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V 3112

EU-TYPE EXAMINATION CERTIFICATE

Number: TCM 141/07 - 4505

Addition 11

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

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: Adast Systems, a.s.
Adamov 496
679 04 Adamov
Czech Republic

For: fuel dispensers

type: 899x.xxx, 46xx.xxx and 47xx.xxx

accuracy class: 0.5

ambient temperature range: -40°C to +55°C (-25°C to +55°C with Beta Control ADP1/L)

Valid until: 21 February 2027

Document No: 0115-CS-A010-07

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

Date of issue: 11 March 2021

Certificate approved by:

Český metrologický institut
-3-

RNDr. Pavel Klenovský

1 Measuring device description

The 899x.xxx, 46xx.xxx and 47xx.xxx fuel dispensers are designed for measurement of liquid fuels volume at dynamic viscosity up to 20 mPa.s, (example gasoline, diesel, aviation gasoline and kerosene, biodiesel B 5 to B 100 - mixture of diesel with FAME, ethanol and mixture of gasoline with ethanol E 5 to E 95) 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.

The fuel dispensers 899x.xxx/S, 46xx.xxx and 47xx.xxx consist of a pumping unit with gas elimination device (except 899x.xxx/P and 47xx.xxx), measurement transducer, electronic calculator with electronic or electromechanical totalizing indicating device, electromagnetic valve and house with delivery nozzle. These fuel dispensers can be equipped with a vapour recovery system and pre-setting device.

The fuel dispensers 899x.xxx, 46xx.xxx and 47xx.xxx can be connected into independent Point of Sale or Paying terminal, which do not influence metrology parameters of fuel dispensers. The Independent Point of Sale or Self-service Device are not subject of this EU – Type examination certificate (excluding calculator UNIDATAZ type CDC which combines function of calculator and Self-service Device in one device).

The fuel dispensers type 899x.xxx/P and 47xx.xxx don't contain any pumping unit and they are intended only for installation in pressurized system with external pump.

The fuel dispensers 899x.xxx, 46xx.xxx and 47xx.xxx differ from each other just in their housing look but they consist of the same components.

The fuel dispensers 46xx.xxx and 47xx.xxx can be made in the „H" – high – version of the hose module with the hoses freely suspended (type marking H 46xx.xxx and H 47xx.xxx) or in the „R" – low – version of the hose module with the hoses drawing-in system (type marking R 46xx.xxx and R 47xx.xxx).

The fuel dispenser 899x.xxx can be made in the 899x.4xx version with the hose suspended at a spring or in the 899x.6xx version with the hose taken out from the dispenser side panel.

There is additional metrology marking V-line or E-line before type marking 899x.xxx, 46xx.xxx and 47xx.xxx which gives information about used electronic components. Hydraulic parts are same for both series.

V-line series can be composed from following electronic components:

- Pulse transmitters: Eltomatic ME01-05, Eltomatic ME01-05-05, METRA MTX 075, Adast 40.
- Calculators: Beta Control type ADP, UNIDATAZ type CDC, Adast Systems type EC_015.
- Temperature sensors: ZPA 112 70 Pt100, TRESTON TAB-01-Ex Pt100.

E-line series can be composed from following electronic components:

- Pulse transmitters: Adast 44, Adast 40.
- Calculator: Adast Systems type ECx, Adast Systems type EC_015.
- Temperature sensor: CAN ATC Ex Pt100.

There are some special versions of fuel dispensers:

- V-line 899x.xxx/P/OIL and V-line 47xx.xxx/OIL designed for measurement of vegetable oils (rape, sunflower, soya etc.) and mineral oils (engine, transformer, hydraulic etc.) at dynamic viscosity up to 1000 mPa.s at Q_{max} < 80 L/min only. There is internal heating to heat of all hydraulic parts to above -10 °C.
- V-line 899x.xxx/LPG Hybrid which is combination of Fuel dispenser and LPG dispenser installed in one housing. Both measuring systems (fuel and LPG) are controlled by common calculator. The LPG dispensers were certified separately in the EC-type examination certificate No. TCM 141/07 – 4506 issued by CMI, Notified Body 1383.
- The LPG module of the type V-line 8690.xxx/LPG, which was certified separately, can be connected to the type V-line 46xx.xxx and V-line 47xx.xxx fuel dispensers.
- The CNG module of the type V-line 8690.xxx/CNG, which was certified separately, can be connected to the type V-line 46xx.xxx and V-line 47xx.xxx fuel dispensers.
- The AdBlue module of the type V-line 8690.xxx/AdBlue, which was certified separately, can be connected to the type V-line 46xx.xxx and V-line 47xx.xxx fuel dispensers.

Satellite delivery point can be present with both series V-line and E-line fuel dispensers.

The fuel dispenser containing calculator Beta Control type ADP1/L can be installed on mobile device powered by battery.

The fuel dispenser type V-line 8662.xxx (metrological part identical with V-line 899x.xxx) can be installed into dispensing system e.g. container dispensing system.

Electronic calculators of the fuel dispensers are equipped with ATC conversion function that converts the measured volume to the volume at base conditions of 15 °C. This function can be enabled or disabled. A temperature sensor of the type stated in point 1.4 has to be connected in case of active ATC function.

1.1. Pumping unit with gas separator

There are two different models of pumping unit with gas separator type P64x.50 with Q_{max} 60 L/min and type P64x.100 with Q_{max} 80 L/min. They have the same construction which differs in internal pump's volume only.

Model P64x.xx/SS differs from others in suction inlet which is placed on bottom side.

Model P64x.xx/x/xx/ATC contains thermowell for installation of temperature sensor.

P64x.xxx/xx/B pumping unit is destined for ethanol, mixture of gasoline with ethanol E 5 to E 95.

The gas elimination device is the same for all models.

1.2. Measuring transducer

There are two different models of measuring transducer type M 403.25xP/1 with Q_{max} 120 L/min and type M 403.32xP/1 with Q_{max} 150 L/min. There is difference in nominal diameter and rotary valve only.

M 403.xxxP measuring transducer consists of a flow sensor with four pistons and cyclic volume 0.48 L and one of the following pulse transmitters:

- Eltomatic ME01-05 two-channel magnetic pulse transmitter with 2 × 48 pulses per revolution,
- Eltomatic ME01-05-05 two-channel magnetic pulse transmitter with 2 × 48 pulses per revolution.

M 403.xxxP/1 measuring transducer consists of a flow sensor with four pistons and cyclic volume 0.48 L and one of the following pulse transmitters:

- METRA MTX 075 two-channel magnetic pulse transmitter with 2 × 48 pulses per revolution,
- Adast 40 two-channel magnetic pulse transmitter with 2 × 48 pulses per revolution,
- Adast 44 (CAN bus) 24 VDC (compatible with ECx electronic only).

Version "P" and "P/B" of the measuring transducer is equipped with mechanical adjustment device, version "EP" and "EP/B" can be adjust by electronic way only.

M 403.xxxP/1 measuring transducer can be adjusted by varying of the stroke of one pair of pistons by the adjustment screw. The regulation is non-continual with steps 0.08 %. Maximum range of adjustment is about ± 2 %. Location of screw is protected by pin.

Special modification M 403.xxxx/B measuring transducer is destined for ethanol, mixture of gasoline with ethanol E 5 to E 95 and biodiesel B 5 to B 100.

1.3. Calculator

These types of calculators can be used alternatively:

The Beta Control calculator type ADP was separately certified by Czech Metrology Institute in Evaluation Certificate ZR 141/10 – 0072 rev. 4. On the front of the dispenser there can be installed multimedia display which is connected directly to Beta Control's calculator. This multimedia display is informative only and up of the display there has to be notice. Basic technical data:

	ADPx/T family	ADP1/L
Max. flowrate Q_{max} [L/min]	680	500
Min. measured quantity MMQ [L]	2	
Maximum unit price (no. of digits)	9999 (4)	
Maximum price to pay (no. of digits)	999999 (6)	
Scale interval- quantity display [L]	0.01	
Type of display	Electronic	
Software version	See the ZR 141/10 – 0072	
Accuracy class	0.5	
Mechanical class	M2	
Electromagnetic class	E2	
Humidity class	H3	
Ambient temperature range [°C]	-40 to +70	-25 to +70

The UNIDATAZ calculator type CDC was separately certified by Czech Metrology Institute in Evaluation Certificate ZR 141/10 – 0073 rev. 7. Calculator type CDC is also approved as Self-service Device. Basic technical data:

Min. measured quantity MMQ [L]	2
Maximum unit price (no. of digits)	9999 (4)
Maximum price to pay (no. of digits)	999999 (6)
Scale interval, volume display [L]	0.01
Type of display	Electronic
Software version	See the ZR 141/10 – 0073
Accuracy class	0.5
Mechanical class	M1
Electromagnetic class	E1
Humidity class	E3
Ambient temperature range [°C]	-40 to +55

The Adast Systems calculator type EC_015 was certified by Czech Metrology Institute in Test Report 6015-PT-P0013-19. Calculator EC_015 is designed for special version of fuel dispenser Adast Basic 899x.6xx which are not destined for direct selling to the public. The fuel dispenser can be equipped one dispensing nozzle only and there is no ATC function. There are two version of the calculator EC_015 – with or without RFID reader. Version Adast Basic 899x.6xx RFID is also approved according to WELMEC 7.2 Software Guide, 2018 – Extension L. Basic technical data:

Flow rate range [L/min]	4 to 80
Min. measured quantity MMQ [L]	2
Maximum unit price (no. of digits)	9999 (4)
Maximum volume (no. of digits)	999999 (6)
Scale interval, volume display [L]	0.01
Type of display	Electronic
Software version	10.03 / CRC 628581
Accuracy class	0.5
Mechanical class	M1
Electromagnetic class	E1
Humidity	H3
Ambient temperature range [°C]	-40 to +55

The Adast Systems calculator type ECx was certified by Czech Metrology Institute in Test Report 6015-PT-P0013-19. Calculator ECx can control up to 12 dispensing nozzles divided to up 6 dispensing nozzles per side. Calculator is equipped by ATC function. Calculator communicates with measuring transducer, all associated measuring devices and functional blocks through CAN bus. Calculator is compatible with Adast 44 (CAN bus) pulse transmitter only. Electronic calibration of measuring transducer is accessible through the touch display of the calculator.

