

**PolAAr Series
Technical
Specifications**

Model	PolAAr 30	PolAAr 31	PolAAr 32	PolAAr 35	PolAAr 3000	PolAAr 3001	PolAAr 3002	PolAAr 3005
Scales	Angular degrees, ISS (°Z), Temperature corrected ISS	Angular degrees, ISS (°Z), Temperature corrected ISS, specific rotation, concentration, 10 user programmable scales, apparent sugar purity if connected to an Index Instruments refractometer	Angular degrees, ISS (°Z), Temperature corrected ISS, specific rotation, concentration, 10 user programmable scales, apparent sugar purity if connected to an Index Instruments refractometer	Angular degrees, ISS (°Z), Temperature corrected ISS, specific rotation, concentration, 10 user programmable scales, apparent sugar purity if connected to an Index Instruments refractometer	Angular degrees, ISS (°Z), Temperature corrected ISS	Angular degrees, ISS (°Z), Temperature corrected ISS, specific rotation, concentration, 10 user programmable scales, apparent sugar purity if connected to an Index Instruments refractometer	Angular degrees, ISS (°Z), Temperature corrected ISS, specific rotation, concentration, 10 user programmable scales, apparent sugar purity if connected to an Index Instruments refractometer	Angular degrees, ISS (°Z), Temperature corrected ISS, specific rotation, concentration, 10 user programmable scales, apparent sugar purity if connected to an Index Instruments refractometer
Range (all models)	Full circle, reading to ±90 angular degrees, in excess of ±250°Z							
Resolution	0.01° 0.01°Z	0.01° 0.01°Z	0.01° 0.01°Z	0.01° 0.01°Z	0.001° 0.01°Z	0.001° 0.01°Z	0.001° 0.01°Z	0.001° 0.01°Z
Accuracy	±0.01°, ±0.02°Z	±0.01°, ±0.02°Z	±0.01°, ±0.02°Z	±0.01°, ±0.02°Z	±0.001° (0 to 10°), ±0.01° (10 to 90°), ±0.01°Z (0 to 25°Z), ±0.02°Z (above 25°Z)	±0.001° (0 to 10°), ±0.01° (10 to 90°), ±0.01°Z (0 to 25°Z), ±0.02°Z (above 25°Z)	±0.001° (0 to 10°), ±0.01° (10 to 90°), ±0.01°Z (0 to 25°Z), ±0.02°Z (above 25°Z)	±0.001° (0 to 10°), ±0.01° (10 to 90°), ±0.01°Z (0 to 25°Z), ±0.02°Z (above 25°Z)
Wavelengths	589.44nm ¹	589.44nm ¹	589.44nm and 546.22nm ¹	589, 546, 436, 405 and 365nm ¹	589.44nm ¹	589.44nm ¹	589.44nm and 546.22nm ¹	589, 546, 436, 405 and 365nm ¹
Light source (all models)	20 watt tungsten halogen lamp, typical life 2000 hours							
OD Tolerance ²	OD 3.0 (ie 99.9% absorbance), warning issued if sample too dark	OD 3.0 (ie 99.9% absorbance), warning issued if sample too dark	OD 3.0 (ie 99.9% absorbance), warning issued if sample too dark	OD 3.0 (ie 99.9% absorbance), warning issued if sample too dark	OD 3.0 (ie 99.9% absorbance), warning issued if sample too dark	OD 3.0 (ie 99.9% absorbance), warning issued if sample too dark	OD 3.0 (ie 99.9% absorbance), warning issued if sample too dark	OD 3.0 (ie 99.9% absorbance), warning issued if sample too dark
Reading time (continuous mode)	10 seconds	10 seconds	10 seconds	10 seconds	25 seconds	25 seconds	25 seconds	25 seconds
Reading modes	Continuous	Continuous, Autoprint, One shot and lock, or Read when stable	Continuous, Autoprint, One shot and lock, or Read when stable	Continuous, Autoprint, One shot and lock, or Read when stable	Continuous	Continuous, Autoprint, One shot and lock, or Read when stable	Continuous, Autoprint, One shot and lock, or Read when stable	Continuous, Autoprint, One shot and lock, or Read when stable
Sample compartment (all models)	Accepts standard sample tubes, 30mm diameter collars. Maximum path length 200mm, bores 8mm down to 1.5mm. Ventilated – temperature rise above ambient does not exceed 3°C							
Thermometers (all models)	Temperature sensor in sample compartment, socket for alternative sample tube sensor. Sensor range 0 to 100°C, accuracy ±0.25°C. Digital display resolution 0.1°C.							
Outputs/inputs (all models)	2 x RS232 (25-way D sockets), 1 x remote (9-way D socket)							
Data output	Rotation reading, units, time and date, polarimeter serial number, wavelength, temperature.	Rotation reading, units, time and date, polarimeter serial number, wavelength, temperature, pre-set parameters, sample number	Rotation reading, units, time and date, polarimeter serial number, wavelength, temperature, pre-set parameters, sample number	Rotation reading, units, time and date, polarimeter serial number, wavelength, temperature, pre-set parameters, sample number	Rotation reading, units, time and date, polarimeter serial number, wavelength, temperature.	Rotation reading, units, time and date, polarimeter serial number, wavelength, temperature, pre-set parameters, sample number	Rotation reading, units, time and date, polarimeter serial number, wavelength, temperature, pre-set parameters, sample number	Rotation reading, units, time and date, polarimeter serial number, wavelength, temperature, pre-set parameters, sample number
Special features	–	User selection and definition of output parameters for GLP (Good Laboratory Practice): in addition to the standard data output, up to 6 user defined sample identifiers	User selection and definition of output parameters for GLP (Good Laboratory Practice): in addition to the standard data output, up to 6 user defined sample identifiers	User selection and definition of output parameters for GLP (Good Laboratory Practice): in addition to the standard data output, up to 6 user defined sample identifiers	–	User selection and definition of output parameters for GLP (Good Laboratory Practice): in addition to the standard data output, up to 6 user defined sample identifiers	User selection and definition of output parameters for GLP (Good Laboratory Practice): in addition to the standard data output, up to 6 user defined sample identifiers	User selection and definition of output parameters for GLP (Good Laboratory Practice): in addition to the standard data output, up to 6 user defined sample identifiers
Controls	Power ON/OFF, zero, scale select and print keys	Power ON/OFF, alpha-numeric keypad, plus function keys including print, zero and scale selection	Power ON/OFF, alpha-numeric keypad, plus function keys including print, zero and scale selection	Power ON/OFF, alpha-numeric keypad, plus function keys including print, zero and scale selection	Power ON/OFF, zero, scale select and print keys	Power ON/OFF, alpha-numeric keypad, plus function keys including print, zero and scale selection	Power ON/OFF, alpha-numeric keypad, plus function keys including print, zero and scale selection	Power ON/OFF, alpha-numeric keypad, plus function keys including print, zero and scale selection
Calibration (all models)	UKAS calibration certificate available if required (Order code 10-01)							
Size and weight (all models)	L 515mm, D 380mm, H 198mm / 15.7kg (approx 23kg packed)							

