Australian Government
Department of Industry, Science and Resources

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 6/4C/326

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 Defender i-D61PW30K1R6 Weighing Instrument

submitted by Ohaus Australia Pty Ltd
Level 1, 191 Salmon 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 October 2015.

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 & variants 1 to 5 approved – certificate issued	15/11/22
1	Variant 6 approved – certificate issued	16/05/25

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 6/4C/326' 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.

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 6/4C/326

1. Description of Pattern approved on 15/11/22

An Ohaus model Defender i-D61PW30K1R6 class (III) single interval self-indicating non-automatic weighing instrument (Figure 1) of 30 kg maximum capacity with a verification scale interval of 0.01 kg, and with a minimum capacity of 0.2 kg.

Instruments are marked 'NOT FOR TRADING DIRECT WITH THE PUBLIC' (or similar wording) unless the maximum capacity of the instrument is greater than 100 kg (i.e. as may be the case for variant 3).

1.1 Basework

The Ohaus model i-D30K1R basework (Figure 5a) has the load receptor directly supported by a single load cell. The load receptor has a nominal dimension of 305 mm × 305 mm, and typically uses a stainless steel type construction.

1.2 Load cell

An HBM model PW15AHC3 50kg load cell of 50 kg maximum capacity is used.

1.3 Indicator

An Ohaus model Defender i-DT61PW digital indicator (Figure 3a) is used.

The indicator has an ABS enclosure with an LCD display for display of the weight value.

The indicator may be mounted on a column attached to the base (Figures 1a).

1.4 Zero

A zero-tracking device may be fitted.

The initial zero-setting device of the pattern 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

An automatic subtractive tare device and/or semi-automatic subtractive tare device and/or pre-set tare device, each of up to maximum capacity of the instrument, may be fitted.

1.6 Display Check

A display check is initiated whenever power is applied.

1.7 Levelling

The instrument is provided with adjustable feet and a level indicator.

The instrument is to be used in a level condition as indicated by the level indicator.

1.8 Power Supply

The instrument operates from 6 x D size 1.5 V dry batteries.

1.9 Additional Features

Instruments may be fitted with certain additional functions including counting, percent weighing, target/check weighing, 'Lo/OK/Hi' display, dynamic weighing, accumulation with statistical information. The additional functions (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 approved for trade use.

Instruments may also be fitted with an 'animal weighing' or 'dynamic weighing' function. This function shall not be used for trade use.

1.10 Verification Provision

Provision is made for the application of a verification mark.

1.11 Descriptive Markings and Notices

Instruments carry the following markings:

Manufacturer's mark, or name written in full	Ohaus Corporation	
Indication of accuracy class	(III)	
Pattern approval number for the instrument	NMI 6/4C/326	
Maximum capacity	*Max* ...../..... g or kg	#1
Minimum capacity	*Min* ..... g or kg	#1
Verification scale interval	*e* = .../..... g or kg	#1
Serial number of the instrument	……..	

#1 These markings are shown near the display of the result.

In addition, instruments shall carry a notice stating NOT TO BE USED FOR TRADING DIRECT WITH THE PUBLIC, or similar wording (see 1. *Description of Pattern* above).

1.12 Sealing Provision

Provision is made for the calibration to be sealed by setting a switch on the main board within the instrument to 'ON' position, and then preventing access within the protective cover (Figure 6).

The switch status (Figure 8a) can be seen in the switch-on display sequence when the power is first applied to the instrument.

- If the switch is in the 'ON' position, the instrument will display 'LFt ON'. In this case the instrument may be verified.
- Otherwise the instrument will not display 'LFt ON' in the switch-on display sequence in which case the instrument should not be verified until the switch has been correctly set to the 'ON' position.

Sealing to prevent access within the protective cover may be achieved by the application of lead and wire type seals or similar with drilled screws or using a destructive label placed over the securing screw in the protective cover as shown in Figure 6.

