



EU-TYPE EXAMINATION CERTIFICATE

Number: TCM 141/07 – 4491

Addition 10

This addition replaces all previous versions of this certificate in full wording.

Page 1 from 26 pages

In accordance: with Directive 2014/32/EU of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments (implemented in Czech Republic by Government Order No. 120/2016 Coll.).

Manufacturer: TATSUNO EUROPE a.s.
Pražská 2325/68
678 01 Blansko
Czech Republic

For: fuel dispenser
type: SHARK BMP 5xx.S, SHARK BMP 2xxx.S, OCEAN BMP 4xxx.O,
SUNNY-XE EURO Sxx xxxx.E

Accuracy class: 0.5

Mechanical class: M1

Electromagnetic class: E1

Valid until: 15 January 2027

Document No: 0115-CS-A004-07

Description: Essential characteristics, approved conditions and special conditions, if any, are described in this certificate.

Date of issue: 12 May 2017

Certificate approved by:




RNDr. Pavel Klenovský

1. Measuring device description

The fuel dispensers types SHARK BMP 5xx.S and 2xxx.S, OCEAN BMP 4xxx.O and SUNNY-XE EURO Sxx xxxx.E are intended for measurement of gasoline, diesel, ethanol and mixture volumes as 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 and are used for the refuelling of motor vehicles, small boats and small aircraft.

The measuring systems SHARK BMP 5xx.S and 2xxx.S, OCEAN BMP 4xxx.O and SUNNY-XE EURO Sxx xxxx.E consist of a pumping unit with gas elimination device, measurement transducer, electronic calculator with electronic or electromechanical totalizing indicating device, electromagnetic valve (optionally), sight glass (optionally) and hose with delivery nozzle. These fuel dispensers can be equipped with a vapour recovery system and pre-setting device.

Electronic calculators PDE, PDEX, and CDC of the fuel dispenser can be equipped with an ATC conversion function for conversion of measurement data to volume at base conditions (15 °C). In case of active ATC function a certified temperature sensor Pt 100 has to be mounted.

There are eight types of measuring systems:

- measuring system with Q_{\max} 50 L/min, which contains one FP-1001 B01 pumping unit and one measurement transducer FM-1007. One pumping unit can supply two measuring systems which can operate simultaneously (Two measuring systems for the same product on each side of dispenser).
- measuring system with Q_{\max} 50 L/min, which contains one FP-1022 pumping unit and one measurement transducer FM-1022. One pumping unit can supply two measuring systems which can operate simultaneously (Two measuring systems for the same product on each side of dispenser).
- high speed measuring system with Q_{\max} 80 L/min, which contains one FP-1001 B02 pumping unit and one measurement transducer FM-1007. One pumping unit can supply two measuring systems which can operate simultaneously (two measuring systems for the same product on each side of dispenser).
- high speed measuring system with Q_{\max} 80 L/min, which contains one FP-1022 pumping unit and one measurement transducer FM-1022. One pumping unit can supply two measuring systems which can operate simultaneously (Two measuring systems for the same product on each side of dispenser).
- ultra high-speed measuring system with Q_{\max} 130 L/min, which contains parallel mounting of two FP-1001 B02 pumping units and parallel mounting two measurement transducers FM-1007. (The fuel is dispensed via one nozzle only).
- ultra high-speed measuring system with Q_{\max} 130 L/min, which contains parallel mounting of two FP-1022 pumping units and parallel mounting two measurement transducers FM-1025. (The fuel is dispensed via one nozzle only).
- ultra high-speed measuring system with Q_{\max} 160 L/min, which contains parallel mounting of two FP-1001 B02 pumping units with a measurement transducer FF-1006. (The fuel is dispensed via one nozzle only).
- ultra high-speed measuring system with Q_{\max} 160 L/min, which contains parallel mounting of two FP-1022 pumping units with a measurement transducer FF-1006. (The fuel is dispensed via one nozzle only).

These types of measuring systems can be installed in one fuel dispenser and they can be connected to one electronic calculator only.

Satellite delivery point can be present as second delivery point on one measuring system. There is version for installation in centrally pumped system. The LPG modules of the type SHARK MOD 2xxx.S/LPG and OCEAN MOD 4xxx.O/LPG, which were certified separately, could be connected. The AdBlue modules of the type SHARK MOD 2xxx.S/AdB and OCEAN MOD 4xxx.O/AdB, which were certified separately, could be connected.

The WSE modules of the type SHARK MOD 2xxx.S/WSE and OCEAN MOD 4xxx.O/WSE, which were certified separately, could be connected.

The SHARK BMP 5xx.S and 2xxx.S, OCEAN BMP 4xxx.O and SUNNY-XE EURO Sxx xxxx.E fuel dispensers could be connected into independent Point of Sale or Paying terminal, which do not influence metrological parameters of measuring system.

These fuel dispensers are compatible with and may be connected to all self-service devices with proprietary protocols PDE, TATSUNO or other protocols notified in their evaluation certificates.

1.1. Pumping unit with gas separator

These pumping units can be used alternatively.

1.1.1. TATSUNO FP-1001 pumping unit has two different models, model B01 with Q_{\max} 50 L/min and model B02 with Q_{\max} 80 L/min. There is difference in volume of pump only. The gas elimination device is the same with Q_{\max} 80 L/min. There are two manufacturers of pumping units TATSUNO CORPORATION, Japan and SHANGHAI TATSUNO CORPORATION, China.

TATSUNO FP-1001 pumping unit used for Diesel and Biodiesel is equipped with TATSUNO – BENČ VRS1 Air Flow Sensor.

1.1.2. TATSUNO FP-1022 pumping unit is fitted with integrated gas separator which is equipped with ZE-2063 magnetic air sensor with Q_{\max} = 80 L/min. There are two configurations of this pumping unit with Q_{\max} = 80 L/min or Q_{\max} = 50 L/min which differ only in revolutions of gear pump shaft.

1.2. Measurement transducer

These measurement transducers can be used alternatively.

1.2.1. TATSUNO FM-1007 measurement transducer consists of a positive displacement measuring sensor with four pistons with cyclic volume 0.5 L and TATSUNO EK-1025 two-channel photoelectric transmitter (pulser) with 50 pulses / revolution and adjustment device.

This measuring sensor can be used for temperature range of measured liquid (-20 to 50) °C.

1.2.2. TATSUNO FM-1025 measurement transducer consists of a positive displacement measuring sensor with four pistons with cyclic volume 0.5 L and TATSUNO ZE-1945 magnetic transmitter (pulser) with 50 pulses / revolution and adjustment device.

This measuring sensor can be used for temperature range of measured liquid (-40 to 50) °C.

TATSUNO FM-1007 and TATSUNO FM-1025 measurement transducers can be adjusted by varying of the strokes of one pair of pistons by the adjustment screw. The regulation is non-continual with steps 0.08 %. Maximum range of adjustment is about ± 1 %. Location of adjustment screw is protected by pin.

1.2.3. TATSUNO FF-1006 measurement transducer consists of a Lobe type positive displacement measuring sensor with cyclic volume 0.16 L and ZE-1945 magnetic transmitter (pulser). This measurement transducer is not equipped with any adjusting device. Flow range of FF-1006 transducer is 10 to 200 L/min and temperature range of measured liquid is (-40 to 50) °C.

TATSUNO FF-1006 measurement transducer was separately certified by Evaluation certificate No. ZR 141/11-0082 issued by CMI, Notified Body 1383.

1.3. Calculator

These electronic calculators can be used alternatively.

1.3.1. There are three different models of TATSUNO PDE electronic calculator. Models PDEVOL can control one measuring system only, model PDEDUO can control two measuring systems and model PDEMPD can control ten measuring systems maximally, two simultaneously. PDEVOL calculator do not consist price indicating device. Software version 3.34

This electronic calculator can be operated by buttons of IR module (remote control). It is necessary to change over value of number of pulses per L, which is stored in memory of calculator (parameter P 44) for electronic calibration. Access to electronic calibration is secured by switch SW1 (location OFF – left site) with sealing cover, alternatively in case of model PDEDUO by DIP switch SW1-1 (location ON – up) with sealing cover.

1.3.2. There are two different models of TATSUNO PDEX electronic calculator. Model PDEDUOX can control two measuring systems and model PDEMPDX can control ten measuring systems maximally, two simultaneously. Calculator PDEX can operate separately or can be controlled by central system of filling station. It can communicate by RS485 by PDE, PumaLAN and ER4 protocol.

Software version 1.03

W&M checksum 20260

This electronic calculator can be operated by buttons of IR module (remote control). It is necessary to change over value of number of pulses per L, which is stored in memory of calculator (parameter P 44) for electronic calibration. Access to electronic calibration is secured by DIP switch SW1-1 (location ON – up) with sealing cover.

1.3.3. There are two different models of TATSUNO TBELTx electronic calculator. Model TBELT2 can control two measuring systems and model TBELT4 can control four measuring systems at maximum, two simultaneously. Calculator TBELTx can operate separately or can be controlled by central system of filling station. It can communicate by RS485 by PDE, PumaLAN and ER4 protocol.

Software version 1.01

W&M checksum 8CA4

This electronic calculator can be operated by four buttons keyboard. It is necessary to change over value of number of pulses per dm^3 , which is stored in memory of calculator (parameter P14, P15, P16 and P17) for electronic calibration. Access to electronic calibration is secured by DIP switch SW1-1 (location ON – up) with sealing cover.

1.3.4. There is UNIDATAZ CDC electronic calculator with included card system used for self-service dispensing.

This electronic calculator can handle up to two nozzles, and is able to serve to one customer at a time only.

This electronic calculator can be equipped with ATC conversion function to converse the measured data to volume at a base temperature of 15°C for gasoline, diesel, LPG, heating oil and biofuels. There has connected certified temperature sensor Pt100.

This electronic calculator could be connected into independent Point of Sale or Paying terminal device which do not influence metrology parameters of measuring system.

Software version and W&M checksum: See bellow mentioned Evaluation certificate.

UNIDATAZ CDC electronic calculator was separately certified by Evaluation certificate No. ZR 141/10-0073 issued by CMI, Notified Body 1383.

1.3.5. Hectronic GmbH TA2331 electronic calculating and indicating device / self-service device was separately certified by Evaluation certificate No. GB-1286 issued by NWML, Notified Body 0126.

Approved Software version: Release II: „SW2331.75.110.xxx“; Release III: „SW2331.75.130.xxx“

Other information in the related Evaluation certificate.

1.3.6. Hectronic GmbH HECONOMY electronic calculating and indicating device / self-service devices were separately certified by Evaluation certificates No. A0445/4225/2012 and No. A0445/1718/2013 issued by BEV, Notified body 0445.

Approved Software version: 1.0.3.x; 1.0.4.x ; 1.0.5.x; 1.0.6.x; 2.0.0.x; 1.1.7.x; 2.1.0.x

W&M checksum: FC DLL = 28D9; CON DLL = 946B

Other information in the related Evaluation certificate.

