TATSUNO EUROPE a.s.

LPG DISPENSERS

TATSUNO EUROPE

Quick User Guide

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Created by:	Ing. Milan Berka
TATSUNO EUROPE a.s., Pražská 2325/68, 678 01 Blansko, Czech Republic, tel.+420 516 428411, http://www.tatsuno-europe.com	

© TATSUNO EUROPE a.s.
Pražská 2325/68 • 67801 Blansko
Czech Republic
Tel.: +420 516428411 • Fax: +420 516428410
e-mail: info@tatsuno-europe.com, http://www. tatsuno-europe.com

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INTRODUCTION

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

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

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

Document revisions

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Revision 00 / 6. 4. 2018	Basic version of the document	Milan Berka

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

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

1. TATSUNO EUROPE FUEL DISPENSERS

1.1. DESCRIPTION OF DISPENSERS

All TATSUNO EUROPE dispensers are equipped with high quality Japanese hydraulics from TATSUNO Corporation (hereinafter referred to as TATSUNO) and a powerful reliable electronic counter of the Czech company TATSUNO EUROPE (hereinafter referred to as TE). All dispensers work in the manual mode – independently, offline – as well as the automated mode, when they are controlled remotely from the kiosk of a fuel station and connected to the cash register (POS) via a data line. All dispensers have body parts (covers, doors, lids, etc.) made of steel painted sheet metal or stainless-steel sheet metal. Supporting parts of dispenser frames are made of steel painted sheet metal of a thickness 0.8 to 2.5 mm, or stainless-steel sheet metal. Each dispenser is equipped with an electronic counter with its own diagnostics and displays showing the delivered amount of money in the currency of the country of installation, the amount of fuel in litres or kilograms and the fuel unit price. Displays of the fuel dispensers specified for private use display only the dispensed fuel volume in litres. The standard colour of TATSUNO EUROPE dispensers is white (RAL9016), silver (RAL 9006) and black (RAL9005).

LPG dispensers and modules are equipped with TATSUNO hydraulics with high reliability and long service life. The two-channel TATSUNO pulse generator is mounted on a piston meter or it is its integral part. The measuring unit consists of a piston meter, a filter, a separator, a liquid phase check valve, and a gaseous phase safety valve. The safety valve is adjusted to a pressure of 1.8 MPa and prevents the maximum operating pressure from being exceeded by discharging the liquid phase back into the storage tank. An electronic differential pressure sensor (formerly TATSUNO differential valve) is mounted at the output of the meter to check the pressure difference between the liquid medium and its gaseous phase. In case of insufficient pressure difference (<1 bar), the pumping of the medium is terminated to avoid inaccurate measurement due to the presence of the gaseous phase in the meter. The pumped medium (LPG) is supplied by a pump located outside the dispenser space, flows through the inlet safety solenoid valve (if installed) then through the G¾" shut-off ball valve through the particulate filter 25µm into the separator. If the liquid contains the gaseous components, these are separated and returned to the storage tank from the top of the separator by a return pipeline which must be opened (ball valve at the inlet G ½") if the dispensing module is in operation. Reverse piping inside diameter must be at least DN 16. From the separator, the liquid flows through the check valve to the piston meter and flows through the solenoid valve controlling the flow of the medium (if installed), the sight hole and the breakaway coupling into the delivery hose and through the delivery nozzle it is transported to the vehicle storage tank. The filling pressure can be monitored on a manometer located under the delivery nozzle hanger.

1.2. BASIC TECHNICAL PARAMETERS

Table 1 - LPG (liquefied propane butane) dispensers and modules

Maximum flow rate Q_{max} [L/min]	30 to 50			
Minimum flow rate Q_{min} [L/min]	5			
Lowest metering MMQ [L]	5			
Maximum pressure [MPa]	1.8			
Minimum pressure [MPa]	0.7			
Maximum unit price (number of digits)	9999(4)			
Maximum amount to pay (number of digits)	999999(6)			
Scale interval [L]	0.01			
Display type	Electronic			
Type of delivered fluid	LPG (liquefied propane-butane)			
Filtration of mechanical particles	Input filter >25µm			
Fluid temperature range [°C]	-20 to +50			
Ambient temperature range [°C]	-20 to +50 (standard dispenser version); -40 to +55 (special dispenser version with heating)			
Accuracy class	1.0			
Mechanical class	M1, M2 for counters PDEX5 and TBELTx			
Electromagnetic class	E1, E2 for the counter PDEX5			
Humidity	Condensing			
Location	Open			
Measured unit	Volume [L] or volume at 15 °C [L]			
Electronic counter	TBELTx	PDEX	TBELTM	PDEX5
Program version (W&M check sum)	1.01 (8CA4)	1.03 (20260)	1.01 (4092)	1.01 (4573)
Calculator powering	230V ± 10%; 50Hz; max. 300VA			
Electro-magnetic valves	Proportional or two-state; + 24VDC / max.1A			

1.3. DISPENSER PARTS MARKING CONVENTIONS

Figure 1 illustrates the TATSUNO EUROPE dispenser marking and sorting system. In dispensers where it is not clear if the left or right side of the dispenser concerns (SUNNY EX EURO and SHARK ECONOMY), the location of the nameplate which is always closest to product No. 1 and nozzle No. 1 (1A) is decisive. In the case of a double-sided dispenser, the right side of the dispenser is also referred to as side A and the left side is referred to as side B. For a one-sided left or one-sided right dispenser, it is always only side A.

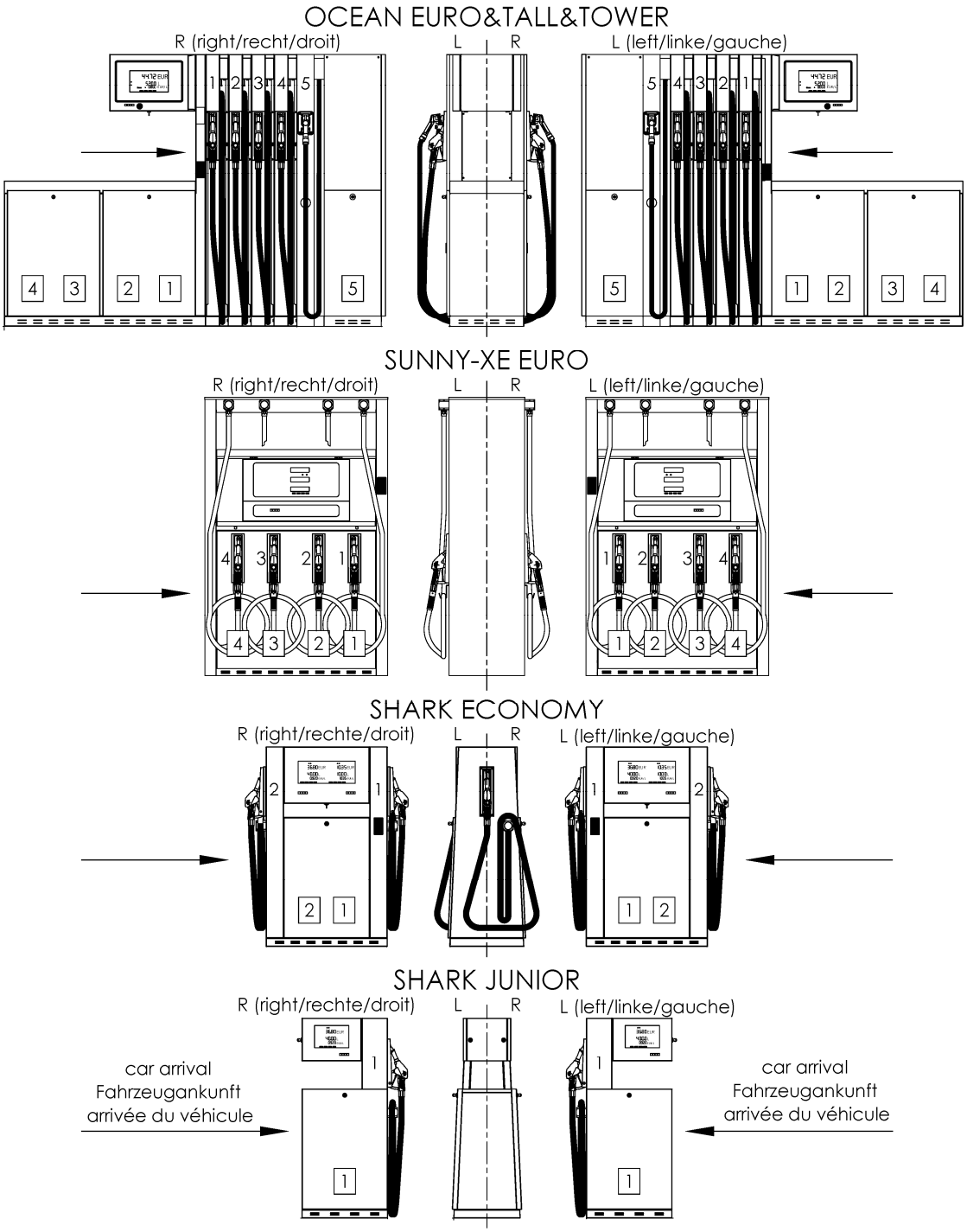


Figure 1 - Dispenser marking system with the recommended arrival direction

2. DISPENSER SETTING AND BASIC FUNCTIONS

Dispenser setting is performed by the set of setting parameters via witch it is possible to control functional parameters of the dispenser, totally change the mode and behaviour of the dispenser in different situations. Depending on the type of an electronic counter installed the parameter values can be viewed and changed using the remote IR (infrared) controller, the service keypad, or the preset keypad buttons located on the dispenser.

