

EU Type Examination Certificate

No. 0200-NAWI-11227

FT-111 / FT-112 / FT-111 panel / FT-112 panel / FT-113

NON-AUTOMATIC WEIGHING INSTRUMENT

Issued by **FORCE Certification**
EU - Notified Body No. 0200

In accordance with the requirements in Directive 2014/31/EU of the European Parliament and Council.

Issued to **Flintec Transducers (Pvt) Ltd.**
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In respect of Non-automatic weighing instrument designated FT-111 / FT-112 / FT-111 panel / FT-112 panel / FT-113 with variants of modules of load receptors, load cells and peripheral equipment.
Accuracy class: III and IIII
Maximum capacity, Max: From 1 kg up to 500 000 kg
Verification scale interval: $e_i = \text{Max}_i / n_i$
Maximum number of verification scale intervals: $n_i \leq 10000$ for single-interval / multi-range / multi-interval (however, dependent on environment and the composition of the modules).
Variants of modules and conditions for the composition of the modules are set out in the annex.

The conformity with the essential requirements in annex 1 of the Directive is met by the application of the European Standard EN 45501:2015 and OIML R76:2006.

The principal characteristics and conditions for certification are set out in the descriptive annex to this certificate.

The annex comprises 19 pages.

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Descriptive annex

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1. Name and type of instrument and modules

The weighing instrument is designated FT-111 / FT-112 / FT-111 panel / FT-112 panel / FT-113. It is a system of modules consisting of an electronic indicator connected to a separate load receptor and peripheral equipment such as printers or other devices, as appropriate. The instrument is a Class III or IIII, self-indicating weighing instrument with single-interval, multi-range or multi-interval, a DC power supply, an external AC mains adapter – if not supplied directly from AC mains - and an internal rechargeable battery (optional).

The indicators FT-111 / FT-112 use the same standard mainboard. Electronic components can be assembled according to features of the instrument. The indicator may have digital load cell interface and/or digital input/output board and/or analogue output board via piggy-back board(s). Model FT-112 has the possibility for an optional second analogue scale input via a piggy-back board. The summing scale can be set, if available and if configured.

Model FT-111 and FT-112 have the possibility for an optional field bus interface via a piggy-back board. The FT-111 panel / FT-112 panel / FT-113 indicators are equipped with a display board and a main board which includes some of the interfaces and serves as motherboard for different piggyback boards such as ADC circuitry, digital load cell interface and more interfaces including the fieldbus options.

The name of the instrument may be followed by alphanumeric characters for technical, legal or commercial characterization of the instrument.

The indicators consist of analogue to digital conversion circuitry, microprocessor control circuitry, power supply, keyboard, non-volatile memory for storage of calibration and setup data, and a weight display contained within a single enclosure. If the indicator is produced only for digital load cell connection, the ADC circuitry may not be assembled.

The modules appear from Sections 3.1, 3.2.1, and 3.2.2; the principle of the composition of the modules is set out in Sections 6.1 and 10.

2. Description of the construction and function

2.1 Construction

2.1.1 Indicator

The indicator is specified in Section 3.1.

Enclosures and keyboard

The FT-111 / FT-112 indicators are housed in enclosures made of stainless steel.

The FT-111 panel / FT-112 panel / FT-113 indicators are housed in an enclosure with body made of aluminium and front made of stainless steel.

The front panels of the indicator comprise of:

- LCD display with backlight having appropriate state indicators, one line alphanumeric information digits and 6 bigger numeric digits for weight indication.
- A keyboard containing 11 keys used to turn indicator ON/OFF and enter commands or data into the weight indicator. Each key is identified with a name and/or pictograph.
Model FT-112 does furthermore have an alphanumeric keypad.
Furthermore, FT-112 may have 2 programmable IR keys.
- Model FT-111 panel has 6 keys for entering commands, plus arrow keys for navigating in the menu.

- Model FT-112 / FT-113 panel have 16 keys for entering commands and alphanumeric characters, plus arrow keys for navigating in the menu.

Electronics

The instruments FT-111 / FT-112 use a single printed circuit board, which contains all of the instrument circuitry.

