

TEST CERTIFICATE

No. **DK0199-R76-05.09**

Instrument type: **MEB & TEB non-automatic weighing indicators**

Test item device: Indicator

Issued by: DELTA Danish Electronics, Light & Acoustics
EU - Notified Body No. 0199
address: Venlighedsvej 4, DK-2970 Hørsholm, Denmark

In accordance with: Paragraph 8.1 of the European Standard EN 45501:1992
WELMEC Guide 2.1

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

Issued to **Tüm Elektronik Mühendislik San. Tic. Ltd. Sti.**

Address: Serif Ali Ciftligi Burhan Sk. No:56, 34775 Y.Dudullu / Ümraniye / Istanbul, TURKEY

Manufacturer: Tüm Elektronik Mühendislik San. Tic. Ltd. Sti.

In respect of: The model of an Indicator, tested as a module of a weighing instrument.

Characteristics: Suitable for a non-automatic weighing instrument with the following characteristics:

Self indicating with Single-interval, Multi-range

Accuracy class	III	IIII	
Maximum capacity	$n * e$	$n * e$	[count]
Verification scale interval, $e =$	Maxi / n	Maxi / n	[count]
$n_{max} =$	3000	1000	[count]
Minimum input-voltage per VSI:	0.65	0.65	[μV]

The essential characteristics are described in the annex.

Description and documentation The Indicator is described and documented in the annex to this certificate.

Remarks: Summary of tests involved: Test report no. DANAK-199788
This test certificate cannot be quoted in an EU type approval certificate without permission of the holder of the certificate mentioned above.

The ANNEX comprises 5 pages

Issued on **2005-12-21**

Signatory


Jens Hovgård



1 NAME AND TYPE OF INSTRUMENT

The Indicator is designated MEB & TEB non-automatic weighing indicators suitable to be incorporated in a non-automatic weighing instrument.
Class III, Single-interval, Multi-range.

2 DESCRIPTION OF THE CONSTRUCTION AND FUNCTION

2.1 Construction

The instrument consists briefly of a main circuit board with data transmission.
Further, see the EU type-approval certificate no. DK0199.77

The instrument has the following devices,

- Initial zero-setting
- Semi-automatic zero-setting
- Automatic zero-tracking
- Semi-automatic subtractive tare
- Net / Gross indication
- Time and data option
- Totalizing device
- Gravity acceleration compensation device
- Battery operation

2.2 Function

The device is a microprocessor based electronic indicator / scale for external connection of strain gauge load cells. The weight information appears in the digital display on the front panel, and may be transmitted to connected equipment. The interface for connection of load cells has been tested and examined thoroughly. The maximum length and resistance of the connecting cable between the test item and a junction box for load cell(s) has been determined by testing and evaluation. The result appears from Summary of results. Evaluation of the software is not included in this type examination.

Setting devices:

Zero-setting devices:	Semi-automatic,	Initial zero-setting	range: 20 % Max
Tare device(s):	Subtractive tare,	Tare range:	100 [% of Max]

3 TECHNICAL DATA

3.1 Indicator

Manufacturer:	Tüm Elektronik Mühendislik San. Tic. Ltd. Sti.		
Type:	MEB & TEB non-automatic weighing indicators		
Accuracy class:	III	&	IIII
Maximum number of VSI's (n_{max}):	3000		1000
Minimum input-voltage per VSI (Δ_{min}):	0.65 [μ V]		0.65 [μ V]
Weighing range:	Single-interval, Multi-range		
Number (i) of Intervals / ranges specified:	2		
Maximum capacity of partial ranges (Maxi):	$n * e$		[count]
Verification scale interval, $e =$	Maxi / n		[count]
Internal resolution:			
Initial zero-setting:	20 [% of Max]		
Maximum tare effect:	100 [% of Max]		
Fractional factor (p_i):	0.5		
Minimum dead load (D_{min}):	0 [mV]		
Maximum input range:	20 [mV]		
Excitation voltage:	5 [Vdc]		
Circuit for remote sense:	Active (see below)		
Minimum input-impedance:	87 [ohm]		
Nominal input-impedance:	350 [ohm]		
Maximum input-impedance:	1200 [ohm]		
Load cell linearizing feature:	None		
Connecting cable to load cell(s):	See 3.3.1		
Operating temperature range:	Min / Max = -10 °C / 40 [°C]		
Temperature effect on no-load confirmed:	-11.6 [ppm/K]	range:	-10 / 39.1 [°C]
Temperature effect on span confirmed:	0.7 [ppm/K]	range:	-10 / 39.1 [°C]
Peripheral Interface(s):	See section 4		
AC power supply:	230 [Vac]	External supply	
DC power supply:	7.5 [Vdc]		

3.1.1 Connecting cable between the indicator and the junction box for load cells, if any

3.1.1.1 4-wire system

Maximum length	The certified cable length for the load cell.
Line	4 wires, shielded

3.1.1.2 6-wire system

Line	6 wires, shielded
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Option 1:

Maximum length	3273 [m/mm ²]
Maximum resistance per wire	55.3 [ohm]

In case the actual (n) for the weighing instrument is less than (n_{max}), the following apply:

Option 2:

Coefficient of temperature of the span error of the indicator:	Es =	0.0009	[% / 25K]
Coefficient of resistance for the wires in the J-box cable:	Sx =	0.0022	[% / ohm]

$$(L/A)_{max} = 295.86 / Sx * (emp / n - Es) [m / mm^2] \text{ in which } emp = p_i * mpe * 100 / e$$

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: WELMEC 2.1, annex 5.

The calculation program is obtainable by downloading at www.delta.dk/weighing.

4 INTERFACES

4.1 Load cell interface

Refer section 3.1.1.

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

- 1) There is a respective OIML Certificate of Conformity (R60) or a test certificate (EN 45501) issued for the load cell by a Notified Body responsible for type examination under the Directive 90/384/EEC.
- 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, paragraph 11), and any particular installation requirements).
- 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.

4.2 Peripheral interfaces

1: RS232C

Security:
protective

Connected cable:
Shielded

5 CONDITIONS FOR USE

None

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.

Location of CE mark of conformity:

A sticker with CE mark of conformity and year of production is located on the back of the enclosure

Inscriptions on the overlay:

Certificate No., Accuracy class, Model Name, Serial No., Max(i), Min, and e(i)

Other inscriptions on the overlay:

Other inscriptions:

7 TESTS

The Indicator type MEB & TEB non-automatic weighing indicators has been tested according to EN 45501 and WELMEC 2.1 Guide for testing of indicators.

Tests and Examinations		
	Input impedance:	High Low
Temperature tests: 21/39/-10/6/21 (tested at minimum input-voltage sensitivity)	X	X
Temperature effect on no-load indication		X
Temperature effect on span	X	X
Repeatability		X
Tare		X
Warm-up time		X
Voltage variations		X
Short time power reductions	X	
Electrical bursts	X	
Electrostatic discharges	X	
Immunity to radiated electromagnetic fields	X	
Damp heat, steady state		X
Span stability		X
Examination of the construction		
Checklist		
Maximum length and impedance of cable to the junction box for load cell(s), if any	X	X
Load cell interface measurements with interruptions of the sense circuit	X	X

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

8 DOCUMENTATION

Contents of the technical documentation held by the notified body:

8.1 Product specification
- description
- drawings
etc.

8.2 Examination report

OIML R76 report No. DANAK-199788

8.3 Test results

Report No. DANAK-199788

EMC Report no. (EMC immunity included in EN 45501 / OIML R76 report)