range -5,00 % to +5,00 % of recognised meter non accurancy by step of 0,05 %.

Automatic Temperature Compensation (ATC) is designed to compensate temperature expandity of dispensed medium based on measured temperature during dispensing. For temperature measuring is used approved certified temperature sensor – **resistance temperature sensor PT 100**, in fuel dispensers V-line 899x.xxx/S build in entering angle to pumping monoblock and in fuel dispensers V-line 899x.xxx/P build in pipeline after the filter unit.

Calibration tablets for ATC on designed medium (type of fuel) can be integrated into SW of electronic counter by customer request. Setting of calibration EC or ATC is provided by using of service keyboard KL-SERINF and setting of proper calibrating switches DIP on body of electronics counter as per instructions described in manual of electronic counters ADP1/T, ADP2/T, ADP1/L.

Providing of calibration is allowed to authorised person, only. The DIP calibration switches must be fixed by plomb after calibration finish.

Displays: LCD type with BACK LIGHT illumination

LCD displays with BACK LIGHT DISPLAY (BLD) **illumination** are used especially for their good readability. The duration of data holding on the display after supply voltage failure is 30 minutes at least. Decimal point on BLD display devices is represented automatically in accordance with the setting of parameters.

Lighting

LED diodes are used for the illumination of displays at dispensers.
ON / OFF switching of the illumination is automatically carried out with the activation of electronics.

Totalizer: non-resetable electronic counter of dispensed volume and its price – 11 digits – or non-resetable electromechanical counter of dispensed volume – 7 digits.

Electronic counter of ADP1/T, ADP2/T, ADP1/L series operates with a 2-channel impulse generator producing 2x 100 impulses per 1 dm^3. The HW and SW counters of the ADP1/T, ADP2/T, ADP1/L series enable high metering accuracy and the application of the electronic calibration using the 2-channel impulse generator.

The local electronic preselection system in IP67 design is integrated into the cover of the counter case. The preselection enables the Customer's preselection of the exact volume or the price of the product to be dispensed. The two-stage or proportional electromagnetic valves ensure the closing of flow and exact dispensing of the preselected volume and smooth initiation of dispensing.

The fuel dispensers can be equipped with ADAMAT filling automatic equipment – payment terminal. This equipment enables dispensing and payment of the product by means of contactless, magnetic and chip cards including receipt printing and this equipment undertakes simultaneously all functions of the dispenser electronic counter for non-public and public dispensing. The electronics of the filling automatic equipment can be complemented by the ADP1/T, ADP2/T, ADP1/L electronic counter with public dispensing.

The fuel dispenser is connected through a communication line to the control system, which controls the operation of the whole filling station (releasing of dispensers, volume preselection, unit price variation, self-diagnosis, etc.). The dispensers can be operated even at the filling stations without any control system – i.e. in serviced operation.

Circuit diagrams for the connection of individual dispenser types to the switchboard of the filling station – see enclosures.

5.3.1. Communication to the control system

The dispensers are equipped with ADP1/T, ADP2/T, ADP1/L electronic counters, which are able to communicate to POS Win control systems. A communication serial interface RS 485 or a communication standard IFSF LON are used for the communication of electronic counters to the superior control system. Communication to different control systems shall be consulted with the manufacturer of the dispensers in advance.

The fuel dispensers connected to the control system can be operated in the mode of volume preselection or the financial sum preselection from the control system (**the dispensers have to be equipped with two-stage or proportional electromagnetic valves**).

The POSWIN control system (POS Win EURO) enables the process control and the sale of goods according to stock cards (999 999 items in 99 groups) including storage facilities. The control systems communicate with the dispenser on the principle of the bus interface RS 485. They combine the basic functions of the filling station, i.e. sale of fuels, sale of dry goods and their filing. The POS system is also able to operate even as a multi-cash one, i.e. its individual parts can be interconnected in the communication SW network, two backoffices and three tills, if more than five backoffices or tills are connected, a server has to be included.

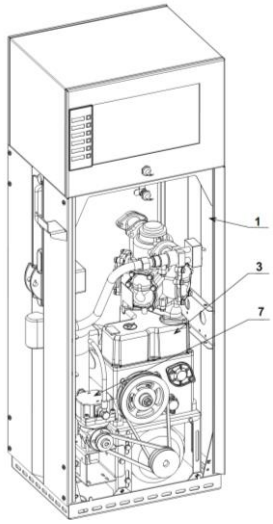
5.4. Vapour recovery system

Fuel dispensers ADAST POPULAR type line V-line 899x.xxx are supplied in the following modifications of petrol vapor recovery systems :

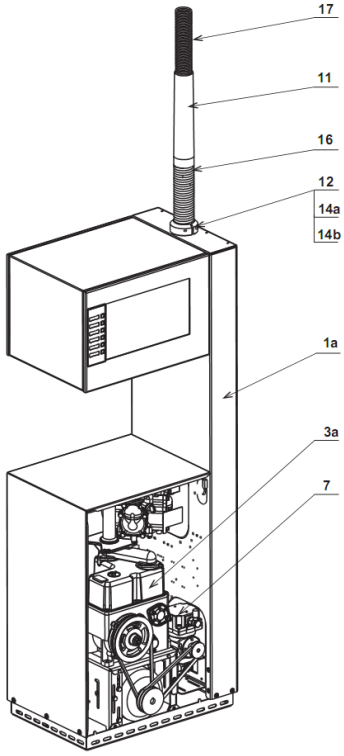
1	System VRC-M	Vapour Recovery Control – Mechanical - control the flow of vapor by hydromechanical proportional valve integrated into nozzle (Elaflex).
2	System VRC-E	Vapour Recovery Control – Electronic – control the flow of vapor through the proportional solenoid valve directly controlled by an electronic control unit dispenser (single-chip microcontroller electronic counter).
3	System VRC-M + VRMS	System VRC-M with automatic control system – VRMS (Vapour Recovery Monitoring System). **VRMS system independently monitors system VRC-M - detect faults in the proper function recovery system Stage II petrol vapor and VRMS system itself, indicate faults to the service station and automatically stops the flow of petrol from the faulty dispenser (dispensing areas), if the fault is not rectified within seven days.**
4	System VRC-E + VRMS	System VRC-E with automatic control system – VRMS (Vapour Recovery Monitoring System). **VRMS system independently monitors system VRC-E - detect faults in the proper function recovery system Stage II petrol vapor and VRMS system itself, indicate faults to the service station and automatically stops the flow of petrol from the faulty dispenser (dispensing areas), if the fault is not rectified within seven days.**

5.4.1. Description of vapour recovery system

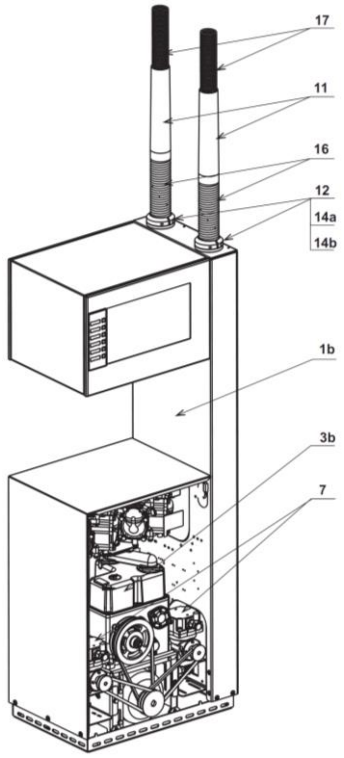
Pic.1



ADAST MINOR V-line 8991.623



ADAST POPULAR V-line 8991.423



ADAST POPULAR V-line 8995.423

Pos. 7 – vapour recovery system

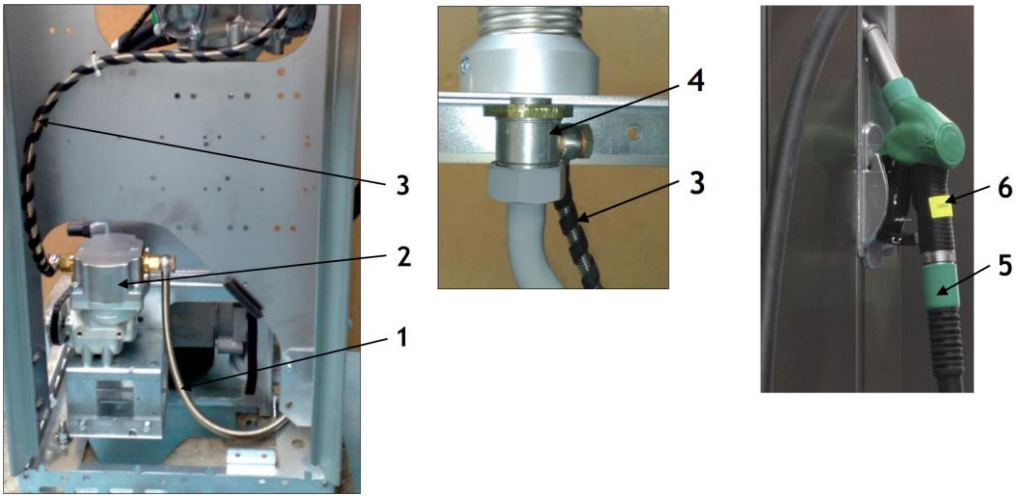
5.4.2. System VRC-M

Vapour Recovery Control – Mechanical - control the flow of vapor by hydromechanical proportional valve integrated into nozzle (Elaflex GRVP).

Vapor recovery system VRC-M of the dispensers V-line 899x.xxx consists of the following basic components (structural layout and design is evident from Figures 1, 2, 3, 4, 5):

Position	Unit name
1	Flexible pipe with union nut M 16 x 1,5 for connection to outgoing pipe into storage tank.
2	Piston vacuum pump
3	Flexible connecting pipe between the vacuum pump and coaxial interpiece
4	Coaxial interpiece for connecting of coaxial delivery hose
5	Coaxial delivery hose
6	Delivery nozzle for vapour recovery with integrated hydromechanical proportional valve (ELAFLEX GRVP)

Pic. 2



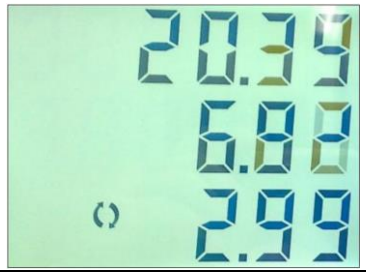
Function of system VRC-M

The vacuum in the VRC-M system is created by piston vacuum pump (Item 2), which is powered via a rubber belt of electric motor of pumping monoblock. For dispensers with pressure system is installed in a compact unit - electric motor with integrated vacuum pump.

Outgoing gasoline vapors from the tank car when dispensing gasoline are drawn special adapter nozzle (item 6), through the channel in the body to control flow through the nozzle hydromechanical valve integrated into nozzle and into the inner coaxial hose DN 8 (Item 5). The coaxial spacer (Item 4) pairs are fed to a flexible connecting pipe (Item 3), goes on to piston pumps (Item 2). The piston pump (item 2) are pushed through a flexible pipe to the exhaust pipe vapor (Item 1). connected to the interior of the storage tank (usually from the lowest octane gasoline.

Optimal flow of vapor is dynamically regulated by proportional hydromechanical valve depending on the actual flow of liquid gasoline nozzle.

Proper function of vapor recovery is indicated by shining symbol of two arrows (Fig. 9) on the display of electronic counter on the appropriate side of the dispenser.

Pic. 3	**Pic. 4**
	
System VRC non functional	**System VRC is functional**

5.4.3. System VRC-E

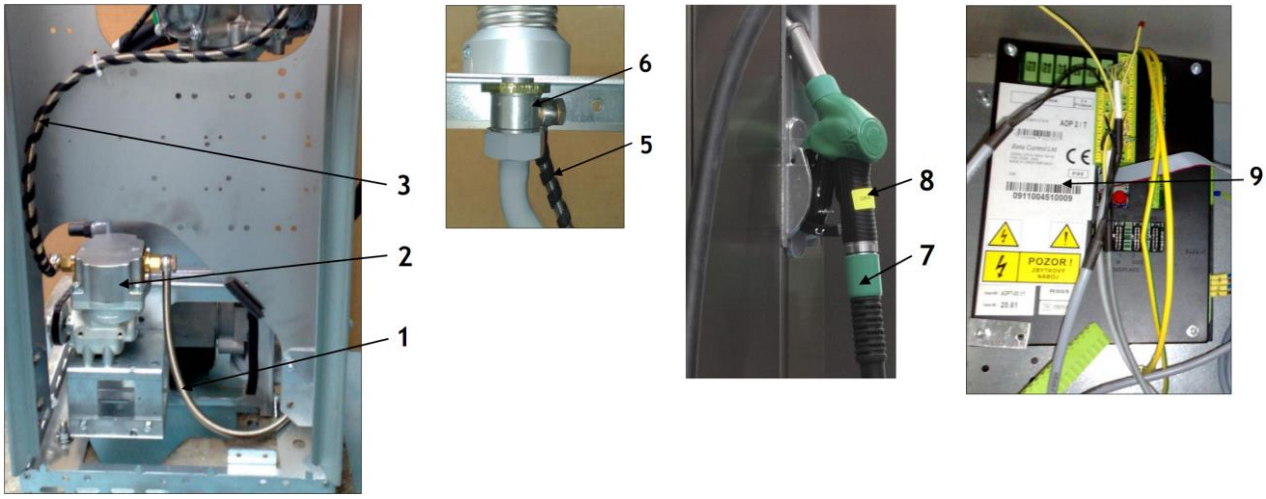
Vapour Recovery Control - Electronic - control the flow of vapor through the proportional solenoid valve controlled electronic counter dispenser.

Vapour recovery system VRC-E of fuel dispensers V-line 899x.xxx consists of the following basic components (structural layout and design is evident from Figure 1, 2:

Position	Unit name
1	Flexible pipe with union nut M 16 x 1,5 for connection to outgoing pipe into storage tank.
2	Piston vacuum pump

3	Flexible connecting pipe between the vacuum pump and electromagnetic proportional valve
4	Electromagnetic proportional valve
5	Flexible connecting pipe between the electromagnetic proportional valve and coaxial interpiece
6	Coaxial interpiece for connecting of coaxial delivery hose
7	Coaxial delivery hose
8	Delivery nozzle for vapour recovery
9	Electronic counter ADP1/T, ADP2/T

Pic. 5



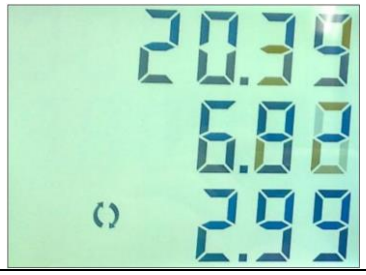
Function of system VRC-E

The vacuum in the VRC-M system is created by piston vacuum pump (Item 2), which is powered via a rubber belt of electric motor of pumping monoblock. For dispensers with pressure system is installed in a compact unit - electric motor with integrated vacuum pump.

Outgoing gasoline vapors from the tank car when dispensing gasoline are drawn special nozzle adapter nozzle (pos. 8) through the channel in the body of the nozzle flow through the inner coaxial hose DN 8 (pos. 7). Inside of coaxial interpiece (pos. 6) pairs are guided to a flexible connecting pipe (pos. 4), then proceed to the proportional solenoid valve (pos. 4). From the proportional valve through conecting flexible pipe (pos. 3) guided to piston vakuum pump (pos. 2). From the piston pump (pos. 2) are drawn through flexible pipe to outgoing pipe of petrol vapours (pos. 1) connected to imide space of storage tank (usually the lowest octane gasoline tank).

Optimal flow of vapor is dynamically regulated by proportional solenoid valve directly controlled electronic counter, depending on the flow rate of liquid gasoline respective meter. Electronic counter controls the flow of vapor based on information about the volume flow meter calculator from magnetic pulse transmitter.

Proper function of vapor recovery is indicated by shining symbol of two arrows (Fig. 9) on the display of electronic counter on the appropriate side of the dispenser.

Pic. 3	Pic. 4
	
System VRC non functional	System VRC is functional

5.4.4. System VRC-M with VRMS

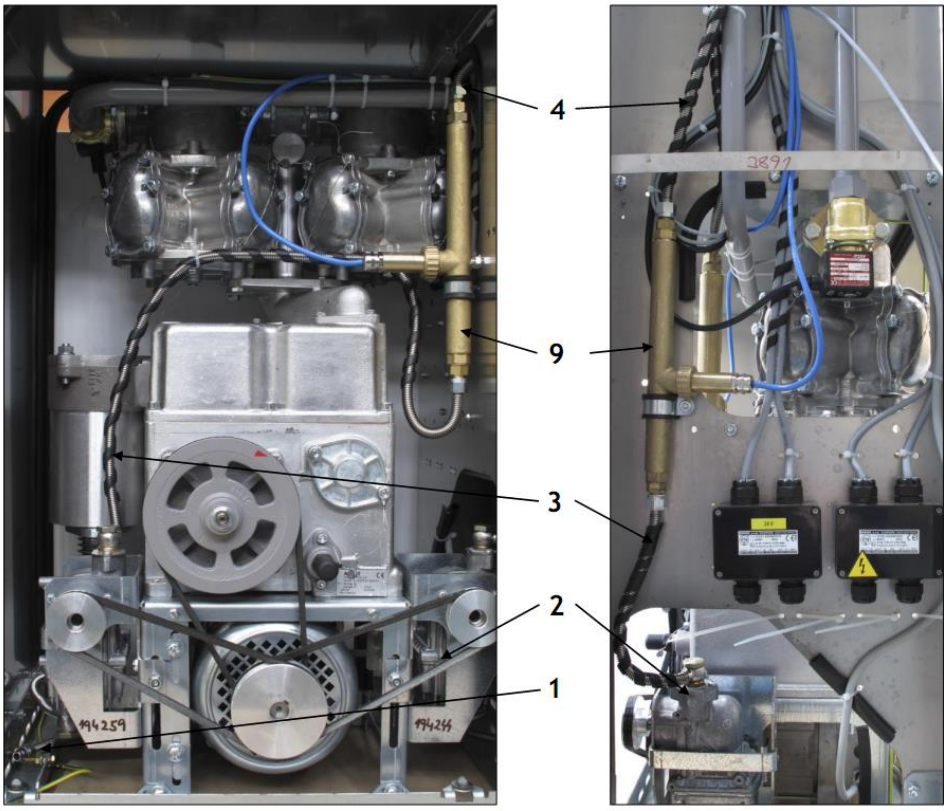
Vapour Recovery Control - Mechanical - flow control vapor through hydromechanical proportional valve integrated into nozzle (ELAFLEX) controlled system VRMS (Vapor Recovery Monitoring System).

Systems **VRC-M and VRMS working separately (independently).**

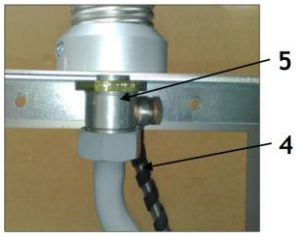
Complete system VRC-M + VRMS contains following components(as on pic. 3, 4, 6, 7, 8, 9):

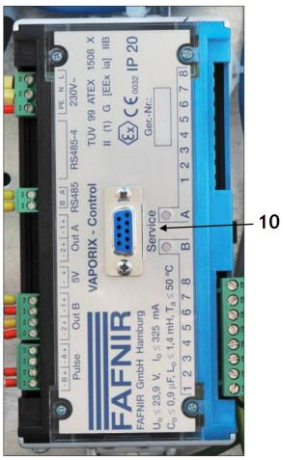
Position	Unit name
Components of system VRC-M	
1	Flexible pipe with union nut M 16 x 1,5 for connection to outgoing pipe into storage tank.
2	Piston vacuum pump
3	Flexible connecting pipe between the vacuum pump and measuring probe VAPORIX-Flow
4	Flexible connecting pipe between measuring probe VAPORIX-Flow and coaxial interpiece
5	Coaxial interpiece for connecting of coaxial delivery hose
6	Coaxial delivery hose
7	Delivery nozzle for vapour recovery with integrated hydromechanical proportional valve (ELAFLEX GRVP)
8	Electronic counter ADP1/L, ADP1/T, ADP2/T
Components of system VRMS – Fafnir VAPORIX	
9	Measuring probe of vapour flow Fafnir VAPORIX-Flow
10	Electronic unit VAPORIX-Control
11	Electronic control unit VAPORIX-Master

Pic. 6



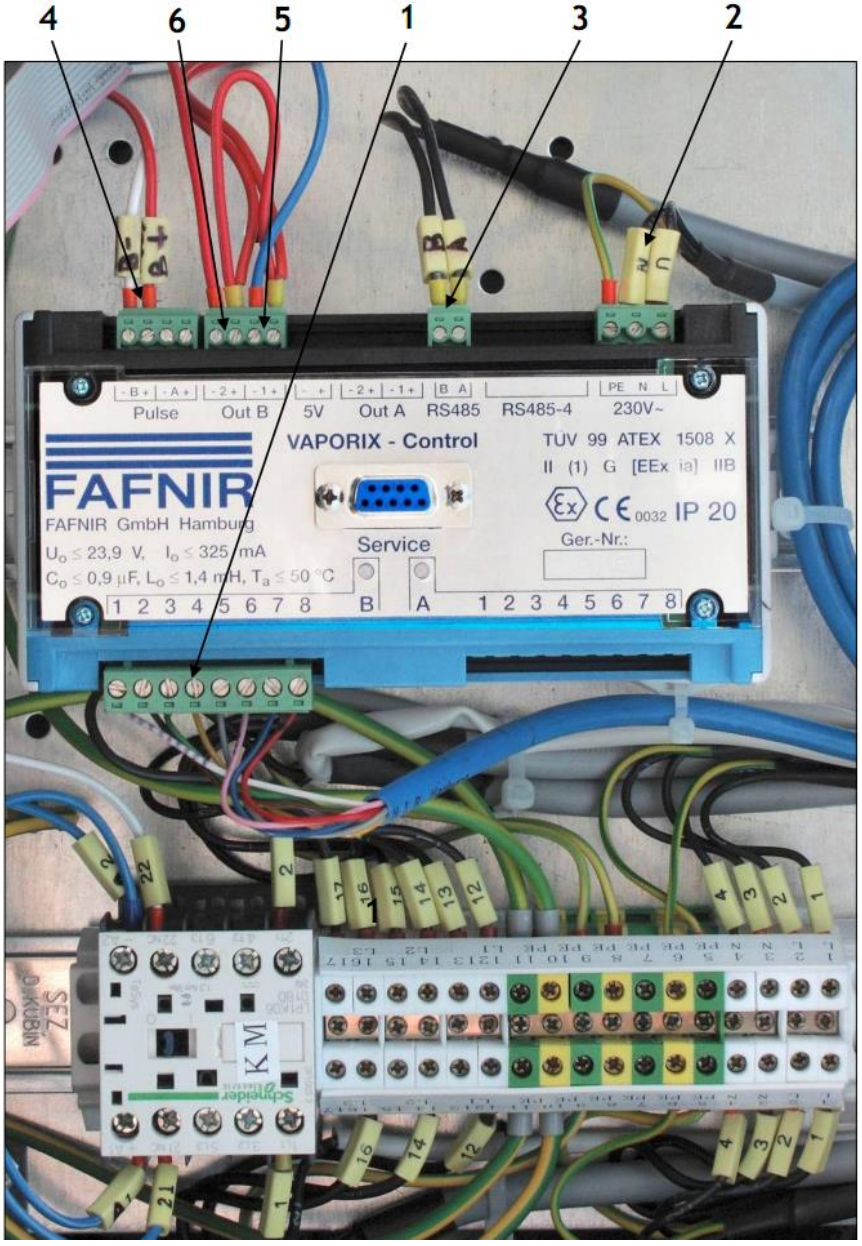
Pic. 7



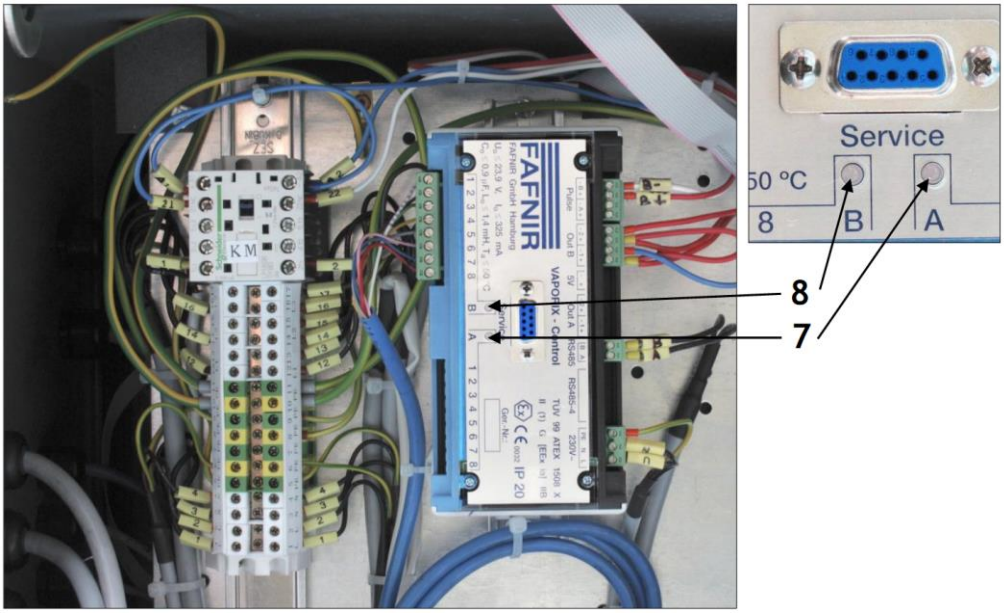


Electronic connection of unit VAPORIX-Control	
1	Terminal block for connection of measuring probe VAPORIX-Flow
2	Terminal block for connection of input power
3	Output – communication line for connecting of unit VAPORIX Master
4	Pulse inlet from the module VAP of electronic counter
5	Out A(B) 1 – NC contact „STOP" – red diode
6	Out A(B) 2 - NO contact „ALARM" – orange diode
7	Indicating LED-diode for side „A"
8	Indicating LED-diode for side „B"

Pic. 8



Pic. 9



5.4.5. System VRC-E with VRMS

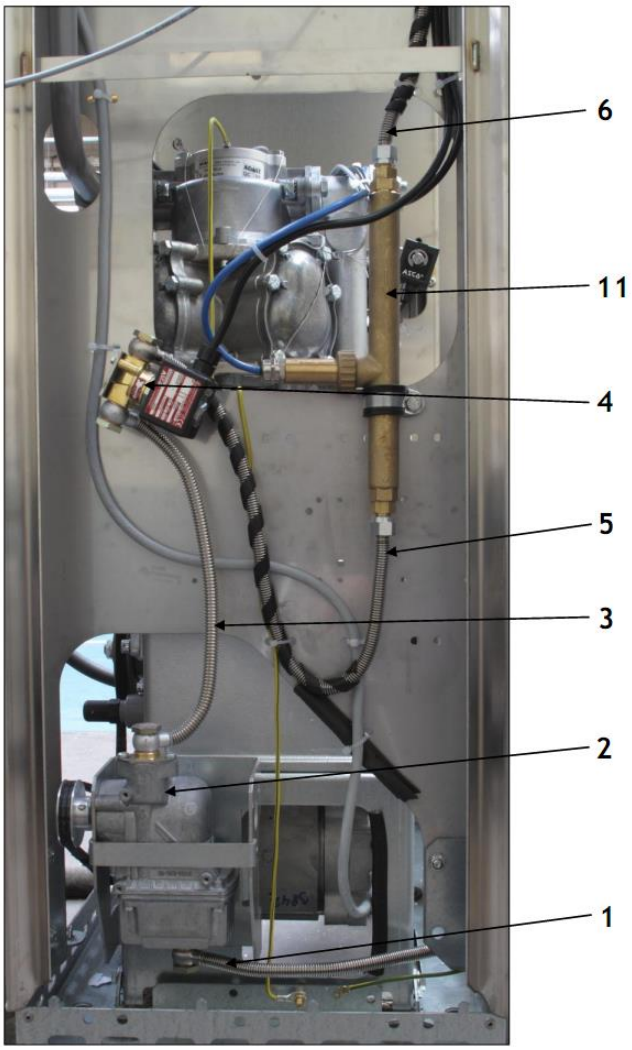
Vapour Recovery Control - Mechanical - flow control vapor through hydromechanical proportional valve integrated into nozzle (ELAFLEX) controlled system VRMS (Vapor Recovery Monitoring System).

VRC-M Systems and VRMS working separately (independently).

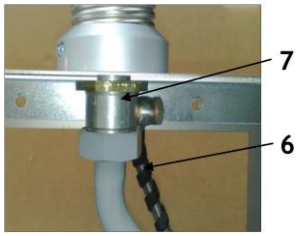
Complete system VRC-E + VRMS contains following components (as pic. 3, 4, 15, 16)

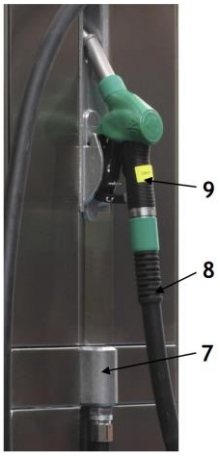
Position	Unit name
Components of system VRC-E	
1	Flexible pipe with union nut M 16 x 1,5 for connection to outgoing pipe into storage tank.
2	Piston vacuum pump
3	Flexible connecting pipe between the vacuum pump and electromagnetic proportional valve
4	Regulation electromagnetic proportional valve
5	Flexible connecting pipe between the vacuum pump and measuring probe VAPORIX-Flow
6	Flexible connecting pipe between the measuring probe VAPORIX-Flow and coaxial interpiece
7	Coaxial interpiece for conection of coaxial delivery hose
8	Coaxial delivery hose
9	Delivery nozzle for vapour recovery
10	Electronic counter ADP1/T, ADP2/T
Components of system VRMS – Fafnir VAPORIX	
11	Measuring probe of vapour flow Fafnir VAPORIX-Flow
12	Electronic unit VAPORIX-Control
13	Electronic control unit VAPORIX-Master

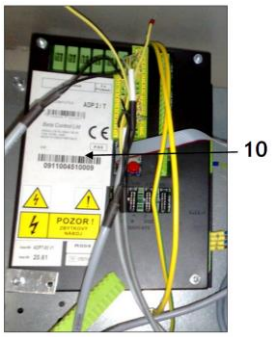
Pic. 15



Pic. 16







Pic. 10 Scheme of inputs and outlets of the unit VAPORIX-Control

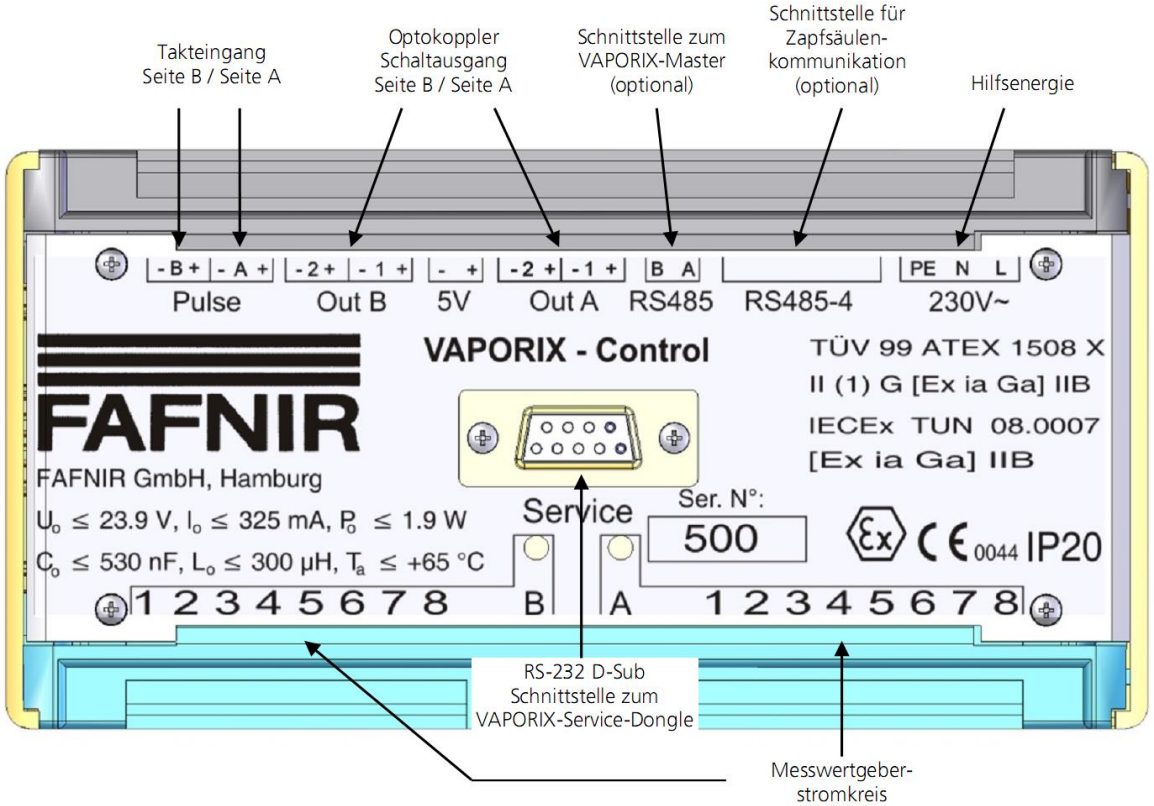
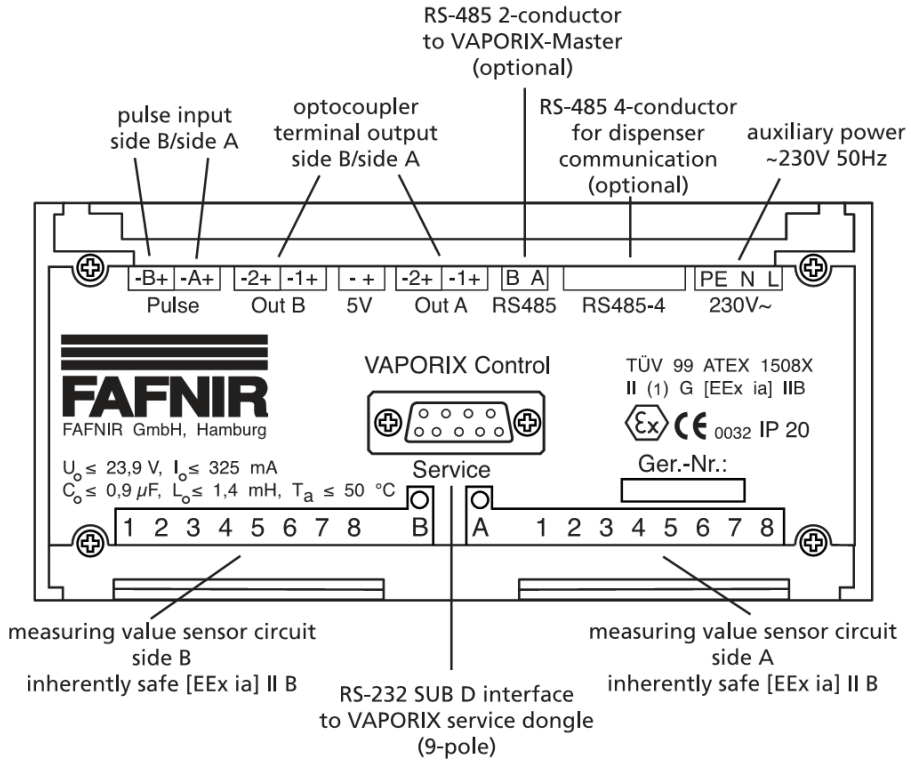


Abb. 7: Anschlüsse VAPORIX-Control



5.4.6. Function of system VRC with VRMS

Function of system VRC-M with VRMS

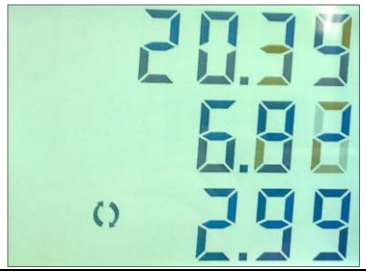
Function of system VRC-M

The vacuum in the VRC-M system is created plunger vacuum pump (Item 2), which is powered via a rubber belt electric pumping monoblock. For dispensers with pressure system is installed in a compact unit with integrated electric pump.

Outgoing gasoline vapors from the tank car when dispensing gasoline are drawn special adapter nozzle (item 7), through the channel in the body to control flow through the gun hydromechanical valve integrated into nozzle and into the inner coaxial hose DN 8 (Item 6). The coaxial spacer (Item 5) pairs are fed to a flexible connecting pipe (Item 4), then proceed to the measurement sensor VAPORIX-Flow (poz.9) and then connecting flexible pipe (Item 3) to the piston pump (pos. 2). The piston pump (item 2) are pushed through a flexible pipe (Item 1) into the duct connected to the vapor inside the storage tank (usually from the lowest octane gasoline).

Optimal flow of vapor is dynamically regulated proportional hydromechanical valve depending on the actual flow of liquid gasoline nozzle.

Proper function of vapor recovery is indicated by shining symbol of two arrows (Fig. 9) on the display of electronic counter on the appropriate side of the dispenser.

Pic. 3	Pic. 4
	
System VRC non functional	System VRC is functional

Function of system VRMS:

Automatic Monitoring System (VRMS) VAPORIX dynamically controls the system to function properly VRC.

Measuring sensor VAPORIX-Flow (Item 9) indicates the instantaneous flow and vapor flow rates found online transmitted to the evaluation unit VAPORIX-Control (Item 10), which compares these values with the values given volume of liquid gasoline from the transmitted pulse output electronic counter (Item 8) into the VAPORIX-Control - Connection Figure 6 (Item 4).

The operational statue of the system can notify the operator VRMS at the kiosk station via electronic unit VAPORIX-Master, which is usually located near the pumping station control system - POS. VAPORIX-Control Units and VAPORIX-Master are communicatively connected via RS 485 interface using a communication cable.

Function of system VRC-E with VRMS

Function of system VRC-E

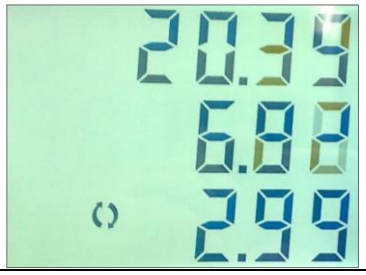
The vacuum in the system VRC-E is generated plunger vacuum pump (Item 2), which is powered via a rubber belt electric pumping monoblock. For dispensers with pressure system is installed in a compact unit with integrated electric vacuum pump.

Outgoing gasoline vapors from the tank car when dispensing gasoline are drawn special adapter nozzle (Item 9), through the channel in the gun body flowing into the inner coaxial hose DN 8 (Item 8), attached to the coaxial spacer (item 7). The coaxial spacer (item 7) are fed to the steam flexible connecting pipe (Item 6), then proceed to the measurement sensor VAPORIX-Flow (poz.11) and then connecting flexible pipe (item 5) to control the proportional solenoid valve. The valve is kept flexible pipe (Item 3) to the piston pump (Item 2). The piston pump (item 2) are pushed through a flexible pipe

(Item 1) into the duct connected to the vapor inside the storage tank (usually from the lowest octane gasoline).

