EC Type Examination Certificate

DK0199.491

MF-BL

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   **MF TECNO Srl.**
Via Porziuncola 28,
06081 Tordandrea di Assisi
ITALY

In respect of   A family of automatic gravimetric filling instruments designated MF-BL with variants of modules of load receptors, load cells and peripheral equipment.
Reference class 0.2
Accuracy class X(0.2), X(0.5), X(1) or X(2)
Maximum capacity, Max = $n \times d$
Verification scale interval: $e \geq 0.5$ g
Number of verification scale intervals: $n \leq 6000$ 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 Annex 1 and the specific requirements in Annex MI-006, chapter I & III of the Directive 2004/22/EC is met by the application of OIML R61-1:2004, section 12 & 13 of OIML D11:2004, WELMEC Guide 7.2:2011, 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 13 pages.

Issued on   **2014-10-28**
Valid until   **2024-10-28**

Signatory: J. Hovgård

Descriptive annex

Contents   Page

1. Name and type of instrument and modules

The automatic weighing instruments designated MF-BL is an automatic gravimetric filling instrument consisting of a W200 electronic weighing indicator connected to a separate load receptor and peripheral equipment such as printers or other devices, as appropriate.

The instruments are self-indicating filling instruments with single-interval.

The modules appear from Sections 3.2, 3.3, 3.4, and 3.5; 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 Electronic weighing indicator

The electronic weighing indicator can either be W200 (Evaluation Certificate DK0199-R61-12.04). W200 is for panel mounting.

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

2.2.1 Functions and devices

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

- Initial zero setting device (max. 20 % of Max)

- Zero-tracking device (max. 4 % of Max)

- Automatic zero-setting device (max. 4 % of Max)

- Automatic tare balancing device

2.2.2 Software

The software version of the weighing controller is displayed at start-up of the controller.
The format for the software version is x.yy.zz, where x is the legal version number, yy is a sub-revision number for software changes not related to the legal functionality of the software, and zz is a sub-revision number used for error corrections.
The approved software version is 1.yy.zz

3. Technical data

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

3.1 MF-BL automatic gravimetric filling machine

Reference class (Ref(x) =):	0.2
Accuracy class:	X(0.2), X(0.5), X(1) or X(2)
Maximum fill (MaxFill):	$\leq$ Max
Minimum fill (MinFill):	See tables below
Maximum capacity (Max):	n$\times$d
Minimum capacity (Min):	=MinFill
Verification scale interval (d):	$\geq$ 0.5 g
Weighing range:	Single-interval
Number of Verification Scale Intervals (n):	$\leq$ 6000
Maximum tare effect:	- Max
Extra warm-up time:	None for net weighing and for gross weighing with aut. zero-setting as part of each cycle, else 18 minutes for $d \geq 1$ µV 41 minutes for 1 µV $> d \geq 0.2$ µV
Maximum time between automatic zero-setting:	103 minutes
Temperature range:	-10° to +40° C
Electromagnetic class:	E2
Humidity:	Non-condensing
Automatic zero-setting:	For each weighing cycle
Mains power supply:	230 VAC, 50 Hz 60 Hz
Peripheral interface:	Set out in Section 4

Minimum filling's (MinFill) dependency of verification scale interval (d) and accuracy class X(x) for a verification scale interval of 0.2 µV.

d	Accuracy class							
	X(0.2)		X(0.5)		X(1)		X(2)	
[g]	d	[kg]	d	[kg]	d	[kg]	d	[kg]
0.5	67	0.0335	27	0.0135	14	0.0070	7	0.0035
1	133	0.133	27	0.027	14	0.014	7	0.007
2	200	0.400	54	0.108	14	0.028	7	0.014
5	399	1.995	80	0.400	27	0.135	7	0.035
10	399	3.99	160	1.60	40	0.40	14	0.14
20	399	7.89	160	3.20	80	1.60	20	0.40
50	599	29.95	160	8.00	80	4.00	40	2.00
100	599	59.9	240	24.0	80	8.0	40	4.0
200	599	119.8	240	48.0	120	24.0	40	8.0
$\geq$ 500	599		240		120		60	