1.3.7. Männl Elektronik GmbH, Tankmanagementsystem ME-TMS electronic calculating and indicating device / self-service device was separately certified by Type certificate No. DE-M-PTB-0075 issued by PTB, Notified body 0102.

Approved Software version: 03.00

W&M checksum: (1D63)hex or (07523)dec

Other information in the related Evaluation certificate.

1.4. Conversion device

PDEINP unit

1.5. Self-service device

1.5.1. Hectronic GmbH HECSTAR and HECFLEET NT self-service devices were separately certified by Evaluation certificate No. A0445/2641/2011 issued by BEV, Notified body 0445.

1.5.2. ALX TECHNOLOGIES, EUROPILE and EUROPOLE self-service devices were separately certified by Evaluation certificates No. LNE-17492-3 and No. LNE-28279-0 issued by LNE, Notified body 0071.

1.5.3. NPS A/S, PAY SYS payment terminal separately certified by Evaluation certificate No. SC311-12 issued by SP, Notified body 0402.

1.6. Temperature sensor

1.6.1. Pt100 ZPA Nová Paka 112 705 714/ZP9306

1.6.2. Pt100 TRESTON TAB-01-Ex

1.6.3. Pt100 TATSUNO EUROPE Pt100Ex

1.7. Hose

ELAFLEX Conti - Slimline DN 16, 21 and 25; maximum length 8 m for MMQ less than 10 L or 25 m for MMQ 10 L

1.8. Nozzle

1.8.1. ELAFLEX ZVA SLIMLINE, ZVA 25, ZVA 32, ZVA 200 GR,

1.8.2. TATSUNO FN-1001, FN-1004, FN-1021, FN-1023, FN-1024 and FN-1025

1.8.3. OPW AVANCE

2. Basic technical data

Measuring system type:	Normal	High speed	UHS
Maximum flowrate Q_{\max} [L/min]:	30 to 50*	70 to 80	120 to 160
Minimum flowrate Q_{\min} [L/min]:	3 to 5*	5	10
Min. measured quantity MMQ [L]:	2	5	10
Maximum unit price (number of digits):	9999 (4)		
Maximum price to pay (number of digits):	999999 (6)		
Type of display:	Electronic		
Type of liquids:	Gasolines, Diesel and Ethanol		
Liquid temperature range:	Liquid temperature range is defined by liquid temperature range of used measuring sensor.		
Maximum pressure [MPa]:	0.4		
Minimum pressure [MPa]:	0.16 for gasoline 0.20 for diesel		
Accuracy class:	0.5		
Ambient temperature range [°C]:	-25 to +55 -40 to +55 with additional internal heating or with CDC electronic calculator		
Mechanical class:	M1		
Electromagnetic class:	E1		
Humidity:	Condensing		
Location:	Open		

* The minimum ratio of $Q_{\max} : Q_{\min}$ has to be 10:1.

3. Test

Technical tests of the SHARK BMP 5xx.S and 2xxx.S, OCEAN BMP 4xxx.O and SUNNY-XE EURO Sxx xxxx.E fuel dispensers were performed according to the International Recommendation OIML R 118 *Testing procedures and test report format for pattern evaluation of fuel dispensers for motor vehicles* and in conformity with International Recommendation OIML R 117-1 *Dynamic measuring systems for liquids other than water*.

Test Report No. 6031-PT-P018-06 issued on 21 December 2006, Test Report No. 6015-PT-P006-08 issued on 25 April 2008 (PDEX extension), Test Report No. 6015-PT-P0002-10 issued on 28 April 2010 (TBE extension), Test report No. 8551-PT-E0151-10 issued 23 February 2011 (EMC), Test report No. 6015-PT-P0047-11 issued on 23 May 2011 (addition of the FM-1025 transducer), Test report No. 6015-PT-P0007-12 issued on 17 February 2012 (addition of the FF-1006 transducer and HECTRONIC self-service device), Test Report No. 6015-PT-P0086-11 issued on 16 August 2011 (SUNNY-XE EURO dispenser), Test report No. 6015-PT-P0002-13 issued on 14 January 2013, Test report No. 6015-PT-P0048-13 issued on 20 January 2014.

All the Test reports were issued by Czech metrology institute, Notified body No. 1383.

4. The measuring device data

There are at least following data on the pumping unit, measuring sensor, pulse transmitter, temperature sensor, conversion device and on the electronic calculator:

- Manufacturer's name, mark or trademark
- Type designation
- Serial number
- Alternatively other relevant characteristics (e.g. Q_{\max} , Q_{\min} , P_{\max} , liquids to be measured, MMQ, temperature range etc.)

There are following data on the each measuring system:

- The "CE" marking and supplementary metrology marking
- Number of EU-type examination certificate
- Manufacturer's name, mark or trademark and post address
- Type designation
- Serial number and year of manufacture
- Accuracy class
- Minimum measured quantity (MMQ)
- Maximum flowrate (Q_{\max})
- Minimum flowrate (Q_{\min})
- Maximum pressure (P_{\max})
- Liquids to be measured
- Liquid temperature range
- Ambient temperature range
- Mechanical class
- Electromagnetic class

The name plate must be inseparably fixed to the construction and clearly visible in normal conditions of use.

There are following data on each face of indicating device visible to user during the operation:

- Near price indication - unit of national currency (e.g. €)
- Near volume indication – unit of volume (ℓ or L or word Litre)
- Near unit price indication - unit price per litre (e.g. € / L or € / Litre)
- Information regarding the minimum measured quantity (MMQ)
- Information regarding base temperature ($T_b = 15\text{ °C}$) in case of active ATC conversion function

All data are in an official language of country where the dispenser is put into operation.

5. Conditions for approval and sealing

Before putting into use it has to be verified that the fuel dispenser is in conformity with this certificate and meets its requirements.

It is recommended to perform the accuracy test at three flow rates:

- Q_{\max} or maximum attainable,
- 25% of Q_{\max} and
- Q_{\min} .

All measured errors have to be in range of tolerance $\pm 0.5\%$.

The switch SW1 has to be set to position OFF (left site) in case of PDEMPD electronic calculator.

The dip switch SW1-1 has to be set to position ON (up) and switch SW1-4 has to be set to position OFF in case of PDEDUO, PDEX and TBELTx electronic calculators.

The DIP switches No. 2 and 3 have to be set to position OFF in case of ADPxxx electronic calculator.

The switch S3 has to be set to position OFF (position up) in case of CDC electronic calculator.

Each measuring system has to be sealed after the conformity assessment with positive result according to following description and pictures:

On the FP-1001 pumping unit:

- | | |
|--|----|
| a) Connection of pumping unit body with gas separator cover and float room cover | 1× |
| b) Connection of pumping unit body with check valve flange | 1× |
| c) Connection of pumping unit body with air flow sensor, if any | 1× |

On the FM-1007 measurement transducer:

- | | |
|--|----|
| d) Connection of transducer body with pistons covers | 1× |
| e) Connection of adjustment device pin with piston cover and type plate | 1× |
| f) Connection of transducer body with upper cover and pulser and totalizer, if any | 1× |
| g) Connection of transducer body with bottom cover | 1× |

On the PDE, PDEX, TBELTx electronic calculator:

- | | |
|---|----|
| h) Connection of calculator cover with calculator console and SW1 switch cover, if separate | 1× |
| i) Connection of cover of electromechanical totalizer with display mask | 1× |
| j) Type plate of calculator | 1× |

On conversion device, if any:

- | | |
|--|----|
| k) Connection of PDEINP unit cover with calculator console | 4× |
| l) Type plate of PDEINP unit, if separate | 1× |
| m) Connection of ATC temperature sensor with the pipe | 1× |
| n) Type plate of temperature sensor, if separate | 1× |

On the fuel dispenser:

- | | |
|---|----|
| o) Connection of dispenser name plate with fuel dispenser frame | 1× |
| p) Symbol of relevant measuring system on the name plate | 1× |
| q) Fuel dispenser data sheet (identification of data on document) | 1× |

On the FP-1022 pumping unit:

- | | |
|--|----|
| r) Connection of pumping unit body with upper cover and gas elimination device cover | 1× |
|--|----|

On the FM-1025 measurement transducer:

- | | |
|---|----|
| s) Connection of measurement sensor body with three pistons covers | 1× |
| t) Connection of sensor body with pistons cover, pulser, adjustment device and data plate | 1× |

On the UNIDATAZ CDC electronic calculator:

- | | |
|---|----|
| u) Connection of S3 switch cover with CPU unit | 1× |
| v) Connection of CPU unit with calculator console | 1× |
| w) Connection of electromechanical totalizer to the frame | 1× |
| x) The type plate of calculator | 1× |

On the FF-1006 measurement transducer:

- y) Connection of the upper cover and pulser cover with transducer body 1x
- z) Type plate of the meas. transducer 1x

On the Hectronic GmbH TA2331 calculating/indicating device/self-service device:

- Access to the calibration switch located on the CPU board is protected by metal cover 1x

On the Hectronic GmbH HECSTAR or HECFLEET NT self-service device:

- Type plate of the SSD on the case of the SSD shall be sealed. 1x
- Metal plate covering the CPU-board "PC/104" and the I/O-board "EB104" 1x
- Metal angle bracket, which protects the compact flash card against removal 1x
- Each (optional) interface FCI 2040 shall be sealed by sealing two screws of the metal cover 1x

On the Hectronic GmbH HECONOMY calculating/indicating device/self-service device:

- Type plate of the SSD on the case of the SSD shall be sealed 1x
- Compact flash disk shall be sealed against removal 1x
- Each (optional) interface FCI 2040 shall be sealed by sealing two screws of the metal cover 2x
- In the case when the SSD is connected to the pulsers of the fuel dispensers, the ingoing pulser lines shall be sealed by screw which fixes the cover on the interface FCI-2040 1x

On the ALX Technologies EUROPOLE and EUROPILE self-service device:

- According to Evaluation certificates No. LNE-17492-3 and No. LNE-28279-0

On the Männl Elektronik GmbH Tankmanagement system ME-TMS calculating/indicating device/self-service device:

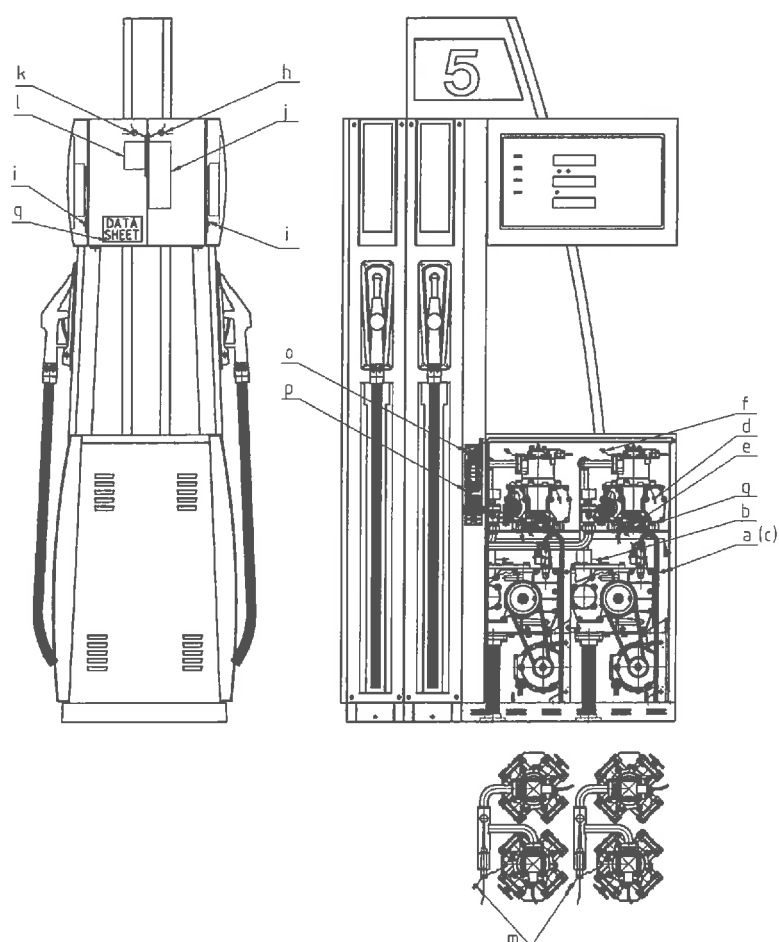
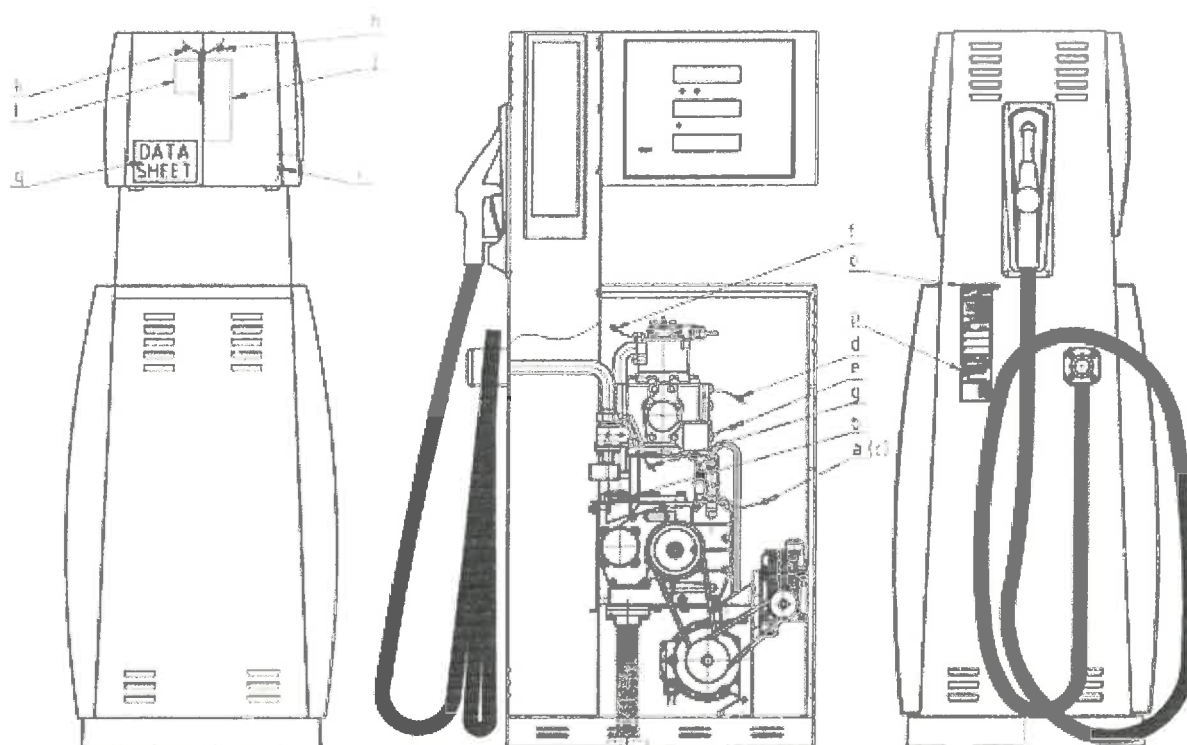
- According to Type certificate No. DE-M-PTB-0075

On the NPS A/S PAY SYS outdoor terminal:

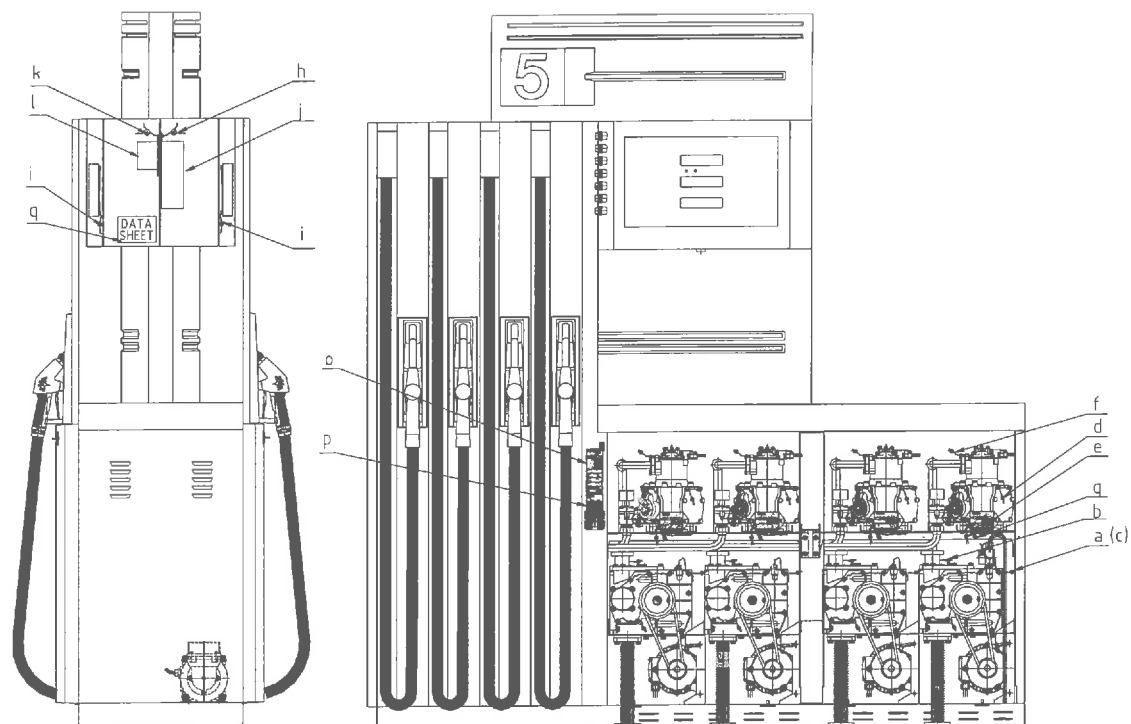
- According to Evaluation certificate No. SC311-12

Additional sealing points beyond the requirements of OIML R 117-1 and WELMEC 10.6 can be used on special request of the local W&M authority.

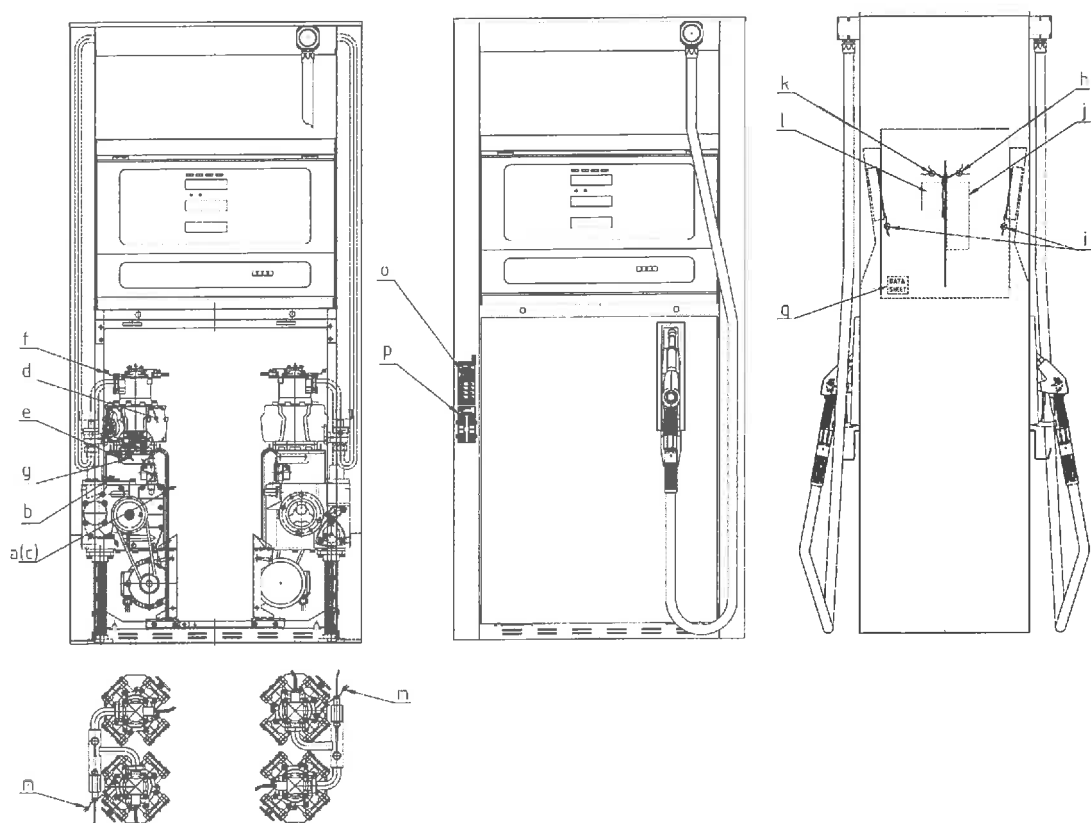
Picture No. 1: The sealing of SHARK 5xx.S and 2xxx.S fuel dispenser



