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EVALUATION CERTIFICATE

No. DK0199-R61-14.12

Object name	**BX13**
Object type	**A weighing controller/indicator for automatic gravimetric filling instruments**
Issued by	**DELTA Danish Electronics, Light & Acoustics**

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

In accordance with	OIML R61:2004, OIML D11:2004 section 12 and 13 applying severity level 3 WELMEC Guide 2.8:2012 WELMEC Guide 7.2:2011 WELMEC Guide 8.8:2008.
Issued to	**BAYKON Endüstriyel Kontrol Sistemleri San ve Tic A.S.** Tuzla Kimya Sanayicileri Organize Sanayi Bolgesi Organik Cad. No:31 Tuzla, 34956 Istanbul Turkey
Manufacturer	**BAYKON Endüstriyel Kontrol Sistemleri San ve Tic A.S.**
Characteristics	A weighing controller/indicator for automatic gravimetric filling instruments.
Description and documentation	The weighing indicator is described and documented in the annex to this certificate.
Remarks	Summary of tests involved: see annex. This evaluation certificate cannot be quoted in an EC type examination certificate without permission of the holder of the certificate mentioned above.

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The annex comprises 10 pages.

Issued on **2015-03-04** **Signatory: J. Hovgård**

DANAK
PROD Reg. nr 7026

Descriptive annex

Contents

1. Name and type of instrument

The self-indicating electronic weighing indicator designated BX13 is a weighing controller for an automatic gravimetric filling instrument. It can be connected to a separate load receptor and peripheral equipment such as printers or other devices, as appropriate.

The name of the indicator may be followed by alphanumeric characters for technical, legal or commercial characterisation 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 of the construction and function

2.1 Construction

2.1.1 BX13 weighing indicator

The obtainable specifications for a BX13 controlled automatic gravimetric filling instrument are specified in Section 3.1.

The BX13 indicator is specified in Section 3.1.

Enclosures and keyboard

The BX13 indicator is housed in an enclosure intended for panel mount with a front of stainless steel, while the body is made of aluminium.

The front panels of the indicator comprise of

- LED display having appropriate state indicators and 6 digits
- A keyboard containing 5 keys used to enter commands or data into the weight indicator. Each key is identified with a name and/or pictograph.

Electronics

The instrument uses three printed circuit boards,

- one for microcontroller, load cell interface, power supply, and some standard I/O
- one for the remaining I/O (several versions depending on the I/O's)
- one for display and keyboard.

All instrument calibration and metrological setup data are contained in non-volatile memory.
The power supply accepts an input voltage of 12 to 28 VDC.
The indicator produces a load cell excitation voltage of 5 VDC.

2.1.2 Load cells

Requirements to connected load cell(s) are set out in Section 3.2.

2.1.3 Load receptor

Requirements to connected load receptor are set out in Section 3.3.

2.1.4 Interfaces and peripheral equipment

Set out in Section 4.

2.2 Functions

The instrument is a microcontroller based electronic weight indicator that requires the external connection of strain gauge load cell(s).

The primary functions provided are:

- Self-test function
- Initial zero-setting – within 20% of Max
- Semi-automatic zero-setting – within 4% of Max
- Automatic zero-setting – within 4% of Max
- Zero-tracking – within 4% of Max
- Automatic tare – up to 100 % of Max
- Semi-automatic tare – up to 100 % of Max
- Printing device
- Extended resolution device
- Target (preset) value device
- Course and fine feeding control device
  Gravity compensation device

Software version
The software versions of the BX13 weighing indicator are displayed at start-up.

The software version of the BX13 firmware is 2.xx, where xx is a sub-revision numbers for software changes not related to the legal functionality of the software.

3. Technical data

3.1 BX13 Automatic gravimetric filling controller

Type:	BX13
Reference class Ref(x):	0.2
Accuracy class X(x):	0.2, 0.5, 1 or 2
Loads per fill:	Single-load or cumulative multi-load
Weighing range:	Single-interval
Rated minimum fill, MinFill:	≥ the value found in the tables below
Maximum capacity (Max):	= n × d
Minimum capacity (Min):	= MinFill for single load fill < MinFill for cumulative fillers
Verification scale interval (d):	≥ 1 g
Number of Verification Scale Intervals (n):	≤ 10 000
Maximum tare effect:	≤ 100 % of Max
Temperature range:	-10° to 40° C
Weighing mode:	Static
Electromagnetic class:	E2
Humidity:	Non-condensing
Maximum time between automatic zero-setting:	90 minutes
Extra warm-up time:	Not needed
Fractional factor:	p'i = 0.5
Minimum input voltage per VSI:	0.4 µV
Excitation voltage:	5 VDC
Circuit for remote sense:	Present
Minimum input impedance:	43 ohm
Maximum input impedance:	1200 ohm
Operating temperature range:	-10 °C to +40 °C
Mains power supply:	12 - 28 VDC, not to be supplied from DC Mains

Minimum filling's (MinFill) dependency of verification scale interval (d) in g and accuracy class X(x) for weighing controller BX13 for verification scale interval d = 0.4 µV.

