Australian Government
National Measurement Institute
Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 13/1/14

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.

Scale Components Model PalletScan Dimensional Measuring Instrument

submitted by Scale Components Pty Ltd
now of 4 Dan Street
Slacks Creek QLD 4127

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 **1/11/19** and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variant 1 approved – interim certificate issued	30/10/07
1	Pattern & variant 1 approved – certificate issued	24/04/08
2	Pattern & variant 1 amended (Test Procedure), reviewed & updated – certificate issued	30/05/14

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 13/1/14' 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 Certificates No S1/0/A or No S1/0B.

Special:

Instruments are only approved for use for determination of the dimensions of opaque objects and for the calculation of volume of the item, 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 of the object, also for the purposes of determining freight or postal charges.

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 13/1/14

1. Description of Pattern approved on 31/10/07

A Scale Components model PalletScan dimensional measuring instrument (Figures 1 and 2) which is approved for use for the determination of the linear dimensions of certain stationary objects.

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 0ºC to +40ºC and must be so marked.

1.1 Details

The pattern is approved for use for the determination of the linear dimensions of objects having maximum dimensions (i.e. length × width × height) of 160 × 140 × 180 cm and minimum dimensions 10 × 10 × 10 cm, with a scale interval of measurement (d) of 10 mm.

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 Condition of Approval).

The pattern may include a stationary platform or a conveyor type receptor. Objects are measured statically by being positioned manually on the platform or delivered into the measurement area by the conveyor system. The measurement operation is initiated by a manual button press or automatically when an object is detected in the measurement area using barcode scanners.

The instrument shall be installed in a location such that ambient light sources do not significantly affect the instrument performance while in use.

(#) 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 Dimensioning Heads

The pattern includes two SICK model VMD500-2000 laser dimensioning heads (Figures 1 and 2) mounted on a linear track above the load receptor.

The linear track moves the dimensioning heads at a speed of up to 1 m/s, taking measurements of the object and then the master head calculates the volume. The dimensioning heads operate with version 2.** software.

Each dimensioning head uses a 13.0 mW laser diode and a rotating mirror to deflect the light beam across the width of the measurement area. The light reflected by the measurement object is directed to a photoelectric receiver and the phase shift of reflected light is used to determine the width and height of the object.

1.3 Tachometer

The instrument uses a Sick model DKS60 tachometer to measure the length of the object in combination with the laser dimensioning head. The tachometer is fitted to the linear track and generates pulses based on the displacement of the track while the dimensioning head detects the object being measured.

1.4 CDM-400 Device

Additional Sick model CDM-400 Connection Device Modular components (Figure 2) are used to provide additional Digital data interfaces and support connectivity and commissioning of the dimensioning head.

1.5 Indications

The pattern is fitted with a local display unit (Figure 3) and in addition measurement data from the CDM device (when fitted) may be made available by means of a serial communication port (e.g. RS 232) to other systems for indication and/or printing.

Printed and displayed information must be made available for verification/certification and must comply with the requirements set out in document NMI R 129, *Multi-dimensional Measuring Instruments*, dated July 2004, 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;
> (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.

1.6 Verification Provision

Provision is made for the application of a verification mark.

1.7 Markings

(a) Instruments carry the following markings:

Manufacturer's mark, or name written in full	Scale Components Pty Ltd
Model designation	.....
Serial number of the instrument	.....
Year of manufacture	.....
Pattern approval mark	13/1/14
Maximum dimensions for each axis	*Max* ..... cm
Minimum dimensions for each axis	*Min* ..... cm
Scale interval	*d* = ... cm
Maximum belt speed	..... m/min
Minimum belt speed	..... m/min
Special temperature limits	0°C to +40°C

(b) Instruments carry one or more notices stating REFLECTIVE OR TRANSPARENT ITEMS CANNOT BE MEASURED, or similar wording.

1.8 Sealing Provision

Provision is made for sealing the calibration adjustments in the indicator/control panel by preventing access to the setup port ('J4') by means of a cover plate and sealing screws provided by the manufacturer (Figure 4) or other suitable method.

2. Description of Variant 1 approved on 30/10/07

The instrument is configured with the dimensioning heads mounted on a fixed frame above a conveyor type receptor. The tachometer is fitted to a conveyor belt and objects are measured by moving through the measuring area of the laser dimensioning heads.

The maximum dimensions (i.e. length × width × height) are 160 × 140 × 180 cm and the conveyor can operate at speeds up to 3 m/s.

4. Description of Variant 3 approved on 13/03/09

This instrument converts the detected characteristics into the linear dimensions of the smallest rectangular box (parallelepiped – #) that would fully contain the object being measured.

(#) 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.

5. Description of Variant 4 approved on 14/01/10

A model PalletScan II instrument which is similar to variant 2 but is configured with two VMS520 series dimensioning heads mounted on a fixed frame above a conveyor type receptor. The tachometer is fitted to a conveyor belt and objects are measured by moving through the measuring area of the laser dimensioning heads.

The maximum dimensions (i.e. length × width × height) are 260 × 140 × 160 cm.

The conveyor can operate at speeds of up to 2 m/s when fitted with model VMD520-0000 or model VMD520-1000 dimensioning heads or at speeds of up to 3 m/s when fitted with model VMD520-2000 dimensioning heads.

TEST PROCEDURE

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.

Note: Refer to clause **1.5 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.

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 N*d* 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, varying position and orientation across the receptor. Each measurement shall be within the maximum permissible error.

