



EU-TYPE EXAMINATION CERTIFICATE

Number: TCM 141/07 – 4493

Addition 8

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

Page 1 from 23 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: LPG dispenser
type SHARK BMP 5xx.S/LPG and 2xxx.S/LPG, OCEAN BMP 4xxx.O/LPG and
SUNNY-XE EURO Sxx xxxx.E/LPG
Accuracy class 1.0
Mechanical environment class: M1 or M2
Electromagnetic environment class: E1 or E2
Ambient temperature range [°C]: -40 to +55

Valid until: 15 January 2027

Document No: 0115-CS-A006-07

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

Date of issue: 8 February 2019

Certificate approved by:




RNDr. Pavel Klenovský

1 Measuring device description

The LPG dispensers of the types SHARK BMP 5xx.S/LPG and 2xxx.S/LPG, OCEAN BMP 4xxx.O/LPG and SUNNY-XE EURO Sxx xxxx.E/LPG are intended for measurement of liquefied petroleum gas (LPG) volumes as a legal measuring device in the sense of the Directive of the European Parliament and of the Council 2014/32/EU of measuring instruments are used for the refueling of motor vehicles.

The measuring systems consist of a gas separator, non-return valve, positive displacement or Coriolis measurement transducer, pressure maintaining device, electronic calculator with electronic or electromechanical totalizing indicating device, electromagnetic (solenoid) valve, safety valve, manometer, sight glass (optionally), break away coupling and hose with delivery nozzle. These LPG dispensers can be equipped with pre-setting device.

These measuring systems can be installed in one LPG dispenser and they can be connected to electronic calculator only. Two measuring systems can be connected to one OPF4 gas separator.

Electronic calculators PDEX, PDEX5, TBELTM and CDC of the LPG 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 is SHARK MOD 2xxx.S/LPG LPG module, the same hydraulic without electronics, to connect to SHARK BMP 2xxx.S fuel dispensers, which was certified separately.

There is OCEAN MOD 4xxx.O/LPG LPG module, the same hydraulic without electronics, to connect to OCEAN BMP 4xxx.O fuel, AdBlue, WSE or CNG dispensers, which were certified separately.

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

These LPG 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 / parts certificates as mentioned in below.

1.1 Gas separator

TECHKO, s.r.o. OPF gas separator with nominal volume of 2.5L or 1.9L with thermometer well for Pt100 temperature sensor. There are four different models of gas separator. Model OPF3 with nominal volume 2.5L is equipped with one input and one output of the liquid phase. Model OPF4 with nominal volume 1.9L is equipped with one input and two outputs of the liquid phase. Model OPF5 and OPF6 (without thermometer well) with nominal volume 1.9L is equipped with one input and one output of the liquid phase.

1.2 Measuring transducer

These measurement transducers can be used alternatively.

1.2.1. TATSUNO MP-02524 measuring transducer consists of a measuring sensor with four pistons of cyclic volume 0.5 L and TATSUNO EK – 1025 two-channel photoelectric pulse transmitter with 50 pulses / revolution.

1.2.2. TATSUNO FM-1029 measuring transducer consists of a measuring sensor with four pistons of cyclic volume 0.5 L and TATSUNO ZE-1945 or TATSUNO EK-1129 magnetic pulse transmitter with 50 pulses / revolution.

TATSUNO MP-02524 and TATSUNO FM-1029 measuring 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 screw is protected by pin.

TATSUNO FM-1029 measurement transducer has been separately certified by Evaluation certificate No. ZR 141/12-0083 issued by CMI, Notified Body 1383.

1.2.3. Endress+Hauser AG LPGmass DN 15 Coriolis measuring transducer.

Measuring transducer consists of Coriolis mass flow measuring sensor and processor unit with pulser output selectable from 100Hz to 5000Hz, passive status output (open collector) and MODBUS RS485 interface.

LPGmass measuring transducer has been certified separately by the Evaluation certificate No. TC7286 issued by NMi Certin B.V., Notified body 0122.

More detailed information about the LPGmass measuring transducer are to be found in this Evaluation certificate.

1.2.4 Micro Motion CMF050, F050 or F025 measuring transducers.

They consist of Coriolis mass flow measuring sensor and processor unit with pulser output and/or analog output and/or MODBUS RS485 interface.

Type	CMF050	F025	F050
Minimum flow rate [kg/min]	110	23	68
Maximum flow rate [kg/min]	1.36	0.75	2.30
Minimum measured quantity [kg]	5	1	5

Micro motion measuring transducers have been certified separately by the Evaluation certificate No. TC7056 and TC7050 issued by NMI Certin B.V., Notified body 0122.

More detailed information about the Micro motion measuring transducers are to be found in these Evaluation certificates.

1.3 Pressure maintaining device

Following pressure maintaining devices may be used alternatively.

1.3.1. TATSUNO VD-0206 differential valve open by differential pressure about 100 kPa.

1.3.2. TRAFAG EXPD differential pressostat with ON/OFF switch activated by differential pressure about 100 kPa.

1.4 Calculator

These electronic calculators can be used alternatively.

1.4.1. 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 via RS485 by proprietary PDE or other protocols.

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.

1.4.2. 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 via RS485 by proprietary PDE or other protocols.

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 dm³, 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.

1.4.3. There is TATSUNO TBELTM electronic calculator. Model TBELTM can control two measuring systems but not simultaneously. It communicates only with Coriolis mass flow meters using MODBUS protocol.

Calculator TBELTM can operate separately or can be controlled by central system of filling station. It can communicate by via RS485 by proprietary PDE or other protocols.

Software version 1.01

W&M checksum 4092

CRC is shown on the display after switching on the calculator. Other way how to access the software version and CRC is in parameter No. 5. Software version is shown in value of the parameter P05-1. CRC value is shown in P05-2.

This electronic calculator can be operated by buttons of IR module (remote control). It is necessary to change over value of calibration factor, which is stored in memory of calculator (parameter P44) for electronic calibration. Access to electronic calibration is secured by DIP switch SW1-1 (location ON – up) with sealing cover.

Electronic calculator TBELTM has been certified separately by the Evaluation certificate No. ZR141/15-0119 issued by CMI, Notified Body No. 1383.

More detailed information about the TBELT calculator are to be found in this Evaluation certificate.

1.4.4. There are two different models of TATSUNO PDEX5 electronic calculator. Model PDEX5S can control three measuring systems simultaneously and model PDEX5L can control ten measuring systems maximally, four simultaneously. Calculator PDEX5 can operate separately or can be controlled by central system of filling station. It can communicate via RS485 by proprietary PDE or other protocols.

Approved Software version: 01.01

W&M checksum: 4493

This electronic calculator can be operated by buttons of IR module (remote control). It is necessary to change over value of correction factor, which is stored in memory of calculator M6-P09 (menu 6, parameter P09) for manual electronic calibration or perform automatic calibration by the function M6-P15 (menu 6, parameter 15). Access to electronic and manual calibration is secured by DIP switch SW1-1 (location ON – up) with sealing cover.

Electronic calculator PDEX5 has been certified separately by the Evaluation certificate No. ZR141/18-0175 issued by CMI, Notified Body No. 1383.

More detailed information about the PDEX5 calculator are to be found in this Evaluation certificate.

1.4.5. 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.

1.4.6. 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.

1.4.7. 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.

1.5 Conversion device

TM module of PDEX or PDEX5 electronic calculator is placed on separate board PDEINP.

1.6 Self-service device

The dispenser may (optional) also be part of any self-service arrangement under conditions that the connected self-service device/devices:

- has any Part Certificate issued by a test institute that also can act as a notified body under module B of MID for measuring instrument for liquids other than water (MI-005) or
- is covered by an Evaluation Certificate listed below and the self-service arrangement fulfils the communication requirements of this certificate

1.6.1 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.

1.6.2. NPS A/S (Nordic Petrol Systems) outdoor payment terminal PAY SYS were separately certified by Evaluation certificate No. SC311-12 issued by SP Technical Research Institute of Sweden, Notified body 0402.

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

1.6.4. LAFON, LAFON ELYS post-payment self-service device equipped with a data display and secured storage system certified by Evaluation Certificate No. LNE-22484 issued by LNE, Notified body 0071.

1.6.5. Doms ApS, PSS5000 forecourt controller and memory device, a purely digital self-service device certified by Parts Certificate No. SC0257-15 issued by RISE Research Institute of Sweden, Notified body 0402.

1.6.6. Knowtronic ApS, KT-OPT outdoor payment terminal including models "KT-Retail" and "KT-Account", a purely digital self-service device certified by Parts Certificate No. SC0099-18 issued by RISE Research Institute of Sweden, Notified body 0402.

1.6.7. Tokheim, Fuel POS self-service device for use as a part of fuel dispenser, LPG dispenser and/or other liquid dispensers (e.g. AdBlue) certified by Evaluation Certificate No. TC7346 issued by NMi Certin B.V., Notified body 0122.

