

# USER´S MANUAL

Instructions for Operation, Maintenance  
and Installation

Fuel Dispenser for the Dispensing  
of Liquefied Propane-butane

**V-line 89xx.xxx/LPG**



CE 1026







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## 1. IMPORTANT NOTICE

This document is a guideline for the user how to proceed when installing, attending and maintaining the dispenser. 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.

In the complex of the filling station, the dispenser is taken for a component of the dedicated gas equipment subject to checks and revisions in the line of valid regulations anchored in the Filling station operating regulation.

In the manufacturing plant, every dispenser is tested as to function, safety and metrology. User's manual, EC statement of a conformity and a service book with identification of the fuel dispenser components are the parts of the dispenser delivery.

Dispensers are manufactured with high accuracy and care for the sake of their long term reliable and safety operation. In time its operation it is necessary to keep primary safety codes, which first of all protect the users before a possible accident and also the fuel dispenser before damage.

**The fuel dispenser is specified for installation into the outside environment - class of environment according to the OIML D11 - C (outside - stationary).**

**The fuel dispenser cannot be installed into the inflammable explosive zones 0, 1, 2, in terms of stated zones (areas) according to the EN 60079-10!**

### Important instructions for installation and operation:

- a) Prior to proceed to the dispenser handling, study these Operating User's manual and other manufacturer's documents belonging to the dispenser accessories carefully.
- b) Check the dispenser delivery for completeness and in the case of any discrepancy or damage, inform supplier or the manufacturer without delay.
- c) Ensure the proper storage of the dispenser in a dry and protected room for the pre-installing period.
- d) Prior to installation, check the dispenser for the completeness of the filling station technology against the valid project, and revise the connecting dimensions of the base frame including the outlet of the piping system.
- e) Rinse the technological equipment (piping systems) through the filtering device and continue rinsing until the filtering device remains free of impurities.
- f) **With respect to operating safety it is necessary at dispenser installation situate with connection of dispensing hose in the direction of exit from the filling station.**
- g) **The dispenser requires the connection to the return piping of a DN 16 (1/2") inner diameter.**
- h) Connect the dispenser electrical equipment and revise it.
- i) Carry out the pressure test of the dispenser including its piping systems with a 2,5 MPa pressure and revise it.
- j) For putting the dispenser into operation, proceed in accordance with the point 16.
- k) Carry out the test for proper function and entrust the metrological verification to a metrological authority representative.
- l) On meeting all of these requirements and after the approval by the representatives of the metrological authority, the standard operation may start.
- m) The servicing interventions should be entrusted to the properly trained personnel of the service firm only.

**SAVE FOR FUTHER USING!**

## 2. USE

The liquid fuel dispensers of the V-line 899x.xxx/LPG series with an electronic counter ADP1/L, ADP1/T, ADP2/T L of volume and price or LOGITRON, alternatively mechanical counter of volume (for non-public dispensing) described in the present manual have been designed for the dispensing of liquefied propane-butane (LPG).

The dispensing is made only by operating staff of the filling station (service mode).

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 prepared for connecting to the control system and it is possible operate this dispensers of self-service operation or serviced operation.

A gas leakage detector connected to the monitoring unit in the filling station booth can be installed in the LPG dispenser for safe and ecological operation of the filling station.

This User's manual serves the user to gain information on the design, correct attendance, maintenance and safe installation.


## 3. INSTRUCTIONS FOR THE SAFETY OF WORK

When pumping the liquefied gas (LPG), within a 10 m perimeters, it is inhibited to smoke and use open flame. Such an restriction must be visibly located at a free and safe place.

The dispenser shows a clear indication to stop the engine and a maximum 80 % filling. The vehicle must be ensured against a spontaneous move.

### 3.1. Safety of the equipment design

**The manufacturer guarantees safety of the equipment design.**

The dispenser design complies with the EN 14678-1 requirements and it is homologated for the operation in environment specified by  II 2G 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 94/9/EC - ATEX by an authorised body FTZÚ, Pikartská 7, 716 07 Ostrava - Radvanice - Notified body no. 1026.

Considering legal metrology the dispensers have been EC - type examination (certification) according to the annex B of the Directive 2004/22/EC - MID by an authorised body Český metrologický institut, Okružní 31, 638 00 Brno - Notified body no. 1383.

### 3.2. Operation safety

Responsible for the filling station operation is the keeper who is bound to charge with the station operation the properly trained and authorised personnel only with corresponding qualification. Duty of the operators consists in filling the vehicle LPG pressure tanks in qualified way while respecting all safety regulations, and in checking - in regular intervals - the dispenser and tank for proper conditions, the mechanical equipment for proper run, gas pressure for proper level, and in keeping the prescribed operational records.

#### Operator's obligation:

- Keep the operated equipment in safety and proper conditions.
- Follow the filling station operating regulations and gas equipment operating instructions.
- Without delay report any defect, failure or irregularity arisen in the course of the gas equipment operation to the keeper and, in case of a danger in delay, put the equipment out of operation immediately.
- Keep the gas equipment clean and in order permanently and take care with avoiding the presence of strangers close to the equipment.
- Without delay report the circumstances that make him more difficult the equipment operation (sudden indisposition, for instance)
- Record the data on the beginning and the end of the work shift and the results of revisions made by the operators and the extent of maintenance, repairs, checks and revisions performed.

- The dispenser and storage tank operators are not supposed to make any repairs of mechanical section, and to alter the setting of any safety fittings.

### 3.3. Ecological safety

The dispenser space, where is the pumping mechanism, may be provided with gas leakage detectors (they do not belong to the dispenser standard outfit) connected to the evaluating unit. In case some leak has been detected (low concentration), the respective unit signals the leakage automatically and - in the case of any danger - (higher concentration) puts the whole system out of operation immediately.

In the case of a small leak of gas, the filling station operators check the whole system and if they do not detect any failure, ventilate the gas leaked (small leakage when connecting and disconnecting the dispensing hose, effect of exhaust gases) and put the system into the operation again. In the case of a higher concentration of leaked gas, the evaluating unit puts the electrical system out of operation. The filling station operators shall put the station out of operation and report the defect to a specialised firm that takes care of the repair.

### 3.4. Hygiene

From the point of view of hygiene, the dispensers are unobjectionable for the operators and the keeper. For carrying out the routine maintenance and dispensing the liquefied propane-butane (LPG), it suits to protect the hands with gloves.

### 3.5. Principles of the first aid

- **In the course of pumping avoid breathing in the propane-butane vapour because of the danger of asphyxiation**

Take the injured individual off the dangerous room to the fresh air. **Take care with your own safety.** Be also aware of the danger of fire and explosion. Lay the injured individual comfortably, release his cloths and leave it in absolute rest (**he is not supposed to speak or walk**). Call a doctor or take the injured individual to a hospital. In the case of his dyspnoea or lack of breathing give him oxygen, or apply artificial respiration.

- **In case the propane-butane contaminates the eyes**, pour a bit of water on them, open the eye-lids with care and rinse the eyes with plenty of running water (for about 15 min) and then look for a medical care - injury of the cornea is imminent.

- **In case the skin gets in contact with the propane-butane**, rinse the skin with plenty of water, take off the cloths and shoes that have been contaminated with propane-butane (taking care with the risk of fire and explosion) and rinse the attacked skin with running water (for about 15 min).

Do not chafe the chilblained skin, instead cover it with a sterile bandage!

- **In the case of a burn**, it suits the cold the injury with cold water from water supply system immediately (for about 15 min). Do not grease the injury with anything and visit a doctor. In case of emergency apply sterile bandage exclusively or, in the case of large burns, wrap up the injured individual into a clean bed sheet - **do not take off the cloths!** In case the cloths start burning, **do not run** (because the flames would be fomented), extinguish with water, stifle the flames with a blanket - jacket, by rolling on the ground. In case of being in the middle of fire, **lie down immediately**, because the flame and gas getting the face, may origin lethal burning of breathing organs.

## 4. DESCRIPTION

### 4.1. Design of the dispensers

Type V - line	Number of hydraulics	Number of dispensing places	Marking
8991.xxx/LPG	1	1	„MONO“
8992.xxx/LPG	2	4	„QUATTRO“
8993.xxx/LPG	1	2	„DUO“
8994.xxx/LPG	2	2	„DUPLEX“
8995.xxx/LPG	1	2	„DUO“

**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 are accessible. Connect the earth wires when the door is fitted back. Electric switch box is inbuilt in the supporting column and it is accessible after the dismantling of the column side cover.

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 of dispensed volume and a price for one unit of dispensed volume are connected from the case interior to the covers or unresettable electromechanical total counters (totalizers) and modules of fuel price per unit are integrated to the indicator. 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 it is required) is located on the case cover as well - for each place separate keyboard.

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.

#### 4.1.1. Hydraulic system of the LPG fuel dispenser

**In normal operation LPG is always in the liquid phase in the hydraulic system of the LPG dispenser.**

A spherical cock (in the LPG supply piping) and a separator with a filter which forms one assembly unit with a check valve of the liquid phase and pressure release valve and safety valve of gaseous phase are located at the bottom of the fuel dispenser. A medium temperature resistance transmitter is connected to the separator from the bottom for the dispensers designed with automatic temperature compensation of dispensed volume in relation to its momentary temperature (ATC).

A metrological branch with a spherical cock G 1/2" for metrological verification and service purposes is a part of the separator return piping.

A piston meter fitted with a sensor of impulses transmitted to the counter is connected to the separator output through a pipe connection. The meter is fitted with pressure control valve keeping the medium in the meter in liquid phase. The output from a differential valve is connected through an electromagnetic valve to a sight-glass to which the dispensing hose with the dispensing nozzle is connected.

**The dispensing hose is connected through safety breaking or rupture coupling.**

The LPG being dispensed is supplied by a pump built-in in the storage tank area. At first the LPG flows through the spherical cock and the filter into the separator. In case the liquid contains gaseous components they should be separated and returned through the nozzle in the separator upper part and the return piping which has to be open (if the dispenser is in operation) to the section of the storage tank that contains the gaseous phase. **The return piping internal diameter should be DN 16 mm (1/2") at least.** The gaseous phase space of the differential valve is connected to the return piping.

If required, the LPG dispenser can be fitted with a two-stage electromagnetic valve closing the LPG flow during dispensing by means of preselection.

#### 4.1.2. Electronics

The dispenser control shall meet the exacting requirements of simplicity and convenience and depends on the button pressing, alternatively on the switch closure of LPG pump motor.

**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 and signalling circuits. 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 accuracy 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 the fuel dispensers V-line 899x.xxx/LPG build in the separator N 821.20/ATC.

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 (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-resettable electronic counter of dispensed volume and its price - 11 digits - or non-resettable 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  $2 \times 100$  impulses per  $1 \text{ dm}^3$ . 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 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 electromagnetic valves ensure the closing of flow and exact dispensing of the preselected volume / price and smooth initiation of dispensing.

The fuel dispensers can be equipped with ADAMAT payment terminal (filling automatic equipment). This equipment enables dispensing and payment of the product by means of contactless, magnetic and chip cards including receipt printing. 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 for 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 are in enclosures.

