Australian Government
Department of Industry, Science, Energy and Resources

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 6/10B/97

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.

Cindicium Model PONDUS 2 Weighing Instrument

submitted by Cindicium Pty. Ltd.
386 Bourke Street
Surry Hills NSW 2010

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 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 – certificate issued	16/06/21

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 6/10B/97' 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 Certificate of Approval No S1/0B.

Special

NMI believes that acceptable results can be achieved in typical operation. However, for this type of instrument, the ability to perform within the specified maximum permissible errors may be influenced by characteristics of the container being weighed, the site at which the weighing takes place, and the installation and usage of the equipment (including matters such as ground condition).

It is the responsibility of the user to exercise control over such matters to ensure compliance with this approval and to ensure performance within the appropriate maximum permissible errors.

In the event of unsatisfactory performance this approval may be withdrawn.

This approval shall NOT be used in conjunction with General Certificate of Approval No 6B/0.

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 6/10B/97

1. Description of Pattern approved on 16/06/21

A Cindicium model PONDUS 2 (Figure 1) class (III) single interval self-indicating non-automatic weighing instrument of 40 000 kg maximum capacity comprising two load receptors with a verification scale interval of 50 kg and with a minimum capacity of 1000 kg, intended for the weighing of 20-foot and 40-foot shipping containers or similarly constructed objects.

The instrument is intended for the weighing of containers in a 'single lift' (i.e. the container is lifted and weighed) – it is not approved for weighing whilst the shipping container load is being increased or decreased.

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

1.1 Basework

The model PONDUS 2 instrument consists of two load receptors, each has a 20-foot shipping container as a baseframe supporting the load cells underneath the load receptor, with the two baseframes specially designed to be welded together to form a two load receptor instrument.

Each load receptor is fitted with 4 load stack assemblies at each corner of the base frame.

The load stack assembly (Figure 2a) consists of:

* A load cell;
* A hydraulic cylinder; and
* A stainless steel supporting structure.

A hydraulic power unit (HPU) (Figure 2b) manages the oil flow to the hydraulic cylinders within the load stack assemblies for engaging and disengaging the load receptors.

1.2 Load Cells

Four Zemic model BM14C-C3-20t-15B load cells (Figure 2c) of 20 000 kg maximum capacity are used for each load receptor.

1.3 Indicator

A CAS model R420 indicator (Figure 2d) is used.

The indicator is also described in the documentation of NMI approval S463.

1.4 Control Electronics and Software

(*) For items marked (*) below, 'Compatible and Equivalent' equipment may be used. 'Compatible and Equivalent' refers to equipment of the same or better specifications, requiring no changes to software for satisfactory operation of the complete system.

The weighing system provides an operator interface computer by which the operator can control the operation of the instrument, and access the protected weighing data (*).

Note: The system may also be controlled and weighing data accessed by other (networked) computers.

The weighing system electronics provide overall system control including interfacing to the networked computers and are housed in a control unit cabinet (Figure 2f), which contains:

* Power supply modules for indicator, communication devices, programmable logic controller (PLC) and HPU;
* A Phoenix Contact PLC model PLCnext AXC F2152;
* A safety switch;
* A CAS model R420 indicator;
* An external modem supporting WiFi and/or Ethernet ports and/or mobile broadband.

1.5 Special Features – Transportable Container Weighing Instrument

The instrument is designed as a transportable container weighing instrument. The system comprises two load receptors, each consisting of a baseframe supporting the load cells which in turn support a load receptor. The two baseframes specially designed to be welded together to form a two load receptor instrument.

Verification of the instrument is required following any re-location of the instrument.

(i) Levelling

A Hummingbird model HMTS2CFG10B 2-axis tilt switch (Figure 2e) attached to the instrument detects the degree to which the instrument is tilted from the reference (level) condition, and switches off the power to the indicator if 0.5 degrees of tilt is exceeded transversally and/or longitudinally.

(ii) Stability of Ground

The site chosen for installing the instrument for weighing shall be firm and within the limits of the tilt switch. The stability of the ground surface should also be considered as subsidence or compaction may affect accuracy.

1.6 Operation

The operation of the Cindicium model PONDUS 2 system is as follows:

(a) A check shall be carried out to ensure that the instrument is at zero prior to a weighing. Operator initiates a weighing sequence with no load on the load receptors. If the indication is not at zero, manual intervention of an operator is required to zero the instrument.

(b) A transport mechanism (using various possible means – crane, straddle carrier etc) lifts a shipping container, places the container on the corner castings of the load receptor(s) and secure the container to the load receptor(s).

