



Australian Government
Department of Industry,
Innovation and Science

National Measurement Institute

Supplementary Certificate of Approval NMI S728

Issued by the Chief Metrologist under Regulation 60
of the
National Measurement Regulations 1999

This is to certify that an approval for use for trade has been granted in respect of the instruments herein described.

Nuweigh Model JAC 825 Digital Indicator

submitted by Newcastle Weighing Services Pty Ltd
104-114 Hannell Street
WICKHAM NSW 2293

NOTE: This Certificate relates to the suitability of the pattern of the instrument for use for trade only in respect of its metrological characteristics. This Certificate does not constitute or imply any guarantee of compliance by the manufacturer or any other person with any requirements regarding safety.

This approval has been granted with reference to document NMI R 76, *Non-automatic weighing instruments, Parts 1 and 2*, dated July 2004.

This approval becomes subject to review on 1/10/21, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern approved – certificate issued	26/09/16

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI S728' and only by persons authorised by the submitter.

Instruments incorporating a component purporting to comply with this approval shall be marked 'NMI S728' in addition to the approval number of the instrument, and only by persons authorised by the submitter.

It is the submitter's responsibility to ensure that all instruments marked with this approval number are constructed as described in the documentation lodged with the National Measurement Institute (NMI) and with the relevant Certificate of Approval and Technical Schedule. Failure to comply with this Condition may attract penalties under Section 19B of the National Measurement Act and may result in cancellation or withdrawal of the approval, in accordance with document NMI P 106.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificates No S1/0B.

The values of the performance criteria (maximum number of scale intervals etc.) applicable to an instrument incorporating the pattern approved herein shall be within the limits specified herein and in any approval documentation for the other components.

Signed by a person authorised by the Chief Metrologist to exercise their powers under Regulation 60 of the *National Measurement Regulations 1999*.



Dr A Rawlinson

TECHNICAL SCHEDULE No S728

1. Description of Pattern **approved on 26/09/16**

A Nuweigh model JAC 825 digital mass indicator (Figure 1) which may be configured to form part of:

- A class III weighing instrument with a single or multi-interval (maximum 3 intervals) weighing range of up to 10 000 verification scale intervals; or
- A class IIII weighing instrument with a single or multi-interval (maximum 3 intervals) weighing range of up to 1000 verification scale intervals.

The pattern may also be known as a Cardinal model 825.

The instrument has a stainless steel enclosure with a 640 × 480 pixel matrix colour back lit LCD display for display of the weight value.

The pattern operates from mains AC power (100 ~ 240 V AC, 50/60 Hz).

Instruments may be fitted with output sockets (output interfacing capability) for the connection of auxiliary and/or peripheral devices (see clause **1.5 Interfaces** below).

TABLE 1 – Specifications

Maximum number of verification scale intervals	10 000 (class III) 1000 (class IIII)
Minimum sensitivity	0.25 μV / scale interval
Excitation voltage	10.85 V DC
Maximum excitation current	434 mA
Fraction of maximum permissible error	$p_i = 0.5$
Minimum load cell impedance	25 Ω
Maximum load cell impedance	1100 Ω
Measuring range minimum voltage	1 mV
Measuring range maximum voltage	40 mV
Maximum tare range	-100% Max (single range) -Max ₁ (multi-interval)
Operating temperature range	-10°C to +40°C
Load cell connection	6-wire shielded

This approval does not include the use of the indicator as an automatic weighing instrument, unless specifically mentioned in a certificate of approval for such an instrument.

1.1 Zero

A zero-tracking device may be fitted.

The initial zero-setting device has a nominal range of not more than 20% of the maximum capacity of the instrument.

The instrument has a semi-automatic zero-setting device with a nominal range of not more than 4% of the maximum capacity of the instrument.

1.2 Tare

A semi-automatic subtractive tare device of up to the maximum (or max₁ for multi-interval) tare capacity of the instrument may be fitted.