## **4.2. 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.

### 4.3. 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.

### 4.4. 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.14.

## 5. TECHNICAL DATA

5.1. Basic parameters				
Dispensed liquid			liquefied propane butane (LPG)	
Electronic counter			ADP1/T, ADP2/T, ADP1/L	
Display			illuminated LCD - BACK LIGHT DISPLAY (BLD)	
Power supply of electronics	U <sub>nap</sub>	P <sub>nap</sub>	1/N/PE AC 230 V ± 15 %, 50 Hz	input 85 VA
Power supply of electronic case heating	U <sub>nap</sub>	P <sub>nap</sub>	1/N/PE AC 230 V ± 15 %, 50 Hz	input 250 VA
Volume displayed			6 digits with the setting of digit position	
Price 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	
Number of impulses per 1 dm <sup>3</sup>			100	
Basic sensed unit			0,01 dm <sup>3</sup>	
Permissible deviation of sensed volume			+/-1 impulse, i.e. 0,01 dm <sup>3</sup>	
Max. flow rate Q <sub>max</sub>			40 dm <sup>3</sup> .min <sup>-1</sup>	
Min. flow rate Q <sub>min</sub>			5 dm <sup>3</sup> .min <sup>-1</sup>	
Minimum measurement V <sub>min</sub>			5 dm <sup>3</sup>	
Cyclic volume V <sub>c</sub>			0,48 dm <sup>3</sup>	
Accuracy of metering			±1,0 %	
Pace (distance between the adjacent positioning holes in the meter regulation screw disc)			cca 0,096 %	
Total range of mechanical meter setting			cca 8 %	
Pace at electronic meter setting			0,05 %	
Total range of electronic meter setting			- 5 % až + 5 %	
Max. operating pressure p <sub>max</sub>			1,8 MPa	
Min. operating pressure p <sub>min</sub>			0,7 MPa	
Ambient operating temperature			standard -20 °C to +50 °C special design -30 °C to +60 °C	
Liquid temperature			-20 °C to + 50 °C	
Filtering property			10 µm	
Reach of dispensing hose			4 to 7 m	
Max. level of noise			<60 dB	
Required inner diameter of feeding piping			DN 19 - inner thread G 3/4" ISO 228 - G ¾"	
Required inner diameter of return piping			DN 16 - inner thread G 1/2" ISO 228 - G ½"	

Communication interface	RS 485; IFSF - LON, TCP/IP (Ethernet)
Average operating period of a repair	$t_{oo} = 25 \text{ min}$
Average service life	$t_z = 5 \text{ years}$

<b>Common data for V-line 899x.x5x/LPG dispensers with GILBARCO - LOGITRON electronic counter</b>	
Electronic counter	GILBARCO - LOGITRON HT-TE; GILBARCO - LOGITRON PUMAFIT
Communication interface	current loop 20 mA
Other data identical with those for the dispenser with ADP1/T, ADP2/T counter.	

<b>5.2. Technical parameters of the fuel dispenser LPG MONO</b>	V-line 8991.6x2/LPG V-line 8991.6x3/LPG V-line 8991.6x4/LPG
Max. flow rate $Q_{max}$	$40 \text{ dm}^3 \cdot \text{min}^{-1}$
Min. flow rate $Q_{min}$	$5 \text{ dm}^3 \cdot \text{min}^{-1}$
Minimum measurement $V_{min}$	$5 \text{ dm}^3$



<b>5.3. Technical parameters of the fuel dispenser LPG DUO a QUATTRO</b>	V-line 8992.6x2/LPG V-line 8993.6x2/LPG V-line 8995.6x2/LPG
Max. flow rate $Q_{max}$	$40 \text{ dm}^3 \cdot \text{min}^{-1}$
Min. flow rate $Q_{min}$	$5 \text{ dm}^3 \cdot \text{min}^{-1}$
Max. flow rate Q dispensed from one nozzle	$40 \text{ dm}^3 \cdot \text{min}^{-1}$
Max. flow rate Q dispensed from both nozzles	$2 \times 30 \text{ dm}^3 \cdot \text{min}^{-1}$
Minimum measurement $V_{min}$	$5 \text{ dm}^3$

<b>5.4. Technical parameters of the fuel dispenser LPG DUPLEX</b>	V-line 8994.6x2/LPG
Max. flow rate $Q_{max}$	$40 \text{ dm}^3 \cdot \text{min}^{-1}$
Min. flow rate $Q_{min}$	$5 \text{ dm}^3 \cdot \text{min}^{-1}$
Max. flow rate Q dispensed from both nozzles	$2 \times 40 \text{ dm}^3 \cdot \text{min}^{-1}$
Minimum measurement $V_{min}$	$5 \text{ dm}^3$

## 6. IDENTIFICATION

### Rating plate of the LPG fuel dispenser V-line 899x.xxx/LPG

1.	Measuring device manufacturer and address	Adast Systems, a.s. CZ - 679 04 ADAMOV
2.	Name of measuring device	LPG dispenser
3.	The „CE“ marking and supplementary metrology marking	<b>CE M 07 1383</b>
4.	Type	See enclosure 15 and 16
5.	Number of EC - type examination certificate	<b>TCM 141/07 - 4506</b>
6.	Accuracy class	1,0
7.	Serial number and year of manufacture	According to dispensers manufacturer files
8.	Liquid temperature range - $T_{Liq}$ [°C]	- 20 to + 50
9.	Ambient temperature range - $T_{Amb}$ [°C]	Ambient operating temperature - according to version of the fuel dispenser
10.	Mechanical class	M 2
11.	Electromagnetic class	E 2
12.	Liquid	LPG

13.	Minimum measured quantity (MMQ)	Min. measured quantity within guaranteed metering accuracy
14.	Maximum flowrate $Q_{max}$ [L/min]	Max. rate of flow certified for respective dispenser
15.	Minimum flowrate $Q_{min}$ [L/min]	Min. rate of flow certified for respective dispenser
16.	Maximum pressure $p_{max}$ [bar]	Max. pressure specified for the dispenser operation
17.	Minimum pressure $p_{min}$ [bar]	Min. pressure specified for the dispenser operation
18.	Number of EC - type examination certificate - Ex	FTZÚ 05 ATEX 0222
19.	 1026	CE marking with the number of the Notified body cooperated in the conformity assessment
20.	 IIG IAT3	Specific marking for the explosion protection including the symbol of the group and category of the device, explosion and temperature categories of dispensed fuels
21.	Standard	EN 14678-1
22.	Electrical parameters	Values of electronics, heating and el. motors feeding

## 7. FILLING OF LIQUEFIED GAS INTO MOTOR VEHICLES

The operator controls the movement of vehicles within the liquefied gas filling area so that the dispensing hose reaches the fuel tank filler of the vehicle. When the vehicle is ready for filling, the operator checks the fuel tank for homologation stamp, switched off engine and all el. equipment of the vehicle. Then he checks the connection to the filler of the storage tank which is led to the vehicle surface, the type of the vehicle fuel tank filler and decides either for direct connection of the dispensing nozzle to the filler or for the use of an adapter for different types of vehicle fillers. The operator checks visually the condition and the wear of the filler which could result in gas leakage from the vehicle. He performs smell test to identify prospective gas leakage from the vehicle. In case he identifies any serious deficiencies, he has to refuse to fill the vehicle and recommends the customer to visit an authorised service shop which can remedy the defects detected. After connecting the dispensing nozzle to the vehicle filler the operator shall check the connection and then pressing the button (switch on the dispenser to "ON" position) resets the counter automatically. After resetting the pump motor is started. The filling can be stopped at any time by releasing the button (switching to "OFF" position).

After filling and releasing the push-button (switch to "OFF" position) the dispensing nozzle is disconnected from the vehicle tank and hung up.

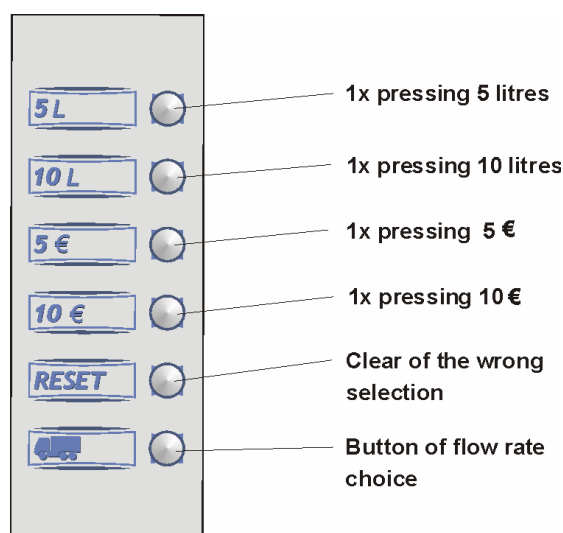
In case the tank is filled to be full (most frequent case) the automatic safety level regulation controlling the filling of the tank to 80 % max. shuts off the supply by means of a mechanical limiter without respect to manual push-button control.

### ATTENTION!

In case of gas leakage or any danger the operator stops the filling!

## 8. DISPENSING WITH PRESELECTION

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



### 8.1. Description of the preselection function

The selection of the required value of fuel to be dispensed is carried out with the switch for pump motor start in the position OFF (0)!

1. Connect the dispensing nozzle to the fuelling ending of the vehicle tank.
- 2.a) Preselect the required quantity to be dispensed according to the price by keys identified 5 € 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.
- 2.b) Preselect the required quantity to be dispensed according to 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 the "RESET" key.
3. The display is reset by pressing down or switching the control switch to the position ON (I), the dispenser is started and filling can be carried out up to the preselected price or volume when dispensing is automatically stopped.
4. After stopping the LPG filling by means of the push-button, release or switching over the switch to "OFF" (0) position, disconnect the dispensing nozzle from the vehicle filler and hang it up into the cover.

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

## 9. FUNCTION OF KL-MANINF MANAGER KEYBOARD OR KL-SERINF ONE

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 „-“ (the „R“ is not used). 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".

### 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.*

### **9.1. 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 by the "+" key (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.

### **9.2. 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.

### **9.3. Displaying procedure of electronic totalizers for dispensers fitted with ADP1/T, ADP2/T, ADP1/L electronic counter**

The ADP1/T, ADP2/T, ADP1/L counter is fitted with non-resettable 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. The display of the totalizer can be switched by lifting the relevant nozzle or by switching the LPG switch.

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 side number and the nozzle number of the totalizer displayed at this moment are displayed on the unit price line:

- e.g.: 1 - 1...A side - nozzle No. 1;  
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 displayed.
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.

#### 9.4. Process of LPG mass in the pressure tank indication on the counter display in the fuel dispensers V-line 899x.62x/LPG/K/V equipped with an electronic counter ADP/T

The counter must be connected with electronic unit of weighing machine DELTAGAZ DT02 by the help of communication cable RS 485. Indication is enabled in the counter mode AUTO and MAN. In AUTO mode the operator must ensure switch over of communication cable from filling station control system to the weighing machine. Indication of measured value is enabled through the KL-MANINF.

**LPG mass in the pressure tank will be indicated on the display before indication of volume and price totalizers of the LPG fuel dispenser.**

##### Process of indication

1. For current LPG mass in the pressure tank indication press the button „+“ or „-“, every segment lights up and switches off (as well as at start of check transaction, if every segment displays correctly).
2. On the unit price line „UE1“ is displayed (1 its number of the weighing machine)
3. LPG mass in the pressure tank displays on the total price and volume lines depending on the total digits number (as well as at screen of the electronic totalizers).
4. By „0“ button press finish the scanning of current LPG mass in the pressure tank and pass into the mode of totalizers indication, when shortly will be screen the total number of power cut and than „U“ and volume sum of appropriate nozzle (or „A“ and price sum of appropriate nozzle) will be indicated. Volume sum or price sum will be indicated according to the button using for LPG mass in the tank indication on the scanning beginning - „+“ indicates volume sum and „-“ indicates price sum.
5. By repeated „+“ button presses or appropriate nozzle lifting it is possible to pass to display of volume totalizers of next dispensing nozzles (by repeated „-“ button presses or appropriate nozzle lifting it is possible to pass to the price totalizer display of next dispensing nozzles).
6. By „0“ button press finish the scanning of electronic totalizers and in the case of temperature and electronic calibration activation pass into its setting mode.
7. ATC temperature calibration setting for appropriate nozzle is presented with text AtC. Electronic calibration setting of appropriate nozzle is presented with text EC.
8. By „0“ button press quit of the scanning and return to the standard mode.

