



Australian Government  
Department of Industry,  
Innovation and Science

## National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

### Certificate of Approval

#### NMI 6/4C/285

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 CK200SC Weighing Instrument

submitted by CAS Corporation  
#262 Geurugogae-ro, Gwangjeok-myeon  
Yangju-si, Gyeonggi-do 11415  
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 1/01/19, and then every 5 years thereafter.

#### DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern and variants 1 to 3 approved – certificate issued	20/12/13
1	Variants 1 to 3 amended – certificate issued	19/03/19

## CONDITIONS OF APPROVAL

### General

Instruments purporting to comply with this approval shall be marked with approval number 'NMI 6/4C/285' 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 Certificate 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*.



**Phillip Mitchell**  
Acting Manager  
Pattern Approval, Policy and  
Licensing Section

## TECHNICAL SCHEDULE No 6/4C/285

### 1. Description of Pattern

approved on 20/12/13

A CAS model CK200SC class  $\text{III}$  non-automatic single interval self-indicating weighing instrument (Table 1 and Figure 1) of 6 kg maximum capacity with a verification scale interval of 0.002 kg.

The instrument has the load receptor directly supported by a CAS model BCLS load cell of 10 kg capacity. The load receptor has maximum nominal dimensions of 280 x 280 mm.

The instrument has a stainless steel enclosure with one LED display for display of the weight value.

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

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

#### 1.1 Zero

A zero-tracking device may be fitted.

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.

#### 1.2 Tare

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

#### 1.3 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'.

#### 1.4 Power Supply

Power for the CAS model CK200SC instrument may be supplied by:

- an 12 V AC/DC mains adaptor; and/or
- an internal 6 V rechargeable battery.

Note: The AC/DC mains adaptor supplied for the instrument was a Perfect Power mains adaptor model PA-120150SN (12 V DC, 1.5 A) – the submitter should be consulted regarding the acceptability of alternative power supply units.

#### 1.5 Display Check

A display check is initiated whenever power is applied.

#### 1.6 Additional Features

Other functions such as counting, peak hold, and checkweighing are available, however these are not approved for trade use.

## 1.7 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 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 NMI General Supplementary Certificate 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 RS-232C/485 serial data interfaces.

## 1.8 Verification Provision

Provision is made for the application of a verification mark.

## 1.9 Sealing Provision

Provision is made for access to the calibration switch within the instrument to be sealed using a 'lead and wire' type seal with drilled screws as shown in Figure 3.

## 1.10 Descriptive Markings and Notices

Instruments carry the following markings:

Manufacturer's mark, or name written in full	CAS Corp Korea
Indication of accuracy class	Ⓜ
Pattern approval mark for the instrument	NMI 6/4C/285
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 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 20/12/13**  
**amended on 19/03/19**

The CAS model CK200SC instruments in certain other capacities as listed in Table 1 below (the pattern is shown in **bold**).

## 3. Description of Variant 2

**approved on 20/12/13**  
**amended on 19/03/19**

The CAS model CK200S (Table 1 and Figure 2) which similar to the pattern and variant 1 but without the checkweighing function.

TABLE 1 – Approved Models of the CK200 Series and Their Specifications

Model	Maximum Capacity ( <i>Max</i> )	Verification Scale Interval ( <i>e</i> )	Platform Size	Load Cell Maximum Capacity $E_{max}$
<b>CK200S/SC</b>	<b>6 kg</b>	<b>0.002 kg</b>	<b>280 × 280 mm</b>	<b>10 kg</b>
CK200S/SC	15 kg	0.005 kg	280 × 280 mm	20 kg
CK200S/SC	30 kg	0.01 kg	280 × 280 mm	50 kg
CK200S/SC	60 kg	0.02 kg	500 × 400 mm	70 kg
CK200S/SC	60 kg	0.02 kg	520 × 400 mm	70 kg
CK200S/SC	150 kg	0.05 kg	500 × 400 mm	180 kg
CK200S/SC	150 kg	0.05 kg	520 × 400 mm	180 kg

#### 4. Description of Variant 3

**approved on 20/12/13  
amended on 19/03/19**

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 **1.10 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 Tables 2 & 3 below.

