



Australian Government
Department of Industry,
Innovation and Science

National Measurement Institute

Supplementary Certificate of Approval NMI S458

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 E1210 Digital Indicator

submitted by Avery Weigh-Tronix
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Smethwick
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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 **1/08/21**, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variants 1 & 2 approved – interim certificate issued	29/07/05
1	Pattern & variants 1 & 2 approved – certificate issued	15/09/05
2	Variant 3 approved – certificate issued	19/08/08
3	Pattern & variants 1 to 3 reviewed – variant 4 approved – certificate issued	30/03/11
4	Pattern & variants 1 to 4 amended (company name), reviewed & updated – certificate issued	7/12/16

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI S458' and only by persons authorised by the submitter.

Instruments incorporating a component purporting to comply with this approval shall be marked 'NMI (or NSC) S458' 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 S1/0/A or 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 S458

1. Description of Pattern

approved on 29/7/05

An Avery Weigh-Tronix model E1210 (Figure 1) digital mass indicator, is approved with the parameters as shown in Table 1, when used with conventional (analogue strain gauge based) load cells. The indicator may alternatively be fitted with an additional two channel communications circuit board and used with a model T301 junction box which contains a load cell scanning circuit board enabling use with remote devices including approved Avery Weigh-Tronix digital load cells.

The indicator which may be configured to form part of:

- A weighing instrument with a single weighing range of up to 10 000 verification scale intervals; or
- A multi-interval weighing instrument with up to three partial weighing ranges (each with its own verification scale interval) in which case it is approved for use with up to 3 000 verification scale intervals per partial weighing range.

When used with digital load cells, the maximum number of verification scale intervals (VSI) applicable is determined by the number of VSI given in the approval documentation for the load cells used.

The instrument has a liquid crystal display (LCD) including provision for display of the weight value and for alphanumeric information/menus.

A symbol (in the form of a stylised scale followed by a number) is provided at the top left of the indicator to show which basework/indication has been selected for display. For example '▲▲1' ('Scale 1') indicates that the corresponding basework (scale 1) has been selected – the weight displayed will be that of scale 1. Refer also to clause **1.6 Two Baseworks Facility**.

Instruments may be fitted with input/output sockets (interfaces) for the connection of auxiliary and/or peripheral devices (see **1.9 Interfaces**).

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.

TABLE 1 – Specifications

Maximum number of verification scale intervals	10 000 or 3000 per range
Minimum sensitivity	0.6 μ V / scale interval
Excitation voltage	10 V DC
Maximum excitation current	458 mA

Note: These specifications apply to each basework connected. Where two baseworks are connected (see clause **1.6** below) the maximum excitation current for both baseworks (combined) shall not exceed the above specification.

1.1 Zero

Zero is automatically corrected to within $\pm 0.25e$ whenever the instrument comes to rest within $0.5e$ of zero

The instrument has a semi-automatic zero setting device (to set the instrument to within $\pm 0.25e$ of zero) with a nominal range of not more than 4% of the maximum capacity of the instrument.

1.2 Tare

A semi-automatic subtractive taring device of up to the maximum capacity of the instrument may be fitted. A pre-set taring device (keyboard-entered and/or stored) of up to the maximum capacity (or of up to the Max_1 for multi-interval instruments) may also be fitted.

Pre-set tare values may be stored and recalled, and may be associated with product or item look-up tables.

1.3 Display Check

A display check is initiated whenever power is applied.

1.4 Linearisation Facility

Instruments are fitted with a programmable five-point linearisation correction facility.

1.5 Power Supply

The instrument operates from mains AC power (110–240 V AC nominal).

1.6 Two Baseworks Facility

Two baseworks may be connected to a single E1210 digital indicator. This will require an additional circuit board which includes a second analogue to digital converter (for a basework using analogue load cells). Where either or both baseworks use digital load cells (see clause 1. **Description of Pattern**), an additional two channel communications circuit board must be fitted.

Each basework shall be clearly identified to the appropriate scale display shown on the indicator. That is, there shall be a clear correspondence between the basework identification and the scale selected indication (shown by a scale symbol and number as described in clause 1.). Trade measurement authorities may require additional markings or signs to ensure that these relationships are clear.

When two baseworks are connected the following indications may be provided:

(a) Individual weight display

The 'SCALES' key of the indicator is used to select which basework is to have its weight value displayed, and the value is displayed with an indication of which scale has been selected (i.e. 'Scale 1' or 'Scale 2'). Tare and zero operations may be applied to each individual basework/indication, as if they were separate instruments.