## 10. MAINTENANCE OF THE 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

### ATTENTION!

All repairs of operating units can only be carried out by a service repair shop and their serviceman with relevant authorisation.

Repairs, changes and dismantlings of undermentioned dispenser units depends of the perfect propane butane displacement with nitrogen from all space of dispenser hydraulic system.

Since even after the education of nitrogen from the dispenser its residues with minimum pressure stay in the hydraulic system, it is necessary to come on very carefully at the service interventions.

Marking of space endangered with pressure expansion of residual nitrogen - see the enclosure no. 7.

### 10.1. LPG piston flow meter

The LPG meter unit consists of proper meter and integrated impulse detector. It is adjusted by the producer. Only authorised specialist 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.

A trained worker should follow the meter continuously to carry out necessary repairs immediately in case of any defect. Constant accuracy of the adjusted meter is one million dm<sup>3</sup> at least for measured liquid without mechanical impurities. It is recommended to check the accuracy of the meter after dispensing such liquid gas quantity. The meter should be periodically inspected (calibrated) by a metrological office according to relevant legal regulations - once per year at least.

The impulse sensor is not being repaired - the meter should only be replaced. New official authorisation (sealing) must be carried out after its replacement.

### 10.2. Differential valve

The valve is designed to keep the substance in liquid condition in the meter. It also damps pressure shocks. Only incompressible liquefied substance of pressure higher (appxm. by 0,1 MPa) than the counterpressure of gaseous phase as generated by the spring pushing the differential piston into the valve seat from the side of the gaseous phase allows to shift the valve cone of the differential piston off the valve seat so that the flow through the valve is open.

All defects of the valve shall be repaired by a professional labourer.

The cover of the valve is protected by a seal of the producer or the service shop against unauthorised intervention.

### 10.3. Separator

The separator prevents the inlet of the gaseous phase into the meter.

The separator together with a filter, non-return valve, pressure-release valve and a safety valve for the gaseous phase form one assembly unit.

### ATTENTION!

The filter collects impurities for the substance being pumped. In case the discharge drops, it is necessary to check the filter, clean or replace it.

The cover of the separator filter can be opened when the substance is displaced by nitrogen!

Identification of areas exposed to the risk of pressure release of residual nitrogen - see Enclosure No. 7.

The safety valve of the gaseous phase in the upper part of the separator (adjusted to 1,8 MPa) prevents the exceeding of the highest working pressure by means of by-passing the liquid phase back to the storage tank.

When pumping is finished, the non-return valve located in

the bottom part of the separator allows the rise of pressure in the meter therefore the substance stays in the liquid condition.

A pressure-release valve built-in into the piston of the non-return valve protects the meter against damage by inadmissible pressure of substance due to its overheating in the hydraulic system of the dispenser. Under critical gauge pressure the pressure-release valve will connect the pipe between the separator and the meter to the interior of the separator which results in pressure fall in the meter.

**ATTENTION!**

**Only a qualified labourer of the service-shop may be charged with repairs of the separator assembly and prospective replacement of the filter.**

#### **10.4. 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.

#### **10.5. Breakage coupling**

The breakage coupling prevents the damage dispensing hose or the dispenser in case the vehicle leaves without the dispensing nozzle being uncoupled form the vehicle tank filler. The coupling is fitted with valves stopping gas leakage when both basic components of the coupling are broken. Only a specialist can carry out the replacement of the broken coupling.

Bending moment, necessary for the breaking of the breaking coupling, is 300 to 600 Nm.

#### **10.6. Rupture coupling**

The rupture coupling prevents the damage of the dispensing hose or the dispenser in case the vehicle leaves without the dispensing nozzle being uncoupled from the vehicle tank filler. The coupling is fitted with valves stopping gas leakage when both basic components are disconnected. Only a specialist of the service shop can connect both disconnected components of the rupture coupling.

Tearing force, necessary for the disconnection of the rupture coupling, is 200 to 500 N.

#### **10.7. LPG sight-glass**

The sight-glass has been designed for the visual checking of the flow of liquefied gas being dispensed. Its design does not require any maintenance. In case of a mechanical defect only a specialist of the service shop can repair it.

#### **10.8. Dispensing hose**

At the fuel dispenser is used the special dispensing hose certificated according to the standard EN 1762.

The dispensing hose is delivered in the standard 4 m length. The hose is provided with a thread at one end for screwing it on the dispensing nozzle and, at the other end, with a thread for its screwing on the breakage or the rupture coupling. Requirement of a hose of another length should be agreed with the manufacturer the maximum length being 7 m. In the case of any damage, the dispensing hose should be replaced, not repaired at the field.

**ATTENTION!**

**WHEN WOULD BE USED THE NON-CERTIFICATED DISPENSING HOSE, THE EXPLOSION CAN BE INITIATED!!!**

## 10.9. LPG dispensing nozzle

The dispensing nozzle for liquefied gas is a final component of the LPG dispensing module. The connecting end of the dispensing nozzle is fitted with a rubber sleeve ensuring tight connection between the dispensing nozzle and the vehicle tank filler. The nozzle is also fitted with protective cover made of antistatic material at the place of operator's hand contact as a protection against sudden cooling of the nozzle metallic parts. The dispensing nozzle is designed to provide accurate connection and low physical effort for handling required. It is recommended to grease the mechanism of the nozzle connecting end and the lever pin with silicone oil once per three months. It can be carried out by the filling station operator. Replacement of sealing and the nozzle itself can be only carried out by a skilled worker of the service shop.

## 10.10. 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 dismantled 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 distribution 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 and QUATTRO hydraulic modules

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

### Dismantling 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.

### Dismantling 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.

## 10.11. 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.

**Recommended time intervals for the maintenance of dispenser 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:**

washing of parts by surfactant, 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 - e.g. ULTRAPUR-d agent (manufactured by MMM - Group, Germany) - once a month.

**10.12. 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.

**11. DISASSEMBLY AND DISPOSAL****ATTENTION!**

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.

**12. PRINCIPLES OF SERVICE INTERVENTIONS FOR LPG DISPENSER**

Service intervention shall be performed in accordance with the operating instructions for the filling station.

1. Before intervention the dispenser unit must be put out of operation, the approach lane marked with portable traffic sign "ENTRY FORBIDDEN" and the visible notice "OUT OF ORDER" shall be located on the dispenser.
2. Prior to any intervention into the LPG module the dispenser has to be disconnected from mains by means of the main switch in the filling station switchboard.
3. Prior to any intervention propane-butane shall be expelled by nitrogen from the complete system (except storage tanks) including LPG dispenser.
4. Both valves in the LPG supply line from the storage tank in the return line to the storage tank must be closed.
5. For the period of the service intervention any motor vehicle traffic has to be avoided within 5 m radius and an extinguisher shall be within service labourers' reach.
6. At least two trained labourers of the authorised service shop have to perform the intervention.
7. Only special non-sparking tools can be used for the intervention!

**13. SUMMARY OF PRINCIPLES FOR INSPECTION OF LPG DISPENSER**

To be carried out simultaneously with the inspection of the filling station gas equipment.

The inspection shall be performed only by an authorised body and consists of:

- inspection of the gas equipment
- repair of the gas equipment

The inspection of the process equipment, storage tank, piping and the LPG module is carried out in periods specified in the operating regulations of the filling station according to the regulations in force specifying intervals and scope of maintenance and inspection.

**The following activities are carried out in the course of the inspection:**

**tightness test of the LPG module hydraulic system by means of a foaming agent**

- checking of the filter in the separator, cleaning or replacement
- functional test of the non-return and safety valves
- checking of the mechanical equipment, dust cleaning, elimination of water and other impurities from storage tanks (LPG reservoir)
- inspection, calibration and official certification of the LPG dispensing module are carried out according to the regulation in force of the metrological office of the appropriate country
- all identified defects are remedied after the inspection

Repairs of the filling station mechanical equipment are carried out after the identification of the faulty condition symptoms and according to the conditions specified by the manufacturer of its individual parts. The functional test and tightness test of the gas equipment are carried out after the completion of the repair.

**ATTENTION!**

**Service is performed by a service company authorised by the manufacturer!**

## 14. 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 pallet. 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.

**ATTENTION!**

**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!**

## 15. DISPENSER INSTALLATION

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.

**The dispenser installation is carried out by the organisation authorised by the manufacturer.** 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. At least 100 dm<sup>3</sup> of LPG has to be discharged from each dispensing nozzle with  $Q_{max}$ .

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

**ATTENTION!**

**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.**

## 15.1. Hydraulic section

Seat and set in concrete the levelled steel base frame - delivered on special request by dispensers' manufacturer - on the shaft with the supply pipeline and return piping from the storage tank.

In case the customer makes use of his own base frame, the frame must meet the requirements of the sufficient rigidity, flatness and proper positions of fixing holes.

It is recommended to fasten the frame to a pedestal approximately 200 mm over the terrain for the reason of easier assembly and handling or servicing purposes. The shaft, after having connected the piping and the electric conductors to the dispenser, should be filled at least to the terrain level in order to prevent the propane-butane gas from accumulating in the well and caverns for being heavier than air.

Attach the dispenser to the embedded frame.

The dispenser requires the connection to the return DN 16 piping. The separator return piping involves a metrological branch provided with a G ½ " spherical cock designed to metrological verification of the dispenser and the servicing purposes. The return piping of DN 16 connected to the storage tank is jointed to the G 1/2" inner thread of the gaseous phase separator piping. The inlet piping of DN 19 at least from the LPG pumping unit is connected to the G 3/4" inner thread of the spherical cock in the separator input.

The manufacturer recommends to seal the bolted joints with the white tape of PTFE - FLEXON material 0.1 mm thick.

### **IMPORTANT NOTICE!**

**ACCORDING TO THE SAFETY REASONS THE HYDRAULIC SYSTEM OF THE FUEL DISPENSER MUST BE PERMANENTLY CONNECTED BY THE HELP OF RETURN PIPING OF GASEOUS PHASE IN THE INSIDE SPACE OF LPG PRESSURE TANK.**

**IN CASE OF STOP-ELEMENT INSTALLATION (ELECTROMAGNETIC VALVE) INTO THE RETURN PIPING OF GASEOUS PHASE BETWEEN THE FUEL DISPENSER AND TANK MUST BE THE RETURN PIPING BETWEEN THE FUEL DISPENSER AND STOP-ELEMENT EQUIPPED WITH THE SAFETY VALVE WITH SETTING MAX. OPENING PRESSURE 2,5 MPa.**

### **IMPORTANT NOTICE!**

In accordance with the article 4.4.1.2 EN 14678-1 the input piping of the liquid phase and return piping of the gaseous phase should be connected to the connecting piping of the dispenser through a shear valve - safety breakage coupling which prevents the substance leaking in case of dispenser failure. The bending moment value for the breaking of the coupling should range within 300 to 600 Nm.

Breakage couplings of the liquid and gaseous phases should be anchored to the lower machinery in the shaft under the dispenser.

Approved breakage coupling is delivered on special request of the Client.

## 15.2. Wiring

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

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.

### **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.

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).

**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, change of unit price, selfdiagnostics, etc.).

## 16. PUTTING OF THE DISPENSER INTO OPERATION

Entire hydraulic system of the LPG module has to be subjected to the pressure test by nitrogen of 2,5 MPa pressure. Being the test pressure attained, check all joints of the hydraulic system by a foaming agent.

Wiring inspection of the dispenser unit has to be carried out.

All functional tests and inspections are carried out under the supervision of a Technical Inspection Institute inspector who will issue a test certificate about tests and inspections.

Being the pressure test and inspection finished and positive results obtained, the hydraulic circuit of the LPG module can be filled with liquid gas.

The inspection of wiring and the pressure test of the LPG module can only be performed by a person provided with a certificate for this activity issued by the state inspection agency.