Optimal flow of vapor is dynamically regulated by the proportional hydromechanical valve depending on the actual flow of liquid gasoline trought delivery nozzle.

Proper function of vapor recovery is indicated by shining symbol of two arrows (Fig. 9) on the display of electronic counter on the appropriate side of the dispenser.

Pic. 3	Pic. 4
	
System VRC non functional	System VRC is functional

Function of system VRMS:

Automatic Monitoring System (VRMS) VAPORIX dynamically controls the system to function properly VRC.

Measuring unit VAPORIX-Flow sensor (pos. 11) indicates the instantaneous flow and vapor flow rates found online transmitted to an evaluation unit VAPORIX-Control (pos. 12), which compares these values with the values given volume of liquid gasoline transmitted from the pulse output electronic counter (pos 10) into the unit VAPORIX-Control – connection as pic.6 – pos. 4.

The operational statue of the system VRMS can notky the operator inside at the kiosk station via electronic unit VAPORIX-Master, which is usually located near the pumping station control system - POS. VAPORIX-Control Units and VAPORIX-Master are communicatively connected via RS 485 interface using a communication cable.

5.4.7. Indication of system status VRMS

1. VRC system operates within a specified tolerance

System status indicator on the unit VRMS VAPORIX-Control:

Status petrol vapor recovery system on the drive VRC-Control VAPORIX indicated by blinking one tri-color LEDs (green, orange, red).

In the event that the compared values match - which means that the variation in the actual flow rate measured by the system VAPORIX set flow rate to the proportional vapour recovery valve are in the range from **85 %** to **115 %** of the exhaust vapor volumetric given liquid gasoline - to drive VAPORIX Control **(Pic. 9 – pos. 7/side "A" pos or pos. 8/side "B") "diode flashing GREEN".**

System status indicator on the dispenser VRMS:

VRC system status on the dispenser is indicated by two light-emitting diodes LED (orange, red), positioned on the front cover (mask) the electronics housing.

In the event that the compared values match **"NO FLASHING DIODE".**

Pic. 11

2. System VRC works out of settled tolerance – first transaction out of the tolerance

System status indication on unit VRMS VAPORIX-Control:

In the case, that compared values of realised transaction does not match – it means that declinations of real volume flow measured by system VAPORIX from the set value on proportional vapour recovery valve are not in range from **85 %** to **115 %** exhausted petrol vapours of delivered liquid petrol from the last transaction – on the unit VAPORIX Control **(pic. 9 – pos. 7/side A or pos. 8/side B) „DIODE IS FLASHING ALTERNALLY GREEN A ORANGE" – proper values of flow of recovered vapours from the last transaction are out of tolerance.**

Status indication VRMS on the fuel dispenser:

On the front cover (mask) the electronics housing **"NO FLASHING DIODE".**

Pic. 12

3. VRC system operates outside the fixed tolerance - a permanent fault

Status indication of systém VRMS on the unit VAPORIX-Control:

In the event that the compared values for ten continue transactions does not match - it means that the variation in the actual flow rate measured by the system VAPORIX set flow rate to the proportional vapour recovery valve are not consistently in the range from **85 %** to **115 %** of the exhaust vapor volumetric issued by the liquid gasoline – on the unit VAPORIX Control (**pic. 9 – pos. 7/side A or pos. 8/side B) „DIODE FLASHING ORANGE" - „warning signal" – the vapor flow values are outside the specified tolerance.**

System status indication VRMS on the fuel dispenser:

On the front cover (mask) the electronics housing **„DIODE FLASHING ORANGE" - „warning signal" pos. 1:**

Pic. 13

The fault in the revelant system must be fixed by specialised service worker within a period of 7 days (168 hod).

4. VRC system works out of setled tolerance - permanent fault mode - after expire of 7-days time period (168 hours)

In the event that the fault of system VRC is not fixed by spealised service worker within a period of 7-days (168 hours) , the functionality of the fuel dispenser will be permanently blocked (given delivery place of the fuel dispenser)!!

System status indication on the unit VRMS VAPORIX-Control:

In the event that the fault system VRC is a professional service person within a specified period of 7 days (168 hours) removed - the unit VAPORIX Control **(Pic. 9 - pos. 7/side A or pos. 8/side B) „DIODE FLASHING RED" - „signal STOP" - the vapor flow values are outside the specified tolerance.**

<u>System status indication VRMS on the fuel dispenser</u>:

On the front cover (mask) the electronics housing **„DIODE FLASHING RED" - „signal STOP" - pos. 2:**

Pic. 14

Notice:

Electrical connection of V-line 899x.xxx dispensers with vapour recovery system with automatic control system VRMS (Vapour Recovery Monitoring System) - see the enclosure no. 38.

Diesel oil filling points are not equipped with the vapour exhaust system.

5.5. Signalling of dispenser conditions (SO)

On Client's special requirement the fuel dispenser can be equipped with a red signal light, which gives information to the customer and the operator about the present dispenser condition – the dispenser is blocked or ready for fuel filling.

5.6. SOPA design

On Client's special request the dispenser in service mode can be equipped with magnetic release switch (SOPA design). The operator of the filling station can release the dispenser for single filling operation in this mode. After nozzle lifting the displays are reset and fuel filling is started. After hanging up the nozzle, the dispensed volume and quantity values are permanently displayed until the dispenser is magnetic released and the dispensing nozzle is lifted off subsequently. The red signal light informs both the operator and the customer about the condition of the dispenser.

5.7. Design with heating of the electronic case

On the special customer´s requirement the fuel dispenser can be delivered with heating of electronic case by heater 250 VA. For feeding of the heating is used an individual cable - see the enclosure no. 37.

6. TECHNICAL DATA

6.1. Basic parameters for the classical and alternative fuels with dynamic viscosity up to 20 mPa.s				
Electronic counter			ADP1/T, ADP2/T, ADP1/L	
Tankautomat (CRID)			ADAMAT/PNN, ADAMAT/PNA	
Display			Iluminated LCD - BACK LIGHT DISPLAY (BLD)	
			ADAMAT - Graphic BLD, Touch screen	
Connecting flange of the suction piece – suction system (899x.xxx/S)			DN 40 with inner thread G 1 1/2" for Q = 40, 2 x 40, 60, 70, 80, 110, 120,130, 150 $dm^3.min^{-1}$	
Connecting piece – pressure system (899x.xxx/P)			DN 40 with outer thread G 1 1/2" for Q = 40, 2 x 40, 60, 70, 80, 110, 120, 130, 150 $dm^3.min^{-1}$	
Required inner diameter of suction piping - suction system (46xx)			**DN 40 for flowrate Q = 40, 60 $dm^3.min^{-1}$**	
			DN 50 for flowrate Q = 2 x 40, 70, 80 $dm^3.min^{-1}$	
			2 x DN 50 for flowrate Q = 110, 120, 130, 150 $dm^3.min^{-1}$	
Piping innner diameter required - pressure system (47xx)			**DN 40 for flowrate Q = 40, 2x 40, 60, 70, 80 $dm^3.min^{-1}$**	
			DN 50 for flowrate Q = 110, 120, 130, 150 $dm^3.min^{-1}$	
Max. flowrate Q_{max} 1)			**40, 60, 70, 80, 110, 120, 130, 150 $dm^3.min^{-1}$**	
Min. flowrate Q_{min} 1)			**4, 5, 10, 15 $dm^3.min^{-1}$**	
Operating flowrate Q 2)			**40 - 150 $dm^3.min^{-1}$ ± 10 %**	
Accuracy of measurement			**± 0,5 %**	
Max. operating pressure p_{max}			for Q_{max} = 40 – 60 $dm^3.min^{-1}$ 0,25 MPa	
			for Q_{max} = 70 – 150 $dm^3.min^{-1}$ 0,32 MPa	
Min. operating pressure p_{min}			for Q_{max} = 40 – 60 $dm^3.min^{-1}$ 0,12 MPa	
			for Q_{max} = 70 – 150 $dm^3.min^{-1}$ 0,19 MPa	
Ambient operating temperature			Standard -20 °C to +50 °C; special -40 °C to +55 °C / -40 °C to +60 °C	
Medium temperature			-20 °C to +50 °C for gasoline, diesel, E 10 to E 85; B 10 to B 60	
			-10 °C to +50 °C for B 70 to B 100, vegetable and mineral oils	
Filtering property			30 µm for petrol	
			30 µm for Diesel oil (60 µm - for extreme temper. below -25 °C)	
Reach of dispensing hose			4 to 6 m	
Max. level of noise			<70 dB - 899x.xxx/S / <60 dB - 899x.xxx/P	
El. motor power supply			3/PE AC 3x 230/400 V ±15 %, 50 Hz	
Output of pump el. motor	P_{3f}		0,75 kW, 1,1 kW	
Output of vacuum pump el. motor	P_{3f}		0,18 kW; 0,37 kW	
Power supply of electronics	U_{nap}	P_{nap}	1/N/PE AC 230 V ±15 % 50 Hz	input 85 VA
Power supply of ADAMAT	U_{nap}	P_{nap}	1/N/PE AC 230 V ±15 % 50 Hz	input 120 VA
Power supply of electronic case heating	U_{nap}	P_{nap}	1/N/PE AC 230 V ± 15 %, 50 Hz	input 250 VA

Basic sensed unit	0,01 dm^3
Number of impulses per 1 dm^3	100
Permissible deviation of sensed volume	+/-1 impulse, i.e. 0,01 dm^3
Price displayed	6 digits with the setting of digit position
Volume displayed	6 digits with the setting of digit position
Unit price displayed	4 digits with the setting of digit position
Total volume counter	electromechanical - 7 digits
	electronically - 11 digits
Communication interface	RS 485; IFSF – LON, TCP/IP (Ethernet)
Average operating period of a repair	t_{oo} = min. 25
Average service life	t_z = 5 years

1) Max. flowrate Q_{max} = 40, 60, 70, 80, 110, 120, 130, 150 $dm^3.min^{-1}$ and min. flowrate Q_{min} = 4, 5, 10, 15 $dm^3.min^{-1}$ - extreme values of flowrate in which can be operate the measuring system of the fuel dispenser - parameters Q_{max} and Q_{min} are given in a certificate about homologation of the meter type.

2) Operating flow rate 40 to 150 $dm^3.min^{-1}$ ±10 % is depended on the fuel dispenser design (V-line 899x.xxx/S, line 899x.xxx/P), on the inner diameter and length of piping and suction head - see the point no 15. in this instructions. The stated values are valid for the fuel dispensers without the safety disconnection couplings.

Using of the safety disconnetion couplings reduces the operating flowrate Q = 40 to 150 $dm^3.min^{-1}$ ± 10 % about approximately 10%.

Using of the satellite reduces the operating flowrate Q = 40 to 130 $dm^3.min^{-1}$ ± 10% about approximately 10%.

6.1.1. Technical parameters of the fuel dispenser Q = 100 $dm^3.min^{-1}$ - with one meter 1x M 403.32xx	**V-line 8990.6x2/S; /P/100**	**V-line 8990.4x2/S; /P/100**
Max. rate of flow Q_{max}	100 $dm^3.min^{-1}$	100 $dm^3.min^{-1}$
Min. rate of flow Q_{min}	10 $dm^3.min^{-1}$	10 $dm^3.min^{-1}$
Operating flowrate at suction head –45 kPa dispensed from one nozzle – suction system Q	**100 ± 10 $dm^3.min^{-1}$**	**100 ± 10 $dm^3.min^{-1}$**
Operating flowrate by dispensing from one nozzle – connection of submersible pump with min. flow rate 110 $dm^3.min^{-1}$ with min. dynamic operating pressure 0,22 MPa on inlet into the dispenser – pressure system Q	**100 ± 10 $dm^3.min^{-1}$**	**100 ± 10 $dm^3.min^{-1}$**
Min. measured quantity (MMQ)	10 dm^3	10 dm^3
Max. suction head – suction system	-85 kPa – for Diesel oil	-85 kPa – for Diesel oil
El. motor – suction system	2 x 1,1 kW	2 x 1,1 kW
The dispenser has been designed for high-performance dispensing of one sort of fuel from one dispensing point.		

6.1.2. Technical parameters of the fuel dispenser Q = 110 $dm^3.min^{-1}$ - with one meter M 403.xx	**V-line 8990.6x2/S; /P/110**	**V-line 8990.4x2/S; /P/110**
Max. rate of flow Q_{max}	110 $dm^3.min^{-1}$	110 $dm^3.min^{-1}$
Min. rate of flow Q_{min}	10 $dm^3.min^{-1}$	10 $dm^3.min^{-1}$
Operating flowrate at suction head –45 kPa dispensed from one nozzle – suction system Q	**110 ± 11 $dm^3.min^{-1}$**	**110 ± 11 $dm^3.min^{-1}$**
Operating flowrate by dispensing from one nozzle – connection of submersible pump with min. flow rate 110 $dm^3.min^{-1}$ with min. dynamic operating pressure 0,22 MPa on inlet into the dispenser – pressure system Q	**110 ± 11 $dm^3.min^{-1}$**	**110 ± 11 $dm^3.min^{-1}$**
Min. measured quantity (MMQ)	10 dm^3	10 dm^3
Max. suction head – suction system	-85 kPa – for Diesel oil	-85 kPa – for Diesel oil
El. motor – suction system	2 x 1,1 kW	2 x 1,1 kW
The dispenser has been designed for high-performance dispensing of one sort of fuel from one dispensing point.		

6.1.3. Technical parameters of the fuel dispenser Q = 120 $dm^3.min^{-1}$ - with one meter M 403.32xx	**V-line 8990.6x2/S; /P/120**	**V-line 8990.4x2/S; /P/120**
Max. rate of flow Q_{max}	120 $dm^3.min^{-1}$	120 $dm^3.min^{-1}$
Min. rate of flow Q_{min}	10 $dm^3.min^{-1}$	10 $dm^3.min^{-1}$
Operating flowrate at suction head –45 kPa dispensed from one nozzle – suction system Q	**120 ± 12 $dm^3.min^{-1}$**	**120 ± 12 $dm^3.min^{-1}$**

Operating flowrate by dispensing from one nozzle – connection of submersible pump with min. flow rate 120 $dm^3.min^{-1}$ with min. dynamic operating pressure 0,22 MPa on inlet into the dispenser – pressure system Q	**120 ± 12 $dm^3.min^{-1}$**	**120 ± 12 $dm^3.min^{-1}$**
Min. measured quantity (MMQ)	10 dm^3	10 dm^3
Max. suction head – suction system	-85 kPa – for Diesel oil	-85 kPa – for Diesel oil
El. motor – suction system	2 x 1,1 kW	2 x 1,1 kW
The dispenser has been designed for high-performance dispensing of one sort of fuel from one dispensing point.		

6.1.4. Technical parameters of the fuel dispenser Q = 130 $dm^3.min^{-1}$ - with one meter M 403.32EP / M 403.32P (M 403.32EP/1 / M 403.32P/1)	**V-line 8990.6x2/S; /P/130**	**V-line 8990.4x2/S; /P/130**
Max. rate of flow Q_{max}	130 $dm^3.min^{-1}$	130 $dm^3.min^{-1}$
Min. rate of flow Q_{min}	10 $dm^3.min^{-1}$	10 $dm^3.min^{-1}$
Operating flowrate at suction head -45 kPa dispensed from one nozzle – suction system Q	**120 ± 12 $dm^3.min^{-1}$**	**120 ± 12 $dm^3.min^{-1}$**
Operating flowrate by dispensing from one nozzle – connection of submersible pump with min. flow rate 130 $dm^3.min^{-1}$ with min. dynamic operating pressure 0,22 MPa on inlet into the dispenser – pressure system Q	**110 ± 11 $dm^3.min^{-1}$**	**110 ± 11 $dm^3.min^{-1}$**
Min. measured quantity (MMQ)	10 dm^3	10 dm^3
Max. suction head – suction system	-85 kPa – for Diesel oil	-85 kPa – for Diesel oil
El. motor – suction system	2 x 1,1 kW	2 x 1,1 kW
The dispenser has been designed for high-performance dispensing of one sort of fuel from one dispensing point.		

6.1.5. Technical parameters of the fuel dispenser Q = 130 $dm^3.min^{-1}$ – with two parallel working meters M 403.25EP / M 403.25P (M 403.25EP/1 / M 403.25P/1)	**V-line 8990.6x2/S; /P/130**	**V-line 8990.4x2/S; /P/130**
Max. rate of flow Q_{max}	130 $dm^3.min^{-1}$	130 $dm^3.min^{-1}$
Min. rate of flow Q_{min}	10 $dm^3.min^{-1}$	10 $dm^3.min^{-1}$
Operating flowrate at suction head – 45 kPa dispensed from one nozzle – suction system Q	**130 ± 13 $dm^3.min^{-1}$**	**130 ± 13 $dm^3.min^{-1}$**
Operating flowrate by dispensing from one nozzle – connection of submersible pump with min. flow rate 130 $dm^3.min^{-1}$ with min. dynamic operating pressure 0,22 MPa on inlet into the dispenser – pressure system Q	**120 ± 12 $dm^3.min^{-1}$**	**120 ± 12 $dm^3.min^{-1}$**
Min. measured quantity (MMQ)	10 dm^3	10 dm^3
Max. suction head – suction system	-85 kPa – for Diesel oil	-85 kPa – for Diesel oil
El. motor – suction system	2 x 1,1 kW	2 x 1,1 kW
The dispenser has been designed for high-performance dispensing of one sort of fuel from one dispensing point.		

6.1.6. Technical parameters of the fuel dispenser Q = 150 $dm^3.min^{-1}$ – with two parallel working meters M 403.25EP / M 403.25P (M 403.25EP/1 / M 403.25P/1)	**V-line 8990.6xx/S/150**	**V-line 8990.6xx/P/150**
Max. rate of flow Q_{max}	150 $dm^3.min^{-1}$	150 $dm^3.min^{-1}$
Min. rate of flow Q_{min}	10 $dm^3.min^{-1}$	10 $dm^3.min^{-1}$
Operating flowrate at suction head – 45 kPa dispensed from one nozzle – suction system Q	**150 ± 15 $dm^3.min^{-1}$**	**-**
Operating flowrate by dispensing from one nozzle – connection of submersible pump with min. flow rate 150 $dm^3.min^{-1}$ with min. dynamic operating pressure 0,22 MPa on inlet into the dispenser – pressure system Q	**-**	**140 ± 14 $dm^3.min^{-1}$**
Min. measured quantity (MMQ)	10 dm^3	
Max. suction head – suction system	-85 kPa – for Diesel oil	
El. motor – suction system	2 x 1,1 kW	
The dispenser has been designed for high-performance dispensing of one sort of fuel from one dispensing point.		

6.1.7. Technical parameters of the fuel dispenser	**V-line 8991.6x/S; /P**	**V-line 8991.4x/S; /P**
Max. rate of flow Q_{max}	40 $dm^3.min^{-1}$	40 $dm^3.min^{-1}$
Min. rate of flow Q_{min}	4 $dm^3.min^{-1}$	4 $dm^3.min^{-1}$
Pumping capacity at suction head –45 kPa Q	40 ± 4 $dm^3.min^{-1}$	40 ± 4 $dm^3.min^{-1}$
Pumping capacity at suction head –45 kPa with vapour recovery system Q	30 ± 3 $dm^3.min^{-1}$	30 ± 3 $dm^3.min^{-1}$
Min. measured quantity (MMQ)	2 dm^3	2 dm^3
Max. suction head – suction system	-55 kPa – for petrol -85 kPa – for Diesel oil	-55 kPa – for petrol -85 kPa – for Diesel oil
El. motor – suction system	0,75 kW	0,75 kW
The dispenser has been designed for the dispensing of one sort of fuel from one dispensing point.		

6.1.8. Technical parameters of the fuel dispenser	**V-line 8993.6x2/S; /P**	**V-line 8993.4x2/S; /P**
Max. rate of flow Q_{max}	40 $dm^3.min^{-1}$	40 $dm^3.min^{-1}$
Min. rate of flow Q_{min}	4 $dm^3.min^{-1}$	4 $dm^3.min^{-1}$
Pumping capac. at suction head –45 kPa dispensed from one nozzle Q	40 ± 4 $dm^3.min^{-1}$	40 ± 4 $dm^3.min^{-1}$
Pumping capac. at suction head –45 kPa dispensed from both nozzles Q	30 ± 3 $dm^3.min^{-1}$	30 ± 3 $dm^3.min^{-1}$
Pumping capacity at suction head –45 kPa dispensed from one nozzle with vapour recovery system Q	30 ± 3 $dm^3.min^{-1}$	30 ± 3 $dm^3.min^{-1}$
Pumping capacity at suction head –45 kPa dispensed from both nozzles with vapour recovery system Q	25 ± 3 $dm^3.min^{-1}$	25 ± 3 $dm^3.min^{-1}$
Min. measured quantity (MMQ)	2 dm^3	2 dm^3
Max. suction head – suction system	-55 kPa – for petrol -85 kPa – for Diesel oil	-55 kPa – for petrol -85 kPa – for Diesel oil
El. motor – suction system	0,75 kW; (1,1 kW with vapour recovery)	0,75 kW; (1,1 kW with vapour recovery)
The dispenser has been designed for the dispensing of one sort of fuel from two dispensing points.		

6.1.9. Technical parameters of the fuel dispenser Q = 1 x 40 $dm^3.min^{-1}$ + 1 x 130 $dm^3.min^{-1}$ - with meter M 403.25EP / M 403.25P (M 403.25EP/1 / M 403.25P/1) + meter M 403.32EP / M 403.32P (M 403.32EP/1 / M 403.32P/1)	**V-line 8993.6xx/S; /P/40/130**	**V-line 8993.4xx/S; /P/40/130**
Max. rate of flow Q_{max}	40/130 $dm^3.min^{-1}$	40/130 $dm^3.min^{-1}$
Min. rate of flow Q_{min}	4/10 $dm^3.min^{-1}$	4/10 $dm^3.min^{-1}$
Operating flowrate at suction head – 45 kPa dispensed from one nozzle – suction system Q	**40 ± 4 $dm^3.min^{-1}$/ 120 ± 12 $dm^3.min^{-1}$**	**40 ± 4 $dm^3.min^{-1}$/ 120 ± 12 $dm^3.min^{-1}$**
Operating flowrate at suction head – 45 kPa dispensed from one nozzle – connection of submersible pump with min. flow rate 130 $dm^3.min^{-1}$ with min. dynamic operating pressure 0,22 MPa on inlet into the dispenser – pressure system Q	**30 ± 3$dm^3.min^{-1}$/ 80 ± 80 $dm^3.min^{-1}$**	**30 ± 3$dm^3.min^{-1}$/ 80 ± 80 $dm^3.min^{-1}$**
Operating flowrate at suction head – 45 kPa dispensed from both nozzles – suction system Q	**40 ± 4 $dm^3.min^{-1}$/ 110 ± 11 $dm^3.min^{-1}$**	**40 ± 4 $dm^3.min^{-1}$/ 110 ± 11 $dm^3.min^{-1}$**
Operating flowrate by dispensing from one nozzle – connection of submersible pump with min. flow rate 130 $dm^3.min^{-1}$ with min. dynamic operating pressure 0,22 MPa on inlet into the dispenser – pressure system Q	**40 ± 4 $dm^3.min^{-1}$/ 70 ± 7 $dm^3.min^{-1}$**	**40 ± 4 $dm^3.min^{-1}$/ 70 ± 7 $dm^3.min^{-1}$**
Min. measured quantity (MMQ)	10 dm^3 / 2 dm^3	10 dm^3 / 2 dm^3
Max. suction head – suction system	-55 kPa – for petrol -85 kPa – for Diesel oil	-55 kPa – for petrol -85 kPa – for Diesel oil
El. motor – suction system	2 x 1,1 kW	2 x 1,1 kW
The dispenser has been designed for the dispensing of one sort of fuel from two dispensing points.		

6.1.10. Technical parameters of the fuel dispenser	V-line 8994.6x2/S; /P	V-line 8994.4x2/S; /P
Max. rate of flow Q_{max}	40 $dm^3.min^{-1}$	40 $dm^3.min^{-1}$
Min. rate of flow Q_{min}	4 $dm^3.min^{-1}$	4 $dm^3.min^{-1}$
Pumping capacity at suction head –45 kPa Q	40 ± 4 $dm^3.min^{-1}$	40 ± 4 $dm^3.min^{-1}$
Pumping capacity at suction head –45 kPa with vapour recovery system Q	30 ± 3 $dm^3.min^{-1}$	30 ± 3 $dm^3.min^{-1}$
Min. measured quantity (MMQ)	2 dm^3	2 dm^3
Max. suction head – suction system	-55 kPa – for petrol -85 kPa – for Diesel oil	-55 kPa – for petrol -85 kPa – for Diesel oil
El. motor – suction system	0,75 kW	0,75 kW
The dispenser has been designed for the dispensing of two sorts of fuel from two dispensing points. The data are identical for both dispensing points.		

6.1.11. Technical parameters of the fuel dispenser	V-line 8995.4x2/S ; /P
Max. rate of flow Q_{max}	40 $dm^3.min^{-1}$
Min. rate of flow Q_{min}	4 $dm^3.min^{-1}$
Pumping capac. at suction head –45 kPa dispensed from one nozzle Q	40 ± 4 $dm^3.min^{-1}$
Pump. capac. at suction head –45 kPa dispensed from both nozzles Q	30 ± 3 $dm^3.min^{-1}$
Pumping capacity at suction head –45 kPa dispensed from one nozzle with vapour recovery system Q_{max}	30 ± 3 $dm^3.min^{-1}$
Pumping capacity at suction head –45 kPa dispensed from both nozzles with vapour recovery system Q_{max}	25 ± 3 $dm^3.min^{-1}$
Max. suction head – suction system	-55 kPa – for petrol -85 kPa – for Diesel oil
Min. measured quantity (MMQ)	2 dm^3
El. motor – suction system	0,75 kW; (1,1 kW with vapour recovery)
The dispenser has been designed for the dispensing of one sort of fuel from two dispensing points.	

6.1.12. Technical parameters of the fuel dispenser	V-line 8996.6x2/S; /P	V-line 8996.4x2/S; /P
	1st dispensing point	2nd dispensing point
Max. rate of flow Q_{max}	40 $dm^3.min^{-1}$	80 $dm^3.min^{-1}$
Min. rate of flow Q_{min}	4 $dm^3.min^{-1}$	5 $dm^3.min^{-1}$
Pumping capacity at suction head –45 kPa Q	40 ± 4 $dm^3.min^{-1}$	80 ± 8 $dm^3.min^{-1}$
Pumping capacity at suction head –45 kPa with vapour recovery system Q	30 ± 3 $dm^3.min^{-1}$	-
Min. measured quantity (MMQ)	2 dm^3	5 dm^3
Max. suction head – suction system	-55 kPa – for petrol -85 kPa – for Diesel oil	-55 kPa – for petrol -85 kPa – for Diesel oil
El. motor – suction system	0,75 kW	1,1 kW
The dispenser has been designed for the dispensing of two sorts of fuel from two dispensing points. The data are identical for both dispensing points.		

6.1.13. Technical parameters of the fuel dispenser	V-line 8997.6x2/S; /P	V-line 8997.4x2/S; /P
Max. rate of flow Q_{max}	80 $dm^3.min^{-1}$	80 $dm^3.min^{-1}$
Min. rate of flow Q_{min}	5 $dm^3.min^{-1}$	5 $dm^3.min^{-1}$
Pumping capacity at suction head –45 kPa Q	80 ± 8 $dm^3.min^{-1}$	80 ± 8 $dm^3.min^{-1}$
Min. measured quantity (MMQ)	5 dm^3	5 dm^3
Max. suction head – suction system	-85 kPa – for Diesel oil	-85 kPa – for Diesel oil
El. motor – suction system	1,1 kW	1,1 kW
The dispenser has been designed for the dispensing of one sort of fuel from one dispensing point.		

6.1.14. Technical parameters of the fuel dispenser	**V-line 8998.6x/S; /P, V-line 8998.4x/S; /P**	
	1st dispensing point	2nd dispensing point
Max. rate of flow Q_{max}	80 $dm^3.min^{-1}$	80 $dm^3.min^{-1}$
Min. rate of flow Q_{min}	5 $dm^3.min^{-1}$	5 $dm^3.min^{-1}$
Pumping capacity at suction head –45 kPa Q	80 ± 8 $dm^3.min^{-1}$	80 ± 8 $dm^3.min^{-1}$
Min. measured quantity (MMQ)	5 dm^3	5 dm^3
Max. suction head – suction system	-85 kPa – for Diesel oil	-85 kPa – for Diesel oil
El. motor – suction system	1,1 kW	1,1 kW
The dispenser has been designed for the dispensing of two sorts of fuel from two dispensing points. The data are identical for both dispensing points V-line 8998.**6**x2, V-line 8998.**4**x2.		

6.1.15. Technical parameters of the fuel dispenser	**V-line 8999.4x2/S; /P**	
	1st dispensing point	2nd dispensing point
Max. rate of flow Q_{max}	40 $dm^3.min^{-1}$	80 $dm^3.min^{-1}$
Min. rate of flow Q_{min}	4 $dm^3.min^{-1}$	5 $dm^3.min^{-1}$
Pumping capacity at suction head –45 kPa Q	40 ± 4 $dm^3.min^{-1}$	80 ± 8 $dm^3.min^{-1}$
Pumping capac. at suction head –45 kPa dispensed from both nozzles Q	30 ± 3 $dm^3.min^{-1}$	50 ± 5 $dm^3.min^{-1}$
Min. measured quantity (MMQ)	2 dm^3	5 dm^3
Max. suction head – suction system	-85 kPa – for Diesel oil	-85 kPa – for Diesel oil
El. motor – suction system	1,1 kW	
The dispenser has been designed for the dispensing of one sort of fuel from two dispensing points.		

6.1.16. Technical parameters of the fuel dispenser	**V-line 8991.6x3/S; /P/40**	**V-line 8991.6x3/LC/S; /P/40**
Max. rate of flow Q_{max}	40 $dm^3.min^{-1}$	
Min. rate of flow Q_{min}	4 $dm^3.min^{-1}$	
Pumping capacity at suction head –45 kPa Q	40 ± 4 $dm^3.min^{-1}$	
Pumping capacity at suction head –45 kPa with vapour recovery system Q	30 ± 3 $dm^3.min^{-1}$	
Min. measured quantity (MMQ)	2 dm^3	
Max. suction head – suction system	-55 kPa – for petrol -85 kPa – for Diesel oil	
El. motor – suction system	0,75 kW	
The dispenser has been designed for the dispensing of one sort of fuel from one dispensing point.		

6.1.17. Technical parameters of the fuel dispenser	**V-line 8991.6x3/S; /P/60**	**V-line 8991.6x3/LC/S; /P/60**
Max. rate of flow Q_{max}	60 $dm^3.min^{-1}$	
Min. rate of flow Q_{min}	4 $dm^3.min^{-1}$	
Pumping capacity at suction head –45 kPa Q	60 ± 6 $dm^3.min^{-1}$	
Min. measured quantity (MMQ)	2 dm^3	
Max. suction head – suction system	-55 kPa – for petrol -85 kPa – for Diesel oil	
El. motor – suction system	0,75 kW	
The dispenser has been designed for the dispensing of one sort of fuel from one dispensing point.		

6.1.18. Technical parameters of the fuel dispenser	V-line 8997.6x3/S; /P/70	V-line 8997.6x3/LC/S; /P/70
Max. rate of flow Q_{max}	70 $dm^3.min^{-1}$	
Min. rate of flow Q_{min}	5 $dm^3.min^{-1}$	
Pumping capacity at suction head –45 kPa Q	70 ± 7 $dm^3.min^{-1}$	
Min. measured quantity (MMQ)	5 dm^3	
Max. suction head – suction system	-55 kPa – for petrol -85 kPa – for Diesel oil	
El. motor – suction system	0,75 kW	
The dispenser has been designed for the dispensing of one sort of fuel from one dispensing point.		

6.1.19. Technical parameters of the fuel dispenser	V-line 8997.6x3/S; /P/80	V-line 8997.6x3/LC/S; /P/80
Max. rate of flow Q_{max}	80 $dm^3.min^{-1}$	
Min. rate of flow Q_{min}	5 $dm^3.min^{-1}$	
Pumping capacity at suction head –45 kPa Q	80 ± 8 $dm^3.min^{-1}$	
Min. measured quantity (MMQ)	5 dm^3	
Max. suction head – suction system	-85 kPa – for Diesel oil	
El. motor – suction system	1,1 kW	
The dispenser has been designed for the dispensing of one sort of fuel from one dispensing point.		

6.2. Basic parameters for the vegetable and mineral oils with dynamic viscosity up to 1000 mPa.s				
Electronic counter			ADP1/T, ADP2/T, ADP1/L	
Tankautomat (CRID)			ADAMAT/PNN, ADAMAT/PNA	
Display			Iluminated LCD - BACK LIGHT DISPLAY (BLD)	
			ADAMAT - Graphic BLD, Touch screen	
Connecting piece – pressure system (47xx)			DN 40 with outer thread G 1 1/2" for Q = 40, 2 x 40, 60, 70, 80 $dm^3.min^{-1}$	
Piping innner diameter required – pressure system (47xx)			**DN 40 for flow rate Q = 40, 2x 40, 60, 70, 80 $dm^3.min^{-1}$**	
Max. flowrate Q_{max} 1)			**40, 60, 70, 80 $dm^3.min^{-1}$**	
Min. flowrate Q_{min} 1)			**4, 5 $dm^3.min^{-1}$**	
Operating flowrate Q 2)			**40 - 80 $dm^3.min^{-1}$ ± 10 %**	
Accuracy of measurement			**± 0,5 %**	
Max. operating pressure p_{max}			**0,6 MPa**	
Min. operating pressure p_{min}			**0,2 MPa**	
Ambient operating temperature			Standard -20 °C to +50 °C; special -40 °C to +55 °C / -40 °C to +60 °C	
Medium temperature			-10 °C to +50 °C	
Filtering property			60 µm	
Reach of dispensing hose			4 to 6 m	
Max. level of noise			<60 dB	
Power supply of electronics	U_{nap}	P_{nap}	1/N/PE AC 230 V ±15 % 50 Hz	input 85 VA
Power supply of ADAMAT	U_{nap}	P_{nap}	1/N/PE AC 230 V ±15 % 50 Hz	input 120 VA
Power supply of electronic case heating	U_{nap}	P_{nap}	1/N/PE AC 230 V ± 15 %, 50 Hz	input 250 VA
Basic sensed unit			0,01 dm^3	
Number of impulses per 1 dm^3			100	
Permissible deviation of sensed volume			+/-1 impulse, i.e. 0,01 dm^3	
Price displayed			6 digits with the setting of digit position	
Volume displayed			6 digits with the setting of digit position	
Unit price displayed			4 digits with the setting of digit position	
Total volume counter			electromechanical - 7 digits	
			electronically - 11 digits	
Communication interface			RS 485; IFSF – LON, TCP/IP (Ethernet)	
Average operating period of a repair			t_{oo} = min. 25	

Average service life	t_z = 5 years
1) Max. flowrate Q_{max} = 40, 60, 70, 80 dm³.min⁻¹ and min. flow rate Q_{min} = 4, 5 dm³.min⁻¹ - extreme values of rate of flow in which can be operate the measuring system of the fuel dispenser - parameters Q_{max} and Q_{min} are given in a certificate about homologation of the meter type. **2) Operating flowrate 40 to 80 dm³.min⁻¹ ±10 % is depended on the fuel dispenser design (V-line 899x.xxx/OIL), on the inner diameter and length of piping and suction head - see the point no 15. in this instructions.**	

6.2.1. Technical parameters of the dispenser	**V-line 8991.6x3/P/40/OIL**	**V-line 8991.6x3/LC/P/40/OIL**
Max. rate of flow Q_{max}	40 dm³.min⁻¹	
Min. rate of flow Q_{min}	4 dm³.min⁻¹	
Operating flowrate by dispensing from one nozzle - connection of submersible pump with min. flow rate 40 dm³.min⁻¹ with min. dynamic operating pressure 0,6 MPa on inlet into the dispenser - pressure system Q	40 ± 4 dm³.min⁻¹	
Min. measured quantity (MMQ)	2 dm³	
Operating pressure p_{max}	0,6 MPa	
The dispenser has been designed for the dispensing of one sort of oil from one dispensing point.		

6.2.2. Technical parameters of the dispenser	**V-line 8991.6x3/P/60/OIL**	**V-line 8991.6x3/LC/P/60/OIL**
Max. rate of flow Q_{max}	60 dm³.min⁻¹	
Min. rate of flow Q_{min}	4 dm³.min⁻¹	
Operating flowrate by dispensing from one nozzle - connection of submersible pump with min. flow rate 40 dm³.min⁻¹ with min. dynamic operating pressure 0,6 MPa on inlet into the dispenser - pressure system Q	60 ± 6 dm³.min⁻¹	
Min. measured quantity (MMQ)	2 dm³	
Operating pressure p_{max}	0,6 MPa	
The dispenser has been designed for the dispensing of one sort of oil from one dispensing point.		

6.2.3. Technical parameters of the dispenser	**V-line 8997.6x3/P/70/OIL**	**V-line 8997.6x3/LC/P/70/OIL**
Max. rate of flow Q_{max}	70 dm³.min⁻¹	
Min. rate of flow Q_{min}	5 dm³.min⁻¹	
Operating flowrate by dispensing from one nozzle - connection of submersible pump with min. flow rate 40 dm³.min⁻¹ with min. dynamic operating pressure 0,6 MPa on inlet into the dispenser - pressure system Q	70 ± 7 dm³.min⁻¹	
Min. measured quantity (MMQ)	5 dm³	
Operating pressure p_{max}	0,6 MPa	
The dispenser has been designed for the dispensing of one sort of oil from one dispensing point.		

6.2.4. Technical parameters of the dispenser	**V-line 8997.6x3/P/80/OIL**	**V-line 8997.6x3/LC/P/80/OIL**
Max. rate of flow Q_{max}	80 dm³.min⁻¹	
Min. rate of flow Q_{min}	5 dm³.min⁻¹	
Operating flowrate by dispensing from one nozzle - connection of submersible pump with min. flow rate 40 dm³.min⁻¹ with min. dynamic operating pressure 0,6 MPa on inlet into the dispenser - pressure system Q	80 ± 8 dm³.min⁻¹	
Min. measured quantity (MMQ)	5 dm³	
Operating pressure p_{max}	0,6 MPa	
The dispenser has been designed for the dispensing of one sort of oil from one dispensing point.		

