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EU Type Examination Certificate

No. DK 0199.558

755

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 the EU Council Directive 2014/31/EU.

Issued to **Detecto Scale Company.**
203 East Daugherty St.,
Webb City, MO 64870,
USA

In respect of Non-automatic weighing instrument designated 755 with variants of modules of load receptors, load cells and peripheral equipment.
Accuracy class III or IIII, single-interval
Maximum capacity, Max: n * e
Verification scale interval: e = Max / n
Minimum input voltage per VSI: 0.8 µV
Number of verification scale intervals: $n \leq 5000$ (Class III)
$n \leq 1000$ (Class IIII)
(however, dependent on environment and the composition of the modules).
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 45501:2015 and OIML R76:2006.

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

The annex comprises 9 pages.

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Descriptive annex

Contents

1. Name and type of instrument and modules

The weighing instrument is designated 755. It is an electronic weighing indicator connected to a separate load receptor and peripheral equipment such as printers or other devices, as appropriate. The instrument is Class III or IIII

The indicator consists of an analogue to digital conversion circuitry, microprocessor, control circuitry, non-volatile memory for storage of calibration and setup data, all contained within a single enclosure.

The modules appear from Sections 3.1, 3.2, and 3.3; the principle of the composition of the modules is set out in Sections 6.1 and 10.

2. Description of the construction and function

2.1 Construction

2.1.1 Indicator

The electronic indicator consists of an electronic board bearing the microcontroller, the analog to digital converting electronic, and the different interfaces. The board also has a non-volatile memory for storing of calibration and setup data.

The enclosure of the 755 model is made of plastic and with the possibility to be mounted on a bracket or on a top of a column attached to the load receptor.
Connectors for power supply and load cell are at the bottom and for other interfaces on the back side.

Display and keys on the indicator are on the front.

The display is a dual row 7-segment LCD type with 6 digits. There are also indications for Stable and Zero.

There are 6 keys, which are used to enter commands in operation or setup. Each key is identified with name and/or a pictograph.

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

The indicator is power supplied with 12 VDC via an external power supply with input 100-240 VAC 50/60 Hz. Alternatively, the indicator can be supplied from 7.5 VDC from a set of 12 batteries mounted in the load receptor.

2.1.2 Load receptors, load cells, and load receptor supports

Set out in Section 3.3.

2.1.3 Interfaces and peripheral equipment

Set out in Section 4.

2.2 Functions

The weight indicating instrument is a microcontroller based electronic weight indicators that require the external connection of a strain gauge load cell. The weight information appears in the digital display located on the front section and may also be transmitted to peripheral equipment for recording, processing or printing. A digital height rod can be connected for calculation of BMI.
The primary functions provided are detailed below.

2.2.1 Display range

The weight indicators will display weight from –20e to Max+9e within the limits of the display capacity.

2.2.2 Zero-setting

2.2.2.1 Initial zero-setting

If enabled the initial Zero-setting will operate within a range of 4 % of Max. Zero-setting is possible only when the load receptor is not in motion.

2.2.2.2 Zero-tracking

If enabled the zero-tracking feature operates over a range of 4 % of Max and only when the display shows zero and the load receptor is not in motion.

2.2.2.3 Semi-automatic zero-setting

Pressing the “ZERO” key causes a new zero reference to be established and turns on the ZERO indicator.

The semi-automatic zero-setting feature operates over a range of 4 % of Max and only when the load receptor is not in motion.

2.2.3 Operator information messages

The weight indicator has a number of general and diagnostic messages, which are described in detail in the user’s guide.

2.2.4 Software version

The software version can be displayed by pressing and holding the Enter key for at least two seconds.

The approved software version is r1.000.

3. Technical data

The 755 weighing instrument is composed of separate modules, which are set out as follows:

3.1 Indicator

The indicators have the following characteristics:

Type:	755
Accuracy class:	III or IIII
Weighing range	Single-interval
Maximum number of verification scale intervals (n):	5000 (Class III) or 1000 (Class IIII)
Minimum input voltage per VSI:	≥0.8 µV
Maximum capacity of interval or range (Max):	n × e
Verification scale interval, e_i =	Max/n
Initial zero-setting range:	4 % of Max
Fractional factor (pi):	0.5
Excitation voltage:	5 VDC
Minimum input impedance:	350 Ohm
Maximum input impedance:	1100 Ohm
Connecting cable to load cell(s):	See Section 3.1.1
Supply voltage:	10 VDC via external power supply with input 110-240 VAC 50/60 Hz
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 cells

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. (No Junction box is allowed).

