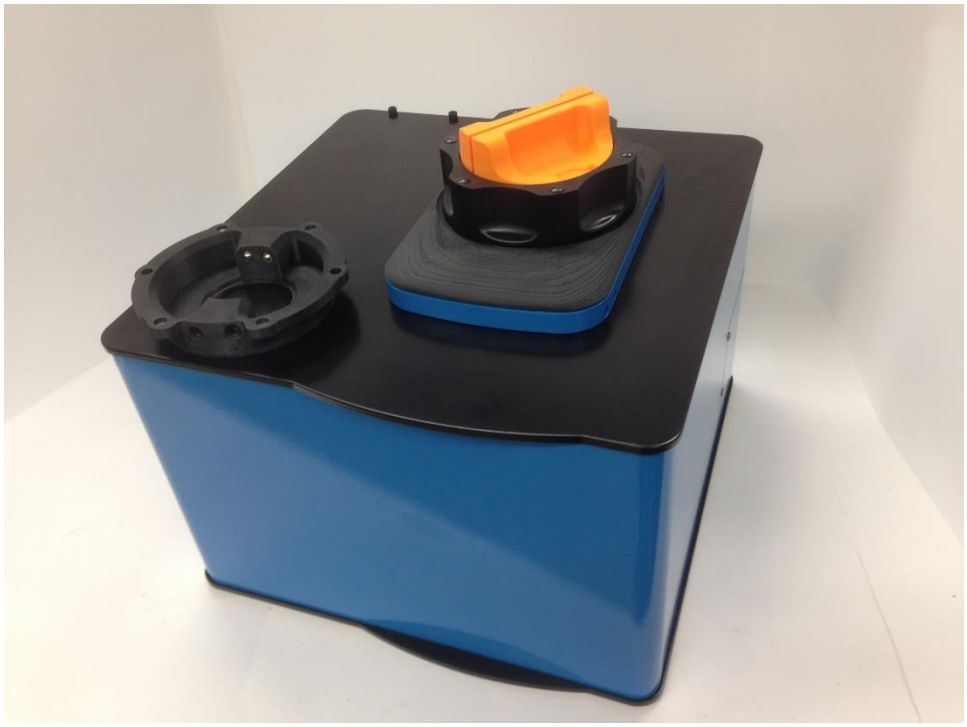
PHOENIX 5000 (Top-Window with Slider-Sampler)



Operations Manual

Please review this manual before
Unpacking or Installing the PHOENIX 5000!

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Table of Contents

1 Specifications

PHOENIX 5000 (patent pending) Performance Specifications	
Configuration	Diffuse Reflectance
Source Lamp	Halogen, MTBF> 8k hours
Wavelength Range	User selectable, typical 1100-2500nm
Wavelength increment	User selectable (.5nm – 10nm)
Spectral bandwidth	Slit selections available for (5nm<HPBW<10nm)
Wavelength Reproducibility	Better than 0.2nm, 10 scans averaged
Photometric Measurement range	Up to 4 absorbance units (scan and wavelength dependent)
Physical and Environmental Specifications	
Weight	~28lbs (~12.7kg) M5_TW
Width	~12.5 inches (317.5mm)
Height	~8.375 inches (213mm)
Depth	~12.5 inches (317.5mm), Add height for Slider and Sample cup
Ambient operating requirements	10-40°C (50-104°F), < 75% relative humidity with no condensate formation
Ambient storage requirements	-20-40°C (-20-104°F), < 75% relative humidity with no condensate formation
Ingress for M5 Unit only	IP50, the nature of spectroscopy requires no condensing water
Power	
Power connection	Via External power supply, Input:100-240VAC, 50/60Hz, 65watt Output: 24VDC, 2.7A. Connect to instrument via DC jack w/screw lock. This version also utilizes an on/off switch at rear of unit
Fuse	
	Internal Fuse package 5mm x 20mm, glass 4.0A slow blow
Interface/Computer	
USB	USB (type A) computer side to USB (type B) instrument side. Use high quality shielded cable.
Operating system	Windows 7 ™ , 10 or better
Processor	2.5 GHz or faster
Memory	2 GB or more
Fixed Disk space	40 GB or larger
Ports	USB 2.0 or better, Ethernet RJ45

