



Australian Government
Department of Industry and Science

National Measurement Institute

Supplementary Certificate of Approval

NMI S679

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.

Teraoka Model DI-166 Digital Indicator

submitted by W W Wedderburn Pty Ltd
 101 Williamson Road
 Ingleburn NSW 2565

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 1/03/20, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variants 1 & 2 approved – certificate issued	12/02/15
1	Pattern amended (sealing, etc.) – variant 3 approved – certificate issued	23/07/15

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI S679' and only by persons authorised by the submitter.

Instruments incorporating a component purporting to comply with this approval shall be marked 'NMI S679' 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 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*.



Mario Zamora

TECHNICAL SCHEDULE No S679

1. Description of Pattern **approved on 12/02/15**

A Teraoka model DI-166 digital mass indicator (Figure 1) which may be configured to form part of:

- A class III weighing instrument with a single weighing range of up to 7500 verification scale intervals; or
- A class II weighing instrument with a single weighing range of up to 1000 verification scale intervals; or
- A class III multi-interval weighing instrument with up to two partial weighing ranges (each with its own verification scale interval) in which case it is approved for use with up to 7500 verification scale intervals per partial weighing range; or
- A class II multi-interval weighing instrument with up to two partial weighing ranges (each with its own verification scale interval) in which case it is approved for use with up to 1000 verification scale intervals per partial weighing range.

Instruments may also be known as a Digi unit of the same model.

The instrument has an ABS plastic enclosure with a LCD display for display of the weight value.

Instruments are approved for use over a temperature range of +0°C to +40°C, and are so marked.

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

TABLE 1 – Specifications

Maximum number of verification scale intervals	7500 (class III)
	1000 (class II)
Minimum sensitivity	0.66 $\mu\text{V}/\text{scale interval}$
Excitation voltage	5 V DC
Maximum excitation current	59 mA
Fraction of maximum permissible error	$p_i = 0.5$
Minimum load cell impedance	85 Ω
Maximum load cell impedance	3300 Ω
Measuring range minimum voltage	0 mV
Measuring range maximum voltage	16 mV
Maximum tare range	< -50% Max
Operating temperature range	0°C to +40°C
Load cell connection	4 or 6 wire plus shield

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 and/or non-automatic keyboard-entered pre-set subtractive tare device may be fitted.

The maximum tare/pre-set tare value is less than 50% of maximum capacity of the instrument (single interval instruments only) or the limit of the first partial weighing range (multi-interval instruments).

1.3 Display Check

A display check is initiated whenever power is applied.

1.4 Power Supply

The instrument is powered by a 9 V AC/DC mains adaptor.

Note: The AC/DC mains adaptor supplied for the instrument was ENG model 3A-066WP09 switch-mode power supply (output 9 V DC, 0.67 A) – the submitter should be consulted regarding the acceptability of alternative power supply units.

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 one RS-232 serial data interface.

1.6 Additional Features



The indicator may be provided with internal count and A/D raw data displays. 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.

1.7 Descriptive Markings and Notices

Instruments carry the following markings:

Manufacturer's mark, or name written in full	Teraoka
Name or mark of manufacturer's agent	WEDDERBURN
Model number
Indication of accuracy class	 or 
Maximum capacity	<i>Max</i> kg #1
Minimum capacity	<i>Min</i> kg #1
Verification scale interval	<i>e</i> = kg #1
Maximum subtractive tare	<i>T</i> = - ... kg #2
Serial number of the instrument
Special temperature limits	0°C to +40°C
Pattern approval mark for the indicator	NMI No S679

#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*.

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

Notes:

For multi-interval instruments the markings shall be as above, with the exception that the 'Maximum capacity' and 'Verification scale interval' shall be marked for both interval ranges, e.g. as follows:

Maximum capacity	<i>Max</i>/..... kg
Verification scale interval	<i>e</i> =/..... kg

1.8 Verification Provision

Provision is made for the application of a verification mark.

1.9 Sealing Provision

Provision is made for the calibration to be sealed by setting a switch on the main board within the instrument to a LOCK position, and then preventing access within the instrument housing (Figure 2).

