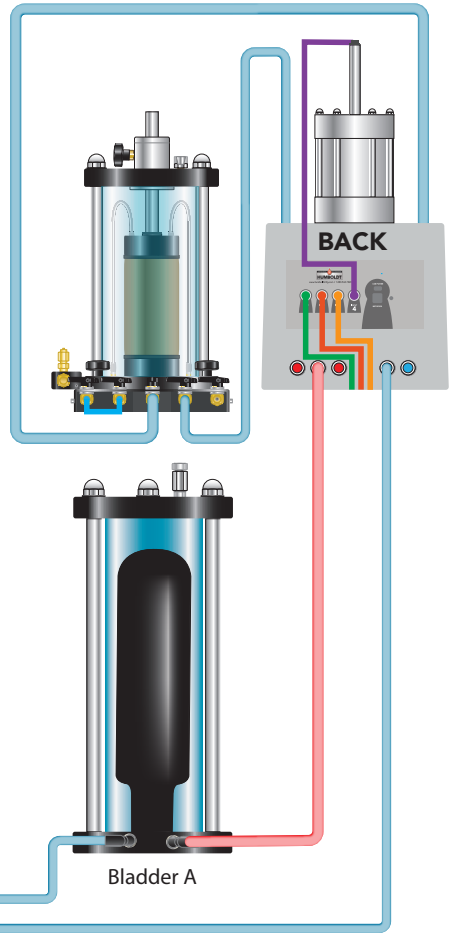
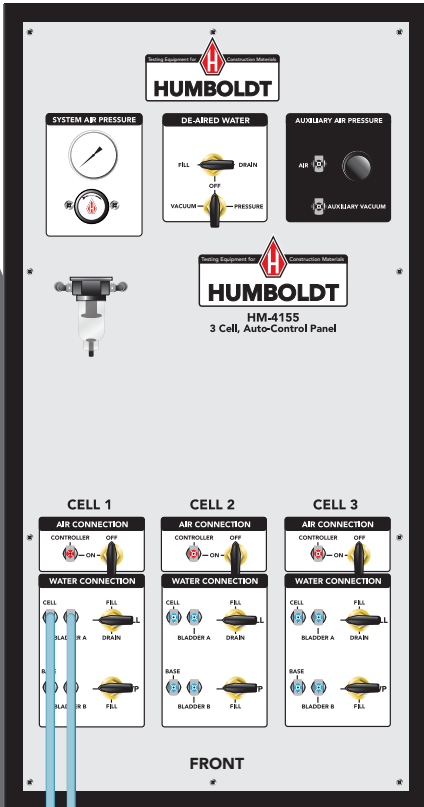
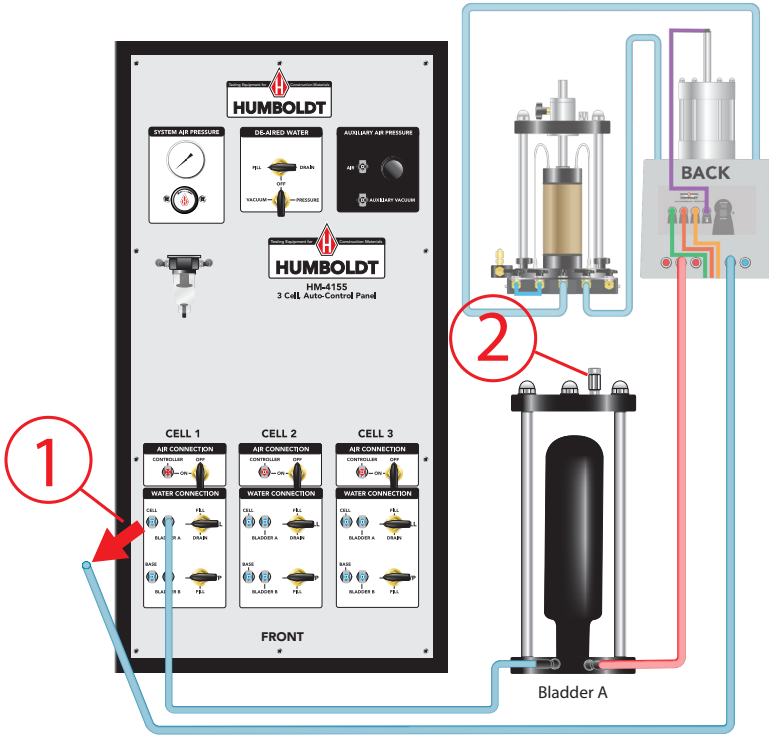


