data sheet

Refractometer Digital Palm Abbe F/Glycerine/Glycol(PA203X)

Misco Palm Abbe Digital Refractometer
Laboratory Precision in the Palm of Your Hand!
5 Scale: Refractive Index nD, Propylene Glycol % v/v, Propylene Glycol Freeze Point ‘F, Glycerin % v/v, Glycerin Freeze Point ;F.
The Palm Abbe refractometer is fast, convenient, and easy to use. Simply place a drop or two of fluid in the titanium well and press a button.
The custom-designed microprocessor delivers a nearly instantaneous readout on one of five different scales.
There are literally hundreds of different units of measure and scale combinations to choose from.
Read directly in the unit of measure of interest to you.
Nonlinear temperature compensation is automatic and insures that fluids read between 0 and 50 °C (+32 to 122 °F) are measured accurately.
Calibration is automatic and does not require the use of special calibration solutions, or tools.
The Palm Abbe refractometer automatically calibrates itself to water and is ready to use in seconds. No more screws to turn and nothing to adjust.
The large dual-line LCD display is easily read, even in dim light, and removes the subjectivity associated with interpreting where a boundary line crosses tiny scale divisions. And, it is so easy to use!
The user interface consists of two buttons, one to take readings and the other to step through various menu options.

For more information see following pages.

Optic Material: Sapphire
Detector Elements: 1,024
Well/ Sample Area Material: Stainless Steel
Evaporation/ Sample Cover: Yes
Country of Origin: USA
Light Source: Precision LED @ 589.3 nm
Display Type:
Display Characters: 24 Characters x 2 Lines
Display Backlight: Yes
Display Language: Russian, English, Spanish, German, French
Temperature Control Method: Auto Temp. Compensation
Temperature Control Basis: Scale Dependent
Temperature Range: 0 to 50 °C (32 to 122 °F)
Power Source: 2 AAA Batteries
Battery Life: 5000+ Readings
Dimensions: 145 x 75 x 37 mm (5.7 x 2.95 x 1.46 in.)
Weight: 250 grams (8.8 Oz.)
User Programmable:actory Reprogrammable, Options/Settings, Select Scale
User Calibration Points: 2
Body Color: BLACK
Body Material: Plastic
Water Resistance: IP64 - Splashing Water
Error Codes: Text-Based
Approvals and Certification: CE

FOR MORE INFORMATION CALL ARGCO AT 800-854-1015
OR LOG ONTO ARGCO.COM

Specifications

	PA201	PA202	PA203
Unit of Measure:	Brix	Brix Refractive Index (nD)	Up to 5 Different Scales
Range:	0.0 to 56.0	0.0 to 85.0 Brix 1.3330 to 1.5040 nD	Equivalent To 1.3330 to 1.5040 nD
Resolution:	0.1 Brix	0.1 Brix 0.0001 nD	Equivalent To 0.0001 nD
Precision:	+/- 0.1 Brix	+/- 0.1 Brix +/- 0.0001 nD	Equivalent To +/- 0.0001 nD
Well Material:	Stainless Steel		
Prism Material:	Sapphire		
Range:	0 to 50° C (32 to 122° F) Typical		
Basis:	Sucrose	Varies	Varies
Min. Sample Volume:	0.3 ml		
Measuring Time:	< 5 Seconds		
Power Supply:	2 X AAA Batteries		
Battery Life:	~3,500+ Readings		
Dimensions:	145 x 75 x 37 mm (5.7 x 2.95 x 1.46 in.)		
Net Weight:	250 grams (8.8 Oz.)		
Languages	5 Languages - English, French, Spanish, German, & Russian		
Display:	2 Lines x 12 Characters		
Color:	Blue	Blue	Black

CE

Protected by US Patent D510880S

Palm Abbe® Digital Refractometer

Instruction Manual
PA201, PA202, & PA203

MISCO
3401 Virginia Rd.
Cleveland, OH 44122

TEL 216-831-1000
www.misco.com

Made in USA
Rev. 130501

⚠WARNING

THE SAFETY INSTRUCTIONS AND WARNINGS PRESENTED BELOW AND ELSEWHERE IN THIS MANUAL ARE MINIMUM REQUIREMENTS FOR THE SAFE AND RELIABLE OPERATION OF THIS EQUIPMENT. THESE PRECAUTIONS MUST BE OBSERVED DURING ALL PHASES OF USE OF THIS EQUIPMENT. FAILURE TO COMPLY WITH THESE PRECAUTIONS OR WITH SPECIFIC WARNINGS GIVEN ELSEWHERE IN THIS MANUAL COULD RESULT IN DEATH OR SERIOUS INJURY.

READ THIS MANUAL BEFORE USING THIS EQUIPMENT. You must read and follow this Manual before operating this equipment. If you have any questions, contact MISCO technical support before use.

KEEP MANUAL AVAILABLE. Keep this Manual available for reference in a safe and accessible location.

