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EC Type-Approval Certificate

No. DK 0199.391 revision 2

J7-10 / Q7-10 / J7-11 / A7-11 / X7-11 / J7-12 / Q7-12 / A7-13 / X7-13 / A7-20 / J7-20 / Q7-20 / X7-20 / A7-40 / J7-40 / Q7-40 / X7-40 / A7-60 / J7-60 / Q7-60 / X7-60 / M7-901 / M7-907

NON-AUTOMATIC WEIGHING INSTRUMENT

Issued by **DELTA Danish Electronics, Light & Acoustics**
EU - Notified Body No. 0199

In accordance with the requirements for the non-automatic weighing instrument of EC Council Directive 2009/23/EC.

Issued to **Tscale Electronics Mfg. (Kunshan) Co., Ltd.**
No. 99 Shunchang Road,
Zhoushi, Kunshan, Jiangsu
CHINA

In respect of Non-automatic weighing instrument designated J7-10 / Q7-10 / J7-11 / A7-11 / X7-11 / J7-12 / Q7-12 / A7-13 / X7-13 / A7-20 / J7-20 / Q7-20 / X7-20 / A7-40 / J7-40 / Q7-40 / X7-40 / A7-60 / J7-60 / Q7-60 / X7-60 / M7-901 / M7-907with variants of modules of load receptors and load cells.
Accuracy class III, single-interval or dual-range
Maximum capacity, Max: From 3 kg to 45 kg
Verification scale interval: e = Max/ n
Maximum number of verification scale intervals: n $\leq$ 3000.
Variants of models 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 45501:1992/AC:1993 and OIML R76:2006

Note: This certificate is a revised edition which replaces previous revisions.

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

The annex comprises 25 pages.

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Descriptive annex

Contents

1. Name and type of instrument

The non-automatic weighing instruments designated J7-10 / Q7-10 / J7-11 / A7-11 / X7-11 / J7-12 / Q7-12 / A7-13 / X7-13 / A7-20 / J7-20 / Q7-20 / X7-20 / A7-40 / J7-40 / Q7-40 / X7-40 / A7-60 / J7-60 / Q7-60 / X7-60 are self-indicating desktop scales of class III with single-interval / dual-range, an external AC/DC mains adapter, and an internal rechargeable battery (optional).

n7-10, n7-11, n7-12 and n7-13 are price computing scales intended for sales to the public.
n7-20 are scales intended for manual check weighing.
n7-40 are counting scales.
n7-60 are 'All-in-One' multifunction scales
where n is J, A, Q or X.
M7-nnn are medical scales.

The J7-nn and X7-nn scales have a built-in printer.

Each scale consists of analogue to digital conversion, microprocessor control, power supply, keyboard, a 7" touch-screen display and non-volatile memory for storage of calibration and weight data contained within a single enclosure. J7-10 / Q7-10 / A7-13 / X7-13 have an additional rear display for customers, and A7-11 / J7-11 / X7-11 / J7-12 / Q7-12 have an additional pole display for customers.

2. Description of the construction and function

2.1 Construction

Enclosures and keyboard

The indicators are housed in an enclosure made of ABS plastic.

The front panels of the scales comprise of:

- 7" touch-screen LCD display with backlight incorporating appropriate state indicators.
- The scales have in addition to the key-in possibilities on the touch screen a keyboard containing 4 keys used to enter commands into the weight indicator, plus a key for turning the indicator on/off. Each key is identified with a pictograph.

In addition to this the following scale models have a rear or pole display:

- The n7-10 scales have a 7-segment rear LCD display with three sections for weight, unit-price, and price-to-pay, respectively.
- The n7-11 scales have a 7" graphic colours LCD display on a pole with three sections for weight, unit-price, and price-to-pay respectively, plus a non-legal area for product information or similar.
- The n7-12 scales have a 7-segment LCD display on a pole with three sections for weight, unit-price, and price-to-pay, respectively.
- The n7-13 scales have a rear LCD colour display with three sections for weight, unit-price, and price-to-pay, respectively.