Max. flowrate Q_{max} [L/min]	500
Min. measured quantity MMQ [L]	2
Maximum unit price (no. of digits)	9999 (4)
Maximum volume (no. of digits)	999999 (6)
Maximum price to pay (no. of digits)	999999 (6)
Scale interval, volume display [L]	0.01
Type of display	Electronic
Software version	Fronted version: 1.0.5 Backend version: 1.0.5 CanBusWrapper: 0.2.0-beta13 (library)
Accuracy class	0.5
Mechanical class	M1
Electromagnetic class	E1
Humidity	H3
Ambient temperature range [°C]	-40 to +55

1.4. Self-service device

The measuring systems may be connected to a Self service device provided that:

a) the Self-service device is described in:
   - one of the Evaluation Certificates as mentioned in the table of SSDs below; or
   - -any Parts Certificate issued by a Notified Body that acts under module B of the MID for ANNEX VII (MI -005);

b) the following applies:
   - the connection is made in such a way that the presentation of the results meets the essential requirements of the MID; and
   - the connection is made through the interfaces with the specified protocols as mentioned in the TEC, and/or the EC/PC.

Table of SSDs

Producer	Type	Evaluation Certificate	Remarks
ALX Technologies	Europole	LNE-17492	Issued by LNE (NB 0071)
ALX Technologies	Europile	LNE-28279	Issued by LNE (NB 0071)

1.5. Temperature sensor

ZPA Nová Paka 112 70 Pt100 temperature sensor
TRESTON TAB-01-Ex Pt100 temperature sensor
CAN ATC Ex Pt100 temperature sensor

1.6. Hose

ASxx/Exx/x; ID 16, 21, 25; (from hosing Elaflex Slimline); maximum length 8 m for MMQ less than 10 L and 25 m for MMQ = 10 L
ELAFLEX Slimline ID 16, 21, 25; maximum length 8 m for MMQ less than 10 L and 25 m for MMQ = 10 L
GOODYEAR Hardwall Kerbside ID 16, 19, 25.4; maximum length 6 m
GOODYEAR Flexsteel Vapour Assist ID 19; maximum length 6.2 m
TRELLEBORG Volukler ID 16; maximum length 3.4 m
TRELLEBORG Volukler ID 21; maximum length 3.2 m

2 Basic technical data

Measuring transducer type	1 × M403.25xP	1 × M403.25xP	1 × M403.32xP	2 × M403.25xP
Pumping unit type	1 × P64x.50 / P64x.100	1 × P64x.100	2 × P64x.100	2 × P64x.100
Number of dispensing nozzles	1	1	1	1
Max. flowrate Q_{max} [dm³/min]	40 to 60	70 to 80	100 to 130	150
Min. flowrate Q_{min} [dm³/min]	4 to 5*	5	10	15
Min. measured quantity MMQ [dm³]	2	5	10	10
Maximum pressure [MPa]	0.25	0.32	0.32	0.32
Minimum pressure [MPa]	0.12	0.19	0.19	0.19
Scale interval, volume display [L]	0.01			
Type of display	Electronic			
Software version	See chapter 1.3. Calculator			
Accuracy class	0.5			
Mechanical class	M1			
Electromagnetic class	Depends on used calculator			
Humidity	H3			
Ambient temperature range [°C]	-40 to +55 -25 to +55 (Beta Control ADP1/L)			
Liquid temperature range [°C]	-20 to +50 -10 to +50 for biodiesel B70 to B100 and oils			
Dynamic viscosity range [mPa.s]	0.3 to 1000			
Measurement unit	Volume [L] or volume at 15 °C [L]			

* The minimum ratio Q_{max}:Q_{min} has to be at least 10:1.

3 Test

Technical tests of the 899x.xxx, 46xx.xxx and 47xx.xxx 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,* in conformity with International Recommendation OIML R 117-1 *Dynamic measuring systems for liquids other than water* and International Recommendation OIML D 11 *General requirements for electronic measuring instruments*.

Examinations of the measuring device and the test results are to be found in following documents:

Test report No. 6031-PT-P021-06,
Test report No. 6015-PT-P010-08,
Test report No. 6015-PT-P022-09,
Test report No. 6015-PT-P0016-11,
Test report No. 6015-PT-P3019-12,
Test report No. 6015-PT-P0031-13,
Test report No. 6015-PT-P0019-17,
Test Report No. 6015-PT-P0043-18,
Test Report No. 6015-PT-P0013-19,
Test Report No. 6015-PT-P0015-20,
Test Report No. 6015-PT-P0052-20,
Test Report No. 6015-PT-P0008-21.

4 The measuring device data

There are at least following data on the measuring transducer, the pumping unit, the multimedia display, the electronic calculator and the temperature sensor:

- Manufacturer's name, mark or trademark
- Type designation
- Serial number

There are following data on the fuel dispenser (name plate):

- 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 0.5
- Minimum measured quantity (MMQ)
- Maximum flowrate (Q_{max})
- Minimum flowrate (Q_{min})
- Maximum pressure (p_{max})
- Minimum pressure (p_{min})
- Liquids to be measured or viscosity range
- 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 near to price indication (e.g. €)
- Unit of volume near to volume indication (ℓ or L or word Litre)
- Unit price per litre near to unit price indication (e.g. € / L or € / Litre)
- Information regarding the minimum measured quantity (MMQ)
- Information regarding base temperature (e.g. Tb = 15 °C) in case of active ATC conversion function

5 Conditions for approval and sealing

Accuracy test at whole flow range has to be performed. All measured errors have to be in range of tolerance +/- 0.5%.

Fuel dispensers for dynamic viscosities higher than 120 mPa.s should be tested with substitute test liquid (Ekopal, Shellsol, ExxSol etc.) with maximum permissible error (-0.4 to +0.6) %.

Access to electronic calibration function has to be protected by sealed switch.
In case of using ADPxxx electronic calculator DIP switches No. 2 and 3 have to be set to position OFF according to picture No. 9.
In case of using UNIDATAZ CDC electronic calculator switch S3 on CPU body has to be set to position OFF (position up) according to picture No.11.

In case of active ATC conversion function a certified temperature sensor has to be connected. Maximum permissible error of the temperature measurement is ± 0.4 °C.

Each fuel dispenser has to be sealed after the conformity assessment with positive result according to following description and pictures No. 1 to 18:

On the M 403.xxP, M 403.xxP/1 measuring transducer:

- Connection of transducer body with upper part and transducer (pulser) 1×
- Connection of transducer body with pistons covers and pin of adjustment device 4×
- Connection of transducer body with type plate 1×

On the M 403.xxEP, M 403.xxEP/1 measuring transducer:

- Connection of transducer body with upper part and transducer (pulser) 1×
- Connection of transducer body with pistons covers 4×
- Connection of transducer body with type plate 1×

On the pumping unit
- Connection of pumping body with cover and cover of pilot valve 2×

On the ADP1/T, ADP2/T and ADPMPDx/T and ADPMPDx/T-PWM calculator:
- Not dissembling of calculator 1×
- The cover of DIP switches 1×
- Connection of electromechanical totalizing indicating device to the frame 1×
- The type plate of calculator 1×

On the ADP1/L calculator:
- Not dissembling of calculator 1×
- Connection of electromechanical totalizing indicating device to the frame 1×
- The type plate of calculator 1×

On the Multimedia display:
- Not dissembling of multimedia display 1×
- The type plate of multimedia display 1×

On the CDC calculator:
- Connection of S3 switch cover with CPU unit 1×
- Connection of CPU unit with calculator console 1×
- Connection of electromechanical totalizing indicating device to the frame 1×
- The type plate of calculator 1×

On the EC_015 calculator:
- Not dissembling of calculator - includes DIP switch protection and RFID reader (if presence) 1×
- The type plate of calculator 1×

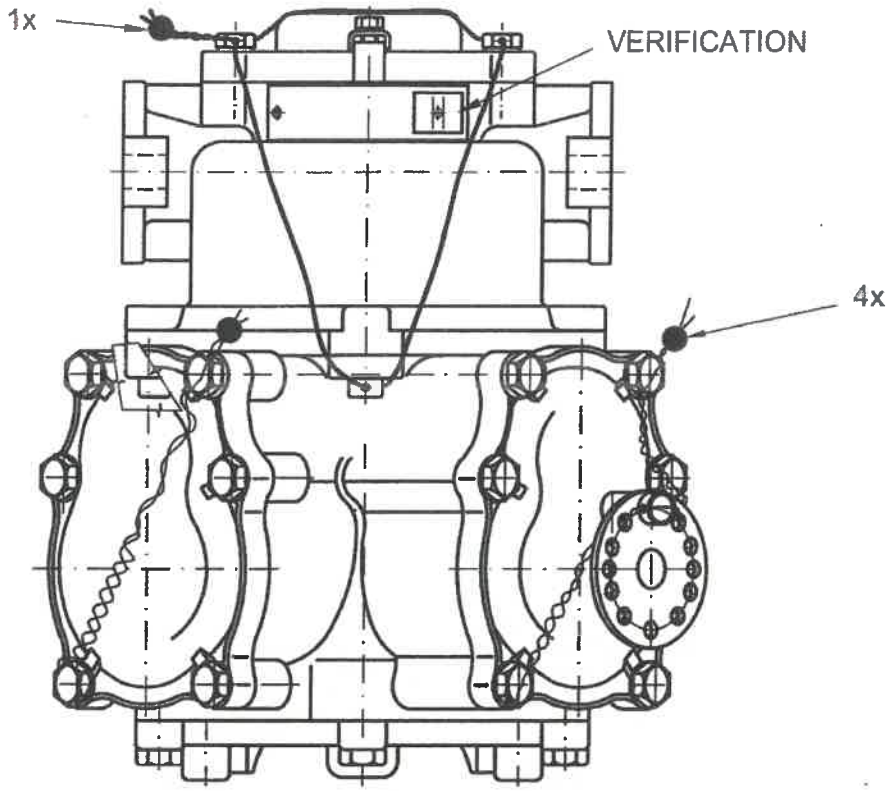
On the ECx calculator:
- Not dissembling of calculator include DIP switch protection 2×
- Display's communication port at calculator's side 1×
- Display's communication port at display's side 1×
- The type plate of calculator 1×

