EVALUATION CERTIFICATE

No. 0200-WL-06378 Revision 1

Object name   **TLB4**

Object type   **Weighing transmitter / indicator for an automatic gravimetric filling instrument**

Issued by   **Force Certification A/S**

Issued in accordance with the requirements in WELMEC Guide 8.8:2017 "Guide on General and Administrative Aspects of the Voluntary System of Modular Evaluation of Measuring instruments".

In accordance with   OIML R61:2017, WELMEC Guide 7.2:2018 and WELMEC Guide 8.8:2017.

Issued to   **Laumas Elettronica S.r.l.**
Via Primo Maggio, 6
43022 Montechiaruglo (PR)
Italy

Manufacturer   **Laumas Elettronica S.r.l.**

In respect of   A weighing transmitter / indicator tested as a module for an automatic gravimetric filling instrument.

Characteristics   The TLB4 transmitter / indicator have the following characteristics:

Weighing range: Single-interval or multi-interval
                        (2 or 3 intervals)
Number of VSIs: $n \leq 10,000$
Reference class, Ref(x) =   0.2
Verification scale interval (d): ≥ 0.1 g
Minimum input voltage per VSI: 0.25 μV
The essential characteristics are described in the annex.

Description and documentation   The weighing transmitter / indicator is described and documented in the annex to this this certificate.

Remarks   The conformity was established by the reports listed in the annex.

This evaluation certificate cannot be quoted in an EU type examination certificate without permission of the holder of this certificate mentioned above.

The annex comprises 12 pages.

Issued on   **2019-08-07**

FORCE Certification references:
Task no.: 118-30904.90.20 and ID no.: 0200-WL-07068   **Signatory: J. Hovgård Jensen**

FORCE Certification A/S · Park Alle 345 2605 Brøndby Tel+45 43 25 01 77 Fax +45 43 25 00 10 info@forcecertification.com www.forcecertification.com
certification.madebydelta.com/weighing

Descriptive annex

1. Introduction

The weighing transmitter / indicator device is designated the TLB4. It is designed to be used in conjunction with a material feed device, a weighing unit with appropriate discharge devices and a digital weighing controller to form an Automatic Gravimetric Filling Instrument.

The name of the instrument may be followed by alphanumeric characters for technical, legal or commercial characterization of the instrument.

The indicators consist of analogue to digital conversion circuitry, microprocessor control circuitry, power supply, keyboard, non-volatile memory for storage of calibration and setup data, and a weight display contained within a single enclosure.

2. Description

2.1 Construction

The TLB4 transmitter / indicator is supplied in an ABS enclosure for DIN rail mounting.

The TLB4 transmitter / indicator is specified in Section 3.1.

2.2 Devices

The TLB4 is provided with the following primary functions,

· Self-test function
· Initial zero-setting – within 20 % of Max
· Semi-automatic zero-setting – within 4 % of Max
· Zero-tracking – within 4 % of Max
· Semi-automatic tare – up to 100 % of Max
· Preset tare – up to 100 % of Max
· Extended resolution
· Gravity compensation
· Data storage device - Alibi memory (optional)

Event counter
The TLB4 weight transmitter / indicator has a non-resettable Event counter, which increments each time the configuration is changed or a calibration is performed.

Software version
The software version is displayed during the start-up of the indicator.
The version format is rx.yy.zz, where x is the legal version no., while yy and zz are major and minor version numbers for changes and corrections not influencing the legal function of the software.
The approved software version is r1.yy.zz.

The software fulfil WELMEC Guide 7.2:2018 for instrument type P, risk class B, with extension L, T & D.

FORCE Certification A/S · Park Alle 345 2605 Brøndby Tel+45 43 25 01 77 Fax +45 43 25 00 10 info@forcecertification.com www.forcecertification.com/ certification.madebydelta.com/weighing