	Accuracy class							
d	**X(0.2)**		**X(0.5)**		**X(1)**		**X(2)**	
[g]	d	[kg]	d	[kg]	d	[kg]	d	[kg]
1	1865	1.865	373	0.373	125	0.125	32	0.032
2	1865	3.730	746	1.492	187	0.374	63	0.126
5	1865	9.325	746	3.73	373	1.865	94	0.470
10	2798	27.98	746	7.46	373	3.73	187	1.87
20	2798	55.96	1119	22.38	373	7.46	187	3.74
50	2798	139.9	1119	55.95	560	28	187	9.35
100	2798	279.8	1119	111.9	560	56	280	28
200	2798	559.6	1119	223.8	560	112	280	56
≥ 500	2798		1119		560		280	

Minimum filling's (MinFill) dependency of verification scale interval (d) in g and accuracy class X(x) for weighing controller BX13 for verification scale interval d = 1.0 µV.

d	Accuracy class							
	X(0.2)		X(0.5)		X(1)		X(2)	
[g]	d	[kg]	d	[kg]	d	[kg]	d	[kg]
1	373	0.373	50	0.050	25	0.025	13	0.013
2	745	1.490	100	0.20	25	0.050	13	0.026
5	745	3.725	298	1.49	75	0.375	25	0.125
10	745	7.45	298	2.98	149	1.49	38	0.38
20	1117	22.34	298	5.96	149	2.98	75	1.50
50	1117	55.85	447	22.35	149	7.45	75	3.75
100	1117	111.7	447	44.7	224	22.4	75	7.5
200	1117	223.4	447	89.4	224	44.8	112	22.4
≥ 500	1117		447		224		128	

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

Cable between indicator and junction box: 6 wires (sense), shielded

Maximum cable length between indicator and junction box (J-box) for load cell(s), if any:

- Option 1: 4824 m/mm²

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 = 0.0044 [% / 25K]

Coefficient of resistance for the wires in the J-box cable: Sx = 0.0002 [% / ohm]

L/Amax = 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 Load cells

3.2.1 General acceptance of load cells

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

1) A test certificate (EN 45501) or a respective OIML Certificate of Conformity (R60) is issued for the load cell by a Notified Body responsible for type examination under the Directive 2009/23/EC.

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, Issue 6, 2014), 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 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.

3.3 Load receptors

The BX13 weighing indicator may only be used with a load receptor that has a load transmission device in accordance with the standard solutions shown in WELMEC Guide 2.4:2001.

3.4 Feeding

The feeding system is gravity feeding. The feeding system has coarse and fine feeding.

3.5 Composition of modules

Composition of modules to automatic gravimetric filling instrument using BX13 shall satisfy OIML R76-1:2006 annex F.
A calculation program is obtainable by downloading at www.delta.dk/weighing.

4. Interfaces and peripheral equipment

4.1 Interfaces

The weight indicator is equipped with one or more of the following protective interfaces:

- RS232
- RS485
- Digital I/O
- Ethernet (BX13 EN only)
- Profibus (BX13 PB only)
- Profinet(BX13 PN only)
- CANopen (BX13 CO only)

The interfaces are characterised “Protective interfaces” according to Section 8.1 in the Directive 2004/22/EC annex I and do not have to be secured.

5. Approval conditions

5.1 The legal metrology parameter (par. 200) must be adjusted as 1

The parameter 200 of the instrument must be adjusted as 1 for usage of the instrument in approved applications.

5.2 Compatibility of modules

In case of composition of modules, OIML R76-1:2006 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 D or F of the Directive 2004/22/EC.

7.1.1 BX13 indicator

Access to the configuration and calibration facility requires that the calibration switch on the mainboard is in position 'ON'.

Sealing of the indicator - to prevent access to the calibration switch and to secure the electronics against dismantling/adjustment - and sealing of load cell connection are accomplished using brittle stickers (see Fig. 2).

7.1.2 Indicator - load cell connector - load receptor

Securing of the indicator, load receptor, and load cell combined is done the following way:

- Sealing of the load cell connector with the indicator using brittle stickers.

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 Junction box for load cells

Access to the junction box for analogue load cells, if any, is prevented by the use of lead wire seals or by sealing it with brittle plastic stickers.

7.1.4 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.

8. Tests performed

Tests carried out by DELTA for this evaluation certificate on Baykon's BX13 weight indicator.