(b) Combined weight display

When two baseworks of the same configuration (maximum capacity and verification scale interval) are connected to a single E1210 indicator it may also be possible to select a mode in which the combined weight on the platforms is displayed. The 'SCALES' key of the indicator is used to select this – when selected 'Scale 3' is indicated rather than 'Scale 1' or 'Scale 2'. The 'Scale 3' indication represents the weight on both platforms 1 and 2. This has similarities to a summing indicator as described in General Supplementary Certificates No S1/0/A or No S1/0B however the feature has some significant differences.

In particular, the combined weight function indication does not necessarily represent the mathematical sum of the values determined for each platform. This is because the combined weight function indication has its own maximum capacity (*Max*), minimum capacity (*Min*) and verification scale interval (*e*), and the indication is based on a separate determination of the weight value using these parameters.

Note however that applying a gross load above the maximum capacity ($Max + 9e$) of either basework will result in the combined weight display indication blanking or showing an error.

Note regarding tare operation: When the combined weight function ('Scale 3') is selected, any tare value is cancelled (for both platforms) and tare is not operational in this mode (gross weight only is displayed).

Note regarding zero operation: When the combined weight function ('Scale 3') is selected the automatic zero tracking device of each platform will continue to operate. However the semi-automatic zero setting device is not operational. Should the indication in the combined weight function ('Scale 3') not be at zero (indicated by the 'o' symbol) prior to weighing, the instrument should be zeroed by switching to and zeroing in both the 'Scale 1' and 'Scale 2' modes.

Note regarding markings: Markings of *Max*, *Min*, *e* and *T* (if applicable) shall be provided for each basework connected, and shall also be provided for the combined weight function if this function is available.

Notes regarding applicability of General Certificate of Approval No 6B/0

- The calculations of 6B/0 shall apply to each basework/indicator combination individually;
- In the case of the combined weight function, the calculations of clauses 6.3 to 6.6 of General Certificate No 6B/0 shall apply, with the number of load cells being the total number in both baseworks; and
- The verification scale interval for the combined weight function ('Scale 3') shall not be less than the sum of the scale intervals for 'Scale 1' and 'Scale 2' (the largest scale interval in the case of multi-interval configurations), and shall be an integer power of 10 multiple of 1, 2 or 5 (i.e. ..., 0.1, 0.2, 0.5, 1, 2, 5, ...).

Note: As an example, of one possible configuration:

Scale 1: *Max* = 60 000 kg, *e* = 20 kg, *Min* = 400 kg

Scale 2: *Max* = 60 000 kg, *e* = 20 kg, *Min* = 400 kg

Scale 3: *Max* = 120 000 kg, *e* = 50 kg, *Min* = 1000 kg

1.7 Additional Features

The indicator also has certain additional functions including setpoints ('cut-offs') and 'under/accept/over' functions. Some functions can be assigned to a function key of the indicator. However, 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.

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.

1.8 Data Storage Memory

The indicator may contain memory for the storage of weighing results. For each weighing, weighing results together with identification including date and time are stored into the storage device. The use of this feature for trade use is subject to the agreement of the applicable trade measurement authority.

In any case, data from the storage device shall only be used for trade if the format of the output complies with General Supplementary Certificates No S1/0/A or No S1/0B.

1.9 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). Relevant functions (such as tare and zero setting) may be possible via corresponding remote commands – the use of this feature for trade use is subject to the agreement of the applicable trade measurement authority (for example, use of tare or zero from a remote location may be dependent on provision of suitable means for surveillance of the platform(s)).


Any measurement data output from the instrument shall only be used for trade if the data and its format comply with General Supplementary Certificates No S1/0/A or No S1/0B.

One or more of the following interface options may be fitted:

- Serial RS 232, RS 485, RS 422 interfaces for the connection of peripheral devices.
- Digital inputs and digital outputs (opto-isolated) for control purposes.
- Analog outputs (voltage or current), pulse inputs, BCD output.
- Interfaces compatible to various control/communication protocols (e.g. Ethernet, Fieldbus, Profibus, DeviceNet and Interbus).

1.10 Markings and Notices

Instruments carry the following markings:

Manufacturer's mark, or name written in full	Avery Weigh-Tronix Ltd	
Name or mark of manufacturer's agent	
Indication of accuracy class		
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	
Pattern approval number for the indicator	NMI S458	
Pattern approval number 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 <i>T</i> is not equal to <i>Max</i> .	
#3	May be located separately from the other markings.	

