Český metrologický institut
Notifikovaná osoba č 1383, Okružní 31
638 00 Brno

EC-TYPE EXAMINATION CERTIFICATE

Number: TCM 141/07 - 4491

Addition 3

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: (applicant) **TATSUNO-BENČ EUROPE a.s.**
Pražská 2325/68
678 01 Blansko
Czech Republic

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

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 23 pages.

Český metrologický institut NOTIFIKOVANÁ OSOBA 1383 AO 250 2

Date of issue: 10 May 2010

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RNDr. Pavel Klenovský
Notified Body No.1383

1. Measuring device description

The SHARK BMP 5xx.S and 2xxx.S fuel dispensers are destined 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 SHARK BMP 5xx.S and 2xxx.S fuel dispensers 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 and ADPMPDx/T electronic calculator. Gasoline density at 15 °C range of PDEX calculator is (700 to 770) kg/m^3. There had to be connected temperature sensor Pt 100.

There are three types of measuring systems:

- Standard with Q_{max} 50 L/min, which contains one FP-1001 B01 pumping unit and one measurement transducer. 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 with Q_{max} 80 L/min, witch varies just in using FP-1001 B02 pumping unit and
- Ultra high-speed with Q_{max} 130 L/min, which contains parallel mounting of two FP-1001 B02 pumping units and parallel mounting two measurement transducer. (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, which was certified separately, could be connected.

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

1.1. Pumping unit with gas separator

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.

1.2. Measurement transducer

TATSUNO FM-1007 measurement transducer consists of a flow sensor with four pistons and cyclic volume 0.5 L, TATSUNO EK – 1025 two-channel photoelectric transducer with 50 pulses / revolution and adjustment device.

TATSUNO FM-1007 measurement transducer 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.

1.3. Calculator

There are three different models of 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

The PDE 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 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

The PDEX 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 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

TBELTx 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 type ADP/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.

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

The electronic calculator family ADP/T was certified separately by CMI, Notified Body No. 1383 in EC - type examination certificate No. TCM 141/07 - 4505.

1.4. Conversion device

PDEINP unit

1.5. Temperature sensor

ZPA Nová Paka 112 705 714/ZP9306 Pt100

1.6. Hose

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

1.7. Nozzle

ELAFLEX ZVA SLIMLINE, ZVA 25, ZVA 32, ZVA 200 GR,
TATSUNO FN-1001

2. Basic technical data

Measuring system type:	Normal	Max.	/UH
Maximum flowrate Q_{max} [L/min]:	30 to 50 *	70 to 80	120 to 130
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:	-20 to +50		
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 +50 with additional internal heating		
Mechanical class:	M1		
Electromagnetic class:	E1		
Humidity:	Condensing		
Location:	Open		

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

3. Test

Technical tests of the SHARK BMP 5xx.S and 2xxx.S 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 December 21. 2006, Test Report No. 6015-PT-P006-08 from April 25. 2008 (PDEX extension) and Test Report No. 6015-PT-P0002-10 from April 28. 2010 (TBE extension).

4. The measuring device data

There are following data on the pumping unit, measurement 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 had to be based temperature (T_b = 15 °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

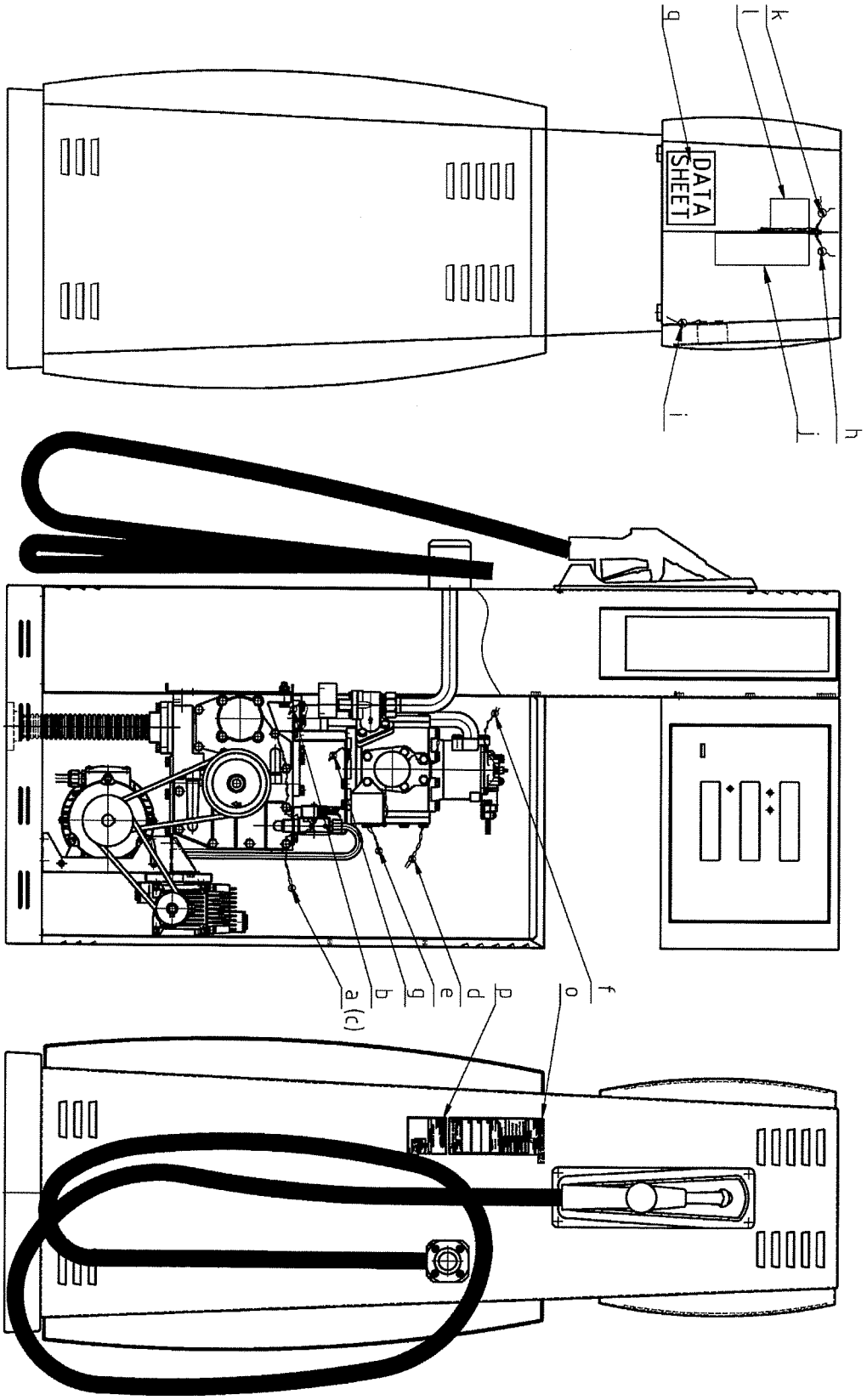
The switch SW1 has to be set to position OFF (left site) in case of PDEMPD electronic calculator.
The dip switch SW1-1 has to be set to position ON (up) in case of PDEDUO, PDEX and TBELTx electronic calculators.
The DIP switches No. 2 and 3 have to be set to position OFF in case of ADPxxx electronic calculator.