2.1. DISPENSER COUNTER

The basic dispenser control unit is an electronic counter that is stored with the displaying units inside the lockable counter cabinet in a non-explosive zone. Various types of counters can be used in dispensers depending on the dispenser type and the pumped medium. Table 2 describes the basic parameters of all electronic counters used in TATSUNO EUROPE dispensers.

Table 2 - Types of TATSUNO EUROPE electronic counters

Counter type	PDEX	TBELTX	TBELTM	PDEX5
Year/month of first installation	06/2008	06/2010	01/2016	5/2018
Use	all types of dispensers	all types of dispensers without temperature compensation and without the “Slave” display	dispensers with a mass meter (CNG and LPG)	all types of dispensers
OIML verification	R117	R117	R117, R139	R117
MID Evaluation certificate	no	no	yes	yes
Software Validation (WELMEC 7.2)	yes	yes	yes	yes
Method of parameter setting	Remote controller PDERT-XS, service PDERT-XO, manager	External keyboard or preset keypad	Remote controller PDERT-XS, service PDERT-XO, manager	Remote controller PDERT-XS, service PDERT-XO, manager
View program version + CRC	after powering on or in parameter P05-1 (version) P05-2 (CRC)	after powering on or in parameter P51 (CRC) P53 (version)	after powering on or in parameter P05-1 (version) P05-2 (CRC)	after powering on or in parameter M0-P05-1 (version) M0-P05-2 (CRC)
Protection of metrological parameters	by a password + switch	by a switch	by a password + switch	by a password + switch
Communication protocol type	PDE (RS485)	PDE (RS485)	PDE (RS485)	PDE (RS485)

The method of setting the dispenser differs depending on the counter used in the dispenser head. The following section describes the basic functions and settings for all counters.

2.2. PDEX COUNTER

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

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

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

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

2.2.1. DESCRIPTION OF PDERT-5O REMOTE CONTROLLER

The keyboard of the PDERT-5O remote manager`s controller is described on Figure 3. While using the remote controller it is necessary to move the remote controller closer to the distance of approx. 1 meter from the centre of the dispenser display, see Figure 2.

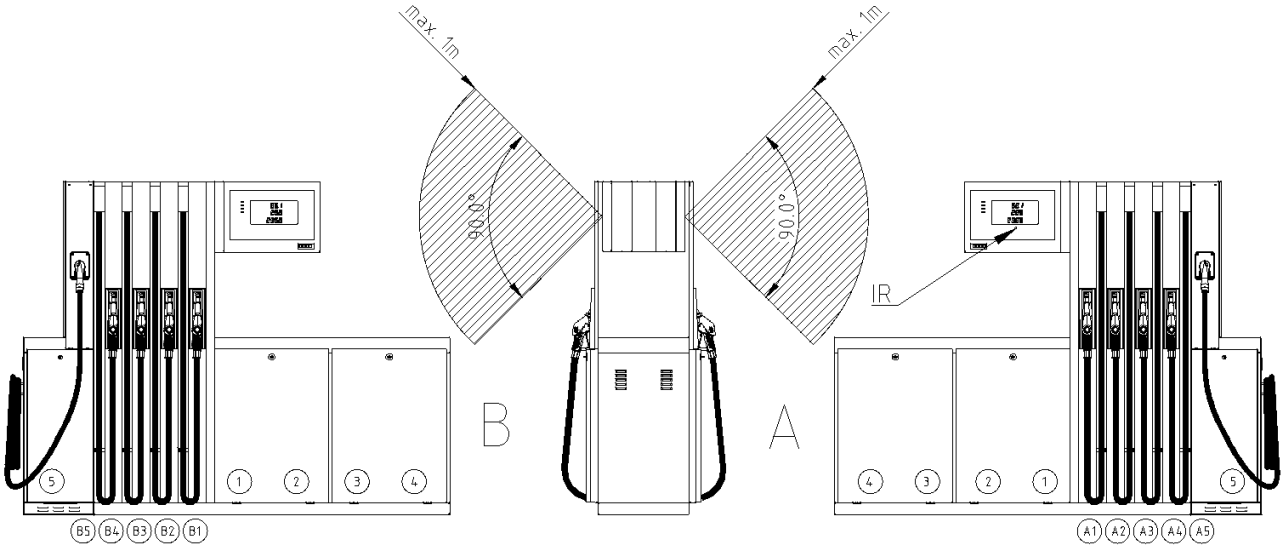


Figure 2 – Range of operation of the remote controller and marking of hoses and dispenser products