A wide range of tubes and quartz plates are available – see separate leaflet



¹Other wavelength options are available

²Optical Density (OD) of the sample for which accurate measurements can still be made is dependent on wavelength. At 589nm and 546nm, samples can be measured which absorb up to 99.9% of the incident light (equivalent to OD 3.0). At 365nm, the OD tolerance is OD 1.5 (97% absorption) and at 880nm the OD tolerance is OD 4.5. In all cases, a warning is given by the polarimeter if the sample is too dark to measure accurately.



We also offer the SacchAAr 880 – a patented Duplex-NIR High Penetration Saccharimeter – the first Saccharimeter that measures samples at both the standard sodium yellow wavelength and also in the near infrared (NIR), for high penetration of dark samples.

- High Accuracy
- Sodium Yellow and Near Infrared wavelengths
- Sample Temperature Monitoring
- Fast Reading Times
- Full GLP capability
- Choice of reading modes
- No need for Lead Acetate

For full details, see separate leaflet.



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PolAAr series Polarimeters



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OPTICAL ACTIVITY LIMITED

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PolAAr series Polarimeters

The PolAAr series of polarimeters and saccharimeters consists of eight models – with the options of single wavelength, dual wavelength or multi wavelength, a choice of two or three figure accuracy, and simple or full alphanumeric keypads.



Manufactured using a substantial aluminium casting and tough aluminium covers, the PolAAr series polarimeters have excellent rigidity and strength, are resistant to chemical attack and provide highly stable instruments. All versions are full circle polarimeters with a reading range of ± 90 angular degrees (in excess of ± 250 sugar degrees).

Light source

A tungsten halogen lamp produces a highly stable white light source and has a typical life in excess of 2000 hours; it is inexpensive and easy to replace by the user.