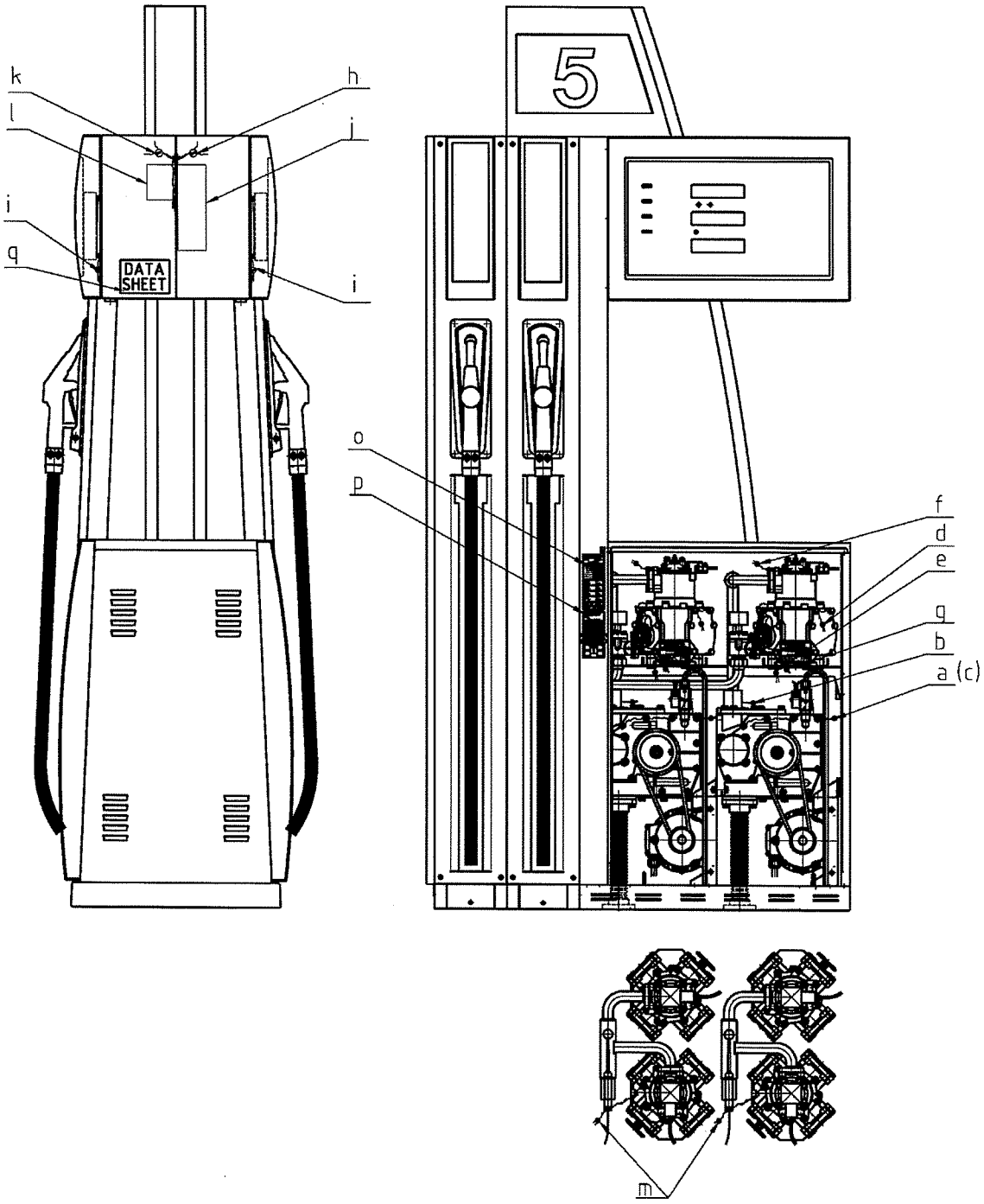
The each measuring system has to be sealed after the tests with positive result:

On the 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 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 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×

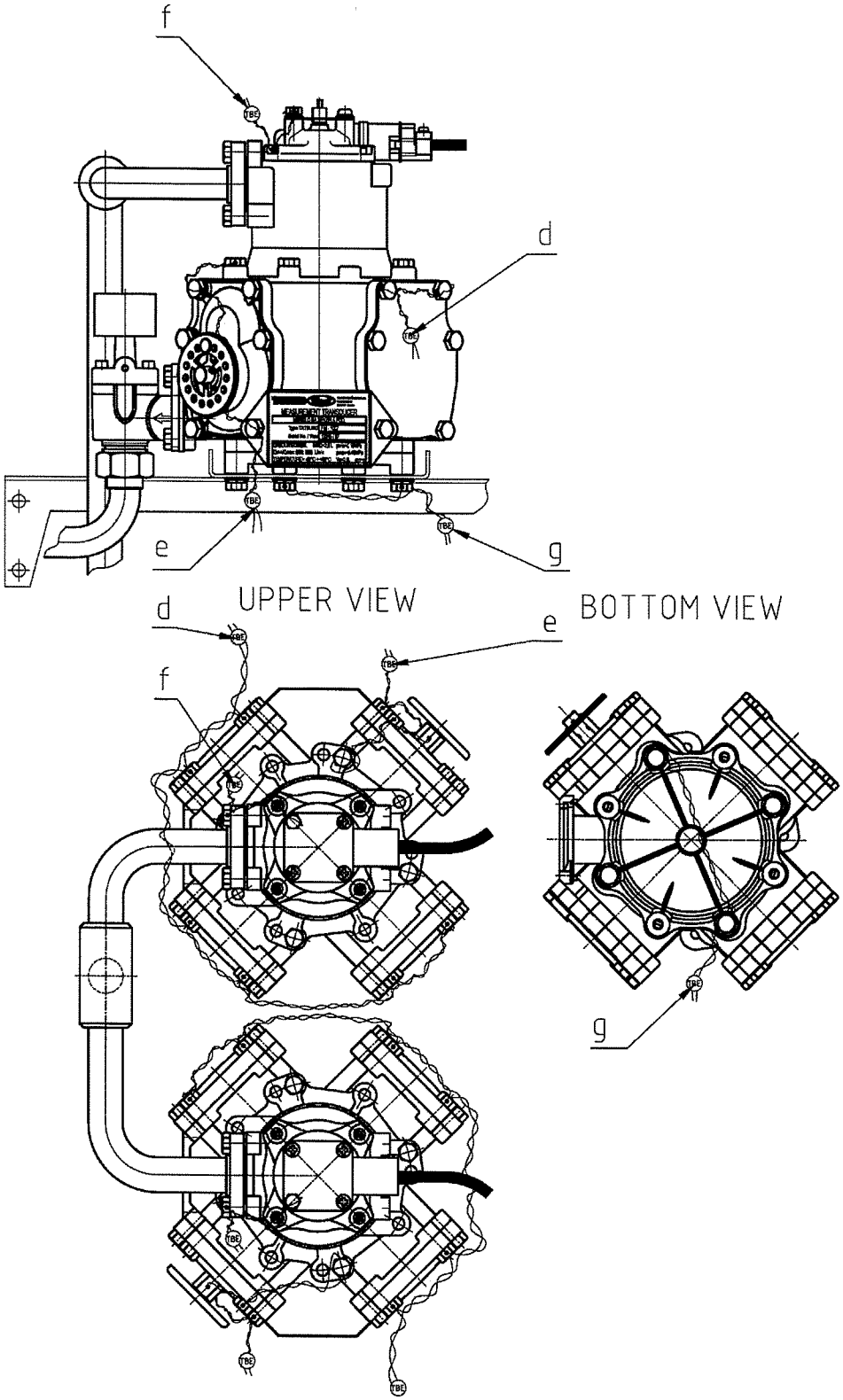
Additional sealing points beyond the requirements of OIML R 117-1 and WELMEC 10.6 can be used on special request of the local W&M authority.