Electronics

The instruments have the following printed circuit boards, a mainboard, a piggy-back for A/D conversion, and a piggy-back for battery charging circuits, which together contain all of the instrument circuitry. The metrological circuitry for the different models of scales are identical.

All instrument calibration and metrological setup data are contained in non-volatile memory. The power supply accepts an input voltage of 12 VDC from the external power adapter with input from

100 – 240 VAC, 50/60 Hz. The scales use a load cell excitation voltage of 5 VDC. The scales can be equipped with an internal 6 V rechargeable battery (optional).

2.2 Function

The weight indicating instruments are microcontroller based self-indicating electronic price computing scales / weighing scales / counting scales. The instruments are available for operation from mains at 100-240 VAC 50/60 Hz using an external AC/DC adapter with 12 VDC output voltage and an optional internal 6V rechargeable battery.

The primary functions provided are detailed below.

2.2.1 Power-up

On power-up, the scale will first perform a check of its integrity. The J7-10 / Q7-10 / J7-12 / Q7-12 will then perform a display test of the customer display. After that the scales will automatically establish the current weight as a new zero reference.

2.2.2 Display range

The scales will display weight from -Max (tare function) to Max (gross weight).

2.2.3 Zero-setting

Zero-setting range: ±2% of Max.
Automatic zero-tracking range: ±2% of Max.
Initial zero-setting range: ≤ ±10% of Max.
Zero-setting is only possible when the load receptor is not in motion.

2.2.3.1 Semi-automatic zero-setting

Pressing the “ZERO” key causes a new zero reference to be established and ZERO annunciator to turn on, indicating that the display is at the centre of zero.

2.2.3.2 Zero-tracking

The scales are equipped with a zero-tracking feature, which operates over a range of ±2% of Max and only when the scale is at gross zero and there is no motion in the weight display. The zero-tracking shall be set to 0.5 d per second.

2.2.4 Tare

The instrument models are provided with a semi-automatic subtractive tare.

2.2.4.1 Semi-automatic tare

Pressing the “TARE” key will enter the currently weight value as the new tare weight value, if the tare function is not already active or setup allows multi-tare operation. The later one is not allowed for price computing scales.
The weight display will automatically change to the net weight display mode and turn on the NET annunciator and the tare value will be displayed. This tare value can be cleared by pressing the TARE key, when there is no load on the load receptor. This tare entry cannot take place, if the load receptor is in motion.

2.2.4.2 Preset tare

The n7-11, n7-13 and n7-60 scales have a preset tare function.
The n7-60 scales can store 4 different preset tare values in memory.

2.2.5 Price Look Up (PLU)

The n7-10, n7-11 and n7-12 scales can store up to 9999 unit price values. These are accessed using the PLU keys, the three product category keys, and the two arrow keys.

Access to editing them can be obtained using the menu key and selecting products.

2.2.6 Check weighing

The n7-20 and n7-60 scales can be set to check the actual weight against a high and/or a low limit set by the user or recalled from the look up table.

2.2.7 Checkweighing limits Look Up (PLU)

The n7-20 and n7-60 scales can store up to 9999 high and/or low limits for checkweighing. These are accessed using the PLU keys, the three product category keys, and the two arrow keys.

Access to editing them can be obtained using the menu key and selecting products.

2.2.8 Counting

The n7-40 and n7-60scales have a counting function. The number of samples on the load receptor can be keyed in using the “SAMPLES” key, or the unit weight of one piece can be keyed in using the “U.W.” key, or it can be recalled from the look-up table of unit weights using the “PRODUCT” key.

The count shown in counting mode and the unit weight, however, are not to be regarded as approved weighing results.

2.2.9 Piece unit weight Look Up (PLU)

The n7-40 and n7-60scales can store up to 9999 piece unit weight values. These are accessed using the PLU keys, the three product category keys, and the two arrow keys.

Access to editing them can be obtained using the menu key and selecting products.

