



Czech Metrology Institute

Notified Body No. 1383, Okružní 31
638 00 Brno

EC-TYPE EXAMINATION CERTIFICATE

Number: TCM 141/07 - 4491

Addition 5

Issued by: **Český metrologický institut**
Okružní 31
638 00 Brno
Czech Republic

Notified Body No. 1383

In accordance with: point 3 of annex 2 to Government Order No. 464/2005 Coll. (annex B of the Directive 2004/22/EC) from 19 October 2005 that lays down technical requirements on measuring instruments and implements in Czech Republic Directive 2004/22/EC of the European Parliament and of the Council.

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

In respect of: **fuel dispenser**
type: **SHARK BMP 5xx.S**
SHARK BMP 2xxx.S
OCEAN BMP 4xxx.O

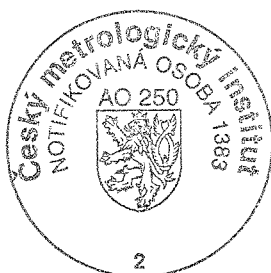
Type of liquids	Gasolines, Diesel, Ethanol
Accuracy class	0.5

Valid until: **16 January 2017**

Document number: **0115-CS-A004-07**

Description: Essential characteristics, approved conditions and special conditions, if any, are described in this certificate. This certificate contains 25 pages.

Date of issue: 5 March 2012




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RNDr. Pavel Klenovský

Notified Body No.1383

1. Measuring device description

The fuel dispensers types SHARK BMP 5xx.S and 2xxx.S and OCEAN BMP 4xxx.O 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. 2004/22/EC 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 and OCEAN BMP 4xxx.O 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 house with delivery nozzle. These fuel dispensers can be equipped with a vapour recovery system and pre-setting device.

There can be ATC conversion function for converse of measurement data to volume at base conditions (15 °C) for gasoline and diesel in PDE, PDEX, ADP1/T, ADP2/T, ADMPDx/T and CDC electronic calculator. Gasoline density at 15 °C range of PDEX calculator is (700 to 770) kg/m³. There has to be connected temperature sensor Pt 100.

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 module of the type SHARK MOD 2xxx.S/LPG and OCEAN MOD 4xxx.O/LPG, which was certified separately, could be connected.

The SHARK BMP 5xx.S and 2xxx.S and OCEAN BMP 4xxx.O fuel dispensers could be connected into independent Point of Sale or Paying terminal, which do not influence metrology parameters of measuring system.

These fuel dispensers may be connected to certified self-service device which communicate by identical protocol as electronic calculator.



1.1. Pumping unit with gas separator

These pumping units can be used alternatively.

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.

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.

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.

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.

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.

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.

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.

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.

There are three different models of Beta Control ADPx/T electronic calculator. Model ADP1/T can control one measuring system only, model ADP2/T can control two measuring systems and model ADPMPDx/T can control ten measuring systems at maximum (e.g. 2×5 products). There is version SMX which can control parallel mounting of two meters; fuel is dispensed via one nozzle.

This calculator can be operated by communication line or KL-SERINF remote controller. Electronic calibration is realized by automatic procedure “Electronic calibration of the meters and ATC“, (manual chapter 2.2.7). Access to electronic calibration is secured by DIP switch No. 2 (location OFF). Access to ATC conversion function setting is secured by DIP switch No. 3 (location OFF). DIP switches are protected by sealing cover.

This electronic calculator can operate separately or can be controlled by central system of filling station. It communicates by RS485 (EASY-CALL), or by IFSF standard (LON FTT-10 or TCP/IP-Ethernet).

Electronic calculator family ADPx/T was certified separately in EC - type examination certificate No. TCM 141/07 – 4505 issued by CMI, Notified Body No. 1383.

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.

1.4. Conversion device

PDEINP unit

1.5. Self-service device

Hectronic GmbH TA2331 self-service device was separately certified by Evaluation certificate No. GB-1286 issued by NWML, Notified Body 0126.

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.



1.6. Temperature sensor

ZPA Nová Paka 112 705 714/ZP9306 Pt100

1.7. Hose

ELAFLEX Conti - Slimline DN 16, 21 and 25; maximum length 8 m

1.8. NozzleELAFLEX ZVA SLIMLINE, ZVA 25, ZVA 32, ZVA 200 GR,
TATSUNO FN-1001**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 and OCEAN BMP 4xxx.O fuel dispensers were performed in compliance with the International Recommendation OIML R 118 *Testing procedures and test report format for pattern evaluation of fuel dispensers for motor vehicles* with conformity to International Recommendation OIML R 117-1 *Dynamic measuring systems for liquids other than water*. Test Report No. 6031-PT-P018-06 from 21 December 2006, Test Report No. 6015-PT-P006-08 from 25 April 2008 (PDEX extension), Test Report No. 6015-PT-P0002-10 from 28 April 2010 (TBE extension), Test report No. 8551-PT-E0151-10 from 23 February 2011 (EMC), Test report No. 6015-PT-P0047-11 from 23 May 2011, Test report No. 6015-PT-P0007-12 from 17 February 2012 (FF-1006 flow meter and HECTRONIC self-service device extension).

4. The measuring device data

There are following data on the pumping unit, measuring sensor, pulser, temperature sensor, conversion device and on the electronic calculator:

- Measuring device manufacturer and type
- Serial number and year of manufacture



There are following data on the each measuring system:

- The "CE" marking and supplementary metrology marking
- Number of EC-type examination certificate
- Measuring device manufacturer and type
- Serial number and year of manufacture
- Accuracy class
- Minimum measured quantity (MMQ)
- Maximum flowrate (Q_{\max})
- Minimum flowrate (Q_{\min})
- Maximum pressure (P_{\max})
- Minimum pressure (P_{\min})
- Type of liquids
- Liquid temperature range
- Ambient temperature range
- Mechanical class
- Electromagnetic class

There are following data on each face of indicating device:

- Currency unit of price (€), near price indication
- Unit of volume (ℓ or L or word Litre), near volume indication
- Currency unit of unit price (€ / L or € / Litre), near unit price indication
- Information regarding the minimum measured quantity (MMQ)

There has to be based temperature ($T_b = 15^\circ\text{C}$) near volume indication on the dial of any indicating device of fuel dispenser with activated ATC conversion function visible to user during the measurement.

5. Sealing

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) 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:

On the FP-1001 pumping unit:

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

On the FM-1007 measurement transducer:

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

On the PDE, PDEX, TBELTx and ADPx/T electronic calculator:

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

On conversion device, if any:

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



On the fuel dispenser:

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

On the FP-1022 pumping unit:

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

On the FM-1025 measurement transducer:

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

On the UNIDATAZ CDC electronic calculator:

- | | |
|--|----|
| u) Conjunction of S3 switch cover with CPU unit | 1× |
| v) Conjunction of CPU unit with calculator console | 1× |
| w) Conjunction 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 | 1× |
| z) Type plate of the meas. transducer | 1× |

On the Hectronic GmbH TA2331 self-service device:

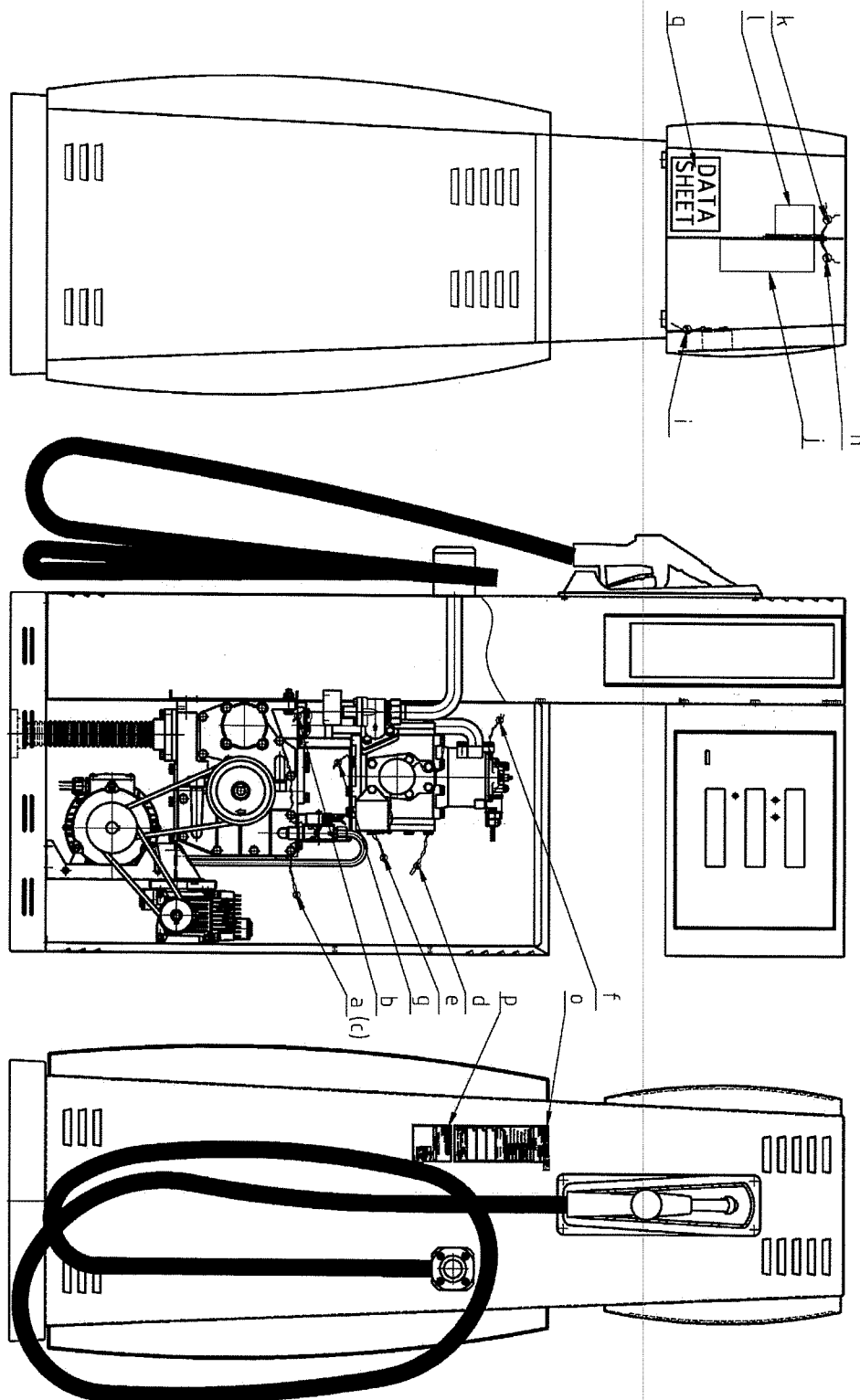
- | | |
|---|----|
| - Access to the calibration switch located on the CPU board is protected by metal cover | 1× |
|---|----|

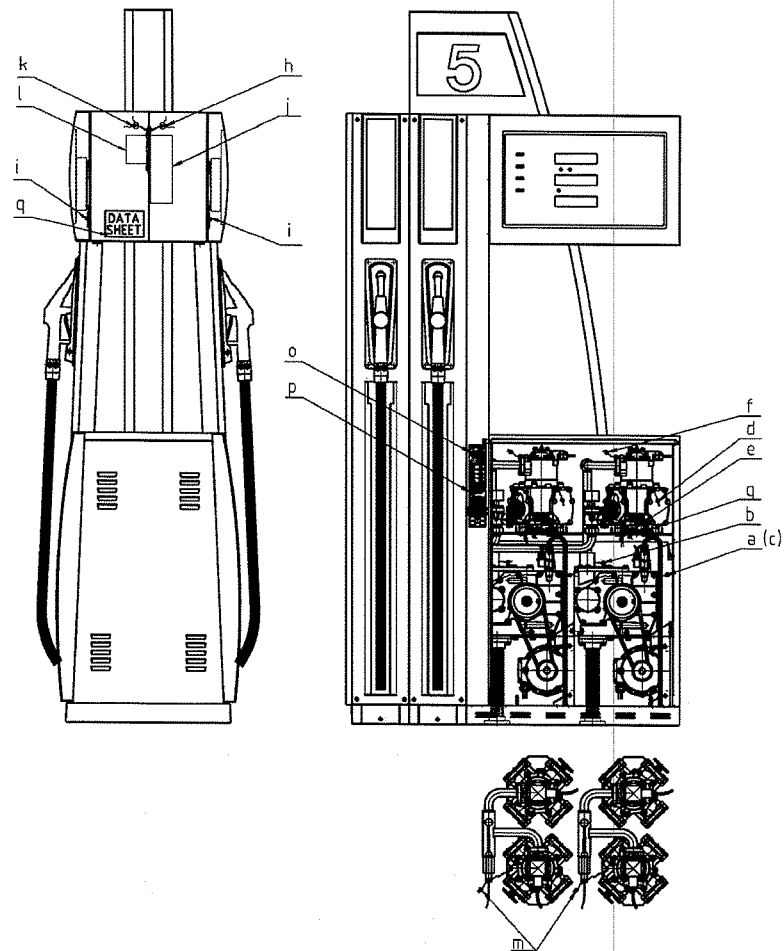
On the Hectronic GmbH HECSTAR or HECFLEET NT self-service device:

- | | |
|---|----|
| - The data 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 |

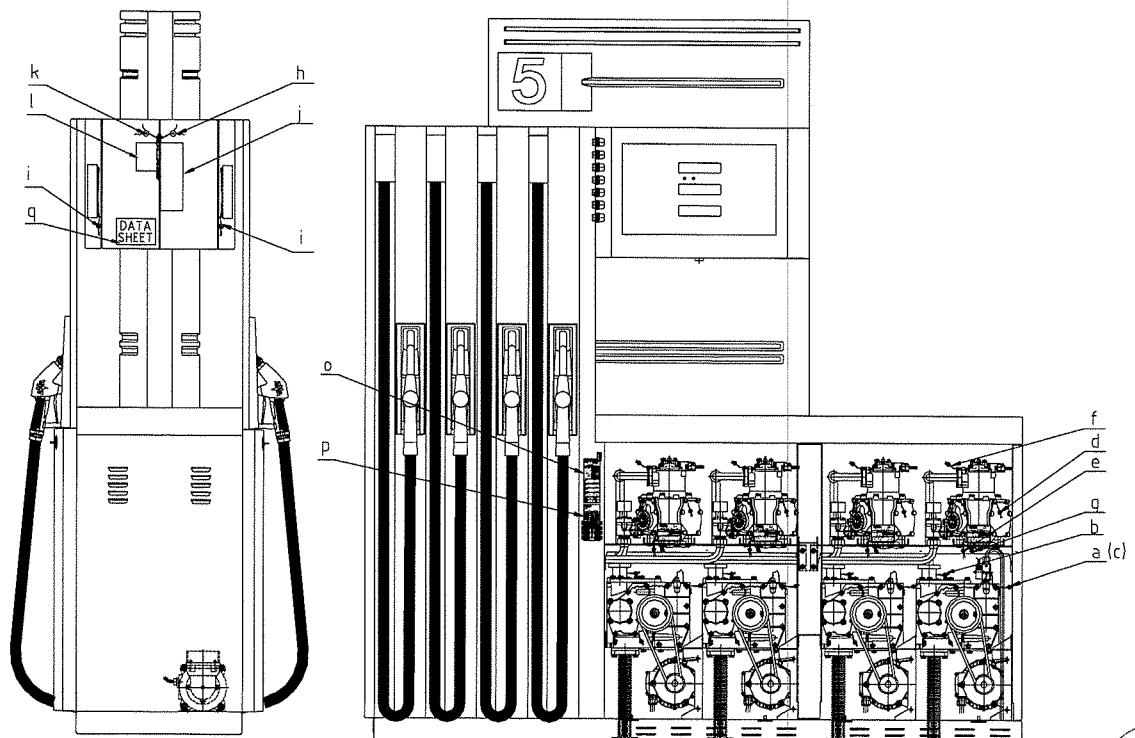
Additional sealing points beyond the requirements of OIML R 117-1 and WELMEC 10.6 can be used on special request of the local W&M authority.

