



Český metrologický institut

Evaluation Certificate

Number: ZR 141/17 – 0144

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Okružní 31
638 00 Brno
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In accordance with: WELMEC Guide 8.8, Issue 1 “General and Administrative Aspects of the Voluntary System of Modular Evaluation of Measuring instruments under the MID
OIML R117:2007

Issued to: Akord Elektronik Ltd. Sti.
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Turkey

In respect of: Electronic calculator for fuel / LPG / AdBlue dispensers

Type: PCUXN

Manufacturer: Akord Elektronik Ltd. Sti.
Turkey


Characteristics:	Accuracy class	0.5 / 1.0 / 1.5
	Ambient temperature range [°C]	-25 to +55

Document number: 0511-ZR-A005-17

Description: Measurement transducer is described in the descriptive annex. This certificate contains 9 pages.

Brno, 5 September 2017



v.ř. 
RNDr. Pavel Klenovský
Director General

Descriptive annex

1. Measuring device description

The electronic calculator type PCUXN is destined for receiving the output signals from the measurement transducers and possibly, from associated measuring instruments, displaying the measured data (volume or mass) and controlling the measurement process. It is used as a component of the fuel, LPG or AdBlue dispensers for the refuelling of motor vehicles, which may be a legal measuring device in the sense of the Directive of the European Parliament and of the Council no. 2014/32/EU of measuring instruments, as amended.

PCUXN calculator receives measured data in form of pulses from one, two, three or four pulse transmitters. It contains also one input for coriolis flow meter that communicates by a Modbus RS485 protocol.

PCUXN calculator can be made in three models:

- PCUX1N – can control one nozzle / measuring transducer
- PCUX2N – can control two nozzles / measuring transducers simultaneously
- PCUX4N - can control four nozzles / measuring transducers simultaneously

The PCUXN electronic calculator consists of a CPU unit, display unit, keypad unit, MUX unit for temperature probes (optional) and electromechanical totalizing device (non-resettable) for each nozzle.

The calculator is controlled by the keypad. It can be used for a preset quantity or price before the filling operation and for adjustment of the menu parameters.

1.1 Software

Approved version of the metrological part of the software is 1.0.2 with check sum value 71B384EB and 1.1.0 with check sum value CDF5B93E.

The software version and check sum can be identified by the Pump menu and parameter 105 – information. To display the software, push once Menu button, then once P3 button, then once Menu button. Then push six times P3 button to display the check sum.

1.2 ATC conversion function

The calculator is equipped with an ATC conversion function for conversion of the measured data to volume at a base temperature of 15 °C. ATC is available for LPG, diesels, gasoline and aviation fuel. Setting of the function is done in the Service menu and it is protected by a sealed button. The function can be disabled or enabled for each nozzle by the service parameter No. 304. Type of the product and density for each nozzle can be selected by the service parameter No. 302.

When the ATC function is enabled, volume converted to 15°C is indicated on the display.

A certified temperature probe has to be connected to the CPU in case of active ATC function. CPU unit contains one input for a digital data about the temperature. When more than one temp. probe is needed in the dispenser, a MUX unit can be connected to the CPU. This unit contains input for up to five temperature probes.

Products and densities from the service parameter No. 302:

Product Name	Standard Density (kg/m ³)@15°C	Density Range (kg/m ³)@15°C	Volume Correction Factor Reference Table
LPG	545-560	500 - 560	ASTM Table 54
Gasoline: all grades	730	640 - 780	Table 54B
Diesel Fuels	840	830 - 900	Table 54B
Aviation Fuels	800	780 - 840	Table 54B
Adblue	-	-	

1.3 Menu parameters

Setting the parameters of the calculator can be performed using the keypad and passwords.

The menu is divided to five levels:

1. Pump menu
2. Admin menu
3. Service menu
4. Factory menu
5. Producer menu

List of the parameters in the Service menu.

