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EC Type-Approval Certificate

No. DK 0199.186 Revision 3

T28

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.
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In respect of Non-automatic weighing instrument designated T28 with variants of modules of load receptors, load cells and peripheral equipment.
Accuracy class III, single-interval or multi-interval (2 intervals)
Maximum capacity, Max: From 3 kg up to 25 kg
Verification scale interval: $e_i = \text{Max}_i / n_i$
Maximum number of verification scale intervals: $n_i \leq 3000$.
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 45501:1992/AC:1993.

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 8 pages.

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Descriptive annex

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1. Name and type of instrument

The weighing instruments designated T28 is self-indicating scale of Class III with single-interval or multi-interval (2 intervals), an external AC mains adapter, and an internal rechargeable battery (optional).

The scale consist of analogue to digital conversion, microprocessor control , power supply, keyboard, non-volatile memory for storage of calibration and weight data, and a weight display contained within a single enclosure, however, the display part is placed on a post.

2. Description of the construction and function

2.1 Construction

Enclosure

The scale is housed in an ABS enclosure. The display is placed on the front together with the keyboard. An optional display may be placed on the rear side of the scale. It is designed primarily for an office environment, but may also be used in industrial environment.

Keyboard

The T28's keyboards contain 3 membrane keys used to control the functions of the scale.

Display

The display comprises,

LCD version

- Front: a 7-segment display with white LED backlight 25 mm high with 5 digits, minus sign and appropriate status indicators.
- Rear: an optional 7-segment display with white LED backlight 20 mm high with 6 digits and appropriate status indicators.

LED version

- Front: a 7-segment LED display, 14 mm high with 6 digits and appropriate status indicators.
- Rear: an optional 7-segment LED display, 14 mm high with 6 digits and appropriate status indicators.

Both display models may have an optional rear display.

Electronics

The instrument has the following printed circuit boards, one main board and one or two for the display boards.

Models

Model	Max	e	N	No of Load cells	Load cell type	E _{max}
T28-3	3 kg	1 g	3000	1	L6D	5 kg
T28-6	3/6 kg	1/2 g	3000/3000			8 kg or 10 kg
T28-15	6/15 kg	2/5 g	3000/3000			20 kg
T28-25	15/25 kg	5/10 g	3000/2500			30 kg or 35 kg

Other models are allowed, if their technical data are in accordance with chapter 3, and they fulfil the requirements in sections 3.1 and 5.2.

2.2 Function

The weight indicating instruments are microcontroller based electronic price computing scales. The weight information appears in the digital display. The instruments are available for operation from mains at 230 VAC 50 Hz and an optional internal 6V/4Ah battery.

The primary functions provided are detailed below.

2.2.1 Power-up

On power-up, the weight indicator will first display the model and the software version for 2 seconds and then perform a display test. After that it will automatically establish the current weight as a new zero reference.

2.2.2 Test function

On power-up, the weight indicator will test all memory functions followed by a display test. The display test consists of counting down the numeric digits from 9 to 0.

2.2.3 Display range

The weight indicators will display weight from -Max (tare function) to Max +9e (gross weight).

2.2.4 Zero-setting

Zero-setting range: $\pm 2\%$ of Max.

Initial zero-setting range: $\leq \pm 10\%$ of Max.

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

2.2.4.1 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.

2.2.4.2 Automatic zero-setting

If the gross weight is below zero the scale will automatically set the gross weight to zero.

2.2.5 Zero-tracking

The indicators are equipped with a zero-tracking feature which operates over a range of $\pm 2\%$ of Max and only when the indicator is at gross zero and there is no motion in the weight display.

2.2.6 Tare

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

2.2.6.1 Semi-automatic tare

Pressing the "TARE/UNIT" key will enter the currently weight value as the new tare weight value.

The weight display will automatically change to the net weight display mode and turn on the NET annunciator. This tare value can be cleared by pressing the TARE key, when there is no load on the load receptor or the Net load is zero. This tare entry cannot take place, if the load receptor is in motion.

2.2.7 Unit

Pressing the "TARE/UNIT" key for 4 seconds will toggle the weighing until between kg and g.

2.2.8 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.

2.2.9 Software version

The software revision level is displayed during the power-up sequence of the instrument.
The approved software version is 6.9.

2.2.10 Battery operation

The scale can be operated from an internal battery. This battery is a 6V/4Ah.

The weight indicator contains the circuitry necessary to recharge the battery, when the indicator is connected to the mains power.

3. Technical data

3.1 Scales

The T28 scale has the following characteristics:

Accuracy class:	III
Weighing range:	Single-interval or multi-interval (2 intervals)
Maximum number of Verification Scale Intervals:	≤ 3000 pr. interval
Maximum capacity Max):	from 3 kg to 25 kg
Verification Scale Interval:	$e_i \geq 1$ g
Maximum tare effect:	$\leq -\text{Max}$
Minimum input voltage per VSI:	1 μV
Excitation voltage:	5 VDC
Minimum load cell input impedance:	350 ohm
Maximum input impedance:	1000 ohm
Mains power supply:	9 - 12 VDC / 230 VAC, 50 Hz using external adapter
Operational temperature:	0 °C to +40 °C
Peripheral interface:	Set out in section 4

3.2 Load cells

3.2.1 ZEMIC L6D load cell

The ZEMIC L6D C3 load cell shall be selected so it fulfils: $0.6 \times E_{\text{max}} \leq \text{Max} \leq 0.9 \times E_{\text{max}}$ and $Y \geq E_{\text{max}} / e_1$.