1.7 Temperature sensor

1.7.1. Pt100 ZPA Nová Paka 112 705 714/ZP9306

1.7.2. Pt100 TRESTON TAB-01-Ex

1.7.3. Pt100 TATSUNO EUROPE Pt100Ex

1.8 Hose

ELAFLEX LPG DN 16; maximum length 7 m

1.9 Nozzle

1.9.1. OPW BREVETTI NETTUNO T3, NT3, NR1, BN300, BN310, BN320, BN300B-HG

1.9.2. Poličské strojírny a.s. VPP02

1.9.3. LPG Group LPG100, LPG200, LPG8xx, LPG9xx

1.9.4. ELAFLEX, ZVG2

2 Basic technical data

Maximum flowrate Q_{\max} [L/min]	30 to 50
Minimum flowrate Q_{\min} [L/min]	5
Min. measured quantity MMQ [L]	5 or 10
Type of display:	Electronic
Type of liquids	LPG
Liquid temperature range	-20 to +50
Maximum pressure [MPa]	1.8
Minimum pressure [MPa]	0.7
Accuracy class	1.0
Ambient temperature range [°C]	-40 to +55
Mechanical class	M1 (M2 with PDEX5 el. calculator)
Electromagnetic class	E1 (E2 with PDEX5 el. calculator)
Environmental class	H3
Volume indication resolution [L]	0.01



3 Test

Technical tests of the SHARK BMP 5xx.S/LPG and 2xxx.S/LPG, OCEAN BMP 4xxx.O/LPG and SUNNY-XE EURO Sxx xxxx.E/LPG LPG 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-P019-06 issued on 21 December 2006, Test Report No. 6015-PT-P006-08 issued on 25 April 2008 (PDEX extension), Test Report No. 6015-PT-P027-08 issued on 22 December 2008 (ADP/T extension), Test Report No. 6015-PT-P0002-10 issued on 28 April 2010 (TBELTx extension), Test Report No. 6015-PT-P0105-11 issued on 9 September 2011 (CDC extension) and Test Report No. 6015-PT-P0004-13 issued on 8 April 2013.

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

4 The measuring device data

There are following data on the gas separator, measurement sensor, pulser, temperature sensor, differential valve, conversion device and the electronic calculator:

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

There are following data on a name plate of the LPG dispenser:

- The "CE" marking and supplementary metrology marking
- Number of EU-type examination certificate
- Manufacturer's name, mark or trademark
- Type designation
- Serial number and year of manufacture
- Accuracy class 1.0
- Minimum measured quantity (MMQ)
- Maximum flowrate (Q_{\max})
- Minimum flowrate (Q_{\min})
- Maximum pressure (P_{\max})
- Minimum pressure (P_{\min})
- 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:

- 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 regarding the base temperature ($T_b = 15\text{ °C}$) has to be mentioned near to each volume indicating device in case of measuring system with 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 $\pm 1.0\%$.

Access to the metrological parameters of the calculators TBELTM, TBELTx, PDEx and PDEX5 is protected by sealed SW1-1 switch on CPU motherboard. The switch has to be set to position "ON" (locked) in normal operation mode. Additionally the switch SW1-4 has to be set to position OFF in case of PDEX and TBELTx electronic calculators.

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

On the Tatsuno measurement transducers:

- | | |
|--|----|
| a) Connection of transducer body with pistons covers | 1x |
| b) Connection of adjustment device pin with piston cover and type plate | 1x |
| c) Connection of transducer body with upper cover and pulser and totalizer, if any | 1x |
| d) Connection of transducer body with bottom cover | 1x |

On the differential valve:

- | | |
|---|----|
| e) Connection of differential valve body with upper and bottom covers | 1x |
|---|----|

On the PDEX, PDEX5, TBELTx calculator:

- | | |
|---|----|
| f) Connection of calculator cover with calculator console and SW1 switch cover, if separate | 1x |
| g) Connection of cover of electromechanical totalizer with display mask | 1x |
| h) Type plate of calculator | |

On the TBELTM el. calculator:

- | | |
|---|----|
| fi) Metal cover of the CPU has to be sealed by two screws | 1x |
|---|----|

On conversion device, if any:

- | | |
|--|----|
| i) Connection of PDEINP unit cover with calculator console | 4x |
| j) Type plate of PDEINP unit, if separate | 1x |
| k) Connection of a temperature sensor with the gas separator | 1x |
| l) Type plate of the temperature sensor, if separate | 1x |

On the LPG dispenser:

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

On the UNIDATAZ CDC electronic calculator:

- | | |
|---|----|
| p) Connection of S3 switch cover with CPU unit | 1x |
| q) Connection of CPU unit with calculator console | 1x |
| r) Connection of electromechanical totalizer to the frame | 1x |
| s) Type plate of the calculator | 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 and No. LNE-28279

On the NPS A/S PAY SYS outdoor terminal:

- According to Evaluation certificate No. SC311-12

On the LAFON ELYS post-payment self-service device

- According to Evaluation Certificate No. LNE-22484

On the Doms ApS, PSS5000 forecourt controller and memory device, a purely digital self-service device

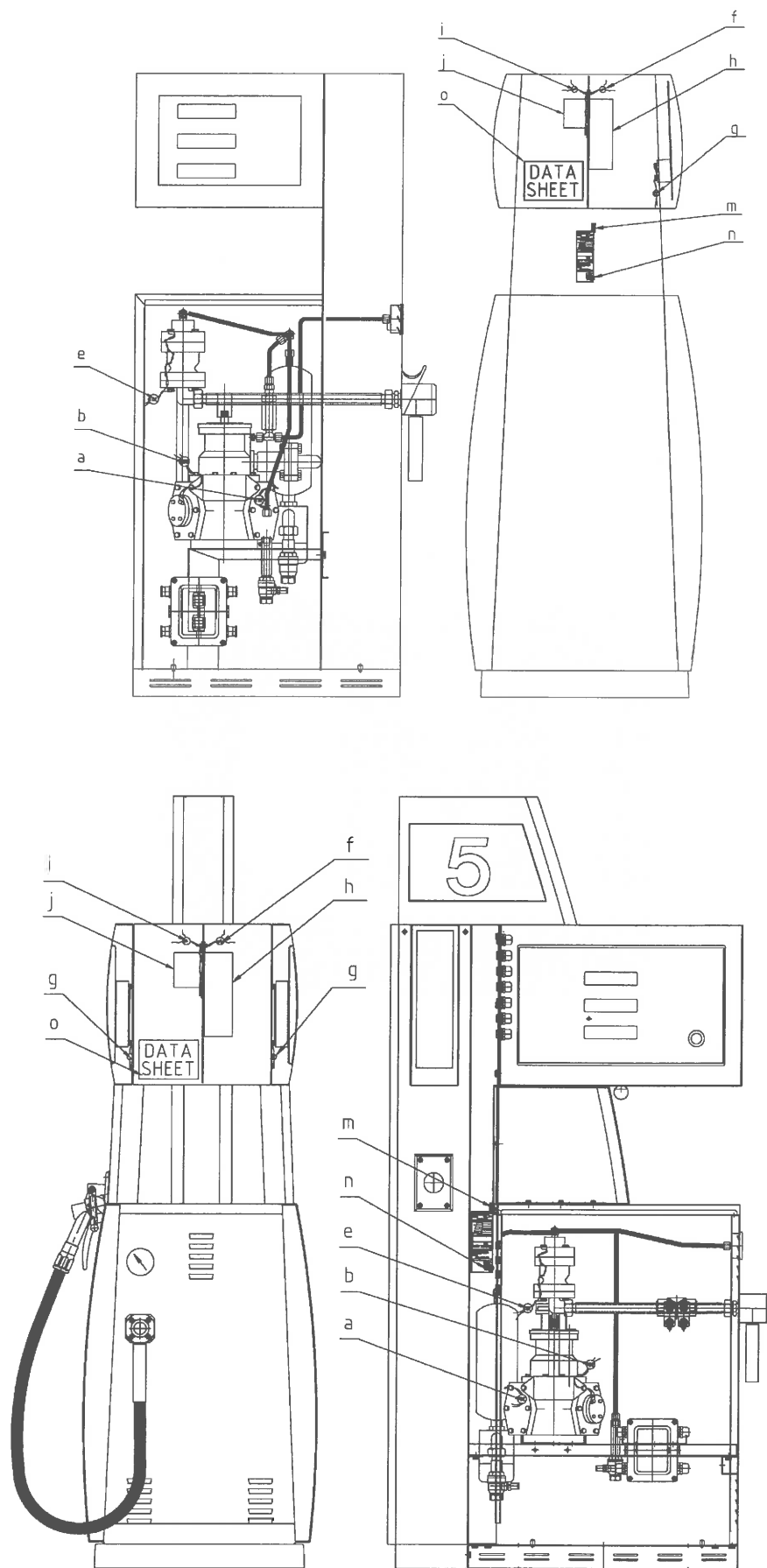
- According to Parts Certificate No. SC0257-15

