Australian Government

National Measurement Institute

Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

No 6/14B/18

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

Accuweigh Model EDW-25 Discontinuous Totalising Automatic Weighing Instrument

submitted by Accuweigh (SA) Pty Ltd
48 West Thebarton Road
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 107, *Discontinuous Totalising Automatic Weighing Instruments (Totalising Hopper Weighers)*, dated July 2004.

CONDITIONS OF APPROVAL

This approval becomes subject to review on 1 November 2012, and then every 5 years thereafter.

Instruments purporting to comply with this approval shall be marked with approval number 'NMI 6/14B/18' and only by persons authorised by the submittor.

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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.

The National Measurement Institute reserves the right to examine any instrument or component of an instrument purporting to comply with this approval.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificate No S1/0/A.

The values of the performance criteria (maximum number of scale intervals etc.) applicable to the instrument shall be within the limits specified herein and in any approval documentation for the components where they are approved separately.

This approval shall NOT be used in conjunction with General Certificate No 6B/0.

DESCRIPTIVE ADVICE

Pattern: approved 29 October 2007

- An Accuweigh model EDW-25 Class 1 discontinuous totalising automatic weighing instrument having two weigh hoppers, each of 25 kg maximum capacity.

Technical Schedule No 6/14B/18 describes the pattern and variant 1.

FILING ADVICE

The documentation for this approval comprises:

Certificate of Approval No 6/14B/18 dated 30 October 2007
Technical Schedule No 6/14B/18 dated 30 October 2007 (incl. Test Procedure)
Figures 1 and 2 dated 30 October 2007

Signed by a person authorised by the Chief Metrologist to exercise his powers under Regulation 60 of the *National Measurement Regulations 1999*.

TECHNICAL SCHEDULE No 6/14B/18

Pattern: Accuweigh Model EDW-25 Discontinuous Totalising Automatic Weighing Instrument

Submittor: Accuweigh (SA) Pty Ltd
48 West Thebarton Road
Thebarton SA 5031

1. Description of Pattern

An Accuweigh model EDW-15 Class 1 discontinuous totalising automatic weighing instrument (Figure 1) having two weigh hoppers, each of 25 kg maximum capacity.

Note: This approval has been granted with reference to document NMI R 107, *Discontinuous Totalising Automatic Weighing Instruments (Totalising Hopper Weighers)*, dated July 2004. The following description is intended to introduce terms used in this Certificate and Technical Schedule which may be additional to those in that document but which are consistent with the terminology in the document.

The system aims to provide a *bulk load delivery* of close to a requested amount (*target totalised load*) using a particular *delivery sequence*.

This sequence involves the totalisation of the results of a number of *discrete load deliveries* or *weighing cycles*, each of which involves the division of the bulk product into *discrete loads*, according to a *target discrete load* the mass of which is then determined by weighing to give the *discrete load delivered* following which the product is discharged to the bulk output. Note that the *target discrete load* may be achieved by stopping or slowing the bulk product delivery prior to the *target discrete load* value being reached according to *discrete load target shutoff adjustments* (such as inflight adjustments or slow flow pre-sets).

Each *discrete load delivered* is totalised (at any time this may be termed the *cumulative totalisation*).

The *target discrete load* is generally a pre-selected value that is the same for most of the *discrete load deliveries* (this may be termed the *pre-selected target discrete load*). However for the final one or two deliveries in the *bulk load delivery* the *target discrete load* may differ (for example to avoid excessively large or small *discrete loads*). In addition, arrangements for stopping or slowing the bulk product delivery prior to the *target discrete load* value being reached may vary for the final discrete deliveries in the delivery sequence according to *target totalised load shutoff adjustments* (such as inflight adjustments or slow flow pre-sets). These adjustments or pre-sets are generally aimed at achieving a *totalised bulk load delivered* which is as close as possible to the *target totalised load*.

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The *totalised bulk load delivered* is the cumulative totalisation (sum of all discrete loads delivered), in the complete *bulk load delivery*. The transaction is based on the *totalised bulk load delivered* (not the *target totalised load*).

