EU Type Examination Certificate

No. 0200-MID-07228 Revision 1

BWdnn-X / RWdnn-X

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   **Bilwinco A/S**
Hedevej 3-9
9800 Hjørring
Denmark

In respect of   An automatic gravimetric filling instrument designated **BWdnn-X / RWdnn-X** working as a selective combination weigher with variants of modules of load receptors, load cells and peripheral equipment.
Reference accuracy class 0.5
Maximum capacity for each weighing unit, $Max = n \times e$
Verification scale interval: $d = 1$ g, or $d = 2$ g
Number of verification scale intervals: $n \leq 3000$ 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 VIII (MI-006), chapter I & II of the Directive 2014/32/EU is met by the application of OIML R61::2004, section 12 & 13 of OIML D11:2004, WELMEC Guide 7.2, and WELMEC Guide 8.16-1.

Note: This certificate is a revised edition which replaces previous revisions.

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

The annex comprises 12 pages.

Issued on   **2019-09-24**
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FORCE Certification references:
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Descriptive annex

Contents

1.   Name and type of instrument and modules

The automatic gravimetric filling instrument designated BWdnn-X / RWdnn-X is an associative (selective combination) weigher manufactured by Bilwinco A/S.

The automatic gravimetric filling instrument is available in various models indicated in the name BWdnn-X as follows,

> d :   scale interval in gram of the instrument.
>> Approved values: d = 0   no extra row of hoppers for collection of feeding
>> d = 1   hopper volume 0.5 litre, 1 litre, or 2 litre
>> d = 2   hopper volume 5 litre
>
> nn :   number of individual weighing units.
>> Approved values: 7, 10, 14, 18, or 28
>
> X :   Type of material to be weighed.
>> Approved values: W   Wet products,
>> D   Dry products,
>> H   Hardware, or
>> E   Economy

and in the name RWdnn-X as follows,

> d :   hopper volume for the instrument.
>> Approved values: d = 0   hopper volume 1 litre
>> d = 1   hopper volume 1 litre
>> d = 2   hopper volume 5 litre
>> d = 3   hopper volume 10 litre
>
> nn :   number of individual weighing units.
>> Approved values: 07 to 32
>
> X :   Type of material to be weighed.
>> Approved values: W   Wet products,
>> D   Dry products

The hopper drive system is pneumatic, and the feeding is driven by a basic vibrator system.

The instrument is a self-indicating filling instrument with single-interval and can be connected to peripheral equipment such as printers or other devices, as appropriate.

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

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2.   Description of the construction and function

2.1   Construction

2.1.1   Weighing controller

The weighing controller of the BWdnn-X / RWdnn-X selective combination weigher consists of a "VM20 CPU" board, 1 to 4 "VM20 I/O" boards, each with 8 analogue to digital conversion channels for connection to load cell / weighing unit plus digital I/O for control of feeding and discharge, a "VM20_COM" board for serial communication, and 1 or 2 "PM20" boards for control of the vibration feeding, all placed in a stainless steel cabinet, which is located on the side of the weighing instrument. On the opposite side is placed a similar stainless steel cabinet for all pneumatic control.

2.1.2   Operation terminal

The DK20 terminal is the user interface of the automatic weighing instrument. It consists of a LCD dot-matrix display with two text lines, a keyboard with 32 keys, and sixteen led indicators.

2.1.3   Load cells

Set out in Section 3.3.

2.1.4   Load receptor

Set out in Section 3.4.

2.1.5   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)

- Semi-automatic subtractive tare balancing device

- Automatic subtractive tare balancing device

- Extended indication device operating on one weighing unit at a time.

- Target (Preset) value device

2.2.2   Software

The software version of the weighing controller is displayed at start-up.

The format for the software version is x.y.zz, where x.y is the version number and zz is a sub-revision number for software changes not related to the legal functionality of the software.

The examined software version is 5.1.32.

