Australian Government

Department of Industry,
Innovation and Science

National
Measurement
Institute

# Certificate of Approval
# NMI 6/9C/299

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.

Ohaus Model VE1500S31PA Weighing Instrument

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

This approval becomes subject to review on **1/06/22**, and then every 5 years thereafter.

DOCUMENT  HISTORY

| Rev | Reason/Details | Date |
|-----|----------------|------|
| 0 | Pattern & variant 1 & 2 approved –certificate issued | 26/11/08 |
| 1 | Pattern & variant 1 & 2 **reviewed** and amended (technical schedule, test procedure & tables ) – certificate issued | 30/05/17 |
| | | |

## CONDITIONS OF APPROVAL

**General**

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 6/9C/299' 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 Certificates No S1/0/A or No S1/0B.

This approval shall NOT be used in conjunction with General Certificate 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.*

**Dr A Rawlinson**

TECHNICAL SCHEDULE No 6/9C/299

## 1. Description of Pattern                    approved on 26/11/08

An Ohaus model VE1500S31PA class ⦿ self-indicating non-automatic weighing instrument (Figure 1) with a verification scale interval ($e$) of 0.5 kg up to the maximum capacity of 1500 kg.

### 1.1 Basework

The model VE1500S basework (Figure 1a & 1b) has four load cells (with self-aligning supporting feet) directly supporting the load receptor which has maximum nominal dimensions of 1000 mm × 1000 mm.

If approach ramps are provided care shall be taken to ensure that these do not interfere with the platform.

### 1.2 Load Cells

Four Zemic model H8C C3 load cells (of 1000 kg maximum capacity) are used, and are mounted as shown in Figure 1.

### 1.3 Indicator

An Ohaus model T31PAU indicator (Figure 2a & 2b) is used. The indicator is described (with additional detail) in the documentation of approval NMI S517.

### 1.4 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.

### 1.5 Tare

A semi-automatic tare device of up to maximum capacity of the instrument may be fitted.

### 1.6 Display Check

A display check is initiated when the instrument is switched on.

### 1.7 Levelling

Where instruments are liable to be tilted (i.e. they are not installed in a permanently fixed location) they are provided with adjustable feet and a level indicator.

### 1.8 Verification Provision

Provision is made for the application of a verification mark.

### 1.9 Sealing Provision

Provision is made for the calibration adjustments to be sealed as described in the approval documentation for the indicator.

## 1.10   Descriptive Markings and Notices

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

| | |
|---|---|
| Manufacturer's mark, or name written in full | Ohaus Corporation |
| Indication of accuracy class | ⅢⅠ |
| Pattern approval number for the instrument | NMI 6/9C/299 |
| Maximum capacity | *Max* ........... kg   #1 |
| Minimum capacity | *Min* ............ kg   #1 |
| Verification scale interval | *e* = ............. kg   #1 |
| Tare capacity (if less then Max) | *T* = - .......... kg   #2 |
| Serial number of the instrument | ............. |
| Pattern approval number for other components | ....................   #3 |

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

#2    This marking is required if $T$ is not equal to *Max*.

#3    May be located separately from the other markings.


## 2.    Description of Variant 1                          approved on 26/11/08

Certain Ohaus VE series instruments, using baseworks and load cells with other parameters as listed in Table 1.

Note that the full instrument model is formed by the basework model followed by suffix 31PA (indicating the T31PAU indicator, as described in approval NMI S517).

TABLE  1

Approved instruments using Ohaus model T31PAU indicators and Zemic model H8C C3 load cells.

| Basework model | (a) VE1500S<br>(b) VE1500R<br>(c) VE1500L | (a) VE3000R<br>(b) VE3000L |
|---|---|---|
| Maximum capacity | 1500 kg | 3000 kg |
| Verification scale interval (e) | 0.5 kg | 1 kg |
| Maximum platform size (m x m) | (a) 1 × 1<br>(b) 1.25 × 1.25<br>(c) 1.5 × 1.5 | (a) 1.25 × 1.25<br>(b) 1.5 × 1.5 |
| Load cell maximum capacity, *Emax* (kg) | 1000 kg | 1500 kg |


## 3.    Description of Variant 2                          approved on 26/11/08

Certain baseworks of this approval used with a compatible NMI approved (by Supplementary Certificate) indicator provided the conditions set out below are met.

Note that the instrument may be known according to the basework model alone, or according to a model number consisting of the basework model followed by a suffix relating to the indicator used (e.g. a model VE3000L basework used with an Ohaus model T31XWAU indicator as described in approval NMI S517, may be known as a model VE3000L31XWA instrument).

In addition to the markings specified in clause **1.10 Descriptive Markings and Notices**, instruments are marked with the NMI approval number for the indicator used, together in the same location.

The baseworks and their limiting characteristics are given in Table 2.