On the self-service device:
- According to relevant Evaluation or Part Certificate if applicable

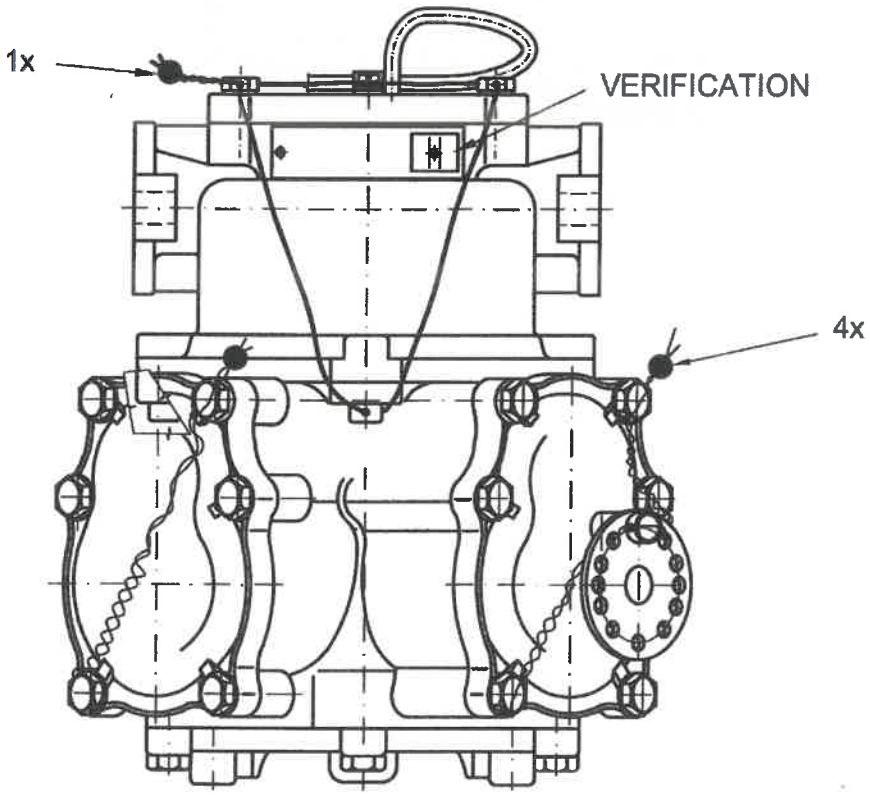
On the temperature sensor (in case of active ATC conversion function):
- Connection of temperature sensor to the pipe or pump body 2×
- The type plate if separate 1×

On the fuel dispenser:
- The name plate of dispenser 1×
- The symbol of relevant measurement transducer on the data plate 1×
- The fuel dispenser data sheet (identification of data on document) 1×

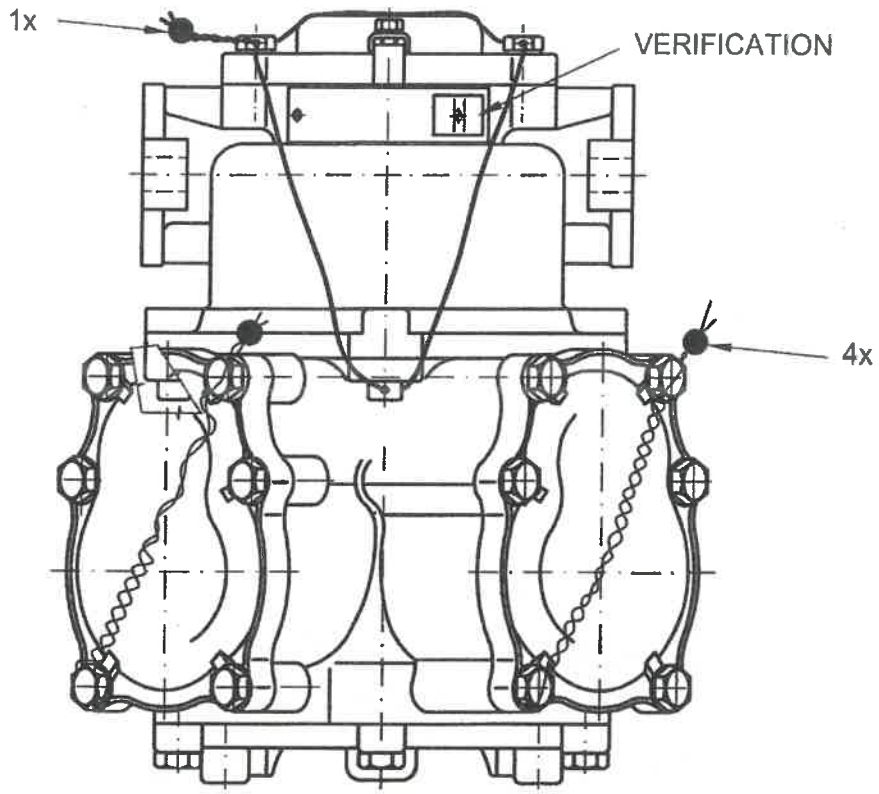
Picture No. 1: The sealing of M403.xxP measuring transducer



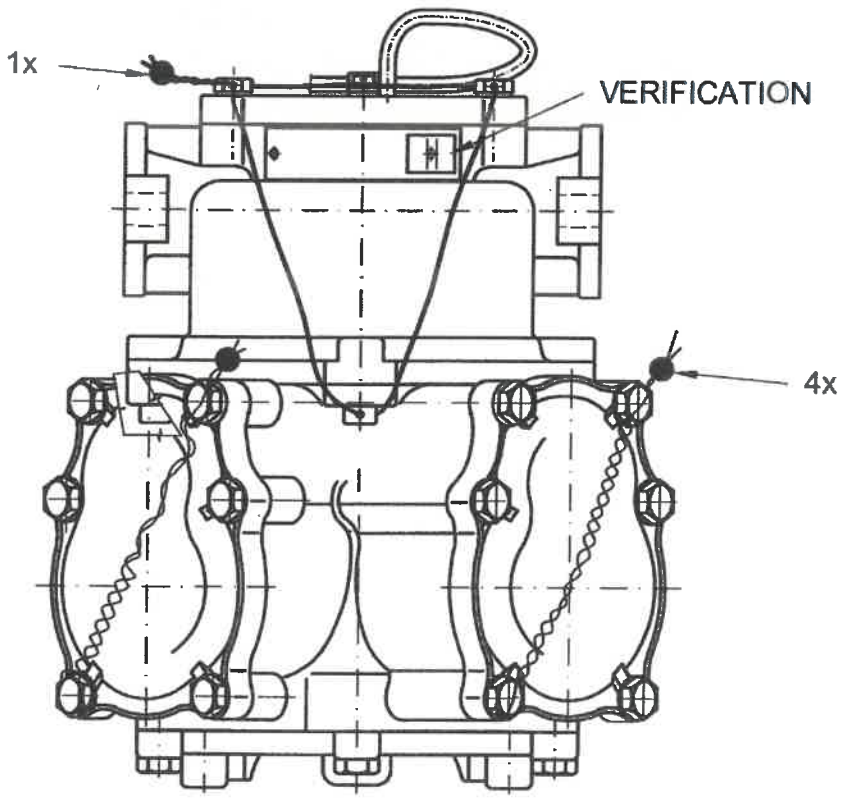
Picture No. 2: The sealing of M 403.xxP/1 measuring transducer