A very narrow band interference filter is used to select wavelength; an accurate wavelength is important, as the optical rotation of most samples is highly dependent on wavelength.

The standard single 589.44nm wavelength models are suitable for measuring dark samples, absorbing up to 99.9% of the incident light, equivalent to OD 3.0, without loss of accuracy.

Sample Compartment

The sample compartment is at the front of the instrument. The cover is in two sections, the front part hinges forward and down; the upper section simply lifts off. The sample compartment has been designed to allow flow tube pipes and/or thermocirculator control pipes to pass through, and is ventilated to minimise temperature rise above ambient. The PolAAr series accepts the full range of polarimeter sample tubes and cells, either jacketed or unjacketed, from 1.5mm to 8mm bore and from 5mm to 200mm path length.

Temperature measurement

Within the sample compartment is a centrally located digital temperature sensor. Also there is a socket to connect jacketed sample tubes with a built-in temperature sensor or, alternatively, a dip-in temperature sensor for unjacketed sample tubes.

The instrument detects that a tube sensor is connected and displays its temperature, instead of the internal sensor, at the lower right hand corner of the display window.



(above) Tube with built-in temperature sensor



PolAAr display



Temperature sensor (for single sample tubes)



Single sample tube in-situ with dip-in temperature sensor

3-button keypad

Two PolAAr models are available with a simple, 3-button keypad arrangement. The difference between these two models is their accuracy. The PolAAr 30 polarimeter has an accuracy of ± 0.01 angular degrees, the PolAAr 3000 a higher accuracy of ± 0.001 angular degrees. Both instruments have a zero, scale select and print keys. Scales available, angular degrees, sugar scale ($^{\circ}Z$) and temperature corrected sugar scale (ISS). When a printer is connected the time and date are printed with every reading, along with the instrument serial number, temperature and wavelength.



(left) 3-button keypad (below) alphanumeric keypad

Full alphanumeric keypad

All other PolAAr models, the PolAAr 31, 32, 35, 3001, 3002 and 3005 have a full alphanumeric keypad, providing a choice of reading mode, additional scales (specific rotation, concentration, 10 user programmable scales), user defined multiplier for different tube lengths and 6 user specified sample identifiers (such as name, batch number, lot number etc) for GLP (Good Laboratory Practice). As user specified headings, these can be in any language. The keyboard can be selectively "locked" to prevent unauthorised or accidental interference with programmed settings.



Multi wavelength

The standard wavelengths offered on the 2 wavelength PolAAr 32 or 3002 models are 589 and 546nm and on the 5 wavelength PolAAr 35 or 3005 models 589, 546, 436, 405 and 365nm. In each model, wavelength selection is by means of a simple knob on the side of the instrument. Other wavelength combinations on either the 2 or 5 wavelength models are available within the wavelength range, near UV (365nm) to near infrared (880nm).

Real time clock

All PolAAr series instruments have a real time clock that tracks time and date. All measurements can be date and time recorded when printed out.

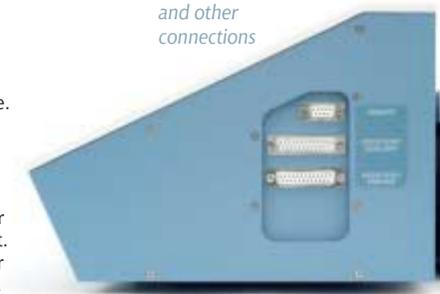
RS232 and Printer Communication

Two RS232 serial outputs are provided for connection to a printer, computer or other ancillary equipment, together with a remote-operate/bar code port. A bar code reader can be used for sample identification and the polarimeter can initiate, or be initiated by, ancillary equipment such as an auto-sampler.

UKAS certification

Optical Activity Limited is a UKAS (United Kingdom Accreditation Service) calibration laboratory therefore all PolAAr 3 series polarimeters can be supplied, if required, with a UKAS certificate of calibration. The UKAS mark on a calibration certificate is your assurance that the laboratory issuing the certificate has been stringently assessed by independent experts to the ISO17025 International Standard and that the measurements are traceable to National and International Standards.

(below) RS232 and other connections



Polarimeter model breakdown

	Accuracy	0.01	0.01	0.01	0.001	0.001	0.001
	Wavelength	1	2	5	1	2	5
3-button Keypad	Model PolAAr 30	-	-	-	Model PolAAr 3000	-	-
	Model PolAAr 31	Model PolAAr 32	Model PolAAr 35	Model PolAAr 3001	Model PolAAr 3002	Model PolAAr 3005	