



EVALUATION CERTIFICATE

No. DK0199-R76-12.01

Instrument type RW / RWS / RWP

Test item device Non-automatic Weighing Indicator

Issued by DELTA Danish Electronics, Light & Acoustics

Issued in accordance with the requirements in WELMEC Guide 8.8:2011 "Guide on the General and Administrative Aspects of the Voluntary System of Modular Evaluation of Measuring instruments"

In accordance with EN 45501:1992/AC:1993 and
WELMEC Guide 2.1:2001

Fractional factor (p_i) 0.5 (refer to 3.5.4 of the standard).

Issued to Tscale Electronics Mfg. (Kunshan) Co., Ltd.
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Zhoushi, Kunshan, Jiangsu
CHINA

Manufacturer Taiwan Scale Mfg. Co., Ltd.

In respect of A family of non-automatic weighing indicators tested as a module of a weighing instrument.

Characteristics Suitable as a non-automatic weighing instruments with the following characteristics:

Self indicating with	single-interval, multi-range or multi-interval
Accuracy class	III or IIII
Verification scale interval: $e =$	Max _i /n Max/n
Maximum number of verification scale intervals: $n_i =$	6000 for single-interval 3000 for multi-range and multi-interval
Minimum input voltage per VSI:	1 μ V

The essential characteristics are described in the annex.

Description and documentation The A/D device is described and documented in the annex to this certificate.

Remarks Summary of tests involved: See test report no. DANAK-1911334.

The annex comprises 5 pages.

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1. Name and type of instrument

The indicators RW / RWS / RWP are a family of weighing indicators suitable to be incorporated in a non-automatic weighing instruments, class III or class IIII, single-interval, multi-range or multi-interval.

2. Description of the construction and function

2.1 Construction

Enclosures and keyboard

The indicators are housed in an enclosure made of either ABS plastic (model RW / RWP) or stainless steel (Model RWS).

The front panels of the indicator comprise of

- LCD display with backlight having appropriate state indicators and 6 digits (22 mm high)
- a keyboard containing 5 keys used to enter commands or data into the weight indicator, plus a key for turning the indicator on/off. Each key is identified with a name and/or pictograph.

Electronics

The instruments use a single printed circuit board, which contains all of the instrument circuitry. The metrological circuitry for the models of weight indicator is identical.

All instrument calibration and metrological setup data are contained in non-volatile memory. The power supply accepts an input voltage of 9 - 12 VDC from the external power adapter, with input from 230 VAC 50 Hz. The indicator produces a load cell excitation voltage of 5 VDC.

Software

The software version is displayed during the start-up of the indicator.

The tested software version is 1.00.

Sealing

The configuration and calibration data can only be changed if the calibration jumper is installed on the circuit board.

Sealing of the cover of the enclosure - to prevent access to the calibration jumper and to secure the electronics against dismantling/adjustment - is accomplished with a brittle plastic sticker. The sticker is placed so access to one of the screws of the enclosure is prohibited

2.2 Function

The devices are a microprocessor based electronic weighing indicators for connection of strain gauge load cells.

List of devices:

- Self test
- Determination and indication of stable equilibrium
- Initial zero-setting $\pm 10\%$ of Max
- Semi-automatic zero-setting $\pm 2\%$ of Max
- Automatic zero-tracking $\pm 2\%$ of Max

- Indication of zero
- Semi-automatic subtractive tare
- Acting upon significant fault
- Weighing unstable samples
- Check weighing
- Totalisation

3. Technical data

3.1 Indicator

Type	RW / RWS / RWP
Accuracy class	III or IIII
Weighing range	Single-interval, multi-range (2 ranges), or multi-interval (2 intervals)
Number of verification scale intervals (n):	≤ 6000 for class III single-interval, ≤ 3000 for class III multi-range and multi-interval ≤ 1000 for class IIII
Minimum input voltage per VSI	1 μV
Maximum capacity of interval (Max _i):	$n_i \times e_i$
Verification scale interval, e =	Max / n
Initial zero-setting range:	± 10 % of Max
Maximum tare effect:	100 % of Max
Fractional factor (pi)	0.5
Excitation voltage	5 VDC
Circuit for remote sense	present on the model with 7-terminal connector
Minimum input impedance	350 ohm
Maximum input impedance	1200 ohm
Connecting cable to load cell(s):	See Section 3.1.1
Supply voltage:	9 - 12 VDC / 230 VAC, 50 Hz using external adapter
Operating temperature range	Min / Max = -10 °C / +40 °C
Peripheral interface(s)	See Section 4

3.1.1 Connecting cable between the indicator and the junction box for load cell(s), if any

3.1.1.1 4-wire system

Line	4 wires, 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

Line	6 wires, shielded
Maximum length	4 m/mm ²
Maximum resistance per wire	0.1 ohm

4. Interfaces

4.1 Load cell interface

Refer to section 3.1.1.

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

- There is a respective test certificate (EN 45501) or an OIML Certificate of Conformity (R60) issued for the load cell by a Notified Body responsible for type examination under the Directive 2009/23/EC.
- 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, section 11), and any particular installation requirements. A load cell marked NH is allowed only if humidity testing to EN 45501 has been performed.
- 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.
- The load transmission must conform to one of the examples shown in the WELMEC 2.4 Guide for load cells.

4.2 Peripheral interfaces

The indicator may be equipped with one or more of the following protective interfaces that have not to be secured.

- RS-232C

The peripheral interfaces are characterised "Protective interfaces" according to paragraph 8.4 in the Directive.

5. Conditions for use

Legal use of the indicator for automatic weighing is not allowed with reference to this evaluation certificate.

A totalised weight is not a legal value.

6. Location of seals and inscriptions

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. The seals shall be placed as shown in EC type-approval certificate DK0199.284.

Location of CE mark of conformity:

The CE mark of conformity is placed on the overlay on the rear side of the device.

Inscription on the overlay:

Type, accuracy class, Temp. -10 °C / +40 °C (optional), Evaluation Certificate No. DK0199-R76-12.01 (optional).

Other inscriptions on the overlay:

Manufacturer's name and/or logo, Part No, Supply voltage.

7. Tests

The indicator has been tested according to EN 45501 and WELMEC 2.1 Guide for testing of indicators.

Examination / tests

Temperature tests: 20 / 40 / -10 / 5 / 20 (tested at minimum input-voltage sensitivity)
Temperature effect on no-load indication (tested at minimum input-voltage sensitivity)
Stability of equilibrium
Repeatability
Warm-up time
Voltage variations
Short time power reductions
Electrical bursts
Electrostatic discharges
Immunity to radiated electromagnetic fields
Damp heat, steady state
Span stability
Checklist
Maximum load cell cable length and impedance of cable to load cell
Load cell interface measurements with interruptions of the sense circuit

The test item fulfilled the maximum permissible errors at all tests.

8. Documentation

Contents of the technical documentation held by the notified body:

8.1 Product specification

- Manuals and descriptions
- Drawings
- Electronic schematics
- PCB layout

8.2 Examination report

OIML R76 report no. DANAK-1911334.

8.3 Test results

Report no. DANAK-1911334.