Australian Government
Department of Industry, Innovation and Science

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 6/9C/319

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.

Associated Scale Services Model SWC-SA-15 Weighing Instrument

submitted by Associated Scale Services Pty Ltd
Unit 4, 47 Learoyd Road
Acacia Ridge QLD 4110.

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 1/09/24, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variants 1 to 3 approved – certificate issued	29/08/19

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with approval number 'NMI 6/9C/319' 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 S1/0B.

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*.

Darryl Hines
Manager
Policy and Regulatory
Services

TECHNICAL SCHEDULE No 6/9C/319

1. Description of Pattern approved on 29/08/19

An Associated Scale Services model SWC-SA-15 class (III) single range self-indicating non-automatic weighing instrument (Figure 1) of 15 kg maximum capacity with a verification scale interval of 0.005 kg. The minimum capacity of the instrument is 0.1 kg. May also be known as Supply Weigh or Any Scales instruments of the same model.

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

1.1 Basework

The Associated Scale Services Model SWB-SA-15 basework (Figure 2a) has the load receptor directly supported by a single load cell. The load receptor has maximum nominal dimensions of 300 mm x 300 mm, uses a stainless steel construction.

1.2 Load Cell

An ANYLOAD model 108JA load cell of 50 kg maximum capacity is used.

1.3 Indicator

A Rice Lake model 480-2A digital indicator is used. The indicator is described in the documentation of approval NMI S673.

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 the maximum tare capacity of the instrument may be fitted.

1.6 Display Check

A display check is initiated whenever power is applied.

1.7 Levelling

Instruments are provided with adjustable feet and a level indicator. The level indicator (bubble) is located on basework underneath the weighing receptor. A notice indicating the location of the level indicator (e.g. "Level bubble provided under platform", or similar) shall be provided in a location clearly visible to the operator.

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

1.8 Interfaces

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 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 No S1/0B (in particular in regard to the data and its format).

Instruments may be fitted with RS-232/RS485 serial data interfaces, digital/analogue inputs/outputs and 20 mA current loop.

1.9 Verification Provision

Provision is made for the application of a verification mark.

1.10 Descriptive Markings and Notices

Instruments carry the following markings:

Manufacturer's mark, or name written in full	Associated Scale Services
Indication of accuracy class	(III)
Pattern approval mark for the instrument	NMI 6/9C/319
Maximum capacity	*Max* ...../..... g or kg #1
Minimum capacity	*Min* ..... g or kg #1
Verification scale interval	*e* = .../..... g or kg #1
Maximum subtractive tare	*T* = - ……. g or kg #2
Serial number of the instrument	.....

#1 These markings are also 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*.

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).

1.11 Sealing Provision

Provision is made for access to the calibration switch within the instrument to be sealed using destructible labels placed over an access hole to the calibration switch and opposite sides of a join in the instrument housing as shown in Figure 3.

1.12 Software

The version of the legally relevant software is 01.00.03. Non-legally relevant functionality software is designated as version 01.xx.xx.

The legally relevant software version number appears in the switch-on display sequence when the power is first applied to the instrument.

2. Description of Variant 1 **approved on 29/08/19**

Certain other capacities of the Associated Scale Services model SWC-SA series instruments as listed in Table 1 (the pattern is shown in **bold**).

Table 1

Model	Maximum Capacity (*Max*)	Verification Scale Interval (*e*)	Maximum Platform Size	Maximum Subtractive Tare Capacity (*T* = - …)	ANYLOAD 108JA Load Cell Maximum Capacity (E_{max})
SWC-SA-15	**15 kg**	**0.005 kg**	**300 x 300 mm**	**14.995 kg**	**50 kg**
SWC-SA-30	30 kg	0.01 kg	400 x 400 mm	29.99 kg	50 kg
SWC-SA-60	60 kg	0.02 kg	500 x 500 mm	59.98 kg	100 kg
SWC-SA-150	150 kg	0.05 kg	600 x 600 mm	149.95 kg	200 kg
SWC-SA-250	250 kg	0.1 kg	600 x 600 mm	249.9 kg	300 kg
SWC-SA-280	280 kg	0.1 kg	600 x 600 mm	249.9 kg	300 kg
SWC-SA-600	600 kg	0.2 kg	600 x 600 mm	599.8 kg	750 kg

3. Description of Variant 2 approved on 29/08/19

The Associated Scale Services model SWC-PA series instruments which are similar to the pattern but having a model SWB-PA basework (Figure 2b) in certain capacities as listed in Table 2. Typically these baseworks have a painted mild steel type of construction.

