Australian Government

Department of Industry, Science and Resources

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Interim

Provisional

Certificate of Approval

NMI P13/1/33

VALID FOR VERIFICATION PURPOSES UNTIL 1 December 2023

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.

SICK Model VML520 Dimensional Measuring Instrument

submitted by   SICK Pty Ltd
                   5 Helen Street
                   West Heidelberg   VIC   3081

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.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern and variation 1 provisionally approved – interim certificate issued	06/06/23

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI P13/1/33' and only by persons authorised by the submittor. (Note: The 'P' in the approval number may be a temporary marking.)

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 Conditions of Approval: (Provisional Approval)

This approval is limited to ten (10) sites only, the locations of which may be obtained from the National Measurement Institute. The submittor shall advise NMI in writing of the proposed location or serial number of each instrument prior to it being initially verified.

The approval will remain provisional pending completion of satisfactory testing and evaluation.

The submittor shall provide the NMI Pattern Approval Laboratory with copies of test results from the initial verification.

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

The submittor 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.

Special: For the pattern and all variants

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 as calculated from the measured dimensions.

1.   Description of Pattern   provisionally approved on 06/06/23

A SICK model VML520 dimensional measuring instrument which is approved for use for the determination of the linear dimensions of certain objects while they are in motion.

Instruments are approved for use over a temperature range of -10°C to +55°C and must be so marked.

1.1   Details

The instrument is approved for use for the determination of the linear dimensions of irregular shaped objects having maximum dimensions (i.e. length x width x height) of 1500 x 1000 x 1000 mm and minimum dimensions 50 x 50 x 50 mm, with a scale interval of measurement (d) of 5 x 5 x 5 mm and a belt speed (V_{max}) of up to 130 m/min.

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).

(#)   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 System

The pattern includes two SICK model MLG-2 optical dimensioning sensors mounted horizontally and vertically on a frame between two belt-conveyors. Each sensor consist of a transmitter and receiver. The sensors form a light grid in the measurement area where light is then blocked by the object to be measured as it travels across the conveyor belt.

The receiver of each sensor detects the light blocked by the object and combined the speed sensing system, is processed by the MSC800 control units to determine the linear dimensions of the object.

1.3   MSC800 control units

The dimensioning sensors is connected to two SICK model MSC800 (Modular System Controller) units to process the sensor and encoder signals to determine the linear dimensions that fully contain the object. The MSC800 controllers provide additional digital data interfaces and supports connectivity and commissioning of the laser dimensioning sensors.

The MSC800 controllers operate software version S2.94.xx

1.4   Speed Sensing System

With a SICK model DFV60B wheel encoder or equivalent (*) to measure the length of the object in combination with the MLG-2 sensors. The encoder is fitted to contact the conveyor belt, usually underneath where it can't be struck by packages, and generates pulses based on the displacement of the belt while the laser dimensioning head detects the object being measured.

(*)   Equivalent' is defined to mean other proprietary equipment of the same or better specifications requiring no changes to the software specified in this approval for satisfactory operation of the system

1.5   Indications

A SICK model LFT LCD display is connected to the MCU800 control unit 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.

Indicator lamps may be fitted to signal when the system is operating, a measurement is in progress or an error has been detected.

The pattern is fitted with a display however measurement data is also made available to other systems for indication and/or printing.

Where other systems are interfaced to the instrument, 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 pre-printed 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.

1.6   Additional System Facilities

The system may interface with other facilities such as barcode reading systems. The facilities shall not interact with the system in a way that would cause an incorrect indication of the measurement result.

1.7   Sealing Provision

Provision is made for sealing the calibration adjustments in the indicator/control panel by preventing access to the setup port by means of a cover plate and sealing screws provided by the manufacturer.

1.8   Verification Provision

Provision is made for the application of a verification mark.

1.9   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	SICK Pty Ltd
Model designation	.....
Serial number of the instrument	.....
Year of manufacture	.....
Pattern approval number for the instrument	NMI P13/1/33
Maximum dimensions for each axis	*Max* ..... mm
Minimum dimensions for each axis	*Min* ...... mm
Scale interval	d = ... mm
Maximum belt speed	*Max* ..... m/sec or m/min
Minimum belt speed	*Min* ..... m/sec or m/min
Special temperature limits	-10°C to +55°C

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

2.   Description of Variant 1   approved on 06/06/23

A SICK model VML520s which is similar to the pattern with the vertically oriented MLG-2 optical scanner now installed on the frame skewed at 30 degrees.
The VML520s is approved to measure objects of maximum dimensions 1500 x 1000 x 370 mm and minimum dimensions 50 x 50 x 20 mm, with a scale interval of measurement (d) of 5 x 5 x 2 mm.

TEST PROCEDURE No P13/1/33

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 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, 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 CERTAIN REFLECTIVE OR TRANSPARENT ITEMS CANNOT BE MEASURED, or similar wording.

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

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 Services

~ End of Document ~