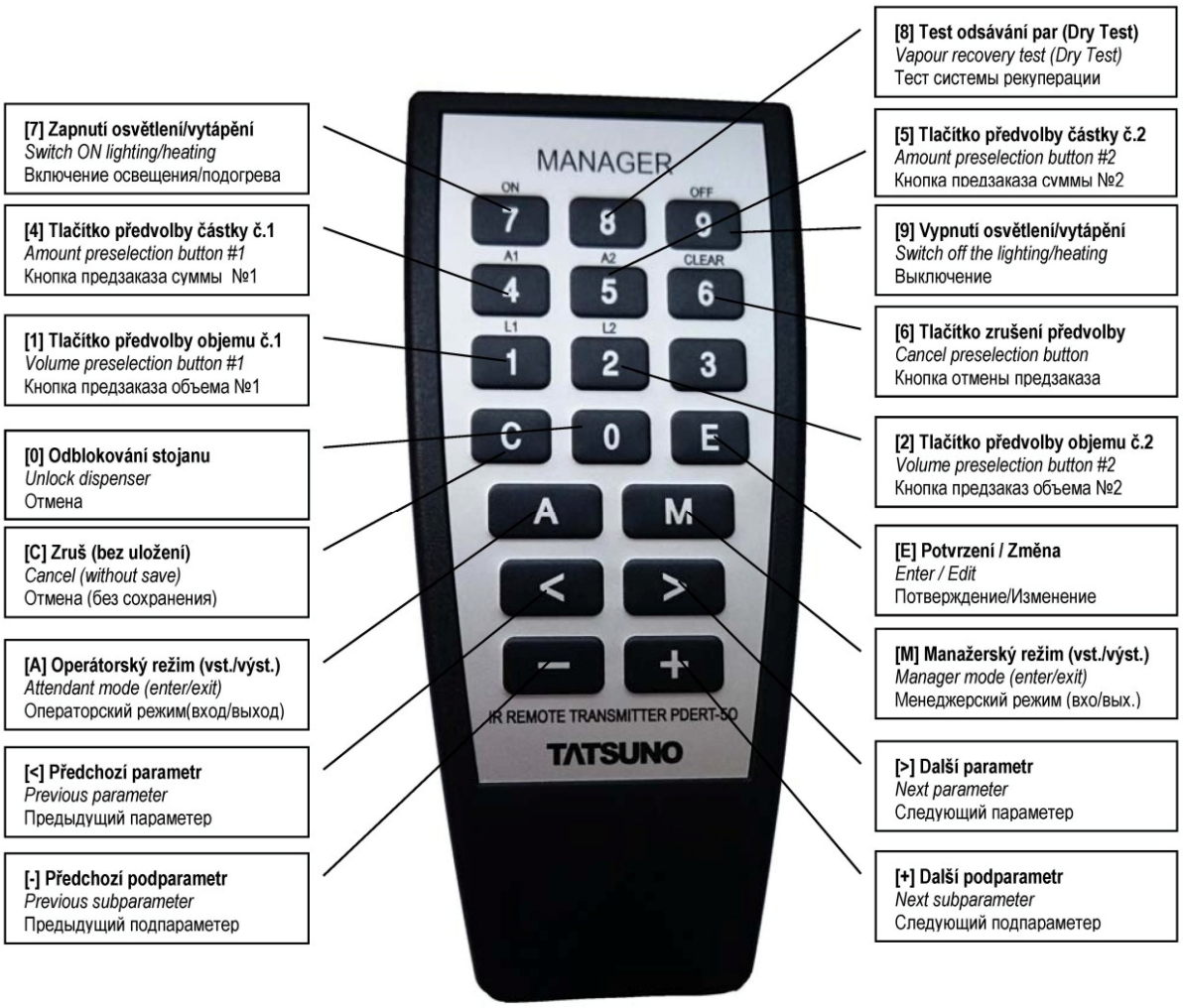


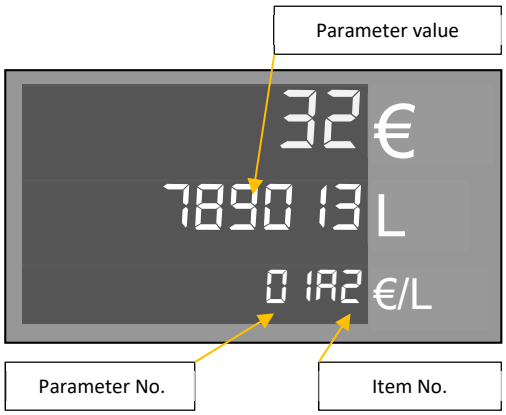
Figure 3 – Description of keys of the PDERT-5O remote controller PDERT-5O

The manager mode is started by pressing the <M> button, the operator mode by the <A> button. The set and read values are displayed on the display. During the reading of the electronic totalizers, the convention of marking the parts of the dispenser applies which is described in Figure 2. In addition to setting and reading parameter values of the electronic counter of the dispenser, the remote controller can also be used for the following operating functions:

- **Pre-selection of the delivered amount/volume.** Keys <A1>, <A2>, <L1>, <L2> and <CLEAR> can be used just like the preset keypad to set the volume/amount pre-selection on the dispenser.
- **Unlocking the dispenser after delivery.** If the dispenser is in the manual mode with the blocking after delivery, you can unlock the dispenser with the <0> key, or only one side with the <C> key.
- **Unlocking the dispenser after an error.** When the dispenser is in the manual mode and an error occurs on the dispenser, the error status can be cancelled by pressing the <0> key or by lifting and hanging the nozzle.

2.2.2. DISPLAYING DATA IN THE SETTING MODE

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



No. of parameter: 01
Item No.: 2 (dispensing hose order)
Auxiliary code: A (dispenser side)
Parameter value: 32789013 (volume in centilitres)

2.2.3. OPERATOR MODE PDEX

The operator mode of the PDEX counter is started by pointing the manager`s remote controller on the dispenser display from the distance of approx. 1 m from the dispenser display centre and by pressing the <**A**> button. **All delivery nozzles on the dispenser must be hung in advance and the sale on the dispenser must be finished (paid).** After calling up the Attendant mode the value of the first parameter is displayed. Parameters and their items may be switched by using the <**>**> and <**+**> keys (see Figure 3). The operator mode allows to view **but not change** the values of all parameters listed below, see Table 3.

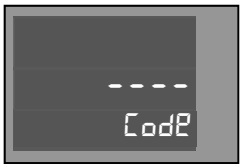
Table 3 - List of parameters of the operator access mode of the PDEX counter

Parameter	Description
01	Non-resettable volume totalizers
02	Daily volume and financial totalizers (resettable)
03	Product unit prices (in manual mode)
04	Current time and date
05	Program version and check sums
06	Error message history
07	Latest delivery history

Individual parameters will be described further. The operator mode is finished by pressing **<R>** or **<A>** keys. The mode is finished automatically if no remote controller button is pressed for 60 seconds.

2.2.4. MANAGER MODE OF THE PDEX

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



Example: Gradually press <**M**><**1**><**1**><**1**><**1**> and <**ENT**> keys.

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

After entering the valid access password the display shows the value of the first parameter 01. Now it is possible to browse parameters by using the <>> key or by entering the **number of searched parameter** and confirm with the <**ENT**> key to go directly to the desired parameter. The Manager mode allows to view and change the values of parameters listed below, see

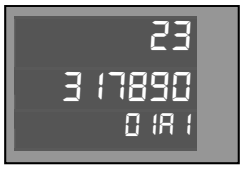


Table 4.

Table 4 - List of parameters of the manager mode of the PDEX counter

Parameter	Description
01	Non-resettable volume totalizers
02	Daily volume and financial totalizers (resettable)
03	Product unit prices (in manual mode)
04	Current time and date
05	Program version and check sums
06	Error message history
07	Latest delivery history
08	Access password for the Manager mode
09	Maintenance history
10, 11	- unoccupied -
12	Dispenser control mode
13	Defects statistics
14	Current operating temperature
15	Resetting daily totalizers
16	Operating control number
17	Intensity of the display backlight
18, 19	- not used

The manager mode is finished by pressing **<R>** or **<A>** keys. The mode is also finished automatically if no remote controller button is pressed for 60 seconds.

2.2.5. NON-RESETTABLE VOLUME TOTALIZERS (CODE 01)

Electronic totalizers for all delivery hoses (nozzles) are saved in the memory of the electronic counter. These totalizers are ***non-resettable*** and state what total volume was delivered by individual delivery hoses.

Table 5 - Description of values of P01 parameter

Parameter	Meaning
011A	volume of fuel pumped by hose 1 on side A in centilitres (x 0.01L)
012A	volume of fuel pumped by hose 2 on side A in centilitres (x 0.01L)
…	…
015A	volume of fuel pumped by hose 5 on side A in centilitres (x 0.01L)
011B	volume of fuel pumped by hose 1 on side B in centilitres (x 0.01L)
012B	volume of fuel pumped by hose 2 on side B in centilitres (x 0.01L)
…	…

Parameter	Meaning
015B	volume of fuel pumped by hose 5 on side B in centilitres (x 0.01L)

NOTE *Number of totalizers of delivery hoses shown in the P01 parameter is conditioned by the configuration of the dispenser. The identification system of delivery hoses and products is described in Figure 2.*

2.2.6. DAILY TOTALIZERS (CODE 02)

Electronic daily totalizers for all delivery hoses (nozzles) are saved in the memory of the electronic counter. **These totalizers may be reset at any time by using the P15 parameter** (see description below). They indicate what total volume and total amount of money has been delivered from each delivery hose since it was last reset.

Table 6 - Description of values of P02 parameter

Parameter	Meaning
02L1 (A)	volume of fuel pumped by hose 1 on side A in centilitres (x 0.01L)
02C1 (A)	the amount delivered by the hose 2 on side A in the unit of currency
…	…
02L5 (A)	volume of fuel pumped by hose 1 on side A in centilitres (x 0.01L)
02C5 (A)	the amount delivered by the hose 2 on side A in the unit of currency
02L1 (B)	volume of fuel pumped by hose 1 on side A in centilitres (x 0.01L)
02C1 (B)	the amount delivered by the hose 2 on side A in the unit of currency
…	…
02L5 (B)	volume of fuel pumped by hose 1 on side A in centilitres (x 0.01L)
02C5 (B)	the amount delivered by the hose 2 on side A in the unit of currency

NOTE Number of totalizers of delivery hoses shown in the P02 parameter is conditioned by the configuration of the dispenser. *The identification system of delivery hoses and products is described in Figure 2.*

2.2.7. FUEL PRODUCT UNIT PRICES (CODE 03)

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

Table 7 - Description of values of P03 parameter

Parameter	Meaning	Factory setting
03 1	fuel product unit price 1	0,00 €/L
03 2	fuel product unit price 2	0,00 €/L
03 3	fuel product unit price 3	0,00 €/L
03 4	fuel product unit price 4	0,00 €/L
03 5	fuel product unit price 5	0,00 €/L

NOTE Number of fuel products shown in the 03 parameter is conditioned by the configuration of the dispenser. *The identification system of delivery hoses and products is described in Figure 2. if you change the unit price, such change will be reflected after a subsequent lift of the delivery nozzle.*

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

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

2.2.8. CURRENT TIME AND DATE (CODE 04)

This function allows to show and set current time and date. The first line of the display shows time in the "HHMMSS" format (hours, minutes, seconds), the second line shows the date in the "DDMMYY" format (day, month, year) - example 15:35:11 24.12.2016. Setting is made by pressing the **<Ent>** key and entering the time/date in the correct format and confirming by the **<Ent>** key.