A pre-set and/or automatic subtractive tare device of up to the maximum (or Max₁ for multi-interval) capacity of the instrument may be fitted.

1.3 Display Check

A display check is initiated on power up.

1.4 Additional Features

Instruments may be fitted with a number of additional functions. The additional functions (other than the indications of measured mass, i.e. gross, tare, net, totals, displayed either on the indicator or on an auxiliary or peripheral device) are not approved for trade use.

Note: In particular circumstances (e.g. in regard to weighbridge or public weighbridge operation), Trade Measurement legislation or other NMI Certificates of Approval may impose requirements in regard to specific features, methods of operation, or records to be provided (and in what form).

Certain features of this instrument are able to be configured by the installer or user. Whilst NMI believes that an acceptable configuration can be achieved for typical basic modes of operation, it may also be possible for the instrument to be configured to produce unacceptable configurations, and use of some configurations may be inappropriate in different situations. It is the responsibility of the installer and user to ensure that the configuration is acceptable and meets relevant requirements for any particular situation.

1.5 Interfaces

The indicator may be fitted with interfaces for the connection of auxiliary and/or peripheral devices. Any interfaces shall comply with clause 5.3.6 of document NMI R76 (the basic intent of which is that it shall not be possible to alter weighing results via the interfaces).

Any measurement data output from the instrument or its interfaces shall only be used for trade in compliance with NMI General Supplementary Certificate No S1/0B (in particular in regard to the data and its format).

Indications other than the indications of measured mass (i.e. gross, tare, net, totals) displayed either on the indicator or on an auxiliary or peripheral device, are not for trade use.

Instruments may be fitted with RS-232 serial data interface, 20 mA current loop, Ethernet TCP/IP interface, USB interface, wireless Lan Card, Fiber-optic and digital inputs/outputs.

1.6 Linearisation Facility

Instruments are fitted with a linearisation correction facility having up to 3 correction points.

1.7 Verification Provision

Provision is made for the application of a verification mark.

1.8 Software

The software is divided into different parts based on hardware functions. The legally relevant parts include boot loader, standard indicator and streaming of weighing results to RS232 interface. The application software in which the weight measurement is displayed is also classified as legally relevant part of the system (e.g. NUWEIGH application software).



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

The approved software parts are listed below.

Software Parts	Present Version	Approved Versions of XX
Boot Loader	1.09.000 or later	1
Mainboard	1.09.001 or later	1
OS/Std. Apps	1.12.000 or later	1

1.9 Markings and Notices

Instruments carry the following markings:

Manufacturer’s mark, or name written in full	Nuweigh
Indication of accuracy class	 or 
Maximum capacity (for each range)	<i>Max</i> kg #1
Minimum capacity (for each range)	<i>Min</i> kg #1
Verification scale interval (for each range)	<i>e</i> = kg #1
Maximum subtractive tare	<i>T</i> = - kg #2
Serial number of the instrument
Pattern approval mark for the indicator	NMI S728
Pattern approval mark for other components #3

- #1 These markings shall also be shown near the display of the result if they are not already located there.
- #2 This marking is required if *T* is not equal to *Max*.
- #3 May be located separately from the other markings.

In addition, instruments not greater than 100 kg capacity carry a notice stating NOT TO BE USED FOR TRADING DIRECT WITH THE PUBLIC, or similar wording.

1.10 Sealing Provision

Provision is made for access to the calibration jumper within the instrument to be sealed using a ‘lead and wire’ type seal with drilled screws as shown in in Figure 2. Alternatively, destructible labels placed over an access hole to the calibration switch and opposite sides of a join in the instrument housing as shown in Figure 3.

Alternatively the indicator is sealed by recording the audit trail counter on verification.

The indicator automatically increments a configuration and/or calibration value (audit trail number) each time the indicator is re-configured and/or calibrated.

The value(s) of these counters may be recorded on a destructible adhesive label attached to the instrument.

Any subsequent alteration to the calibration or configuration will be evident as the recorded values and the current counter values will differ.