All indicators can optionally have a piggy-back board for a digital input/output interface and/or analogue output. FT-111 and FT-112 can optionally have a piggy-back board for a fieldbus interface.

FT-112 can optionally have a piggy-back board for a second analogue scale input.

The instruments FT-111 panel, FT-112 and FT-113 panel are equipped with a display board and a main board which includes some of the interfaces and serves as motherboard for different piggyback boards such as ADC circuitry, digital load cell interface and more interfaces including the fieldbus options.

FT-111 / FT-112 indicators which have digital load cell interface can have a piggy-back board installed instead of a second scale analogue input. On FT-111 panel, FT-112 panel and FT-113 are the digital load cell interface board placed instead of the analogue load cell interface board.

Alibi memory data is saved at the SD card near the calibration switch on FT-111 / FT-112, and at a SD-card under the mainboard of FT-111 panel / FT-112 panel / FT-113. The second SD card is used to store the data to activate some features like Modbus RTU etc.

All instrument calibration and metrological setup data are contained in non-volatile memory. The power supply accepts an input voltage of 10-30 VDC from the external power supply or adaptor with input from 100-240 VAC, 50/60 Hz or directly from 100-240 VAC, 50/60 Hz depending of model. The indicator can have an internal rechargeable battery.

The indicator produces a load cell excitation voltage of 5 VDC.

2.1.2 Load receptors, load cells and load receptor support

Set out in Section 3.2.

2.1.3 Interfaces and peripheral equipment

Set out in Section 4.

2.2 Functions

The weight indicating instruments are microcontroller based electronic weight indicators that require the external connection of strain gauge load cell(s) or digital load cell(s). The weight information appears in the digital display located on the front panel and may be transmitted to peripheral equipment for recording, processing or displaying.

The indicator can be configured to show the weight in either g, kg, or t (metric ton).

The primary functions provided are detailed below.

2.2.1 Display range

The weight indicators will display weight from -Max (net weight) to Max+9e (gross weight) within the limits of the display capacity.

2.2.2 Zero-setting

Pressing the “ZERO” key causes a new zero reference to be established and ZERO annunciator to turn on, indicating the display is at the centre of zero. Zero setting might be done via any protected digital interface or digital input instead of pressing key.

Semi-automatic zero-setting range: $\leq 4\%$ of Max.

Automatic zero-tracking range: $\leq 4\%$ of Max.

Initial zero-setting range: $\leq 20\%$ of Max.

Zero-setting is only possible when the load receptor is not in motion.

2.2.3 Zero-tracking

The indicators are equipped with a zero-tracking feature, which operates over a range of up to 4 % of Max and only when the indicator is at gross zero and there is no motion in the weight display, if activated.

2.2.4 Tare

Instruments are provided with subtractive tare. Maximum tare capacity corresponds to the maximum indication of the scale.

Tare-setting is only possible when the load receptor is not in motion.

2.2.4.1 Semi-automatic subtractive tare

The instrument models are provided with a semi-automatic subtractive tare feature activated using the “TARE” key. Consecutive tare operations are allowed – if configured. Taring might be done via any protected digital interface or digital input instead of pressing key.

2.2.4.2 Automatic subtractive tare

As an alternative to semi-automatic subtractive tare the indicator can be configured to automatic subtractive taring, when a load is placed on the empty load receptor.

2.2.4.3 Auto clear tare

As an alternative to clear the tare via key, the indicator can be configured to automatic clear the tare, when the load is removed from the load receptor.

2.2.4.4 Preset tare

Model FT-112 / FT-111 panel / FT-112 panel / FT-113 have the possibility for preset tare.

2.2.4.5 Semi-automatic additive tare (FT-111 panel / FT-112 panel / FT-113 only)

FT-111 panel / FT-112 panel / FT-113 can be configured so its semi-automatic tare is additive instead of subtractive.

2.2.4.6 Automatic additive tare (FT-111 panel / FT-112 panel / FT-113 only)

FT-111 panel / FT-112 panel / FT-113 can be configured so its automatic tare is additive instead of subtractive.