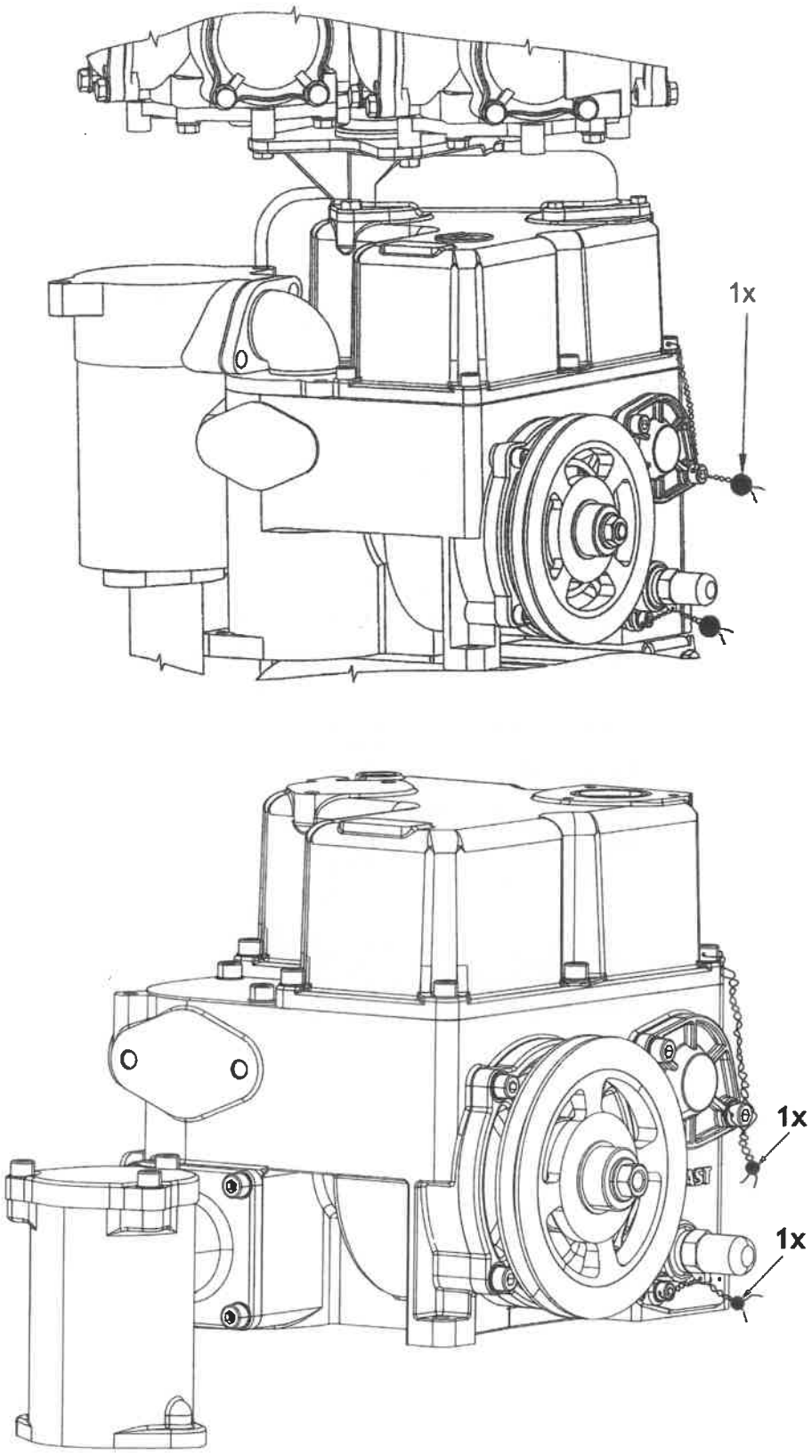
Picture No. 3: The sealing of M 403.xxEP measuring transducer



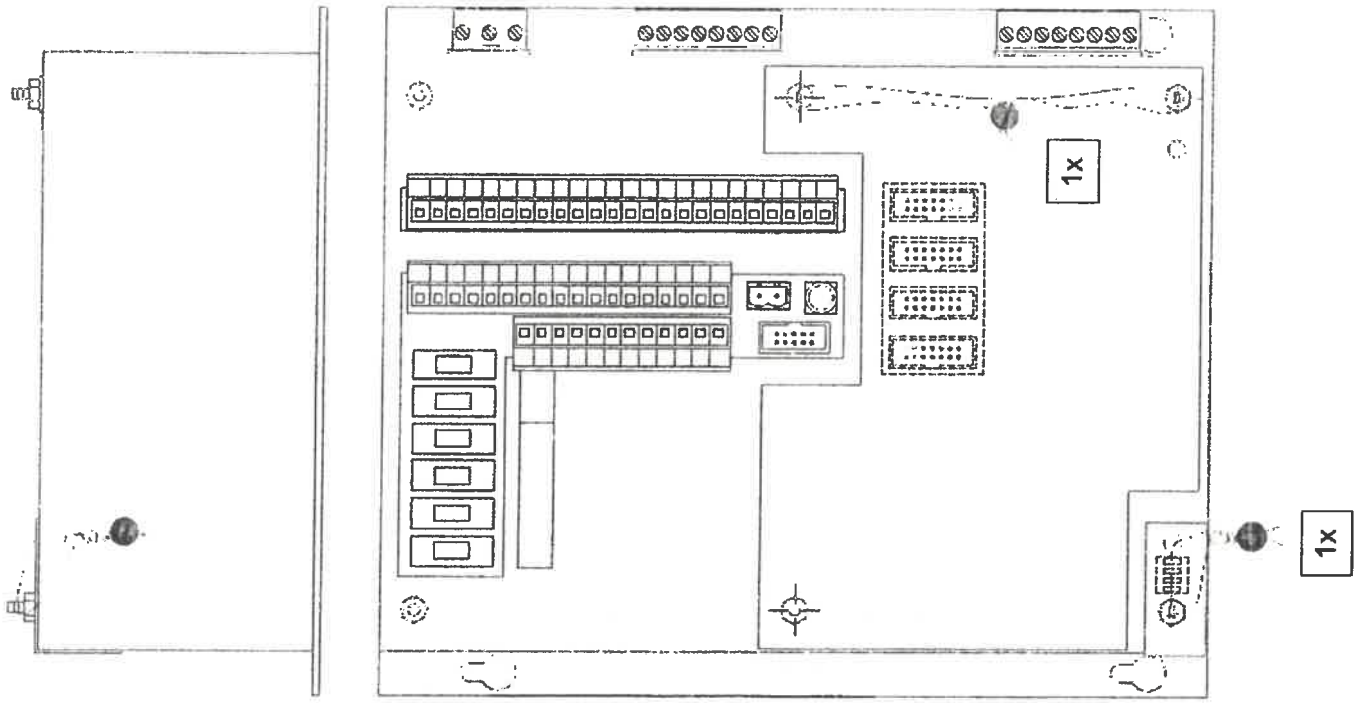
Picture No. 4: The sealing of M 403.xxEP/1 measuring transducer



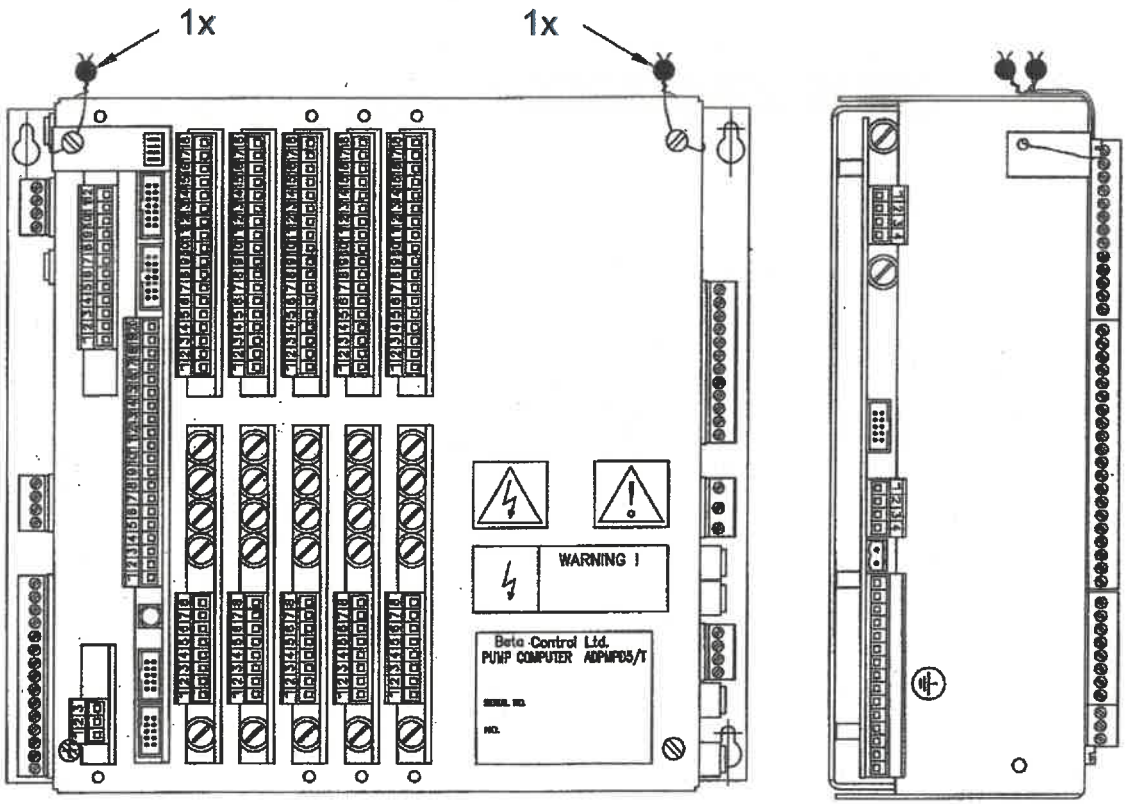
Picture No. 5: The sealing of 64x.xxx/x/xx/xxx pumping unit