Access to allow changing of set-up parameters including calibration parameters must be protected by a passcode.

The instructions for accessing the configuration and calibration audit trail are as follows:

- Turn off instrument power, and then turn the power on again.
- Press “3” on keypad to select “3. Legal metrology information / Setup” on Startup screen.
- At the “Legal metrology information / Setup” screen, Press “1” on keypad to select “1. View event counters”.
- At the “Event counters” screen, record the “Calibrate” and “Config” count number.
- Compare the count numbers with previous recorded count number on seal label to see if the calibration is tempered.

For checking if the calibration & configuration are protected by calibration jumper (closed), follow the instructions below.

- Turn off and then turn on the instrument.
- Press “3” on keypad to select “3. Legal metrology information / Setup” on Startup screen.
- At the “Legal metrology information / Setup” screen, press “3” on keypad to select “3. Setup menu”.
- At the “Setup menu” screen, press “3” on keypad to select “3. Calibration”
- At the “Setup Scale Number” screen, press “1” to select “1. Scale 1”.
- At “Scale 1 – calibration options” screen, check if there is a “Hardware calibration disabled” statement at the bottom of the screen. If there is no statement then the calibration jumper is opened and the calibration is not protected.

1.11 Multiple Baseworks Facility

See the note at clause **1.4 Additional Features**.

(a) Individual weight display

Up to six baseworks (load receptors) may be connected to a single JAC825 digital indicator. The indicator screen can be arranged to show up to seven individual displays (i.e. six display screen for baseworks/platforms and one display screen for the summing function). The display screen for each basework is identified by a number on the top right corner of the display (e.g. S1-6).

(b) Summed weight display

The instrument has the summing function for up to maximum of 6 individual primary platforms/scales (Figure 4). The sum function is within the 'NUWEIGH' application program and is part of the Cardinal 825 software (Figure 5).

Where two or more baseworks/platform are summed, the sum of the gross weight values for the individual baseworks/displays may be calculated and displayed in the summing display (identified by 'Tot' as shown in Figure 6). The displayed sum is the arithmetic sum of the gross weight values for all individual displays (the tare function is inoperative on the summing display).

The individual primary platforms/scales that are summed will have a "*" in its display screen (Figure 6).

Notes regarding summed weight display:

- The scale interval of the summing indicator shall be of a value to suit the sum of the scale intervals of the primary indicators being summed and the summed result. The summing indicator shall be able to display all possible combinations of the scale intervals of all primary indicators
- All weight displays in the system shall display the same units of measurement (e.g. all kg or all t).
- The summed value shall show non-numerical characters if any of the primary indicators display an error message or a negative value.

Note regarding zero function:

The zero function may operate whilst the summed display is selected, but only when all the individual weight displays are displaying gross weight values. In this case the zero function will operate to zero all weight displays simultaneously.

Note regarding identification of baseworks/displays:

Where a number of baseworks are connected to and displayed by the indicator, there shall be a clear identification and correspondence between each display and its corresponding basework. This may require additional markings (e.g. to identify baseworks as 'A', 'B', 'C' or 'D'). Where a display showing the sum of weight values from different platforms is present, a clear indication of the baseworks comprising this sum shall be provided (e.g. 'S = A + B + C + D').

1.12 Weighbridge Modes

See the note at clause 1.4 **Additional Features**.

The instrument may be fitted with facilities for facilitating transactions, particularly weighbridge transactions.

This may include the entry and recording of information such as client identification, product information and vehicle registration, and the storage of pre-set tare values.

These 'weighbridge modes' may provide for:

- Simple vehicle weighing, where the gross weight of a vehicle is determined by a single weighing;
- Inbound/outbound weighing, where a vehicle is weighed before and after a loading or unloading operation; and
- Weighing with pre-set vehicle weight, where the net weight of a vehicle is determined from the gross weighing operation and the application of a pre-set tare value.

Other functions such as to provide an indication of axle or group loading may be provided, however these are not approved for trade use.