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.

Note:

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	Max/..... kg	#1
Verification scale interval	e =/..... kg	#1

#1 These markings are also shown near the display of the result if they are not already located there.

1.11 Verification Provision

Provision is made for the application of a verification mark.

1.12 Sealing Provision

Access to the configuration and calibration facility is password protected. 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 CAL xx , CFG yy).

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

The current value can be displayed by using the following sequence (starting from normal weighing mode):

- Press the 'F2' key below the wording 'Super'.
- Press the 'F3' key below the wording 'Alter'.
- Press the 'F3' key six times to scroll across the menus so that the wording "Audit" appears above the 'F1' key.
- Press the 'F1' key.
- Press the 'F2' key below the wording 'View'.
- The display will then show 'Audit Trail', 'Calibration Events xx' then 'Config Events yy'.

Press 'Esc', then 'F1'(Exit), then 'F1'(Store) – (No) to return to the normal weighing mode.

Alternatively, it is possible to configure the indicator such that access to configuration and calibration facilities requires access to a switch within the instrument casing.

Hence the indicator may be sealed by the following:

- (a) Ensuring that protection of the configuration and calibration has been enabled.
 - With the instrument in normal weighing mode, press the key designated as 'STATUS'.

- Then press the key designated as 'INFO'.
 - Then either repeatedly press the INFO key (for the models E1105 and E1110) or use the keys designated as scroll keys (i.e. up/down arrows, for the models E1205 and E1210), to scroll through the status information.
 - Observe the sealing status (indicated by the word 'Seal' followed by 'None', 'Cal', 'View Only' or 'Deny All').
 - A status of 'View Only' or 'Deny All' indicates that suitable protection of the configuration and calibration has been enabled.
- (b) Applying destructible adhesive labels at each side of the instrument casing, or using a lead and wire type seal to restrict access within the instrument casing.

2. Description of Variant 1 **approved on 29/7/05**

The Avery Weigh-Tronix model E1205 (Figure 2) which is similar to the model E1210, but has a housing of plastic construction.

3. Description of Variant 2 **approved on 29/7/05**

The Avery Weigh-Tronix model E1105 (plastic housing construction) and E1110 (stainless steel housing construction) which utilise an alternative display technology and have a reduced set of function keys (Figures 3 and 4).

3. Description of Variant 3 **approved on 19/8/08**

An Avery Weigh-Tronix model E1250 digital mass indicator (Figure 5) which has the same features and capabilities as the pattern (model E1210) but in an intrinsically-safe housing.

The model E1250 operates from either a part number E1150Ex0000600 intrinsically-safe mains power supply or from a part number E1150Ex0000800 intrinsically-safe battery power supply. Note that if the battery power supply is used the indicator is limited to providing power for four (4) load cells and one (1) scale card only.

3. Description of Variant 4 **approved on 30/3/11**

The Avery Weigh-Tronix model E1210, E1205, E1105 or E1110 digital indicators (as described for the pattern and variants 1 and 2) now fitted with a different power supply and revised electronics, in which case they have the specifications set out in Table 2 below.

TABLE 2 — Specifications (Variant 4)

Maximum number of verification scale intervals	10 000
Minimum sensitivity	0.6 μ V/scale interval
Excitation voltage	10 V DC
Maximum excitation current	458 mA
Minimum load cell impedance	22 Ω
Maximum load cell impedance	1200 Ω
Measuring range minimum voltage	0 mV
Measuring range maximum voltage	20 mV
Fraction of maximum permissible error (aka portioning factor)	0.5
Temperature range	-10°C to +40°C
Maximum value of load cell cable length per wire cross section	138 m/mm ² (copper wire)
The indicator has provision for sense wires (6-wire system)	

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 S458 – 1



Avery Weigh-Tronix Model E1210 Digital Indicator

FIGURE S458 – 2



Avery Weigh-Tronix Model E1205 Digital Indicator

FIGURE S458 – 3



Avery Weigh-Tronix Model E1105 Digital Indicator

FIGURE S458 – 4



Avery Weigh-Tronix Model E1110 Digital Indicator

FIGURE S458 – 5



Avery Weigh-Tronix Model E1250 Digital Indicator
With Intrinsically-Safe Battery Power Supply

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