### 16.1. Putting of the dispenser and electronic counter into operation

- Switch on the feeding of the dispenser in the switchboard of the filling station (feeding of the electronics and el. motor of the LPG pump).
- The octal test of the counter will be performed after depressing or switching over the LPG switch and if the LPG dispensing nozzle is connected to the vehicle tank, it is possible to perform filling.
- Switch off the LPG switch.
- In case the dispenser is switched with the LPG switch on, it is necessary to switch off an on this switch and again to activate the dispenser (counter resetting).
- Now it is possible to start fuel filling.

### 16.2. 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. pump motor).

### 16.3. 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 button pressing or switch-over of switch into the ON position is preserved on the counter display.
- In case power failure has occurred in the very time of fuel filling, it is necessary to button release or switch off the LPG switch 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 button pressing or switching the LPG switch on.

## 17. PACKING AND STORAGE

### 17.1. 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.

### 17.1. Storage

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.

## 18. GUARANTEE AND RECLAMATION

The dispenser reliable operation and service life depend on its proper servicing and maintenance. This is why every individual who operates, checks or maintains the dispenser, should be acquainted with all principles of correct operation, safety, revisions, and maintenance, and with relevant regulations on handling liquefied gas. Particularly important it is necessary to keep the intervals of revisions and checks defined by the plan of maintenance.

Defects and deficiencies resulting from the incorrect or careless servicing, revision and maintenance of the dispenser and of its various functional units are not subject of guarantee and, therefore, the reclamations of this kind will be never admitted.

In the course of operation, the liquefied gas storage tanks have to be checked and water and other impurities have to be removed. In case the manufacturer - when making repairs covered by guarantee - finds out excessive amount of water or other impurities in the hydraulic system, he will refuse the reclamations by reason of concerning impurities, and the repair costs will be charged to the user.

**The reclamations cannot be admitted in the following cases:**

- Defects originated by a faulty project or faulty installation of the technological device.

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- Defects originated by a faulty heavy-current installation at the filling station, for instance switchboard installed incorrectly, faulty grounding system, faulty installation of cables - power cables together with communication ones.
- Defects originated by faulty light-current installation at the filling station, such as for instance:
  - Faulty installation of communication cables, mainly from the interference point of view
  - Missing UPS (ON LINE) - supply net
  - Standard voltages must be:  $U_n \pm 15\%$  with the 50 Hz frequency

The guarantee does not cover the consumables - for instance fluorescent lamps, filter.

**Guarantee and reclamations are defined on contract.**

**The fuel dispenser can be reclaimed only at the dealer, where the customer bought this dispenser.**

## 19. 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.

## 20. ACCESSORIES

Parts of the dispenser delivery:

- Transporting palette - it must be dismantled by the shaft before installation
- Set for fuel dispenser connection to the basic frame (screws, washers)
- Set of electric installation (plug ATEX, bushing ATEX)
- 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) - optional
- On the special order the basic frame

## 21. DOCUMENTATION DELIVERED

- User's manual
- EC Declaration of Conformity

- Service manual

## 22. ENCLOSURES

Enclosure No.	1	Main dimensions of dispensers V-line popular 899x.xxx/LPG
Encl. No.	2	Main dimensions of dispensers V-line minor 899x.xxx/LPG
Encl. No.	3	Min. distances of the dispenser from a steady obstacle located at the filling station.
Encl. No.	4	Installation dimensions of V-line 8991.xxx/LPG and V-line 8995.xxx/LPG dispensers
Encl. No.	5	Installation dimensions of V-line 8994.xxx/LPG dispensers
Encl. No.	6	Installation dimensions of V-line 8991.6x3/LPG, V-line 8991.6x4/LPG dispensers
Encl. No.	7	Areas with risk of gas pressure release or residual nitrogen at the separator used in the hydraulic circuit of V-line 899x.xxx/LPG dispensers
Encl. No.	8	Wiring and operating conditions of UPS for supplying the control system and the electronic part of V-line LPG series of dispensers
Encl. No.	9	Connection of the fuel dispenser V-line 8991.xxx/LPG, V-line 8993.xxx/LPG and V-line 8995.xxx/LPG to the filling station switchboard
Encl. No.	10	Connection of the fuel dispenser V-line 8992.xxx/LPG and V-line 8994.xxx/LPG to the filling station switchboard
Encl. No.	11	Connection of the fuel dispenser V-line 8991.xx3/LPG with ADP/L counter to the filling station switchboard
Encl. No.	12	Connection of the fuel dispenser V-line 8991.xx3/LPG with ADP/T counter to the filling station switchboard
Encl. No.	13	Connection of the fuel dispenser V-line 8991.6x4/LPG with mechanical counter to the filling station switchboard
Encl. No.	14	Connection of the fuel dispenser heating to the filling station switchboard (valid only for the fuel dispenser with electronic case heating)
Encl. No.	15	Type marking on the dispenser rating plate V-line 899x.xxx/LPG
Encl. No.	16	Type marking on the dispenser rating plate V-line 899x.xxx/LPG/CA
Encl. No.	17	EC DECLARATION OF CONFORMITY - FUEL DISPENSER TYPE SERIES V-line 899x.xxx/LPG

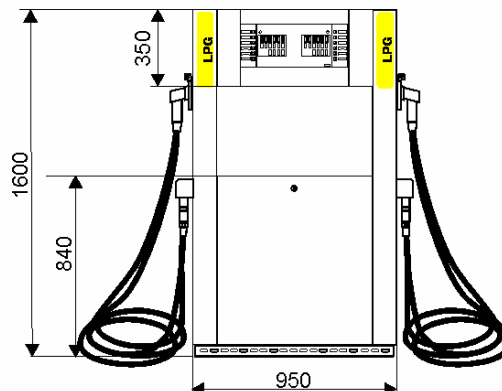
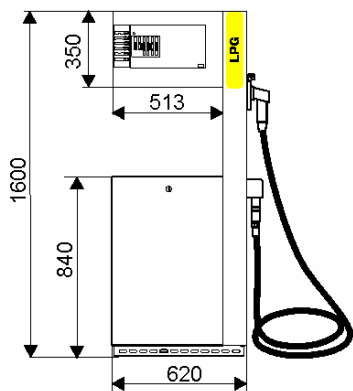
Adast Systems, a.s., Mírová 2, 679 04 ADAMOVI, Czech Republic

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

Main dimensions of dispensers V-line popular 899x.xxx/LPG

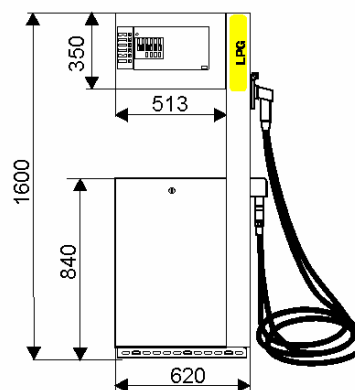
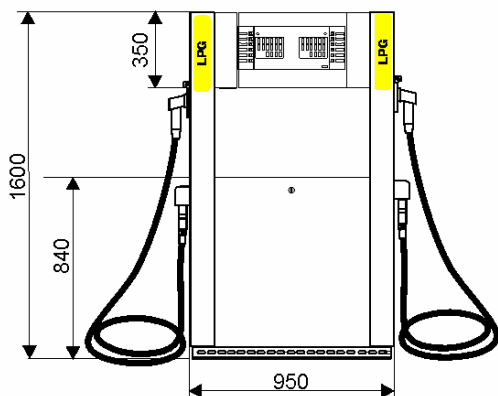
V - line 8991.6x2/LPG

V - line 8992.6x2/LPG



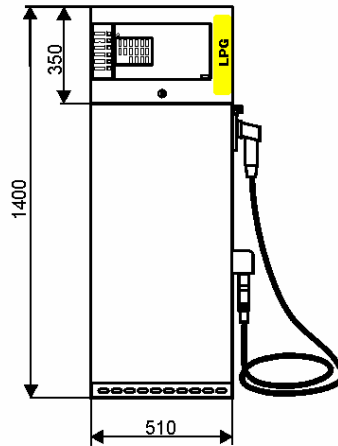
V - line 8993.6x2/LPG  
V - line 8994.6x2/LPG

