



Australian Government
**Department of Industry,
Science and Resources**

**National
Measurement
Institute**

36 Bradfield Road, West Lindfield NSW 2070

**Interim
Provisional
Certificate of Approval
NMI P6/14B/34**

VALID FOR VERIFICATION PURPOSES UNTIL 30 June 2025

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.

Systemco Fabrication Model STDEQ-BAT01-00 Discontinuous Totalising Automatic Weighing Instrument

submitted by Systemco Australia Pty Ltd
 3/20 Lillian Crescent
 Kensington QLD 4670

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.

This approval is subject to review at the decision of the Chief Metrologist in accordance with the conditions specified in the document NMI P 106.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern provisionally approved – interim certificate issued	05/03/25

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI P6/14B/34' 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 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

Special Conditions of Approval: (Provisional Approval)

This approval is limited to 10 (ten) instruments only, located at:

- Farnsfield, 131 Pranges Rd, Farnsfield, QLD 4460; and
- Wide Bay Sorting, 1858 Bucca Road, Bucca, Queensland, 4670; and
- Alloway, 121 Chapmans Road, Alloway, Queensland, 4670; and
- Australian Premium Macadamias, 110 Targo St, Bundaberg South QLD 4670.

Instruments purporting to comply with this approval shall be marked with approval number 'NMI P6/14B/34' and only by persons authorised by the submitter. (Note: The 'P' in the approval number may be a temporary marking.)

The approval will remain provisional pending completion of satisfactory testing and evaluation (results of verification testing shall be copied to the Pattern Approval Section at NMI).

In the event of unsatisfactory performance the approval may be cancelled (or varied).

The submitter shall implement such modifications as required by NMI. In the event that such modifications (if any are required by NMI) are not made to the satisfaction of NMI, this approval may be withdrawn.

1. Description of Pattern **provisionally approved on 05/03/25**

A Systeco Fabrication model STDEQ-BAT01-00 Class 0.5 discontinuous totalising automatic weighing instrument (DTAWI) (Figure 1) having a weigh hopper of 200 kg maximum capacity.

The instrument is installed in a permanently fixed location.

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* using a particular automatic *delivery sequence* (the term 'delivery' may also be taken to refer to 'receipt').

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).

The *totalised bulk load delivered* may be the quantity measured without a particular target totalised load.

Alternatively the *totalised bulk load delivered* may be intended to be close to a requested amount (*target totalised load*) in which case adjustments and pre-sets as described above may be used to achieve this as closely as possible.

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 STDEQ-BAT01-00 instrument is a Class 0.5 discontinuous totalising automatic weighing instrument having a weigh hopper with a maximum capacity of 200 kg.

The instrument is approved for use with a minimum totalised load (Σ_{min}) of not less than 100 kg and a totalisation scale interval of 0.1 kg. The instrument has a minimum capacity of 100 kg, and is set to have a *target discrete load* of from 100 kg to 200 kg.

The STDEQ-BAT01-00 instrument permanently records the *totalised bulk load delivered* and the net value of each discrete load delivered. This information can be sent to a printer if required.

Note: The discrete load values are NOT approved for trade use. The totalised bulk load delivered (a total of the discrete load delivered values) is the value approved for trade use.

1.2 Weighing System

The pattern comprises components as described below.

- (a) A weigh hopper with out-feed gate, using four (4) Zemic model H8C-C3-200kg shear beam load cells (Figure 2) of 200 kg maximum capacity. The load cells are also described in the documentation of approval NMI S752. The load cells are located symmetrically around the weigh hopper.
- (b) A SysTec model IT8000E digital indicator (Figure 3) for the weighing system (the digital indicator is also described in the documentation of approval NMI S556). The indicator is fitted with associated networking and input/output modules as necessary to control gates of the hoppers, interface with relevant sensors (e.g. upper garner fill level), and communicate with any plant control system, computer, printer etc.
- (c) The SysTec model IT8000E mentioned in (b) above operates with SysTec ABS software (Version V4.16) which utilises the weight readings provided by the digital indicator to determine the discrete load values and totalises them to determine the *totalised bulk load delivered*, and stores the weighing data.
- (e) The SysTec model IT8000E mentioned in (b) above incorporates an operator interface by which the operator can control the system, and access the weighing data.

Note: The system may also be controlled and weighing data accessed by other (networked) computers.
- (f) Actuators and associated position sensors to control the product in-feed and the out-feed gates for the weigh hopper. (*)
- (*) For items marked (*) above, 'Compatible and Equivalent' equipment may be used. 'Compatible and Equivalent' refers to equipment of the same or better specifications, requiring no changes to software for satisfactory operation of the complete system.

