Australian Government
Department of Industry, Innovation and Science

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 6/4C/276

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.

A & D Model SE-30KAM Weighing Instrument

submitted by A & D Australasia Pty Ltd
32 Dew Street
Thebarton SA 5031

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 1/08/17, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variants 1 and 2 approved – certificate issued	24/07/12
1	Variant 3 approved – certificate issued	13/03/14
2	Variant 4 approved – certificate issued	27/11/18
3	Variant 4 amended (model number) & variant 5 approved – certificate issued	3/04/19

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with approval number 'NMI 6/4C/276' 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.

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
Pattern Approval, Policy and
Licensing Section

TECHNICAL SCHEDULE No 6/4C/276

1. Description of Pattern approved on 24/07/12

The A & D model SE-30KAM class (III) non-automatic self-indicating single interval weighing instrument (Figure 1a and Table 1) of 30 kg maximum capacity with a verification scale interval of 0.01 kg.

The instrument has the load receptor directly supported by a single load cell. The load receptor has maximum nominal dimensions of 300 × 380 mm.

The instrument is fitted with one LCD display for display of the weight value.

The instrument operates from 6 D size 1.5 V batteries.

Instruments shall be marked 'NOT FOR TRADING DIRECT WITH THE PUBLIC' (or similar wording).

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

1.1 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.

A zero-tracking device may be fitted.

1.2 Tare

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

1.3 Display Check

A display check is initiated whenever power is applied.

1.4 Levelling

The instrument is provided with adjustable feet and adjacent to the level indicator is a notice stating 'Instrument must be level when in use' or similar wording.

1.5 Additional Features

Instruments may be fitted with a number of additional functions including comparator (LO, OK and HI) and counting ('pcs'). 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.

1.6 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 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 Supplementary Certificates No S1/0/A or No S1/0B (in particular in regard to the data and its format).

Instruments may be fitted with RS-232C and USB serial data interfaces.

1.7 Verification Provision

Provision is made for the application of a verification mark.

1.8 Sealing Provision

Provision is made for access to the calibration switch within the instrument to be sealed by means of lead and wire type seals with a drilled screw as shown in Figure 3.

1.9 Descriptive Markings and Notices

Instruments carry the following markings:

Manufacturer's mark, or name written in full	A & D Company Limited
Name or mark of manufacturer's agent	A & D Australasia Pty Ltd
Indication of accuracy class	(III)
Pattern approval mark for the instrument	NMI 6/4C/276
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 shall carry a notice stating NOT FOR TRADING DIRECT WITH THE PUBLIC, or similar wording.

2. Description of Variant 1 **approved on 24/07/12**

Other models in the SE-KAM series in certain other capacities as listed in Table 1.

3. Description of Variant 2 **approved on 24/07/12**

Certain other models in the S*-K** series as listed in Table 1 including:

(i) SE-KAL series which have a 390 × 530 mm load receptor (Figure 1b). Certain models may also be known as AWP models.

(ii) SC-KA* series which have stainless steel construction (Figures 2a & 2b). Baseworks may have either the M or L size receptor. Certain models may also be known as AWPS models.

(iii) S*-KB* series which have the display mounted on a table stand separately from the load receptor. Instruments may be of either the SE or SC (stainless steel) construction and may have either the M or L size receptor (Figures 2c and 2d). Certain models may also be known as AWP or AWPS models.

TABLE 1 – Approved Models of the S*-K** and AWP/AWPS Series

Model Number	Maximum Capacity (*Max*)	Maximum Capacity (*Min*)	Verification Scale Interval (*e*)
SE-30KAM	**30 kg**	**0.2 kg**	**0.01 kg**
SE-30KBM / AWP30	30 kg	0.2 kg	0.01 kg
SC-30KAM	30 kg	0.2 kg	0.01 kg
SC-30KBM / AWPS30	30 kg	0.2 kg	0.01 kg
SE-60KAM	60 kg	0.4 kg	0.02 kg
SE-60KBM	60 kg	0.4 kg	0.02 kg
SE-60KAL / AWP60	60 kg	0.4 kg	0.02 kg
SE-60KBL	60 kg	0.4 kg	0.02 kg
SC-60KAM	60 kg	0.4 kg	0.02 kg
SC-60KBM	60 kg	0.4 kg	0.02 kg
SC-60KAL / AWPS60	60 kg	0.4 kg	0.02 kg
SC-60KBL	60 kg	0.4 kg	0.02 kg
SE-150KAM	150 kg	1 kg	0.05 kg
SE-150KBM	150 kg	1 kg	0.05 kg
SE-150KAL / AWP150	150 kg	1 kg	0.05 kg
SE-150KBL	150 kg	1 kg	0.05 kg
SC-150KAM	150 kg	1 kg	0.05 kg
SC-150KBM	150 kg	1 kg	0.05 kg
SC-150KAL / AWPS150	150 kg	1 kg	0.05 kg
SC-150KBL	150 kg	1 kg	0.05 kg

Notes: The numerals in the model number represent the capacity in kilograms
The pattern (model SE-30KAM) is shown in **bold** text

4. Description of Variant 3 approved on 13/03/14

Certain baseworks of this approval used with a compatible approved (by Supplementary Certificate) indicator (including multi-interval and/or multiple range operation, if approved) provided the conditions set out below are met. In this case instruments may be known according to the basework model number.

