DANAK
PROD Reg. nr 7026

FORCE Certification

EU Type Examination Certificate

No. 0200-MID-04851

BX30 Fill

AUTOMATIC GRAVIMETRIC FILLING INSTRUMENT

Issued by **FORCE Certification**
EU - Notified Body No. 0200

In accordance with the requirements in Directive 2014/32/EU of the European Parliament and Council.

Issued to **BAYKON Endüstriyel Kontrol Sistemleri San ve Tic A.S.**
Tuzla Kimya Sanayicileri OSB
Organik Caddesi 31
Tepeören, Tuzla
34956 Istanbul
TURKEY

In respect of An automatic gravimetric filling instrument designated **BX30 Fill** with variants of modules of load receptors, load cells and peripheral equipment.
Reference class 0.1
Maximum capacity, Max = n × e
Verification scale interval: e ≥ 0.1 g
Number of verification scale intervals: n ≤ 10000 per interval/range
(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 and the specific requirements in Annex VIII (MI-006), chapter I & III of the Directive 2014/32/EU is met by the application of OIML R61:2017 and WELMEC Guide 7.2:2018.

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

The annex comprises 13 pages.

Issued on **2018-12-13**
Valid until **2028-12-13**

Jens Hovgård Jensen
2018-12-13

Digitally signed by Jens Hovgård Jensen
jhje@force.dk
Certification Manager

FORCE Certification references:
Task no.: 118-30741.90.40 and ID no.: 0200-MID-04851

Signatory: J. Hovgård Jensen

Descriptive annex

Contents

1. Name and type of instrument

The automatic weighing instrument designated BX30 Fill is an automatic gravimetric filling instrument consisting of an electronic weighing indicator connected to a separate load receptor and peripheral equipment such as printers or other devices, as appropriate.

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.

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

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

2. Description of the construction and function

2.1 Construction

2.1.1 BX30 Fill weighing indicator

The weighing indicator of the BX30 Fill gravimetric filling instrument scale is Baykon's indicator type BX30 Fill.

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 turn indicator ON/OFF and enter commands or data into the weight indicator. Each key is identified with a name and/or pictograph.

BX30 Fill has 21 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.

The module is specified in Section 3.2.

2.1.2 Load cells

Set out in Section 3.3.

2.1.3 Load receptor

Set out in Section 3.4.

2.1.4 Interfaces and peripheral equipment

Set out in Section 4.

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

The automatic weighing instruments and its modules are set out as follows:

3.1 BX30 Fill Automatic gravimetric filling instrument

Type:	BX30 Fill
Reference class:	0.1
Accuracy class:	0.1 or 0.2 or 0.5 or 1 or 2
Maximum Fill (MaxFill):	= Max
Minimum Fill (MinFill):	See tables below
Maximum capacity (Max):	= n × d
Minimum capacity (Min):	= Minfill
Verification scale interval (d):	≥ 0.1 g
Weighing range:	Single-interval / multi-range / multi-interval
Number of Verification Scale Intervals (n):	≤ 10000 per interval / range
Maximum subtractive tare:	-Max
Maximum additive tare:	depend on modular compatibility configuration
Maximum time between automatic zero-setting:	120 minutes
Extra warm-up time:	2 minutes [1)]
Temperature range:	-10° to 40° C
Weighing mode:	static
Electromagnetic class:	E2
Humidity:	Non-condensing

[1)] *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 ≥ 0.4 µV** (and d < 1.0 µV).

	Reference accuracy class									
d	**X(0.1)**		**X(0.2)**		**X(0.5)**		**X(1)**		**X(2)**	
[g]	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
≥ 500	1702	1702×d	851	851×d	341	341×d	170	170×d	57	57×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 ≥ 1.0 µV**.

	Reference accuracy class									
d	**X(0.1)**		**X(0.2)**		**X(0.5)**		**X(1)**		**X(2)**	
[g]	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
≥ 500	1000	500×d	500	500×d	200	200×d	100	100×d	51	51×d

3.2 Indicator

The indicator has the following characteristics:

Type:	BX30 Fill
Accuracy class:	III and IIII
Weighing range:	Single interval / multi-range / multi-interval
Maximum number of Verification Scale intervals:	≤ 10000 per interval/range
Fractional factor:	p'i = 0.5
Verification scale interval (d =):	≤ 0.4 µV
Excitation voltage:	5 VDC
Circuit for remote sense:	Active
Minimum input impedance:	43 ohm
Maximum input impedance:	1200 ohm
Internal resolution:	Up to 8,000,000 counts
Operating temperature range:	-10° C to +40° C
Mains power supply:	12-28 VDC, not to be supplied from DC Mains
Maximum cable length between indicator and junction box for load cells:	9840 m/mm^2
Peripheral interface:	Set out in section 4

3.3 Load cells

3.3.1 General acceptance of load cells

Any analogue 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 or R60:2017) 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 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.