2.2.4.7 Temporary gross indication

When the semi-automatic or automatic tare function is active the Gross weight can be displayed temporarily, if the indicator is configured to it.

2.2.5 Printing

A printer may be connected to the serial data port. The weight indicator will transmit the current weight value to the printer, PC or to any other peripheral when the “ENTER” key is pressed.

The printing will not take place if the load receptor is not stable, if the gross weight is less than zero, or if the weight exceeds Max.

Printing might be done by digital input or by receiving a command from any protected digital interface instead of pressing key.

2.2.6 Automatic printing

The indicator can be configured to automatic print, when the load receptor is loaded and stable.

2.2.7 Piece counting (FT-112 only)

The indicator has - if configured to it - a mode for piece counting.

2.2.8 Check weighing (FT-112 / FT-111 panel / FT-112 panel / FT-113 only)

The indicator can be set to check the actual weight against limits of item if configured. The target value of item is tared the indicator as PT. The net value is displayed to inform the deviation from the target of item to the user.

2.2.9 Classifying (Sorting) (FT-112 / FT-111 panel / FT-112 panel / FT-113 only)

The indicator can be set to classify actual weight against limits of item, if configured.

2.2.10 Filling (FT-112 / FT-111 panel / FT-112 panel / FT-113 only)

The indicator can be set to a non-automatic filling mode - filling the actual weight against limits of item, if configured.

2.2.11 Packing (FT-112 / FT-111 panel / FT-112 panel / FT-113 only)

The instrument can be set to manual packing which operates with actual weight against limits of item, if configured. The weighing is available in gross , in net or preset tare, depending on the configuration.

2.2.12 Transactional weighing (only FT-111 panel / FT-112 panel)

The instrument can be set to transactional weighing for standalone operation or operation in dialog with PC, PLC etc.

2.2.13 Calculated volume (FT-112 / FT-111 panel / FT-112 panel / FT-113 only)

The indicator can be set to calculate the volume by preset density entry. The information display announces the density and the calculated volume. If any, the calculated volume is marked and printed together with preset density value.

2.2.14 Multiple platforms (FT-112 only)

The indicator can - if configured to it – be connected to two platforms with analogue load cells (named scale 1 and scale 2).

2.2.15 Summing scales (FT-112 only)

The indicator has - if it has 2 platforms (scale 1 and scale 2) and is configured to it - a mode where the two platforms work as one legal scale (named scale 1+2).

2.2.16 Memories

The indicator has memories for storing the identification data and limit values of 500 items for usage at basic weighing, checkweighing, classifying or filling.

For usage at piece counting, the indicator has memories for 500 items for storage of average part weight and limit values of items in quantity.

Furthermore, the instrument has 500 PT memory for specified tare values.

2.2.17 Weighing unstable samples

The indicator has - if configured to it - a special mode for weighing unstable samples like living animals.

2.2.18 Extended resolution

The indicator can - if configured to it - temporarily display the actual weight with extended resolution ($d = 0.1e$).

2.2.19 Display test

A self-test routine is initiated by pressing the on/off key to turn the instrument off, then pressing it again to turn the instrument on. The test routine turns on and off all of the display segments and light indicators to verify that the display is fully functional.

2.2.20 Operator information messages

The weight indicator has a number of general and diagnostic messages, which are described in detail in the user's guide.

2.2.21 Software version

The format of the software is XX.YY, where XX is the revision of the legally relevant functionality of the software and YY is the sub-revision number for software changes not related to the legal functionality of the software.

The software of the instrument can be upgraded to improve the instruments. This feature is protected by the calibration switch, and by encryption and checksum control in the software of each variant.

The approved version is: 01.YY.

2.2.22 Totalisation

The indicator has a totalisation function, adding actual weight display value to the memory when pressing "M+" key, if the equilibrium is stable.

Totalization can only be performed on one scale, so if another scale is selected totalization is inhibited until the original scale is selected again.

The totalised value is a calculated value and shall be marked as such when printed.

2.2.23 Battery operation

The indicator can be operated from an internal rechargeable battery, if this option is installed.

