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EC Type Examination Certificate

No. DK 0199.244

BBF / BFB / BFT

AUTOMATIC GRAVIMETRIC FILLING INSTRUMENT

Issued by **DELTA Danish Electronics, Light & Acoustics**
EU - Notified Body No. 0199

In accordance with the requirements for the automatic weighing instruments in Directive 2004/22/EC of the European Parliament and Council of March 31, 2004 on Measuring Instruments (MID).

Issued to ESiT Elektronik Sistemler Imalat ve Ticaret Ltd. Sti.
Nişantepe Mahallesi Handegül Sokak No:6,
Çekmeköy,
34794 İstanbul
Turkey

In respect of An automatic gravimetric filling instrument designated **BBF / BFB / BFT** with variants of modules of load receptors, load cells and peripheral equipment.
Reference class 0.2
Maximum capacity, 10 kg ≤ Max ≤ 2000 kg
Verification scale interval: e ≥ 5 g
Number of verification scale intervals: n ≤ 6000 for single-interval
(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 Directive 2004/22/EC Annex 1 and the specific requirements in Annex MI-006, chapter I & IV are met by the application of OIML R61-1:2004, OIML D11:2004 section 12 & 13 applying severity level 3, WELMEC Guide 7.2, and WELMEC Guide 8.16-2:2006.

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

The annex comprises 14 pages.

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Descriptive annex

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1. Name and type of instrument and modules

The automatic weighing instrument designated BBF / BFB / BFT 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 instrument is a self-indicating filling instrument with single-interval.

The modules appear from Sections 3.2, 3.3, and 3.4; 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 PWI weighing indicator

The weighing indicator of the BBF/BFB/BFT automatic gravimetric filling instrument is Esit's indicator type PWI.

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.

PWI indicator can be supplied either in desk type enclosure, stainless steel enclosure, panel type enclosure or Ex-proof metal enclosure.

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 Functions

The weighing indicator is microcontroller based electronics that requires the external connection of strain gauge based analogue load cells. The weight information appears in the digital display located on the front of the instrument and may be transmitted to peripheral equipment for recording, processing or display. The PWI table top weight indicators are available for operation from mains at 230 VAC 50 or 60 Hz other enclosures are powered from external adapter with 12 - 36 VDC.

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)
- No motion detection and indication
- Automatic tare device
- Coarse filling device
- Fine filling device
- Stop mode (for check and verification purpose)
- Detection of significant fault

2.2.2 Software version

The software version of the PWI weighing indicator is displayed at start-up.
The approved software version is 4.4

3. Technical data

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

3.1 BBF/BFB/BFT Automatic gravimetric filling instrument

Type:	BBF/BFB/BFT
Reference class:	0.2
Accuracy class:	0.2 or 0.5 or 1 or 2
Maximum capacity (Max):	10 kg to 2000 kg
Minimum capacity (Min):	= Minfill
Verification scale interval (d):	≥ 5 g
Filling speed:	up to 20 fills/min
Weighing range:	Single-interval
Number of Verification Scale Intervals (n):	≤ 6000
Loads per fill:	1
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:	100 minutes
Extra warm-up time:	61 minutes

Rated minimum fill (Minfill):

MinFill for d = 0.5 µV

d	Reference accuracy class							
	X(0.2)		X(0.5)		X(1)		X(2)	
[g]	d	[kg]	d	[kg]	d	[kg]	d	[kg]
5	618	3.090	247	1.235	62	0.310	21	0.105
10	618	6.18	247	2.47	124	1.24	31	0.31
20	926	18.52	247	4.94	124	2.48	62	1.24
50	926	46.30	371	18.55	124	6.20	62	3.10
100	926	92.6	371	37.1	186	18.6	62	6.2
≥ 200	926		371		186		62	

MinFill for d = 0.7 µV

d	Reference accuracy class							
	X(0.2)		X(0.5)		X(1)		X(2)	
[g]	d	[kg]	d	[kg]	d	[kg]	d	[kg]
5	441	2.205	89	0.445	30	0.150	8	0.040
10	441	4.410	177	1.77	45	0.45	15	0.15
20	441	8.820	177	3.54	89	1.78	23	0.46
50	662	33.10	177	8.85	89	4.45	45	2.25
100	662	66.2	265	26.5	89	8.90	45	4.50
≥ 200	662		265		133		45	

