DANAK
PROD Reg. nr 7026

FORCE Certification

EU Type Examination Certificate

No. 0200-NAWI-17598

10i / 10s

NON-AUTOMATIC WEIGHING INSTRUMENT

Issued by **FORCE Certification**
EU - Notified Body No. 0200

In accordance with the requirements in Directive 2014/31/EU of the European Parliament and Council.

Issued to **Fidelity Measurement Co., Ltd.**
6F No. 33 Dalian 4th Street,
Taoyuan District,
Taoyan City 33043
Taiwan

In respect of Non-automatic weighing instrument designated 10i / 10s with variants of modules of load receptors, load cells and peripheral equipment.
Accuracy class III
Single interval, multi interval (dual), multirange (dual)
Maximum number of verification scale intervals: n ≤ 10000 or 2x 10000 (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 the European Standard 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 13 pages.

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Valid until **2034-07-04**

Jens Hovgård Jensen
2024-07-04

Digitally signed by Jens Hovgård Jensen
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FORCE Certification references:
Task no.: 123-31187.90.10 and ID no.: 0200-NAWI-17598-1

Signatory: Jens Hovgård Jensen

Descriptive annex

Contents

1. Name and type of instrument and modules

The weighing instrument is designated 10i / 10s. It is a system of modules consisting of an electronic indicator connected to a separate load receptor and peripheral equipment, such as printers or other devices, as appropriate. The instrument is a Class III or IIII self-indicating weighing instrument with single interval, multi interval (dual) or multirange (dual), supplied with 12 VDC from external mains adapter and with an internal rechargeable battery (optional).

The name of the instrument may be followed by alphanumeric characters for technical, legal or commercial characterization of the instrument.

The indicators consist of analogue to digital conversion circuitry, microprocessor control circuitry, power supply, keyboard, non-volatile memory for storage of calibration and setup data, and a weight display contained within a single enclosure.

The modules appear from Sections 3.1, 3.2.1, and 3.2.2; 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 is specified in Section 3.1.

Enclosures and keyboard

The indicators are housed in an enclosure made of either ABS plastic (10i) or stainless steel (10s).

The front panels of the indicator comprise:

- an LCD display with appropriate state indicators and 6 digits.
- A keyboard containing 12 keys plus a numerical keyboard. Each key is identified with a name and/or pictograph and is used to enter commands or data into the weight indicator.

Electronics

The instruments use a single PCB, which contains all of the instrument circuitry including microprocessor, memory, AD circuitry and display. The metrological circuitry for the models of weight indicator is identical.
Additionally, there is a PCB for different kind of interfaces.
A calibration jumper is mounted on the main board and is accessed by opening the housing.

All instrument calibration and metrological setup data are contained in non-volatile memory. The power supply accepts an input voltage of 12 VDC from the external power adapter with input from 100 to 240 VAC 50/60 Hz. The indicator produces a load cell excitation voltage of 5 VDC.

2.1.2 Load receptors, load cells, and load receptor supports

Set out in Section 3.2.

2.1.3 Interfaces and peripheral equipment

Set out in Section 4.

2.2 Functions

The weight indicating instruments are microcontroller based electronic weight indicators that require the external connection of strain gauge load cell(s). The weight information appears in the digital display located on the front panel and may be transmitted to peripheral equipment for recording, processing or display.

The primary functions provided are detailed below.

2.2.1 Display range

The weight indicators will display weight from –Max to Max (gross weight) within the limits of the display capacity.

2.2.2 Zero-setting

Pressing the "ZERO" key causes a new zero reference to be established and ZERO annunciator to turn on indicating the display is at the centre of zero.

Semi-automatic zero-setting range: ≤4% of Max.
Automatic zero-tracking range: ≤4% of Max.
Initial zero-setting range: ≤20% of Max.

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

2.2.3 Zero-tracking

The indicators are 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.

2.2.4 Semi-automatic Tare

The indicators are provided with a semi-automatic subtractive tare feature activated using the "TARE" key.

2.2.5 Automatic Tare

The indicators are provided with an automatic Tare device.

