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EC Type Examination Certificate

DK0199.399

BOS

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 instrument of Directive 2004/22/EC of the European Parliament and Council on Measuring Instruments (MID).

Issued to **Elektroniczne Wagi Przemyslowe**
Ul. Zacna 31
80-283 Gdansk
Poland

In respect of An automatic gravimetric filling instrument designated BOS with variants of modules of load receptors, load cells and peripheral equipment.
Reference accuracy class, Ref(x): 0.2
Accuracy class: 0.2, 0.5, 1 or 2.
Maximum capacity: 6 kg ≤ Max: ≤ 1500 kg.
Verification scale interval: 2 g ≤ d ≤ 500 g
Maximum number of verification scale intervals: n ≤ 3000 (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, OIML D11:2004 section 12 & 13 with severity level 3, WELMEC Guide 7.2:2009, and WELMEC Guide 8.16-3:2006.

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

The annex comprises 13 pages.

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Descriptive annex

Contents

1. Name and type of instrument and modules

The automatic weighing instrument designated BOS is an automatic gravimetric filling instrument intended for filling bags or big bags with loose materials.

The instrument is a self-indicating filling instrument with single-interval.

The weighing instrument consists of an electronic weighing indicator LD5290 connected to a separate load receptor, a hopper with valve for feeding and peripheral equipment such as printers or other devices, as appropriate.

The LD5290 weighing indicator is mounted into the front door of a control cabinet containing I/O (input/output) electronics and air valves for operating the hopper. It also contains the Mains Switch, Emergency Stop.

The Instrument is Type P and Risk Class B according to WELMEC Guide 7.2:2011.

The LD5290 weighing indicator and its software is produced by Leon Engineering, Greece.

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 Indicator

The indicator has an aluminium/plastic enclosure intended for panel mount. The display and keyboard are mounted in the front lid. The back side contains connectors for power, load cells, peripherals etc.

The display consists of an LED weight display of 9 digits, (7-segments, 10 mm high, with LED annunciators to indicate no-motion, centre of zero, Tare in use, Net, Rate, Scale platform 1 or Scale platform 2 or the sum of platforms 1+2 is displayed) and a two lines by 40 character information/dialogue display.

The keyboard is of the flat membrane type with acoustic feedback and has 33 keys.

The electronics of the indicator consists of a mainboard circuit with digital circuit, EPROM instruction memory, RAM data memory with battery backup, Real Time Clock, serial EEPROM for storage of configuration and calibration parameters, an analogue load cell signal processing circuit enclosed in an EMC shielding box and interface circuits for serial and parallel input/output.

2.1.2 Load cell

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 display is used to display other information than weight during setup and adjustment. During the display of other information, the weighing mode is inoperative, except for a test monitor, which is intended for verification and has d = 1/10 e - see figure 3.

Access to the functions is controlled through passwords in several levels.

The functions provided are detailed 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 (≤ 4 % of Max)
- Zero tracking device (≤ 4 % of Max)
- Automatic zero setting device (≤ 4 % of Max)
- No motion detection and indication
- Semi-automatic tare device
- Preset tare device
- Stop mode (for check and verification purpose)
- Detection of significant fault

2.2.2 Software identification

Software terminal LD5290 (LESCON-BOS) is identified by the indication of the name, linguistic version, and terminal type, issue number, date of version, description and date of subversion.

The identification of the tested software was,

LD5290.BOS/606 VER: NWSK/ 23-08-12

where:

LD5920	terminal name
.BOS	terminal type (Filling Scale)
/606	issue number
NWSK:	name of subversion
23-08-12.	date of software version

3. Technical data

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

3.1 BOS Automatic gravimetric filling instrument

Type:	BOS
Reference class, Ref(x):	0.2
Accuracy class:	0.2, 0.5, 1
Maximum capacity (Max):	6 kg ≤ Max ≤ 1500 kg
Maximun filling (MaxFill):	≤ Max
Minimum filling (MinFill):	≥ values stated in tables below
Minimum capacity (Min):	=MinFill
Verification scale interval (d):	2 g ≤ d ≤ 500 g and d = Max / n
Weighing range:	Single-interval
Number of Verification Scale Intervals (n):	≤ 3000
Temperature range:	-10° to 40° C
Weighing mode:	Static
Maximum time between automatic zero setting:	107 minutes
Extra warm-up time:	15 minutes
Electromagnetic class:	E2
Humidity:	Non-condensing

