

# JOHANSON **INDICIZER**

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## SYSTEM

### **Flow Rate Indicizer® Set-up**

1. The Flow Rate Indicizer® requires compressed air as part of its operation. We recommend a pressure between 10-100 psi. This is compatible with most lab air supply systems.
2. Where there is a concern about the purity of the air source or a need for an inert gas environment, Nitrogen can be used.
3. To install the air supply there is a 1/8" female pipe thread brass bulkhead fitting on the back of the unit.
4. The Flow Rate Indicizer® has an internal regulator, but care should be taken not to exceed the above psi range.
5. The Flow Rate Indicizer® also has an internal air filter, but care should also be taken to assure that moisture is minimized from your air source.
6. Once an air source is installed, the unit is ready to be plugged in with the provided power cord to an 110V power source and switched on.
7. You may use your finger, a stylus or any other non-marking/non scratching tool on the touchscreen.

### **Test Station Recommendations**

The following is a list of set up requirements and support equipment we recommend for the Johanson Indicizer® System.

1. Bench space for the Indicizer® (approximately five-feet long and three-feet high to make the reading of the display easy)
2. Surge protected 110 volt strip
3. Electronic balance or scale that will read up to at least 800 grams  $\pm 0.1$  grams minimum.
4. Wide mouth containers (four inches or larger with sealable covers to contain volatiles between tests)
5. Plastic Ziploc bags to keep the sample in.
6. Tray for sample preparation (Approximately 12 by 14 inches)
7. Clean rags
8. Vacuum with brush attachment for general cleanup.

Items provided with your Indicizer® to assist in testing; metal whisk, small brush, spatula, spoon and reference material.

## **Material Selection Preparation**

### **Sample Selection**

Always select a fresh sample representing the material that will give you problems in your equipment. This usually means the finest material. Be aware that moisture content will affect your results. There is a moisture content that produces worst-case conditions, which will become better if the material is drier or wetter. If your moisture content varies significantly then you should measure your material over the entire range of expected moisture levels.

Never collect samples from the edge of a pile. Natural segregations will usually bias the samples on the coarse side.

### **Duplicating Process Conditions**

You should duplicate the moisture, humidity, temperature and any special atmospheric conditions existing in your equipment.

### **Preparing the Material**

Effective material preparation and loading can be achieved with the reference material provided with our Indicizer®.

We suggest that the reference material, or your material be placed in a resealable and airtight container or bowl such as a Tupperware container. This will allow the material to not only be stored during testing, but also add to the ease of fluffing, scooping and return dumping.

It is recommended that the material get “fluffed” before it is placed in the cell. This can be done by whipping the material (with the provided whisk) for five to ten seconds or until the major lumps have been broken up and the material appears to have reached a homogeneous state. The wire whisk is effective on free flowing to moderately cohesive materials. For extremely cohesive material, you will have to pull apart large lumps with your fingers. With free-flowing material segregation of fines and coarse particles must be avoided during sample preparation. In this case, you should load the cell in such a way as to distribute fine and coarse particles uniformly across the test cell.

### **Loading the Cell**

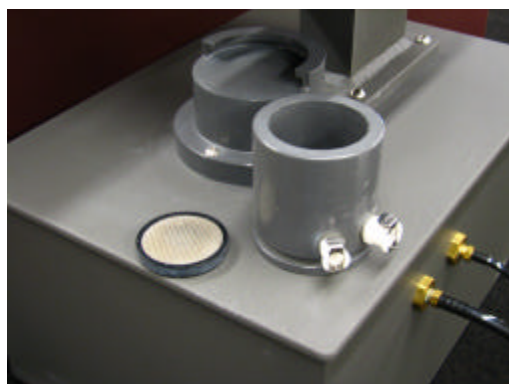
Once the material has been fluffed you can proceed with loading the test cell. Make sure the cell is brushed clean from previous tests and that the screen disk is seated level at the bottom of the cell, with the screen surface up.

Use a spoon to load the material into cell making sure to distribute the solids, uniformly across the test cell, while filling the voids as much as possible. It is better to use smaller spoonfuls to fill cell rather than a few large spoonfuls. In our labs it usually takes about 15 spoonfuls to fill the cell completely. Do not pour material into or shake the test cell during this filling process because it tends to segregate the particles. Also refrain from tamping or pressing powdered materials. This can consolidate and compact the sample prematurely.

