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EC Type Examination Certificate

DK0199.308

ILERPES

AUTOMATIC GRAVIMETRIC FILLING INSTRUMENT

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

In accordance with the requirements of the automatic weighing instrument regulation No. 1033 of 17 October 2006, that implements in Denmark Directive 2004/22/EC of the European Parliament and Council of March 31, 2004 on Measuring Instruments (MID).

Issued to **Técnicas Mecánicas Ilerdenses S.L.**
Pol. Ind. Camí dels Frares, C\Alcarràs parcel 66.2
25190 Lleida
Spain

In respect of An automatic gravimetric filling instrument designated ILERPES working as a single fill weigher with variants of modules of load receptors, load cells and peripheral equipment.
Reference accuracy class 0.2
Maximum capacity (Max = n × d) from 10 kg to 4000 kg
Verification scale interval: d ≥ 2 g
Number of verification scale intervals: n ≤ 6000, 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, 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 15 pages.

Issued on **2011-06-22**
Valid until **2021-06-22**

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Descriptive annex

Contents

1. Name and type of instrument and modules

The automatic gravimetric filling instrument designated ILERPES is a single-fill weigher manufactured by Técnicas Mecánicas Ilerdenses S.L.

The instrument is a self-indicating filling instrument with single-interval consisting of a weighing transducer type LDU 78.1 version 3, a VIPA type 313SC PLC, a touch screen operator's panel type AGP3200-T1-D24, and a load receptor.

The modules appear from the sections 3.2, 3.3 and 3.4; 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 Weighing transducer

The weighing transducer LDU 78.1 version 3 is an analogue to digital converter and data processing unit converting the analogue load cell signal to a digital weight. The module is described in details in Evaluation Certificate DK0199-.R61-10.10

2.1.2 PLC

The PLC is a type 313SC from VIPA. It receives the weight from the weighing transducer over a RS485/RS422 serial interface and control the feeding system and discharging using its I/O interfaces. The PLC communicates with the operator's panel using a serial communication interface.

2.1.3 Operator's panel

The operator's panel is a type AGP3200-T1-D24 touch screen display. The software running on it defining the user interface is stored in the ROM of the touch panel.

2.1.4 Load cells

Set out in Section 3.3.

2.1.5 Load receptor

Set out in Section 3.4.

2.1.6 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)
- Automatic zero-setting device

- Semi-automatic subtractive tare balancing device
- Automatic subtractive tare balancing device
- Extended indication device.
- Target (Preset) value device

2.2.2 Software

The software versions are displayed at start-up.

The approved firmware versions of the weighing transducer are 02.46 and 02.47.

The software version for the operators panel is 01.00.

The software of the PLC is protected by a checksum

The approved software for the PLC is version 1.01 with checksum 0610B3F02AAE.

3. Technical data

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

3.1 ILERPES automatic gravimetric filling instrument

Type:	ILERPES
Reference class:	0.2
Accuracy class:	0.2 or 0.5 or 1 or 2
Maximum capacity (Max):	10 kg to 4000 kg
Maximum fill (MaxFill):	= Max
Rated minimum fill (MinFill):	see table below.
Minimum capacity (Min):	= Minfill
Verification scale interval (d):	≥ 2 g
Weighing range:	Single-interval
Number of Verification Scale Intervals (n):	≤ 6000
Maximum tare effect:	≤ 100 % of Max
Maximum rate of operation:	up to 40 loads/min, but to be determined at initial verification
Temperature range:	-10° to +40° C
Electromagnetic class:	E2
Humidity:	Non-condensing
Maximum time between automatic zero-setting:	105 minutes
Warm-up time:	16 minutes
Mains power supply:	400 VAC or 230 VAC, 50 Hz or 60 Hz
Peripheral interface:	Set out in Section 4

3.1.1 Rated minimum fill (Minfill):

MinFill for verification scale interval d = 0.3 µV

d	Reference accuracy class							
	X(0.2)		X(0.5)		X(1)		X(2)	
[g]	d	[kg]	d	[kg]	d	[kg]	d	[kg]
2	1775	3.550	710	1.420	178	0.365	60	0.120
5	1775	8.875	710	3.550	355	1.775	89	0.445
10	2662	26.62	710	7.10	355	3.55	89	1.78
20	2662	53.24	1065	21.30	355	7.10	178	3.56
50	2662	133.10	1065	53.25	533	26.65	178	8.90
100	2662	266.2	1065	106.5	533	53.3	267	26.7
≥ 200	2662		1065		533		267	