3.2 Load receptors, load cells, and load receptor supports

Removable platforms shall be equipped with level indicators.

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) There is a respective Part / Evaluation / Test Certificate (EN 45501) or an OIML Certificate of Conformity (R60:2000) issued for the load cell by a Notified Body responsible for type examination under Directive 2014/31/EU.

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 2:2015), 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 EU verification or declaration of EU conformity of type.

4) The load transmission must conform to one of the examples shown in the WELMEC 2.4 Guide for load cells.

3.2.2 Platforms

Construction in brief:	Metal platform.
Reduction ratio:	1
Load cells:	Load cell according to Section 3.2.1
Drawings:	Various

3.3 Composition of modules

In case of composition of modules, EN 45501:2015 annex F shall be satisfied.

3.4 Documents

The documents filed at DELTA (reference No. T211621) are valid for the weighing instruments described here.

4. Interfaces and peripheral equipment

4.1 Interfaces

4.1.1 Load cell input

The connector terminals for load cell connection are located at the bottom of the enclosure.

4.1.2 Other interfaces

The indicator may be equipped with one of following protective interfaces located on the back of the enclosure:

- RS232
- Digital height rod
- Micro USB

The interface is characterised “Protective interfaces” according to paragraph 8.4 in the Directive and do not have to be secured.

4.2 Peripheral equipment

Connection between the indicator and peripheral equipment is allowed by a suitable cable.

The instrument may be connected to any simple peripheral device with a CE mark of conformity.

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, EN 45501:2015 annex F 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 or 4 of Directive 2014/31/EU.

7.1.1 Indicator

The indicator has Traceable Access Counters, which increment each time the calibration or configuration of the set-up has been changed.
The counters can be found by pressing and holding the Enter key for at least two seconds. After the software version has been shown, the calibration counter is shown followed by the configuration counter.

7.1.2 Indicator - load cell connector - load receptor

Securing of the indicator, load receptor, and load cell combined is done by one of the following ways:

- sealing of the load cell connector / cable by a lead wire seal

In special cases where the place of installation makes it impossible to use the above sealing:

- inserting the serial number of the load receptor as part of the principal inscriptions contained on the indicator identification label
- the load receptor bears the serial number of the indicator on its data plate.

7.1.3 Peripheral interfaces

All peripheral interfaces are “protective”; they neither allow manipulation with weighing data or legal setup, nor change of the performance of the weighing instrument in any way that would alter the legality of the weighing.

7.1.4 Printers used for legal transactions

Printers covered by this type approval and other printers according to Section 4.2, which have been subject to the conformity assessment procedure, shall not bear supplementary metrological marking in order to be used for legal transactions.

8. Location of CE mark of conformity and inscriptions

8.1 Indicator

8.1.1 CE mark

CE mark and supplementary metrological marking shall be applied to the indicator according to article 16 of Directive 2014/31/EU.

8.1.2 Inscriptions

The following information shall be found near the display:

- Max, Min, e =

The following information shall be found at the identification section:

- Manufacturer’s name or trademark, postal address of manufacturer, model no., serial no., type examination certificate no. and accuracy class.

8.1.2.1 Load receptor

On a data plate:

- Manufacturer's name, type, serial number, capacity

9. Pictures

Figure 1 755 indicator seen from front.

Figure 2 755 indicator seen from back.

10. Composition of modules – example

COMPATIBILITY OF MODULES

Ref.: WELMEC 2

Non-Automatic Weighing Instrument, single-interval.