7. IDENTIFICATION

All manufactured and delivered dispensers are provided with a rating plate, which includes the following data and is located on a visible point of the dispenser body:

1.	Measuring device manufacturer and address	**Adast Systems, a.s., CZ – 679 04 Adamov 496**
2.	Name of measuring device	**Fuel dispenser**
3.	CE marking with the number of the Notified body coopreated in the conformity Assessment and supplementary metrology marking **M** (xx – year of verification of the dispenser)	CE M xx 1383
4.	Type	**See enclosure 50 and 51**
5.	Number of EC – type examination certificate - **M**	**TCM 141/07 – 4505**
6.	Accuracy class	**0,5**
7.	Serial number and year of manufacture	**xxxx/xx - according to dispensers manufacturer files**
8.	Ambient temperature range – T_{Amb} [°C]	**Ambient operating temperature – according to version of the fuel dispenser**
9.	Liquid temperature range – T_{Liq} [°C]	**- 20 to + 50** [°C] **- 10 to + 50** [°C] **- for biodiesel B 70 to B 100, vegetable and mineral oils**
10.	Mechanical class	**M 2**
11.	Electromagnetic class	**E 2**
12.	Viscosity class	**I: 0,3 to 1 mPa.s II: 1,1 to 8 mPa.s** **III: 8,1 to 17 mPa.s IV: 17,1 to 1000 mPa.s**
13.	Maximum flowrate	**Q_{max} [L/min]**
14.	Minimum flowrate	**Q_{min} [L/min]**
15.	Minimum measured quantity	**MMQ [L]**
16.	Maximum pressure	**p_{max} [bar]**
17.	Minimum pressure	**p_{min} [bar]**
18.	Number of EC – type examination certificate - **Ex**	**FTZÚ 05 ATEX 0185**
19.	CE marking with the number of the Notified body coopreated in the conformity assessment	CE 1026
20.	Specific marking for the explosion protection including the symbol of the group and category of the device, explosion and temperature categories of dispensed fuels	Ex **II2G IIAT3**
21.	Standard for fuel dispensers	**EN 13617-1**
22.	Electrical parameters	**Values of electronics, heating and el. motors feeding**

8. OPERATION

ATTENTION!

- **When pumping liquid fuels it is forbidden to smoke and handle open fire!**
- **No smoking applies to people inside the car!**
- **It is forbidden to pump into the vehicle tanks while the engine is running**
- **It is forbidden to use mobile phones near the dispenser!**

WARNING!

- **It is recommended to use protective gloves when pumping liquid fuels and performing routine maintenance.**
- **During pumping it is necessary to avoid inhalation of vapors of liquid fuels.**
- **If the skin is affected and splashed by the fuel, it is necessary to clean the affected area as soon as possible with water and soap**
- **In case of eye contact, seek medical attention.**

8.1. putting the dispenser into operation

After the dispenser installation remove the filter cover and prime the pumping monoblock with relevant fuel. Fit on the cover back and tighten the nuts evenly. Now the dispenser is ready for operation as far as hydraulic conditions are concerned, on presumption that the tank is filled up with fuel.

8.1.1. Putting the dispenser and electronic counter into operation

- Hang up the dispensing nozzle.
- Switch on the feeding of the dispenser in the switchboard of the filling station (feeding the electronics and el. motors).
- After lifting the dispensing nozzle the counter performs octal test, eights are reset and filling can be carried out.
- Hang up the nozzle.
- In case the dispenser is switched on with the nozzle lifted, it is necessary to hang the nozzle up and lift it again to activate the dispenser (counter resetting).
- Now it is possible to start fuel filling.

8.1.2. Shutdown of the dispenser and electronic counter

- Switch the feeding of the dispenser in the switchboard of the filling station off (feeding the electronics and el. motors).

8.1.3. Restart of the dispenser and electronic counter after power failure and voltage drop

- In case of power failure or voltage alteration beyond acceptable limits the information about the volume and price of the fuel dispensed within the interval from the last lifting of the dispersing nozzle is preserved on the counter display.
- In case power failure has occurred in the very time of fuel filling, it is necessary to hang up the dispensing nozzle (filled volume and price of fuel are preserved on the display) and cash in the sum, which is preserved on the display.
- After el. power supply recovery the electronic counter is ready-to-start and fuel filling can continue by lifting the dispensing nozzle.

8.2. Attendance

Only simple steps are used to attend the dispenser. It is up to the customer's decision what fuel he is going to fill. The electronic counter is activated by lifting the dispensing nozzle, test of proper function of the counter, automatic switching on of the pump and opening of electromagnetic valves are performed. The customer can fill. There is a condition to insert the dispensing nozzle adapter into a tank socket as deep as possible and control smoothly (squeeze) the dispensing nozzle lever. When the filling is over, the dispensing nozzle is withdrawn from the tank socket and hung up into the nozzle cover where a magnetic switch is located controlled by permanent magnet in the nozzle body. Hanging the dispensing nozzle up will interrupt the control circuit therefore the dispenser is stopped. The data of last filling are preserved on the electronic counter. The filling can continue by new lifting the dispensing nozzle.

If the dispenser is equipped with preselection, the customer can preselect the required quantity or quantity of the preselected sum of money. The customer sets relevant values by the push-button and counter, switching on the pump and filling will be performed again after lifting the dispensing nozzle. The filling is automatically finished after filling the preselected volume. The customer can stop the filling anytime by releasing the dispensing nozzle lever before the filling of the preselected volume is finished. The dispensing nozzle shall be withdrawn from the tank socket and hung up in the nozzle cover when filling is over.

Preselection keyboard is also equipped with a key with a symbol of a truck, which enables to change the filling rate (it is possible to use only when the fuel dispenseer is equipped with the proportional valve) at the Diesel MIN/MAX dispensing point. After lifting the dispensing nozzle, it is possible to preselect rapid filling by pushing the key DIESEL MAX (alternatively 60, 70, 80, 120, 130, 150 $dm^3.min^{-1}$) according to the dispenser design. If the key is not depressed, the filling rate is 40 $dm^3.min^{-1}$ or 80 $dm^3.min^{-1}$.

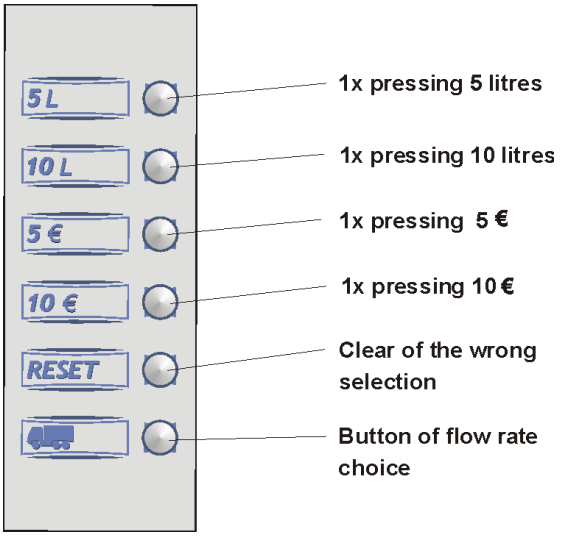
8.3. Dispenser operation

The dispenser is started by lifting the dispensing nozzle from the cover with simultaneous resetting of the data on the counter displays. The price for 1 dm^3 of fuel is displayed. The el. motor of the pump is also started and filling of fuel can be carried out. The dispensing nozzle controls the rate of filling.

The filling is stopped by closing the valve of the dispensing nozzle (control lever release). Then the nozzle is hung up in the cover, which stops the el. motor of the pump. The filled quantity indication is preserved until the next lifting of the dispensing nozzle is carried out.

8.3.1. Dispensing with preselection

Such filling is only possible with dispensers equipped with local preselection.



8.3.2. Description of the preselection function

The selection of the required value of fuel to be dispensed is carried out with the dispensing nozzle hang up.

1.a) Preselect the required quantity to be dispensed according to **the price** by keys identified **5 €** (for example) and **10 €** in arbitrary sequence up to the amount of money level. **The preselected quantity to be dispensed is displayed on the price display.** In case of invalid option deselect it by the "**reset**" key.

1.b) Preselect the required quantity to be dispensed according **the volume** by keys identified **5 litres** and **10 litres** in arbitrary sequence up to the required volume level. **The preselected volume to be dispensed is displayed on the volume display.** In case of invalid option deselect it by ěthe "**reset**" key.

2. The display is reset by lifting the dispensing nozzle, the dispenser is started and filling can be carried out up to the preselected price or volume when dispensing is automatically stopped.

3. For rapid filling **DIESEL MAX (alternatively 60, 70, 80, 120, 130, 150 $dm^3.min^{-1}$)** depress the key with the symbol of the truck (can be used only when the dispenser is equipped with a proportional valve).

Non-dispensed preselected volume is reset after 20 seconds approximately.

When the filling is finished, withdraw the dispensing nozzle from the tank socket and hang up to the nozzle cover.

8.4. Functions of KL-MANINF Manager and KL-SERINF service keyboardS

The KL-MANINF manager keyboard and the KL-SERINF service keyboard are delivered as a design with infrared wireless transmission IR.

IR KL-MANINF manager keyboard

The keyboard enables the setting of unit prices and the situation display of electronic totalizers.
The manager keyboard is equipped with four keys marked **„0“**, **„+“**, **„-“** and **„R“**. The **„0“** key is used for the transition to the "setting of unit prices for MAN" and for the termination of any function executed on the manager keyboard.
The **„+“** and **„-“** keys are used for proper setting of the unit price values or for the transition to the mode of "situation display of electronic totalizers".
The **„R“** key is used for check of vapour recovery exhaustion.

IR KL-SERINF service keyboard

The keyboard enables the counter setting and the keying of values for electronic calibration of meters and ATC, the situation display of electronic totalizers, setting of unit prices and setting the vapour exhaust recovery.

The service keyboard is fitted with four keys, **„0“**, **„+“„-“** as a standard and the "**S**" key as an extra key.

The "**S**" key is used for the transition to the mode of "the data setting / calibration".

If the "**S**" key is not used, the service keyboard can be used for all functions controlled by the manager keyboard and the keying is identical with that of the manager keyboard.

N. B.

If the nozzle has been lifted at least once since the last activation of the counter, the transition to the setting of unit prices is not executed in the MAN mode. The transition to the setting is also not executed even in case the nozzle has been either hung up again without fuel dispensing or previous transaction has not been deactivated by means of RLS entry.

8.4.1. Manual setting of unit prices

Necessary conditions for the transition to the setting of unit prices
- MAN mode of operation
- the nozzle has not been lifted since the last activation of the counter
- transaction executed shall be acknowledged (deactivation by means of RLS entries).

In the MAN mode the unit prices of fuel product are set by means of the KL-MANINF manager keyboard or the KL-SERINF service keyboard.

1. The user can enter the setting mode of unit prices by depressing the **„0“** key.

2. In the setting mode of unit prices

- the number of side for which the unit price is being set ("1" ... A side, "2" ... B side) is displayed on the first line of displays (i.e. on the line of total price)
- the number of nozzle for which the unit price is being set is displayed on the second line of displays (i.e. the line of total volume)
- on the third line of displays the digit, the value of which is being set by the user, is flashing (e.g. on the line of unit price)

3. The user
   - raises the numerical value of the digit actually set (i.e. the flashing one), (digit 9 passes into 0), by depressing the "+" key we can list through 0-9 values - i.e. the autorepeat function
   - shifts the digit setting to higher digit positions by means of the "-" key
     shifts the setting from the highest position of the product unit price to the lowest digit position of the product unit price of the next nozzle by means of the "-" key
4. In this way the user can set successively the price values for all nozzles on the A side, then B side (if it exists and the products on this side differ in price).
5. Whenever the user can terminate the setting of the unit price values by depressing the **„0"** key.
6. Now the unit price values have been written in non-volatile storage in this way and the counter sets the MAN mode.

8.4.2. Setting of unit price values from the control system in AUTO mode

In AUTO mode the unit price values are set from the control system for all transactions independently on unit price values set for the MAN mode.

The unit price values for the AUTO mode are set for all dispensing points by dynamic statement (command) "permission to dispense" transmitted from the filling station console or by the "price setting" statement. All these statements are a part of the specification of the EASYCALL communication protocol.

8.4.3. Display of electronic totalizers

The ADPMPD/T, ADP 1,2/Tcounter is fitted with non-resettle electronic totalizers of volume and price for individual dispensing nozzles.

The totalizers can be displayed on the displays of the side by means of the KL-MANINF manager keyboard or the KL-SERINF service keyboard. The display of the totalizer can be switched by lifting the relevant nozzle.
The sum of the volume (or the sum of the price) is displayed on the displays of the side on the coupled lines of the total price and total volume.
Both displays of the side display an identical sum.
As the first from the left "**U**" character is displayed on the total price line for the display of the volume sum and "**A**" character for the display of the price sum.
The second character from the left displays the highest digit position of the relevant sum.
The sixth character from the left displays the lowest digit position of the relevant sum.
The sums are counted and displayed with decimal place count according to the data setting of the counter.
The side number and the nozzle number of the totalizer displayed at this moment are displayed on the unit price line:

e.g..: 1 - 3...A side - nozzle No. 3;
2 - 1...B side - nozzle No. 1.

Display procedure:

1. Both dispensing points shall be free (transitions are not running at any of the both points and terminated transactions shall be acknowledged).
2. Depress the "+" key to display the volume sum. Depress the "-" key to display the price sum.
3. All segments light up and light out on the displays of the sides after depressing the "+" key (or the "-" key) (similarly with the transaction starting to checking if all segments display correctly) and total number of feeding voltage drop-outs is shortly displaced.
4. Then "**U**" and the volume sum of the relevant nozzle (or "**A**" and the price sum of the relevant nozzle) are displayed on the displays of sides.
5. It is possible to carry out the transition to the volume totalizer displays of the next dispensing nozzles by repeated depressing the "+" key or by lifting the relevant nozzle (as well as the transition

to the price totalizer displays of the next dispensing nozzles by repeated depressing the "-" key or by lifting the relevant nozzle).

6. Terminate the scanning of electronic totalizers by depressing the "**0**" key and in case the thermal and electronic calibration are activated, transition in the display mode of their setting occurs.
7. The setting of thermal calibration for relevant nozzle is activated by the ATC text. The setting of electronic calibration of the relevant nozzle counter is activated by the EC text.
8. Terminate the scanning by depressing the "**0**" key and return to the standard mode.

8.4.4. Check of vapour recovery system function

This function enables to carry out the independent check-up of vapour recovery from the tank without fuel dispensing.

The check-up it is possible to activate by the help of KL-MANINF keyboard.

The necessary conditions for transition into the check of vapour recovery from the tank:

- from last switch of the counter the dispensing nozzle wasn´t lifted
- the transactions must be confirmed (unblocking by the help of RLS entry, if the parameter No. 4 value is 1

Notice:

KL-MANINF manager keyboards from the serial number 2110104000001 enable the activation of vapour recovery check.

1. Switch the power supply of the fuel dispenser off and wait for min. 30 s.
2. Switch the power supply of the fuel dispenser on.
3. With key **„R"** on KL-MANINF keyboard choose the function of vapour recovery check The text Vapour Check appears on the display.
4. By dispensing nozzle lifting the vapour recovery system is activated. On the line of unit price the value of the vapour recovery flow rate 20 l/min displays.
   Notice: The dispensing nozzle is equipped with automatic valve which closes the vapour recovery system, if the dispensing nozzle is hanged. Therefore it is necessary to knock the nozzle down for releasing of the valve. During the all check it is necessary to keep the nozzle in the down direction for not closing the valve not to stop vapour recovery.
5. Put testing device (it is not a part of the dispenser delivery – can be ordered from the producer – ELAFLEX Co.) on the nozzle up to the suction channel for vapour recovery or if the testing device is not available, a plastic bag filled with air to cover the suction channel, tight it well and by reducing of its volume check the function of vapour recovery.
6. The check of vapour recovery finish by hanging of all the dispensing nozzles and by pressing of the key **„R"**. Than the counter will be returned to the mode of fuel dispensing.

9. MAINTENANCE OF A DISPENSER AND ITS INDIVIDUAL OPERATING UNITS

The user of the dispenser is obliged to operate the device safely, reliably and in economic way. First of all he is obliged to:

- appoint a worker responsible for the operation and technical conditions of the dispenser and its individual components
- ensure inspection, testing, repairs and maintenance by qualified methods
- carry out records and file documents - see point 3.2

ATTENTION!

All repairs of functional units may only be carried out by a service company and its authorized personnel!

ATTENTION!

- **Before performing all service and maintenance work on mechanical, hydraulic and electrical components, it is always necessary to securely disconnect the power supply to the dispenser and ensure reliable re-connection during maintenance!**
- **Only approved components may be used when replacing parts. All parts subject to approval must always be in a state that prescribes the technical documentation (leakage, earthing, electrostatic conductivity, etc.)**
- **After any service intervention and remounting it is necessary to check visually the tightness of the bolted connections and possible fuel leakage shall be eliminated.**

9.1. Pumping monoblock

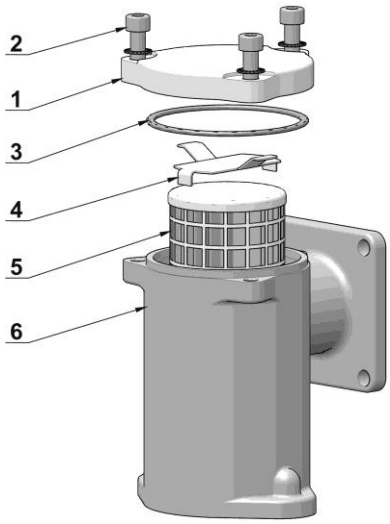
Prior to the first start after installation it is necessary to prime the pumping monoblock by pumped fuel. It is carried out by dismantling the filter cover, at first two nuts are removed. Then the liquid is filled through the filter. The pump has to be manually rotated several times after priming. Then the chamber is covered and nuts are properly tightened. Basic maintenance consists of the filtering sleeve exchange, regular tightening of the filter cover nuts and fixing of the bolts of the monoblock to the bracket.

After dispensing a million dm^3 through the dispenser or once per a year at least check the greasing condition of the pump ball bearing. If necessary grease the bearing by LITOL 24 lubricating grease or a grease of similar quality. Checking should be performed after dismantling the pump belt pulley.

Possible defects of the monoblock:

- clogged filter - exchange the filtering sleeve
- faulty venting, air bubbles appear in the sight glass - it is necessary to check the condition of all sealing parts of the monoblock and complete suction piping
- leakage of the seal - possible seizing of the bearing
- irregular running of the dispenser and higher noise - malfunction of vanes

Filling station operators replace the filtering sleeve. Other defects shall be serviced by a qualified repair shop!



9.1.1. Changing the filter element – pumping monoblock with lower suction

1. When replacing the filter insert Protect your hands from splashes your skin the pumped liquid!
2. Dismantle three screws (2) of the filter cover (1) and remove the lid. After removing the pressure plate (4), pulling it upwards to remove the filter insert (5) of the filter body (6).
3. Insert the new filter (5) element and perform reassembly.
4. Check the condition of the sealing "O" ring (3) in the filter cover. Possibly make his replacement. Damaged seal ring can cause a malfunction (crashes liquid levels, or air leak).
5. Chamber to close the filter cover and tighten thoroughly.

9.1.2. Changing the filter element – pumping monoblock with upper suction

1. When replacing the filter insert Protect your hands from splashes your skin the pumped liquid!
2. Unscrew the filter cover nuts and remove the cover for the exchange of the filtering sleeve.
3. Then seize the flap of the check valve and draw the filter sleeve upward together with the integrated check valve.
4. Remove the filter sleeve from the filter body and insert a new filter sleeve.

5. Carry out the reassembly. Prior to the reassembly check the condition of the O-rings on the insertion with the integrated check valve and in the filter cover. Replace them if necessary. Faulty O-rings can result in level drop or air intake.
6. Chamber to close the filter cover and tighten the nuts thoroughly.

9.2. Piston flowmeter

The meter unit consists of the proper meter with integrated impulse detector. Only authorised specialists can handle the metering unit because the meter is officially sealed. If the seals are damaged, it is necessary to carry out an official inspection and new official sealing.

The condition of the meter (e.g. liquid leakage) shall be followed continuously and repairs shall be performed in time. The stability of the set accuracy for the calibrated meter is at least one million dm^3 for measured dispensed fuel without mechanical impurities. It is recommended to check the meter accuracy after the dispensing of such fuel quantity. Even if the seals are not damaged, the meter shall be periodically inspected by an authorised specialist - once per two years at least.

Also the impulse detector should not be repaired - the meter is replaced only. The fixing of these components is sealed by an official authority, when replaced they are sealed again the official authority.

9.3. Electromagnetic two-stage valve

It is used for two-stage closing of flow when dispensing the preselected volume. The first stage partially closes the flow to approximately 10% of the flow rate just before the set value is achieved. The second stage closes the flow completely. The operation of the two-level stage closing of the valve shall be followed and prospective defect shall be repaired in time.

The closing and the throttling functions are eliminated in the service mode. The repair is performed by qualified workers. Fixing bolts of the valve shall be regularly checked and retighten to prevent any liquid leakage.

9.4. Sight glass of the dispenser

It is used for visual inspection of the liquid flow. Possible defects of the sight glass: leakage, broken glass and other damages. All these defects shall be repaired by a qualified worker only.

9.5. Dispensing hose

Special dispensing hoses certified according to EN 1360 standards are used for dispensers.

One end of the dispensing hose is threaded for screwing onto the dispensing nozzle, the adapter for connection to dispenser is on the other end. The dispensing hoses are not repaired but replaced.

ATTENTION!

THERE IS EXPLOSION HAZARD WHEN USING A NON-CERTIFIED HOSE!!!

9.6. Dispensing nozzle

It is a terminal part of the dispenser by means of which fuels are dispensed. The dispensing nozzle enables:

- service dispensing - the rate of flow can be controlled up to its full stop by means of control lever
- STOP function - the dispensing nozzle stops the flow if the tank is filled up
- safety function - the dispensing nozzle stops the flow in case of unskilled handling or when the nozzle falls out from the fuel tank filler

After both these safety actions the control lever shall be released to get it automatically back to its initial position. The dispensing nozzle is a highly sensitive and complicated closing device. Therefore replacing is recommended instead of repairing at the filling station. The nozzle is unscrewed from the

hose adapter while taking care not to lose the screen located in the nozzle. The screen shall be cleaned regularly because the clogged screen may result in substantial reduction of fuel flow.

9.7. V-belt of the pump

A swivelling bracket of the el. motor is used for tightening the pump V-belt. After replacing the fixing bolt the motor can be shifted so that the V-belt has 10 to 12 mm sag if slightly pushed down by hand. Then the bolt is retighten. The V-belt must satisfy the conductivity property according to **ISO 1813 and R044-001**.
The V-belt of identical dimensions and similar conductivity property shall be used for the replacement of the existing V-belt. The contact surfaces of V-belt pulleys shall be metal clean to provide earthing.

ATTENTION!

THERE IS EXPLOSION HAZARD WHEN USING A NON-CONDUCTIVE V-BELT!!!
The contact surfaces of V-belt pulleys shall be metal clean to provide earthing.

9.8. Dismantling of covers

It is carried out in required scope during installation, routine maintenance, minor repairs and modifications of electric or hydraulic parts.

The original location of covers must be held in remounting!

Covering of MONO, DUO hydraulic modules.

To make the interior of hydraulics accessible the door shall be dismounted by unlocking, tilting and slipping out.

To make the entire interior of the hydraulic module accessible it is necessary to dismantle the module cover by loosening six M8 nuts, three on the column and three on the foundations. Four bolts positioned at the upper part of the column shall be loosened for lifting the column cover off to make the junction box accessible. Then the column can be tilted and slipped out. **Take care of the magnetic switch cable for controlling the lifting of the dispensing nozzle.**

Covering of DUPLEX hydraulic module.

To make the interior of hydraulics accessible the door shall be dismounted by unlocking, tilting and slipping out. The dismounting of the column covers is similar to MONO and DUO dispensers.

Covering of counter case

Face covers are disassembled by unlocking the cover and lifting it upwards on hinges. The cover lifted is screwed by means of the cover holder in the upper position.This allows the access to the electronic counter and other components located in the box.

Any handling the electric and electronic parts may only be carried out by a specialist who is responsible for the safety of the equipment. The IP 54 protection may not be affected during the counter case handling.

It is necessary to check the gasket prior to remounting the cover. Damaged gasket shall be replaced.

Dismounting of the metering unit

Dismount the covers, unscrew the bolts connecting the meter to the joining piece. Disconnect the flange connection to electromagnetic valve, dismount the bolts of the integrated detector and remove it from the meter. Reverse procedure is used for remounting the meter.

Dismounting of the electromagnetic valve

Disassemble the covers of hydraulics, disconnect the joining tube by means of a cap nut. Then dismount the fixing bolts of the valve flange. Release the wires of electromagnetic spools in bushings after removing the covers of the hose module. Then disconnect the wires in the counter case and remove the valve after withdrawing the wires from the wire bundle. Reverse procedure is used for mounting the valve.

Dismantling of the vacuum pump set

It is carried out by loosening four M6 bolts fixing the pump to the bracket. The vacuum pump bracket can be dismounted by loosening the two M8 nuts used also for the belt tightening control. Prior to the vacuum pump removal disconnect both the suction and discharge piping by loosening two hollow bolts.

Dismantling of distribution piping

Dismantling of pipes is carried out by loosening the G1" cup nuts screwed on the electromagnetic valve thread of the hydraulic module and on the equal-angle piece in the column (lower outlet of the hose) or on the thread of the spring hinge lower part. Then the tubes can be removed.

ATTENTION!

After any service intervention and remounting it is necessary to check visually the tightness of bolted connections and possible fuel leakage shall be eliminated.

9.9. Maintenance instructions for dispenser body parts

Good appearance of dispensers is a part of the filling station standard. Even if the parts of external covering have either been provided with coats of good quality or made of stainless steel, their maintenance should be carried out regularly. Instructions for use specified by the supplier shall be adhered to.

Higher attention should be paid to these parts in winter season because of unfavourable effect owing to aerosol from chloride agents used for road maintenance.

Preservative polishing agents are recommended for the restoration of surfaces stained by fuel liquids.

The maintenance of the dispenser covering is carried out by filling station operators.

NOTE

For the maintenance of the dispenser covering use only agents recommended by the producer of fuel dispensers! Act upon instruction given on agents.

Recommended time intervals for the maintenance of dispenser painted body parts:

- washing the dispenser with hot water - twice per month at least (according to staining severity and season of the year)
- washing the dispenser with surfactant, proper cleaning of covers from salt residues, dust and grease with subsequent restoration of preservative coating on the body parts - once per month (according to the season of the year)
- washing the dispenser with surfactant and restoration of preservative coating is also recommended after more extensive surface staining by fuels

Recommended time interval for the maintenance of stainless body parts:

ATTENTION!
DO NOT WASH STAINLESS STEEL SHEETS
BY WATER OR EVEN SURFACTANT!!

Recommended procedure for stainless steel sheets:

- **Washing of parts by thorough cleaning of salt residues, dust and grease followed by the renewal of protective coating on body parts - by special agent for the protection of stainless steel sheet - once a month.**
- **Recommended special agents:**
  - **NEOBLANK spray (producer: Chemische Fabrik Dr. Weight GmbH & Co. KG, Mühlenhagen 85 - D - Hamburg**
  - **ANTOX Surface Care 800 S (producer: Chemetall AG, Silostrasse 7, CH - 5606, Dintikon**
  - **ULTRAPUR – d (producer: MMM – Group, SRN)**

9.10. Electronic counter

No maintenance of the electronic counter is performed. Any manipulation with the counter and wiring of the dispenser can be only performed by a qualified person.

The electronic counter itself is repaired by replacement at the filling station.

10. DISASSEMBLY AND DISPOSAL

Considering the fact that the residues of fuel always are left in hydraulic distributing systems and in hydraulic parts of the dispenser it is necessary to pay **higher attention to the disassembly and disposal. The dismantling must be carried out on dripping grids where the residues of fuels are safely removed into dripping tanks.**

It is forbidden to carry out the disposal by using burners and sparkling device.

Hoses have to be disposed according to special regulations for the disposal of ecologically undesirable materials.

11. SUMMARY OF BASIC PRINCIPLES FOR DISPENSER MAINTENANCE

ATTENTION!

Prior to all maintenance activities relevant to mechanical, hydraulic or electric parts it is always necessary to switch el. current off and carry out reliable provision to prevent its incidental switching on.

Service manipulation is performed in accordance with operating regulations for the filling station.

- replace the filter sleeve of the pump filter in compliance with the mode of operation and ensure proper reassembly of the filter
- keep all operating units of dispenser clean to enable easy identification and rapid repair of unexpected failure
- check systematically all joints and if any leakage is identified, retighten the joint or make it tight
- check and tighten the V-belt by means of a swivelling bracket of the motor if required
- check and if required tighten the bolts fixing the el. motor and the monoblock to the bracket

- check the condition of the dispensing nozzle; either repair or replace the nozzle according to the type and extent of the failure
- check the door lock function, grease it occasionally
- pay attention to the cleanness of the dispenser, especially the glass of the counter
- discharge sediments, water or other contaminants from the tank (containers of fuel) by means of sludge pumps

12. TRANSPORT

The customer shall agree to the method of dispenser transport from the manufacturer in the contract. In case Adast Systems, a.s. provides the transport for the customer, the product will be delivered to the agreed destination. The manufacturer possesses the necessary knowledge of handling and transportation methods. In case the customer is responsible for another method of transport, the manufacturer shall ensure professional loading of the product but is not responsible for the transport itself. It is generally accepted that the dispenser shall be shipped properly boxed and always fixed to the wood pallete. The dispenser should be protected against damage (of covering and painting), displacement and rolling over on the means of transport. All manipulation and transport have to be carried out only in vertical position - the dispenser must not be put on its covering.

WARNING!

- **Only forklifts are allowed to be used for manipulation. If other handling devices are used, Adast Systems, a.s. does not guarantee any prospective damage!**
- **All manipulation and transport have to be carried out only in vertical position - the dispenser must not be put on its covering.**
- **Use protective equipment during handling.**

13. INSTALLATION OF THE FUEL DISPENSER

ATTENTION!

THE DISPENSER INSTALLATION CAN BE CARRY OUT ONLY BY THE ORGANISATION AUTHORISED BY MANUFACTURER!!!

WARNING!

- **Use protective equipment when handling and installing the dispenser.**
- **Observe the safety regulations when handling flammable liquids.**
- **Fire extinguishers - powder extinguishers must be provided during installation.**
- **It is forbidden to smoke and handle open fire in the immediate vicinity of the dispenser.**

Read carefully the article **1. IMPORTANT NOTICE**.

The dispenser can be joined only to process equipment (tanks, piping) of perfect tightness and cleanness. The supplier of the process equipment is responsible for its tightness and cleanness.

Prior to the installation the organisation shall perform the inspection of used power and communication cables.

When the dispenser is installed, they shall check the tightness, function of hydraulic equipment of the dispenser, supply piping and fittings. They also check power and communication cables including their lines and fixing.

Prior to official metrological testing the dispenser (every dispensing nozzle) has to operate for min. 5 minutes in max. flow rate.

The process and service equipment of filling stations can be operated only when they have been built up according to the approved design and on the basis of positive result of licence regime.

13.1. Hydraulic part

A steel foundation frame will be seated and set in concrete on the shaft in horizontal level (with respect to the final level of the island - e.g. with a paving). The supply line from the fuel storage tank (underground or aboveground) with G 1 1/2" and G 2" threads for flanges with inner thread (part of the dispenser delivery) is outgoing from the shaft. The threads should be sealed (caulking or Teflon tape) and pressure tested.

The vapour exhaust recovery will be connected to the T or L pieces (part of the dispenser delivery) by means of M 16 x 1,5 cap nuts of the connecting piping (special hose). The T or L piece is screwed through a reducer on the draw-off pipe DN 25 with external thread G 1" and sealed similarly to suction flanges.

Leakage is difficult to identify after the dispenser seating!

The dispenser is connected to the frame (see Enclosure No. 17). A gasket shall be inserted between the coupling flanges of the lower process equipment and the dispenser and the joints shall be carefully fixed and tightened. The same procedure is used to connect the vapour exhaust recovery.

NOTICE!

- **V-line 899x.xxx/P dispensers intended for pressure distribution system of fuels have to be connected to the piping system of the filling station through the safety breaking valve (typ OPW-10R) ensuring the closing of fuel supply to the dispenser in case of any damage.**
- **The valve shall be properly fixed to the solid part of the shaft under the dispenser!**

13.1.1. Installation on the filling station with underground tanks

At fuel dispenser installation on the filling station with uderground tanks it is necessary to comply the parameters given in the tables 1 and 2 - Operating flow rate of the fuel dispenser in relation on the fuel storage tanks parameters.

Installation scheme of the fuel dispenser – see the fig. 1

Table 1 - Operating flow rate of the fuel dispenser in relation on the fuel storage tanks parameters for hydraulic unit with Q_{max} = 40 $dm^3.min^{-1}$.

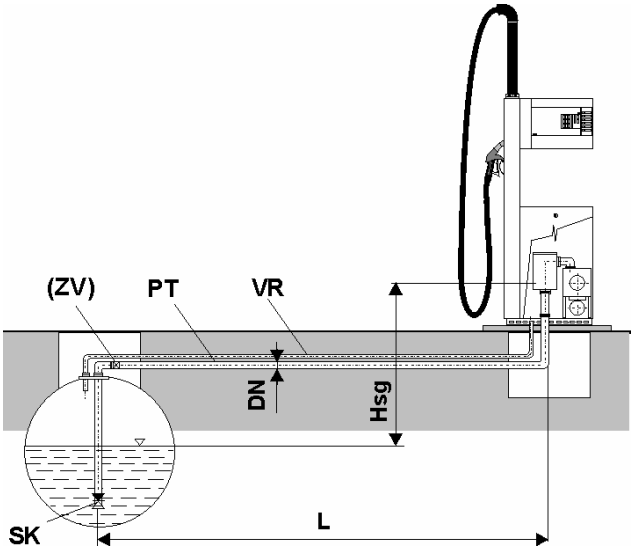
Geodetic suction head Hsg_{max} [m]	Inner diameter of suction piping DN_{min} [mm]	Length of suction piping L [m]	Operating flow rate of the fuel disppenser without vapour recovery Q [$dm^3.min^{-1}$] ±10 %	Supposed loss in pressure in suction piping [kPa]
			Petrol	
			Diesel oil	
3	40	10	40	13
			40	
		20	40	14
			40	

		25	35	15
			40	
		30	35	16
			40	
		35	30	17
			35	
		40	**25**	**18**
			35	
		45	**20**	**19**
			30	
-	**50**	**Greater than 35**	**Pressure system - submersible pump in the tank**	

Table 2 - Operating flow rate of the fuel dispenser in relation on the fuel storage tanks parameters for hydraulic unit with Q_{max} = 80 $dm^3.min^{-1}$, Q_{max} = 130 $dm^3.min^{-1}$, Q_{max} = 150 $dm^3.min^{-1}$ and Q_{max} = 150 $dm^3.min^{-1}$

Geodetic suction head Hsg_{max} [m]	Inner diameter of suction piping DN_{min} [mm]	Length of suction piping L [m]	Operating flow rate of the fuel disppenser without vapour recovery Q [$dm^3.min^{-1}$] ±10 %	Supposed loss in pressure in suction piping [kPa]
			Petrol	
			Diesel oil	
3	50	10	80	14
		20	80	15
		25	80	16
		30	75	17
		35	75	18
		40	70	19
		45	65	20
-	**50**	**Greater than 45**	**Pressure system - submersible pump in the tank**	

Fig. 1 - Fuel dispenser connection to the underground tanks



PT - fuel suction piping
VR - return piping for vapour recovery
DN min. 20)
SK - strainer
ZV - return valve (alternatively)
Hsg - geodetic suction head (m)
DN - inner diameter of suction piping (mm)
L - lehgth of suction piping (m)

13.1.2. Installation at the filling station with overground (aboveground) tanks

A safety relief check valve (PZV), opening at vacuum pressure Hs = - 0,03 MPa max. induced by dispenser pump, shall be installed in the suction piping (PT) connecting the dispenser and the storage tank. The check valve (PZV) is usually connected to the suction fitting located on the tank cover. The check valve prevents permanent supply of stored fuels into the pumping monoblock when the dispenser is out of operation.

The pumping monoblock of dispensers (P 640 type) is designed with air separator permanently open to the deaerating chamber formed by the space in the monoblock body and the space of the monoblock cover. There is a hole in the upper wall of the cover with integrated DN 6 adapter for connecting the air outlet pipe (OT).

To eliminate the overfilling of the deaeration chamber of the pumping monoblock and discharging of fuel into the interior of the dispenser and consequently into its close area in case of the leakage or blocking of the check valve flap when the dispenser is out of operation, it is necessary to connect the separator outlet of the pumping monoblock to the storage tank. This connection shall be carried out by means of a tube (OT) min. 8 x 1 (DN 6) connected to the tube adapter DN 6. The tube adapter with the gasket is screwed into the opening M 12 x 1,5 in the upper wall of the monoblock. The tube outlet mouths in the tank above the level of the stored fuel. The connection shall be carried out by means of the tube adapter DN 6 screwed into the tank cover (tapped hole M 12 x 1,5 in the tank cover shall be made).

Closing the outlet opening of the pumping monoblock separator is not allowed. Accumulation of separated air or fuel vapours and their sequential compression in this closed space of the pumping monoblock or a change in the fuel volume owing to the ambient temperature increase can induce excessive pressure in the hydraulic system. Thus blockage of the fuel dispensing or another defect could occur.

A stop-valve (UV) of relevant nominal inside diameter shall be installed in the suction piping as close to the dispenser as possible (e.g. in the shaft close to the dispenser).

Piping from air separator (OT – min. DN 6 – 8 x 1) install in the tank area above the level of storage fuel.

Scheme of the fuel dispenser installation – see fig. 2, 3 and 4.