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

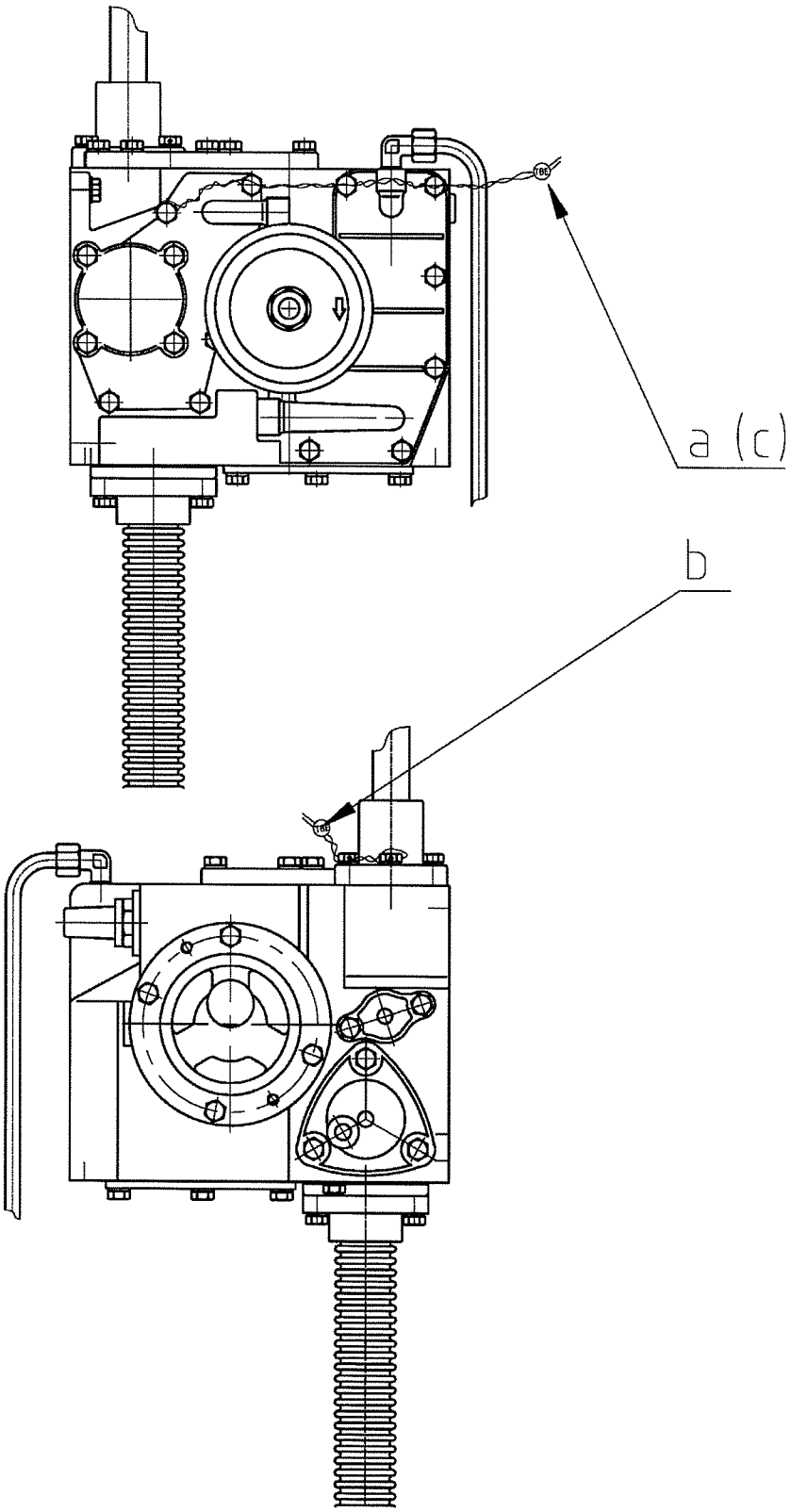




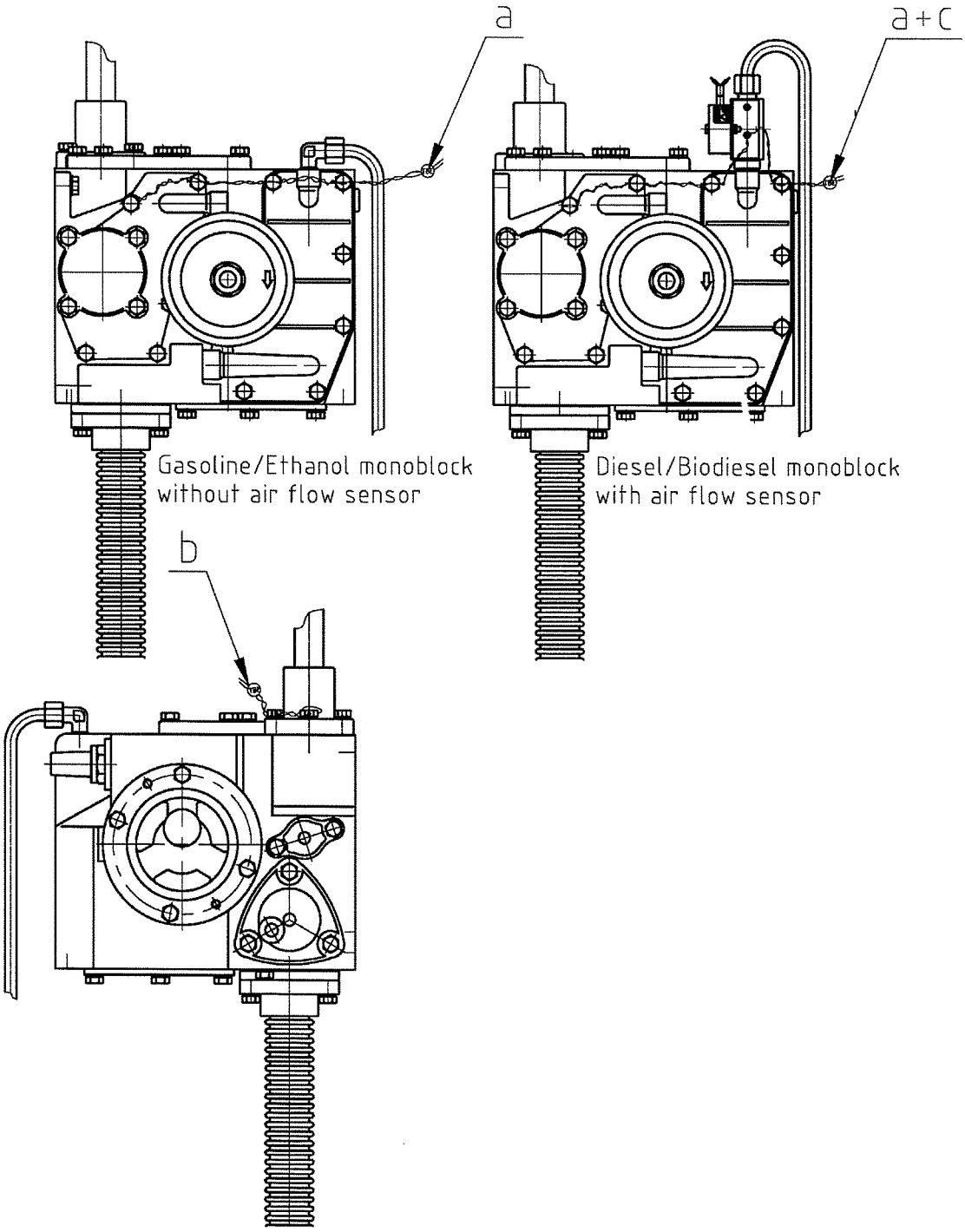
Picture No. 2: The sealing of FM-1007 measurement transducer



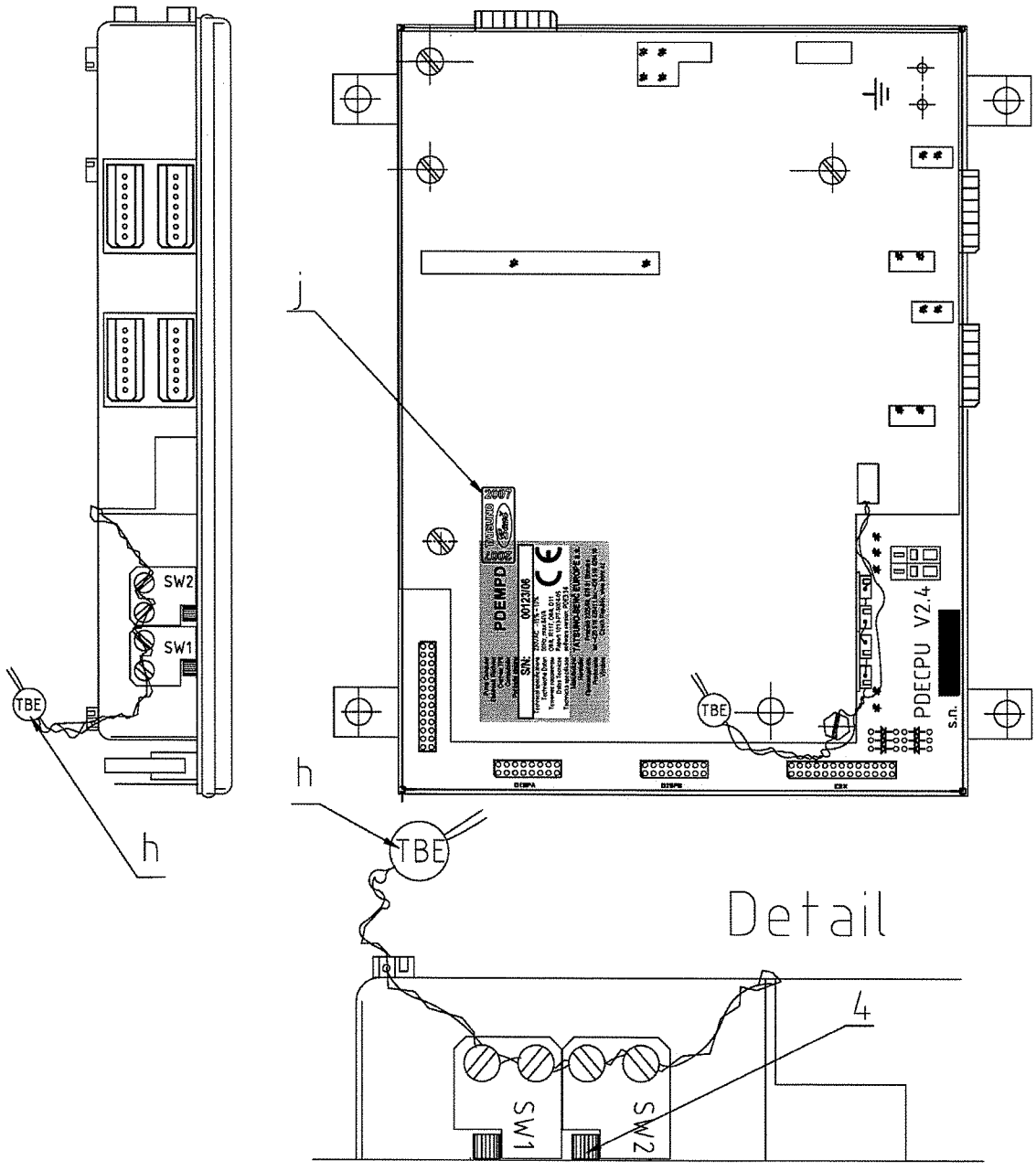
Picture No. 3: The sealing of FP-1001 pumping unit