MinFill for verification scale interval d = 0.67 µV

d	Reference accuracy class							
	X(0.2)		X(0.5)		X(1)		X(2)	
[g]	d	[kg]	d	[kg]	d	[kg]	d	[kg]
2	795	1.590	160	0.320	53	0.106	14	0.028
5	795	3.975	319	1.595	80	0.400	27	0.135
10	795	7.95	319	3.19	159	1.59	40	0.40
20	1192	23.84	319	6.38	159	3.18	80	1.60
50	1192	59.60	478	23.90	159	7.95	80	4.00
100	1192	119.2	478	47.8	239	23.9	80	8.0
≥ 200	1192		478		239		120	

MinFill for verification scale interval 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]
2	533	1.066	71	0.142	18	0.036	9	0.018
5	533	2.665	213	1.065	36	0.180	+	0.045
10	533	5.33	213	2.13	107	1.07	18	0.18
20	799	15.98	213	4.26	107	2.14	54	1.08
50	799	39.95	320	16.00	107	5.35	54	2.70
100	799	79.9	320	32.0	160	16.0	54	5.4
≥ 200	799		320		160		80	

3.2 LDU 78.1 version 3 weighing transducer

Type:	LDU 78.1 version 3
Maximum capacity (Max):	n × d
Verification scale interval (d):	≥ 0.3 µV
Weighing range:	Single-interval
Number of Verification Scale Intervals (n):	≤ 10000
Maximum tare effect:	≤ 100 % of Max
Temperature range:	-15° to +55° C
Electromagnetic class:	E2
Humidity:	Non-condensing
Excitation voltage:	5 VDC
Analogue range:	±11 mV
Minimum input impedance:	87.5 ohm
Maximum input impedance:	1150 ohm
Mains power supply:	12-24 VDC for input impedance ≥ 350 ohm 12-14 VDC for input impedance < 350 ohm
Peripheral interface:	Set out in Section 4

3.2.1 Connecting cable between the A/D module and the junction box for load cell(s), if any

3.2.1.1 4-wire system

Maximum length	The certified cable length for the load cell.
Line	4 wires, shielded

3.2.1.2 6-wire system

Line 6 wires, shielded

Option 1:

Maximum length	2243 m/mm^2
Maximum resistance per wire	37.9 Ohm

In case the (n) for the weighing instrument is less than (n_{max}) mentioned above, the following applies:

Option 2:

Coefficient of temperature of the span error of the indicator: Es = 0.0004 % / 25°K
Coefficient of resistance for the wires in the J-box cable: Sx = 0.0006 % / 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: WELMEC 2.1, annex 5.

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

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) 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

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 bin, tank or conveyor etc.
Reduction ratio	1
Junction box	Mounted in, on or near the dead load.
Load cell	Any R60 certified load cell according to section 3.2.1.
Drawings	Various.

3.4.2 'Loss-in-weight receptors

Construction in brief	A tank with screw transporter for emptying the specified weight of loss material from the tank. The tank and transporter are commonly suspended in 3 load cells.
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.

3.4.3 Load receptors for gross weighing

Construction in brief	Load cell assemblies with support for hold on bag, big bag and similar during the weighing directly into it.
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. T200092) are valid for the weighing instruments described here.

4. Interfaces and peripheral equipment

The aut. Weighing instrument shall have no accessible communication interfaces for communication to external equipment.

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, WELMEC 2 (Issue 5) 2009, paragraph 11 shall be satisfied.

6. Special conditions for verification

6.1 Composition of modules

The composition of modules shall agree with Section 5.2.

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

6.2 Maximum rate of operation

The maximum rate of operation shall be determined as part of the initial verification.

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 Weighing transducer

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 65535.

The current value of the event counter can be displayed on the operator's panel.

To indicate the sealed status of the event counter, the inscribed count of the event counter shall be written on the inscription plate or on a label, which is then placed on the inscription plate and then sealed by partially covering it with an official sealing label.