2.2.10 Totalisation

The scales have a totalisation function for accumulating transactions. On Q7-10 / A7-11 / Q7-12 / A7-13 the totalisation function is to be disabled unless a printer is connected.

Totalised weight value is a calculated value and shall be marked as such when printed.

2.2.11 Facilitated weighing operations

The n7-60 scales have a number of functions facilitating weighing operations. These are,

Class operation	for sorting items into 5 different grades based on weight.
Take out operation	for display of removed weight during down weighing and also accumulating the removed weight.
Target operation	for comparing the accumulated weight of a number of separate weighings against a target
Recipe operation	assisted weighing of components for a recipe.

2.2.12 Extended resolution (×10)

The n7-20, n7-40 and n7-60 scales have an extended resolution function, Pressing the key will show the weight with d = 0.1e for 5 seconds.

2.2.13 Gravity compensation

The scales have a gravity compensentation function making it possible to perform the verification at a place with another gravity constant than the place of use.
The function is sealed.

2.2.14 Hold function (only M7-90n medical scales)

Pressing the LOCK key will turn on the "LOCK" indicator and the weight value will be hold on the display, until the LOCK key is pressed again.
If the Hold function has been active for 10 seconds, it will automatically turns off and unlock the weight display.

This feature is not to be used in trade applications, but may be convenient in clinical or health care weighing applications.

2.2.15 BMI (only M7-90n medical scales)

The BMI key is used to access the Body Mass Index feature of the indicator. This allows the operator to enter the height and the gender of the person on the load receptor for calculation and display of the Body Mass Index (BMI).

As an alternative to entering the height a height rod can be connected to the indicator for automatic reading of the height.

2.2.16 Printing

J7-nn and X7-nn scales have a built-in printer, while A7-nn, Q7-nn and M7-90n scales may have a printer connected to an USB port or to the RS232 interface.

On J7-10 / J7-11 / X7-11 / J7-12 printing takes place automatically at the closing of a totalisation using the "OK" key inside the checklist.

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.

2.2.17 Operator information messages

The weight display can show a number of general and diagnostic messages, which are described in detail in the User's Manual.

2.2.18 Software version

The software is separated in weighing software and application software.

The software version of the weighing software is shown under system settings in the menu, while the software version of the application soft is displayed in the top line of the T-Touch screen.

The approved software versions are,
weighing software: V1.10
application software: A1.xx

2.2.19 Battery operation

The scale models are supplied with 12 VDC from an external AC/DC adapter and can be operated from an optional internal 6V rechargeable battery. The scales with battery contain the circuitry necessary to recharge the battery when the scale is connected to the mains power.

3. Technical data

3.1 Scales

The scales have the following characteristics:

Accuracy class:	III
Weighing range:	Single-interval or dual-range
Maximum number of Verification Scale Intervals:	≤ 3000 or 2×3000
Maximum capacity (Max):	3 kg to 250 kg
Minimum capacity (Min):	20 e
Verification Scale Interval (e):	≥ 1 g
Maximum tare effect:	≤ -Max
Minimum verification scale interval:	e ≥ 1.5 µV for single-interval e ≥ 1.0 µV for dual-range
Excitation voltage:	5 VDC
Minimum load cell impedance:	87.5 Ω for single interval 350 Ω for dual range
Mains power supply:	12 VDC / 100 - 240 VAC, 50/60 Hz using external AC/DC adapter 6 V battery (optional)
Operational temperature:	0°C to 40°C for single-interval 5°C to 35°C for dual-range
Peripheral interface:	Set out in Section 4

3.2 Load cell for scale

Zemic load cell type L6D C3 and L6E C3 with $v_{min} \leq e$ and $0.6 \times E_{max} \leq Max \leq 0.9 \times E_{max}$.
Alternatively the load cell can be selected according to section 3.3.2.1.