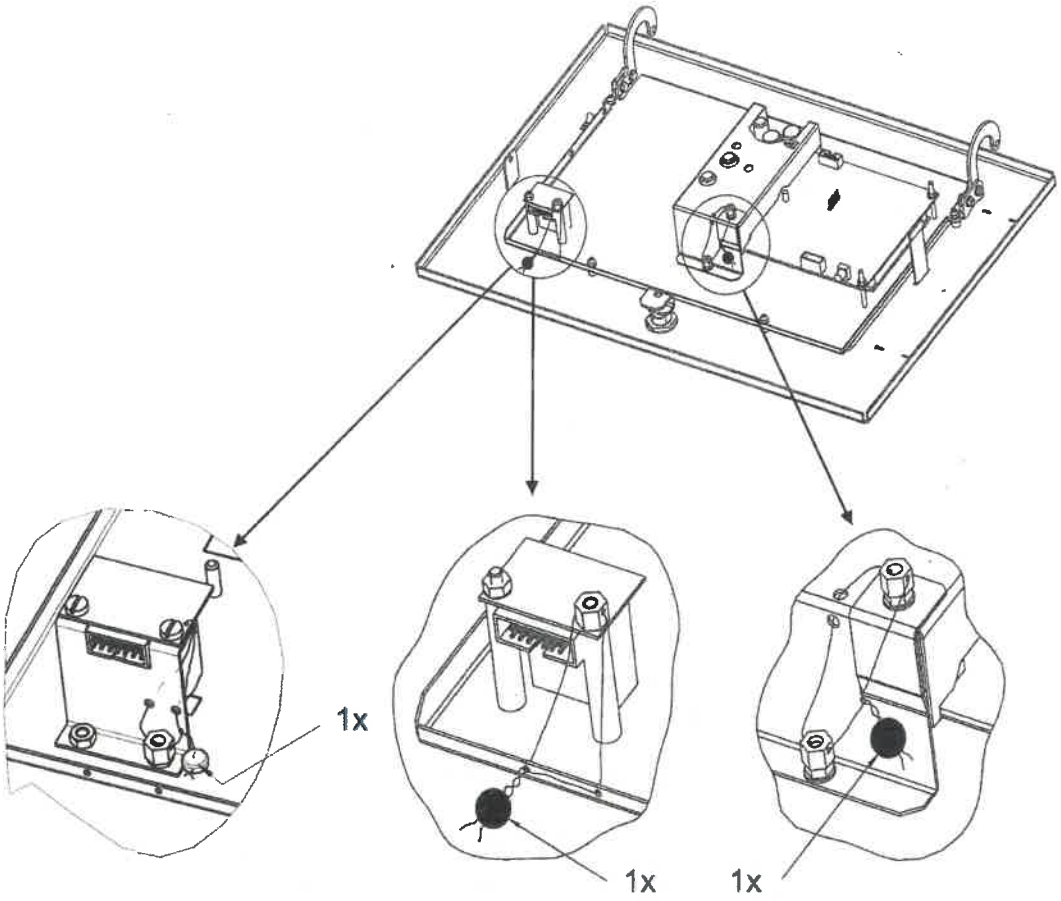
Picture No. 6: The sealing of ADP1/T and ADP2/T calculator



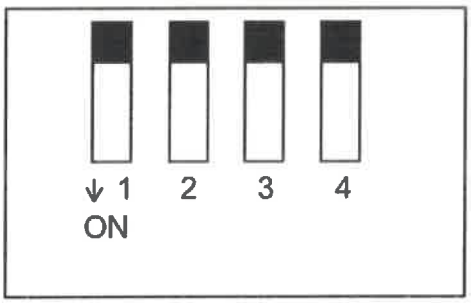
Picture No. 7: The sealing of ADPMPDx/T calculator



Picture No. 8: The sealing of ADP1/L calculator:



Picture No. 9: The calibration DIP switch

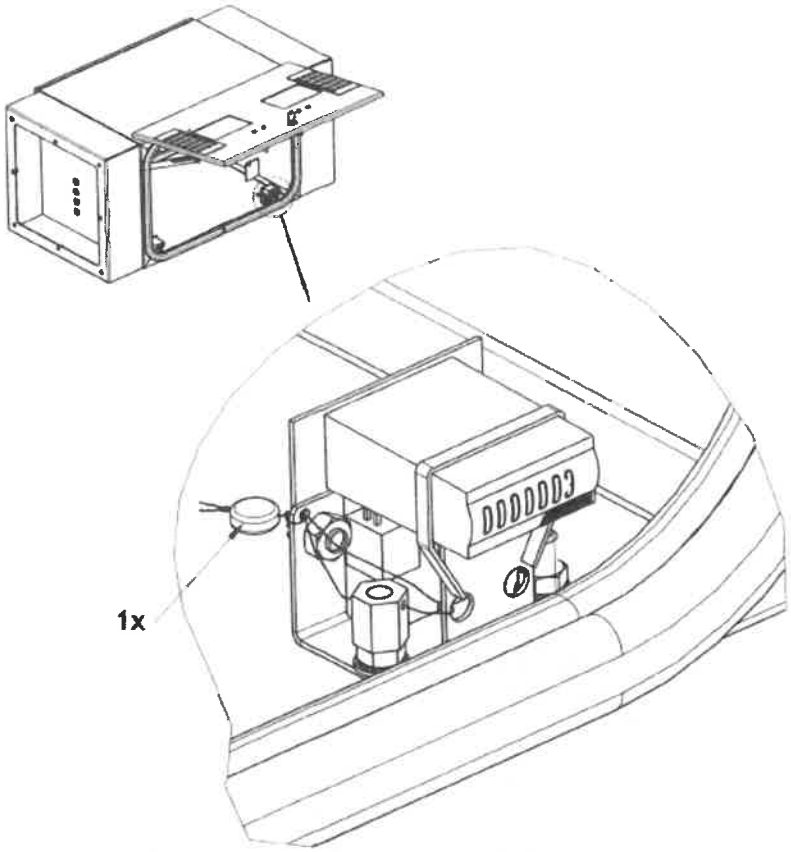


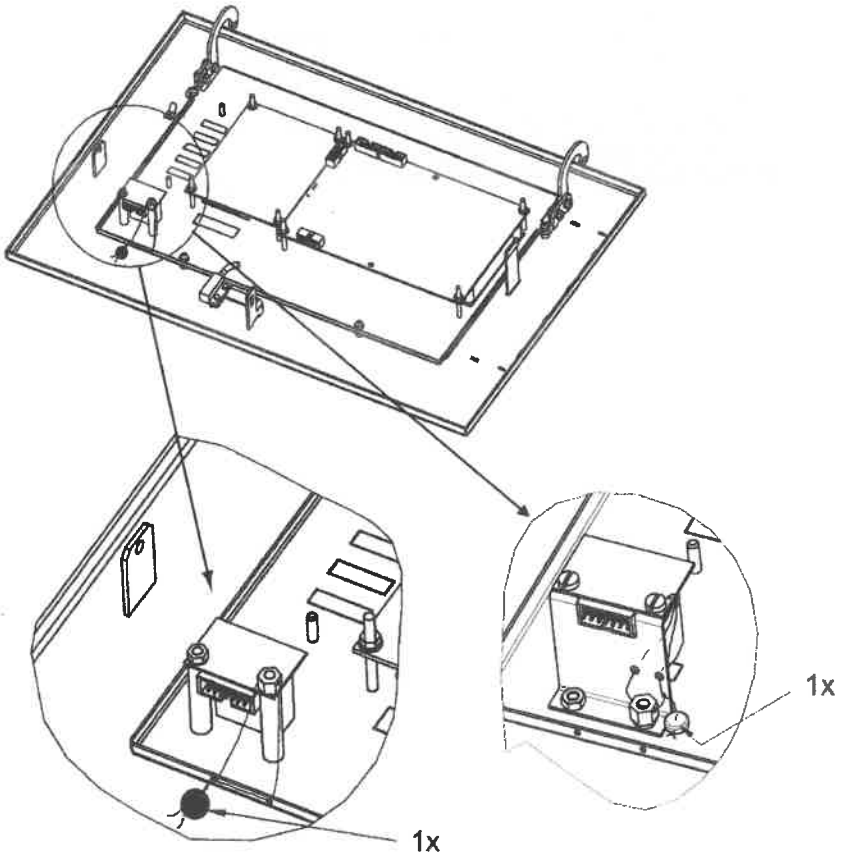
Description of DIP switches

DIP-1	Setting of the number of channel pulsers
ON	2–channel
OFF	3–channel

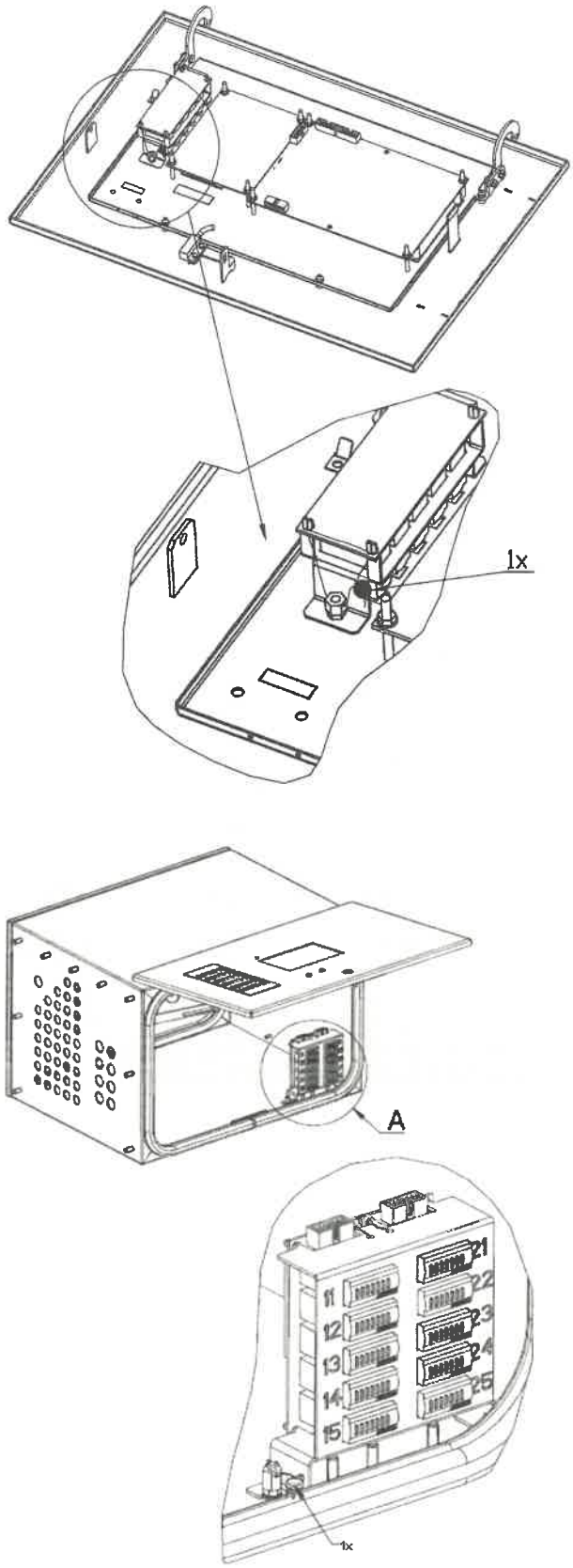
DIP-2 ON	Enable EC setting
DIP-3 ON	Enable ATCsetting
DIP-4	reserved

