

# EVALUATION CERTIFICATE

**No. 0200-WL-04850**

**Object name** BX30 Fill  
**Object type** Weighing indicator for an automatic gravimetric filling instrument  
**Issued by** Force Certification A/S

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 R61:2017, WELMEC Guide 7.2:2018 and WELMEC Guide 8.8:2017.

**Issued to** **BAYKON Endüstriyel Kontrol Sistemleri San ve Tic A.S.**  
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TURKEY

**Manufacturer** **BAYKON Endüstriyel Kontrol Sistemleri San ve Tic A.S.**

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

**Characteristics** The BX30 Fill weighing indicator has the following characteristics:  
Weighing range: Single-interval or multi-range or multi-interval  
Reference class: Ref(0.1)  
Number of VSIs:  $n \leq 10,000$   
Minimum input voltage per VSI:  $\geq 0.4 \mu V$   
The essential characteristics are described in the annex.

**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 EU type examination certificate without permission of the holder of this certificate mentioned above.

The annex comprises 7 pages.

**Issued on** **2018-12-13**

FORCE Certification references:

Task no.: 118-30741.90.30 and ID no.: 0200-WL-04850

**Signatory: J. Hovgård Jensen**

## **Descriptive annex**

### **1. Name and type of instrument**

The weighing indicator is designated BX30 Fill and suitable to be incorporated in an automatic gravimetric filling instrument, reference class Ref(0.1), with single-interval, multi-range or multi-interval.

### **2. Description of the construction and function**

#### **2.1 Construction**

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

The BX30 Fill indicator is housed in an enclosure with body made of aluminium and front made of stainless steel.

The front panels of the indicator comprise of:

- LCD display with backlight having appropriate state indicators, one line alphanumeric information digits and 6 bigger numeric digits for weight indication.
- A keyboard containing 21 keys used to enter commands or data in-to the weight indicator. Each key is identified with a name and/or pictograph.

BX30 Fill has 16 keys for entering commands and alphanumeric characters, plus arrow keys for navigating in the menu.

The BX30 Fill indicator is equipped with a display board and a main board which includes some of the interfaces and serves as motherboard for different piggyback boards such as ADC circuitry, digital load cell interface and more interfaces including the fieldbus options.

Alibi memory data is saved at a SD-card under the mainboard of the BX30 Fill. The second SD card is used to store the data, to activate some features like Modbus RTU etc.

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

#### **Sealing of the indicator**

Access to the configuration and calibration facility requires that a calibration switch is in position ON.

The switch is positioned on the main board and accessible through a hole at the rear of the indicator. This hole is sealable by a sticker.

Sealing of the indicator against opening - to prevent access to the calibration switch and to secure the electronics against dismantling/adjustment – is accomplished with either wire and seal or using brittle stickers.

## 2.2 Function.

The weight indicating instruments are microcontroller based electronic weight indicators that require the external connection of strain gauge load cell(s) or digital load cell(s). The weight information appears in the digital display located on the front panel and may be transmitted to peripheral equipment for recording, processing or displaying.

The indicator can be configured to show the weight in either g, kg, or t (metric ton).

The main functions are described below.

### 2.2.1 Functions and devices

The automatic weighing instrument has the following permitted functions and devices that are subject to the Measuring Instrument Directive:

- Power up test
- Initial zero setting device (max. 20 % of Max)
- Semiautomatic zero setting device (max 4 % of Max)
- Zero tracking device (max 4 % of Max)
- Automatic zero setting device (max 4 % of Max)
- Detection and indication of zero and of equilibrium
- Automatic subtractive tare device
- Automatic additive tare device
- Preset tare device
- Printing device
- Coarse feeding device
- Medium feeding device
- Fine feeding device
- Data storage device (alibi memory)
- Gravity compensation device
- Stop mode (for check and verification purpose)
- Detection of significant fault

### 2.2.2 Software

The software versions of the BX30 Fill weighing indicator are displayed at start-up.