On the Tokheim, Fuel POS self-service device

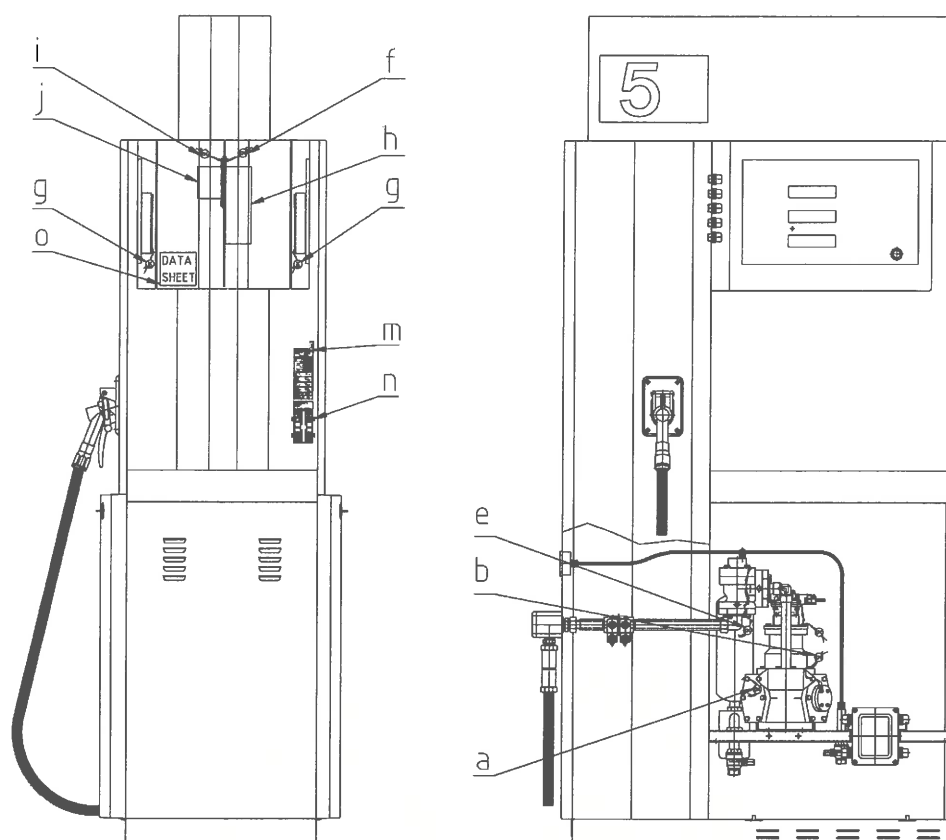
- According to Evaluations Certificate No. TC7346

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.

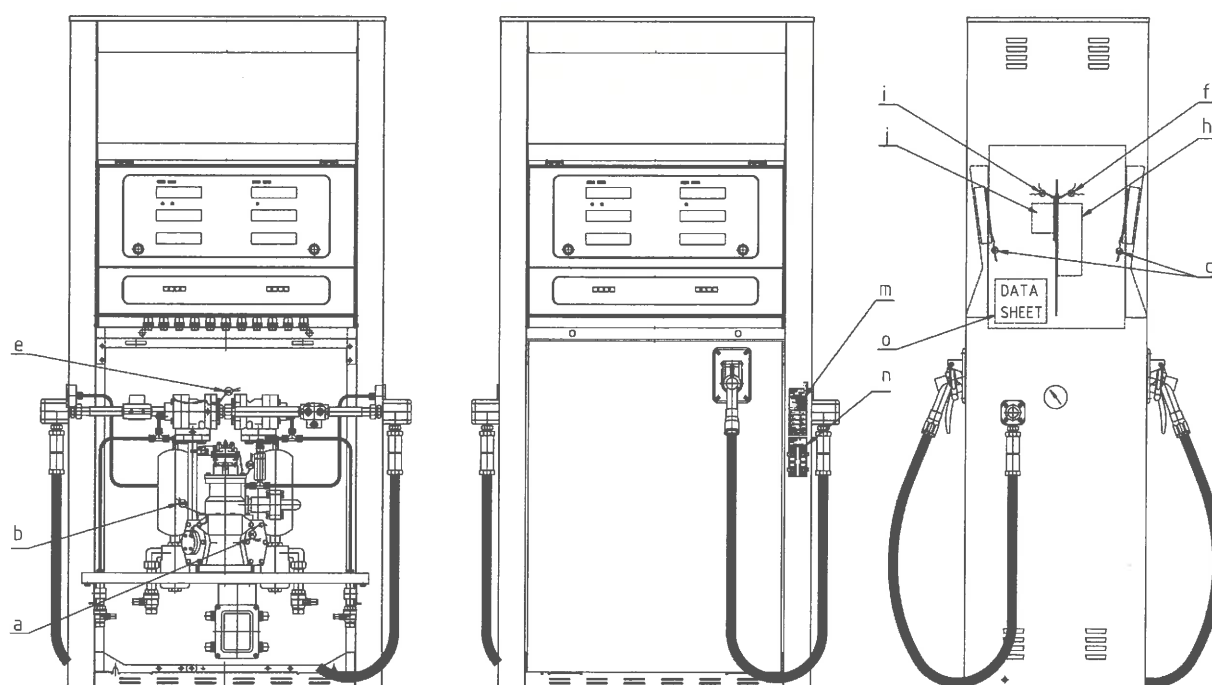
Picture No. 1a: The sealing of SHARK BMP 5xx.S/LPG and 2xxx.S/LPG LPG dispenser



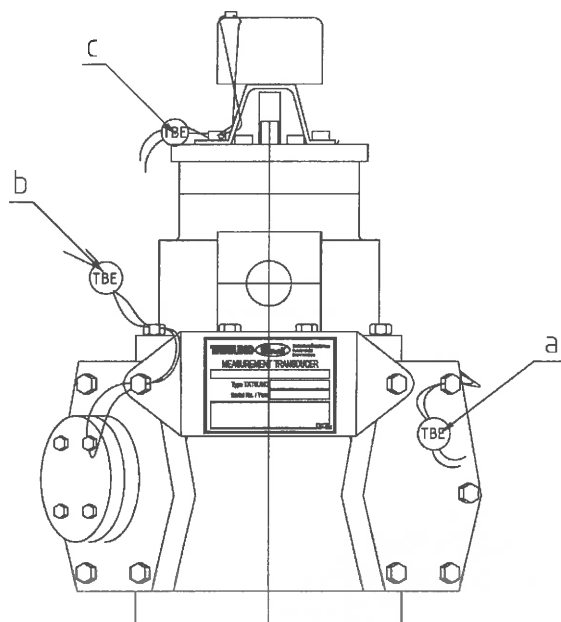
Picture No. 1b: The sealing of OCEAN BMP 4xxx.O/LPG LPG dispenser



