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EC Type-Approval Certificate

No. DK 0199.541

KCFill1

NON-AUTOMATIC WEIGHING INSTRUMENT

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

In accordance with the requirements for the non-automatic weighing instrument of EC Council Directive 2009/23/EC.

Issued to **Kosan Crisplant A/S**
P. O. Pedersens Vej 22
8200 Aarhus N
Denmark

In respect of Non-automatic weighing instrument designated KCFill1 using variants of modules of load cells and peripheral equipment.
Accuracy class III
Maximum capacity, Max: From 30kg up to 120 kg
Verification scale interval: e = Max / n
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 of the Directive is met by the application of EN 45501:2015 and OIML R76:2006

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

The annex comprises 12 pages.

Issued on **2015-09-23**
Valid until **2025-09-23**

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Descriptive annex

Contents

1. Name and type of instrument and modules

The non-automatic weighing instrument designated KCFill1 is a self-indicating scale intended for weighing of gas cylinders hanging from the instrument.

The instrument is a Class III, self-indicating weighing instrument with single-interval. The instrument is powered by either the CPI-Ex (Crisplant Power Interface) or the CBP-Ex (Crisplant Battery Pack), which also contains a serial interface to peripheral equipment such as a PC. The system is for use in hazardous areas.

The modules appear from Sections 3.2 and 3.3; 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 KCFill1

Enclosures and keyboard

The KCFill1 is designed primarily for industrial use, but may also be used in an office environment. This enclosure is designed to meet an IP65 rating and can be exposed to water and dust.

The front panel comprises:

- LCD display
- 16 key sealed membrane keypad (12 keys for encoding and 4 function keys).
  Each key is identified with a name and / or pictograph.
- Push button

The bottom of the enclosure contains:

- A power/communication cord attached to the instrument via a gland connector.
- The load receptor with a screw eye or a hook for connecting the hanging load

The KCFill1 is fitted with a levelling device and a level indicator (see Figure 2).
The limiting value of tilting is defined by a marking ring on the level indicator, which shows when the maximum permissible tilt has been exceeded. For the KCFill1 the maximum permissible tilt has been exceeded when the bubble is displaced from its central position and the edge of the bubble is touching the marking ring.
The level indicator is placed clearly visible in the bottom of the equipment on the front side.

Electronics

The main board includes a microprocessor circuit control with volatile and non-volatile memory, keyboard, and display.
The function of it is to control the filling sequence and to receive weight information from the load cell interface module (LCM) and show the digital represented weight in the display.

The LCM module includes a microprocessor control circuit, analogue to digital conversion circuitry for digitizing the load cell signal, non-volatile memory for storage of calibration and weight data.
All the configuration parameters for the weight that is under legal metrology control are stored in the non-volatile memory of the LCM module. The LCM module is programmed with the weight software driver version 1.01.zz.

2.1.2 Power supply box / junction box

The CPI-Ex power supply for the instrument is of universal switching type and can accept an input voltage from mains from 100 to 240 VAC 50 or 60 Hz.

Alternative the instrument can be supplied from the CPB-Ex battery pack.

When the instrument is powered a junction box is inserted between the KCFill1 and the power source. The power supply includes an interface to a bi-directional RS485 serial interface.

2.1.3 Interfaces and peripheral equipment

Set out in Section 4.

2.2 Function

The primary functions provided are detailed below.

2.2.1 Power up / reset

On power up or reset, the weight indicator will show a logo, then the instrument model number and the software revision followed by a test. Hereafter the indicator will show ready (if no errors detected) and finally the current weight using either the previously established zero reference or, if configured to do so, will automatically establish the current weight as a new zero reference.

2.2.2 Test function

On power up or reset, the weight indicator will test all memory functions followed by a display test. Each test takes about ½ second. At the conclusion of the test, the indicator displays “ready”.

2.2.3 Display range

The weight indicators will display weight from –99,999e to Max +9e (gross weight) within the limits of the display capacity.

2.2.4 Zero-setting

Pressing the ZERO key causes a new zero reference to be established.

Zero-setting range: 4 % of Max.
Initial zero-setting range: 20 % of Max.

Zero-setting is only possible when the load receptor is not in motion.