3.4 Load receptors

Movable platforms shall be equipped with level indicators.

3.4.1 Platforms

Construction in brief	All-steel, aluminium, plastic, steel-reinforced concrete construction or hybrid construction of these materials. Bench, surface, pit or wall mounted.
Reduction ratio	1
Junction box	Mounted in, on or near the platform.
Load cells	Any R60 certified load cell according to section 3.3.1.
Drawings	Various.

3.4.2 Bin, tank, hopper and hanging load receptors

Construction in brief	Load cell assemblies each consisting of a load cell stand assembly to support one of the mounting feet bin, tank, conveyor or bag hanging etc.
Reduction ratio	1
Junction box	Mounted in, on or near the dead load.
Load cell	Any R60 certified load cell according to section 3.3.1.
Drawings	Various.

3.5 Composition of modules

For composition of modules EN 45501:2015 annex F shall be satisfied.

3.6 Documents

The documents filed at FORCE (reference No. 118-30741) are valid for the weighing instruments described here.

4. Interfaces and peripheral equipment

4.1 Interfaces

The interfaces are characterised “Protective interfaces” according to paragraph 8.1 in annex I of the Directive.

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.

4.2 Peripheral equipment

The instrument may be connected to any simple peripheral device with a CE mark of conformity. Connection between the indicator and peripheral equipment is allowed by screened cable.

5. Approval conditions

5.1 Compatibility of modules

For composition of modules EN 45501:2015 annex F shall be satisfied for maximum additive tare effect.

6. Special conditions for verification

6.1 Approval parameter 511 shall be set to OIML

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

6.2 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.

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, module F or D of Directive 2014/32/EU.

7.1.1 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 - and sealing of load cell connection are accomplished with either wire and seal or using brittle stickers.

7.1.2 Indicator - load cell connector - load receptor

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

- The load cell connector is positioned next to the calibration switch on the mainboard and therefore secured by the same cover using brittle stickers or by wire and 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 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.

8. Location of CE mark of conformity and inscriptions

8.1 Scale

8.1.1 CE mark

CE mark and supplementary metrological marking shall be applied to the scale according to article 20 of Directive 2014/32/EU.

8.1.2 Inscriptions

Max, Min, MinFill and d shall be located near the display(s).

On the inscription plate of the instrument:

- Manufacturer's name and/or trademark
- Postal address of manufacturer
- Type designation
- Serial number
- Product(s) designation
- Reference class
- Accuracy class
- Max, Min, MinFill, d =
- Temperature range: -10 / +40 °C (optional)
- Electromagnetic class: E2
- Humidity: Non-condensing
- EU type examination certificate number
- Supply voltage
- Pneumatic/hydraulic pressure
- Maximum additive tare
- Maximum subtractive tare

9. Pictures

Figure 1 BX30 Fill indicator.