Fig. 2 - Fuel dispenser connection to the overground tank

PT – fuel suction piping

VR – return piping for vapour recovery (DN min. 20)

OT – piping from air separator (min. DN 6)

PZV – return valve (Hs = -30 kPa)

UV – stop-valve

DN – inner diameter of suction piping (mm)

L – lehgth of suction piping (m)

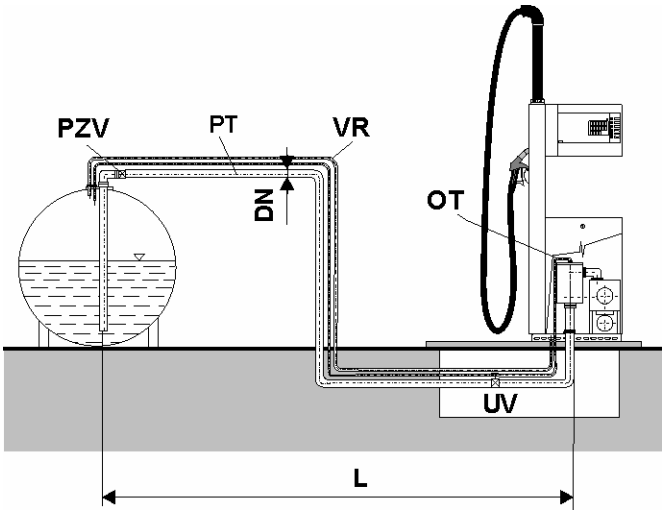
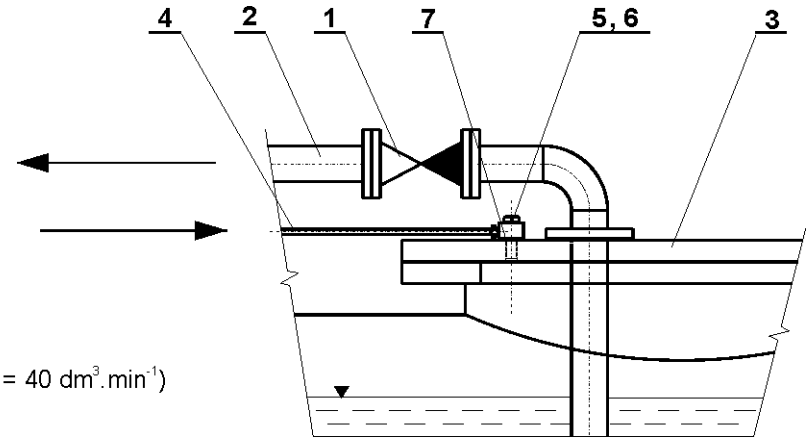


Fig. 3 – Example of the suction piping design for the connection of the fuel dispenser to the overground tank



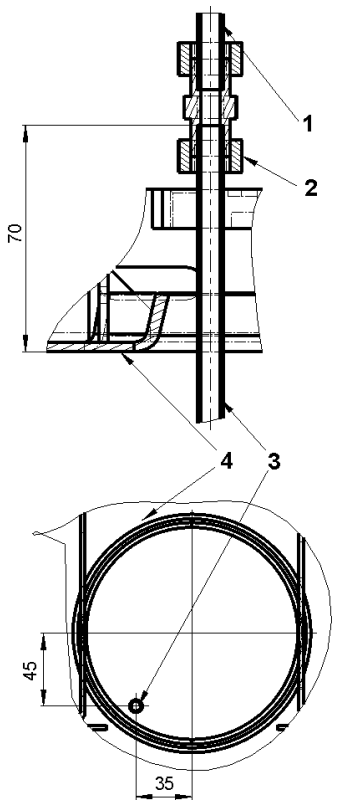
Legend:

1. Non-return hypertensive straight valve (DN according to the suction piping)
2. Suction piping from the tank DN 40 (Q = 40 $dm^3.min^{-1}$) or DN 50 (Q = 80 - 130 $dm^3.min^{-1}$)
3. Tank cover
4. Tube Ø 8 x 1 (DN 6) for air exhaustion from pumping monoblock
5. Angular tube adapter DN 6 - nomenclature 1580700006
6. Sealing ring 14 x 18 - nomenclature 1383171814
7. Sealing ring 12 x 16 - nomenclature 1383171612

Notice: Producer can supply the pcs. 5, 6, 7 as the extra packing to the fuel dispenser delivery with listed nomenclature numbers.

Fig. 4

Connecting of pipeline output from air separator (OT) in case of connecting fuel dispenser to overground tank.



1. Air separation pipe with direct connector
2. Direct connector
3. Output pipe DN 6
4. Leakproof pan

13.2. Mounting of spring of the spring hinge

The spring is screwed into the sleeve of the spring hinge lower part on the dispenser column. Then it is secured by tightening the sleeve with the built-in M 6 clamping bolt.

13.3. Wiring

ATTENTION! Emergency switching off!

It shall be enabled to switch off the filling equipment from one point, which is accessible anytime. The electric equipment situated in the explosion hazard area can be switched off by means of the emergency breaker located outside the explosion hazard area. The switch for normal operation can be also used as emergency breaker.

ATTENTION!

- **For electrical connection of the fuel dispenser must be used electric cables that meet the requirements of EN 13617-1: 2013 - meet the standard EN 60079-14 and EN 50525-2-51:, 2011.**
- **The power supply cables must be connected to the distribution box. The earthing conductor must be connected to the grounding point of the dispenser.**
- **After installation, carefully check the correctness of electrical wiring!**

Earthing conductor shall be connected to the shaft under every dispenser.

Lead-in cables from the switchboard to the dispenser shall answer (number of cores and cross-section) to the specification in enclosures - Connection of dispensers to the switchboard of the filling station.

Leads to the dispenser must be sealed to prevent its interior from the penetration of combustible liquids or vapours. Only cable terminals resistant to combustion liquid effect can be used in the shafts under dispensers. The cable bushings can always be used for one cable only if cable outlets for more cables are not used.

El. motors are equipped with integrated thermal protection which switches off the motor in case of its overload. Any motor can be put into operation by the RESET key on the electronic counter after its cooling down and the remedy of the overload.

Supply conductors are connected to the junction box located in the dispenser.

The communication line cable is connected to the junction box for the communication line.

There are two wiring systems of the filling station: either the communication line is connected to the dispenser (i.e. self-service operation with the control system) or not (i.e. service operation).

ATTENTION!

If the communication line is not connected to the dispenser, the passage into the electronics box must always be closed with the ATEX plug.

The dispenser in self-service operation with the control system is connected through the communication line to the control system which controls operation of complete filling station (i.e. dispenser release, preselection of volume and price, unit price alteration, selfdiagnostics, etc.).

14. PACKING AND STORAGE

14.1. Packing

The packing of dispensers differs in dependence on the point of destination. Dispensers for home market are packed up in bubble wrap, while cardboard wrapping is mostly used for abroad. On preliminary agreement of the customer the dispensers delivered abroad can be also packed up in bubble wrap or other similar packing.

Packaging materials are recyclable. Do not put the packaging in municipal waste, but hand it over for reuse.

14.2. Storag

Max. storage time under the shelter is 3 months and 1 month for outdoor storage with bubble wrapping.
Max. storage time under the shelter is 6 months with cardboard packing.

15. GUARANTEE AND CLAIMING

Reliable operation and service life of the dispenser depends on correct attendance and maintenance. Therefore it is necessary that every employee maintaining or attending the dispenser is acquainted with all principles of correct attendance and maintenance and related regulations for combustibles handling.

Smoking, handling open fire, tanking vehicles with engine running, etc. are particularly forbidden!

Defects and shortcomings owing to incorrect or careless attendance and maintenance of the dispenser and its individual functional parts are not included in the guarantee. Therefore any complaint within this matter would be acknowledged.

The disposal of sludge, water or other impurities from tanks (fuel storage tanks) shall be ensured entirely. It is carried out by means of decantation equipment which shall be a part of the filling station equipment. If the manufacturer carrying out guarantee repairs identifies excessive quantity of impurities in the hydraulic system, the complaint will not be accepted and expenses will be charged to the user.

Claims will not be acknowledged due to the following reasons:

- Use of unsuitable fluid (non-standard liquid fuels, substances containing water, diluting agents, etc.).
- **Shortcomings owing to incorrect design or imperfect assembly of "the lower process equipment", i.e. tank location, length and diameter of piping, type and characteristics of fittings, overrun of suction head values etc. - fuel dispenser installation on the filling station must answer the given criteria from point no 15. hereof instructions.**
- **The recommended highest operation suction head is -45 kPa and max. length of suction piping for individual fluids:**
  for petrol 35 m
  for Diesel oil 40 m
- Leakage in the hydraulic system of the storage results in permanent air intake into the pumping monoblock - air separator is in permanent function - dispensing discontinuance occurs.
- **Consequence: increased wear of pumps**
- Faulty check valves in the suction line can cause its systematic discharging ("level drop") **Consequence: irregular and unreliable run, considerable stressing of pumps, increased wear of the pump vanes in "idle running", reduction of pump service life.**
- Defects owing to impurities in fluid can result in the seizing of the rotor, destruction of vanes or their excessive wear as well as excessive wear of rotor, stator and bearings of the gland, etc. With meters the impurities can result in function locking, excessive wear of slide valve gear, cylinders and packing.
- Defects owing to faulty high-power wiring at the filling station, e.g.:
  - incorrect installation of the switchboard
  - incorrect earthing system
  - incorrect cable distribution systems - power cables together with communication cables

– Defects from faulty low power wiring at the filling station, faulty wiring of communication cables especially as far as interference is concerned
  - missing UPS (ON LINE) - mains supply
  - standardised voltage values: U nominal ±15 % with frequency 50 Hz

The guarantee does not cover consumable supplies: filter bushings, V-belts, etc.
The guarantee and claiming are specified in the contract.
The guarantee claims can only be asserted at the purchaser of the fuel dispenser.

Claiming faulty function of the dispenser specify the following data:
– Serial number of the dispenser, its name, as specified on the rating plate of the dispenser.
– Precise description of the defect or failure.
– Description of circumstances when the defect occurred.
– If a complaint is claimed within the guarantee period, the seals may not be broken without previous consent.

If the seals have been broken or some not permitted unqualified handling the dispenser found out, the complaint will not be admitted.

For dispensers with control system or with control system and local preselection the complaint concerning the control system, electronics and software of dispensers cannot be acknowledged because of non-observance of wiring conditions and operation of the permanent feeding source UPS (UPS - Uninterruptible Power Supply).

16. SPARE PARTS CATALOGUE

Spare parts catalogues of the dispenser are supplied to service organisations. The user can request the spare part catalogues from the manufacturer.

17. ACCESSORIES

Parts of the dispenser delivery:

– **Shipping pallet - dismounted at the dispenser shaft site.**
– **Set for hydraulic system connection to V-line 899x.xxx/S dispensers (Enclosure No. 17):**
  - connecting pieces (suction corrugated pipe) are either screwed to the filter of the monoblock or enclosed extra
  - threaded flanges for the supply piping
  - O-rings for connecting pieces
  - cover of the inlet opening
– **Set for hydraulic system connection to V-line 899x.xxx/P dispensers (Enclosure No. 18):**
  - connecting piece
  - packing
– **Set of parts for the connection of vapour recovery system (Enclosure No. 17)**
– **Set for the dispenser connection to the base frame - special washers (Enclosure No. 17)**
– **Set of el. parts (Enclosure No. 21 – 33)**
  - ATEX plug
– **Set of el. parts (Enclosure No. 27 - 33)**
  - ATEX bushing

The delivery of the dispenser is not:

KL-MANINF infrared manager keyboard - for the selection of unit prices and display of electronic totalizers **for dispensers not connected to the control system** of the filling station (service operation of the filling station) - **can be ordered when ordering the dispenser, or as a spare part under number 9046800802.**

18. DOCUMENTATION DELIVERED

– Instructions for Operation, Maintenance and Installation
– EC Declaration of Conformity
– Service manual

19. ENCLOSURES

Enclosure No. 1	Main dimensions of V-line 899x.xx2/S dispensers
Enclosure No. 2	Main dimensions of V-line 899x.xx2/P dispensers
Enclosure No. 3	Main dimensions of V-line 899x.6x3/S, /P, V-line 899x.6x4 /S,/P; V-line 899x.6x3/S, /P/CA dispensers
Enclosure No. 4	Main dimensions of V-line 899x.6x3/LC/S, /P; V-line 899x.xx4/LC/S,/P/CA dispensers
Enclosure No. 5	View of dispensers V-line 899x.4x2 series
Enclosure No. 6	View of dispensers V-line 899x.6x3 series View of dispensers V-line 899x.6x3/CA series with Tankautomat ADAMAT
Enclosure No. 7	View of dispensers V-line 899x.6x3/OIL/CA series with Tankautomat ADAMAT
Enclosure No. 8	Min. distances of the dispenser from a steady obstacle located at the filling station Detail of dispenser location on the filling station island
Enclosure No. 9	Dispensing nozzle positions during fuel dispensing
Enclosure No. 10	Conditions of connection and operation of UPS for feeding the control system and electronic parts of V - line dispensers Conditions for the operation of V-line 899x.xxx/P (pressure design) dispensers
Enclosure No. 11	Installation dimensions of V-line 8990.xx2/P, 8991.xx2/S, /P, 8995.xx2/S, /P, 8997.xx2/S, /P, 8999.xx2/S, /P dispensers
Enclosure No. 12	Installation dimensions of V-line 8990.xx2/S, 8993.xx2/S, /P, 8994.xx2/S, /P, 8996.xx2/S, /P, 8998.xx2/S, /P dispensers
Enclosure No. 13	Installation dimensions of V-line 899x.6x3/S, /P dispensers
Enclosure No. 14	Installation dimensions of V-line 899x.6x3/LC/S dispensers
Enclosure No. 15	Installation dimensions of V-line 899x.6x3/LC/P dispensers
Enclosure No. 16	Installation dimensions of V-line 899x.6x4/S, /P dispensers
Enclosure No. 17	Connection of V-line 899x.xxx/S dispensers
Enclosure No. 18	Connection of V-line 899x.xxx/P dispensers
Enclosure No. 19	Connection of V-line 899x.xxx/P dispenser - „SUPERMAX"
Enclosure No. 20	Connection of satellite outlet at the V-line dispensers 899x.xxx/S and 899x.xxx/P
Enclosure No. 21	Connection of V-line 899x.xxx/S dispensers to the filling station switchboard
Enclosure No. 22	Connection of V-line 8991.xx2/P, 8993.xx2/P, 8995.xx2/P dispensers with vapour recovery system to the filling station switchboard
Enclosure No. 23	Connection of V-line 8994.xxx/P, 8996.xxx/P dispensers with vapour recovery system to the filling station switchboard
Enclosure No. 24	Connection of V-line 8990.xx2/P, 8991.xx2/P, 8993.xx2/P, 8995.xx2/P, 8997.xx2/P, 8999.xx2/P dispensers without vapour recovery system to the filling station switchboard
Enclosure No. 25	Connection of V-line 8994.xx2/P, 8996.xx2/P, 8998.xx2/P dispensers without vapour recovery system to the filling station switchboard
Enclosure No. 26	Connection of V-line 899x.xx2/S, /P, V-line 899x.xx3/S, /P dispensers with satellite to the filling station switchboard
Enclosure No. 27	Connection of V-line 899x.6x3/S and V-line 899x.6x3/LC/S dispensers with ADP1/L counter to the filling station switchboard

Enclosure No. 28	Connection of V-line 899x.6x3/P and V-line 899x.6x3/LC/P dispensers with vapour recovery system and with ADP1/L counter to the filling station switchboard
Enclosure No. 29	Connection of V-line 899x.6x3/P and V-line 899x.6x3/LC/P dispensers without vapour recovery system with ADP1/L counter to the filling station switchboard
Enclosure No. 30	Connection of V-line 899x.6x3/S and V-line 899x.6x3/LC/S dispensers with ADP1/T counter to the filling station switchboard
Enclosure No. 31	Connection of V-line 899x.6x3/P and V-line 899x.6x3/LC/P dispensers with vapour recovery system and with ADP1/T counter to the filling station switchboard
Enclosure No. 32	Connection of V-line 899x.6x3/P and V-line 899x.6x3/LC/P dispensers without vapour recovery system with mechanical counter to the filling station switchboard
Enclosure No. 33	Connection of V-line 899x.6x3/S dispenser without the conduit box to the filling station switchboard
Enclosure No. 34	Connection of V-line 899x.6x3/P dispenser without the conduit box to the filling station switchboard
Enclosure No. 35	Connection of V-line 8991.x83/CA, V-line 8991.x83/LC/CA and V-line 8997.x83/CA, V-line 8997.x83/LC/CA dispensers to the filling station switchboard
Enclosure No. 36	Connection of V-line 899x.6x4/S dispensers with mechanical counter to the filling station switchboard
Enclosure No. 37	Connection of V-line 899x.6x4/P dispensers without vapour recovery system with mechanical counter to the filling station switchboard
Enclosure No. 38	Connection of V-line 899x.xxx dispensers with vapour recovery system with automatic control system VRMS (Vapour Recovery Monitoring System).
Enclosure No. 39	Connection of the fuel dispenser heating to the filling station switchboard (valid only for the fuel dispenser with electronic case heating)
Enclosure No. 40	Connection of the magnetic pulse transmitter ME 01-05 and MTX 075 to the electronic counter ADP1 - connector X1
Enclosure No. 41	Connection of the magnetic pulse transmitter ME 01-05 and MTX 075 to the electronic counter ADP1/T, ADP2/T - connector X2
Enclosure No. 42	A location scheme official marks on the flowmeter M 403.25P for mechanical calibration
	A location scheme official marks on the flowmeter M 403.25P/1 for mechanical calibration
Enclosure No. 43	A location scheme official marks on the flowmeter M 403.xxEP for electronic calibration
	A location scheme official marks on the flowmeter M 403.xxEP/1 for electronic calibration
Enclosure No. 44	A location scheme official marks on the pumping unit P641.xxx/2/SS
	A location scheme official marks on the temperature sensor PT 100(Just if ATC conversion function is activated)
Enclosure No. 45	A location scheme marks official on the temperature sensor PT 100 – fuel dispenser connected to the central pressure system
	A location scheme official marks on ADP1/L electronic calculator
Enclosure No. 46	A location scheme official marks on ADP1/T a ADP2/T L electronic calculator
	A location scheme verification marks on electromagnetic total counter for single-sided fuel dispensers
Enclosure No. 47	A location scheme verification marks on electromagnetic totalcounter (case version 2017)

Enclosure No.	48	Hazardous zones of dispensers V-line 899x.xxx series
Enclosure No.	49	Hazardous zones of fuel dispensers V-line 899x.6x2
Enclosure No.	50	Hazardous zones of fuel dispensers V-line 899x.4x2
Enclosure No.	51	Hazardous zones of fuel dispensers V-line 899x.6x3
Enclosure No.	52	Type identification on the rating plate of V-line 899x.xxx dispenser
Enclosure No.	53	Type identification on the rating plate of V-line 899x.xxx/CA dispenser

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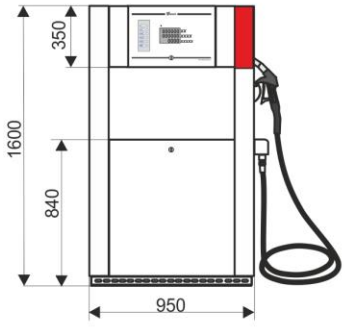
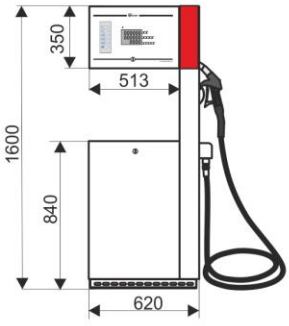
Regarding continuous development the producer stipulates the right to pursue technical changes!

Main dimensions of V-line 899x.xx2/S dispensers

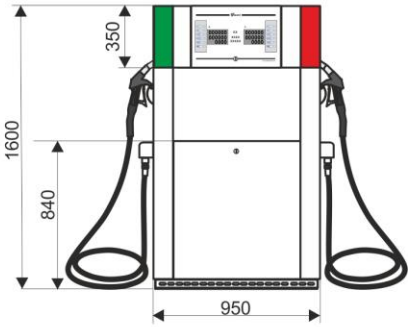
V-line 8990.6x2/S



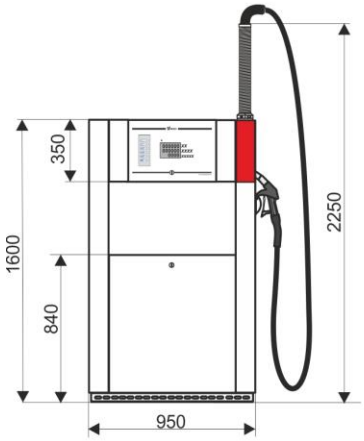
V-line 8991.6x2/S
V-line 8997.6x2/S



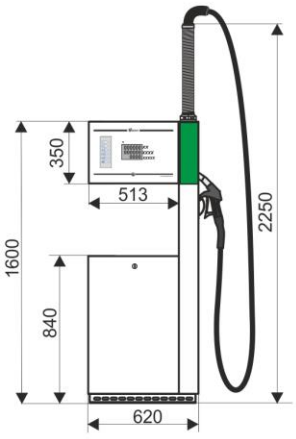
V-line 8993.6x2/S
V-line 8994.6x2/S
V-line 8996.6x2/S
V-line 8998.6x2/S



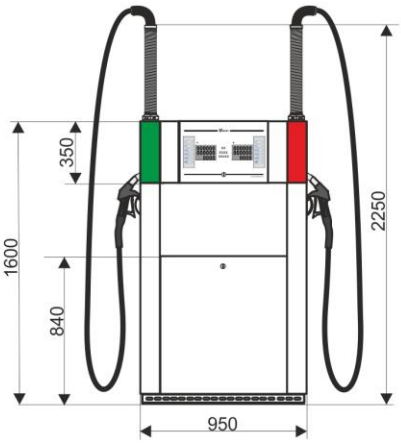
V-line 8990.4x2/S



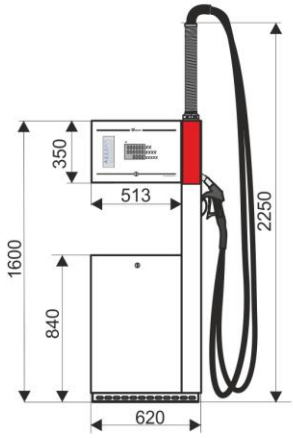
V-line 8991.4x2/S
V-line 8997.4x2/S



V-line 8993.4x2/S
V-line 8994.4x2/S
V-line 8996.4x2/S
V-line 8998.4x2/S



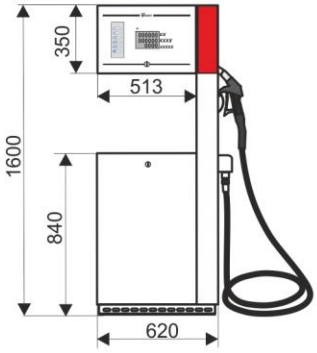
V-line 8995.4x2/S
V-line 8999.4x2/S



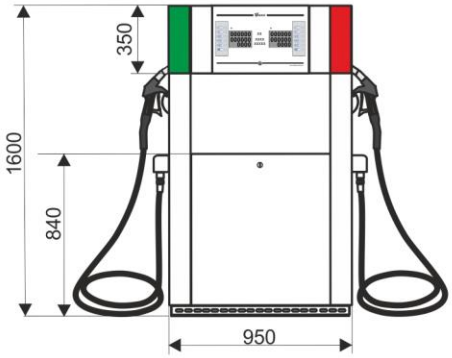
Width of all fuel dispensers is 410 mm

Main dimensions of V-line 899x.xx2/P dispensers

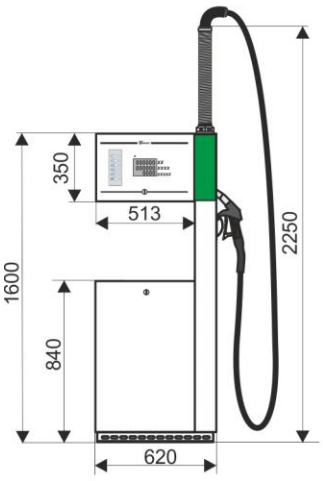
V-line 8990.6xx/P
V-line 8991.6xx/P
V-line 8997.6xx/P



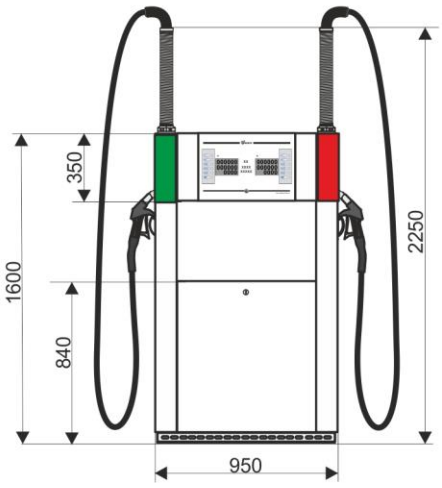
V-line 8993.6xx/P
V-line 8994.6xx/P
V-line 8996.6xx/P
V-line 8998.6xx/P



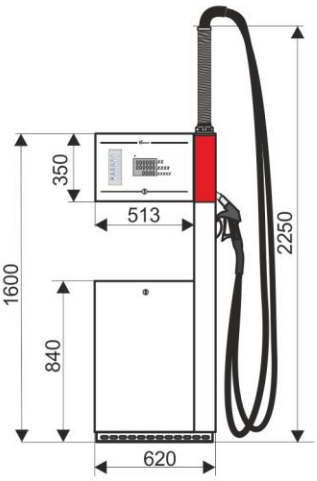
V-line 8990.4xx/P
V-line 8991.4xx/P
V-line 8997.4xx/P



V-line 8993.4xx/P
V-line 8994.4xx/P
V-line 8996.4xx/P
V-line 8998.4xx/P



V-line 8995.4xx/P
V-line 8999.4xx/P

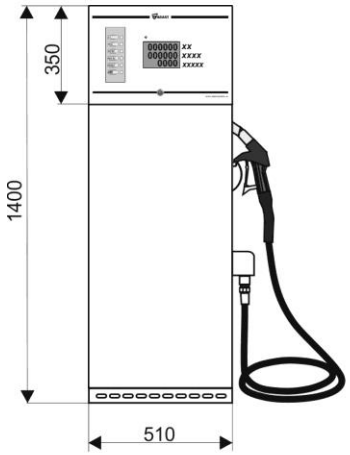


Width of all fuel dispensers is 410 mm

Main dimensions of V-line 899x.6x3/S, /P, V-line 899x.6x4 /S,/P; V-line 899x.6x3/S, /P/CA dispensers

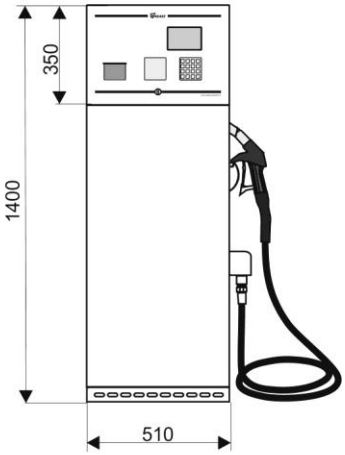
V-line 8991.6x3/S;
V-line 8997.6x3/S;

V-line 8991.6x3/P;
V-line 8997.6x3/P;



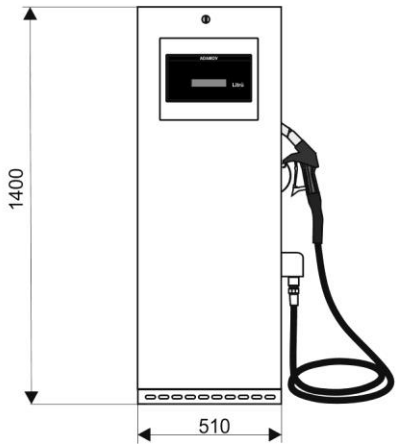
V-line 8991.6x3/S/CA
V-line 8997.6x3/S/CA

V-line 8991.6x3/P/CA
V-line 8997.6x3/P/CA



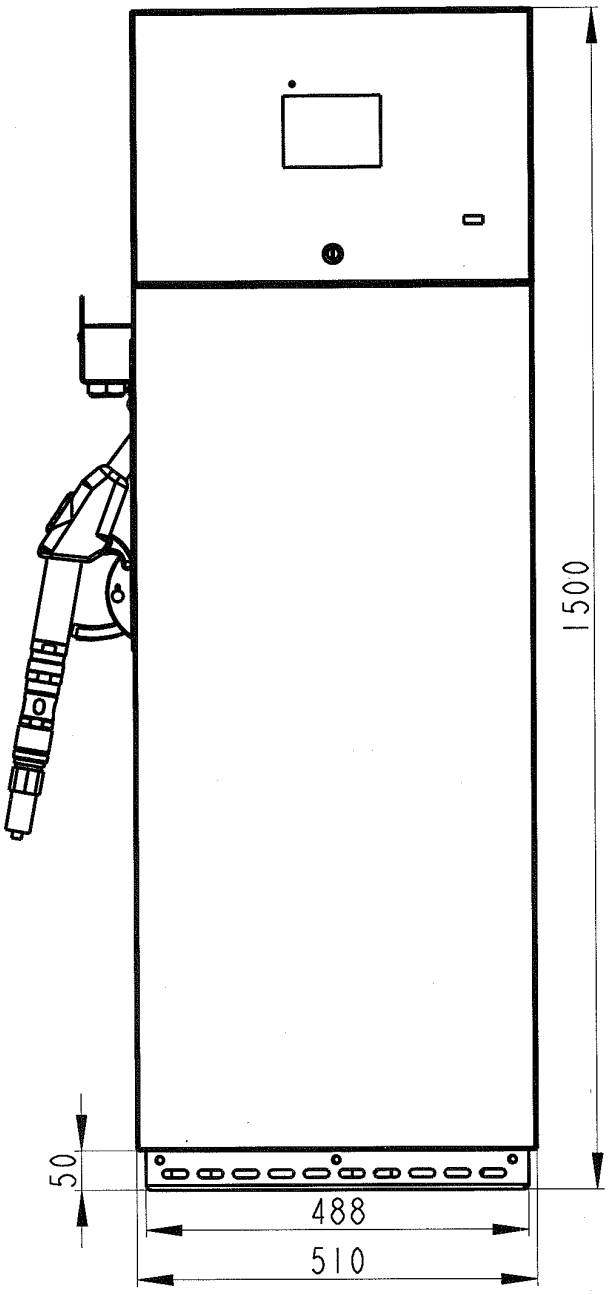
V-line 8991.6x4/S
V-line 8997.6x4/S

V-line 8991.6x4/P
V-line 8997.6x4/P



Width of all fuel dispensers is 410 mm

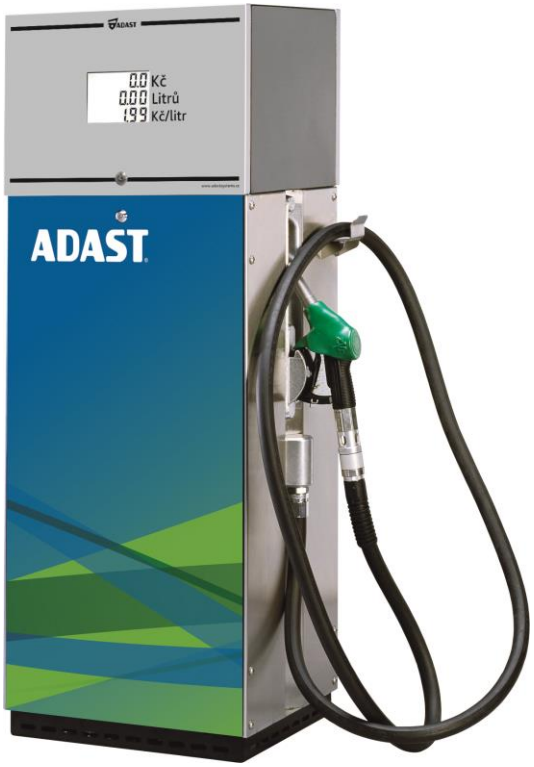
Main dimensions of V-line 899x.6x3/LC/S, /P; V-line 899x.6x3/LC/S, /P/CA dispensers



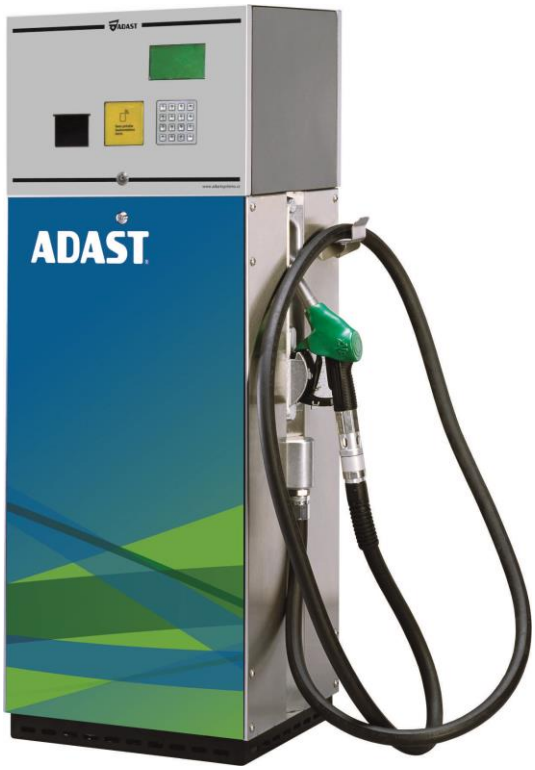
Width of all fuel dispensers is 410 mm.

View of dispensers V-line 899x.4x2 series

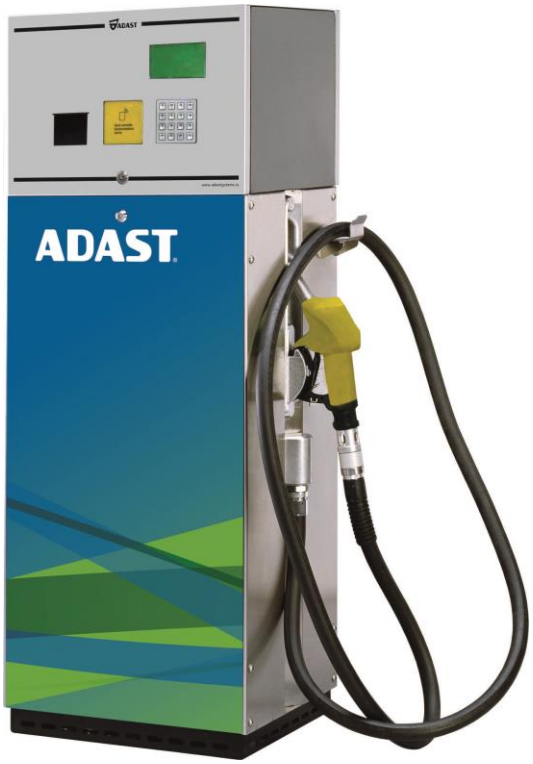
View of dispensers V-line 899x.6x3 series



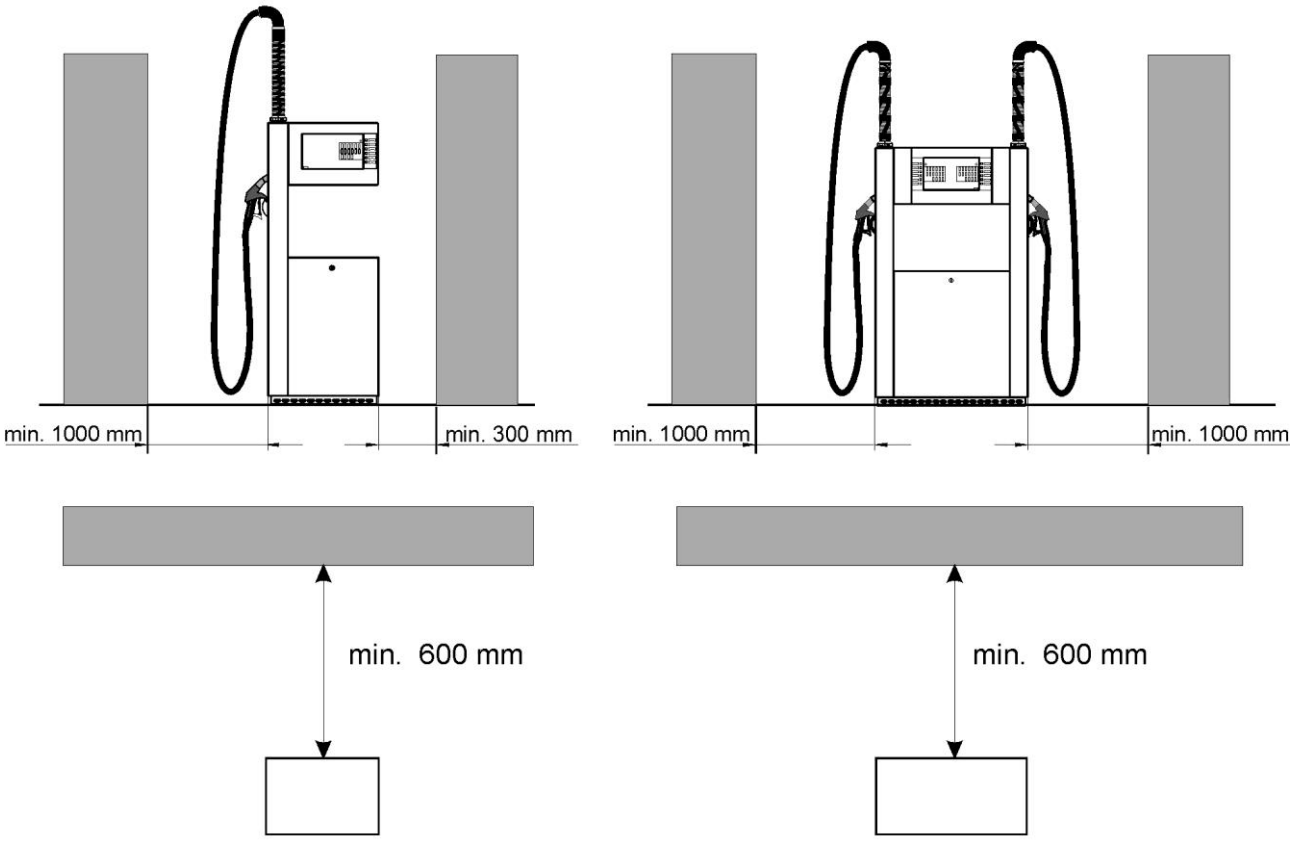
View of dispensers V-line 899x.6x3/CA series with Tankautomat ADAMAT



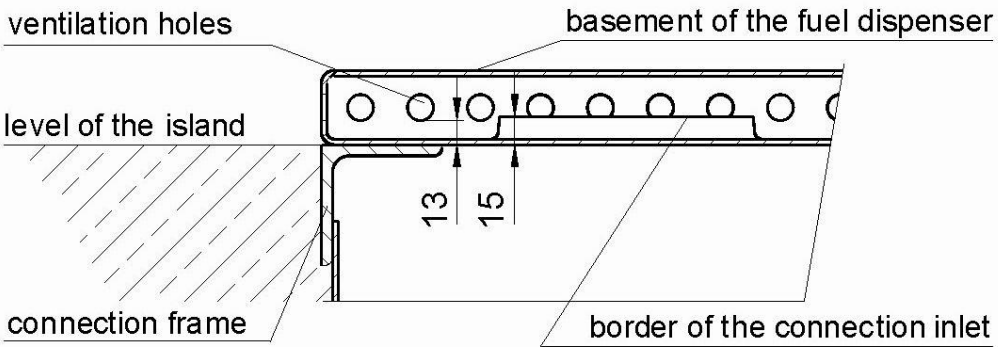
View of dispensers V-line 899x.6x3/OIL/CA series with Tankautomat ADAMAT



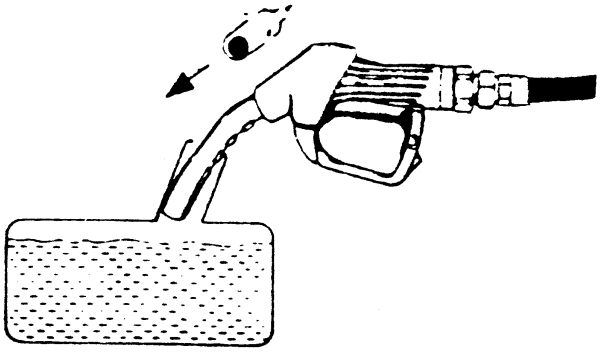
Minimum distance betwen the side wal of the fuel dispenser and steady barrier at the location on the filling station



Detail of the fuel dispenser location on the filling station island

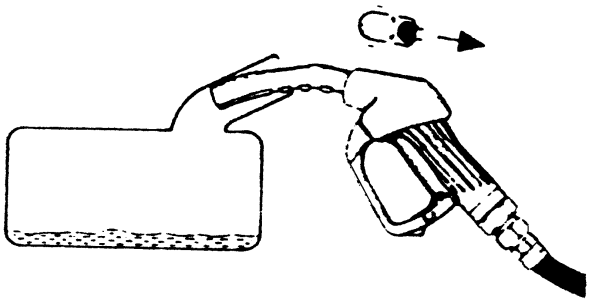


Dispensing nozzle positions during fuel dispensing



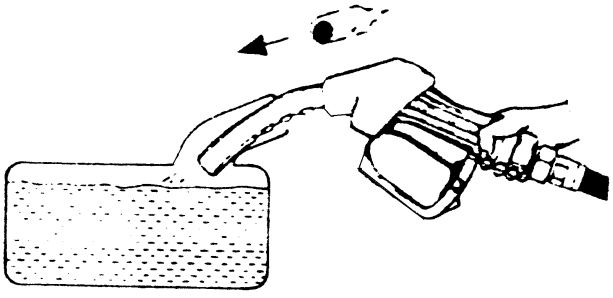
1. Correct position of dispensing nozzle during filling

The dispensing nozzle is almost in the horizontal position, the ball does not prevent from air passing, the fuel flows through



2. Incorrect position of dispensing nozzle during filling

The dispensing nozzle is diverted from the horizontal plane (drawn position). The ball prevents from air passing - the fuel does not flow through.