SUBMENUS IN THE SERVICE MENU	INITIAL VALUES	SETTING RANGES
*301- Configuration	1 D SPLY+1 NZ	
*302-Product Type	DIESEL	
*303-Calibration	0 milliliter	-100 to 100 milliliters
*304-Temp. Probe Status	ENABLE	DISABLE, ENABLE
305- Low Flow Rate	5 LITERS/MIN	1 TO 20
306- Low Flow Rate Dur.	30 SECONDS	1 TO 60
307-Valve Fast On	0,5 LITER	0,1 TO 1
308- Valve Fast Off	0,5 LITER	0,1 TO 1
309-Display Delay	0,1 LITER	0 TO 1
310-Display Decimal	2-2-3	0 TO 3 - 0 TO 3 - 0 TO 3
*311-Fiscal Mode	DISABLE	DISABLE, ENABLE
312-SCU Address	1	1 TO 255
313-Mass Meter Address	247	1 TO 247
314- Grade Quantity	1	1 TO 6
415-Related Grade	1	1 TO 6
316-SCU Factor	2-2-3	0 TO 3 - 0 TO 3 - 0 TO 3
317- SCU Preset Factor	2-2	0 TO 3 - 0 TO 3
318- Comport Timeout		
319-Date Settings	-	-
*320-Clear Totals		
321-Clear Filling Rec.		
322-Clear Event Rec.		
323-Log Mode	COMPORT 1	COMPORT1, COMPORT1, COMPORT1, COMPORT ALL
*324-Service Code	255	1 TO 254
325-Service New Pass	00000	
*326-Volume Total Adjust		

List of the parameters in the Factory menu

SUBMENUS IN THE FACTORY MENU	INITIAL VALUES	SETTING RANGES
*401-Filling Type	LITER	LITER, Kg, LITER or Kg
*402-Volume Type	LITER	LITER, GALLON
403-Pulsar Type	NPNTYPE	NPN TYPE, RS485 TYPE, MASS FLOW METER
*404-Pulsar Volume/Rev	0,500ml/rev	0,100 to 50,000 milliliters
*405-Pulsar Slot Quantity	50	10 to 500
406-Pulsar Direction	CW	CW, CCW, BOTH DIRECTION
407- Comport Protocol	1*WAYNE DART	WAYNE DART, GILBARCO, MASS FLOW, ESC PRINTER L 50, STANDALONE
408-Comport Band Rate	9600	1200, 2400, 4800, 5700, 5787, 9600, 19200, 38400, 57600, 115200
409-Comport Parity	1* ODD	ODD, EVEN, NONE
*410-Auto Density	DISABLE	DISABLE, ENABLE
411-Direct Filling	DISABLE	DISABLE, ENABLE
412-Nozzle Switch Type	NORMALLY OPEN	NORMALLY OPEN, NORMALLY CLOSED
413-Start Button Assign	1*. Nozzle	One of the Nozzles
414-Menu Timeout	60 seconds	30 to 240 seconds
415-Filling Timeout	30 seconds	10 to 240 seconds
416-Preset Timeout	3 minutes	1 to 20 minutes
417-SCU Timeout	10 seconds	1 to 60 seconds
418-Authorize Timeout	5 minutes	1 to 20 minutes
419- Mass Flow Timeout	5 seconds	1 to 240 seconds
*420-ATC Check	NO FILLING	NO FILLING, JUST WARNING, NO CHECK
*421-Pulsar Check	NO FILLING	NO FILLING, JUST WARNING, NO CHECK
*422-Totalizer Check	NO FILLING	NO FILLING, JUST WARNING, NO CHECK
423-Keyboard Check	NO CHECK	NO FILLING, JUST WARNING, NO CHECK
*424-Display Check	NO FILLING	NO FILLING, JUST WARNING, NO CHECK
425-Pulsar Dir. Check	NO FILLING	NO FILLING, JUST WARNING, NO CHECK
*426-SCU Check	NO FILLING	NO FILLING, JUST WARNING, NO CHECK
427-Mass Meter Check	NO FILLING	NO FILLING, JUST WARNING, NO CHECK
428-Low Flow Rate check	NO FILLING	NO FILLING, JUST WARNING, NO CHECK
429-Filling T. Out Check	NO FILLING	NO FILLING, JUST WARNING, NO CHECK
430-Motor Outputs	NONE	NONE, RL8, MFRL1, MFRL2
431-Password Type	NORMAL	NORMAL, KEYGEN TYE
*432-Distributor Code	255	1 TO 255
*433-Factory Settings	-	-
*434-Factory New Pass.	00000	-

1.3.1 Menu protection

Each menu has an own password.

First two levels Pump menu and Admin menu don't contain any legally controlled parameters.

To access some settings in Service menu and Factory menu it is necessary to push a button placed on the CPU motherboard. This button is protected by a sealing. Those legally controlled parameters are marked in the charts by *.