2.2.24 Alibi memory

The indicators have an optional data storage device (DSD), which can store all the weighing results, when enabled. The alibi memory is organized as a cyclic buffer of alibi records.

2.2.25 Gravity compensation

The indicators have a gravity compensation function making it possible to perform the verification at a place with another gravity constant than the place of use.

The function is sealed.

2.2.26 Tilt switch input

The indicators can be setup to be connected to a tilt switch of a movable platform. The signal from the tilt switch will, when tilted more than its limit disable the weight indication. The function is sealed.

3. Technical data

The weighing instruments are composed of separate modules, which are set out as follows:

3.1 Indicator

The indicators have the following characteristics:

Type:	FT-111 / FT-112 / FT-111 panel / FT-112 panel / FT-113
Accuracy class:	III and IIII
Weighing range:	Single-interval, multi-interval (up to 3 intervals), multi-range (up to 3 ranges)
Maximum capacity (Max):	1 kg to 500 000 kg
Verification scale interval ($e_i =$):	≥ 0.1 g
Maximum number of Verification Scale Intervals (n_i):	≤ 10000 (class III), ≤ 1000 (class IIII)
Maximum subtractive tare effect:	-Max within display limits
Maximum additive tare effect (FT-111 panel / FT-112 panel / FT-113 only):	+XXXX.X (depend on configuration, see section 5.3)
Fractional factor:	$p'i = 0.5$
Minimum input voltage per VSI:	0.4 μ V
Excitation voltage:	5 VDC
Circuit for remote sense:	present on the model with 7-terminal connector
Minimum input impedance:	43 ohm
Maximum input impedance:	1200 ohm
Mains power supply:	90-240 VAC, 50/60 Hz, or 10-30 VDC. Internal rechargeable battery (optional).
Operational temperature:	-10 °C to +40 °C
Peripheral interface:	Set out in Section 4

3.1.1 Connecting cable between the indicator and load cell / junction box for load cell(s)

3.1.1.1 4-wire system

Cable between indicator and load cell(s): 4 wires (no sense), shielded

Maximum length: The certified length of the load cell cable, which shall be connected directly to the indicator.

3.1.1.2 6-wire system

Cable between indicator and load cell(s): 6 wires (sense), shielded.

Maximum cable length between indicator and junction box (J-box) for load cell(s), if any:

- Option 1: 4012 m/mm²

In case the (n) for the weighing instrument is less than (n) mentioned above, the following apply:

- Option 2:

Coefficient of temperature of the span error of the indicator: $E_s = 0.0012$ [% / 25K]

Coefficient of resistance for the wires in the J-box cable: $S_x = 0.0016$ [% / ohm]

$L/A_{max} = 295.86 / S_x * (emp / n - E_s)$ [m / mm²] in which $emp = p'i * mpe * 100 / e$

From this the maximum cable length for the weighing instrument may be calculated with regard to (n) for the actual configuration of the instrument.

Reference: See Section 10.

3.2 Load receptors, load cells, and load receptor supports

Movable platforms shall be equipped with level indicators or tilt switches.

3.2.1 General acceptance of analogue load cells

Any analogue load cell(s) may be used for instruments under this certificate of type examination provided the following conditions are met:

- 1) There is a respective Part / Evaluation / Test Certificate (EN 45501) or an OIML Certificate of Conformity (R60:2000) issued for the load cell by a Notified Body responsible for type examination under Directive 2014/31/EU
- 2) The certificate contains the load cell types and the necessary load cell data required for the manufacturer's declaration of compatibility of modules (WELMEC 2:2021), and any particular installation requirements). A load cell marked NH is allowed only if humidity testing to EN 45501 has been conducted on this load cell.
- 3) The compatibility of load cells and indicator is established by the manufacturer by means of the compatibility of modules form, contained in the above WELMEC 2 document, or the like, at the time of EC verification or declaration of EC conformity of type.
- 4) The load transmission must conform to one of the examples shown in the WELMEC 2.4:2021 Guide for load cells.

3.2.2 Digital load cells

The digital load cells, which are listed below, are certified as modules in the weighing instrument.