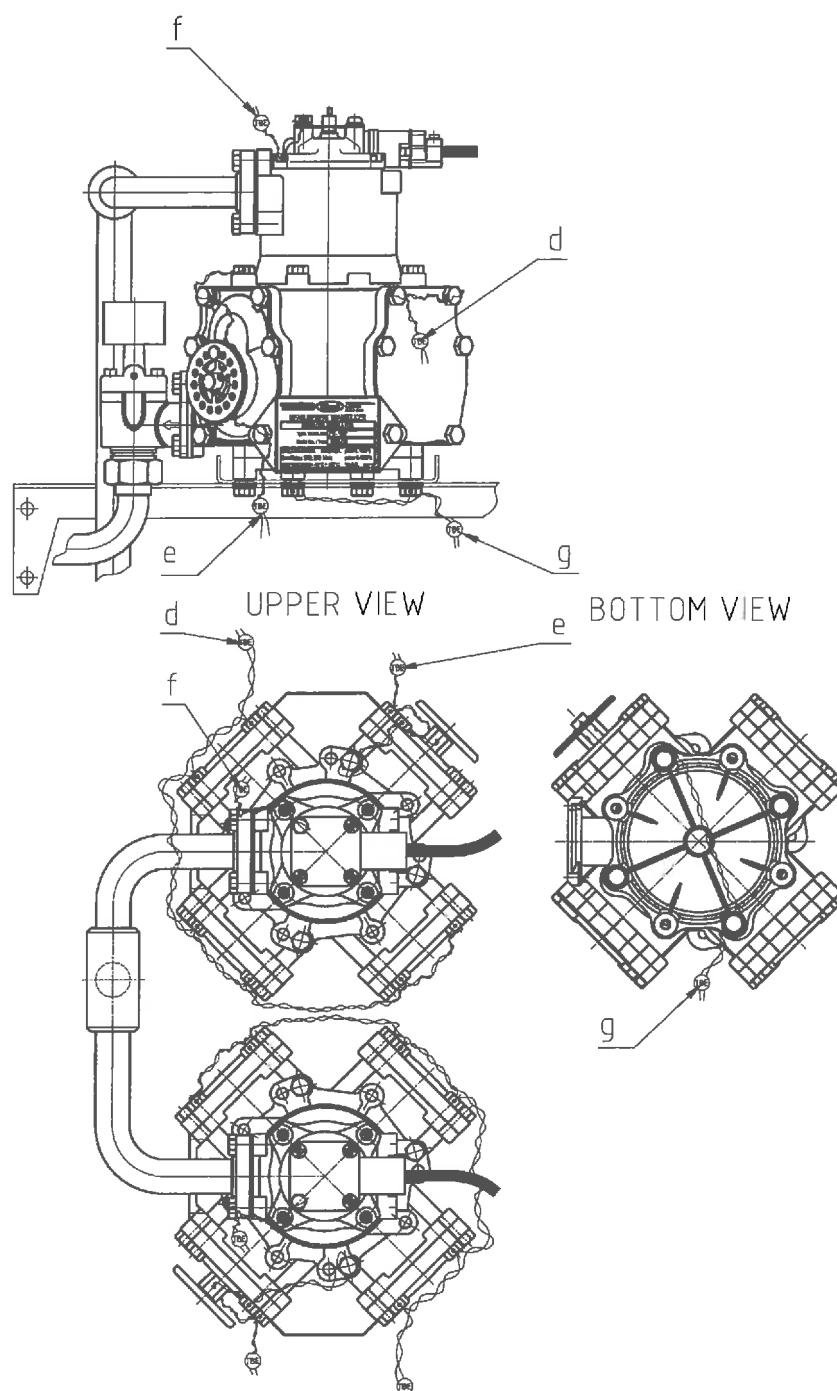
Picture No. 2: The sealing of OCEAN BMP 4xxx.O dispenser



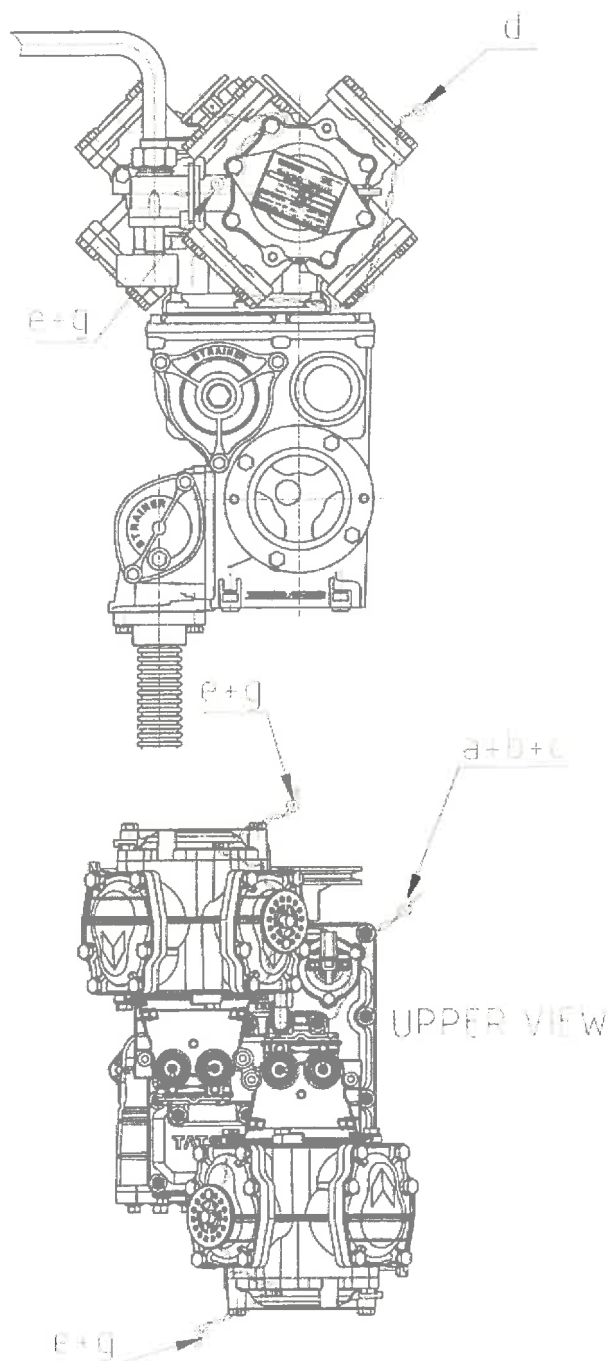
Picture No. 2a: The sealing of SUNNY-XE EURO Sxx xxxx.E fuel dispenser



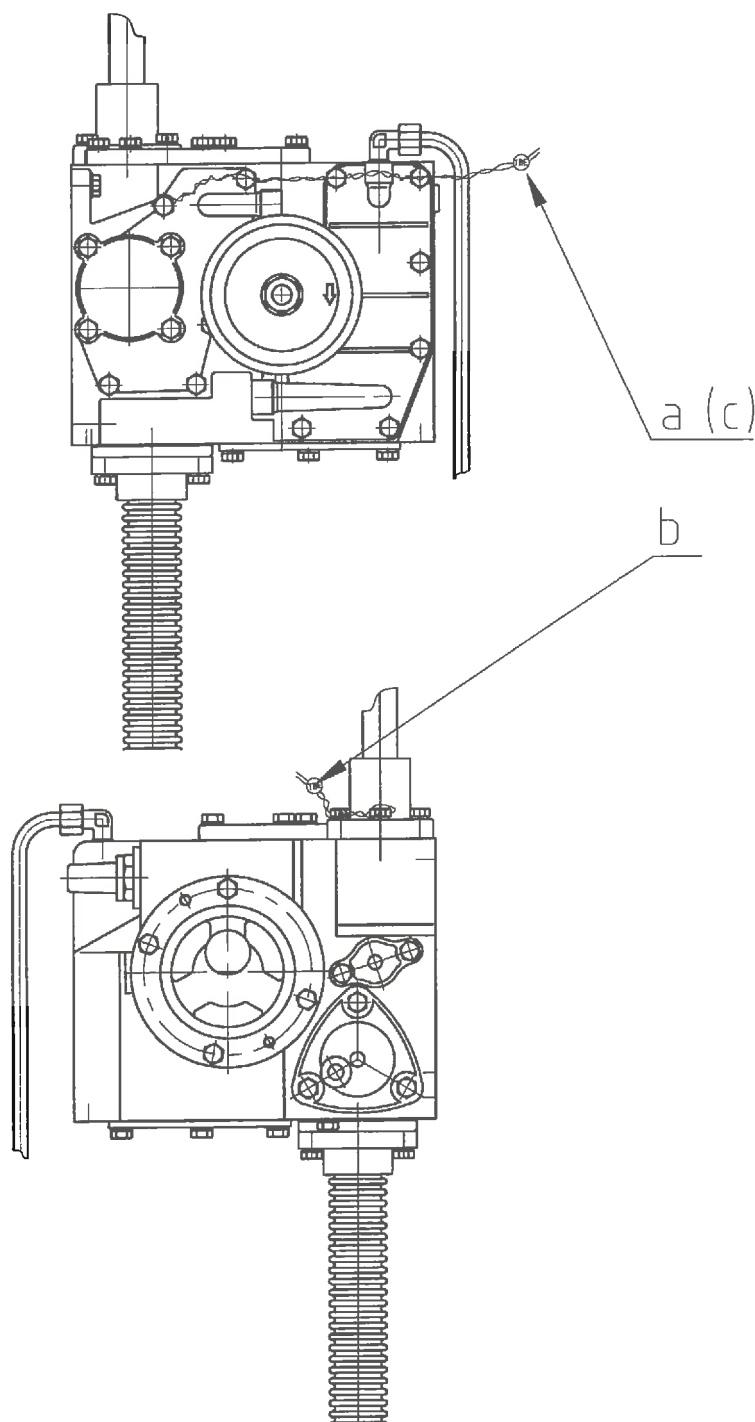
Picture No. 3: The sealing of FM-1007 measurement transducer