MinFill for d = 1.0 µV

d	Reference accuracy class							
	X(0.2)		X(0.5)		X(1)		X(2)	
[g]	d	[kg]	d	[kg]	d	[kg]	d	[kg]
5	333	1.665	67	0.335	22	0.110	6	0.030
10	333	3.33	133	1.33	33	0.33	11	0.11
20	333	6.66	133	2.66	67	1.34	17	0.34
50	500	25.00	133	6.65	67	3.35	33	1.65
100	500	50.0	200	20.0	67	6.70	33	3.30
≥ 200	500		200		100		33	

3.2 Indicator

The indicator has the following characteristics:

Type:	PWI
Accuracy class:	III
Weighing range:	Single interval
Maximum number of Verification Scale intervals:	7000
Maximum subtractive tare effect:	-Max, within display limits
Fractional factor:	p'i = 0.5
Minimum input voltage per VSI:	0.5 µV
Minimum input voltage:	0.5 mV
Excitation voltage:	10 VDC
Analogue range:	±100 mV
Circuit for remote sense:	Active
Minimum input impedance:	35 ohm
Maximum input impedance:	1100 ohm
Internal resolution:	> 100,000 counts
Operating temperature range:	-10° C to +40° C
Mains power supply:	230 VAC, 50 Hz 60 Hz or 12 VDC
Peripheral interface:	Set out in Section 4

3.2.1 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: 377 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 = 0.0055 [% / 25K]
Coefficient of resistance for the wires in the J-box cable: Sx = 0.0041 [% / 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.

Reference: See Section 10.

The calculation program is obtainable by downloading at www.delta.dk/weighing.

3.3 Load cells

3.3.1 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 5, 2009), 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

Removable platforms shall be equipped with level indicators.

3.4.1 Bin, tank, and hopper load receptors

Construction in brief	Load cell assemblies each consisting of a load cell stand assembly to support one of the mounting feet or suspension points of bin, tank or hopper.
Reduction ratio	1
Junction box	Mounted in, on or near the dead load.
Load cell	Any R60 certified load cell according to Section 3.2.1.
Drawings	Various.

3.4.2 Bag load receptors

Construction in brief	Load cell assemblies each consisting of a load cell stand assembly to support one of the suspension points of the bag to be filled.
Reduction ratio	1
Junction box	Mounted in, on or near the dead load.
Load cell	Any R60 certified load cell according to Section 3.2.1.
Drawings	Various.

3.5 Composition of modules

In case of composition of modules, EN 45501 paragraph 3.5 and 4.12 shall be satisfied.

3.6 Documents

The documents filed at DELTA (reference No. A530835-2) are valid for the weighing instruments described here.

4. Interfaces and peripheral equipment

4.1 Interfaces

One or more of the following interfaces may be incorporated. The interfaces are protective interfaces within the meaning of 2004/22/EC annex I, sect. 8.1 and need not to be secured.

4.1.1 Printer interface

A 9-pin male connector for interconnection of a printer is positioned on the backside of the standard and panel mount enclosures and provides RS232C serial weight data. The waterproof enclosure ("S" type) has a three position terminal block for connection of the printer.

4.2 Peripheral equipment

Connection between the indicator and peripheral equipment shall be done by screened cables.

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

5. Approval conditions

5.1 Zero drift correction

The instrument can be configured for automatic zero drift correction. The function is disabled when the SETUP menu shows "drift 0". When the function is disabled and the indicator is secured (see Section 7.1.1) the function cannot be enabled.

This zero drift function is not covered by this type approval.

5.2 Compatibility of modules

In case of composition of modules, WELMEC 2 (Issue 5) 2009, paragraph 11 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.

An example of a declaration of conformity document is shown in Section 10.

The calculation program is obtainable by downloading at www.delta.dk/weighing.

7. Securing and location of seals and verification marks

7.1 Securing and sealing

Seals shall bear the verification mark of a notified body according to ANNEX F of the Directive 2004/22/EC or alternative mark of the manufacturer according to ANNEX D of the Directive 2004/22/EC.