2.2.5 Zero-tracking

The indicator is equipped with a zero-tracking feature, which operates over a range of 4 % of Max and only when the indicator is at gross zero and there is no motion in the weight display.

2.2.6 Units

The selected unit of measure is indicated in the weight display. Available units of measure include kilogram or pound.

2.2.7 Tare

The instrument models are provided with keyboard preset tare feature.

2.2.7.1 Preset (numeric) tare

A pre-set or numeric tare feature, which allows entry of a known tare value, is available in the instrument.

Encoding of tare:
Press the appropriate numeric keys to enter the known tare weight, then press the ENTER key. When ENTER key is pressed, the numeric value entered will be accepted and the tare will be written and shown in the display. Tare encoding will only be accepted if a load above a pre-configured START limit is applied to the weighing system.

Pre-set tare (fix tare):
The instrument can also work with a pre-set (fix tare option). If using the fix tare option, the fix tare information will be shown in the display when a load above a pre-configured START limit is applied to the weighing system.

When load gets below the configured START limit, the tare information in display is cleared.
The tare value entered must agree with the verification scale interval (e). Entered values with more decimals than the visible display resolution are rounded to the e-value.

2.2.8 Operator information messages

The weight indicator has a number of general and diagnostic messages, which are described in detail in the Owner's Manual.

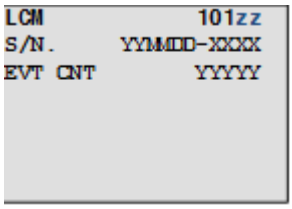
2.2.9 Software version

The approved software versions are:

For mainboard	3.xx.yy
For LCM module	1.01.zz

Mainboard software:
[xx] : This number is a value between [01..99]
[yy] : This number is a value between [01..99]

LCM module software:
Version number information for the LCM module:



[zz] : This number is a value between [01..99]

S/N. [YYMMDD-XXXX is the serial number of the LCM module. YY=year, MM=month, DD=date followed by a number in succession.

EVT CNT [YYYYY] is the LCM-event counter value. The counter is a non-resettable value that increments once each time a special operational mode of the weighing instrument is entered and one or more changes are made to configuration parameters of the scale. The counter value is stored in non-volatile memory.

The mainboard software number is shown during start-up of the instrument, alternatively all software revision levels can be displayed upon request. Refer to owner user manual.

3. Technical data

3.1 KCFill1

The KCFill1 non-automatic weighing instrument has the following characteristics:

Accuracy class:	III
Weighing range:	Single-interval
Number of Verification Scale Intervals (n):	≤ 3000
Maximum capacity (Max):	30 kg to 120 kg
Verification scale interval (e =):	Max/n
Minimum capacity (Min):	≥ 20e
Maximum tare effect:	-Max within display limits
Electromagnetic class:	E2
Temperature range:	-10 °C to 55 °C
External mains power supply:	100 to 240 Vac (50/60 Hz) or 12 Vdc battery
Peripheral interface:	Set out in Section 4

3.2 A/D board (for compatibility of modules calculation)

Accuracy class:	III
Weighing range:	Single-interval
Maximum number of Verification Scale Intervals:	3000
Internal resolution:	> 30,000 counts
Fractional factor:	pi = 0.5
Minimum input-voltage per VSI:	1 µV
Minimum signal voltage for dead load:	1 mV
Excitation voltage:	5 Vdc
Analogue range:	0 to 10 mV
Circuit for remote sense:	None
Minimum input-impedance:	175 ohm
Maximum input-impedance:	1200 ohm

3.3 Load cell

3.3.1 General acceptance of modules

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 OIML Certificate of Conformity (R60) or a test certificate (EN 45501) 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 Composition of modules

For the composition of modules, EN 45501: 2015 annex F shall be satisfied.

3.5 Documents

The documents filed at DELTA (reference No. T211102) are valid for the weighing instruments described here.

4. Interfaces and peripheral equipment

The interfaces are characterised "Protective interfaces" according to paragraph 8.4 in the Directive.

4.1.1 Power supply / junction box

The power supply includes electronics to convert the main power supply to appropriate supply voltage for the weighing system.
The junction box includes connectors for distributing the supply voltage. Figure 1 shows an example of one particular configuration of the weighing equipment.