1.13 Data Storage Memory

See the note at clause **1.4 Additional Features.**

The indicator may contain memory (or external memory may be provided) for the storage of weighing results.

For each weighing, weighing results together with information uniquely identifying the results such as the following are stored into the storage device:

- Unique ID to identify the each weighing
- Date/time of each weighing
- Unique serial number of the device used for each weighing
- Unique ID of the load receptor(s)
- NET weight with unit of measurement
- TARE weight with unit of measurement
- Checksum value for the complete data

TEST PROCEDURE No S728

Instruments should be tested in accordance with any relevant tests specified in the National Instrument Test Procedures.

The instrument shall not be adjusted to anything other than as close as practical to zero error, even when these values are within the maximum permissible errors.

Maximum Permissible Errors

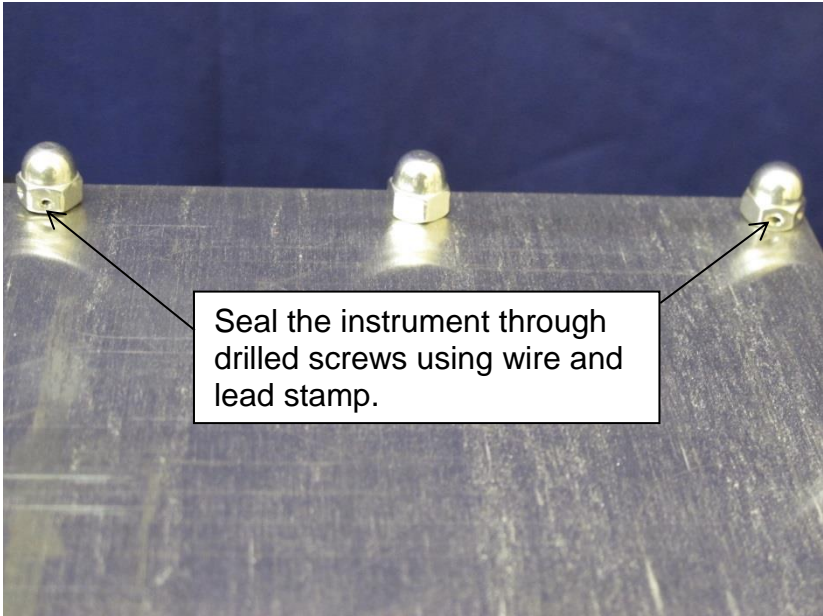
The maximum permissible errors are specified in Schedule 1 of the *National Trade Measurement Regulations 2009*.

