Australian Government
National Measurement Institute
Bradfield Road, West Lindfield NSW 2070

Supplementary Certificate of Approval

NMI S655

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.

Avery Weigh-Tronix Model ZM201 Digital Indicator

submitted by Avery Weigh-Tronix Ltd
Foundry Lane
Smethwick
West Midlands B66 2LP UK

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 OIML R 76 – Edition 2006(E), *Non-automatic weighing instruments*, dated 2006.

This approval becomes subject to review on 1/04/19, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variant 1 approved – certificate issued	12/03/14

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI S655' and only by persons authorised by the submittor.

Instruments incorporating a component purporting to comply with this approval shall be marked 'NMI S655' in addition to the approval number of the instrument, and only by persons authorised by the submittor.

It is the submittor'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 S655

1. Description of Pattern approved on 12/03/14

An Avery Weigh-Tronix model ZM201 digital mass indicator (Figure 1 and Table 1) which may be configured to form part of a weighing instrument with a single weighing range of up to 6000 verification scale intervals.

The instrument has an LCD display for weight measurement value, and is available in three versions/housing types – model ZM201-SD2 (stainless steel desktop), model ZM201-PD2) (ABS desktop) and model ZM201-SP2 (stainless steel panel mount).

Instruments may be fitted with output sockets (output interfacing capability) for the connection of auxiliary and/or peripheral devices (see clause 1.6 below).

TABLE 1 – Specifications

Maximum number of verification scale intervals	6000 (class III) 1000 (class IIII)
Minimum sensitivity	0.8 µV / scale interval
Excitation voltage	5 V DC
Maximum excitation current	57.14 mA
Fraction of maximum permissible error	$p_i = 0.5$
Minimum load cell impedance	87.5 Ω
Maximum load cell impedance	1100 Ω
Measuring range minimum voltage	0.5 mV
Measuring range maximum voltage	25 mV
Maximum tare range	-100% Max
Operating temperature range	-10°C to +40°C
Load cell connection	4-wire or 6-wire with braided outer screen, flexible PVC overall jacket. 0.5 mm^2 per core, Maximum length (6-wire) = 30 m (60 m/mm^2)

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.

When the instrument is used for trade or other legal purposes, the ‘UNITS’ key (Figure 2) and the related ‘unit of measurement 1’ function must be disabled, and the ‘unit of measurement 2’ function must be set to ‘1000 g’ for measuring in ‘kg’ units. Refer to Figure 2.

1.1 Zero

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

1.2 Tare

A semi-automatic, or a pre-set, subtractive tare device each of up to the maximum capacity of the instrument may be fitted.

1.3 Display Check

A display check is initiated whenever power is applied.

1.4 Power Supply

The indicator can be powered by AC or DC power depending on the enclosure type, as follows:

For the stainless steel desktop model ZM201-SD2;

- mains supply (110 – 240 V AC); or
- optional internal rechargeable battery pack.

For the ABS desktop model ZM201-PD2;

- 12 – 36 V DC supplied by an AC/DC mains adaptor; or
- optional rechargeable battery pack.

For the panel mount model ZM201-SP2;

- 12 – 36 V DC supplied by an AC/DC mains adaptor.

Note: The AC/DC mains adaptor supplied was a GME model GFP241 DA-2410-1 switch mode power supply (output 24 V DC, 1 A) – the submittor should be consulted regarding the acceptability of alternative power supply units.

1.5 Additional Features

Other functions such as counting, setpoint, batching, peak hold, checkweighing, accumulation, and totalisation are available, but these functions are not approved for trade use.

1.6 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, Ethernet interface, logic level inputs, and open collector outputs.

1.7 Linearisation Facility

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

1.8 Verification Provision

Provision is made for the application of a verification mark.

1.9 Markings and Notices

Instruments carry the following markings:

Manufacturer's mark, or name written in full	Avery Weigh-Tronix
Indication of accuracy class	(III) or (IIII)
Maximum capacity	*Max* ..... kg #1
Minimum capacity	*Min* ..... kg #1
Verification scale interval	*e* = ... kg #1
Maximum subtractive tare	*T* = - ..... kg #2
Serial number of the instrument	…….....
Pattern approval mark for the indicator	NMI No S655
Pattern approval mark for other components	..... #3

#1 These markings are shown near the display of the result.

#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 Software

The software is designated AWT30-500177 version 1.x.x.x where x.x.x refers to the identification of non-legally relevant software.