Load the material slightly higher than the top of the test cell. Using the provided spatula, strike off excess material. Be sure to hold the spatula blade at a 90° to the cell top so that the sample is not added to by the excess, nor preconsolidated by the action of the blade. Return the loaded test cell to the weight scale and note the actual sample weight for later input.

## **General Care**

Always make sure that the upper shroud is turned to the lowest position and that the perforated piston is free from debris. Also, make sure that the o-rings on the quick disconnect couplings are not cracked and periodically treated with a very light amount of silicone grease.



Cell with Screen



Quick disconnect couplings and o-rings

## **Flow Rate Test procedure**

**IMPORTANT: DO NOT RUN A TEST WITHOUT MATERIAL IN THE CELL OR THE CELL PROPERLY POSITIONED ON THE BASE. If the Machine has a test failure at any time please turn machine off and on again and start test procedures from the beginning. If this continues please contact Johanson Innovations.**

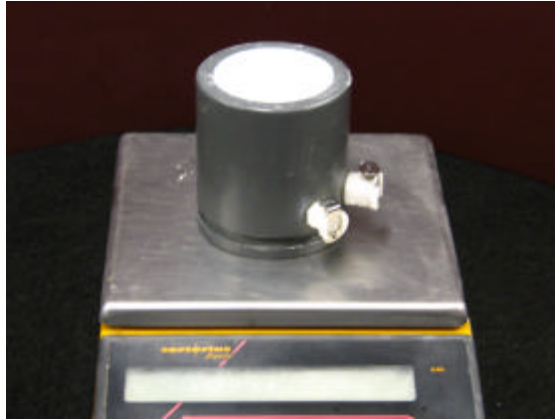
### **Standard Test**

A1. Select **Run Test** from main menu. Screen will read **Initiating system**.

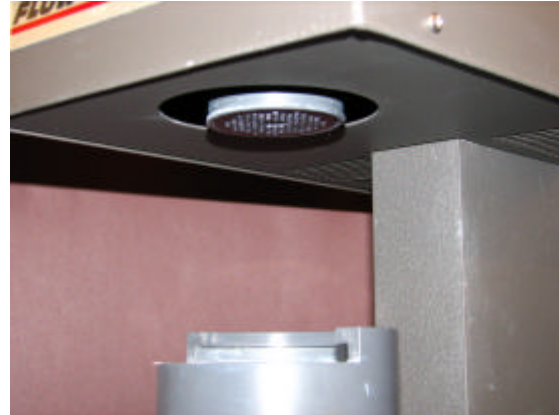
A2. Display will read **Standard, Scientific Mode and Density Only**. Make selection. For Standard continue to A3, for Scientific Mode continue to B1. For Density Only continue to C1.

A3. **Enter Material ID** using touch Screen. Press **Enter**.

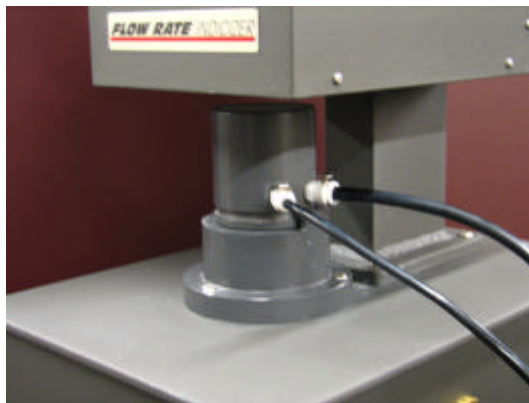
A4. Display will read **Fill Cell with material to be tested and strike level. Weigh and record net weight of sample. Return cell to base and connect air tubes.** Make sure outer shroud is in its lowest position. Press **Continue**.



**Weigh Material with Cell**



**Shroud in Lowest position**



**Connect Air Supply**

A5. **Enter Sample weight in grams.** Press **Continue**.

A6. **Enter Bin diameter in Feet.** For a standard test enter 10. Press **Continue**.

A7. **Enter Bin Outlet Diameter in Inches.** For a standard test enter 12. Press **Continue**.

A8. **Enter conical hopper angle measure from the vertical in degrees.** For standard test enter 20. Press **Continue**.

A9. Display will read **running test, please wait**. When test is complete, results will be displayed. Press **Continue**. Machine will return to main menu. Remove cell and air connectors. Clean upper perforated piston, cell base, and remove material from cell making sure there is no remaining material.

