DANAK
PROD Reg. nr 7026

FORCE Certification

EU Type Examination Certificate

No. 0200-NAWI-20475

825

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 **Cardinal Scale Manufacturing Company**
102 East Daugherty
Webb City, MO 64870
USA

In respect of Non-automatic weighing instrument designated 825 with variants of modules of load receptors, load cells and peripheral equipment.
Accuracy class III or IIII, single-interval or dual interval
Maximum capacity, Max: From 1 kg up to 999 999 kg
Verification scale interval: $e_i = Max_i / n_i$
Maximum number of verification scale intervals: $n_i = 10000$ for Class III, $n_i = 1000$ for class IIII (however, dependent on environment and the composition of the modules).
Variants of modules and conditions for the composition of 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 16 pages.

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2026-01-26
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FORCE Certification references:
Task no.: 124-23866 and ID no.: 0200-NAWI-20475

Signatory: Michael Lang Sørensen

Descriptive annex

Contents

1. Name and type of instrument

The weighing instrument is designated Model 825, which is a system of modules consisting of an electronic indicator, connected to a separate load receiver 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 or multi-interval and an internal AC mains power supply.

2. Description of the construction and function

2.1 Construction

2.1.1 Enclosures and keyboard

Enclosure

The enclosure for the 825 can be one of multiple versions:

1. Desktop mount.
   Dimensions: 14.3in x 10.5in x 11.8in
   Enclosure material: Stainless steel, mild steel, or aluminum.
   Connections: An IEC 60320 C14 power plug with integrated line filter is located at the back of the enclosure; additionally, there is room for nine (9) pass-through glands or grommets.
   Environmental rating: IP54.

2. Wall mount.
   Dimensions: 14.3in x 11.5in x 5.6in
   Enclosure material: Stainless steel, mild steel, or aluminum.
   Connections: There is room for nine (9) pass-through glands or grommets.
   Environmental rating: IP66.

3. Panel mount.
   Dimensions: 14.3in x 11.5in x 5.6in
   Enclosure material: Stainless steel, mild steel, or aluminum.
   Connections: There is room for nine (9) pass-through glands or grommets.
   Environmental rating: None.
   Miscellaneous: The power supply may be located on the shielded main board, or located externally to the unit.

4. No screen.
   Dimensions: 12.3in x 11.3in x 5.2in
   Enclosure material: Stainless steel, mild steel, or aluminium.
   Connections: There is room for nine (9) pass-through glands or grommets.
   Environmental rating: IP54.

Keyboard

The unit has an on-screen keyboard and on-screen programmable soft keys. Data entry can also be done via an external USB keyboard.

Display
The display consists of a 1280 x 800 pixel color, 12.1in diagonal size TFT unit that is back lit by white LEDs.
External display is connected through an HDMI interface and uses a USB connection to the integrated touch screen.

Connections
The rear panel of the indicator contains up to 6 pass-through glands and on power entry.

2.1.2 Electronics

The Model 825 weight-indicating instrument uses two printed circuit boards; the first is the main board which contains all of the instrument circuitry, and the second is the plug-in scale card interface. The indicator will accept additional option cards which contain their own printed circuit boards.

The 825 uses an NXP i.MX family and minimum 1GHz processor with 4G or more of RAM and 16G or more eMMC program memory. All instrument calibration and metrological setup data is contained in nonvolatile memory. The power supply is a universal switching type and can accept an input voltage from 90 to 264 VAC 50 or 60 Hz. The indicator produces a load cell excitation voltage of 10.85VDC when powered from AC mains power.

2.1.3 Load cells

Set out in Section 3.3.

2.1.4 Load receptors

Set out in Section 3.4.

2.1.5 Interfaces and peripheral equipment

Set out in Section 4.

2.2 Function

The Model 825 weight-indicating instrument is a microcontroller based electronic weight indicator that requires the external connection of one or more strain gauge load cells. 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 indicator is powered from the power mains at 90 to 264 VAC 50 or 60 Hz.

The primary functions provided are detailed below.

2.2.1 Power up

On power up the indicator will perform a display test then show the instrument model number and the software revision level for three seconds. After that the standard indicator or another application is started and it will display 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

Upon power up the display goes from all pixels off to the white, grey, red and black Cardinal logo for several seconds during boot up. The startup screen then appears showing the model number and software version

2.2.3 Displayed Range

The indicator displays 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 and the zero annunciator to turn on indicating the display is at the center of zero.

