



Australian Government

Department of Industry,
Science and Resources

**National
Measurement
Institute**

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 6/4C/325

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.

National Weighing & Instruments Model Spartan XK 3-CW Weighing Instrument

submitted by National Weighing & Instruments Pty. Limited
(T/A NWI GROUP)
1/88 Magowar Road
Girraween NSW 2145

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 2 approved – certificate issued	21/07/22

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number `NMI 6/4C/325' 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.

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 6/4C/325

1. Description of Pattern**approved on 21/07/22**

A National Weighing & Instruments model Spartan XK 3-CW class  single interval self-indicating non-automatic weighing instrument (Figure 1) of 3 kg maximum capacity with a verification scale interval of 0.001 kg and with a minimum capacity of 0.02 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 1).

Instruments are approved for use over a temperature range of 0 °C to +40 °C, and must be so marked.

1.1 Basework

The National Weighing & Instruments model 3-CW basework has the load receptor directly supported by a Zemic L6D-8kg load cell of 8 kg maximum capacity. The load receptor has a nominal dimension of 300 mm x 300 mm.

1.3 Indicator

A Guangdong Huapu Electrical Appliance Group model Spartan XK3119WP-PRO weighing indicator mounted on a column is used.

Note: The load cell is connected to the indicator directly without a junction box or lengthening the load cell cable.

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

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

1.6 Display Check

A display check is initiated whenever power is applied.

1.7 Power Supply

Power for the instrument may be supplied by:

- 240 V AC mains power; and/or
- an internal 6 V rechargeable battery.

1.8 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.

1.9 Additional Features

Instruments may be fitted with certain additional functions (e.g. check weighing (HI/OK/LO), counting, animal weighing (HOLD), and simple price computing). 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 a 'weighing unstable sample' or 'animal 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	National Weighing & Instrument Pty. Limited
Indication of accuracy class	
Pattern approval number for the instrument	NMI 6/4C/325
Maximum capacity	<i>Max</i> g or kg #1
Minimum capacity	<i>Min</i> g or kg #1
Verification scale interval	<i>e</i> = g or kg #1
Maximum subtractive tare	<i>T</i> = - g or kg #2
Serial number
Special temperature limits	0 °C to 40 °C

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

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

In addition, instruments may be required to 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 Software

The legally relevant embedded software is designated VEr 1.0 (Figure 2).

The software version and number appears at initial checking sequence when power is first applied to the instrument.

1.13 Sealing Provision

Provision is made for the calibration is sealed by setting the JP1 jumper within the instrument to an 'OFF' position, and then preventing access within the instrument house. Sealing to prevent access within the instrument housing may be achieved by mean of lead and wire type seals with drilled screws or destructible adhesive labels placed over the opposite sides of a join in the instrument housing (Figure 3).

It is possible to determine the jumper status by pressing and holding the TARE button.

If the JP1 jumper is in the 'OFF' position, the instrument will not display **CAL SP**. In this case the instrument may be verified.

Otherwise the instrument will display **CAL SP** in which case the instrument should be not be verified until the JP1 jumper has been correctly located in the 'OFF' position.

2. Description of Variant 1

approved on 21/07/22

The National Weighing & Instruments model Spartan XK (##) series single interval instruments (where ## represents the basework model used) using a Zemic load cell in certain other capacities as listed in Table 1 (pattern is shown in **bold**).

Instruments are approved for use over a temperature range of 0 °C to +40 °, and must be so marked.

TABLE 1

Maximum Capacity (Max) (kg)	Minimum Capacity (Min) (kg)	Verification Scale Interval (e) (kg)	Basework Model (##)	Load Receptor Size (mm x mm)	Zemic C3 Load Cell Model and Maximum Capacity
3	0.02	0.001	3-CW	300 x 300	L6D-8kg
6	0.04	0.002	6-CW	300 x 300	L6D-15kg
15	0.1	0.005	15-CW	300 x 300	L6D-30kg
15	0.1	0.005	15-CX	330 x 425	L6E-50kg
30	0.2	0.01	30-CX	330 x 425	L6E-50kg
60	0.4	0.02	60-CX	330 x 425	L6E-100kg
150	1	0.05	150-CX	390 x 530	L6E3-200kg
300	2	0.1	300-ECU	600 x 700	L6G-500kg
500	4	0.2	500-ECU	600 x 700	L6G-600kg

3. Description of Variant 2

approved on 21/07/22

Single load cell baseworks of this approval and 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 shall be known according to the basework model number (e.g. model CW300). Any devices and features described in the approval for the indicator shall apply to this instrument.

Note: Only submitor-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). If the temperature limits of the instrument are different from the special temperature limits specified in clause **1.11 Descriptive Markings and Notices**, the marking of temperature limits should be updated.

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 **1.11 Descriptive Markings and Notices**, instruments are marked with the NMI approval number for the indicator used, together in the same location.

The approved single load cell baseworks and their limiting characteristics are given in Tables 2 to 4.

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, \dots = 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.