The software version of the BX30 Fill is 01.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 Weighing indicator

Type:	BX30 Fill
Reference class:	Ref(0.1)
Accuracy class:	0.1 or 0.2 or 0.5 or 1 or 2
Weighing range:	Single-interval, multi-range or multi-interval
Maximum Fill (MaxFill):	= Max
Minimum Fill (MinFill):	See tables below
Maximum capacity (Max <sub>i</sub> ):	= $n_i \times d_i$
Minimum capacity (Min):	= Minfill
Maximum number of verification scale intervals (n):	10,000
Verification scale interval (d):	≥ 0.1 g
Minimum input voltage per VSI (d <sub>i</sub> ):	0.4 μV
Initial zero-setting range:	20 % of Max
Maximum subtractive tare effect:	100 % of Max
Maximum additive tare effect:	depend on compatibility of modules.
Fractional factor (p <sub>i</sub> ):	0.5
Excitation voltage:	5 VDC
Circuit for remote sense:	Active (see below)
Minimum input impedance:	43 Ohm
Maximum input impedance:	1200 Ohm
Connecting cable to load cell(s):	See Section 3.1.1
Maximum time between automatic zero-setting:	120 minutes
Minimum warm-up time:	2 minutes <sup>1)</sup>
Weighing mode:	static
Electromagnetic class:	E2
Humidity:	Non-condensing
Supply voltage:	12 - 28 VDC, not to be supplied from DC Mains
Operating temperature range:	-10 °C / +40 °C
Maximum cable length between indicator and junction box for load cells:	9840 m/mm <sup>2</sup>
Peripheral interface(s):	See Section 4

<sup>1)</sup> After power on filling shall be disabled for this time.

**Rated minimum fill (MinFill)**

Minimum filling's (MinFill) dependency of verification scale interval (d) in g and accuracy class X(x) for weighing controller BX30 Fill for verification scale interval  $d \geq 0.4 \mu\text{V}$  (and  $d < 1.0 \mu\text{V}$ ).

d	Reference accuracy class									
	X(0.1)		X(0.2)		X(0.5)		X(1)		X(2)	
	d	[kg]	d	[kg]	d	[kg]	d	[kg]	d	[kg]
0.1	190	0.0190	95	0.0095	38	0.0038	19	0.0019	10	0.0010
0.2	190	0.0380	95	0.019	38	0.0076	19	0.0038	10	0.0020
0.5	379	0.1895	95	0.0475	38	0.0190	19	0.0095	10	0.0050
1	1135	1.135	189	0.189	38	0.038	19	0.019	10	0.010
2	1135	2.270	567	1.134	76	0.152	19	0.038	10	0.020
5	1135	5.675	567	2.835	227	1.135	38	0.190	10	0.050
10	1702	17.02	567	5.67	227	2.27	114	1.14	19	0.19
20	1702	34.04	851	17.02	227	4.54	114	2.28	57	1.14
50	1702	85.10	851	42.55	341	17.05	114	5.70	57	2.85
100	1702	170.2	851	85.1	341	34.1	170	17.0	57	5.7
200	1702	340.4	851	170.2	341	68.2	170	34.0	57	17.0
$\geq 500$	1702	$1702 \times d$	851	$851 \times d$	341	$341 \times d$	170	$170 \times d$	57	$57 \times d$

Minimum filling's (MinFill) dependency of verification scale interval (d) in g and accuracy class X(x) for weighing controller BX30 Fill for verification scale interval  $d \geq 1.0 \mu\text{V}$ .