Minimum filling's (MinFill) dependency of verification scale interval (d) and accuracy class X(x) for a verification scale interval of 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]
0.5	56	0.0280	22	0.0110	11	0.0055	6	0.0030
1	111	0.111	22	0.022	11	0.011	6	0.006
2	167	0.334	22	0.044	11	0.022	6	0.012
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	6.7	33	3.3
200	500	100.0	200	40.0	100	20.0	33	6.6
≥ 500	500		200		100		50	

3.2 W200 weighing controllers

Reference class (Ref(x) =): 0.2

Weighing range: Single-interval, multi-range or multi-interval (2 or 3)

Maximum number of verification scale intervals (n): 10000

Minimum input voltage per VSI: 0.2 µV

Maximum capacity of interval or range (Max_i): $n_i \times e_i$

Verification scale interval, $e_i =$: Max_i/n_i

Initial zero-setting range: ± 10 % of Max

Maximum tare effect: 100 % of Max

Fractional factor (pi): 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

Supply voltage: 12 - 24 VDC, or 230 VAC

Operating temperature range: -10 ° C to +40 ° C

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 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.

3.4 Load receptors

The net weighers use a bin of painted iron or steel, but may also be realized by a moving belt conveyor that weighs all the material of the fill simultaneously. The gross weighers are weighing the bag or big bag or box hanging from or placed on a mechanical arrangement placed on the load cells.

3.5 Feeding

The feeding system can be either gravity feeding, screw feeding, belt feeding or vibration feeding. The feeding system has coarse and fine feeding.

3.6 Composition of modules

For the composition of modules EN 45501 paragraph 3.5 and 4.12 shall be satisfied.

3.7 Documents

The documents filed at DELTA (reference No. T209581) are valid for the weighing instruments described here.

4. Interfaces

The following interfaces are incorporated. The interfaces are protective and need not to be secured.

- RS485 - for communication with the non-legal touch screen computer

- RS232 - for connection to a printer or non-legal computer

- Profibus, DeviceNet, and CANopen

- Dig. I/O - for internal control of operation

- Analogue input / output

5. Approval conditions

5.1 Compatibility of modules

In case of composition of modules, WELMEC 2 (Issue 6) 2014, paragraph 11 shall be satisfied.

6. Special conditions for verification

None.

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 Plc-based touch screen

The software of this unit cannot influence the metrological characteristic of the filling machine and need not to be secured.

7.1.2 Electronic weighing indicator

7.1.2.1 Securing and sealing of W200

The calibration and configuration parameters as well as the software of W200 are secured by a non-resettable event counter. The current values of the event counter of a W200 can be displayed upon request from the keyboard of the indicator.

To indicate the sealed status of the event counter, the inscribed count of the event counter is written on the inscription plate or on a label placed on the inscription plate or next to it.

The event counter's label is sealed by partially covering it with an official sealing label.

The enclosure of W200 shall be sealed against opening.

7.1.2.2 Sealing of indicator connections

Sealing of the connection of the load cell to the indicator is done with two brittle stickers. One covering the screw terminals of the connector and one placed on both the fixed and the removable part of the connector.

7.1.3 Peripheral interfaces

All peripheral interfaces are "protective". They neither allow non-traceable 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.

7.2 Verification marks

A sticker with verification mark is to be placed on the identification plate of the filling machine.

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 shall be located on a visible place on the instrument.

8.1.1 CE mark and metrological M

A CE mark of conformity followed by a rectangle surrounding the metrological M and year of production 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
- Reference accuracy class Ref(0.2)
- Accuracy class X(x)
- Type examination certificate number
- Maximum fill (MaxFill =)
- Minimum fill (Minfill =)
- Maximum capacity (Max =)
- Verification scale interval (d =)
- Maximum tare
- Maximum rate of operation
- Temperature range: -10 / +40 °C
- Electromagnetic class: E2
- Humidity: Non-condensing
- Supply voltage
- Serial number of indicator
- Event counter values for indicator

9. Pictures

Figure 1 W200 weighing indicator.

