EC Type-Approval Certificate

No. DK 0199.341

5024G
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	Eilersen Electric A/S
	Kokkedal Industripark 4
	2980 Kokkedal
	Denmark

In respect of	Non-automatic weighing instrument designated 5024G with variants of modules.
	Accuracy class III
	Maximum capacity, Max 1 kg up to 999 999 kg
	Verification scale interval: $e = \text{Max} / n$
	$n_{max} = 10000$ (depending on the compatibility of 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 the European Standard EN 45501:1992 and OIML R76:2006

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

The annex comprises 10 pages.

Issued on	**2014-10-17**
Valid until	**2024-10-17**

Signatory: J. Hovgård

Descriptive annex

Contents **Page**

1. Name and type of instrument and modules

The instrument is a non-automatic weighing instrument, designated Eilersen Electric 5024G, consisting of a digital weighing terminal 5024G (see Fig. 1) and a load receptor equipped with digital load cell(s), and with the load cell(s) communicating through a digital load cell interface to the 5024G using a RS485 or ethernet connection.

The maximum number of digital load cells connected to one 5024G through the digital load cell interface(s) is 16.

The instrument is a class III, 24 VDC powered, self-indicating weighing module with single-interval or multi-interval.

The weighing instrument is composed of separate modules and units that are listed in Sections 3.1 to 3.4; the principle of composition of modules is set out in Section 6.1.

2. Description of the construction and function

2.1 Construction

2.1.1 Display module (see Figure 1 and 3)

2.1.2 Indicator

The indicator is specified in Section 3.1.

Enclosures and keyboard

The indicator is housed in an enclosure made of steel.

The front panels of the indicator comprise:

- A dot matrix LCD display with appropriate state indicators.

- A keyboard containing 7 function keys with pictogram, which may be stated more precisely by a pictogram in the display just above the key.

Electronics

The indicator consists of a mainboard, a power supply board, a keyboard interface board, and a display interface board. The mainboard contains a RS485 port for connection to the digital load cells and Ethernet communication interfaces.

All instrument calibration and metrological setup data are contained in non-volatile memory. The indicator is power supplied by 24 VDC.

2.1.3 Load receptors, load cells and load receptor supports

Set out in Section 3.2.

2.1.4 Interfaces and peripheral equipment

Set out in Section 4.

2.2 Function

The functions provided are detailed below.

2.2.1 Power-up

On power-up, the 5024G first displays the name of the manufacturer for 5 seconds, while it performs a self-test and initial zero-setting. It then displays the software version and the value of the event counter after which it enters normal weighing mode.

2.2.2 Zero-setting

The instrument is equipped with an initial zero-setting device with the effect of ±8 % of Max from the calibration zero.

The instrument is also equipped with a semi-automatic zero-setting device operated by the key marked >0<. The semi-automatic zero device has a maximum effect of ±2 % of Max from the initial set zero.

Zero-setting is only possible when the load receptor is not in motion (the '━' annunciator is on).

The '>0<' annunciator is on when the weight result is within 0.25 e of the zero-point.

2.2.3 Zero-tracking

The instrument is optionally equipped with a zero-tracking device, which operates up to ±2 % of Max from the initial zero-setting, when the load receptor is not in motion and the indication is at zero. The corrections are not more than 0.5 e within one second.
When zero-tracking is operating the "ZT"indicator is turned on.

2.2.4 Tare

The instrument is equipped with a semi-automatic tare balancing device operated by the 'T' key.

2.2.4.1 Semi-automatic tare

The current weighed value is entered as a tare by pressing the 'T' key. Repeated pressing causes the actual tare to be cleared and the new tare to be entered in its place.

The '⏎' key toggles between display of net weight and gross weight. The text 'GROSS' or 'NET' in the display shows the actual selected one.

The tare device is a subtractive tare device with maximum effect T = -Max.

2.2.5 No-motion indication

The 5024G indicates no-motion by a no-motion annunciator '━', which extinguishes when the load receptor is in motion.

2.2.6 Printing

The 5024G has the possibility of transmitting the current weight to a standard RS485 or Ethernet printer by activating the "Print" key.

2.2.7 Alibi memory

The 5024G has an internal long term storage device in which all printed data are stored.

2.2.8 Real time clock

5024G is equipped with a real time clock.

2.2.9 Operator information messages

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

2.2.10 Software version

The approved software version is STD.130917.2vXX, where XX is minor version numbers for changes and corrections not influencing the legal function of the software.