3.3 External platform (optional)

3.3.1 Scale part

Accuracy class:	III
Weighing range:	Single-interval
Maximum number of Verification Scale Intervals(n):	≤ 3000
Maximum capacity (Max):	3 kg to 300 000 kg
Minimum capacity (Min):	20 e
Maximum tare effect:	≤ -Max
Fractional factor:	p'i = 0.5
Minimum input voltage per VSI:	1.5 µV
Excitation voltage:	5 VDC
Circuit for remote sense:	present
Minimum input impedance:	87 ohm
Maximum input impedance:	1200 ohm

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

3.3.1.1.1 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.

3.3.1.1.2 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): 580 m/mm^2

3.3.2 Load receptor part

Movable platforms shall be equipped with level indicators.

3.3.2.1 General acceptance of modules

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

1) A test certificate (EN 45501) or OIML Certificate of Conformity (R60) respectively issued for the load cell by a Notified Body responsible for type examination under the Directive 2009/23/EC.

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, Issue 5, 2009), 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 Guide for load cells.

3.3.2.2 Platform

Construction in brief:	Metal construction
Reduction ratio:	1
Junction box:	Mounted in or on the platform, if pressent
Load cells	Load cell according to Section 3.3.2.1
Drawings:	Various

3.3.3 Composition of modules

In case of composition of modules, EN 45501 paragraph 3.5 and 4.12 shall be satisfied.

3.4 Documents

The documents filed at DELTA (reference No. T205512) 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 from an external second platform (optional)

A 7-terminal connector for connection of the load cell cable from an external second platform to the scale.

4.1.2 RS-232 interface

The scale is equipped with one or two RS-232 interfaces for connection to a computer or to a printer.

4.1.3 USB interface

The scale is equipped with two USB interfaces for connection to peripheral equipment.
The length of the USB cables is specified to be less than 3 meter.

4.1.4 Ethernet interface

The scale may be equipped with a RJ45 connector for connection of the scale to a Local Area Network.

4.1.5 Cash drawer interface

The scale is equipped with a RJ11 connector with digital output signals for connection to a cash drawer.

4.1.6 Wi-Fi interface (optional)

The scale can be equipped with a Wi-Fi interface.

4.2 Peripheral equipment

The instruments may be connected to any simple peripheral with a CE mark of conformity using a screened cable.

5. Approval conditions

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 approval.

5.2 Counting operation is not approved for NAWI

The count shown as result of the counting function is not covered by this NAWI approval.

5.3 Totalised weight is not a legal value.

When using the totalisation function creating a sum of several weighing results, this sum is only informative, as it is not a legal value.

5.4 Compatibility of modules

In case of external platform the composition of modules, WELMEC 2 (Issue 5) 2009, paragraph 11 shall be satisfied.

6. Special conditions for verification

None.

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 2.3 of the Directive 2009/23/EC.

7.1.1 Scale

Access to the configuration and calibration facility is achieved by pressing a calibration switch accessed through a hole in the bottom of the enclosure of the scale. Sealing of the access to the calibration switch is accomplished by a sticker covering the hole through which the switch is accessed.

Sealing of the enclosure is accomplished by an additional sticker covering the assembling screw placed roughly in the centre of the enclosure.

7.2 Verification marks

A green M-sticker and a sticker with verification marks on or next to the inscription plate placed on the side of the scale.

8. Location of CE mark of conformity and inscriptions

8.1 Scale

8.1.1 CE mark

A sticker with the CE mark of conformity and year of production is located on the identification plate which is located on the side of the scale.

8.1.2 Inscriptions

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

In the top line of the display:

- Max, Min, e = , software version

On the inscription plate:

- Manufacturer's name and/or logo, model no., serial no., type-approval certificate no., accuracy class, temperature range, electrical data and other inscriptions.

9. Pictures

Figure 1 J7-10 price computing scale.

Figure 2 Q7-10 price computing scale.

Figure 3 A7-11 price computing scale.

Figure 4 J7-11 price computing scale.

Figure 5 X7-11 price computing scale.

Figure 6 J7-12 price computing scale.

Figure 7 Q7-12 price computing scale.