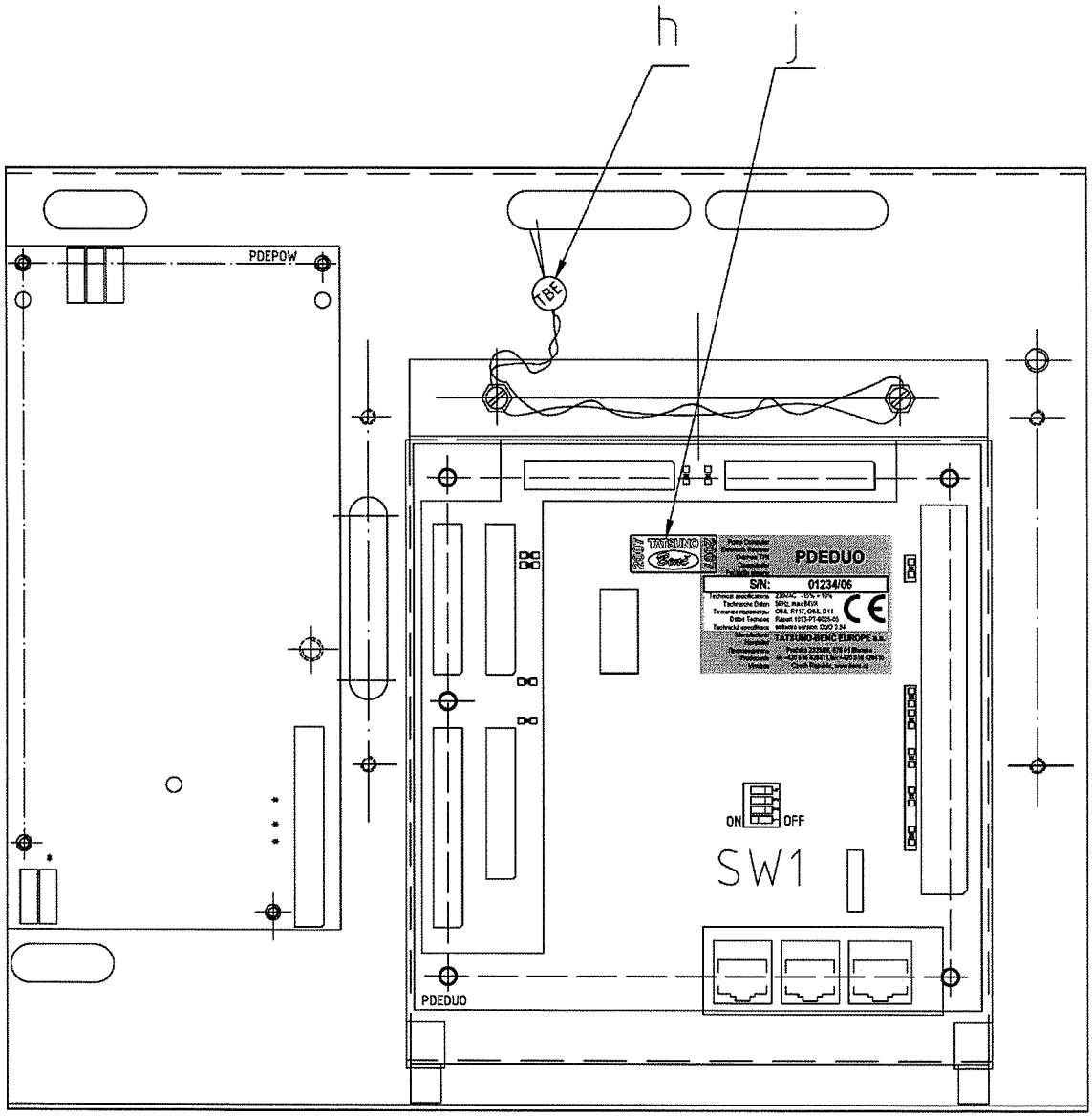
Picture No. 4: The sealing of FP-1001 pumping unit with Air Flow Sensor



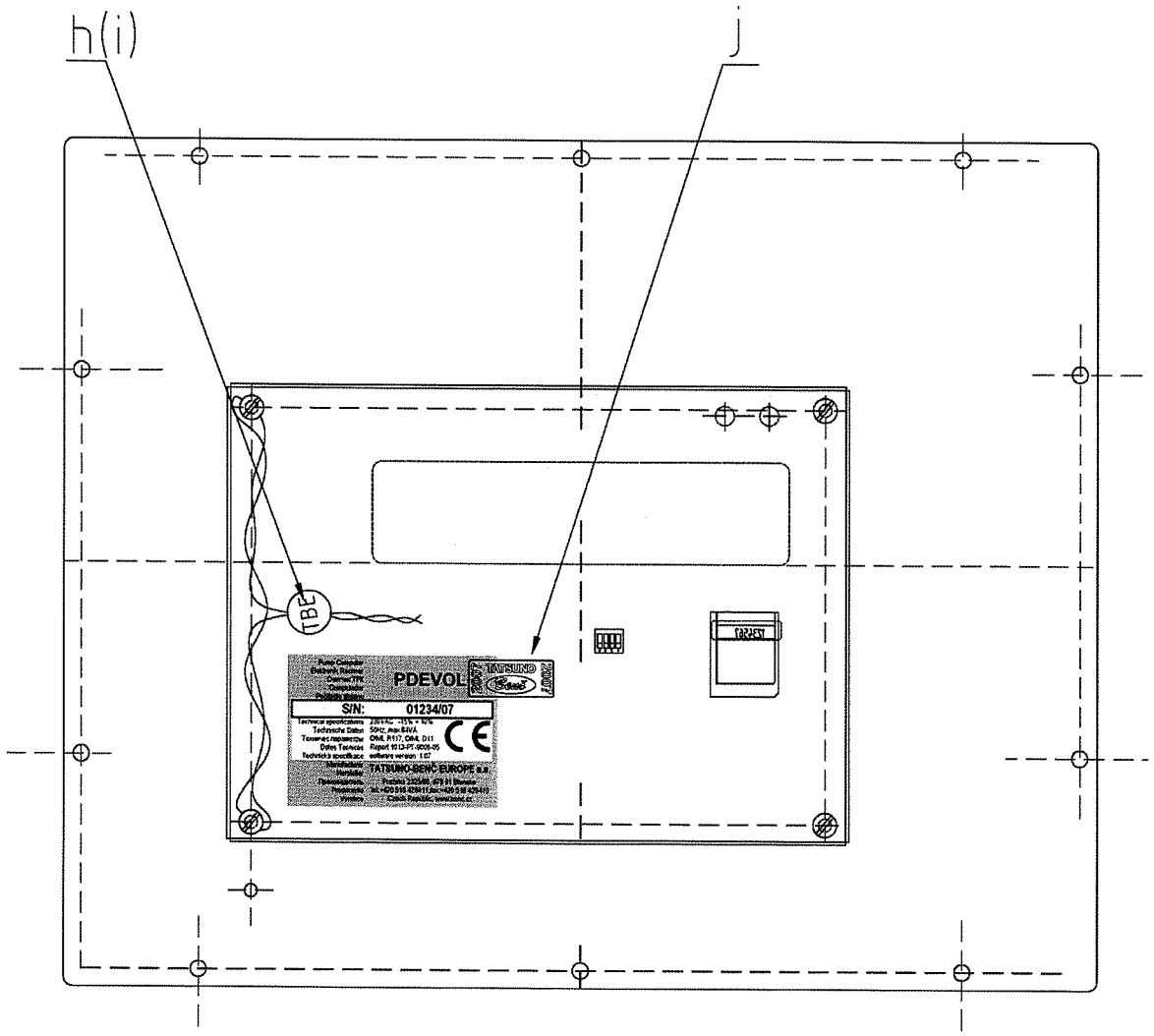
Picture No. 5: The sealing of PDEMPD electronic calculator