TW (Top-WIndow) (patent pending) Sampler Specifics	
Configuration	Adapter allowing scanning of an industry standard fast pack cup (~50mm) 2 inch diameter, (12.7mm) ½ inch wide or the Large (~3.5 inch) adjustable volume sample cup.
Excellent Sample coverage	The Large sample cup may be scanned in a thorough fashion with the scanner covering virtually all of the ~3.5” window
Fast Cup placement	User may install the sample cup in moments
Interface	Integrated into BlueScan software
Options	Large Cup (~3.5”) or small cup (~2”)

2 General Information

2.1 Warranty Policy

The Warranty policy is either specified on the Corporate web site and/or on the confirming documents from the purchase order.

In General, the manufacturer warrants workmanship and materials to be free from defects for the period of one year from the date of shipment to customer and/or user.

Warranty will not cover products which have been in our judgment tampered with or subjected to electrical or mechanical abuse.

The foregoing warranty shall be in lieu of all other warranties, expressed or implied, and the Corporation expressly disclaims any warranty for merchantability or fitness for a particular purpose.

The liability of the Corporation to any purchaser or user of its products shall not in any case exceed the cost of correcting defects in a product as herein provided and, upon expiration of one year from the date of sale, all such liability shall terminate. In no event shall the Corporation be liable for interruption of operations, loss of profit, or special or consequential damages.

2.2 General Safety

Make sure to read the entire Operations Manual carefully before you unpack the instrument, set up the instrument and commission the instrument.

Do not use or install the instrument in any manner other than what is specified in this operations manual.

Observe all safety codes when using and providing electric power to the instrument. Take all necessary safety precautions when using and providing electric power to the unit.

2.2.1 Safety around Lamp

The lamp provides broadband light and uses less than 10 watts of power but is still a burn hazard should one somehow touch the envelope while it is active or soon after. Always disconnect the mains power from the instrument and allow the lamp at least 2 minutes cool down time before replacement. Do not touch the glass envelope of the bulb! While the bulb is cool, it may be cleaned with isopropyl alcohol utilizing a lint free cloth.

2 General Information

2.2.2 Safety around AC power

Other than for lamp replacement, the user is prohibited from entering the Enclosure of the Phoenix 5000. The lamp is located in the top chamber and is isolated from the lower chamber. Do not enter the lower chamber unless you are an authorized service technician.

2.3 Precautionary Labeling

Pay attention to all precautionary labeling

2.4 PHOENIX 5000 (TOP-WINDOW) Overview

The PHOENIX 5000 (patent pending) is a bench top diffuse reflectance spectrometer designed for rapid non-destructive analysis of a range of products and product blends taking advantage of near infrared absorption bands and corresponding calibration techniques.

The PHOENIX 5000-Top-Window unit supports sample handling in the form a large (~3.5inch diameter) sample cup as well as an industry standard 50mm round cup designed to be packed with product and placed in the sampling unit. The Top-Window (TW) sampling Slider-Sampler accessory (patent pending) will allow placement and very complete scanning of the sample placed within. Under software control, the unit will automatically and thoroughly scan the sample presented at the cups window interface.

The BlueScan software can be run on a standard personal computer running Windows 7,10™ or equivalent as defined by the manufacturer. The software suite will allow for control of the sample handler in conjunction with near infrared scanning of the sample. Additional tools can be provided allowing the user to develop a calibration, and/or allow prediction of constituent values after calibration development, storage of the acquired spectrum along with the constituent values and data basing functions for necessary parameters. The Blue Scan Software suite can also be provided with qualitative analysis functions.