3. Due to different executions of inlet fuel tank sockets, it is necessary to find an optimum position of the dispensing nozzle, when the fuel still flows through. The flow can be broken when the fuel flow from the dispensing nozzle strikes to the tank filler wall. In such case an optimum position must be found, too.

Conditions of wiring and operation of UPS for feeding a control system and electronic part of V-line dispensers

1. All the cooperating electronic circuits of the control system and dispensers must be connected to the UPS and for this point of view they are considered as a closed electronic unit.
2. The control system and electronic instruments of dispensers connected to it as a closed electronic unit must be connected only to one source of UPS.
3. The feeding of perhaps even a part of the system from another source is not permitted.
4. A parallel cooperation of more UPS on one system is not permitted.
5. "Live" conductors of control system supply circuits and dispenser electronic equipment must be galvanic-separated from the mains and even from protective conductors – a system of "swimming zero" is created.
6. To comply with the requirement under item 5, the proper UPS must have galvanic-separated input and output circuits.
7. For feeding of electronic system of the filling station, the UPS of ON LINE type must be used exclusively.
8. For the correct function of UPS, the size of permanently installed load representing max. 60 % of nominal UPS output, must be provided.
9. To the stabilized voltage circuits, no other consumers that are not a part of prescribed technology, can be connected.
10. Therefore the sockets of stabilized voltage must be marked by the description e.g. "Control system feeding".
11. The protection of input circuits of UPS must be dimensioned so that UPS feed outage and total battery discharge did not occur under standard equipment function.

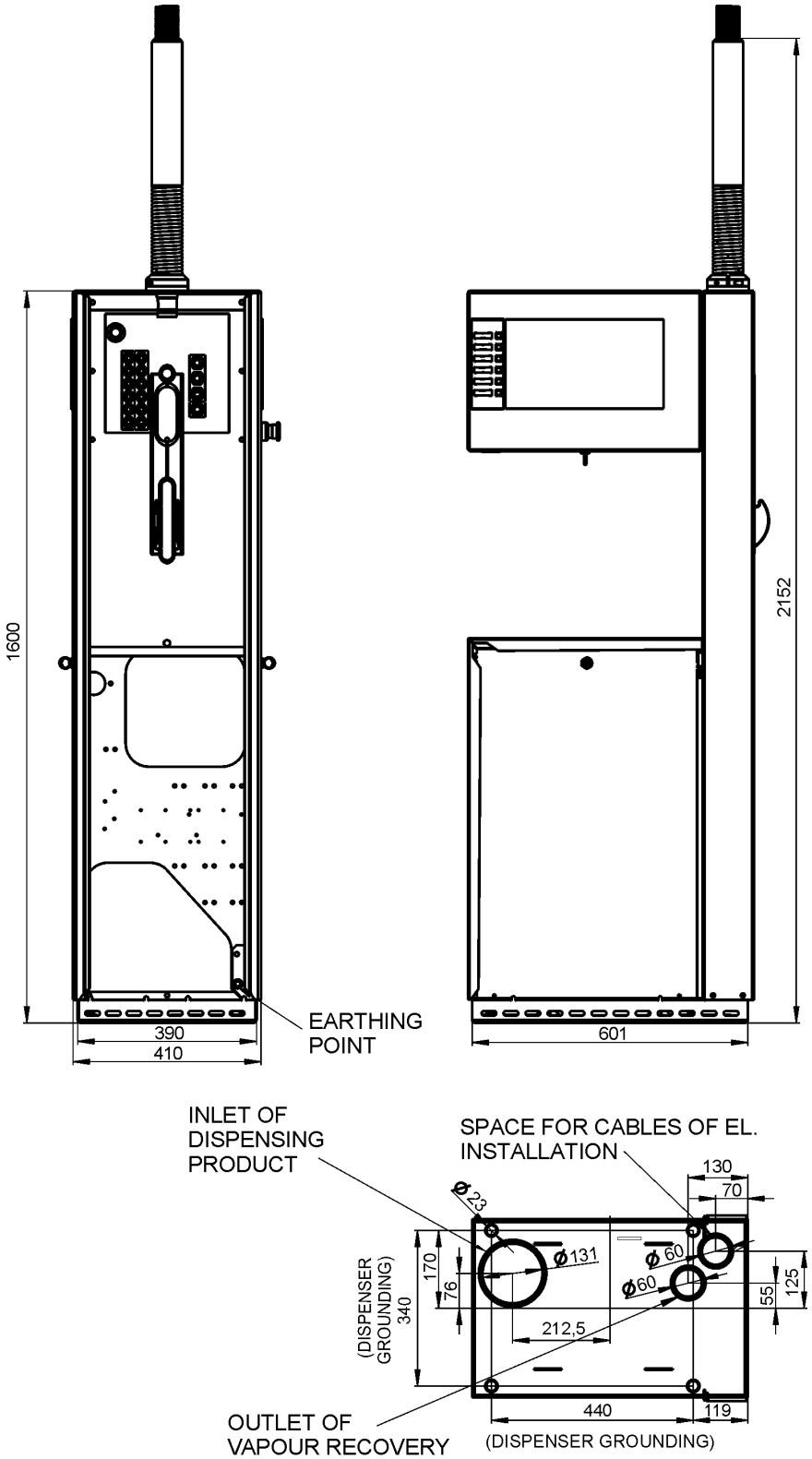
Operating conditions of the V-line 899x.xxx/P fuel dispensers (pressure design)

The pressure system of the distribution should be designed with a submerged pump built-in directly into the storage tank under the substance level. The tank should be equipped with a detector of the lowest substance level switching the el. circuit of the pump motor being the min. level attained.

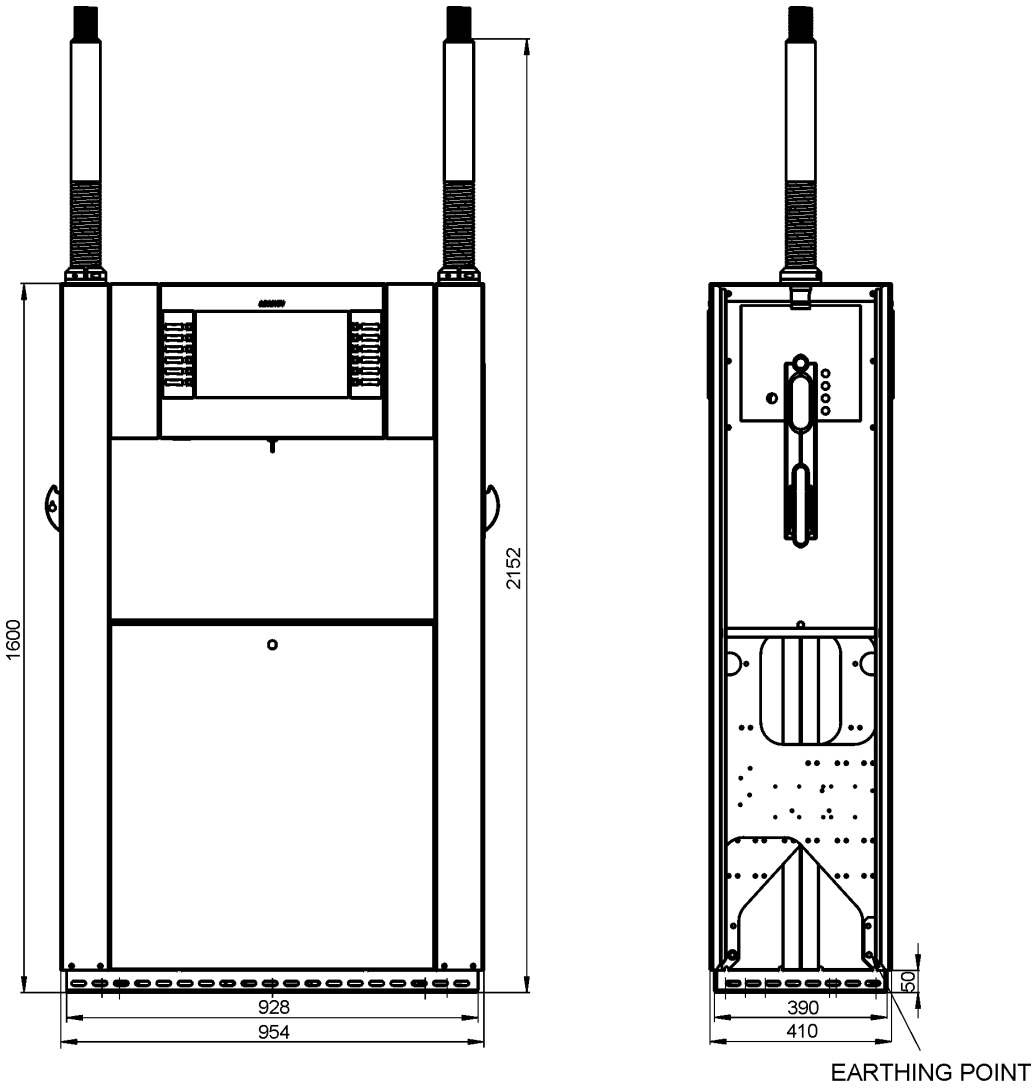
The location of the pump under the lowest fluid level in the storage tank and the min. level control switch shall prevent the access of air or gas into the pump.

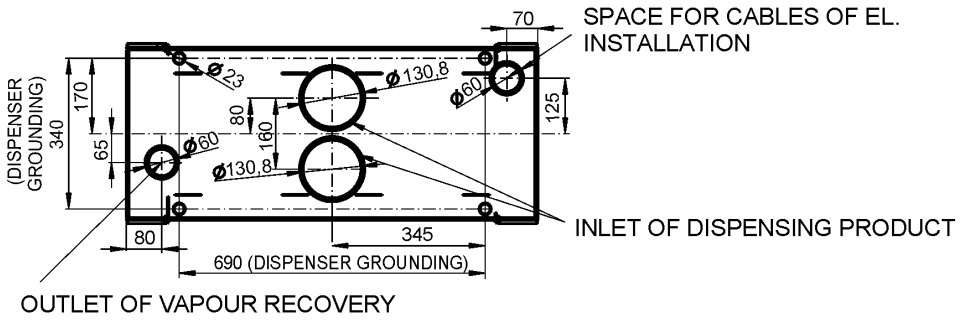
P12 = 0 parameter shall be preselected in the electronic counter for the pressure system of submerged pumps operation in the storage tank in case of V-line 899x.xxx/P dispensers operation. At first the electronic counter starts up the submerged pump in this mode of operation (the fluid in entire hydraulic system is under pressure) then the counter tests the displays and closes the el. magnetic valve - and the dispensing is started.

Installation dimensions of V-line 8990.xx2/P, 8991.xx2/S, /P, 8995.xx2/S, /P, 8997.xx2/S, /P, 8999.xx2/S, /P dispensers

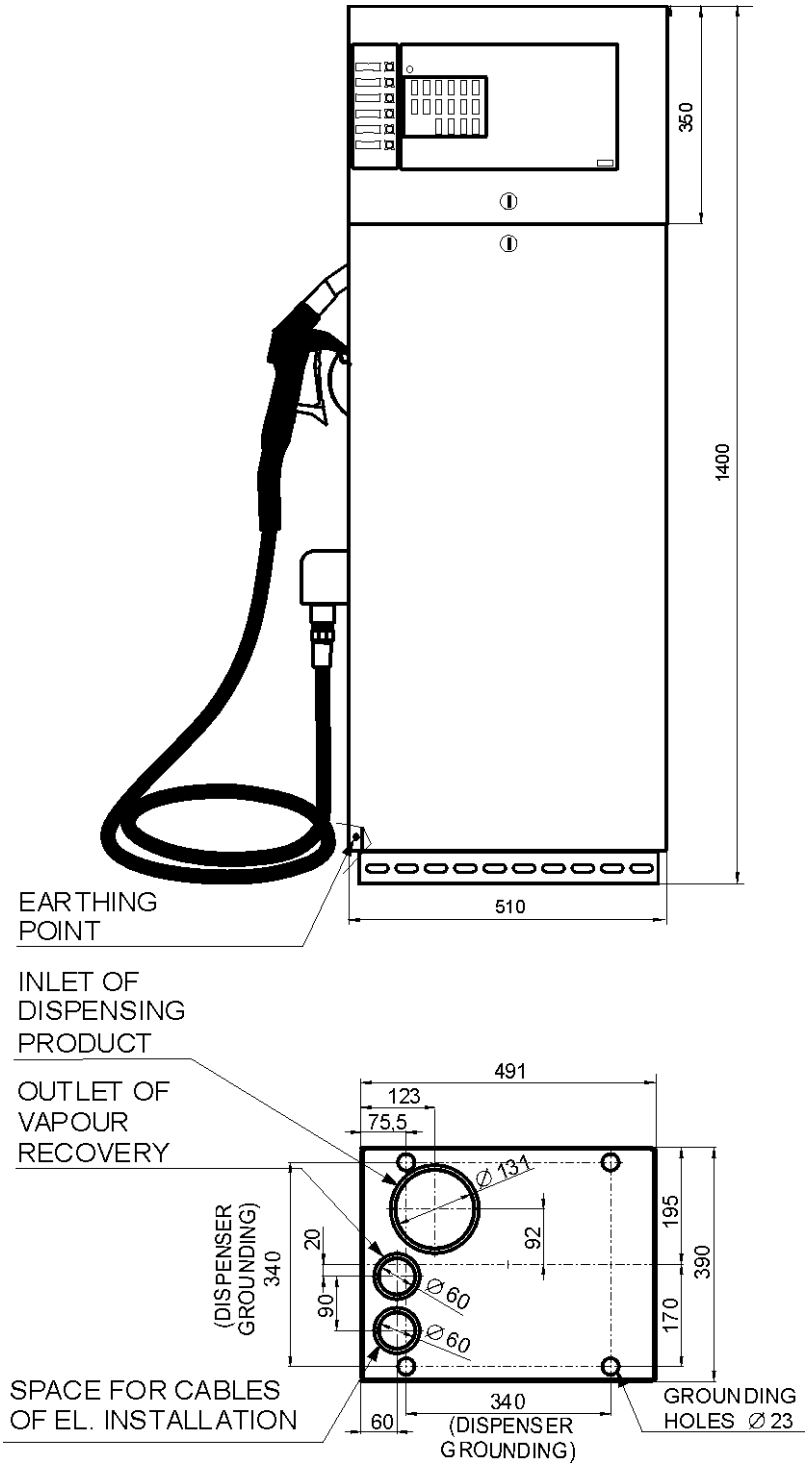


Installation dimensions of V-line 8990.xx2/S, 8993.xx2/S, /P, 8994.xx2/S, /P, 8996.xx2/S, /P, 8998.xx2/S, /P dispensers

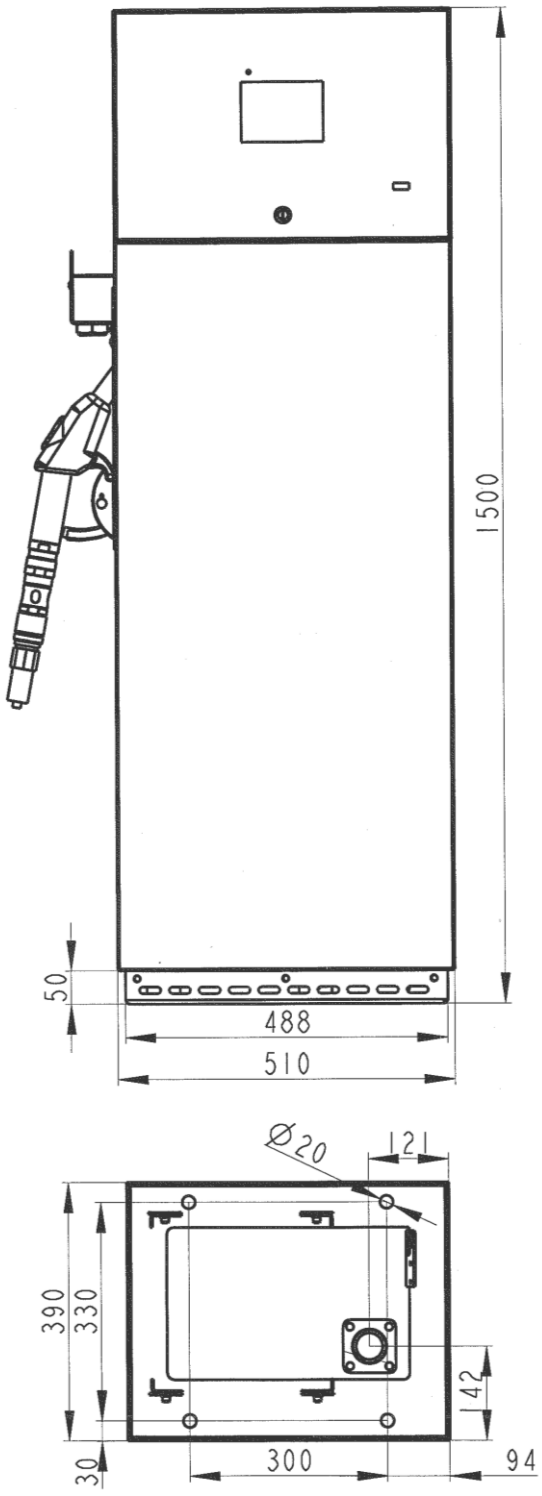




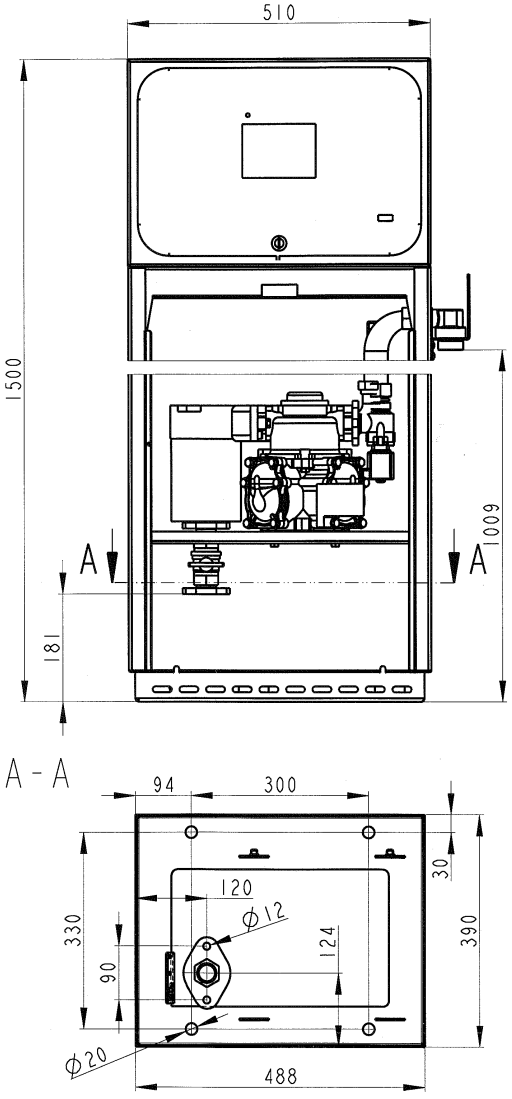
Installation dimensions of V-line 899x.6x3/S, /P; V-line 899x.6x3/S, /P/CA dispensers



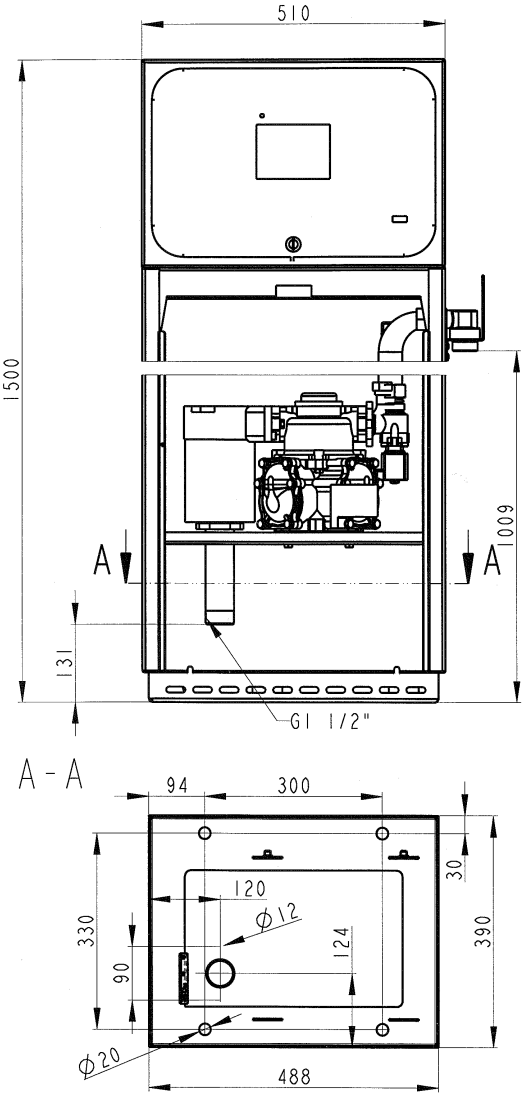
Installation dimensions of V-line 899x.6x3/LC/S, V-line 899x.6x3/LC/S/CA dispensers



Installation dimensions of V-line 899x.6x3/LC/P, V-line 899x.6x3/LC/P/CA dispensers

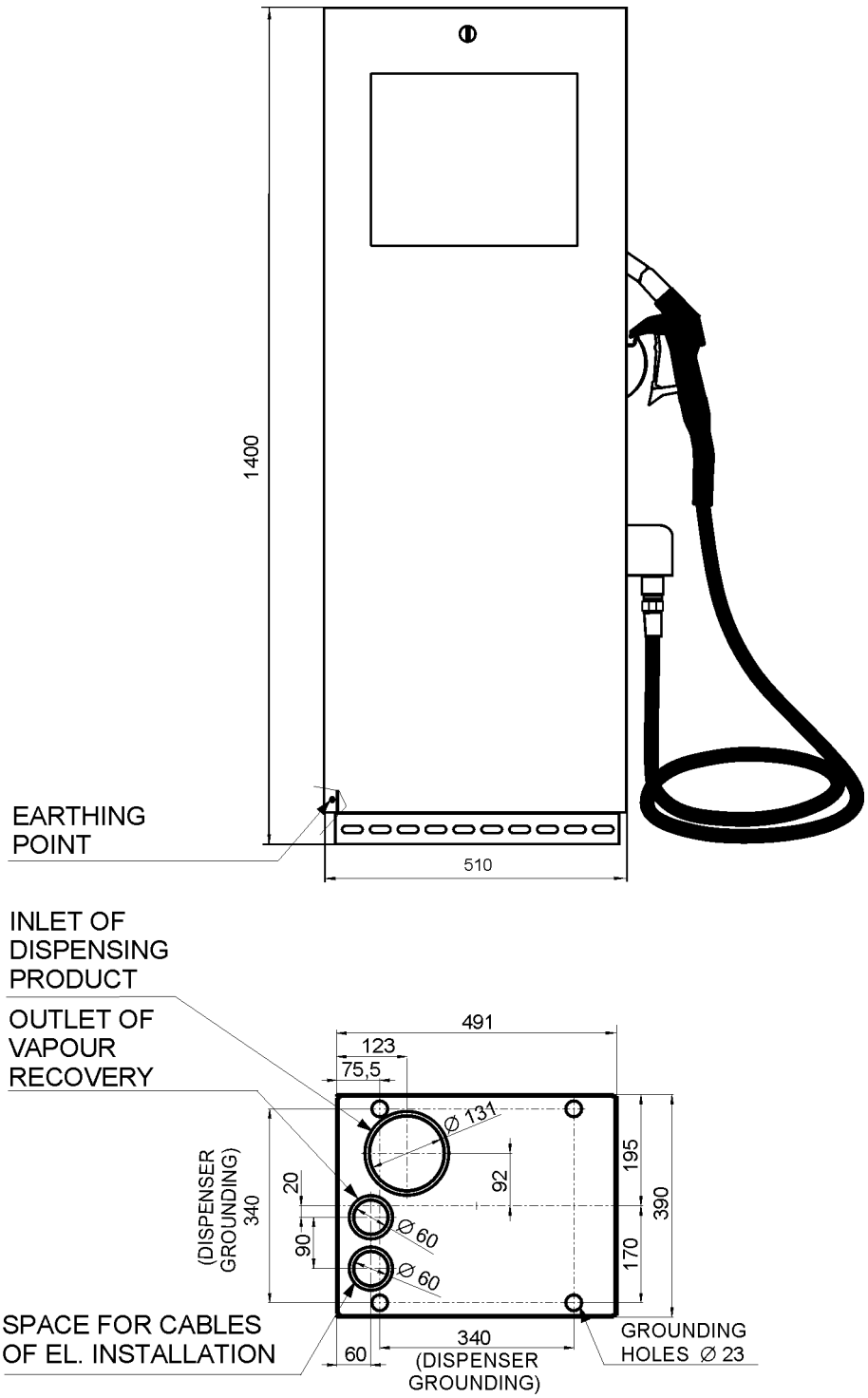


Connection with ball valve



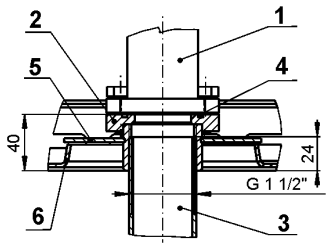
Connection without ball valve

V-line dimensions of V-line 899x.6x4/S, /P dispensers



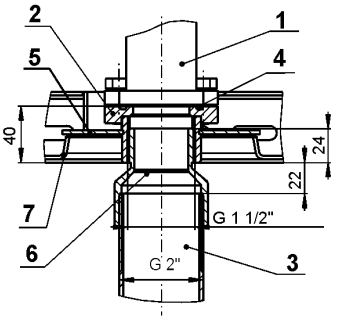
Connection of V-line 899x.xxx/S dispensers

Connection for
Q = 40 dm^3.min^{-1}
Connection of satelite outlet
Q = 1 x 40; 80; 100; 110; 120; 130 dm^3.min^{-1}



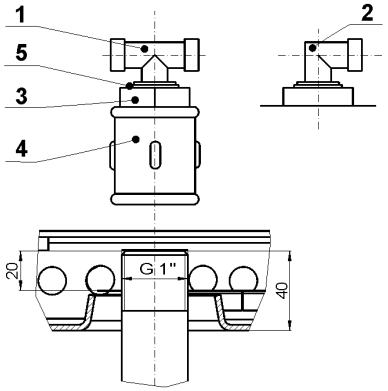
1. Suction connecting flexible piece (corrugated pipe) DN 40
2. Connecting flange
3. Suction tube DN 40 (it is not a part of the fuel dispenser)
4. "O" sealing ring
5. Inlet cover - modification in case of drip-pan assembly
6. Drip-pan - optional acc. to the filling station design

Connection for
Q = 2 x 40 dm^3.min^{-1}
Q = 1 x 80; 100, 110; 120; 130; 150 dm^3.min^{-1}



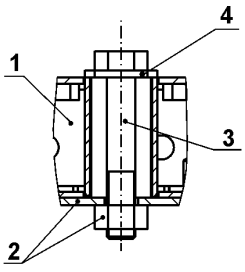
1. Suction connecting flexible piece DN 40
2. Connecting flange
3. Suction tube DN 50 (it is not a part of the fuel dispenser)
4. "O" sealing ring
5. Inlet cover - modification in case of drip-pan assembly
6. Adapter M4 acc. to EN 10242
7. Drip-pan - optional acc. to the filling station design

Connection of vapour recovery



1 - Socket (T) of tube connection DN 8
2 - Angular socket (L) DN 8
3 - Reducer - mark N4, G 1" / 3/8"
4 - Socket with inner thread G 1"
5 - Sealing ring 17 x 24

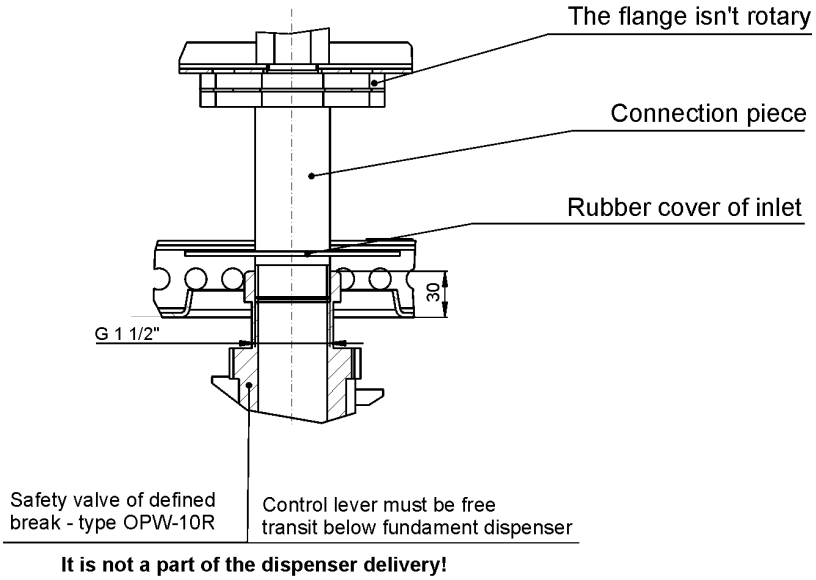
Detail of the fuel dispenser connection to the basic frame



1. Dispenser base
2. Connecting frame with welded nuts M12 - part of lower process equipment of the filling station
3. Connecting wint M 12x70
4. Washer

Connection of V-line 899x.xxx/P dispensers

Q = 1 x 40; 2 x 40; 1 x 80; 110; 120; 130; 150 $dm^3.min^{-1}$

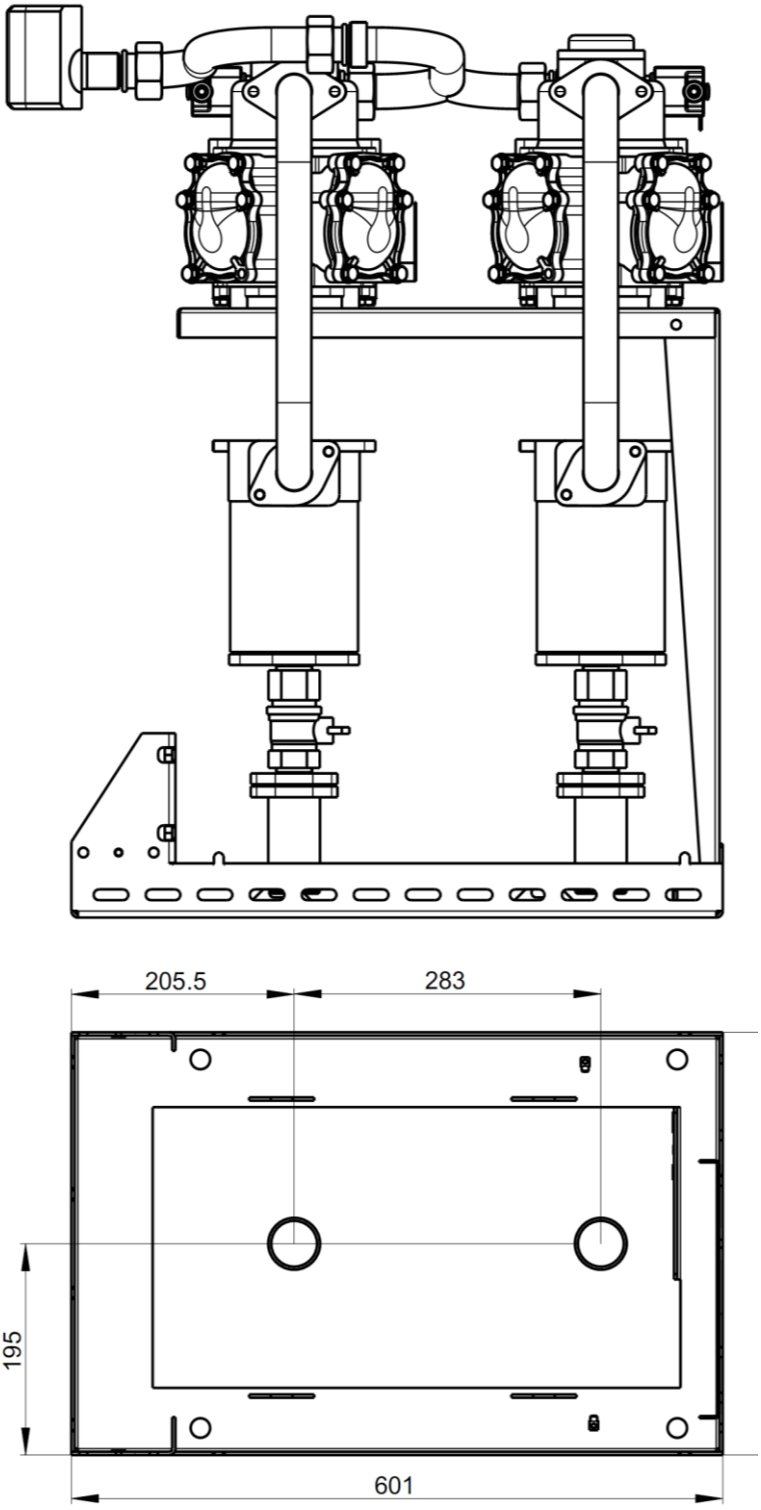


Connection of pressure modules of the fuel dispensers V - line 899x.xxx/P

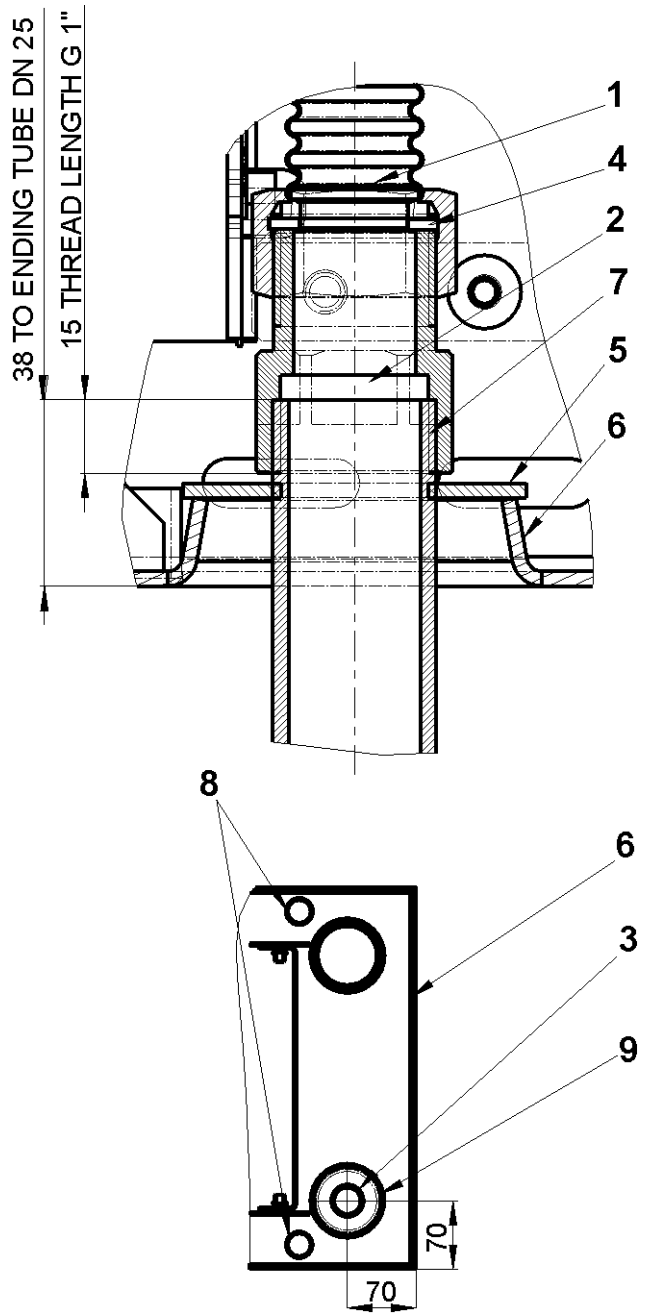
Connection of the V - line 899x.xxx/P dispensers requires the automatic closure of the dispenser intake in the case of a failure. Use of the valve type OPW -10R is recommended.
To assure a perfect attachment to the dispenser island and the free motion of the valve lever below the dispenser foundation, the valve installation has to follow the indication of the figure.
When installing, the attaching inter-axial distances have to be kept.
The non-observance of these distances can result in the breakage (non-reversible destruction) of the breaking-off valve.

