



Australian Government
Department of Industry,
Science and Resources

**National
Measurement
Institute**

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval
NMI 13/1/36

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 TLD970 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 approved – interim certificate issued	02/08/22
1	Pattern amended (interim validity date) – interim certificate issued	25/07/23
2	Pattern amended and Variant 1 approved – certificate issued	05/06/25

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with approval number 'NMI 13/1/36' 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.

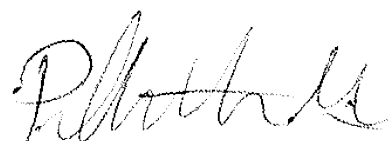
Special

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, postal or storage 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 Phillip Mitchell

A/g Manager
Policy and Regulatory Services

TECHNICAL SCHEDULE No 13/1/36

1. Description of Pattern

approved on 02/08/22

A Mettler Toledo model TLD970 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 and carried by a forklift truck.

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 $+40^{\circ}\text{C}$.

1.1 Details

The pattern is approved for use for the determination of the linear dimensions of irregular shaped objects having maximum dimensions (i.e. length \times width \times height) of $2500 \times 2500 \times 2600$ mm, minimum dimensions $200 \times 200 \times 100$ mm, with a scale interval of measurement (d) of $20 \times 20 \times 10$ mm.

The pattern is approved to measure objects carried by a forklift truck travelling at a minimum speed (V_{\min}) of 0.8 m/s and a maximum speed (V_{\max}) 4.1 m/s. Objects must be carried with the bottom surface of the object raised no greater than 400 mm from the floor.

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 four Mettler Toledo 900S dimensioning units (Figure 2) mounted on a supporting frame above a defined measurement area (Figure 3).

One of the four heads is configured as the Main Device (SAU 0) and the three others (SAU 1-3) as sub-ordinate units controlled by the Main Device.

One or more barcode sensors are positioned above the measurement area which are used to identify the forklift truck carrying the objects. Forklift trucks must be registered with a barcode affixed to the roof and measured properties stored in the system before use (Figure 4).

The mounting configuration ensures that the four scanners together get a full view of the top and sides of the objects without any shadowing effects.

Objects to be measured are transported through the defined measurement area carried on a forklift truck. The forklift truck dimensions are not included with the detected linear dimensions of the object.

The optical scanner measures the reflected light, and is analysed by the central processing units (CPUs) in the main dimensioning head to determine the linear dimensions of the object.

1.3 Taring

Tare function operates negatively from the ready condition in the height dimension only, and is used when the object to be measured is placed on a platform such as a pallet.

The Tare function raises the reference plane from the detected bottom surface of the platform/pallet to the top level of the platform/pallet, such that only the object resting on this surface is included in the measurement.

The tare function is activated by giving a non-zero tare value with the measurement command and is the height (in cm) of the platform/pallet above the reference plane.

The TLD970 reports the net dimensions of the object and the tare value used with the measurement and the display indicates the tare applied to the measurement on the bottom line of the display (Figure 5). The dimensions indicated with a tare applied will be that of the volume enclosing the object from the new zero or ready condition.

The tare function is active for one measurement at a time. The operator must determine the correct tare value to be used by measuring the height of the pallet/platform with appropriate means. The software may be configured for pre-set tare values for use with pallets of standard sizes.

1.4 Indication device

A graphics display (Figure 5) is connected to a USB port of any one of the dimensioning units to provide indication of measurement results. 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.

1.5 OctoCSM display

The TLD970 may operate OctoCSM software (Figure 6) on the built in computer, or on an external workstation connected via Ethernet (Figure 7). Measurement results and status codes are displayed on a standard graphics display (VGA or equivalent) connected to the computer.

1.6 Indications

The pattern is fitted with a local indicator unit (Figure 5 or 6) however measurement data from the TLD970 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 R 129, *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.