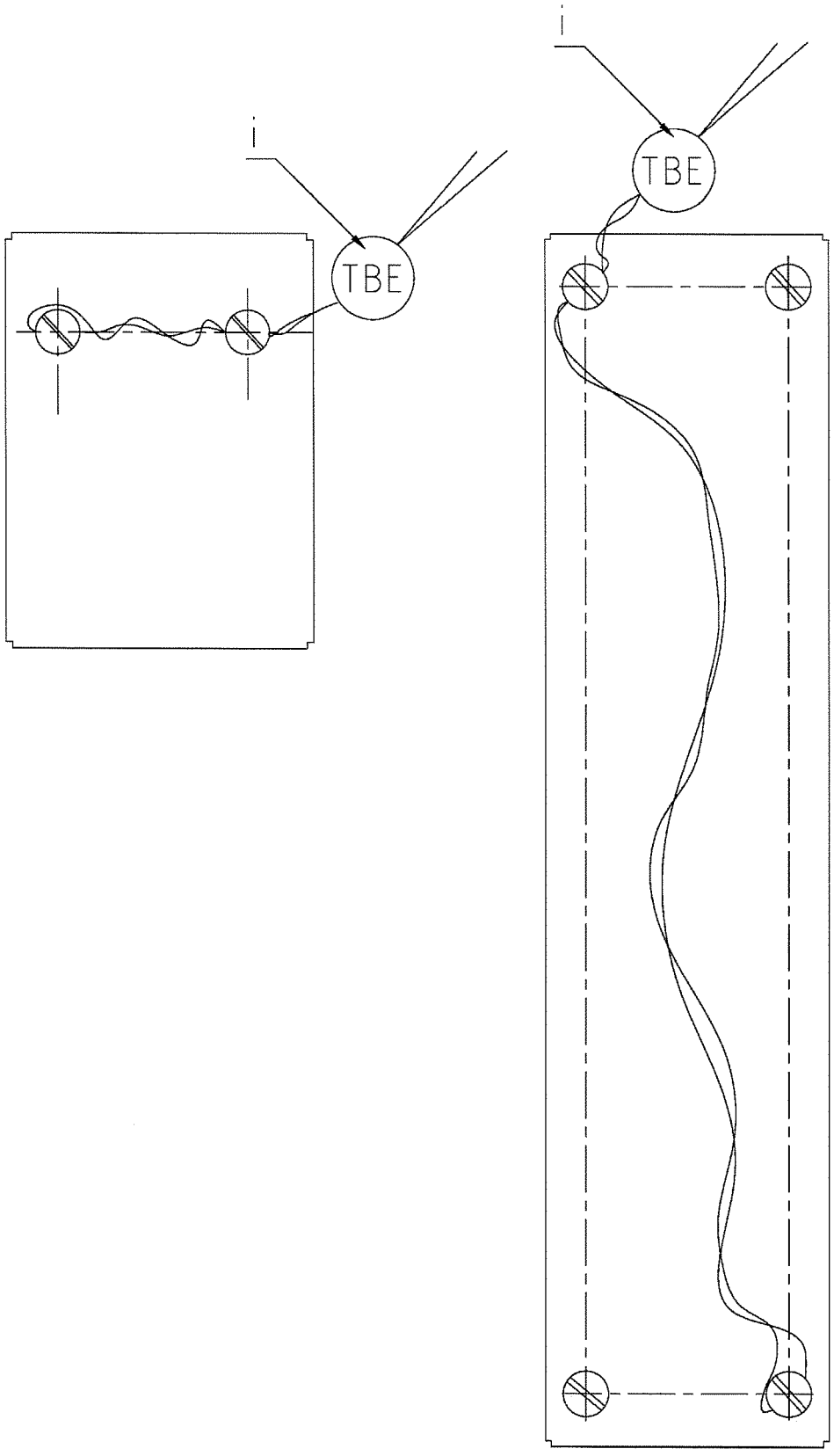
Picture No. 6: The sealing of PDEDUO calculator



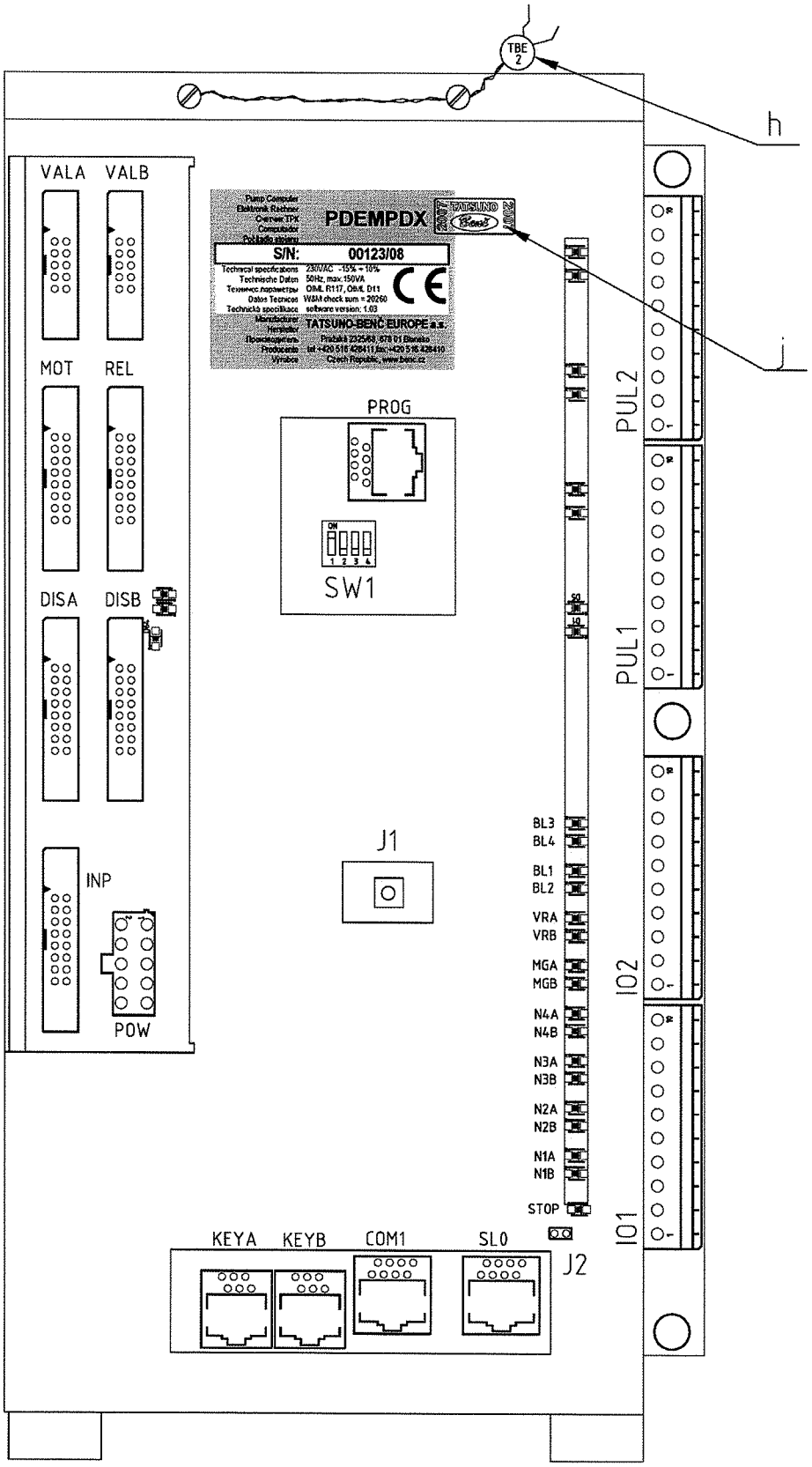
Picture No. 7: The sealing of PDEVOL calculator