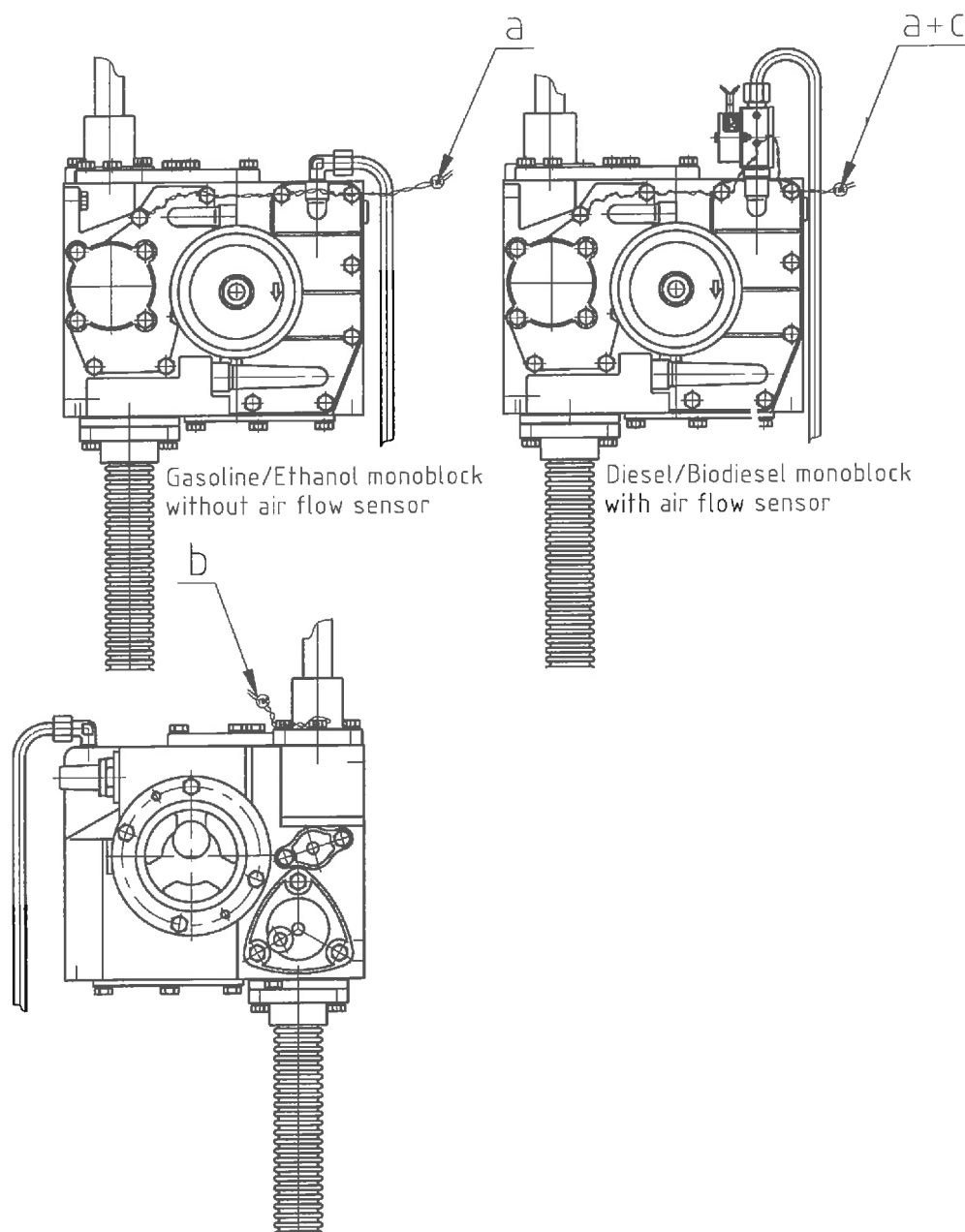
Picture No. 4: The sealing of FM-1025 measurement transducer and FP-1022 pumping unit



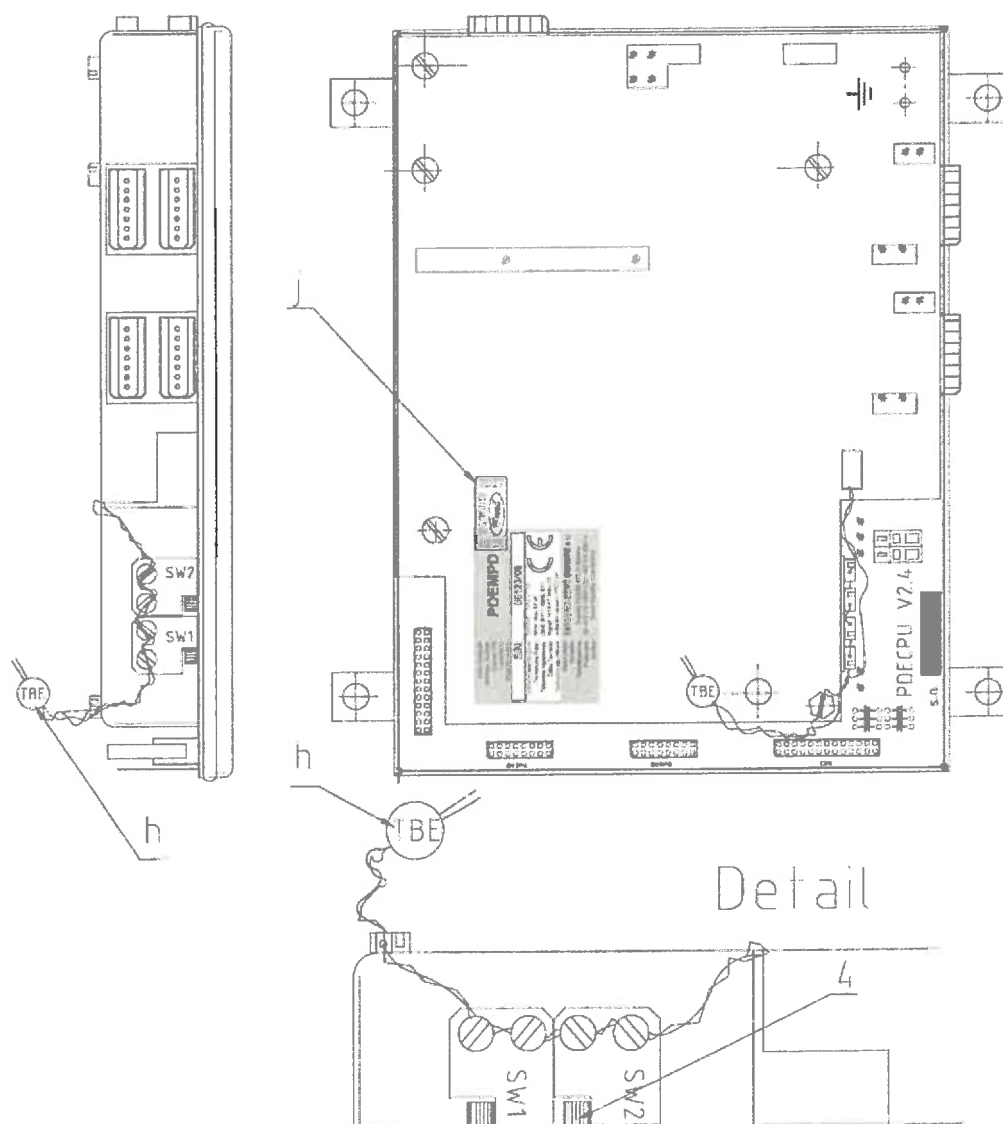
Picture No. 5: The sealing of FP-1001 pumping unit



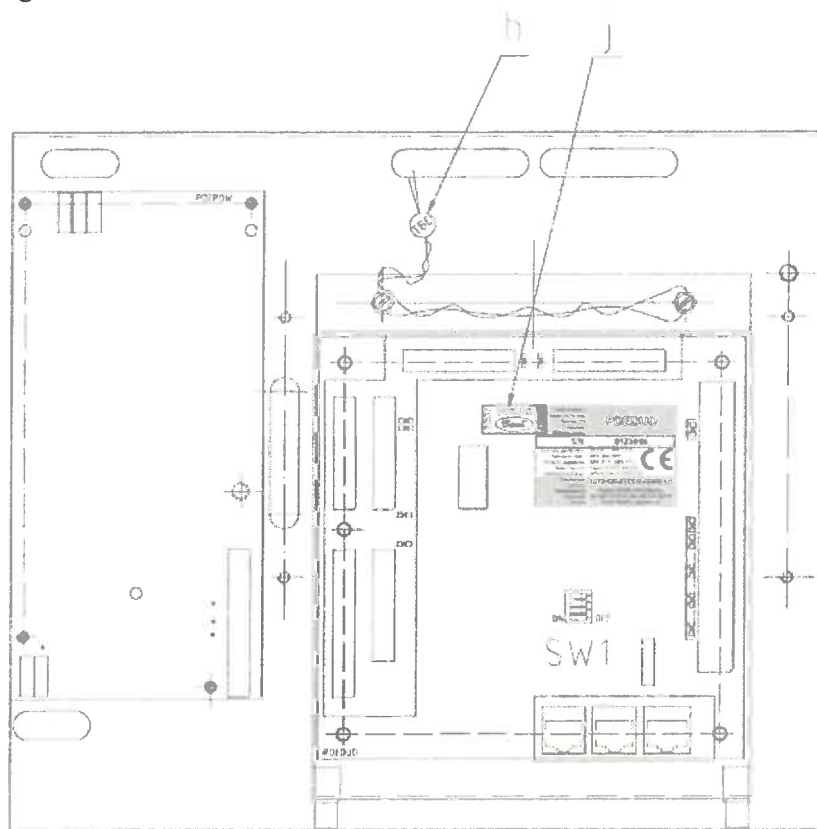
Picture No. 6: The sealing of FP-1001 pumping unit with Air Flow Sensor



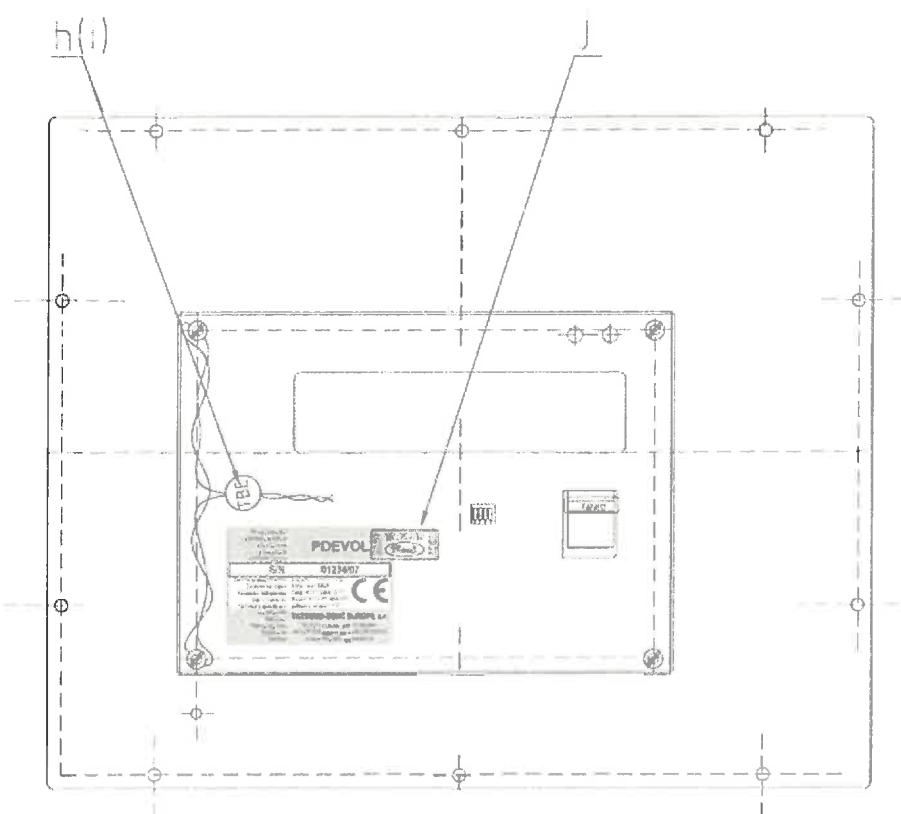
Picture No. 7: The sealing of PDEMPD electronic calculator