1.7 Descriptive Markings

- (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 mark	NMI 13/1/36
Maximum dimensions for each axis	<i>Max</i> mm
Minimum dimensions for each axis	<i>Min</i> mm
Scale interval for each axis	<i>d</i> = mm

- (b) Instruments carry one or more notices stating CERTAIN REFLECTIVE OR TRANSPARENT ITEMS CANNOT BE MEASURED, or similar wording.
- (c) Instruments carry one or more notices stating the following, or similar wording:
 - The pallet should be lifted at least 5 cm up from floor, but no more than 40 cm up from floor.
 - The pallet should not be tilted upwards / backwards more than 10° and not tilted downwards / forwards more than -3° .
 - Drive as straight as possible through the measuring area. Do not deviate more than $\pm 10^\circ$.
 - Avoid abrupt speeding, braking etc. while passing through the gate. The smoother the driving the better the measuring results.

1.8 Verification Provision

Provision is made for the application of a verification mark.

1.9 Sealing Provision

Provision is made for sealing the calibration adjustments in software using an audit trail which records adjustments. A 4 digit Event counter is also incremented when an adjustment has been made and is displayed on the USB display (Figure 8a) or the System info page of the Octo CSM software (Figure 8b).

The Audit trail is accessed and viewed from within the workstation or by logging in to the system using a web browser.

2. Description of Variant 1

approved on 05/06/25

The Mettler Toledo model TLD970 dimensional measuring instrument may also be used to determine the linear dimensions of irregular shaped objects having maximum dimensions (i.e. length \times width \times height) of 2500 \times 2500 \times 2600 mm, minimum dimensions 200 \times 200 \times 200 mm, with a scale interval of measurement (d) of 20 \times 20 \times 20 mm.

TEST PROCEDURE No 13/1/36

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

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.

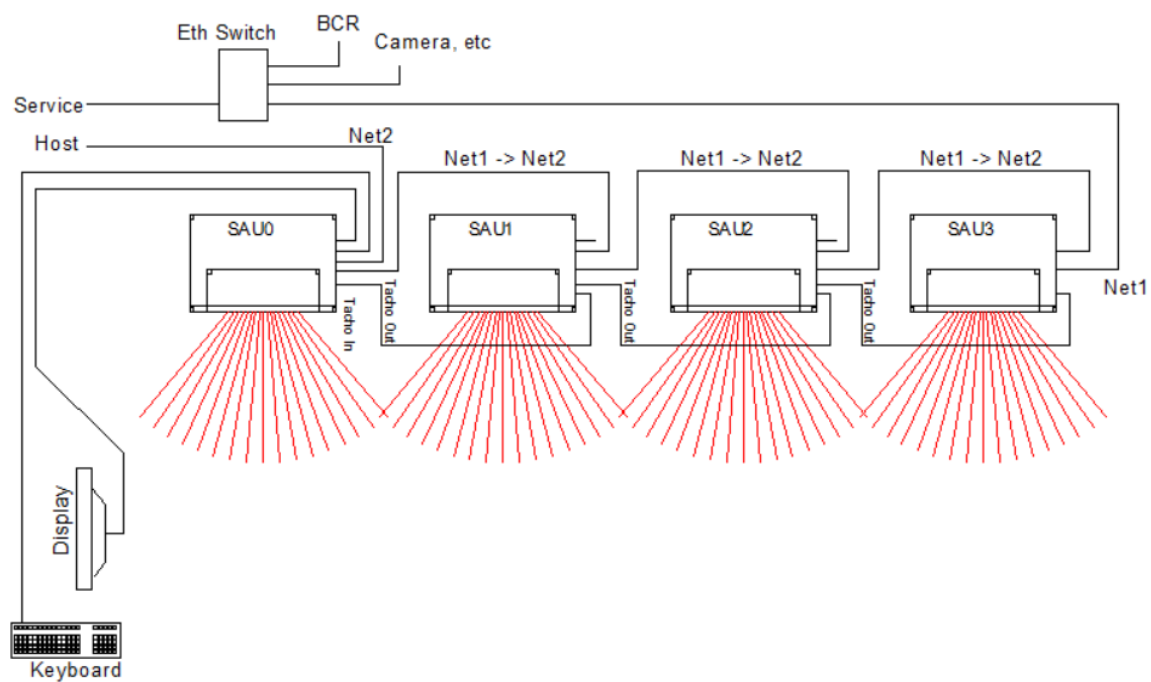
Maximum Permissible Errors

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

Instruments shall be tested as follows:

- (a) Test objects shall be used, in the shape of rectangular boxes with known linear dimensions such that each axis (i.e. length \times width \times height) is tested for at least five dimensions between and including the minimum and maximum dimensions (approximately) specified on the instrument nameplate. Each test object shall be non-sound absorbing, rigid and with flat faces and well-defined edges. All adjacent faces and edges shall be perpendicular to each other. The dimensions of the test objects shall be equal to $N \times d$ 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 are marked in accordance with clause **1.7 Descriptive Markings**.

FIGURE 13/1/36 – 1



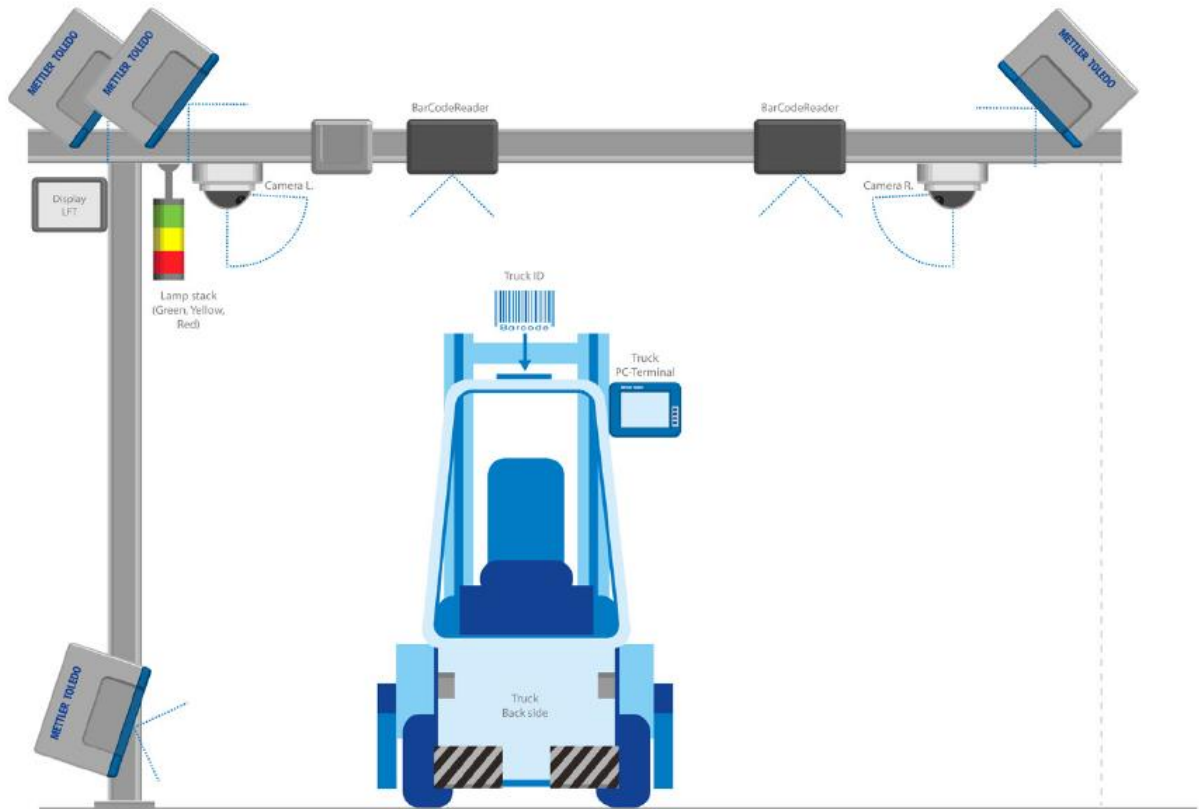
Mettler Toledo Model TLD970 Dimensional Measuring Instrument