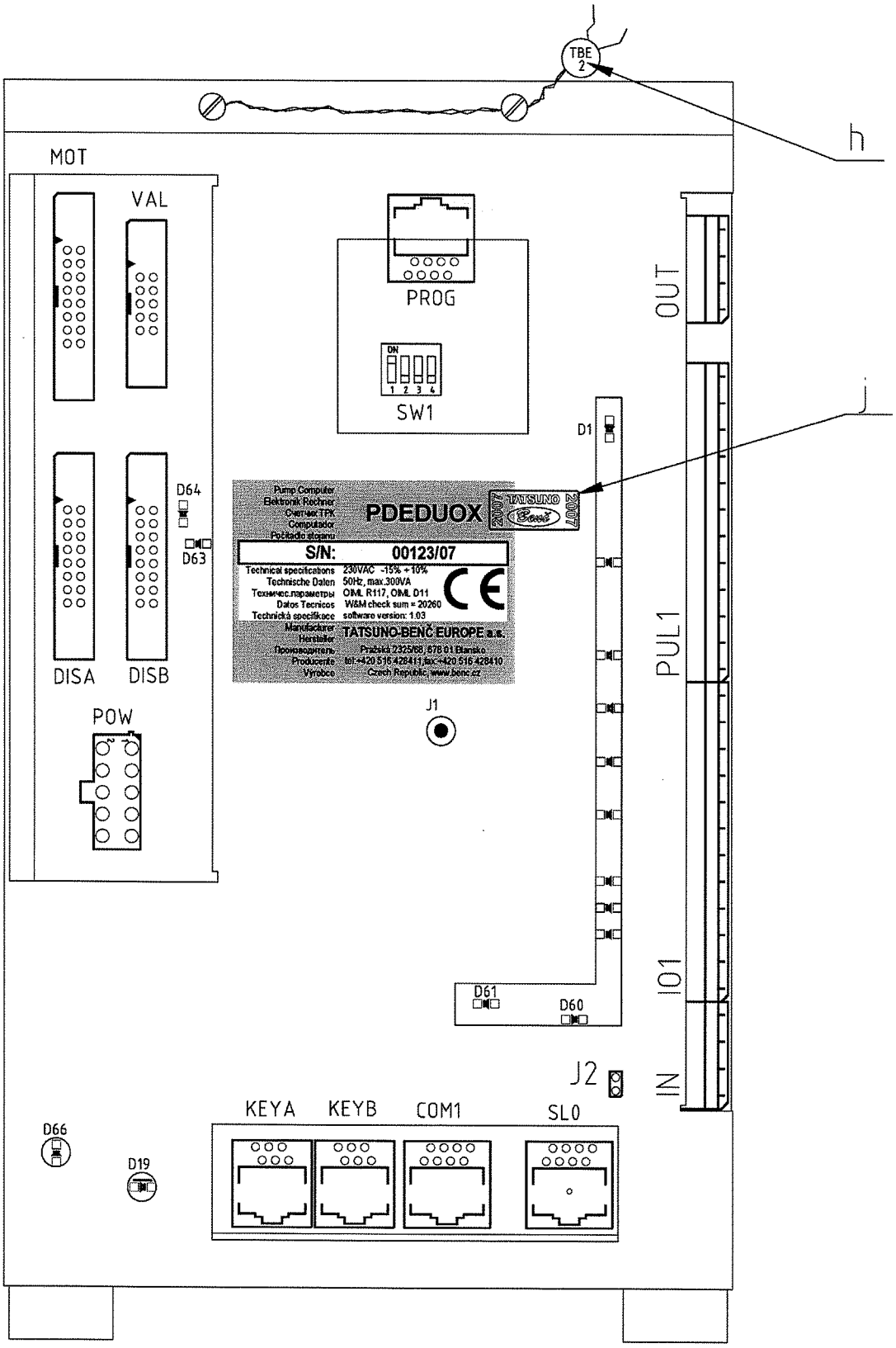
Picture No. 8: The sealing of totalizing indicating device



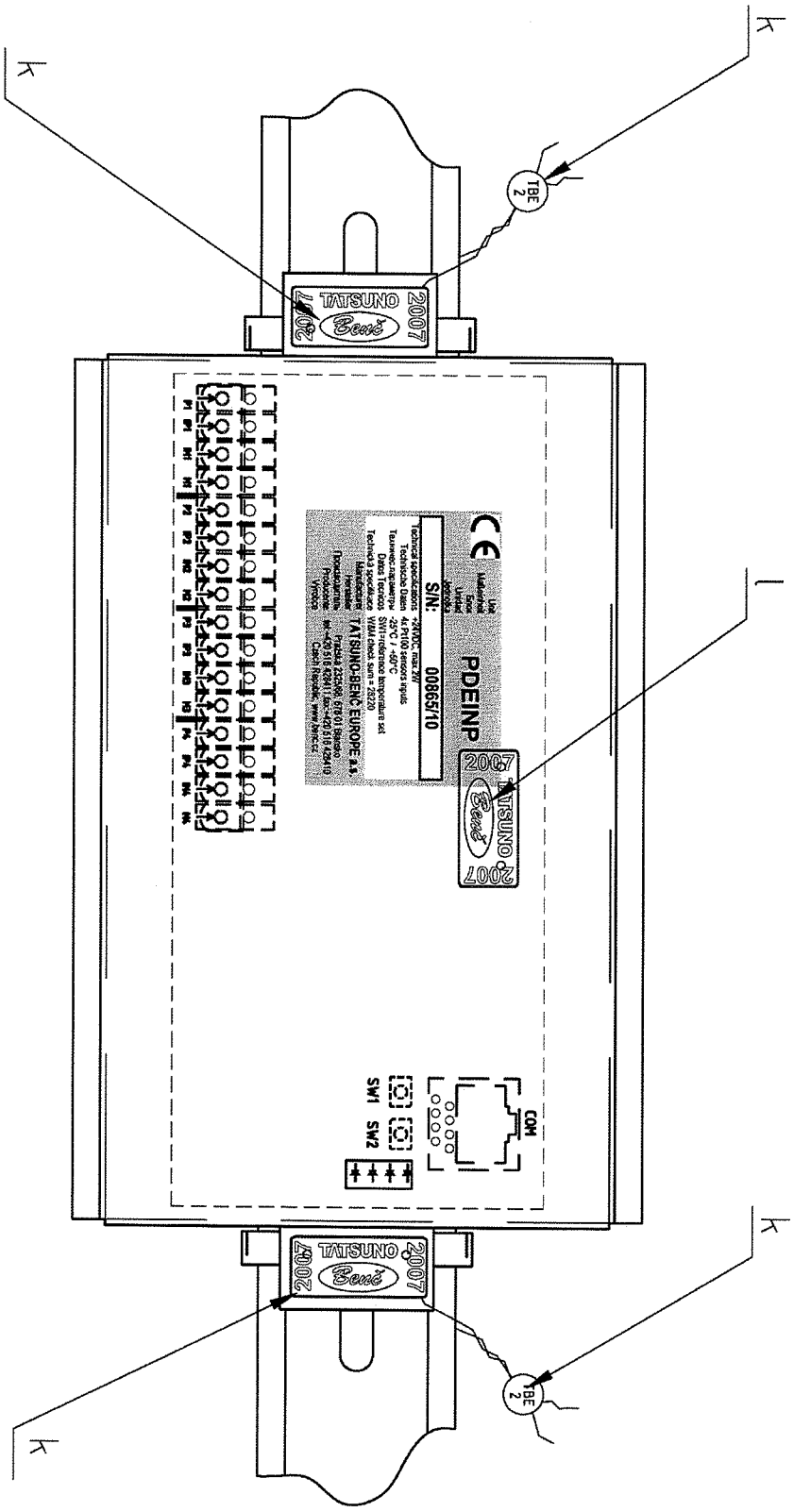
Picture No. 9: The sealing of PDEMPDX calculator