The Phoenix 5000 and its associated components were truly designed with the user in mind. It is our intention and single mission to give the user the best experience in the industry. With this in mind, you as the user are encouraged to give feedback on any related issue at any time. Together, we can make your experience NIR-Perfect!

2 General Information

2.5 System Layout (PHOENIX 5000) or Top-Window

The PHOENIX 5000 Spectrometer is configured with a Slider-Sampler scanning block floating above the scanning table. This configuration will allow the user to load a Large sample cup as well as a smaller sample cup into the Slider. The Slider scanning mechanism (Patent Pending) is designed to allow for complete scanning of a sample cup. This means that the M5 optical collection system is looking at the sample in a very thorough fashion as compared to some of the instruments in the industry.

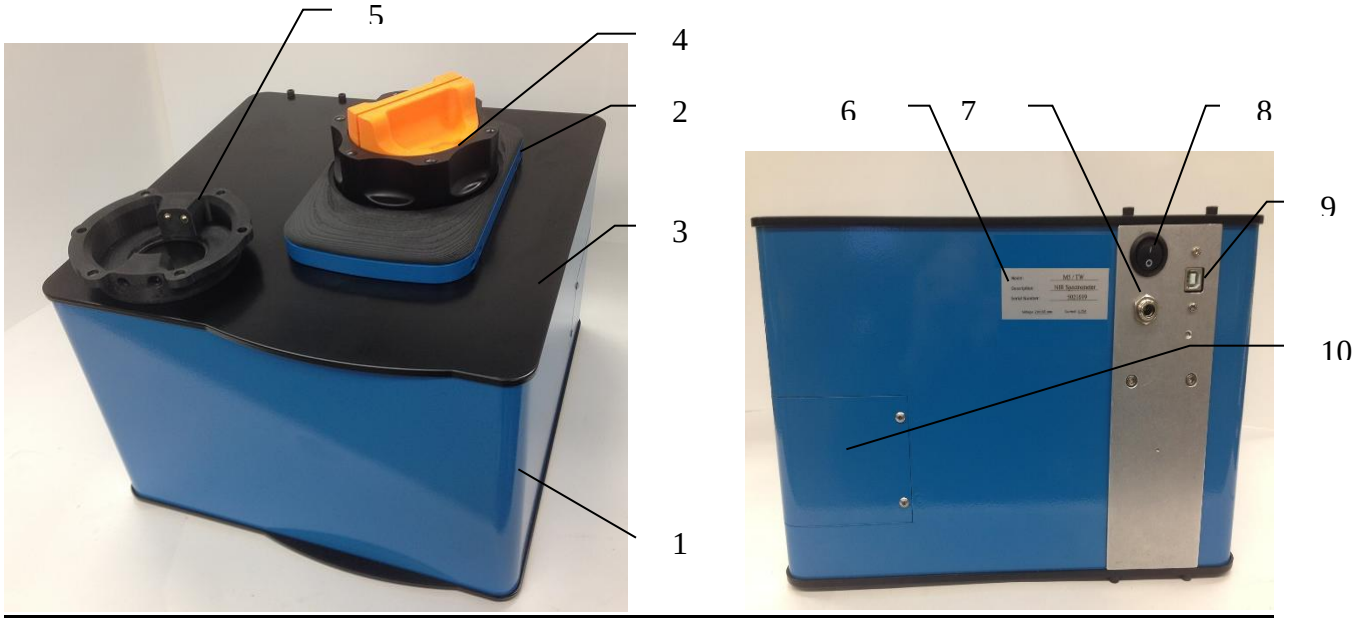

Fig. 1.0 Phoenix 5000 / Top Window (Top-Front and Rear views)

1 PHOENIX 5000-Top Window Scanning Unit
2 Slider Sampling Unit
3 Top Window Surface
4 Large Sample Cup
5 Small Sample Cup Adapter
6 Rear View (Label)
7 Rear View (Power Entry Jack)
8 Rear View (Power Switch)
9 Rear View (USB Port)
10 Rear View (Lamp Access Door)