In addition to the markings specified in clause **1.9 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 below.

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 instrument for a multiple range instrument, i.e. the maximum capacity of the highest 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 approved for the baseworks.
- The platform used shall be as shown in Figures 1 and 2. Platforms which result in additional dead load (e.g. rollers) are not acceptable.
- 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 nmax 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.

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

<u>Additional requirement 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 requirement 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 (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.

TABLE 2 – SC Series Baseworks and Their Limiting Characteristics

Make	A & D		
Basework model	SC-30BM	SC-60BL	SC-150BL
Platform size (mm × mm)	300 × 380	390 × 530	390 × 530
Maximum capacity (kg)	30	60	150
Typical verification scale interval (kg)	0.01	0.02	0.05
Max. number of verification scale intervals (n_{max})	3000	3000	3000
N, number of load cells	1	1	1
Load cell maker	A & D		
Load cell model used	1LC176-30K	1LC176-60K	1LC176-150K
Load cell max. capacity, E_{max} (kg)	30	60	150
Min. value of verification scale interval for basework, (V_{min} of load cell) (kg)	0.01	0.02	0.05
DR value of load cell (kg)	0.005	0.01	0.025
Load cell sensitivity at E_{max} (mV/V)	1	1	1
Input impedance (ohm)	1600	1600	1600
Excitation voltage (max.) (V) DC	15	15	15
Cable length (m) (#)	1.8	1.8	1.8
Number of leads (plus shield)	4	4	4

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

5. Description of Variant 4 — approved on 27/11/18 amended on 3/04/19

The A & D model SE-K-JS airport baggage weighing instruments (Figure 4) which are similar to the pattern but having the indicator mounted in a metal cabinet housing and with capacities as listed in Table 3.

TABLE 3 – Approved Models of the SE-K-JS Series

Model Number	Maximum Capacity (*Max*)	Maximum Capacity (*Min*)	Verification Scale Interval (*e*)
SE-60K-JS	60 kg	0.4 kg	0.02 kg
SE-150K-JS	150 kg	1 kg	0.05 kg

5.1 Zero

The automatic zero tracking facility shall be enabled.

5.2 Tare

The tare facility shall be disabled.

5.3 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.

5.4 Sealing Provision

Provision is made for access to the calibration switch within the instrument to be sealed by using destructive labels placed over the opposite sides of a join in the housing as shown in Figure 5.

6. Description of Variant 5 approved on 3/04/19

The A & D model S*-K**-JS airport baggage weighing instruments (Figure 6) which are similar to the pattern but having the weighing platform mounted on four castor wheels and with capacities as listed in Table 4.

6.1 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.

A notice is shown near the LCD display stating ‘Instrument must be level and wheels are locked when in use’ or similar wording (Figure 7).

TABLE 4 – Approved Models of the S*-K**-JS Series

Model Number	Maximum Capacity (*Max*)	Maximum Capacity (*Min*)	Verification Scale Interval (*e*)
SE-30KAM-JS	30 kg	0.2 kg	0.01 kg
SE-30KBM -JS	30 kg	0.2 kg	0.01 kg
SC-30KAM-JS	30 kg	0.2 kg	0.01 kg
SC-30KBM-JS	30 kg	0.2 kg	0.01 kg
SE-60KAM-JS	60 kg	0.4 kg	0.02 kg
SE-60KBM-JS	60 kg	0.4 kg	0.02 kg
SE-60KAL-JS	60 kg	0.4 kg	0.02 kg
SE-60KBL-JS	60 kg	0.4 kg	0.02 kg
SC-60KAM-JS	60 kg	0.4 kg	0.02 kg
SC-60KBM-JS	60 kg	0.4 kg	0.02 kg
SC-60KAL-JS	60 kg	0.4 kg	0.02 kg
SC-60KBL-JS	60 kg	0.4 kg	0.02 kg
SE-150KAM-JS	150 kg	1 kg	0.05 kg
SE-150KBM-JS	150 kg	1 kg	0.05 kg
SE-150KAL-JS	150 kg	1 kg	0.05 kg
SE-150KBL-JS	150 kg	1 kg	0.05 kg

TABLE 4 – Approved Models of the S*-K**-JS Series (cont…)

Model Number	Maximum Capacity (*Max*)	Maximum Capacity (*Min*)	Verification Scale Interval (*e*)
SC-150KAM-JS	150 kg	1 kg	0.05 kg
SC-150KBM-JS	150 kg	1 kg	0.05 kg
SC-150KAL-JS	150 kg	1 kg	0.05 kg
SC-150KBL-JS	150 kg	1 kg	0.05 kg

TEST PROCEDURE No 6/4C/276

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*.