The instructions for accessing the software id are as follows (starting from the normal weighing mode):

- Press and hold '*F1*' key until '*PASS*' is displayed.
- Enter the password '*111*' using '*TARE*' and '*UNITS*' keys, and press the '*ZERO*' key to enter the '*USER*' menu level.
- Press the '*UNITS*' key until '*About*' is displayed and then press the '*SELECT*' key to enter '*boot*' level.
- Press the '*UNITS*' key until '*FirM*' is displayed and then press the '*SELECT*' key.
- Press the '*SELECT*' key while '*Partno*' is displayed, and then press the '*UNITS*' key. Record/Check the software version.
- Press '*F1*' until '*Save no*' is displayed.
- Press the '*ZERO*' key to return to the normal weighing mode.

1.11 Sealing Provision

The calibration and legally relevant parameters are protected via physical or software means. A jumper (P7) located on the main board prevents all access to the legally relevant parameters. When the jumper is applied, the instrument is '*SEALED*'. The following steps can be used for checking the protection of calibration and legally relevant parameters.

- Press and hold '*F1*' key until '*PASS*' is displayed.
- Enter the password '*111*' and press the '*ZERO*' key to enter the '*USER*' menu level.

- Press the '*SELECT*' key once and then press the '*UNITS*' key until '*SEAL*' is displayed.
- Press the '*SELECT*' key while '*SEAL*' is displayed. If the jumper is applied then the instrument should display '*SEALEd*'. Otherwise, the instrument should display '*no SEAL*'.
- Press the '*F1*' key until '*Save no*' is displayed.
- Press the '*ZERO*' key to return to the normal weighing mode.

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 (e.g. as CONFIG x, CAL y).

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

The instructions for accessing the configuration and calibration audit trail are as follows (starting from the normal weighing mode):

- Press and hold '*F1*' key until '*PASS*' is displayed.
- Enter the password '*111*' and press the '*ZERO*' key to enter the '*USER*' menu level.
- Press the '*UNITS*' key until '*Audit*' is displayed and then press the '*SELECT*' key twice.
- Press the '*SELECT*' key while '*ConFig*' is displayed. The '*CONFIG*' counter value is displayed. Record this value and check with the value shown on seal.
- Press '*F1*' once.
- Press the '*UNIT*' key then press the '*SELECT*' key while '*CALib*' is displayed. The '*CAL*' counter value is displayed. Record this value and check with the value shown on seal.
- Press the '*F1*' key until '*Save no*' is displayed.
- Press the '*ZERO*' key to return to the normal weighing mode.

The indicator is sealed by preventing access within the indicator housing. The method used depends on the type of instrument housing:

For the stainless steel desktop model ZM201-SD2, sealing may be by means of two sealing nuts and the studs provided on the rear of the indicator;

For the ABS desktop model ZM201-PD2, sealing is by the method shown in Figure 3a; and

For the panel mount models ZM201-SP2 and ZM205, sealing is by the method shown in Figure 3b. Additionally, if the load cell cable connection requires sealing, the panel into which the instrument is mounted must be sealed by suitable means.

2. Description of Variant 1 approved on 12/03/14

The Avery Weigh-Tronix model ZM205 (Figure 4) which is similar to the pattern but it is designed for baggage scale system, and it only has gross weighing and accumulator weighing operations. The model ZM205-SP2 is designed as a master indicator and the model ZM205-SR2 is designed as a remote indicator. The instrument shall be sealed by applying destructible seal labels as shown on Figure 3c.

TEST PROCEDURE No S655

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 Schedule 1 of the *National Trade Measurement Regulations 2009*.

TEST

Check that the ‘UNITS’ key (Figure 2) and the related ‘unit of measurement 1’ function are disabled, and the ‘unit of measurement 2’ function is set to ‘1000 g’ for measuring in ‘kg’