Table 2

Model	Maximum Capacity (*Max*)	Verification Scale Interval (*e*)	Maximum Platform Size	Maximum Subtractive Tare Capacity (*T* = - …)	ANYLOAD 108JA Load Cell Maximum Capacity (E_{max})
SWC-PA-15	15 kg	0.005 kg	300 x 300 mm	14.995 kg	50 kg
SWC-PA-30	30 kg	0.01 kg	400 x 400 mm	29.99 kg	50 kg
SWC-PA-60	60 kg	0.02 kg	500 x 500 mm	59.98 kg	100 kg
SWC-PA-150	150 kg	0.05 kg	600 x 600 mm	149.95 kg	200 kg
SWC-PA-250	250 kg	0.1 kg	600 x 600 mm	249.9 kg	300 kg
SWC-PA-280	280 kg	0.1 kg	600 x 600 mm	249.9 kg	300 kg
SWC-PA-600	600 kg	0.2 kg	600 x 600 mm	599.8 kg	750 kg

4. Description of Variant 3 approved on 29/08/19

Any model base work of this approval, used with a compatible approved (by Supplementary Certificate) indicator provided the conditions set out below are met. The limiting characteristics of the load cell used in these base works are given in Tables 3.

The resulting instrument may be single range, multi-interval or multi range (according to the indicator used), provided that the conditions and any additional requirements given in this variant are met.

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. 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 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), e1 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.

The conditions are:

- The excitation voltage used is within the range of the load cell used in the approved baseworks.
- The maximum load applied to the basework (live load plus any dead load) does not exceed the load cell maximum capacity.
- 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 refers to the smallest verification scale interval (i.e. e_1).

- The number of verification scale intervals is less than or equal to the n_{max} value specified for the load cell and also for the approved indicator. ***In the case of 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 / Emax

<u>Additional requirements for multi-interval operation:</u>

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:

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

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

<u>Additional requirements for multiple range operation:</u>

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 (e1) shall satisfy the following:

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

(ii) Or, the smallest verification scale interval (e1) 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.

TABLE 3 – Approved Baseworks and Their Limiting Characteristics

Instrument Model	SWC-SA-15 SWC-PA-15	SWC-SA-30 SWC-PA-30	SWC-SA-60 SWC-PA-60	SWC-SA-150 SWC-PA-150	SWC-SA-250 SWC-PA-250	SWC-SA-280 SWC-PA-280	SWC-SA-600 SWC-PA-600
Basework Model	SWB-SA-15 SWB-PA-15	SWB-SA-30 SWB-PA-30	SWB-SA-60 SWB-PA-60	SWB-SA-150 SWB-PA-150	SWB-SA-250 SWB-PA-250	SWB-SA-280 SWB-PA-280	SWB-SA-600 SWB-PA-600
Basework Maximum Capacity (kg)	15	30	60	150	250	280	600
Maximum Platform Sizes (mm)	300 x 300	400 x 400	500 x 500	600 x 600	600 x 600	600 x 600	600 x 600
Load Cell Used	108JA	108JA	108JA	108JA	108JA	108JA	108JA
Number of load cells	1	1	1	1	1	1	1
Load Cell Maximum Capacity Emax (kg)	50	50	100	200	300	300	750
nLC	5000	5000	5000	5000	5000	5000	4000
Minimum Verification Scale Interval Value (kg)	0.004	0.004	0.008	0.016	0.024	0.024	0.186
Dead Load Return Value DR (kg)	0.005	0.005	0.01	0.02	0.03	0.03	0.05
Output Rating at Emax (mV/V)	2	2	2	2	2	2	2
Input Impedance (Ω)	415						
Excitation Voltage (V)	10						
Cable Lengths (+0.1m) (m)	2 (#)						
Number of Leads (plus shield)	4						

* Cable length attached to load cell supplied with basework shall not be lengthened or shortened.