1.1 Details

The instrument is a Class 1 discontinuous totalising automatic weighing instrument having two weigh hoppers, each with a minimum capacity (for the *target discrete load*) of 10 kg, and a maximum capacity (for the *target discrete load*) of 25 kg. The instrument is approved for use with a minimum totalised load (Σ_{min}) of not less than 500 kg and a totalisation scale interval of 0.05 kg.

1.2 Weighing System

The pattern (Figures 1 and 2) comprises:

(a) Two weigh bins adjacent to each other, with the in-feed arrangement designed to divert the product feed to either weigh bin (Figure 1);

(b) Four A&D Mercury model LC4102-K030 load cells of 54 kg maximum capacity, two supporting each weigh bin, and mounted as shown in Figure 1 (the load cells are also described in the documentation of approval NMI S484.);

(c) Two Rinstrum model 5000 digital indicators, one for each weigh bin (the digital indicators are also described in the documentation of approval NMI S363);

(d) An electronics cabinet (Figure 2) which, in addition to the two Rinstrum 5000 digital indicators, contains additional electronic components including:

- an ADVANTECH model ADAM 4055 Digital Input/Output Module;
- a MOXA model EDS-205 ethernet switch;
- MOXA models NPort 5230 and NPort 5210 serial to ethernet server devices;
- rechargeable batteries which are used to power the system; and
- relays;

(e) actuators and associated position sensors to control the diverter (to change product delivery from one weigh bin to the other) as well as the product in-feed and the out-feed gates of each weigh bin;

(f) a printer (to print transaction data); and

(g) a control computer with touch screen operator display/control panel (Figure 2).

1.3 Indicator

The control computer with touch screen operator display/control panel controls the measurement functions, capturing empty and full load readings for each discrete load from the Rinstrum indicators and totalising the discrete load values. It also controls the process starting and stopping, diverter and in-feed and out-feed gate controls, gate limit switches, and alarm functions. The touch screen display provides the control panel and display for measurement data.

1.4 Operation

The automatic weighing cycle is started with the weigh bin empty. The first bin is then filled with product, and once full (i.e. a load close to the target discrete load has been achieved) the diverter is then switched so that product is delivered to the second bin. Whilst the second bin is filling, a weight reading is taken from the first bin, the out-feed gates of the first bin are opened and after emptying, a weight reading of the (empty) first bin is taken. The difference in the two weighings is the discrete load delivered for the first bin. A similar procedure occurs for the second bin to determine the discrete load delivered for the second bin.

In this way the two weigh bins are alternately filled and emptied, and the control computer totalises the discrete loads delivered from both bins.

Settings such as the target discrete load ('Dump Weight') and target totalised delivery may be set by the operator via the touch screen display/control panel. Other adjustments such as settling time may also be set via the touch screen display/control panel by use of the 'Accuweigh Access' button, which is password protected.

1.5 Level Indicator

Where the instrument is not installed in a permanently fixed location (e.g. where it is installed on a vehicle), a level indicator shall be provided, together with a prominent notice advising that the INSTRUMENT MUST BE LEVEL WHEN IN USE, or similar.

1.6 Verification/Certification Provision

Provision is made for the application of a verification/certification mark.

1.7 Sealing Provision

Provision is made for the calibration adjustments in both of the Rinstrum indicators to be sealed by means of a destructible label over the calibration access on their indicator facias (as described in the documentation of approval NMI S363).

1.8 Markings and Notices

(a) Instruments carry the following markings, grouped together in a clearly visible place on the instrument, either on a descriptive plate fixed near the indicating device or on the indicating device itself:

Manufacturer's mark, or name written in full	Accuweigh Australia Pty Ltd
Indication of accuracy class	1
Pattern approval mark for the instrument	6/14B/18
Model number	EDW-25
Serial number	.....
Maximum capacity	*Max* = 25 kg *
Minimum capacity	*Min* = 10 kg *
Minimum totalised load	Σ_{min} = 500 kg *
Totalisation scale interval	d_t = 0.05 kg
Serial number of the instrument	.....
Material to be measured	.....

* These markings shall also be shown near the display of the result if they are not already located there.

(b) Instruments carry a notice visible to the operator stating TARGET LOAD SHALL BE NO LESS THAN 10 kg, or similar wording. (This refers to the *target discrete load*.)

TEST PROCEDURE

Instruments shall be tested in conjunction 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*.