2.2.6 Preset Tare

The indicators are provided with a Preset Tare device. The tare value is introduced via the numeric keyboard.

2.2.7 Unit

The unit can be changed using the Unit key. Only allowed units is g (gram) and kg (kilogram)

2.2.8 Checkweighing

The instrument can be used for checking weight or piece value against a high or low value

2.2.9 Printing

A printer may be connected to the instrument. The weight indicator will transmit the current weight indication to the printer automatically or manually when the “PRINT” key is pressed.

The printing will not take place if the load receptor is not stable, if the gross weight is less than zero, or if the weight exceeds Max.

2.2.10 Display test

A self-test routine is initiated by pressing the on/off key to turn the instrument off, then pressing it again to turn the instrument on. The test routine turns on and off all of the display segments and light indicators to verify that the display is fully functional.

2.2.11 Operator information messages

The weight indicators have a number of general and diagnostic messages, which are described in detail in the user’s guide.

2.2.12 Software version

The version of the software is displayed during the power-up sequence of the instrument.
The approved software version is CE010

2.2.13 Totalisation

The indicator has a totalisation function, adding actual weight display values to the memory automatically or manually when pressing the “Print/M+” key and the equilibrium is stable. An indicator will turn on when the totalising function is active. Pressing the “MR/unit”. key with empty load receptor will display the total accumulated weight. Pressing the “Zero” key in this mode will clear the totalised value.

2.2.14 Counting

The count shown in counting mode and the unit weight, however, are not to be regarded as approved weighing results.

2.2.15 PLU

The instrument has the possibility for quick access PLU’s.

2.2.16 Battery operation

The indicator can be operated from an internal rechargeable battery, if this option is installed.

2.2.17 Extended display indication

The indicator has an extended display indication function using the “CE/x10” key. This function may be used only temporarily (max 10s), and printing shall be inhibited during its functioning.

3. Technical data

The 10i / 10s weighing instruments are composed of separate modules, which are set out as follows:

3.1 Indicator

The indicators have the following characteristics:

- Accuracy class: III or IIII
- Single interval, multi interval, multi-range
- Max number of verification scale intervals (n): 10000 or 2x10000
- Maximum capacity (Max): $n_i \times e_i$
- Minimum capacity (Min): $20 \times e_i$
- Verification scale interval(e_i): Max_i / n_i
- Minimum input voltage per VSI: 0.5 µV/e
- Minimum signal voltage for dead load: 0.0mV for e ≥ 1.5 µV
  0.5mV for 0.5 µV ≤ e < 1.5 µV
- Fractional factor: p'i = 0.5
- Excitation voltage: 5 VDC
- Circuit for remote sense: Yes
- Minimum input impedance: 87 ohm
- Maximum input impedance: 1050 ohm
- Power supply: 12 VDC from external mains adapter for 100-240VAC 50/60Hz
  Optional 6 VDC rechargeable battery
- Maximum tare effect: -Max_i within display limits

Temperature range. -10 °C to +40 °C
Peripheral interface: Set out in Section 4

3.1.1 Connecting cable between the indicator and load cell / junction box for load cell(s)

3.1.1.1 4-wire system

Cable between indicator and load cell(s): 4 wires (no sense), shielded
Maximum length: the certified length of the load cell cable, which shall be connected directly to the indicator.

3.1.1.2 6-wire system

Cable between indicator and junction box: 6 wires, shielded
Maximum length: 7481 m / mm²

3.2 Load receptors, load cells and load receptor supports

Movable platforms shall be equipped with level indicators.

3.2.1 General acceptance of modules

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

1) There is a respective Part / Evaluation / Test Certificate or an OIML Certificate of Conformity (R60:2000 or R60:2017) 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 ((EN 45501:2015 annex F), 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 EN 545501 document, or the like, at the time of EU verification or declaration of EU conformity of type.

4) The load transmission must conform to one of the examples shown in the WELMEC 2.4 Guide for load cells.

3.2.2 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

3.2.3 Bin, tank, hopper and non-standard systems

Construction in brief	Load cell assemblies each consisting of a load cell stand assembly to support one of the mounting feet 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

3.3 Composition of modules

In case of composition of modules, EN 45501 Annex F shall be satisfied.

