



Australian Government

National Measurement
Institute

Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

No 15/3/151

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.

Rudolf Research Model Autopol 589/880 Polarimetric Saccharimeter and Polarimeter (Pol) Tubes

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 does NOT permit the verification of new instruments (#) installed after **1 December 2015**. It does not become subject to review.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern approved – certificate issued	15/02/13
1	Pattern amended (sealing) – certificate issued	3/05/13
2	Pattern amended (new instruments (#) date) – certificate issued	8/07/15

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 15/3/151'.

This approval applies only to existing instruments in the field; they may be verified, reverified, or verified after repairs, by a servicing licensee or trade measurement authority.

Instruments may be relocated and reinstalled but shall not be altered in any way other than to replace damaged components with equivalent components.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificates Nos 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*.



Dr A Rawlinson

TECHNICAL SCHEDULE No 15/3/151

1. Description of Pattern

approved on 15/02/13

A Rudolf Research model Autopol 589/880 self-indicating polarimetric saccharimeter approved to measure the optical rotation of linear polarised light transmitted through a cane juice sample in °Z units.

The cane juice is contained by a polarimeter (pol) tube sealed by a cover glass at each end.

The angular degree (°) optical rotation caused by the 'normal sugar solution' or equivalent quartz plate standard has been published for several wavelengths and is equivalent to 100 °Z units on the ICUMSA International Sugar Scale (SPS – 1: 2007).

1.1 Field of Operation

The field of operation of the measuring system is determined by the following characteristics:

- The pattern is presumed to comply with the requirements for class 0.1
- Sample temperature monitoring and correction can be conducted automatically by the instrument or manually by the operator
- Ambient and test sample temperature range 15 to 30°C
- Ambient and test sample temperature differential up to 10°C
- Rated nominal voltage 240 V AC

1.2 Verification Provision

Provision is made for the application of a verification mark.

1.3 Sealing Provision

Protection by tamper evident physical seals and/or an electronic seal shall be implemented in instruments where provision is made.

Some examples of physical seals include sealing wire with crimp seal (lead or plastic), destructible adhesive sticker or foil. Any stickers or labels applied to the instrument should not give the impression of being a verification mark.

Acceptable electronic seals meet the following requirements:

- Prevention of unauthorised access to adjustment facilities, e.g. access to adjustment facilities is password protected.
- Generation of an audit trail, i.e. a time stamped, comprehensible record of the most recent action(s) performed on the instrument that can affect metrological properties. An access counter is also acceptable if a destructible record of the access count prior to verification is adhered to the instrument.

For the units covered by this approval, sealing is not required for metrological properties that are not sealable.

1.4 Descriptive Markings and Legends

Saccharimeters must bear the following markings, in a clearly legible and indelible manner:

- a) name of the manufacturer or their mark
- b) serial number
- c) for saccharimeters where the displayed value is not shown in scale unit °Z:
legend 'ICUMSA International Sugar Scale'
- d) class of accuracy = 0.1
- e) for saccharimeters without automatic tube recognition:
length of the polarimeter tube or tubes which must be used
- f) reference temperature of 20°C and the wavelength(s) for which the saccharimetric scale is valid (if this is not shown in the display)
- g) pattern approval number NMI No 15/3/151

1.5 Polarimeter (Pol) Tube

Refer to General Certificate of Approval No 15/4/0 for requirements applicable to pol tubes used to measure the optical rotation of cane juice for payment purposes. A test procedure allowing pol tubes to be verified is included in the document.

NOTE: Until March 2014, pol tubes that do not have a verification mark are permitted provided they fulfil the admissible deviation (ΔL) for Class 0.03 or Class 0.01 as evidenced by a measurement report issued by a laboratory with a length standard and calibration procedure endorsed by NATA (or overseas equivalent).

After this date, only Class 0.01 or Class 0.03 pol tubes bearing the marks of a servicing licensee or a trade measurement authority are permitted.

TEST PROCEDURE No 15/3/151

Polarimetric saccharimeter

Instruments shall be tested in accordance with the tests specified in the National Instrument Test Procedures (NITP 15.2 Part 1).

Maximum Permissible Errors

Accuracy class of instrument	MPE (°Z)
0.02	±0.02
0.05	±0.05
0.1	±0.1

Internal length of polarimeter (pol) tube

Take note of the following information on the pol tubes used for trade measurements:

- Pol tube serial number
- Best accuracy class
- Evidence of length conformity, for e.g. verification mark, measurement report from NMI Verifying Authority, measurement report from NATA-endorsed lab (or overseas equivalent).

Strain in cover glasses

Test at least one set of cover glasses used with the pol tube as described in General Certificate of Approval No 15/4/0.