3.2 Weighing indicator

The LD5290 weighing indicator has the following characteristics:

Type:	LD5290
Temperature range:	-10° to 40° C
Accuracy class:	III or IIII
Weighing range:	Single-interval or multi-interval
Maximum number of Verification Scale Intervals:	10000 for class III 1000 for class IIII
Internal resolution:	500000 counts
Fractional factor:	p'i = 0.5
Minimum input voltage per VSI:	0.6 µV
Minimum signal voltage for dead load:	-1.25 to 10 mV
Analogue range:	-1.25 to 20 mV
Excitation voltage:	5 VDC switched polarity
Circuit for remote sense:	Remote sense using 6-wires in the load cell cable
Minimum input-impedance:	35 ohm (10 load cells of 350 ohm)
Maximum input-impedance:	2000 ohm
Maximum line resistance between indicator and junction box for load cell(s), if any:	5 ohm for each wire
Mains power supply:	220 / 240 VAC, 50 / 60 Hz optional 9 - 15 VDC from external AC/DC adapter
Peripheral interface:	Set out in Section 4

3.2.1 Connecting cable between the indicator and the junction box for load cells

The cable between the weighing indicator and a junction box for load cells shall be a 6-wire system using sense.

6-wire system

Line	:	6 wires, screened
Maximum length	:	300 m / mm2

Reference: See Section 10.

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

3.3 Load cells

General acceptance of modules

Any load cell(s) may be used for instruments under this type examination certificate provided the following conditions are met:

1) There is a respective test certificate (EN 45501) or an OIML Certificate of Conformity (R60) 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

The following type of load receptor is approved for the automatic weighing instrument:

- Fixed mounted hopper suspended in 1 to 4 load cells selected according to Section 3.3.
- Bag or big bag clamped on a funnel suspended in 1 to 4 load cells selected according to Section 3.3.

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. T203942) are valid for the weighing instruments described here.

4. Interfaces and peripheral equipment

4.1 Interfaces

As an option, the indicator may be supplied with peripheral interfaces, which allow peripheral equipment to be connected. The peripheral interfaces are positioned on the same side as the load cell interface.

The indicator may have the following optional interfaces:

- Serial Communication ports RS232 C
- Serial Communication ports RS485A
- Serial Communication port 20 mA Current loop
- Parallel Communication port (centronics)
- Digital inputs - outputs (24 VDC, opto-isolated)
- Analogue output 0 - 20 or 4 - 20 mA or 0 - 10 V (galvanic isolated)

The interface is characterised “Protective interfaces” according to Annex I, paragraph 8.1 in Directive 2004/22/EC.

4.2 Peripheral equipment

Connection between the weight indicator and peripheral equipment is allowed by screened cable.

4.2.1 Printers for legal transactions

The instrument may be connected to any simple recipient printer with a CE mark of conformity (see WELMEC 2 issue 5). A printer like this may be used for legal transactions.

5. Approval conditions

5.1 Connection of cables

All cables shall be shielded and the shield shall be properly EMC wise connected to the housing/connector in both ends.

5.2 Compatibility of modules

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

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

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.

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 Mechanical sealing

The identification plate shall be secured against removal with a brittle plastic sticker.

The weighing indicator shall be secured against opening with brittle plastic sticker(s) covering the mounting screw(s), and likewise shall the load cell cable connector and an eventually junction box be secured against removal/opening with brittle plastic stickers.

7.2 Verification marks

A sticker with verification marks is to be placed on or near 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 shall be located on a visible place on the measuring instrument.

8.1.1 CE mark

A sticker with the CE mark of conformity, the last two digits of the year of its affixing, and the supplementary metrology marking consisting of the capital letter ‘M’ surrounded by a rectangle, 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 class, Ref(x) =
- Accuracy class, X(x) =
- Max, Min and d (these shall additional be duplicated near or on the display)
- Maximum fill, MaxFill
- Minimum fill, MinFill
- Maximum rate of operation
- Product designation
- Temperature range: -10 °C / +40 °C
- Electromagnetic class: E2
- Humidity: Non-condensing
- Type examination certificate number
- Supply voltage
- Pneumatic pressure