3 Installation

3.1 Unpacking your instrument

The following components are supplied as standard with the PHOENIX 5000 Unit:

- ⇨ PHOENIX 5000 TW-Spectrometer
- ⇨ Slider-Sampler block
- ⇨ Stand-alone power supply with AC adapter cord
- ⇨ USB A to USB B interface cord. Length: 6 ft. (2m)
- ⇨ Sample cups (qty.=1 Large Cup with Weight or Pressure plug)
- ⇨ Cup Adapter (for use with small 2 inch (50.8mm) cup)
- ⇨ Sample cup backings (qty.=20 if specified)
- ⇨ Software Suite V1.0 Basic
- ⇨ Operation / Users manual covering Software V1.0 Basic Suite

1. Please make note of the condition of the packaging and alert the manufacture if any damage to the packaging or its contents has occurred.

2. Remove the accessories (i.e. Slider Block mechanism, power chord, power supply, sample cup/s, cup backings etc.) from the packaging.

3. Remove the Spectrometer unit from the box and place on a sturdy surface. The unit has foam side-caps and may be lifted out with the unit. Take care not to hurt your back as the unit's weight is approximately 28 lbs. (~12.7kg).

4. **Do not place the Slider-Sampler Block-Mechanism on the unit until you review the placement technique (Section 3.5.0) as the unit utilizes powerful magnetics to hold the Slider to the top of the unit.**

Alert the manufacture immediately if any of these components are missing or damaged.

3.2 Environmental Considerations

After unpacking the instrument and its accessories, find a suitable location where the weight, physical dimensions and restrictions outlined in the Specifications section 1 are understood and adhered to. Consider your operating space as it pertains to loading and unloading sample cups as well as operating the software from a computer.

In General:

1. Position the instrument securely on a flat, level surface with the feet down. Suggested placement assures that the slight bump out is facing toward the user.
2. Take care that your space observes all environmental restrictions outlined in Specifications section 1.

3 Installation

3.3 Power Connectivity

1. Make sure that the power switch located at the rear of the unit is off (“o”)
2. Connect the C5 end of the AC power cable (provided) to the standalone power supply receptacle. Connect the other end of the AC power cable to a power outlet providing 100-240 VAC, 50/60hz. 90VA. It is preferred that the outlet be an uninterruptible power supply with signal conditioning and lightning strike protection.
3. Connect the Jack end of the stand-alone power supply (provided) to the receiver jack located at the rear of the instrument. Hand tighten to secure.

3.4 Computer connections/consideration (ignore if using an integrated display/computer).

1. Review the necessary computer specifications (section 1) to make sure of compliance
2. Connect the USB A end of the provided USB cable to the operating computer
3. Connect the USB B end of the provided USB cable to the socket located at the rear of the unit.
4. Load the Operating Software onto the computer. The software should install properly without errors.

3.5 Detachable sampling accessory (Slider-Sampler Block)

The Slider-Sampler mechanism when placed on the unit will facilitate scanning of the Large (~3.5 inch) sample cup as well as small industry standard 2 inch round cups).

Features include:

1.	Complete scan	=>	Slide Scanner allows for optical scanning of nearly all the sample presented at the cups window interface
2.	Ring Cup Adapter	=>	Accepts Industry wide 2”(~50mm) diameter Ring cup
3.	PDR Cup Adapter	=>	Accepts Industry Standard Powder Cup w/ Cam lock
4.	XLR Cup Adapter	=>	Accepts a Transflectance Cup for Liquids analysis
5.	Easy Clean	=>	Allows for easy removal of Slider yielding simple cleanup if necessary

3.5.0 Slider-Sampler Placement

The Slider block contains magnets that will engage with corresponding magnets contained within the Top-Window unit but invisible to the user. Care should be taken to insure that the Slider-Sampler is not slammed onto the top window surface.