3.4 Documents

The documents filed at FORCE (reference No. 123-31187) are valid for the weighing instruments described here.

4. Interfaces and peripheral equipment

4.1 Interfaces

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

4.1.1 Load cell input

A 7-terminal connector for the load cell is positioned on the back of the enclosure.

4.1.2 Other interfaces

The indicator may be equipped with the following protective interfaces located on the main board .

- RS-232C
- Bluetooth
- WiFi
- Digital input/output via Relay
- USB

The interface does 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 Totalised weight is not a legal value.

When using the totalisation function creating a sum of several weighing results, this sum is only informative, as it is not a legal value.

5.3 Compatibility of modules

In case of composition of modules, EN45501:2015, annex F 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 5.3.

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, section 2 or 4 of the Directive 2014/31/EU.

7.1.1 Indicator

Access to the configuration and calibration facility requires that a calibration jumper on the main board is short-circuited.

The instrument has a calibration counter that will be increased when the unit is calibrated. The value of the counter shall be noted on a tamperproof label at initial verification.

Sealing of the cover of the enclosure - to prevent access to the calibration switch and to secure the electronics against dismantling/adjustment - is accomplished by sealing of the enclosure with wire and seal.

7.1.2 Indicator - load cell connector - load receptor

Securing of the indicator, load receptor, and load cell combined is done in one of the following ways:

- Sealing of the load cell connector with the indicator by a wire and seal.

In special cases where the place of installation makes it impossible to use the above sealing:

- Inserting the serial number of the load receptor as part of the principal inscriptions contained on the indicator identification label.
- The load receptor bears the serial number of the indicator on its data plate.

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 Indicator

8.1.1 CE mark

CE mark and supplementary metrological marking shall be applied to the indicator according to article 16 of Directive 2014/31/EU.

8.1.2 Inscriptions

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

Indelibly printed on a brittle plastic sticker located on the front panel overlay:

- Max, Min, e =

On the inscription plate:

- Manufacturer's name and/or trademark
- Manufacturers postal address
- Model no./Type designation
- Serial no.
- Type examination certificate no.
- Max, Min. e=
- Accuracy class
- Maximum tare
- Temperature range
- Electrical data and other inscriptions.

8.1.2.1 Load receptors

On a data plate:

- Manufacturer's name, type, serial number, capacity

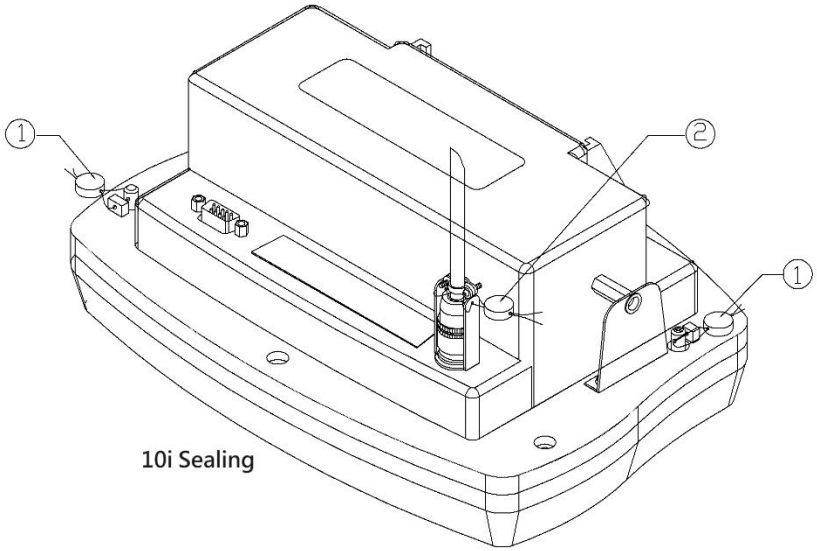
Left to the manufacturer choice as provided in Section 7.1.2:

- Serial no. of the indicator

9. Pictures

Figure 1 Sample of the 10i indicator.