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

Zero setting can only take place when the load receptor is not in motion.

2.2.5 Zero-Tracking

The weight indicators 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 on the weight display.

2.2.6 Units

The on-screen UNITS key may be used to select the units in which the weight is displayed. The selected unit of measure is indicated in the weight display. The Model 825 can be configured to display in units of kilograms, grams and tons.

2.2.7 Tare

The weight indicator is provided with a semi-automatic tare and a keyboard preset tare feature.

2.2.8 Semi-automatic Tare

When the semi-automatic tare feature has been selected, pressing the on-screen TARE key will enter the currently displayed weight value as the new tare weight value. The weight display will automatically change to the net weight display mode and turn the NET annunciator on. This tare value can be cleared by pressing the on-screen TARE key when there is no load on the load receptor. This tare entry cannot take place if the load receptor is in motion or if a print operation is taking place.

2.2.9 Preset (numeric) Tare

The preset or numeric tare feature allows the manual entry of a known tare value. Press the appropriate on-screen numeric keys to enter the known tare weight then press the on-screen TARE key. When the on-screen TARE key is pressed, the numeric value entered will be accepted as the new tare weight and the display will automatically enter the net weight display mode as indicated by turning the NET annunciator on. The tare value entered must agree with the verification scale interval, e.

2.2.10 Net / Gross Indication

Once a valid tare weight, other than zero, has been stored, the weight display can be switched from a gross weight only display to a net weight display mode by pressing the on-screen NET / GROSS key. Each time the key is pressed, the display will alternate between the net and gross display modes.

2.2.11 Printing

A printer may be connected to the selected serial data port. In the net display mode, the gross, tare and net weights are transmitted to the printer each time the on-screen PRINT key is pressed. In the gross mode, only the gross weight is transmitted. The time and date and identification, if selected, will also be transmitted. It is also possible to include additional data in the form of customer name or number on the printed record. The print will not take place if the load receptor is not stable, if the gross weight is less than zero, if the weight exceeds Max, or during data entry from the keyboard.

2.2.12 Time and Date

The Model 825 weight indicator is equipped with a time and date feature. To view and / or reset the time and date, press the on-screen TIME / DATE key. The time and date settings can be viewed and / or reset using the on-screen numeric and on-screen ENTER keys. The time and date information are retained in battery-backed memory and will continue to be stored during power outages.

2.2.13 Operator Information Messages

The weight indicator has a number of general and diagnostic messages which are described in detail in the 825 Series Owner's Manual.

2.2.14 Software Version

The 825 indicator software is segregated into parts, where the legally relevant part is the software that includes boot loader, standard indicator and streaming of weighing results to RS232, while the application software apart from display of the weight (see Section 5.2 and 6.2) shall be non-legally relevant in order to be covered by this type approval certificate.

The software revision level is displayed during the power up sequence of the instrument as XX.YY.ZZZ where XX is the version of the legally relevant software and YY.ZZZ is the subversion not affecting the legally functions of the software part.

Software part	**Approved versions of XX**
Boot Loader	1.YY.ZZZ, for YY ≥ 09
Mainboard	1.YY.ZZZ, for YY ≥ 20
OS / Std. Apps	1.YY.ZZZ, for YY ≥ 12
Scale Input Board (SIB)	1.YY.ZZZ, for YY ≥ 07
DIO Board	0.YY.ZZZ, for YY ≥ 05
DAC Board	1.YY.ZZZ, for YY ≥ 01

2.2.15 Multi-Interval Feature

The weight indicator allows a maximum of three intervals.

2.2.16 Multi-Point Calibration Feature

A maximum of three calibration points (one of which is at no-load or Min) may be used with the Model 825 to compensate for non-linearity within the system.

2.2.17 Electronic tally roll / Alibi memory

The Model 825 weight indicator is provided with an electronic tally roll feature to store weight and consecutive number for each weight transaction transmitted to an external computing peripheral. This data is stored in non-volatile memory and has a capacity of 7000 transactions. Once capacity has been reached subsequent transactions will replace the earliest transactions. The contents of the file can be displayed on the weight indictor's display screen.

