



Australian Government  
Department of Industry,  
Innovation and Science

## National Measurement Institute

# Supplementary Certificate of Approval

## NMI S676

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.

Leon Engineering Model LD 5290 Digital Indicator

submitted by Grainline  
1 Hartog Place  
Wagga NSW 2650

**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 1/11/20, and then every 5 years thereafter.

### DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern provisionally approved – interim certificate issued	23/10/14
1	Pattern approved – interim certificate issued	20/03/15
2	Pattern approved – certificate issued	2/12/15

## CONDITIONS OF APPROVAL

### General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI S676' and only by persons authorised by the submitter.

Instruments incorporating a component purporting to comply with this approval shall be marked 'NMI S676' in addition to the approval number of the instrument, and only by persons authorised by the submitter.

Instruments purporting to comply with this approval and currently marked 'NMI PS676' may be re-marked 'NMI S676' but 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 Certificate 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 S676

**1. Description of Pattern** **provisionally approved on 23/10/14**  
**approved 20/03/15**

A Leon Engineering model LD5290 digital mass indicator (Figure 1) may be configured to form part of weighing instrument with the specifications in Table 1.

Table 1 – Specification for the pattern

Accuracy classes	Ⓜ and ⓂⓂ
Weighing range	Single
Measuring range	-1.25 mV to 20 mV
Maximum number of verification scale intervals	≤ 10 000 (class 3) ≤ 1000 (class 4)
Minimum sensitivity	0.4 μV / verification scale interval
Excitation voltage	5 V DC
Minimum load cell impedance	35 Ω
Maximum excitation current	142.86 mA
Maximum load cell impedance	1000 Ω
Load cell connection (analogue load cells)	6-wire screened with sense, maximum length: 300 m/mm <sup>2</sup>

The instrument has an aluminium or stainless steel housing.

The instrument may be fitted with output sockets (output interfacing capability) for the connection of auxiliary and/or peripheral devices.

This approval does not include the use of the indicator as an automatic weighing instrument, unless specifically mentioned in an NMI 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 capacity of the instrument may be fitted. A pre-set subtractive tare device of up to the maximum capacity of the instrument (or up to  $Max_1$  for multi-interval instruments) may be fitted.

**1.3 Power Supply**

The instrument has a 240 V AC, 50 Hz power supply. The submitter should be consulted regarding the acceptability of alternative power supply units.

## 1.4 Additional Features

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.

### 1.4.1 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).

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

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-232C/485 serial data interfaces, analogue output (4 – 20 mA, 0 – 10V), parallel data interfaces, and digital inputs/outputs (24 V DC opto-isolated).

### 1.4.2 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 have not been assessed as suitable for trade use.

**1.4.3 Data Storage Memory**

See the note at clause 1.4 Additional Features.



The indicator may contain memory 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

**1.5 Markings and Notices**

Instruments carry the following markings:

Manufacturer’s mark, or name written in full	Grainline
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 S676
Pattern approval mark for other components	..... #3

- #1 These markings are also 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.

**1.6 Sealing Provision**

The instrument may be sealed via physical and/or software means.

The configuration and calibration functions are protected by ‘JP1’ jumper which is located on the main print circuit board next to the analogue circuit, and inside the indicator enclosure. When ‘JP 1’ jumper is closed, the word ‘SEALED’ will be shown on the display following a software command or by executing MENU\MISC\OIML. The ‘Audit Trial’ counter is also displayed after displaying ‘SEALED’. The ‘Audit Trial’ counter which is incremented each time access to the calibration parameter is attempted may be used as alternative seal of the indicator. The indicator enclosure shall be sealed with a lead seal wire or destructible label (Figure 2).

## **1.7 Verification Provision**

Provision is made for the application of a verification mark.

### **TEST PROCEDURE**

Instruments shall 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**

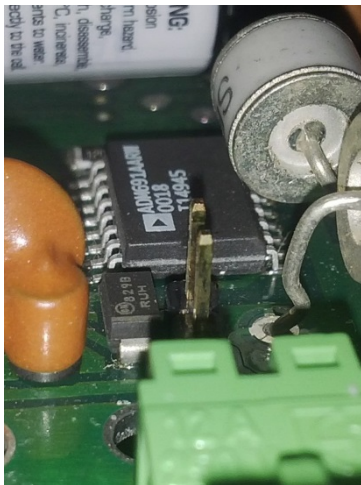
The maximum permissible errors are specified in the *National Trade Measurement Regulations 2009*.

FIGURE S676 – 1

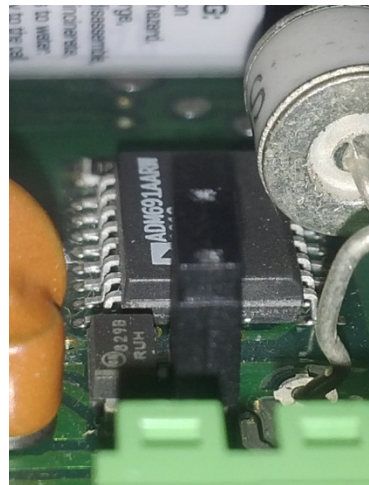


Leon Engineering Model LD 5290 Digital Indicator

FIGURE S676 – 2



'JP1' Jumper Unsealed



'JP1' Jumper Sealed

Typical Mechanical Sealing of 'JP1' Jumper

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