V - line 8995.6x2/LPG

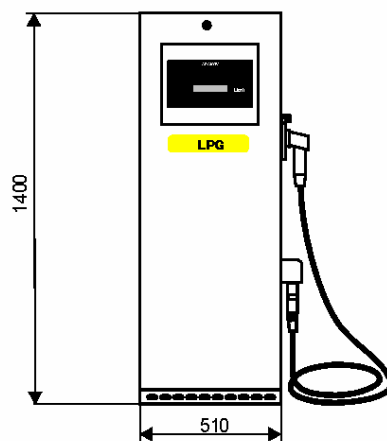


Main dimensions of dispensers V-line minor 899x.xxx/LPG

V - line 8991.6x3/LPG

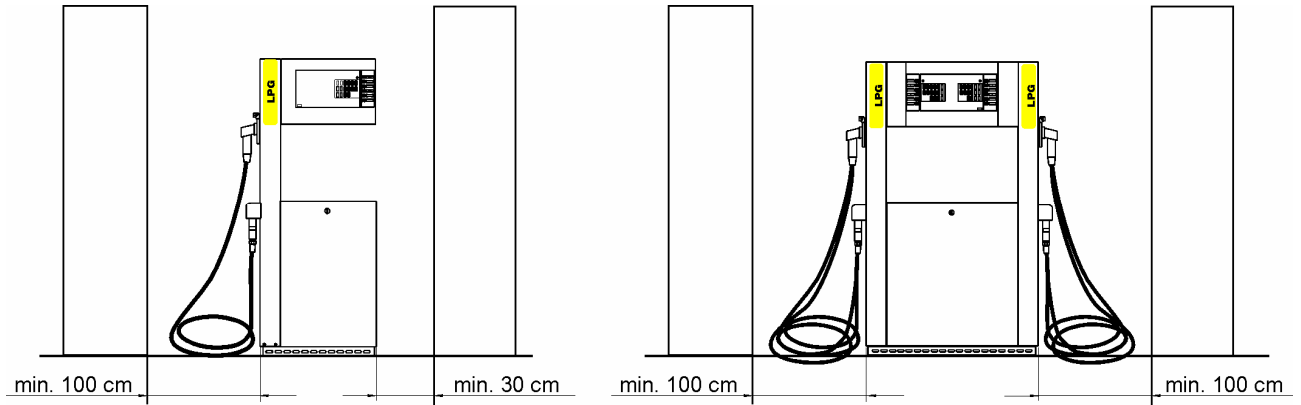


V - line 8991.6x4/LPG

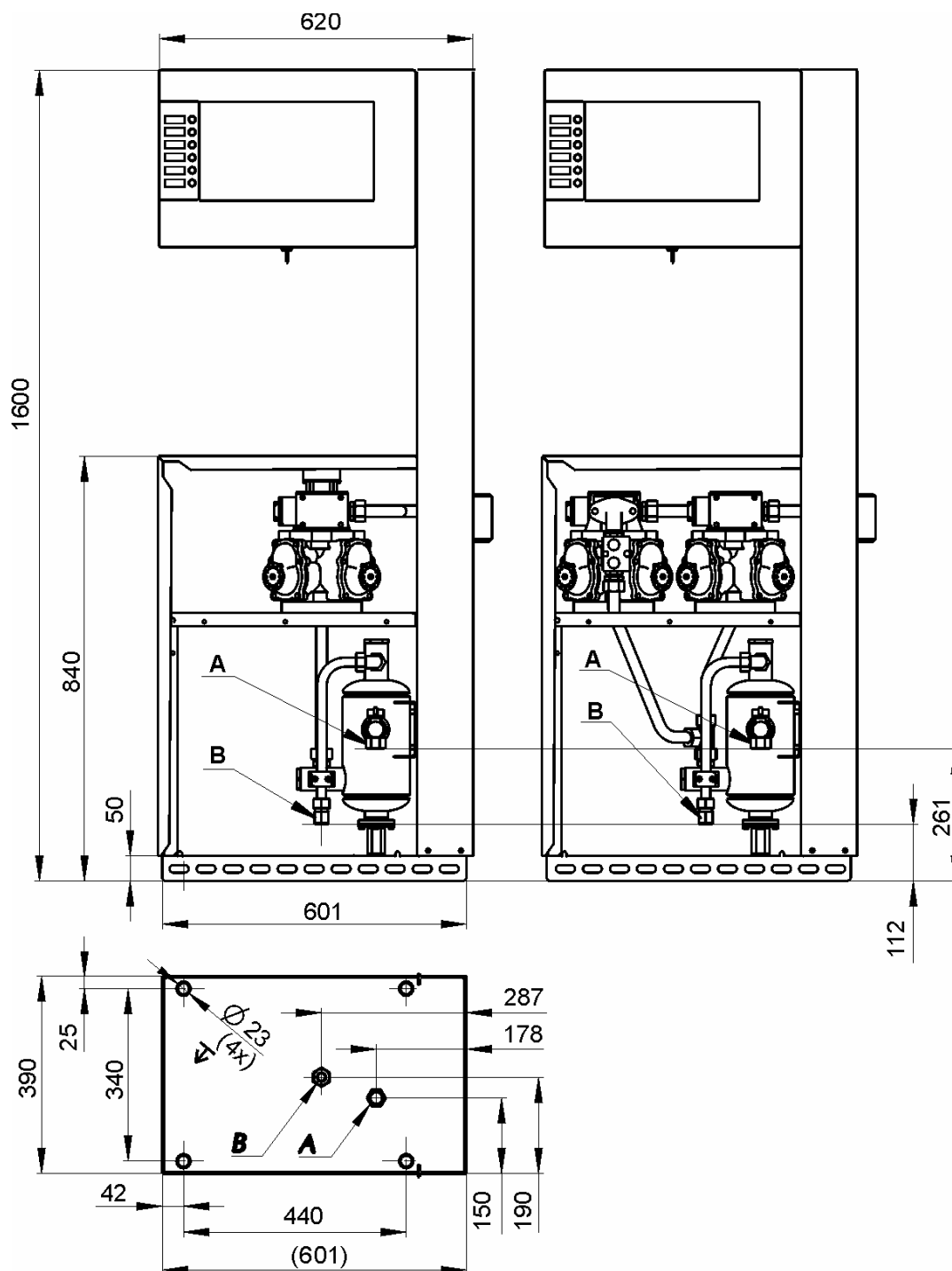


Width of all fuel dispensers is the same - 410 mm

**Min. distances of the dispenser from a steady obstacle located at the filling station**



### Installation dimensions of V-line 8991.xxx/LPG and V-line 8995.xxx/LPG dispensers



**LEGEND:**

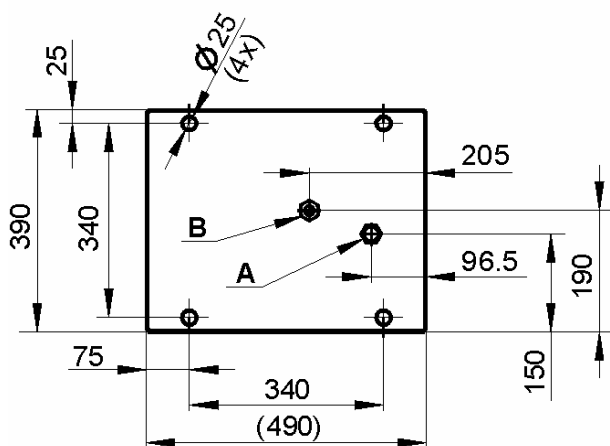
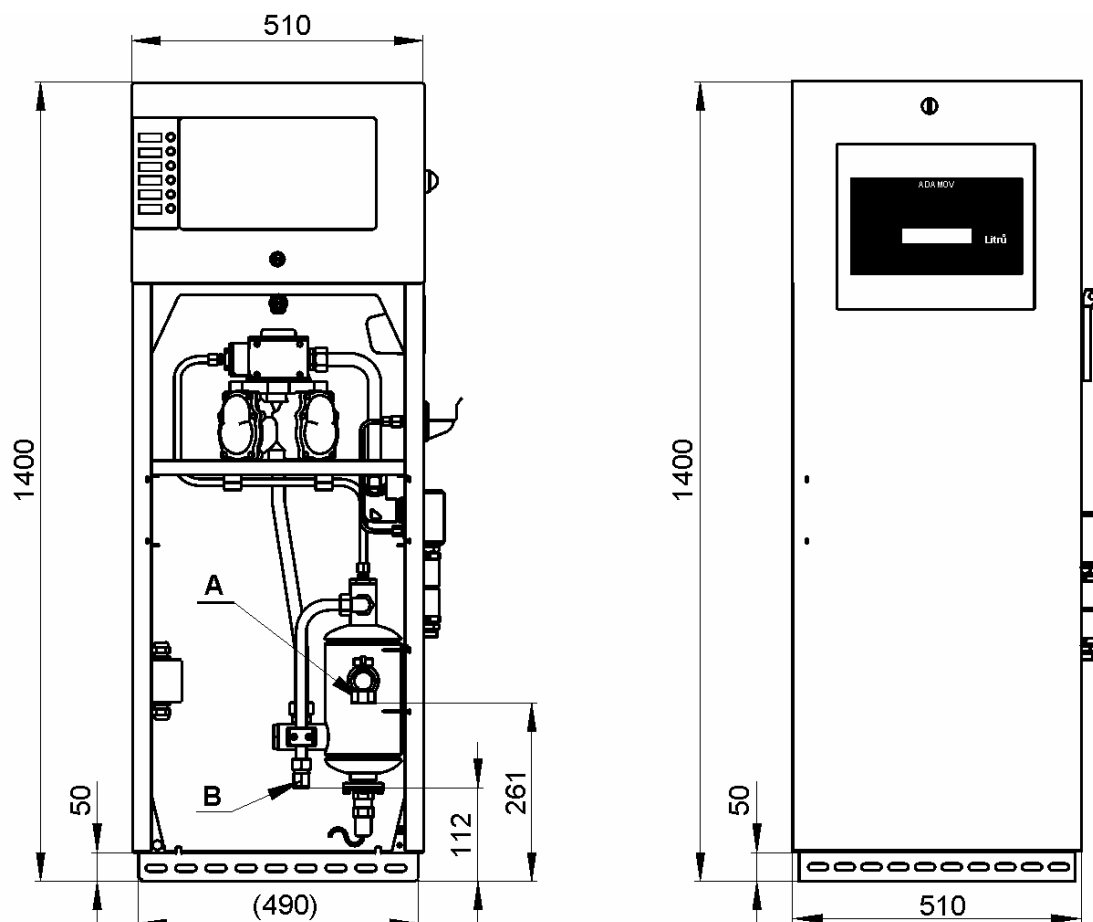
A - Feeding piping - inner thread ISO 228 G 3/4"

B - Return piping - inner thread ISO 228 G 1/2"

$\nabla$  - Anchor holes of the fuel dispenser



Installation dimensions of V-line 8991.6x3/LPG  
and V-line 8991.6x4/LPG dispensers



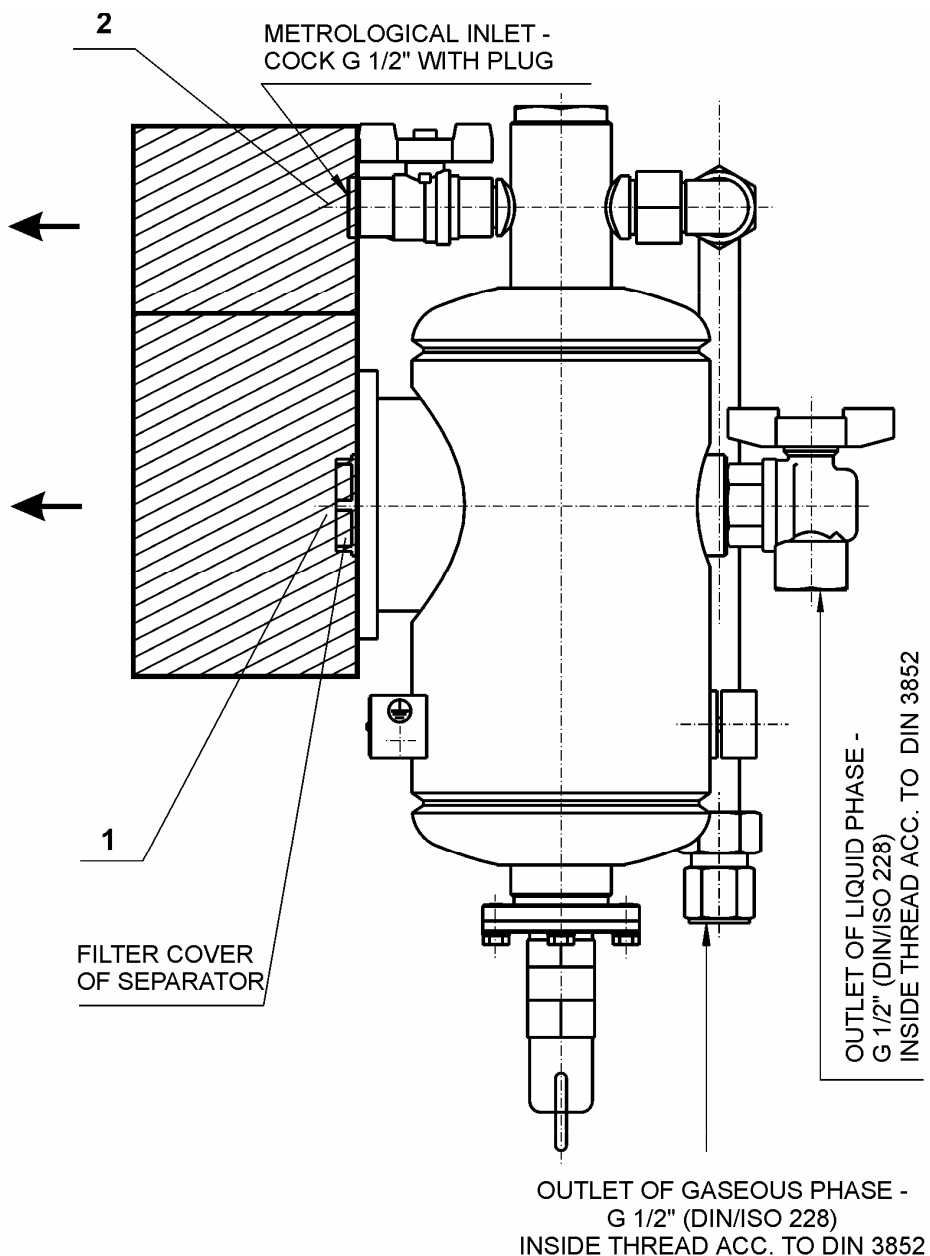
**LEGEND:**

A - Feeding piping - inner thread ISO 228 G 3/4"

B - Return piping - inner thread ISO 228 G 1/2"

∇ - Anchor holes of the fuel dispenser

**Areas with risk of gas pressure release or residual nitrogen at the separator used in the hydraulic circuit of V-line 899x.xxx/LPG dispensers**



