Australian Government
Department of Industry, Innovation and Science

National Measurement Institute

Certificate of Approval
NMI S503

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.

A & D Model AD-4402 Digital Indicator

submitted by A & D Australasia Pty Ltd
formerly submitted by A & D Mercury Pty Ltd
32 Dew Street
Thebarton SA 5031

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 **1/12/21**, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variant 1 approved – certificate issued	21/11/07
1	Pattern & variant 1 updated & **reviewed** – certificate issued	2/06/16

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with approval number 'NMI S503' and only by persons authorised by the submittor.

Instruments incorporating a component purporting to comply with this approval shall be marked 'NMI S503' in addition to the approval number of the instrument.

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 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*.

Dr A Rawlinson

TECHNICAL SCHEDULE No S503

1. Description of Pattern approved on 21/11/07

An A & D model AD-4402 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 10 000 verification scale intervals.

The instrument has a fluorescent display incorporating both seven segment and dot matrix configurations. The seven segments provide for the display of the weight value and other numerical values while the dot matrix displays alphanumeric information/menus.

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.

Any measurement data output from the instrument or its interfaces shall only be used for trade in compliance with Supplementary Certificate No S1/0/A (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 output sockets (output interfacing capability) for the connection of auxiliary and/or peripheral devices.

Instruments are approved for use over a temperature range of –5°C to +40°C and must be so marked.

TABLE 1 – Specifications

Maximum number of verification scale intervals	10 000
Minimum sensitivity	1.0 µV / scale interval
Excitation voltage	10 V DC
Maximum excitation current	230 mA

1.1 Zero

Zero may be automatically corrected to within ±0.25*e* whenever the instrument comes to rest within 0.5*e* of zero or whenever power is applied.

If the instrument comes to rest outside that range but within the zero setting range, zero may be set by pressing the zero button.

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

The instrument has provision for subtractive semi-automatic tare and pre-set tare devices each of up to maximum capacity of the instrument.

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 Temperature limits

The instrument is limited to the temperature range of -5°C to +40°C and is so marked.

1.5 Power Supply

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

1.6 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 Certificate No S1/0/A.

1.7 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).

Data derived from any analogue output or interface shall not be used for trade use.

Interfaces of the following types may be fitted:

- serial data interfaces, e.g. RS232, RS422/RS485, PS2, USB, Ethernet
- analogue output
- digital I/O
- A keyboard may be connected to the indicator for convenient data entry. Relevant functions (such as tare and zero setting) may be possible via corresponding remote commands.

1.8 Additional Features (Batching & Filling Functions)

The model AD-4402 indicator may be provided with certain other features and pre-set operational arrangements for batching and filling (hopper weighing).

These functions include provision for ‘material and recipe’ identification data and pre-set tare values to be stored in memory.

The batch weighing functions provide for:

- simple hopper weighing, where the gross weight of a batch is determined by a single weighing;

- simple hopper weighing, where the gross weight of a batch is determined by several weighings of different materials;
- single batch weighing, where the net weight of a batch is determined from the gross weighing operation and the application of a pre-set tare value; and
- function keys programmed to perform various functions (such as accessing and searching stored recipes, batches, item, product or client information).

Notes: The use of these features may or may not be appropriate in different situations.

The acceptability in any particular situation must be assessed in-situ and may require consultation with the appropriate trade measurement authority. In some situations it may be necessary for a print-out of the weighing result to be produced for the method of operation to be considered acceptable. In such situations General Supplementary Certificate No S1/0/A should be consulted.

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.

1.9 Verification Provision

Provision is made for the application of a verification mark.

1.10 Markings and Notices

Instruments carry the following markings:

Manufacturer's mark, or name written in full	A & D Company Ltd, Japan
Name or mark of manufacturer's agent	…….
Indication of accuracy class	(III)
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 S503
Pattern approval mark for other components	..... #3
Special temperature limits	-5°C to +40°C

#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.

1.11 Sealing Provision

Access to the calibration switch may be sealed by use of a destructible adhesive label to secure any unused 'blanking' panels on the rear of the indicator, as well as the use of a destructible adhesive label on one side of the panel at the top of the indicator (Figure 2).

However, to ensure that the calibration is 'secured', it is also important that the calibration switch within the indicator has been correctly set, so that access to the instrument menus that allow calibration adjustments is prevented.

This can be checked by the following procedure:

(a) Commence with the indicator switched on in normal weighing mode.

(b) Press the 'enter' (←) and 'cursor/scroll' (┼>) keys together and a sub-menu is displayed.

(c) Press the 'cursor/scroll' key several times until 'CAL' is highlighted.

(d) Press the 'enter' key.

(e) If the calibration function is set correctly to 'disabled', a message "Calibration is impossible" is displayed to indicate that calibration is protected.

(f) Press the 'ESC' key several times to return to the normal weighing mode.

2. Description of Variant 1 approved on 21/11/07

The A & D model AD-4404 which is similar to the pattern (model AD-4402), but which has software incorporating additional features intended for use in filling/packaging operations (e.g. HI / LO / OK setpoints) and for the control of conveyors.

Note: The model AD-4404 has a number of modes of operation (particularly the 'Automatic Mode' and 'Conveyor Stop Mode') which are intended for use in the development of automatic weighing instruments (i.e. instruments which operate without the intervention of an operator in each weighing cycle).

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

Conditions relating to additional functions (e.g. as indicated in clause **1.8 Additional Features (Batching & Filling Functions** above) also apply to this variant.

TEST PROCEDURE

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

Maximum Permissible Errors

The maximum permissible errors are specified in Schedule 12 of the *National Measurement Regulations 1999*.

Ensure that instruments are only being used within the special temperature limits stated elsewhere in this Technical Schedule.

FIGURE S503 – 1

A & D Model AD-4402 Digital Indicator

FIGURE S503 – 2

Typical Sealing Arrangements

~ End of Document ~