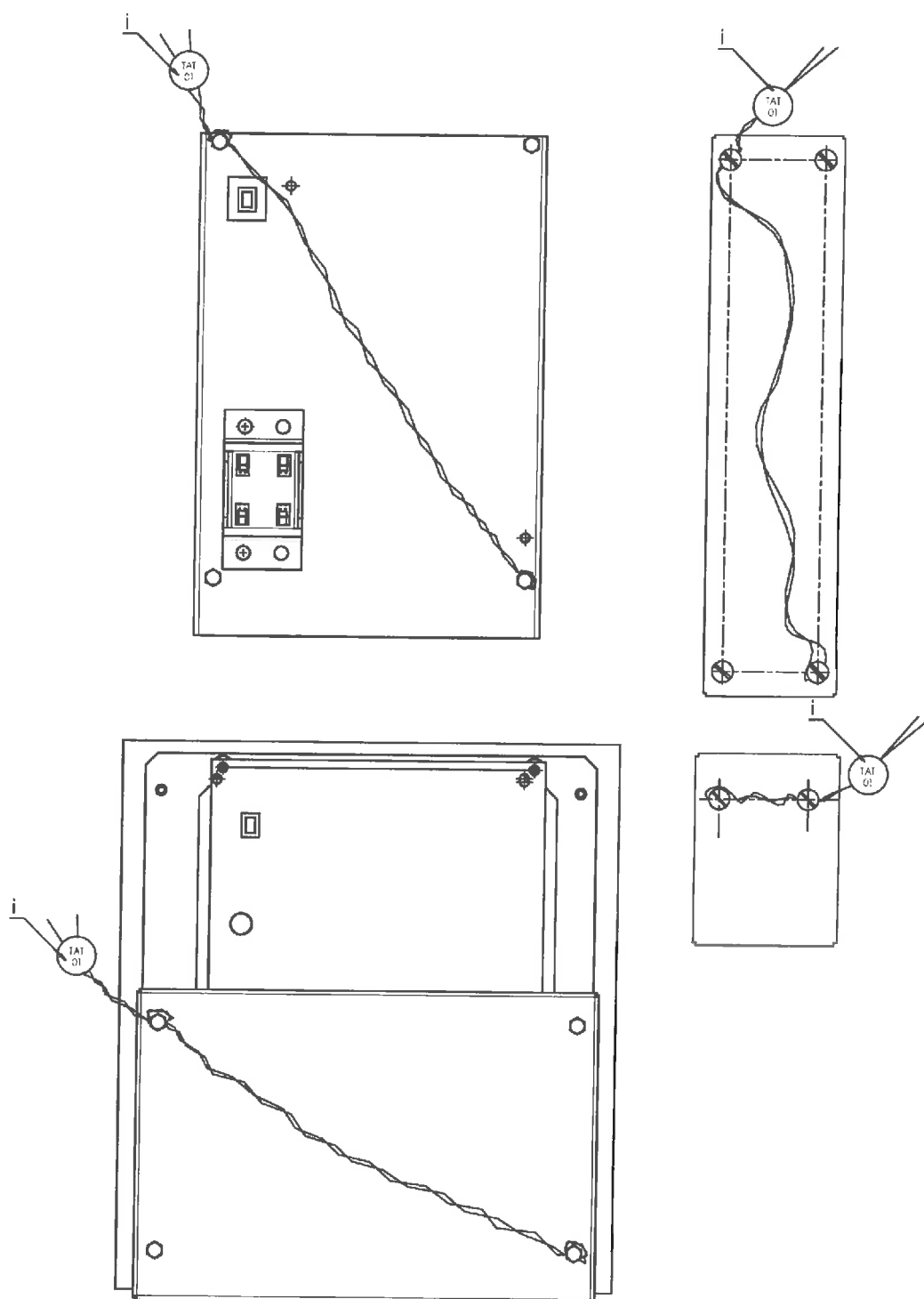
Picture No. 8: The sealing of PDEDUO calculator



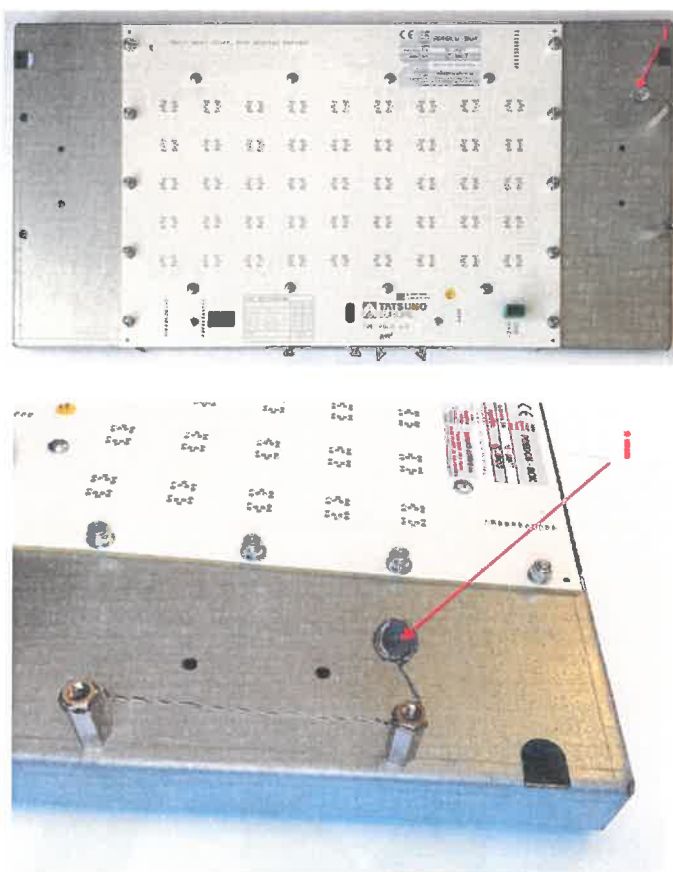
Picture No. 9: The sealing of PDEVOL calculator



Picture No. 10: The sealing of totalizing indicating device



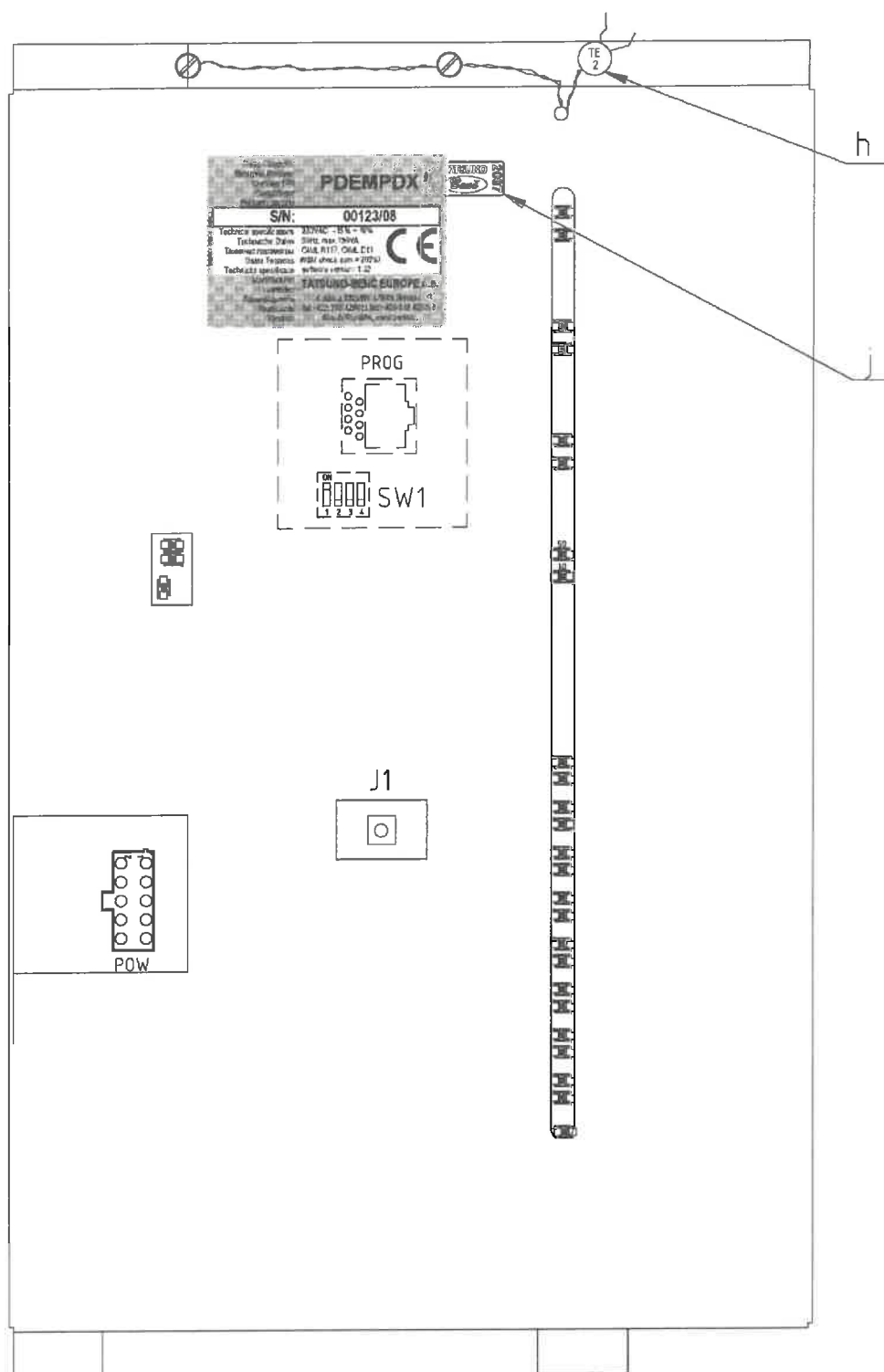
Picture No. 10a: Sealing of the totalizing indicating device with proportional display PDEDCU