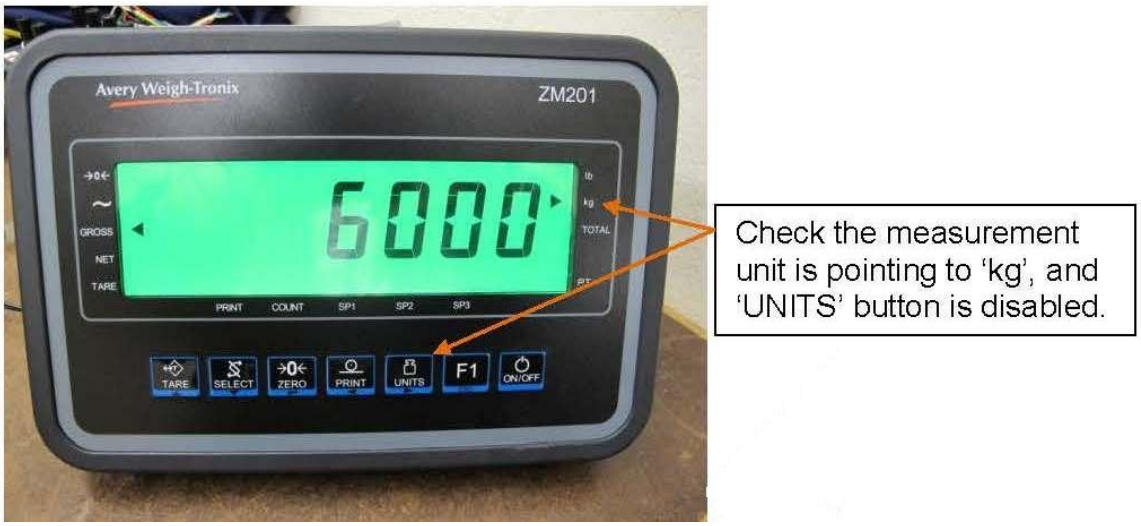
FIGURE S655 – 1

(a) Avery Weigh-Tronix Model ZM201-SD2 Digital Indicator

(b) Avery Weigh-Tronix Model ZM201-PD2 Digital Indicator

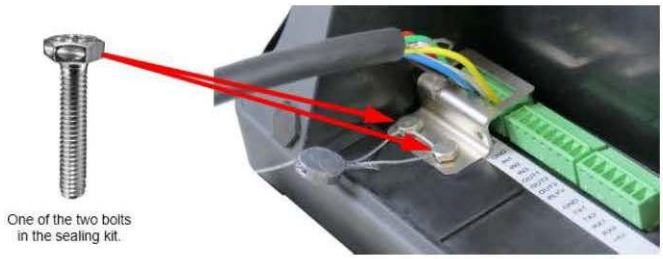
(c) Avery Weigh-Tronix Model ZM201-SP2 Digital Indicator

FIGURE S655 – 2

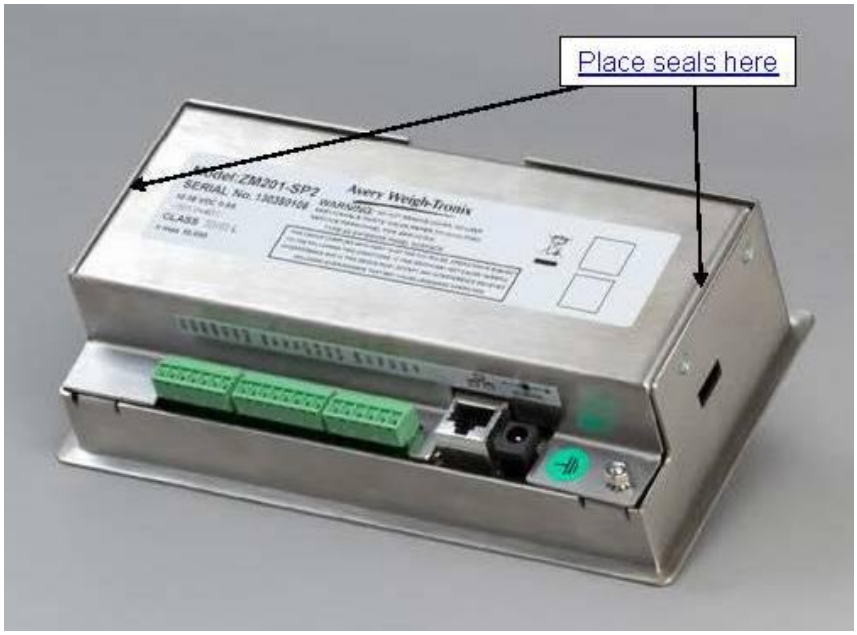


Confirming Correct Setting of Unit of Measurement

FIGURE S655 – 3



(a) For ABS Desktop Mount Models



(b) For Panel Mount Models

Typical Mechanical Sealing

FIGURE S655 – 4

(a) Avery Weigh-Tronix Model ZM205-SP2 (Master) Baggage Scale Digital Indicator

(b) Avery Weigh-Tronix Model ZM205-SR2 (Remote) Baggage Scale Digital Indicator

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