Manufacturer	Load cell type	Cert. No.
Flintec	RC3D digital load cell	TC6586

3.2.3 Platforms, weigh bridge platforms

Construction in brief: All-steel or steel-reinforced concrete construction, surface or pit mounted
 Reduction ratio: 1
 Junction box: Mounted in or on the platform
 Load cells: Load cell according to Section 3.2.11 and 3.2.2
 Drawings: Various

3.2.4 Bin, tank, hopper and non-standard systems

Construction in brief: Load cell assemblies each consisting of a load cell stand assembly to support one of the mounting feet bin, tank or hopper
 Reduction ratio: 1
 Junction box: Mounted on or near the dead structure
 Load cell: Load cell according to Section 3.2.11 and 3.2.2
 Drawings: Various

3.2.5 Crane, hoist, mono-rail and other suspension type systems

Construction in brief	Load cell assembly(-ies) each consisting of a load cell depends on the system.
Reduction ratio	1
Junction box	Mounted in, on or near the dead load
Load cell	Any R60 certified load cell according to Section 3.2.1 and 3.2.2
Drawings	Various

3.3 Composition of modules

In case of composition of modules, EN 45501:2015 Annex F shall be satisfied.

3.4 Documents

The documents filed at FORCE Technology (reference No. T211947 and 118-21979) are valid for the weighing instruments described here.

4. Interfaces and peripheral equipment

4.1 Interfaces

The interfaces are characterised “Protective interfaces” according to paragraph 8.4 in the Directive.

4.1.1 Load cell input

One or two 7-terminal connectors for the analogue load cell(s); or 6/7-terminal connector for digital load cell(s) is positioned inside the enclosure or in the enclosure.

4.1.2 Communication and I/O interfaces

The indicator is equipped with the following communication and I/O interfaces,

- 2 RS-232
- RS485
- RS422 (only FT-111 panel / FT-112 panel / FT-113)
- USB
- Ethernet
- Optional: Analog and/or digital input/outputs
- Optional: Modbus RTU, Modbus TCP, Ethernet, Profinet, Profibus, Ethercat, CCLink. Powerlink, CC-Link IE.
- Optional: Bluetooth or WiFi.

4.2 Peripheral equipment

The instrument may be connected to any simple peripheral device with a CE mark of conformity. Connection between the indicator and peripheral equipment is allowed by screened cable.

5. Conditions for certification

5.1 Measurement functions other than non-automatic functions

Measurement functions that will enable the use of the instrument as an automatic weighing instrument are not covered by this type examination.

5.2 Counting operation is not approved for NAWI

The count shown as result of the counting function is not a legal value.

5.3 Compatibility of modules

Composition of modules, EN 45501:2015, Annex F shall be satisfied. If more than one platform it shall be satisfied for each platform/scale.

For FT-111 panel / FT-112 panel / FT-113 shall compatibility of modules be fulfilled for the maximum additive tare effect.

If FT-112 is configured with a summing scale (scale 1+2) composition of modules shall be satisfied for this too.

6. Special conditions for verification

6.1 Approval parameter 511 shall be set to OIML

The parameter related with approval, which is coded as 511, shall be selected as OIML.

6.2 Composition of modules

The environmental conditions should be taken into consideration by the composition of modules for a complete weighing instrument, for example instruments with load receptors placed outdoors and having no special protection against the weather.

The composition of modules shall agree with Section 5.3.

7. Securing and location of seals and verification marks

7.1 Securing and sealing

Seals shall bear the verification mark of a notified body or alternative mark of the manufacturer according to ANNEX II, section 2 or 4 of the Directive 2014/31/EU.

7.1.1 Indicator

Access to the configuration and calibration facility requires that a calibration switch is in position ON. The switch is positioned on the main board below a sealable cover inside the enclosure for FT-111 / FT-112, and for FT-111 panel / FT-112 panel / FT-113 on the main board at the rear of the indicator which is sealable.

Sealing of the indicator - to prevent access to the calibration switch and to secure the electronics against dismantling/adjustment - and sealing of load cell connection are accomplished with either wire and seal or using brittle stickers.