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

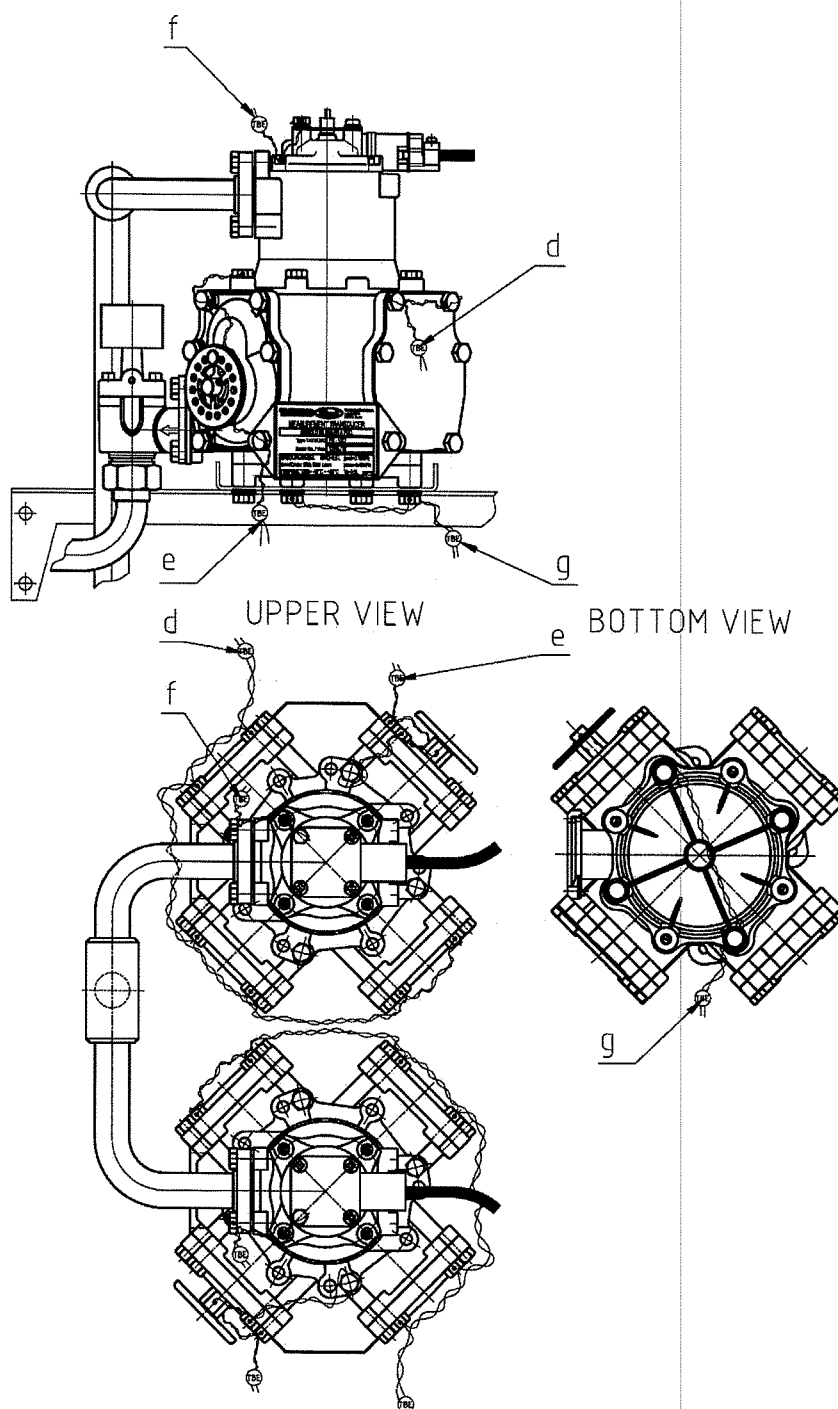




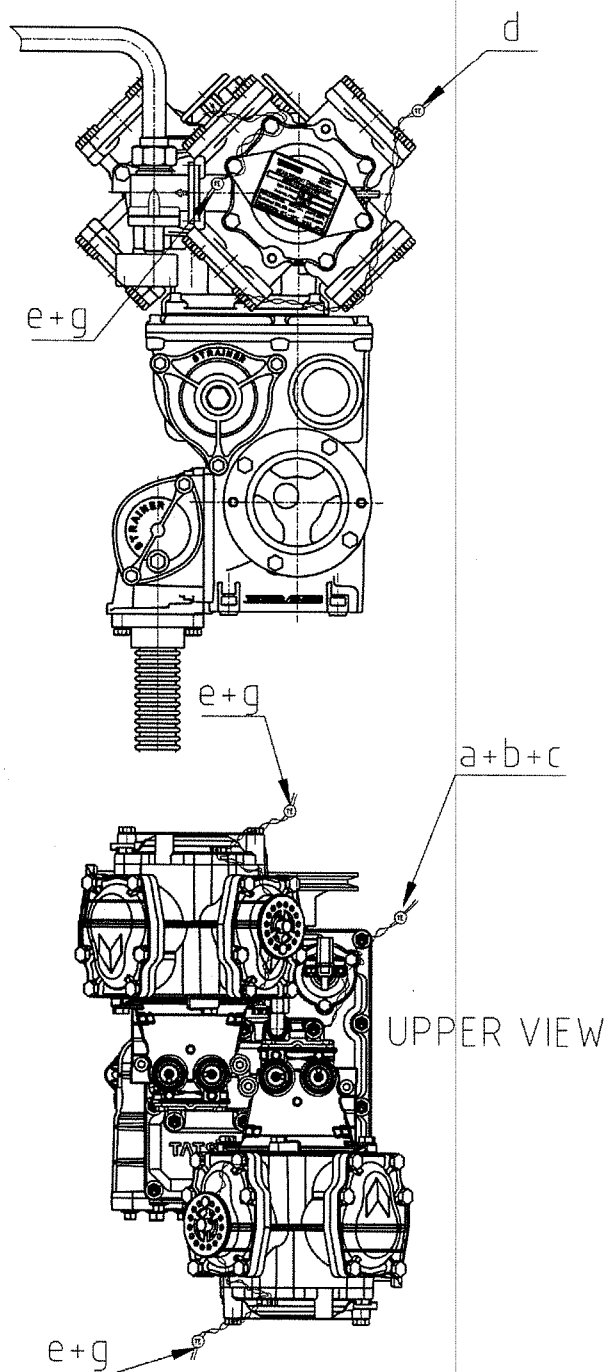
Picture No. 2: The sealing of OCEAN BMP 4xxx.O dispenser



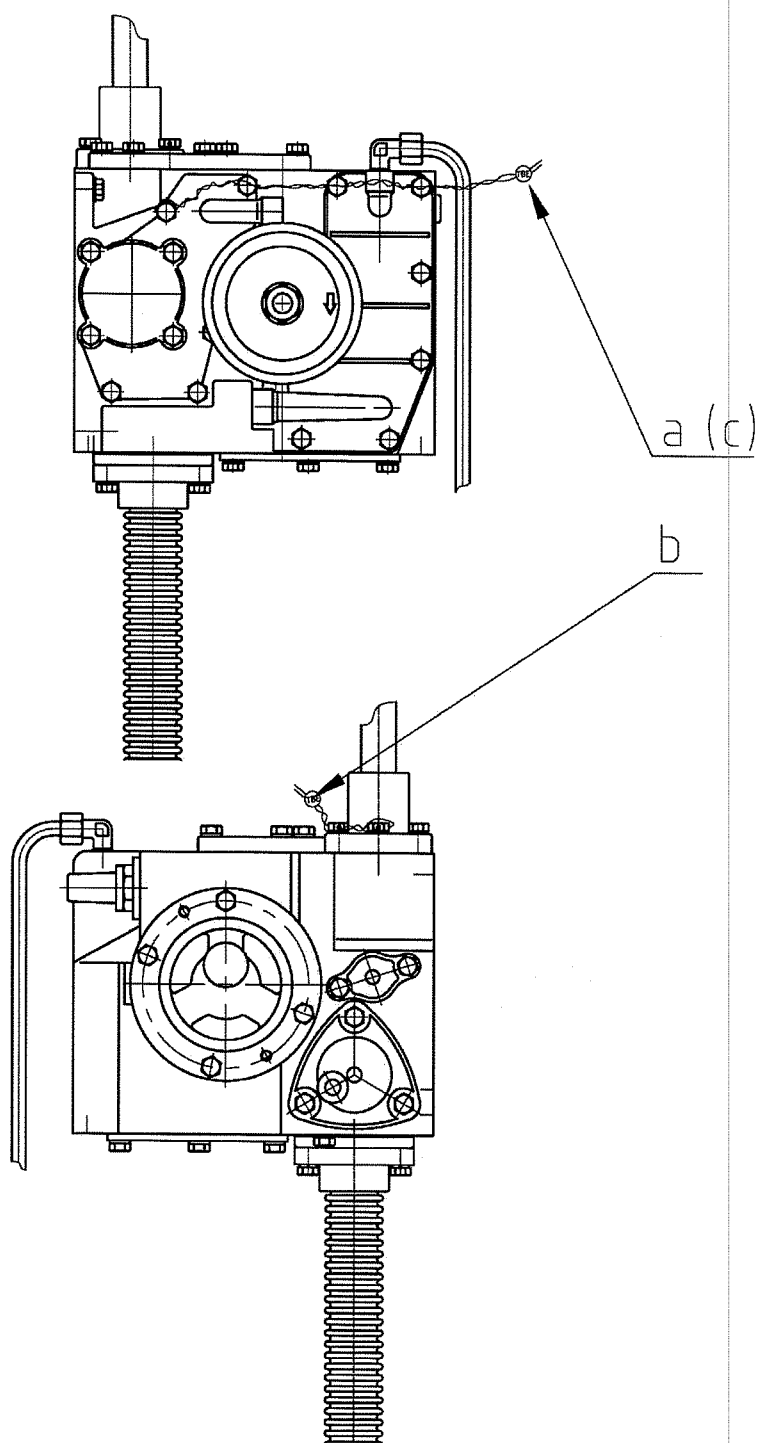
Picture No. 3: The sealing of FM-1007 measurement transducer