7.1.1 Indicator

Access to the configuration and calibration facilities is achieved by removing an internal calibration jumper, which is located on the Scale Input Card.

Access is prohibited when the jumper is applied.

Sealing of the access to the jumper is accomplished by either sealing the enclosure with a lead wire seal through holes in the fixing screws of the indicator enclosure or by means of a brittle plastic sticker across the assembly of the indicator enclosure.

7.1.2 Indicator - load cell connector - load receptor

Securing of the load cell connector(s) with the indicator is done by means of a lead wire seal or a brittle sticker.

7.1.3 Junction box for load cells

The junction box, if any, is sealed by means of brittle stickers or lead seals.

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, which would alter the legality of the weighing.

7.2 Verification marks

A metrological M-sticker and a sticker with verification mark are to be placed on the identification plate of the instrument.

8. Location of CE mark of conformity and inscriptions

8.1 Identification plate

All inscriptions for the instrument shall be placed on the identification plate, which is located on the display module.

8.1.1 CE mark and metrological M

A CE mark of conformity and year of production grouped together with space for the metrological M shall be located on the identification plate.

8.1.2 Inscriptions

The identification plate shall bear the following inscriptions:

- Manufacturer's trademark and / or name
- Type designation
- Serial number
- Accuracy class
- Max, Minfill and d (these shall additional be duplicated near the display unless the description plate is located near the display)
- Temperature range: -10 / +40 °C
- Electromagnetic class: E2
- Humidity: Non-condensing
- Maximum filling speed
- Type examination certificate number

9. Pictures

Figure 1. BBF/BFB/BFT control with panel mounted PWI indicator.