9. Pictures

Figure 1 LD5290 weighing indicator

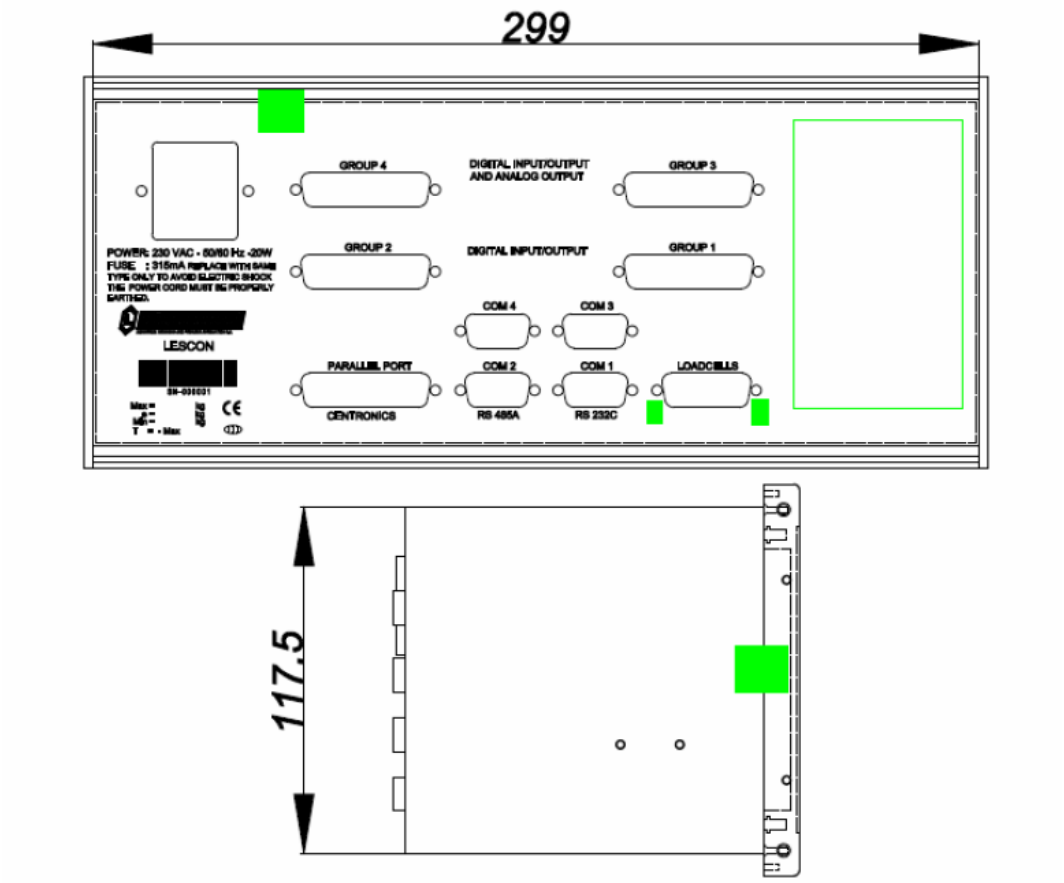


Figure 2 Sealing of LD5290 weighing indicator with protecting stickers and protections of screws at the plug of load cells connection

Junction box made of the plastic (ABS) sealed with protecting stickers – 2 stickers

The aluminium junction box sealed with protecting stickers – 2 stickers

metal junction box sealed with the protecting lead seal – the wire with the seal provided through two plates of the JB