2.2.18 High Resolution Weight Display

This weight indicator is provided with a high-resolution display feature where the weight is displayed in increments of one-tenth e. The high-resolution mode can only be enabled while the instrument is in the calibration mode.

2.3 Available options

2.3.1 Scale Input Cards

The Scale Input card allows additional load receiver to be connected to the indicator. These cards are inserted into one or more of the available connectors on the main printed circuit board.

2.3.2 Input / output card

The optional I/O Card provides eight configurable digital input and output lines that can be used for special interfacing applications.

3. Technical data

The weighing instrument is composed of separate modules, which are set out as follows:

3.1 Indicator

The indicator model has the following characteristics:

Type:	Model 825
Accuracy class:	III and IIII
Weighing range	Single-interval or multi-interval (max 3 intervals)
Maximum number of Verification Scale Intervals:	10000 (class III), 1000 (class IIII)
Internal resolution:	>16,000,000 counts
Maximum tare effect:	-Max.
Fractional factor:	p'I = 0.5
Minimum input-voltage per VSI:	0.5 µv
Minimum signal voltage for dead load:	1 mV
Excitation voltage:	10.85 VDC
Analog range:	1 to 40 mV
Circuit for remote sense:	Active
Minimum input-impedance:	25 ohms
Maximum input-impedance:	1100 ohms
Mains power supply:	100 to 264 VAC @ 50/60 Hertz
Peripheral interfaces:	Set out in Section 4

3.1.1 Connecting cable between the indicator and load cells

Cable between Indictor and load cell(s): 4 wires, shielded

The cable of the load cell(s) shall be connected directly to the indicator.

3.1.2 Connecting cable between indicator and load cell(s) junction box for load cell(s)

Cable between indicator and load cell(s): 6 wires (sense), shielded.

Maximum cable length between indicator and junction box (J-box) for load cell(s), if any: 46 m/mm²

3.2 Load receptors, load cells, and load receptor supports

Movable platforms shall be equipped with level indicator.

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 (EN 45501:2015) or an OIML Certificate of Conformity (R60:2000 or R60:2017 or R60:2021) 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 (EN45501:2015 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 EN45501 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 Load cells

The load cells, which are set out below are approved as modules in the weighing instrument:

Manufacturer	Load cell type
Cardinal	CB6
Cardinal	TSP
Cardinal	TB
Cardinal	LFB

3.2.3 Digital load cells

The digital load cells and analog processing devices that are listed below are certified as modules in the weighing instrument.

Manufacturer	Load cell type
Cardinal	SCBD
Cardinal	DC
Cardinal	SmartCAN

3.2.4 Platforms

Construction in brief: All-steel, aluminum or steel-reinforced concrete construction surface or pit mounted.
Reduction ratio: 1
Junction box: Mounted in or on the platform.
Load cells: Any R60 certified load cell according to Section 3.2.1, 3.2.2 or 3.2.3

3.2.5 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 of a bin, tank or hopper.
Reduction ratio: 1
Junction box: Mounted on dead structure.
Load cell: Any R60 certified load cell according to Section 3.2.1, 3.2.2 or 3.2.3

3.3 Composition of modules

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

3.4 Documents

The documents filed at FORCE (reference No. 124-23866) are valid for the weighing instruments described here.

4. Interfaces and peripheral equipment

Interfaces
Interfaces are characterized “Protective interfaces” according to paragraph 8.4 in the Directive.

4.1.1 Load cell interface

A 7-pin polarized connector for the analogue load cell is positioned on the instrument circuit board and is accessed through a gland on the rear panel of the instrument enclosure. For digital load cells a 5 terminal connector is mounted in the enclosure and connected to the optional digital load cell board.

4.1.2 USB interfaces

Both USB 3.0 host, USB 2.0 host and USB-C dual roll mode interface connectors are positioned on the instrument circuit board and are accessed through glands on the rear panel of the instrument enclosure.

4.1.3 Logic-level inputs

A 10-terminal connector is used for the Model 825. This connector is located on the main board. Access to the connector is made through a gland connector located on the back panel of the instrument enclosure.