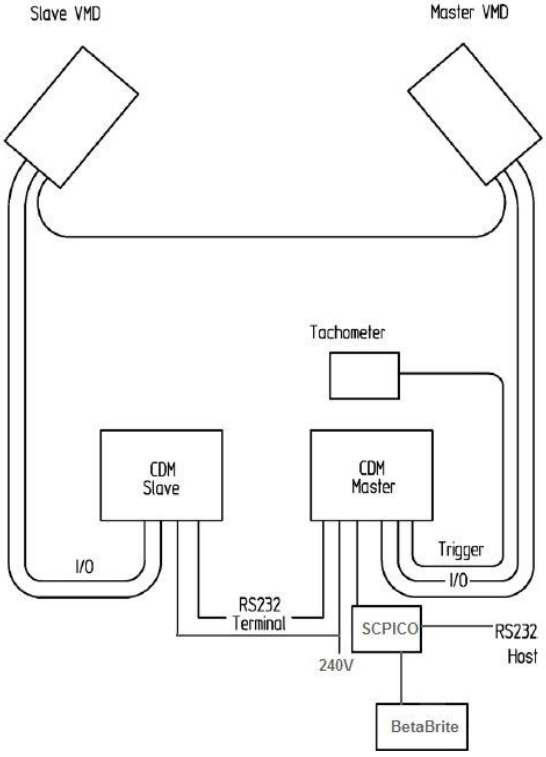
(c) Check that instruments carry one or more notices stating REFLECTIVE OR TRANSPARENT ITEMS CANNOT BE MEASURED, or similar wording.

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

FIGURE 13/1/14 – 1

Scale Components Model PalletScan Dimensional Measuring Instrument

FIGURE 13/1/14 – 2

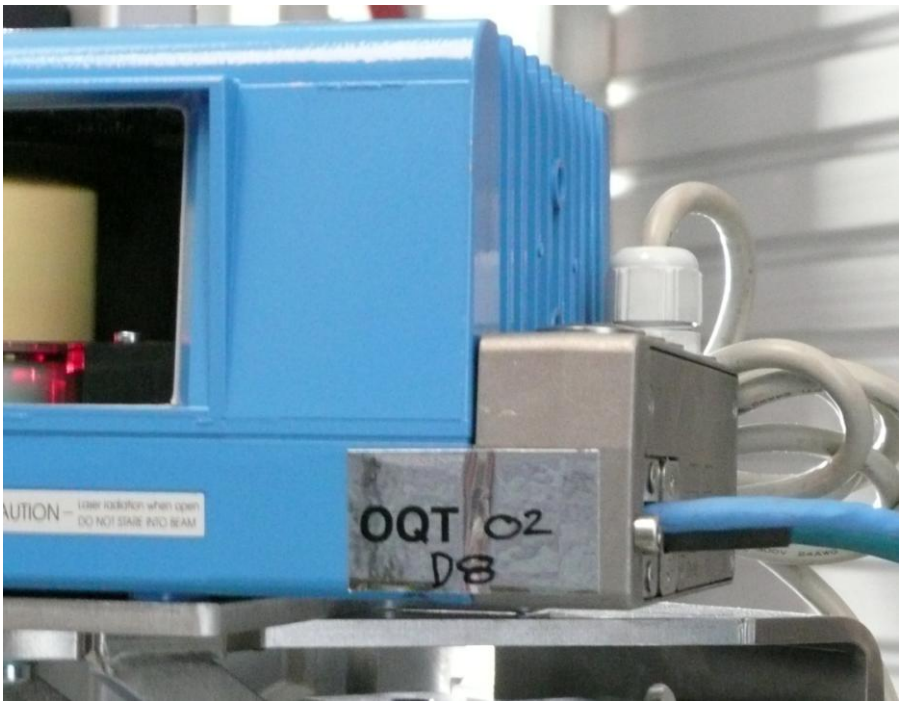


Scale Components Model PalletScan Dimensional Measuring Instrument

FIGURE 13/1/14 – 3

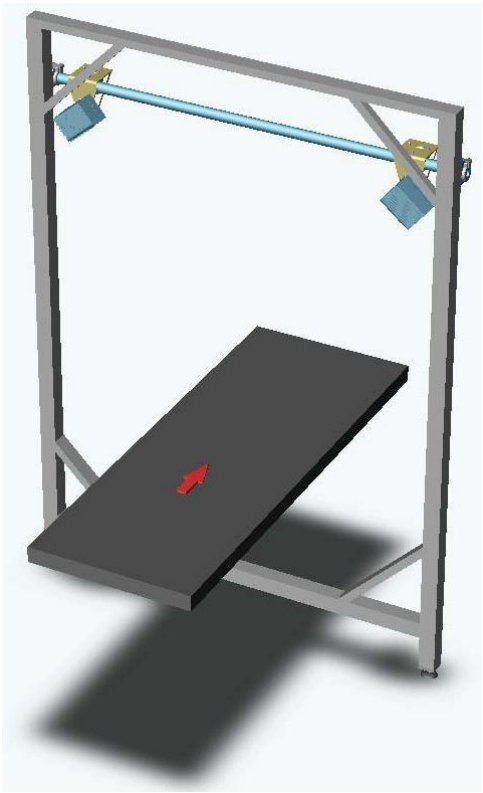
Alternate Views of Scale Components Display Unit

FIGURE 13/1/14 – 4



Typical Sealing

FIGURE 13/1/14 – 5



With Fixed Dimensioning Heads – Variant 1

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