Picture No. 1c: The sealing of SUNNY-XE EURO Sxx xxxx.E/LPG LPG dispenser

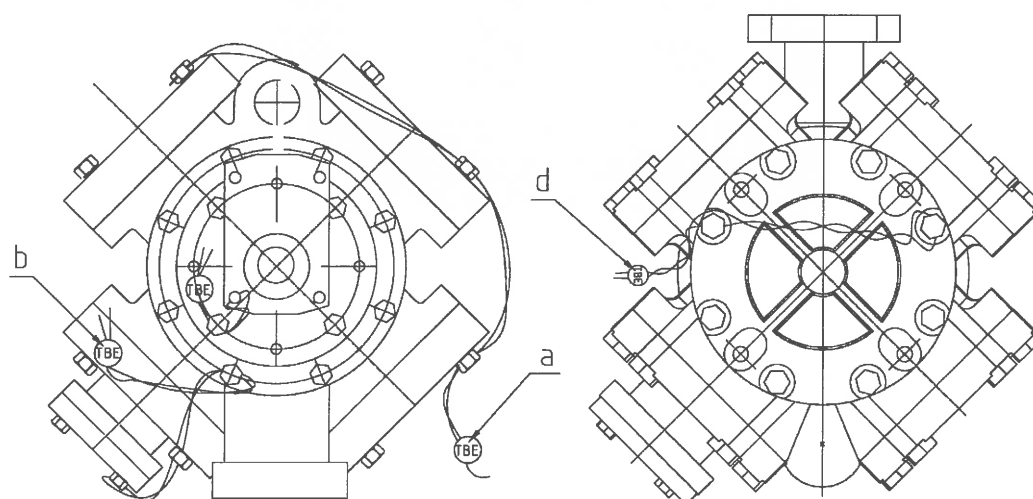


Picture No. 2a: The sealing of MP-02524 measuring transducer

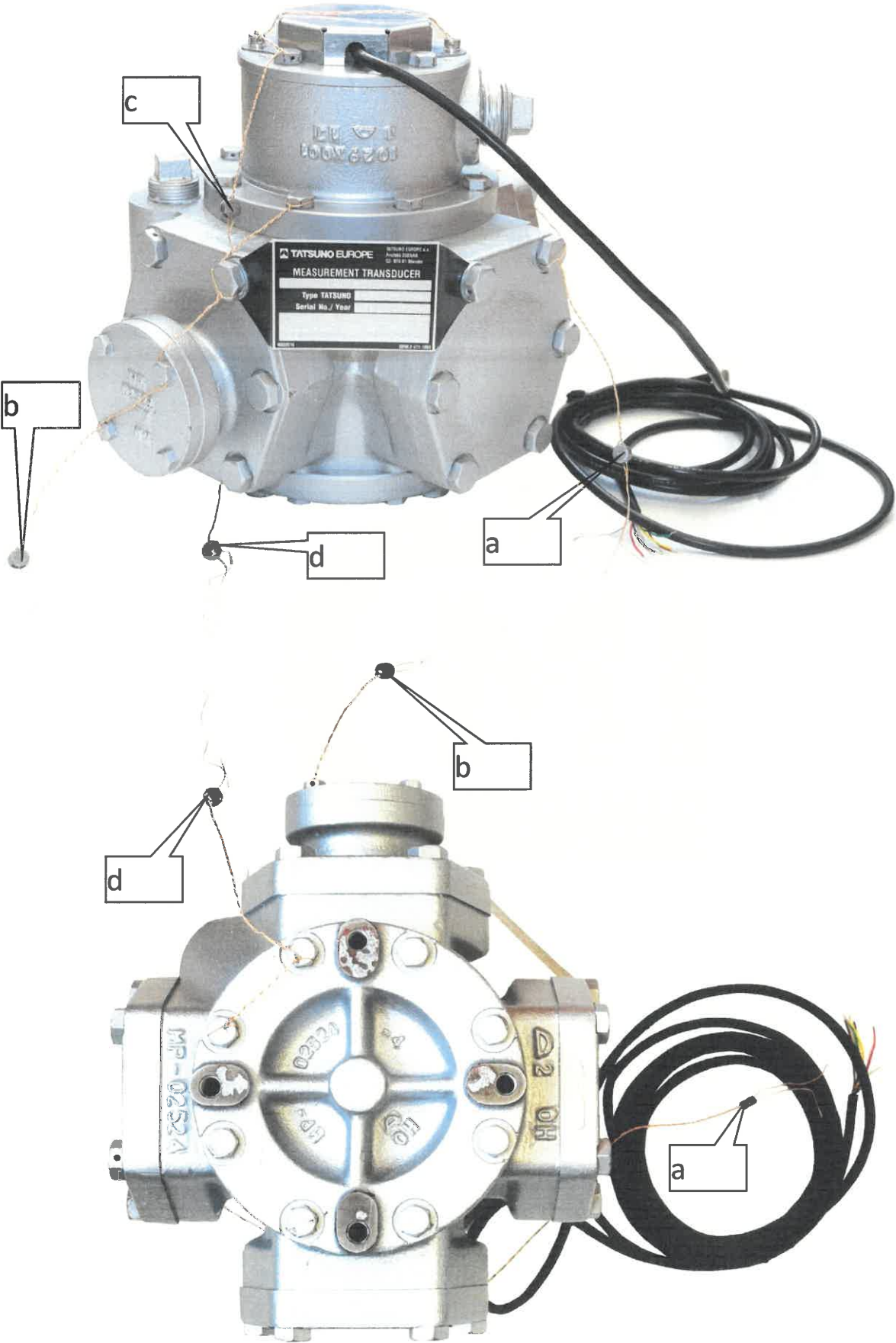


Upper view

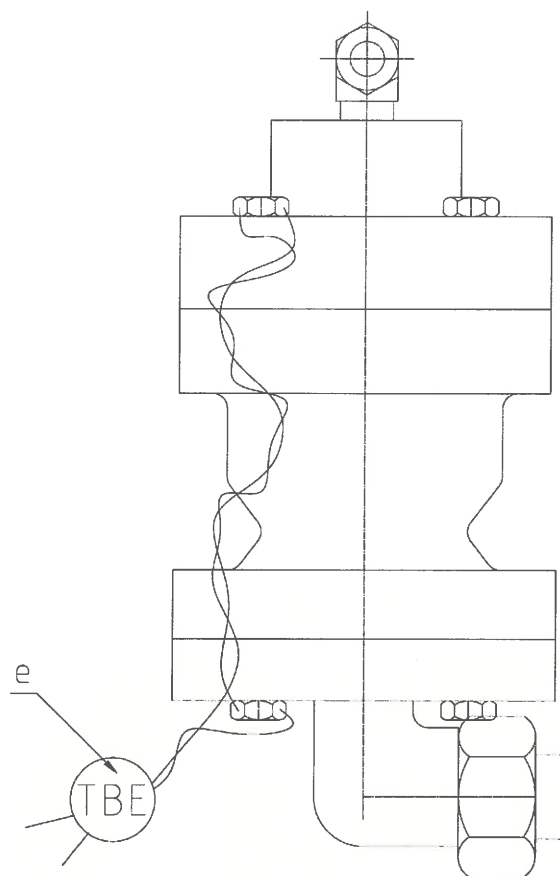
Bottom view



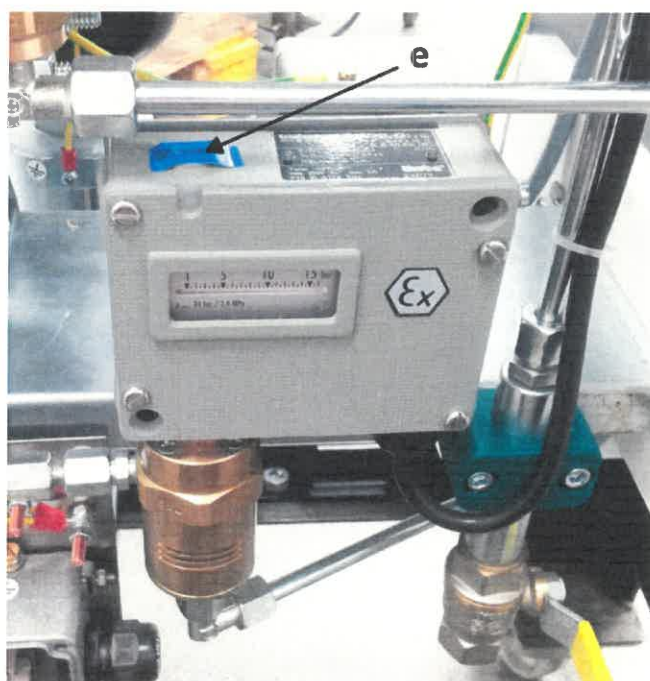
Picture No. 2b: Sealing of the FM-1029 measurement transducer with ZE-1945 pulser