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 ( $\mu$ 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.***

***$Max_1 Max_2 \dots$  = 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, or 4. 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  $n_{max}$  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.**

TABLE 2 – CK200 Series Baseworks and Their Limiting Characteristics

Instrument model	CK200S/CK200SC				
Basework model	CK200S-P/CK200SC-P				
Platform size (mm × mm)	280 × 280	280 × 280	280 × 280	520 × 400	520 × 400
Maximum capacity (kg)	6	15	30	60	150
Typical verification scale interval (kg)	0.002	0.005	0.01	0.02	0.05
Max. number of verification scale intervals ( $n_{max}$ )	4000	4000	4000	3000	3000
N, number of load cells	1	1	1	1	1
Load cell model used	BCLS	BCLS	BCLS	BCLS	BCLS
Load cell classification	C4	C4	C4	C3	C3
Load cell max. capacity, $E_{max}$ (kg)	10	20	50	70	180
Min. value of verification scale interval for basework, ( $V_{min}$ of load cell) (kg)	0.0015	0.003	0.0075	0.0107	0.0276
DR value of load cell (kg)	0.0012	0.0024	0.0059	0.0052	0.0134
Load cell sensitivity at $E_{max}$ (mV/V)	2	2	2	1	1
Input impedance (ohm)	390	390	390	390	390
Excitation voltage (max.) (V)	15	15	15	15	15
Cable length (m) (#)	1.5 or 3	1.5 or 3	1.5 or 3	2	2
Number of leads (plus shield)	4 or 6	4 or 6	4 or 6	4 or 6	4 or 6

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

TABLE 3 – CK200 Series Baseworks and Their Limiting Characteristics

Instrument model	CK200S/CK200SC	
Basework model	CK200S-P/CK200SC-P	
Platform size (mm × mm)	500 × 400	500 × 400
Maximum capacity (kg)	60	150
Typical verification scale interval (kg)	0.02	0.05
Max. number of verification scale intervals ( $n_{max}$ )	3000	3000
N, number of load cells	1	1
Load cell model used	BCLS	BCLS
Load cell classification	C3	C3
Load cell max. capacity, $E_{max}$ (kg)	70	180
Min. value of verification scale interval for basework, ( $V_{min}$ of load cell) (kg)	0.0107	0.0276
DR value of load cell (kg)	0.0052	0.0134
Load cell sensitivity at $E_{max}$ (mV/V)	1	1
Input impedance (ohm)	390	390
Excitation voltage (max.) (V)	15	15
Cable length (m) (#)	2	2
Number of leads (plus shield)	4 or 6	4 or 6

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

## TEST PROCEDURE No 6/4C/285

Instruments should 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/285 – 1



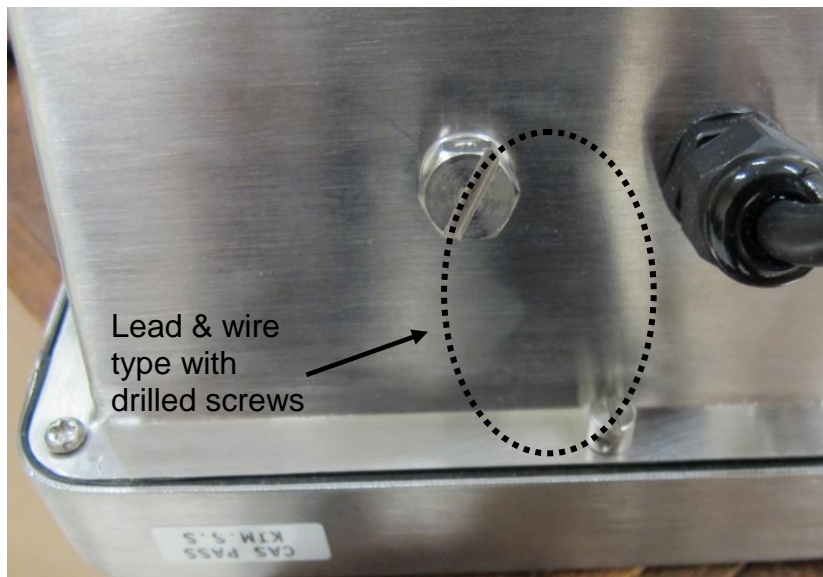
CAS Model CK200SC Weighing Instrument

FIGURE 6/4C/285 – 2



CAS Model CK200S Indicator (Variant 2)

FIGURE 6/4C/285 – 3



Showing Typical Sealing

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