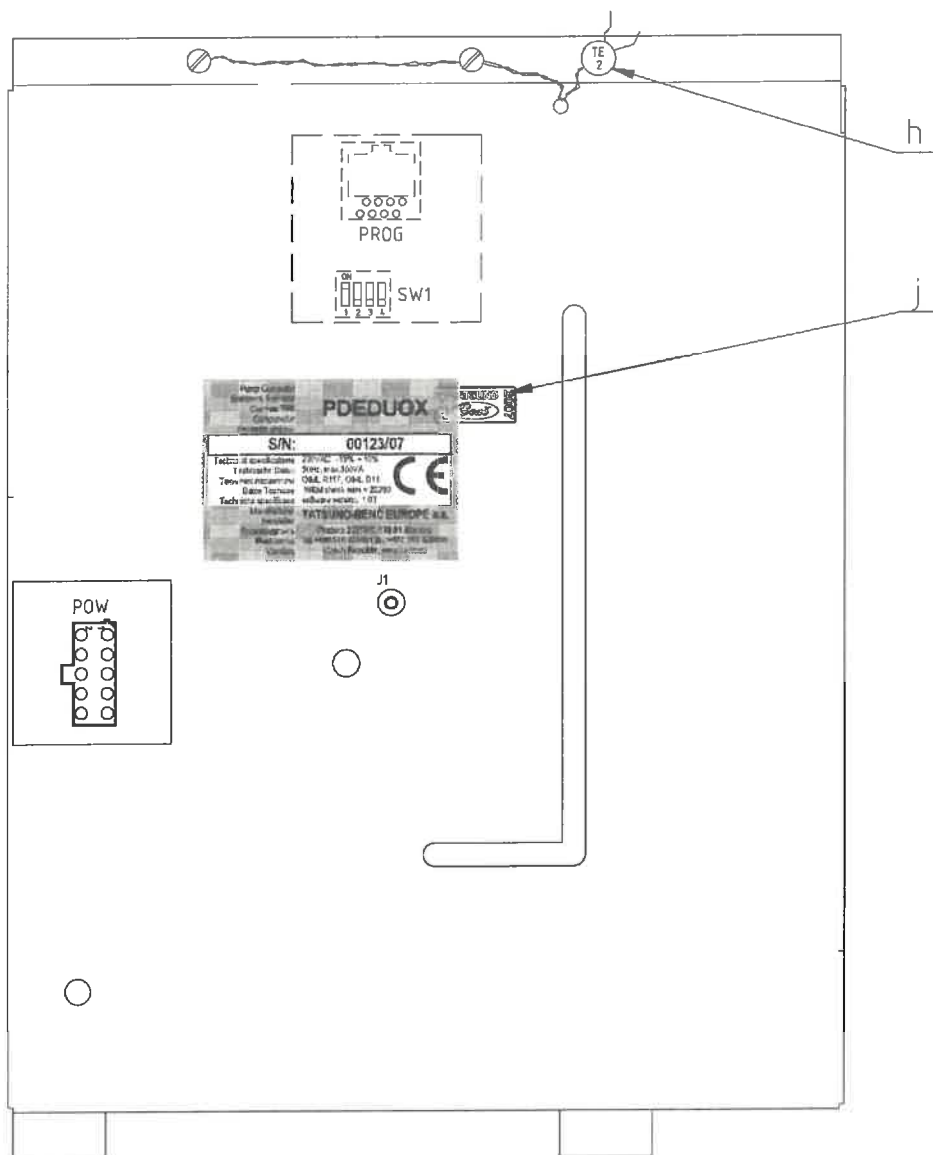
Picture No. 10b: Sealing of the totalizing indicating device with display PDEDIL V6



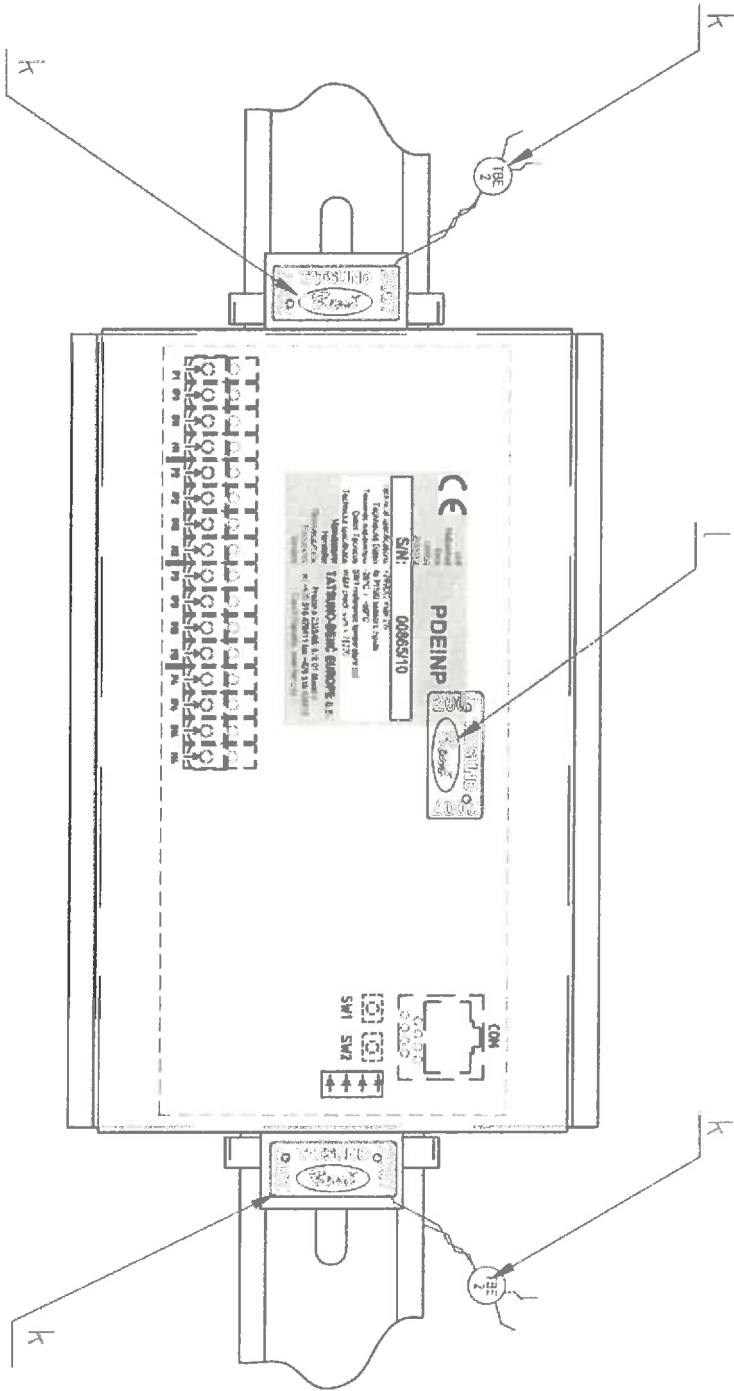
Picture No. 11: The sealing of PDEMPDX calculator



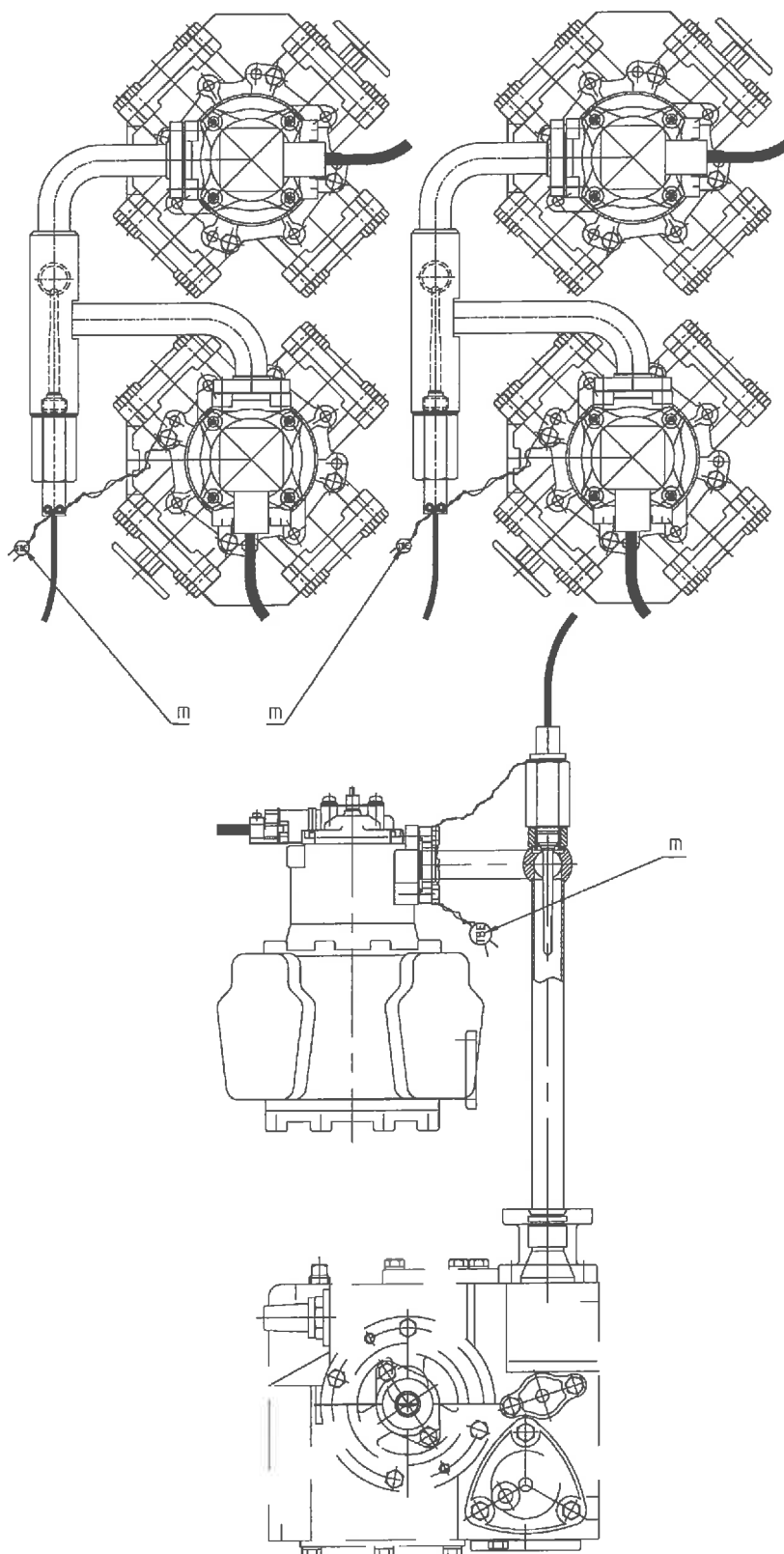
Picture No. 12: The sealing of PDEDUOX calculator