Note: The far end pairs of corner castings are used for weighing a 40-foot shipping container; and the two adjacent pairs of corner castings of either load receptor are used for weighing a 20-foot container.

(c) Operator initiates a weighing sequence and confirms all the readings are valid.

(d) The system may send the results of the weighing process to clients or other parties.

Note: The above is a general outline, additional steps may be involved. In addition administrative information may need to be recorded.

1.7 Zero

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.

The zero-tracking facility of the CAS model R420 indicator shall not be operational.

Prior to commencing weighing operations, the instrument shall be zeroed as described in ***1.6 operation*** above.

1.8 Tare

The semi-automatic subtractive tare device and pre-set tare device shall not be operational.

1.9 Interface

Instruments may be fitted with interfaces for the connection of auxiliary and/or peripheral devices. Any interfaces shall comply with clause 5.3.6 of document 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 General Supplementary Certificate of Approval 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.

Instruments may be fitted with RS232/RS485 serial interface, IR optical interface, analogue output (voltage or current) and digital input/output.

1.10 Display Check

A display check of the CAS model R420 indicator is initiated whenever power is applied to it.

1.11 Power Supply

The instrument and control unit operate from 230 V mains AC power.

The Hydraulic Power Unit operates from 3-phase 410 V mains AC power.

1.12 Verification Provision

Provision is made for the application of a verification mark.

1.13 Software

The software version of the CAS model R420 indicator is designated v2.xx, where ‘xx’ represents the identification of the non-legally relevant software.

Instruments are fitted with Windows 10 software and Cindicium control software on the interfacing networked computer. The control software version is designated version 1.0.0.

The control software version can been seen at the bottom right corner of the main screen (Figure 3).

1.14 Descriptive Markings and Notices

Instruments are marked with the following data, in the form shown at right:

Manufacturer's mark, or name written in full	Cindicium Pty. Ltd.
Indication of accuracy class	(III)
Pattern approval number for the instrument	NMI 6/10B/97
Maximum capacity	*Max* ..... kg or t #
Minimum capacity	*Min* ..... kg or t #
Verification scale interval	*e* = ... kg or t #
Serial number	……

These markings are also shown near the display of the result if they are not already located there.

1.15 Sealing Provision

Provision is made for the calibration adjustments to be sealed.

- The instrument is sealed by recording the event counter on verification.

  The calibration and set-up modes of the indicator can be secured with a passcode. To ensure that a passcode has been set, attempt to enter full setup by pressing the POWER and FUNCTION 3 (f_3) keys together. If a passcode has been set "P.CODE" will be shown on the main display and "FULL" on the top right auxiliary display. Pressing OK will return to normal operation.

  In addition, a non-resettable calibration event counter increments each time that calibration or any parameter effecting calibration is changed and saved. The value of the calibration event counter is shown (as C followed by a number) in the display as part of the power-up display sequence, and the value at the time of verification shall be recorded on a destructible adhesive label attached to the instrument.

  Any subsequent alteration to the calibration or parameters will be evident as the recorded value and the current calibration event counter value will differ.

- The tilt switch unit shall be sealed by applying destructible labels on opposite sides of a join in the housing.

TEST PROCEDURE No 6/10B/97

Instruments shall be tested in accordance with any relevant tests specified in the National Instrument Test Procedures, taking into account the following notes.

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*.

Notes:

(i) The tests may be applied to the instrument in-situ using a 40-foot flat rack container of known weight, provided to represent a container and able to be loaded with reference standard weights.

Testing shall be carried out with the instrument arranged to be level.

(ii) As indicated in ***1. Description of Pattern*** the instrument is intended for single lift weighing using hydraulic cylinders. This approach should be utilised in testing for each discrete load. Testing with decreasing load values is not required.

(iii) A repeatability test may be carried out by successively engaging and disengaging the load stack assemblies with the test load applied to the load receptor(s).

Additional Tests

Additional performance tests using a 20-foot flat rack container of known weight, provided to represent a container and able to be loaded with reference standard weights, shall be carried out on each load receptor separately.