7.1.2 Indicator - load cell connector - load receptor

Securing of the indicator, load receptor and load cell combined is done the following way:

- The load cell connector is positioned next to the calibration switch on the mainboard and therefore secured by the same cover using brittle stickers or by wire and seal.

In special cases where the place of installation makes it impossible to use the above sealing:

- Inserting the serial number of the load receptor as part of the principal inscriptions contained on the indicator identification label.
- The load receptor bears the serial number of the indicator on its data plate.

7.1.3 Peripheral interfaces

The peripheral interfaces are “protective”; it neither allows manipulation with weighing data or legal setup, nor change of the performance of the weighing instrument in any way that would alter the legality of the weighing.

8. Location of CE mark of conformity and inscriptions

8.1 Indicator

8.1.1 CE mark

CE mark and supplementary metrological marking shall be applied to the indicator according to article 16 of Directive 2014/31/EU

8.1.2 Inscriptions

Manufacturer's trademark and/or name and the type designation is located on the front panel overlay.

Indelibly printed on a brittle plastic sticker located on the front panel overlay:

- Max_i , Min_i , $e_i =$, and $d_i =$ (if $d < e$)

On the inscription plate:

- Manufacturer's name and/or logo, postal address of manufacturer, model no., serial no., type examination certificate no., Max_i , Min_i , $e_i =$, $d_i =$ (if $d < e$) , accuracy class, supply voltage.

8.1.2.1 Load receptors

On a data plate:

- Manufacturer's name, type, serial number, capacity

In special cases as provided in Section 7.1.2:

Serial no. of the indicator

9. Pictures



Figure 1 FT-111 indicator – Wall hanging model.



Figure 2 FT-111Ex indicator – Desktop model.



Figure 3 FT-111Ex indicator – Wall hanging model.



Figure 4 FT-112 indicator – Wall hanging model.



Figure 5 FT-112Ex indicator – Desktop model.

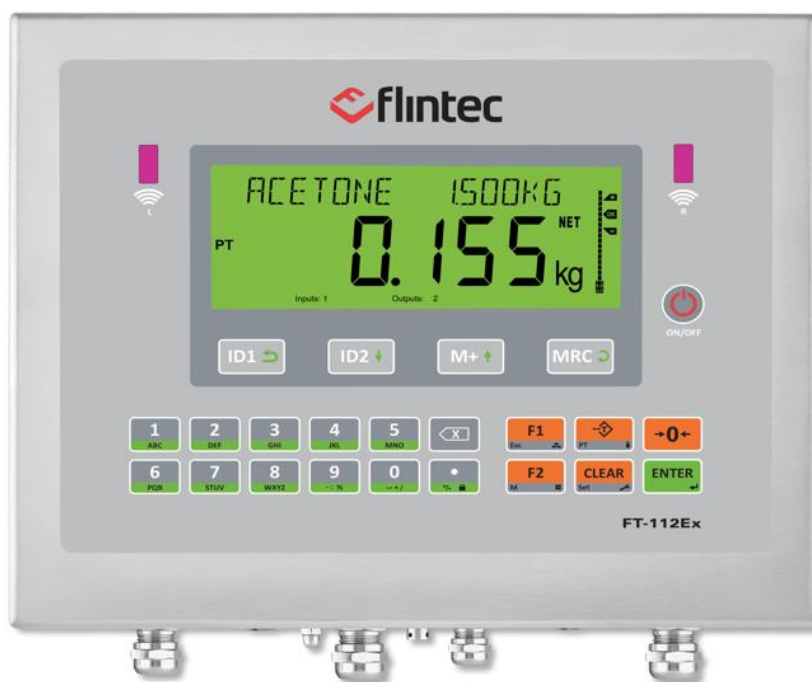


Figure 6 FT-112Ex indicator – Wall hanging model.



Figure 7 FT-111 panel indicator.



Figure 8 FT-112 panel indicator.



Figure 9 FT-113 indicator.



Figure 10 Example of logo for front panel of indicator.