FIGURE 13/1/36 – 2



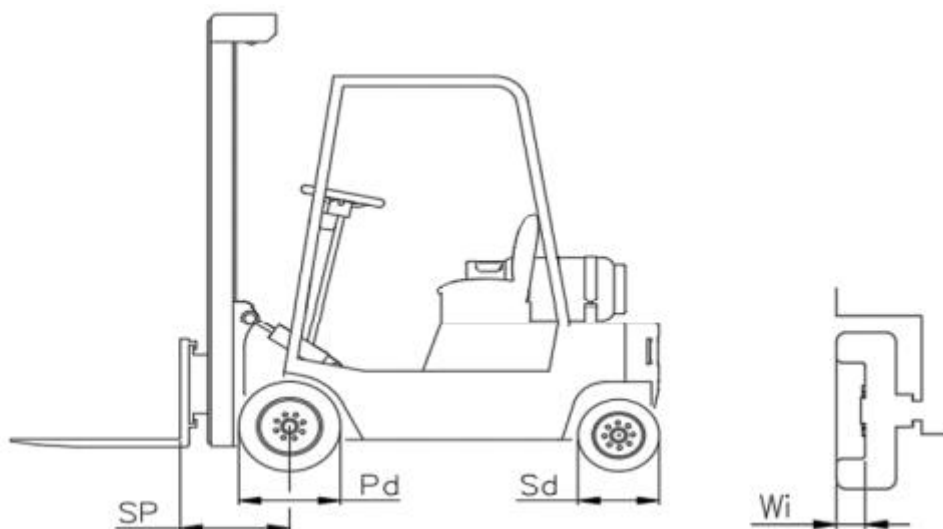
Mettler Toledo Model 900S dimensioning unit

FIGURE 13/1/36 – 3



Mettler Toledo Model TLD970 Dimensional Measuring Instrument

FIGURE 13/1/36 – 4



- a. Primary Diameter (Pd) – This is the diameter of the front wheel
- b. Secondary Diameter (Sd) – This is the diameter of the rear wheel
- c. Split Point (SP) – The distance from the front of the forks to the center of the front wheel hub.
- d. Wheel Instep (Wi) – The distance from the outside edge of the hub to the inside edge of the hub

FIGURE 13/1/36 – 5

METTLER TOLEDO		TLD970
Length		70cm
Width		30cm
Height		18cm
Tare		14cm
OK		

Typical Display of a Mettler Toledo Model CS220 Indicator

FIGURE 13/1/36 – 6

METTLER TOLEDO

Test Certificate:

TC7413

Weight: —

Dimensions: L: 92 cm x W: 61 cm x H: 36 cm TH: 14 cm

Octo™

DataCapture

Good Packages Scanned: 100.0 %

ID	Dimensions	Time	Error
BAMA-LOCAL-20211013T122821Z	69.0 x 30.0 x 19.0 cm	Wed Oct 13 14:28:25 2021	
BAMA-LOCAL-20211013T122828Z	69.0 x 30.0 x 19.0 cm	Wed Oct 13 14:28:31 2021	
BAMA-LOCAL-20211013T122837Z	70.0 x 30.0 x 19.0 cm	Wed Oct 13 14:28:40 2021	
BAMA-LOCAL-20211013T122843Z	70.0 x 30.0 x 19.0 cm	Wed Oct 13 14:28:46 2021	
BAMA-LOCAL-20211013T123252Z	93.0 x 61.0 x 37.0 cm	Wed Oct 13 14:32:55 2021	
BAMA-LOCAL-20211013T123303Z	92.0 x 60.0 x 36.0 cm	Wed Oct 13 14:33:06 2021	
BAMA-LOCAL-20211013T123309Z	92.0 x 60.0 x 36.0 cm	Wed Oct 13 14:33:13 2021	
BAMA-LOCAL-20211013T123321Z	92.0 x 61.0 x 36.0 cm	Wed Oct 13 14:33:25 2021	