1.4 Input of the measured values

- a) Pulse input: Akord PS2 pulser, or other certified pulser can be used together with the PCUXN calculator. The pulser is shown on the picture No. 5.
- b) RS485 input
- c) mass flow meter

1.5 Temperature probe

For measurement of the liquid temperature is used a DS18B20 digital temperature probe.

- Provides 9-bit to 12-bit Celsius temperature measurements,
- Resolution 0.1 °C
- Measuring range (-10 to 50) °C
- length of the sensor 45 mm
- digital output that is to be connected directly to the CPU
- shown on the picture No. 6

2. Basic technical and metrological data

Accuracy class	0.5 / 1.0 / 1.5
Measuring unit	volume [L], volume at 15 °C [L] or mass [Kg]
Min. measured quantity MMQ [L]	2
Scale interval, quantity display [L] [kg]	0.01 or 0.001
Type of display:	Electronic LCD
Mechanical class	M1
Electromagnetic class	E1
Humidity class	H3
Ambient temperature range [°C]	-25 to +55
Power supply	90 - 240 V AC, 50 Hz
Approved software version (W&M checksum)	1.0.2 (71B384EB) 1.1.0 (CDF5B93E)

3. Test

Examinations of the PCUXN electronic calculator have been performed in conformity with the following documents:

- International Recommendation OIML R 117-1 *Dynamic measuring systems for liquids other than water, Metrological and technical requirements,*
- International Recommendation OIML R 117-2 *Dynamic measuring systems for liquids other than water, Metrological controls and performance tests,*
- International Recommendation OIML R 118 *Testing procedures and test report format for pattern evaluation of fuel dispensers for motor vehicles,*
- WELMEC Guide 7.2 *Software Guide,*
- WELMEC Guide 10.4 *Guide for testing of electronic calculators with conversion function and conversion devices,*

Examination and tests results are described in:

- Test report No. 6015-PT-P3017-16, issued by CMI (Notified body No. 1383),
- Test report No. 8553-PT-S1013-16 (software validation),
- Test report No. AB-387-T EMC 423 06.16 (EMC tests),
- Test report No. LVD 115 06.16 (climatic tests),
- Test report No. 8553-PT-S1022-17,
- Test report No. 6015-PT-P3031-17.



4. The measuring device data

At least a following data shall be stated on the device:

- Measuring device manufacturer and type
- Serial number and year of manufacture
- Number of the Evaluation Certificate

Following data are to be stated on face of each indicating device:

- Unit of national currency (e.g. €) is indicated next to price display,
- Unit of volume (ℓ or L or word Litre) is indicated next to volume display,
- Unit price per litre (e.g. €/L or €/Litre) is indicated next to unit price display,
- Information regarding the minimum measured quantity (MMQ),
- Information, that the indicated volume is at base conditions (e.g. $T_b = 15\text{ °C}$) in case of active ATC conversion function.