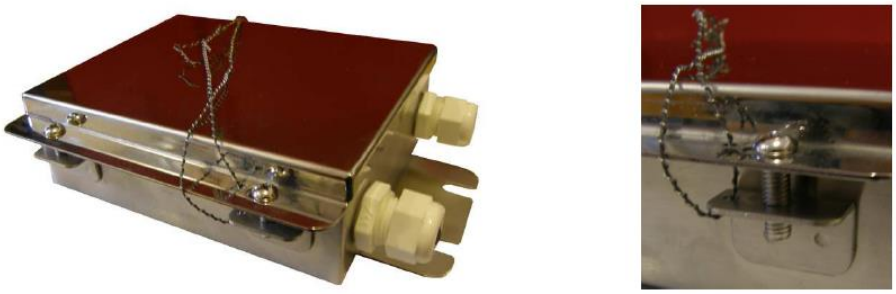


Figure 3 Sealing of junction box

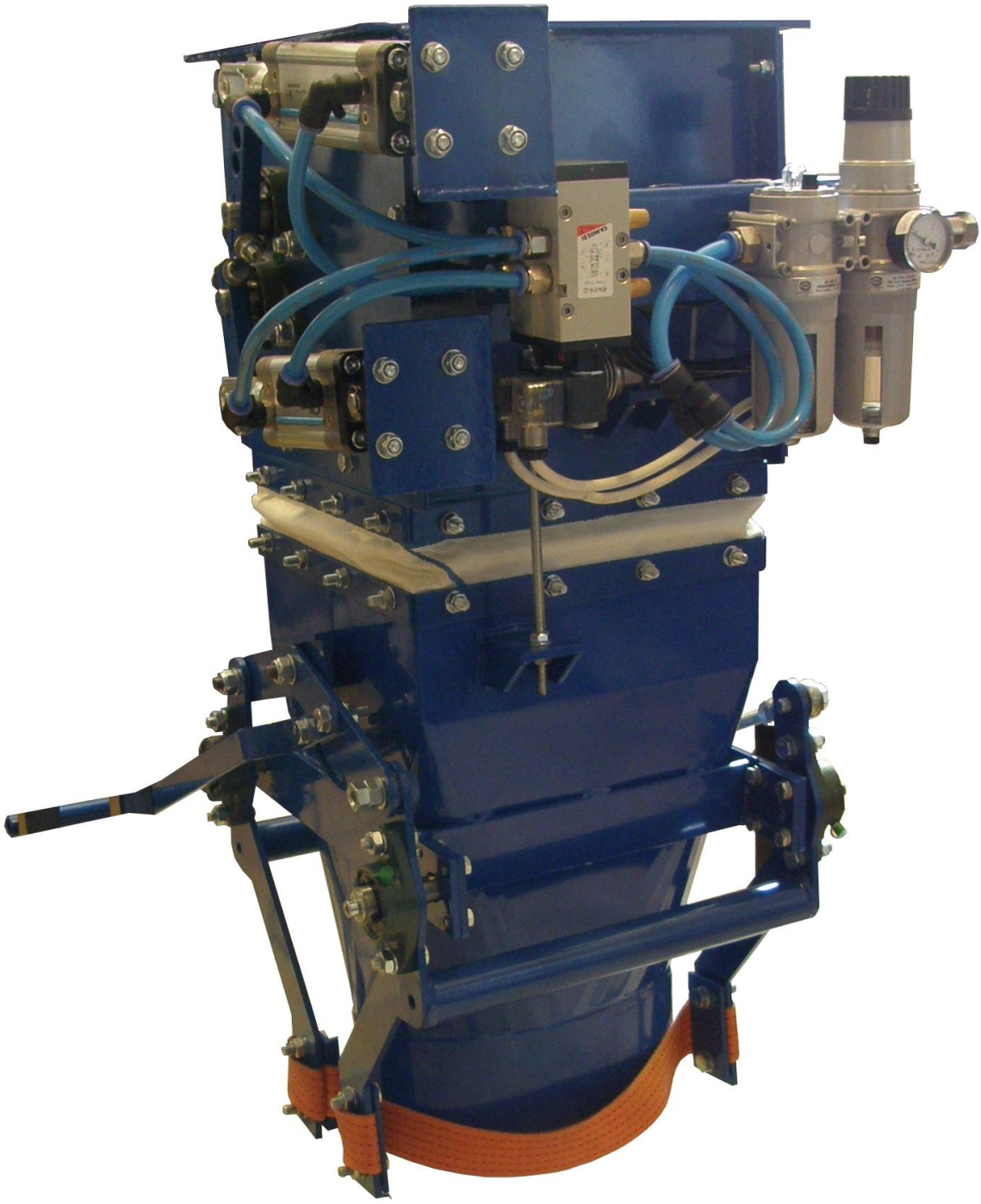


Figure 4 BOS load receptor for gross weighing with manual clamp.