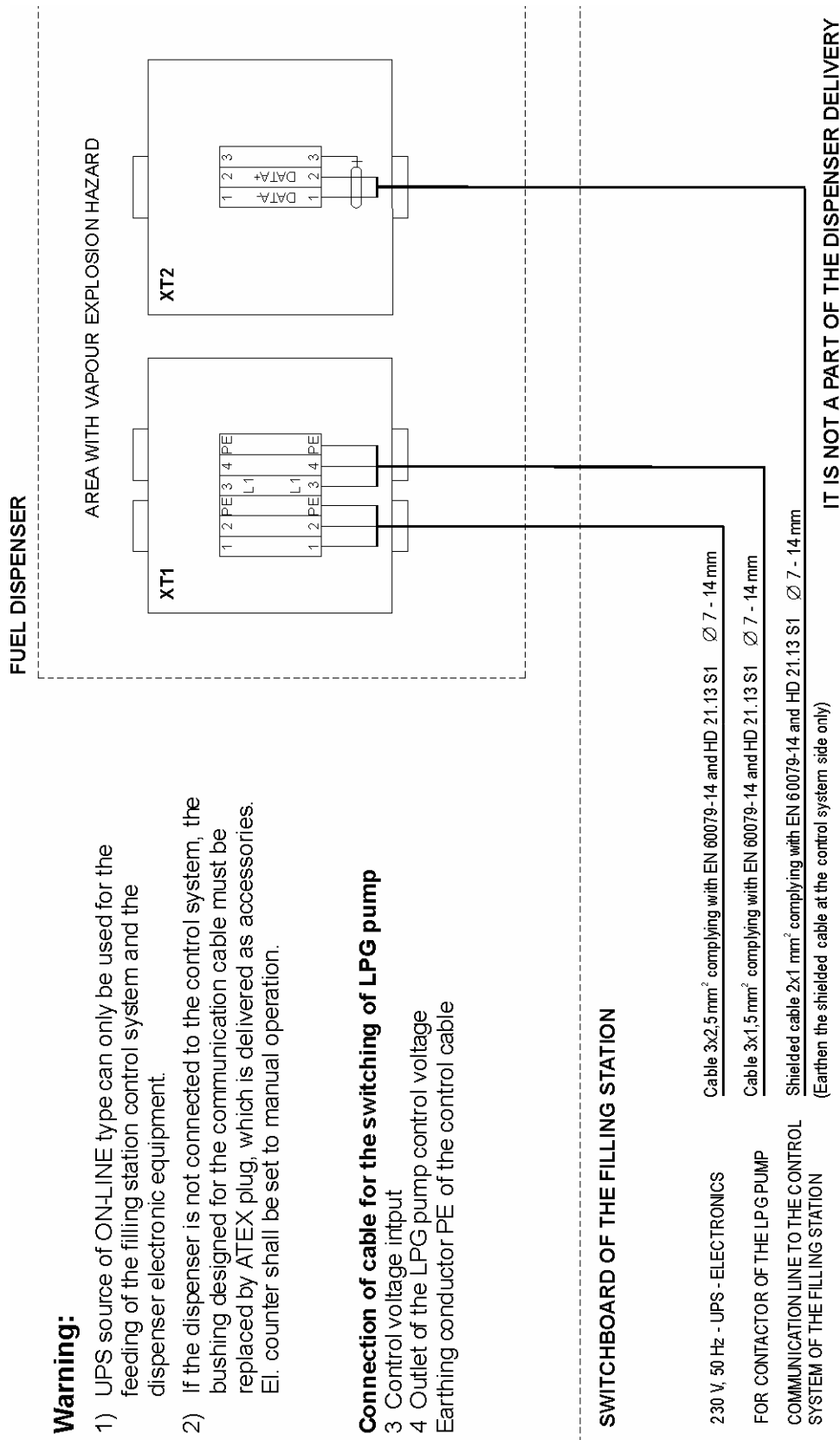
**1 Endangered area at filter change**

**2 Endangered area at nitrogen discharging from hydraulic system of the fuel dispenser**

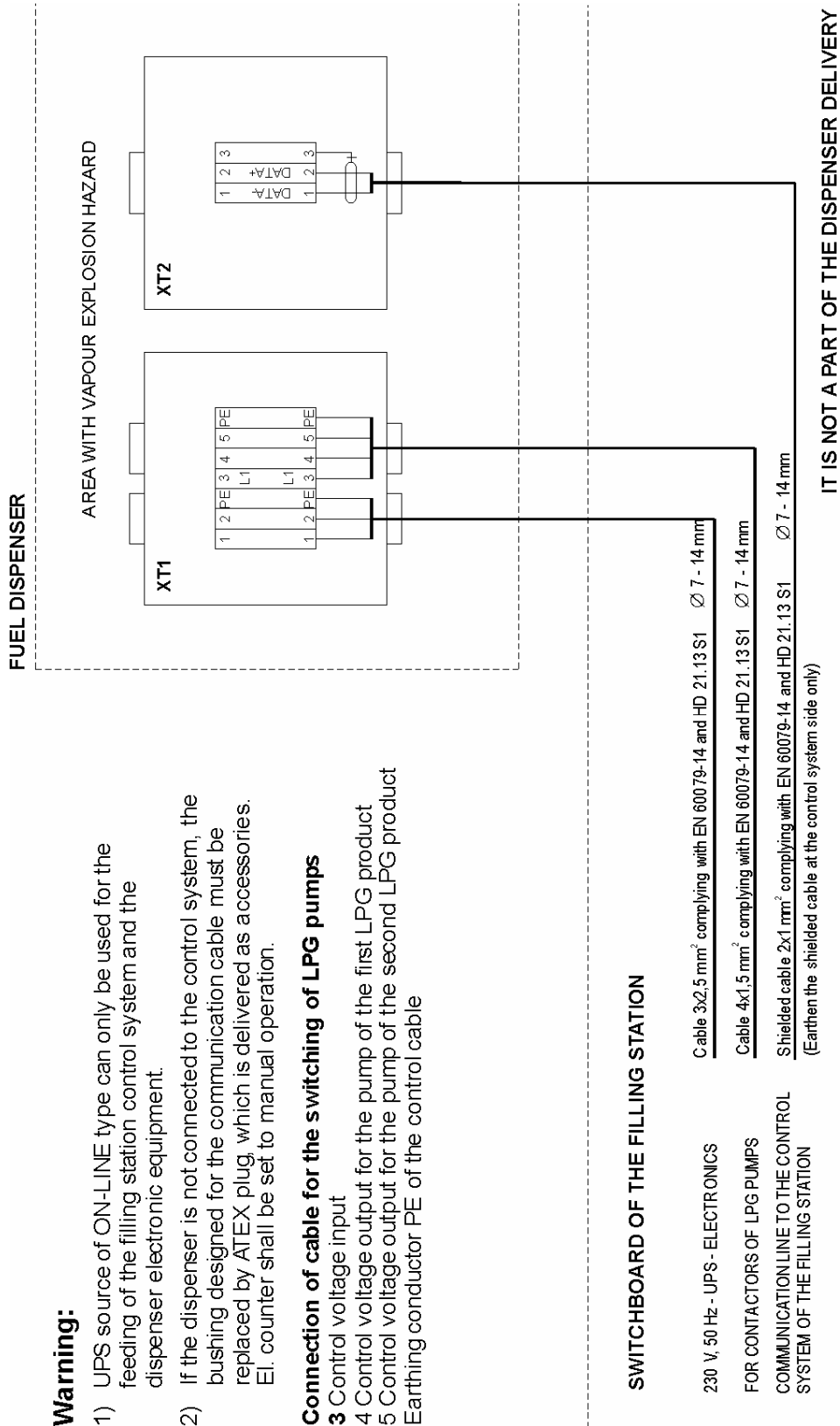
## Conditions of wiring and operation of UPS for feeding a control system and electronic part of V-line dispensers

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.

## Connection of the fuel dispenser V-line 8991.xxx/LPG, V-line 8993.xxx/LPG and V-line 8995.xxx/LPG to the filling station switchboard



## Connection of the fuel dispenser V-line 8992.xxx/LPG and V-line 8994.xxx/LPG to the filling station switchboard



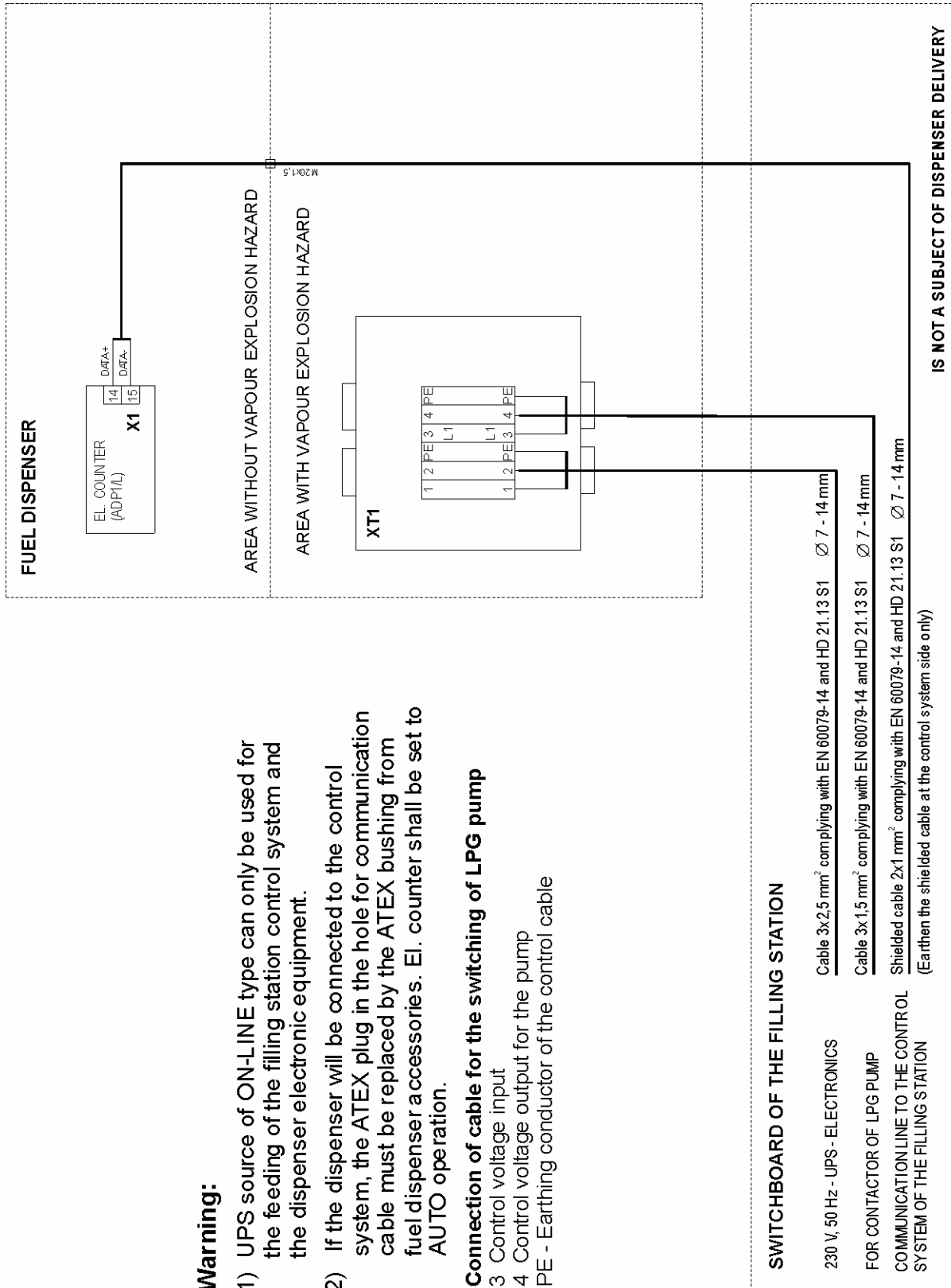
**Warning:**

- 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. EI counter shall be set to manual operation.

