



Australian Government
Department of Industry,
Science and Resources

**National
Measurement
Institute**

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 13/1/27

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.

Mettler Toledo Model Cargoscan CSN950 Dimensioner™ Dimensional Measuring Instrument

submitted by Mettler-Toledo Limited
 220 Turner Street
 Port Melbourne VIC 3207

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 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 & variant 1 approved – certificate issued	19/03/15
1	Variants 2 and 3 approved – Test Procedure amended – certificate issued	06/10/16
2	Pattern and Variant 3 amended – Variant 4 & 5 approved – certificate issued	12/10/22

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with approval number 'NMI 13/1/27' 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.

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*.



Darryl Hines
Manager
Policy and Regulatory Services

TECHNICAL SCHEDULE No 13/1/27

1. Description of Pattern

approved on 19/03/15
amended on 12/10/22

A Mettler Toledo model Cargoscan CSN950 Dimensioner™ dimensional measuring instrument (Figure 1) which is approved for use for the determination of the linear dimensions of certain objects while they are in motion. 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 -10°C to +50°C and must be so marked.

Instruments may also be known as Mettler Toledo model TLD950 Dimensioner.

1.1 Details

The instrument is approved for use for the determination of the linear dimensions of rectangular box-shaped (parallelepiped (#), cuboidal) objects only having maximum dimensions (i.e. length × width × height) of 4000 × 1200 × 900 mm and minimum dimensions 50 × 50 × 50 mm, with a scale interval of measurement (d) of 5 mm and a belt speed (V_{max}) of up to 200 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).

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 wrap'.

(#) 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 a Mettler Toledo model CSN950 dimensioning unit (Figure 2) mounted on a supporting frame above a belt-conveyor type load receptor (Figure 1 shows a typical conveyor arrangement). The optical scanner measures the reflected light, and with data from the encoder (see cl. **1.3 Speed Sensing System**), this is analysed by the central processing units (CPUs) in the dimensioning unit to determine the linear dimensions of the object.

Measurement results are output to the Mettler Toledo model CS2200LX indicator (Figure 3).

1.3 Speed Sensing System

The instrument uses a Leine & Linde model 500 encoder or equivalent (*) to measure the length of the object in combination with the CSN950. The encoder (tachometer) 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

1.4 Indicator Unit

A Mettler Toledo model CS2200LX 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.

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

1.5 Workstation

An optional workstation (Figure 4) can also be used to initiate measurement operations and display results, as well as collecting additional information about the object being measured via barcode scanners or keyboard data entry.

1.6 Indications

The pattern is fitted with a local indicator unit (Figure 3) however measurement data from the CSN950 is made available to other systems 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 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.

1.8 Sealing Provision

Provision is made for sealing the calibration adjustments in software using an audit trail which records adjustments. The Audit trail is accessed and viewed from within the workstation or by logging in to the system using a web browser.

Provision is also made for sealing the CSN950 enclosure by means of at least one sealing label applied over the edge of the enclosure (Figure 5).

1.9 Verification Provision

Provision is made for the application of a verification mark.

1.10 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	Mettler Toledo
Model designation
Serial number of the instrument
Year of manufacture
Pattern approval number for the instrument	NMI 13/1/27
Maximum dimensions for each axis	<i>Max</i> mm
Minimum dimensions for each axis	<i>Min</i> mm
Scale interval	<i>d</i> = mm
Maximum belt speed	<i>Max</i> m/sec or m/min
Minimum belt speed	<i>Max</i> m/sec or m/min
Special temperature limits	-10°C to +50°C

- (b) Instruments carry one or more notices stating CERTAIN REFLECTIVE OR TRANSPARENT ITEMS CANNOT BE MEASURED, or similar wording.
- (c) Instruments of the pattern and variant 1 carry one or more notices stating 'TO BE USED FOR RECTANGULAR BOX SHAPED OBJECTS ONLY', or similar wording.

2. Description of Variant 1

approved on 19/03/15.

The pattern with the Speed Sensing System of clause 1.3 using a Datalogic model PLL-8000 photocell trigger and Phase Lock Loop (PLL) or equivalent (*) as an alternative to measure the length of the object in combination with the CSN950. The photocell trigger and PLL detect the movement and generate a signal based on the moment of the conveyor belt.