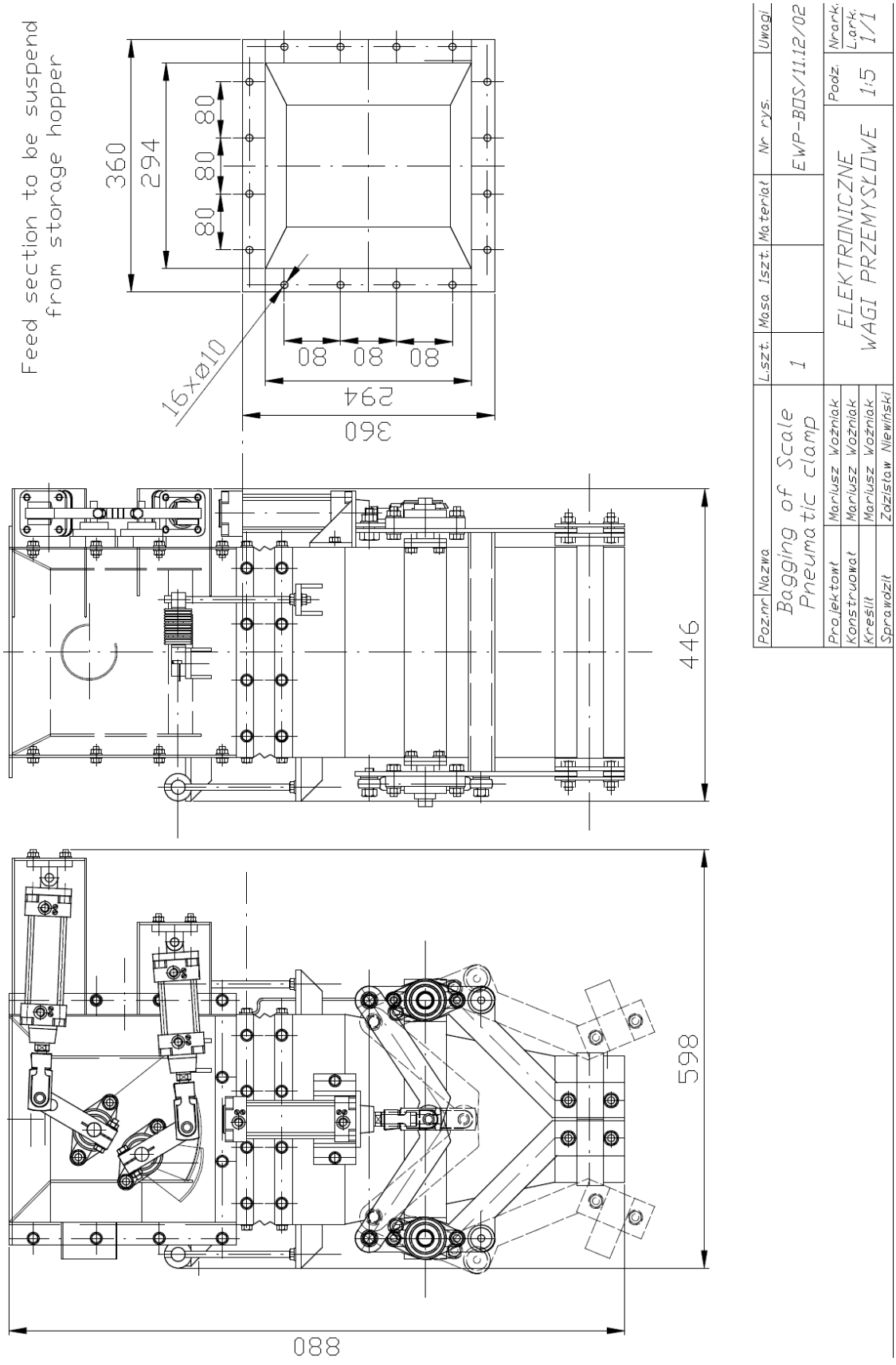
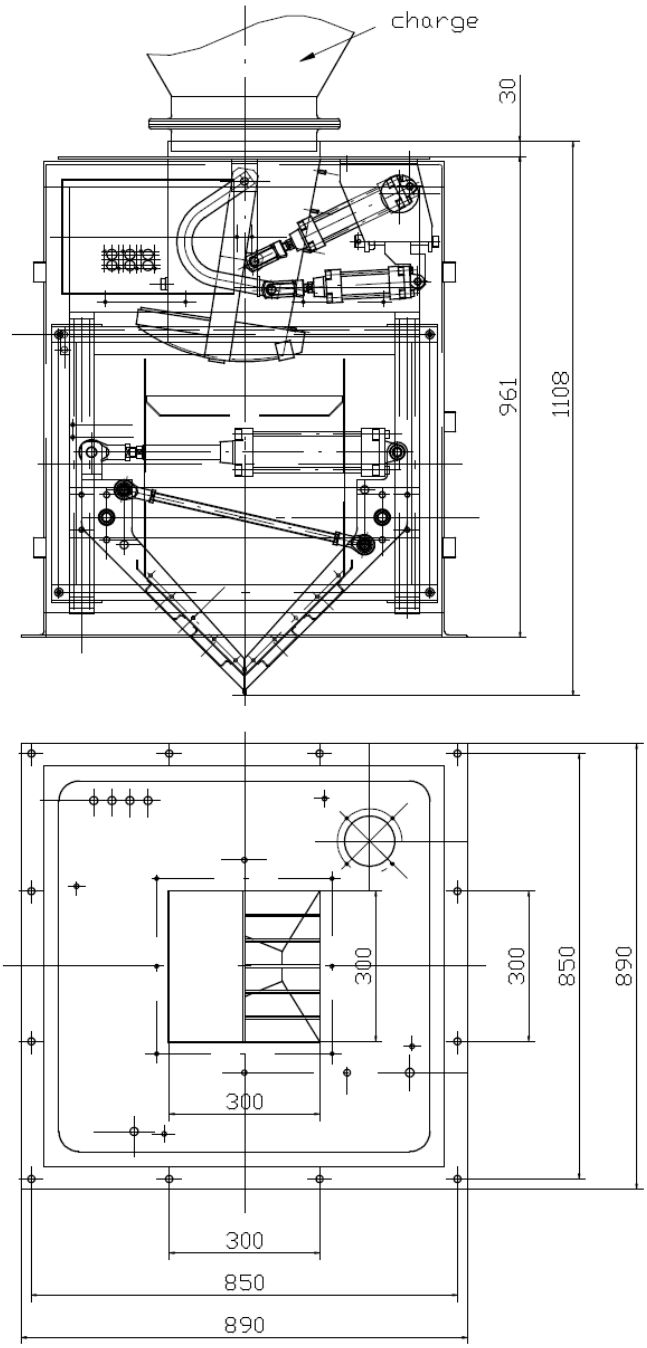