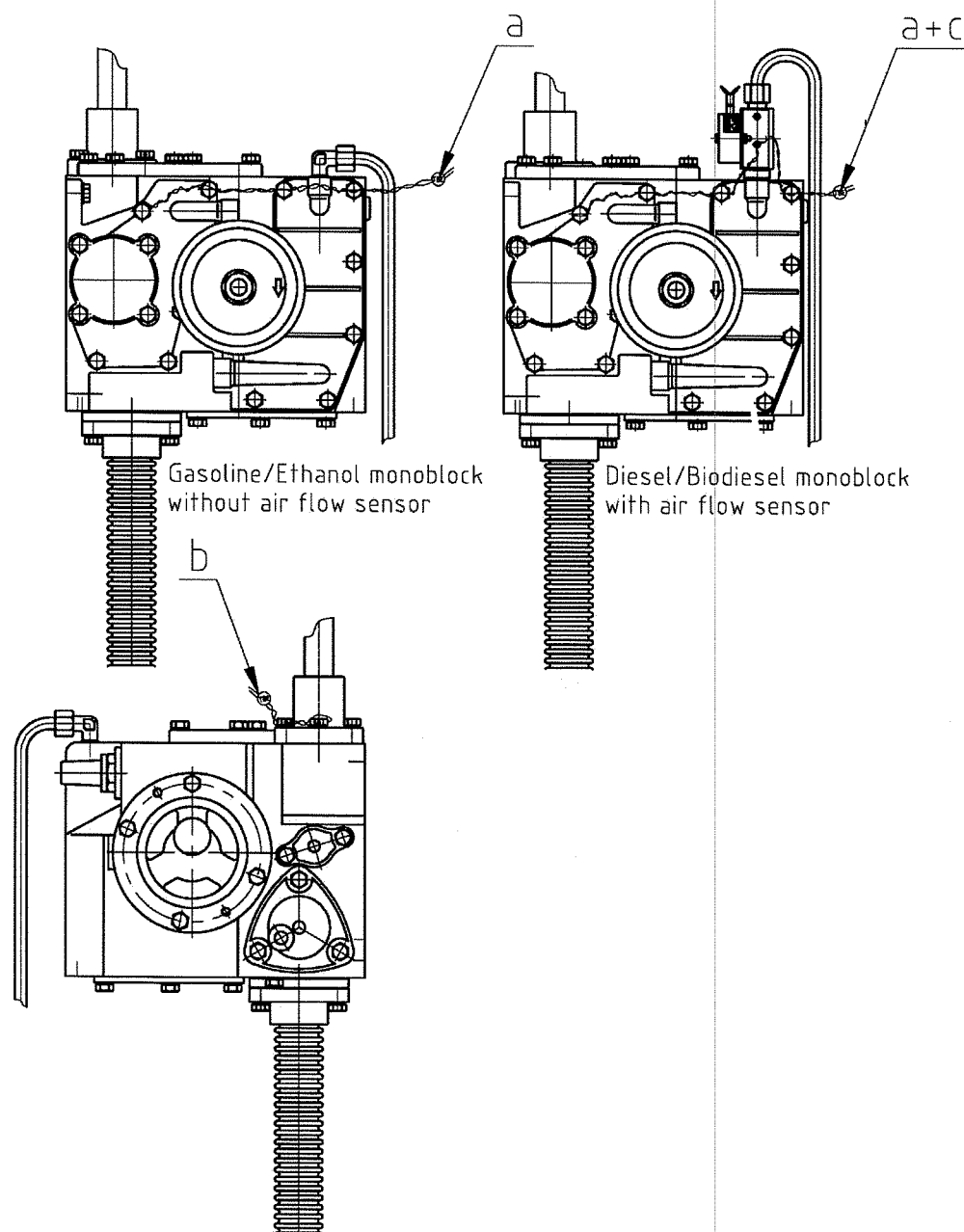
Picture No. 4: The sealing of FM-1025 measurement transducer and FP-1022 pumping unit



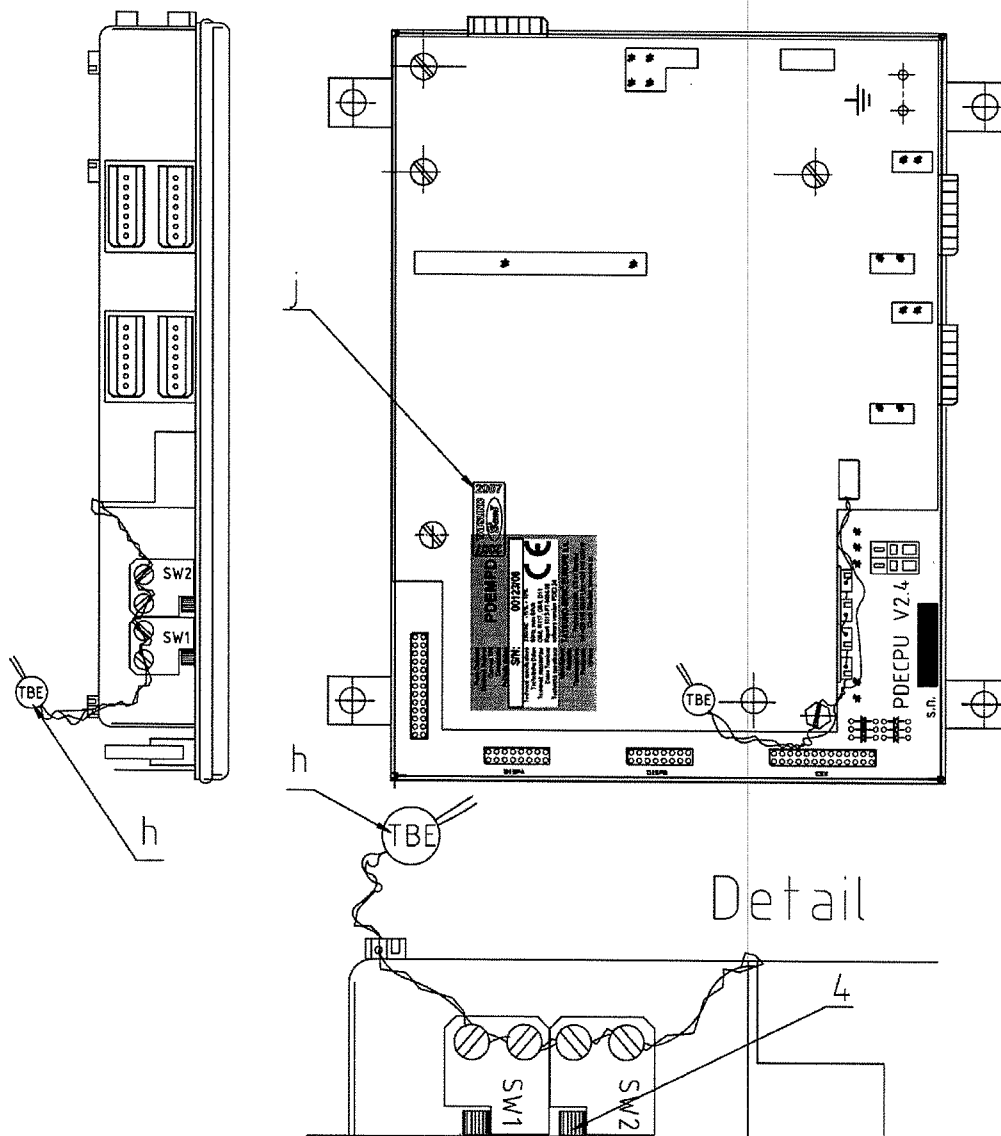
Picture No. 5: The sealing of FP-1001 pumping unit



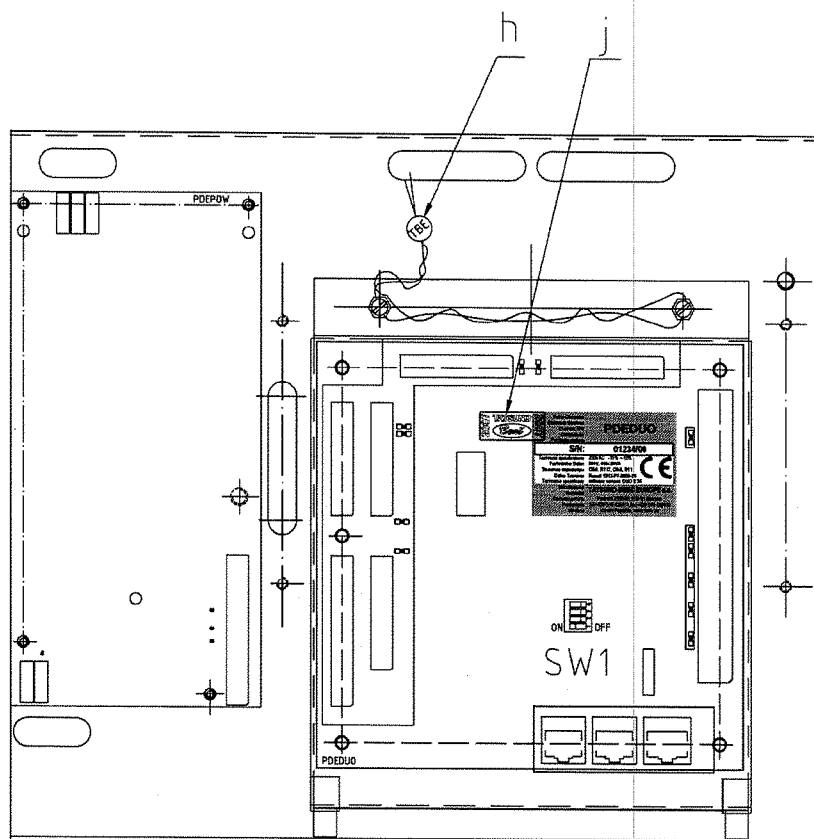
Picture No. 6: The sealing of FP-1001 pumping unit with Air Flow Sensor