- (*) '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.

3. Description of Variant 2 **approved on 06/10/16**

With a Mettler Toledo model CSN950MH instrument (Figure 6) which is similar to the pattern but has two Mettler Toledo CSN950 dimensioning units (Figure 7). The variant may also use the Speed Sensing System described in Variant 1.

The CSN950MH is approved to measure objects with the same details as in clause 1.1 however it may also measure irregular shaped objects. The CSN950MH converts the detected characteristics into the linear dimensions of the smallest rectangular box (parallelepiped – #) that would fully contain the object.

The variant is not required to carry the notice described in clause 1.10 (c)

- (#) 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.

4. Description of Variant 3 **approved on 06/10/16**
amended on 12/10/22

With a Mettler Toledo model CSN950MH described in variant 2 configured with the scale interval of the height axis of measurement (*d*) of 2 mm.

Objects may be measured having maximum dimensions (i.e. length × width × height) of 4000 × 1600 × 900 mm and minimum dimensions 50 × 50 × 20 mm, with a scale interval of measurement (*d*) of 5 × 5 × 2 mm.

The variant is not required to carry the notice described in clause 1.10 (c)

5. Description of Variant 4 **approved on 12/10/22**

With the models similar to the pattern and variants known as Mettler Toledo model TLD950SH (Figure 8) configured with a single dimensioning unit and Mettler Toledo model TLD950MH.

The characteristics of the models of this variant are given in table 1 below.

Table 1

Model	TLD950SH		TLD950MH
Number of dimensioning units	1 sensor		2 sensors
	length × width × height		
Maximum dimensions	4000 × 1200 × 700 mm	4000 × 900 × 900 mm (#1)	4000 × 1600 × 1200 mm
Minimum dimensions	50 × 50 × 20 mm		
Scale Interval (<i>d</i>)	5 × 5 × 2mm		
Maximum belt speed (V_{max})	200 m/min		
Speed sensing system	Fritz Kübler model Sendix 5000 encoder or equivalent (#2)		

- (#1) Alternative configuration reduces maximum width and increases maximum height.

- (#2) '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.

5.1 Indicator Unit

The Mettler Toledo model CS2200LX described in **1.4 Indicator Unit** may be replaced by a graphics display connected to a USB port of any one of the dimensioning units to provide indication of measurement results (Figure 9). The indicator 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.

5.2 Sealing Provision

Provision is made for sealing the calibration adjustments in software using an audit trail which records adjustments. The Audit trail is accessed and viewed from within the workstation or by logging in to the system using a web browser.

6. Description of Variant 5 approved on 12/10/22

With the pattern or variants using either the Speed sensing system of clause 1.3 or Variant 1, or with either of the following systems:

- Two Sick photo eye or equivalent (*) sensors to detect the movement and generate a signal based on the moment of the conveyor belt.
- Magnetic Hall effect sensors are mounted to the frame and are sensing the motion of the magnets that are mounted on the cross belt carriages

- (*) '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.

TEST PROCEDURE No 13/1/27

Note: Refer to clause **1.6 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.

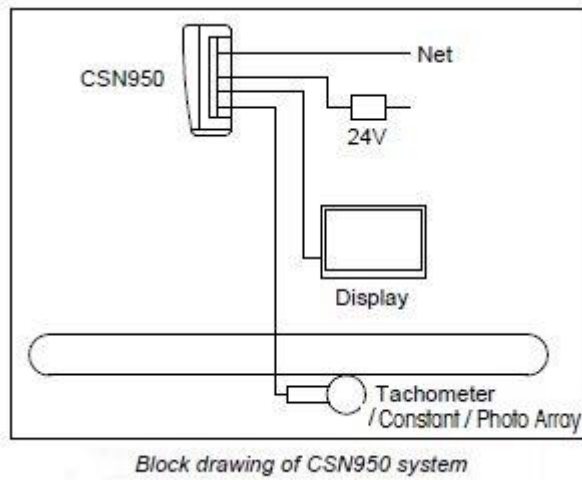
Maximum Permissible Errors

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

Instruments shall be tested as follows:

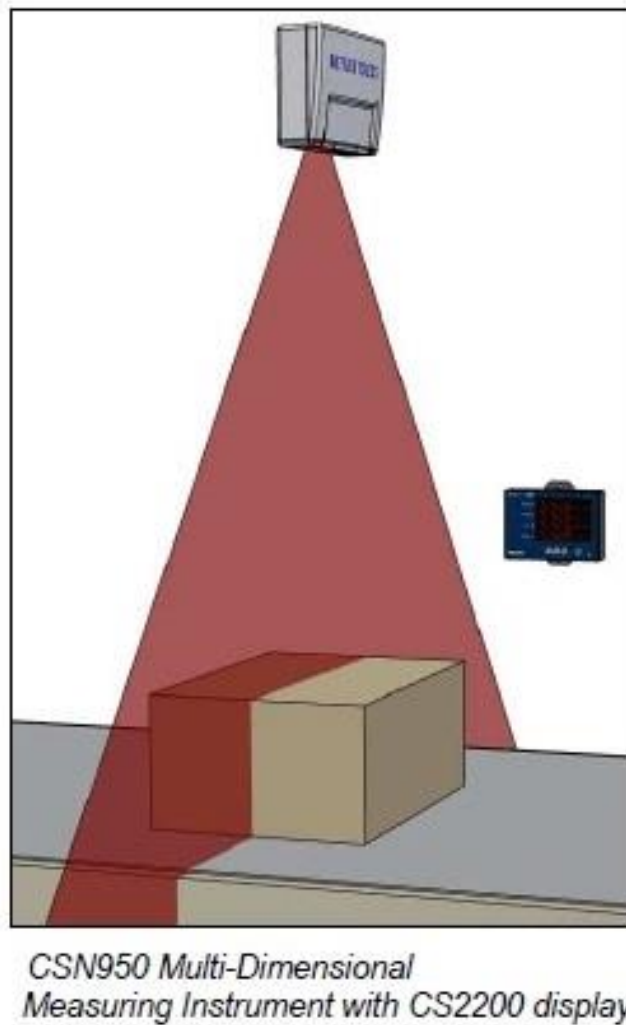
- (a) Test objects shall be used of known lengths such that each axis (i.e. length x width x height) is tested for at least five dimensions between and including the minimum and maximum lengths specified on the instrument nameplate. Each test object shall be rigid and with well-defined edges to simulate 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 $\pm 1/5$ 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) Check that instruments carry one or more notices stating TO BE USED FOR RECTANGULAR BOX SHAPED OBJECTS ONLY, or similar wording. This notice is not required for the model CSN950MH variants 2 and 3.
- (e) Ensure that instruments are only being used within the special temperature limits stated elsewhere in this Technical Schedule.

FIGURE 13/1/27 – 1



Mettler Toledo Model CSN950 Dimensional Measuring Instrument (Pattern & variant 1)

FIGURE 13/1/27 – 2



Mettler Toledo Model CSN950 Dimensioning Unit (Pattern & variant 1)