4.1.4 Analogue output

When provided with the optional analogue output, a 3-terminal connector provides both 0 to 10 volts and 4 to 20 mA analogue representations of the displayed weight. These terminals are positioned on the option card connected to the main printed circuit board and accessed through a gland on the rear panel of the instrument enclosure.

4.1.5 Ethernet LAN interface

A standard 10/100/1000 Ethernet Local Area Network port is positioned on the instrument circuit board and is accessed on the rear panel of the instrument enclosure.

4.1.6 Wireless interfaces

Wi-Fi and Bluetooth connectivity is available at the instrument.

4.1.7 Serial interfaces

Three 5-terminal connectors providing a bi-directional RS232 compatible interface are positioned on the indicator's main circuit board and are accessed through a gland connector on the bottom panel of the instrument enclosure.

4.2 Peripheral equipment

Connection between the weight 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 Scale totalizer

Summation of the weights from two or more load receivers is a calculated value and shall be marked as such, if enabled.

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.

6.2 Application software

Use the following procedure to check for the presence of application software:

Turn the indicator off, wait a few seconds then turn the 825 indicator on. The screen will perform a self-test and display three options at the bottom of the screen. Within seven seconds, press the number 1 key to select the application menu.

1) After selecting the application menu, a screen similar to that shown below will be displayed. This is a list of all application programs resident. Select the application program of interest by either pressing the numeric key associated with it or touching the selection on the display screen with your finger.

2) After the application program has started and a weight value is displayed, zero the weight display if necessary and place a load on the load-receiver platform. Record the value of this weight. Turn the indicator off.

3) Turn the power back on to the indicator and, when the display returns to the initial display shown in step ,1 select the standard indicator selection by pressing the number 2 key or touching the selection on the screen.

4)After a short delay, the standard indicator screen will be displayed. Make sure the weight display is at zero then place the same load used in step 3 on the load-receiver platform. Compare this value with the value recorded in step 3. The two values must be identical to validate the application program.

5) To view the software version of the application program, start the application then select the HELP and then ABOUT keys.

6.3 Serial Weight Output

1) If the application program transmits weight from the COM 2 or another serial interface on the indicator, a check should be made to verify its integrity. With the indicator executing the Application program, inspect the weight data transmitted (if any) from the serial port(s).

2) Using a display terminal or similar device, connect it to COM 3 and view the weight data transmitted from this protective interface. The weight data transmitted from COM 3 is the gross weight from the Standard program and must be identical to the gross weight transmitted from the Application program.

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, Module D or F of the Directive 2014/31/EU.

7.1.1 Indicator

The 825 indicator provides an audit trail record for securing. At verification the value of the audit trail counter is written on the inscription plate or on a brittle plastic sticker - sealed with a verification mark next to it.
If the value of the audit trail counter differs from the one written at verification time, the seal of the indicator is broken.
Access to the electronics of the indicator is sealed 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 by one of the following ways:

- 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 Junction box for load cells

Access to the junction box, if any, is prevented by use of wire and seal or by sealing it with brittle plastic stickers.

7.1.4 Peripheral interfaces

All peripheral interfaces are “protective”; they neither allow manipulation with weighing data or Legal Setup, nor change 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 CE mark

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

8.2 Inscriptions

8.2.1 Indicator

Manufacturer's trademark and name and the type designation are located on the front panel overlay.
Indelibly printed on a brittle plastic sticker located on the side of the unit:

Max, Min, e =
T = Max_1, PT = Max_1 (for multi-interval scale)
Certificate No., accuracy class
Model No., Serial No., electrical data and other inscriptions

On the inscription plate – a single brittle plastic sticker – located on the side of the weight indicator:

- • Manufacturers name and/logo
- • Manufacturers postal address
- • Model no./Type designation
- • Serial no.
- • Type examination certificate no.
- • Max, Min. e=
- • Accuracy class
- • Temperature range
- • Electrical data and other inscriptions.

8.2.2 Load receptors

On a data plate:

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

In special cases as provided in Section 7.1.2:

- Serial no. of the indicator

9. Pictures

Figure 1 Model 825-D.

Figure 2 Model 825-S.

Figure 3 Sealing of the 825-D model.

Figure 3 Sealing of the 825-S model.

Figure 3 Sealing of the 825-NS model.