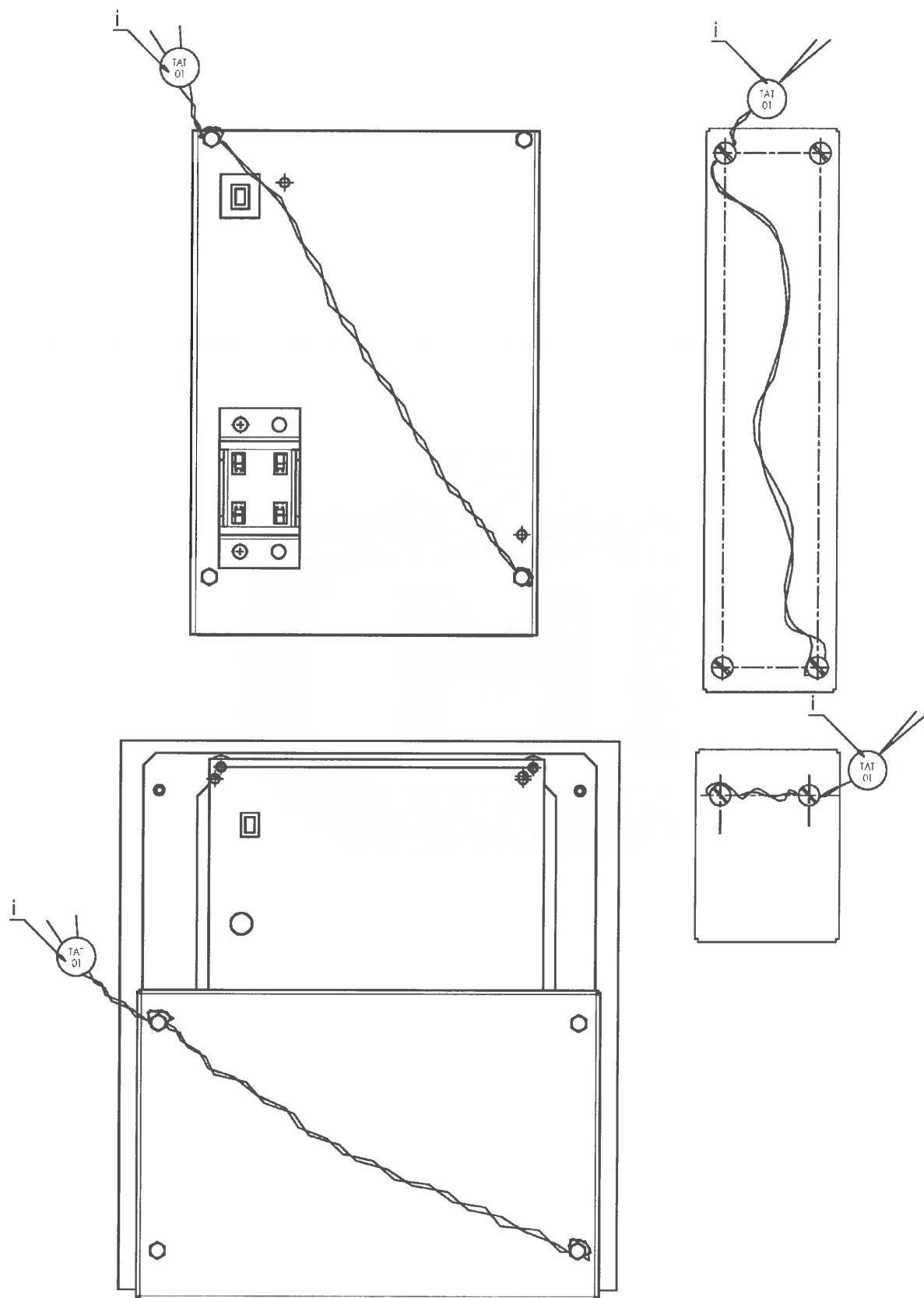
Picture No. 3: Sealing of the differential valve:



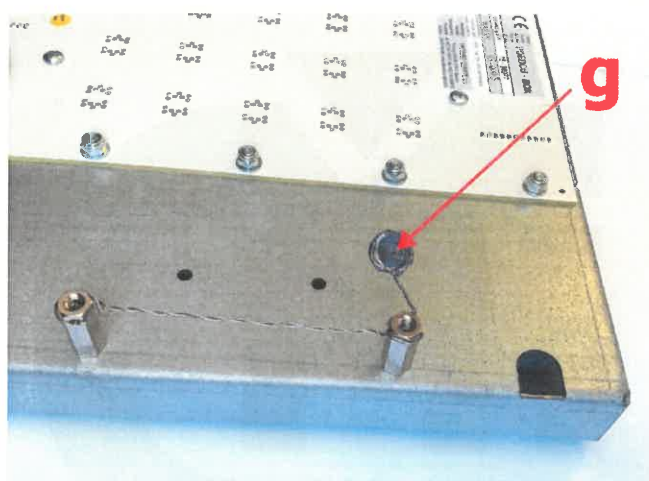
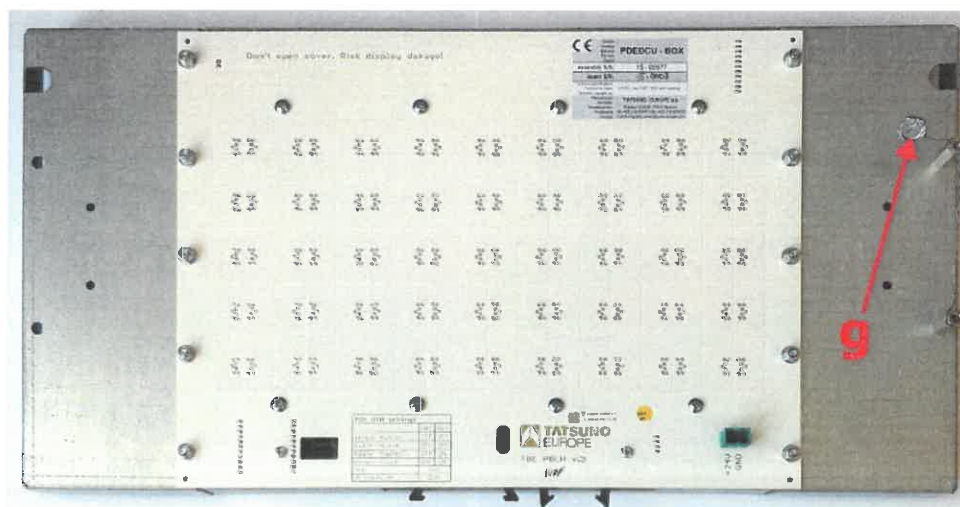
Picture No. 3a: Sealing of the differential pressostat:



Picture No. 4: Sealing of the totalizing indicating device (examples of covers)



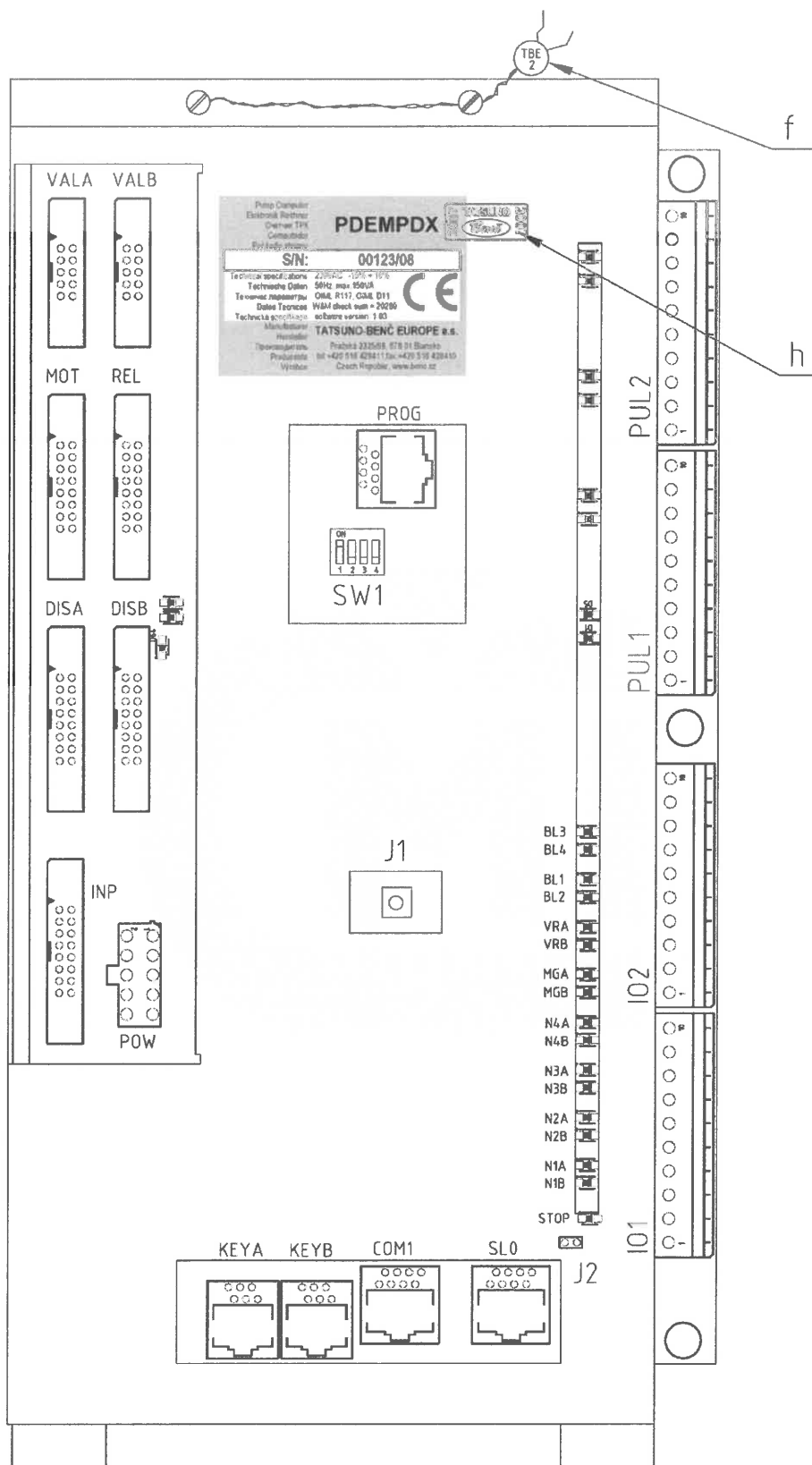
Picture No. 4a: Sealing of the totalizing indicating device with proportional display PDEDCU