7.1.1.2 Sealing of electronic boards

The LDU 78.1 version 3 shall be protected against exchange by a sealing label covering the head of one of the screws used for fastening the board, or for fastening the enclosure covering the board.

7.1.1.3 Sealing of load cell connector

The connection of the cable from the junction box / the load cell is done with a sealing label.

7.1.2 Sealing of the VIPA 313 PLC

The memory card of the VIPA 313 PLC shall be secured against removal / exchange with a sealing label.

The communication cable to the operator's panel shall be secured with a sealing label.

All communication connectors except those for communication with the weighing transducer and with the operator's panel shall be secured against use with sealing labels.

7.1.3 Sealing of operator's panel

The operator's panel shall be protected against exchange by a sealing label. Its connection cable to the PLC shall likewise be sealed by a sealing label.

All other communication interfaces shall be sealed against use.

7.1.4 Sealing of junction box for load cells

The junction box shall be sealed against opening.

7.1.5 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.

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 shall be located on a visible place on the instrument.

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
- MaxFill, Minfill, Max, Min, and d (these shall additional be duplicated near the display unless the description plate is located near the display)
- Maximum rate of operation
- Kind of material(s) to be weighed
- Temperature range: -10 / +40 °C
- Electromagnetic class: E2
- Humidity: Non-condensing
- Type examination certificate number
- Value of event counter (see section 7.1.1.1)

9. Pictures

Figure 1: Control rack with operator's panel on front and weighing transducer and PLC inside