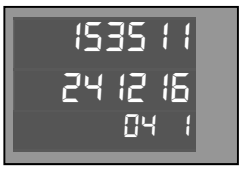


Table 8 - Description and setting of values of P04 parameter

Parameter	Meaning	Factory setting
04 1	Date setting, DDMMYY format (e.g. 241211 = 24. 12. 2016)	1.1.2001
04 2	Time setting, HHMMSS format (e.g. 153511 = 15:35:11)	0:00:00

NOTE The time and date information is used during their displaying on a graphical proportional display and in P06 and P07 parameters for recording time of defect occurrence and time of delivery finish.

NOTICE 72 hours after disconnecting the electrical power supply of the dispenser the internal clock will be reset. *Time and date values will switch to factory setting and must be set again!*

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

This function shows the number of the program version of the dispenser counter and different check sums. These values are intended for metrology authorities and authorized service engineers.

Table 9 - Description of values of P05 parameter

Parameter	Meaning
05 1	Program version + release (e.g. 1.03 + 7)
05 2	Check sum W&M (20260)
05 3	Program check sum (e.g. 52359)
05 4	P20-P99 parameter memory check sum (e.g. 34567)
05 5	Check sum of the device for the main unit of temperature compensation (e.g. 47644)
05 6	Check sum of the temperature compensation auxiliary unit (e.g. 47644)
05 7	Time and date of program creation (e.g. 19. 07. 2011, 07:56:17)

2.2.10. HISTORY OF ERROR MESSAGES (CODE 06)

This function is intended to show history of last 10 error codes of defects that occurred in the dispenser. After switching to parameter P06, the display shows the code of the last fault message on the dispenser A side (e.g. 41 - E41 hose pulse generator fault 1A. After pressing the **<ENT>** key the display shows time and date of fault origin. After pressing the **<+>** key the display shows the code of the last error message on the dispenser B side. Also see Table 10.

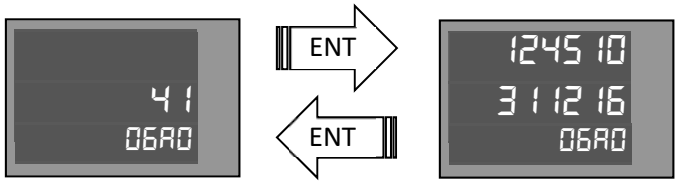


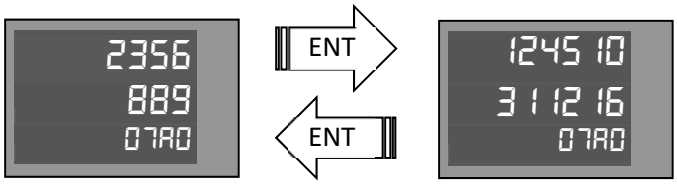
Table 10 - History of error messages P06

Parameter	Meaning
06A0	code of the last dispenser error on side A
06B0	code of the last dispenser error on side B
…	…
06A9	code of the tenth last dispenser error on side A
06B9	code of the tenth last dispenser error on side B

NOTE If two errors of the same type with the same error code occur in sequence, only the latest one will be stored in the counter memory.

2.2.11. HISTORY OF LAST DELIVERIES (CODE 07)

This function is intended to show history of last 10 deliveries on each side of the dispenser. This parameter has the following arrangement of data on the display:



After switching to parameter P07, the display shows the last delivery code on the A side of the rack (e.g. 310 €/10 L). The price per litre alternates on the display with the parameter number. After pressing the **<ENT>** key the display shows time and date of delivery finish. After pressing the **<+>** key the display shows the code of the last error message on the dispenser B side. Also see Table 11 .

Table 11 – History of last deliveries P07

Parameter	Meaning
07A0	last dispenser delivery on side A
07B0	last dispenser delivery on side B
…	…
07A9	the tenth last dispenser delivery on side A
07B9	the tenth last dispenser delivery on side B

NOTE *If the storage tank intended for delivery history is empty, i.e. if there is no delivery stored in history, "------ " appears on the display.*

2.2.12. ACCESS PASSWORD FOR THE MANAGER MODE (CODE 08)

This function allows to show and change the access password for the Manager mode.

The default access password “1111” is set in the factory.

2.2.13. HISTORY OF MAINTENANCE (CODE 09)

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

2.2.14. OPERATING MODE OF THE DISPENSER (CODE 12)

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

Table 12 - Operating mode of the dispenser P12

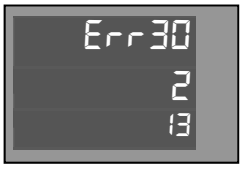
Parameter	Meaning
12 = 0	Automatic mode with remote control
12 = 3	Manual mode

The parameter value may be 0 and 3.

- If the parameter value **P12 equals 0** then the dispenser works in solely automatic mode, i.e. connected to the control computer via a data line. The dispenser is completely controlled by a remote control unit (PC, control counter, ...) – dispenser release for delivery, dispenser blocking, setting the fuel price and maximum amount/volume for each delivery, etc. Shortly after interrupting communication between the computer and the dispenser the display shows the error message E18. After communication recovery the E18 message disappears.
- If the parameter value **P12 equals 3** then the dispenser works in solely manual mode. The dispenser is completely independent – not controlled remotely. The data line is blocked. Fuel unit prices are controlled by the P03 parameter. If no special manual mode with blocking after delivery or a mode with RELEASE signal control is set, the delivery starts immediately after lifting the delivery nozzle and resetting the display.

2.2.15. ERROR STATISTICS (CODE 13)

This function is intended for showing statistics of defects occurred on the dispenser from the moment of initialization or resetting the counter. This parameter has different arrangement of data on the display. The first line of the display shows the dispenser error code - 01 to 59, the second line shows frequency of defect occurrence from dispenser commissioning or from resetting the statistics by the service engineer. You can browse the defect statistics by using **<+>** or **<->** keys.



2.2.16. CURRENT OPERATING TEMPERATURE (CODE 14)

This function shows current operating temperature measured by the heat sensor located on the processor board of the counter, possibly a current temperature of heat sensors Pt100 located in the dispenser hydraulics, if installed. This parameter has the following display layout - the first line of the display shows the temperature on the processor board in decimal degrees of Celsius (26.8 °C), the second line shows the temperature of the fuel product No. 1 in the hydraulic system of the dispenser in tenths of degrees of Celsius (14.6 °C).

Table 13 - Current operating temperature P14

Parameter	Meaning
14 1	The temperature around the counter processor and the fuel temperature of product No. 1
14 2	The temperature around the counter processor and the fuel temperature of product No. 2
14 3	The temperature around the counter processor and the fuel temperature of product No. 3
14 4	The temperature around the counter processor and the fuel temperature of product No. 4
14 5	The temperature around the counter processor and the fuel temperature of product No. 5

NOTE *Number of fuel products shown in the P14 parameter is conditioned by the configuration of the dispenser. The identification system of delivery hoses and products is described in Figure 2.*

2.2.17. RESETTING DAILY TOTALIZERS (CODE 15)

This function is intended for resetting all daily totalizers of delivery hoses/nozzles. After setting the parameter to **1** and confirming (**<ENT> + <1> + <ENT>**) all totalizers that are a part of the P02 parameter will be **reset**.

2.2.18. OPERATING CONTROL NUMBER (CODE 16)

This function is used to display a 6-digit operating control number and to enter the operating code if the dispenser is blocked or is running within the trial period. This parameter has the following arrangement of data on the display: The first line of the display shows the numeric code (operating control number) required to remotely unlock the dispenser. The second row shows the number of days of trial operation after which the dispenser will be blocked. If the first line of the display is blank and the second line shows 0, then the dispenser is in the standard operating mode.

2.2.19. DISPLAY BACKLIGHT INTENSITY (CODE 17)

The function allows you to set the intensity of the LED backlight of the PDEDCU graphical proportional display and the PDEDIL V6 display. For other display types, the parameter is non-functional.