For each load receptor, additional tests applicable for a 25 000 kg capacity for repeatability, eccentricity and weighing performance as specified in the National Instrument Test Procedures

Re-location

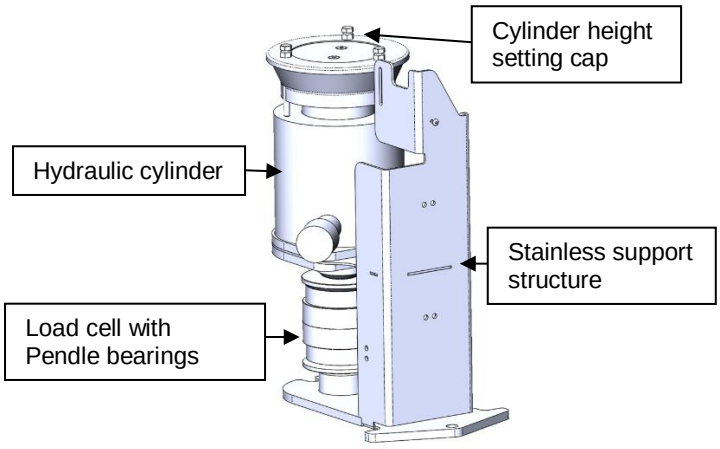
The instrument is designed as a transportable container weighing instrument.

Verification of the instrument is required following any re-location of the instrument.

FIGURE 6/10B/97 – 1

Cindicium Model PONDUS 2 with Lifting Frames

FIGURE 6/10B/97 – 2



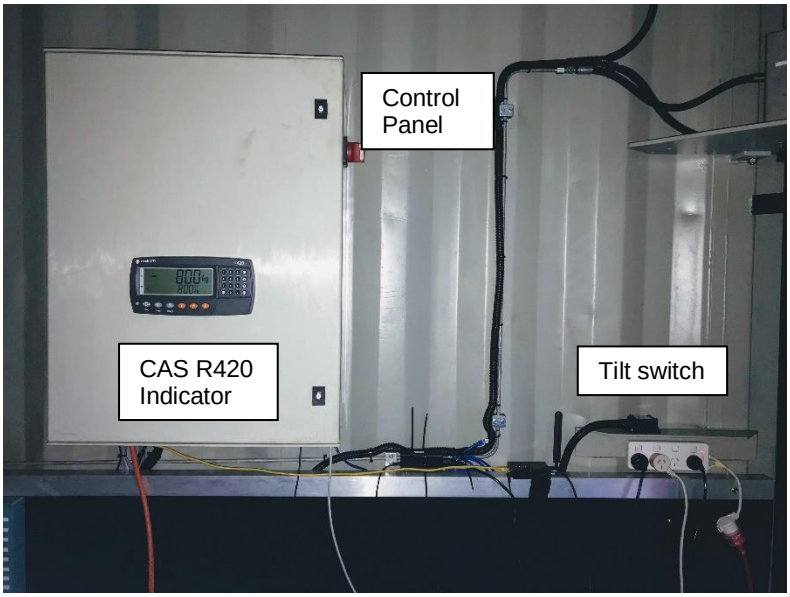
(a) Load Stack Assembly

(b) Hydraulic Power Unit

(c) Zemic Model BM14C Load Cell

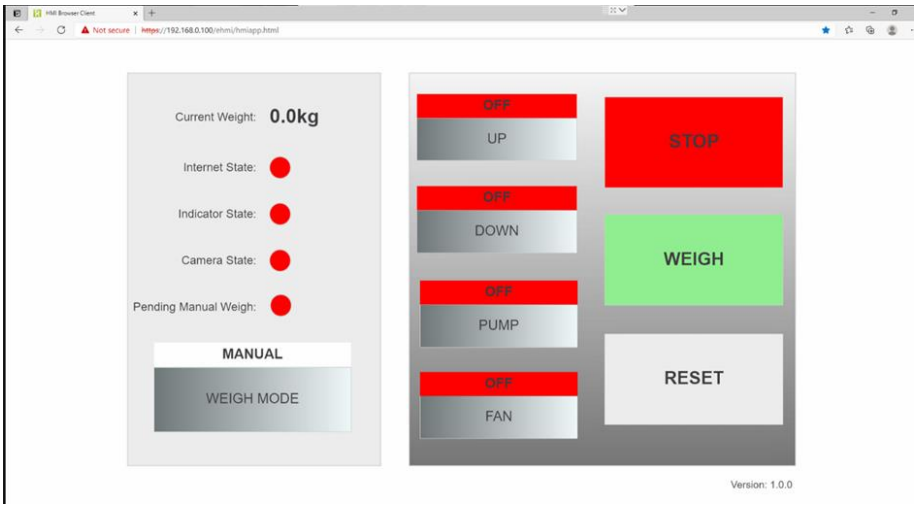
(d) CAS Model R420 Indicator

(e) Hummingbird Model HMTS2CFG10B Tilt Switch



(f) Control Panel

FIGURE 6/10B/97 – 3



Typical System Operator Screen

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