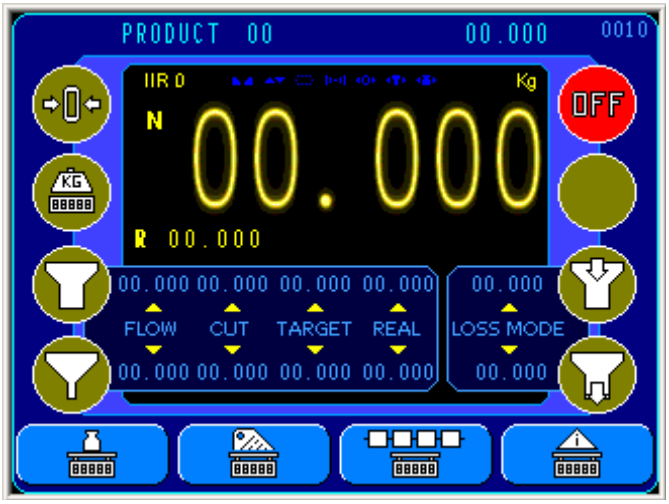

Figure 2: Operator's touch screen panel

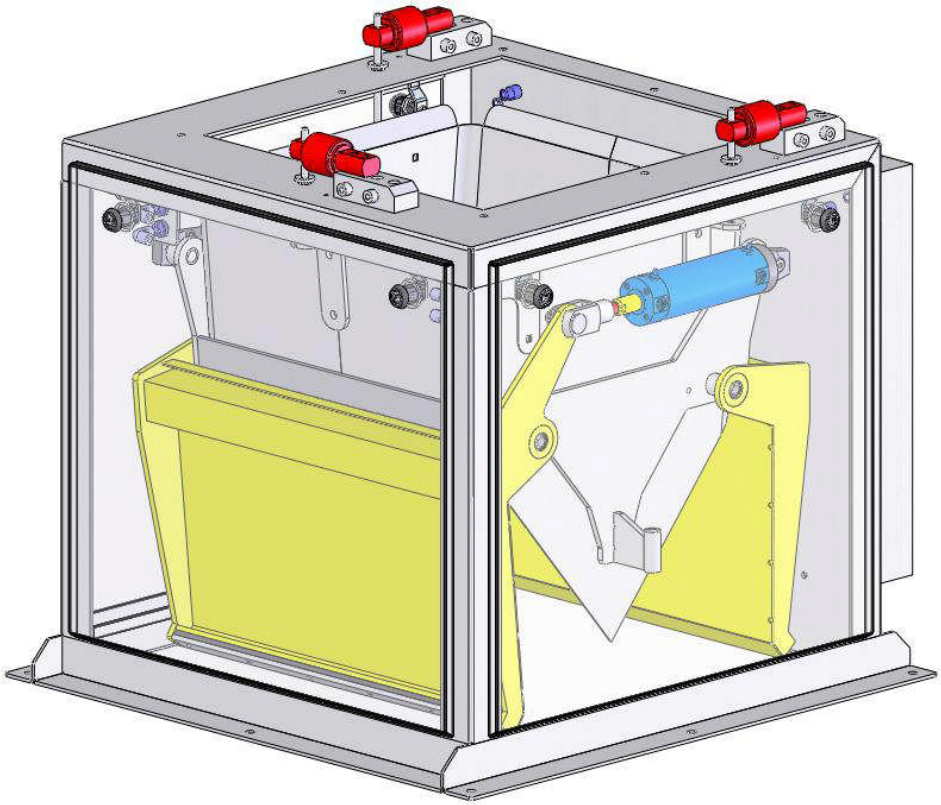

Figure 3: Load receptor bin for net weighing

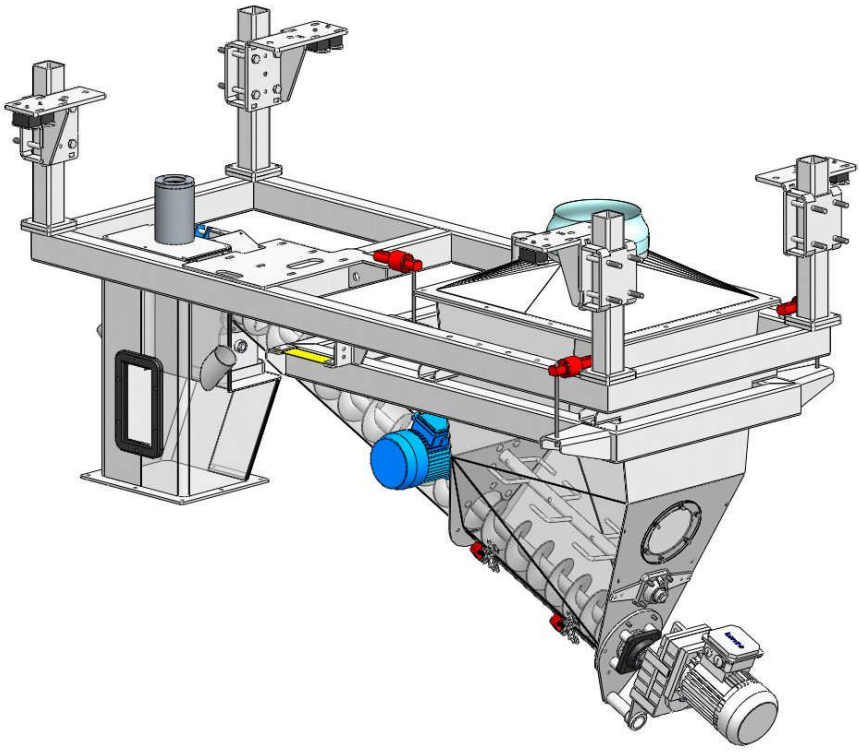

Figure 4: Load receptor for loss-in-weight system.