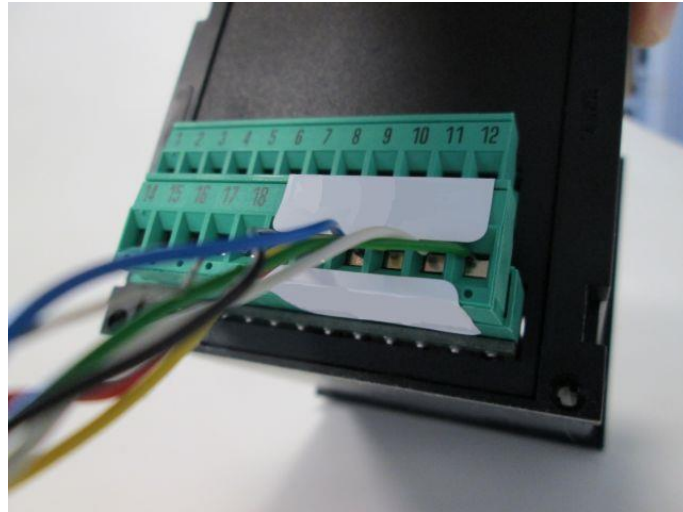**Figure 2** Sealing of W200 enclosure.

Figure 3 Sealing of the connection of the load cell to W200.
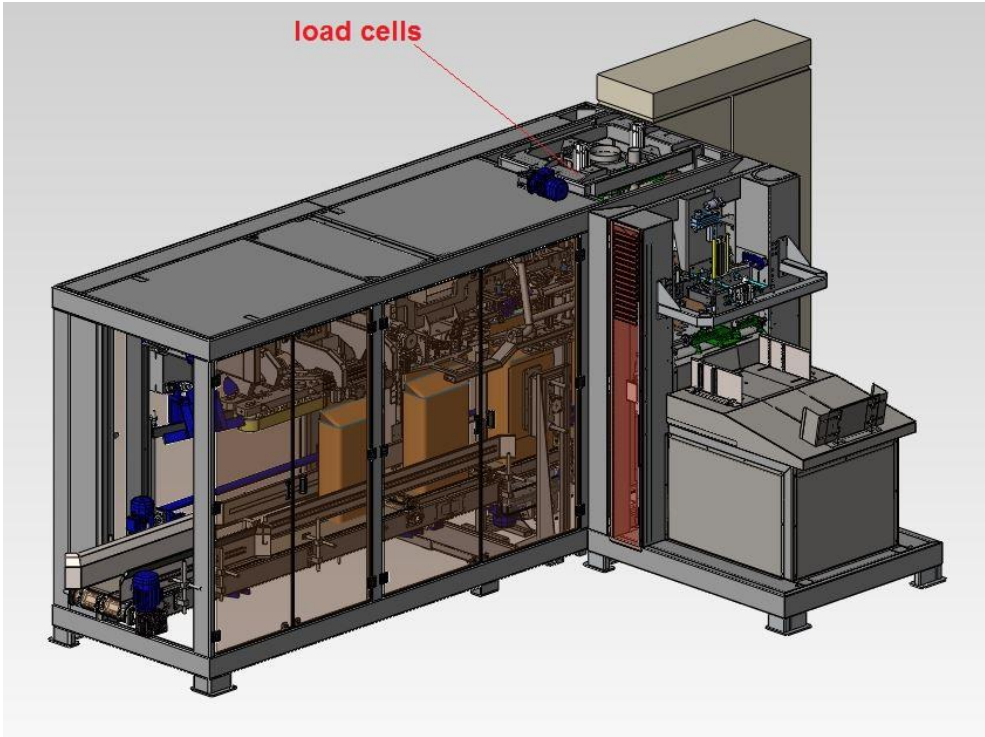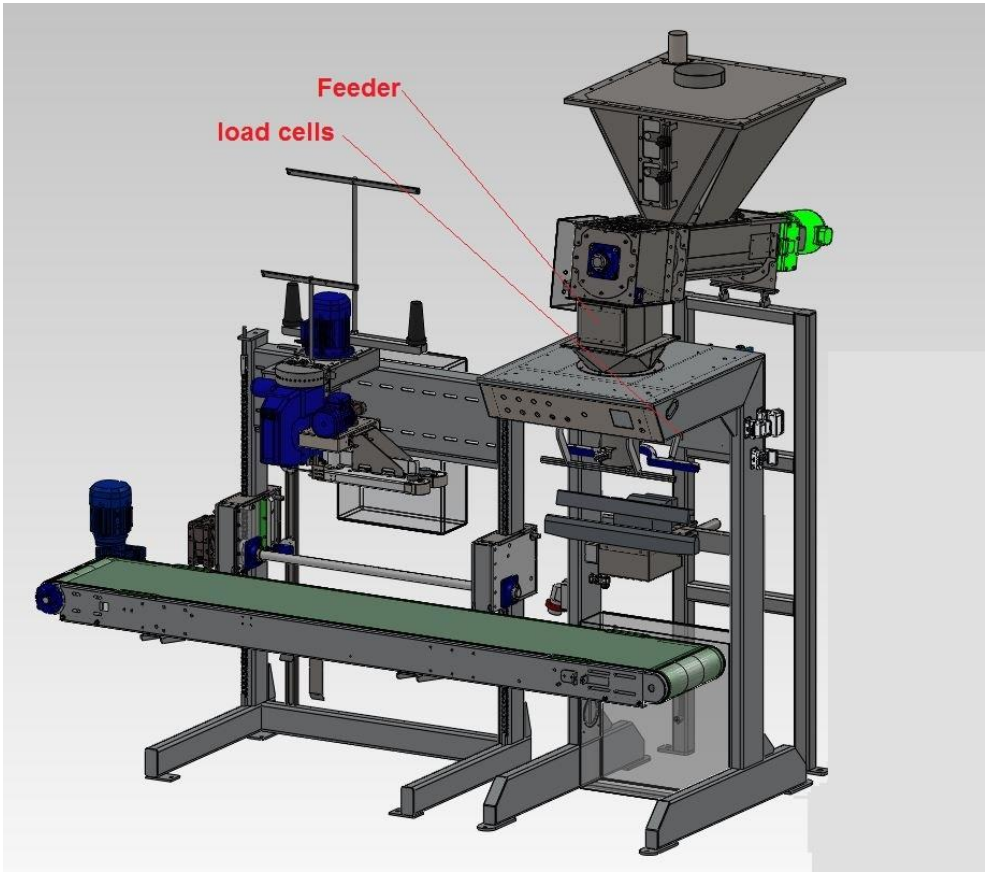
Figure 4 MF-BL gross weigher

