



Australian Government

National Measurement
Institute

Bradfield Road, West Lindfield NSW 2070

Supplementary Certificate of Approval

NMI S516

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.

Schenck Model DISOMAT Tersus Digital Indicator

submitted by Schenck Process Australia
 65 Epping Road
 North Ryde NSW 2113

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 76, *Non-automatic weighing instruments, Parts 1 and 2*, dated July 2004.

This approval becomes subject to review on **1/08/18**, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variant 1 approved – certificate issued	29/07/08
1	Pattern & variant 1 reviewed & updated – variant 2 approved – certificate issued	24/10/12

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI S516' and only by persons authorised by the submitter.

Instruments incorporating a component purporting to comply with this approval shall be marked 'NMI S516' in addition to the approval number of the instrument, 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 Certificates No S1/0/A or No S1/0B.

The values of the performance criteria (maximum number of scale intervals etc.) applicable to an instrument incorporating the pattern approved herein shall be within the limits specified herein and in any approval documentation for the other components.

Signed by a person authorised by the Chief Metrologist
to exercise his powers under Regulation 60 of the
National Measurement Regulations 1999.

A handwritten signature in black ink, consisting of a series of loops and a long horizontal stroke at the bottom.

TECHNICAL SCHEDULE No S516

1. Description of Pattern

approved on 28/07/08

A Schenck model DISOMAT Tersus (VTG 20450) digital indicator as shown in Figure 1 and Table 1 may be configured to form:



- A weighing instrument with a single weighing range; or
- A multi-interval instrument with two partial weighing ranges (each with its own verification scale interval); or
- A multiple range instrument with two weighing ranges. The changeover between weighing ranges may be automatic or manual.

In addition, for multi-interval or multiple range instruments, the maximum capacity of the highest range, divided by the verification scale interval of the smallest range shall not exceed 15 000.

Instruments may be fitted with output sockets (output interfacing capability) for the connection of auxiliary and/or peripheral devices (see clause 1.9 Interfaces).

This approval does not include the use of the indicator as an automatic weighing instrument, unless specifically mentioned in a certificate of approval for such an instrument.

TABLE 1 – Specifications

Maximum number of verification scale intervals	Single range instruments 8000 (class ) , and 1000 (class ) , or Multiple range instruments 8000 per range, or Multi-interval instruments 4000 per partial weighing $Max / e_1 \leq 15\,000$
Minimum sensitivity	0.4 μ V/scale interval
Excitation voltage	12 V AC
Maximum excitation current	280 mA

1.1 Zero

A zero-tracking device may be fitted.

The initial zero-setting device has a nominal range of not more than 20% of the maximum capacity of the instrument.

The instrument has a semi-automatic zero-setting device with a nominal range of not more than 4% of the maximum capacity of the instrument.

1.2 Tare

The instrument has provision for semi-automatic subtractive and pre-set tare devices of up to maximum capacity (except for instruments configured as multi-interval instruments, in which case the maximum preset tare value is Max_1).

1.3 Display Check

A display check is initiated whenever power is applied.

1.4 Power Supply

The indicator may be powered from the mains power supply, or by an 18-36 V (24 V nominal) DC power supply with a current rating of at least 1 A.

1.5 Linearisation Facility

Instruments are fitted with a three-point linearisation correction facility (linearisation adjustments may be applied at 25%, 50% and 75% of maximum capacity).

1.6 Load Cell Connection Module

The cables from the load cell(s) are connected to a module (Figure 2) which plugs into the indicator. This module is referred to as a 'Dongle' and also contains a memory device so that calibration parameters of the platform can be stored within the 'Dongle'. If the indicator is replaced or repaired, reverification of the instrument is required (this may be contrary to the manufacturer's stated intention of this arrangement).

Provision is made for the calibration parameters that are stored in the 'Dongle' to be sealed – refer to clause **1.13 Sealing Provision**.