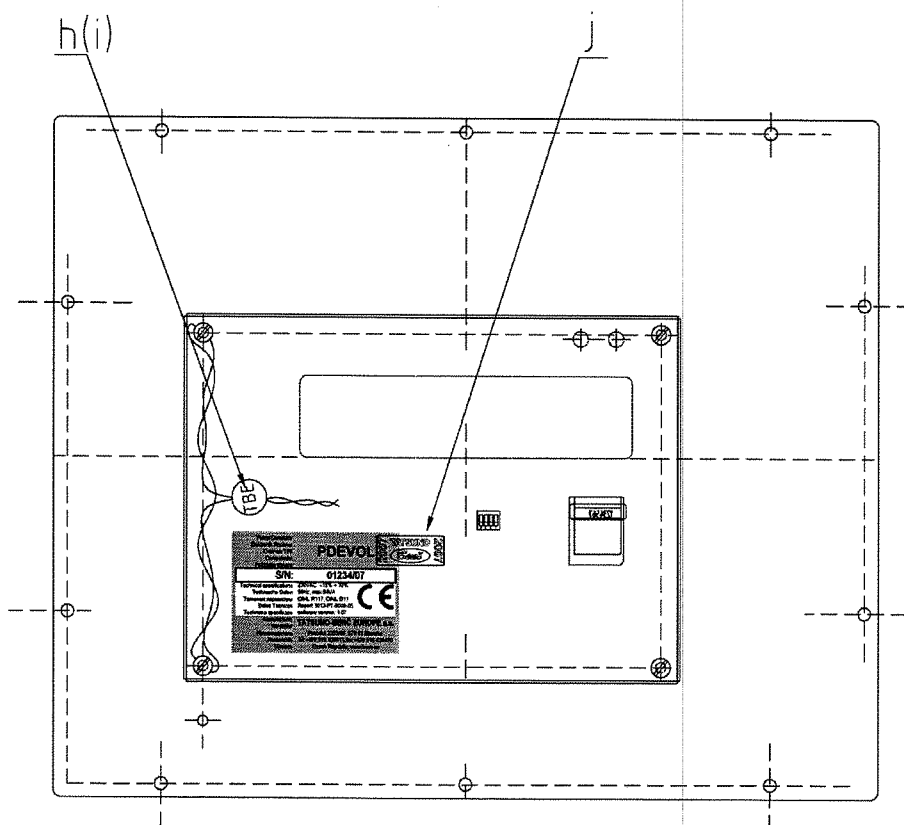
Picture No. 7: The sealing of PDEMPD electronic calculator



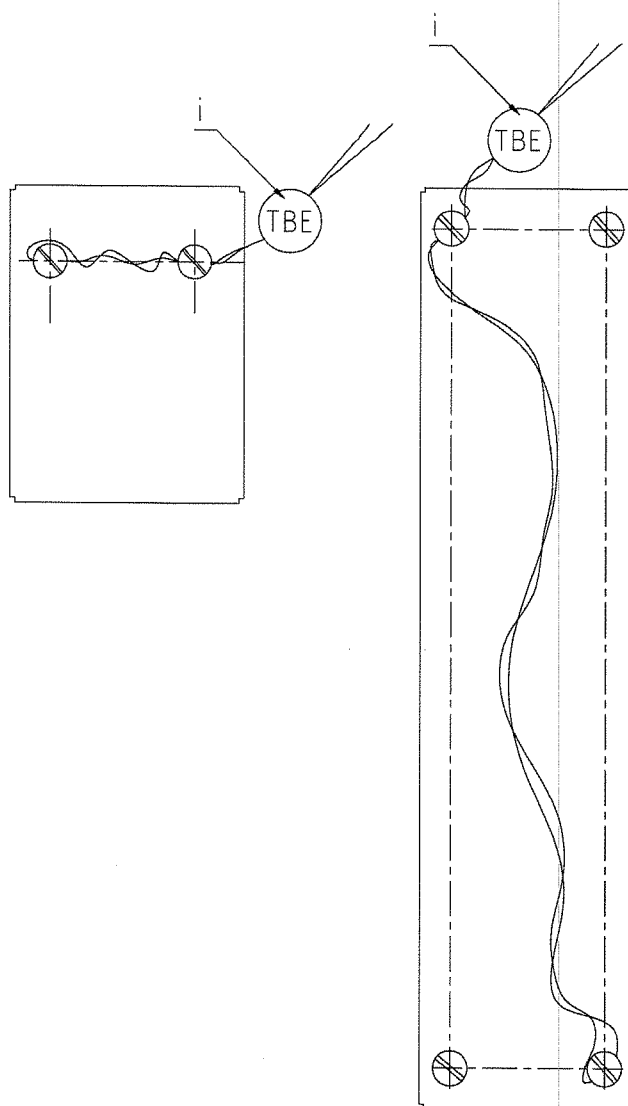
Picture No. 8: The sealing of PDEDUO calculator



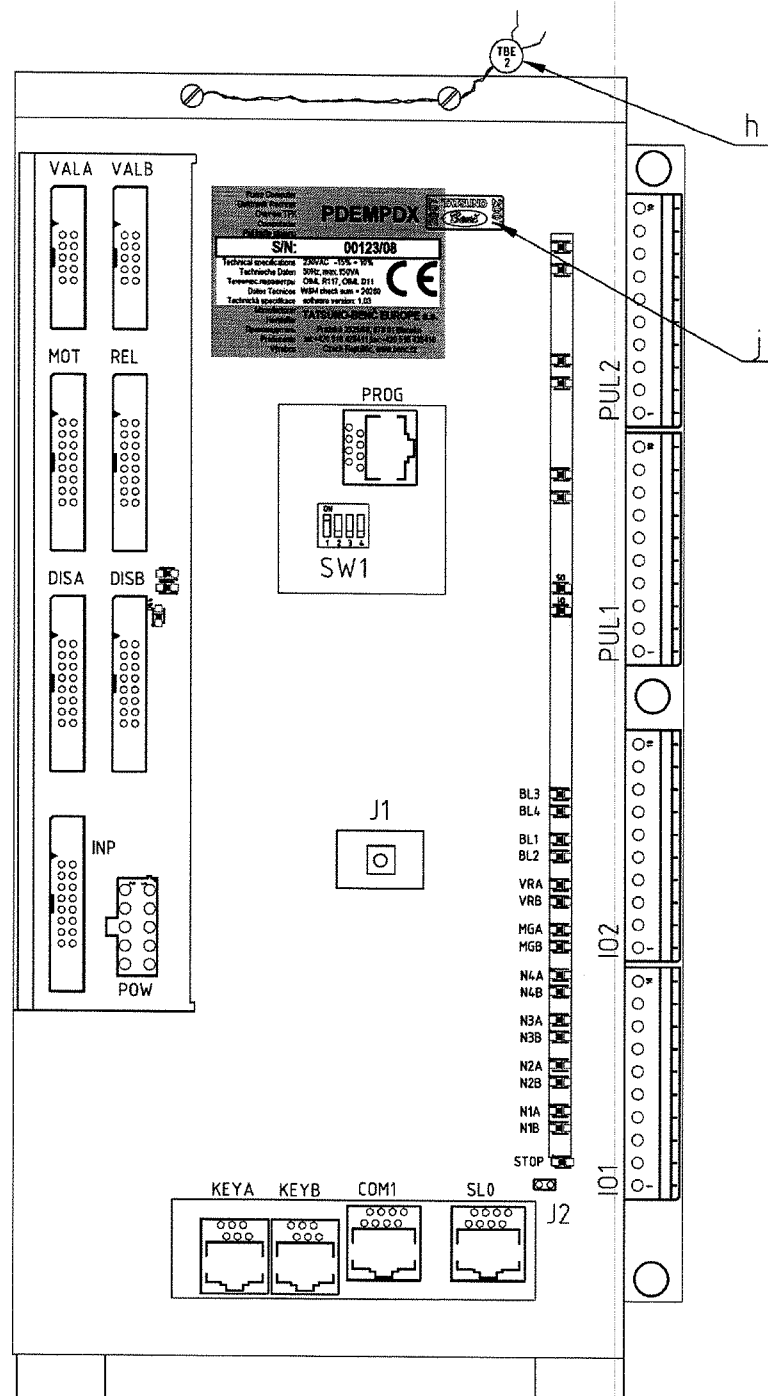
Picture No. 9: The sealing of PDEVOL calculator