Picture No. 10: The sealing of totalizing indicating device of the ADPx/T calculator (two options)

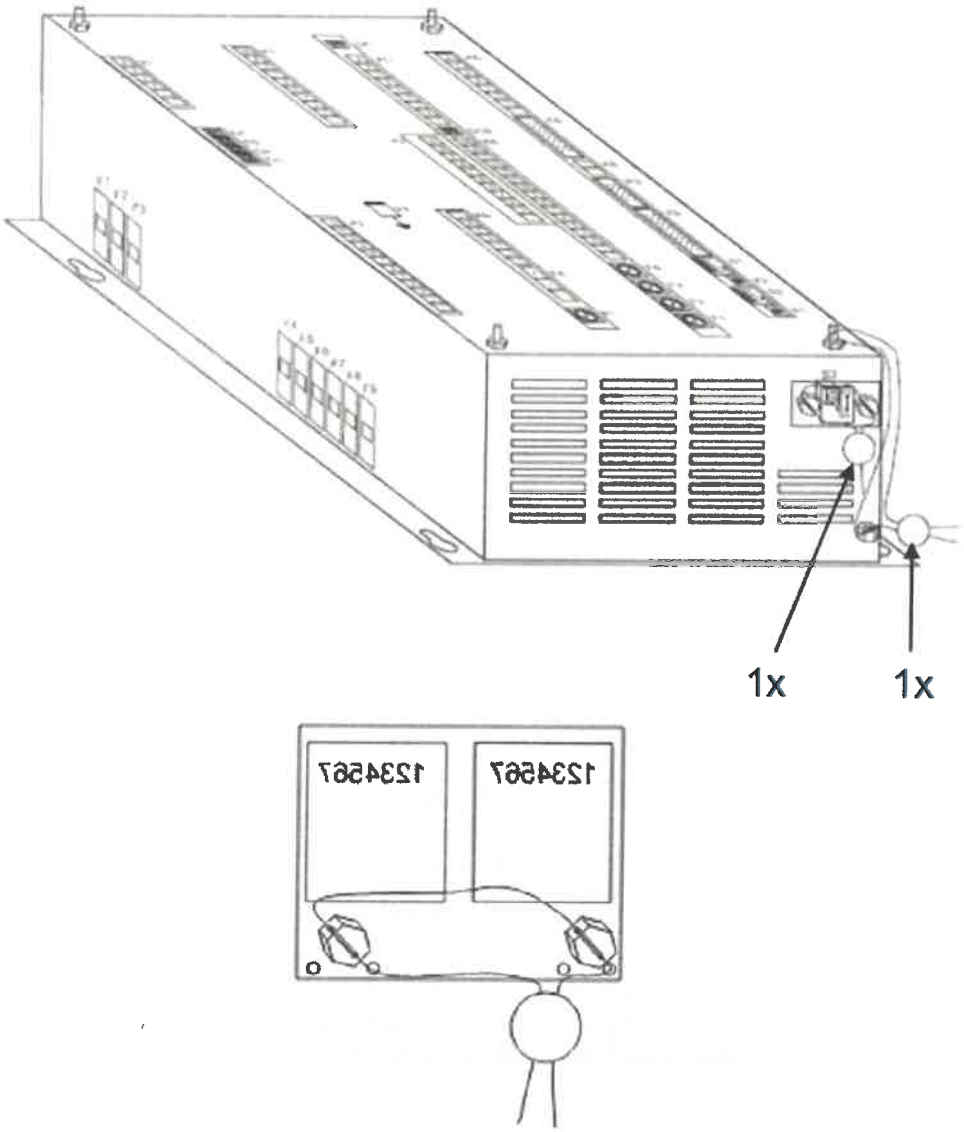




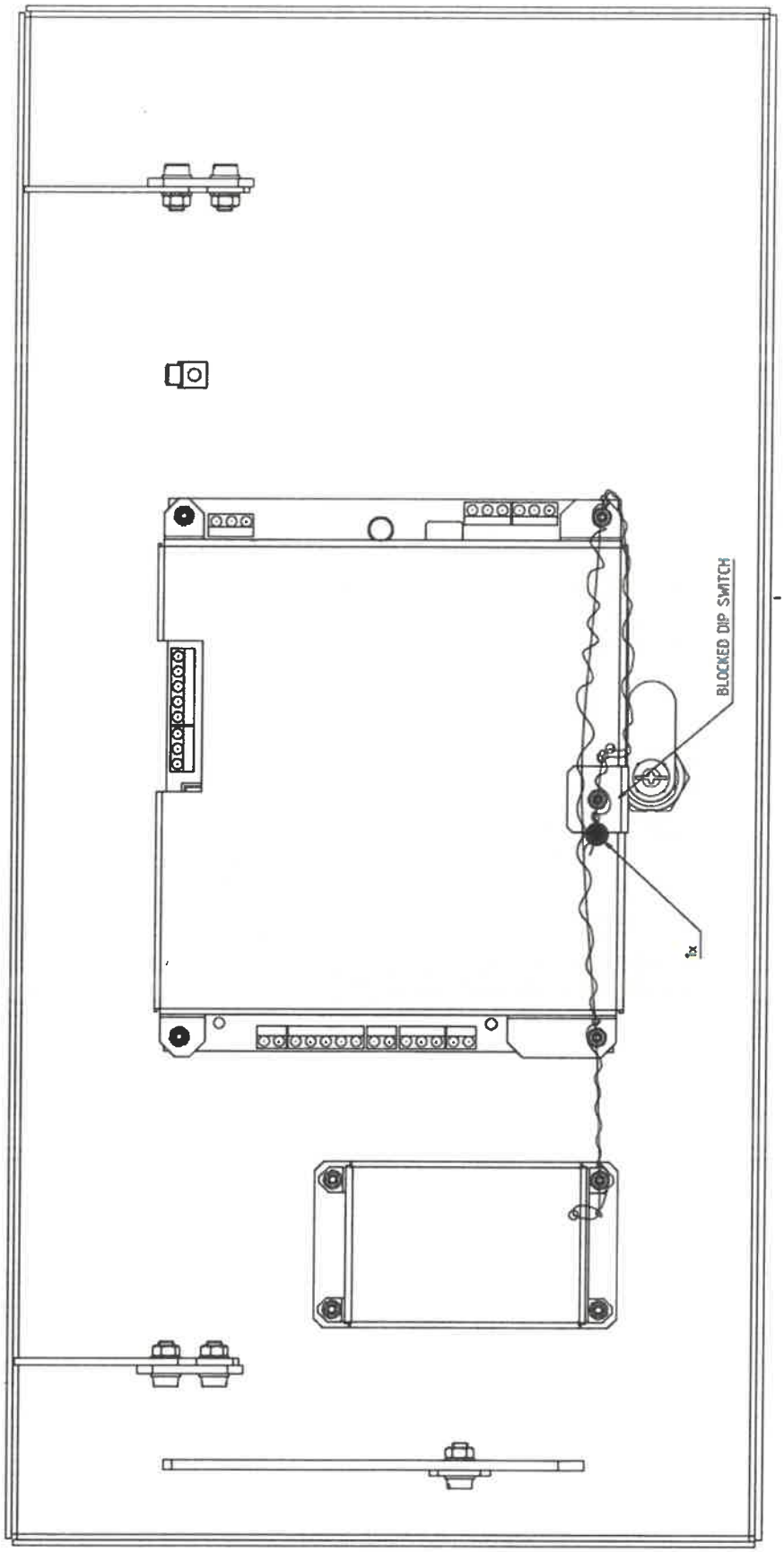
Picture No. 10a: The sealing of totalizing indicating device of the ADPMPDx/T(PWM) calculator (two options)