Figure 8 A7-13 price computing scale.

Figure 8a Rear of A7-13 price computing scale.

Figure 9 X7-13 price computing scale.

Figure 9a Rear of X7-13 price computing scale.

Figure 10 A7-20 checkweighing scale.

Figure 11 J7-20 checkweighing scale.

Figure 12 Q7-20 checkweighing scale.

Figure 13 X7-20 checkweighing scale.

Figure 14 A7-40 counting scale.

Figure 15 J7-40 counting scale.

Figure 16 Q7-40 counting scale.

Figure 17 X7-40 counting scale.

Figure 18 A7-60 'All-inOne' scale.

Figure 19 J7-60 'All-inOne' scale.

Figure 20 Q7-60 'All-inOne' scale.

Figure 21 X7-60 'All-inOne' scale.

Figure 22 M7-901 Medical scale.

Figure 23 M7-907 Medical scale.

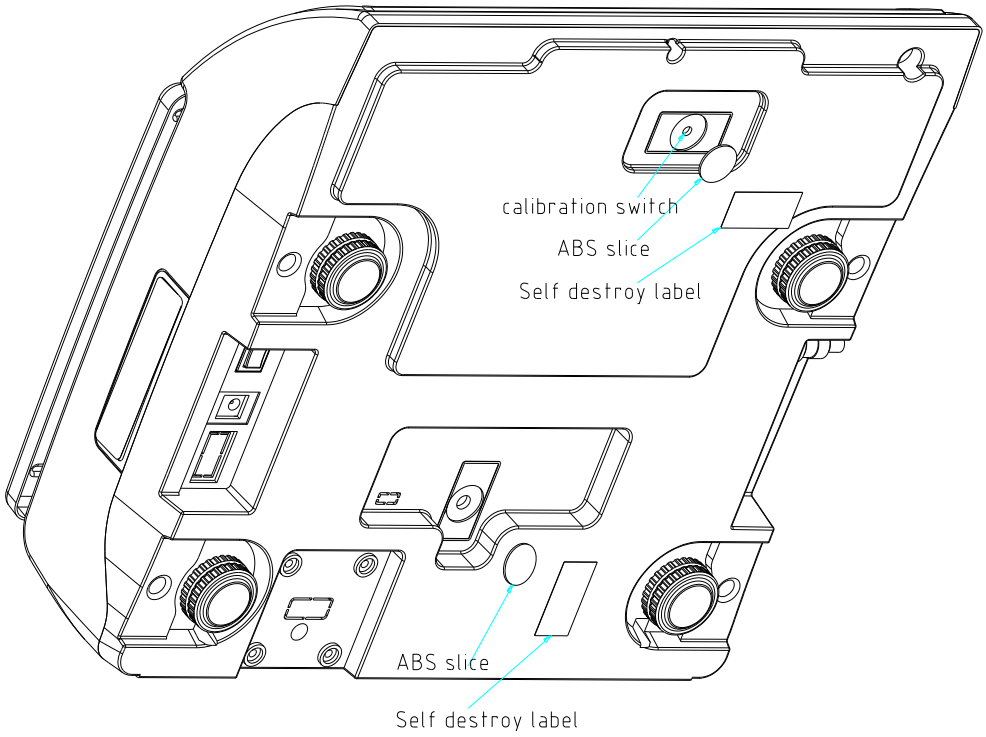

Figure 24 Sealing of J7-nn scales (type A)