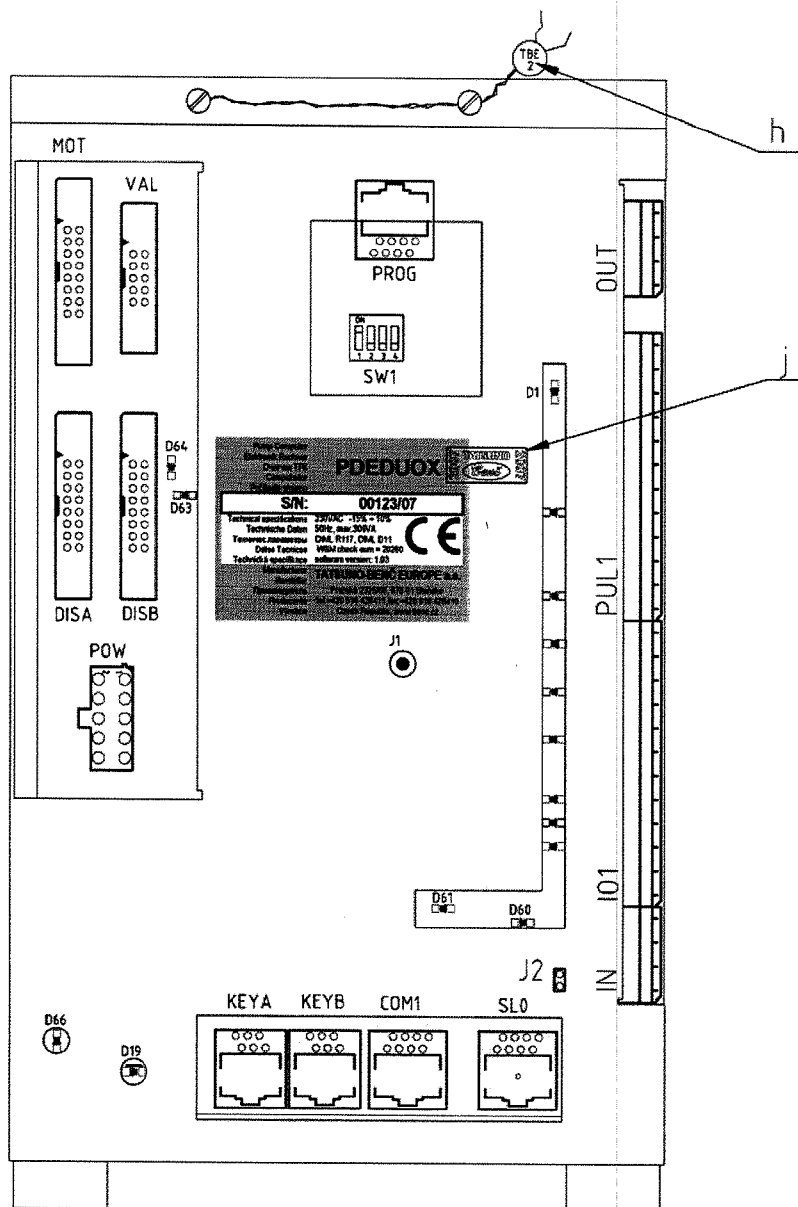
Picture No. 10: The sealing of totalizing indicating device



Picture No. 11: The sealing of PDEMPDX calculator



Picture No. 12: The sealing of PDEDUOX calculator



Technical drawing of a TATSUNO 2007 electronic device, showing a top view and a side view.

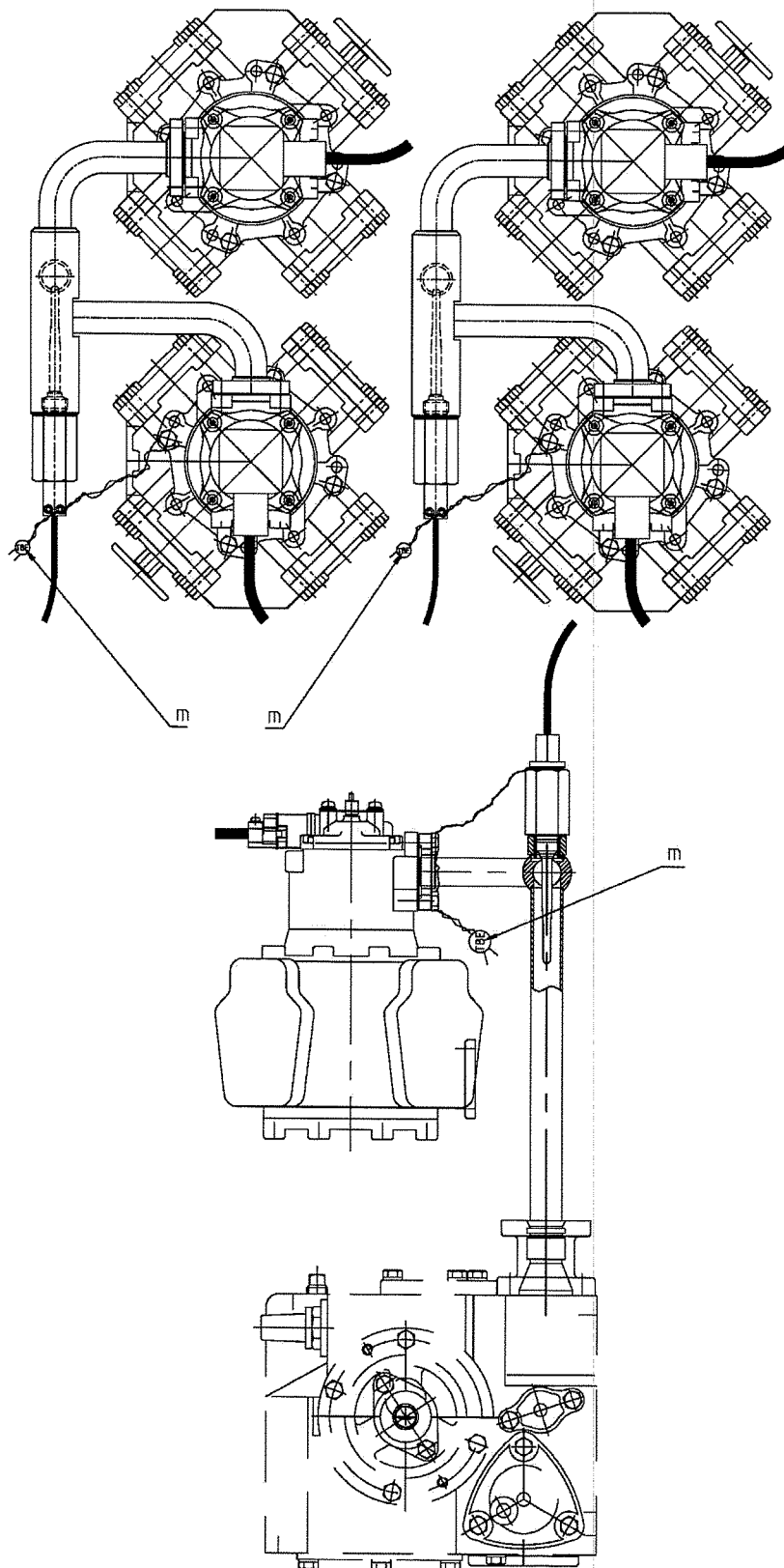
Top View:

- Label:**
 - CE mark
 - Model: 2007
 - SN: 0085/10
 - Technical specifications:
 - Operating temperature: -20°C to +70°C
 - Storage temperature: -40°C to +125°C
 - Humidity: 5% to 95% RH
 - Shock: 1000g, 10ms
 - Vibration: 10g, 10Hz to 1000Hz
 - Barcode: 0085/10
- Dimensions:**
 - Overall width: 100mm
 - Overall height: 100mm
 - Overall depth: 100mm