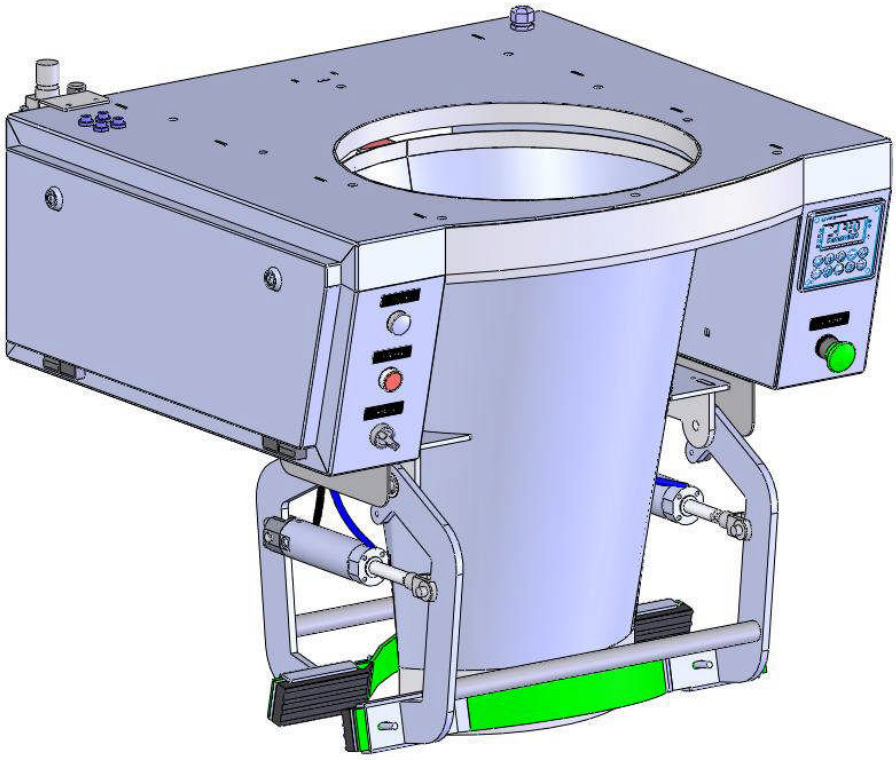

Figure 5: Load receptor for gross weighing into bag, big bag, etc.

Figure 6. Sealing of LDU 78.1 weighing transducer, against removal and its load cell cable,

