Australian Government

Department of Industry and Science

National Measurement Institute

Certificate of Approval

NMI 13/1/28

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.

CubeLogic Systems Model VCM1250 Dimensional Measuring Instrument

submitted by   CubeLogic Systems
                      Level 4, 83 Mount Street
                      North Sydney   NSW   2060

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 129, *Multi-dimensional Measuring Instruments*, dated July 2004.

This approval becomes subject to review on 1/09/20, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern approved – certificate issued	19/08/15

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with approval number 'NMI 13/1/28' 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.

Special:

Instruments are only approved for use for determination of the dimensions and volume of the smallest rectangular box that could contain an object, for the purposes of determining freight or postal charges.

The dimensions determined may also be used for the calculation (by peripheral equipment) of a volume and/or 'dimensional weight' (*) value of the object, also for the purposes of determining freight or postal charges.

(*)   A 'dimensional weight' value is a calculated value deemed to be a weight value obtained by applying a conversion factor to the object's volume.

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 13/1/28

1.   Description of Pattern   approved on 19/08/15

A CubeLogic Systems model VCM1250 dimensional measuring instrument (Figure 1) which is approved for use for the determination of the linear dimensions of stationary objects. Instruments may be fitted with output sockets (output interfacing capability) for the connection of auxiliary and/or peripheral devices.

1.1   Details

The pattern is approved for use for the determination of the linear dimensions of objects having maximum cubic (*) dimensions (i.e. length × width × height) of 59 × 59 × 59 cm and minimum dimensions 10 × 10 × 10 cm, with a scale interval of measurement (d) of 1 cm.

(*)   Non-cubic objects may be of different maximum dimensions, e.g. 102 × 102 × 20 cm (Figure 2).

The pattern converts the detected characteristics into the linear dimensions of the smallest rectangular box (parallelepiped – #) that would fully contain the object.

The pattern is approved for use in measuring the linear dimensions of opaque objects only; the dimensions determined may also be used for the calculation of volume and/or 'dimensional weight' value (**) of the item (refer to the Special Conditions of Approval).

Note: This instrument is NOT suitable for:

- transparent objects and objects packed in thick, transparent wrapping material, e.g. 'bubble wrap'; or
- objects with a mirror-like surface, e.g. chrome or other high gloss finish.

However, the instrument can measure objects covered in shiny sealing tape or glossy plastic wrapping, e.g. 'cling warp'.

Objects are measured statically by being positioned manually in the defined measurement area. Objects must be positioned within the laser pattern (+) that is visible on the table so the edges of the object are within and parallel to the measurement axis.

(#)   A rectangular box (parallelepiped) is a polyhedron having six faces that are parallel in pairs; each face is a parallelogram and adjacent edges are perpendicular.

(**)   A **'dimensional weight'** value is a calculated value deemed to be a weight value obtained by applying a conversion factor to the object's volume as calculated from the measured dimensions.

1.2   Laser Scanner

The pattern includes a scanner unit containing two Gocator model 2080 laser line profile sensors (Figure 1) mounted to a frame above a table which forms the defined measurement area. The scanner unit is positioned above the measurement area to detect the edges of the object to be measured.

The laser scanner performs a scan of the object in the measurement area. The image data is processed by the CubeLogic model VCM1250 controller and the measurement result is output to the CubeLogic Systems model VCM1250 indicator. The system operates using CubeLogic VCM1250 version 2.2.1 firmware.

1.3 Indicator Unit

A CubeLogic Systems model VCM1250 indicator (Figure 3) provides a 4-line alphanumeric LCD display for indication of measurement results. The indicator is also used to operate and configure the instrument and displays any error messages that occur during a measurement operation.

1.4 Indications

The pattern is fitted with a CubeLogic Systems model VCM1250 indicator however measurement data from the pattern is made available to other systems via ethernet and/or serial communications for indication and/or printing.

Printed and displayed information must be made available for verification and must comply with the requirements set out in document NMI R129, *Multidimensional Measuring Instruments*, in particular as per the extract below.