FLUIDS TESTED MAY BE HAZARDOUS OR TOXIC. You must read and follow all safety instructions and handling procedures in the Material Safety Data Sheet (MSDS) and/or Safety Data Sheet (SDS) for each fluid you choose to test. Pay careful attention to the information concerning Hazards, and to the instructions and warnings for Handling and Storage, and Exposure Controls/Personal Protection. If testing bodily fluids, take precautions to prevent exposure. In all cases, properly discard any residual sample after testing.

INTRODUCTION

The MISCO Palm Abbe refractometers are advanced fourth-generation handheld digital refractometers that put laboratory precision in the palm of your hand. They are designed for the rapid and accurate determination of fluid concentrations. These instruments will automatically compensate for temperature with computer precision, and when used and cared for properly, will provide years of trouble-free service. This manual will help you maximize the usefulness of your instrument and MUST be read completely before use. If you have any questions, please call:

MISCO technical support at (216) 831-1000.

The PA201 is equipped to take readings on the Brix scale and utilizes sucrose as the temperature compensation basis.

The PA202 is equipped to take readings on the Brix and Refractive Index (nD) scales. Both scales use sucrose as the temperature compensation basis. The PA202x may have up to two custom scales and may have special temperature compensation.

The PA203x may have from one to five different scales, each scale having an individual unit of measure and temperature compensation basis.

To the extent that your particular instrument is equipped with scales other than those described above, the scale specifications will be documented on a specifications card accompanying the instrument.

Calibration - Zero Set

The Palm Abbe Refractometer MUST be Zero Set before initial use and periodically thereafter. *It is recommended that a Zero Set be performed at least once a day as well as prior to performing tests requiring the highest precision, or when moving between environments with extreme changes in ambient temperature.*

A clean container of water is all that is needed to automatically zero the instrument. Although tap water may be used, distilled or deionized water is recommended. *The water temperature for zero setting should ideally be between 10°C to 30°C (50° to 86°F).* It is important to independently verify that you are indeed calibrating the instrument with water and not just a clear liquid which you think is water. Never use an instrument unless you have personal knowledge of its calibration.

1. Inspect the measuring surface to make sure it is clean and dry. Place a few drops of distilled water on measuring surface.

2. Close the sample cover and allow some time for the temperature to equalize. The sample cover MUST be closed to calibrate or take readings.

3. Press and release <GO> to turn the instrument on.

4. Press and release <MENU> until the display reads:

SET ZERO?
(GO) TO SET

5. Press and release <GO> to automatically zero the instrument. Remember to clean and dry the measuring surface after calibration.

If the calibration was successful, the instrument will display "READY," otherwise there will be an error message displayed.

Calibration - Span Set

The Span Point represents a calibration point toward the upper end of the Palm Abbe range. Although it is important to Zero Set the Palm Abbe daily, you may at some time want to set the span adjustment as well. The span should be set if you notice a general degradation of the instrument's accuracy and precision and/or on a periodic basis determined by your particular history with the instrument.

Factors affecting your decision to set the span adjustment include how often the instrument is used, how roughly it is handled, how often it is exposed to large temperature changes, and the level of precision you require for your measurements.

To set the span adjustment, follow the procedures for zero setting on the opposite page but go to the *SET SPAN ? / (GO) TO SET* menu and substitute the calibration fluid for distilled water in the procedure. *The calibration fluid temperature for span setting must be between 15 to 30°C (59 to 86°F). Once the Span Point is successfully set, the instrument will read "Ready," otherwise an error message will be displayed.*

It is recommended that you use only a NIST traceable calibration fluid specific to the Palm Abbe. This fluid is available from MISCO by calling 216-831-1000 or is available for purchase online from the MISCO website, at www.misco.com *(p/n CALFLU202-3).*

Call MISCO for NIST Traceable Certified Calibration 216-831-1000

Menu Options

Various options are accessible through the <MENU> button. With the instrument "ON", press and release <MENU> to step through the options.

SCALE #1
(GO) TO SET

This option sets the default unit of measure, or scale, the instrument will read. The actual scale name will replace the words "SCALE #1" on the display. Some instruments are programmed with more than one scale. Pressing <MENU> will step through all available scales. Press <GO> to set a scale as the default.

SET ZERO?
(GO) TO SET

The Zero Set option will zero or calibrate the instrument to water. See "Calibration - Zero Set."

SET SPAN?
(GO) TO SET

The Span Set option will calibrate the upper range of the instrument to a special calibration solution. See "Calibration - Span Set."

LCD-LIGHT?
(GO) YES

This option allows you to turn the LCD display backlight on or off. The options are "Yes" and "NO."

LANGUAGE?
(GO) TO SET

This option allows you to set the display to a particular language; English, Spanish, German, French, or Russian. Just follow the prompts to your language of choice and press <GO> to set.