Max₁ Max₂ ... = 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.

$$\text{Indicator Sensitivity} \leq 1000 \times Ex \times LC_Sens \times e / E_{max}$$

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 2 – Spartan CW 300 Approved Baseworks and Their Limiting Characteristics

Basework Model	CW 300		
	300 x 300	300 x 300	300 x 300
Platform Sizes (mm)	300 x 300	300 x 300	300 x 300
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)	3.3	3.3	3.3
Load Cell Used	Zemic L6D		
Load Cell Maximum Capacity E_{max} (kg)	8	15	30
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)	0.0013	0.0025	0.005
Operating Temperature Range (°C)	-10 to 40		
Output Rating at E_{max} (mV/V)	2	2	2
Input Impedance (Ω)	409	409	409
Excitation Voltage (V AC or DC)	5 – 12	5 – 12	5 – 12
Cable Lengths (m)	1.6 m (#)	1.6 m (#)	1.6 m (#)
Number of Leads (plus shield)	4	4	4

(#) The cable length supplied with the basework shall not be shortened.

TABLE 3 - Spartan CW400 Approved Baseworks and Their Limiting Characteristics

Basework Model	CW 400			
	400 x 500	400 x 500	400 x 500	400 x 500
Platform Sizes (mm)	400 x 500	400 x 500	400 x 500	400 x 500
Basework Maximum Capacity (kg)	15	30	60	150
Typical Verification Scale Interval (kg)	0.005	0.01	0.02	0.05
Maximum Number of Verification Scale Intervals (n_{max})	3000	3000	3000	3000
Dead Load of Platform (kg)	6.5	6.5	6.5	6.5
Load Cell Used	Zemic L6E	Zemic L6E	Zemic L6E	Zemic L6E3
Load Cell Maximum Capacity E_{max} (kg)	50	50	100	200
n_{LC}	3000	3000	3000	3000
Minimum Value of Verification Scale Interval for basework (kg)	0.005	0.005	0.01	0.02
Minimum Dead Load Output Return DR (kg)	0.006	0.006	0.012	0.033
Operating Temperature Range (°C)	-10 to 40			
Output Rating at E_{max} (mV/V)	2	2	2	2
Input Impedance (Ω)	406	406	406	406
Excitation Voltage (V AC or DC)	5 – 12	5 – 12	5 – 12	5 – 12
Cable Lengths (m)	3 m (#)	3 m (#)	3 m (#)	3 m (#)
Number of Leads (plus shield)	4	4	4	4

(#) The cable length supplied with the basework shall not be shortened.

TABLE 4 - Spartan ECU Approved Baseworks and Their Limiting Characteristics

Basework Model	ECU	
	600 x 700	600 x 700
Platform Sizes (mm)	600 x 700	600 x 700
Basework Maximum Capacity (kg)	300	500
Typical Verification Scale Interval (kg)	0.1	0.2
Maximum Number of Verification Scale Intervals (n_{max})	3000	3000
Dead Load of Platform (kg)	21.7	21.7
Load Cell Used	Zemic L6G	
Load Cell Maximum Capacity E_{max} (kg)	500	600
n_{LC}	3000	3000
Minimum Value of Verification Scale Interval for basework (kg)	0.05	0.1
Minimum Dead Load Output Return DR (kg)	0.083	0.1
Operating Temperature Range (°C)	-10 to 40	
Output Rating at E_{max} (mV/V)	2	2
Input Impedance (Ω)	409	409
Excitation Voltage (V AC or DC)	5 – 12	5 – 12
Cable Lengths (m)	3 m (#)	3 m (#)
Number of Leads (plus shield)	4	4

(#) The cable length supplied with the basework shall not be shortened.

TEST PROCEDURE No 6/4C/325

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*.

Ensure that instruments are only being used within the special temperature limits stated elsewhere in this Technical Schedule.

FIGURE 6/4C/325 - 1



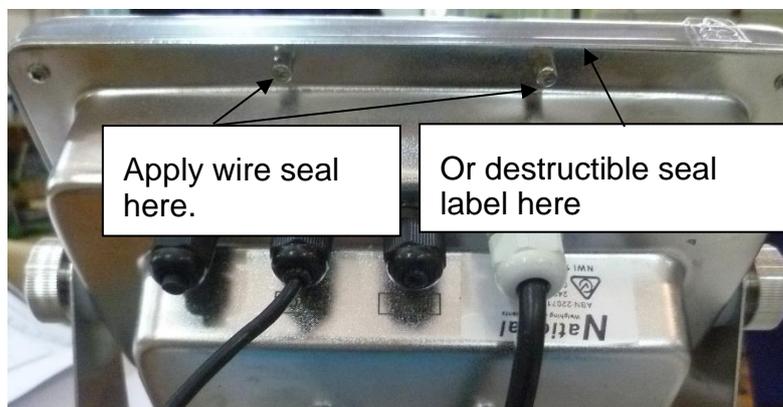
National Weighing & Instruments Model Spartan XK 3-CW Weighing Instrument
(Pattern)

FIGURE 6/4C/325 - 2



Software Version

FIGURE 6/4C/325 - 3



Sealing Method

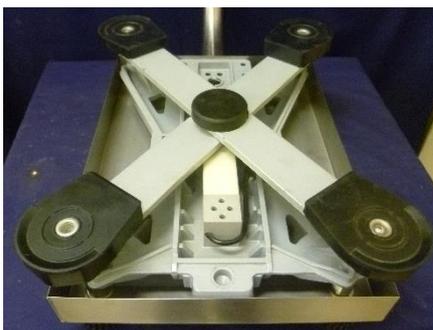
FIGURE 6/4C/325 - 4



(a) CW Basework 300 mm x 300 mm



(b) CX Basework 390 mm x 530mm



(c) CX Basework 330 mm x 425 mm



(d) ECU Basework 600 mm x 700 mm

~ End of Document ~