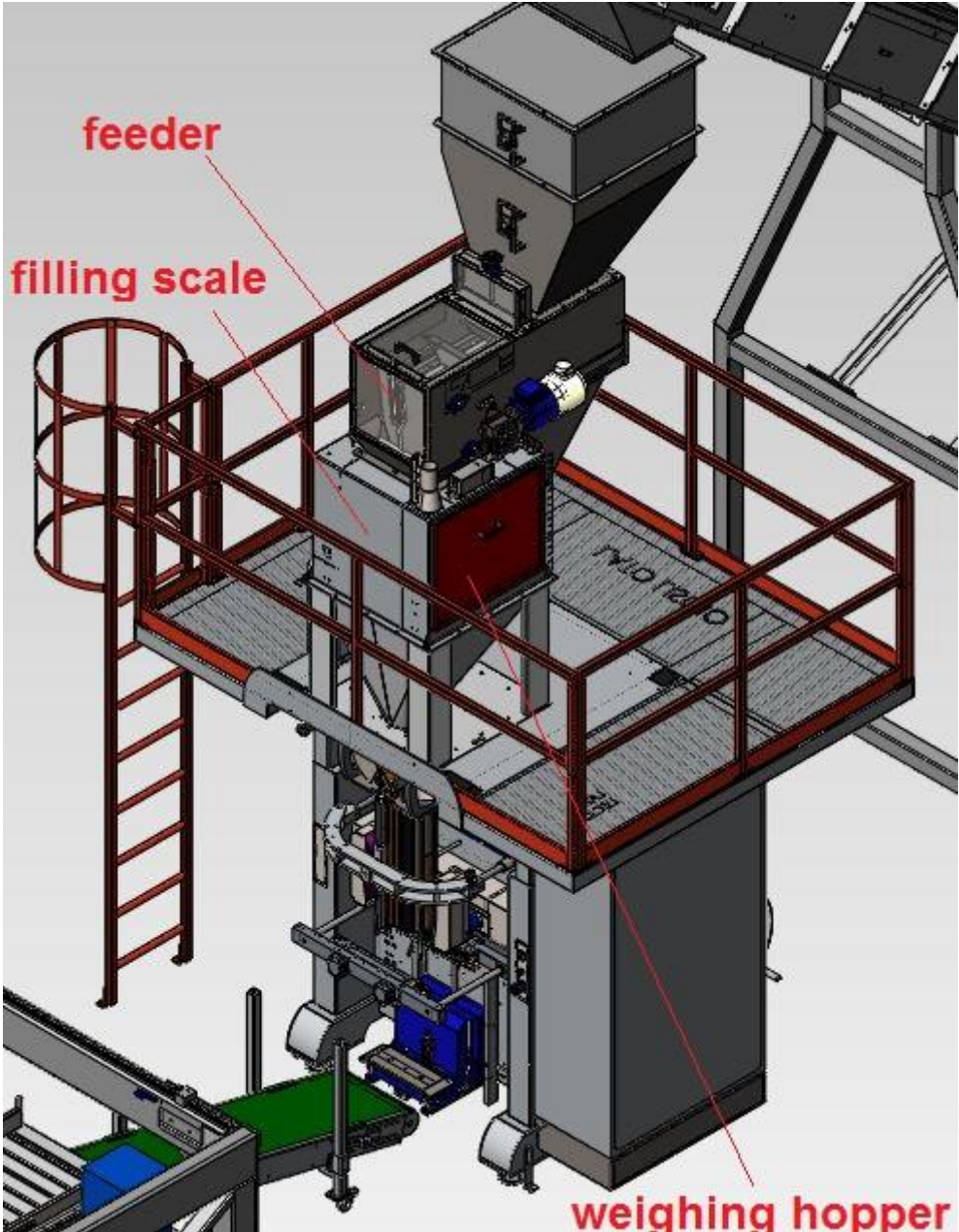**Figure 5** MF-BL gross weigher with screw feeder.