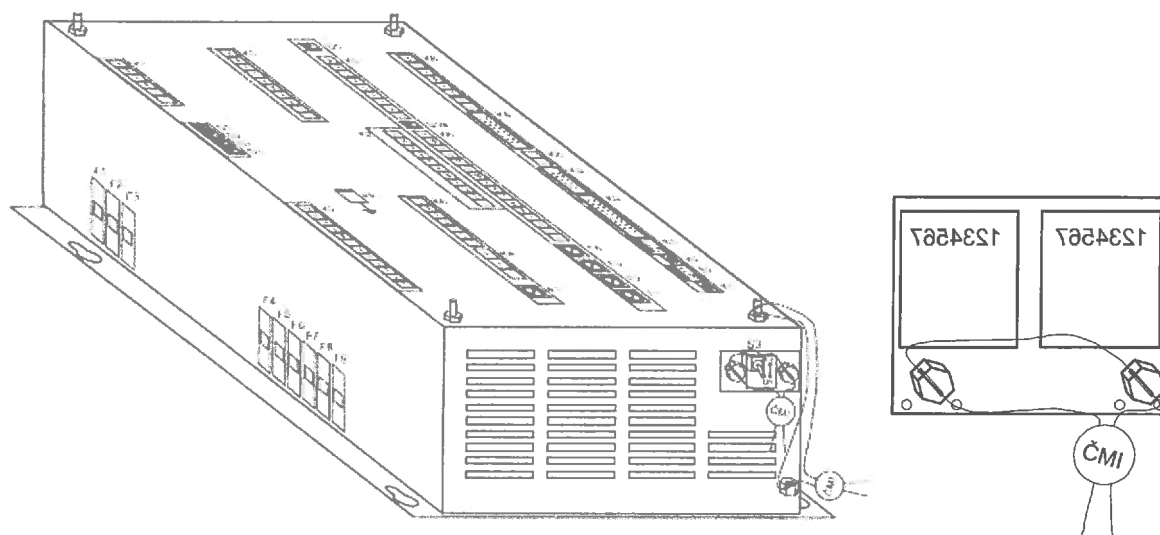
Picture No. 13: The sealing of PDEINPX conversion device



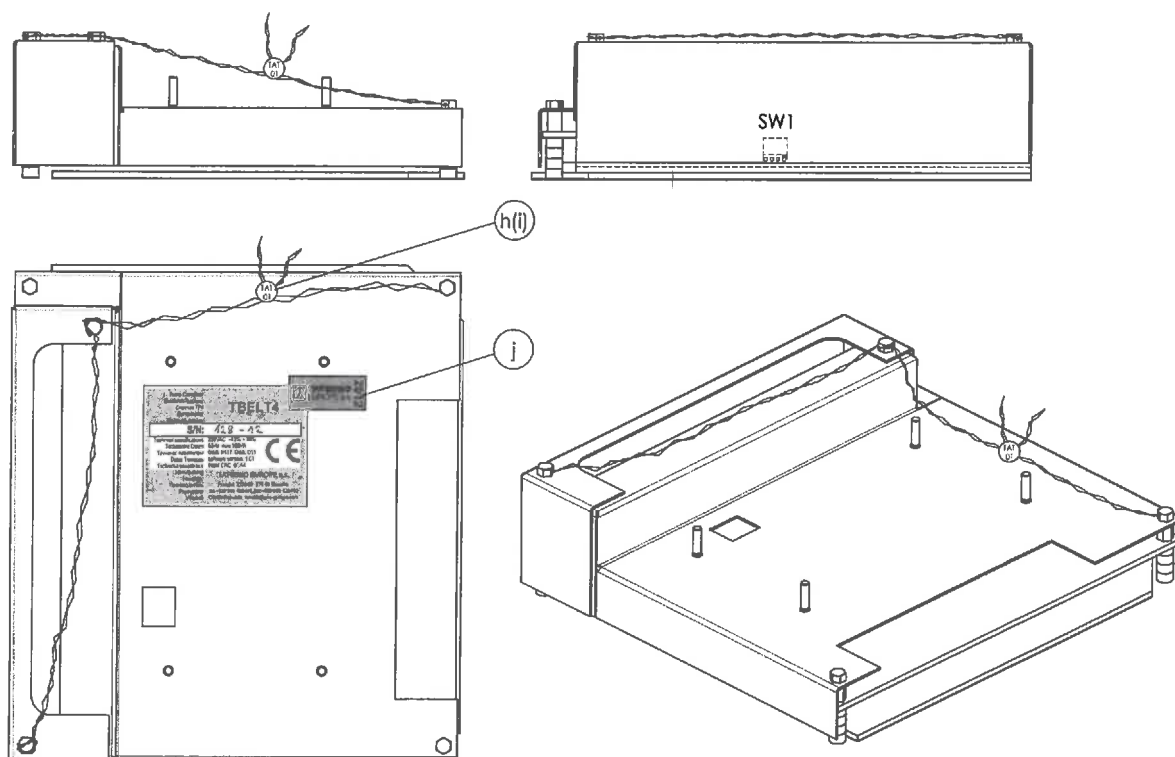
Picture No. 14: The sealing of Pt100 temperature sensor (liquid fuel dispenser)



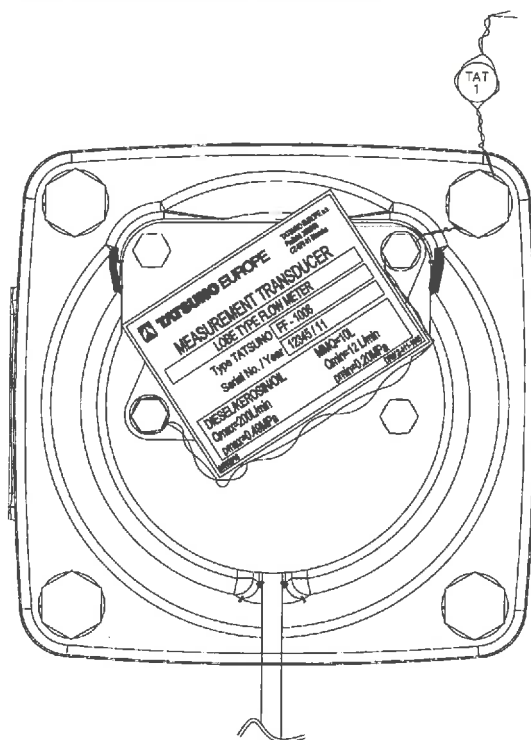
Picture No. 15: The sealing of the UNIDATAZ CDC electronic calculator with totalizer



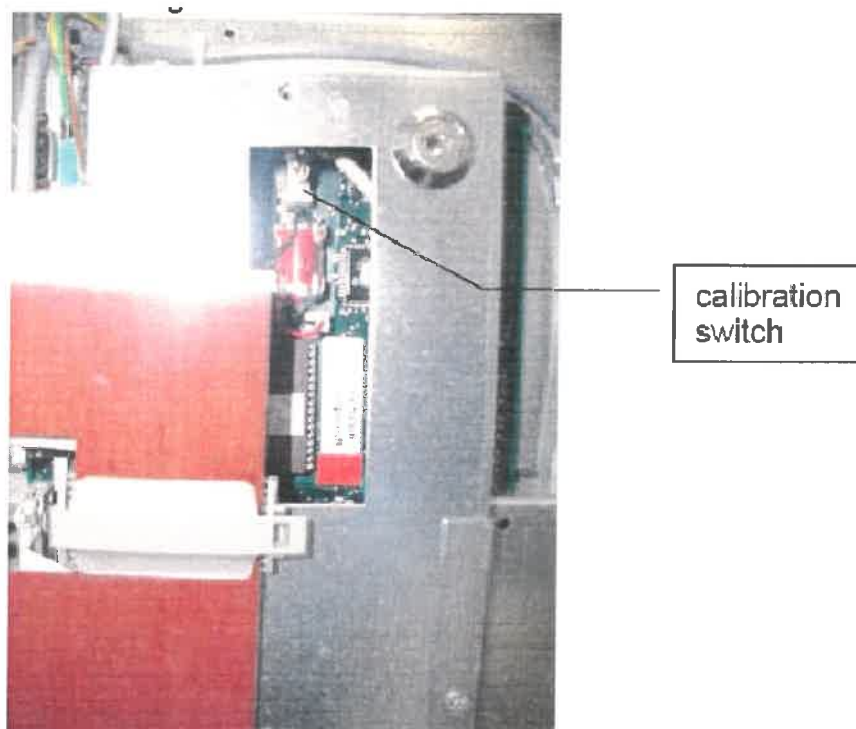
Picture No. 16: The sealing of TBELTx calculator



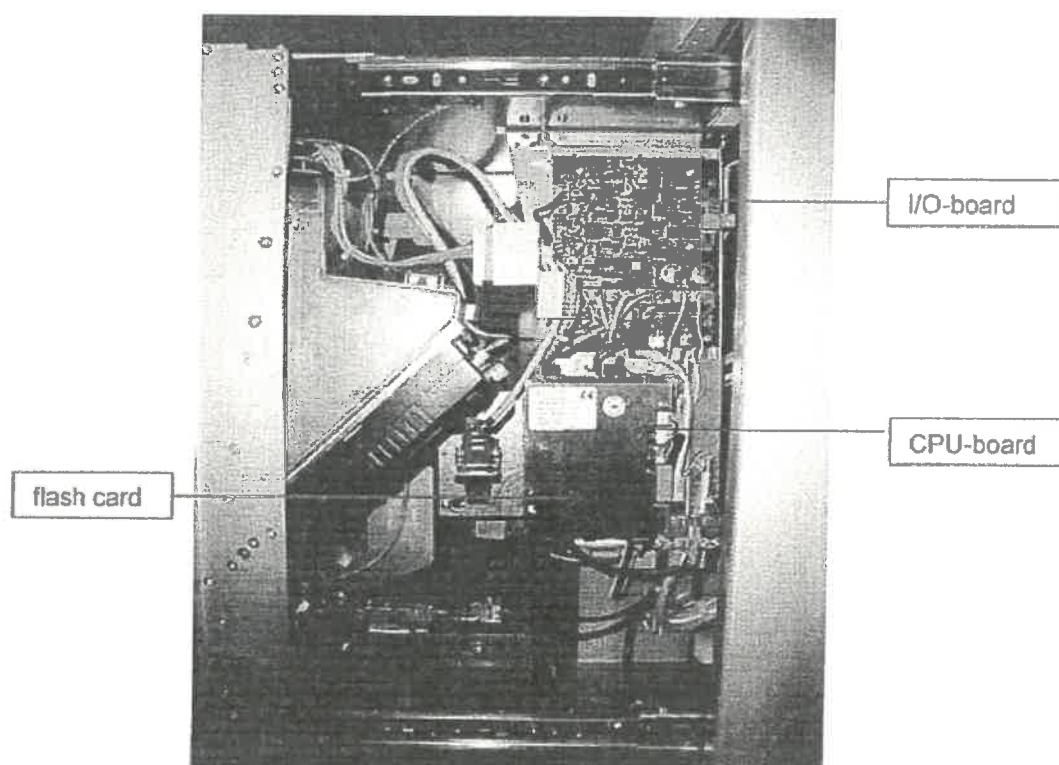
Picture No. 17: Sealing of the FF-1006 measurement transducer



Picture No. 18: Sealing of calibration switch of Hectronic GmbH TA2331 self-service device



Picture No. 19: Sealing of CPU and flash card of Hectronic GmbH HECSTAR/ HECFLEET NT self-service device



Picture No. 20: Sealing of CPU, type label, flash disk and pulsers of Hectronic GmbH HECONOMY self-service device