Connection of V-line 899x.xxx/P dispenser - „SUPERMAX“

Q = 130 $dm^3.min^{-1}$, Q = 150 $dm^3.min^{-1}$



Connection of satellite outlet at the V-line 899x.xxx/S and 899x.xxx/P dispensers



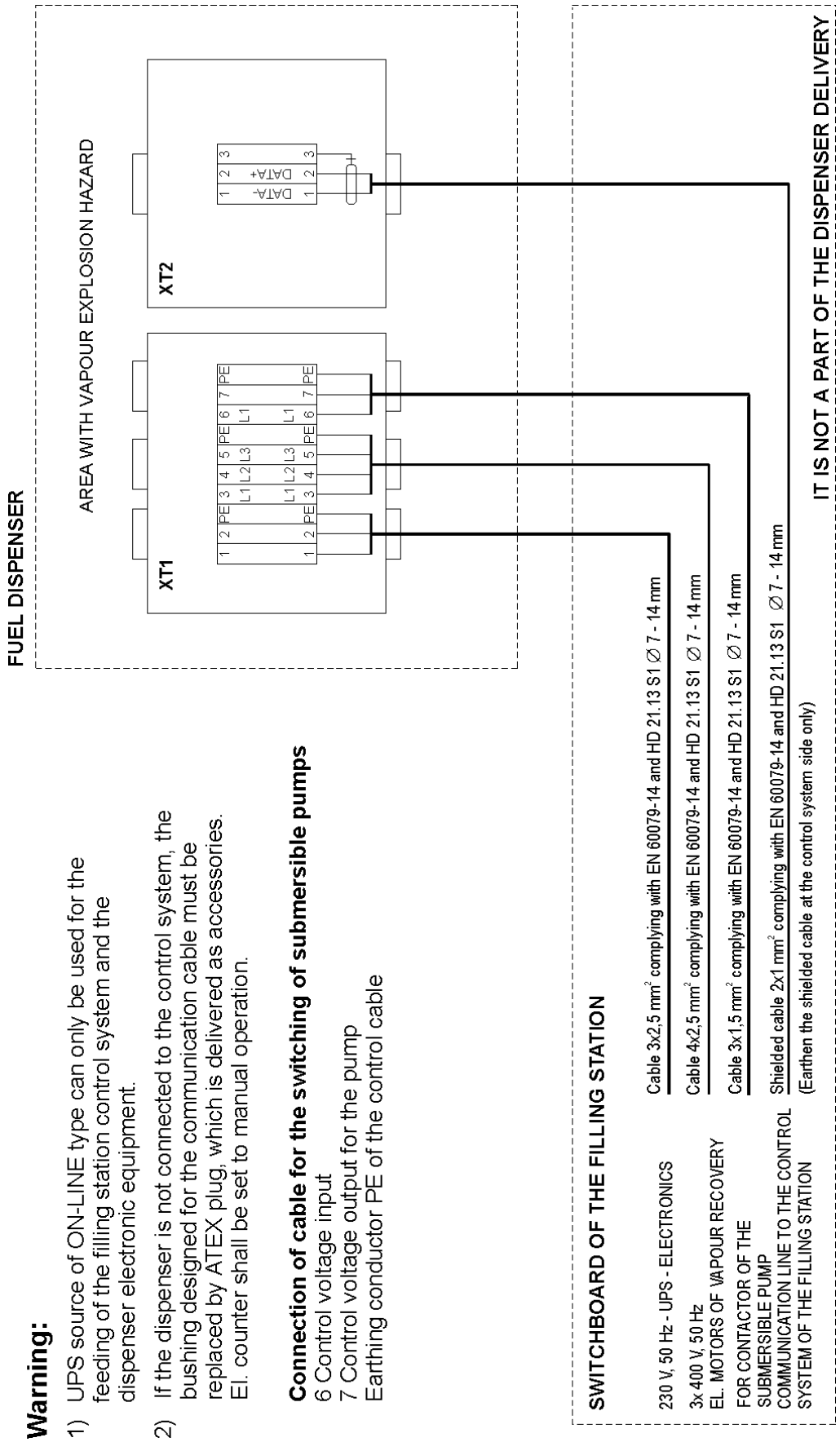
1. Output pipe with cap nut
2. Reducer 1" to 1"
3. Satelite connection pipe DN 25
4. Gasket
5. Output hole cover
6. Leak proof pan
7. Screw connection sealed by sealant
8. Anchor holes
9. Output hole for satelite fuel dispenser connection

Connection of V-line 899x.xxx/S dispensers to the filling station switchboard

Warning:

1) UPS source of ON-LINE type can only be used for the feeding of the filling station control system and the dispenser electronic equipment.
2) If the dispenser is not connected to the control system, the bushing designed for the communication cable must be replaced by ATEX plug, which is delivered as accessories. El. counter shall be set to manual operation.

Connection of V-line 8991.xx2/P, 8993.xx2/P, 8995.xx2/P dispensers with vapour recovery system to the filling station switchboard

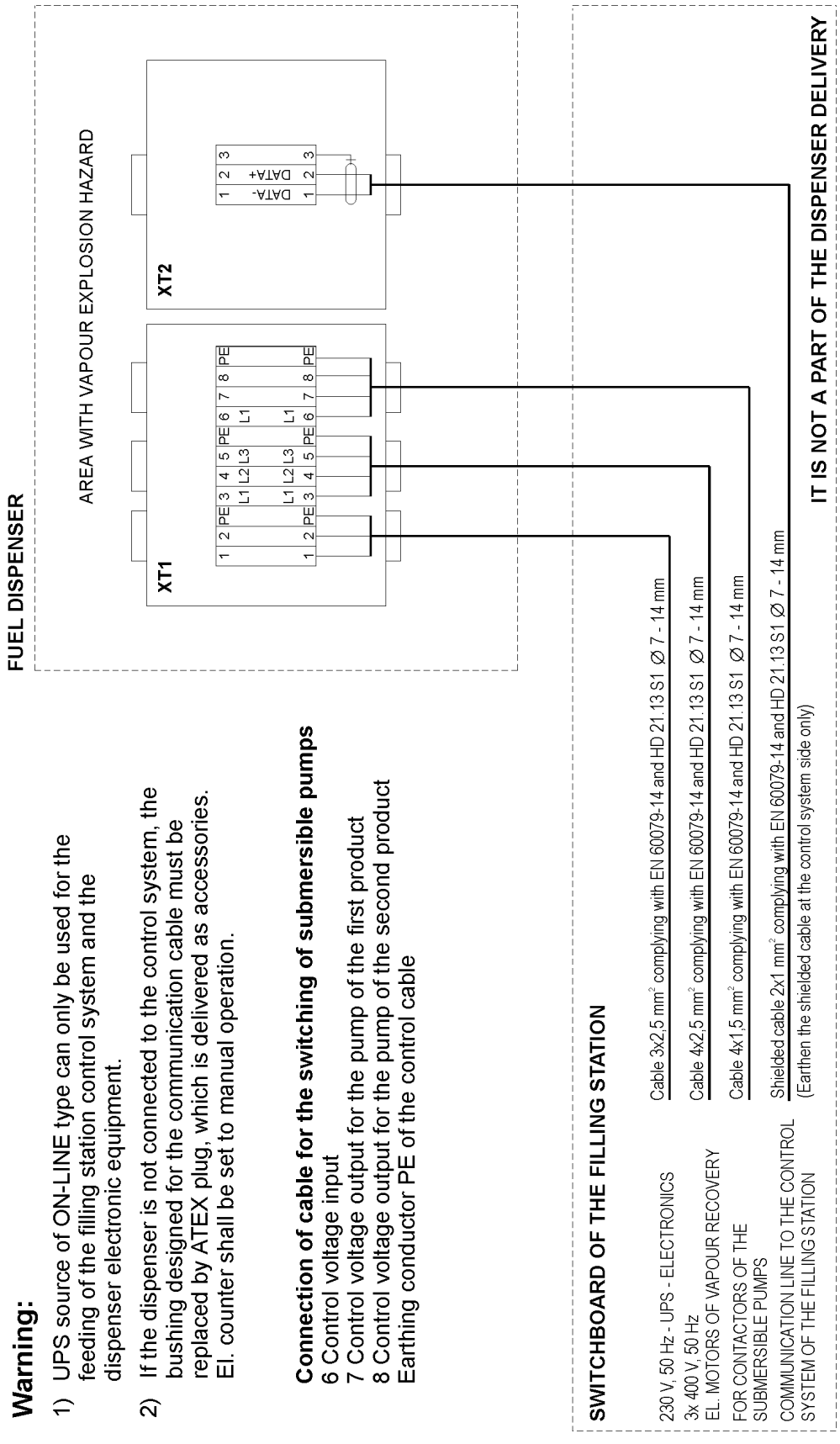


Warning:

1) UPS source of ON-LINE type can only be used for the feeding of the filling station control system and the dispenser electronic equipment.
2) If the dispenser is not connected to the control system, the bushing designed for the communication cable must be replaced by ATEX plug, which is delivered as accessories. El. counter shall be set to manual operation.

Connection of cable for the switching of submersible pumps
6 Control voltage input
7 Control voltage output for the pump
Earthing conductor PE of the control cable

Connection of V-line 8994.xxx/P, 8996.xxx/P dispensers with vapour recovery system to the filling station switchboard

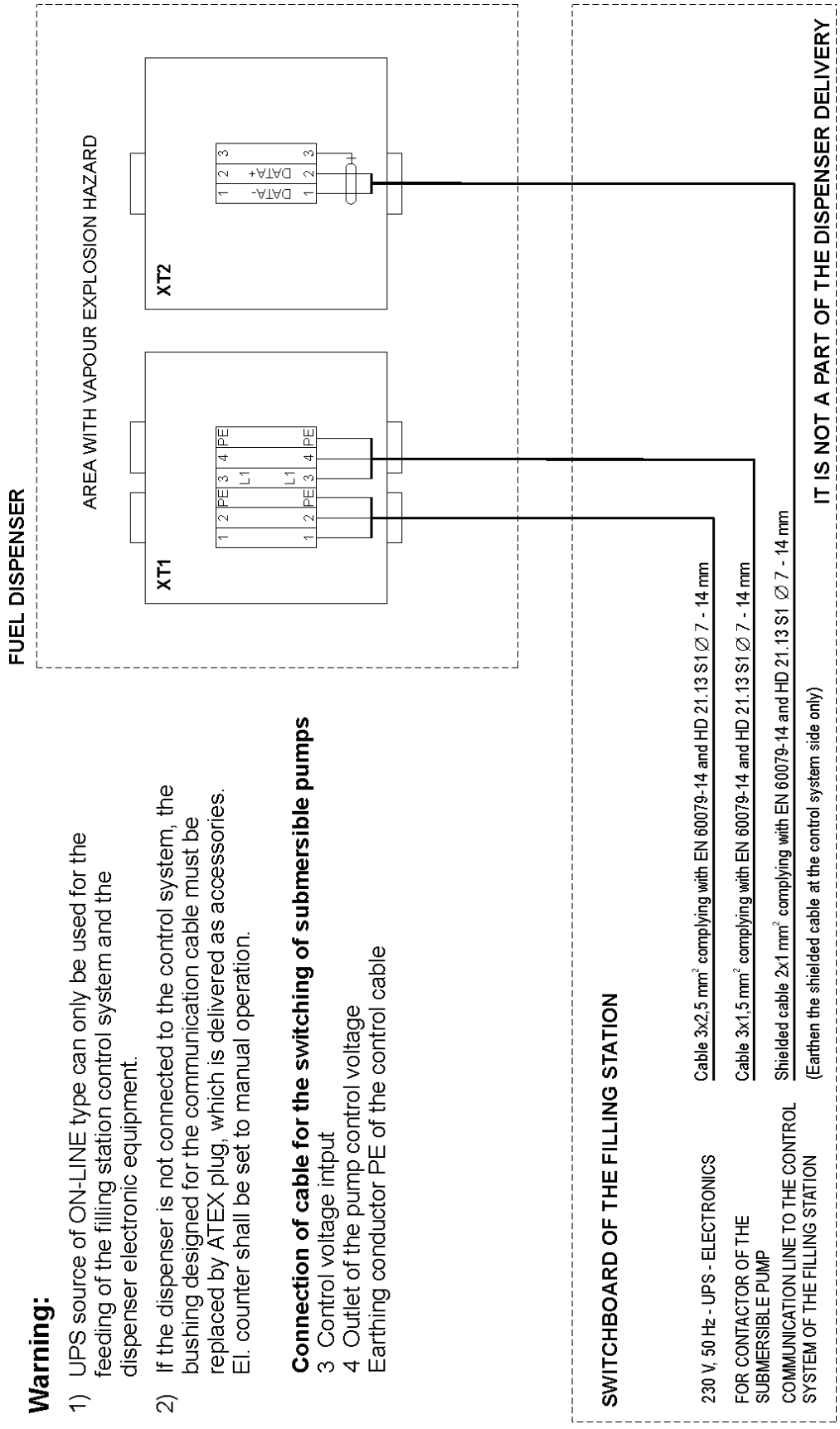


Warning:

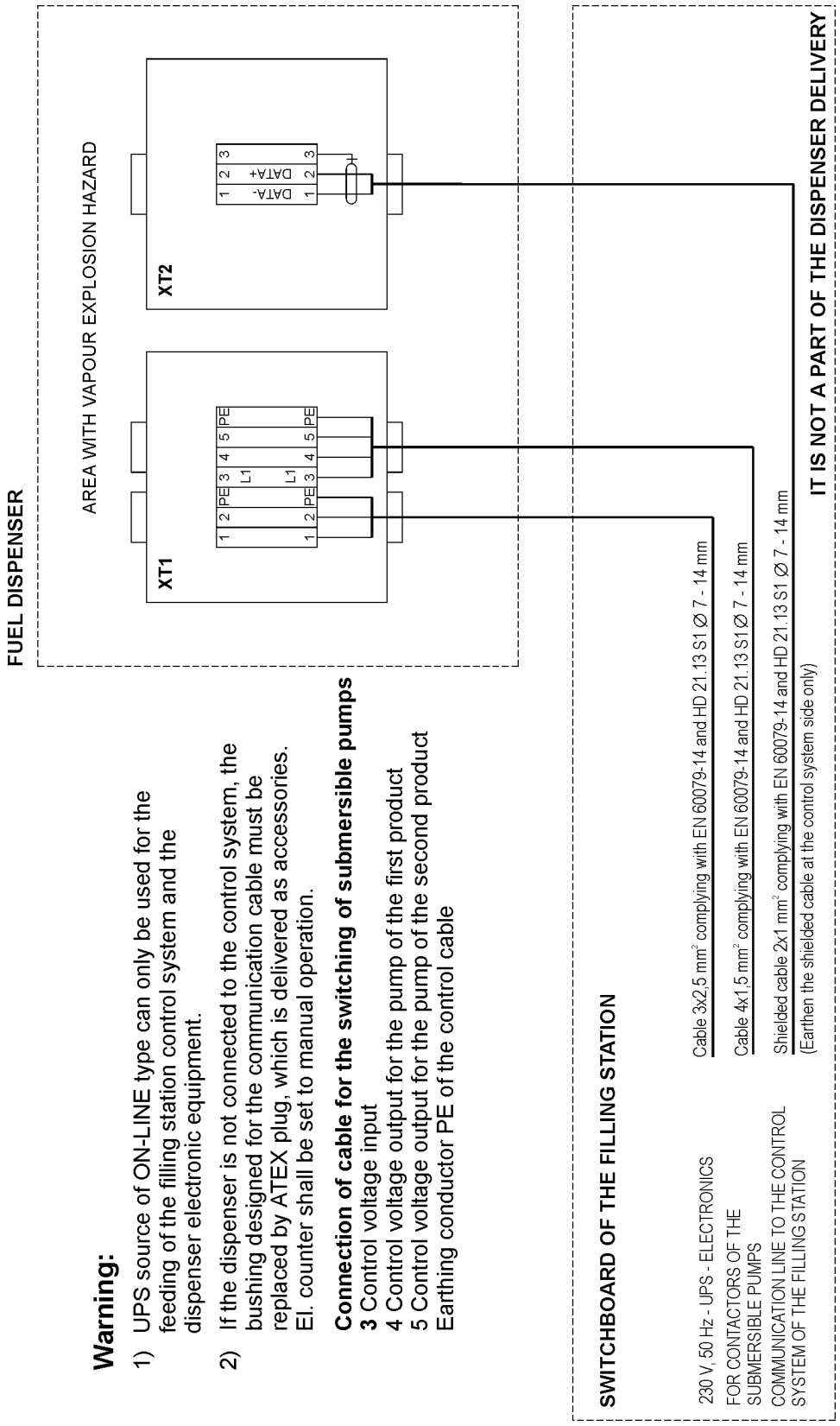
1) UPS source of ON-LINE type can only be used for the feeding of the filling station control system and the dispenser electronic equipment.
2) If the dispenser is not connected to the control system, the bushing designed for the communication cable must be replaced by ATEX plug, which is delivered as accessories. El. counter shall be set to manual operation.

Connection of cable for the switching of submersible pumps
6 Control voltage input
7 Control voltage output for the pump of the first product
8 Control voltage output for the pump of the second product
Earthing conductor PE of the control cable

Connection of V-line 8990.xx2/P, 8991.xx2/P, 8993.xx2/P, 8995.xx2/P, 8997.xx2/P, 8999.xx2/P dispensers without vapour recovery system to the filling station switchboard



Connection of V-line 8994.xxx/P, 8996.xxx/P, 8998.xxx/P dispensers without vapour recovery system to the filling station switchboard

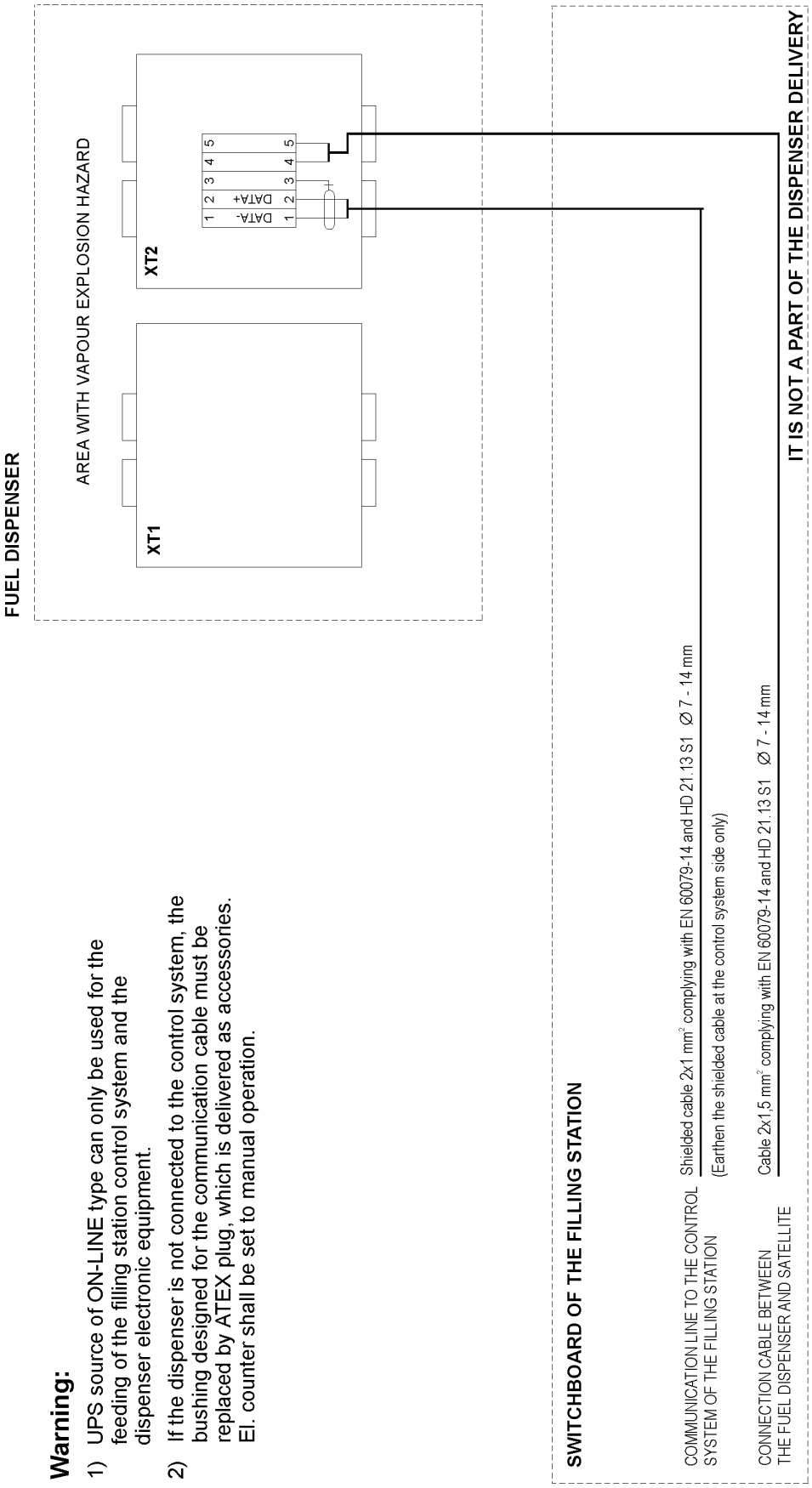


Warning:

1) UPS source of ON-LINE type can only be used for the feeding of the filling station control system and the dispenser electronic equipment.
2) If the dispenser is not connected to the control system, the bushing designed for the communication cable must be replaced by ATEX plug, which is delivered as accessories. El. counter shall be set to manual operation.

Connection of cable for the switching of submersible pumps
3 Control voltage input
4 Control voltage output for the pump of the first product
5 Control voltage output for the pump of the second product
Earthing conductor PE of the control cable

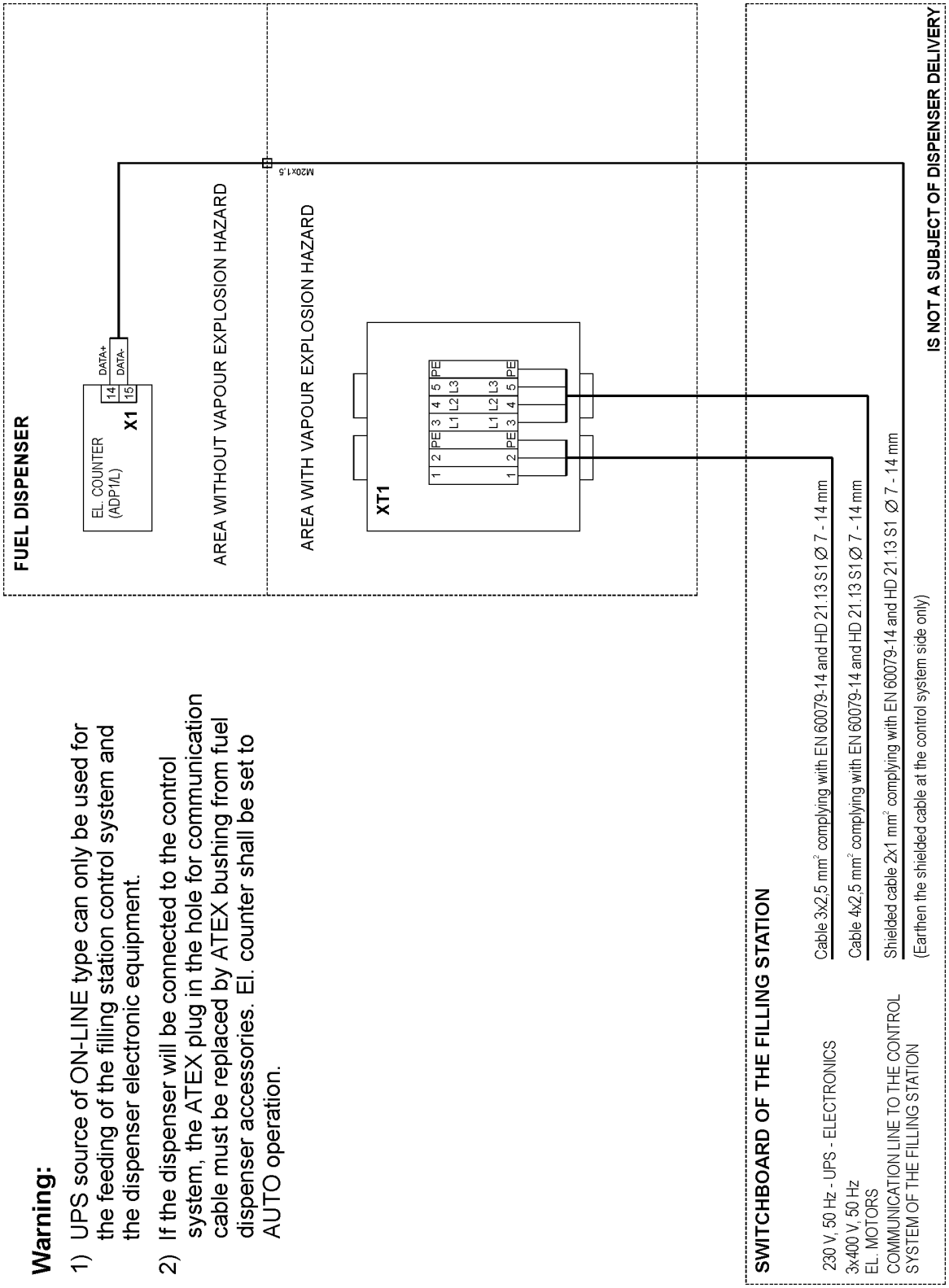
Connection of V-line 899x.xxx dispensers with satellite to the filling station switchboard



Warning:

1) UPS source of ON-LINE type can only be used for the feeding of the filling station control system and the dispenser electronic equipment.
2) If the dispenser is not connected to the control system, the bushing designed for the communication cable must be replaced by ATEX plug, which is delivered as accessories. El. counter shall be set to manual operation.

Connection of V-line 899x.6x3/S and V-line 899x.6x3/LC/S dispensers with ADP1/L counter to the filling station switchboard



Warning:

1) UPS source of ON-LINE type can only be used for the feeding of the filling station control system and the dispenser electronic equipment.
2) If the dispenser will be connected to the control system, the ATEX plug in the hole for communication cable must be replaced by ATEX bushing from fuel dispenser accessories. El. counter shall be set to AUTO operation.

Connection of V-line 899x.6x3/P and V-line 899x.6x3/LC/P dispensers with vapour recovery system and with ADP1/L counter to the filling station switchboard

Warning:

1) UPS source of ON-LINE type can only be used for the feeding of the filling station control system and the dispenser electronic equipment.
2) If the dispenser will be connected to the control system, the ATEX plug in the hole for communication cable must be replaced by ATEX bushing from fuel dispenser accessories. El. counter shall be set to AUTO operation.

Connection of cable for the switching of submersible pumps

6 Control voltage input
7 Control voltage output for the pump
PE - Earthing conductor of the control cable

Connection of V-line 899x.6x3/P and V-line 899x.6x3/LC/P dispensers without vapour recovery system with ADP1/L counter to the filling station switchboard

Warning:

1) UPS source of ON-LINE type can only be used for the feeding of the filling station control system and the dispenser electronic equipment.
2) If the dispenser will be connected to the control system, the ATEX plug in the hole for communication cable must be replaced by ATEX bushing from fuel dispenser accessories. El. counter shall be set to AUTO operation.

Connection of cable for the switching of submersible pumps

6 Control voltage input
7 Control voltage output for the pump
PE - Earthing conductor of the control cable

Connection of V-line 899x.6x3/S and V-line 899x.6x3/LC/S dispensers with ADP1/T counter to the filling station switchboard

Warning:

1) UPS source of ON-LINE type can only be used for the feeding of the filling station control system and the dispenser electronic equipment.
2) If the dispenser will be connected to the control system, the ATEX plug in the hole for communication cable must be replaced by the ATEX bushing from fuel dispenser accessories. El. counter shall be set to AUTO operation.

Connection of V-line 899x.6x3/P and V-line 899x.6x3/LC/P dispensers with vapour recovery system and with ADP1/T counter to the filling station switchboard

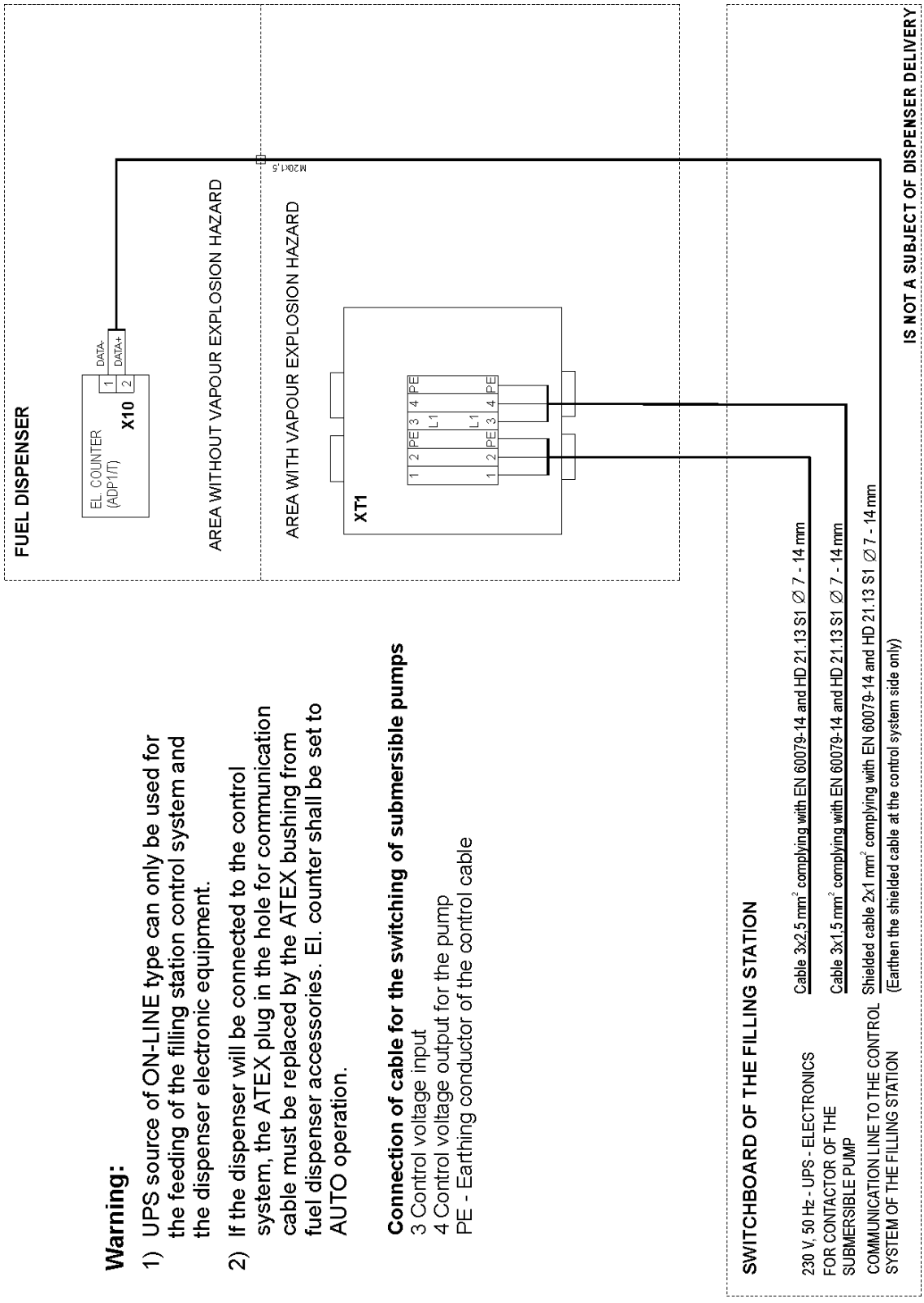
Warning:

1) UPS source of ON-LINE type can only be used for the feeding of the filling station control system and the dispenser electronic equipment.
2) If the dispenser will be connected to the control system, the ATEX plug in the hole for communication cable must be changed with the ATEX bushing from fuel dispenser accessories. El. counter shall be set to AUTO operation.

Connection of cable for the switching of submersible pumps

6 Control voltage input
7 Control voltage output for the pump
PE - Earthing conductor of the control cable

Connection of V-line 899x.6x3/P and V-line 899x.6x3/LC/P dispensers without vapour recovery system and with ADP1/T counter to the filling station switchboard



Warning:

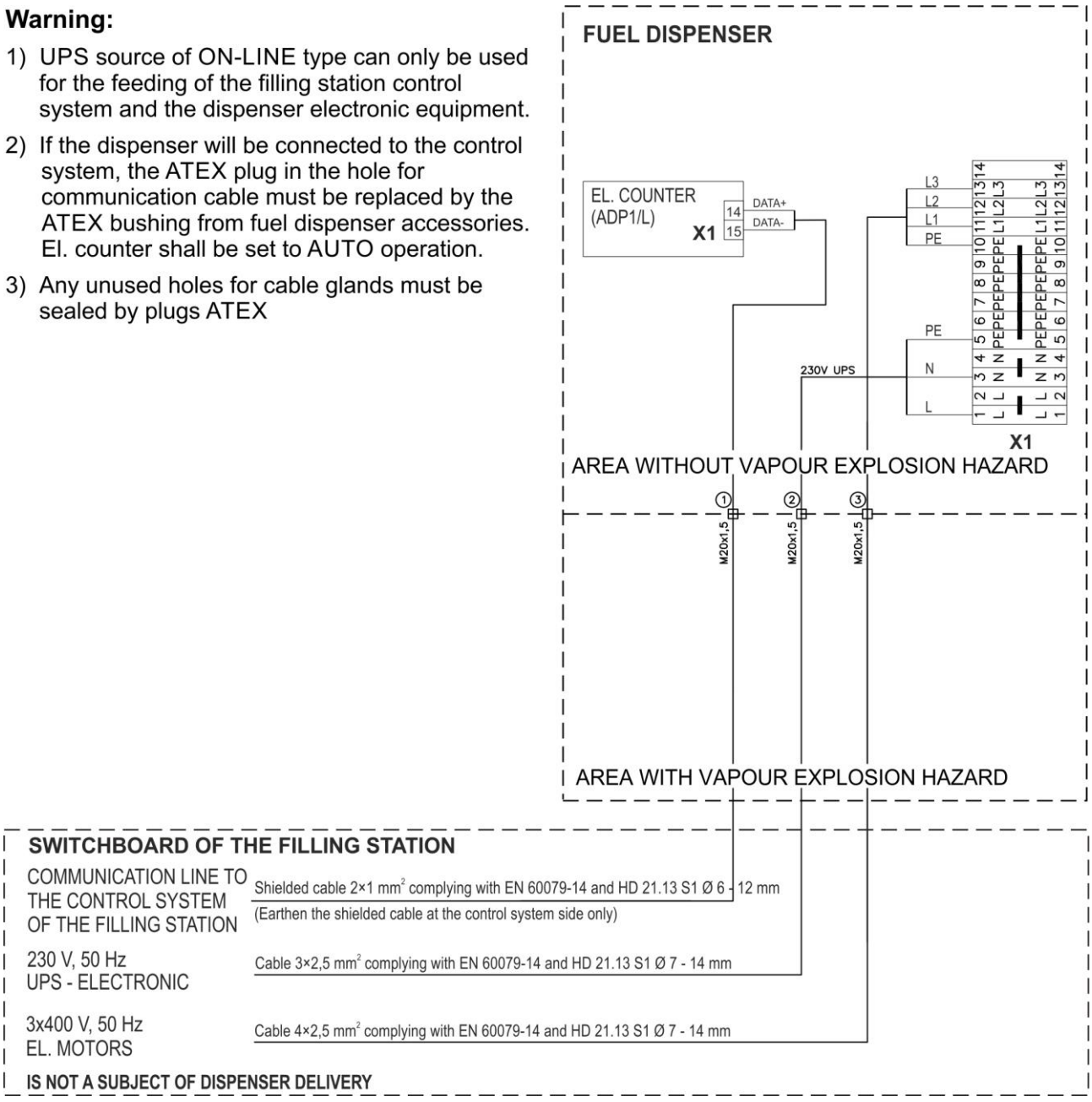
1) UPS source of ON-LINE type can only be used for the feeding of the filling station control system and the dispenser electronic equipment.
2) If the dispenser will be connected to the control system, the ATEX plug in the hole for communication cable must be replaced by the ATEX bushing from fuel dispenser accessories. El. counter shall be set to AUTO operation.

