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TEST CERTIFICATE

No. DK0199-R76-09.01

Instrument type BWS / VW / CW / KW

Test item device Non-automatic Weighing Indicator

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

In accordance with Paragraph 8.1 of the European Standard on metrological aspects of non-automatic weighing instruments EN 45501:1992.

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

Issued to Taiwan Scale Mfg. Co., Ltd.
282, Sec. 3, Hoping W. Road
Taipei
TAIWAN

Manufacturer Taiwan Scale Mfg. Co., Ltd.

In respect of A family of 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	single-interval
Accuracy class	III	III
Verification scale interval: $e =$	Max_i/n	Max/n
Maximum number of verification scale intervals: $n =$	6,000	1,000
Minimum input voltage per VSI:	1 μV	1 μV

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-1910388 and NMI 709226.

This test certificate cannot be quoted in an EU type approval certificate without permission from the holder of the certificate mentioned above.

The annex comprises 5 pages.

Issued on 2009-01-17

Signatory: J. Hovgård

DELTA
Danish Electronics,
Light & Acoustics

Venlighedsvej 4
2970 Hørsholm
Denmark

Tel. (+45) 72 19 40 00
Fax (+45) 72 19 40 01
www.delta.dk

VAT No. DK 12275110



1. Name and type of instrument

The indicators BWS / VW / CW / KW are a family of weighing indicators suitable to be incorporated in a non-automatic weighing instruments, class III or class IIII, single-interval.

2. Description of the construction and function

2.1 Construction

The electronic indicator consists of a single circuit board, SMD populated on both sides as the A/D-interface circuits, the microprocessor and the voltage regulation are placed on one side and the LCD display on the other side.

The LCD-display has indication for: stable, zero, gross, net, tare, and weight unit (kg, g, t), and on model BWS, VW and CW are 5½ digits with a height of 52 mm, while model KW has 6 digits with a height of 24 mm.

The enclosure is made of stainless steel for the BWS indicator or of ABS plastics for the VW, CW and KW indicators.

The front of the enclosure has an on/off key plus 6 keys for operating the functions of the indicator.

All instrument calibration and metrological setup data are stored in the non-volatile memory.

The indicators are power supplied with 9 VDC - normally supplied by external 230 VAC to 9 VDC adapter. An optional internal battery can be factory installed.

As part of the indicators EMC protection ferrites shall be placed as follows:

- Externally around the DC supply cable near its connection to the indicator (min. 1 turn).
- Internal on cable between power plug and main board (4 turns).
- Internal on cable between load cell connector and main board (min. 2 turns).

Software

The software version is displayed during the start-up of the indicator. The tested software version is 1.07 for BWS, VW and CW indicators, and 1.02 for the KW indicator.

Sealing

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

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
- Real time clock (optional)

3. Technical data

3.1 Indicator

Type	BWS / VW / CW / KW
Accuracy class	III or IIII
Weighing range	Single-interval
Maximum number of verification scale intervals (n)	6000 for class III 1,000 for class IIII
Minimum input voltage per VSI	1 μ V
Maximum capacity of interval (Maxi):	$n \times e$
Verification scale interval, e =	Max / n
Initial zero-setting range:	$\pm 10\%$ of Max
Maximum tare effect:	100 % of Max
Fractional factor (pi)	0.5
Excitation voltage	5 VDC
Circuit for remote sense	Active, (see below)
Minimum input impedance	100 ohm
Maximum input impedance	1000 ohm
Connecting cable to load cell(s):	See Section 3.1.1
Supply voltage:	9 VDC
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	283 m/mm ²
Maximum resistance per wire	3.8 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 90/384/EEC.
- 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 4, 2004, 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
- Analogue output (0 - 10 V / 4 - 20 mA)
- Digital output
- Blue Tooth

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 or as counting device is not allowed with reference to this test certificate.

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 90/384/EEC. The seals shall be placed as shown in type-approval certificate DK0199.165.

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, Certificate No. DK0199-R76-09.01.

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
- Etc.

8.2 Examination report

OIML R76 report no. DANAK-1910388 and NMi 709226.

8.3 Test results

Report no. DANAK-1910388 and NMI 709226.