Table 14 - Display backlight intensity P17

Parameter	Meaning
17 = 0	Display backlight is not regulated
17 = 1-100	PWM value of display backlight.

The factory default setting for the parameter value is 70.

2.3. TBELTM COUNTER

The TBELTM electronic counter in the same way as the PDEX counter, see chapter 2.2, by remote controllers PDERT-5S (service) and PDERT-5O (manager), which can be used to:

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

The operator and manager mode of the TBELTM counter is almost the same as in the PDEX counter (chapter 2.2). The difference is only in a few parameters - see below.

Table 15 - List of parameters of the operator access mode of the TBELTM counter

Parameter	Description
01	Non-resettable amount totalizers
02	Daily quantity and financial totalizers (resettable)
03	Product unit prices (in manual mode)
04	Current time and date
05	Program version and check sums
06	Error message history
07	Latest delivery history

Table 16 - List of parameters of the manager mode of the TBELTM counter

Parameter	Description
01	Non-resettable volume totalizers
02	Daily volume and financial totalizers (resettable)
03	Product unit prices (in manual mode)
04	Current time and date
05	Program version and check sums
06	Error message history
07	Latest delivery history
08	Access password for the Manager mode
09	Maintenance history
10	Serial numbers of peripheral units
11	- unoccupied -
12	Dispenser control mode
13	Defects statistics
14	Current operating temperature
15	Resetting daily totalizers
16-19	- unoccupied -

Differences of the TBELTM counter parameters from the PDEX counter:

- Parameter P04 - Current time and date - Internal clock power is backed up for 5 days
- Parameter P06 - History of error messages - 100 error codes are backed up.
- Parameter P07 - History of deliveries - stores up to 50 deliveries
- Parameter P10 - Serial numbers of peripheral units - new parameter, see 2.3.1

2.3.1. DISPLAYING PERIPHERAL UNIT SERIAL NUMBERS (CODE 10)

This feature allows you to view serial numbers of peripheral units that are stored in the counter memory.

Table 17 - Display of serial numbers of peripheral units P10

Parameter	Unit	E code
10-1	Processor unit	
10-2	Main displaying unit (Master display)	E80
10-3	Auxiliary displaying unit (Slave display)	E81
10-4	Totalizer unit	E82
10-5	Temperature measuring unit (PDEINP)	E83
10-6	Mass meter	E84

NOTE *Serial numbers of peripheral units are checked before each delivery and re compared to numbers stored in the counter memory. In discrepancy, delivery is not allowed and the fault code will appear on the display (see column E in the table). Changing serial numbers is only possible in a service mode by the authorized employee after previous metrological seal damage.*

2.4. PDEX5 COUNTER

The PDEX5 electronic counter is set in the same way as the PDEX counter, see chapter 2.2, by remote controllers PDERT-5S (service) and PDERT-5O (manager), which can be used to:

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

The operator and manager mode of the PDEX5 counter is almost the same as in the PDEX counter (chapter 2.2). The difference is only in the numbers of the individual parameters. Table 18 a Table 19 describe the lists of operator and manager parameters of the PDEX5 counter. The last column in the table indicates the corresponding parameter of the PDEX counter, see 2.2.

Table 18 - List of parameters of the operator access mode of the PDEX5 counter

Parameter	Description	(PDEX)
00	Non-resettable amount totalizers	(P01)
01	Resettable (daily) quantity totalizers	(P02)
02	Resettable (daily) amount totalizers	(P02)

Table 19 - List of parameters of the manager mode of the PDEX5 counter

Parameter	Description	(PDEX)
00	Non-resettable amount totalizers	(P01)
01	Resettable (daily) quantity totalizers	(P02)
02	Resettable (daily) amount totalizers	(P02)
03	Product unit prices in a manual mode	(P03)
04	Current time and date	(P04)
05	Program version and check sums	(P05)
06, 07	- not used -	
08	Access password for the Manager mode	(P08)
09	- not used -	

Parameter	Description	(PDEX)
10	Serial numbers of peripheral units	-
11	- not used -	(P11)
12	Dispenser control mode	
13	- not used -	
14	Current product temperature	(P14)
15	Resetting daily totalizers	(P15)
16-19	- not used -	
20	Error message history	(P06)
21	Statistics of dispensing site A failures	(P13)
22	Statistics of dispensing site B failures	(P13)
23	Statistics of dispensing site C failures	(P13)
24	Statistics of dispensing site D failures	(P13)
25	History of delivery operations in the dispensing site A	(P07)
26	History of delivery operations in the dispensing site B	(P07)
27	History of delivery operations in the dispensing site C	(P07)
28	History of delivery operations in the dispensing site D	(P07)
29	Maintenance history	(P09)

Differences of the PDEX5 counter parameters from the PDEX counter:

- Parameter P04 - Current time and date - Internal clock power is backed up for 5 days
- Parameter P20 - History of error messages - 100 error codes are backed up on each side of the dispenser.
- P21, P22, P23, P24 parameter – Statistics of errors – is individually for each dispensing site
- P25, P26, P27, P28 parameter – Delivery history – 100 deliveries for each dispensing site
- Parameter P10 - Serial numbers of peripheral units - new parameter, see 2.4.1

2.4.1. DISPLAYING PERIPHERAL UNIT SERIAL NUMBERS (CODE 10)

This feature allows you to view serial numbers of peripheral units that are stored in the counter memory. The column E code contains error codes that appear on the display if the serial number of the unit does not match the number stored in the counter memory.

Table 20 - Display of serial numbers of peripheral units P10

Parameter	Unit	E code
10-1	Processor unit	
10-2	PDEINP1 temperature correction main unit (temperature sensors 1 to 4)	E83-1
10-3	PDEINP2 temperature correction auxiliary unit (temperature sensors 5 to 8)	E83-2
10-4	Mass meter A	E84-1
10-5	Mass meter B	E84-2
10-6	Dispensing site A main (master) displaying unit (display)	E80-1
10-7	Dispensing site A auxiliary (slave) displaying unit (display)	E80-2
10-8	Dispensing site A electromechanical totalizer main unit	E82-1
10-9	Dispensing site A electromechanical totalizer auxiliary unit	E82-2
10-10	Dispensing site B main (master) displaying unit (display)	E80-1
10-11	Dispensing site B auxiliary (slave) displaying unit (display)	E80-2
10-12	Dispensing site B electromechanical totalizer main unit	E82-1
10-13	Dispensing site B electromechanical totalizer auxiliary unit	E82-2
10-14	Dispensing site C main (master) displaying unit (display)	E80-1
10-15	Dispensing site C auxiliary (slave) displaying unit (display)	E80-2

10-16	Dispensing site C electromechanical totalizer main unit	E82-1
10-17	Dispensing site C electromechanical totalizer auxiliary unit	E82-2
10-18	Dispensing site D main (master) displaying unit (display)	E80-1
10-19	Dispensing site D auxiliary (slave) displaying unit (display)	E80-2
10-20	Dispensing site D electromechanical totalizer main unit	E82-1
10-21	Dispensing site D electromechanical totalizer auxiliary unit	E82-2

NOTE *Serial numbers of peripheral units are checked before each delivery and re compared to numbers stored in the counter memory. In discrepancy, delivery is not allowed and the fault code will appear on the display (see column E in the table). Changing serial numbers is only possible in a service mode by the authorized employee after previous metrological seal damage.*

2.5. TBELTX COUNTER

The TBELTx electronic counter is set using the 4-button keyboard or the preset keyboard if installed on the dispenser. Using the keyboard, you can:

- set unit prices of fuel products (in manual operation)
- read non-resettable electronic litre totalizers of all delivery hoses
- change the dispenser working mode

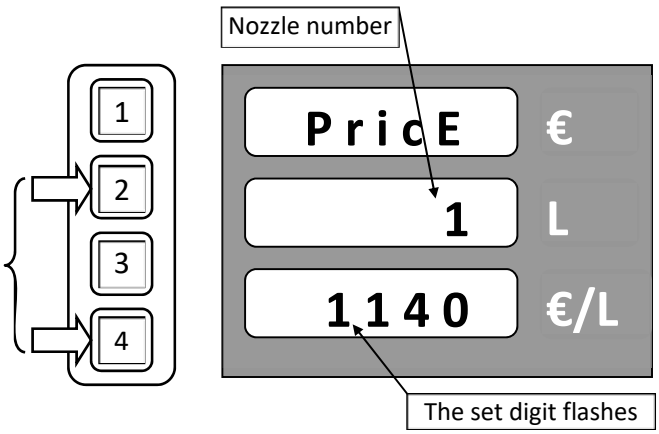
2.5.1. SETTING THE FUEL UNIT PRICE

If the dispenser operates in the manual mode, then the product unit prices saved in the calculator memory where a single fuel unit price is assigned to each pump are used for calculation of the sum for dispensed fuel. Changes of the fuel price on the display will take effect after the next time the nozzle is taken out. A zero price value for all fuel products is set at the factory. It is necessary to set a non-zero price, or dispensing will not commence and the error message E30 – "zero price" will appear. If the dispenser works in the automatic mode, the fuel unit prices sent from the control computer at each dispensing authorization is used to calculate the total dispensed sum. Prices saved in the parameter P03 are non-functional.

