



Australian Government
Department of Industry,
Innovation and Science

National Measurement Institute

Certificate of Approval NMI 6/9C/306

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.

CAS Model BW-60RB Weighing Instrument

submitted by CAS Corporation
#262, Geurugogae-ro, Gwangjoek-myeon
Yangju-si, Gyeonggi-do
Republic of Korea

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 **1/04/21**, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variants 1 & 2 approved – interim certificate issued	10/03/10
1	Pattern & variants 1 & 2 approved – certificate issued	7/05/10
2	Pattern & variants 1 & 2 amended (address), reviewed & updated – certificate issued	1/05/17

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 6/9C/306' and only by persons authorised by the submitter.

It is the submitter'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.

The use of substitute approved load cells (i.e. through the application of General Certificate of Approval No 6B/0) is not approved.

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/306

1. Description of Pattern **approved on 10/03/10**

A CAS model BW-60RB class III self-indicating non-automatic weighing instrument (Figure 1) with a verification scale interval (e_1) of 0.02 kg with a maximum capacity of 60 kg. The instrument may also be known as the CAS model BW-1N (this name may also apply to variants of the instrument).

Instruments are powered by the battery pack or by a Hua Jung Components model HAPU05F3 (12V DC) AC/DC adaptor – the submitter should be consulted regarding the acceptability of alternative power supply units.

1.1 Basework

The basework (Figure 2) of the instrument has the load receptor directly supported by a single load cell. The load receptor has maximum nominal dimensions of 405 mm x 525 mm.

1.2 Load Cell

A CAS model BCO-70L load cell of 70 kg maximum capacity is used.

1.3 Indicator

A CAS model BI-II digital indicator (Figure 1) with a single liquid crystal display is used. Instruments may be fitted with output sockets (output interfacing capability) for the connection of peripheral and/or auxiliary devices.

1.3.1 Additional Management Functions

The instrument also has provision for additional management functions such as the setting of target values and limits ('HI OK LO' display), counting (PCS), and 'Hold'; and has buttons and displays associated with these functions.

The additional functions (other than the indications of measured mass, i.e. gross, tare, net, displayed either on the indicator or on an auxiliary or peripheral device) are not approved for trade use.

NOTE: If an alternative unit (lb/kg) function is fitted it must be inoperative.

1.3.2 Zero

Zero is automatically corrected to within $\pm 0.25e$ whenever power is applied and whenever the instrument comes to rest within $0.5e$ of zero.

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.

1.3.3 Tare

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

1.3.4 Display Check

A display check is initiated whenever power is applied.

1.4 Levelling

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

1.5 Sealing Provision

Provision is made for sealing access to the calibration button. The sealing location is located within the battery compartment of the instrument which is user accessible via a latch. Refer to Figure 3.

1.6 Verification Provision

Provision is made for a verification mark to be applied.

1.7 Descriptive Markings and Notices

Manufacturer's mark, or name written in full	CAS Corp Korea
Indication of accuracy class	Ⓜ
Maximum capacity	<i>Max</i> kg #1
Minimum capacity	<i>Min</i> kg #1
Verification scale interval	<i>e</i> = kg #1
Maximum subtractive tare	<i>T</i> = - kg #2
Serial number of the instrument
Pattern approval number for the instrument	6/9C/306

#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*.

In addition, instruments shall carry a notice stating NOT TO BE USED FOR TRADING DIRECT WITH THE PUBLIC, or similar wording.

2. Description of Variant 1

approved on 10/03/10

A model BW-150RB instrument with a maximum capacity of 150 kg and a verification scale interval of 0.05 kg. May also known as a CAS model BW-1N.

A CAS model BCO-180L of 180 kg maximum capacity is used.

Instruments shall carry a notice stating NOT TO BE USED FOR TRADING DIRECT WITH THE PUBLIC, or similar wording.

3. Description of Variant 2

approved on 10/03/10

Certain baseworks of this approval used with a compatible approved (by Supplementary Certificate) indicator 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 1.7 **Descriptive Markings and Notices**, instruments are marked with the NMI approval number for the indicator used, together in the same location.

The baseworks approved in this certificate and their limiting characteristics are given in Table 1.

TABLE 1

Instrument model	BW-60RB	BW-150RB
Basework model (aka model BW-1N)	BW Body	BW Body
Platform size (mm x mm)	405 x 525	405 x 525
Basework Maximum capacity	60 kg	150 kg
Typical verification scale interval	0.02 kg	0.05 kg
Max. number of verification scale intervals (n_{max})	3000	3000
Number of load cells	1	1
Load cell model used	BCO-70L	BCO-180L
Load cell classification	C3	C3
Load cell max. capacity, E_{max}	70 kg	180 kg
Minimum value of verification scale interval (V_{min} value of load cell)	0.0093 kg	0.024 kg
DR value of load cell	0.007 kg	0.018 kg
Load cell sensitivity (at E_{max})	1.5 mV/V	1.5 mV/V
Input impedance	350 ohm	350 ohm
Excitation voltage (max.)	15 V DC	15 V DC
Cable length (± 0.1 m)	1.5 m	1.5 m
Number of leads (plus shield)	4 wire	4 wire

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

E_x = 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 (μ V)

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, \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 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 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. ***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.