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3. Technical data

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

3.1 BWdnn-X / RWdnn-X automatic gravimetric filling instrument

Type:	BWdnn-X / RWdnn-X
Reference class:	0.5
Accuracy class:	0.5 or 1
Maximum fill (MaxFill):	10 kg
Rated minimum fill (MinFill):	see table below.
Number of loads per fill (average):	3
Maximum capacity (Max):	$= n \times d$
Minimum capacity (Min):	1/3 of Minfill
Verification scale interval (d):	1 g, or 2 g or 5 g
Weighing range:	Single-interval
Number of Verification Scale Intervals (n):	≤ 3000
Maximum tare effect:	$\leq 100\%$ of Max
Temperature range:	-10° to +40° C
Electromagnetic class:	E2
Humidity:	Non-condensing
Maximum time between automatic tares:	312 seconds
Excitation voltage:	10 VDC
Analogue range:	-20 to 20 mV
Minimum input voltage per verification scale interval (Δu_{min}):	1.67 µV
Minimum input impedance:	350 ohm
Maximum input impedance:	1100 ohm
Internal resolution:	> 1,600,000 counts
Mains power supply:	3 x 400 VAC, 50 Hz 60 Hz
Peripheral interface:	Set out in Section 4

Rated minimum fill (Minfill):

d	Rated minimum fill			
	X(0.5)		X(1)	
[g]	d	[kg]	d	[kg]
1	546	0.546	137	0.137
2	546	1.092	273	0.546
5	546	2.730	273	1.365

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3.2   DK 20 Terminal

The terminal has the following characteristics:

Designation   DK20

Type: Digital display unit with keyboard

Power supply: 24 VAC or 36 VDC from weighing controller

3.3   Load cells

All load cells are connected directly to the weighing controller.

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)   There is a respective Part / Evaluation / Test Certificate (EN 45501) or an OIML Certif-icate of Conformity (R60) 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 hu-midity 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 doc-ument, 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.Load cells

Load cells

The load cells, which are listed below, are certified as module in the weighing instrument.

Manufacturer	Load cell type	Capacity	Vmin
Vishay Revere Transducers	HPS C3	12 kg	1 g
Vishay Revere Transducers	HPS C3 or C2	30 kg	≤ 5 g
HBM	PW27	20 kg	2 g

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3.4　　Load receptors

Each weighing unit of the automatic weighing instrument has a hopper load receptor.

Construction in brief	Stain-less steel
Reduction ratio	1
Number of load cells	1
Junction box	None
Load cells	According to Section 3.3.2, or any R60 certified load cell according to Section 3.3.1
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 FORCE (reference No. A530574) 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 EN 45501 sect. 5.3.6.1 and need not to be secured.

4.1.1　　Serial interface

Indicator can be equipped with up to two RS232-C serial interfaces. These interfaces can be used to transmit production data to a connected PC or printer.

4.1.2　　Printer interface

If any, serial interface can be used for printer connection.

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.

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5. Approval conditions

5.1 Tolerances for preset target

It is the responsibility of the instrument owner that the in-service tolerance for the instrument is not exceeded. This includes the instrument owner's, or the by him selected user's, setting of tolerances for preset target.

5.2 Compatibility of modules

In case of composition of modules, EN 45501:2015 annex F shall be satisfied.

6. Special conditions for verification

6.1 Composition of modules

The composition of modules shall agree with Section 5.3.

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

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 Weighing controller

7.1.1.1 Securing of calibration data

The calibration and configuration parameters are secured by a non-resetable event counter. The maximum count of the event counter is 999.

The current value of the event counter is displayed during start-up.

To indicate the sealed status of the event counter, a label with the inscribed count of the event counter is placed on the inner side of the door of the electronic cabinet.

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

7.1.1.2 Sealing of electronic boards

The microprocessor board "VM20 CPU" and also all analogue input boards "VM20 I/O" shall be protected against exchange by a sealing label - for each board - covering the head of one of the screws used for fastening the board, or for fastening the enclosure covering the board.

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7.1.2 Sealing of load cell connectors

Securing of the load cells combined is done by sealing the load cell connector for each weighing unit's load cell with a sealing label.

This connector is placed on the load cell cable approx. 20 cm from the load cell and is hidden inside the mechanical construction protected against cleansing agents.