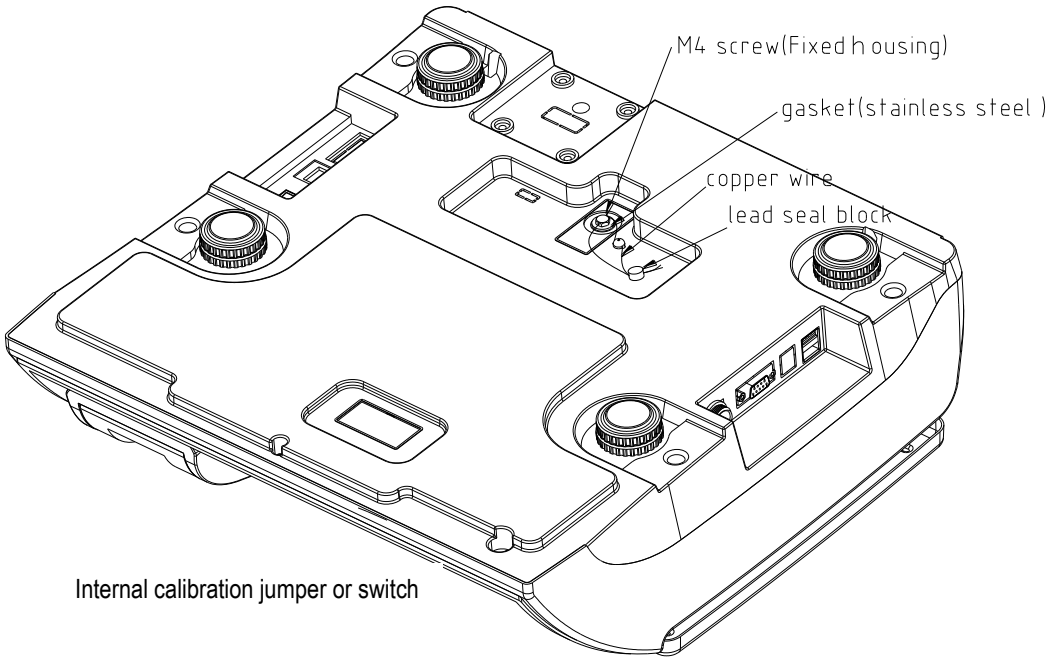

Figure 25 Sealing of J7-nn scales (type B)