Recommended placement technique:

1. Place the Slider-Sampler onto the Top window surface position as indicated (Fig. P1). Note placement relative to the window.
2. Gently slide the unit forward toward the bump out until you feel the unit engage.

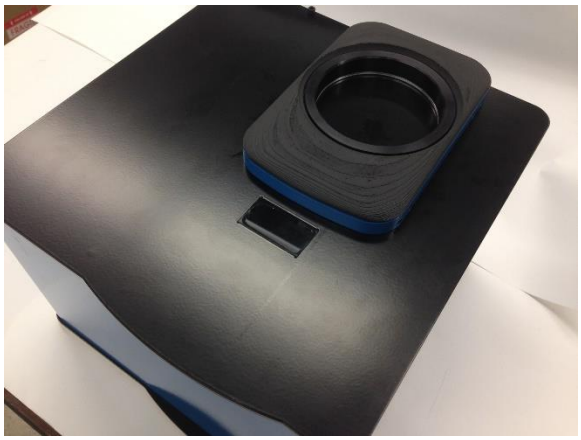

Fig. P1 (Slide/set Slider onto unit)

Fig. P2 (Slide Slider into resting place)

3.5.1 Sample Cup (Small)

- The PHOENIX 5000 configured instrument accepts industry wide round (~50mm) sample cups (FPC style). Via Cup adapter
- These cups are typically loaded with product to a fill depth then a cardboard backing is placed into the cup to retain the product. The product of interest is intended to be finely ground though some applications may utilize a more course ground sample.

3.5.1.1 Sample preparation and fill

Note: For sample specific details and techniques on filling, refer to the technical briefs and staff

- The sample of interest is typically well ground.
- To fill **(see Fig. C0)**:

1. Place the cup on a table with the glass face down.
2. Pour a pre-measured amount of product/material into the cup.
3. Press a backing plate into the cup to secure the material against the cup window.
4. Place cup into Cup-Adapter then place into the Slider-Sampler

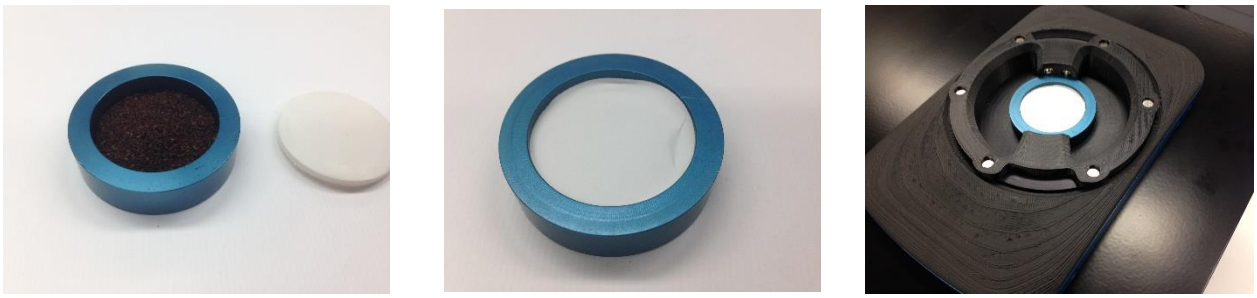

Fig. C0 (Small Sample Cup (Ground Sample fill and place)

3.5.2 Sample Cup (Large)

Note: For sample specific details and techniques on filling, refer to the technical briefs and staff

- The Large sample cup is designed for scanning of relatively large amounts of course ground sample.
- To insure packing pressure, one may utilize our Pressure plate which uses weight to hold the sample down and provide packing pressure.

  Alternatively one may utilize our pressure plug which allows for two pressure locking points. The user may use Locking point 1 for whole grains such as corn and soybean and Locking point 2 for sample that is course ground. Refer to Apendix 3.5.2 for details on the use of the Plug

3.5.2.1 Sample preparation and fill

- The sample of interest can be course ground (grains and mixed feed) or whole (i.e. Corn, soybeans etc.) .

