InstroTek® Inc.

innovators in instrumentation technology

CORE DRY PRO™

Rapid Asphalt Drying System

OPERATING MANUAL

www.InstroTek.com

CoreDry Pro™
Operation Manual Version 9

Important

*CoreDry units are shipped within the Continental United States with oil in the pump – the additional oil shipped with the unit is for your **next** oil change.*

*CoreDry units shipped outside the Continental United States are **WITHOUT** oil in the pump. An extra bottle is shipped with the unit for filling before use.*

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PRECAUTIONS WHEN USING THE COREDRY

1. **There is an air heater located inside the CoreDry to maintain the sample at room temperature. The heat is on during flow cycle. THE BOTTOM OF THE DRYING CHAMBER MAY BE VERY HOT DURING AND AFTER COMPLETION OF THE TEST.**
2. **Be aware that the vapor trap reaches temperatures below freezing.**
3. **Voltage of 120V is present inside the CoreDry cabinet. DO NOT PROBE INTO THE MAIN CABINET WITH METAL TOOLS OR FINGERS. IF COVER MUST BE REMOVED CONTACT INSTROTEK FIRST.**

4. **Do not attempt to repair this unit without first consulting and receiving direction from an InstroTek technician.**
5. **Change your vacuum pump oil after 80 hours of use (a software prompt will tell you to do this). Only use recommended vacuum oil (InstroTek part number 419.0005).**
6. **Change your Tank Filters every 1 to 2 months depending on usage (a software prompt will tell you to do this). (InstroTek part number 977.1004 package of 12 filters).**
7. **Change your exhaust filter on the vacuum pump once a year (a software prompt will tell you to do this). (InstroTek part number 977.1005).**
8. **Call InstroTek at (919) 875-8371 if you have any questions.**

Table of Contents

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1. Introduction

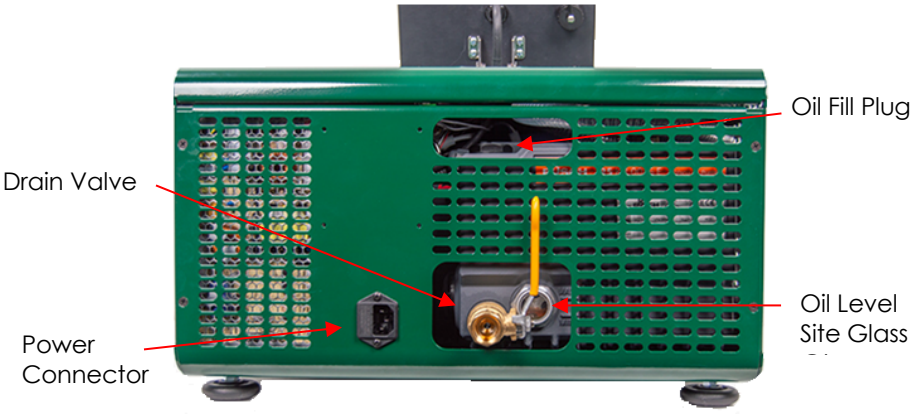
Congratulations on the purchase of your CoreDry Unit. The CoreDry is an innovative device used for rapid vacuum drying of samples, while maintaining the sample at room temperature. Keeping the sample cool during drying process ensures that the characteristics of the sample have not changed.

This product is the result of industry demand for rapid testing results in the road paving industry in which previous drying methods took many hours. Although the results are the same, drying with rapid vacuum technology provides the user with samples that can be tested in a few minutes. Now you can use the dry weight from the CoreDry to measure your core density in minutes or get a quick measure of your stockpile aggregate moisture content.

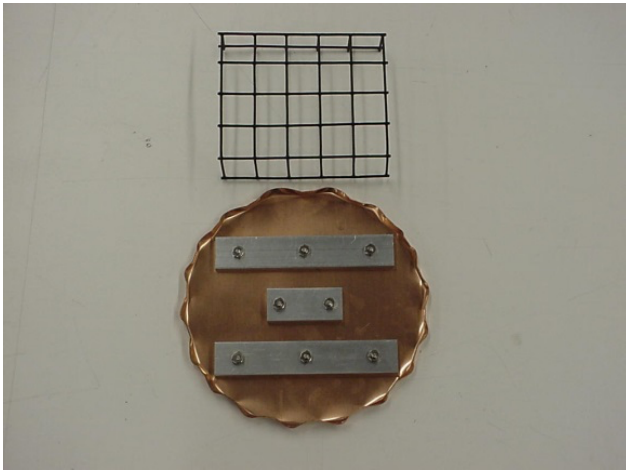
The CoreDry uses high vacuum in conjunction with a thermoelectric cold trap to first draw the water out from every pore of a sample, quickly evaporate the drawn-out water by lowering the vapor pressure and then trap and condense the vapor in a separate chamber. The vapor trap serves two purposes in the system: first it prevents much of the vapor from entering the pump which keeps the pump efficiency high and secondly it improves the efficiency of the drying process by increasing the vacuum of the system by causing condensation to occur.

CoreDry Components

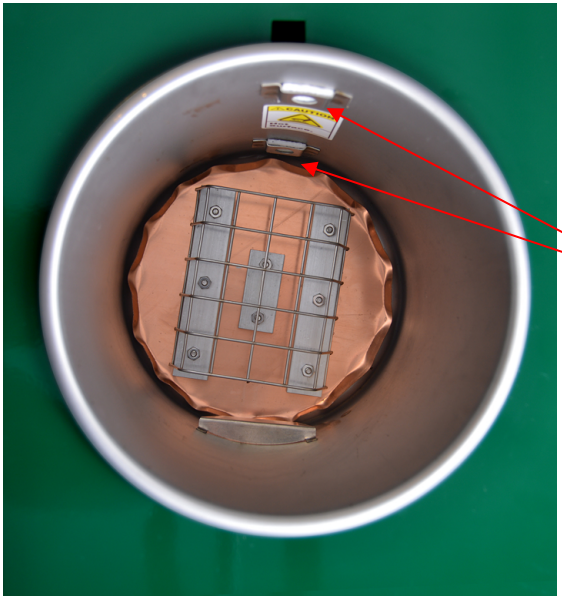
CoreDry Front View



CoreDry Back View



Flow Plate & Wire Mesh Sample



Flow Plate and Sample Holder Installed in Sample chamber

Tank Filters

2. Getting Started

Setup Guide

1. **Remove from shipping box**: Remove foam protection from box and remove CoreDry unit, covers and accessories. Place CoreDry close to 120V outlet on a flat bench surface. Leave at least 6" of space on both sides of the CoreDry for air circulation. **DO NOT PLACE NEXT TO ANY HEAT GENERATING DEVICES.**

2. **Pump oil**: In continental United States, the pump oil bottle sent with the unit inside the drying chamber is for a future oil change after approx. **80 hours of use**. **IMPORTANT – For international units, use the oil to fill the vacuum pump before the first use.** Refer to the maintenance section of this manual for filling and replacing the vacuum pump oil.

3. **Lids and Flow Plate**: Remove the Sample Chamber lid, which is located next to the CoreDry unit inside the box. The Flow Plate/Mesh holder is in the bottom of the large tank along with extra tank filters, the Cold Trap lid, a bottle of oil, and a USB thumb drive containing electronic copies of the manual and calibration paperwork. Remove all accessories from the large tank. Place the flow plate on the bottom of the large sample tank and affix the wire mesh sample holder to the flow plate. Place the lids on the large and small tanks.

4. **Turn on CoreDry**: Plug in the unit and flip the on/off switch to the ON position. The display will indicate the software version once turned on. Next it will pressurize the system. The display will then prompt for the user to dry the Cold Trap. Once the drying countdown is complete or Continue is pressed, the Cold Trap will begin cooling. The system is now ready to use.

Note: The CoreDry draws a maximum current of 15 A. Take this into account before plugging the machine into power strips or extension cords. Be sure not to overload your power circuit.

Operating Instructions

A software flow chart detailing the drying process using default settings is provided on the following page. In summary, the sample is registered as dry when the Pressure Setpoint (default: 7 mmHg) is reached. In order to avoid heat damage to the sample, a message will prompt the user to rotate the sample after the number of cycles specified by the Max Cycles setting (default: 10 cycles).

Vacuum Cycle: Air is pulled from the chamber through the Cold Trap and out through the pump.

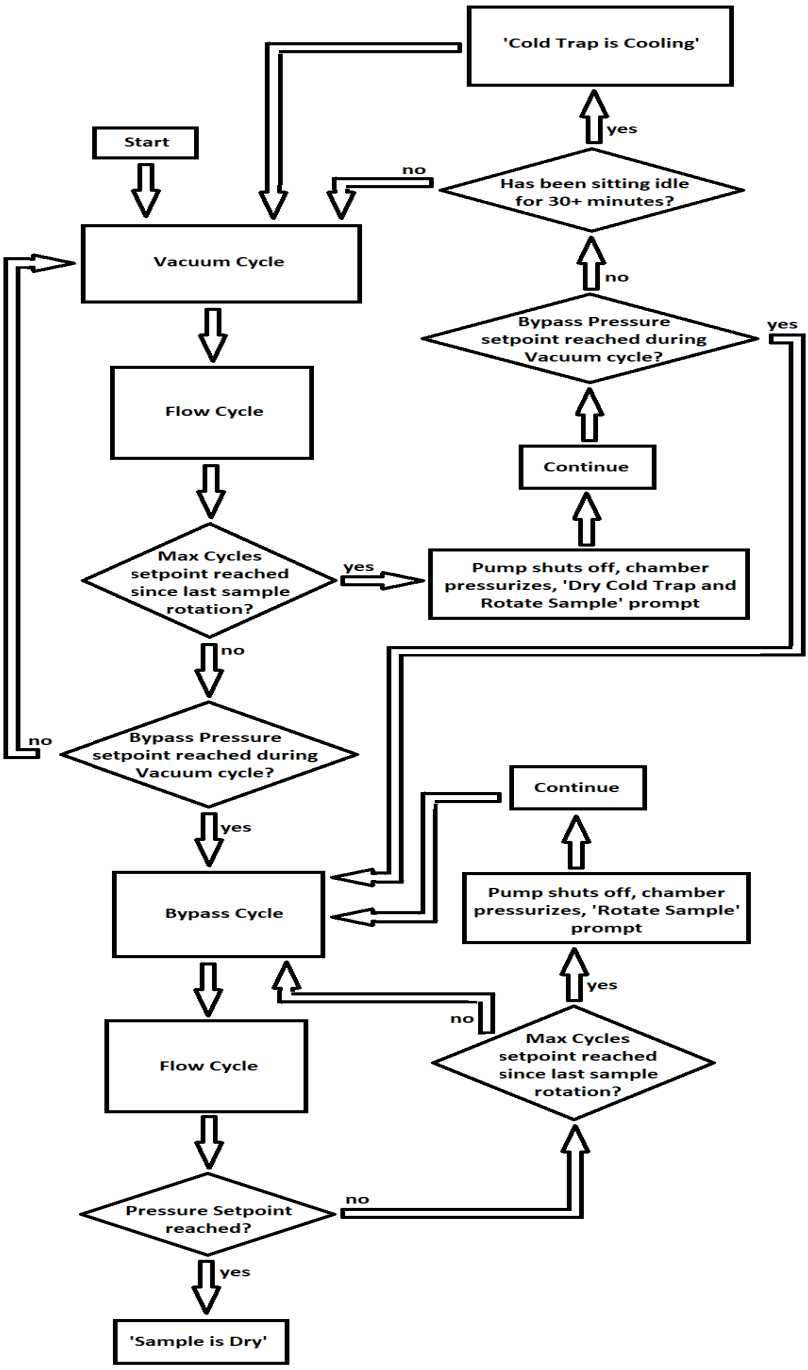
Flow Cycle: Air is pulled from atmosphere through the air heater into the chamber and out through the pump.

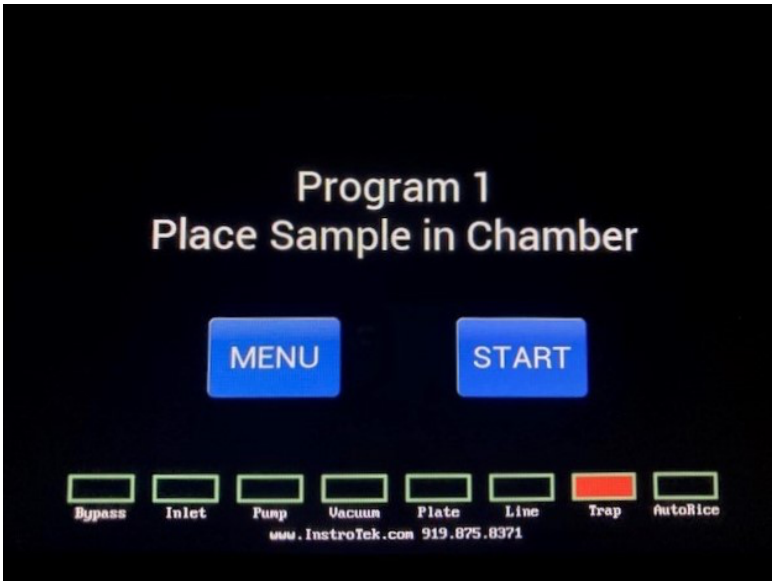
Bypass Cycle: Air is pulled from the chamber directly out through the pump. The Cold Trap is disengaged.

Note: To speed up the drying process for multiple samples, dry one sample in the CoreDry and place all other samples to be dried in the CoreDry later in front of a fan.

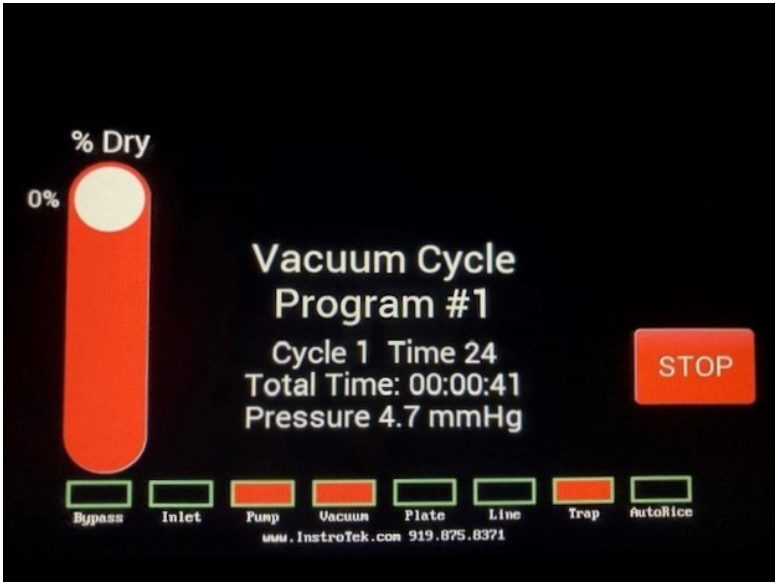
a) Make sure the sample is at room temperature or higher. Higher sample temperatures will speed up the drying time and is preferable (temperature not to exceed 110F). Conversely, cooler than room sample temperatures will significantly lengthen the drying time.
b) Towel dry the surface of your wet asphalt sample to remove as much of the free water as possible. Place the sample on its side, then on the wire mesh sample support (as shown below), place the lid on the sample chamber and press Start.
c) When the sample is dry, the unit will automatically stop and pressurize so that lids can be freely removed. **1 run is defined as 1 complete drying process.**

Note: STOP button can be pressed at any time to stop the operation and release pressure in the chambers.

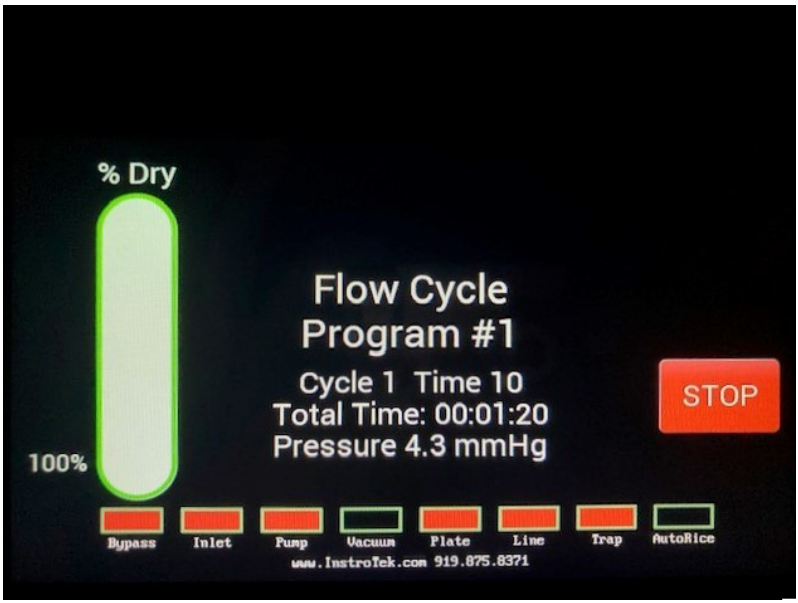

'Cold Trap is Cooling'
yes
Start
no
Has been sitting idle for 30+ minutes?
Vacuum Cycle
no
Bypass Pressure setpoint reached during Vacuum cycle?
yes
Flow Cycle
Continue
Max Cycles setpoint reached since last sample rotation?
yes
Pump shuts off, chamber pressurizes, 'Dry Cold Trap and Rotate Sample' prompt
no
Bypass Pressure setpoint reached during Vacuum cycle?
no
yes
Continue
Bypass Cycle
Pump shuts off, chamber pressurizes, 'Rotate Sample' prompt
yes
no
Flow Cycle
Max Cycles setpoint reached since last sample rotation?
Pressure Setpoint reached?
no
yes
'Sample is Dry'



Main Screen

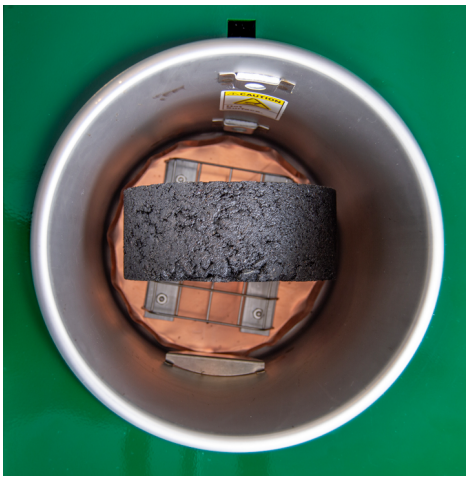


Example of screen during Vacuum Cycle



Example of screen during Flow Cycle

Example of screen during Bypass Cycle



For best results, place the sample on its side.

Important note for drying extremely wet samples*- If the sample is not dry after 45 cycles, remove the sample and place at room temperature for 15 minutes. After 15 minutes it is ok to put the sample back in the sample chamber and complete the drying with the CoreDry.*

Cold Trap: Liquid and/or ice will accumulate in the Cold Trap as samples are drying. For faster drying and to extend the life of the vacuum pump, it is best to remove the Cold Trap lid/baffle and wipe out the moisture between samples and during rotations. Be sure to replace the baffle before drying the next sample.

Daily Test:

a) Every day before starting operation, dry the cold trap and the sample chamber using a lint-free cloth. Do not use paper towel as pieces of paper can get left in the system and subsequently be pulled into the vacuum pump.
b) Place the appropriate lids on the sample chamber and the cold trap. Press Start to begin a test without any samples. The vacuum reading on the display should be 6 mmHg or less when complete. If the vacuum without

a sample is higher than 6 mmHg, refer to the trouble shooting section or call InstroTek for service information.

Note: When you receive the CoreDry or after transport to other locations, you might have to run the CoreDry several cycles to achieve 6 mmHg. Moisture from humidity might build up within the vacuum lines. By running the unit several times, the CoreDry eliminates the moisture in the pipes and reduces the pressure within the chamber to 6 mmHg.

3. Menu Functions

Main Menu

- **Active Program # __**

  (default: 1) Choose between 5 different sets of parameters for drying cores or other samples. The following parameters are specific to the Program #:

  Number of Runs
  Max Cycles
  Initial Vacuum Time
  Vacuum Time
  Initial Flow Time
  Flow Time
  Initial Pressure Set Point
  Pressure Set Point
  Cycle Limit
  Bypass Pressure
  Plate Limit
  Plate Cutoff

Reduce Flow
Post BP Cycle
Post PL Cycle
Pause Time

Use the Previous and Next buttons to cycle through the programs. Press the Details button to view the settings for the selected program.

- **AutoRice**

  Pressing this button enters AutoRice Mode. This enables an external AutoRice device to use the CoreDry's pump and Cold Trap to automatically conduct a Rice test. In this mode, the Cold Trap is left on, the Vacuum valves are left open, and the pump is turned on when the AutoRice sends a signal to the machine. Vacuum is pulled through the AutoRice port on the side of the machine. See '*AutoRice Mode*' at the end of this section for more information.

- **Manual Pump**

  Pressing this button enters Manual Pump Mode. The pump can be set to run for a specified amount of time. The Cold Trap is left on, and vacuum is pulled through the AutoRice port on the side of the machine. This is similar to AutoRice Mode, except the pump is being controlled by the CoreDry.

- **Settings**

  1. **Maximum Cycles: __**
     (default: 10) Number of cycles the machine will run until the chamber pressurizes and the 'Rotate Sample' prompt is displayed.

  2. **Cold Trap Cool Time: ____ Sec**

(default: 60) Displays the amount of time (in seconds) that the Cold Trap will cool at initialization and in between drying runs.

3. **Beeper Volume: (____)**
   (default: Medium) Adjusts the volume of the beeper between four settings Off, Low, Medium, or High.

4. **Oil Change in _____ Hours**
   Displays the amount of time until the next vacuum pump oil change is required. Press the button on the right to reset after changing oil.

5. **Change Tank Filters in ____ Cycles**
   Displays the number of cycles until a tank filter change is recommended. (Note: depending on frequency of use and dirtiness of samples, tank filters may need to be changed more often than indicated. It is advisable to change the tank filters as soon as they are visibly dirty). Press the button on the right to reset after replacing tank filters.

6. **Change Exhaust Filter in _____ Hours**
   Displays the amount of time until the next pump exhaust filter change is required. Press the button on the right to reset after changing pump filter.

7. **Screen Brightness: ____%**
   (default: 50%) Set the brightness of the touchscreen display.

8. **Calibrate Touch Screen**
   Perform touchscreen calibration. User will be prompted to touch 3 dots appearing at different locations on the screen.

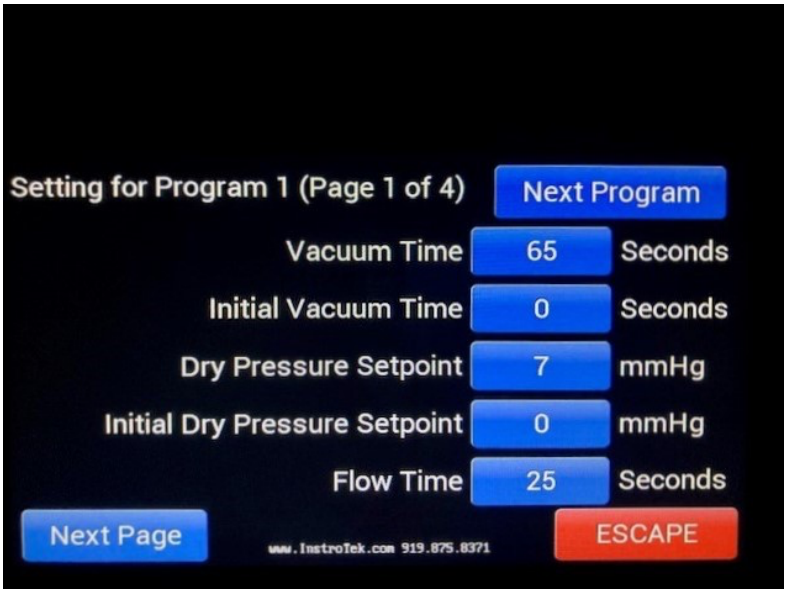
9. **Self Test**
   Runs self-diagnostics. The Self-Test activates individual components of the CoreDry and determines if the current being drawn by each component is sufficient. Insufficient current may indicate a component failure or

disconnect. The Self-Test will switch between the valves, relay, pump, air heater, and power supplies. Before using Self-Test, place both lids on sample tank and Cold Trap.

10. **System Menu**
    Access System Menu. Password is 65535. System Menu functions are listed in the following subsection. Note: this menu should only be accessed by persons with knowledge of and experience with operating a CoreDry, or upon instructions from an InstroTek technician. Changing settings in this menu may have an adverse effect on drying time/quality!

11. **Firmware Update**
    Updates device firmware. Place a USB drive containing the correct .cyacd file into the device and press Start Update.

System Menu



1. **Vacuum Time**
   (default: 65) Length of time (in seconds) the Vacuum and Bypass cycles will last.

2. **Initial Vacuum Time**
   (default: 0) See *'Initial Mode'* at the end of this section.

3. **Dry Pressure Set Point**
   (default: 7) Once this pressure (in mmHg) is reached, the sample is registered as dry. The machine will continue for the number of cycles specified in the 'Post PL Cycle' setting before stopping the drying run.

4. **Initial Dry Pressure Set Point**
   (default: 0) See *'Initial Mode'* at the end of this section.

5. **Flow Time**
   (default: 25) Length of time (in seconds) the Flow cycle will last.

6. **Initial Flow Time**
   (default: 0) See *'Initial Mode'* at the end of this section

7. **Plate Temperature Limit**
   (default: 90) Temperature (in degrees C) setpoint for the hot plate beneath the sample chamber.

8. **Cold Trap Bypass Pressure**
   (default: 12) Once this setpoint (in mmHg) is reached, the machine will continue to run the number of Vacuum cycles specified in the 'Post BP Cycle' setting and then switch into Bypass mode. The Cold Trap is disengaged and bypassed for the remainder of the drying run.

9. **Plate Cutoff Pressure**
   (default: 9) Once this pressure (in mmHg) has been reached and the cycle count is greater than 3, the hot plate will stop heating.

10. **Minimum Cycles**

(default: 1) Minimum number of Vacuum cycles the machine will run, regardless of the chamber pressure reached, before entering Bypass mode or alerting the user that the sample is dry.

11. **Post Bypass Cycles**
    (default: 0) Number of Vacuum cycles the machine will continue to run after the Bypass Pressure setpoint has been reached before switching into Bypass mode for the remainder of the drying run.

12. **Post Pressure Limit Cycles**
    (default: 1) Number of cycles the machine will continue to run after the Pressure Set Point has been reached before the drying run is complete.

13. **Release Vacuum Time**
    (default: 10) Length of time (in seconds) of the 'Pressurizing Chamber' countdown.

14. **Number of Runs**
    (default: 1) If this setting is greater than 1, when the machine registers the sample as dry, it will reset the cycle counter and automatically initiate another drying run after the number of seconds specified in Pause Time. This continues for the specified number of runs.

15. **Dwell Time**
    (default: 120) Length of time (in seconds) the machine will pause in between drying runs if the Number of Runs is set to a value greater than 1.

16. **Pressure Offset**
    (default: 0) The machine interprets the chamber pressure as the value given by the internal pressure sensor (in mmHg) offset by the number in this setting. This is used to calibrate the pressure reading.

17. **Reduce Flow**

(default: 3) Once this setpoint (in mmHg) is reached, subsequent Flow cycles will last for only ½ the duration specified in the Flow Time setting.

18. **Device ID**
Sets the Bluetooth ID which will be used to connect to the device from a smartphone or PC.

Operating modes

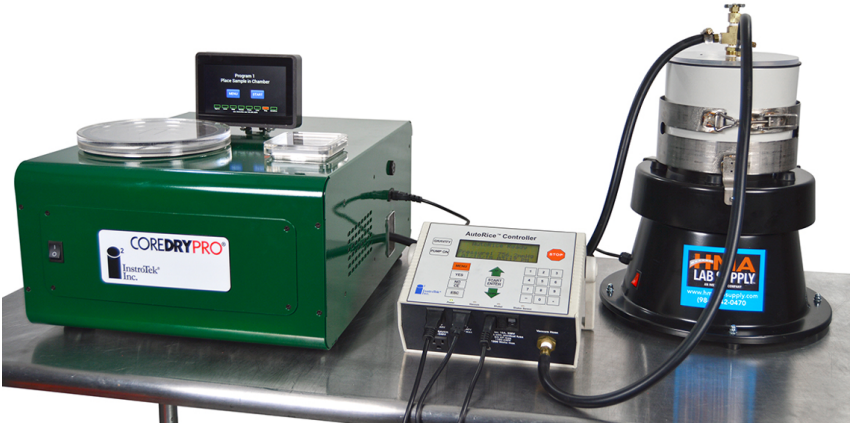
Initial Mode:
If any of the 3 Initial settings are set to a value greater than 0, the machine will begin the drying process in *Init mode*. Operation in Init mode is identical to normal operation with 2 exceptions:

- The Initial settings for Vacuum Time, Pressure Set Point, and Flow Time are used instead of the Normal settings. If any of the Initial settings are still 0, the Normal setting is used in its place.
- The machine will not pressurize the chamber and prompt the user to rotate the sample after the number of cycles specified by Max Cycles.

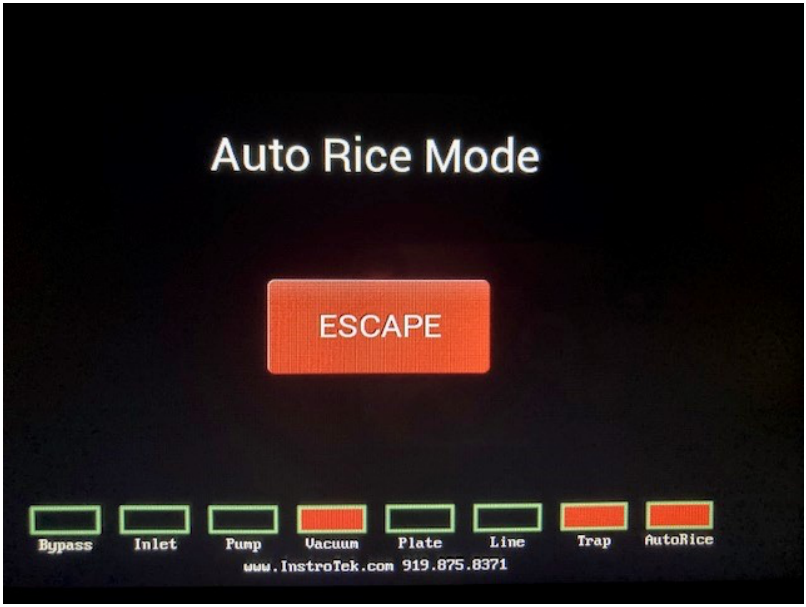
The machine will continue in Init mode until the sample is registered as dry. At this time, the cycle counter will reset, and the machine will automatically initiate a second drying run in Normal mode using the Normal settings.

AutoRice Mode:
In this mode, the CoreDry can be used in conjunction with the InstroTek AutoRice™ to perform Rice tests (AASHTO T209 & ASTM 2041). The CoreDry provides suction using its vacuum pump and removes a large percentage of the moisture from the air using its Cold Trap while the AutoRice controls the testing process automatically, including regulating the pressure. The vacuum line from a pycnometer connects to a dedicated vacuum port while the Pump outlet on the

AutoRice connects to an electrical port, both on the side of the CoreDry. The AutoRice is then able to switch on the pump as needed.



CoreDry set up with AutoRice, pycnometer, and shaker



CoreDry screen while in AutoRice Mode

4. Aggregate Testing Using the InstroTek CoreDry™

The CoreDry can be used for determination of aggregate moisture content. Use the following procedure to dry aggregates and to determine moisture content:

1. Set the CoreDry to Program #2 using the first option in the Menu.
2. Remove the wire mesh sample holder and the flow plate from the sample chamber.
3. Place the bottom portion of the aggregate fixture on a scale capable of reading to 0.1 gram and tare the scale.
4. Place approximately 100-500 grams of aggregates in the aggregate fixture. Please refer to the following table for aggregate quantities to use in the fixture. Record weight.
5. When you determine the sample weight, re-tare the scale.
6. Replace the lid and tighten the fasteners on the aggregate fixture.
7. Weight the entire fixture with the aggregate on the scale. Record this as weight A. This is the weight of the entire fixture with wet aggregates.
8. Place the aggregate fixture in the chamber. The fixture will be in direct contact with the bottom of the sample chamber.
9. Place the chamber lid on top of the sample chamber and press Start.
10. The unit will start the drying process.
11. When the unit stops, remove the aggregate fixture and place on the scale. Record this weight as weight B. This is the weight of the fixture and the dry aggregate.

    Caution: The aggregate fixture may be hot to the touch when it's removed from the sample chamber.

    Note: If the maximum number of cycles (20) is reached and the aggregate is still not dry, the unit will display a

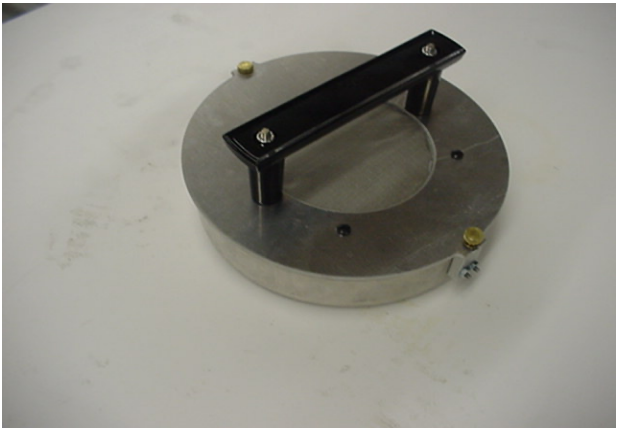
message prompting the user to turn the sample and restart the drying operations. At this point remove the fixture from the chamber, shake the fixture to re-orient the aggregates and replace inside the sample chamber. Close the lid and press Enter. The unit will continue until the sample is completely dry.

12. Determine the moisture content by the following equation:

Moisture Content= Weight A – Weight B

Aggregate Type	**Sample Weight**
Crushed fine aggregates and sand	100-150 grams
Rounded fine aggregates	300-400 grams
Coarse aggregates	400-500 grams

Note: The above estimates on sample weights are based on saturated aggregate samples.
If the aggregate is not saturated, higher sample weights can be used.



Aggregate Sample Fixture

Aggregate Fixture with one fastener and lid removed

5. Maintenance

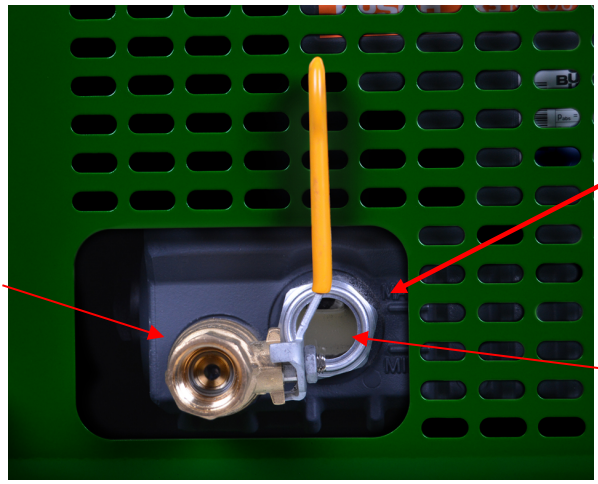
Tank filters - Clean Frequently (Replacement part number 977.1004)

The two particle filters cover the tank ports. Remove the filters when dust or debris is present and replace with two new filters. These filters are used to protect your pump from damage due to particles and debris. A prompt will alert you as to when it is recommended to change the filters. Once that screen has appeared and after you change the filters go into the Menu to reset the timer for the next change.

Oil – Change every 80 hours of run time (Replacement part number 419.0005)

A prompt will appear on the screen when the next oil change is recommended.

1. Turn the ON/OFF switch to OFF position.
2. Unplug the power cord from the wall outlet.
3. Position the unit such that the oil drain nozzle on the back hangs over the edge of a table.
4. Place a bucket underneath the drain nozzle.
5. Place a 2"-3" block or book under the front of the unit to tilt the unit toward the rear.
6. Open the drain valve to allow the oil to drain into the bucket. Once the oil is drained, close the drain valve.
7. Remove the 2"-3" block from underneath the unit.
8. Remove the 4 screws on the corners of the back plate and flip the hood up using the handle on the top rear.
9. Use a funnel to refill the pump to 2/3 to 3/4 full by viewing the level in the pump view window.
10. Replace the fill cap. Do not over tighten the fill cap.
11. Once the oil has been changed, go to Menu and reset the oil change timer.



Caution: Please dispose of the oil in a responsible manner. Always discard the oil at certified disposal facilities!

Caution: Carefully remove any spilled oil from the floor to avoid accidents.

Only use high-quality synthetic vacuum oil. Vacuum pump oil can be obtained by calling InstroTek at 919-875-8371 or fax 919-875-8328. The InstroTek part number is 419.0005.

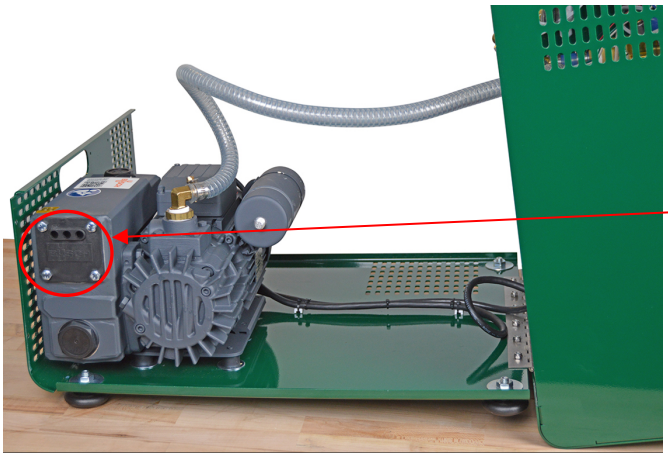
Pump Filter Change- Necessary every 320 hours of run time

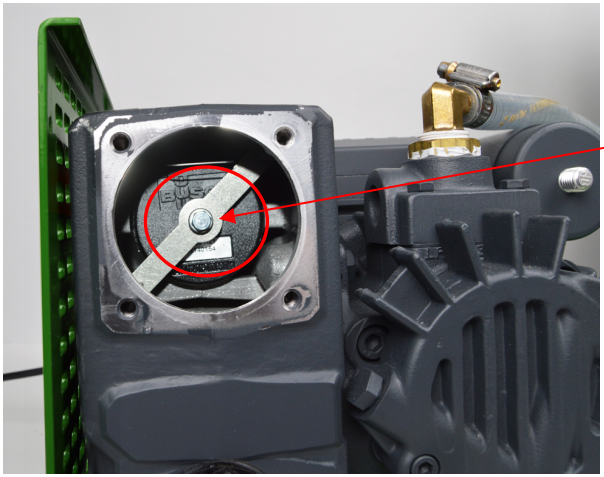
Changing Pump Filter - Busch Pump (Replacement part number 977.1005)

CAUTION: Do not attempt any repairs or maintenance of CoreDry with the power cord connected to AC Power. Make sure it is unplugged. Consult an InstroTek technician before performing any non-ordinary maintenance (other than oil/filter changes).

Tools Needed: 10mm metric socket
Ratchet or nut driver

1. Turn CoreDry off and unplug unit from power source.
2. Locate the exhaust port on the left side of the vacuum pump, which is located at the back of the unit. An opening in the side of the chassis gives access to the exhaust port.
3. Remove the 4 metric 10mm bolts on the corners of the exhaust cover and then remove the cover. After removing the four bolts, you may have to gently pry the cover off with a flat screwdriver.
4. Loosen the screw located on the retaining bar holding the exhaust filter in place. Remove bar when loosened.
5. Gently pull the old exhaust filter out by the attached clip above the arrow on the filter. Verify that rubber O-Ring on the opposite side of the filter is removed as well.
6. Install the new filter, ensuring the narrow end of the filter fits snuggly into its socket inside the pump.
7. Replace the retaining bar and tighten the screw.
8. Replace the exhaust cover and 4 bolts. Tighten the bolts.
9. Go into the Menu and reset the timer for the Exhaust Filter.





Verify Vacuum Pressure Reading and Calibrate if Needed (every 6 months)

1. Ensure there is no moisture inside the Cold Trap.
2. Ensure the unit is set to Program #1.
3. Warm up the CoreDry by running the unit empty with both lids on. The unit can be properly warmed up by one of two methods:
    - From the main screen, press the Start button to begin a run. Wait until the pump shuts off and the screen displays "Sample is Dry, Remove the Sample, Dry Cold Trap". Press the Continue button twice to begin another run. Do this for at least 3 runs. Or…
    - From the main screen, go into the Menu and then go into the System Menu (pw is 65535). Change the Cycle Limit setting to 10, then go back to the main screen and press Start. The unit will run for 10 cycles without the need to press Continue. After this, be sure to change the Cycle Limit setting back to 1.