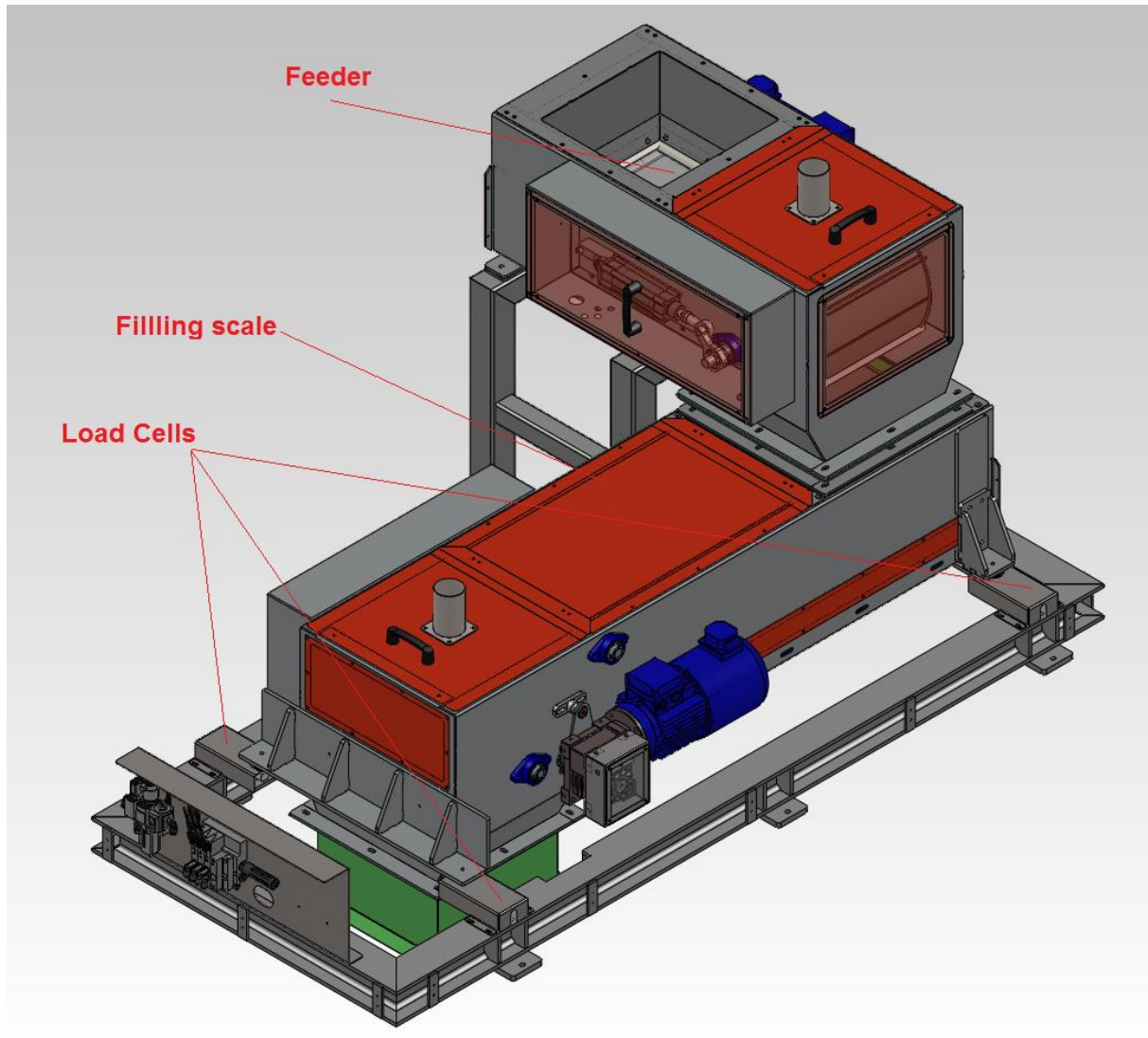
Figure 6 MF-BL net weigher