5. Conditions for approval and sealing

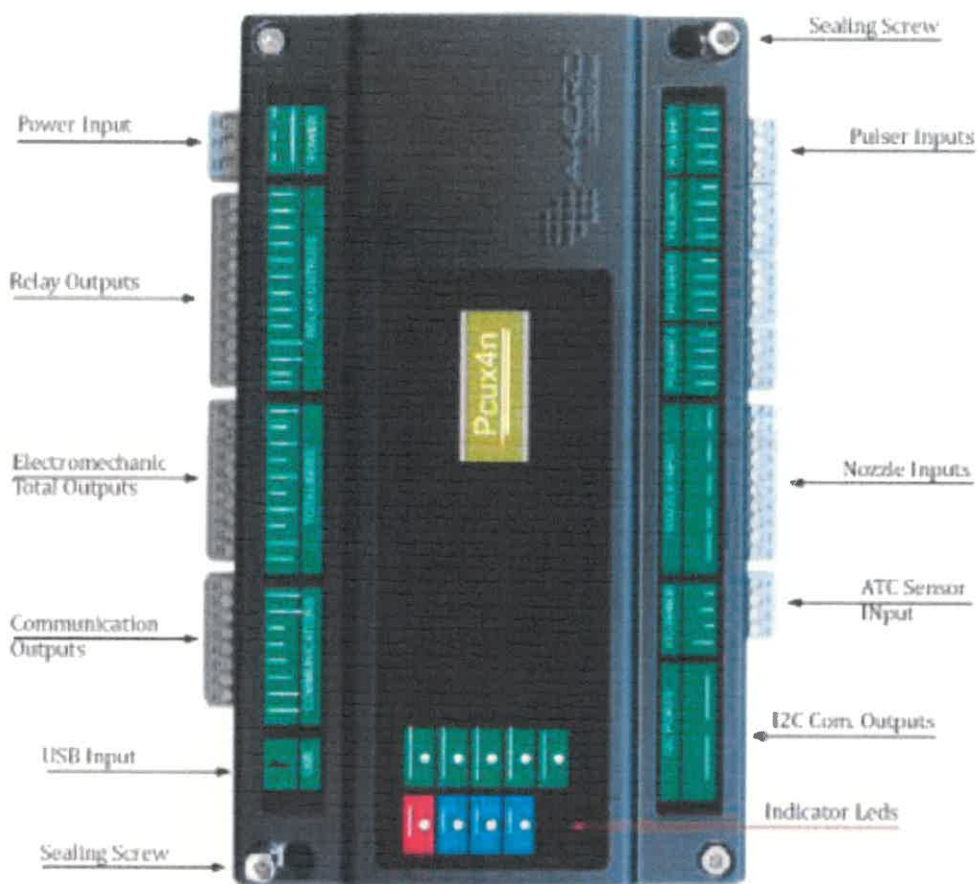
- Other parties may use this Evaluation certificate only with a written permission of Akord Elektronik Ltd. Sti
- Complete measuring system (fuel / LPG /AdBlue dispenser) must be covered by EC-type examination certificate.
- PCUXN el. calculator has to be designed in accordance to this Evaluation certificate.
- Settings:
 - o Parameter No. 309 – Display delay has to be set according to MMQ of the dispenser (0.02 for MMQ = 2 L, 0.05 for MMQ = 5 L, 0.10 for MMQ = 10 L),
 - o Parameter No. 310 – Display Decimal: second number (value for quantity display) has to be set to the value 2 or 3.
 - o Parameters No. 420 – ATC Check, 421 – Pulser Check and 424 – Display Check have to be set to value “No filling”.
- After the successful conformity assessment of the fuel dispenser the electronic calculator has to be sealed according to following description.

Seals on the calculator:

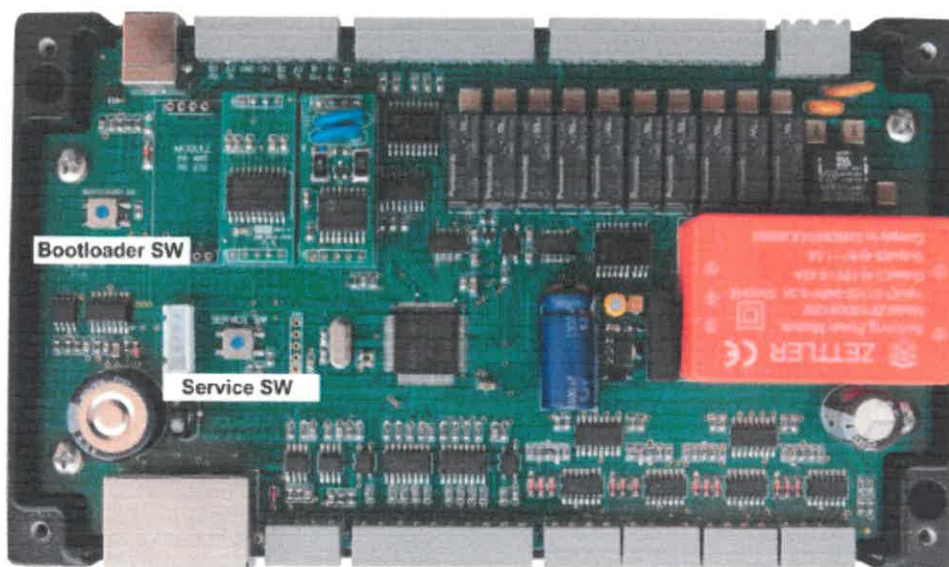
- Cover of the CPU has to be sealed by two screws (picture No. 3)
- Cover of the pulse transmitter
- Temperature probe (if installed)