Certificate of EU Type-Approval N°: TAC: DK0199.558

INDICATOR A/D (Module 1)		Type:	Cardinal Detecto 755		s/n E28215-0371
Accuracy class according to EN 45501 and OIML R76:			$Class_{ind}$ (I, II, III or IIII)		III
Maximum number of verification scale intervals (n_{max}):			n_{ind}		5000
Fraction of maximum permissible error (mpe):			p_1		0,5
Load cell excitation voltage:			U_{exc}	[Vdc]	5
Minimum input-voltage per verification scale interval:			Δu_{min}	[µV]	0,8
Minimum load cell impedance:			R_{Lmin}	[Ω]	350
Coefficient of temperature of the span error:			Es	[% / 25°C]	
Coefficient of resistance for the wires in the J-box cable:			Sx	[% / Ω]	
Specific J-box cable-Length to the junction box for load cells:			$(L/A)_{max}$	[m / mm²]	
Load cell interface:			4-wire (no sense)		
Additive tare, if available:			T^+	[% of Max]	0
Initial zero setting range:			IZSR	[% of Max]	-2 / 2
Temperature range:			T_{min} / T_{max}	[°C]	-10 / 40
Test report (TR), Test Certificate (TC) or OIML Certificate of Conformity:					
LOAD RECEPTOR (Module 2)		Type:			
Construction:			Platform		
Fraction of mpe:			p_2		0,5
Number of load cells:			N		1
Reduction ratio of the load transmitting device:			$R=F_M / F_L$		1
Dead load of load receptor:			DL	[% of Max]	1
Non uniform distribution of the load:	(NUD = 0 is acceptable)		NUD	[% of Max]	0
Correction factor:	$Q = 1 + (DL + T^+ + IZSR^+ + NUD) / 100$				1,03
LOAD CELL ANALOG (Module 3)		Type:	H30A		
Accuracy class according to OIML R60:			$Class_{LC}$ (A, B, C or D)		C
Maximum number of load cell intervals:			n_{LC}		3000
Fraction of mpe:			p_3		0,7
Rated output (sensitivity):			C	[mV / V]	2
Input resistance of single load cell:			R_{LC}	[Ω]	404
Minimum load cell verification interval:	$(v_{min\%} = 100 / Y)$		$v_{min\%}$	[% of Emax]	0,0133
Rated capacity:			E_{max}	[kg]	500
Minimum dead load, relative:			$(E_{min} / E_{max}) * 100$	[%]	0,0166
Temperature range:			T_{min} / T_{max}	[°C]	-10 / 40
Test report (TR) or Test Certificate (TC/OIML) as appropriate:			DK0199-R60-12.18		
COMPLETE WEIGHING INSTRUMENT			Single-interval		
Manufacturer:		Type:			
Accuracy class according to EN 45501 and OIML R76:			$Class_{WI}$ (I, II, III or IIII)		III
Fractions: $p_i = p1^2 + p2^2 + p3^2$:			p_i		1,0
Maximum capacity:			Max	[kg]	300
Number of verification scale intervals:			n		3000
Verification scale interval:			e	[kg]	0,1
Utilisation ratio of the load cell:			$\alpha = (Max / E_{max}) * (R / N)$		0,60
Input voltage (from the load cells):			$\Delta u = C * U_{exc} * \alpha * 1000 / n$	[µV/e]	2,00
Cross-section of each wire in the J-box cable:			A	[mm²]	
J-box cable-Length:			L	[m]	
Temperature range to be marked on the instrument:	Not required		T_{min} / T_{max}	[°C]	
Peripheral Equipment subject to legal control:					

Acceptance criteria for compatibility				Passed, provided no result below is < 0	
$Class_{WI}$	<=	$Class_{ind}$ & $Class_{LC}$	(WELMEC 2: 1)	$Class_{WI}$:	PASSED
pi	<=	1	(R76: 3.5.4.1)	1 - pi =	0,0
n	<=	n_{max} for the class	(R76: 3.2)	n_{max} for the class - n =	7000
n	<=	n_{ind}	(WELMEC 2: 4)	n_{ind} - n =	2000
n	<=	n_{LC}	(R76: 4.12.2)	n_{LC} - n =	0
E_{min}	<=	DL * R / N	(WELMEC 2: 6d)	(DL * R / N) - E_{min} =	2,917
$v_{min} * \sqrt{N} / R$	<=	e	(R76: 4.12.3)	e - (v_{min} * √N / R) =	0,034
or (if v^{min} is not given)				Alternative solutions: ↑ ↓	
$(E_{max} / n_{LC}) * (\sqrt{N} / R)$	<=	e	(WELMEC 2: 7)	e - ((E_{max} / n_{LC}) * (√N/ R)) =	
Δu_{min}	<=	Δu	(WELMEC 2: 8)	Δu – Δu_{min} =	1,20
R_{Lmin}	<=	R_{LC} / N	(WELMEC 2: 9)	(R_{LC} / N) - R_{Lmin} =	54
L / A	<=	$(L / A)_{max}^{WI}$	(WELMEC 2: 10)	$(L / A)_{max}^{WI}$ - (L / A) =	Not applicable
T_{range}	<=	$T_{max} - T_{min}$	(R76: 3.9.2.2)	(T_{max} - T_{min}) - T_{range} =	20
Q * Max * R / N	<=	E_{max}	(R76: 4.12.1)	E_{max} - (Q * Max * R / N) =	191,0

Signature and date:

Conclusion . . . . . PASSED

This is an authentic document made from the program: "Compatibility of NAWI-modules version 3.2".