Annex page 1 of 12

3. Technical data

3.1 Weighing transmitter /

Type:	TLB4
Reference class:	Ref(0.2)
Weighing range:	Single-interval or multi-interval ($\leq$ 3 intervals)
Weighing mode:	Static
Maximum capacity (Max_i):	$= n_i \times e_i$
Minimum fill (MinFil):	See tables in section 3.2
Excitation voltage:	5 VDC
Maximum number of Verification Scale Intervals (n):	$\leq$ 10000 per interval
Verification scale interval (e):	$\geq$ 0.1 g
Minimum input voltage per VSI:	0.25 µV
Maximum subtractive tare effect:	$\leq$ -Max
Fractional factor (p_i):	0.5
Number of load cell input channels:	4
Extra warm-up time:	22 minutes
Maximum time between aut. zero-setting:	109 minutes
Minimum input impedance per channel:	175 ohm, when all channels are in use
Minimum input impedance of all connected: load cells collectively for all channels:	43 ohm
Maximum input impedance per channel:	1100 ohm
Connecting cable to load cell(s):	6-wire
Electromagnetic class:	E2
Humidity:	Non-condensing
Supply voltage:	12 - 24 VDC (not to be supplied from DC Mains)
Operating temperature range:	-10 °C / +40 °C
Maximum cable length between TLB4 and junction box for load cells:	1926 m/mm^2
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 cable length of the load cell shall be connected directly to the transmitter/indicator.

FORCE Certification A/S · Park Alle 345 2605 Brøndby Tel+45 43 25 01 77 Fax +45 43 25 00 10 info@forcecertification.com www.forcecertification.com/
certification.madebydelta.com/weighing

Annex page 2 of 12

3.1.1.2 6-wire system

Line: 6 wires, screened

Option 1:

Maximum length: 1926 m/mm² (for n = 10,000)
Maximum resistance per wire: 32.6 ohm

In case the (n) for the weighing instrument is less than (n) mentioned above, the following apply:

Option 2:

Coefficient of temperature of the span error of the indicator: Es = 0.0016 [%/25K]
Coefficient of resistance for the wires in the J-box cable: Sx = 0.0009 [%/ohm]

L/A_{max} = 295.86 / Sx * (emp/n - Es) [m/mm²] 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.

3.2 Minimum filling (MinFill)

Minimum values of MinFill.

d-	X(0.2)		X(0.5)		X(1)		X(2)	
[g]	d	[kg]	d	[g]	d	[g]	d	[g]
0.1	80	0.008	32	0.0032	16	0.0016	8	0.0008
0.2	80	0.016	32	0.0064	16	0.0032	8	0.0016
0.5	80	0.040	32	0.0160	16	0.0080	8	0.0040
1	160	0.160	32	0.032	16	0.016	8	0.008
2	240	0.480	64	0.128	16	0.032	8	0.016
5	480	2.400	96	0.480	32	0.160	8	0.040
10	480	4.80	192	1.92	48	0.48	16	0.16
20	480	9.60	192	3.84	96	1.92	24	0.48
50	719	35.95	192	9.60	96	4.80	48	2.40
100	719	71.9	288	28.8	96	9.6	48	4.8
200	719	143.8	288	57.6	144	28.8	48	9.6
≥500	719	-	288	-	144	-	72	-

FORCE Certification A/S · Park Alle 345 2605 Brøndby Tel+45 43 25 01 77 Fax +45 43 25 00 10 info@forcecertification.com www.forcecertification.com/
certification.madebydelta.com/weighing

Annex page 3 of 12

4. Interfaces

4.1 Load cell interface

The connectors for the four channels of load cell connection are located on top and bottom of the indicator, when it is mounted on a DIN rail.

4.2 Peripheral interfaces

The indicator may be equipped with one or more of the following protective interfaces,

- RS485

- Digital input/output

- Analog output (optional)

- CANopen (optional)

- CC-Link (optional)

- DeviceNet (optional)

- EherCAT (optional)

- Ethernet TCP/IP (optional)

- Ethernet IP (optional)

- MODBUS/TCP (optional)

- PowerLink (optional)

- Profibus (optional)

- Profinet I/O (optional)

- SERCOS III (optional)

5. Approval conditions

5.1 Compatibility of modules

In case of composition of modules OIML R76-1:2006/EN45501:2015 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 5.1.

FORCE Certification A/S · Park Alle 345 2605 Brøndby Tel+45 43 25 01 77 Fax +45 43 25 00 10 info@forcecertification.com www.forcecertification.com/
certification.madebydelta.com/weighing

Annex page 4 of 12

7. Securing and sealing of TLB4 transmitter / indicator

7.1 Securing and sealing

Seals shall bear the mark of the manufacturer or alternative the verification mark of a notified body according to ANNEX II module D or F of Directive 2014/31/EU.