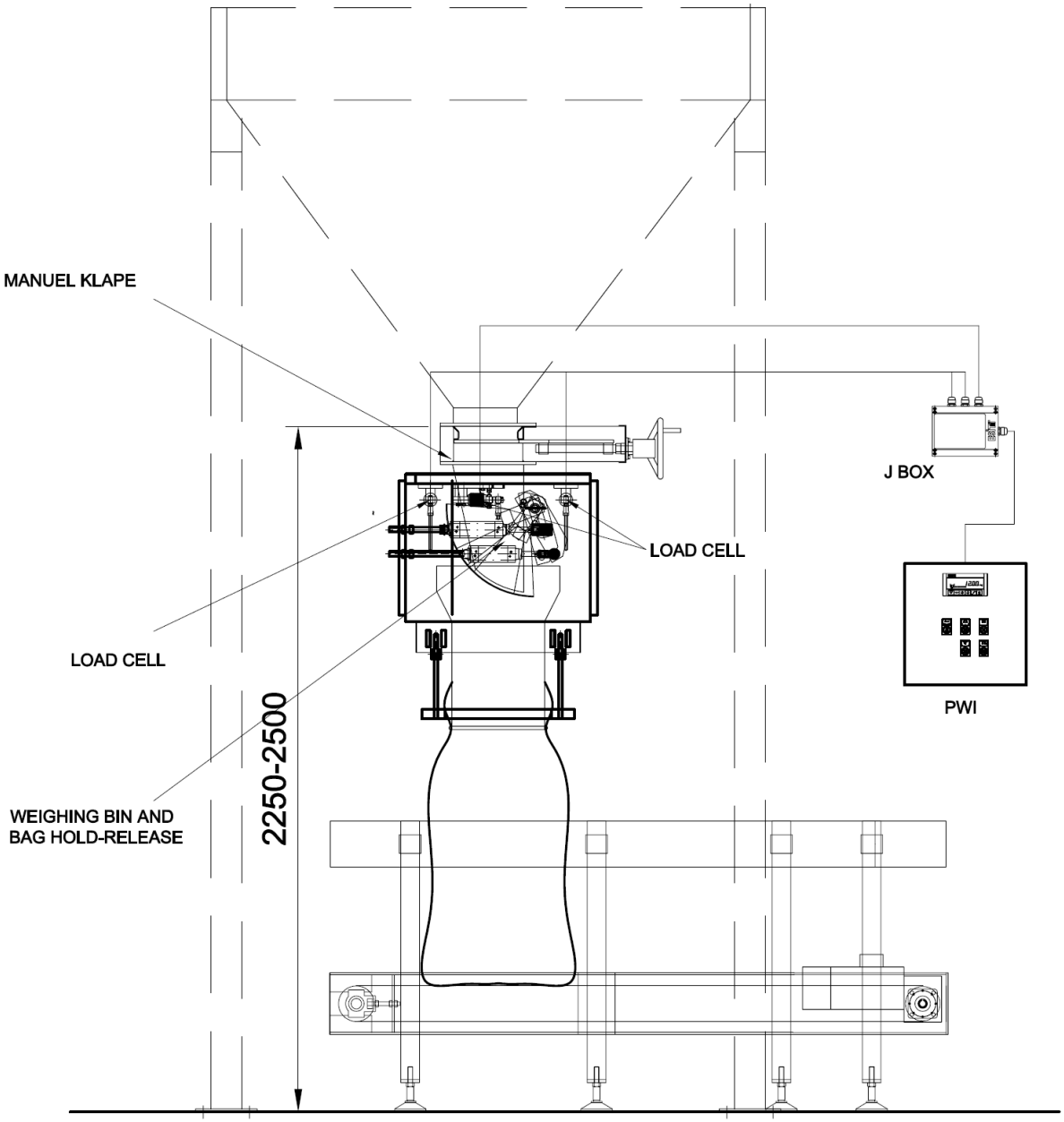

Figure 2. Model BFT.