To fill:

Course ground sample (**see Fig. C1**):

1. Place at least 5 rounded table spoons of product at the bottom of the cup in even distributed piles.
2. Gently move the material around to fill in all available spaces and level
3. Insert/ place the Weighted plug into the cup and on top of the sample
4. Place the sample cup into the Slider-Sampler once complete

Note: your goal is to provide for evenly distributed product with the finer particles evenly distributed among the courser particles. This is important technique. For further information please refer to our product specialists for assistance.l

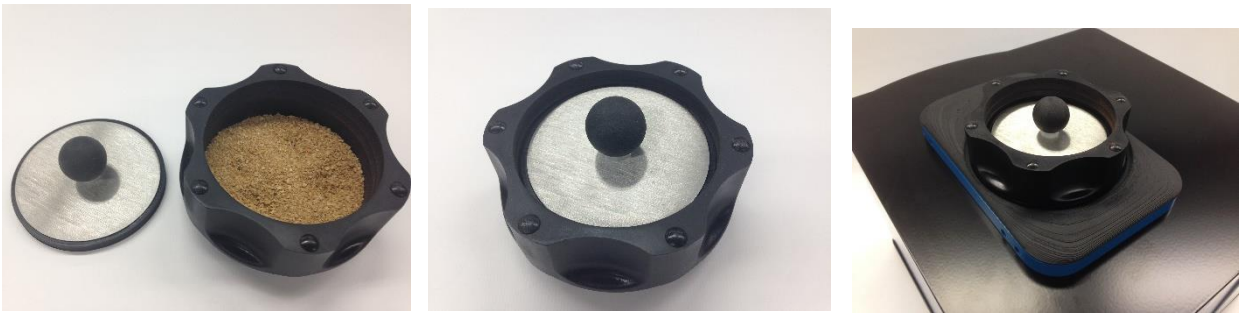

Fig. C1 (Large Sample Cup (Course Ground Sample fill and place)

Whole sample (**see Fig. C2**):

1. Pour ~100-125ml (1/2 cup) of product into the sample cup
2. Gently move the material around to fill in all available spaces and level
3. Insert/ place the Weighted plug into the cup and on top of the sample
4. Place the Sample cup into the Slider-Sampler once complete

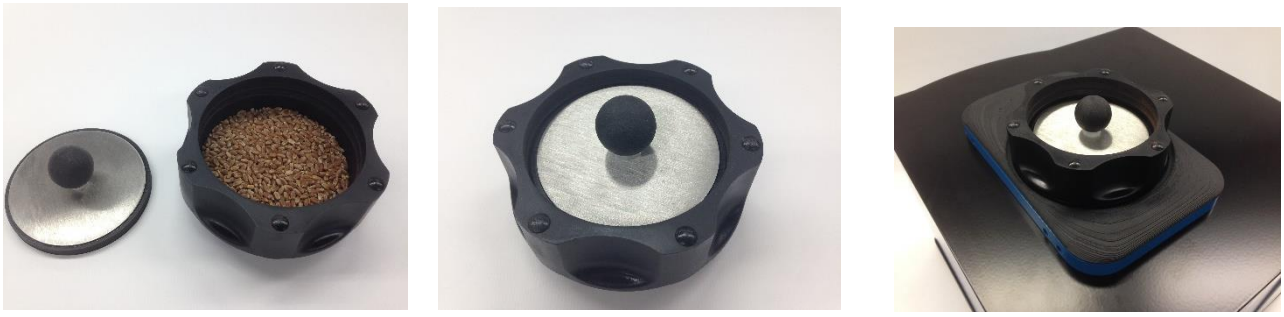

Fig. C2 (Large Sample Cup (Whole Sample fill and place)