3. Technical data

3.1 Digital indicator

Manufacturer:	Eilersen Electric A/S
Type:	5024G
Accuracy Class:	III
Weighing ranges:	Single-interval or multi-interval
Maximum number of verification scale intervals:	≤ 10000
Internal resolution:	24 bit
Maximum tare effect:	-Max
Operating temperature range:	-10 °C / +40 °C
Power supply:	24 Vdc ± 10 %, 2 A, not to be supplied from DC Mains
Peripheral interfaces:	Set out in Section 4

3.2 Digital load cells

Digital load cell(s) with RS485 made by Eilersen Electric may be used for instruments under this certificate of type approval provided the following conditions are met:

1) There is a respective test certificate (EN 45501) or 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), 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.

3.3 Load receptors

3.3.1 Platforms, weigh bridge platforms

Construction in brief:	All-steel or steel-reinforced concrete construction, surface or pit mounted
Reduction ratio:	1
Junction box:	Mounted in or on the platform
Load cells:	Load cell according to Section 3.2.1
Drawings:	Various

3.3.2 Bin, tank and hopper systems

Construction in brief:	Load cell assemblies each consisting of a load cell stand assembly to support one of the mounting feet of the bin, tank or hopper
Reduction ratio:	1
Junction box:	Mounted on dead structure
Load cell:	Load cell according to Section 3.2.1
Drawings:	Various

3.4 Composition of modules

In case of composition of modules, EN 45501 paragraph 3.5 and 4.12 shall be satisfied.

3.5 Documents

The documents filed at DELTA (reference No. T200854) are valid for the weighing instruments described here.

3.6 Composition of modules

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

4. Interfaces and peripheral equipment

4.1 Interfaces

All cables used for connection to the interfaces shall be shielded.

4.1.1 Digital load cell bus

A RS485 interface used for communication with the digital load cell(s).

4.1.2 I/O and communication interfaces

- Ethernet

- RS485

- Digital I/O

- Analog output

4.2 Peripheral equipment

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

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

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 for the composition of modules 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 Event counter

The digital indicator has a non-resettable event counter, which is incremented each time the setup or calibration data are changed. The event counter is also incremented, if new software is downloaded into the indicator.

7.1.2 Digital indicator

The digital indicator shall be sealed against disassembling by means of brittle plastic stickers inscribed with verification mark of a notified body. Any attempt to remove the cover plate shall result in damage to the seal.

7.1.3 Digital indicator – digital load cell module – digital load cell(s) connections

The connectors of the cables between the digital indicator and the digital load cell module and/or digital load cell(s) shall all be sealed with brittle plastic stickers or with wire and seal.

7.1.4 Peripheral interfaces

All peripheral interfaces are "protective"; they neither allow manipulation of 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 Display module

A green M-sticker and a sticker with verification marks shall be placed visible on the digital indicator.

7.2.2 Printers used for legal transactions

Printers according to Section 4.2 shall not bear a green M-sticker, as a non-automatic weighing instrument shall only bear one green M.

8. Location of CE mark of conformity and inscriptions

8.1 Display module

8.1.1 CE mark

A CE mark of conformity and year of production shall be placed on the inscription plate.

8.1.2 Inscriptions

On the front of the Display module the following is inserted on a rating plate near the primary Weight Display:

- Max, Min, e =

On the front panel are the following inscriptions:

- Manufacturer's name/trademark, the type designation, serial number, accuracy class, type approval certificate No., electrical data.

8.2 Load receptors

On an inscription plate:

- Manufacturer's name/trademark, type designation, serial number, Max.