4.1.2 Serial I/O interface

The serial connection to KCFill1 is always done through the power supply, which has a RS485 channel that also Ex protects the device.
A 2-terminal connector providing a bi-directional RS485 compatible interface is positioned on the power supply and is accessed through a gland connector on the side panel of the instrument enclosure.

The interfaces do not have to be secured.

4.2 Peripheral equipment

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

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

5. Approval conditions

5.1 Measurement functions other than non-automatic functions

Measurement functions that will enable the use of the instrument as an automatic weighing instrument are not covered by this type approval.

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 5.2.

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 or alternative mark of the manufacturer according to ANNEX II, section 2.3 of the Directive 2009/23/EC.

7.1.1 KCFill1

Access to the configuration and calibration facility requires that the scale is set in unlocked mode. Unlocking and locking is done via the menu system. If the scale is unlocked and/or legal parameters is changed, a non-resettable audit trail counter is incremented.

The value of the counter can be read out on the display.

Sealing of the cover of the enclosure – to prevent exchange of load cell and to secure the electronics against dismantling/adjustment - is accomplished with two brittle plastic stickers. The stickers are placed across the internal enclosure assembly between the electronics and the load cell (see Figure 3).

7.1.2 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

7.2.1 Indicator

A green M-sticker shall be placed next to the CE mark on the inscription plate.

The sticker with verification marks may be placed on or next to the inscription plate or on the front of the indicator.

7.2.2 Printers used for legal transactions

Printers covered by this type approval and other printers according to Section 4.2, which have been subject to the conformity assessment procedure, shall not bear a separate green M-sticker in order to be used for legal transactions.

8. Location of CE mark of conformity and inscriptions

8.1 CE mark

The CE mark is located on the front panel overlay or placed on a metalized label on the enclosure.

8.1.1 KCFill1 inscriptions

Manufacturer's trademark and name and the type designation is located on the front panel overlay.

- Type name
- Other electrical data and inscriptions.

Indelibly printed on a plastic sticker or a non-removable metalized label located on the front panel overlay:

- Max, Min, e =
- Serial number: S/N yymmdd-xxx (year,month,day – number in succession).
- Humidity: Non-condensing
- Temperature range
- EMC Class
- Certificate No., Accuracy class

A sticker placed by notified body, who makes the authorisation including the information:

- Notified body number
- Audit trail counter (from the recalled software version information for the LCM module)