TABLE 2

Basework parameters for calculations related to use of alternative indicators.

| Basework model | (a) VE1500S<br>(b) VE1500R<br>(c) VE1500L | (a) VE3000R<br>(b) VE3000L |
|---|---|---|
| Maximum capacity | 1500 kg | 3000 kg |
| Maximum platform size (m × m) | (a) 1 × 1<br>(b) 1.25 × 1.25<br>(c) 1.5 × 1.5 | (a) 1.25 × 1.25<br>(b) 1.5 × 1.5 |
| Maximum number of verification scale intervals, $n_{LC}$ | 3000 | 3000 |
| Load cell make | Zemic | Zemic |
| Load cell model | H8C C3 1.0t | H8C C3 1.5t |
| Load cell classification | C3 | C3 |
| Number of load cells | 4 | 4 |
| Load cell maximum capacity, *Emax* (kg) | 1000 kg | 1500 kg |
| $v_{min}$ of load cell (kg) | 0.15 | 0.15 |
| Load cell DR value (kg) | 0.11 | 0.15 |
| Load cell sensitivity (mV/V) | 3 | 3 |
| Input impedance (ohm) | 350 | 350 |
| Excitation voltage (max) (V) | 15 | 15 |
| Cable length (m) | 4 | 4 |
| Number of leads (plus shield) | 4 | 4 |

The conditions to be met are given below, and include calculations using the following terms:

Ex = Excitation from indicator (V)

LC_Sens = Load cell sensitivity (mV/V)

$E_{max}$ = Load cell maximum capacity (kg)

Indicator Sensitivity = Minimum sensitivity value per verification scale interval for the indicator (µV)

e = verification scale interval of the instrument (kg). ***In the case of multi-interval or multiple range instruments, any reference to 'e' refers to the smallest verification scale interval (i.e. $e_1$).***

$e_1$, $e_2$, … = verification scale interval of each range for multiple range instruments (or partial weighing ranges for multi-interval instruments), $e_1$ refers to the smallest verification interval.

*Max = the maximum capacity of the instrument. This refers to the maximum capacity of the highest range (i.e. $Max_r$ for multiple range instruments).*

*$Max_r$ = the maximum capacity of the instrument for a multiple range instrument, i.e. the maximum capacity of the highest range.*

*$Max_1$ $Max_2$ … = the maximum capacity of the various ranges for a multiple range instrument. $Max_1$ refers to the maximum capacity of the smallest range.*

*$n_{LC}$ = the maximum number of verification intervals for which the load cell or basework is approved (e.g. 3000 for a 'class C3' load cell).*

*DR = dead load return value for the load cell. Note: Many load cells do not have a specified DR value.*

*N = Number of load cells used.*

The conditions are:

- The excitation voltage used is within the range approved for the baseworks.

- The maximum load applied to the basework (live load plus any dead load) does not exceed the load cells maximum capacity, i.e.

$$E_{max} > (Max + platform\ dead\ load)/N$$

- The verification scale interval is not less than the minimum value specified. *In the case of multi-interval or multiple range instruments, the verification scale interval (e) refers to the smallest verification scale interval (i.e. $e_1$).*

$$v_{min} < \frac{e}{\sqrt{N}}$$

- The number of verification scale intervals is less than or equal to the $n_{max}$ value specified. *In the case of multi-interval or multiple range instruments, the number of verification scale intervals refers to the largest number in any weighing range or partial weighing range (i.e. the largest of $Max_1/e_1$, $Max_2/e_2$ etc).*

- The signal voltage per verification scale interval is not less than the minimum sensitivity value per verification scale interval for the indicator (as specified in the approval documentation for the indicator), i.e.

$$IndicatorSensitivity \leq \frac{1000 \times Ex \times LC\_Sens \times e}{N \times E_{max}}$$

**_Additional requirement for multi-interval operation:_**

*In the case of indicators which are configured to form a multi-interval weighing instrument the instrument shall comply with one of the following conditions:*

*(i) The smallest verification scale interval ($e_1$) shall satisfy the following:*

$$e_1 \geq Max/n_{LC}$$

*(ii) Or, the smallest verification scale interval ($e_1$) shall satisfy the following:*

$$e_1 \geq 2 \cdot DR \cdot Max/E_{max}$$

*Of course (ii) cannot apply where a value of 'Deadload return' DR is not given.*

*The instrument shall also comply with the following condition:*

*$Max_i / e_{i+1} \geq 500$ (e.g. $Max_1/e_2 \geq 500$ and $Max_2/e_3 \geq 500$ )*

### *Additional requirement for multiple range operation:*

***In the case of indicators which are configured to form a multiple range weighing instrument the instrument shall comply with one of the following conditions:***

> ***(i) The smallest verification scale interval ($e_1$) shall satisfy the following:***
>
> > ***$e_1 \geq 0.4\ Max_r/n_{LC}$***
>
> ***(ii) Or, the smallest verification scale interval ($e_1$) shall satisfy the following:***
>
> > ***$e_1 \geq DR.\ Max_r/E_{max}$***
>
> ***Of course (ii) cannot apply where a value of 'Deadload return' DR is not given.***

## TEST PROCEDURE

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 $e_1$, $e_2$, …, apply $e_1$, for zero adjustment, and for maximum permissible errors apply $e_1$, $e_2$, …, as applicable for the load.

FIGURE 6/9C/299 – 1



(a) Ohaus Model VE1500S31PA Weighing Instrument



(b) View of Bottom of VE1500S Basework

## FIGURE 6/9C/299 – 2



(a) Ohaus Model T31PAU (also known as 3000 Series)



(b) Sealing of Ohaus T31PAU (lead and wire type seal, or labels)

~ End of Document ~