1.13 Software

The legally relevant software is designated Sr 1.xx, where 'xx' refers to the identification of non-legally relevant software.

The software version and number can be seen in the switch-on display sequence (when the power is first applied to the instrument).

2. Description of Variant 1 approved on 15/11/22

The Ohaus model Defender i-D61PW series single interval instruments in certain other capacities as listed in Table 1 and as shown in Figures 1, 5a and 5b (the pattern is shown in **bold**).

TABLE 1

Model	Maximum Capacity (*Max*) (kg)	Minimum Capacity (*Min*) (kg)	Verification Scale Interval (*e*) (kg)	Platform Size (mm x mm)	HBM PW15AHC3 Load Cell
i-D61PW3K1S6AU	3	0.02	0.001	254 x 254	PW15AHC3 10kg
i-D61PW6K1S6AU	6	0.04	0.002	254 x 254	PW15AHC3 10kg
i-D61PW15K1R6AU	15	0.1	0.005	305 x 305	PW15AHC3 20kg
i-D61PW30K1R6AU	**30**	**0.2**	**0.01**	**305 x 305**	**PW15AHC3 50kg**
i-D61PW60K1L7AU	60	0.4	0.02	400 x 500	PW15AHC3 100kg

3. Description of Variant 2 approved on 15/11/22

The Ohaus model Defender i-D61PW series instruments which are similar to the pattern but with an i-DT61PW digital indicator attached to the basework in certain single interval capacity as listed in Table 2 and as shown in Figures 2, 5a and 5b.

TABLE 2

Model	Maximum Capacity (*Max*) (kg)	Minimum Capacity (*Min*) (kg)	Verification Scale Interval (*e*) (kg)	Platform Size (mm x mm)	HBM PW15AHC3 Load Cell
i-D61PW3K1S5AU	3	0.02	0.001	254 x 254	PW15AHC3 10kg
i-D61PW6K1S5AU	6	0.04	0.002	254 x 254	PW15AHC3 10kg
i-D61PW15K1R5AU	15	0.1	0.005	305 x 305	PW15AHC3 20kg
i-D61PW30K1R5AU	30	0.2	0.01	305 x 305	PW15AHC3 50kg
i-D61PW60K1L5AU	60	0.4	0.02	400 x 500	PW15AHC3 100kg

4. Description of Variant 3 approved on 15/11/22

The Ohaus model Defender i-D61PW series instruments which are similar to the pattern but using a Mettler Toledo model SSH C3 load cell in certain single interval capacity as listed in Table 3 and as shown in Figures 1 and 5c.

TABLE 3

Model	Maximum Capacity (*Max*) (kg)	Minimum Capacity (*Min*) (kg)	Verification Scale Interval (*e*) (kg)	Platform Size (mm x mm)	Mettler Toledo SSH C3 Load Cell
i-D61PW150K1L7AU	150	1	0.05	400 x 500	SSH 300kg

5. Description of Variant 4 approved on 15/11/22

The Ohaus model Defender i-D61PW series instruments which are similar to the pattern but using a Mettler Toledo model SSH C3 load cell and with an i-DT61PW digital indicator attached to the basework in certain single interval capacity as listed in Table 4 and as shown in Figures 2 and 5c.

TABLE 4

Model	Maximum Capacity (*Max*) (kg)	Minimum Capacity (*Min*) (kg)	Verification Scale Interval (*e*) (kg)	Platform Size (mm x mm)	Mettler Toledo SSH C3 Load Cell
i-D61PW150K1L5AU	150	1	0.05	400 x 500	SSH 300kg

6. Description of Variant 5 approved on 15/11/22

The Ohaus model Defender i-D61XWE series instruments which are similar to the pattern and variants 1 and 3 but using an Ohaus model Defender i-DT61XWE digital indicator (Figure 3b) and typically having a stainless steel platform in certain single interval capacities as listed in Tables 5 to 6 and as shown in Figures 4, 5a, 5b and 5c.