9. Pictures

FIG. 1 KCFill1

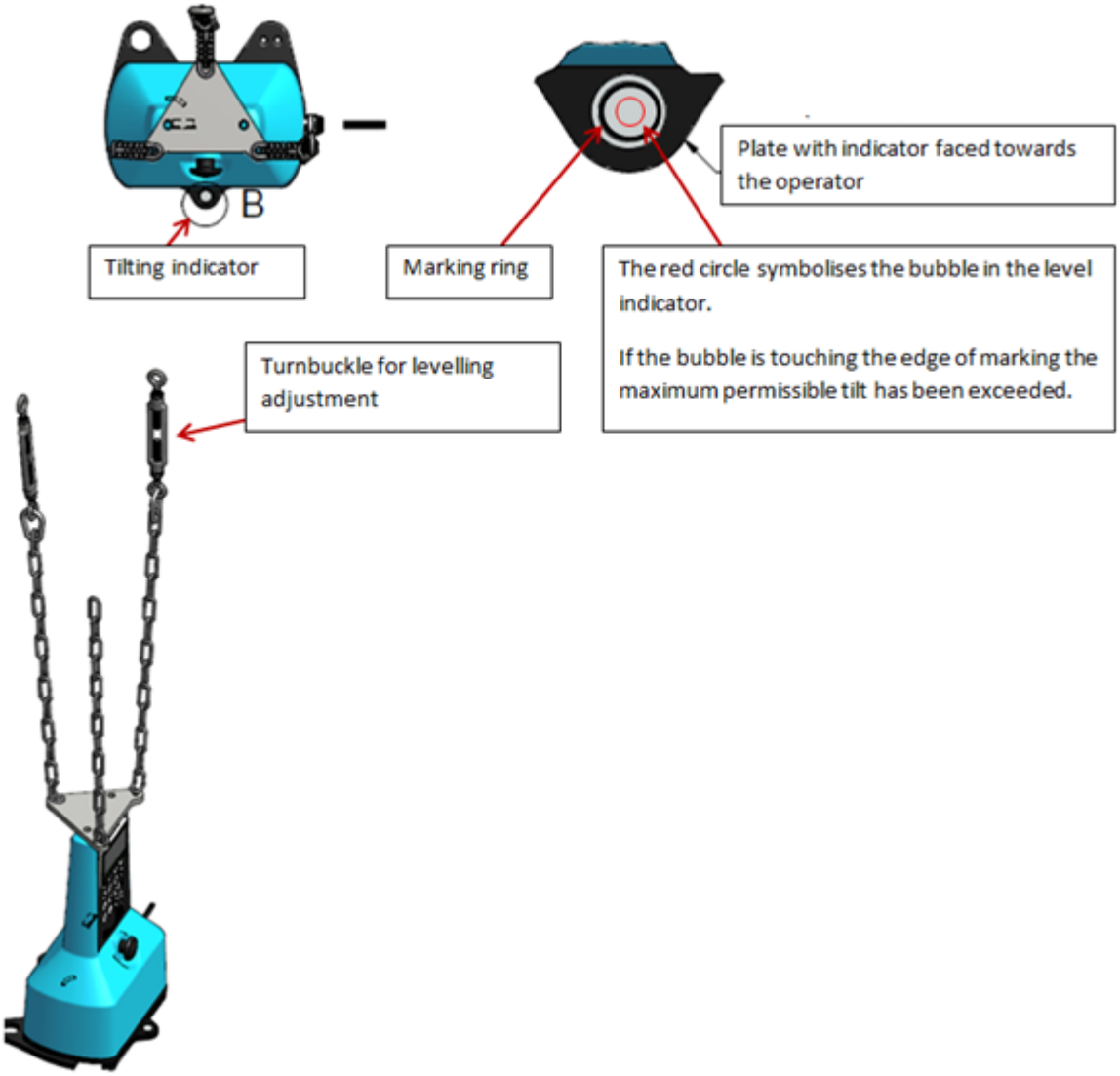


Fig. 2 KCFill1 suspension and tilt indicator.