7.1.3 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. 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

CE mark and supplementary metrological marking shall be applied to the scale according to article 21 of Directive 2014/32/EU.

8.1.2 Inscriptions

The identification plate shall bear the following inscriptions:

- Manufacturer's trademark and / or name
- Manufacturers postal adress
- Type designation
- Serial number
- Accuracy class
- MaxFill, Minfill, Max, Min, 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
- Type examination certificate number

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9. Pictures

Figure 1: BW118-W

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Figure 2: RW114-D

Figure 3. DK20 terminal

Figure 4. Sealing of boards

Figure 5. Sealing of load cell cable connector

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10. Composition of modules - illustrated

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

Certificate of EU Type Examination N°:　　　　　TEC｜0200-MID-07228

INDICATOR	A/D (Module 1)	Type:	Billwinco's electronic controller		
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$_{ind}$	3000		
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]	1.67		
Minimum load cell impedance:		R$_{Lmin}$ [Ω]	350		
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]	10		
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	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]	20		
Correction factor:		Q = 1 + (DL + T + IZSR + NUD) / 100	1.5		

LOAD CELL	ANALOG (Module 3)	Type:	Vishay Revere Transducers, HPS		
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]	350		
Minimum load cell verification interval:	(Vmin% = 100 / Y)	Vmin% [% of Emax]	0.0083		
Rated capacity:		Emax [kg]	12		
Minimum dead load, relative:		(Emin / Emax) * 100 [%]	0		
Temperature range:		T$_{min}$ / T$_{max}$ [°C]	-10 / 40		
Test report (TR) or Test Certificate (TC/OIML) as appropriate:			TC2513		

COMPLETE WEIGHING INSTRUMENT　　Single-Interval

Manufacturer:	Billwinco	Type:	BW128-W		
Accuracy class according to EN 45501 and OIML R76:		Class$_{WI}$ (I, II, III or IIII)	III		
Fractions: p$_1$ = p$_1$³ + p$_2$³ + p$_3$³		p$_1$	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:		α = (Max / Emax) * (R / N)	0.25		
Input voltage (from the load cells):		Δu = C * U$_{exc}$ * α * 1000 / n [μV/e]	1.67		
Cross-section of each wire in the J-box cable:		A [mm²]	0.22		
J-box cable-Length:		L [m]	1		
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$_{LC}$	(WELMEC2: 1)	Class$_{WI}$:	PASSED
p$_1$	←	1	(R76: 3.5.4.1)	1 - p$_1$ =	0.0
n	←	n$_{max}$ for the class	(R76: 3.2)	n$_{max}$ for the class - n =	7000
n	←	n$_{ind}$	(WELMEC2: 4)	n$_{ind}$ - n =	0
n	←	n$_{LC}$	(R76: 4.12.2)	n$_{LC}$ - n =	0
Emin	←	DL * R / N	(WELMEC2: 6d)	(DL * R / N) - Emin =	0.6
Vmin * $\sqrt{N}$ / R	←	e	(R76: 4.12.3)	e - (Vmin * $\sqrt{N}$ / R) =	0.000
or (if Vmin is not given)				Alternative solutions:	↑ ↓
(Emax / n$_{LC}$) * ($\sqrt{N}$ / R)	←	e	(WELMEC2: 7)	e - ((Emax / n$_{LC}$) * ($\sqrt{N}$ / R)) =	
Δu$_{min}$	←	Δu	(WELMEC2: 8)	Δu - Δu$_{min}$ =	0.00
R$_{Lmin}$	←	R$_{LC}$ / N	(WELMEC2: 9)	(R$_{LC}$ / N) - R$_{Lmin}$ =	0
L / A	←	(L / A)$_{max}$^{WI}	(WELMEC2: 10)	(L / A)$_{max}$^{WI} - (L / A) =	5
Trange	←	T$_{max}$ - T$_{min}$	(R76: 3.9.2.2)	(T$_{max}$ - T$_{min}$) - Trange =	20
Q * Max * R / N	←	Emax	(R76: 4.12.1)	Emax - (Q * Max * R / N) =	7.5

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

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

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