1.3 Indicator and Weighing Control Arrangements

The SysTec model IT8000E indicator running SysTec ABS software is self-sufficient for operating the bulk weigher and recording the weight data from the digital indicator. The unit controls the weighing sequence; including checking of various aspects of the system operation (blocked chutes, gates open or closed as appropriate).

The IT8000E may interface with equipment which controls other aspect of plant operation, by providing an 'error' signal to this equipment if any issues are detected in the weighing process, along with a signal indicating 'Material Short' (i.e. indicating that space is available in the upper garner, and thus that product flow to it should be started or stopped).

The SysTec ABS software uses inputs from the system to determine when no further product delivery is required (e.g. when the no further product is available, the discharge receptacle is full, or sufficient product has been supplied). In some cases these inputs may be provided by the plant operator's control system (e.g. to indicate that sufficient product has been supplied).

Weight data from the IT8000E is used by the SysTec ABS software to determine the discrete load values, totalise them to determine the *totalised bulk load delivered*, and store this weight data.

Where sufficient product has been supplied, the SysTec ABS software finalises the delivery and totalises the discrete load deliveries to form the *total bulk load delivered* value.

The weight data, together with information regarding the weighing sequence status, may also be provided to the plant operator's control system, which may retrieve weight data for printing if required. In addition the SysTec ABS software maintains a record of every completed weighing cycle. The record consists of the weight value, date and an identification number, which cannot be deleted or changed.

The system has provision for additional mode:

Manual operation

In which the gates of the system may be manually operated, outside the normal operation sequence, the product delivery is not totalised.

This mode is not approved for trade use.

1.4 Operation

An overview of the sequence of operation of the system is shown in Figure 5.

The system is considered to be a discontinuous totalising automatic weighing instrument as it follows a predetermined program of automatic processes characteristic of the instrument. The product is weighed by individual discrete loads, which are totalised to determine the bulk product weighed.

1.5 Verification Provision

Provision is made for the application of a verification mark.

1.6 Sealing Provision

Provision is made for the calibration adjustments to be sealed by the use of at least two destructible adhesive labels one at each side of the back cover plate of the instrument (Figure 4a).

The calibration parameters are stored within the ADM module for each platform. The ability to change these parameters is inhibited when the jumper 'W1' on each ADM module is in the protected location (connecting pins 1 and 2, as shown in Figure 4b).

1.7 Descriptive 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	Systemco Fabrication
Importer's mark or name written in full	Systemco Australia
Indication of accuracy class	0.5
Pattern approval mark for the instrument	NMI P6/14B/34
Model number	STDEQ-BAT01-00
Serial number of the instrument
Maximum capacity	<i>Max</i> = 200 kg (#)
Minimum capacity	<i>Min</i> = 100 kg (#)
Minimum totalised load (not less than)	Σ_{min} = 100 kg (#)
Totalisation scale interval	d_t = 0.1 kg
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 DISCRETE LOAD SHALL BE xxxx kg to yyyy kg ONLY, or similar wording (where xxxx and yyyy are in the range of 100 kg to 200 kg).

Note: Markings for variants vary according to particular characteristics.

TEST PROCEDURE No P6/14B/34

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

Where a specific National Instrument Test Procedure for DTAWI does not exist, an appropriate test procedure (e.g., Inspectors Handbook Test Procedure No 22) shall be used and a copy of Test Procedure No 22 should be requested from NMI.

Maximum Permissible Errors

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

Application of Inspectors Handbook Test Procedure No 22 Clause 5.2

Weighing Performance Tests

The following test procedure assesses the weighing performance of the DTAWI with the type of material that it is intended to weigh. The performance tests shall be carried out in accordance with *separate verification method* only.

A minimum of 3 material weighing tests is required as specified below.

Maximum Target Discrete Load

This test procedure assesses the weighing performance operating with maximum target discrete loads.

1. Determine the number of weighing cycles required to deliver the minimum totalised load (Σ_{min}) when operating with maximum target discrete loads (Max_T) as follows:

$$N_{Max} = \frac{\Sigma_{min}}{Max_T}$$

where N_{Max} is rounded up to the next integer.

2. Perform a weighing test with a target discrete load of Max_T and a target totalised load of Σ_{min} .
3. If N_{Max} is less than 5, perform an additional material weighing test with a target discrete load of Max_T and a target totalised load of $5 \times Max_T$.

Minimum Target Discrete Load

This test procedure assesses the weighing performance operating with minimum target discrete loads.