How to set the fuel price in a manual mode

The price change can only be made between powering on the counter and the first delivery on the dispenser.

- Turn the counter power supply off and on.
- Press and hold the button 2 simultaneously with button 4 for at least 3 seconds.
- The middle line shows the number of the set nozzle (product), the unit price is shown on the lower line. The price is set by individual locations. The set digit flashes.
- Use the button 1 to change the value of the flashing location.



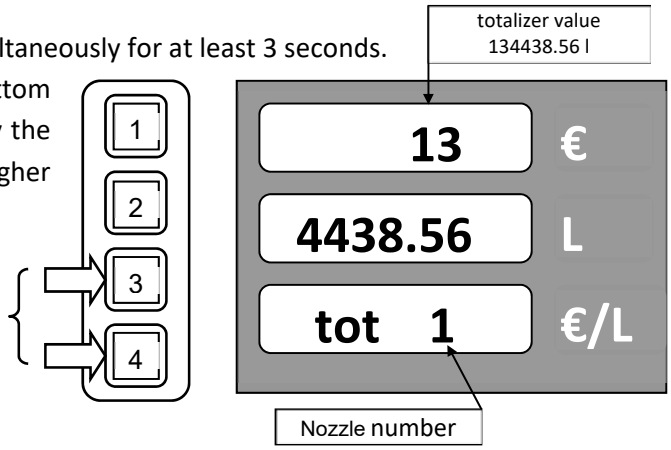
- By button 2 you can move between different orders.
- Use the button 3 to change the number of the nozzle for which the price is being set.
- To quit the price setting, press the button 4.

2.5.2. READING ELECTRONIC TOTALIZERS

The TBELTx counter is equipped with electronic volume totalizers for each delivery hose / nozzle. The value of these totalizers can be determined using the preset keyboard or by the command on the communication line. Totalizer reset can be done using the P18 configuration parameter. Totalizer reset can only be done if the SW1-1 switch is set to OFF.

How to read the electronic totalizers:

- You can only display the value of the totalizers on the counter display if all the nozzles are hung and the previous delivery is paid.
- Press and hold the buttons 3 and 4 simultaneously for at least 3 seconds.
- The nozzle number appears on the bottom line. The upper and middle lines display the totalizer value (the upper line shows higher orders).
- Use the 1(+) and 2(-) buttons to change the nozzle number.
- To end the display of the totalizer, press the button 4 (Cancel).

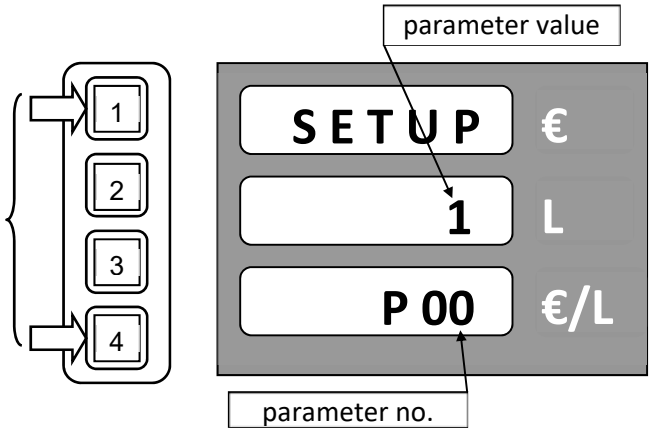


2.5.3. CHANGE OF THE WORKING MODE

Changing the dispenser working mode must be performed when the dispenser is disconnected from the control system (e.g. in the event of a malfunction of the control system) when the dispenser is to be operated manually or vice versa when the dispenser is in a manual mode and must be connected to the control system.

How to change the working mode:

- Turn the power supply of the dispenser counter off and on.
- During the counter test (zero countdown), press and hold buttons 1 and 4 simultaneously until the letter "P" flashes on the lower line indicating the entry to the setting mode.
- When the counter test is completed, the parameter number P00 appears on the bottom line.
- The value of that parameter is displayed on the middle line.
- Opening the parameter for editing is made by pressing the button 3 (Enter).



- When the parameter is opened, its value flashes.
- Change the parameter value with buttons 1 and 2 to 0 – for automatic mode or 1 – for manual mode.
- To store the parameter value, press the button 3 (Enter).
- The parameter setting mode is ended by pressing the button 4 for at least 2 seconds (Cancel).

3. OPERATION

3.1. INSTRUCTIONS FOR SAFE OPERATION

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

Smoking forbidden

Open flame use forbidden

Use of mobile phones forbidden

NOTICE->LPG *For LPG dispensers/modules, a pressure test of the LPG dispenser must be performed with a pipeline system by pressure of 2.5 MPa, including a review, before commissioning.*

WARNING *Dispensers are hygienically harmless for the customer and operator. It is advisable to protect your hands, for example, with eco-friendly gloves during normal maintenance and during deliveries. In case of skin contact, wash the affected area as soon as possible with soap and water. In case of eye contact, etc., seek medical attention. During deliveries, avoid inhalation of vapours of the pumped medium.*

CAUTION

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

CAUTION

- ***Technical and technological devices must correspond to approved conditions together with regulations for safe operation and maintenance as well as solutions of emergencies. The device must be fitted with carbon-dioxide extinguishers according to the fire-safety solution.***
- ***The LPG fuel station may only be operated by demonstrably trained persons.***
- ***The "STOP button" is placed at the dispenser (for emergency situations). The procedure in case of fire or emergency is precisely defined in local operating rules and regulations – the attendant must be demonstrably trained with regard to this.***

- ⚠ ***The "STOP line" must be located at least 5 meters from the dispenser.***
- ⚠ ***LPG containers, piping and dispenser must be earthed, the grounding point for the pumping tank must be established and marked.***
- ⚠ ***When pumping LPG or pumping out or removing from tanks, it is necessary to proceed according to the regulations issued, in accordance with specific conditions the entry and operation in the designated area of the fuel station must be avoided.***
- ⚠ ***It is necessary to follow the prescribed procedure for the sale and delivery of LPG. In any danger, immediately disable this device. During the LPG delivery, the LPG station operator must also be present, the delivery must not be carried out in the event of the risk of atmospheric discharges in storms.***
- ⚠ ***It is necessary to observe defined terms to perform regular checks and inspections of all installed technical devices. Do not allow persons without appropriate professional qualification to tamper the installed technology including the gas devices.***

CAUTION

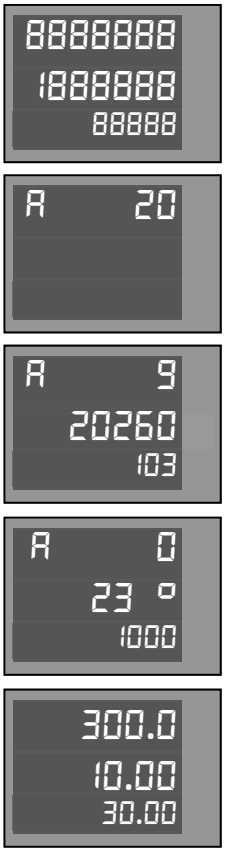
- ⚠ ***The attendant must keep the device in proper and safe order, immediately inform the service organization about the defect of abnormality during operation and immediately decommission the device in case of danger of default.***

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

3.2. DISPENSER COMMISSIONING

Switching on and off of fuel dispensers is carried out in the main switchboard of the fuel station where the power supply of the dispensers is provided. Each dispenser has one power point in the main switchboard. This power point is secured by the appropriate circuit breaker that enable the dispenser to be switched on and off.