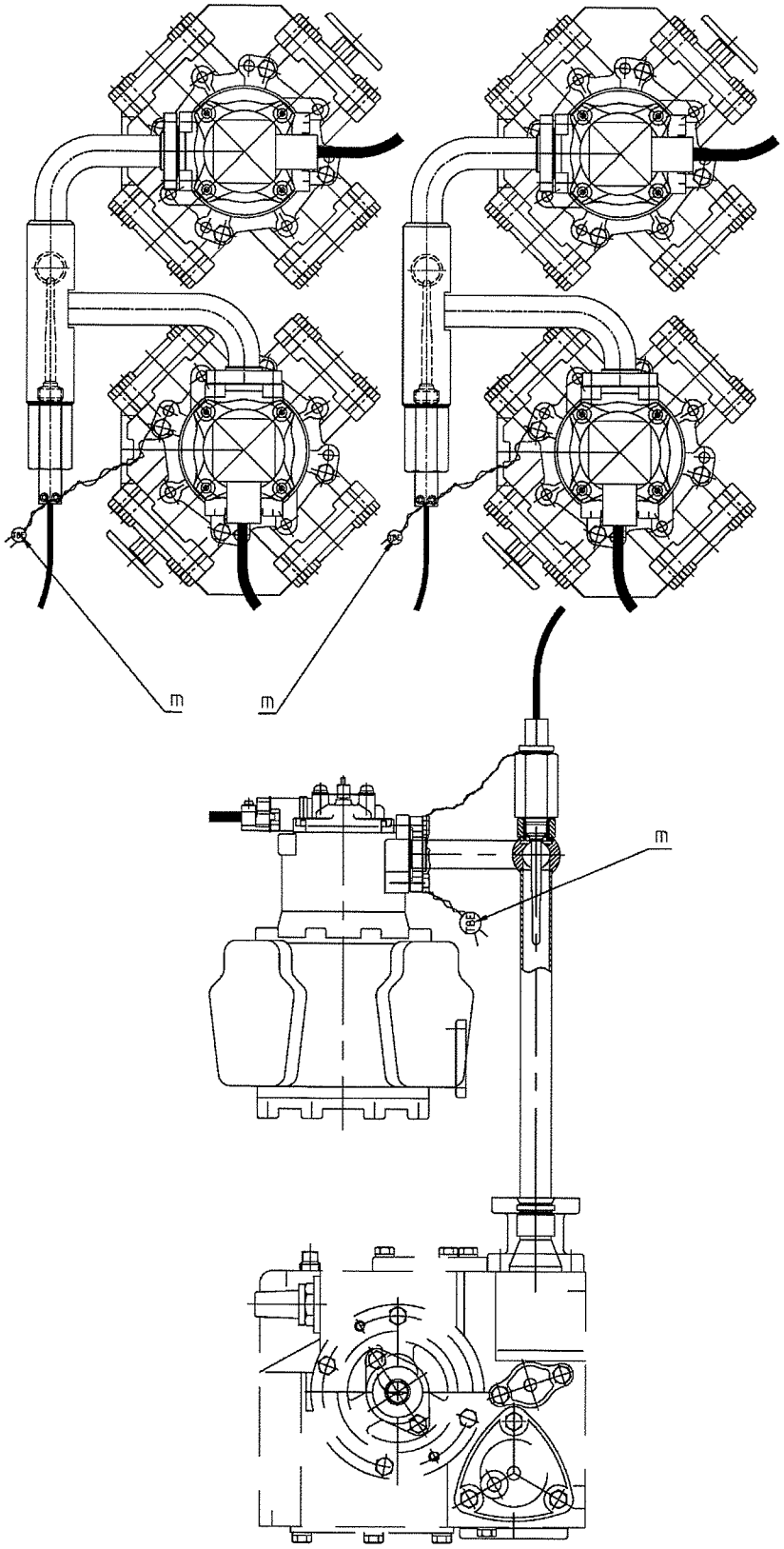
Picture No. 10: The sealing of PDEDUOX calculator



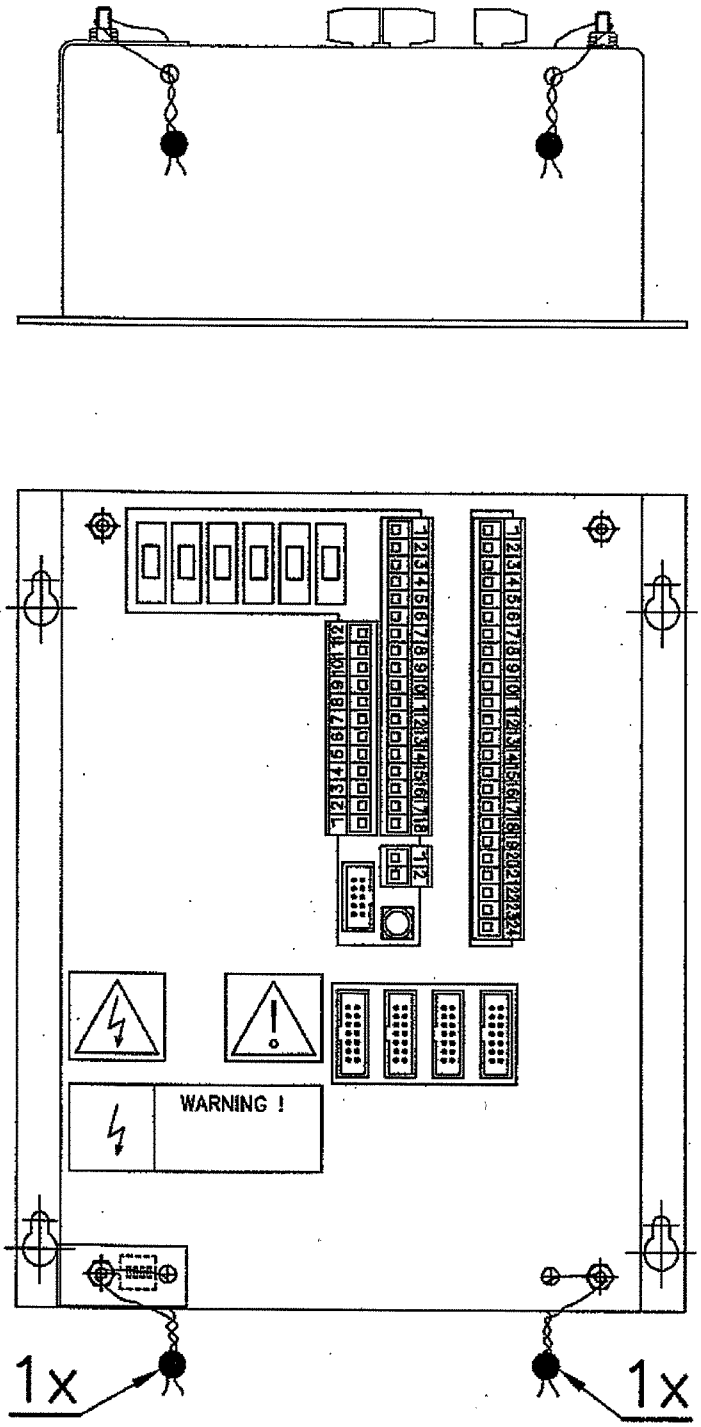
Picture No. 11: The sealing of PDEINPX conversion device



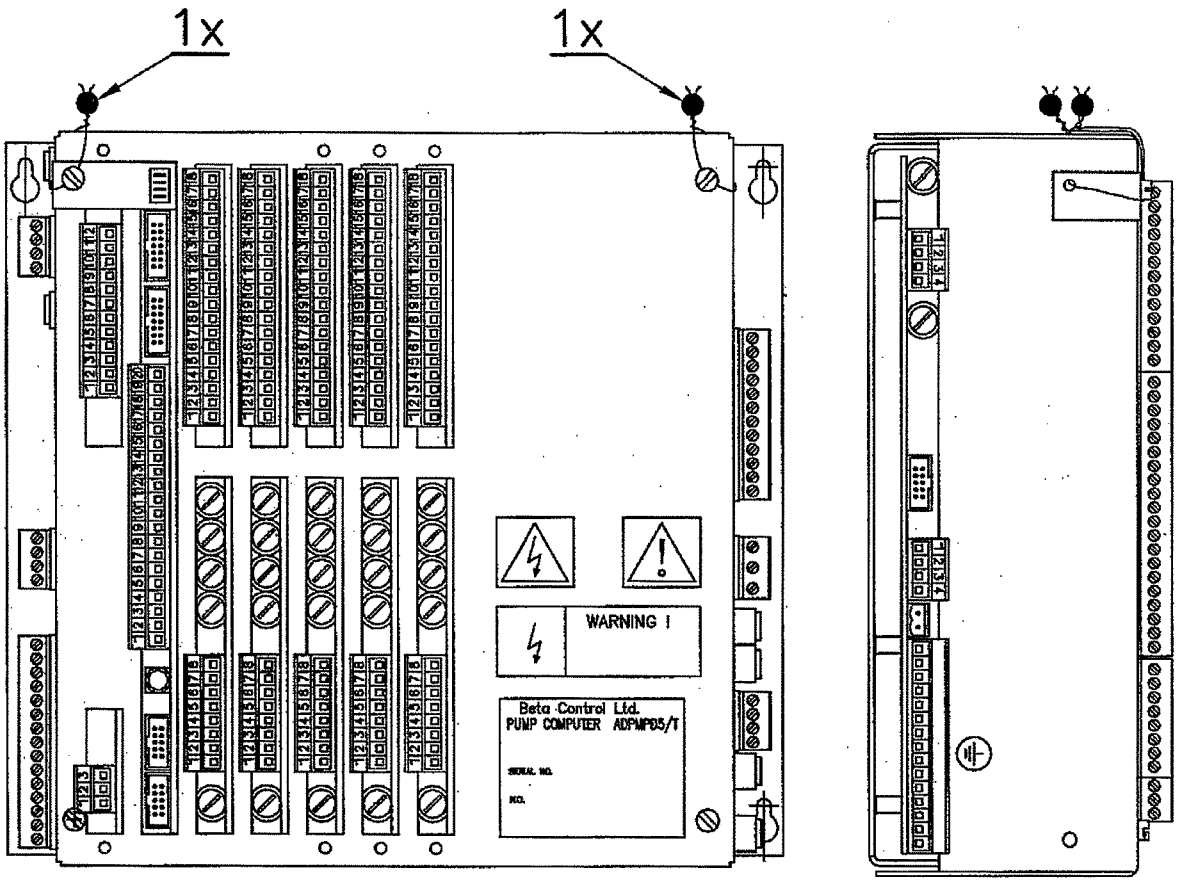
Picture No. 12: The sealing of Pt100 temperature sensor (liquid fuel dispenser)