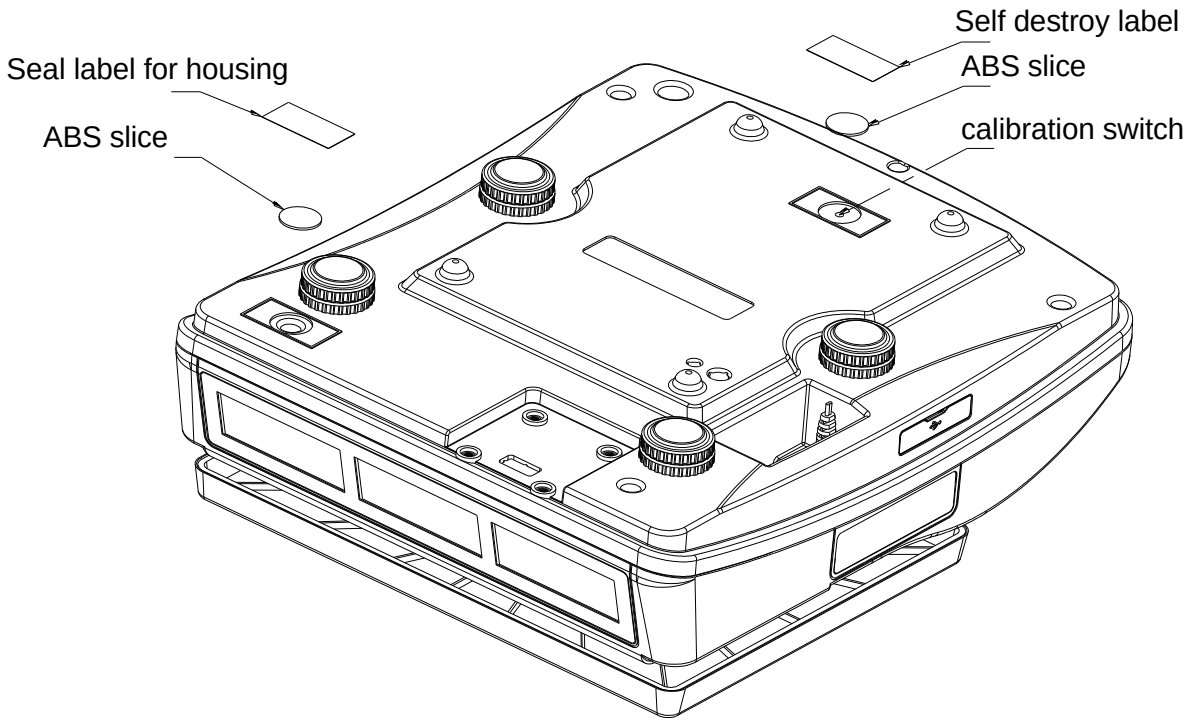

Figure 26 Sealing of Q7-nn scales

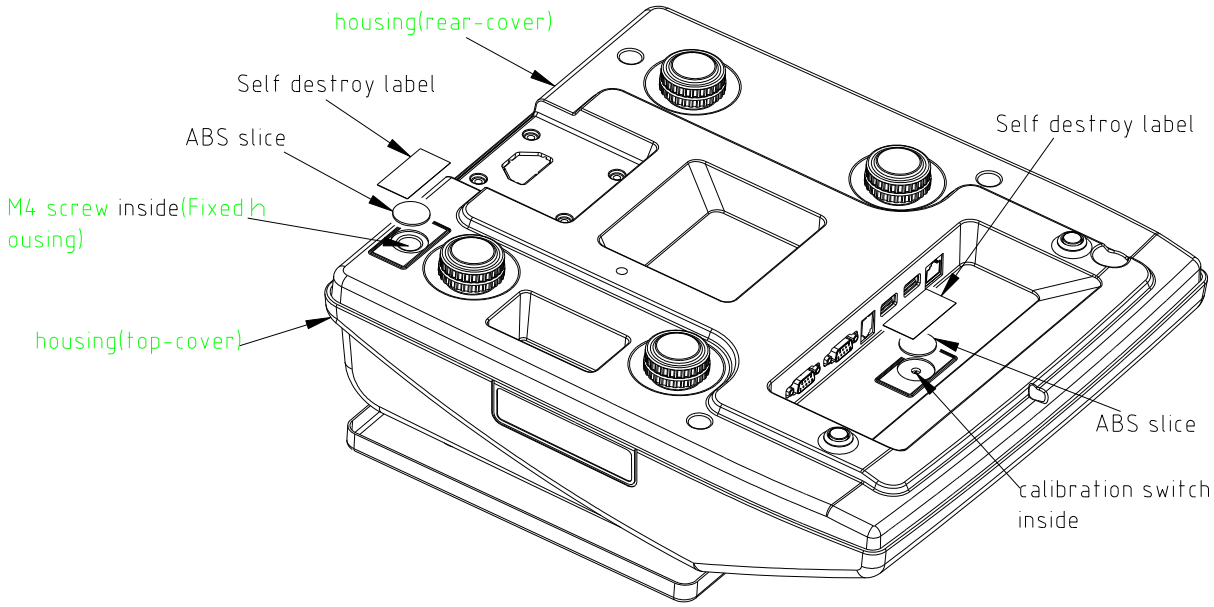

Figure 27 Sealing of A7-nn scales