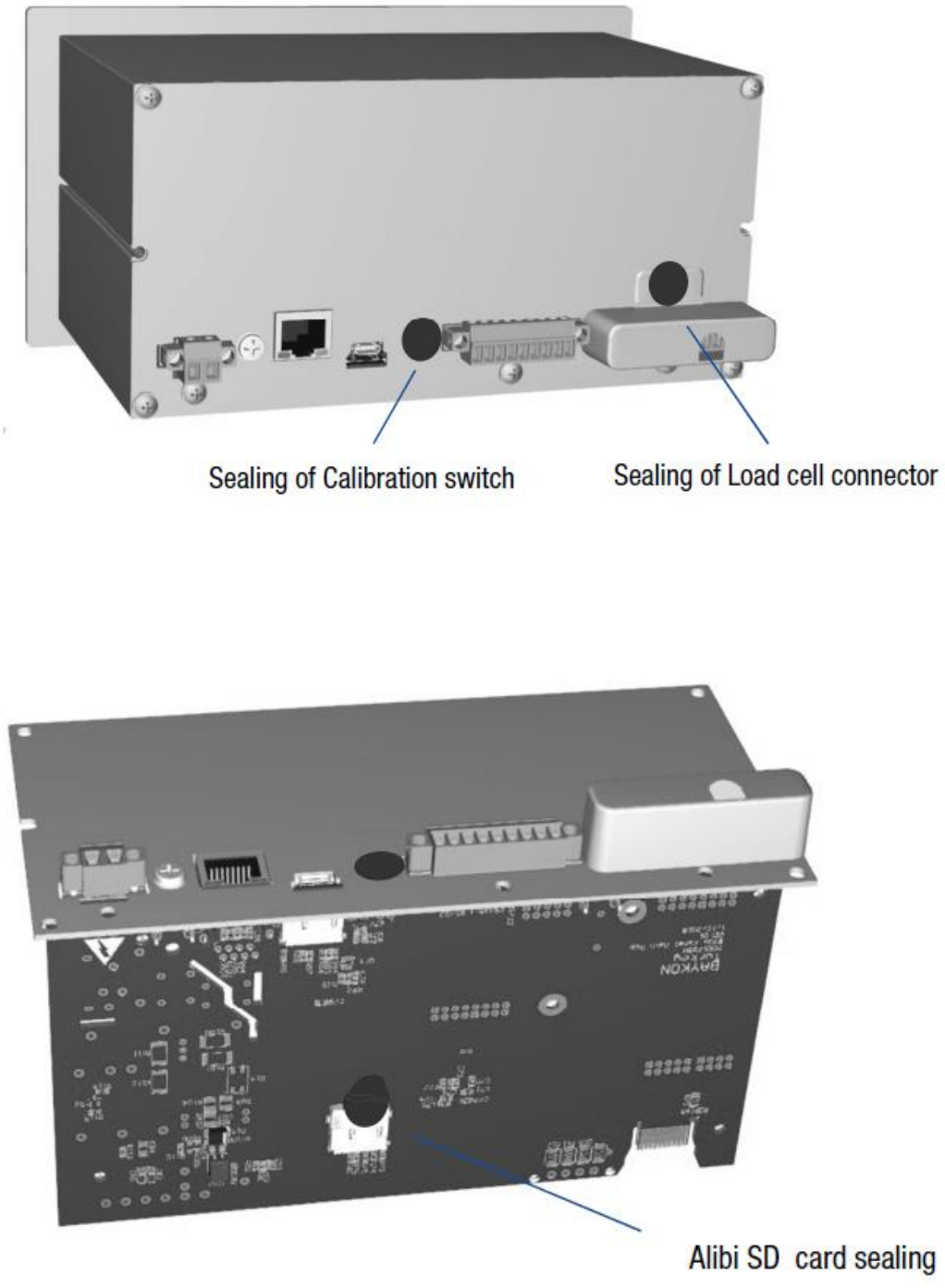

Figure 2 Sealing of BX30 Fill indicator with brittle sticker.