1.7 Two Baseworks Facility

Up to two baseworks (using two 'Dongles') may be connected to a DISOMAT Tersus digital indicator.

A function to select the basework/combination in use may be selected using the menu structure of the indicator (it may in addition be assigned to function key(s)). In addition it may be possible to select a third function, in which the combined weight on both platforms is displayed (see clause **1.9 Interfaces**).

A scale symbol (e.g. $\frac{1}{\Delta\Delta}$) below the weight value indicates the basework/combination selected. The top line of the display changes to indicate the *Max*, *Min* and *e* values of the selected basework.

Note: In the case of this feature and 1.8 below, each basework/combination shall be clearly identified to correspond to the appropriate scale display shown on the indicator. That is, there shall be a clear correspondence between the basework/combination identification, the scale selected indication (shown by the symbol $\frac{1}{\Delta\Delta}$, $\frac{2}{\Delta\Delta}$ or $\frac{3}{\Delta\Delta}$ below the weight value), and the scale selection function. Trade Measurement Authorities may require additional markings or signs to ensure that these relationships are clear.

1.8 Combined Weight Display

When two baseworks are connected to a single DISOMAT Tersus indicator it may also be possible for a mode ('TwinUnit') to be selected in which the combined weight on both platforms is displayed.

This has similarities to a summing indicator as described in NMI General Supplementary Certificates No S1/0/A or No S1/0B however the feature has some significant differences.

In particular the 'TwinUnit' indication does not necessarily represent the mathematical sum of the values determined for each platform. This is because the 'TwinUnit' indication is assigned its own Maximum capacity, Minimum capacity and Verification Scale Interval and the 'TwinUnit' indication is based on a separate determination of the weight value using these parameters.

Note however that applying a Gross load above the maximum capacity of either basework will result in the 'TwinUnit' indication showing overload symbol.

The top line of the display changes to indicate the *Max*, *Min* and *e* values of the 'TwinUnit' indication. A symbol $\frac{3}{\Sigma}$ below the weight value indicates that the 'TwinUnit' (summing of two baseworks) is selected.

Note Regarding Applicability of NMI General Certificate 6B/0

The calculations of NMI General Certificate 6B/0 shall apply to each basework/indicator combination individually.

In the case of the 'TwinUnit' indication, the calculations of clauses 6.3 to 6.6 of 6B/0 shall apply, with the number of load cells being the total number in both baseworks.

1.9 Interfaces

The indicator may be fitted with interfaces for the connection of auxiliary and/or peripheral devices. The interfaces shall comply with clause 5.3.6 of NMI R76 (the basic intent of which is that it shall not be possible to alter weighing results via the interfaces).

Any measurement data output from the instrument or its interfaces shall only be used for trade in compliance with NMI General Supplementary Certificates No S1/0/A or No S1/0B (in particular in regard to the data and its format).

Indications other than the indications of measured mass (i.e. gross, tare, net, totals) displayed either on the indicator or on an auxiliary or peripheral device, are not for trade use.

The following are some of the interface options which may be fitted:

- Serial interfaces (e.g. RS 232, RS 422/485 (2-wire) or RS 485 (4-wire)) for the connection of peripheral devices.
- Analog and Digital (binary) inputs/outputs for control purposes.
- Fieldbus (Profibus, Device-Net).
- A PC keyboard may be connected to the indicator for convenient data entry. Relevant functions (like tare and zero setting) shall be unambiguously assigned to keys on the keyboard.
- Ethernet connection, USB ports, and/or Bluetooth module.

1.10 Data Storage Device

An internal storage device may be incorporated into the electronic indicator. For each weighing request, weighing results together with identification including date and time are stored into the storage device.

The use of either of these features for trade use is subject to the agreement of the applicable trade measurement authority. In any case, data from the storage device shall only be used for trade if the format of the output complies with NMI General Supplementary Certificates No S1/0/A or No S1/0B.