## Scientific Mode

B1. **Enter Material ID** using touch Screen. Press **Enter**

B2. Display will read **Fill Cell with material to be tested and strike level. Weigh and record net weight of sample. Return cell to base and connect air tubes**. Follow the outlined procedure for loading the cell. Make sure outer shroud is in its lowest position. Press **Continue**.

B3. **Enter sample weight in grams**. Press **Continue**.

B4. **Enter number of data points (1-10)**. This is the number of user defined compaction pressures for the scientific test.

B5. **Enter compaction pressure for point one in psf**.

B6. Repeat step B5 for all points starting from lowest to highest.

B7. Display will read **running test, please wait**. When test is complete, results will be displayed. Press **Continue**. Machine will return to main menu. Remove cell and air connectors, clean upper perforated piston, cell base, and remove material from cell making sure no material remains in cell. In scientific mode the tester will measure a density and permeability value at each compaction pressure.

## Density Only Test

C1. **Enter Material ID** using touch Screen. Press **Enter**

C2. Display will read **Fill Cell with material to be Tested and Strike Level. Weigh and record net weight of sample. Return cell to base. There is no need to connect the air tubes**. Follow the outlined procedure for loading the cell. Make sure outer shroud is in its lowest position. Press **Continue**.

C3. **Enter Sample weight in grams**. Press **Continue**.

C4. **Enter number of data points (1-10)**.

C5. **Enter Compaction Pressure for point one in psf**.

C6. Repeat step C5 for all points starting from lowest to highest.

C7. Enter compression speed (500-40,000). Standard speed is 8000. Press [Continue](#).

C8. Display will read [running test, please wait](#). When test is complete, results will be displayed. Press [Continue](#). Machine will return to main menu. Remove cell and air connectors. Clean upper perforated piston, cell base, and remove material from cell making sure no material remains in cell. In Density Only the tester will measure a density value at each compaction pressure.

## **Calibration**

From main menu press calibrate. There are 5 calibration procedures; 1. Cell Top, 2. Load Cell, 3. Transducer one, 4. Transducer two, 5. Leak Test. Procedures 3, 4, and 5 will need additional equipment to calibrate. Please contact Johanson Innovations Inc. for instructions and equipment requirements. All five of the procedures have been performed before shipping.

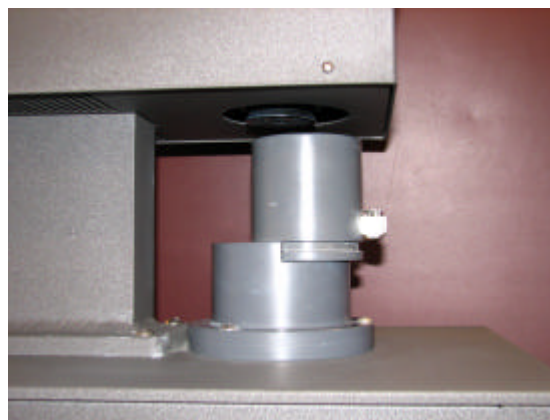
### **Calibration of Cell Top**

D1. From main menu press Calibrate. Press [Cell Top](#). Machine will initiate.

D2. [Remove cell from base. Turn outer shroud to right to expose inner piston](#). Rest cell off center on test base. Press [Continue](#).



**Shroud in Up-most Position**



**Cell Off Center on Test Base**

D3. Display will read [please Wait](#). Upper piston will move down making contact with cell to establish cell top position. Screen will return to main menu.

## Calibration of Load Cell

F1. From main menu press [Calibrate](#). Press [Load Cell](#). Machine will initiate.

F2. Remove cell from base. Turn outer shroud to right to expose inner piston. Gently turn machine upside down. Press [Continue](#).



**Indicizer turned upside down with Small Load**

F3. [Place a small load on inner piston between 75 and 200 grams](#). Press [Continue](#).

F4. Enter [weight](#) in grams on touch screen. Press [Continue](#).

F5. [Place a large load on inner piston between 800 and 2000 grams](#). Press [Continue](#).

F6. Enter [weight](#) in grams on touch screen. Press [Continue](#).

F7. Load Cell is now calibrated. Turn Shroud to lowest position so that it is even with piston. Gently turn machine to right side up.