> 7.9.1 Any printed ticket or displayed indication shall include sufficient information to identify the transaction, for example:
> (a) dimensions: length (*L*), width (*W*) and height (*H*);
> (b) volume (vol);
> (c) weight (Wt) if the instrument includes a weighing instrument;
> (d) dimensional weight (Dim Wt ... kg or DW ... kg);
> (e) dimensional tare (DT ... kg);
> (f) conversion factor (F);
> (g) quantity for charging, for example dimensions, vol or DW ... kg;
> (h) price rate and price; and
> (i) date, transaction number or other identification of the object.
>
> *Note 1:* Icons may be used to identify indications.
> *Note 2:* When the customer is not present during the measurement process the above information need not be displayed or printed out at the time but shall be available on request.
> *Note 3:* The price interval and the price rate shall comply with the national regulations applicable for trade.
>
> 7.9.2 A printed ticket shall also contain the following printed or preprinted information:
> (a) that the dimensions and/or volume shown are those of the smallest rectangular box that fully encloses the object; and
> (b) that the dimensional weight is a calculated value deemed to be a weight value obtained by applying a conversion factor to the object's volume or dimensions.

1.5 Sealing Provision

Provision is made for sealing the calibration adjustments in software using an audit trail which records adjustments.

Provision is also made for sealing the CubeLogic controller enclosure by means of at least one sealing label applied over the edge of the enclosure (Figure 4).

Provision is made for sealing the laser scanner mounting frame by means of at least one sealing label applied over the edge of the enclosure (Figure 5).

1.6 Verification Provision

Provision is made for the application of a verification mark.

1.7 Descriptive Markings and Notices

(a)   Instruments carry the following markings (in the vicinity of the indicating device):

Manufacturer's mark, or name written in full	CubeLogic Systems Pty Ltd
Model designation	VCM1250
Serial number of the instrument	.....
Year of manufacture	.....
Pattern approval mark	NMI 13/1/28
Maximum dimensions for each axis	*Max* ..... cm
Minimum dimensions for each axis	*Min* ..... cm
Scale interval	d = ... cm

(b)   Instruments carry one or more notices stating:

'Instruments may only be used to measure objects which:

  - are square or rectangular shaped
  - have smooth and flat surfaces with non-rounded edges
  - are non-transparent
  - do not have black surface colour
  - do not have black colouring on their perimeters
  - must be located in the correct position (central and square with the laser pattern)

Use with any other objects is not approved.'

TEST PROCEDURE

Note: Refer to clause **1.4 Indications** – Printed and displayed information must be made available for verification and must comply with the requirements set out in document NMI R 129, *Multi-dimensional Measuring Instruments*, dated July 2004.

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.

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

Maximum Permissible Errors

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

Instruments shall be tested as follows:

(a)   Test objects shall be used of known lengths such that each axis (i.e. length × width × height) is tested for at least five dimensions between and including the minimum and maximum lengths specified on the instrument nameplate. Each test object shall be rigid and with well-defined edges to simulate the edges of a rectangular box. All adjacent faces and edges shall be perpendicular to each other. The dimensions shall be equal to Nd and the lengths shall be known to an uncertainty equal to or better than ±1/5 of the maximum permissible error, which is equal to the scale interval (d). N is a whole number.

(b)   Carry out at least three test runs for each length. Each measurement shall be within the maximum permissible error.

(c)   Check that instruments are marked and carry one or more notices in accordance with clause **1.7 Descriptive Markings and Notices**.