Test Procedure

The test procedures to be used are based on NMI R 107, *Discontinuous Totalising Automatic Weighing Instruments (Totalising Hopper Weighers)*, dated July 2004.

The following assumes use of the separate verification method. Care shall be taken to ensure that the control instrument and its method of use are adequate, in accordance with NMI R 107.

Note: Practical circumstances for particular installations may necessitate variations to this test procedure. Such variations shall only be implemented with the agreement of the appropriate trade measurement authority.

Tests

Carry out testing with *target discrete loads* and *target totalised loads* determined as follows.

Note: In the following a factor of 10 is used for the *target totalised load* instead of a factor of 5 which normally applies to discontinuous totalising automatic weighing instruments. This reflects the nature of this particular instrument which effectively has two totalising hoppers operating in parallel – i.e. the *minimum totalised load* is twice what would apply for a single totalising hopper.

(i) Deliveries with target discrete load of *Max*

From the intended Σ_{min} and the *Max* value, calculate $N_{(max)}$, the number of weighing cycles required to deliver the minimum totalised load when operating with discrete loads of *Max*.

Where $N_{(max)}$ is 10 or more, one delivery shall be carried out with a target discrete load of *Max* – the quantity of the test load (target totalised load) shall be Σ_{min}.

Where $N_{(max)}$ is less than 10, two deliveries shall be carried out with the target discrete load set to *Max*, as follows:

- one with a test load (target totalised load) of Σ_{min}; and
- another with a test load (target totalised load) of 10 × Max.

(ii) Deliveries with target discrete load of *Min*

Similarly, from the intended Σ_{min} and the *Min* value, calculate $N_{(min)}$, the number of weighing cycles required to deliver the minimum totalised load when operating with discrete loads of *Min*.

Where $N_{(min)}$ is 10 or more, one delivery shall be carried out with a target discrete load of Min – the quantity of the test load (delivery) shall be Σ_{min}.

If $N_{(min)}$ is less than 10, two deliveries shall be carried out with the target discrete load set to *Min*, as follows:

- one with a test load (target totalised load) of Σ_{min}; and
- another with a test load (target totalised load) of 10 × *Max*.

(iii) Additional test if the procedure indicates less than three tests

In some cases the above procedure may indicate only two tests to be performed. If this is the case an additional test is carried out (to achieve a total of three material tests). For this test, the test load (target totalised load) is to be Σ_{min} with the instrument operating with target discrete loads of a value which is typical for the installation (if it is difficult to arrive at a typical value use *Min*).

Note: For some types of instrument the quantity delivered must be an integer multiple of the discrete load, whereas for other instruments this is not required. In the former case unless the minimum totalised load is an integer multiple of the discrete load, it may be necessary to use the next larger possible test load (which is an integer multiple of the discrete load).

(iv) Tests – to be repeated for each delivery as determined above

(a) Start the weighing system, including surrounding equipment that is normally in use when the weighing instrument is in use.

(b) Set the *target discrete load* and *target totalised load* (as determined above).

(c) Set the instrument to the maximum rate of weighing cycles per hour.

(d) Initiate the delivery, ensuring that all delivered material is collected.

(e) Once the delivery is complete record the totalised load indicated by the instrument.

(f) Transport the delivered material to the control instrument and weigh it.

(g) Calculate the relative error, as follows:

$$Error = \frac{control\ instrument\ indication - instrument\ totalised\ load \times 100}{control\ instrument\ indication}$$

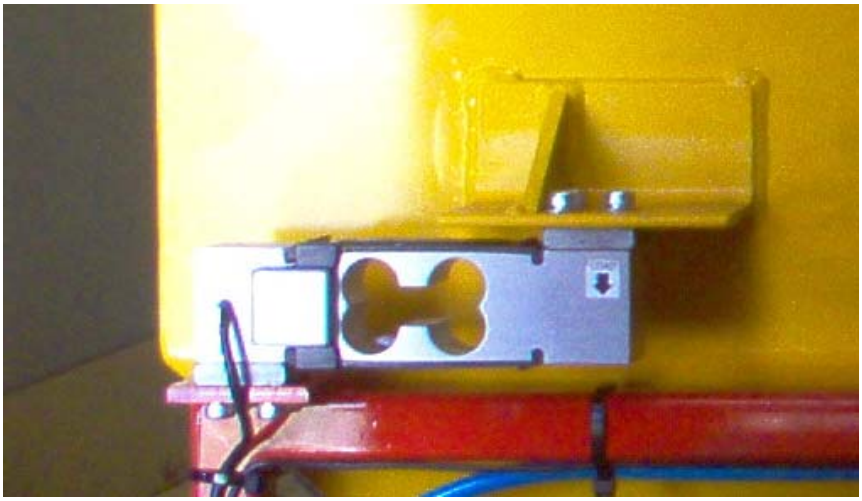
The relative error shall be within the MPE for each delivery.