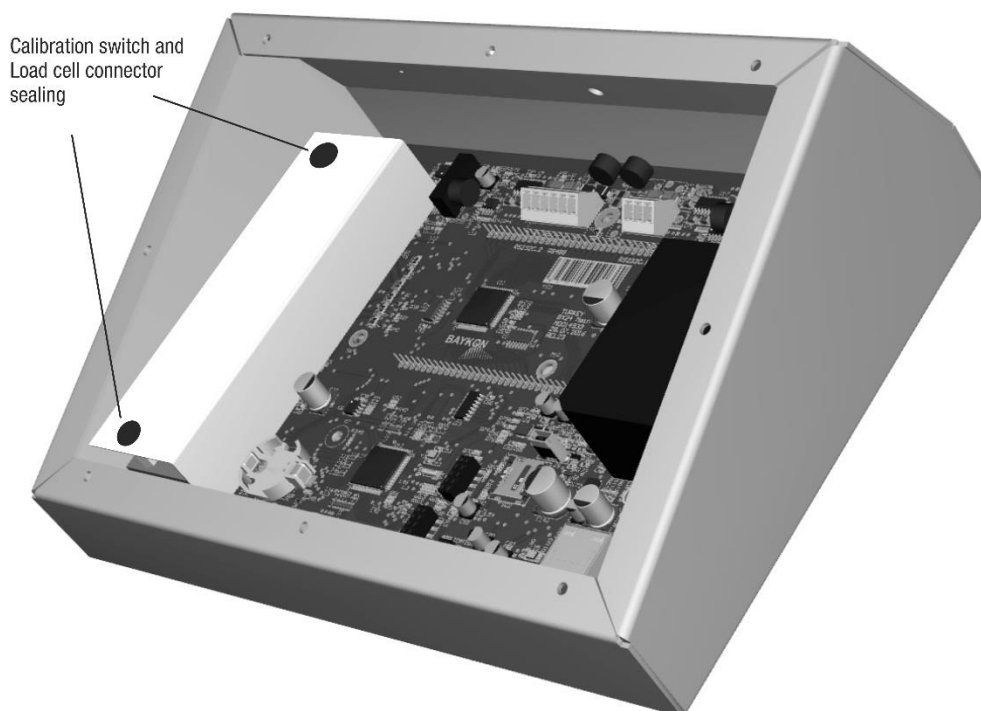


Figure 11 Sealing of indicator with brittle sticker – Desktop model.

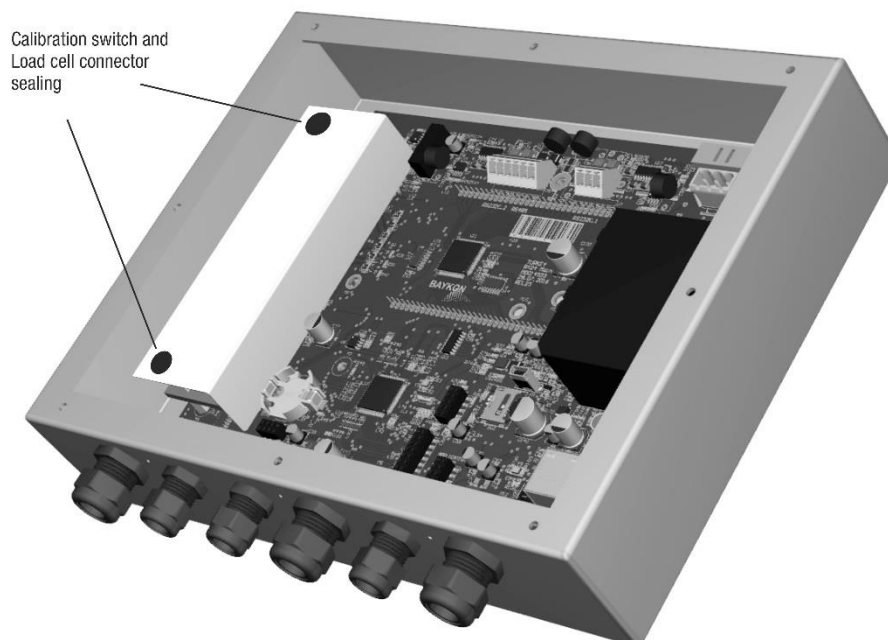


Figure 12 Sealing of indicator with brittle sticker – Wall hanging model.