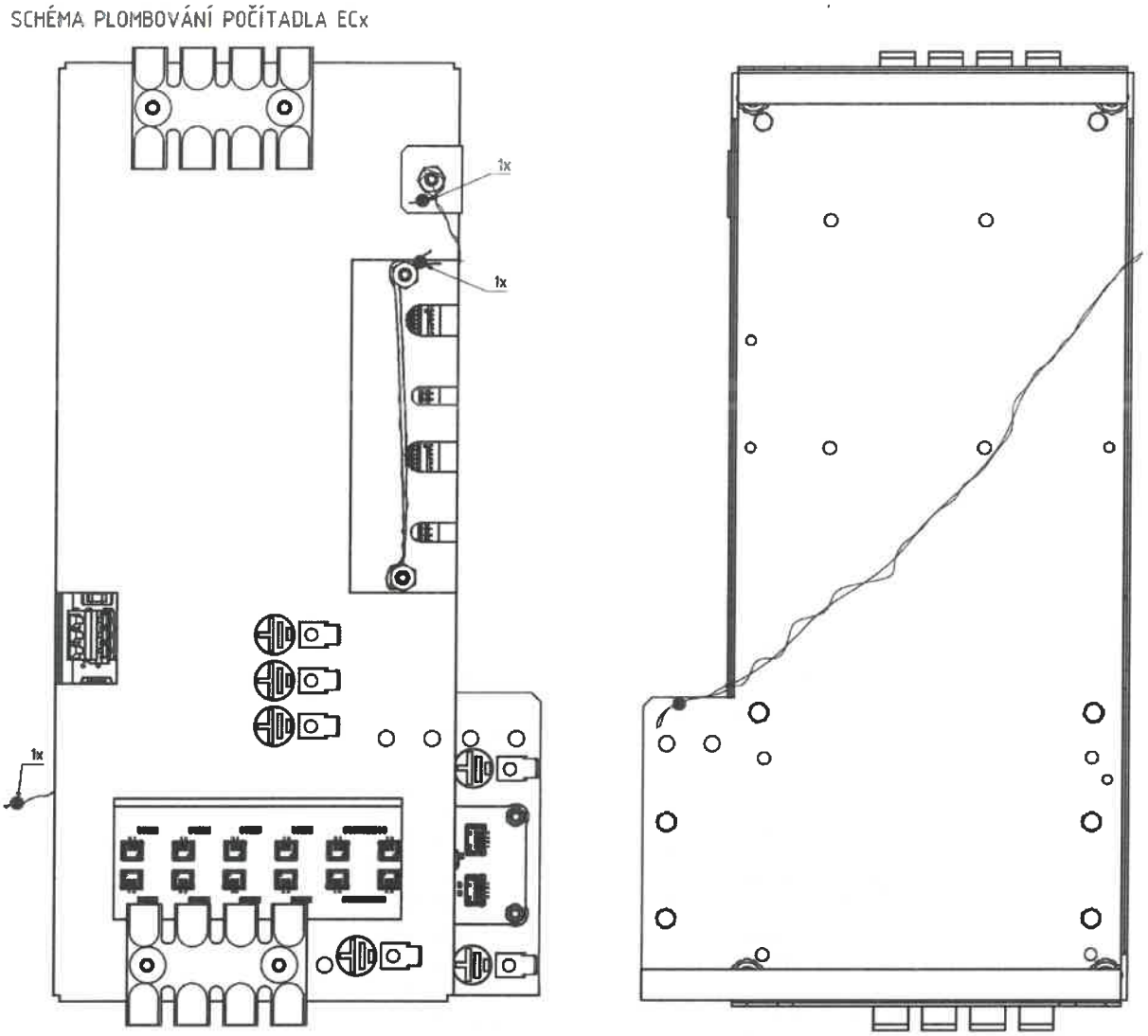
Picture No. 11: The sealing of CDC calculator (CPU unit with S3 switch and totalizer):



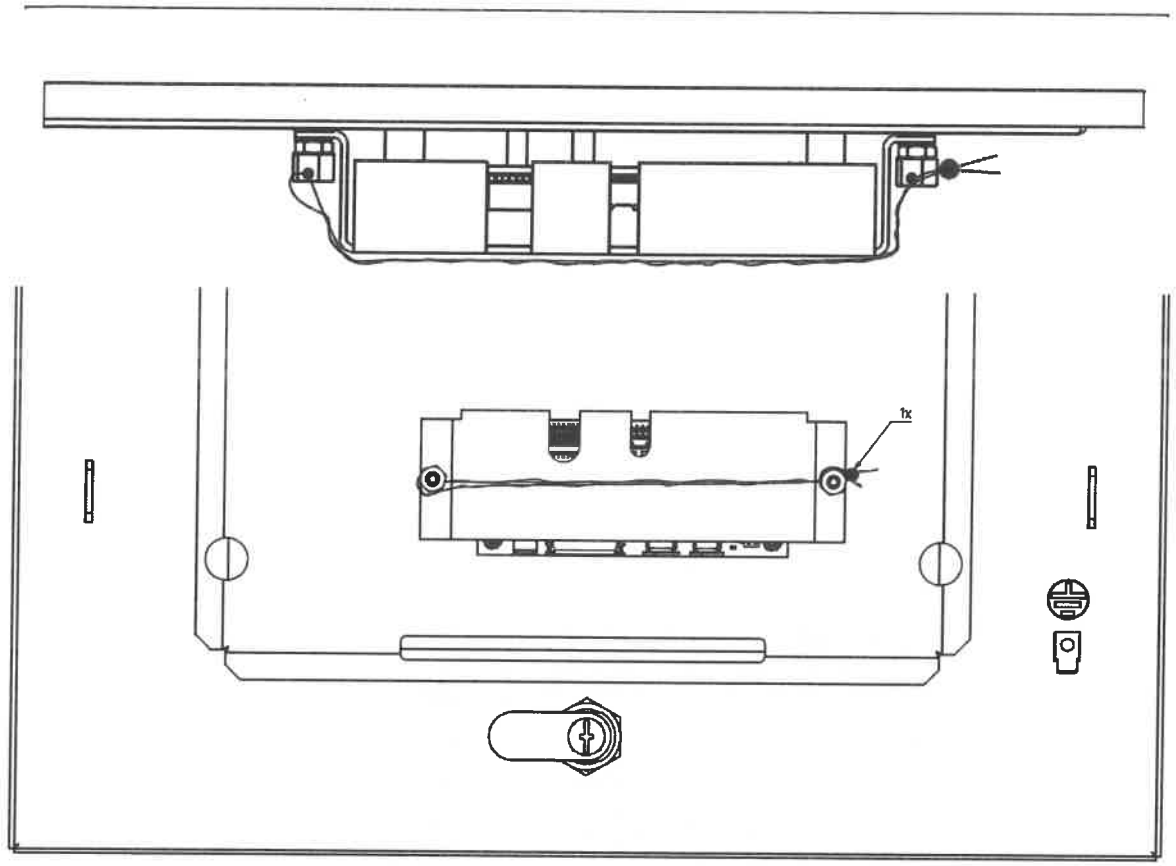
Picture No. 12: The sealing of EC_015 calculator:



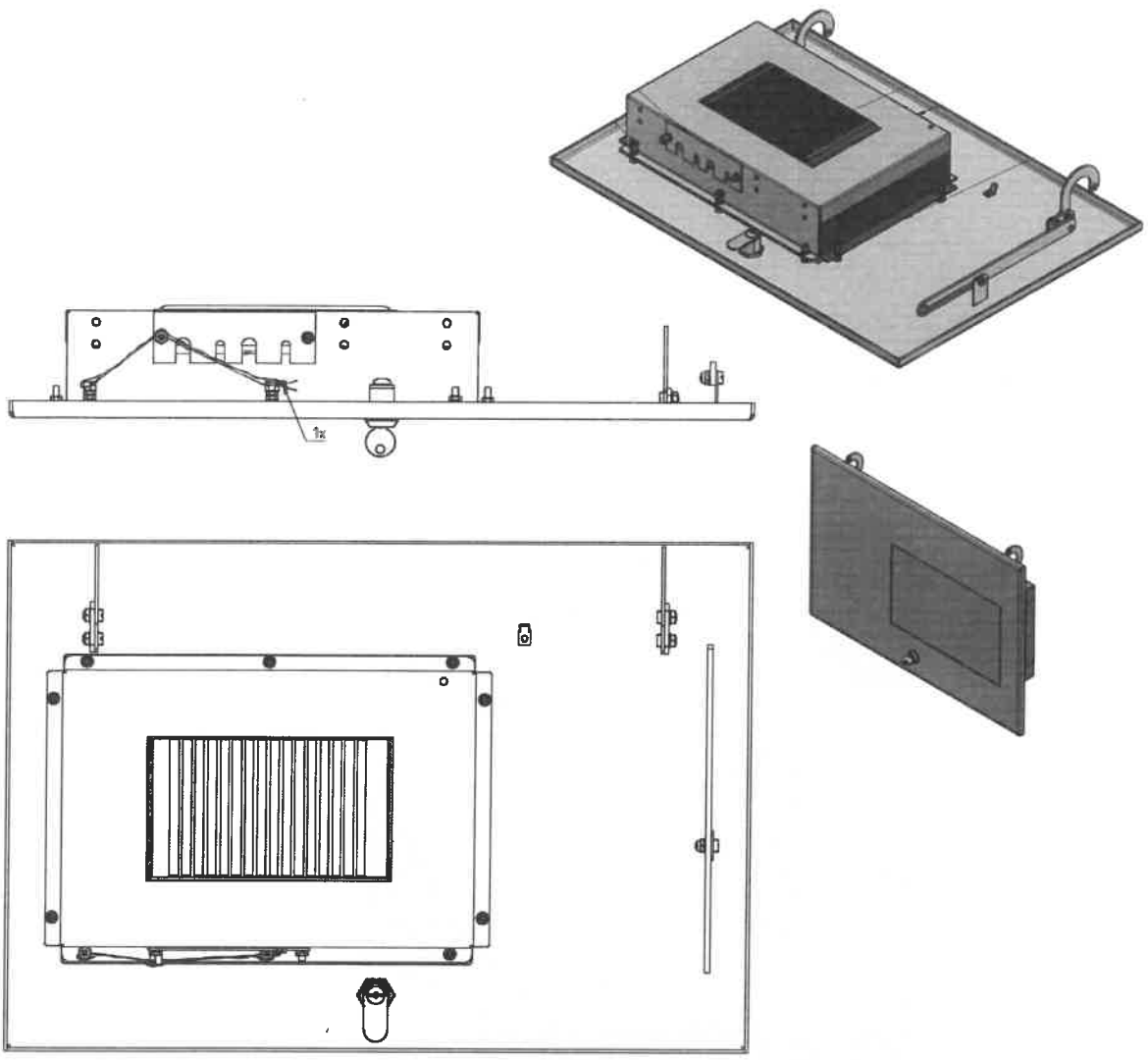
Picture No. 13: The sealing of ECx calculator:



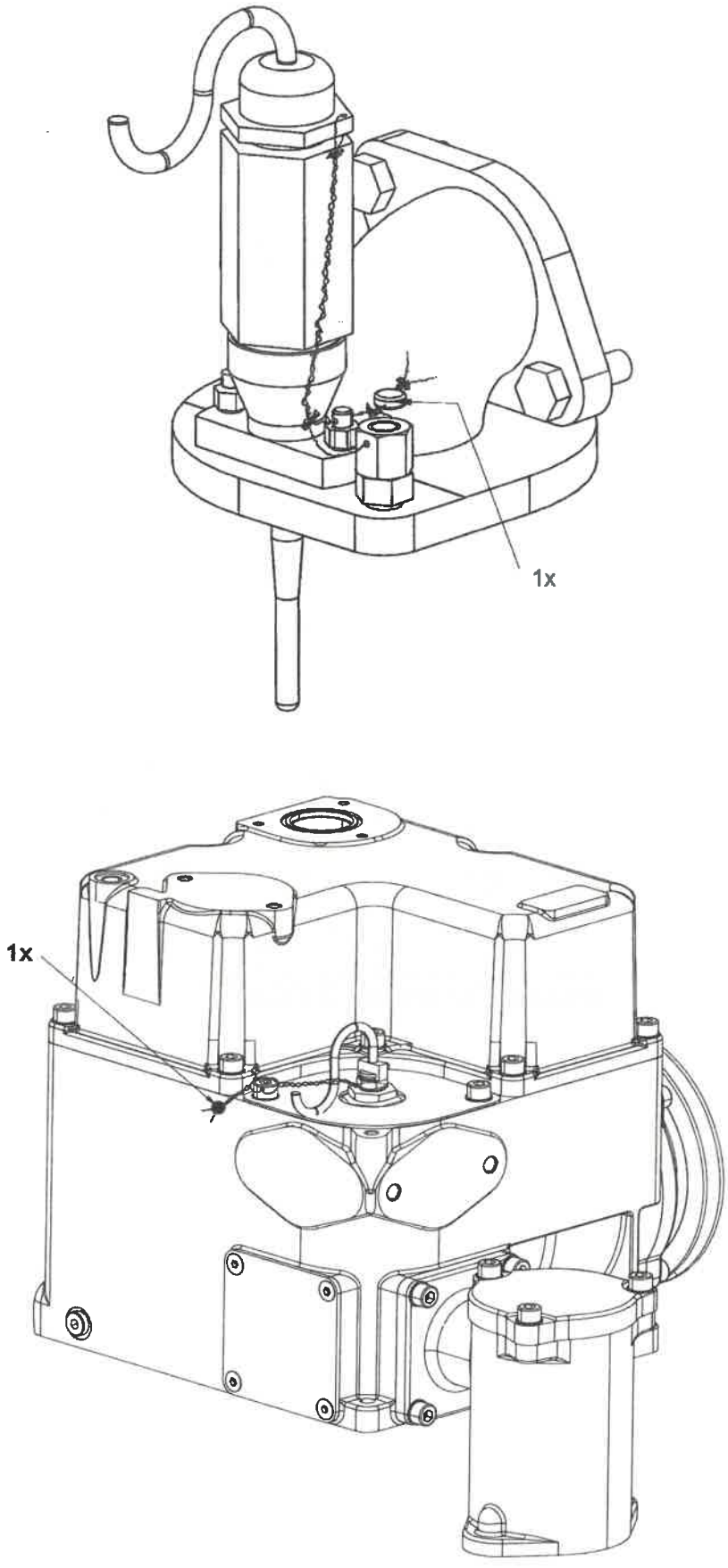
Picture No. 14: The sealing of the display connected to the ECx calculator:



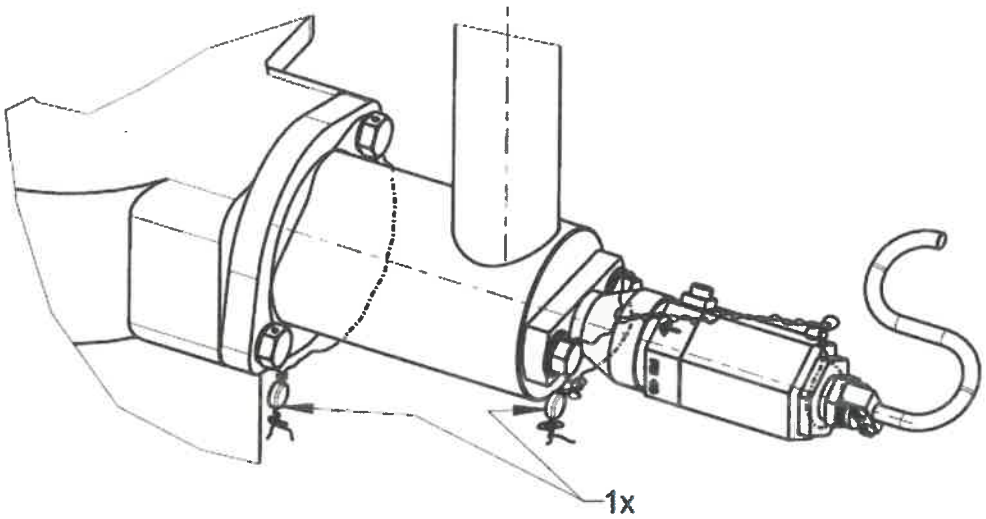
Picture No. 15: Sealing of the multimedia display



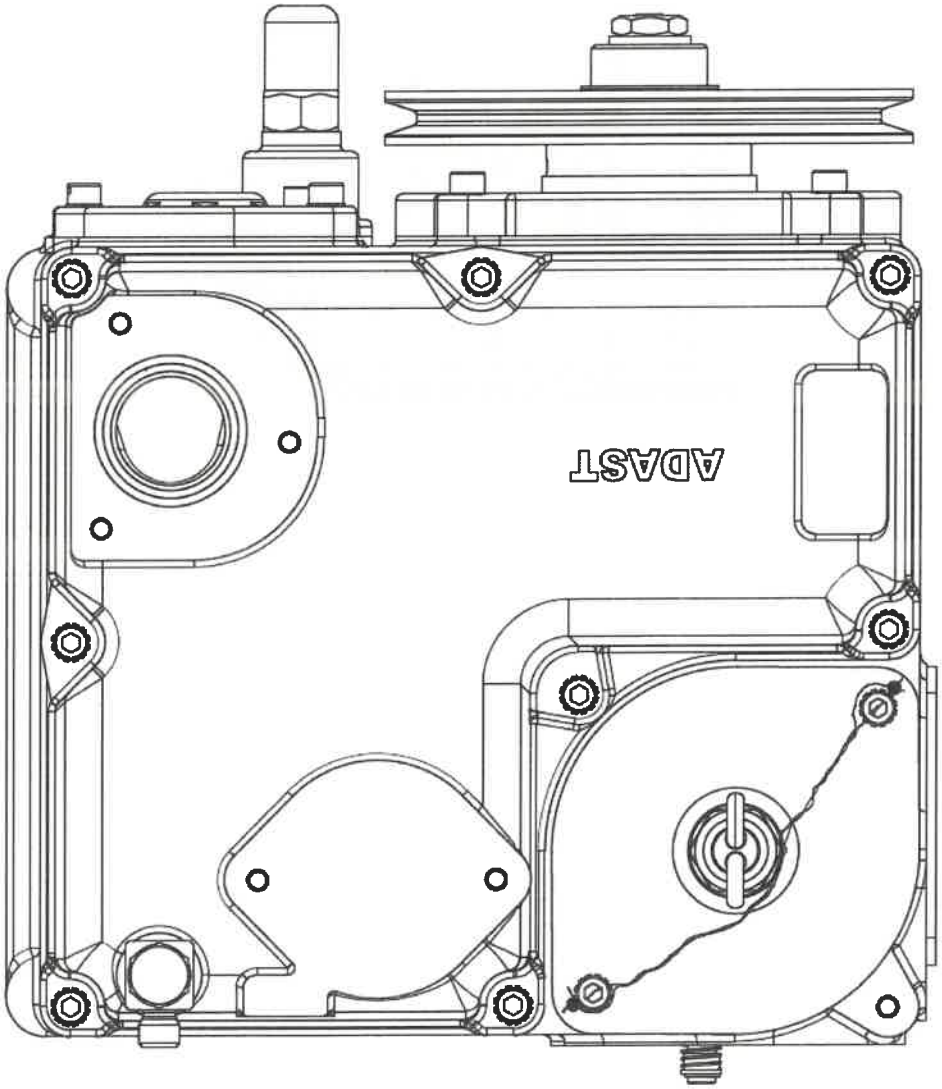
Picture No.16: The sealing of P64x.xxx/xx/x/ATC pumping unit with temperature sensor



Picture No.17: Sealing of the temperature sensor installed a dispenser without pumping unit



Picture No. 18: Sealing of CAN ATC Ex Pt100 temperature sensor:



Picture No. 19: Example of dispenser's appearance equipped by multimedia display