FIGURE S728 – 1



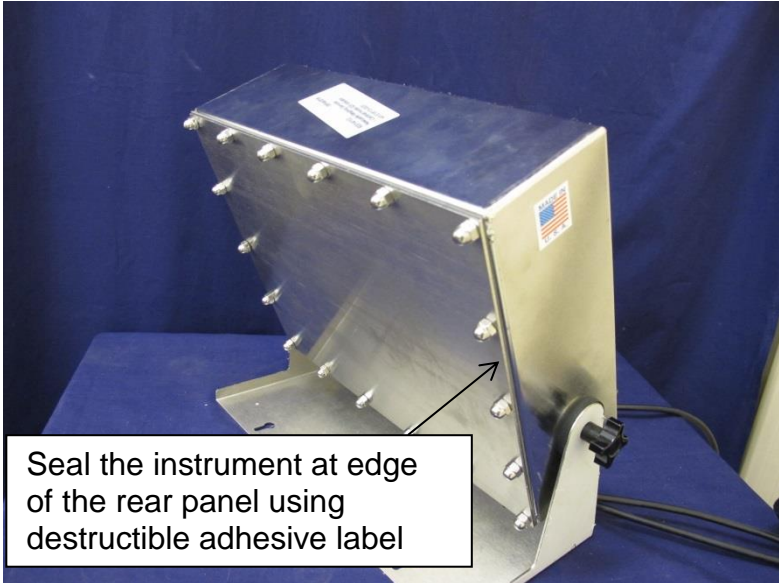
Nuweigh Model JAC 825 Digital Indicator

FIGURE S728 – 2



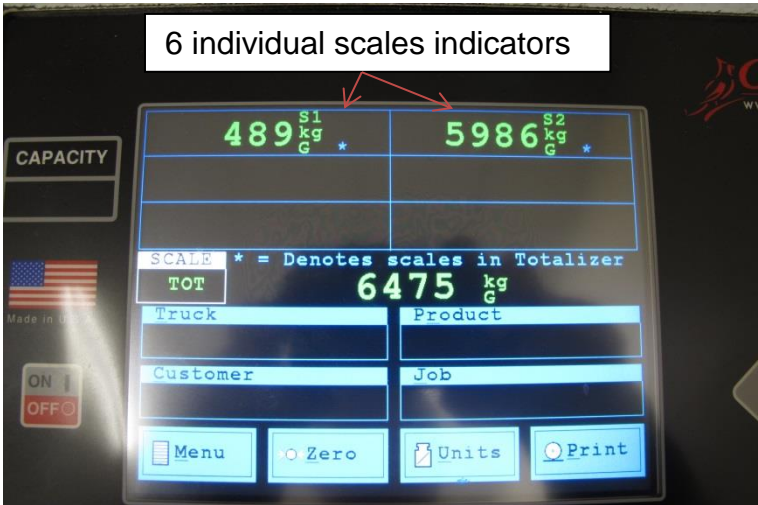
Typical Sealing Using Lead and Wire Type with Drilled Screws

FIGURE S728 – 3



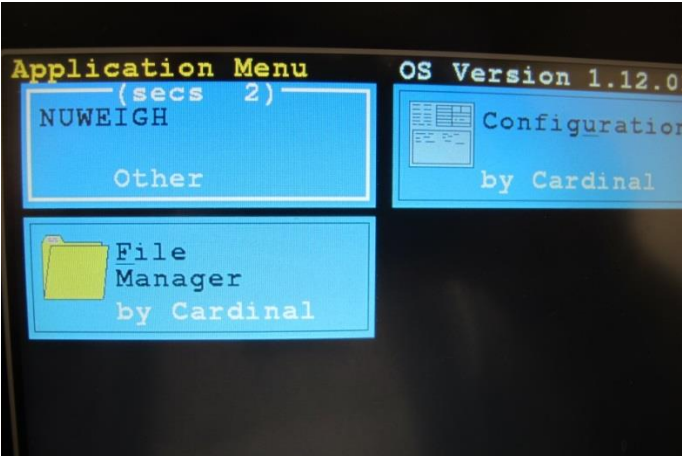
Typical Sealing Using Destructible Adhesive Labels

FIGURE S728 – 4



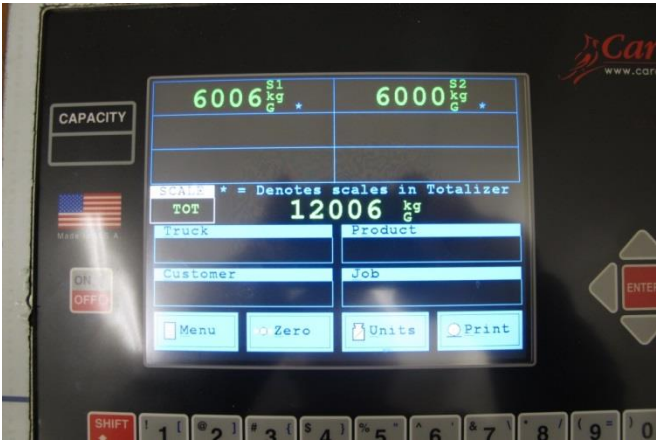
6 primary platforms/scales indicators and 1 summing indicator

FIGURE S728 - 5



NUWEIGH application program

FIGURE S728 - 6



Typical screen showing summing function

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