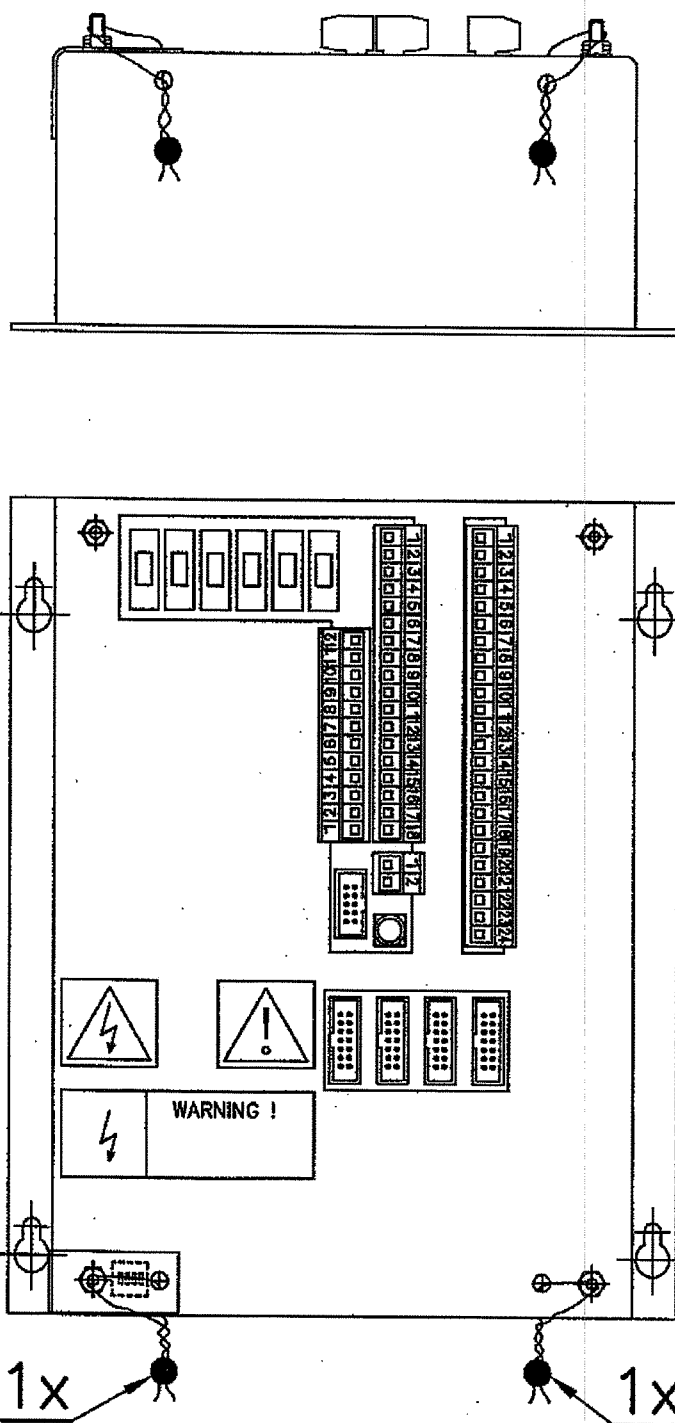
Side View:

- Label:**
 - Model: 2007
 - SN: 0085/10
- Dimensions:**
 - Overall width: 100mm
 - Overall height: 100mm
 - Overall depth: 100mm

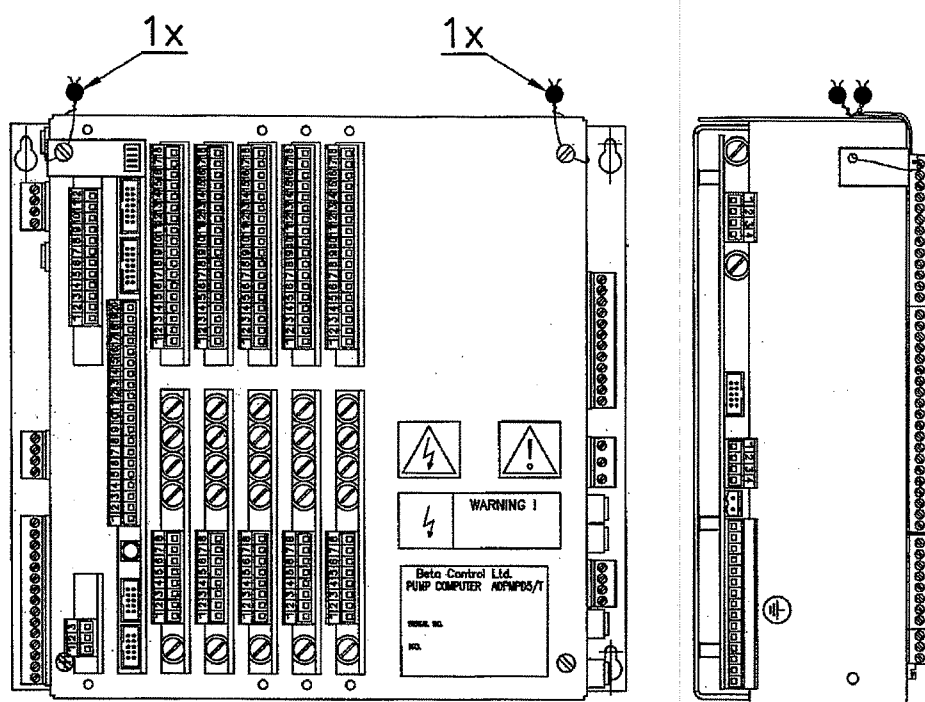
Picture No. 14: The sealing of Pt100 temperature sensor (liquid fuel dispenser)



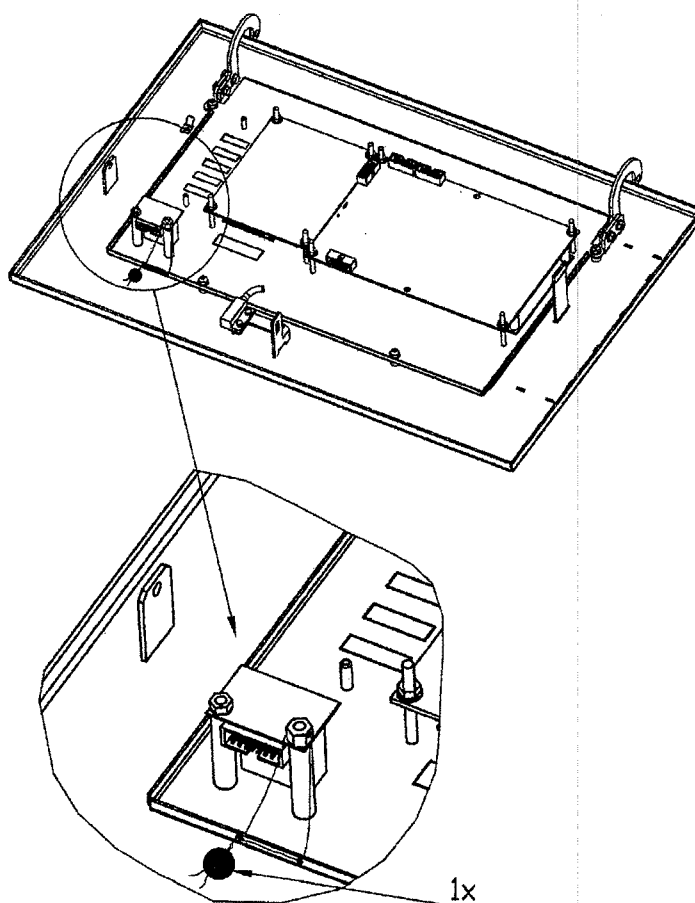
Picture No. 15: The sealing of ADP1/T and ADP2/T calculator