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

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.

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:***

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

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 the *National Trade Measurement Regulations 2009*.

FIGURE 6/9C/306 – 1



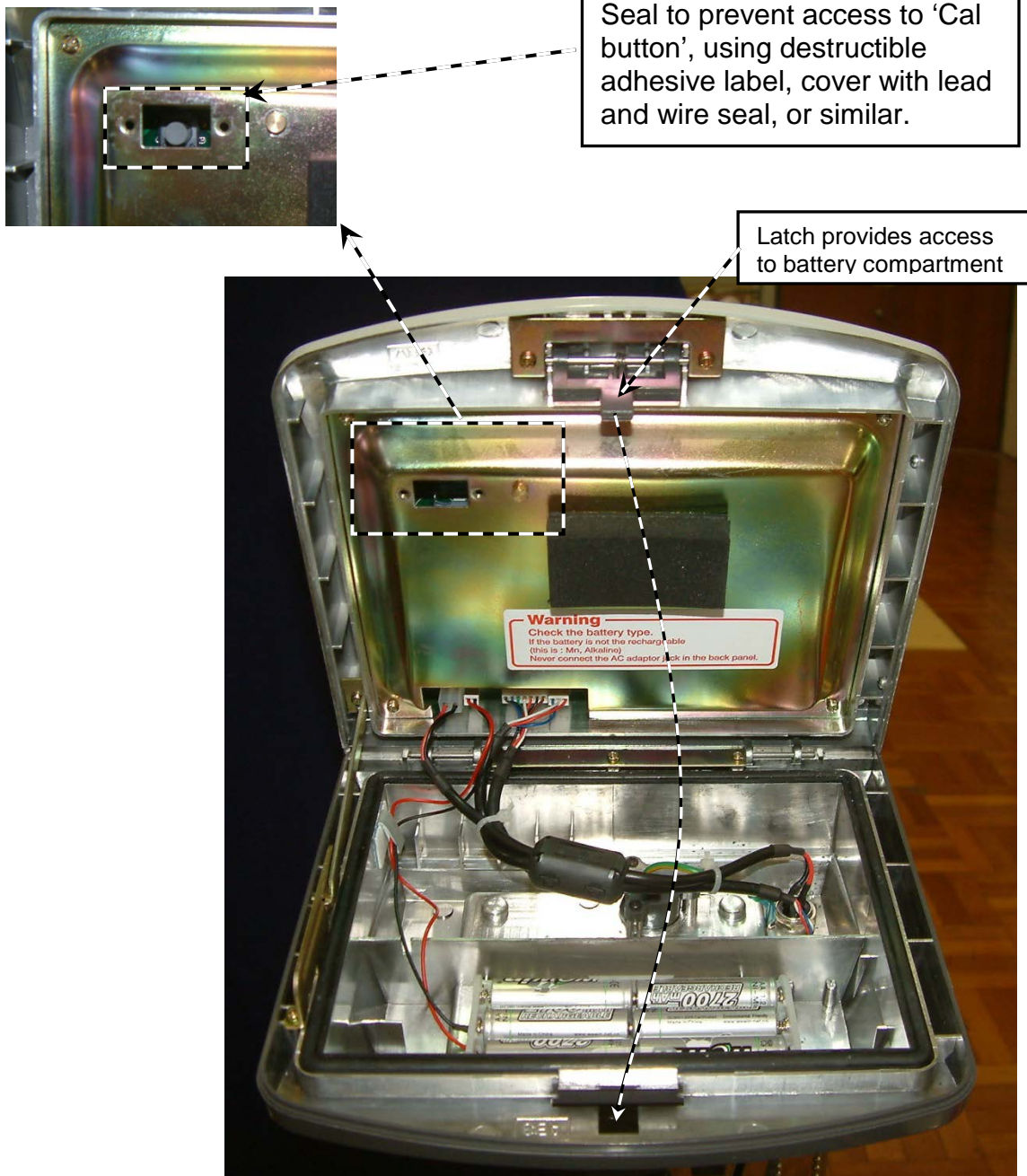
CAS Model BW-60RB (aka BW-1N) Instrument

FIGURE 6/9C/306 – 2



CAS Model BW-1N (BW-60RB) basework (platter removed)

FIGURE 6/9C/306 – 3



Typical Sealing Arrangements

~ End of Document ~