(v) Additional tests with other products

Where the instrument is used with products of different characteristics, additional tests shall be carried out for the range of products used.

FIGURE 6/14B/18 – 1

(a) Hoppers

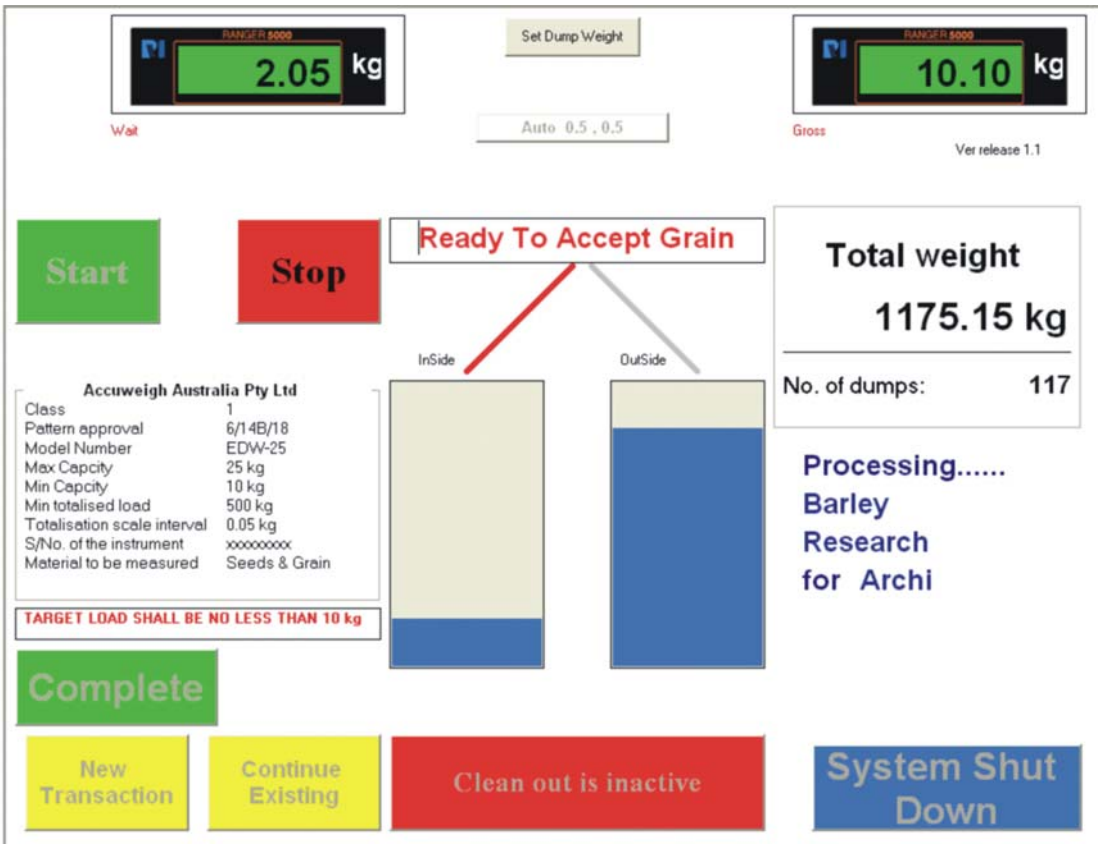


(b) Load Cell Mounting

Accuweigh Model EDW-25 Weighing Instrument

FIGURE 6/14B/18 – 2

(a) Accuweigh Model EDW-25 Electronics Cabinet



(b) Accuweigh Model EDW-25 Operator Display and Control Panel