d	Reference accuracy class									
	X(0.1)		X(0.2)		X(0.5)		X(1)		X(2)	
	d	[kg]	d	[kg]	d	[kg]	d	[kg]	d	[kg]
0.1	111	0.0111	56	0.0056	22	0.0022	11	0.0011	6	0.0006
0.2	111	0.0222	56	0.0112	22	0.0044	11	0.0022	6	0.0012
0.5	222	0.1110	56	0.0280	22	0.0110	11	0.0055	6	0.0030
1	333	0.333	111	0.111	22	0.022	11	0.011	6	0.006
2	667	1.334	167	0.334	22	0.044	11	0.022	6	0.012
5	667	3.335	333	1.665	67	0.335	22	0.110	6	0.030
10	667	6.67	333	3.33	133	1.33	33	0.33	11	0.11
20	1000	20.00	333	6.66	133	2.66	67	1.34	17	0.34
50	1000	50.00	500	25.00	133	6.65	67	3.35	33	1.65
100	1000	100.0	500	50.0	200	20.0	67	6.7	33	3.3
200	1000	200.0	500	100.0	200	40.0	100	20.0	33	6.6
$\geq 500$	1000	$500 \times d$	500	$500 \times d$	200	$200 \times d$	100	$100 \times d$	51	$51 \times d$

**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**

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

Option 1:

Maximum length                      9840 m/mm<sup>2</sup>

Maximum resistance per wire      166 Ohm

In case the (n) for the weighing instrument is less than (n<sub>max</sub>) mentioned above, the following applies:

Option 2:

Coefficient of temperature of the span error of the indicator:  $E_s = 0.0036 \% / 25^{\circ}\text{K}$

Coefficient of resistance for the wires in the J-box cable:  $S_x = 0.0002 \% / \text{ohm}$

$L/A_{\text{max}} = 295.86 / S_x * (\text{emp} / n - E_s) [\text{m} / \text{mm}^2]$  in which  $\text{emp} = p_i * m_p * 100 / e$

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 2.1:2001, annex 5.

**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 an part, evaluation or test certificate (EN 45501) or respective an OIML Certificate of Conformity (R60:2000 or R60:2017) issued for the load cell by a Notified Body responsible for type examination under the Directive 2014/31/EU.
- 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 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 is equipped with the following communication and I/O interfaces,

- 2 RS-232
- RS485
- RS422
- USB
- Ethernet
- Optional: Analog and/or digital input/outputs
- Optional: Modbus RTU, Modbus TCP, CanOpen, Ethernet, EthernetIP, Profinet, Profibus, Ethercat, CClink, Powerlink, CC-Link IE
- Optional: Bluetooth or WiFi.

The peripheral interfaces are characterised “Protective interfaces” according to EU Directive 2014/32/EU annex I paragraph 8.1.

## 5. Conditions for use

The parameter related with approval, which is coded as 511, shall be selected as OIML.

## 6. Tests

The BX30 weighing indicator has been tested according to EN 45501:2015, OIML R76-1:2006, WELMEC 2.1:2001 annex 5 and OIML D11:2013 for electromagnetic class E2.

The test results have afterwards been re-examined against the requirements in MID - Directive 2014/32/EU Annex I and Annex VIII (MI-006) chapter 1 and 3, and OIML R61:2017. The software has been examined against the requirements in WELMEC Guide 7.2:2018.

The tested BX30 Fill has the following software version number: 1.00

### Examination / tests

Temperature tests: 20/55/-15/5/20 (tested at minimum input-voltage sensitivity)
Temperature effect on no-load indication
Temperature effect on span
Repeatability
Tare
Warm-up time
Voltage variations
Short time power reductions
Electrical bursts
Surge
Electrostatic discharges
Immunity to radiated electromagnetic fields
Immunity to conducted electromagnetic fields
Damp heat, steady state
Span stability
Examination of construction
Maximum load cell cable length and impedance of cable to load cell

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

## 7. Documentation

Contents of the technical documentation held by the notified body:

### 7.1 Product specification

- Manual
- Schematics
- PCB layout

### 7.2 Test & Examination report

OIML R76 report no. DANAK-1919104

OIML R61 report no. 118-30741-01