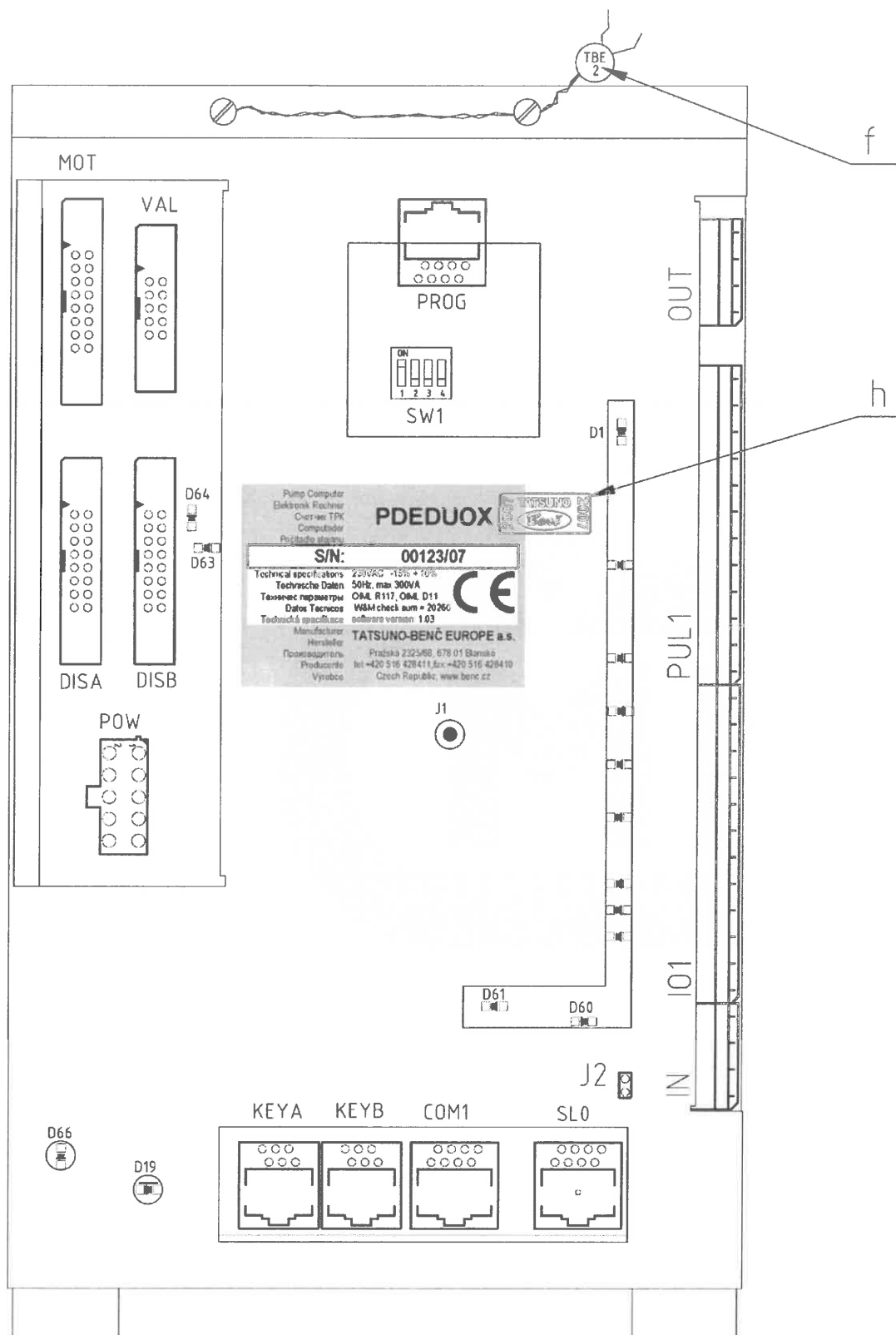
Picture No. 4b : Sealing of the totalizing indicating device with display PDEDIL V6



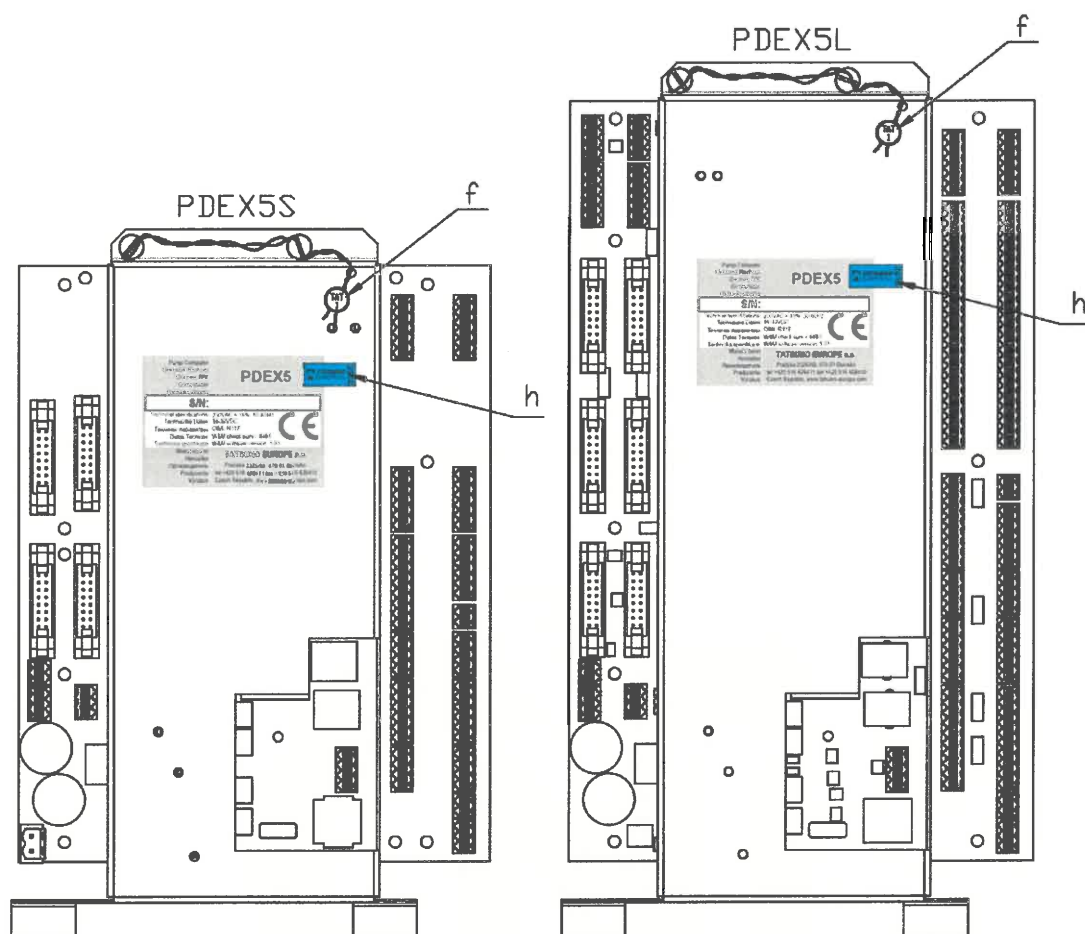
Picture No. 5: Sealing of the PDEMPD.X calculator



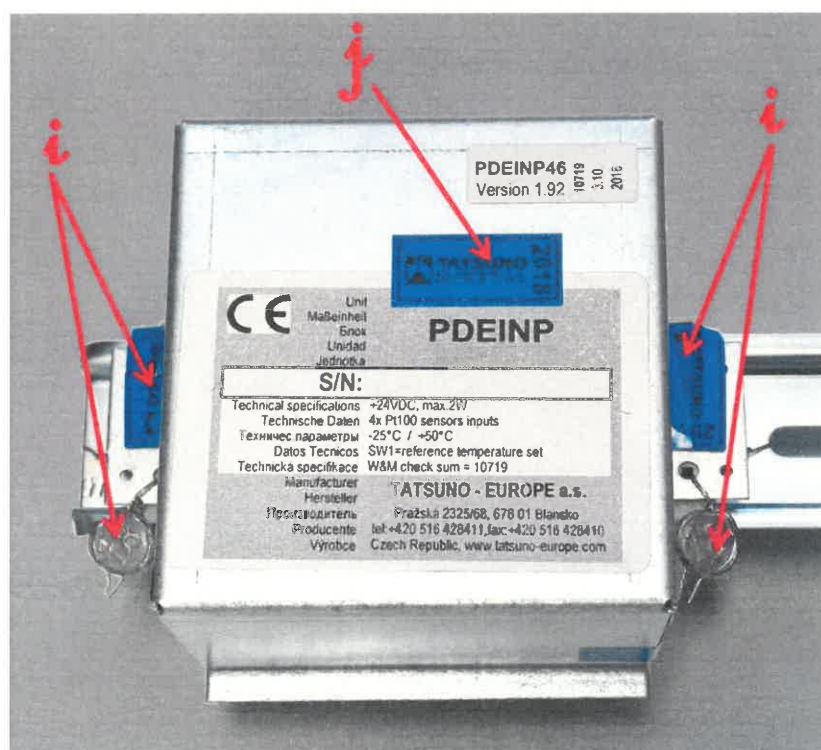
Picture No. 6: Sealing of the PDEDUO.X calculator