Figure 5 BOS load receptor for gross weighing with pneumatic clamp.



Poz.nr	Nazwa	L.szt.	Masa 1szt.	Materiał	Nr rys.	Uwagi
	Bagging Scale NET version	1		St3S	EWP-BOS/11.12/01	
Projektował	Mariusz Woźniak	ELEKTRONICZNE WAGI PRZEMYSŁOWE			Podz. 1:10	Nrark. L.ark. 1/1
Konstruował	Mariusz Woźniak					
Kreślił	Mariusz Woźniak					
Sprawdził	Zdzisław Niewiński					

Figure 6 BOS load receptor for net weighing.

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: DK0199.399

INDICATOR	A/D (Module 1)	Type:	LD5290			
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]	0,8	
Minimum load cell impedance:			R_{Lmin}	[Ω]	35	
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]	300	
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]	100	
Non uniform distribution of the load:			NUD	[% of Max]	20	
Correction factor:		$Q = 1 + (DL + T^+ + IZSR^+ + NUD) / 100$			2,3	
LOAD CELL	ANALOG (Module 3)	Type:	ZEMIC BM11			
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:		$(v_{min\%} = 100 / Y)$	$v_{min\%}$	[% 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:			D09-06.44			
COMPLETE WEIGHING INSTRUMENT			Single-interval			
Manufacturer:	EWP	Type:	BOS w. Maxfill 25 kg			
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		1500	
Verification scale interval:			e	[kg]	0,02	
Utilisation ratio of the load cell:		$\alpha = (Max / E_{max}) * (R / N)$			0,20	
Input voltage (from the load cells):		$\Delta_u = C * U_{exc} * \alpha * 1000 / n$		[µV/e]	1,33	
Cross-section of each wire in the J-box cable:			A	[mm²]	0,22	
J-box cable-Length:			L	[m]	5	
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 =	8500
n	<=	n_{ind}	(WELMEC 2: 4)	n_{ind} - n =	8500
n	<=	n_{LC}	(R76: 4.12.2)	n_{LC} - n =	1500
E_{min}	<=	DL * R / N	(WELMEC 2: 6d)	(DL * R / N) - E_{min} =	10
$v_{min} * \sqrt{N} / R$	<=	e	(R76: 4.12.3)	e - (v_{min} * √N / R) =	0,011
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} =	0,53
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) =	277
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) =	27,0

Signature and date:

Conclusion . . . . . **PASSED**

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