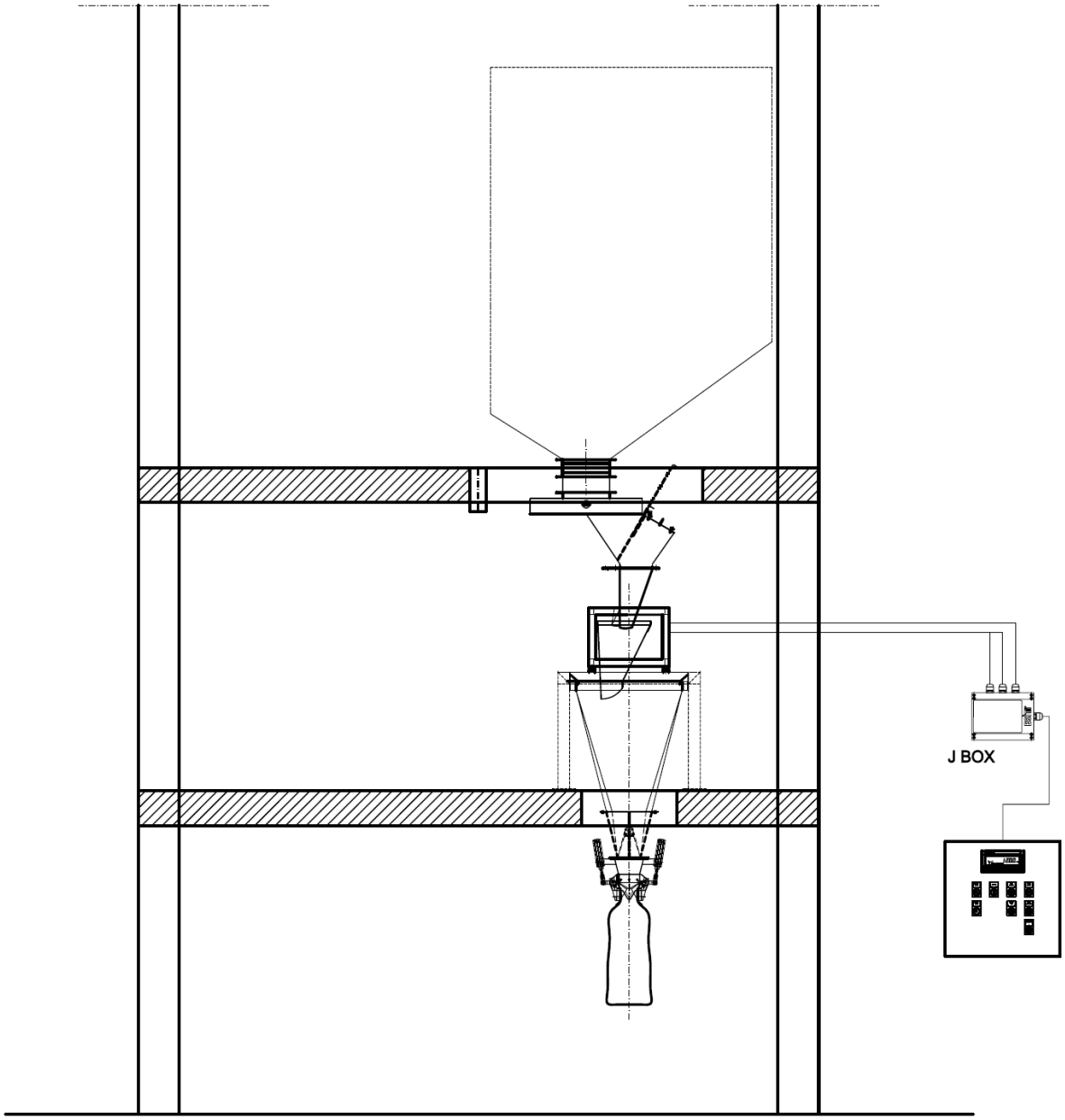

Figure 3. Model BFB.