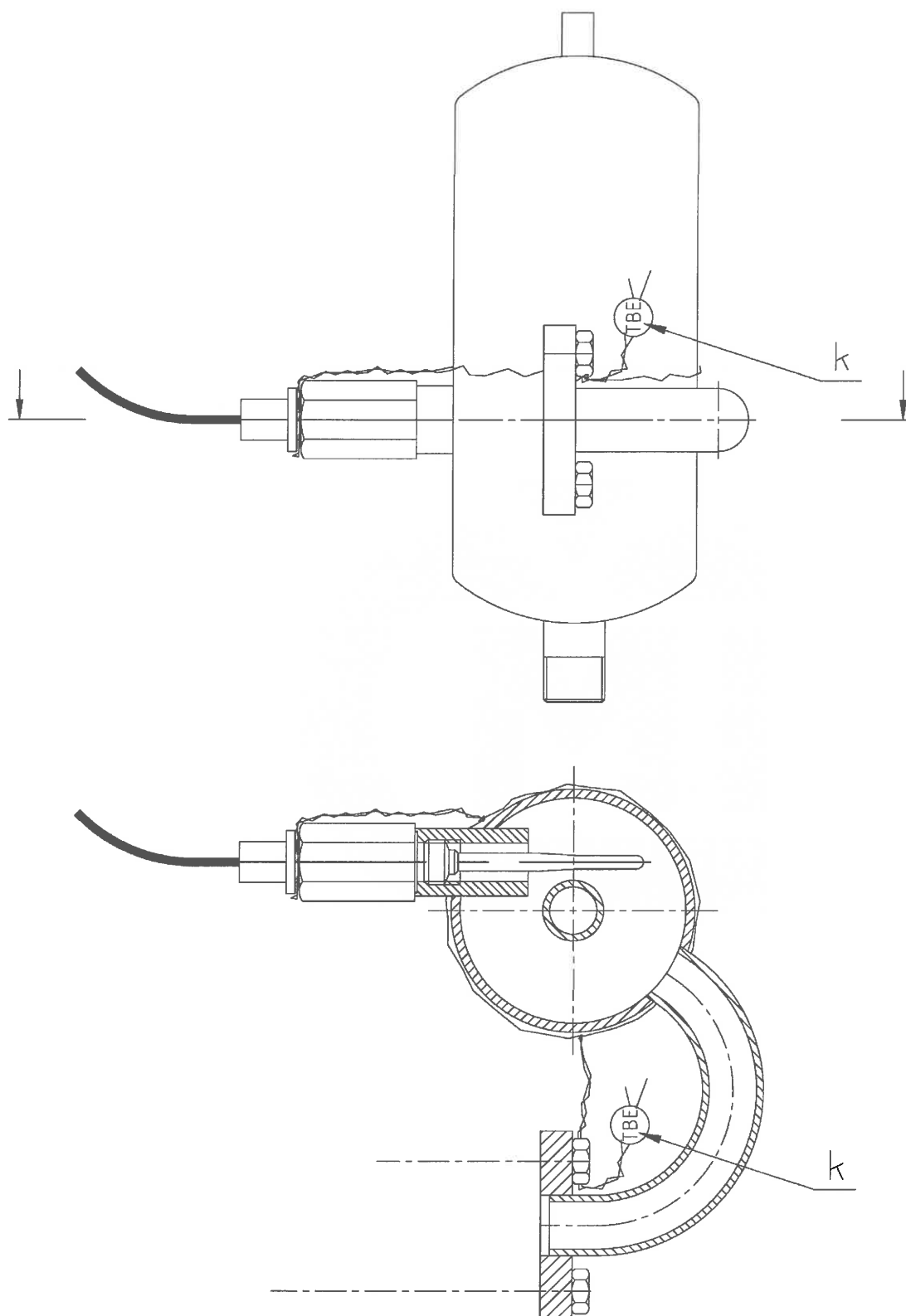
Picture No. 6a: The sealing of PDEX5 calculator (modification PDEX5S and PDEX5L)



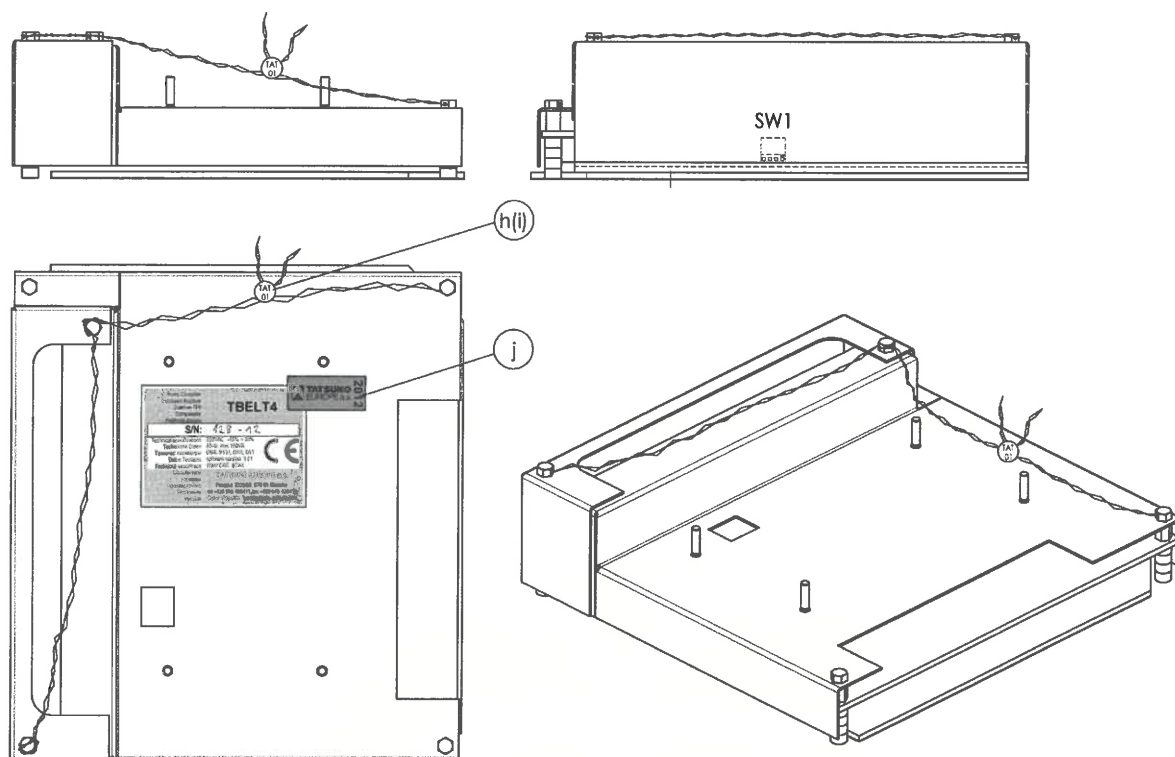
Picture No. 7: Sealing of the PDEINP.X conversion device



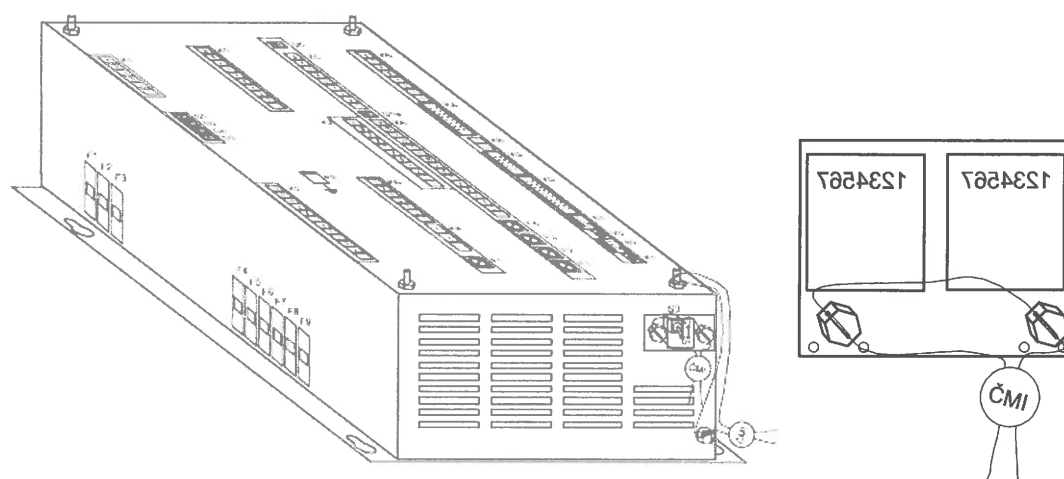
Picture No. 8: Sealing of the Pt100 in gas separator