9. Pictures

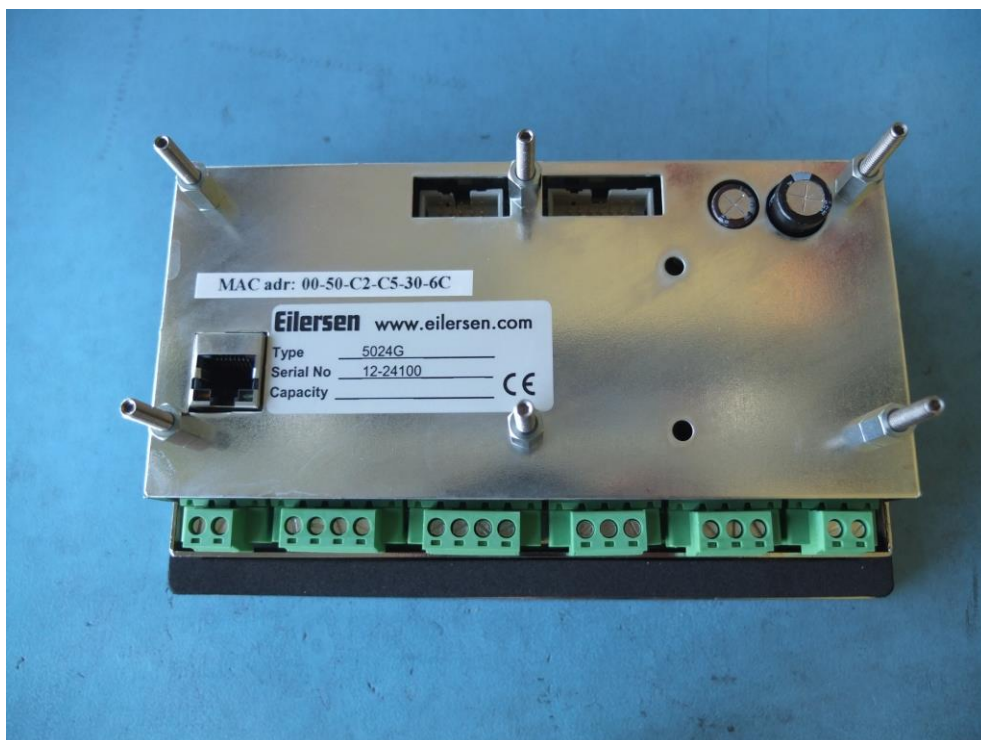

Figure 1. 5024G digital indicator.

Figure 2. 5024G digital indicator seen from the rear side.

Fig.3 MCE2010 Digital load cell interface module.

Fig.4 Digital load cell type SD.

10. Composition of modules – an example

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

Certificate of EU Type-Approval Nº: TAC: DK0199.341

DISPLAY MODULE   (digital)(Module 1)   Type: 5024G

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
Load cell excitation voltage:	U_{exc}	[Vdc]	Not applicable (N/A)
Minimum input-voltage per verification scale interval:	Δu_{min}	[µV]	N/A
Minimum load cell impedance:	R_{Lmin}	[Ω]	N/A
Coefficient of temperature of the span error:	Es	[% / 25°C]	N/A
Coefficient of resistance for the wires in the J-box cable:	Sx	[% / Ω]	N/A
Specific J-box cable-Length to the junction box for load cells:	$(L/A)_{max}$	[m / mm²]	N/A
Load cell interface:			N/A
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:			Platform
Fraction of mpe:	p_2		0,5
Number of load cells:	N		4
Reduction ratio of the load transmitting device:	$R=F_M/F_L$		1
Dead load of load receptor:	DL	[% of Max]	25
Non uniform distribution of the load:	NUD	[% of Max]	20
Correction factor:	$Q = 1 + (DL + T^+ + IZSR^+ + NUD) / 100$		1,55

LOAD CELL   **DIGITAL** (Module 3)   Type: SD

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		0,8
Rated output (sensitivity):	C	[mV / V]	Digital output
Input resistance of single load cell:	RLC	[Ω]	Not applicable
Minimum load cell verification interval: ($v_{min\%} = 100 / Y$)	$v_{min\%}$	[% of Emax]	0,002
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:			

COMPLETE WEIGHING INSTRUMENT   **Single-interval**

Manufacturer:	Eilersen Electric A/S	Type:	5024G
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		0,9
Maximum capacity:	Max	[kg]	120
Number of verification scale intervals:	n		6000
Verification scale interval:	e	[kg]	0,02
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]	Not applicable (N/A)
Cross-section of each wire in the J-box cable:	A	[mm²]	N/A
J-box cable-Length:	L	[m]	N/A
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 =	0,1
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} =	7,5
$v_{min} \cdot \sqrt{N} / R$	<=	e	(R76: 4.12.3)	e - ($v_{min} * \sqrt{N} / R$) =	0,018
or (if v_{min} is not given)				Alternative solutions:	↑ ↓
$(E_{max} / n_{LC}) \cdot (\sqrt{N} / R)$	<=	e	(WELMEC 2: 7)	e - ((E_{max} / n_{LC}) * ($\sqrt{N}/ R$)) =	
Δu_{min}	<=	Δu	(WELMEC 2: 8)	$\Delta u - \Delta u_{min}$ =	N/A
R_{Lmin}	<=	R_{LC} / N	(WELMEC 2: 9)	(R_{LC} / N) - R_{Lmin} =	N/A
L / A	<=	$(L / A)_{max}^{WI}$	(WELMEC 2: 10)	$(L / A)_{max}^{WI}$ - (L / A) =	N/A
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) =	3,5

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

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