Connection of cable for the switching of submersible pumps
3 Control voltage input
4 Control voltage output for the pump
PE - Earthing conductor of the control cable

Connection of V-line 899x.6x3/S dispenser without the conduit box to the filling station switchboard

Warning:

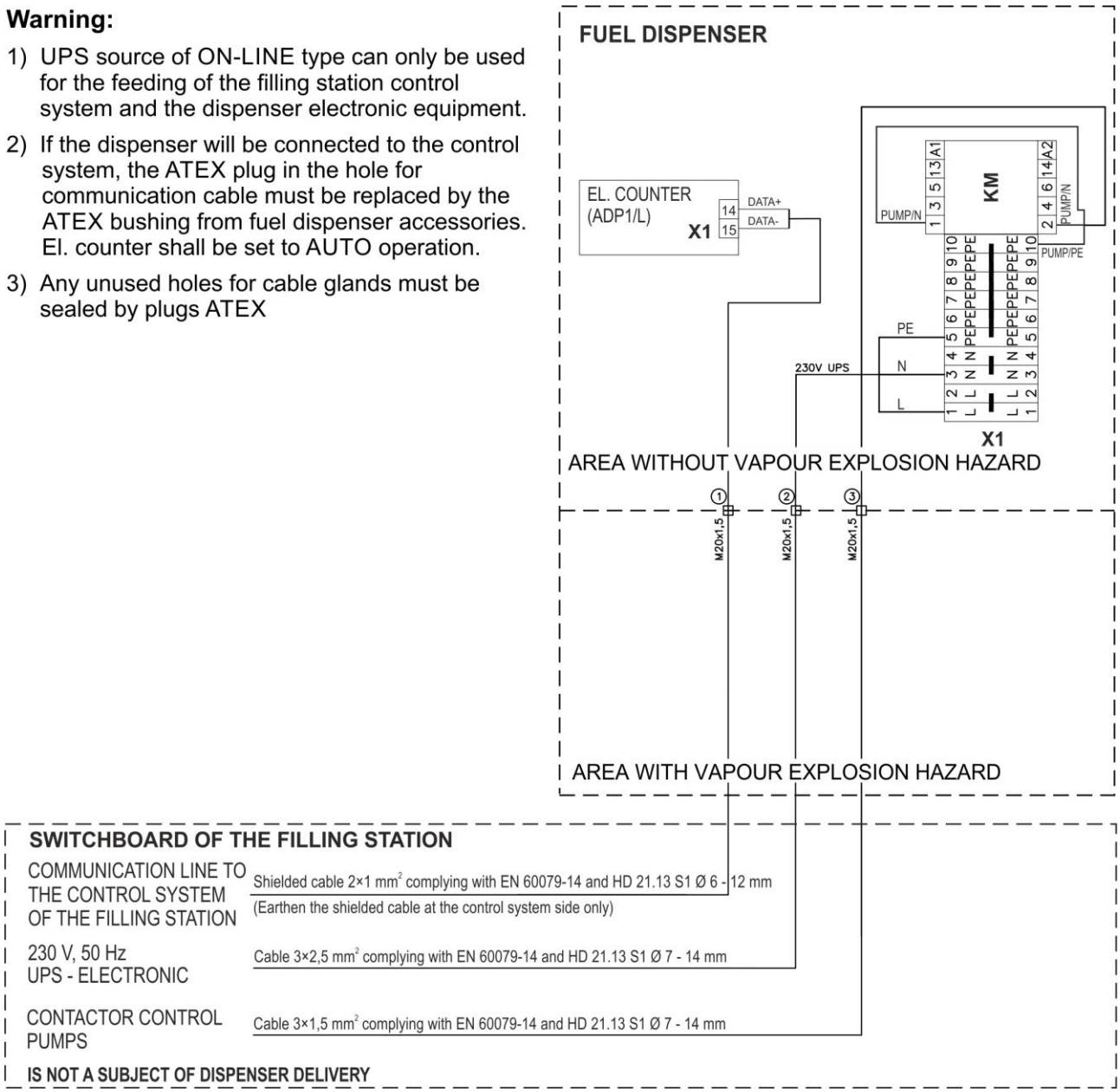
1) UPS source of ON-LINE type can only be used for the feeding of the filling station control system and the dispenser electronic equipment.
2) If the dispenser will be connected to the control system, the ATEX plug in the hole for communication cable must be replaced by the ATEX bushing from fuel dispenser accessories. El. counter shall be set to AUTO operation.
3) Any unused holes for cable glands must be sealed by plugs ATEX



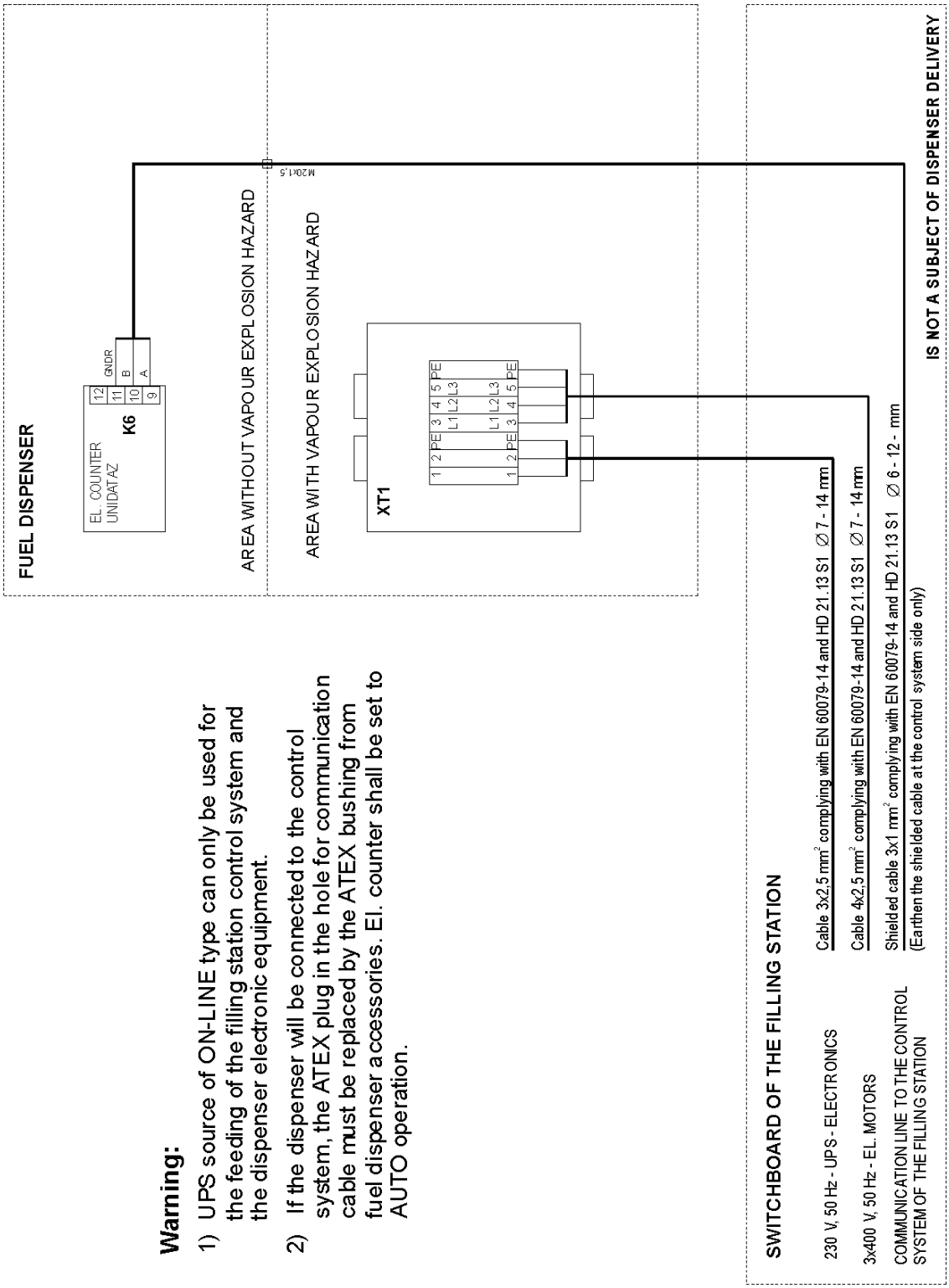
Connection of V-line 899x.6x3/P dispenser without the conduit box to the filling station switchboard

Warning:

1) UPS source of ON-LINE type can only be used for the feeding of the filling station control system and the dispenser electronic equipment.
2) If the dispenser will be connected to the control system, the ATEX plug in the hole for communication cable must be replaced by the ATEX bushing from fuel dispenser accessories. El. counter shall be set to AUTO operation.
3) Any unused holes for cable glands must be sealed by plugs ATEX



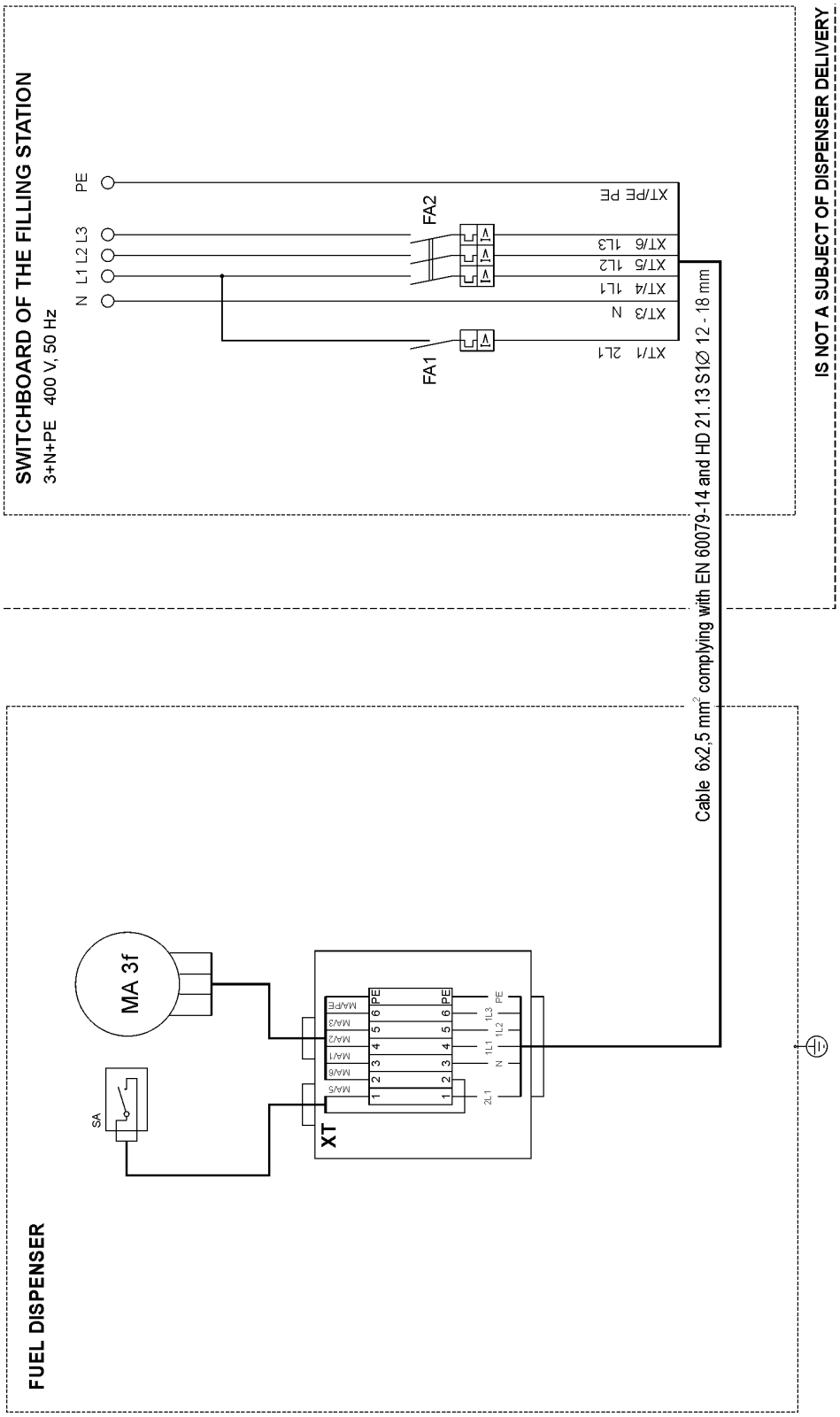
Connection of V-line 8991.x83/CA, V-line 8991.x83/LC/CA and V-line 8997.x83/CA, V-line 8997.x83/LC/ CA dispensers to the filling station switchboard



Warning:

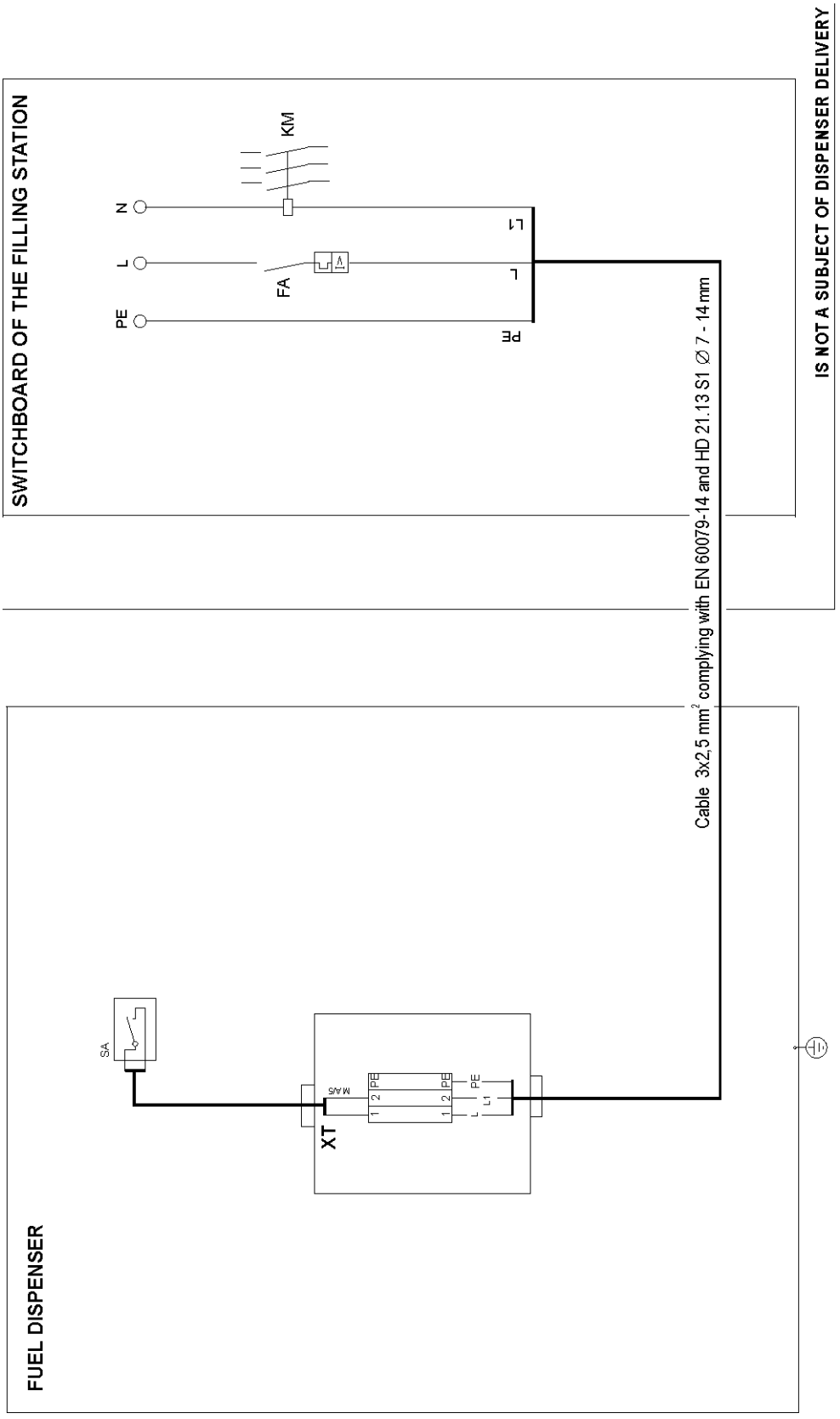
1) UPS source of ON-LINE type can only be used for the feeding of the filling station control system and the dispenser electronic equipment.
2) If the dispenser will be connected to the control system, the ATEX plug in the hole for communication cable must be replaced by the ATEX bushing from fuel dispenser accessories. El. counter shall be set to AUTO operation.

Connection of V - line 899x.6x4/S dispensers with mechanical counter to the filling station switchboard

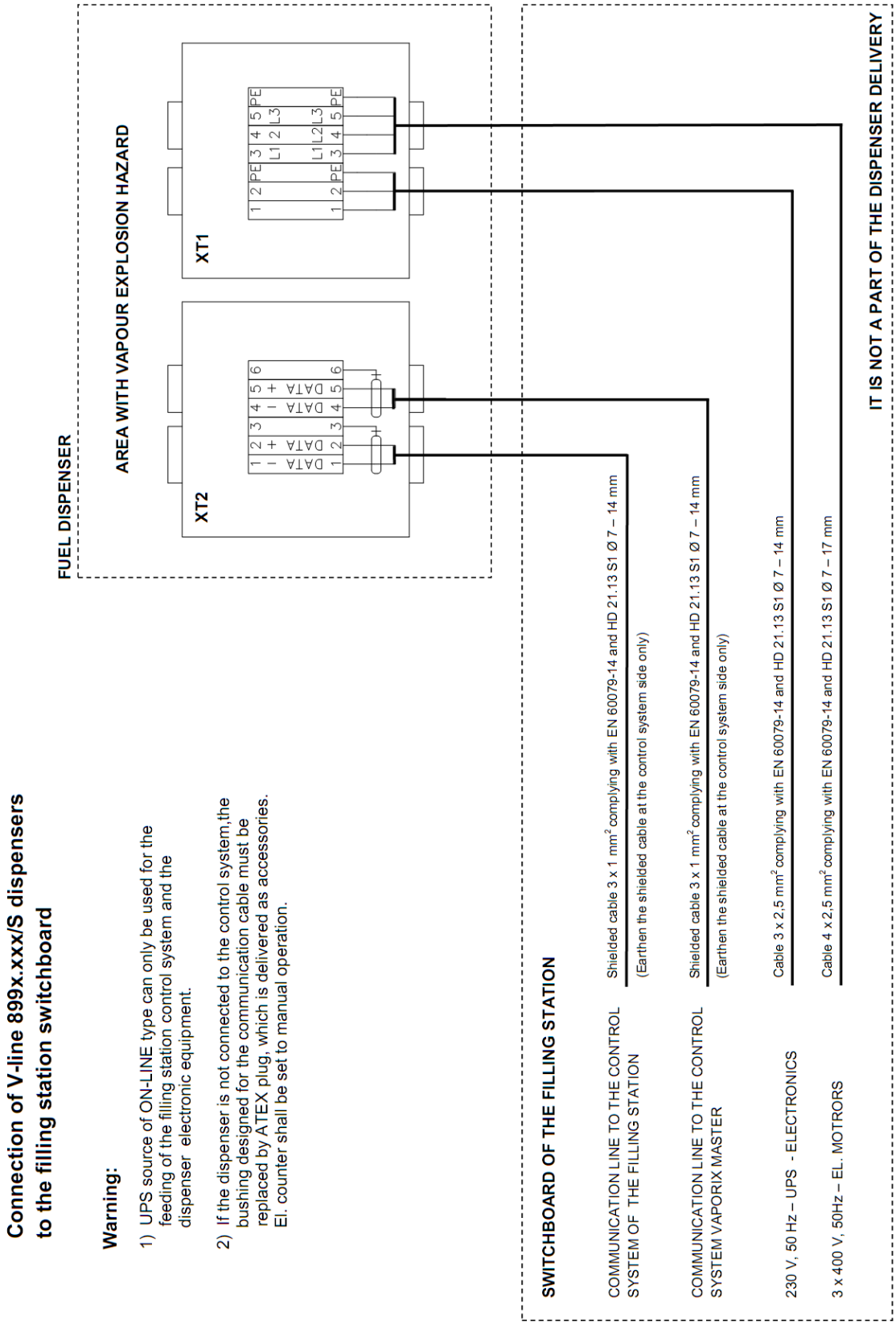


FA1 - Circuit breaker (for control circuit)
FA2 - Circuit breaker (for el. motor)
MA 3f - El. motor (RAEL, ELNOR) with integrated thermal protection 0,55 kW; 400 V; 50 Hz (for 8991.614/3)
- El. motor (RAEL, ELNOR) with integrated thermal protection 1,1 kW; 400 V; 50 Hz (for 8997.614/3)
SA - Magnetic switch of dispensing nozzle lifting
XT - Distribution box E331/A-2

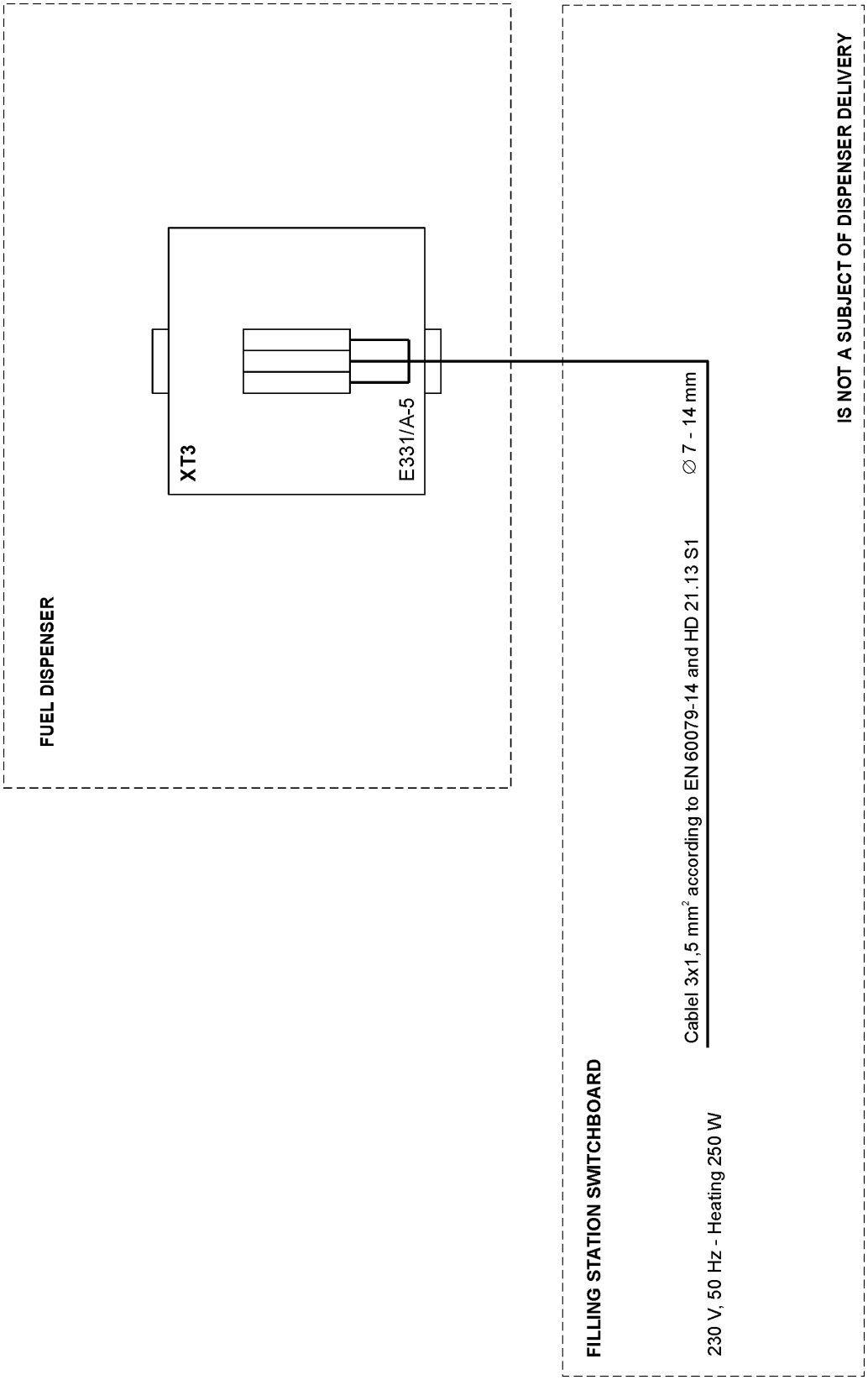
Connection of V-line 899x.6x4/P dispensers without vapour recovery system with mechanical counter to the filling station switchboard



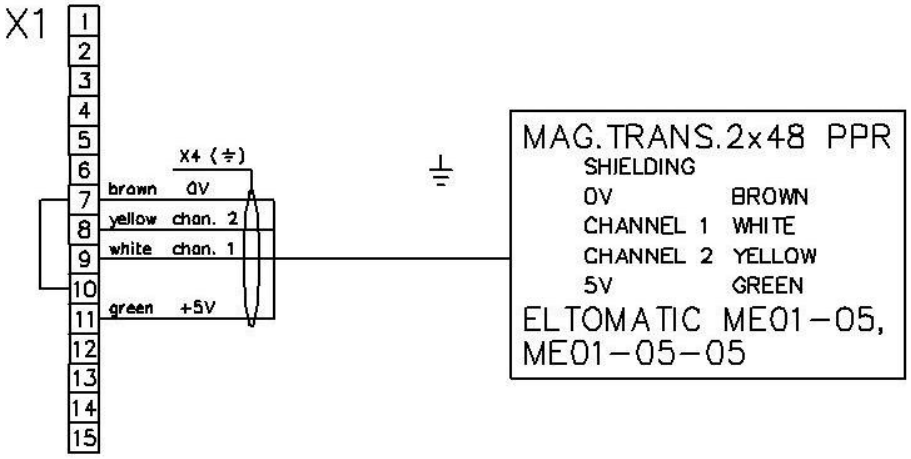
Connection of V-line 899x.xxx dispensers with vapour recovery system with automatic control system VRMS (Vapour Recovery Monitoring System).

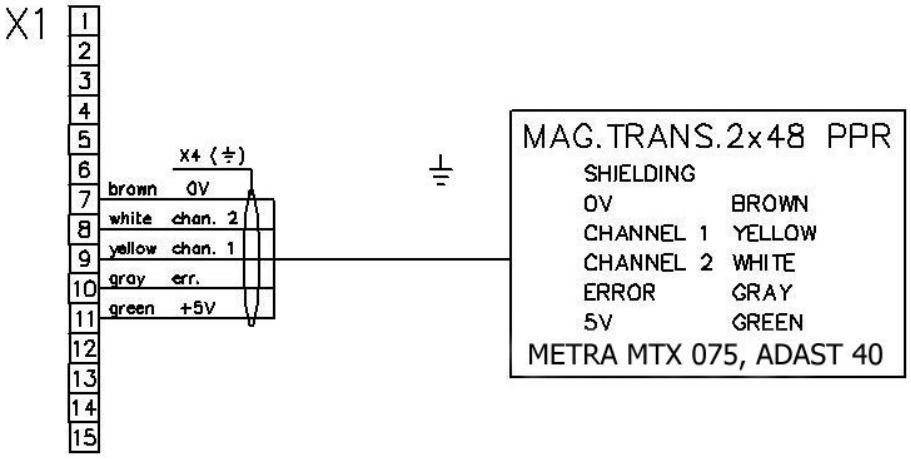


Connection of the fuel dispenser heating to the filling station switchboard (valid only for the fuel dispenser with electronic case heating)



Connection of the magnetic pulse transmitter ME 01-05, ME 01-05-05 and ADAST 40 or MTX 075 to the electronic counter ADP1/L - connector X1





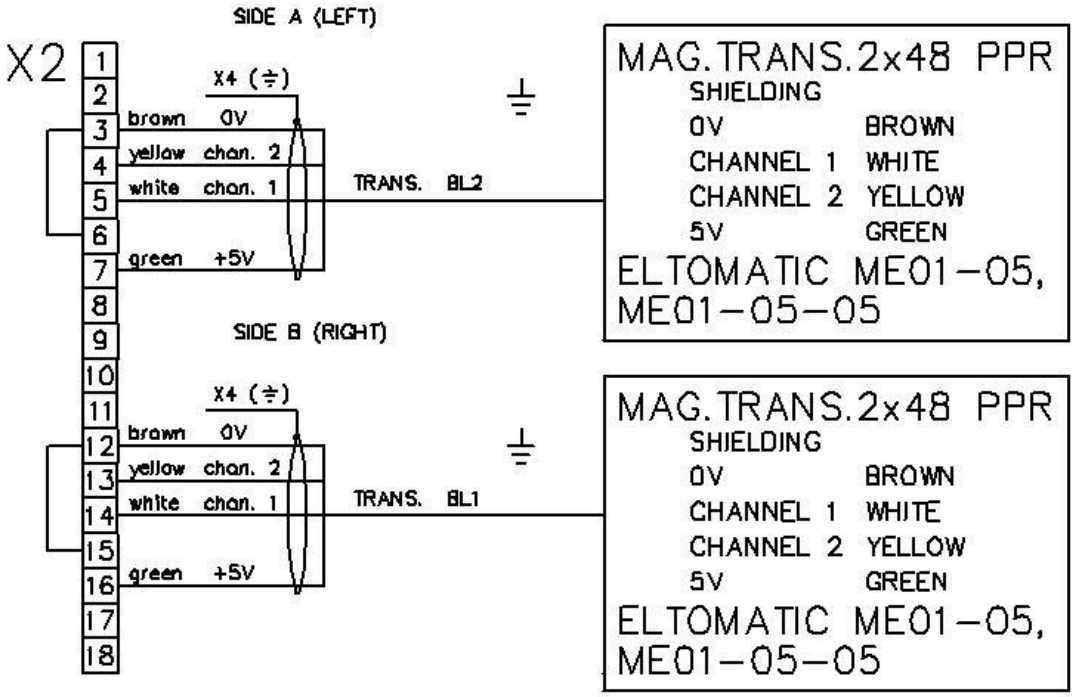
Magnetic pulse transmitter **ME 01-05**

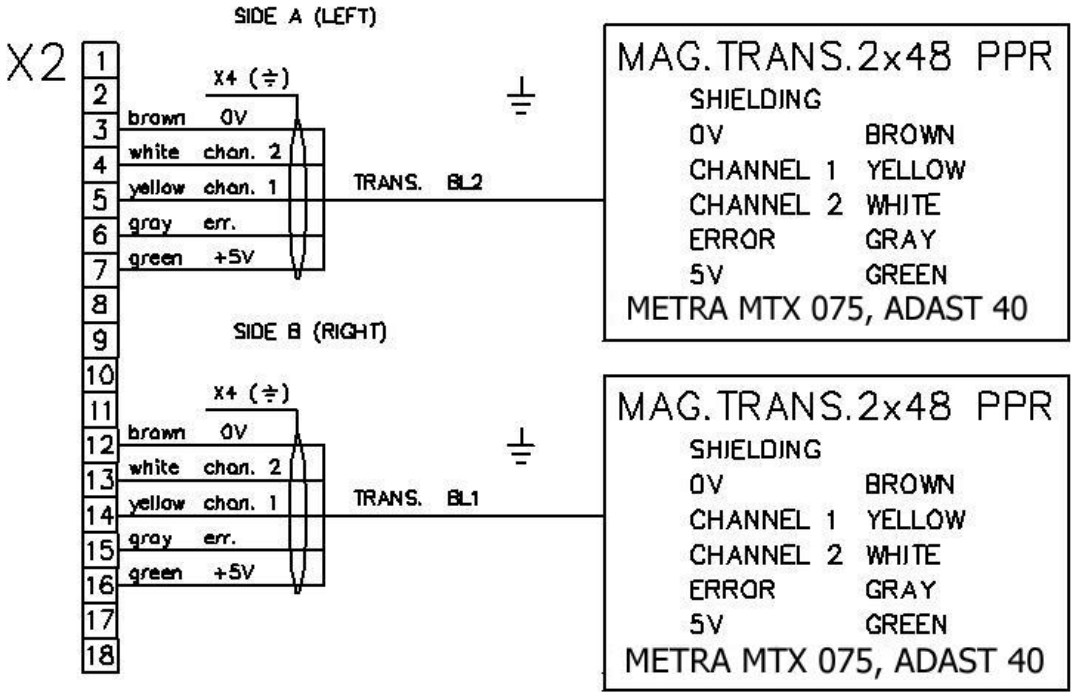
Magnetic pulse transmitter **ME-01-05-05**

Magnetic pulse transmitter **MTX 075**

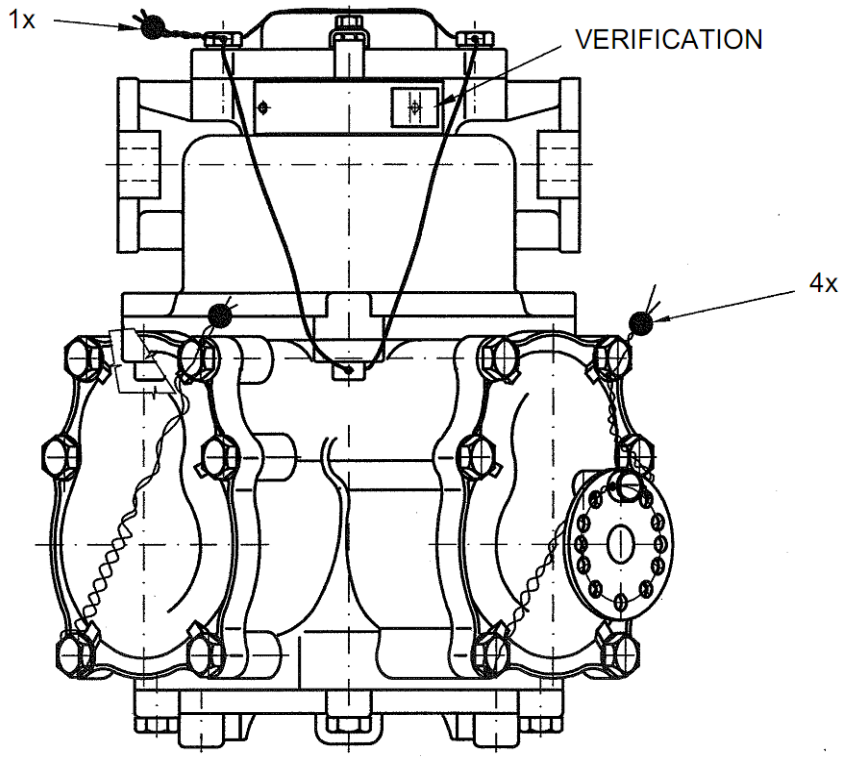
Magnetic pulse transmitter **ADAST 40**

Connection of the magnetic pulse transmitter ME 01-05, ME 01-05-05 and ADAST 40 or MTX 075 to the electronic counter ADP1/T, ADP2/T - connector X2

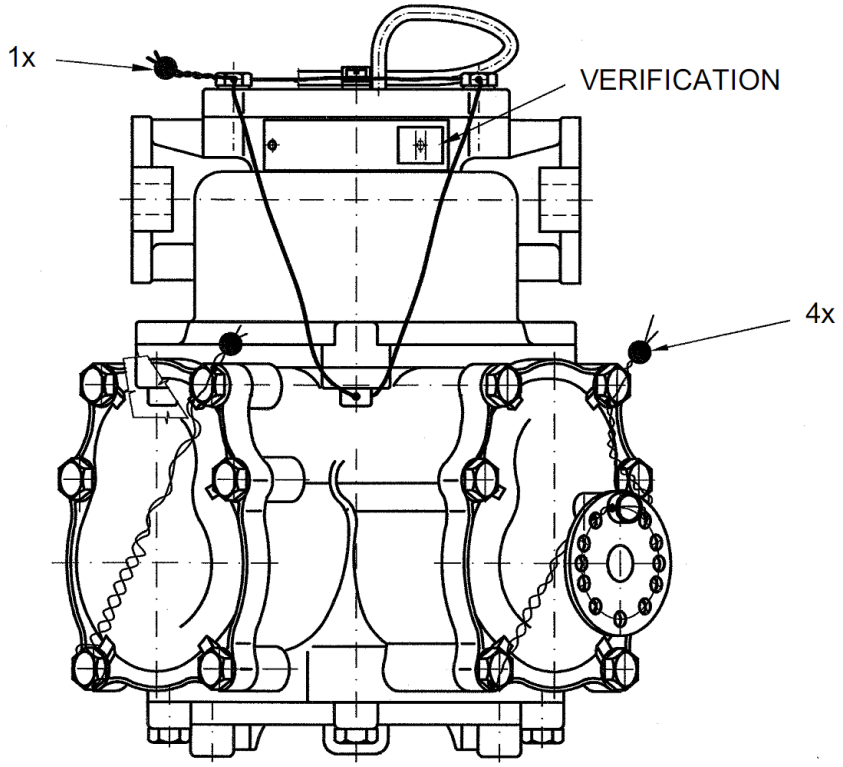




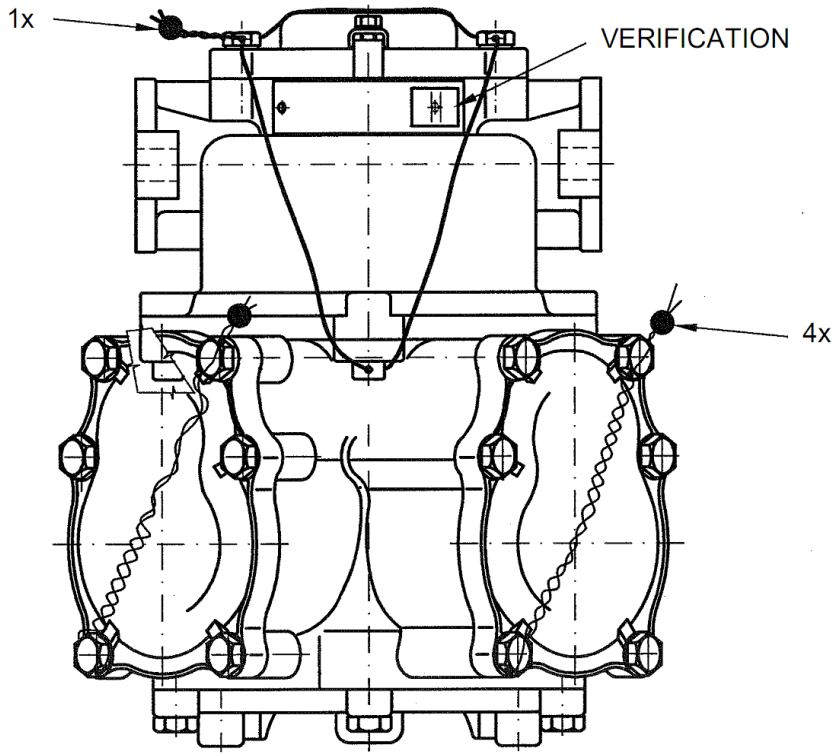
A location scheme official marks on the flowmeter M 403.25P for mechanical calibration



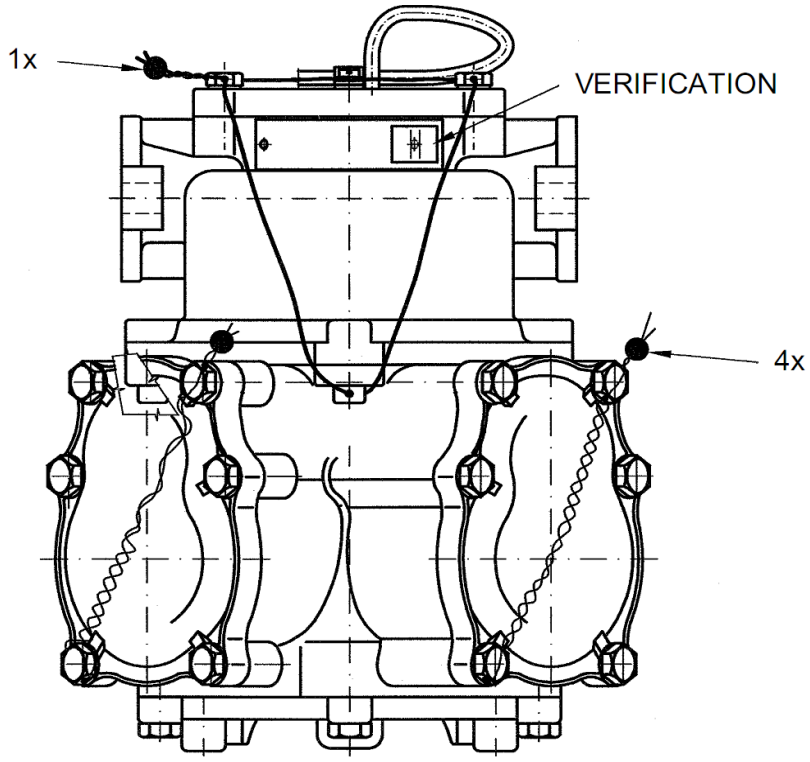
A location scheme official marks on the flowmeter M 403.25P/1 for mechanical calibration