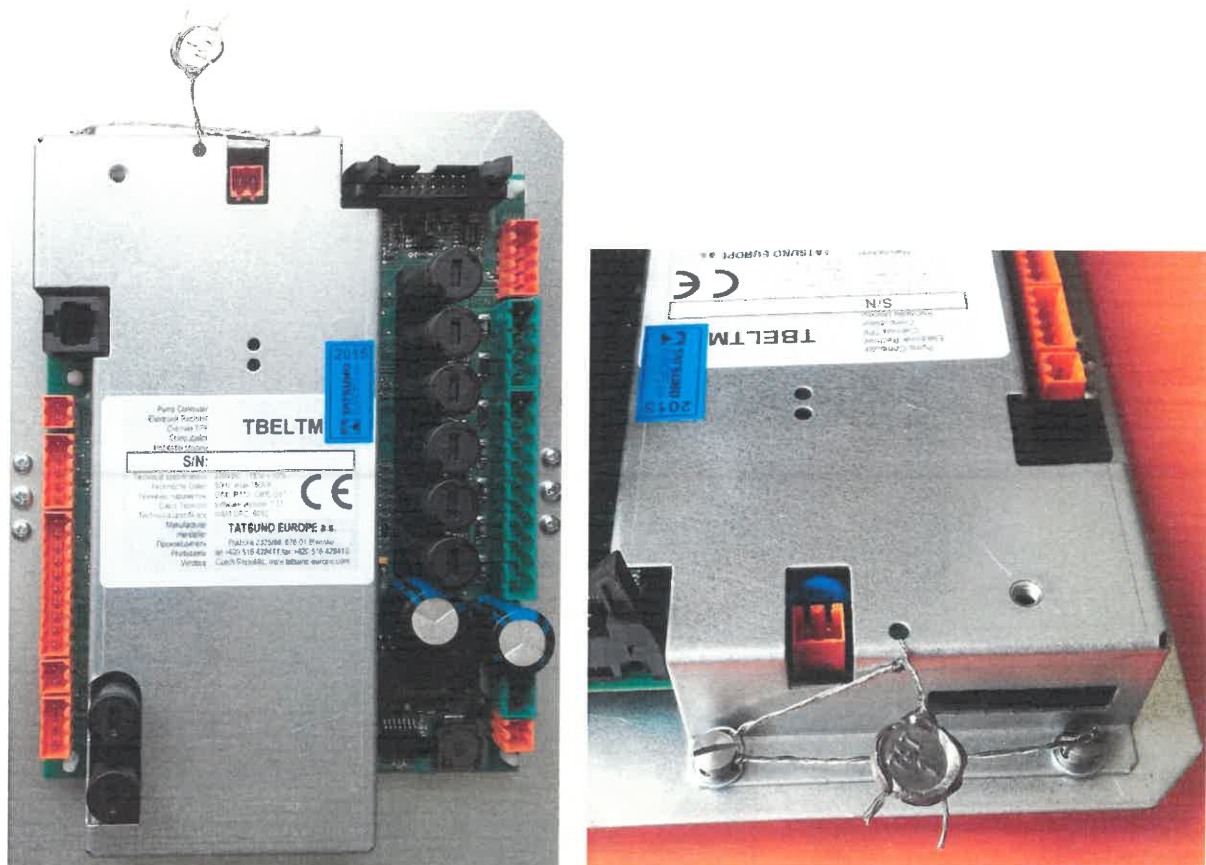
Picture No. 9: Sealing of the TBELTx calculator



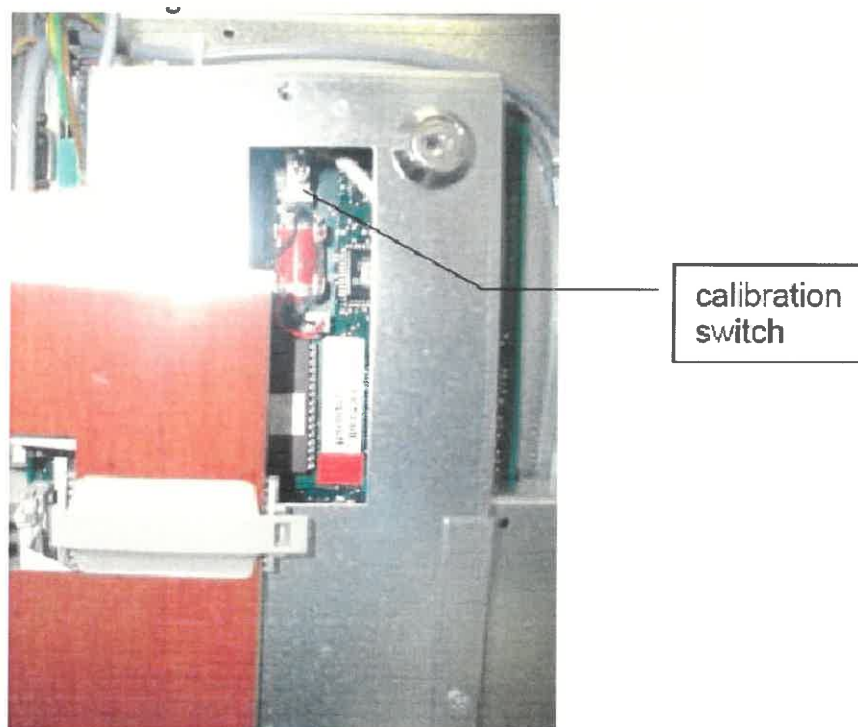
Picture No. 10: Sealing of the UNIDATAZ CDC electronic calculator with totalizer



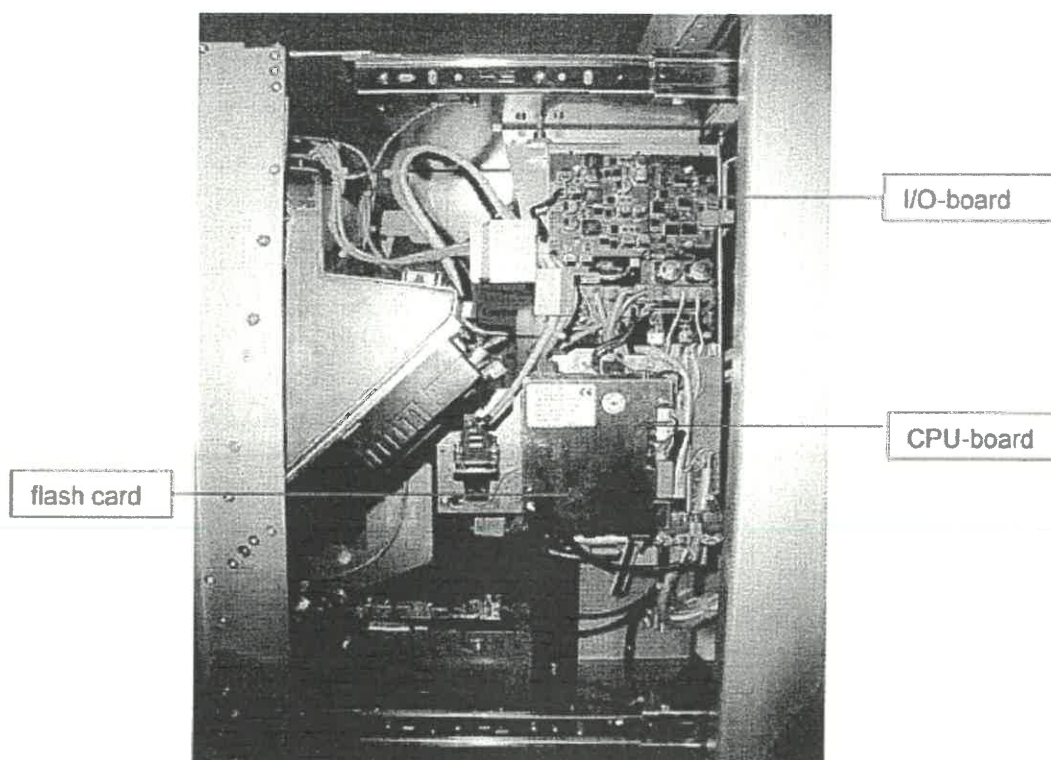
Picture No. 11: Sealing of the TBELTM calculator



Picture No. 12: Sealing of the calibration switch of Hectronic GmbH TA2331 self-service device



Picture No. 13: Sealing of the CPU and flash card of Hectronic GmbH HECSTAR/ HECFLEET NT self-service device



Picture No. 14: Sealing of CPU, type label, flash disk and pulsers of Hectronic GmbH HECPUMP self-service device