During each counter powering on, the following processes are carried out:



- **displaying units (displays) test.** The display backlight turns on and then all segments (digit "8") are displayed for approx. 1 second.
- **time delay when the counter is turned on.** The time needed to start the multimedia display. During the time delay, the display shows the side of the counter where the display is connected (A = DISA or B = DISB) and the time in seconds remaining to the activation of the electronic counter of the dispenser. The length of the time delay can be set by the counter parameter, standardly without delay.
- **processor unit test.** A ten-second test that controls all functions and the processor unit memory. During the test the displays show the counter side where the display is connected (A = DISA or B = DISB), the metrological control sum of the program (20260) and the version of the counter program (1.03).
- **temperature test around the processor and the SW1 switch position display.** The value of the measured temperature in tenths of degrees is displayed on the display. If the measured temperature is T<-15 °C, then the display heating (if enabled) is started. The display shows the position of SW1-1, SW1-2, SW1-3 and SW1-4 switches (1 = ON, 0-OFF). If the switch SW1-1 is in position 1, the setting of selected metrology parameters cannot be performed on the counter.
- **setting of the calculator state before turning it off.** The information that was on the display before the last counter turnoff is displayed. If the calculator was working in the manual mode, dispensing can commence immediately after lifting the nozzle. If the calculator was working in the automatic mode, it waits until communication with the control computer is established and - if necessary - until the transaction is finished (paid), in case it was not finished regularly before turning off.

Now the dispenser is ready for fuel delivery.

3.3. DISPENSER OPERATION

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

3.3.1. LPG DELIVERY

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

LPG delivery into motor vehicles with attendants

The operation of the dispenser is ensured by the employee of the fuel station who lifts the delivery nozzle from the dispenser and connects it to the storage tank of the vehicle which must be secured against moving. After pressing the control button (START button) located on the counter case, the reset of the electronic counter is performed and the pump electric motor located at the storage tank starts. Delivery can be terminated at any time by releasing the control button. When refilling the "full" tank, after reaching the 80% fill level the tank filler neck is closed and the safety control (electronic counter) terminates the delivery within 10 seconds regardless of the control button. Delivery data remains recorded on the counter display. Dispensers equipped with an electronic pre-selection allow pre-selection of the exact quantity required which is determined by volume or amount. These stands are equipped with a two-stage solenoid valve.

NOTICE *Pursuant to EN 14678-1:2013, article 4.5.8, LPG dispensers designed for self-service operation must be equipped with a* ***"dead man button"*** *(START button) to ensure that the delivery process can only be started and maintained by pressing this button.* ***Release of this button shall immediately stop the flow of LPG.***

NOTE *According to EN 14678-1:2013, article 4.5.1.1, LPG dispensers must be equipped with a breakaway or shear coupling located between the delivery nozzle and the dispenser. This breakaway coupling disconnects the flow rate at both ends in case of emergency. LPG dispensers are standardly equipped with a breakaway coupling which breaks if a force greater than 200N and less than 500N is applied to it.*

OBLIGATIONS OF LPG DISPENSER/MODULE ATTENDANT

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

Unattended LPG delivery into motor vehicles

In the case of unattended delivery, the customer him/herself lifts the delivery nozzle from the dispenser and connects it to the tank of the vehicle. After pressing the control button (START button) located on the counter case, the reset of the electronic counter is performed and the pump electric motor located at the storage tank starts. Delivery can be terminated at any time by releasing the control button or by pressing the STOP button (safety STOP button). When refilling the "full" tank, after reaching the 80% fill level the

tank filler neck is closed and the safety control (electronic counter) terminates the delivery within 10 seconds regardless of the control button. Upon completion, the customer is obliged to hang the delivery nozzle back into the dispenser, into the delivery nozzle holder. Only after the nozzle has been properly hung up, the transaction is terminated and the registration of the delivery by the control system is completed.

NOTE *In the unattended mode, the start of delivery only occurs after lifting the nozzle and pressing the START button. Delivery termination only occurs after releasing the "START" button and returning the delivery nozzle. In the attended mode, commencing / terminating delivery occurs after pressing / releasing the START button.*

NOTE *LPG dispensers for unattended fuel stations must be, in addition to the START button, also equipped with a safety STOP button and the delivery nozzle position sensor – see EN 14678-1, art. 4.5.6* ***"Unattended fuel stations must be equipped with a device to ensure that the fuel filler is properly positioned back after the fuel delivery is completed"****.*

Safety at work with the LPG dispenser/module

The operator is responsible for the fuel station operation and is obliged to entrust its operation only to trained employees having relevant authorization. The attendant shall competently perform filling the LPG storage tanks of refilled vehicles, checks the conditions of the dispenser and other devices in regular intervals as well as the operation of the entire device, and keeps operating records. The smoking ban and ban on using open fire within a radius of 10 m must be locate done a visible place nearby the dispenser. There must be also a notice on switching off the engine, max. filling level of 80% and securing the vehicle against spontaneous setting in motion.

In terms of construction, dispensers and all their components which could be the source of initiation of the explosion are approved by the state authorized institution, State Testing Office No. 210 FTZÚ Ostrava Radvanice that issues the relevant certificates. Environmental safety is documented by the approval of ČIŽP No. 90/00/895/01/TOM. After detecting possible gas leak the detector sensors may be located in the dispenser area. However, these sensors are not included in the basic offer. In terms of hygiene, the given device is harmless for attendants and operators. While performing operation and maintenance it is advisable to protect your hands by wearing gloves.

3.3.2. ELECTROMECHANICAL TOTALIZERS

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

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

3.3.3. DISPENSER OPERATING MODES

There are two basic dispenser operating modes:

1) manual mode
2) automatic (remote) mode

The **manual mode** is a status when the dispenser works independently of any remote control.

The **automatic mode** is a status when the dispenser is remotely controlled by a control device (program in PC, control device, station controller, etc.). The automatic mode allows remotely control deliveries from the fuel station booth. The booth contains a control device by which the fuel station attendant releases the dispenser for delivery and collects information about the delivered fuel amount and price after the delivery is finished.

Switch from the automatic to the manual mode. By default, the dispensers are connected and set as it is expected they should work at the fuel station, i.e. if the fuel station is equipped with a control system, the dispensers will be set to the automatic mode; if the fuel station is without the control system, the dispensers are set to the manual mode by default.

In case you have to switch the dispensers from automatic to manual mode - e.g. because of a crash in the control system, you have to do the following:

- ***PDEX counter*** It is necessary to change the value of parameter P12 from value 0 to value 3 using the IR remote controller and check the unit price setting in parameter P03, see chapter 2.2.14.
- ***TBELTx counter*** It is necessary to change the value of parameter P00 from value 0 to 1 by using the 4-button keyboard and to check unit price settings, see chapter 2.5.3.

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

3.3.4. PRESET KEYPAD

dispensers may be equipped with a so-called preset keypad enabling presetting the delivered sum or amount by the customer directly on the dispenser. The customer may decide before he/she starts the delivery what volume or for what sum of money he/she wants to refill the storage tank. The pre-selected value may be cancelled by pressing the <**Cancel**> button at the moment when the delivery has not started yet. It is then possible to set another pre-selected value or deliver in a classic way without using the pre-selection.