Figure 2 Sample of the 10s indicator.



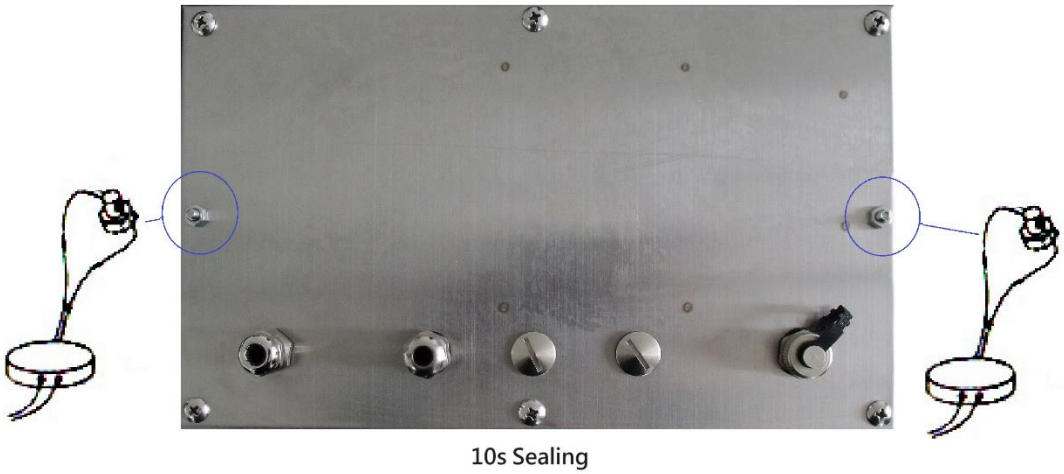


Figure 3 Samples of sealing.

10. Composition of modules – an example

COMPATIBILITY OF MODULES

Ref.: OIML R76-1:2006 annex F

Weighing Instrument, single-interval.

Certificate of EU Type-Approval N°: TEC: 0200-NAWI-17598

INDICATOR — A/D (Module 1) — Type: 10i

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]	1
Minimum load cell impedance:	R_{Lmin}	[Ω]	87
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]	7481
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:			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: (0 is acceptable)	NUD	[% of Max]	50
Correction factor:	$Y = 1 + (DL + T^+ + IZSR^+ + NUD) / 100$		1,7

LOAD CELL — ANALOG (Module 3) — Type: ZEMIC L6G

Accuracy class according to OIML R60:	$Class_{LC}$ (A, B, C or D)		C
Maximum number of load cell intervals:	n_{LC}		4000
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]	100
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: Souzhou Hope Scale Co. Ltd. — Type: 10i

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]	50
Number of verification scale intervals:	n		500
Verification scale interval:	e	[kg]	0,1
Utilisation ratio of the load cell:	$\alpha = (Max / E_{max}) * (R / N)$		0,50
Input voltage (from the load cells):	$\Delta_u = C * U_{exc} * \alpha * 1000 / n$	[µV/e]	10,00
Cross-section of each wire in the J-box cable:	A	[mm²]	0,22
J-box cable-Length:	L	[m]	10
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 =	9500
n	<=	n_{ind}	(WELMEC 2: 4)	n_{ind} - n =	9500
n	<=	n_{LC}	(R76: 4.12.2)	n_{LC} - n =	3500
E_{min}	<=	DL * R / N	(WELMEC 2: 6d)	(DL * R / N) - E_{min} =	5
$v_{min} * \sqrt{N} / R$	<=	e	(R76: 4.12.3)	e - (v_{min} * $\sqrt{N}$ / R) =	0,093
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}) * ($\sqrt{N}$/ R)) =	
Δu_{min}	<=	Δu	(WELMEC 2: 8)	$\Delta u - \Delta u_{min}$ =	9,00
R_{Lmin}	<=	R_{LC} / N	(WELMEC 2: 9)	(R_{LC} / N) - R_{Lmin} =	263
L / A	<=	$(L / A)_{max}^{WI}$	(WELMEC 2: 10)	$(L / A)_{max}^{WI}$ - (L / A) =	7436
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) =	15,0

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