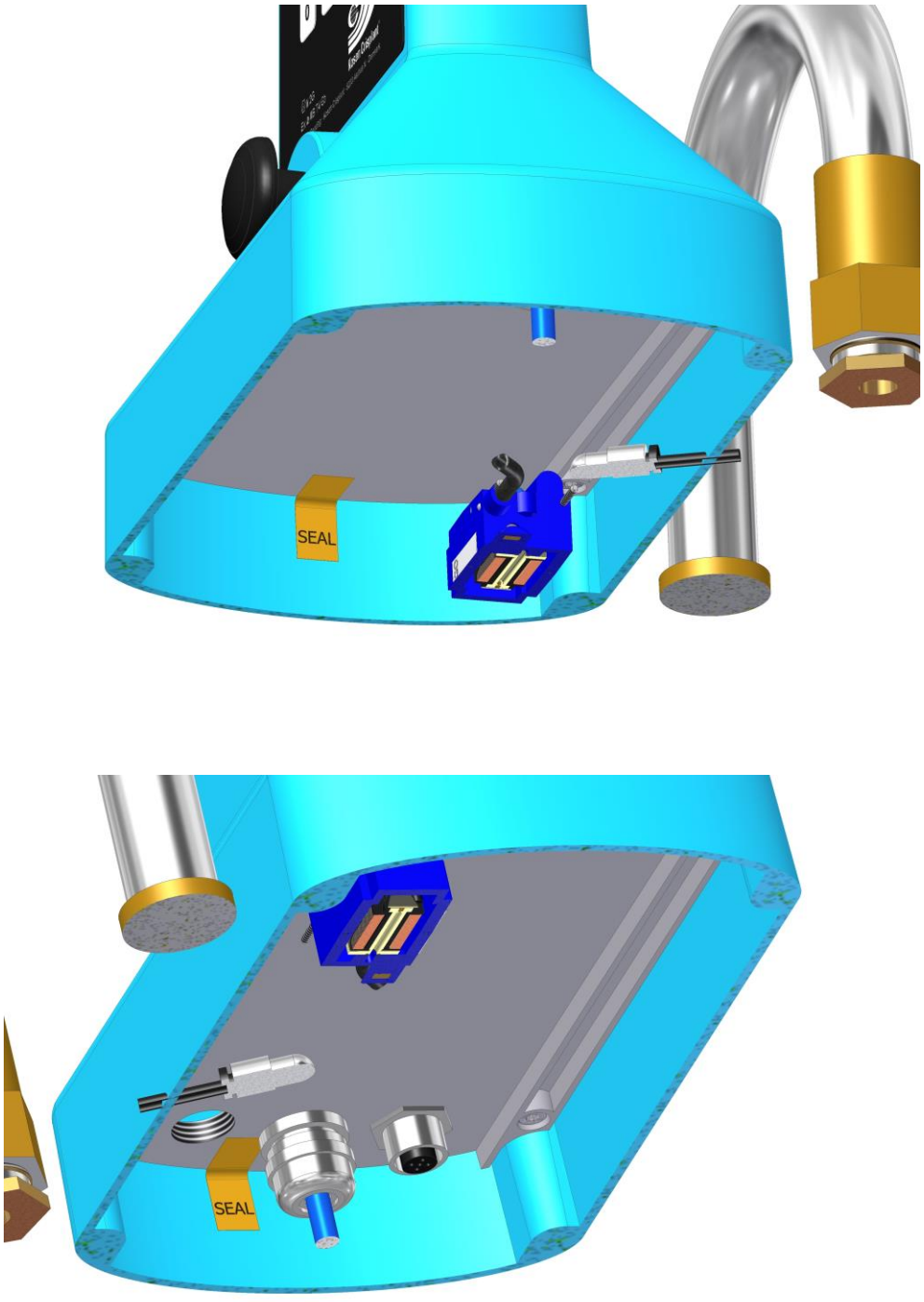


FIG. 3 Sealing of KCFill1

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: DK0199.541

INDICATOR A/D (Module 1)		Type:	KCFill1			
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]	5		
Minimum input-voltage per verification scale interval:		Δu_{min}	[µV]	1		
Minimum load cell impedance:		R_{Lmin}	[Ω]	175		
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]			
Load cell interface:				4-wire (no 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	/	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		1		
Reduction ratio of the load transmitting device:		$R=F_M / F_L$		1		
Dead load of load receptor:		DL	[% of Max]	10		
Non uniform distribution of the load:	(NUD = 0 is acceptable)	NUD	[% of Max]	0		
Correction factor:	$Q = 1 + (DL + T^+ + IZSR^+ + NUD) / 100$			1,2		
LOAD CELL ANALOG (Module 3)		Type:	Flintec PC6			
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]	200		
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:			D09-00.02			
COMPLETE WEIGHING INSTRUMENT			Single-interval			
Manufacturer: Kosan Crisplant		Type:	KCFill1			
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]	120		
Number of verification scale intervals:		n		2400		
Verification scale interval:		e	[kg]	0,05		
Utilisation ratio of the load cell:		$\alpha = (Max / E_{max}) * (R / N)$		0,60		
Input voltage (from the load cells):		$\Delta_u = C * U_{exc} * \alpha * 1000 / n$	[µV/e]	2,50		
Cross-section of each wire in the J-box cable:		A	[mm²]			
J-box cable-Length:		L	[m]			
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 =	7600
n	<=	n_{ind}	(WELMEC 2: 4)	n_{ind} - n =	600
n	<=	n_{LC}	(R76: 4.12.2)	n_{LC} - n =	600
E_{min}	<=	DL * R / N	(WELMEC 2: 6d)	(DL * R / N) - E_{min} =	12
$v_{min} * \sqrt{N} / R$	<=	e	(R76: 4.12.3)	e - (v_{min} * √N / R) =	0,030
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} =	1,50
R_{Lmin}	<=	R_{LC} / N	(WELMEC 2: 9)	(R_{LC} / N) - R_{Lmin} =	175
L / A	<=	$(L / A)_{max}^{WI}$	(WELMEC 2: 10)	$(L / A)_{max}^{WI}$ - (L / A) =	Not applicable
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) =	56,0

Signature and date:

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

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