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

a) Example of entering the pre-selection in crowns

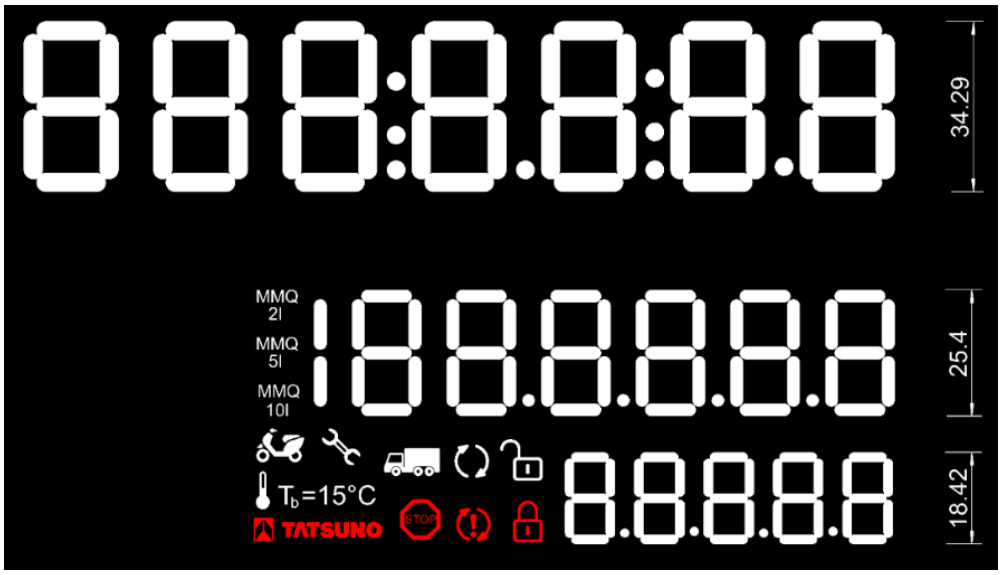
- The customer arrives to the dispenser and wants to deliver fuel for €10.
- The customer presets the value 10 on the pre-selection keyboard (presses the **<€5>** button twice.
- He/she selects the product he/she wants to deliver, lifts the delivery nozzle from the dispenser, puts it in the car tank and presses START button.
- The dispenser delivers exactly the amount he/she has chosen and then stops automatically.
- The customer hangs the delivery nozzle back into the dispenser and goes to pay the sum.

b) Example of presetting the litres

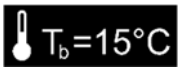
- The customer arrives to the dispenser and wants to refill 20 litres of fuel.

- The customer presets the value 20 by using the pre-selection keyboard (presses the **<10 litres>** button twice).
- He/she selects the product he/she wants to deliver, lifts the delivery nozzle from the dispenser, puts it in the car tank and presses START button.
- The dispenser delivers exactly the volume he/she has chosen and then stops automatically.
- The customer hangs the delivery nozzle back into the dispenser and goes to pay the volume.

3.3.5. DESCRIPTION OF THE PDEDIL V6 DISPLAY



The LCD display consists of the following parts:

Display segment	Function	Note
	Amount delivered	
	Volume delivered	
	Delivered fuel unit price	
	Minimum Measured Quantity	- the display is set by parameter P91 for each delivery hose
	Temperature volume compensation (ATC)	- not functional for LPG dispensers
	High and low output signals (fuel flow)	- not functional for LPG dispensers
	Function and fault indication of the vapour recovery system	- not functional for LPG dispensers
	Dispenser status indication - released for delivery / blocked	- it appears automatically when the dispenser status changes
	Signalling of forced termination of delivery	- it appears after the STOP command has been received from the booth, after the preset number / preset amount has been reached or after the allowed time without delivery has been exceeded
	Fault signalling or maintenance required.	- it will be displayed at each fault indication together with the fault code (see **Chyba! Nenalezen zdroj odkazů.**)

3.3.6. DISPENSER OPERATION TERMINATION

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

- **Switch off the 230 V circuit breaker for stabilized power supply of the electronic counter of the dispenser.**

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

Now the dispenser is out of order.

4. MAINTENANCE AND SERVICE

4.1. MAIN PRINCIPLES OF DISPENSER MAINTENANCE

- keep all functional units of the dispenser clean so that any potential unexpected defect may be easily identified and quickly removed
- continuously check all connections if the leakage of the fuel occurs, tighten and reinforce joints
- check and, if necessary, correct tensioning of the V-belt with the engine bracket
- check and, if necessary, tighten the screws that secure the electric motor to the bracket
- inspect the condition of the delivery nozzle and decide on repair or replacement of the delivery nozzle, if necessary, according to the type and size of the defect
- regularly check the condition of the delivery hoses. In case of mechanical damage to the delivery hose, ensure its immediate replacement.
- check the function of the door locks and the mechanism for hanging the delivery nozzle
- care for external cleanliness of the dispenser, pay special attention to counter window cleanliness
- regularly carry out sludge, water and other impurities removal by using a sludge pump from tanks (fuel tanks)

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

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

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

CAUTION

- ***Any handling and dismantling, even opening the filter cap, is conditioned by extracting the medium with nitrogen or inert gas from the hydraulic system of the dispenser!***
- ***The interventions into electrical and electronic parts may only be performed by a specialist who is responsible for device safety. The wires must be repositioned to their original position after finishing the service intervention. Proper fitting of wires must prevent contact with the movable parts of the reel module.***
- ***Caution! Tightness of hydraulic sections must be visually inspected in every service intervention and possible medium leaks must be removed.***

THE OPERATOR OF THE DISPENSER IS OBLIGED TO:

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

PRINCIPLES OF LPG DISPENSING MODULE INSPECTIONS

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

- Review of the LPG dispensing module hydraulic system tightness by soap solution.
- Review of the machinery.
- Review of the check and safety valve functioning.
- The inspection, calibration and official verification of the LPG dispenser is performed by the National Metrology Institute according to applicable regulations
- The inspection is preceded by cleaning the entire device from dust, removal of water and other impurities from tanks.

4.1.1. MAINTENANCE OF DISPENSER COVERS

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

Recommended maintenance of painted covers:

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

Recommended maintenance of stainless covers:

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

RECOMMENDATION

We recommend the following protective agents and detergents for stainless sheet metal:

- ***ULTRAPUR – d*** *(producer: MMM-Group, Germany)*
- ***NEOBLANK spray*** *(producer: Chemische Fabrik GmbH, Hamburg, Germany)*
- ***ANTOX Surface Care 800 S*** *(producer: Chemetall AG, Switzerland)*

NOTICE ***DO NOT WASH STAINLESS COVERS WITH DETERGENTS!***

4.2. TROUBLESHOOTING AND SOLVING DISPENSER DEFECTS

When you encounter a problem, first read the **"What to do if ..." table** (see Table 21) where the most frequently asked questions of the dispenser users about the problems encountered at the fuel station are described.

In the event of a dispenser defect, the electronic counter that controls the dispenser displays a fault message in the form of a numeric code. The fault codes for the individual types of electronic counters are listed in the chapter **Chyba! Nenalezen zdroj odkazů.**.

Table 21 - What to do if ...

The dispenser does not respond to the removal of the delivery nozzle and there is no fault message on the display
This means that the dispenser is without the power supply, or the delivery nozzle on the dispenser is poorly hinged, or that the dispenser is blocked by the control system. ➢ Check proper hanging of all delivery nozzles ➢ Check whether pumping made on the dispenser is paid at the cash desk ➢ If the dispenser is in manual mode, try unlock the dispenser with the IR remote controller (press the "0") ➢ Turn the power supply of dispenser counter off and on. ➢ Check the power supply of dispenser, i.e. when the power is turned on the display must pass the test ➢ Check the position of the circuit-breaker for the single-phase power supply 230V of the dispenser in the main switchboard of the fuel station ➢ If the dispenser is connected to the control computer, the dispenser blocking may be coupled to a control system that does not release the dispenser for pumping or blocks the dispenser. Turn the power dispenser off and on and change the dispenser mode from automatic to manual – see chapters 2.2.14 or 2.5.3. If the stand is in a manual mode, there is a fault on the control computer side.
An error message "**E18**" will appear on the display of the dispenser
This is a dispenser fault message that indicates that communication between the dispenser and the control unit (computer, station controller, control console, etc.) has been lost. ➢ check the correct operation of the control unit (turning on the counter, turning on the data converter) ➢ check the data cable connection
After picking up the delivery nozzle an error message **"E30"** appears on the display of the dispenser .
This is a fuel dispenser failure report that states that the fuel unit price is zero. ➢ If the rack is operating in a manual mode without the remote control, then the unit price is incorrectly set. Set the fuel unit price, see chapter 2.2.7 and 2.5.1. ➢ If the dispenser is controlled remotely, then check the fuel unit price settings in the station controller (computer, controller). Before each delivery, the fuel price is automatically sent to the dispenser.

4.3. SERVICE OF LPG DISPENSERS

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

4.3.1. WARRANTY AND COMPLAINTS

The contractual warranty is determined – by default, the manufacturer provides warranty for provided devices for 2 years or 1 million litres of delivered fuels. This warranty does not cover consumables. In case of any complaints the following information must be specified:

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

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

4.3.2. ACCESSORIES

- Installation and User Manual
- Certificate on product quality and completeness
- EU Declaration of conformity
- Master card of the dispenser
- Master cards of all meters installed in the dispenser
- Pressure test protocol
- IR controller for counter operation and setting
  (may be ordered with dispensers equipped with the PDEX counter)
- Foundation frame (may be ordered)

Spare parts catalogue

This document is intended for service companies and service engineers only.

NOTES: