

Operator Manual

HIAC 9705

LIQUID PARTICLE COUNTING SYSTEM

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Manual Overview

About This Manual

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Safety Conventions



WARNING

A warning is used to indicate a condition which, if not met, could cause serious personal injury and/or death. Do not move beyond a warning until all conditions have been met.

CAUTION:

A caution is used to indicate a condition which, if not met, could cause damage to the equipment. Do not move beyond a caution until all conditions have been met.

Note:

A note is used to indicate important information or instructions that should be considered before operating the equipment.

General Safety Considerations

- All service procedures should be conducted by properly trained service personnel.
- Make sure the Model 9705 Liquid Particle Counting System is properly installed and all hydraulic connections are correctly installed before operation. All safety guidelines should be observed.
- Follow all procedures in [“Return Procedures” on page 71](#) before shipping a unit to a service center for repair or re-calibration.



WARNING

Use of controls or adjustments, or performance of procedures other than those specified herein may result in hazardous radiation exposure.

**WARNING**

Only factory certified personnel should perform service of the 9705. Attempts by untrained personnel to disassemble, alter, modify or adjust the electronics and/or hydraulics may result in personal injury and damage to the 9705.

This instrument has been tested and found to comply with:

- EN 61326 Electro Magnetic Compatibility (EMC) EN 61010-1 Safety Requirement for Electrical Equipment for Measurement, Control and Laboratory Use.
- Low Voltage Directive EN 60825-1 Safety of Laser Products
- FDA Laser Safety 21 CFR, Chapter 1, Sub-Chapter J

**WARNING**

The following DANGER label is clearly visible on the body of the laser sensor inside the unit. Do not disassemble or attempt to service due to the possibility of eye damage.

DANGER

INVISIBLE AND VISIBLE LASER
RADIATION WHEN OPEN. AVOID
DIRECT EXPOSURE TO BEAM.

Although the 9705 is designed for rugged use, it is still an instrument that should be cared for and maintained as described in this manual. Following proper safety and handling instructions will promote accident free operation and prolong product life.

Warranty

Hach Ultra warrants that this instrument will be free of defects in materials and workmanship for a period of one (1) year from the shipping date. If any instrument covered under this warranty proves defective during this period, Hach Ultra will, at its option, either repair the defective product without charge for parts and labor, or provide an equivalent replacement in exchange for the defective product.

To obtain service under this warranty, the customer must notify the nearest Hach Ultra service support center on or before the expiration of the warranty period and follow their instructions for return of the defective instrument. The customer is responsible for all costs associated with packaging and transporting the defective unit to the service support center, and must prepay all shipping charges. Hach Ultra will pay for return shipping if the shipment is to a location within the same country as the service support center.

This warranty shall not apply to any defect failure or damage caused by improper use or maintenance or by inadequate maintenance or care. This warranty shall not apply to damage resulting from attempts by personnel other than Hach Ultra representatives, or factory-authorized and trained personnel, to install, repair or service the instrument; to damage resulting from improper use or connection to incompatible equipment; or to instruments that have been modified or integrated with other products when the effect of such modification or integration materially increases the time or difficulty of servicing the instrument.

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- Cavo is a trademark or registered trademark of Tecan Systems, Inc.
- Plexiglas is a registered trademark of Rohm and Haas Company Corporation.
- Teflon is a registered trademark of E.I. du Pont de Nemours and Company.

1 Introduction

This guide helps the operator begin using the HIAC Model 9705 Liquid Particle Counting System productively with minimal up-front instruction. The guide contains the information most essential to running the 9705.



WARNING

The operator should always wear proper safety equipment and clothing when operating any fluid system. The operator should also ensure that all connections are tight.

1.1 Product Overview

The Model 9705 Liquid Particle Counting System combines proven technology and application knowledge in a compact syringe sampler. This instrument precisely measures particles from small and large volume parenterals as well as fluid used for cleaning medical devices or precision parts and water for injection (WFI) systems.

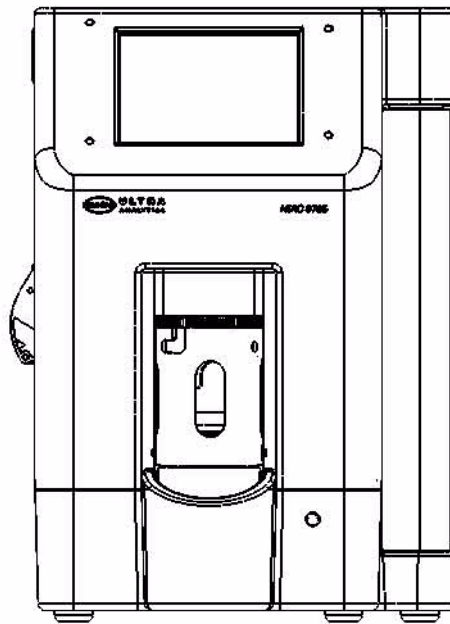


Fig 1-1 : Model 9705 Liquid Particle Counting System

The 9705 offers the Accu-Swirl™ built-in stirring mechanism to agitate the entire sample bottle to distribute particles uniformly, thus increasing the sample's accuracy. No separate stirring mechanism is necessary. When used with PharmSpec 2.1, the 9705 supports FDA 21 CFR Part 11 compliance.

The 9705 can also be used with a Large Volume Adapter to sample from vessels greater than 125 mL. The adjustable height stand and stainless steel tube intake accommodate IV bags and Large Volume Injectables (LVIs) and adds 0.054 mL tare volume per inch of tubing.

1.2 Operation Conventions

While the 9705 is most commonly used with PharmSpec to conduct compendial tests, some 9705 setup and display information is accessed by use of a TFT color touch screen located on the front panel of the unit, shown in [Figure 1-1](#). All commands may be executed through the touch screen.

Items on the screen that need to be touched or pressed to invoke actions appear in **bold text**. Buttons or tab names that should be pressed in sequence appear like this:

- 1) Press **Settings** icon > **System** icon to invoke the **System** screen.

Screen items commonly referred to in this manual include:

- A screen is a window of the Graphical User Interface (GUI) which takes all up all visible space on the touch screen and can only be exited by pressing a button.
- A tab is a subdivision the GUI easily accessed by touching the tab at the top of the screen.
- A button is an area of the touch screen that should be touched to invoke another screen or execute an action (such as performing a sample run or clearing the buffer).
- A field indicates an area of the screen where strings of text and/or numbers may be entered. To enter information in a field, touch the field. Depending on the nature of the field (alphanumeric versus numeric), a keypad will appear on the touch screen to allow text or numeric entries. Touch **OK** to complete the entry.
- A checkbox allows functions to be toggled on or off. Touch the box to make a checkmark appear and enable the function. Touch the box a second time to make a checkmark disappear and disable the function.
- A dropdown menu allows operators to choose from a set list of values. Dropdown menus can be identified by the arrow on the right side of the field. To use a dropdown menu, touch the arrow to show the list, drag a finger down the list to show all items, then highlight the desired item to select it.
- A pop-up box is a warning or note to make sure actions are taken as intended. Click **OK** or **Yes** to continue or **Cancel** to stop.

1.3 Accessories

Several accessories are available which can be ordered from a local Hach Ultra representative or from the factory by calling either a local representative or the factory at 800.866.7889 or +1 541.472.6500 during the week from 6:00 a.m. to 4:30 p.m. PT.

2 Initialization

This section contains information on unpacking and setting up the Model 9705 Liquid Particle Counting System so it is ready for use.

CAUTION:

Do not attempt to operate or set up the 9705 without reading and following the procedures described in this section.

2.1 Inspection and Unpacking

The 9705, shown in [Figure 2-1](#), is shipped in a single carton. Visually inspect the outside of the carton for signs of damage (dents, tears, etc.) that may have occurred during shipping and bring the damage to the attention of the shipper. Save this carton for reshipping the 9705.

Inspect the interior of the carton for damage to the contents. Compare the contents of the carton to the shipping papers to assure all items are present. If any items are missing, contact the factory at 800.866.7889 or +1-541.472.6500 or a local Hach Ultra representative.



WARNING

Never reach inside the bottle dock. There is a sharp needle inside the bottle dock; personal injury may occur.

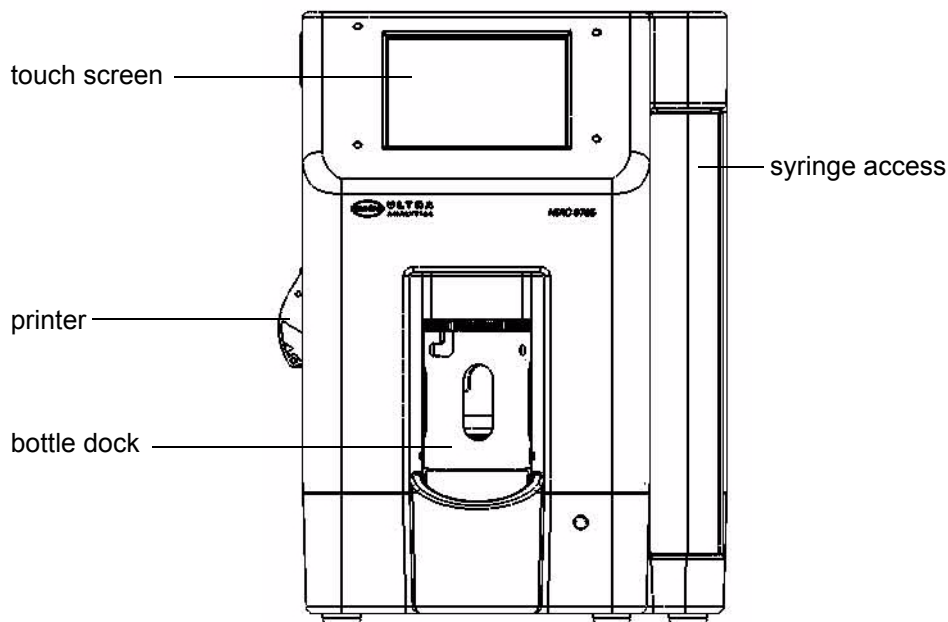


Fig 2-1 : 9705 Particle Counting System

2.2 9705 Components

Figure 2-2 shows the locations of connectors on the back panel of the 9705.

Place the particle counter on a dry, level surface. Do not power up any instruments until all electrical and communications connections are complete.

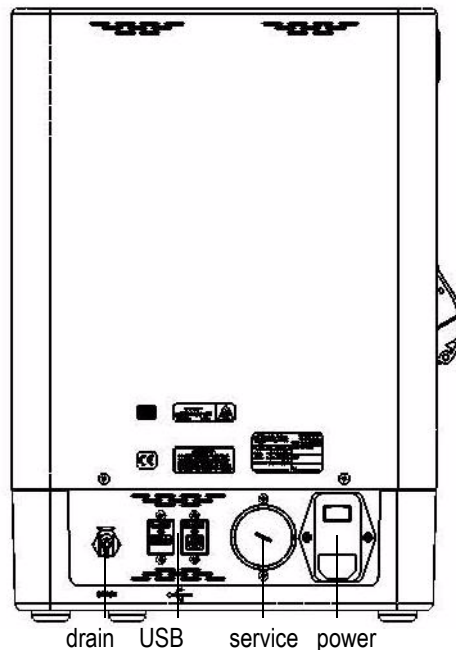


Fig 2-2 : Rear View of 9705

2.3 Fluid Connections

2.3.1 Connecting the Drain Line

- 1) Attach the drain line to the back of the unit.
- 2) Be sure the connection is secure before powering on the unit.
- 3) Place the other end of the drain line in a suitable waste-fluid receptacle.

Note:

The sensor cleaning port is located on the left side of the unit below the printer. For more information, refer to [“Sensor Port Cleaning” on page 62](#).

2.4 Electrical Connections

2.4.1 USB Communications

On the back of the 9705, shown in [Figure 2-2](#), connect a computer or data device using the following connectors:

- USB Client
- USB Host (for services updates only, not data transfer)

2.4.2 Power Cable

Connect the end of the power cord to the male socket on the rear panel of the 9705. Plug the power cord into an appropriately rated AC line.

Attach the AC power cable supplied with the unit to the AC power socket. Do not turn the power on until installation is complete.

CAUTION:

The round connection slot left of the AC power is for use by service personnel only. Do not operate the unit with this cover removed.

2.5 Syringe Installation

The syringe is located on the right side of the 9705 as shown in [Figure 2-3](#).

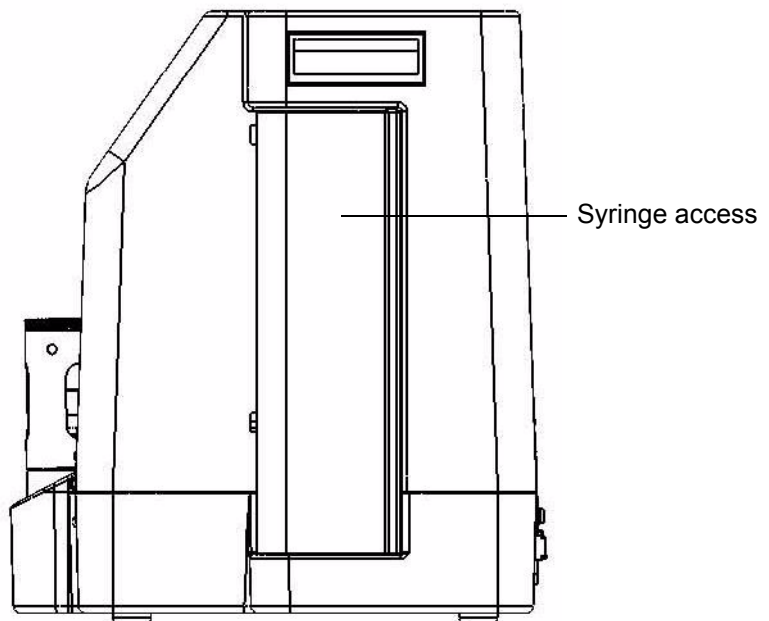


Fig 2-3 : 9705 Right Side View

CAUTION:

The 9705 ships with the syringe drive positioned for loading a syringe. Load the syringe prior to initially powering the 9705.

A syringe may be loaded or unloaded with the syringe drive plunger bolt set at its top travel point.

Each syringe has the same plunger travel distance, so this procedure allows changing to different volume syringes. The 9705 uses syringes in these volumes:

- 1 mL
- 10 mL
- 25 mL

To load a syringe into the syringe drive:

- 1) Make sure the 9705 has been flushed of all fluids and the unit power is off. Make sure the syringe drive plunger bolt is positioned at its top travel point.
- 2) Gently push the Plexiglas[®] door on the right of the 9705 upward to open it and gain access to the syringe cavity.
- 3) Be certain that the syringe is of an appropriate size. Remove the drive bolt from the syringe drive mechanism.
- 4) Fasten the syringe to the drive by bolting the drive bolt through the syringe plunger.
- 5) Pull up on the syringe until the lower fitting mates with the Teflon[®] fitting at the bottom of the syringe drive.

CAUTION:

Do not overtighten the connection! Overtightening may cause Teflon extrusion and connector degradation.

- 6) Twist the syringe until the connection is secure. Try to tighten so that the numbers on the syringe face outward.

CAUTION:

When loading or removing a syringe, twist the syringe into and out of the fitting. Repeated lateral movement of the syringe may cause damage to the Teflon syringe fitting.

- 7) Close the door. An error message will appear and an alarm will sound if a run is initiated without closing the door.



Fig 2-4 : Door Open Error Message



WARNING

The 9705 will not operate with the syringe door open. Attempts to operate the 9705 with the door open may result in personal injury and/or damage to the 9705. Do not tamper with the door interlock. Do not attempt to operate the 9705 with the door open.

Note:

When changing syringe sizes, adjust the 9705's settings to make sure the syringe installed matches the syringe size setting. This procedure is described briefly here but is explored in more detail in ["Changing the Syringe Size" on page 49](#).

- 8) Turn the unit on. The **Main Screen** should appear, similar to the one shown in [Figure 2-5](#).

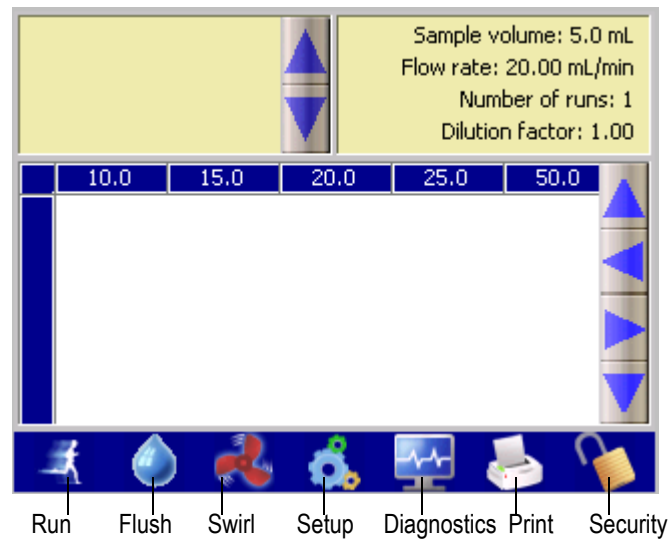


Fig 2-5 : Main Screen

- 9) From the Main Screen, select the **Setup icon** to invoke the **Setup** screen, shown in Figure 2-6.

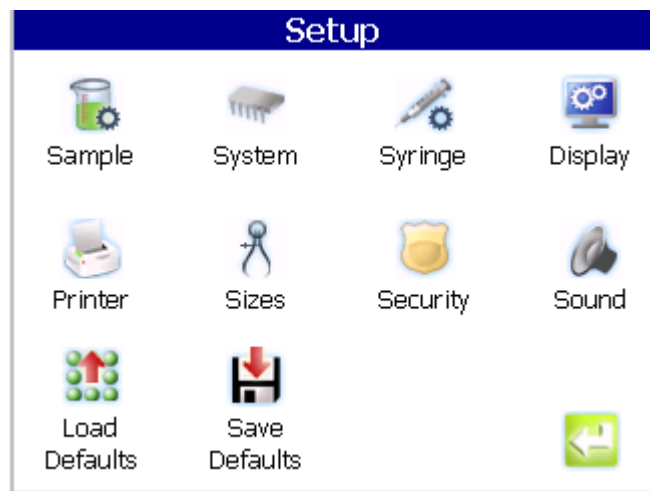


Fig 2-6 : Setup Screen

- 10) From the **Setup** screen, select the **Syringe** icon to invoke the **Syringe Settings** screen, shown in Figure 2-7.
- 11) Check that the syringe size listed matches the one installed.

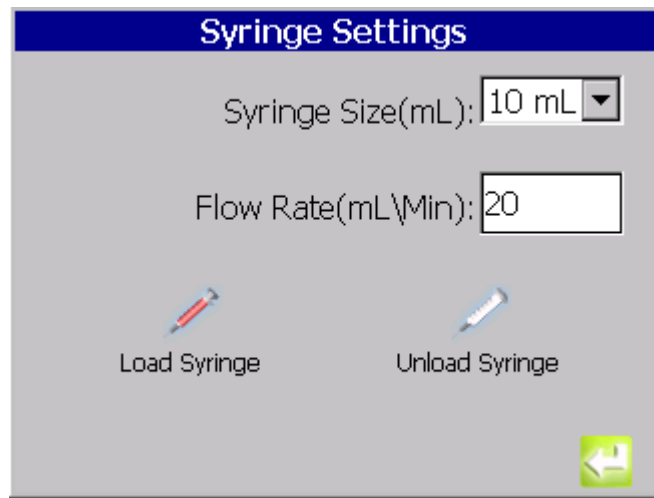


Fig 2-7 : Syringe Settings Screen

Note:

If the syringe sizes do not match, refer to [“Changing the Syringe Size”](#) on page 49 to adjust the system settings.

- 12) Touch the **Return** icon to exit the **Syringe Settings** screen and return to the **Setup** screen, then press **Return** again to return to the **Main Screen**.

2.6 Loading Printer Paper

The 9705 features an internal printer located on the left side of the unit for easy printing of records, shown in [Figure 2-8](#). Print procedures are described in detail in [“Setting Print Results”](#) on page 38.

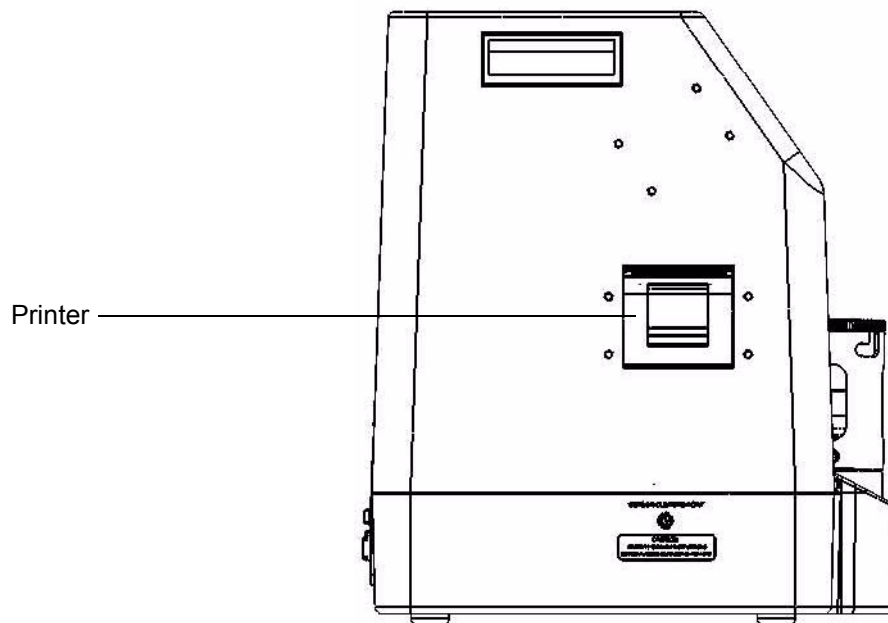


Fig 2-8 : 9705 Left Side View

CAUTION:

*The printer should not be operated without paper as damage may occur to the print head. If the particle counter must be operated without paper in the printer, be sure to set the Print Mode to **None** as described in [“Automatically Printing Results” on page 58](#).*

CAUTION:

Paper used in this printer is temperature-sensitive on one side and must go into the printer as explained in the instructions. Do not substitute other types of paper.

To load printer paper:

- 1) Locate the printer on the left of the unit, shown in [Figure 2-8](#).
- 2) Pull up the green handle in the center of the paper cover until a click is heard.
- 3) Fold the door down and remove the cardboard tube from the previous roll, if present.
- 4) Load the new paper roll so the paper feeds over the top of the roll. Position the end of the paper on the black roller at the end of the printer feed door.
- 5) Push the printer door back until it clicks into place.
- 6) The printer is now ready to print. Print options include:
 - Automatically printing runs, described in [“Automatically Printing Results” on page 58](#)
 - Manually printing the displayed record, described in [“Manually Printing Results” on page 59](#)

Note:

If the paper does not feed out or no image appears on the paper after a print command has been sent, double-check paper direction.

2.7 Initial Power On

Once the unit is powered on, the screen appears like the one shown in [Figure 2-9](#).

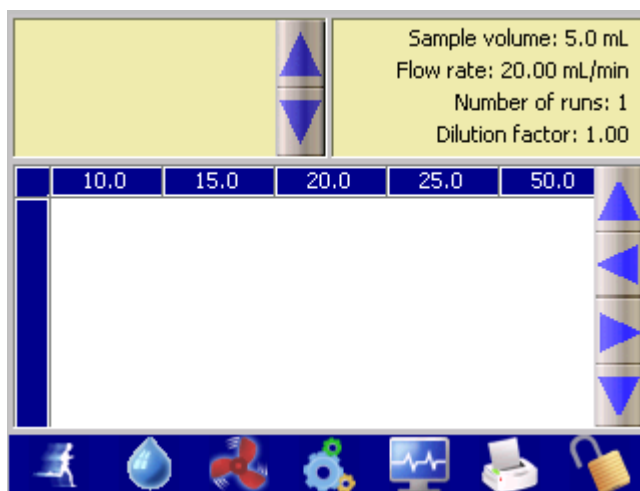


Fig 2-9 : Main Screen

- Refer to [“Operating the 9705” on page 55](#) for more information on operating the unit.
- Refer to [“System Setup” on page 23](#) for information on system configuration.

3 System Setup

3.1 Settings Overview

The 9705's functions are accessed via an icon bar, shown in [Figure 3-1](#).

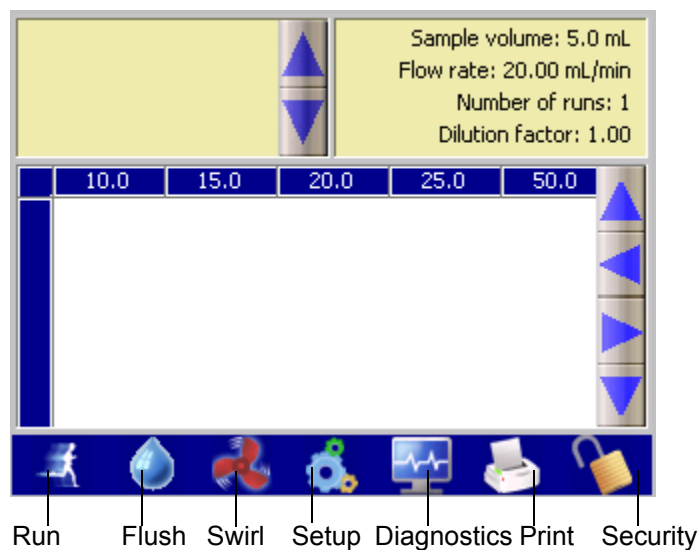


Fig 3-1 : 9705 Icon Bar

Many of the 9705's settings are accessed via the **Setup** icon shown in [Figure 3-1](#). Touching the **Setup** icon invokes the **Setup** screen, shown in [Figure 3-2](#).

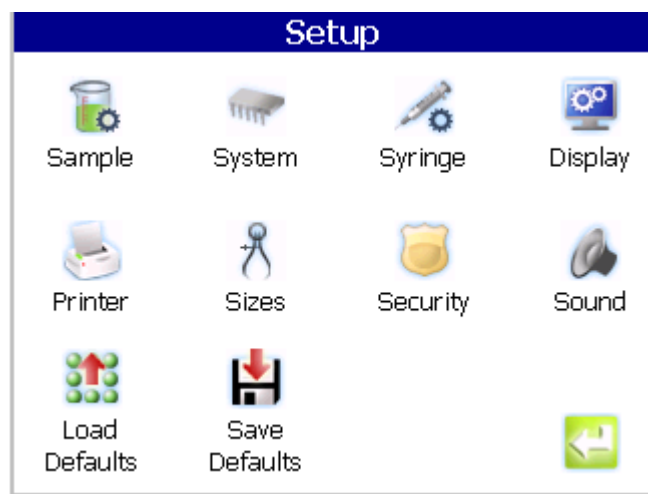


Fig 3-2 : Setup Screen

These functions are listed in [Table 3-1](#).

Table 3-1 : Settings Button Functions

Icon Name	Functions	Relevant Sections
Sample	Set sample parameters, including: <ul style="list-style-type: none"> • Number of runs • Sample Volume • Tare • Multi-Stroke Tare • Dilution Factor • Stir speed 	“Changing Sample Parameters” on page 49
System	<ul style="list-style-type: none"> • Change date and time • Setting the backlight timeout • Changing the display language 	<ul style="list-style-type: none"> • “Changing the Date and Time” on page 26 • “Setting Backlight Timeout” on page 29
Syringe	<ul style="list-style-type: none"> • Changing syringe size • Changing flow rate 	<ul style="list-style-type: none"> • “Changing the Syringe Size” on page 49 • “Setting Flow Rate” on page 28
Display	Setting these parameters: <ul style="list-style-type: none"> • Count display • Scaling • Number of runs to display 	“Display Settings” on page 25
Printer	<ul style="list-style-type: none"> • Configuring automated print commands • Manually feeding paper out of the printer 	<ul style="list-style-type: none"> • “Automatically Printing Results” on page 58 • “Loading Printer Paper” on page 19
Sizes	<ul style="list-style-type: none"> • Adding size channel to monitor • Editing existing size channel • Deleting size channel 	<ul style="list-style-type: none"> • “Adding a Size” on page 27 • “Editing a Size” on page 28 • “Deleting a Size” on page 28
Security	<ul style="list-style-type: none"> • Enabling or disabling password protection • Changing the password 	“Password Protection” on page 52
Sound	<ul style="list-style-type: none"> • Setting sound effects for actions and errors • Setting system volume 	“Configuring Sounds” on page 31
Load Defaults	Loads the default settings for the 9705	N/A
Save Defaults	Saves the current settings as the default settings	N/A

3.2 Changing the Language

- 1) From the Main Screen, select the **Setup** icon > **System** icon to invoke the **System Settings** screen, shown in [Figure 3-3](#).

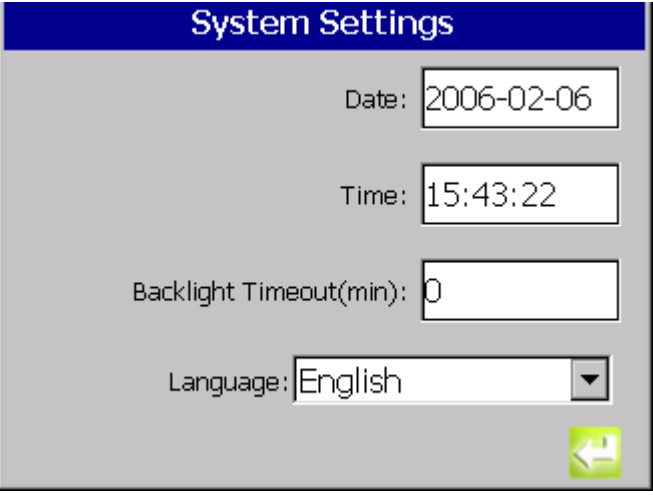
The image shows a 'System Settings' screen with a blue header bar. Below the header, there are four settings: 'Date' with a text box containing '2006-02-06', 'Time' with a text box containing '15:43:22', 'Backlight Timeout(min):' with a text box containing '0', and 'Language:' with a dropdown menu showing 'English'. A green arrow button is located at the bottom right of the screen.

Fig 3-3 : System Settings Screen

- 2) To change the language, touch the **Language** field to invoke a keypad entry screen.
- 3) Select the language from the dropdown menu.
- 4) A warning message will appear to ask for confirmation that the language will change. If the language selected is correct, press **OK**.
- 5) Press **Return** to save changes and exit.

3.3 Display Settings

- 1) From the Main Screen, select the **Setup** icon > **Display** icon to invoke the **Display** screen, shown in Figure 3-4.

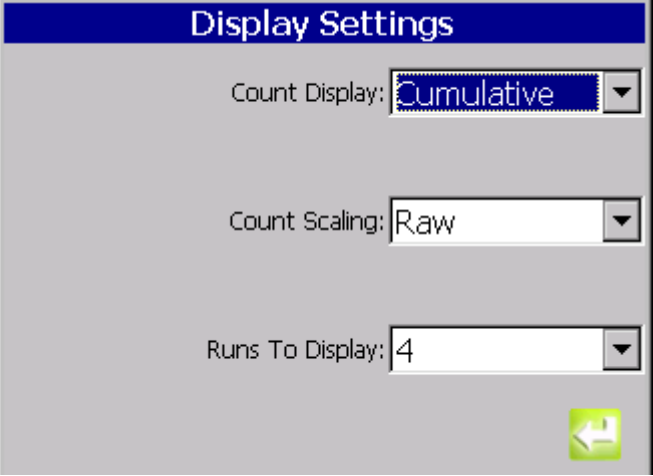
The image shows a 'Display Settings' screen with a blue header bar. Below the header, there are three settings: 'Count Display:' with a dropdown menu showing 'Cumulative', 'Count Scaling:' with a dropdown menu showing 'Raw', and 'Runs To Display:' with a dropdown menu showing '4'. A green arrow button is located at the bottom right of the screen.

Fig 3-4 : Display Settings Tab

The **Display Settings** screen allows modification to the type of count displayed, scaling, and number of runs displayed. These fields are described in [Table 3-2](#).

Table 3-2 : Display Settings Fields

Field Name	Description	Valid Entries
Count display	Select whether data will be displayed in cumulative or differential mode	<ul style="list-style-type: none"> • Cumulative • Differential
Count scaling	Select whether or not data will be scaled on the display	<ul style="list-style-type: none"> • Raw • Counts/100mL • Counts/mL • Counts/L
Runs To Display	The number of runs displayed in a data record	1 through 5

- 2) Make changes by touching a field to invoke a dropdown menu, touching the desired choice to highlight it.
- 3) Press **Return** to exit the **Display Settings** screen.

3.4 Changing the Date and Time

- 1) From the Main Screen, select the **Setup** icon > **System** icon to invoke the **System Settings** screen, shown in [Figure 3-5](#).

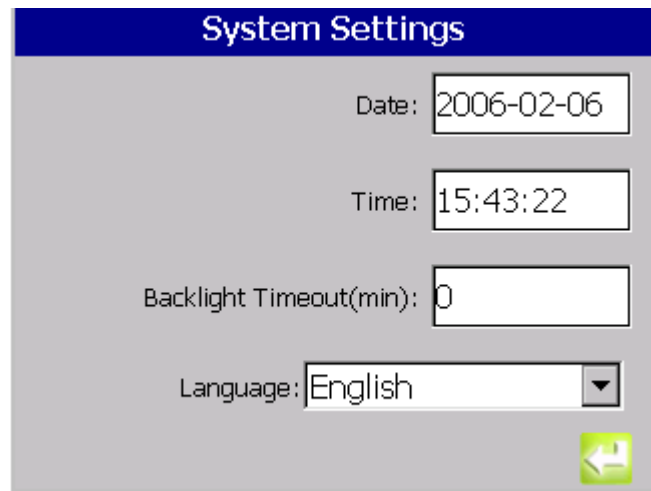


Fig 3-5 : System Settings Screen

- 2) To change the date, touch the **Date** field to invoke a keypad entry screen.
- 3) Enter the current date by pressing the number keys in YYYY/MM/DD format. Be sure to add any leading zeroes; for example, December 1, 2006, should be entered 2006/12/01.

Note:

Use the << and >> keys to move the cursor through the field; the **DELETE** and **BKSPC** keys will not work. Do not enter separators (/); they will automatically appear.

- 4) When the date is correct, press **Enter**. The keypad entry screen closes and the **System Settings** screen displays.
- 5) Press **Return** to save changes and exit.

3.5 Setting Particle Sizes

From the Main Screen, select the **Setup** icon > **Sizes** icon to invoke the **Size Settings** screen, shown in [Figure 3-6](#).

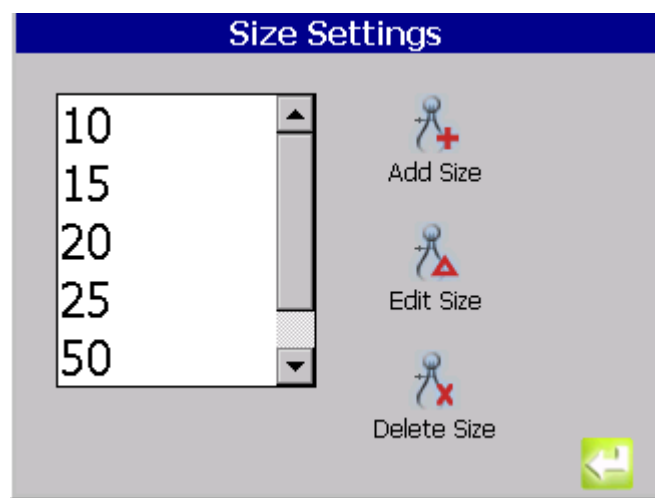


Fig 3-6 : Sizes Tab

These functions are accessed through the icons on this tab:

- Adding sizes
- Editing sizes
- Deleting sizes

The minimum size that may be entered is 1.3; the maximum size is 200.0.

3.5.1 Adding a Size

Note:

The 9705 will not extrapolate beyond the calibration curves. Setting sizes outside the calibration curves will result in an error.

- 1) From the Main Screen, select the **Setup** icon > **Sizes** icon to invoke the **Size Settings** screen, shown in [Figure 3-6](#).
- 2) Touch the **Add Size** icon from the **Sizes** tab to invoke the **Particle Size Entry** screen.
- 3) Use the touch screen to enter a new size.

Note:

Sizes entered must be up to two decimal places between 1.3 and 200.0 or an error message will be invoked.

- 4) Use the backspace key to delete any unwanted text in the field. Enter the particle size (in microns) to be measured, up to two decimal places (such as 1.55).
- 5) Press **Enter** to save changes and close the **Particle Size Entry** screen.
- 6) Press the **Return** icon to return to the main screen.

3.5.2 Editing a Size

- 1) From the Main Screen, select the **Setup** icon > **Sizes** icon to invoke the **Size Settings** screen, shown in [Figure 3-6](#).
- 2) Touch the **Edit Size** icon from the **Sizes** tab to invoke the **Particle Size Entry** screen.
- 3) Use the touch screen to edit a size.

Note:

Sizes entered must be up to two decimal places between 1.3 and 200.0 or an error message will be invoked.

- 4) Use the backspace key to delete any unwanted text in the field. Enter the particle size (in microns) to be measured, up to two decimal places (such as 1.55).
- 5) Press **Enter** to save changes and close the **Particle Size Entry** screen.
- 6) Press the **Return** icon to return to the main screen.

3.5.3 Deleting a Size

- 1) From the Main Screen, select the **Setup** icon > **Sizes** icon to invoke the **Size Settings** screen, shown in [Figure 3-6](#).
- 2) Highlight a size from the list on the left by touching it.
- 3) Press **Delete Size** to delete the size. The size disappears from the list at left.
- 4) Press the **Return** icon to return to the main screen.

3.6 Setting Flow Rate

Note:

The 9705 is not flow rate independent. It has been calibrated to a specific flow rate. To operate the 9705 at a different flow rate, calibrate the 9705 to that specific flow rate. PharmSpec will store multiple calibration curves for this purpose.

CAUTION:

If the flow rate is set to a value other than the rate corresponding to the calibration curve, the system response may be inaccurate.

- 1) From the Main Screen, select the **Setup** icon > **Syringe** icon to invoke the **Syringe Settings** screen, shown in [Figure 3-7](#).
- 2) Touch the **Nominal Flow Rate** field to invoke a **Flow Rate Entry** keypad screen.

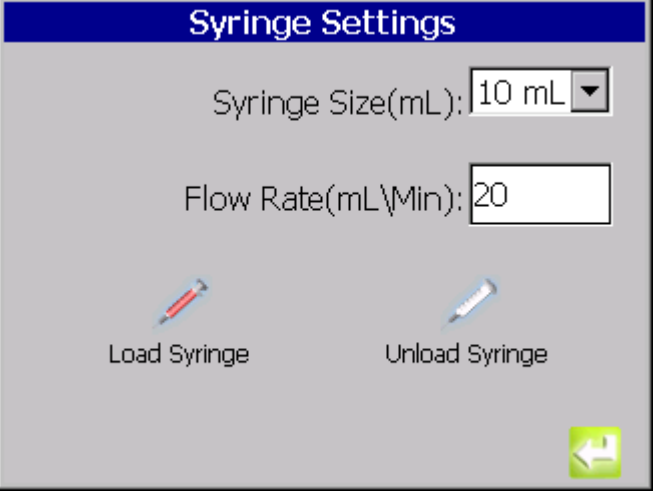
The image shows a software screen titled "Syringe Settings". It has a blue header bar with the title. Below the header, there are two input fields: "Syringe Size(mL):" with a dropdown menu showing "10 mL" and a small downward arrow, and "Flow Rate(mL\Min):" with a text box containing "20". Below these fields are two icons of syringes. The left icon is labeled "Load Syringe" and the right icon is labeled "Unload Syringe". In the bottom right corner, there is a green square button with a white left-pointing arrow.

Fig 3-7 : Syringe Settings Screen

- 3) Use the backspace key to delete any unwanted text in the field. Enter the flow rate.

Note:

*If an invalid entry is made, a pop-up window appears to prompt an entry between 10 and 60 mL. Touch **OK** to close this window and return to the **Flow Rate Entry** screen.*

- 4) Press **Enter** to save changes and return to the **Syringe Settings** screen.
- 5) Press the **Return** icon to return to the main screen.

3.7 Setting Backlight Timeout

- 1) From the Main Screen, select the **Setup** icon > **System** icon to invoke the **System Settings** screen, shown in Figure 3-8.

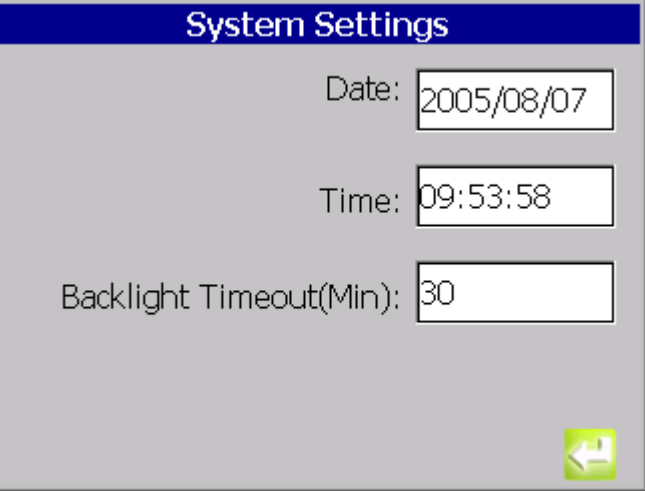
The image shows a software screen titled "System Settings". It has a blue header bar with the title. Below the header, there are three input fields: "Date:" with a text box containing "2005/08/07", "Time:" with a text box containing "09:53:58", and "Backlight Timeout(Min):" with a text box containing "30". In the bottom right corner, there is a green square button with a white left-pointing arrow.

Fig 3-8 : System Settings Screen

- 2) Touch the **Backlight Timeout** field to invoke the **Backlight Timeout Entry** screen. This sets the amount of time in minutes the 9705 is inactive before the unit display goes dark to conserve screen life.

Note:

A setting of zero (0) will prevent the backlight from timing out.

- 3) Press **OK** when finished to return to the **System Settings** screen.
- 4) Press the **Return** icon to return to the main screen.

3.8 Configuring Sounds

To change the sound effects when actions occur:

- 1) From the Main Screen, select the **Setup icon > Sounds** icon to invoke the **Sound Settings** screen, shown in [Figure 3-9](#).

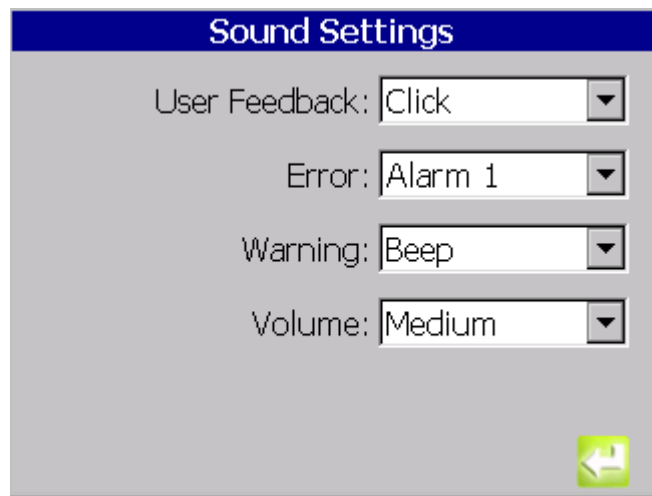


Fig 3-9 : Sound Settings Screen

- 2) Make changes by touching a field to invoke a dropdown menu, touching the desired choice to highlight it. Descriptions of fields and available choices are listed in [Table 3-3](#).

Table 3-3 : Sound Tab Field Descriptions

Field	Description	Entries
User Feedback	Sound effect for any action taken by the user	<ul style="list-style-type: none"> • None • Click • Beep
Error	Sound effect to indicate a critical system error that has stopped the sampling process	<ul style="list-style-type: none"> • None • Alarm1 • Alarm2 • Beep
Warning	Sound effect to indicate a non-critical system error which does not impede sampling but should be checked, such as low printer paper	<ul style="list-style-type: none"> • None • Alarm1 • Alarm2 • Beep
Volume	Sets volume of all sounds Note: <i>Mute turns all sounds off completely.</i>	<ul style="list-style-type: none"> • Mute • Low • Medium • High

- 3) Press the **Return** icon to save changes and return to the main screen.

3.9 Changing the Needles

The 9705 comes with two vent needles to allow sampling from a variety of bottle sizes.

- The shorter vent needle is used to sample 5-30 mL bottles.
- The longer vent needle is used to sample 50-125 mL bottles.

The vent needle must be removed to use the Large Volume Adapter (LVA); this process is described in [“Connecting the Large Volume Adapter” on page 35](#).

Note:

The short sampling needle does not need to be removed at any time. Do not attempt to remove the shortest needle.

To change needles:

- 1) Tilt the bottle dock forward.

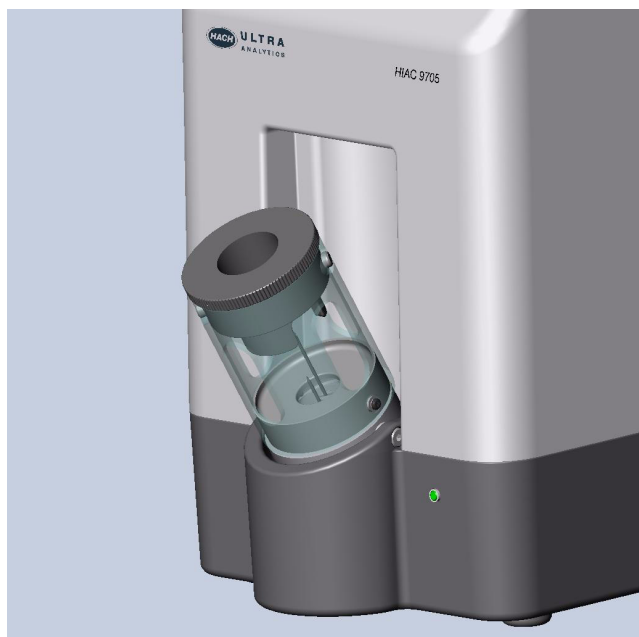


Fig 3-10 : Tilt Bottle Dock

- 2) Remove the bottle guide.



Fig 3-11 : Remove Bottle Guide

- 3) Carefully slide the removal tool over the longer needle.



Fig 3-12 : Insert Needle Removal Tool

- 4) Seat the tabs of the removal tool into the slot of the needle screw and turn counterclockwise to remove the needle.



Fig 3-13 : Seat the Tabs

- 5) Remove the needle from the bottle dock, carefully slide it out of the tool, and place it in the protective sleeve that it was originally supplied with.

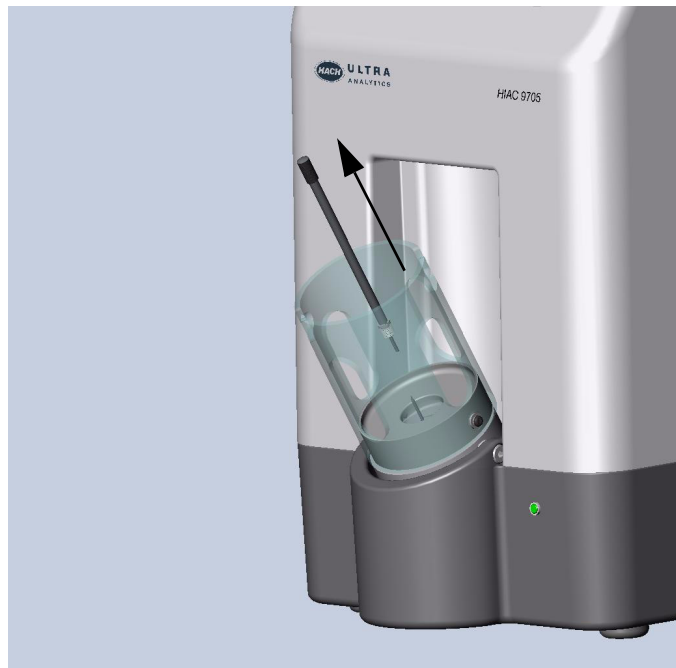


Fig 3-14 : Remove the Needle

- 6) Remove the replacement needle from its protective sleeve and carefully slide it into the needle removal tool.
- 7) Insert the needle into the bottle dock by seating the tabs of the removal tool into the slot of the needle screw and turning clockwise to secure the needle.
- 8) Remove the tool from the needle.
- 9) Tilt the bottle dock back. The 9705 is now ready for use with a different sample size.

3.10 Connecting the Large Volume Adapter

The 9705 can also be used with a Large Volume Adapter to sample from vessels greater than 125 mL. Using the Large Volume Adapter (LVA) requires these steps:

- 1) Remove the vent needle.
- 2) Connect the Large Volume Adapter to the sample needle.
- 3) Connect the Large Volume Adapter to the sampling probe.
- 4) Shorten the adapter tube length, if needed.
- 5) Calculate and enter the tare volume.

Note:

When using the LVA, the stir speed must be set to 0 (off). This procedure is described in "Changing Sample Parameters" on page 49.

3.10.1 Connecting the Large Volume Adapter to Sample Needle

- 1) Tilt the bottle dock forward.



Fig 3-15 : Tilt Bottle Dock

- 2) Remove the bottle guide.



Fig 3-16 : Remove Bottle Guide

- 3) Carefully slide the removal tool over the long needle.



Fig 3-17 : Insert Needle Removal Tool

- 4) Seat the tabs of the removal tool into the slot of the needle screw and turn counterclockwise to remove the needle.

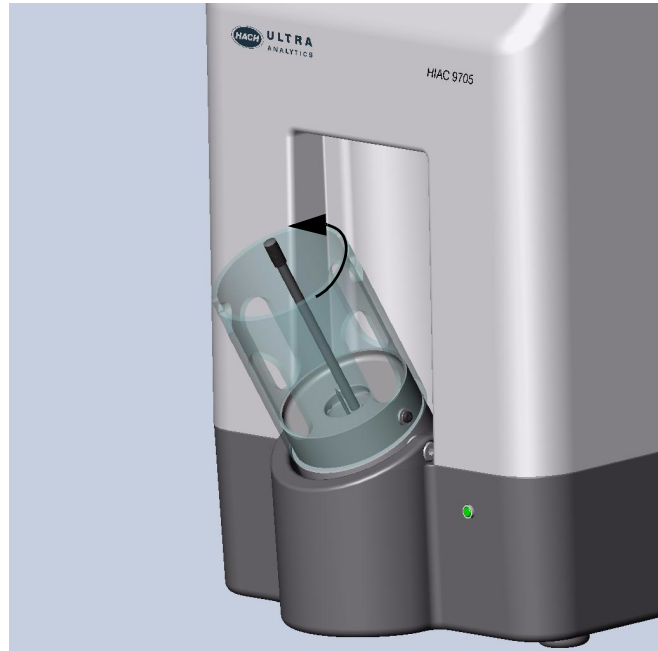


Fig 3-18 : Seat the Tabs

- 5) Remove the needle from the bottle dock, carefully slide it out of the tool, and place it in the protective sleeve that it was originally supplied with.

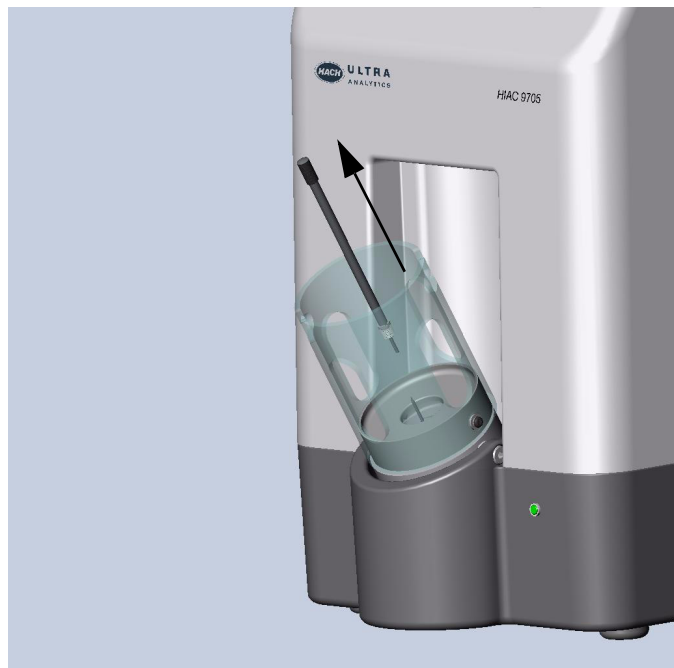


Fig 3-19 : Remove the Needle

- 6) Prepare the large volume adapter by turning the handle fully counterclockwise. This opens the internal O-ring.

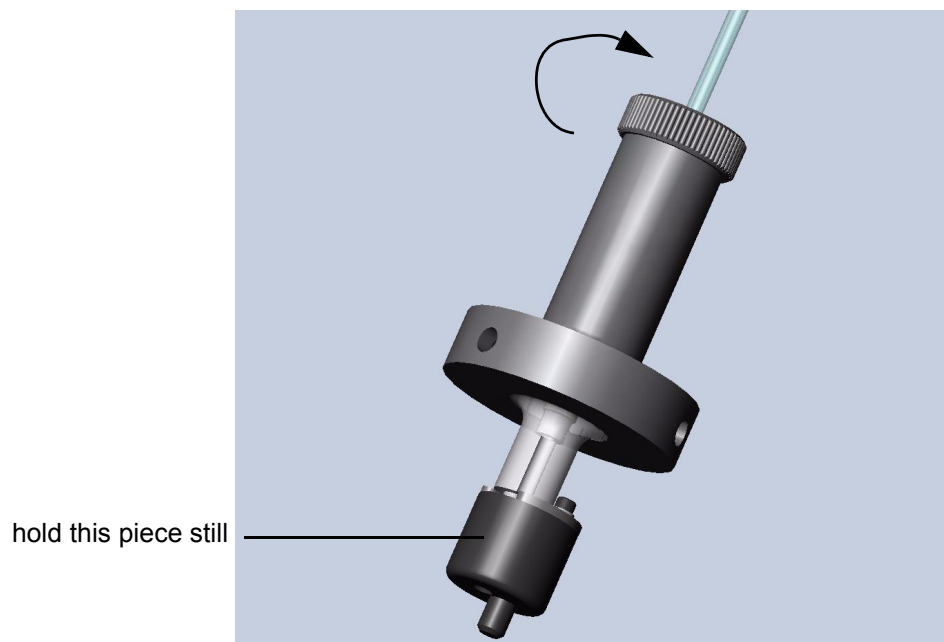


Fig 3-20 : Turn the Handle Counterclockwise

- 7) With the O-ring opened, align the adapter as shown in [Figure 3-21](#), such that the peg on the bottom aligns with the threaded hole in the bottle dock. Position the hole in the bottom of the adapter directly over the short needle.

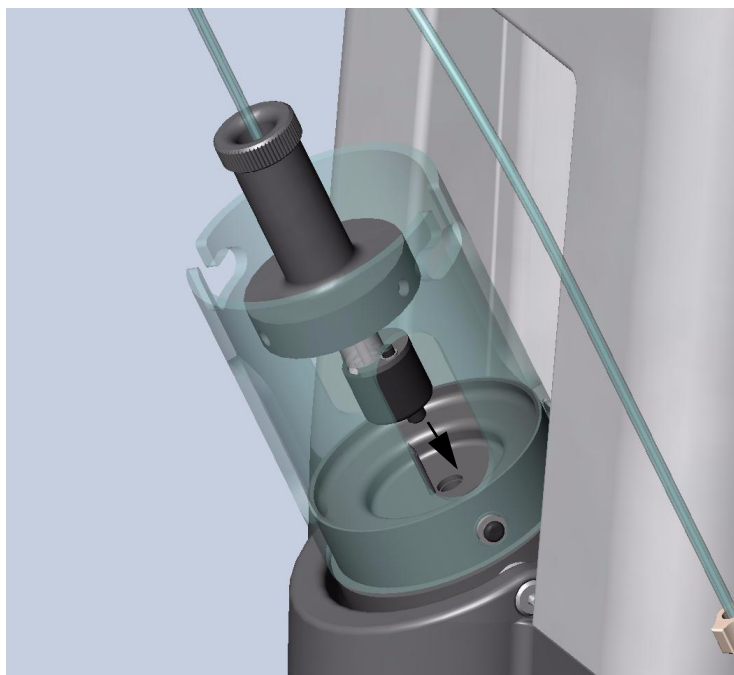


Fig 3-21 : Align the Adapter

CAUTION:

Do not damage the tip of the needle. Feed the needle CAREFULLY into the hole adjacent to the adapter peg.

- 8) Fully seat the adapter over the short needle such that the bottom sits firmly on the base of the bottle dock. Turn the adapter handle fully clockwise. This closes the internal O-ring.

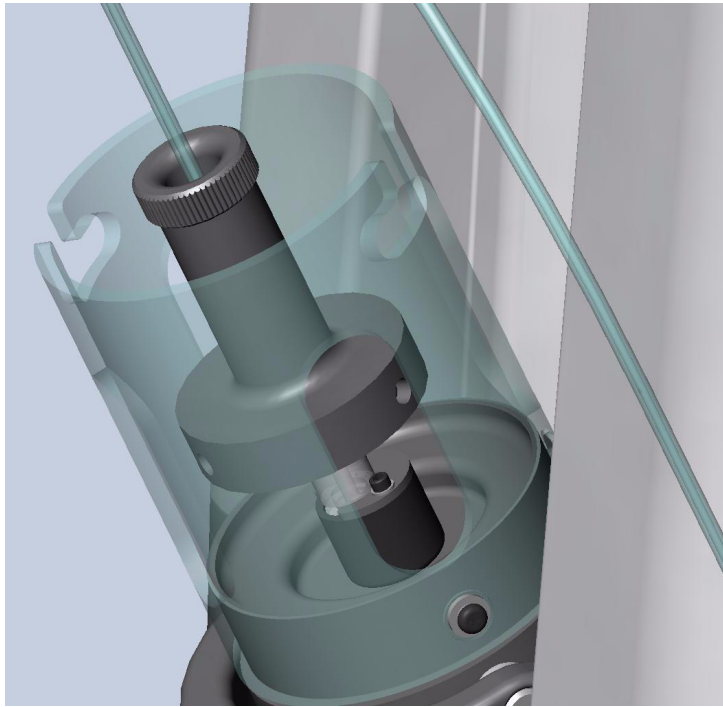


Fig 3-22 : Seat the Adapter

- 9) Pass the adapter tubing through the center hole of the bottle guide and install the bottle guide as shown to secure the adapter in place. Use the 20 mL guide for this purpose.

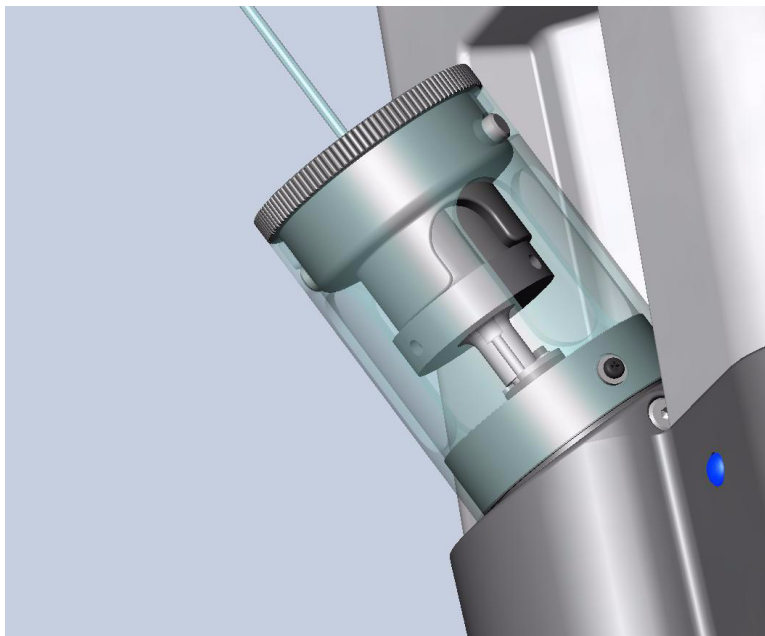


Fig 3-23 : Install the Bottle Guide

- 10) The large volume adapter is now ready to be connected to an external sampling probe, sample bag, or other vial.

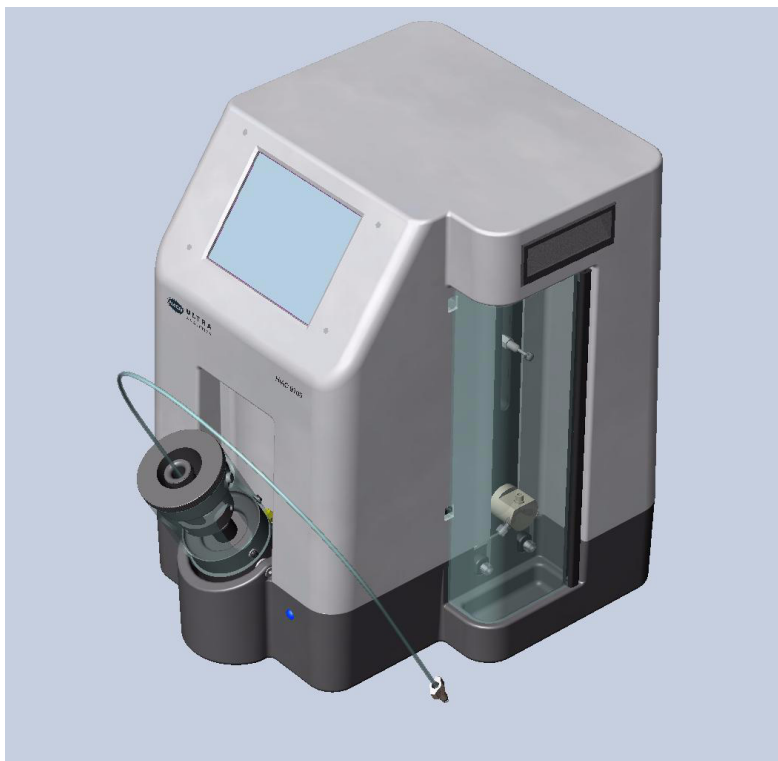


Fig 3-24 : Ready for LVA Connection

3.10.2 Connecting the Large Volume Adapter to the Sampling Probe

- 1) The sampling probe will be attached to a lab stand. Assemble the lab stand components as shown in [step 3-25](#).



Fig 3-25 : Lab Stand Assembly

- 2) Screw the sampling probe on to the 1/4-20 threaded stud on the end of the horizontal support rod.



Fig 3-26 : Connect the LVA Fitting to the Sampling Probe

- 3) Connect the large volume adapter fitting to the sampling probe.

Finger-tighten the connection clockwise until it bottoms, and then another 1/8 of a turn.

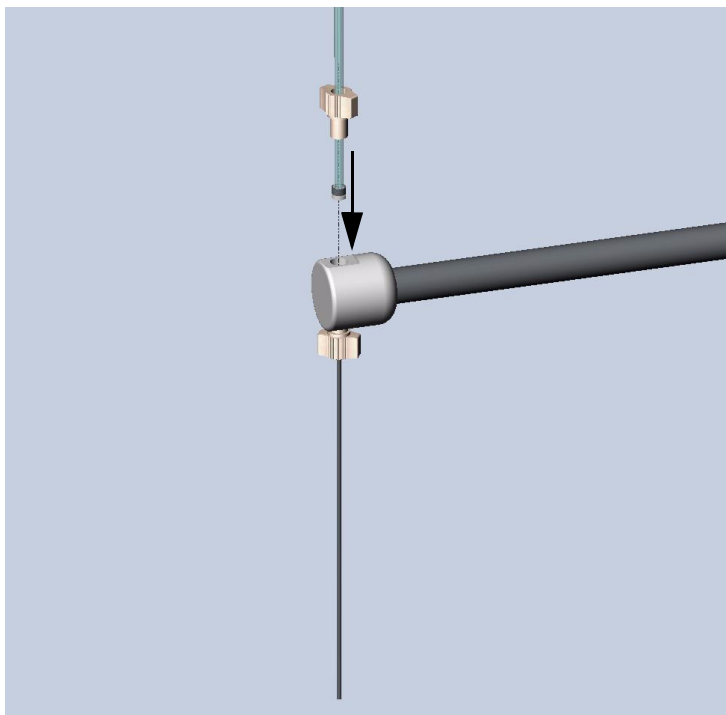


Fig 3-27 : Connect the LVA Fitting to the Probe



Fig 3-28 : Large Volume Adapter Assembly

3.10.3 Shortening the Adapter Tube Length

The Large Volume Adapter is supplied with a 24-inch long tube. It has a two piece ferrule pre-installed for connection into the sampling probe. The ferrule can not be re-used. If a shorter sample tube is desired, then proceed through the following steps.

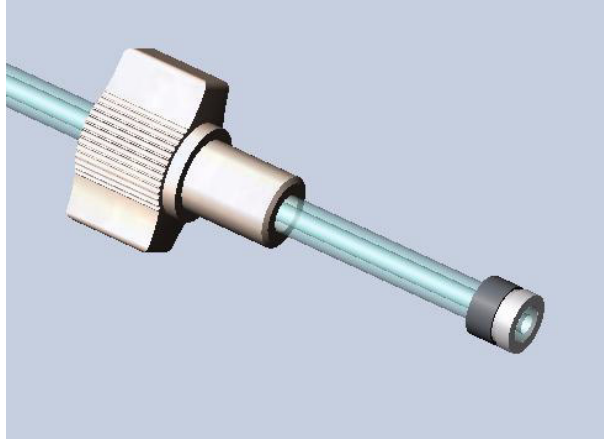


Fig 3-29 : Ferrule Installation

- 1) Leave the tube connected to the Large Volume Adapter. Cut the sampling probe end to the desired length. Make this cut clean and square. Leave the fitting nut on the tube as shown. Save the tubing that was cut off and observe how the ferrule is installed on it.

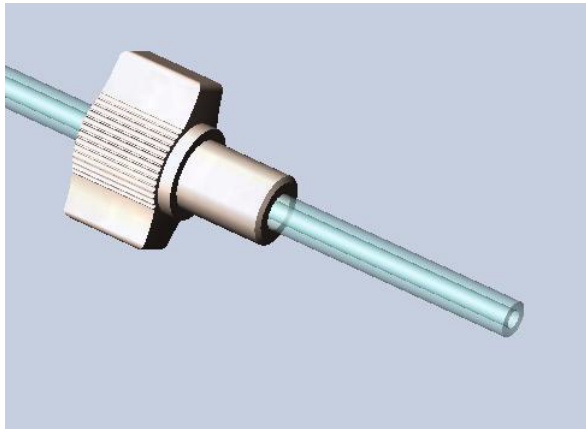


Fig 3-30 : Clean Cut of Tube

- 2) Carefully observe the loose stainless steel ferrule sleeve that has been supplied. Note that it has a flat end and the opposite end is sharp. It is a tapered sleeve.

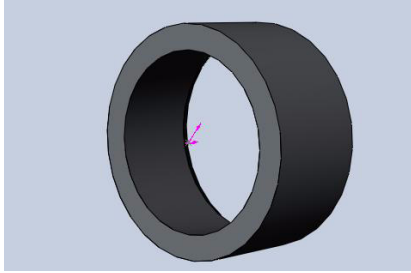


Fig 3-31 : Flat End



Fig 3-32 : Sharp End

- 3) Orient the two ferrule pieces as shown and slide them onto the tubing in the order shown.

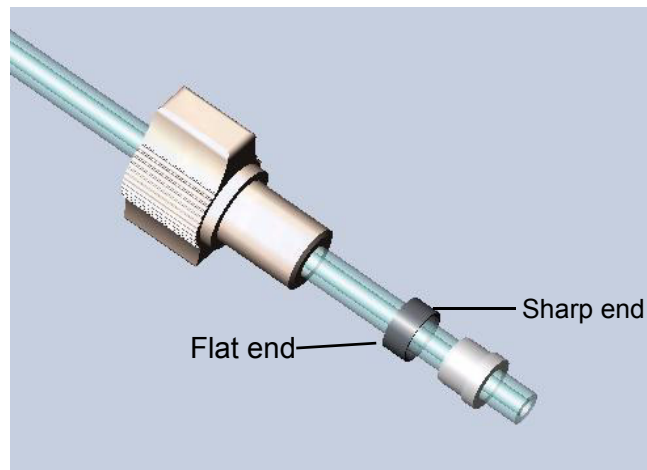


Fig 3-33 : Slide Ferrule Pieces onto Tubing

- 4) Connect the tube to the sampling probe. Tighten it completely by hand.

CAUTION:

The tube is to be inserted and held flush with the bottom of the port while the ferrules are pushed in and the nut is tightened.

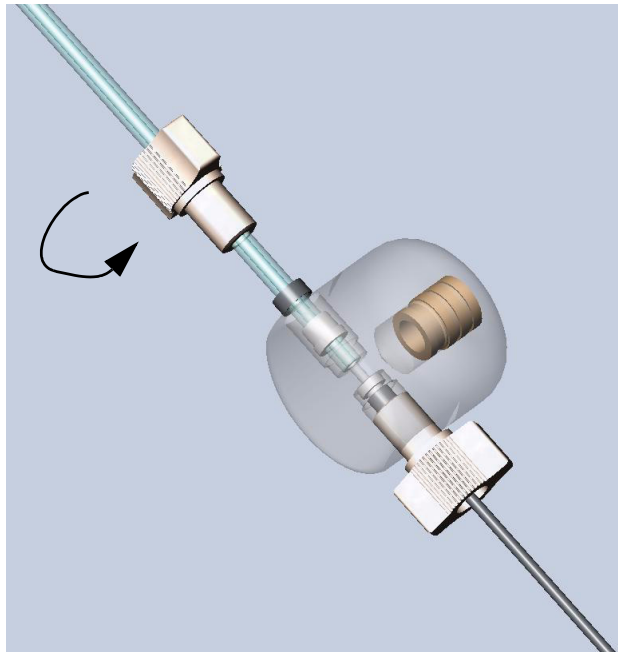


Fig 3-34 : Connect the Tube to the Probe

- 5) Remove the tube from the sampling probe and inspect the ferrule crimp. It should look the same as the ferrule cut off in [step 1](#). The tube end should be flush with the ferrule end and free of nicks and burrs.

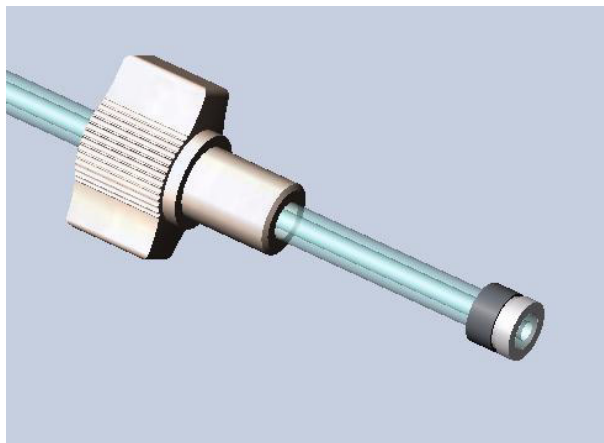


Fig 3-35 : Tube End Flush with Ferrule End

- 6) After inspection, re-insert the tube end into the sampling probe and tighten it completely by hand.

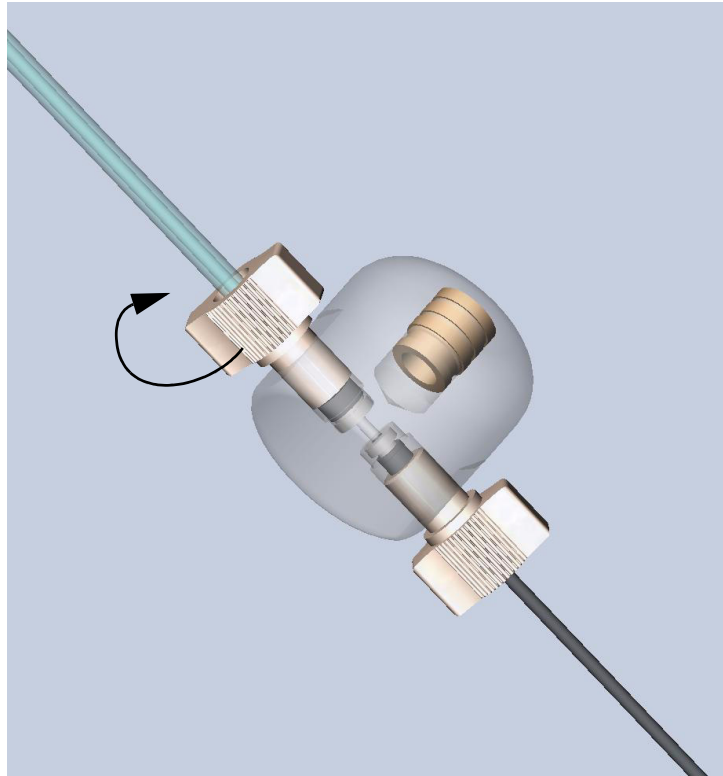


Fig 3-36 : Tighten by Hand

3.10.4 Alternate Use of Lab Stand as Sample Bag Hanger

The optional ram's horn hook can be fastened to the Lab Stand for hanging flexible bags, such as IV bags. The user will need to supply a suitable fitting to connect the flexible bag to the 1/8" outer diameter tubing of the Large Volume Sample Adapter.

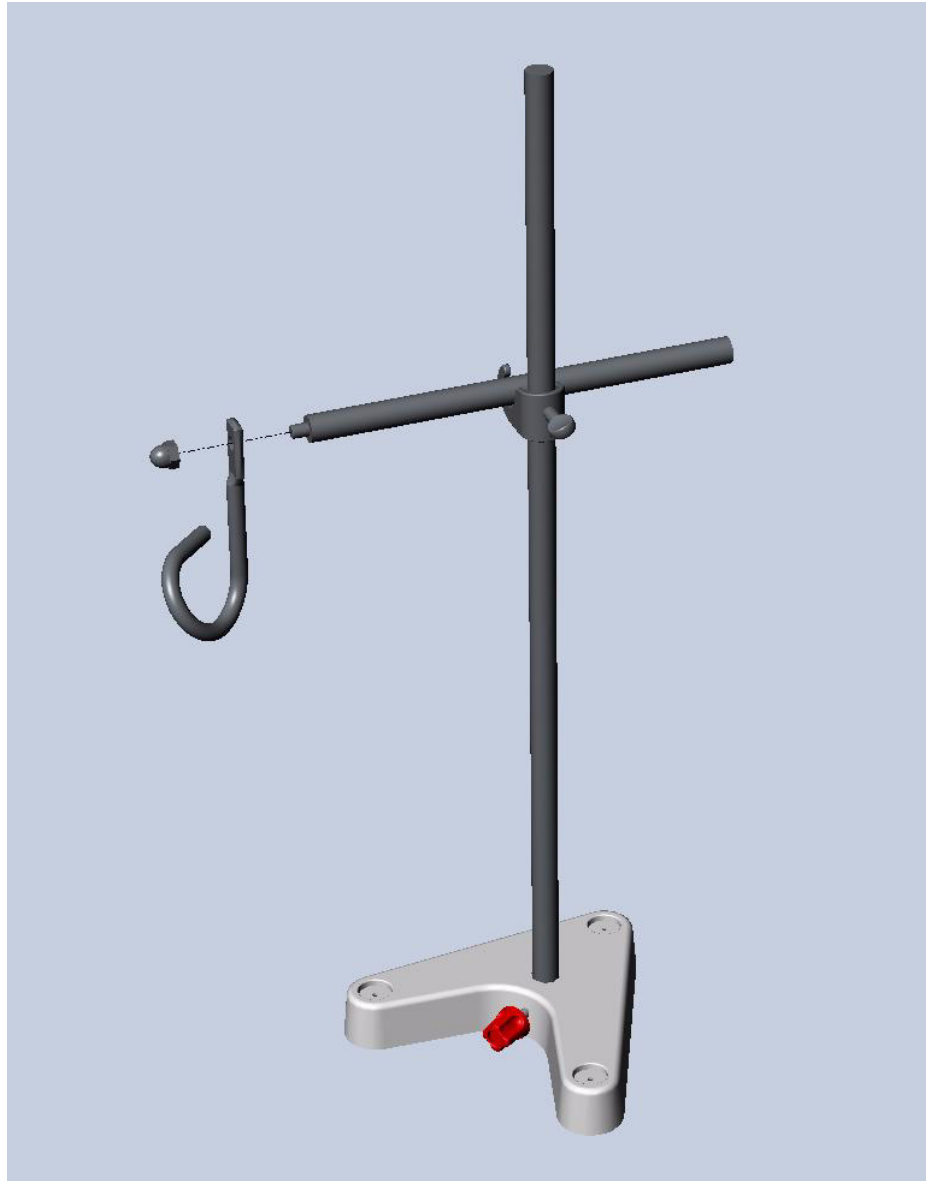


Fig 3-37 : Ram's Hook Attachment

3.10.5 Calculating Tare Volume

The tare volume when using the adapter can be calculated by adding the fixed component volume of 0.83 mL to the volume of the adjustable length tube. To calculate the volume of the adapter tube, multiply the length of the tube by 0.054.

Total Tare Volume = Fixed Component Volume + Tube Volume

Fixed Component Volume

9705 internal tare volume	0.54 mL	
Adapter fitting volume	0.11 mL	
Sampling probe assembly volume	0.18 mL	
	<u>0.83 mL</u>	Fixed Component Volume

Example tube volume for a 24 inch tube:

Adapter tube 24 inch @ 0.054ml/inch	1.30 mL	
	<u>1.30 mL</u>	Adjustable length tubing volume
Fixed Component Volume	0.83 mL	
Tube Volume	1.30 mL	
Total Tare Volume	<u>2.13 mL</u>	

- 7) Once the tare volume has been calculated, modify the tare volume factor in the 9705 by following the procedure described in [“Changing Sample Parameters” on page 49](#).

3.11 Changing the Syringe Size

- 1) Load a new syringe into the 9705 by using the procedure outlined in [“Syringe Installation” on page 15](#).
- 2) Turn the unit on.
- 3) From the sliding menu on the **Main screen**, select the **Setup** icon > **Syringe** icon to invoke the **Syringe Settings** screen, shown in [Figure 3-7 on page 29](#).
- 4) To change the syringe size, touch the field to invoke the dropdown menu, then touch the entry desired to make a selection. Valid entries include:
 - 1 mL
 - 10 mL
 - 25 mL
- 5) Press the **Return** icon to save changes and return to the main screen.

3.12 Changing Sample Parameters

- 1) To change the sample parameters, touch the upper right section of the screen where the sampling information is listed or from the icon bar on the **Main screen**, select the **Setup** icon > **Sample** icon, shown in [Figure 3-2 on page 23](#).
- 2) The **Sample Settings** screen displays as shown in [Figure 3-38](#).

The image shows a 'Sample Settings' screen with a blue header. Below the header, there are six input fields: 'Number of Runs' with the value 1, 'Sample Volume(mL)' with the value 5.0, 'Tare(mL)' with the value 0, 'Multi-Stroke Tare(mL)' with the value 0, 'Dilution Factor' with the value 1.00, and 'Stir Speed' with the value 4 and a dropdown arrow. At the bottom of the screen, there are three icons: a red up arrow, a red down arrow, and a green left arrow.

Fig 3-38 : Sample Settings Screen

- 3) To change a setting, touch the field to change the setting.
 - Numeric entry fields invoke a keypad entry screen similar to the one shown in [Figure 3-39](#).
 - Dropdown menu selections are made by touching the field to invoke the menu, then touching the desired setting to highlight it.
- 4) Press **Save** and **OK** to save the settings and exit the **Sample Settings** screen.

Note:

Press **Load** to reload the default settings.

Settings for the **Sample Settings** screen are described in [Table 3-4](#).

Table 3-4 : Sample Settings Fields

Field Name	Description	Valid Entries
Number of runs	The number of samples taken from one bottle at one time	1 through 32
Sample Volume	The volume of sample taken from the bottle for each run	0.1 through 10000.0 mL
Tare	A tare volume is a volume of fluid that is drawn before the counter begins counting particles. A tare volume ensures that the sample fluid is moving at the desired flow rate and that no liquid meniscus passes through the sensor during counting operations. Refer to “Calculating Tare Volume” on page 48 when using the Large Volume Adapter.	0.0 through 25.0

Table 3-4 : Sample Settings Fields

Field Name	Description	Valid Entries
Multi-Stroke Tare	The multi-stroke tare can be used when sampling volumes larger than the syringe size. These sample volumes require the liquid to be brought to speed before the sample is taken.	0.0 through 25.0
Dilution Factor	Ratio of fluid to be added to the sample for dilution.	1.00 and 99.99
Stir Speed	Speed the stirring mechanism will agitate the sample bottle.	0 through 10 <ul style="list-style-type: none"> • 0 is off (use with Large Volume Adapter) • 1 is slowest • 10 is fastest

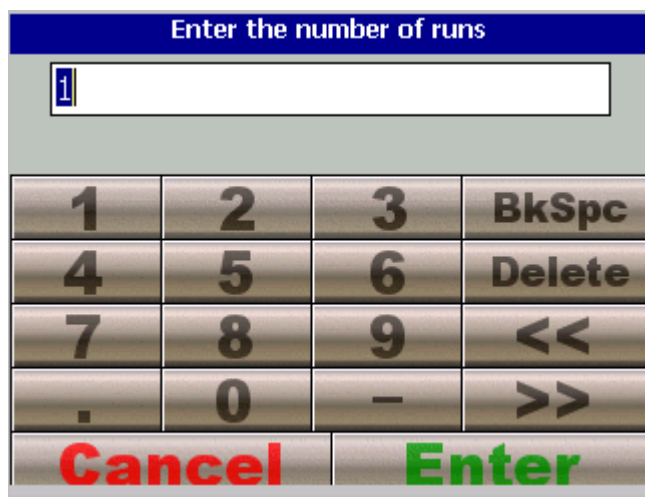


Fig 3-39 : Numeric Keypad Entry Screen, Number of Runs

3.13 Automatically Printing Results

The 9705 can automatically print results every time a sample run is completed.

- 1) From the main screen, select the **Settings** button > **Print** to invoke the **Print** tab, shown in [Figure 3-40](#).

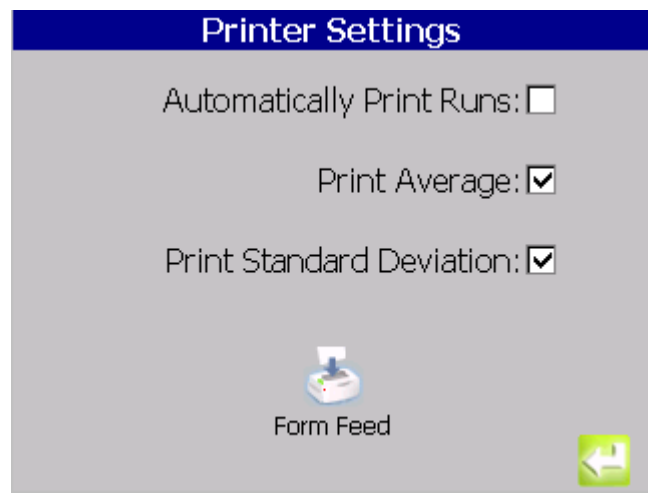


Fig 3-40 : Print Tab

- 2) Select **Automatically Print Runs** by touching the checkbox to mark it.
- 3) Set the average or standard deviation to print by clicking the boxes.
- 4) Press **Return** to return to the main screen.

3.14 Password Protection

Password protection enables the functions listed in [Table 3-5](#) to only be accessible once a password has been entered. When security is enabled, users must enter a password to access most functions.

Table 3-5 : Functions Affected by Password Security

Affected by Password Security	Not Affected by Password Security
<ul style="list-style-type: none"> • Settings • Diagnostics • Flush • Run 	Ability to toggle graph/chart display

3.14.1 Enabling Password Protection

- 1) From the **Main screen**, select the **System** icon > **Security** icon to invoke the **Security Settings** screen shown in [Figure 3-41](#).



Fig 3-41 : Security Settings Screen

- 2) Touch the **Enabled Security** checkbox to enforce password protection.

CAUTION:

For system security, immediately change the password from the default.

Note:

Once a password has been set, it cannot be deleted. If a password is lost or forgotten, call Hach Ultra at 800.866.7889 or +1-541.472.6500 for assistance.

- 3) Press the **Return** icon to save changes and return to the main screen.

3.14.2 Changing the Password

- 1) From the **Main screen**, select the **System** icon > **Security** icon to invoke the **Security Settings** screen shown in [Figure 3-41](#).
- 2) Press the **Change Password** icon to invoke the **Change Password** screen.
- 3) Touch the **Enter New Password** field. A keyboard entry screen appears.
- 4) Enter the new password from the keyboard entry screen.
 - Passwords are case-sensitive and must be at least 1 character and no longer than 12 characters.
 - Asterisks appear in the field to preserve the password's security.
- 5) Press **Enter**.
- 6) Touch the **Confirm new password** field to invoke a keyboard screen. Re-enter the new password and press **Enter** to close the keyboard entry screen.
- 7) Press the **Return** icon to save changes and return to the main screen.

Note:

Once a password has been set, it cannot be deleted. If a password is lost or forgotten, call Hach Ultra at 800.866.7889 or +1-541.472.6500 for assistance.

3.14.3 Disabling Passwords

- 1) From the **Main screen**, select the **System** icon > **Security** icon to invoke the **Security Settings** screen shown in [Figure 3-41](#).
- 2) From the **Security Settings** screen, touch the **Enabled Security** checkbox to remove the check and turn off password protection.
- 3) Press the **Return** icon to save changes and return to the **Setup** screen.

4 Operating the 9705

The Model 9705 Liquid Particle Counting System operates as both particle counter and sampler in one self-contained unit.

4.1 Touch Screen Familiarization

The touch screen of the 9705 is divided into three sections as shown in [Figure 4-1](#).

- The upper left corner of the screen contains any notes given on a sample. The arrow keys to the right of the notes field allow scrolling through the notes.
- The upper right corner of the screen shows the current settings for:
 - Sample volume
 - Flow rate
 - Number of runs
 - Dilution factor
- The lower half of the screen shows the particle sizes being monitored and either the current count or the last count taken. The arrows to the right allow scrolling to see all sizes and counts, if necessary.
- The status of the 9705 is shown at the bottom of the screen, running a sample or sample stopped.

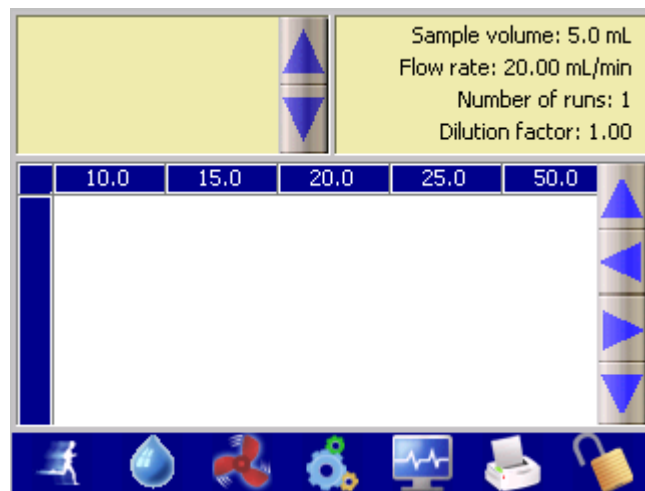


Fig 4-1 : Main Screen

The icon bar allows access to these functions:

- Run/stop sampling
- Swirling
- Check system diagnostics
- Lock or unlock system security
- Flush system
- Configure settings
- Print sample results

4.2 Preparing Samples



WARNING

Only trained personnel should create septa-sealed sample bottles. Be sure to wear protective clothing while creating septa-sealed sample bottles, including eye protection.

To prepare samples:

- 1) Follow good sampling practices to obtain a representative sample as determined by the applicable standard operating procedure.
- 2) Make sure bottles are clean by rinsing in deionized water ten times or following the facility's Standard Operating Procedures (SOPs) before proceeding.
- 3) Transfer the sample to the appropriate size sample bottle by pouring, using a pipette, or following the method specified in the facility's SOPs.
- 4) Making sure the top of the bottle is dry, place a septa seal in the opening of the bottle.
- 5) Place the aluminum seal on top of the septa and use the hand crimper to seal the bottles.



WARNING

Be careful when crimping the seals to avoid pinching fingers.

4.3 Loading Samples into the Accu-Swirl



WARNING

Needles are sharp. Avoid contact with needles while loading and unloading sample bottles into the 9705.

To load a sample:

- 1) Prepare sample as described in [“Preparing Samples” on page 56](#).

CAUTION:

Make sure there is sufficient sample volume in the bottle. Running the 9705 with an insufficient sample volume loaded may result in erroneous counts.

- 2) If present, remove the perforated center of the metal seal from the top of the bottle and discard.
- 3) Tilt the bottle dock outward, away from the body of the 9705 unit.
- 4) Position the bottle in the bottle dock with the top (down) facing the needles.



WARNING

Needles are sharp. Be careful not to contact the needles.

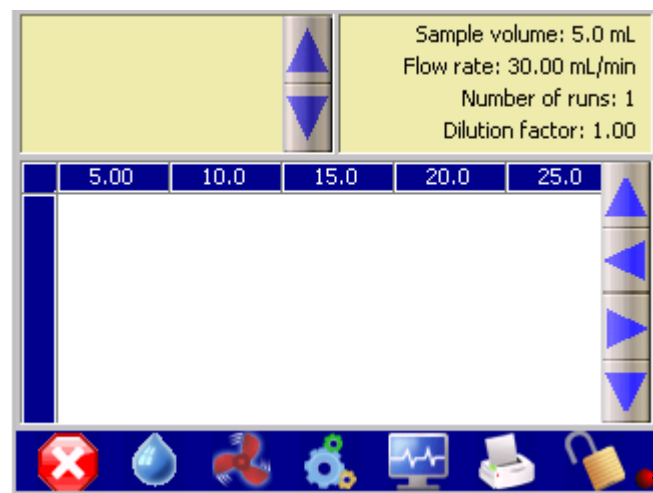
- 5) Press the bottle down gently but firmly. Make sure both needles penetrate the rubber stopper of the bottle and that the bottle is seated securely.
- 6) Tilt the bottle dock towards the body of the 9705 unit until it snaps into place.

4.4 Loading Samples with the Large Volume Adapter

Attach the sample vessel to the 9705 as described in [“Connecting the Large Volume Adapter” on page 35](#). Make sure the stir speed is set to 0 (off).

4.5 Running a Sample

- 1) Once the bottle is loaded or the large volume adapter is attached, double-check that the settings in the upper right hand corner of the display are correct. If necessary, change settings as described in [“Changing Sample Parameters” on page 49](#).
- 2) From the **Main Screen**, press the **Swirl** icon to begin particle dispersion.
- 3) Press the **Run** icon to start the sample run. A red light appears to the right of the **Lock** icon in the icon bar, as shown in [Figure 4-2](#). This light appears when a sample is being drawn, during both tare volume and sample volume.



Test Running Indicator

Fig 4-2 : Main Screen with Red Status Light

- 4) While the sample run is in progress, parameters cannot be changed. Click on the lower portion of the main screen to toggle between viewing the data in a chart form and in a graph form. In the chart form, use the blue arrows at the right of the screen to scroll through the data. Runs appear on Y-axis; particle sizes appear on the X-axis.
- 5) If laser current or calibration is detected to be out of range, a yellow caution triangle appears on the screen. Click on the triangle to invoke the **Diagnostic** screen. Refer to [“Diagnostics and Troubleshooting” on page 65](#) for more information.
- 6) When the run is finished and all samples have been taken from the bottle, the red light will disappear. Tilt the bottle dock away from the unit to begin unloading the sample.
- 7) Place fingers through the holes on the side of the bottle dock. Gently but firmly pull up on the bottle, being careful not to come in contact with the needles.
- 8) Dispose of any sample bottles according to standard operating procedures (SOPs). Do not re-use samples since they are no longer sterile.

- 9) Load a bottle of deionized water and flush the system by pressing the **Flush** icon to ensure no sample remains in the inner tubing before running the next sample.

4.5.1 Adding Notes

From the **Main Screen**, the **Notes** tab is also available. To add notes about the sample, such as information about the location, type, or any identifying information about the sample:

- 1) Touch the upper-left hand corner of the main screen to invoke the **Notes** screen, shown in [Figure 4-3](#).

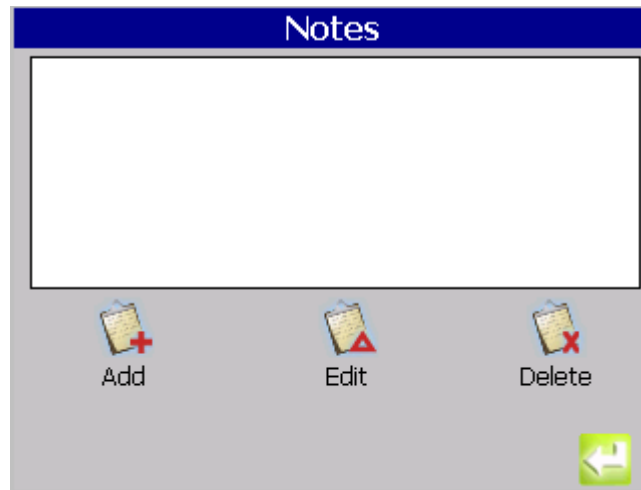


Fig 4-3 : Notes Tab

- 2) To add notes, touch the **Add Notes** icon to invoke a keyboard entry screen. Notes are limited to 24 characters per line.
- 3) Press **Enter** to return to the **Notes** screen.
- 4) Press the **Return** icon to return to the main screen and start the run. The note will appear the next time a run is initiated.

4.5.2 Editing Notes

- 1) To edit a note, access the **Notes** screen by tapping the upper left corner of the main screen.
- 2) Highlight the note and tap **Edit**. A keyboard entry screen appears. Notes are limited to 24 characters.
- 3) Press **Enter** to finish the entry and return to the **Notes** tab.

4.6 Printing Results

Results may be printed automatically or manually.

4.6.1 Automatically Printing Results

The 9705 can automatically print results every time a sample run is completed.

- 1) From the main screen, select the **Settings** icon > **Printer** icon to invoke the **Printer Settings** screen, shown in Figure 4-4.

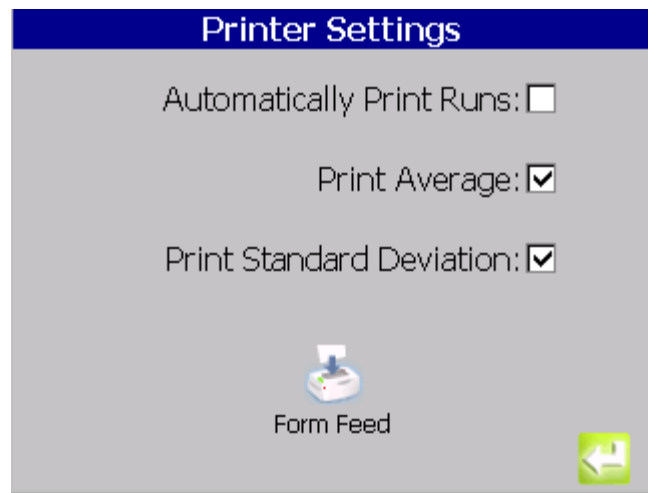


Fig 4-4 : Print Tab

- 2) Select **Automatically Print Runs** by touching the checkbox to mark it.
- 3) Set the average or standard deviation to print by clicking the boxes.
- 4) Press **Return** to return to the **Setup** screen.

4.6.2 Manually Printing Results

- 1) From the main screen, select the **Print** icon.
- 2) The currently displayed data record prints.

4.7 Operating with PharmSpec

The Model 9705 Liquid Particle Counting System can be used with PharmSpec 2.1 software. Refer to the PharmSpec Software User Guide (part number 720-100-0063) for additional information on operating with PharmSpec software.

5 Maintenance Procedures

5.1 Overview

This section describes maintenance procedures. The recommended intervals for each procedure are shown in [Table 5-1](#).

Table 5-1 : Preventative Maintenance Timetable

Procedure	Daily	As Needed
"Cleaning the 9705" on page 61		X
"Flushing the 9705" on page 62	X	
"Syringe Maintenance" on page 62		X
"Sensor Port Cleaning" on page 62		X

5.2 Cleaning the 9705

With use, the exterior of the instrument may become dirty or soiled. If liquid spills on the exterior, or if the instrument becomes dirty, follow these steps to clean the instrument.



WARNING

If a hazardous chemical comes in contact with the touchscreen, clean the touchscreen immediately to prevent human contact with the chemical.

To clean the touchscreen, first wipe it with a soft cloth. If debris remains, wipe with a soft cloth moistened with a mild cleaning solution or alcohol.

CAUTION:

Do not spray the touchscreen with solution as the solution may penetrate the electronics and damage the 9705.

Note:

Verify all panels are in place and the interior components are not exposed before starting this procedure.

- 1) Wipe the exterior surfaces with a moist cloth.
- 2) If the instrument is still not clean, wipe any exterior surfaces except for the touchscreen with soap and warm water. Rinse with a damp cloth.
- 3) If the instrument is still not clean, moisten a lint-free tissue with isopropyl alcohol. Wipe the exterior surfaces with the moistened tissue.

5.3 Flushing the 9705

- 1) Insert a bottle of deionized (DI) water into the Accu-Swirl or connect the Large Volume Adapter (LVA) to a container of DI water.
- 2) From the **Main Screen**, press **Flush**. Flush as many as times as required by applicable SOPs. Flushing with at least 10 cm³ of clean fluid is recommended.
- 3) Remove water when finished.

5.4 Syringe Maintenance

The Cavro™ syringes provided for the syringe drive perform optimally when these guidelines are followed:

- Do not run syringes for more than a few cycles without liquid in them.
- Thoroughly flush the syringe with distilled or deionized water after each use.
- If the plunger is removed from the syringe, wipe the plunger with alcohol before replacement.
- Clean the syringes periodically with a mild detergent. Allow the detergent to sit in the syringe for 30 minutes or more, then flush the syringe with distilled or deionized water for at least 10 cycles.
- If the plunger does not move easily in the barrel, remove the plunger and wet the plunger seal with deionized water.

5.5 Sensor Port Cleaning

The sensor port should be cleaned whenever large particles clog the cell.

- 1) Remove the clean-out port cap.
- 2) Retrieve a clean cell cleaning brush from the shipping container.
- 3) Slide the brush into the cleaning port, shown in [Figure 5-1](#) until resistance is encountered.

CAUTION:

Excessive pressure will result in brush and possible cell damage. If the brush will not go into the cell, pull the brush out and inspect the cleaning tip for damage.



Fig 5-1 : Insert Brush Into Cleaning Port

- 4) Gently push the brush into the sensor with a twisting motion.
- 5) Once the cell has been cleaned with the brush, remove the brush and reinstall the clean-out port cap. Tighten cap snugly. *Do not over-tighten.*
- 6) Flush the sensor with at least 30 cm³ of clean fluid.

6 Diagnostics and Troubleshooting

6.1 Error Messages

When error messages occur, a pop-up window appears with the error message highlighted.

Any sound effects related to errors will be heard.

- Press **Silence Alarm** to stop the sound but keep the error message on the screen.
- Press **OK** to close the error message pop-up window and view the **Diagnostics** tab.

Error messages are described in [Table 6-1](#).

Table 6-1 : Error Messages

Error Message	Cause	Solutions
Syringe door open	Occurs when the syringe door is ajar	Close syringe door
Communication error	Occurs when communications are lost	<ul style="list-style-type: none"> • Double-check all communications connections. • Reboot the 9705.
Flow system error	Occurs when there is a problem with the flow of sample through the 9705	<ul style="list-style-type: none"> • Double-check all communications connections. • Reboot the 9705.

6.2 Troubleshooting Steps

[Table 6-2](#) shows a list of symptoms, possible causes and solutions for various 9705 problems.

Table 6-2 : 9705 Symptoms and Solutions

Symptom	Possible Cause	Solution
Unit will not power up.	Unit may be disconnected from AC power.	Check AC power connection.
	Check fuses in AC power cord.	Replace faulty fuses.
Screen is dark.	Backlight timeout is in effect.	Tap touchscreen. If tone sounds and screen still does not light, contact technical support.

6.3 Diagnostics Screen



Fig 6-1 : Diagnostics Icon

When a warning condition exists, such as a value out of range, a yellow **Caution!** triangle appears on the screen. Press the yellow triangle or the **Diagnostics** icon, shown in [Figure 6-1](#), to invoke the **Diagnostics** screen, shown in [Figure 6-2](#).

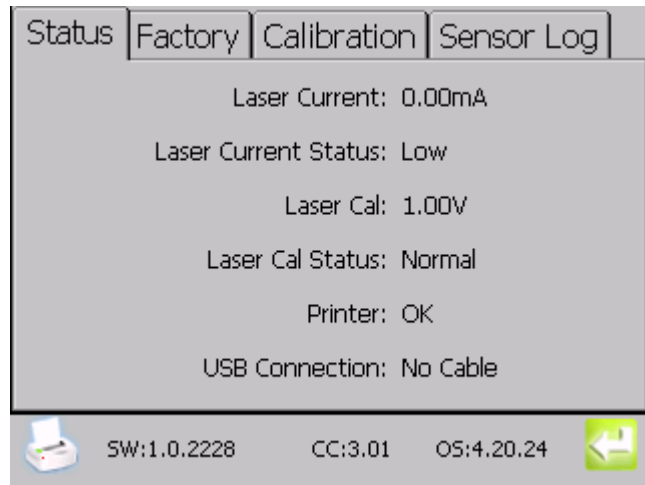


Fig 6-2 : Diagnostics Screen

While the 9705 has a limited number of user-serviceable parts, the **Diagnostics** tab lists information that may be useful either to the end user or Technical Support.

The **Diagnostics** screen is divided into four tabs:

- **Status**
- **Factory**
- **Calibration**
- **Sensor Log**

All **Diagnostics** tabs allow two functions:

- Printing the information displayed
- Closing the **Diagnostics** tab via the **Return** icon

All information is read-only and cannot be edited.

6.3.1 Status Tab

The **Status** tab, shown in [Figure 6-3](#), lists the information in [Table 6-3](#).

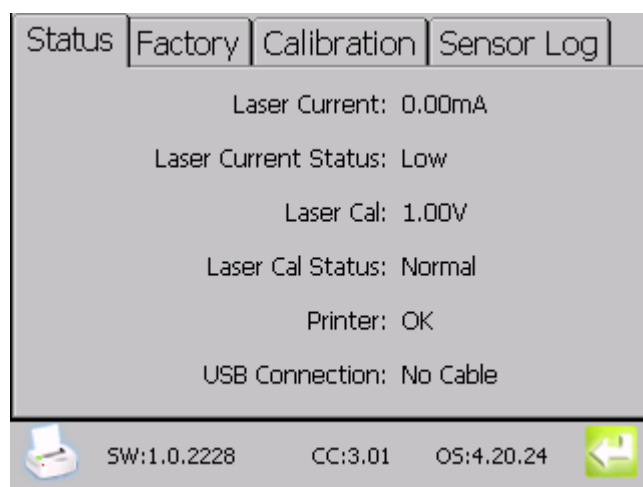


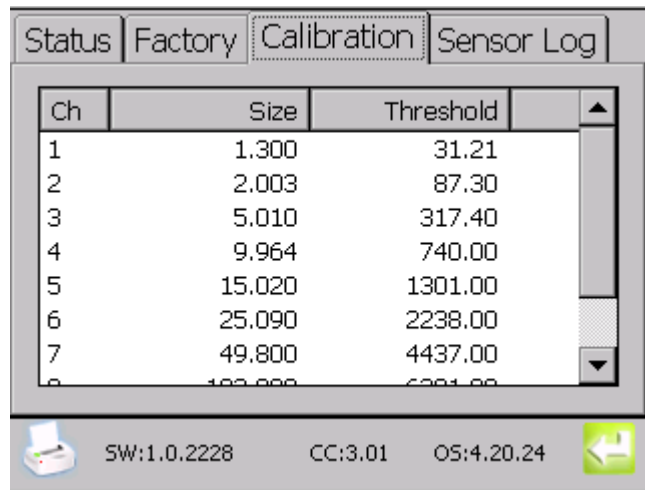
Fig 6-3 : Status Tab

Table 6-3 : Status Tab Fields

Field	Description
Laser Current	Displays the laser current value
Laser Current Status	<ul style="list-style-type: none"> • Normal • Low (exceeds minimum) • High (exceeds maximum)
Laser Cal	Displays the laser calibration voltage
Laser Cal Status	<ul style="list-style-type: none"> • Normal • Low (exceeds minimum) • High (exceeds maximum)
Printer	
USB link	Displays current status of the USB link: <ul style="list-style-type: none"> • Connected • Offline

6.3.2 Calibration Tab

The **Calibration** tab lists calibration data thresholds for each particle size channel in the 9705, as shown in [Figure 6-4](#). This tab is for factory use only.

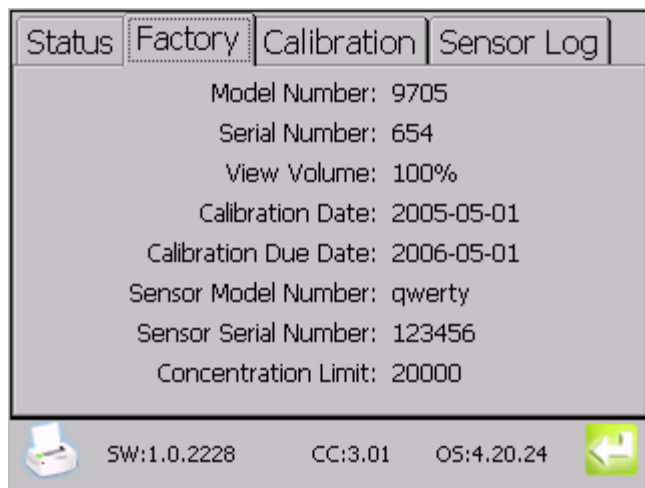


Ch	Size	Threshold
1	1.300	31.21
2	2.003	87.30
3	5.010	317.40
4	9.964	740.00
5	15.020	1301.00
6	25.090	2238.00
7	49.800	4437.00
8	100.000	6000.00

Fig 6-4 : Calibration Tab

6.3.3 Factory Tab

The **Factory** tab lists factory-set information, such as the model number, serial number, and unit calibration data, as shown in [Figure 6-5](#). This tab is for factory use only.



Model Number: 9705
Serial Number: 654
View Volume: 100%
Calibration Date: 2005-05-01
Calibration Due Date: 2006-05-01
Sensor Model Number: qwerty
Sensor Serial Number: 123456
Concentration Limit: 20000

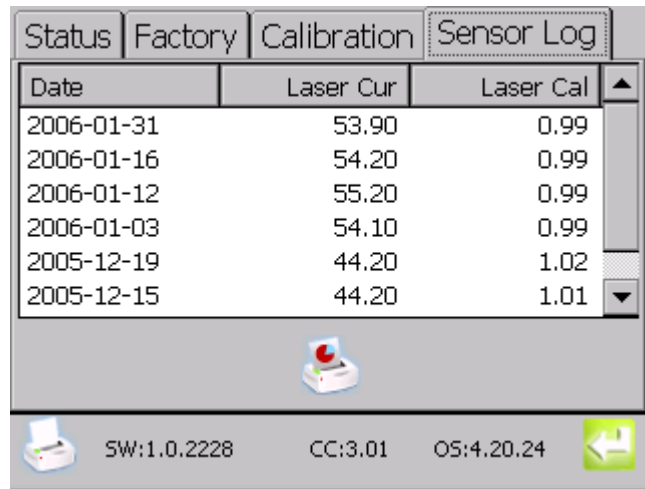
Fig 6-5 : Factory Tab

Table 6-4 : Factory Tab Fields

Field	Description	Field Values
Model Number	Model number of the 9705	Read-only
Serial Number	Serial number of the 9705	Read-only
View Volume	View volume of the sensor	1 through 100
Calibration Date	Date the 9705 was calibrated	Read-only
Calibration Due Date	Date the 9705's calibration expires	Read-only
Sensor Model Number	Model number of the sensor	Maximum 10 characters
Sensor Serial Number	Serial number of the sensor	Maximum 10 characters
Concentration Limit	Concentration limit of the installed sensor	0 through 100,000

6.3.4 Sensor Log Tab

The **Sensor Log** tab lists laser current and calibration information for the 9705, as shown in Figure 6-6.



The screenshot shows a software interface with four tabs: Status, Factory, Calibration, and Sensor Log. The Sensor Log tab is active, displaying a table with three columns: Date, Laser Cur, and Laser Cal. The table contains six rows of data. Below the table is a printer icon. At the bottom of the interface, there is a status bar with a printer icon, the text 'SW:1.0.2228', 'CC:3.01', 'OS:4.20.24', and a green arrow icon.

Date	Laser Cur	Laser Cal
2006-01-31	53.90	0.99
2006-01-16	54.20	0.99
2006-01-12	55.20	0.99
2006-01-03	54.10	0.99
2005-12-19	44.20	1.02
2005-12-15	44.20	1.01

SW:1.0.2228 CC:3.01 OS:4.20.24

Fig 6-6 : Sensor Log Tab

Appendix A: Service Procedures

A.1 Return Procedures

To return the Model 9705 Liquid Particle Counting System for service, first obtain a returned material authorization number (RA#). The RA# is necessary for any instrument that requires repair or calibration by an authorized service center. Include the RA# on the shipping label when the instrument is returned.

While the RA# process is described in this section, for the most up-to-date RA# process information, including copies of all required forms, call Hach Ultra at 800.866.7889 or +1 541.472.6500.

To return an instrument for credit, please contact the local sales representative.



WARNING

The following actions must be performed when returning any unit for any reason to prevent personal injury and/or damage to the unit.

- Before shipping or storing the unit, run a test without attaching a sample vial to purge the unit of all liquid.
- All analyzers returned for repair or replacement must be thoroughly cleaned and all process material is removed.
- Sludge contains bacteria that could be hazardous to Hach Ultra personnel. If a contaminated unit is received, Hach Ultra reserves the right to have the unit removed and destroyed by a hazardous material disposal team at the shipper's expense.

A.2 Technical Support Information

Technical Support Engineers are available to provide high quality advice and recommendations for applications, product operation, measurement specifications, hardware and software, factory and customer site training.

Please provide name, company, phone, fax, model number, serial number and comment or question.

Call +1 (541) 472-6500

Toll Free (800) 866-8854 (US/CA)

Fax +1 (541) 474-7414

6:00 AM to 5:00 PM Pacific Time

Monday through Friday

Email: TechSupportGP@hachultra.com

Appendix B: Specifications and Accessories

B.1 Performance Specifications

Temperature Range	10 to 40°C
Relative Humidity	20 to 80%, non-condensing
Temperature Range of Sample	5 to 40°C
Viscosity Limit	< 15 cp
Voltage	100 to 240 VAC, 50-60 Hz
Power	90 VA maximum
Current	0.5A at 115VAC
Fusing	1.25A, 250VAC, Type T, SB, 5 x 20mm
Dimensions (H x W x D)	40.5 x 30.1 x 34.3 cm (16.0 x 11.9 x 13.5 in)
Weight	10.7 kg (23.5 lbs)
Sample Bottle Clearance	11.8 cm (4.6 in)
Tare Volume	0.54 mL
Volume Accuracy	± 2%
Flow Rate Accuracy	± 3%
Sample Flow Rate	10 - 60 mL/min; default is 20 mL/min
Concentration Limit	10% coincidence loss @ 10,000 cts/mL (10µm PSL)
Sizing Range	1.3 µm to 150 µm
Sample Vial Sizes	5 mL, 10 mL, 20 mL, 30 mL, 50 mL, 60 mL, 100 mL, 125 mL
Software Compatibility	PharmSpec 2.1 or higher

Note:

Actual flow rate is determined by the particular sensor calibration flow rate.

B.2 Accessories

Table B-1 : Included Accessories

Part Number	Description
VP069201	Sensor Cleaning Brush
2087866-03	100 mL Adapter Ring
2087864-02	Standard Needle for 50-125 mL Bottles
2087809-01	Large Volume Adapter
210-400-517	Stylus
2087831	Needle Removal Tool

Table B-1 : Included Accessories

Part Number	Description
460-400-571	USB Cable, 2 m
460519	Printer paper
510667	Power cord
460-400-4799	USB Cable, 2 meter, A to B TYPE

Table B-2 : Optional Accessories

Part Number	Description
2087804-01	Accessory Kit: Adapter rings (5, 10, 20, 30, 60, 100, 125 mL), short needle for 5 - 30 mL bottles, standard needle, printer paper
2088030-XX	Sample Prep Kit: Capper tool, decapper tool, 20 bottles, 100 caps and seals, adapter ring. Specify bottle and adapter ring size.
2087809-02	Large Volume Adapter w/ Integrated Stirrer
690-500-0018	Capper Tool
690-500-0019	Decapper Tool
2087865-01	5 mL Adapter Ring
2087865-02	10 mL Adapter Ring
2087865-03	20 mL Adapter Ring
2087865-04	30 mL Adapter Ring
2087866-02	60 mL Adapter Ring
2087866-04	125 mL Adapter Ring
2087864-01	Short Needle for 5-30 mL Bottles
690-300-0005	Syringe, 1 mL
690-300-0003	Syringe, 25 mL
690-500-0021	Septa Seals
690-500-0023	Aluminum Caps
690-500-2XXX	Septa Seal Bottles, specify size

To order these materials, contact a local Hach Ultra representative or contact the factory at 800.866.7889 or +1-541.472.6500.

Appendix C: Certifications

C.1 Overview

This section contains the WEEE statement and any Certificates of Conformity. For more information, contact a local Hach Ultra representative or contact the factory at 800.866.7889 or +1-541.472.6500.



Electrical equipment marked with this symbol may not be disposed of in European public disposal systems after 12 August of 2005. In conformity with European local and national regulations (EU Directive 2002/96/EC), European electrical equipment users must now return old or end-of life equipment to the Producer for disposal at no charge to the user.

Note: For return for recycling, please contact the equipment producer or supplier for instructions on how to return end-of-life equipment for proper disposal.

Important document. Retain with product records.

GERMAN

Elektrogeräte, die mit diesem Symbol gekennzeichnet sind, dürfen in Europa nach dem 12. August 2005 nicht mehr über die öffentliche Abfallentsorgung entsorgt werden. In Übereinstimmung mit lokalen und nationalen europäischen Bestimmungen (EU-Richtlinie 2002/96/EC), müssen Benutzer von Elektrogeräten in Europa ab diesem Zeitpunkt alte bzw. zu verschrottende Geräte zur Entsorgung kostenfrei an den Hersteller zurückgeben.

Hinweis: Bitte wenden Sie sich an den Hersteller bzw. an den Händler, von dem Sie das Gerät bezogen haben, um Informationen zur Rückgabe des Altgeräts zur ordnungsgemäßen Entsorgung zu erhalten.

Wichtige Informationen. Bitte zusammen mit den Produktinformationen aufbewahren.

FRENCH

A partir du 12 août 2005, il est interdit de mettre au rebut le matériel électrique marqué de ce symbole par les voies habituelles de déchetterie publique. Conformément à la réglementation européenne (directive UE 2002/96/EC), les utilisateurs de matériel électrique en Europe doivent désormais retourner le matériel usé ou périmé au fabricant pour élimination, sans frais pour l'utilisateur.

Remarque : Veuillez vous adresser au fabricant ou au fournisseur du matériel pour les instructions de retour du matériel usé ou périmé aux fins d'élimination conforme.

Ce document est important. Conservez-le dans le dossier du produit.

ITALIAN

Le apparecchiature elettriche con apposto questo simbolo non possono essere smaltite nelle discariche pubbliche europee successivamente al 12 agosto 2005. In conformità alle normative europee locali e nazionali (Direttiva UE 2002/96/EC), gli utilizzatori europei di apparecchiature elettriche devono restituire al produttore le apparecchiature vecchie o a fine vita per lo smaltimento senza alcun costo a carico dell'utilizzatore.

Nota: Per conoscere le modalità di restituzione delle apparecchiature a fine vita da riciclare, contattare il produttore o il fornitore dell'apparecchiatura per un corretto smaltimento.

Documento importante. Conservare con la documentazione del prodotto.

DANISH

Elektriske apparater, der er mærket med dette symbol, må ikke bortskaffes i europæiske offentlige affaldssystemer efter den 12. august 2005. I henhold til europæiske lokale og nationale regler (EU-direktiv 2002/96/EF) skal europæiske brugere af elektriske apparater nu returnere gamle eller udtjente apparater til producenten med henblik på bortskaffelse uden omkostninger for brugeren.

Bemærk: I forbindelse med returnering til genbrug skal du kontakte producenten eller leverandøren af apparatet for at få instruktioner om, hvordan udtjente apparater bortskaffes korrekt.

Vigtigt dokument. Opbevares sammen med produktdokumenterne.

SWEDISH

Elektronikutrustning som är märkt med denna symbol kanske inte kan lämnas in på europeiska offentliga sopstationer efter 2005-08-12. Enligt europeiska lokala och nationella föreskrifter (EU-direktiv 2002/96/EC) måste användare av elektronikutrustning i Europa nu återlämna gammal eller uttrangerad utrustning till tillverkaren för kassering utan kostnad för användaren.

Obs! Om du ska återlämna utrustning för återvinning ska du kontakta tillverkaren av utrustningen eller återförsäljaren för att få anvisningar om hur du återlämnar kasserad utrustning för att den ska bortskaffas på rätt sätt.

Viktigt dokument. Spara tillsammans med dina produktbeskrivningar.

SPANISH

A partir del 12 de agosto de 2005, los equipos eléctricos que lleven este símbolo no deberán ser desechados en los puntos limpios europeos. De conformidad con las normativas europeas locales y nacionales (Directiva de la UE 2002/96/EC), a partir de esa fecha, los usuarios europeos de equipos eléctricos deberán devolver los equipos usados u obsoletos al fabricante de los mismos para su reciclado, sin coste alguno para el usuario.

Nota: *Sírvase ponerse en contacto con el fabricante o proveedor de los equipos para solicitar instrucciones sobre cómo devolver los equipos obsoletos para su correcto reciclado.*

Documento importante. Guardar junto con los registros de los equipos.

DUTCH

Elektrische apparatuur die is voorzien van dit symbool mag na 12 augustus 2005 niet meer worden afgevoerd naar Europese openbare afvalsystemen. Conform Europese lokale en nationale wetgeving (EU-richtlijn 2002/96/EC) dienen gebruikers van elektrische apparaten voortaan hun oude of afgedankte apparatuur kosteloos voor recycling of vernietiging naar de producent terug te brengen.

Nota: *Als u apparatuur voor recycling terugbrengt, moet u contact opnemen met de producent of leverancier voor instructies voor het terugbrengen van de afgedankte apparatuur voor een juiste verwerking.*

Belangrijk document. Bewaar het bij de productpapieren.

POLISH

Sprzęt elektryczny oznaczony takim symbolem nie może być likwidowany w europejskich systemach utylizacji po dniu 12 sierpnia 2005. Zgodnie z europejskimi, lokalnymi i państwowymi przepisami prawa (Dyrektywa Unii Europejskiej 2002/96/EC), użytkownicy sprzętu elektrycznego w Europie muszą obecnie przekazywać Producentowi stary sprzęt lub sprzęt po okresie użytkowania do bezpłatnej utylizacji.

Uwaga: *Aby przekazać sprzęt do recyklingu, należy zwrócić się do producenta lub dostawcy sprzętu w celu uzyskania instrukcji dotyczących procedur przekazywania do utylizacji sprzętu po okresie użytkowania.*

Ważny dokument. Zachować z dokumentacją produktu.

PORTUGUESE

Qualquer equipamento eléctrico que ostente este símbolo não poderá ser eliminado através dos sistemas públicos europeus de tratamento de resíduos sólidos a partir de 12 de Agosto de 2005. De acordo com as normas locais e europeias (Directiva Europeia 2002/96/EC), os utilizadores europeus de equipamentos eléctricos deverão agora devolver os seus equipamentos velhos ou em fim de vida ao produtor para o respectivo tratamento sem quaisquer custos para o utilizador.

Nota: *No que toca à devolução para reciclagem, por favor, contacte o produtor ou fornecedor do equipamento para instruções de devolução de equipamento em fim de vida para a sua correcta eliminação.*

Documento importante. Mantenha junto dos registos do produto.

DECLARATION of CONFORMITY

We,

Hach Ultra Analytics
481 California Avenue
Grants Pass, OR 97526

declare under sole responsibility that the

Model: 9705 Liquid Particle Counter

conforms to Directive 89/336/EEC for Electromagnetic Compatibility and Directive 73/23/EEC for Low Voltage. Compliance was demonstrated to the following specifications as listed in the official Journal of the European Communities:

EN 61326, Class A, Group 1, Emissions:

EN 55011:1991 Class A Radiated
EN 55011:1991 Class A Conducted

EN 61326, Immunity:

EN 61000-4-2 Electrostatic Discharge
EN 61000-4-3 Radiated Immunity, Amplitude Modulated
EN 61000-4-4 Electrical Fast Transient
EN 61000-4-5 Surge Transients
EN 61000-4-6 Conducted Immunity
EN 61000-4-8 Immunity to Power Frequency Magnetic Fields
EN 61000-4-11 Voltage Dips and Interrupts

EN 61010-1 Amendment 1 & 2, Safety Requirement for Electrical Equipment for Measurement, Control and Laboratory Use

EN 60825-1 Safety of Laser Products, Equipment Classification, Requirements and User's Guide.

Hach Ultra Analytics

13-MAR-06

(Place and date of issue)

Shawn Hogan, Engineering Manager

Shawn Hogan

(Name/signature of authorized person)


Annex

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[illegible]

	<p>Electrical equipment marked with this symbol may not be disposed of in European public disposal systems after 12 August of 2005. In conformity with European local and national regulations (EU Directive 2002/96/EC), European electrical equipment users must now return old or end-of life equipment to the Producer for disposal at no charge to the user. <i>Note: For return for recycling, please contact the equipment producer or supplier for instructions on how to return end-of-life equipment for proper disposal.</i> Important document. Retain with product records.</p>
	<p>GERMAN Elektrogeräte, die mit diesem Symbol gekennzeichnet sind, dürfen in Europa nach dem 12. August 2005 nicht mehr über die öffentliche Abfallentsorgung entsorgt werden. In Übereinstimmung mit lokalen und nationalen europäischen Bestimmungen (EU-Richtlinie 2002/96/EC), müssen Benutzer von Elektrogeräten in Europa ab diesem Zeitpunkt alte bzw. zu verschrottende Geräte zur Entsorgung kostenfrei an den Hersteller zurückgeben. <i>Hinweis: Bitte wenden Sie sich an den Hersteller bzw. an den Händler, von dem Sie das Gerät bezogen haben, um Informationen zur Rückgabe des Altgeräts zur ordnungsgemäßen Entsorgung zu erhalten.</i> Wichtige Informationen. Bitte zusammen mit den Produktinformationen aufbewahren.</p>
	<p>FRENCH A partir du 12 août 2005, il est interdit de mettre au rebut le matériel électrique marqué de ce symbole par les voies habituelles de déchetterie publique. Conformément à la réglementation européenne (directive UE 2002/96/EC), les utilisateurs de matériel électrique en Europe doivent désormais retourner le matériel usé ou périmé au fabricant pour élimination, sans frais pour l'utilisateur. <i>Remarque : Veuillez vous adresser au fabricant ou au fournisseur du matériel pour les instructions de retour du matériel usé ou périmé aux fins d'élimination conforme.</i> Ce document est important. Conservez-le dans le dossier du produit.</p>
	<p>ITALIAN Le apparecchiature elettriche con apposto questo simbolo non possono essere smaltite nelle discariche pubbliche europee successivamente al 12 agosto 2005. In conformità alle normative europee locali e nazionali (Direttiva UE 2002/96/EC), gli utilizzatori europei di apparecchiature elettriche devono restituire al produttore le apparecchiature vecchie o a fine vita per lo smaltimento senza alcun costo a carico dell'utilizzatore. <i>Nota: Per conoscere le modalità di restituzione delle apparecchiature a fine vita da riciclare, contattare il produttore o il fornitore dell'apparecchiatura per un corretto smaltimento.</i> Documento importante. Conservare con la documentazione del prodotto.</p>
	<p>DANISH Elektriske apparater, der er mærket med dette symbol, må ikke bortskaffes i europæiske offentlige affaldssystemer efter den 12. august 2005. I henhold til europæiske lokale og nationale regler (EU-direktiv 2002/96/EF) skal europæiske brugere af elektriske apparater nu returnere gamle eller udtjente apparater til producenten med henblik på bortskaffelse uden omkostninger for brugeren. <i>Bemærk: I forbindelse med returnering til genbrug skal du kontakte producenten eller leverandøren af apparatet for at få instruktioner om, hvordan udtjente apparater bortskaffes korrekt.</i> Vigtigt dokument. Opbevares sammen med produktdokumenterne.</p>

SWEDISH Elektronikutrustning som är märkt med denna symbol kanske inte kan lämnas in på europeiska offentliga sopstationer efter 2005-08-12. Enligt europeiska lokala och nationella föreskrifter (EU-direktiv 2002/96/EC) måste användare av elektronikutrustning i Europa nu återlämna gammal eller uttrangerad utrustning till tillverkaren för kassering utan kostnad för användaren. *Obs! Om du ska återlämna utrustning för återvinning ska du kontakta tillverkaren av utrustningen eller återförsäljaren för att få anvisningar om hur du återlämnar kasserad utrustning för att den ska bortskaffas på rätt sätt.* Viktigt dokument. Spara tillsammans med dina produktbeskrivningar.

SPANISH A partir del 12 de agosto de 2005, los equipos eléctricos que lleven este símbolo no deberán ser desechados en los puntos limpios europeos. De conformidad con las normativas europeas locales y nacionales (Directiva de la UE 2002/96/EC), a partir de esa fecha, los usuarios europeos de equipos eléctricos deberán devolver los equipos usados u obsoletos al fabricante de los mismos para su reciclado, sin coste alguno para el usuario. *Nota: Sírvase ponerse en contacto con el fabricante o proveedor de los equipos para solicitar instrucciones sobre cómo devolver los equipos obsoletos para su correcto reciclado.* Documento importante. Guardar junto con los registros de los equipos.

DUTCH Elektrische apparatuur die is voorzien van dit symbool mag na 12 augustus 2005 niet meer worden afgevoerd naar Europese openbare afvalsystemen. Conform Europese lokale en nationale wetgeving (EU-richtlijn 2002/96/EC) dienen gebruikers van elektrische apparaten voortaan hun oude of afgedankte apparatuur kosteloos voor recycling of vernietiging naar de producent terug te brengen. *Nota: Als u apparatuur voor recycling terugbrengt, moet u contact opnemen met de producent of leverancier voor instructies voor het terugbrengen van de afgedankte apparatuur voor een juiste verwerking.* Belangrijk document. Bewaar het bij de productpapieren.

POLISH Sprzęt elektryczny oznaczony takim symbolem nie może byćlikwidowany w europejskich systemach utylizacji po dniu 12 sierpnia 2005. Zgodnie z europejskimi, lokalnymi i państwowymi przepisami prawa (Dyrektywa Unii Europejskiej 2002/96/EC), użytkownicy sprzętu elektrycznego w Europie muszą obecnie przekazywać Producentowi stary sprzęt lub sprzęt po okresie użytkowania do bezpłatnej utylizacji. *Uwaga: Aby przekazać sprzęt do recyklingu, należy zwrócić się do producenta lub dostawcy sprzętu w celu uzyskania instrukcji dotyczących procedur przekazywania do utylizacji sprzętu po okresie użytkowania.* Ważny dokument. Zachować z dokumentacją produktu.

PORTUGUESE Qualquer equipamento eléctrico que ostente este símbolo não poderá ser eliminado através dos sistemas públicos europeus de tratamento de resíduos sólidos a partir de 12 de Agosto de 2005. De acordo com as normas locais e europeias (Directiva Europeia 2002/96/EC), os utilizadores europeus de equipamentos eléctricos deverão agora devolver os seus equipamentos velhos ou em fim de vida ao produtor para o respectivo tratamento sem quaisquer custos para o utilizador. *Nota: No que toca à devolução para reciclagem, por favor, contacte o produtor ou fornecedor do equipamento para instruções de devolução de equipamento em fim de vida para a sua correcta eliminação.* Documento importante. Mantenha junto dos registos do produto.

This document contains information which is only required for the export of this instrument into the People's Republic of China.
Ce document contient les informations nécessaires pour l'exportation d'instruments vers la République Populaire de Chine.
本手册只包含出口到中华人民共和国的仪器的必要信息。