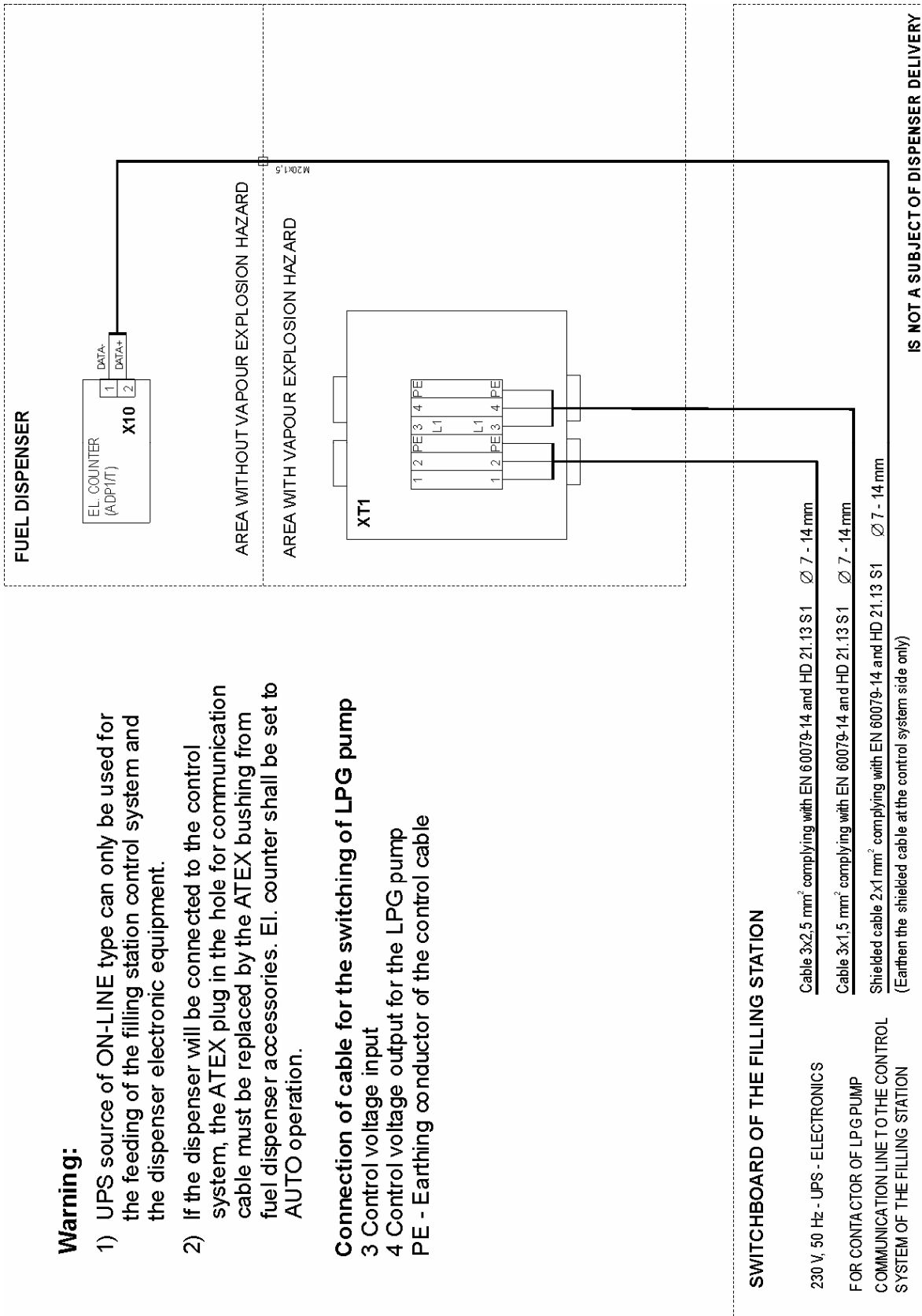
**Connection of cable for the switching of LPG pumps**

- 3 Control voltage input
  - 4 Control voltage output for the pump of the first LPG product
  - 5 Control voltage output for the pump of the second LPG product
- Earthing conductor PE of the control cable

## Connection of the fuel dispenser V-line 8991.xx3/LPG with ADP1/L counter to the filling station switchboard



## Connection of the fuel dispenser V-line 8991.xx3/LPG with ADP1/T counter to the filling station switchboard



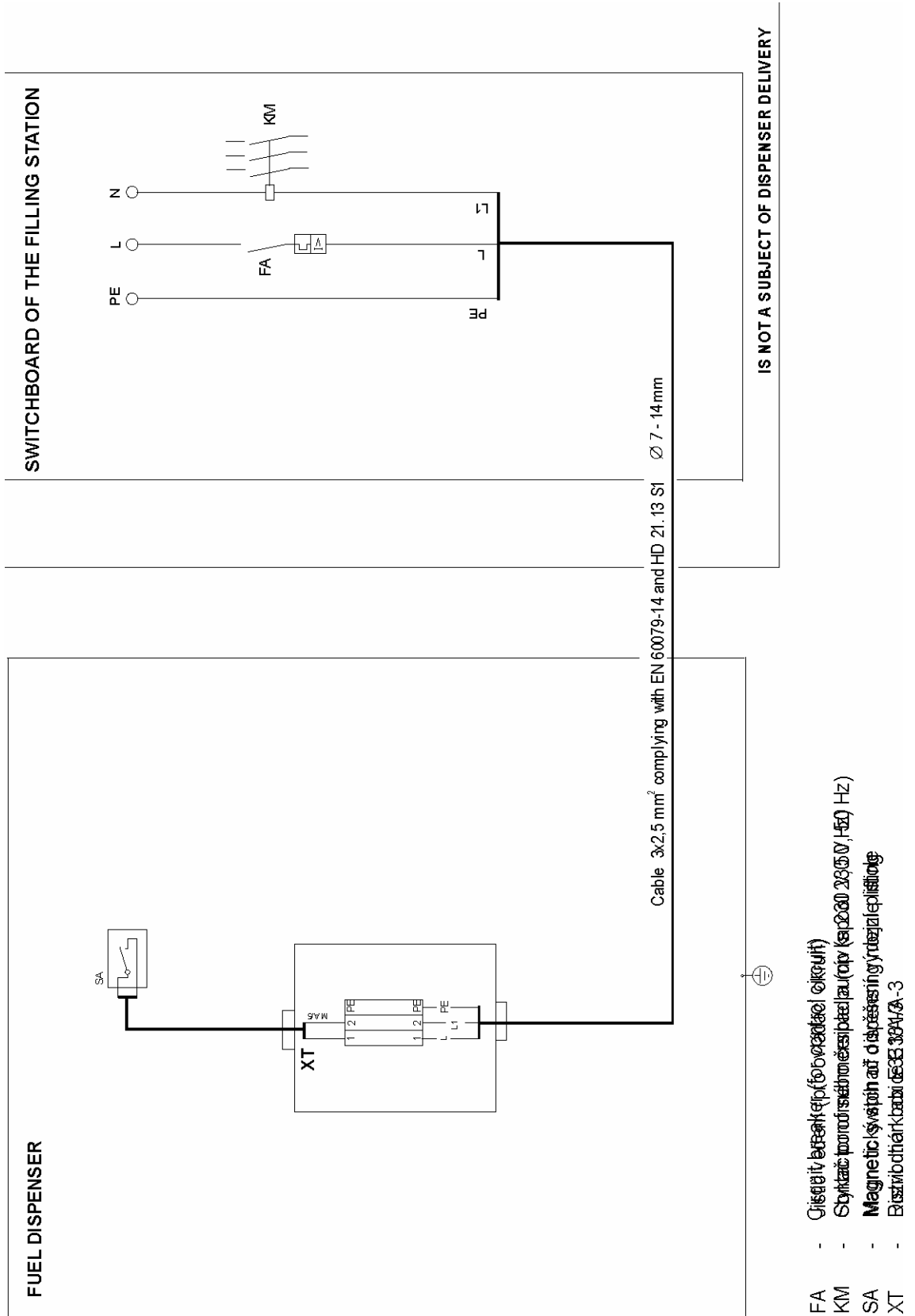
**Warning:**

- 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.

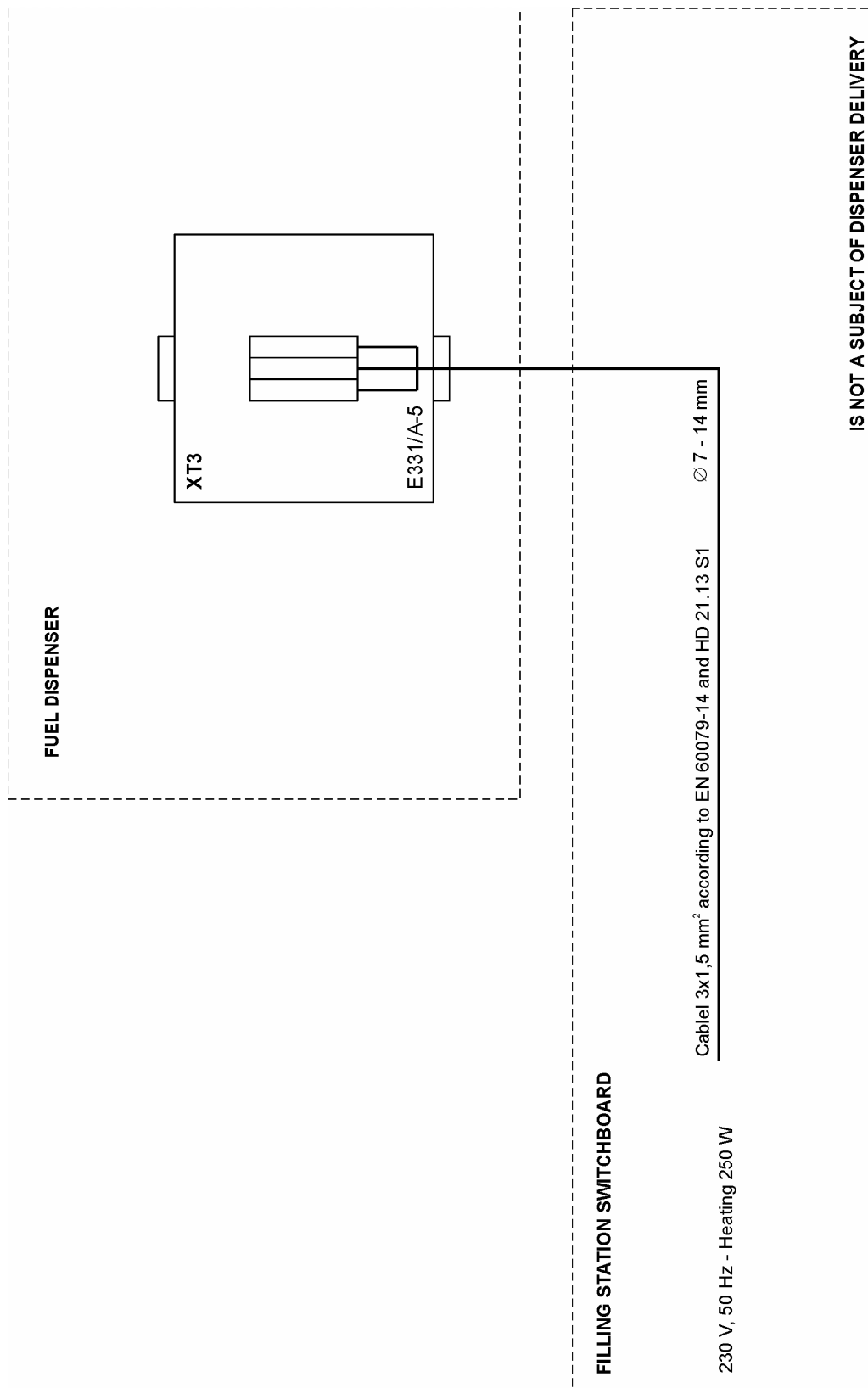
**Connection of cable for the switching of LPG pump**