FIGURE 13/1/28 – 1

CubeLogic Systems Model VCM1250 Dimensional Measuring Instrument

FIGURE 13/1/28 – 2
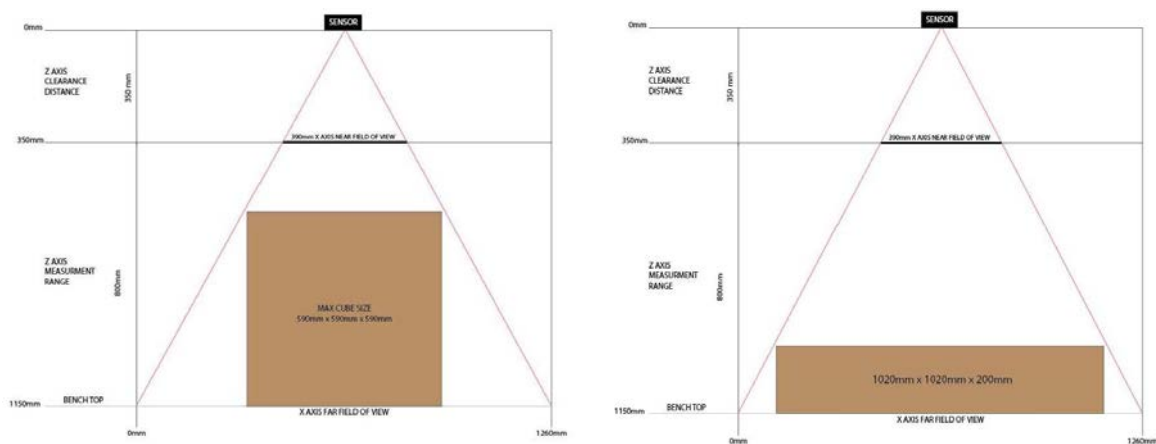
Examples of Different Maximum Dimensions for Different Object Shapes
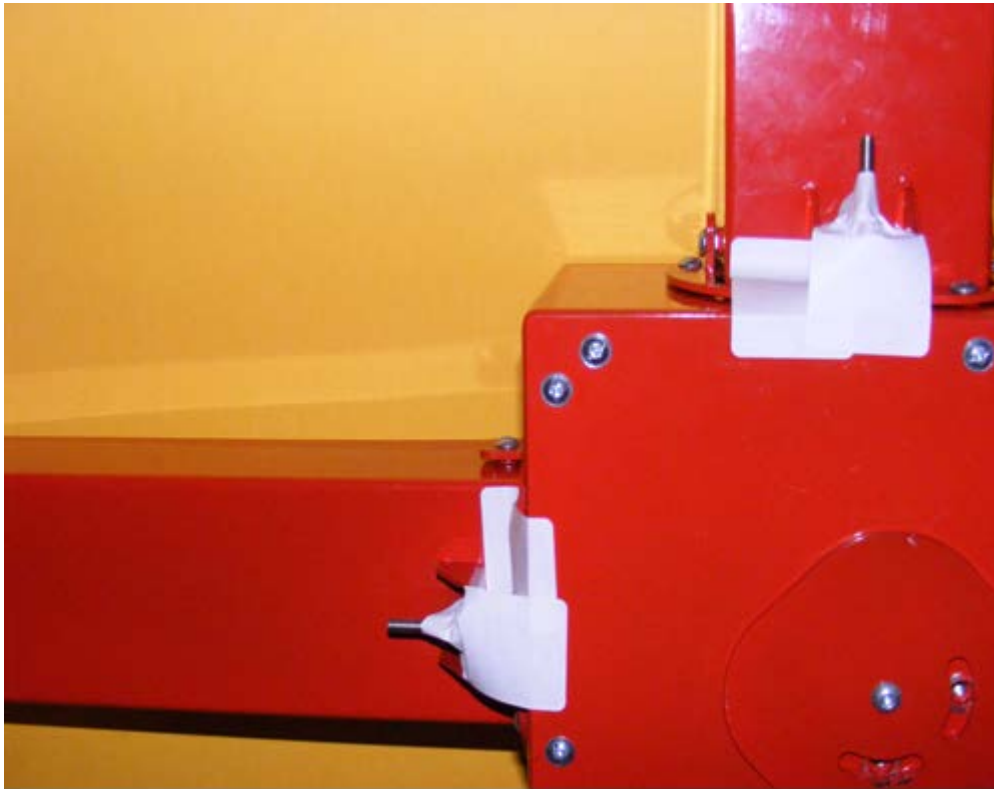
FIGURE 13/1/28 – 3

CubeLogic Systems Model VCM1250 Indicator

FIGURE 13/1/28 – 4

Typical Mechanical Sealing of CubeLogic Controller Enclosure

FIGURE 13/1/28 – 5

Typical Mechanical Sealing of Laser Scanner Mounting Frame

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