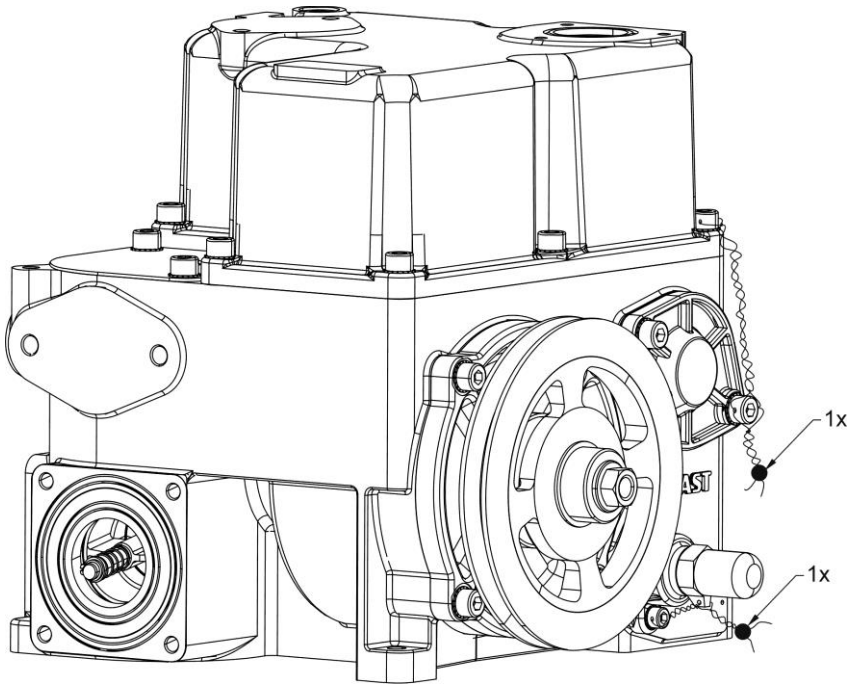
A location scheme official marks on the flowmeter M 403.xxEP for electronic calibration



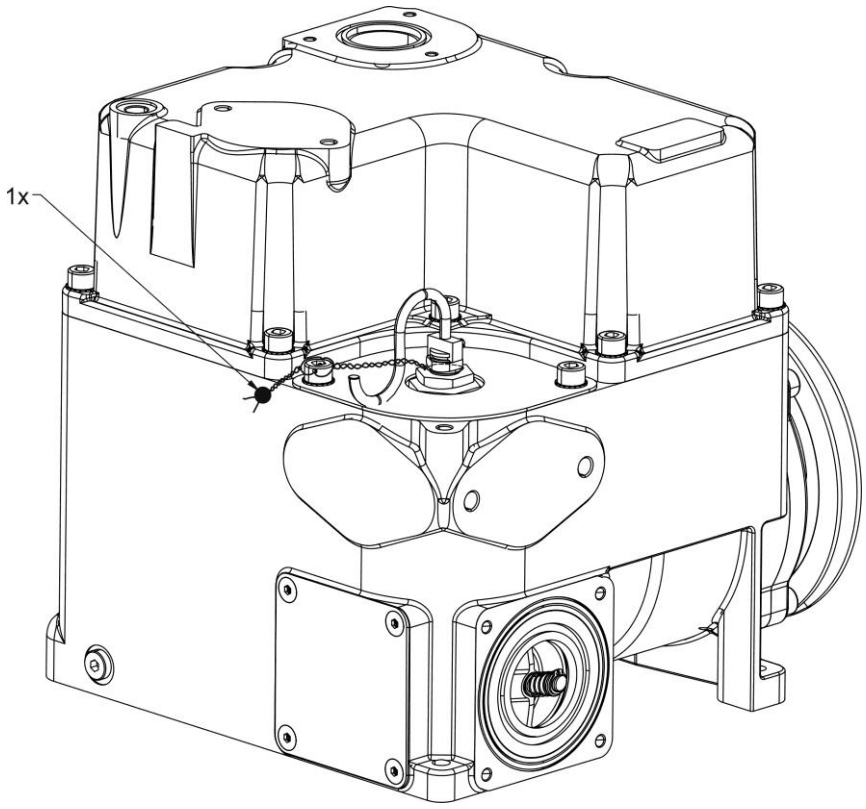
A location scheme official marks on the flowmeter M 403.xxEP/1 for electronic calibration



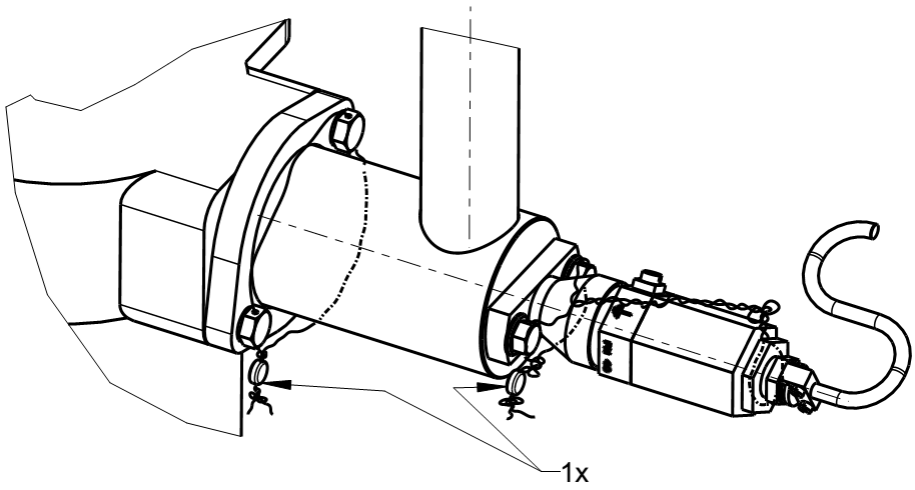
A location scheme official marks on the pumping unit P641.xxx/2/SS



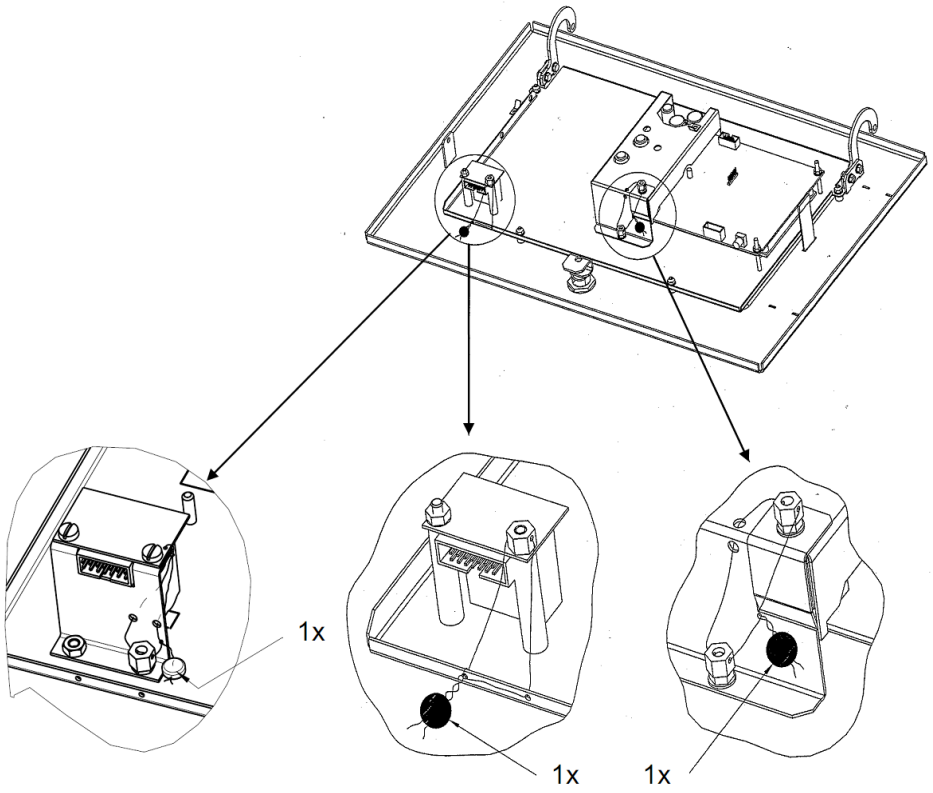
A location scheme official marks on the temperature sensor PT 100 (Just if ATC conversion function is activated)



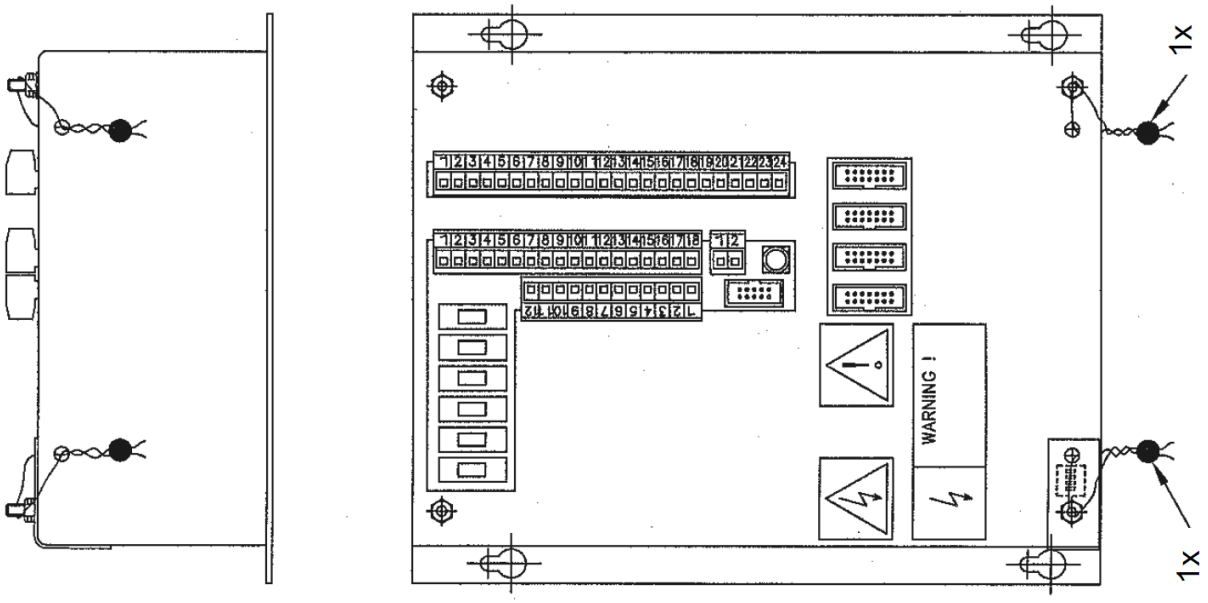
A location scheme marks official on the temperature sensor PT 100 - fuel dispenser connected to the central pressure system



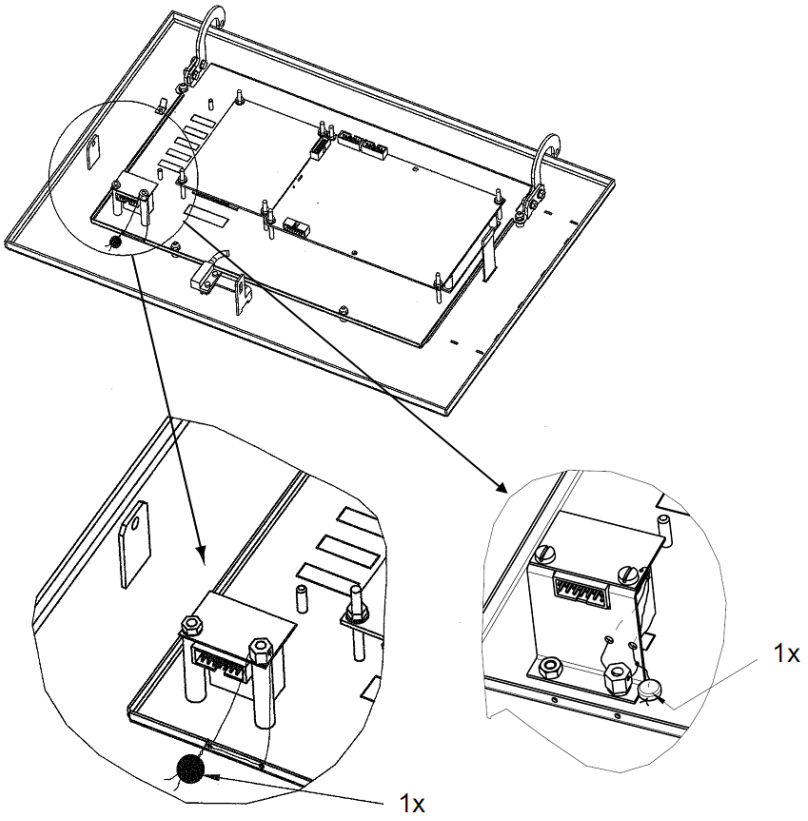
A location scheme official marks on ADP1/L electronic calculator



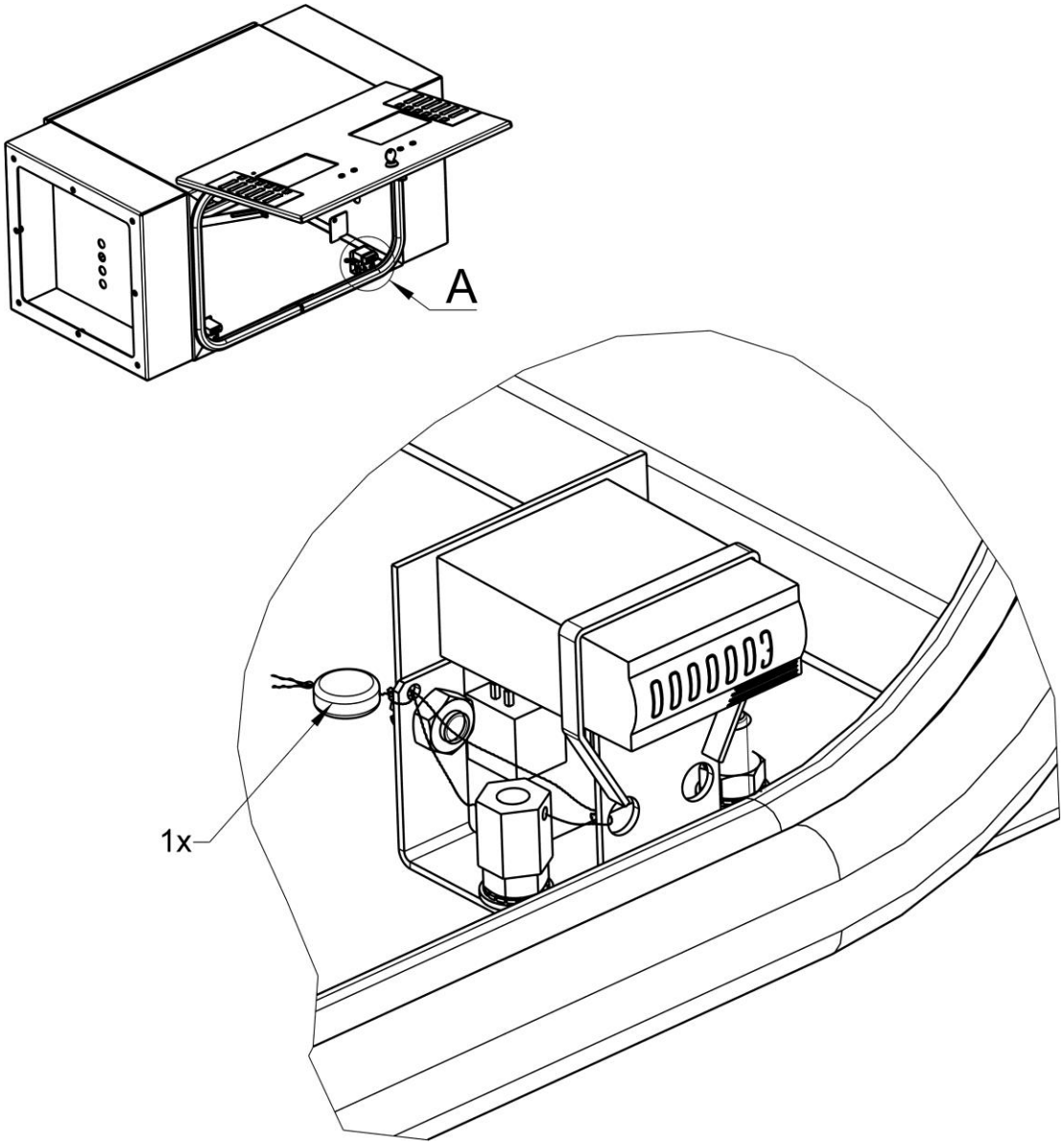
A location scheme official marks on ADP1/T a ADP2/T L electronic calculator



A location scheme verification marks on electromagnetic total counter for single-sided fuel dispensers



A location scheme verification marks on electromagnetic total counter (case version 2017)



Hazardous zones of fuel dispensers V-line 899x.xxx series

Hazardous zones both inside and outside the fuel dispenser have been defined according to **EN 13617-1+ A1.**

Fuel dispenser V-line 899x.6x2:

The inner space of the fuel dispenser hydraulic housing – **ZONE 1.**

The inner space of the fuel dispenser column – **ZONE 1.**

The outside space of the hydraulic housing and the column within 50 mm above the top edge of the housing, column and within 200 mm horizontally in all directions down to the ground – **ZONE 2.**

The electronic counter housing anchored to column is separated by vertical barrier **type 1**. The housing is designed with protection degree **IP67/IP54 – category 2/IP43 according to EN 60529** – inside and outside the housing is non-hazardous area.

Fuel dispenser V-line 899x.6x3:

The inner space of the fuel dispenser hydraulic housing – **ZONE 1.**

The outside space of the hydraulic housing within 50 mm above the top edge of the housing and within 200 mm horizontally in all directions down to the ground – **ZONE 2.**

The electronic counter casing anchored to hydraulic housing is separated by horizontal barrier **type 1**. The casing is designed with protection degree **IP67/ IP54 – category 2/ IP43 according to EN 60529** – inside and outside the housing is non-hazardous area.

Fuel dispenser V-line 899x.6x4:

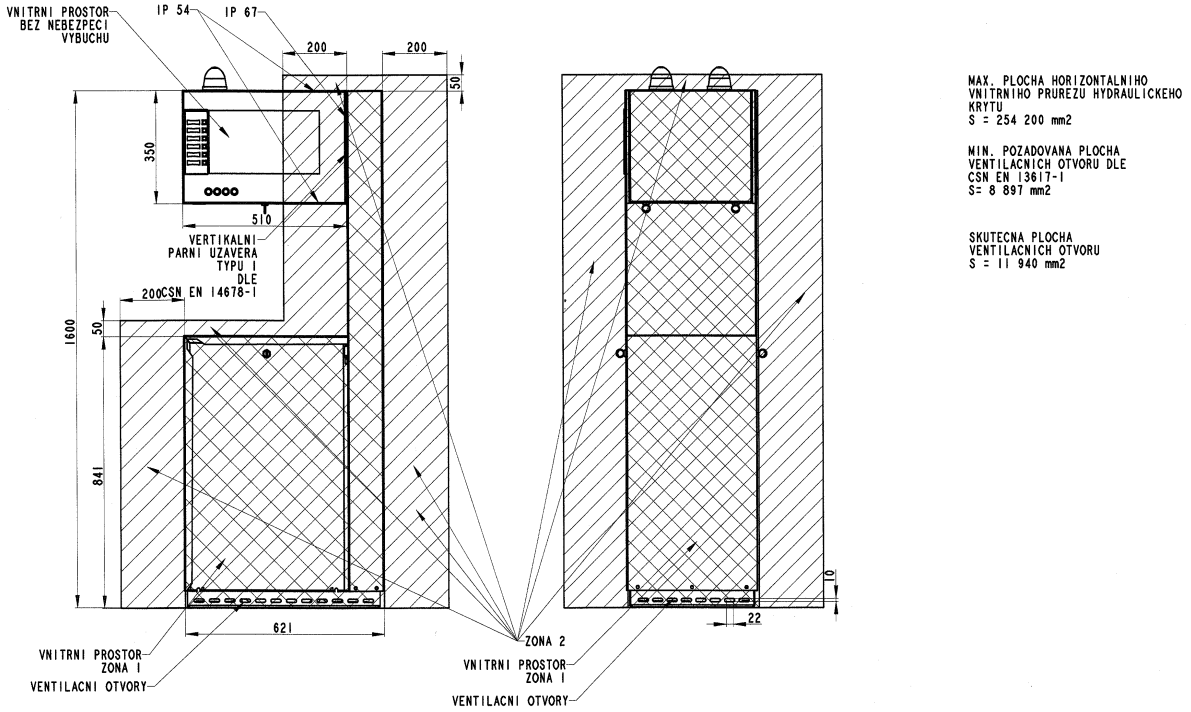
The inner space of the fuel dispenser hydraulic housing and – **ZONE 1.**

The outside space of the hydraulic housing 50 mm above the top edge of the housing and within 200 mm horizontally in all directions down to the ground – **ZONE 2.**

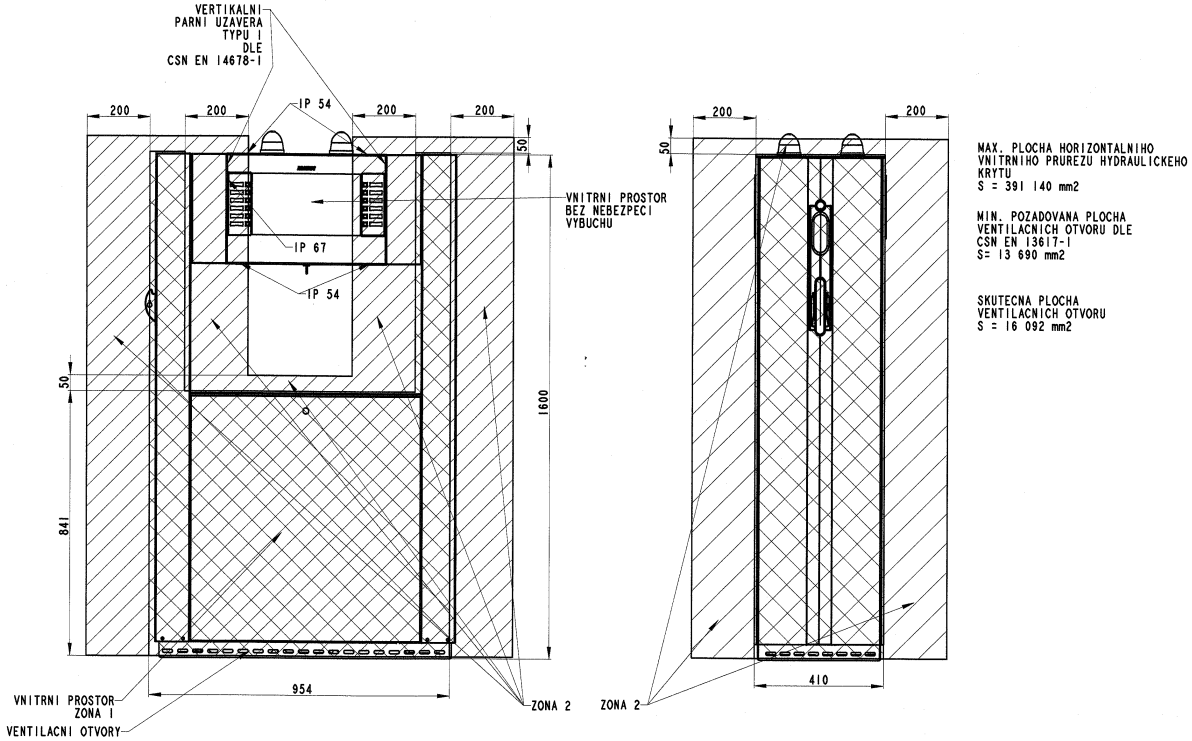
Pos.	Description	Pos.	Description
0	ZONE 0	3	The internal space inside the cabinet without explosion hazard Protection degree IP67/ IP54 / IP43
1	ZONE 1	4	The barrier type 1 according to EN 13617-1 Protection degree IP 67
2	ZONE 2	5	Ex cable entry IP 67

Hazardous zones of fuel dispensers V-line 899x.6x2

Hazardous zones of fuel dispensers V-line 8991.6x2, V-line 8995.6x2, V-line 8997.6x2, V-ine 8999.6x2

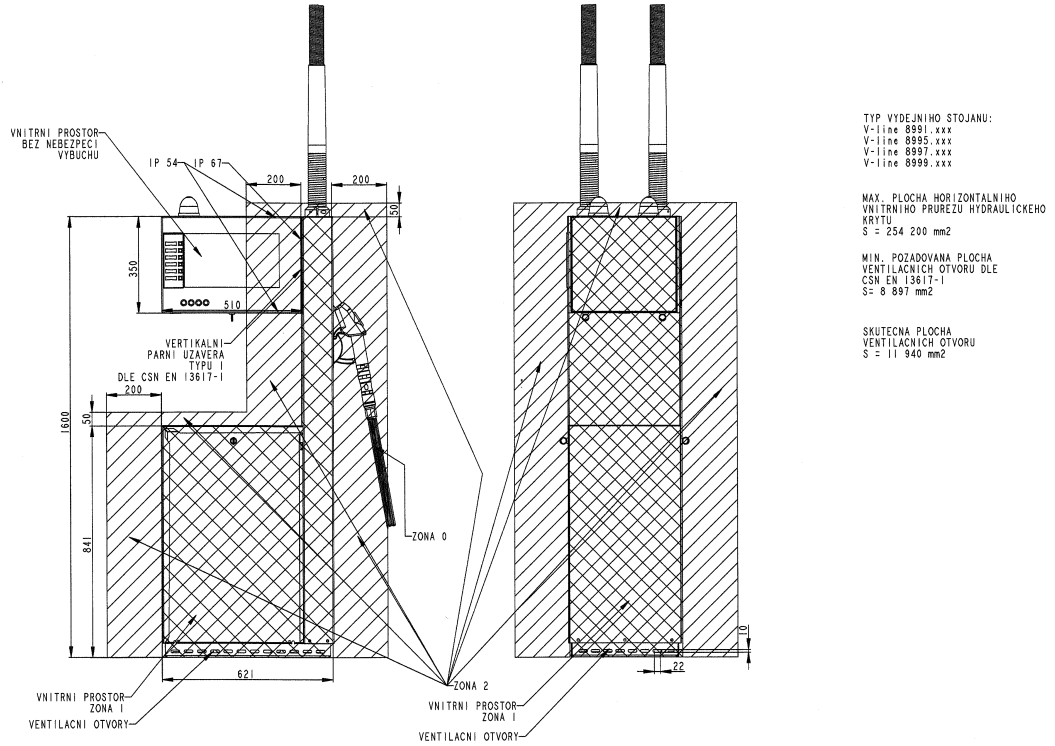


Hazardous zones of fuel dispensers V-line 8990.6x2, V-line 8993.6x2, V-line 8994.6x2, V-line 8996.6x2, V-line 8998.6x2

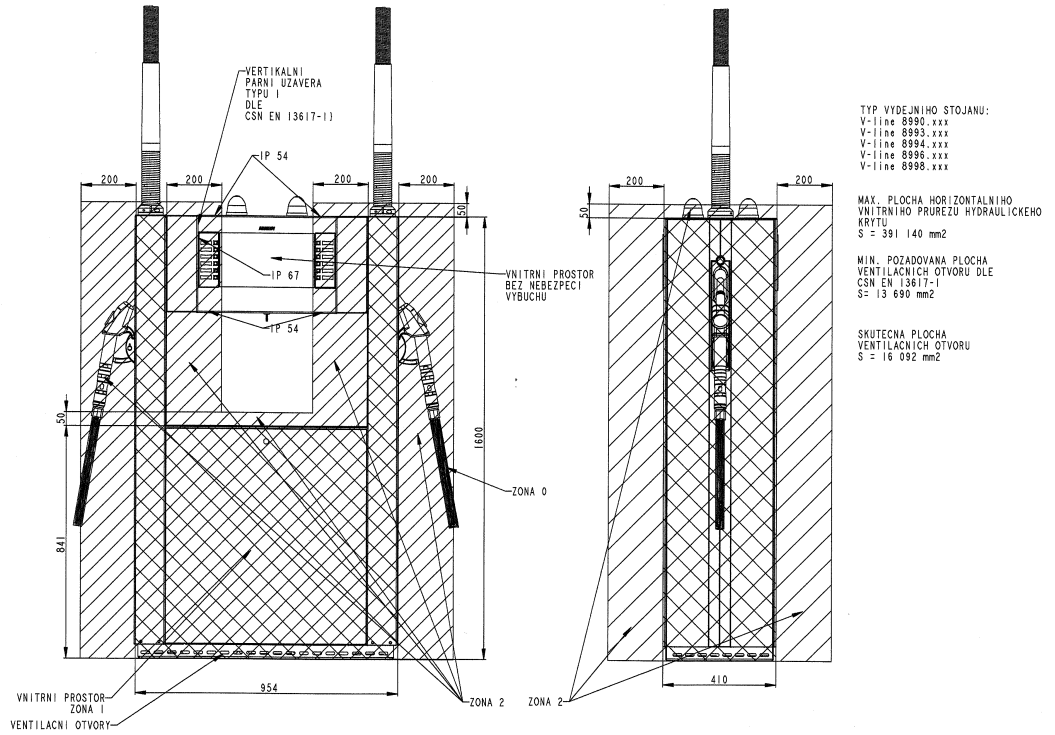


Hazardous zones of fuel dispensers V-line 899x.4x2

Hazardous zones of fuel dispensers V-line 8991.4x2, V-line 8995.4x2, V-line 8997.4x2, V-line 8999.4x2

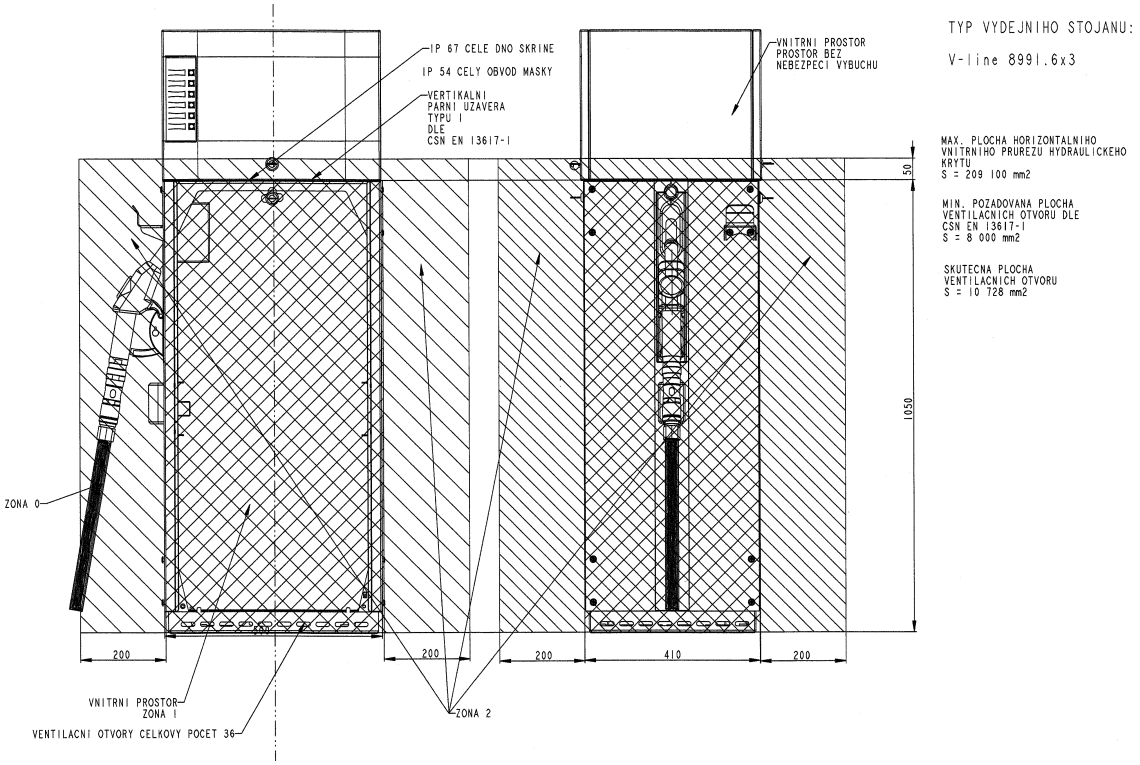


Hazardous zones of fuel dispensers V-line 8990.4x2, V-line 8993.4x2, V-line 8994.4x2, V-line 8996.4x2, V-line 8998.4x2



Hazardous zones of fuel dispensers V-line 899x.6x3

Hazardous zones of fuel dispensers V-line 8991.6x3, V-line 8997.6x3,



Type identification on the rating plate of V-line 899x.xxx dispenser

V - line 899x. xxx / x / xx / xx / xxx

Operating flow rate $dm^3.min^{-1}$

System of pumping
S - suction design
P - pressures design

Design of body
2 - Two-space body with column
3 - Two-space body without column
4 - One-space body without column

Counter

1 - mechanické
2 - ADP - elektronické
3 - Quitec - elektronické
4 - PE - elektronické
5 - GVR (Logitron) - elektronické
6 - Precis - elektronické

Hose connecting
4 - on the spring hanger
6 - on the side wall of dispenser

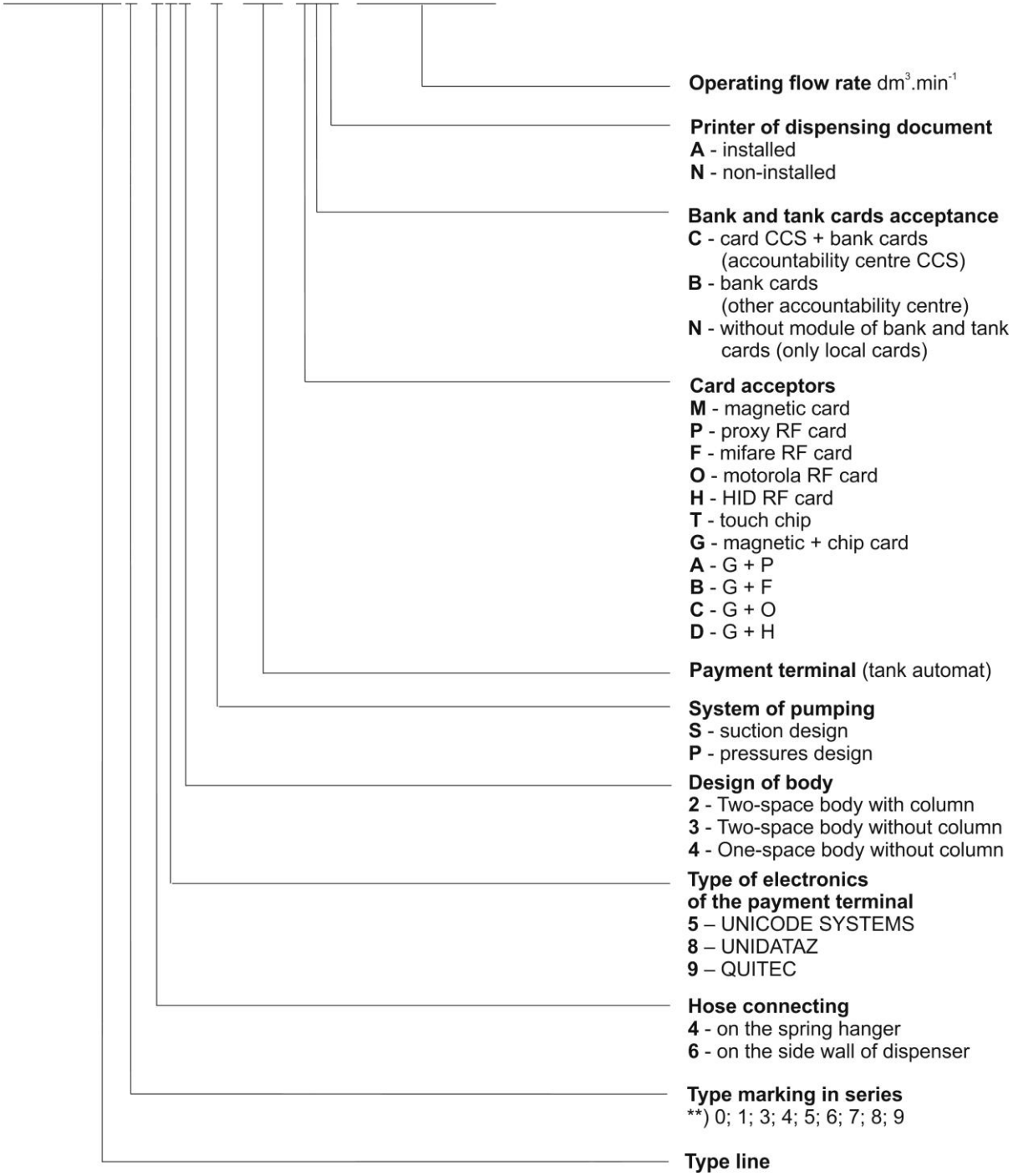
Type marking in series
**) 0; 1; 3; 4; 5; 6; 7; 8; 9

Type line

★★) **0 - MONO - SUPERMAX Q = 110, 120, 130, 150 l/min**
1 - MONO Q = 40, 60 l/min
3 - DUO Q = 2 x 40, 40 +110, 40 + 120 l/min
4 - DUPLEX Q = 40 + 40 l/min
5 - DUO Q = 2 x 40 l/min
6 - DUPLEX Q = 40 + 80 l/min
7 - MONO Q = 70, 80 l/min
8 - DUPLEX Q = 80 + 80 l/min
9 - DUO Q = 40 + 60, 40 + 70, 40 + 80 l/min

Type identification on the rating plate of V-line 899x.xxx/CA dispenser

V - line 899x. xxx / x / CA / xxx / xx / xx / xxx



Operating flow rate $dm^3.min^{-1}$

Printer of dispensing document
A - installed
N - non-installed

Bank and tank cards acceptance
C - card CCS + bank cards (accountability centre CCS)
B - bank cards (other accountability centre)
N - without module of bank and tank cards (only local cards)

Card acceptors
M - magnetic card
P - proxy RF card
F - mifare RF card
O - motorola RF card
H - HID RF card
T - touch chip
G - magnetic + chip card
A - G + P
B - G + F
C - G + O
D - G + H

Payment terminal (tank automat)

System of pumping
S - suction design
P - pressures design

Design of body
2 - Two-space body with column
3 - Two-space body without column
4 - One-space body without column

Type of electronics of the payment terminal
5 – UNICODE SYSTEMS
8 – UNIDATAZ
9 – QUITEC

Hose connecting
4 - on the spring hanger
6 - on the side wall of dispenser

Type marking in series
**) 0; 1; 3; 4; 5; 6; 7; 8; 9

Type line

★★) **0 – MONO – SUPERMAX Q = 110, 120, 130, 150 l/min**
1 – MONO Q = 40, 60 l/
3 – DUO Q = 2 x 40, 40 +110, 40 + 120 l/min
4 – DUPLEX Q = 40 + 40 l/min
5 – DUO Q = 2 x 40 l/min
6 – DUPLEX Q = 40 + 80 l/min
7 – MONO Q = 70, 80 l/min
8 – DUPLEX Q = 80 + 80 l/min
9 – DUO Q = 40 + 60, 40 + 70, 40 + 80 l/min