1. Determine the number of weighing cycles required to deliver the minimum totalised load when operating with minimum target discrete loads (Min_T) as follows:

$$N_{Min} = \frac{\Sigma_{min}}{Min_T}$$

where N_{Min} is rounded up to the next integer.

2. Perform a weighing test with a target discrete load of Min_T and a target totalised load of Σ_{min} .
3. If N_{Min} is less than 5, perform an additional weighing test with a target discrete load of Min_T and a target totalised load of $5 \times Min_T$.

Additional Test

In some cases the above procedure may indicate only two tests to be performed. To achieve three material tests in total, perform an additional weighing test with target totalised load of Σ_{min} and a target discrete load value which is standard or typical for the installation. If it is difficult to arrive at a standard value then use Min_T .

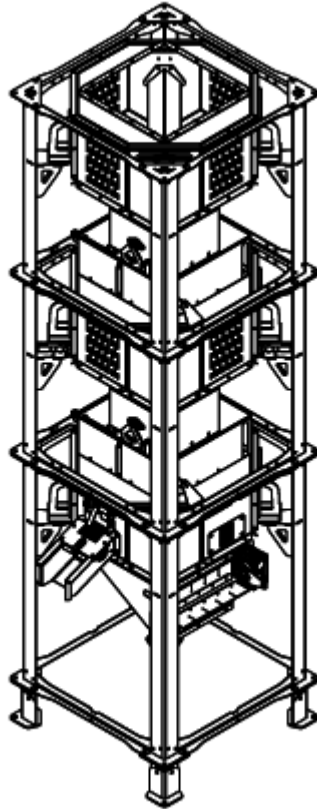
Note: For some types of instruments the quantity delivered (target totalised load) must be an integer multiple of the discrete load. In this case unless the minimum totalised load is an integer multiple of the discrete load, it may be necessary to use the next larger possible test load (which is an integer multiple of the discrete load).

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



Darryl Hines
Manager
Policy and Regulatory
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FIGURE P6/14B/34 – 1



Typical Integration Installation

FIGURE P6/14B/34 – 2



Zemic Model H8C Series Shear Beam Load Cell

FIGURE P6/14B/34 – 3

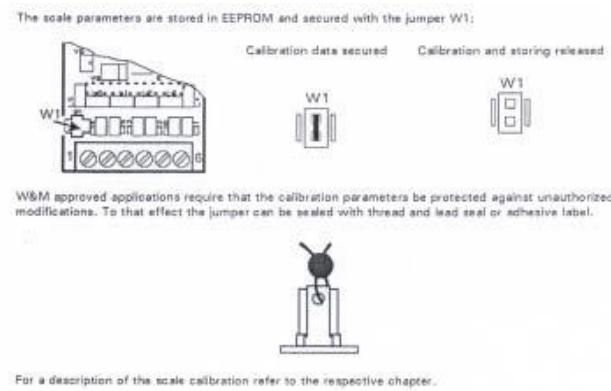


SysTec Model IT8000E Digital Indicator

FIGURE P6/14B/34 – 4



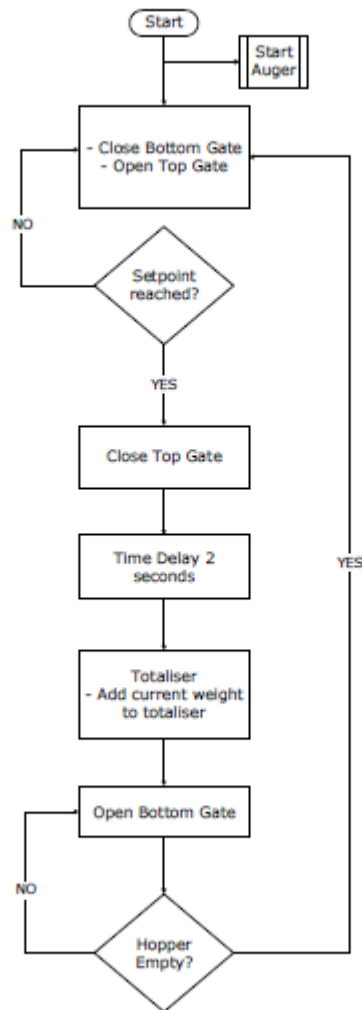
(a) Typical Sealing of SysTec Model IT8000E Digital Indicator



(b) Showing Jumper W1 Sealing – Model IT8000E

Typical Sealing Methods

FIGURE P6/14B/34 – 5



Overview of System Operation

~ End of Document ~