The indicator has a stainless steel enclosure with an LED display for display of the weight value.

6.1 Tare

An automatic subtractive tare device and/or semi-automatic subtractive tare device and/or pre-set tare device, each of up to maximum capacity of the instrument, may be fitted.

6.2 Interfaces

The indicator 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 R 76 (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 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, USB, Ethernet and digital inputs/outputs.

6.3 Power Supply

The instrument operates from mains AC power (100–240 V AC, 50/60 Hz).

6.4 Additional Features

Instruments may be fitted with certain additional functions including counting, percent weighing, target/check weighing, dot matrix colour LED display, dynamic weighing, accumulation with statistical information, filling/setpoints and a 'library' function to allow storing/recall of 'under/accept/over' values, average piece weight for counting, reference weight for percentage weighing, setpoint values for filling, tare values and material name against part numbers. The additional functions (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 approved for trade use.

Instruments may also be fitted with an 'animal weighing' or 'dynamic' function. This function shall not be used for trade use.

6.5 Sealing Provision

Provision is made for the calibration to be sealed by setting a switch on the main board within the instrument to 'ON' position, and then preventing access within the protective cover (Figures 7).

The switch status (Figure 8b) can be seen in the switch-on display sequence when the power is first applied to the instrument.

- If the switch is in the 'ON' position, the instrument will display 'LFt ON'. In this case the instrument may be verified.
- Otherwise the instrument will not display 'LFt ON' in the switch-on display sequence in which case the instrument should not be verified until the switch has been correctly set to the 'ON' position.

Sealing to prevent access within the protective cover may be achieved by the application of lead and wire type seals or similar with wire holes or using a destructive label placed over the securing screw in the protective cover as shown in Figure 7.

TABLE 5

Model	Maximum Capacity (*Max*) (kg)	Minimum Capacity (*Min*) (kg)	Verification Scale Interval (*e*) (kg)	Platform Size (mm x mm)	HBM PW15AHC3 Load Cell
i-D61XWE3K1S6AU	3	0.02	0.001	254 x 254	PW15AHC3 10kg
i-D61XWE6K1S6AU	6	0.04	0.002	254 x 254	PW15AHC3 10kg
i-D61XWE15K1R6AU	15	0.1	0.005	305 x 305	PW15AHC3 20kg
i-D61XWE30K1R6AU	30	0.2	0.01	305 x 305	PW15AHC3 50kg
i-D61XWE60K1L7AU	60	0.4	0.02	400 x 500	PW15AHC3 100kg

TABLE 6

Model	Maximum Capacity (*Max*) (kg)	Minimum Capacity (*Min*) (kg)	Verification Scale Interval (*e*) (kg)	Platform Size (mm x mm)	Mettler Toledo SSH C3 Load Cell
i-D61XWE150K1L7AU	150	1	0.05	400 x 500	SSH 300kg

7. Description of Variant 6 approved on 16/05/25

Single load cell baseworks of this approval used with a compatible approved indicator (Supplementary approval with reference to document **NMI R 76 dated October 2015 or later**) provided the conditions set out below are met. In this case instruments may be known according to the basework model number (e.g., model i-D15K1RAU). Any devices and features described in the approval for the indicator shall apply to this instrument.

Note: Only submittor-authorised manufacture or conversion is permitted under this variant.

The basework is connected to the indicator directly without lengthening the load cell cable.

The minimum temperature limit of the instrument is equal to the greater of the lower temperature limit of the basework or indicator. The maximum temperature limit is equal to the lesser of the upper temperature limit of the basework or indicator. The temperature range of the instrument shall be a minimum of 30 °C (e.g., 0 °C to 40 °C or 5 °C to 35 °C).

Note: Where no special temperature limits are given in the **Descriptive Markings and Notices**, then the temperature limits are −10 °C to 40 °C. If the temperature limits of the instrument are other than −10 °C to +40 °C, additional marking of special temperature limits must be added to the existing descriptive markings.