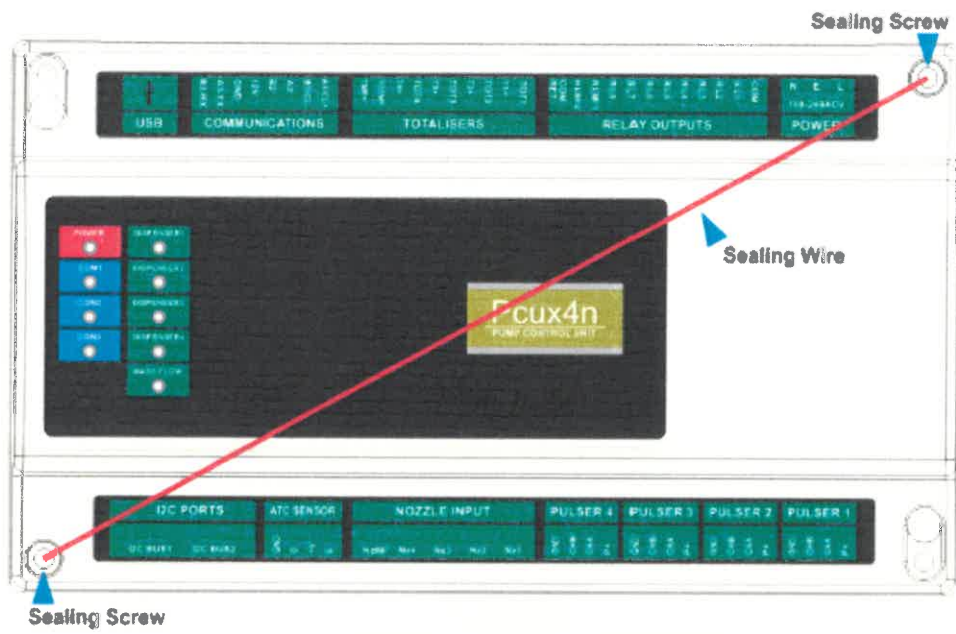
Picture No. 1: PCUXN CPU unit



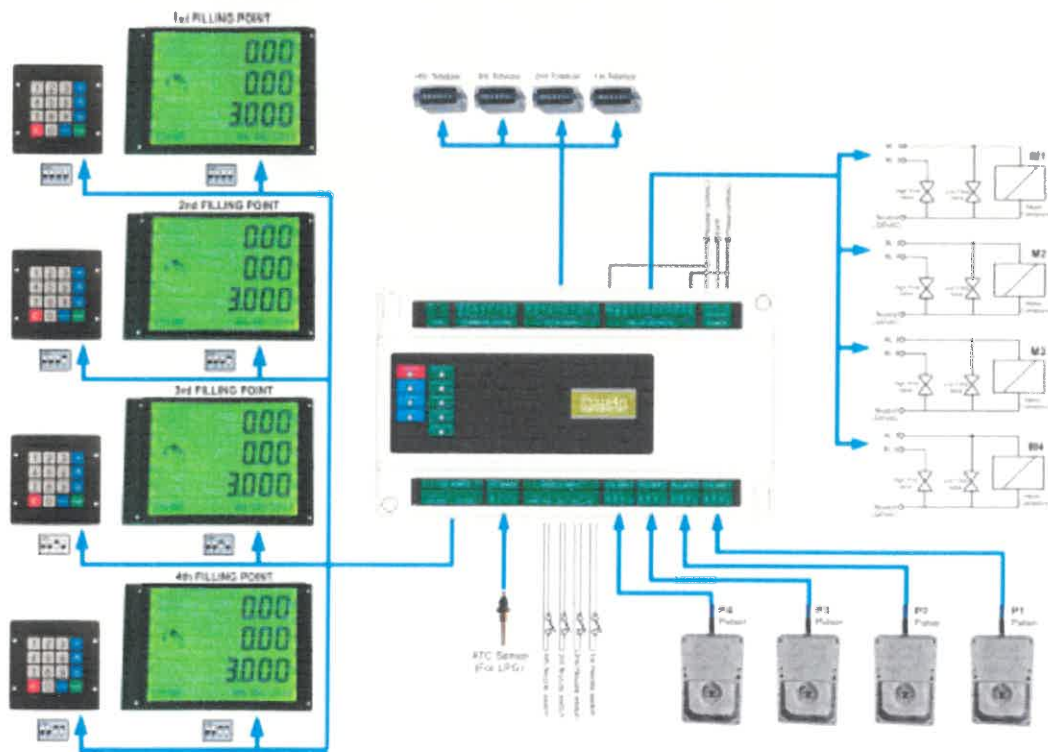
Picture No. 2: Motherboard of the PCUXN and position of the Service button



Picture No. 3: Sealing of the CPU cover



Picture No. 4: Connection schema



Picture No. 5: Akord PS2 pulse transmitter



Picture No. 6: DS18B20 Temperature probe