TEST PROCEDURE No 6/9C/319

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

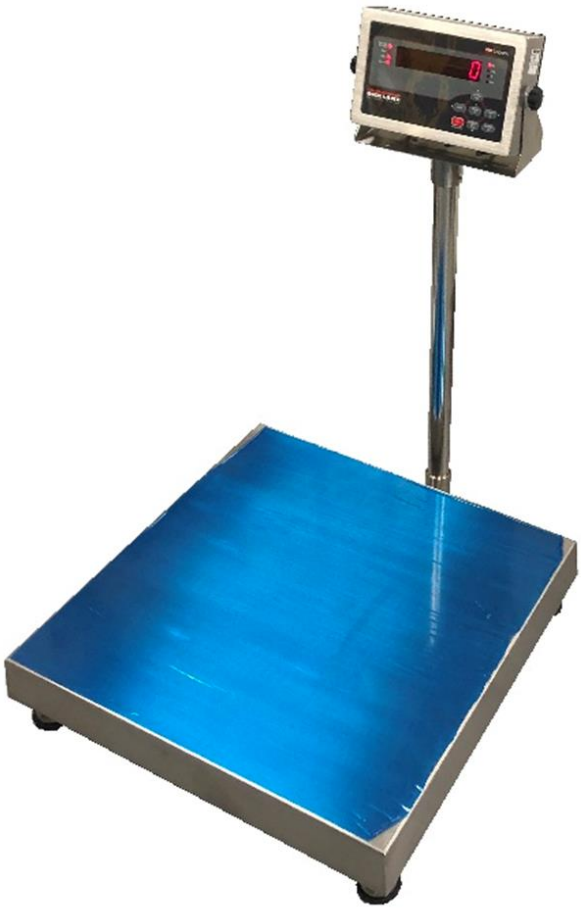
Maximum Permissible Errors

The maximum permissible errors are specified in Schedule 1 of the *National Trade Measurement Regulations 2009*.

Tests

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 6/9C/319 – 1



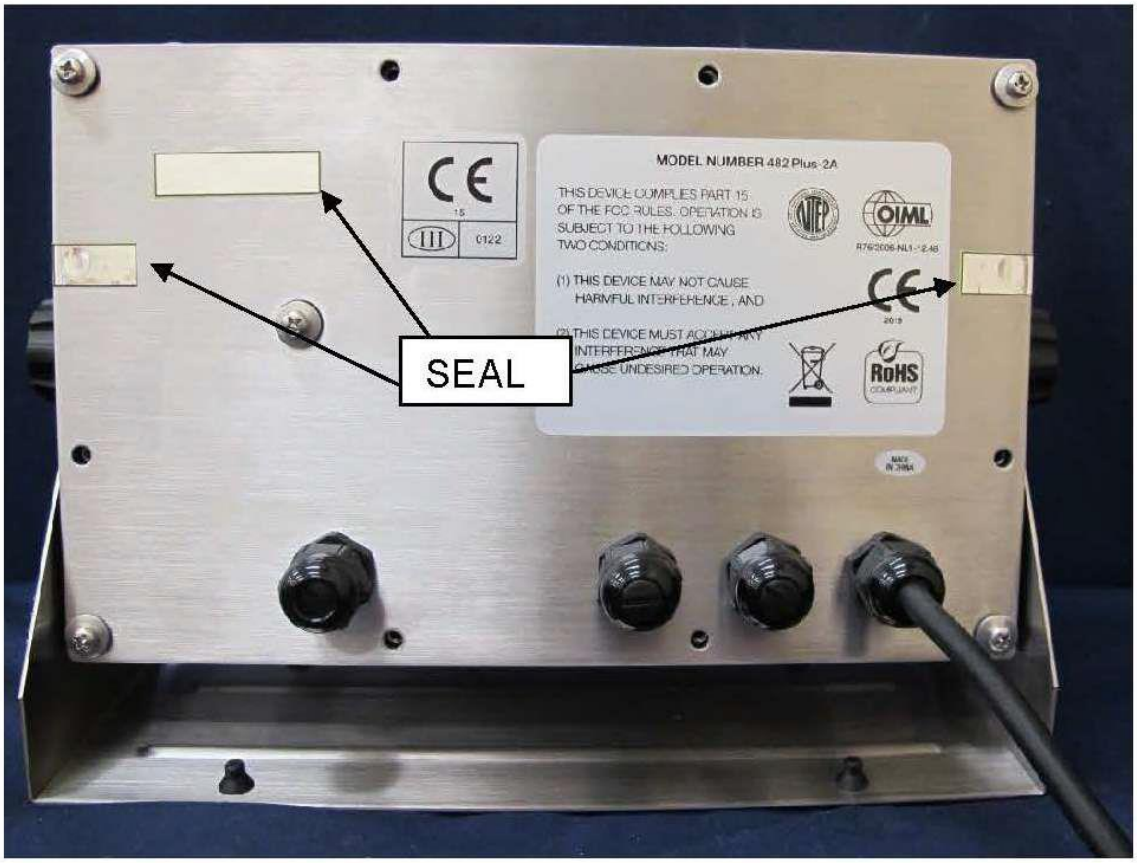
Associated Scale Services model SWC-SA/PA Weighing Instrument
(Pattern)

FIGURE 6/9C/319 – 2

(a) Model SWB-SA basework

(b) Model SWB-PA basework

FIGURE 6/9C/319 – 3



Typical Sealing - Model SWC-SA/PA series with 480-2A Indicator

~ End of Document ~