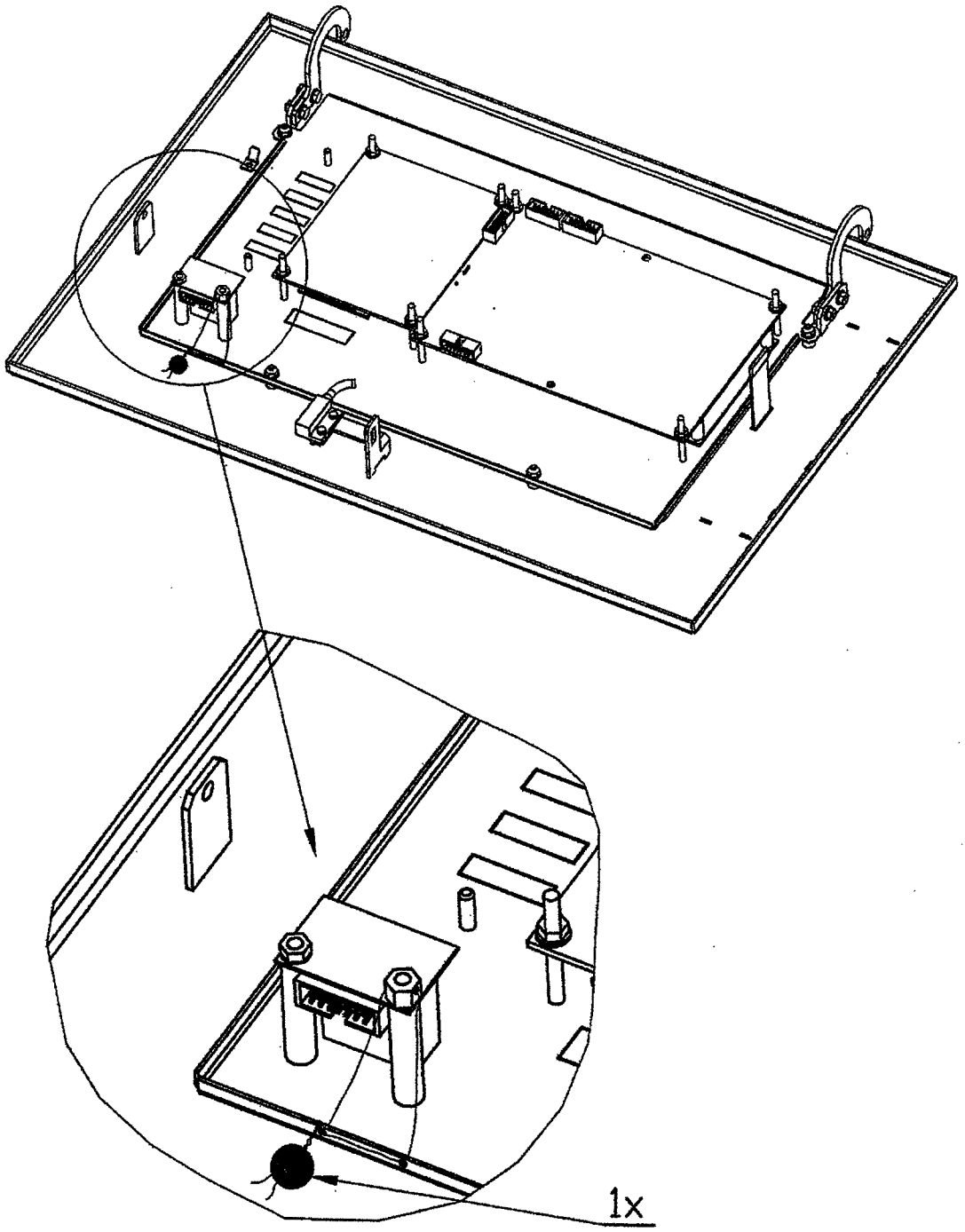
Picture No. 13: The sealing of ADP1/T and ADP2/T calculator

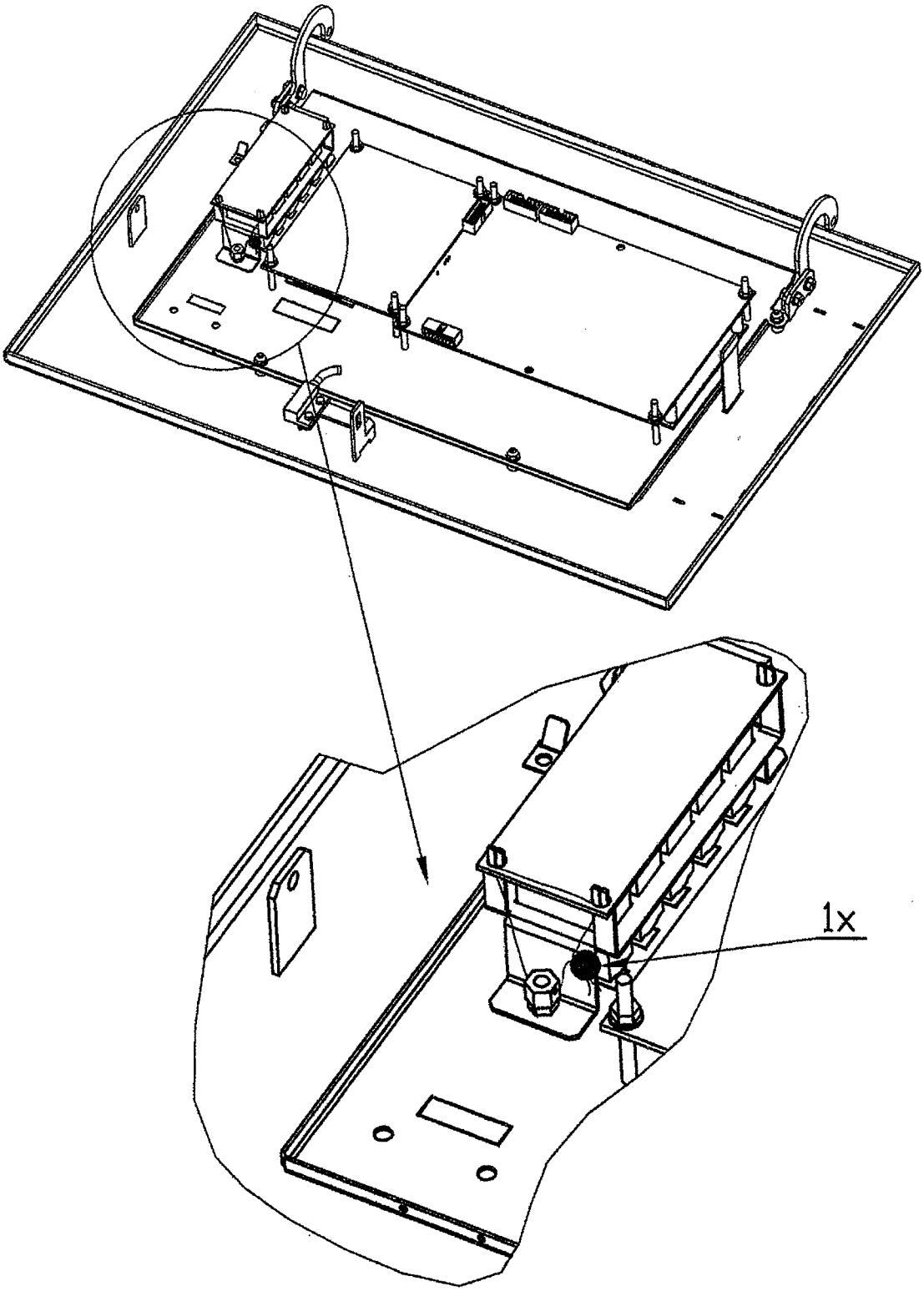


Picture No. 14: The sealing of ADPMPDx/T calculator



Picture No. 15: The sealing of totalizing indicating device (ADPx/T, ADTMPDx/T)





Picture No. 16: The sealing of TBELTx calculator