F1 Home

F2 Menu

F5

F6

F7

F8 Mode

F10 Login

Typical Display of a Mettler Toledo OctoCSM software indication

FIGURE 13/1/36 – 7

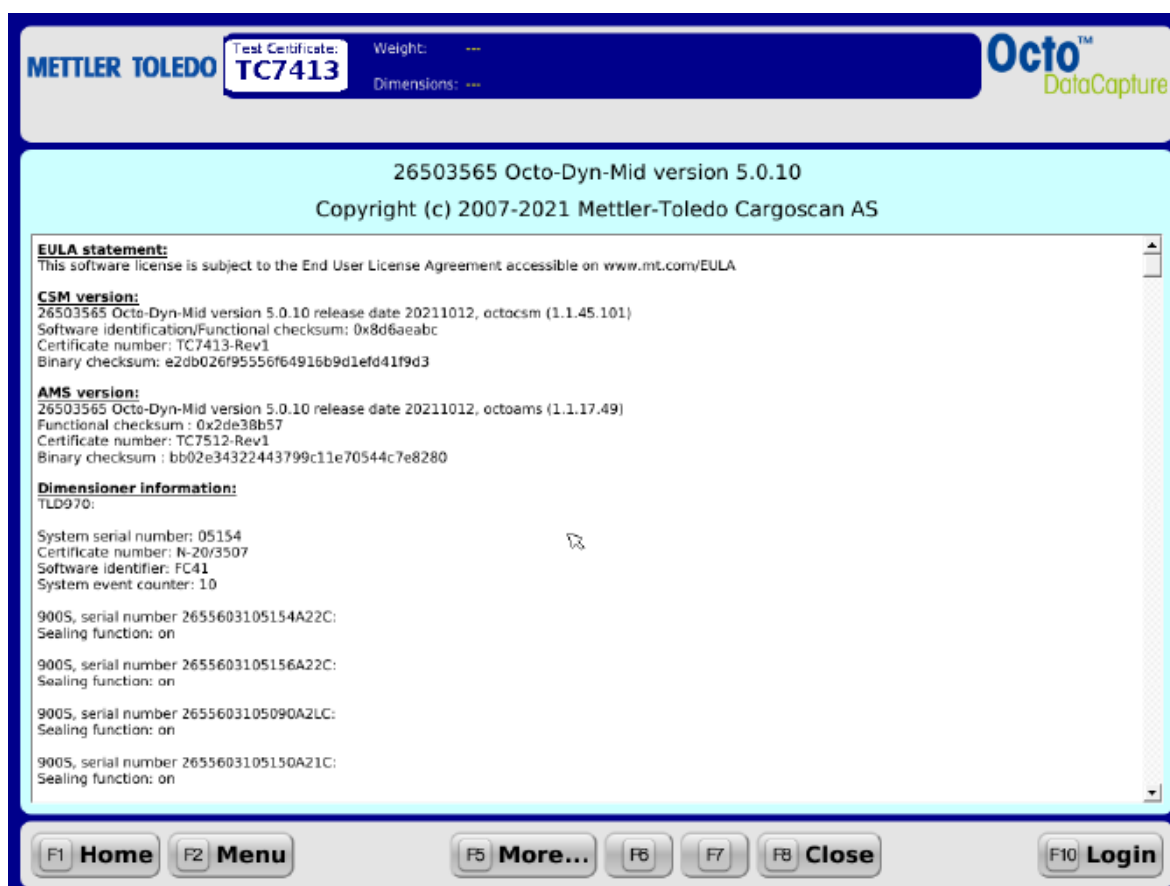


Typical Optional Workstation

FIGURE 13/1/36 – 8



(a) Sealing and Event counter displayed on CS220 USB display



(b) Sealing and Event counter displayed on OctoCSM software

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