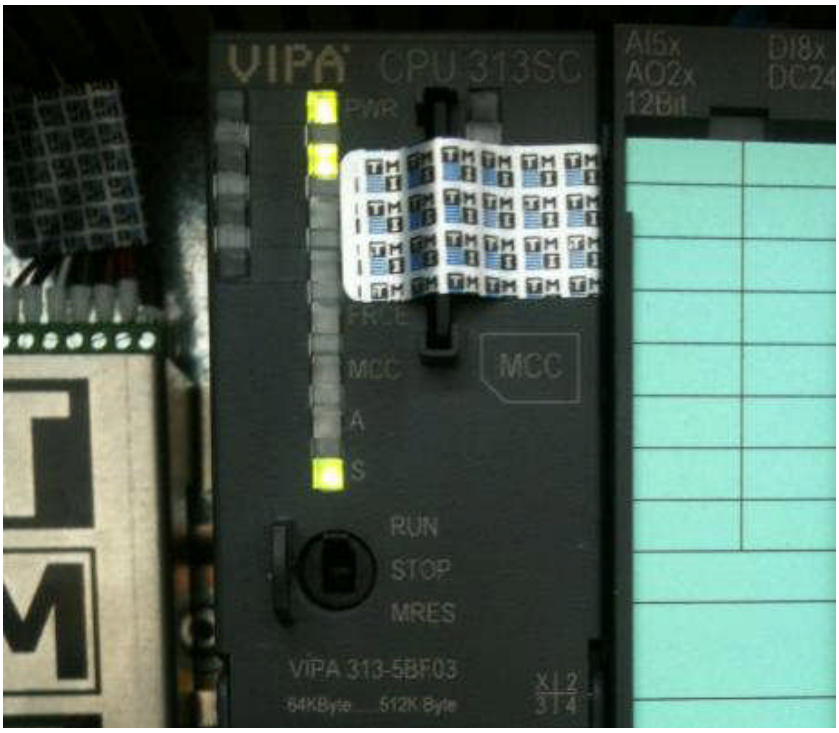

Figure 7. Sealing of the memory card of the PLC

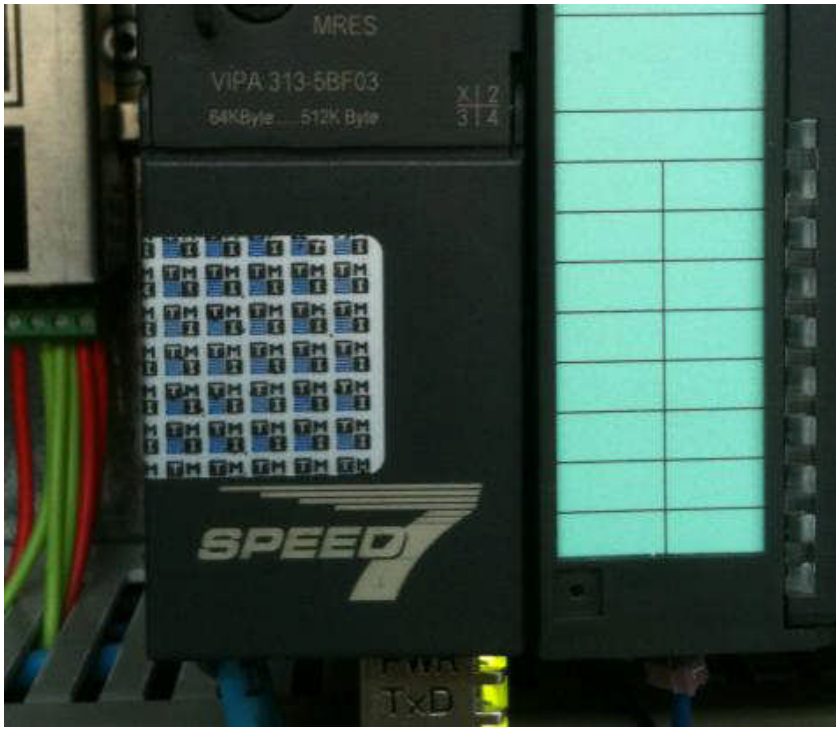

Figure 8. Sealing of access to communication terminals of the PLC

Figure 9. Sealing of AGP3200 and its interfaces

10. Composition of modules - illustrated

COMPATIBILITY OF MODULES

Ref.: WELMEC 2

Non-Automatic Weighing Instrument, single-interval

Certificate of EU Type-Approval N°: TAC: DK0199.308

INDICATOR A/D (Module 1)	Type:	LDU 78.1 version3			
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]	0,3	
Minimum load cell impedance:		R_{Lmin}	[Ω]	87,5	
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]	2243	
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]	-15 /	55
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		3	
Reduction ratio of the load transmitting device:		$R=F_M / F_L$		1	
Dead load of load receptor:		DL	[% of Max]	75	
Non uniform distribution of the load:		NUD	[% of Max]	20	
Correction factor:	Q = 1 + (DL + T^+ + $IZSR^+$ + NUD) / 100			2,05	
LOAD CELL ANALOG (Module 3)	Type:	HBM Z6			
Accuracy class according to OIML R60:		$Class_{LC}$ (A, B, C or D)		C	
Maximum number of load cell intervals:		n_{LC}		6000	
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]	0,00667	
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:		TC2207			
COMPLETE WEIGHING INSTRUMENT		Single-interval			
Manufacturer: TMI	Type:	ILERPES			
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]	60	
Number of verification scale intervals:		n		6000	
Verification scale interval:		e	[kg]	0,01	
Utilisation ratio of the load cell:		α = (Max / E_{max}) * (R / N)		0,40	
Input voltage (from the load cells):		Δ_u = C * U_{exc} * α * 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]	0	
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 =	4000
n	<=	n_{ind}	(WELMEC 2: 4)	n_{ind} - n =	4000
n	<=	n_{LC}	(R76: 4.12.2)	n_{LC} - n =	0
E_{min}	<=	DL * R / N	(WELMEC 2: 6d)	(DL * R / N) - E_{min} =	15
v_{min} * √N / R	<=	e	(R76: 4.12.3)	e - (v_{min} * √N / R) =	0,004
or (if v_{min} is not given)				Alternative solutions: ↑ ↓	
(E_{max} / n_{LC}) * (√N / R)	<=	e	(WELMEC 2: 7)	e - ((E_{max} / n_{LC}) * (√N/ R)) =	
Δu_{min}	<=	Δu	(WELMEC 2: 8)	Δu – Δu_{min} =	0,37
R_{Lmin}	<=	R_{LC} / N	(WELMEC 2: 9)	(R_{LC} / N) - R_{Lmin} =	29
L / A	<=	$(L / A)_{max}^{WI}$	(WELMEC 2: 10)	$(L / A)_{max}^{WI}$ - (L / A) =	2243
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) =	9,0

Signature and date:

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

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