



Australian Government

**National Measurement
Institute**

12 Lyonpark Road, North Ryde NSW 2113

Supplementary Certificate of Approval
No S430

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
Cardinal Model 204 Digital Indicator

submitted by Cardinal Scale Manufacturing Co
203 East Daugherty Street
Webb City MO 64870
USA.

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.

CONDITIONS OF APPROVAL

This approval becomes subject to review on 1 March 2009, and then every 5 years thereafter.

Instruments purporting to comply with this approval shall be marked with approval number 'NSC S430' and only by persons authorised by the submitter.

Instruments incorporating a component purporting to comply with this approval shall be marked 'NSC S430' in addition to the approval number of the instrument.

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.

The National Measurement Institute reserves the right to examine any instrument or component of an instrument purporting to comply with this approval.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificate No S1/0/A.

The values of the performance criteria (maximum number of scale intervals etc.) applicable to an instrument incorporating the pattern approved herein shall be within the limits specified herein and in any approval documentation for the other components.

DESCRIPTIVE ADVICE

Pattern: approved 6 February 2004

- A Cardinal model 204 digital indicator.

Variant: approved 6 February 2004

1. Model 204S digital indicator.

Technical Schedule No S430 describes the pattern and variant 1.

FILING ADVICE

The documentation for this approval comprises:

Supplementary Certificate of Approval No S430 dated 6 August 2004
Technical Schedule No S430 dated 6 August 2004 (incl. Table 1 and Test
Procedure)
Figures 1 and 2 dated 6 August 2004

Signed by a person authorised by the Chief Metrologist
to exercise his powers under Regulation 60 of the National
Measurement Regulations 1999.

A handwritten signature in black ink, appearing to be 'J. H. T.', located in the bottom right corner of the page.

TECHNICAL SCHEDULE No S430

Pattern: Cardinal Model 204 Digital Indicator

Submittor: Cardinal Scale Manufacturing Co
203 East Daugherty Street
Webb City MO 64870
USA

1. Description of Pattern

A Cardinal model 204 single interval digital mass indicator (Table 1 and Figure 1) which is approved for use with up to 5000 verification scale intervals.

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

This approval does not include the use of the indicator as an automatic weighing instrument, unless specifically mentioned in a certificate of approval for such an instrument.

TABLE 1 – Specifications

Maximum number of verification scale intervals	5000
Minimum sensitivity	1.67 μ V/scale interval
Excitation voltage	5 V DC
Maximum excitation current	57 mA

1.1 Zero

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

The instrument has a semi-automatic zero-setting device (to set the instrument to within $\pm 0.25e$ of zero) with a nominal range of not more than 4% of the maximum capacity of the instrument.

1.2 Tare

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

1.3 Power Supply

Power supply may be either:

- supplied by an AC/DC mains adaptor or other DC power source; or
- by 6 x C type batteries (alkaline, NiMH or NiCad).

Note: The power supply required is nominally 12 V DC, 300 mA, however the AC/DC mains adaptor supplied was a Cardinal/Detecto model MKD-140300 power supply (output 14 V DC, 300 mA) – the submitter should be consulted regarding the acceptability of alternative power supply units or DC power sources.

1.4 Display Check

A display check is initiated whenever power is applied.

1.5 Additional Features

The indicator also has an additional 'hold' function which can be assigned to a function key of the indicator. The additional function (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) is not approved for trade use.

1.6 Sealing Provision

Provision is made for the calibration adjustments to be sealed by a sealable screw (Figure 1).

1.7 Verification/Certification Provision

Provision is made for the application of a verification/certification mark.

1.8 Markings and Notices

Instruments carry the following markings:

Manufacturer's mark, or name written in full
Name or mark of manufacturer's agent
Indication of accuracy class	Ⓜ
Maximum capacity	<i>Max</i> kg *
Minimum capacity	<i>Min</i> kg *
Verification scale interval	<i>e</i> = kg *
Maximum subtractive tare	<i>T</i> = - kg @
Serial number of the instrument
Pattern approval mark for the indicator	NSC No S430
Pattern approval mark for other components #

* These markings are also shown near the display of the result if they are not already located there.

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

May be located separately from the other markings.

In addition, instruments not greater than 100 kg capacity shall carry a notice stating NOT TO BE USED FOR TRADING DIRECT WITH THE PUBLIC, or similar wording.

2. Description of Variant 1

Cardinal model 204S indicator in a in an alternative housing (Figure 2). This model may be powered directly by mains AC power.

TEST PROCEDURE

Instruments should be tested in conjunction with any tests specified in the approval documentation for the instrument to which the pattern is connected, as appropriate, and in accordance with any relevant tests specified in the Uniform Test Procedures.

Maximum Permissible Errors at Verification/Certification

For single range instruments, the maximum permissible errors for increasing and decreasing loads on initial verification/certification for loads, m , expressed in verification scale intervals, e , are:

- $\pm 0.5e$ for loads $0 \leq m \leq 500$;
- $\pm 1.0e$ for loads $500 < m \leq 2\,000$; and
- $\pm 1.5e$ for loads $2\,000 < m \leq 10\,000$.

FIGURE S430 – 1



Typical Sealing



Cardinal Model 204 Digital Indicator

S430
6 August 2004

FIGURE S430 – 2



Typical Sealing



Cardinal Model 204S Digital Indicator