- 3 Control voltage input
  - 4 Control voltage output for the LPG pump
- PE - Earthing conductor of the control cable

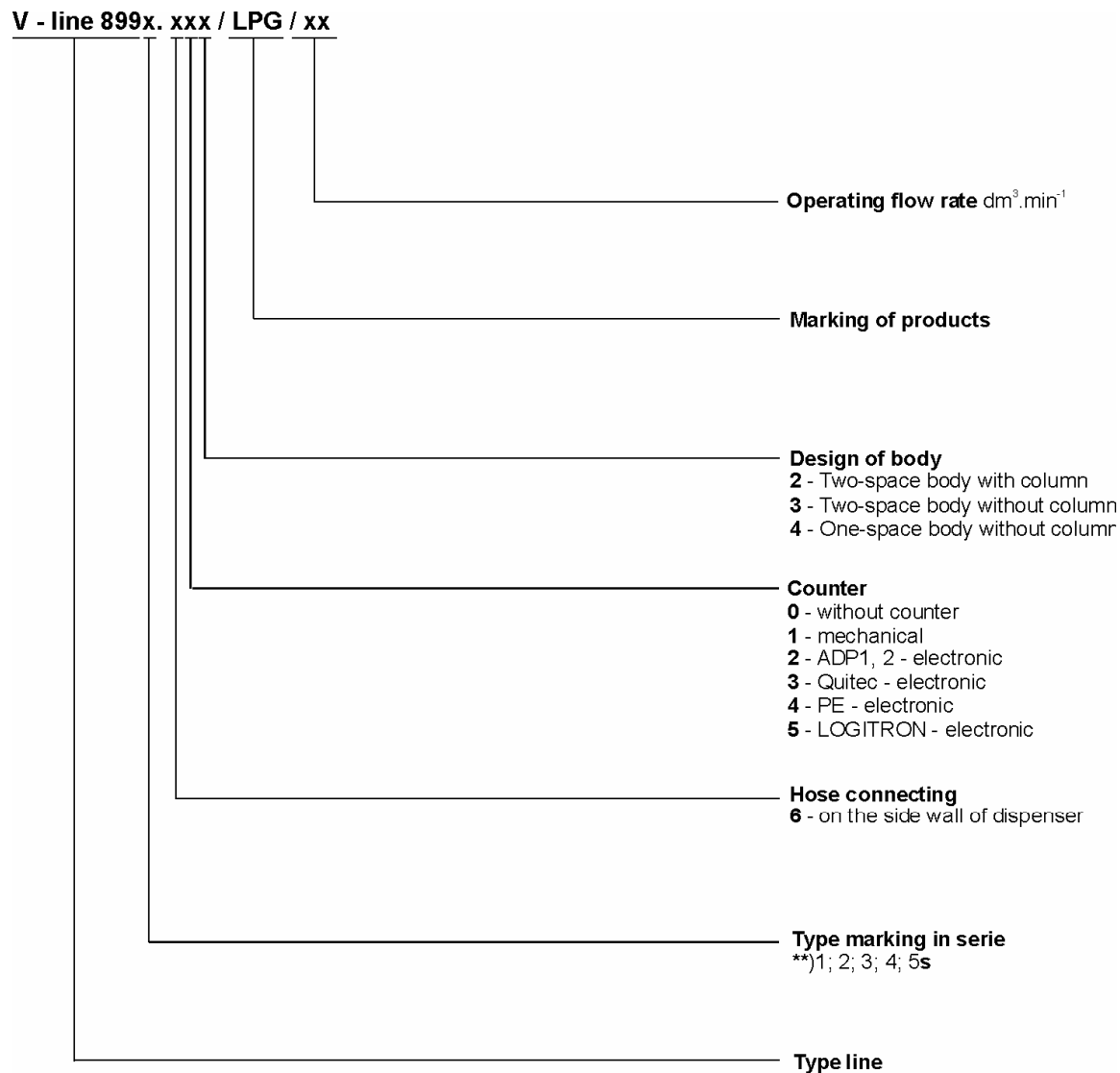
## Connection of the fuel dispenser V-line 8991.6x4/LPG with mechanical counter to the filling station switchboard



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



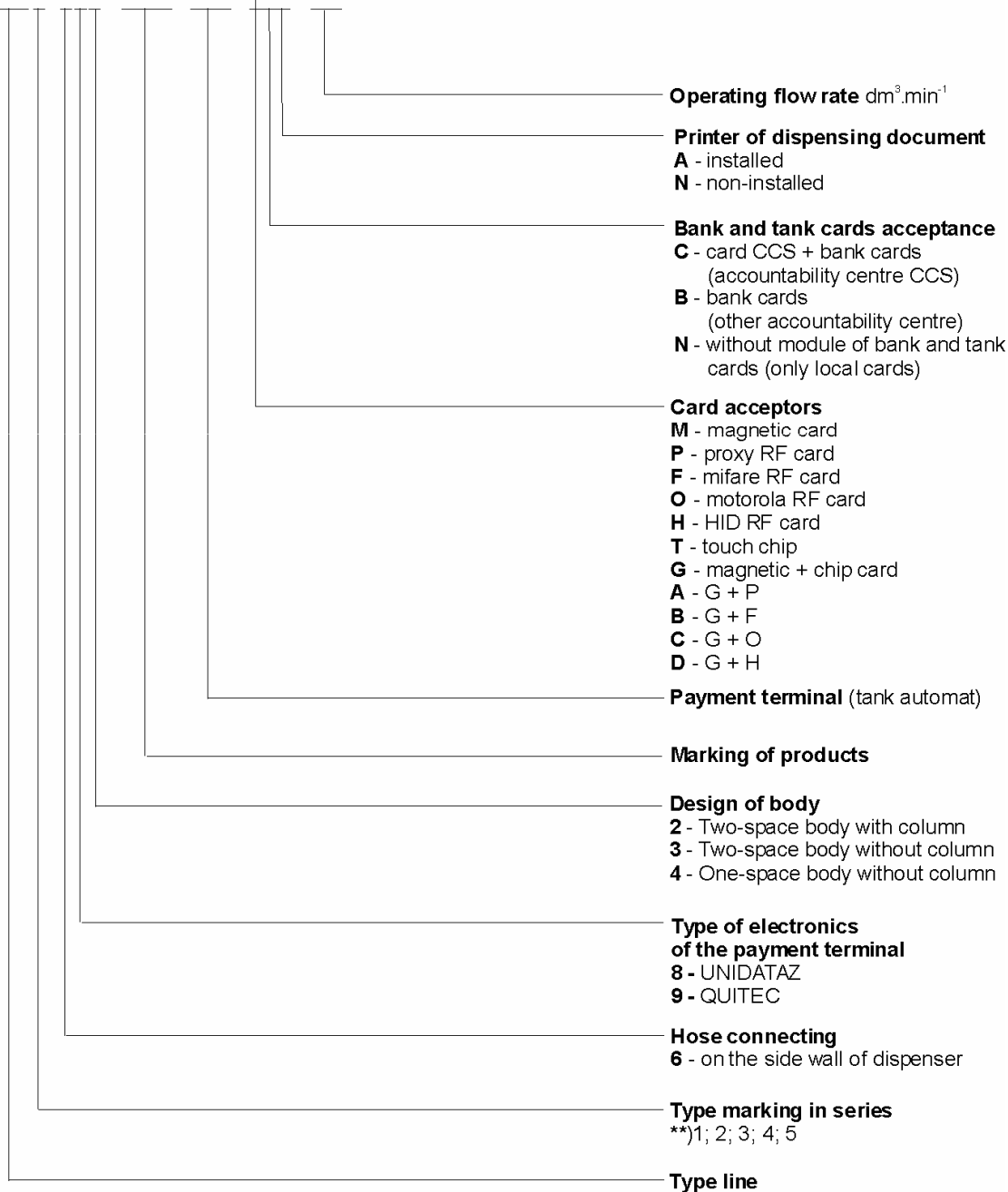
## Type marking on the dispenser rating plate - V-line 899x.xxx/LPG



- \*\*1 - MONO -  $Q = 40 \text{ dm}^3 \cdot \text{min}^{-1}$   
 2 - QUATTRO -  $Q = 4 \times 40 \text{ dm}^3 \cdot \text{min}^{-1}$   
 3 - DUO (in DUPLEX body) -  $Q = 2 \times 40 \text{ dm}^3 \cdot \text{min}^{-1}$   
 4 - DUPLEX -  $Q = 40 + 40 \text{ dm}^3 \cdot \text{min}^{-1}$   
 5 - DUO (in MONO body) -  $Q = 2 \times 40 \text{ dm}^3 \cdot \text{min}^{-1}$

## Type marking on the dispenser rating plate - V-line 899x.xxx/LPG/CA

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



\*\*  
 1 - MONO -  $Q = 40 \text{ dm}^3.\text{min}^{-1}$   
 2 - QUATTRO -  $Q = 4 \times 40 \text{ dm}^3.\text{min}^{-1}$   
 3 - DUO (in DUPLEX body) -  $Q = 2 \times 40 \text{ dm}^3.\text{min}^{-1}$   
 4 - DUPLEX -  $Q = 40 + 40 \text{ dm}^3.\text{min}^{-1}$   
 5 - DUO (in MONO body) -  $Q = 2 \times 40 \text{ dm}^3.\text{min}^{-1}$



**EC DECLARATION OF CONFORMITY**



Manufacturer: ADAMOV – SYSTEMS, a.s.

Address: Mírová 2, 679 04 Adamov  
Czech Republic

Name of product: **LPG DISPENSER TYPE SERIES V-line 899x.xxx/LPG**

Description of product: LPG dispensers, type series V-line 899x.xxx/LPG, are intended for dispensing of liquid hydrocarbon gases and their mixtures – propane-butane (LPG).

We declare on our exclusive responsibility that the product is, subjected to the conditions of correct installation, standard and given application and maintenance, safe for the specified purpose; measures have been taken to ensure compliance with requirements of Directives of the European parliament and the Council:

CE 1026	CE M 07 1383
Directive 94/9/EC of the European parliament and the Council Directive 98/37/EC of the European parliament and the Council Directive 2006/95/EC of the European parliament and the Council	Directive 2004/22/EC of the European parliament and the Council Directive 89/336/EEC of the Council

Compliance assessment was made in cooperation with Notified body:

CE 1026	CE M 07 1383
Physical Technical Testing Institute Pikartská 7, 716 07 Ostrava – Radvanice Notified body No. 1026	Český metrologický institut Okružní 31, 638 00 Brno Notified body No. 1383
EC-Type Examination Certificate: FTZÚ 06 ATEX 0222	EC-Type Examination Certificate: TCM 141/07 - 4506

The product is in conformity with following standards conformable with provisions of 94/9/EC, 98/37/EC, 89/336/EEC, 2006/95/EC, 2004/22/EC Directives:

Directive 94/9/EC, 98/37/EC	Directive 89/336/EEC, 2006/95/EC	Directive 2004/22/EC
EN 14678-1	EN 55011 OIML R 117 Edition 1995 (E) EN 55022 OIML R 118 Edition 1995 (E) EN 61326-1 OIML D 11 Edition 2004 (E) EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-11 EN 61010-1	OIML R 117 Edition 1995 (E) OIML D 11 Edition 2004 (E)

Name and signature of the authorised representative of the manufacturer:

Name: Ing. Jiří Štoudek  
Position: Supervisor of EC Conformity  
assessment station

Ing. David Kotajný  
Managing Director

Signature:

Date: 23 March 2007