4. Place an analog absolute vacuum gauge inside the sample chamber and place lids on both the sample chamber and Cold Trap.
5. Start a run by pressing Start.
6. The unit will pull vacuum in the sample chamber for the time specified in the Vacuum Time setting. Ensure that the pressure reading on the analog vacuum gauge reaches 6 mmHg or below before the countdown is finished and the Flow Cycle begins. If it does not, refer to the subsection '*CoreDry runs but does not draw sufficient vacuum'* in the '*Troubleshooting'* section.
7. Air will enter the tank from atmosphere during the Flow Cycle for the time specified in the Flow Time setting. After this, the 'Vacuum Time' countdown will begin again. The screen should display "Bypass Cycle" and the Bypass indicator on the screen should be lit. If it is, proceed to the next step. If the screen still displays "Vacuum Cycle" and the Bypass indicator is not lit, refer to the subsection '*CoreDry does not enter Bypass mode'* in the '*Troubleshooting'* section.
8. During the Bypass cycle, make a note of the difference between the vacuum gauge reading and the reading on the CoreDry display when the gauge reads around 7 mmHg. If the difference is +/- 1 mmHg or less, no offset adjustment is needed, and the verification is complete. Press Stop to end the run. If the difference is greater than 1 mmHg, proceed to the next step.
9. Press Stop. After the tank pressurizes, press Continue to skip the 'Dry Cold Trap' countdown. Press Continue again to skip the 'Cold Trap is Cooling' countdown.
10. Go into the Menu and then into the System Menu (pw is 65535). Adjust the Pressure Offset setting according to the observed difference between pressure readings (Ex. If the analog vacuum gauge displayed 7 mmHg while the CoreDry displayed 9 mmHg, reduce the Pressure Offset by 2). Press Finished after the correct offset has been entered.
11. Begin another run. Verify that the pressure according to the CoreDry is now within 1 mmHg of the analog vacuum gauge reading when the gauge displays around 7 mmHg during the bypass cycle. If so, the

calibration is complete. If not, repeat the process from step 4. If the readings still do not match after 3 attempts, contact InstroTek for further troubleshooting instructions.

6. Troubleshooting

CoreDry does not turn on –

- Make sure unit is plugged in.
- Test the outlet by plugging another device such as a lamp or fan into the same outlet.
- Contact InstroTek for further instructions: 919-875-8371.

CoreDry runs but never indicates the sample is dry –

The CoreDry will register that the sample is dry only after the chamber pressure specified in the Pressure Set Point setting (default is 7 mmHg) is reached during a Bypass Cycle.

- Determine if the unit is entering Bypass mode (the screen will display 'Bypass Cycle' and the Bypass indicator will be lit while vacuum is being pulled in the sample chamber). Depending on the moisture content of the sample, it may take up to 20 Vacuum/Flow cycles before Bypass mode is entered. If the unit never enters Bypass mode, refer to the subsection '*CoreDry does not enter Bypass mode'*.
- If the unit enters Bypass mode but never reaches the Pressure Set Point, refer to the subsection '*CoreDry does not draw sufficient vacuum'*.

CoreDry is taking a longer time to dry samples than before –

- Run the unit with the sample chamber empty. The reading on the screen should reach 6 mmHg or lower. If not, refer to the subsection '*CoreDry does not draw sufficient vacuum'*.
- Ensure the bottom of the Cold Trap is getting noticeably cold while the unit is sitting idle and the main screen is being displayed.
- Ensure the unit is entering Bypass mode after the Bypass Pressure setpoint has been reached in the previous cycle. Refer to the subsection '*CoreDry does not enter Bypass mode'*.

CoreDry does not enter Bypass mode –

- Run the unit with the sample chamber empty. Note the minimum pressure reached during the first Vacuum Cycle. Ensure that it is at or below the Bypass Pressure setpoint (default is 12 mmHg). If the pressure does not reach the Bypass Pressure setpoint according to the CoreDry display, refer to the subsection '*CoreDry does not draw sufficient vacuum'*.
- Ensure that the Max Cycles setting in the System Menu is set to 1.

CoreDry melts/burns/deforms asphalt samples -

- Lower the maximum plate heater temperature specified by the Plate Limit setting in the System Menu (default is 90°C).
- Ensure the unit is entering Bypass mode after the Bypass Pressure setpoint has been reached in the previous cycle. Refer to the subsection '*CoreDry does not enter Bypass mode'*.
- Ensure the chamber vacuum is sufficient. Refer to the subsection '*CoreDry does not draw sufficient vacuum'*.
- It may sometimes be necessary to soak samples before drying them. This ensures uniform moisture distribution, which prevents one part of the sample from becoming too hot while the other part is not yet dry.

CoreDry does not draw sufficient vacuum –

- Ensure both lids are seated correctly on the sample chamber and the Cold Trap. Push down gently to seat while the unit is running.
- Remove any dust from the sample chamber using a damp cloth, then install clean tank port fabric filters.
- Make sure the pump oil fill cap is installed, fitting correctly and tight.
- Ensure the oil drain valve is closed completely.
- Run the Self-Test to make sure all electrical components are drawing sufficient current.
- Open the chassis and make sure no hoses are pinched or loose.
- Verify that the vacuum is insufficient using an analog vacuum gauge. If there is a discrepancy between the

displayed and actual readings, see the subsection *'Verify Vacuum Pressure Reading and Calibrate if Needed' in the 'Maintenance' section.*

- Contact InstroTek for further troubleshooting instructions: 919-875-8371.

CoreDry will not release vacuum –

- Make sure the unit is powered on.
- Run Self-Test to make sure all electrical components are receiving power.
- Open the chassis and remove one of the hoses from the sample tank. **WARNING: DOING SO WILL RELEASE VACUUM IN TANK AND WILL CAUSE THE LIDS TO BECOME FREE TO MOVE.**
- Contact InstroTek for further troubleshooting instructions: 919-875-8371.

Warning screen prompting to change oil –

- Change oil following procedure outlined in manual.

7. Warranty

InstroTek extends a 1-year warranty on the CoreDry to the original purchaser of this equipment. This warranty covers defects in material, workmanship and operation under the conditions of normal use and proper maintenance. This warranty includes all components except for normal wear items.

InstroTek will replace, free of charge, any part found to be defective within the warranty period.

This warranty is void if inspection shows evidence of abuse, misuse or unauthorized repair.

This warranty covers replacement of defective materials and workmanship only. It does not cover shipping charges, duties or taxes in the transport to and from the factory or authorized service center. Always insure the shipment, if a return for repair is needed. InstroTek does not take responsibility for shipping damages.

InstroTek's liability is in all cases limited to the replacement price of its products. InstroTek shall not be liable for any other damages, whether consequential, indirect, or incidental arising from use of its product.

If return of the product is necessary, please include return shipping directions, contact name, phone & fax number and a description of the action needed.

Do not ship products back via small parcel carriers i.e. UPS or FedEx. Use a freight shipping company i.e. R&L, FedEx Freight, UPS Freight or Estes.

Call InstroTek, Inc. for shipping details at (919) 875-8371 or fax at (919) 875-8328.

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