1.11 Additional Features

The indicator has additional features as indicated below:

- Set point facilities and operations (under/over limits etc).
- Facilities for operations (such as set points, zero setting, tare (pre)setting, and printing) to be initiated through the interfaces of the instrument from external devices.
- Facilities for function keys to be programmed to perform various functions.

These facilities may be used to provide operational arrangements tailored to particular requirements, or to provide certain pre-set operational arrangements, such as 'Filling Scale', 'Discharge Scale', 'Crane Scale', 'Cargo Scale', and 'Road Weigh-bridge'.

Notes: NMI has not examined the above features in detail. The use of these features may or may not be appropriate in different situations. The acceptability in any particular situation must be assessed in-situ and may require consultation with the appropriate trade measurement authority. In some situations it may be necessary for a print-out of the weighing result to be produced for the method of operation to be considered acceptable. In such situations NMI General Supplementary Certificates No S1/0/A or No S1/0B should be consulted.

This approval does not include the use of the indicator as an automatic weighing instrument, unless specifically mentioned in a certificate of approval for such an instrument.

Indications other than the indications of measured mass (i.e. gross, tare, net, totals) displayed either on the indicator or on an auxiliary or peripheral device, are not for trade use.

1.12 Verification Provision

Provision is made for the application of a verification mark.

1.13 Sealing Provision

Provision is made for the calibration parameters to be sealed. These parameters are stored in the Load Cell Connection Module ('Dongle'). To seal the calibration parameters, it is necessary to ensure that the selector plug (jumper) in the 'Dongle' is in the write protection ('Wprot') position and then to seal the casing of the 'Dongle'.

The position of the write protection selector within the 'Dongle' can be checked by either:

- (a) Opening instrument casing and also the 'Dongle' casing (prising apart the two halves) and checking that the selector plug is in the 'Wprot' location, as shown in Figure 2 – the casing can then be reassembled; or
- (b) Without opening the instrument casing, by the following procedure.

Press the yellow up arrow key ↑ and then (continuing to hold down the up arrow key) press the enter key.

- (i) Press the enter key successively to select a line for display of the write protection status (e.g. line 7).


- (ii) Note the status of the selected line in the display.
- (iii) Change the status of the selected line in the display to 'Contacts' by using the left and right arrow keys.
- (iv) Accept this selection by pressing the 'OK' key.
The selected line of the display now indicates 'IN ... OUT ...'.
If 'W' or 'w' is indicated to the left of 'OUT' (e.g. 'IN ...w OUT ...') this indicates that one of the connected 'Dongles' does not have the selector plug in the write protection position.
- (v) Following this check, repeat steps (i), to (iv), resetting the status of the selected line to that noted in step (iii).

Note: One line of the display may previously have been set to display the 'Contacts' information (e.g. 'IN ... OUT ...'), in which case it may not be necessary to follow the full procedure above.

Once it has been ensured that the selector plugs are in the 'Wprot' position, the instrument may be sealed by use of destructible adhesive labels to prevent access within the instrument housing (e.g. one label on each side of a join in the instrument housing).

1.14 Descriptive Markings and Notices

- (a) Instruments are marked with the following data:

Manufacturer's mark, or name written in full	Schenck Process GmbH
Name or mark of manufacturer's agent
Indication of accuracy class	
Maximum subtractive tare	$T = -\dots \text{ kg} \quad \#$
Serial number of the instrument
Pattern approval mark for the indicator	NMI S516
Pattern approval mark for other components

This marking is only required if T is not equal to Max .

The instrument has the markings of maximum capacity (Max), minimum capacity (Min) and verification scale interval (e) displayed in the top line of the liquid crystal display of the indicator, as shown below (by example).

Single interval weighing range configuration

$e = 20 \text{ kg} \quad Min \ 400 \text{ kg} \quad Max \ 60\ 000 \text{ kg}$

Multiple range (or multi-interval) configuration

$e = 0.5/1 \text{ kg} \quad Min \ 10 \text{ kg} \quad Max \ 3000/6000 \text{ kg}$

The (partial) weighing range which is in operation is indicated by the particular values associated with that range being in light pixels on a dark background rather than the opposite for the inoperative ranges. The value of Min changes according to the (partial) weighing range which is in operation.