It is possible to determine that the switch status is in the 'LOCK' position as follows:

- Hold down the →0← key, and press the →T← key once and then the ← key twice in weighing mode.

- If the switch is in the 'LOCK' position, the instrument will display 'S-off'. In this case the instrument may be verified.
- Otherwise the instrument will display 'S-on' in which case the instrument should not be verified until the switch has been correctly located in the 'LOCK' position.

Sealing to prevent access within the instrument housing may be achieved by using a 'lead and wire' type seal with drilled screws or using destructible labels placed over the opposite sides of a join in the instrument housing as shown in Figure 2.

1.10 Software Version

The software version is designated u1.xx, where 'xx' refers to the identification of non-legally relevant software.

The software version can be seen in the switch-on display sequence (when the power is first applied to the instrument).

2. Description of Variant 1 approved on 12/02/15

The Teraoka model DI-166SS indicator (Figure 3) which is similar to the pattern but having a stainless steel housing.

The model DI-166SS indicator operates from mains AC power (230 - 240 V AC, 50 Hz) or a 9 V AC/DC mains adaptor.

3. Description of Variant 2 approved on 12/02/15

The Teraoka model DI-167 indicator which is similar to the pattern and variant 1 but having a stainless steel front panel (Figure 4a) and ABS weather proof plastic back housing (Figure 4b).

Power for the model DI-167 instrument may be supplied by:

- a 9 V AC/DC mains adaptor; and/or
- an internal 6 V rechargeable battery.

4. Description of Variant 3 approved on 23/07/15

The Teraoka model DI-166 indicator which is similar to the pattern but instead powered by 230 – 240 V, where the AC transformer is within the indicator housing.

TEST PROCEDURE

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

Maximum Permissible Errors

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

Tests

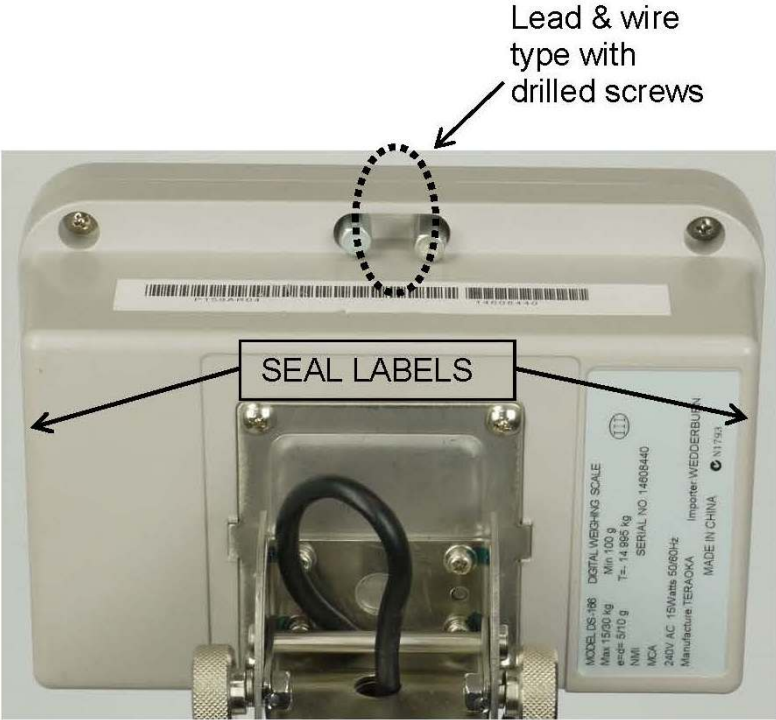
For multi-interval and multiple range instruments with verification scale intervals of $e_1, e_2 \dots$, apply e_1 for zero adjustment, and maximum permissible errors apply $e_1, e_2 \dots$, as applicable for the load.

FIGURE S679 – 1



Teraoka Model DI-166 Indicator (Pattern)

FIGURE S679 – 2



Typical Sealing Methods

FIGURE S679 – 3



Teraoka Model DI-166SS Indicator (Variant 1)

FIGURE S679 – 4



(a) Indicator Front Panel

(b) Indicator Back Housing

Teraoka Model DI-167 (Variant 2)

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