Figure 7 MF-BL net weigher, weighing the material on a belt.

10. Composition of modules - example

COMPATIBILITY OF MODULES
Ref.: WELMEC 2
Non-Automatic Weighing Instrument, single-interval

Certificate of EU Type-Approval Nº: TAC: DK0199.491

INDICATOR   A/D (Module 1)   Type: W200

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]	0,2
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]	1315
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:	DK0199-R61-12.04		

LOAD RECEPTOR   (Module 2)   Type:

Construction:			Hopper
Fraction of mpe:	p$_2$		0,5
Number of load cells:	N		2
Reduction ratio of the load transmitting device:	R=F$_M$/ F$_L$		1
Dead load of load receptor:	DL	[% of Max]	60
Non uniform distribution of the load:	NUD	[% of Max]	20
Correction factor:	Q = 1 + (DL + T$^+$ + IZSR$^+$ + NUD) / 100		1,9

LOAD CELL   ANALOG (Module 3)   Type: Flintec SB8

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]	380
Minimum load cell verification interval: (v$_{min\%}$ = 100 / Y)	v$_{min\%}$	[% of Emax]	0,01
Rated capacity:	E$_{max}$	[kg]	50
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:	D09-05.13		

COMPLETE WEIGHING INSTRUMENT   Single-interval

Manufacturer: MF TECNO Srl.	Type:		MF-BL
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]	30
Number of verification scale intervals:	n		3000
Verification scale interval:	e	[kg]	0,01
Utilisation ratio of the load cell:	α = (Max / E$_{max}$) * (R / N)		0,30
Input voltage (from the load cells):	Δ_u = C * U$_{exc}$ * α * 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]	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 =	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$_{min}$ =	9
v$_{min}$ * $\sqrt{N}$ / R	<=	e	(R76: 4.12.3)	e - (v$_{min}$ * $\sqrt{N}$ / R) =	0,003
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)	Δu – Δu$_{min}$ =	0,80
R$_{Lmin}$	<=	R$_{LC}$ / N	(WELMEC 2: 9)	(R$_{LC}$ / N) - R$_{Lmin}$ =	147
L / A	<=	(L / A)$_{max}$^{WI}	(WELMEC 2: 10)	(L / A)$_{max}$^{WI} - (L / A) =	1270
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) =	21,5

Signature and date: ***Conclusion . . . . .***   **PASSED**

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

DELTA