FIGURE 6/4C/276 – 1

A & D Model SE-KAM and SE-KAL Weighing Instruments

FIGURE 6/4C/276 – 2

(a) Model SC-KAM

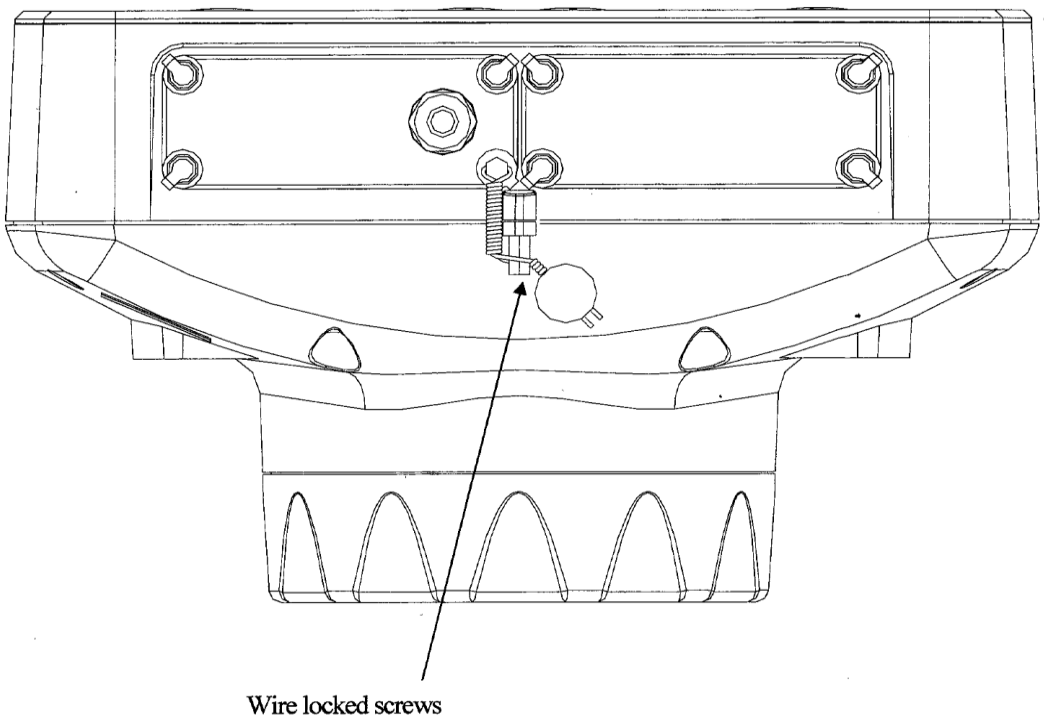
(b) Model SC-KAL

(c) Model SC-KBM

(d) Model SC-KBL

Other A & D SC Series Weighing Instruments

FIGURE 6/4C/276 – 3

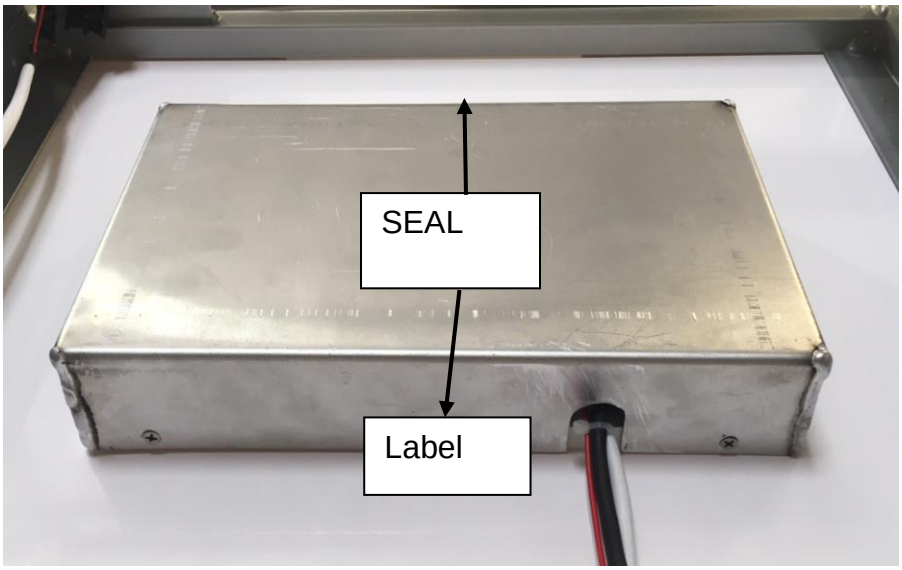


Showing Typical Sealing

FIGURE 6/4C/276 – 4

A & D Model SE-K-JS Airport Baggage Weighing Instrument

FIGURE 6/4C/276 – 5



Typical Sealing of SE-150K-JS Weighing Instrument

FIGURE 6/4C/276 – 6

A & D Model S*-K**-JS Airport Baggage Weighing Instrument

FIGURE 6/4C/276 – 7

Typical Level Notice - A & D Model S*-K**-JS Series Weighing Instrument

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