Test
Temperature effect on sensitivity with minimum weighing range and input impedance of 35 / 350 Ohm (20, 40, -10, 5 and 20 °C)
Temperature effect on no-load indication with minimum weighing range and input impedance of 35 Ohm (20, 40, -10, 5 and 20 °C)
Damp heat, steady state
Repeatability
Warm-up time
Span stability
Cable length between the wight indicator and a junction box for load cells
EMC immunity tests are performed with a load cell of 350 Ohm
Voltage variations
Electrical bursts (OIML D11:2004, severity level 3)
Electrostatic discharge
Radiated electromagnetic fields
Conducted electromagnetic fields
Material testing (OIML R61:2004, accuracy class 0.2)

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

Surge is not tested as BX13 is not to be supplied from DC Mains.

The test results has been re-examined

9. Documentation

Test report
DANAK-1914027, dated 11 August 2014, 72 pages
DANAK-1914611, dated 22 October 2014, 91 pages

Technical file
Contents of the technical documentation held by the notified body in technical file T207744.

10. Pictures

Figure 1 BX13 indicator.

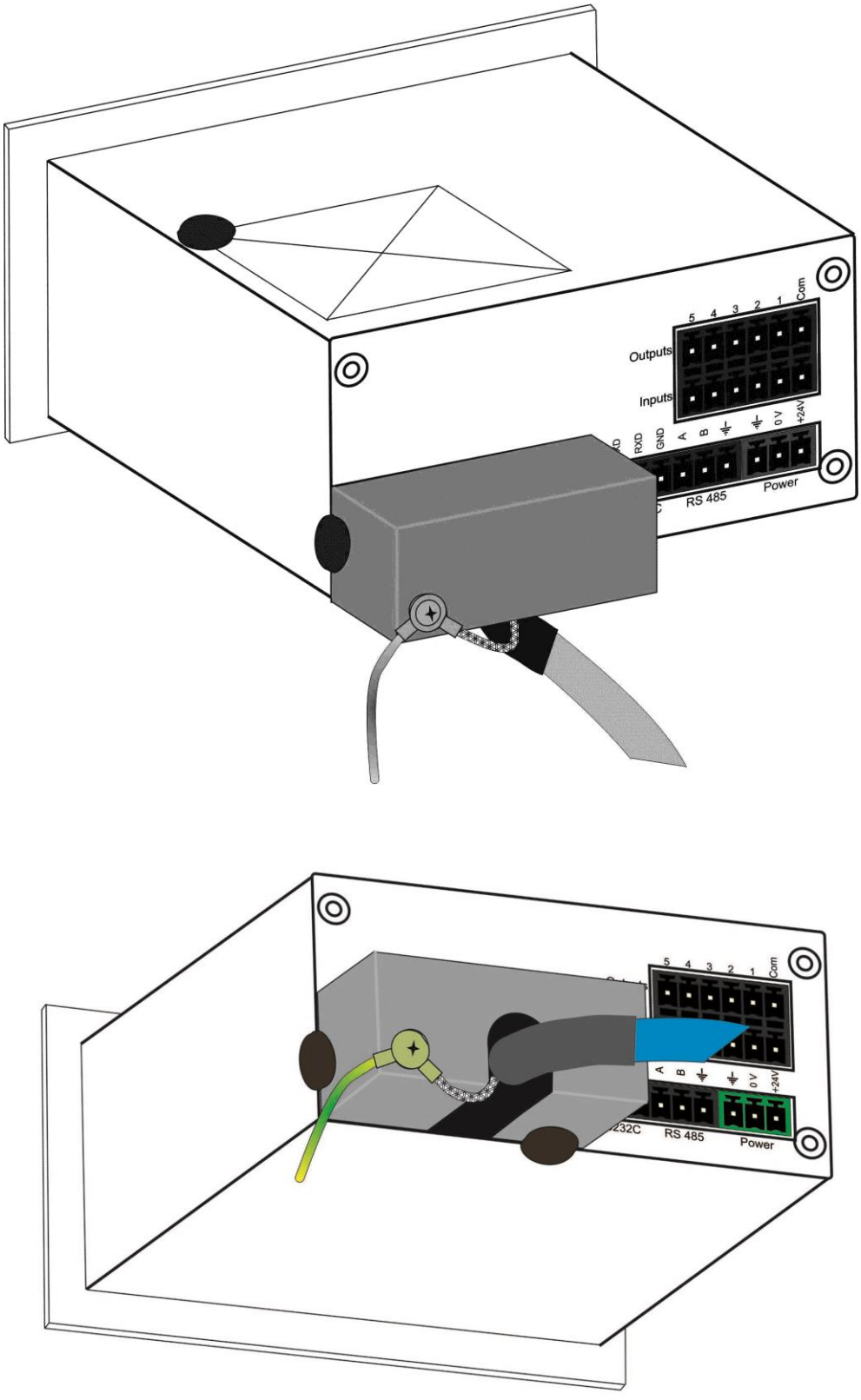

Figure 2 Sealing of BX13 indicator with brittle stickers.