7.1.1 TLB4 transmitter / indicator

Access to the configuration and calibration facility requires either that a calibration jumper is installed on the underside of the main board, or that the operator types first a password and the key looked up on a special key card delivered by the manufacturer, or via a fieldbus interface.

The transmitter / indicator has also a non-resettable event counter, which increment each time the configuration is changed.

Sealing of the cover of the indicator - to prevent access to the calibration jumper and to secure the electronics against dismantling/adjustment - is accomplished by a sticker across the enclosure assembly.

7.1.2 Weight transmitter / indicator - load cell connector - load receptor

Sealing of the connection between the TLB4 weighing transmitter / indicator and the load receptor and load cell(s) is accomplished by sealing the connector(s) with brittle plastic sticker(s) or with wire and seal.

In the rare cases where this is not possible the connection can be secured in one of the following ways:

- Inserting the serial number of the load receptor as part of the principal inscriptions contained on the TLB4 weighing transmitter / indicator identification label.

- The load receptor bears the serial number of the TLB4 weighing transmitter / indicator on its data plate.

7.1.3 Junction box for load cells

A junction box for load cells shall be sealed against opening with wire and seal or brittle plastic sticker(s).

8. Documentation

Test report
DANAK-1915857, dated 13 November 2015, 37 pages.
DANAK-1915050, dated 31 March 2015, 77 pages.
118-35804.10, dated 15 May 2019, 69 pages.
119-30904.10, dated 5 August 2019, 51 pages

Technical file
Contents of the technical documentation held by the notified body in technical file T207885 and 118-35804.

FORCE Certification A/S · Park Alle 345 2605 Brøndby Tel+45 43 25 01 77 Fax +45 43 25 00 10 info@forcecertification.com www.forcecertification.com/ certification.madebydelta.com/weighing

Annex page 5 of 12

9. Pictures

Figure 1 TLB4 indicator

Figure 2 TLB4 indicator – sub model TLB4 CANopen

Figure 3 TLB4 indicator – sub model TLB4 CC-Link.

Figure 4 TLB4 indicator – sub model TLB4 DeviceNet.

FORCE Certification A/S · Park Alle 345 2605 Brøndby Tel+45 43 25 01 77 Fax +45 43 25 00 10 info@forcecertification.com www.forcecertification.com/
certification.madebydelta.com/weighing

Annex page 7 of 12

Figure 5 TLB4 indicator – sub model TLB4 EtherCAT.

Figure 6 TLB4 indicator – sub model TLB4 EthernetTCP/IP

FORCE Certification A/S · Park Alle 345 2605 Brøndby Tel+45 43 25 01 77 Fax +45 43 25 00 10 info@forcecertification.com www.forcecertification.com/ certification.madebydelta.com/weighing

Annex page 8 of 12

Figure 7 TLB4 indicator – sub model TLB4 EtherNet/IP

Figure 8 TLB4 indicator – sub model TLB4 MODBUS/TCP

FORCE Certification A/S · Park Alle 345 2605 Brøndby Tel+45 43 25 01 77 Fax +45 43 25 00 10 info@forcecertification.com www.forcecertification.com/
certification.madebydelta.com/weighing

Annex page 9 of 12

Figure 9 TLB4 indicator – sub model TLB4 POWERLINK

Figure 10 TLB4 indicator – sub model TLB4 PROFIBUS

FORCE Certification A/S · Park Alle 345 2605 Brøndby Tel+45 43 25 01 77 Fax +45 43 25 00 10 info@forcecertification.com www.forcecertification.com/
certification.madebydelta.com/weighing

Annex page 10 of 12

Figure 11 TLB4 indicator – sub model TLB4 PROFINET IO

Figure 12 TLB4 indicator – sub model TLB4 RS485

FORCE Certification A/S · Park Alle 345 2605 Brøndby Tel+45 43 25 01 77 Fax +45 43 25 00 10 info@forcecertification.com www.forcecertification.com/ certification.madebydelta.com/weighing

Annex page 11 of 12

Figure 13 TLB4 indicator – sub model TLB4SERCOS III

Sealing sticker

Figure 14 Sealing of TLB4 indicator.