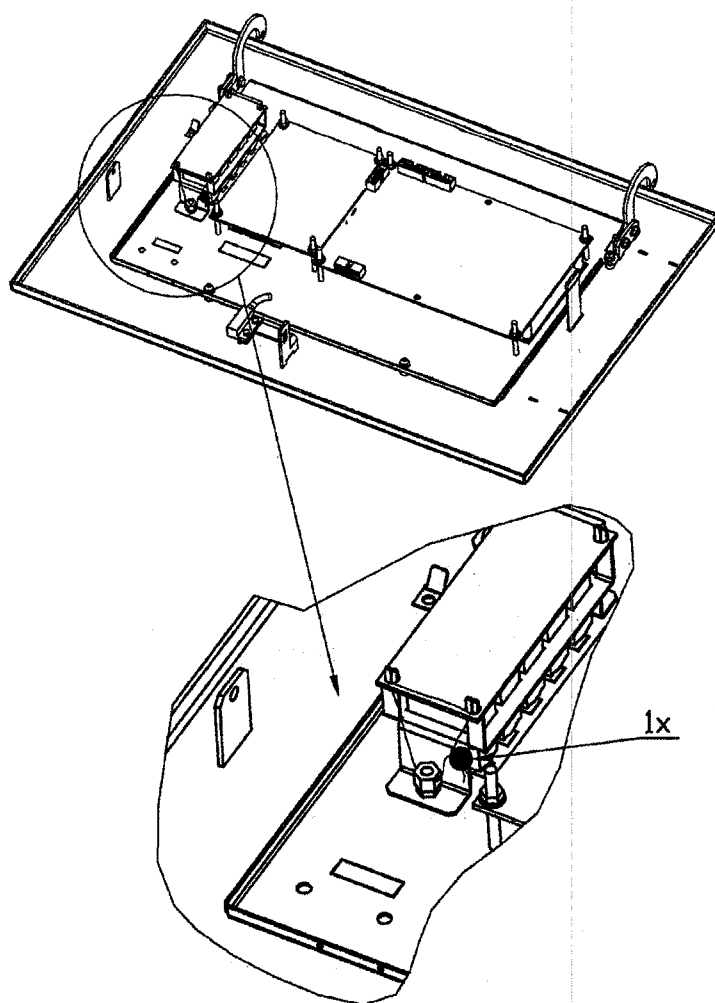


Picture No. 16: The sealing of ADPMPDx/T calculator

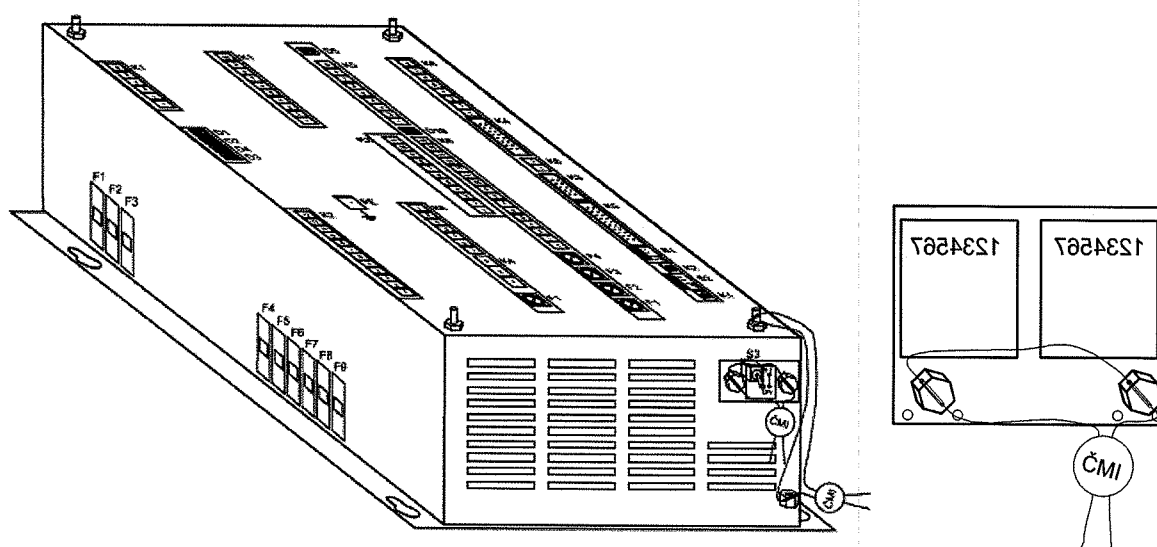


Picture No. 17: The sealing of totalizing indicating device (ADPx/T, ADTMPDx/T)

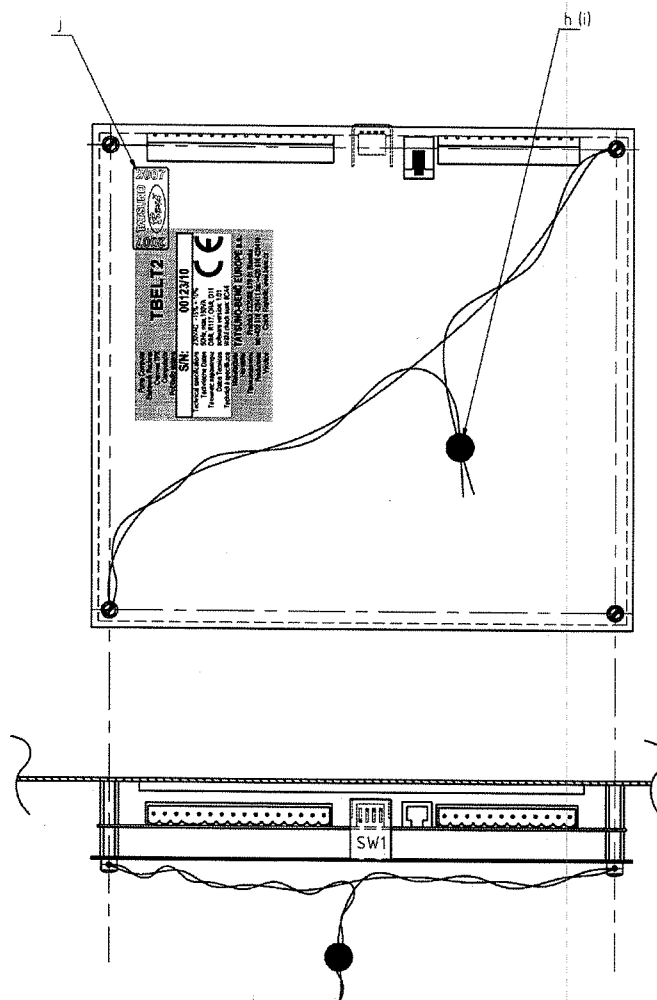




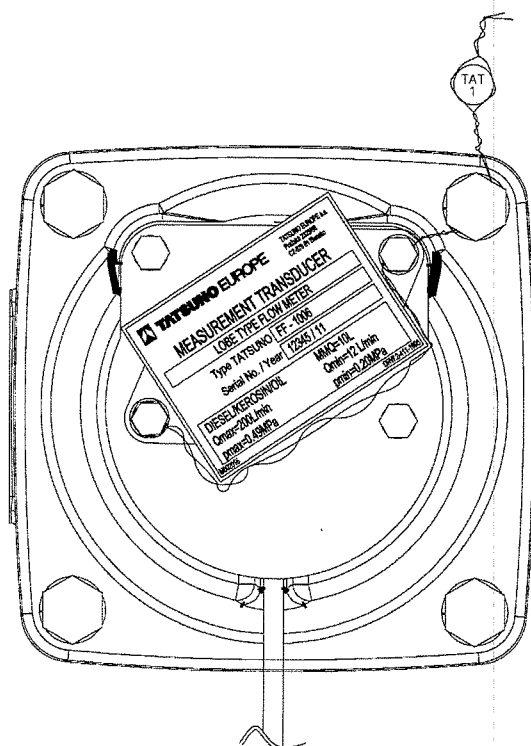
Picture No. 18: The sealing of the UNIDATAZ CDC electronic calculator with totalizer



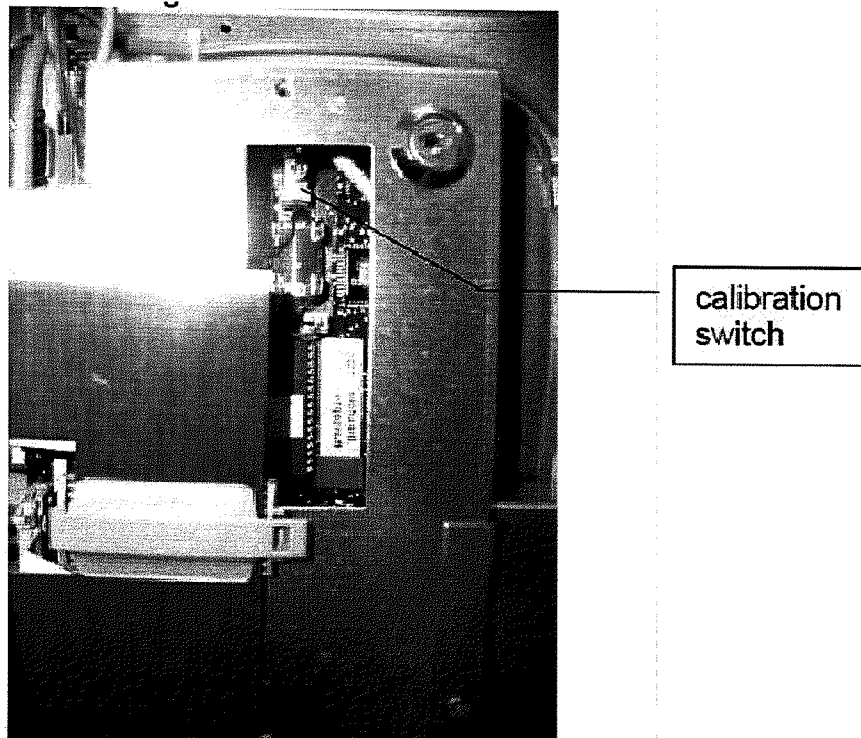
Picture No. 19: The sealing of TBELTx calculator



Picture No. 20: Sealing of the FF-1006 measurement transducer



Picture No. 21: Sealing of calibration switch of Hectronic GmbH TA2331 self-service device



Picture No. 22: Sealing of CPU and flash card of Hectronic GmbH HECSTAR/ HECFLEET NT self-service device