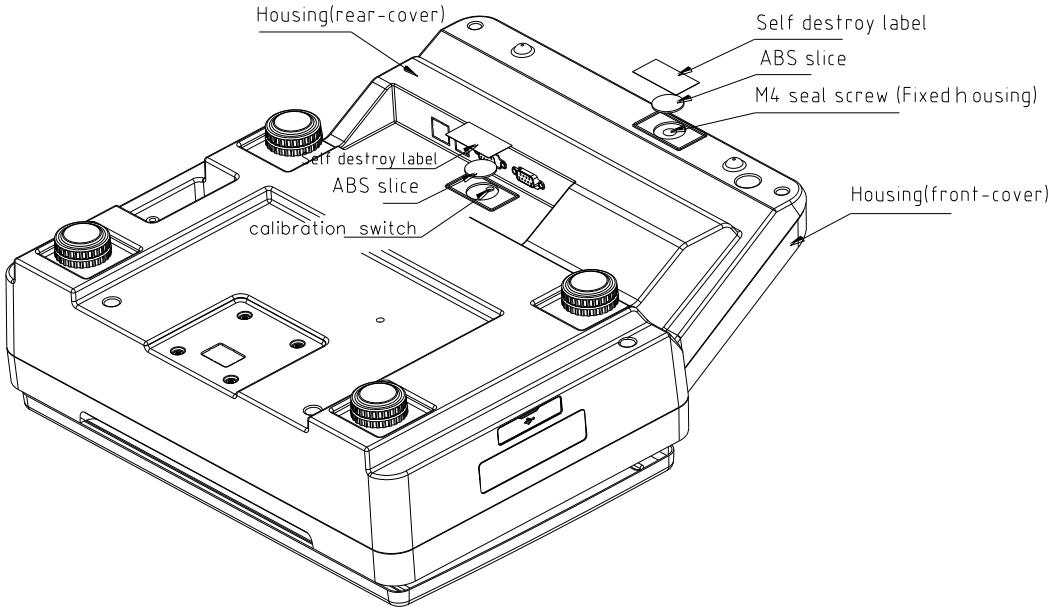

Figure 28 Sealing of X7-nn scales

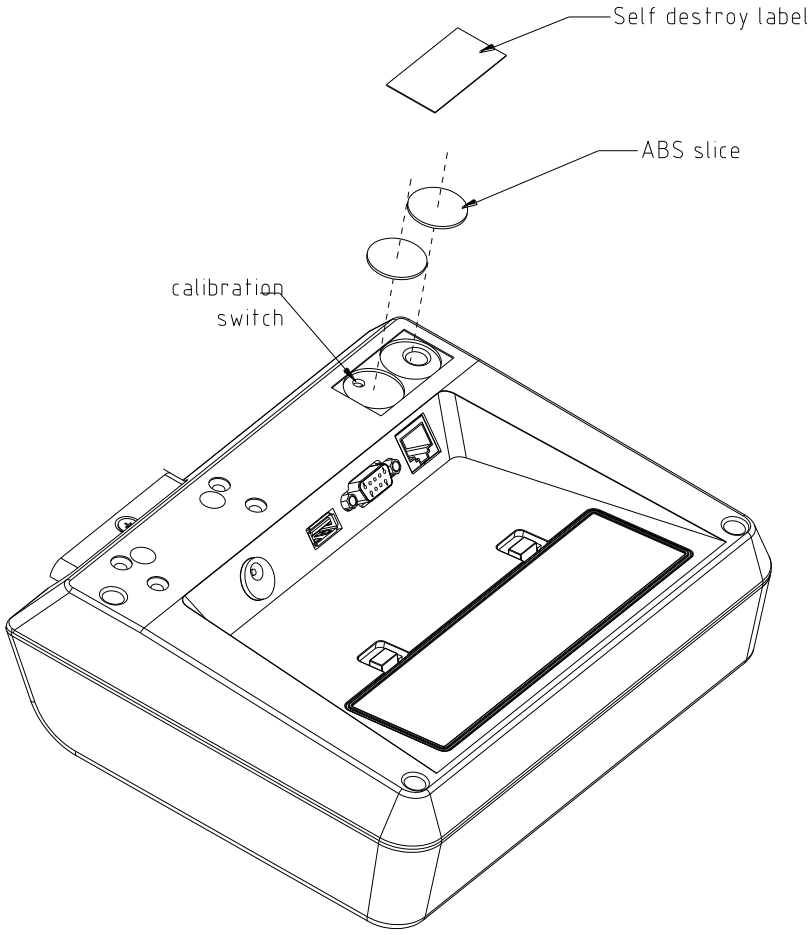

Figure 29 Sealing of M7-nnn scales