- (b) In addition, instruments not greater than 100 kg capacity carry a notice stating NOT TO BE USED FOR TRADING DIRECT WITH THE PUBLIC, or similar wording.

2. Description of Variant 1

approved on 28/07/08

The DISOMAT Tersus indicator in certain alternative housings (Figure 3).

- Panel mount housing DISOMAT Tersus (VEG 20450)
- Stainless steel housing DISOMAT Tersus (VKG 20450)

3. Description of Variant 2

approved on 24/10/12

With the Schenck model DISOBX Plus VME21000 analogue data processor (NMI approval S601) connected to the DISOMAT Tersus indicator in which case the specifications (Table 1) are replaced by those of the Disobox Plus VME 21000 as shown in the documentation of NMI approval S601.

In this case the DISOBX Plus VME21000 analogue data processor replaces the load cell connection module(s) described in clause 1.6. The Disobox Plus VME21000 may replace two 'Dongles', allowing connection of up to two baseworks as described in clauses 1.7 and 1.8.

3.1 Sealing Provision

For this variant sealing shall be carried out in accordance with the description for the DISOBX Plus VME21000 (NMI approval S601).

TEST PROCEDURE No S516

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*.

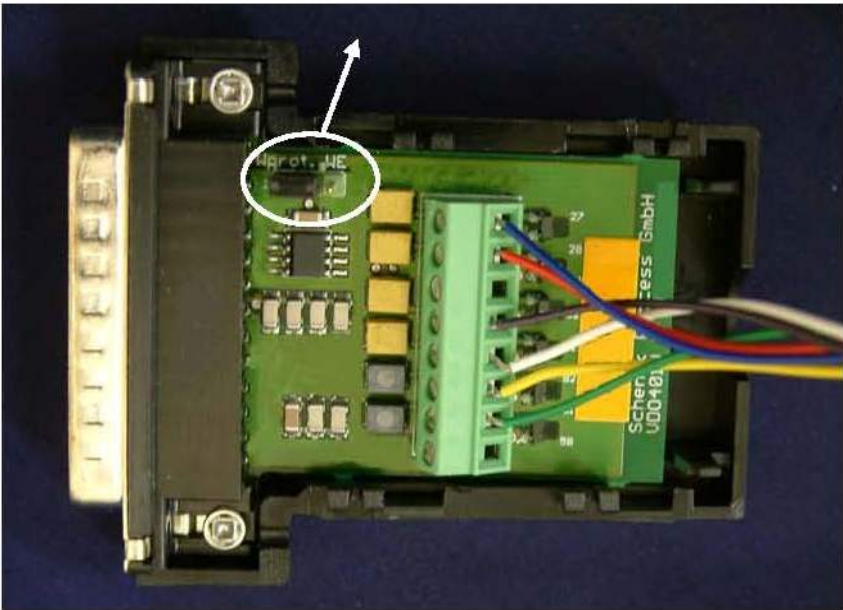
For multi-interval and multiple range instruments with verification scale intervals of $e_1, e_2 \dots$, apply e_1 for zero adjustment, and maximum permissible errors apply $e_1, e_2 \dots$, as applicable for the load.

FIGURE S516 – 1



Schenck Model DISOMAT Tersus (VTG 20450) Digital Indicator and
Typical Display Arrangement

FIGURE S516 – 2



'Dongle' Module and Positions for Calibration Selector Plug (Jumper)

FIGURE S516 – 3



(a) Panel Mount Housing DISOMAT Tersus (VEG 20450)



(b) Stainless Steel Housing DISOMAT Tersus (VKG 20450)

Note – The displays shown here are not configured for Australian use.

~ End of Document ~