In addition to the markings specified in clause **1.12 Descriptive Markings and Notices**, instruments are marked with the NMI approval number for the indicator used, together in the same location. Where the resulting instrument is a multiple range instrument, appropriate markings regarding the ranges and scale intervals shall be provided in accordance with the Supplementary Certificate for the indicator.

The approved single load cell baseworks and their limiting characteristics are given in Tables 7a to 7b.

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

Ex = Excitation voltage from indicator (V)

LC_Sens = Load cell sensitivity (mV/V)

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

IZSR = Initial zero setting range for the indicator (kg) (positive range only)

DL = Dead load of load receptor (kg)

T^+ = Additive tare capacity (kg)

U_{min} = Minimum input voltage for the indicator (mV)

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 multiple range or multi-interval 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 output return value for the load cell. Note: Many load cells do not have a specified DR value.

The conditions are:

- The excitation voltage used is within the range approved for the baseworks.
- The load cell input impedance is within the impedance range approved for the indicator.
- The maximum load applied to the load cell (live load plus any dead load) does not exceed the load cell maximum capacity, i.e.

  $Max + DL + IZSR + T^+ \leq E_{max}$
- The verification scale interval is not less than the minimum value specified. ***In the case of multiple range or multi-interval instruments, the verification scale interval refers to the smallest verification scale interval (i.e. e_1).***
- The number of verification scale intervals of the instrument is less than or equal to the *maximum number of verification intervals* specified for the load cell and also for the approved indicator. ***In the case of multiple range or multi-interval 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.

  Indicator Sensitivity ≤ 1000 × Ex × LC_Sens × e / E_{max}

  In the case of multiple range or multi-interval instruments, *e* is replaced by e_1.
- The input voltage for the indicator (when the basework is unloaded) is not less than the minimum input voltage for the indicator (as specified in the approval documentation for the indicator), i.e.

$U_{min} \leq Ex \times LC\_Sens \times DL / E_{max}$

Where U_{min} is not given in the Supplementary Certificate of Approval for the indicator, U_{min} = 0 mV.

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 the following conditions:

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

$$e_1 \geq DR \times Max_r / E_{max}$$

Of course (i) cannot apply where a value of 'Dead load output return' DR is not given. In this case the smallest verification scale interval (e_1) shall satisfy the following:

$$e_1 \geq 0.4 \times Max_r / n_{LC}$$

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 the following conditions:

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

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

Of course (i) cannot apply where a value of 'Dead load output return' DR is not given. In this case the smallest verification scale interval (e_1) shall satisfy the following:

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

(ii) The instrument shall also satisfy the following condition with the exception of the last partial weighing range:

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

TABLE 7a

Basework Model	i-D3K1SAU	i-D6K1SAU	i-D15K1RAU
Platform Size (mm)	254 x 254	254 x 254	305 x 305
Basework Maximum Capacity (kg)	3	6	15
Typical Verification Scale Interval (kg)	0.001	0.002	0.005
Maximum Number of Verification Scale Intervals (n_{max})	3000	3000	3000
Dead Load of Platform (kg)	2.49	2.52	3.45
Load Cell Used	HBM PW15AHC3		
Load Cell Maximum Capacity (E_{max}) (kg)	10	10	20
n_{LC}	3000	3000	3000
Minimum Value of Verification Scale Interval for basework (kg)	0.001	0.002	0.005
Minimum Dead Load Output Return DR (kg)	0.0017	0.0017	0.0033
Operating Temperature Range (°C)	-10 to 40		
Output Rating at E_{max} (mV/V)	2		
Input Impedance (Ω)	380		
Maximum Excitation Voltage (V AC or DC)	15		
Cable Lengths (m)	3		
Number of Leads (plus shield)	6		