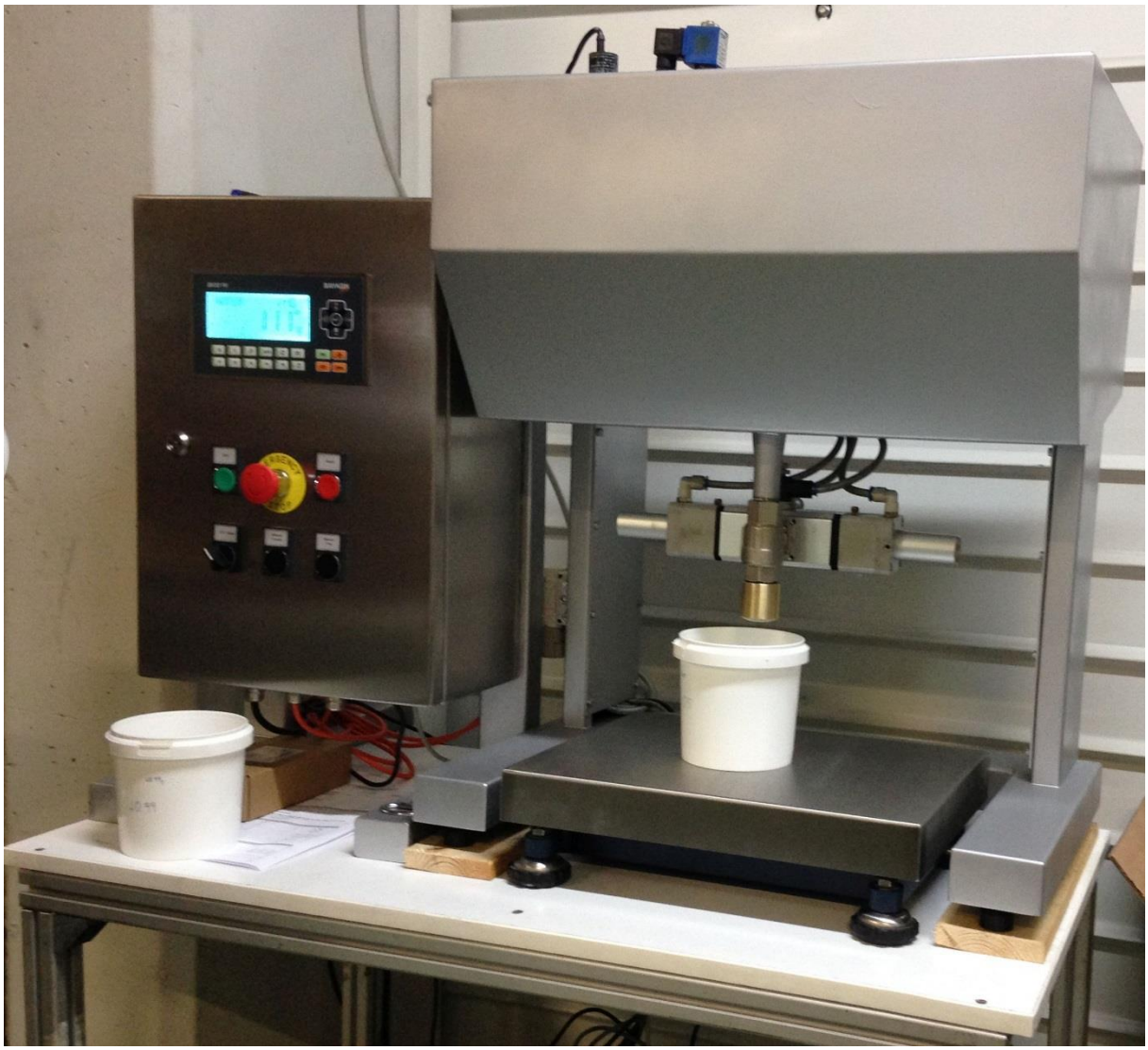

Figure 3 Example of a BX30 Fill automatic gravimetric filling instrument.

10. Composition of modules – an example

COMPATIBILITY OF MODULES

Ref.: WELMEC 2

Non-Automatic Weighing Instrument, single-interval.

Certificate of EU Type-Approval N°: TAC: 0200-MID-04851

INDICATOR	A/D (Module 1)	Type:	BX30 Fill			
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}		10000		
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]	0,4		
Minimum load cell impedance:		R_{Lmin}	[Ω]	43		
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]	9840		
Load cell interface:				6-wire (remote sense)		
Additive tare, if available:		T^+	[% of Max]	100		
Initial zero setting range:		IZSR	[% of Max]	-10	/	10
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]	20		
Non uniform distribution of the load:	(NUD = 0 is acceptable)	NUD	[% of Max]	0		
Correction factor:	$Q = 1 + (DL + T^+ + IZSR^+ + NUD) / 100$			2,3		
LOAD CELL	ANALOG (Module 3)	Type:	Tedea Huntleigh 1042			
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]	415		
Minimum load cell verification interval:	($v_{min\%}$ = 100 / Y)	$v_{min\%}$	[% of Emax]	0,00666		
Rated capacity:		E_{max}	[kg]	10		
Minimum dead load, relative:		$(E_{min} / E_{max}) * 100$	[%]	0		
Temperature range:		T_{min} / T_{max}	[°C]	-10	/	40
Test report (TR) or Test Certificate (TC/OIML) as appropriate:			TC2949			
COMPLETE WEIGHING INSTRUMENT			Single-interval			
Manufacturer: Baykon		Type:	BX30 Fill			
Accuracy class according to EN 45501 and OIML R76:		$Class_{WI}$ (I, II, III or IIII)		III		
Fractions: $p_i = p_1^2 + p_2^2 + p_3^2$:		p_i		1,0		
Maximum capacity:		Max	[kg]	3		
Number of verification scale intervals:		n		3000		
Verification scale interval:		e	[kg]	0,001		
Utilisation ratio of the load cell:		$\alpha = (Max / E_{max}) * (R / N)$		0,30		
Input voltage (from the load cells):		$\Delta_u = C * U_{exc} * \alpha * 1000 / n$	[µV/e]	1,00		
Cross-section of each wire in the J-box cable:		A	[mm²]	0,22		
J-box cable-Length:		L	[m]	2		
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 =	7000
n	<=	n_{LC}	(R76: 4.12.2)	n_{LC} - n =	0
E_{min}	<=	DL * R / N	(WELMEC 2: 6d)	(DL * R / N) - E_{min} =	0,6
$v_{min} * \sqrt{N} / R$	<=	e	(R76: 4.12.3)	e - (v_{min} * $\sqrt{N}$ / R) =	0,000
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}) * ($\sqrt{N}$/ R)) =	
Δu_{min}	<=	Δu	(WELMEC 2: 8)	$\Delta u - \Delta u_{min}$ =	0,60
R_{Lmin}	<=	R_{LC} / N	(WELMEC 2: 9)	(R_{LC} / N) - R_{Lmin} =	372
L / A	<=	$(L / A)_{max}^{WI}$	(WELMEC 2: 10)	$(L / A)_{max}^{WI}$ - (L / A) =	9833
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) =	3,1

Signature and date:

Conclusion . . . . . **PASSED**

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