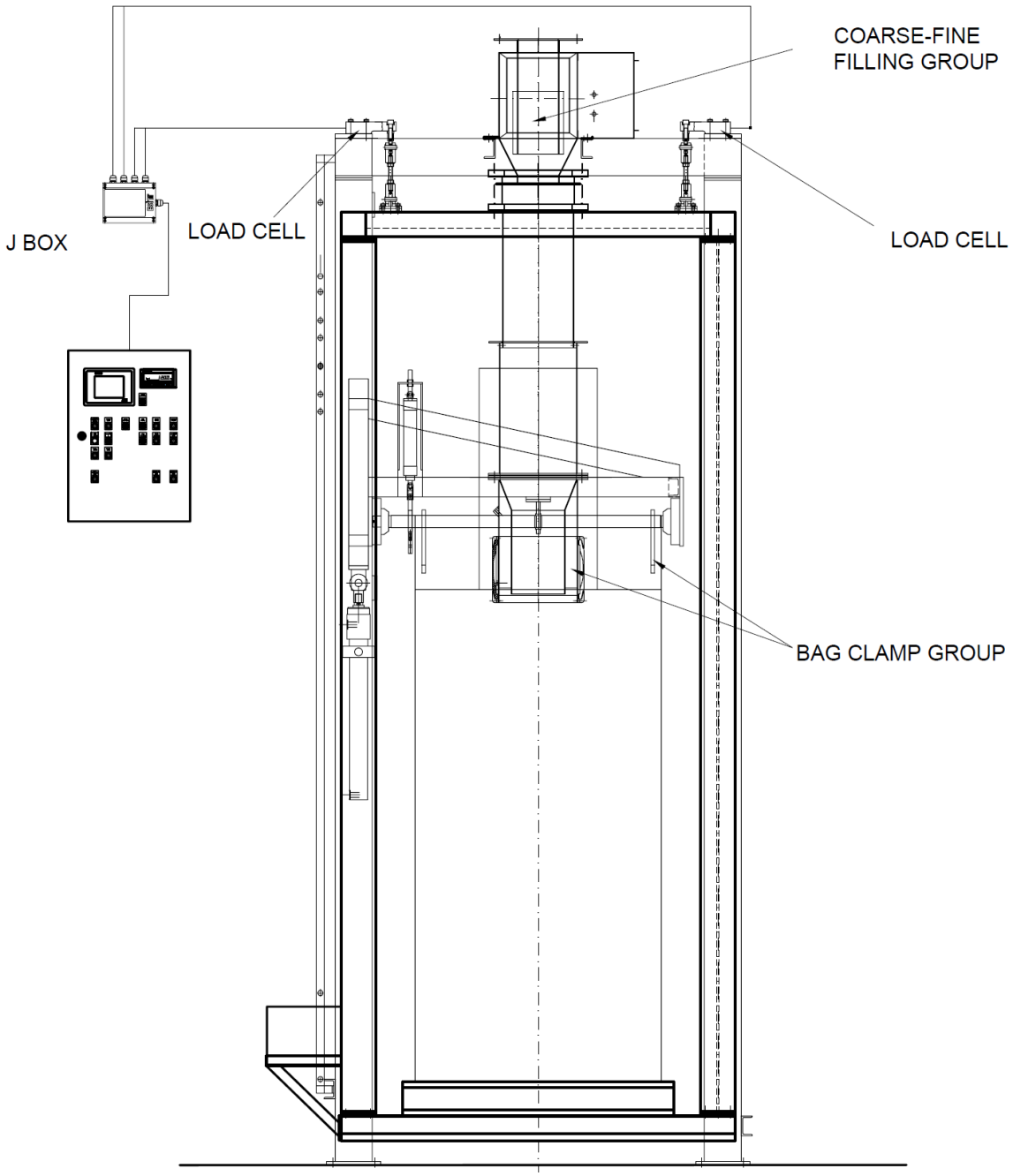

Figure 4. Model BBF.

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: DK0199.244

INDICATOR A/D (Module 1)	Type:	PWI				
Accuracy class according to EN 45501 and OIML R76:		$Class_{ind}$ (I, II, III or IIII)		III		
Maximum number of verification scale intervals (t_{max}):		n_{ind}		7000		
Fraction of maximum permissible error (mpe)		p_1		0,5		
Load cell excitation voltage:		U_{exc}	[Vdc]	10		
Minimum input-voltage per verification scale interval:		Δu_{min}	[µV]	0,5		
Minimum load cell impedance:		R_{Lmin}	[Ω]	35		
Coefficient of temperature of the span error:		Es	[% / 25°C]			0,0055
Coefficient of resistance for the wires in the J-box cable:		Sx	[% / Ω]			0,0041
Specific J-box cable-Length to the junction box for load cells		$(L/A)_{max}$	[m / mm²]			376
Load cell interface:				6-wire (remote sense)		
Additive tare, if available:		T^+	[% of Max]	0		
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:				Hopper		
Fraction of mpe:		p_2		0,5		
Number of load cells:		N		3		
Reduction ratio of the load transmitting device:		$R=F_M / F_L$		1		
Dead load of load receptor		DL	[% of Max]	70		
Non uniform distribution of the load		NUD	[% of Max]	20		
Correction factor:	$Q = 1 + (DL + T^+ + IZSR^+ + NUD) / 100$			2		
LOAD CELL ANALOG (Module 3)	Type:	ESiT BB				
Accuracy class according to OIML R60:		$Class_{LC}$ (A, B, C or D)		C		
Maximum number of load cell intervals:		n_{LC}		5000		
Fraction of mpe:		p_3		0,7		
Rated output (sensitivity):		C	[mV / V]	2		
Input resistance of single load cell:		R_{LC}	[Ω]	350		
Minimum load cell verification interval:	$(v_{min\%} = 100 / Y)$	$v_{min\%}$	[% of Emax]	0,005		
Rated capacity:		E_{max}	[kg]	100		
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						
COMPLETE WEIGHING INSTRUMENT				Single-interval		
Manufacturer: Esit	Type:	BFB				
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]	50		
Number of verification scale intervals:		n		5000		
Verification scale interval		e	[kg]	0,01		
Utilisation ratio of the load cell		$\alpha = (Max / E_{max}) * (R / N)$		0,17		
Input voltage (from the load cells):		$\Delta_u = C * U_{exc} * \alpha * 1000 / n$	[µV/e]	0,67		
Cross-section of each wire in the J-box cable:		A	[mm²]	0,22		
J-box cable-Length		L	[m]	10		
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 =	5000
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} =	11,66666667
$v_{min} * \sqrt{N} / R$	<=	e	(R76: 4.12.3)	e - (v_{min} * √N / R) =	0,001
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} =	0,17
R_{Lmin}	<=	R_{LC} / N	(WELMEC 2: 9)	(R_{LC} / N) - R_{Lmin} =	82
L / A	<=	$(L / A)_{max}^{WI}$	(WELMEC 2: 10)	$(L / A)_{max}^{WI}$ - (L / A) =	640
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) =	66,7

Signature and date:

.....

Conclusion . . . . . ***PASSED***

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