TABLE 7b

Basework Model	i-D30K1RAU	i-D60K1LAU	i-D150K1LAU
Platform Size (mm)	305 x 305	400 x 500	400 x 500
Basework Maximum Capacity (kg)	30	60	150
Typical Verification Scale Interval (kg)	0.01	0.02	0.05
Maximum Number of Verification Scale Intervals (n_{max})	3000	3000	3000
Dead Load of Platform (kg)	3.3	8.4	8.55
Load Cell Used	HBM PW15AHC3		Mettler Toledo SSH C3
Load Cell Maximum Capacity (E_{max}) (kg)	50	100	300
n_{LC}	3000	3000	3000
Minimum Value of Verification Scale Interval for basework (kg)	0.01	0.02	0.05
Minimum Dead Load Output Return DR (kg)	0.0083	0.0167	0.05
Operating Temperature Range (°C)	-10 to 40		-10 to 40
Output Rating at E_{max} (mV/V)	2		2
Input Impedance (Ω)	380		381
Maximum Excitation Voltage (V AC or DC)	15		20
Cable Lengths (m)	3		2.5
Number of Leads (plus shield)	6		6

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

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*.

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

FIGURE 6/4C/326 – 1

Ohaus Model Defender i-DT61PW Series Weighing Instrument

FIGURE 6/4C/326 – 2

Ohaus Model Defender i-DT61PW Series Weighing Instrument (Bench Style)

FIGURE 6/4C/326 – 3

(a) Ohaus Model Defender i-DT61PW Digital Indicator

(b) Ohaus Model Defender i-DT61XWE Digital Indicator

FIGURE 6/4C/326 – 4

Ohaus Model Defender i-DT61XWE Series Weighing Instrument

FIGURE 6/4C/326 – 5

(a) Ohaus Model Defender i-D61PW / i-D61XWE Series Basework Fitted with an HBM PW15AH Load Cell

(b) Ohaus Model Defender i-D61PW / i-D61XWE Series Basework Fitted with an HBM PW15AH Load Cell

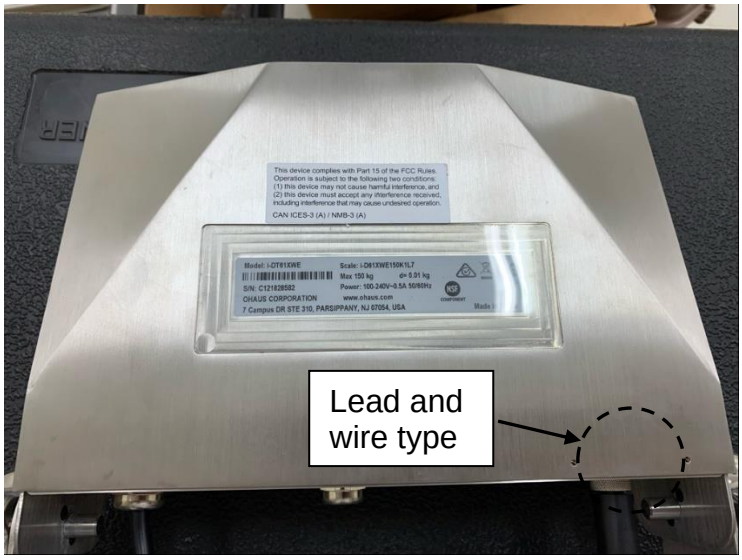
(c) Ohaus Model Defender i-D61PW / i-D61XWE Series Basework Fitted with a Mettler Toledo SSH Load Cell

FIGURE 6/4C/326 – 6

Sealing of i-DT61PW Digital Indicator

Typical Sealing Methods

FIGURE 6/4C/326 – 7



Sealing of i-DT61XWE Digital Indicator

Typical Sealing Methods

FIGURE 6/4C/326 – 8

(a) Model i-DT61PW Digital Indicator Calibration Switch Status

(b) Model i-DT61XWE Digital Indicator Calibration Switch Status

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