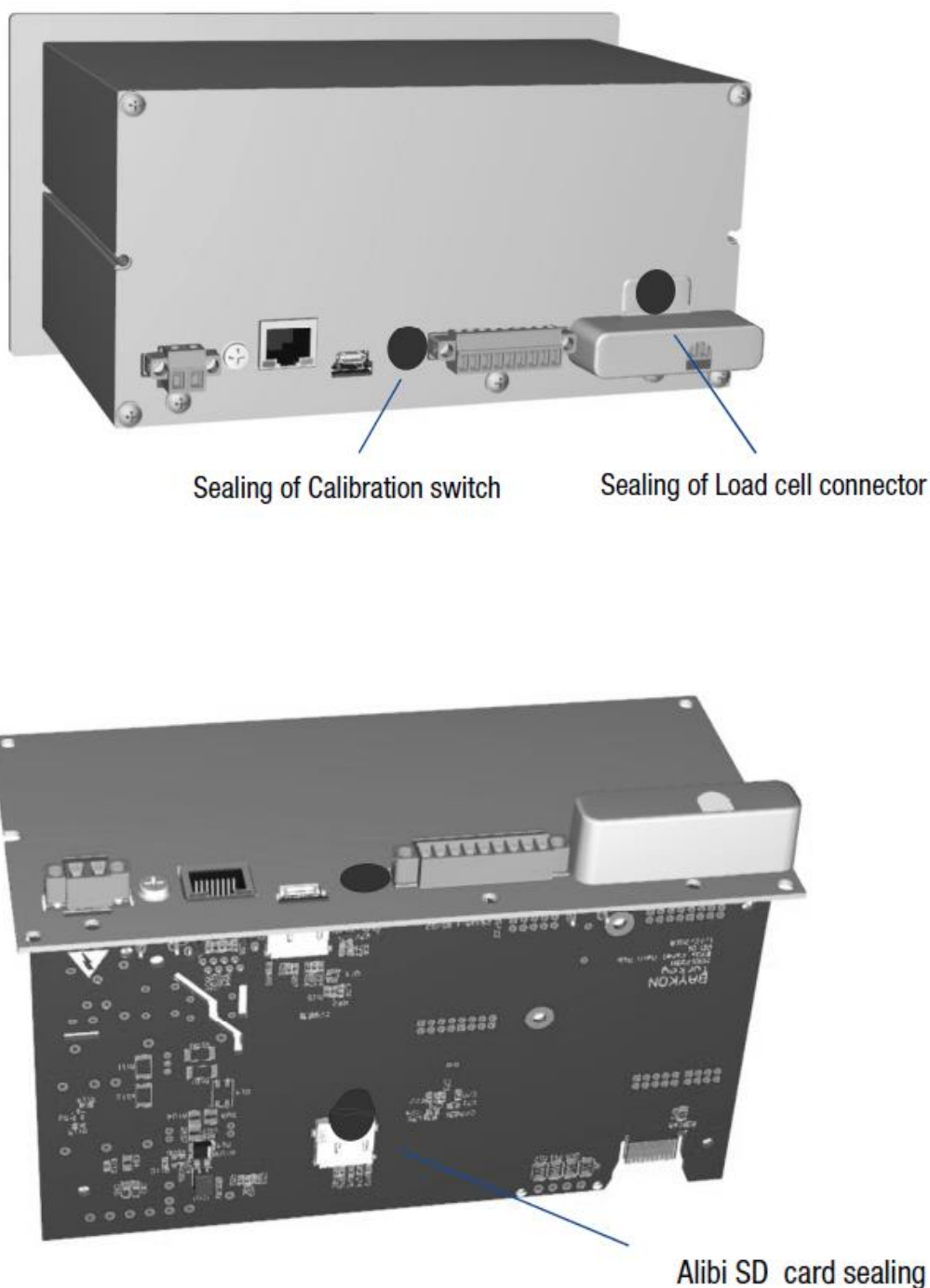


Figure 13 Sealing of FT-111 panel / FT-112 panel / FT-113 indicator with brittle sticker – Panel type model.