3.2.2 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 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. A530742) are valid for the weighing instruments described here.

4. Interfaces and peripheral equipment

4.1 Interfaces

The T28 scale has no interfaces.

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 Compatibility of modules

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

6. Special conditions for verification

6.1 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 5.2.

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 the presence of an internal jumper placed on the main board (older models) or by a calibration switch accessed through a hole in the bottom of the enclosure of the scale.

Sealing of the access to the jumper / switch is accomplished by a sticker covering one of the assembling screws of the enclosure and for the calibration switch by an additional sticker covering the hole in the bottom of the enclosure (see fig.2).

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, type designation, maxi, min, e_i and tare shall be located near the display(s).

On a label located on the side of the scale enclosure:

- Manufacturer's trademark
- type designation
- \max_i , \min , e_i
- tare
- temperature range
- model no., serial no., electrical data and other inscriptions

9. Pictures



Figure 1 T28 scale.

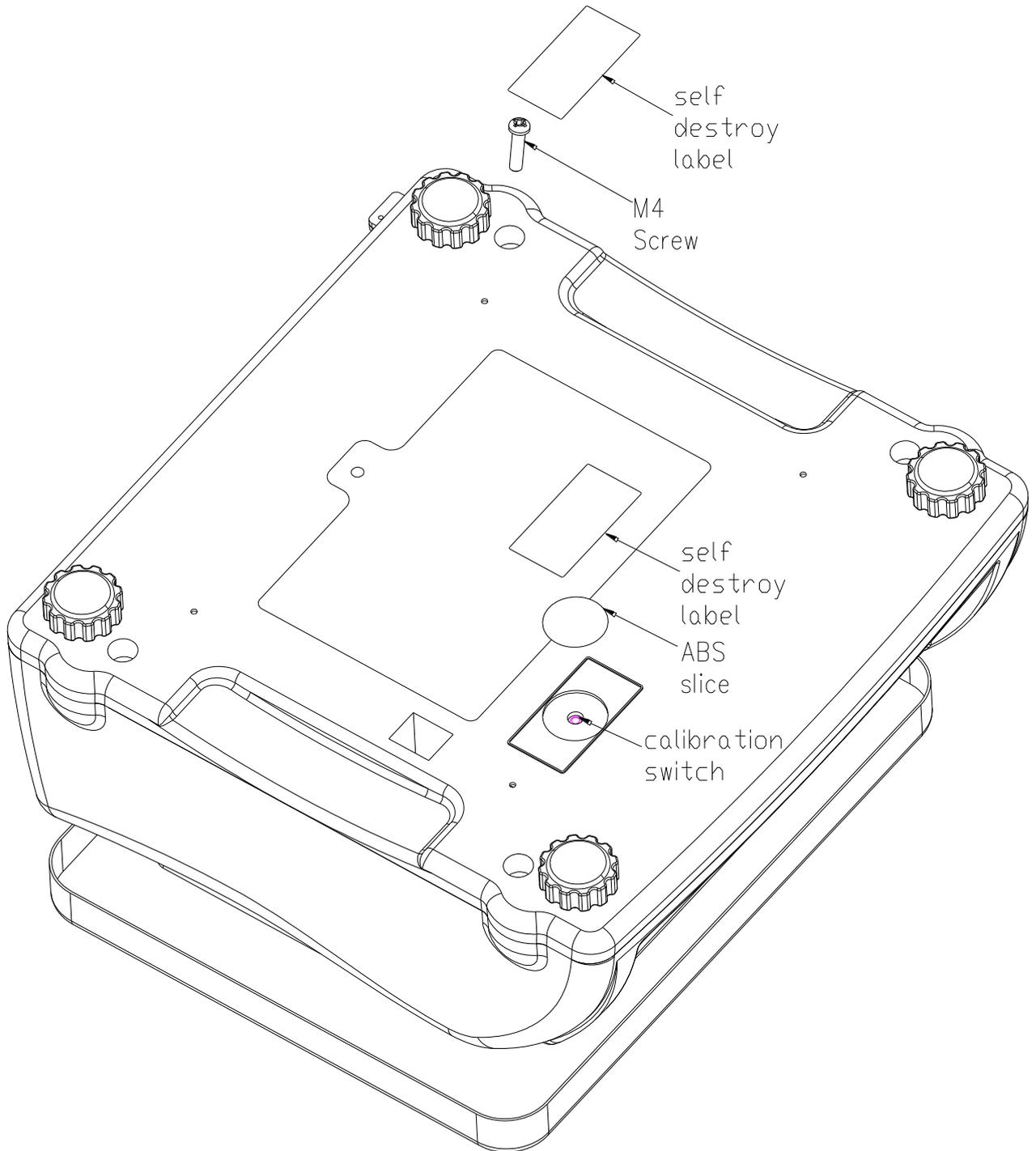


Figure 2 Sealing of T28.
(calibration switch not present on all models)