FIGURE 13/1/27 – 3



Typical Display of a Mettler Toledo Model CS2200LX Indicator

FIGURE 13/1/27 – 4



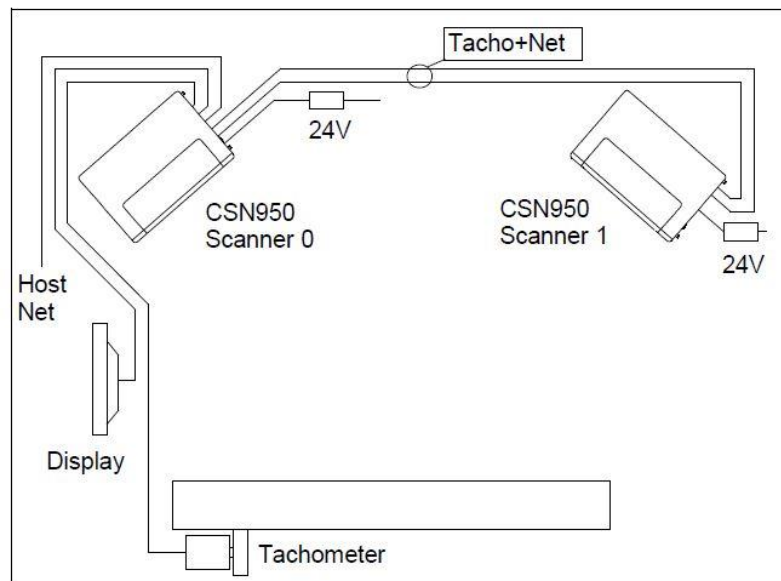
Typical Optional Workstation

FIGURE 13/1/27 – 5



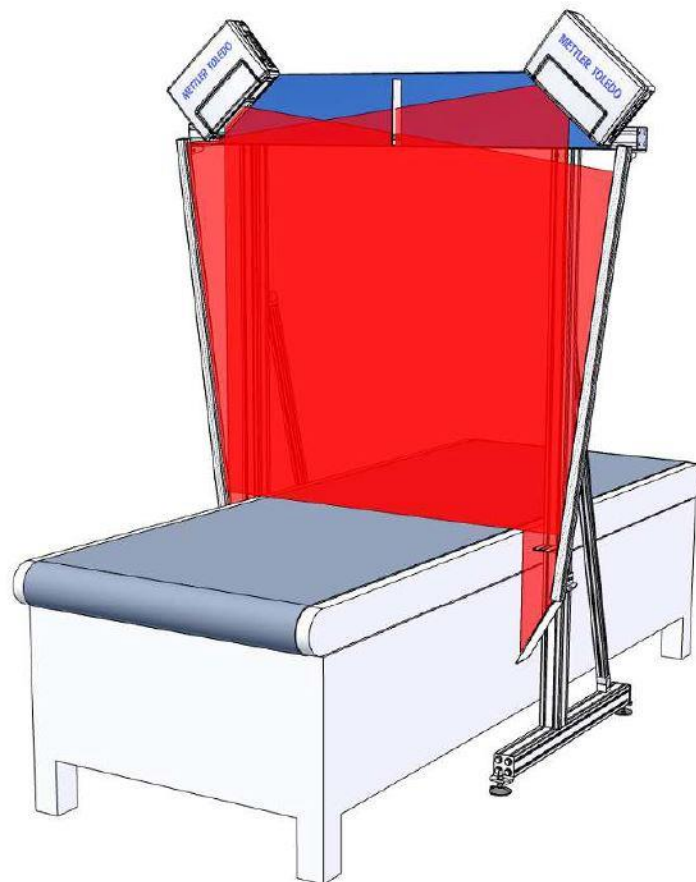
Typical Mechanical Sealing Provision

FIGURE 13/1/27 – 6



Mettler Toledo Model CSN950MH Dimensional Measuring Instrument (Variants 2 & 3)

FIGURE 13/1/27 – 7



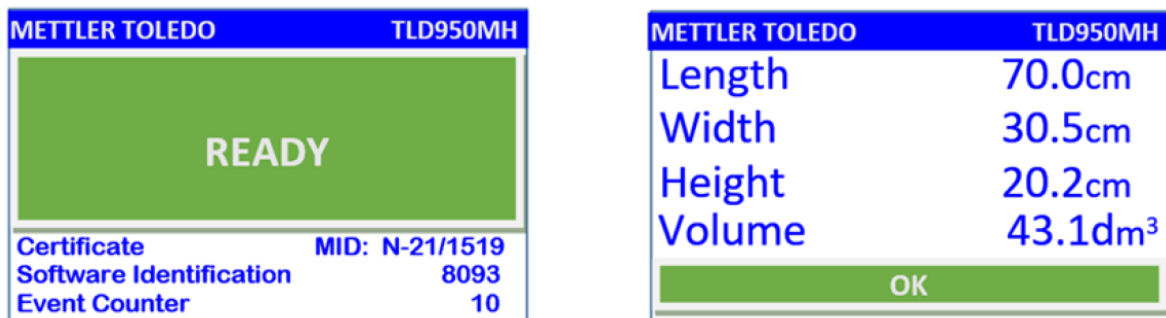
Mettler Toledo Model CSN950MH Dimensional Measuring Instrument (Variants 2 & 3)

FIGURE 13/1/27 – 8



Mettler Toledo Model TLD950SH Dimensioning Unit (Variant 4)

FIGURE 13/1/27 – 9



Mettler Toledo Model USB graphical display (Variant 4)

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