Automatic Triaxial Setup

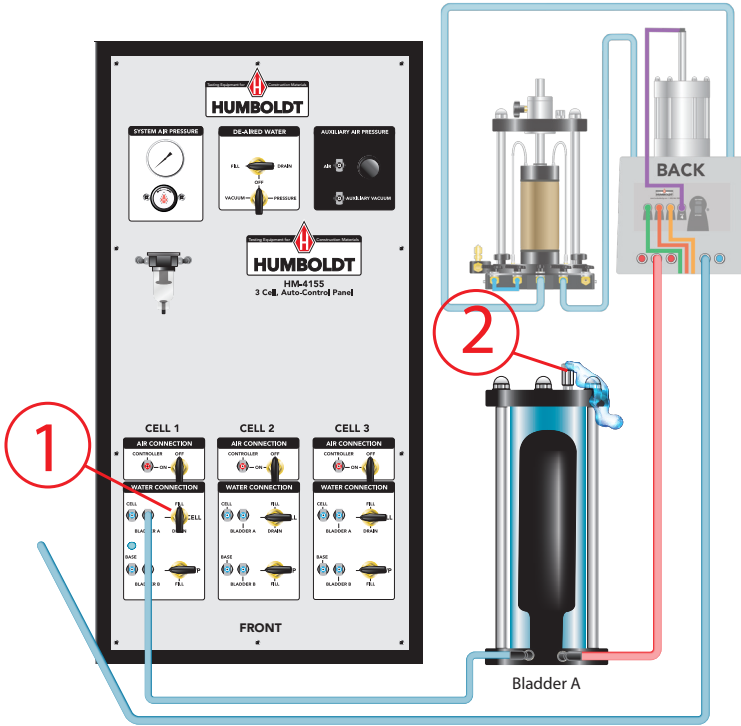




STEP 1

Filling Air/Water Bladder A (Cell Bladder)
from HM-4154 or HM-4155 Distribution Panels

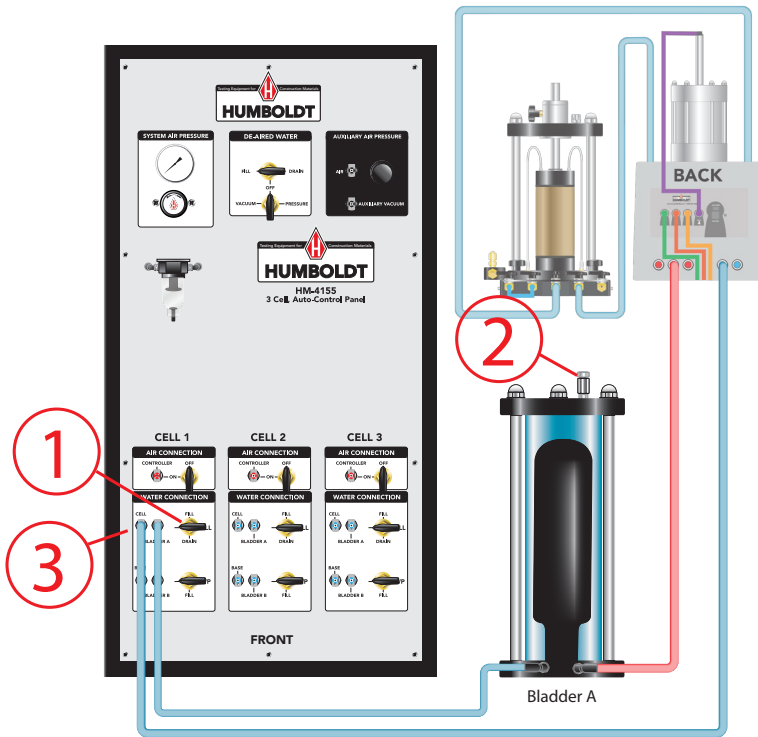
1. Disconnect Cell Water line from Panel.
2. Release Bladder Bleed Screw (Vent).



STEP 2

Filling Air/Water Bladder A (Cell Bladder) from HM-4154 or HM-4155 Distribution Panels

1. Slowly Turn Water Connection Valve to Fill.
Slow the water fill rate of the Chamber as the water level approaches the top of the Chamber.
2. Continue filling the Chamber until water exits the Chamber Vent.

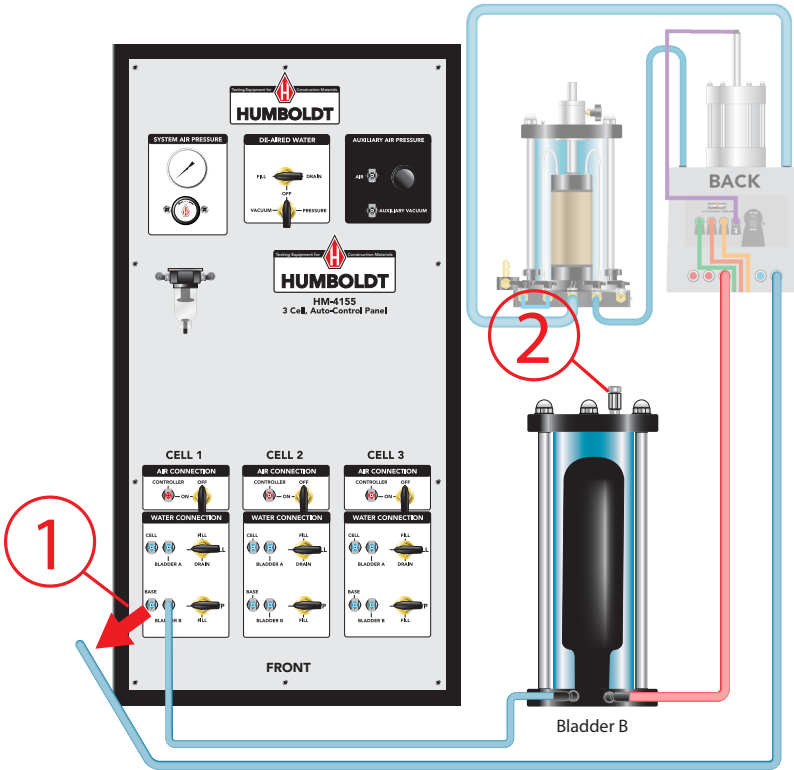


STEP 3

Filling Air/Water Bladder A (Cell Bladder)

from HM-4154 or HM-4155 Distribution Panels

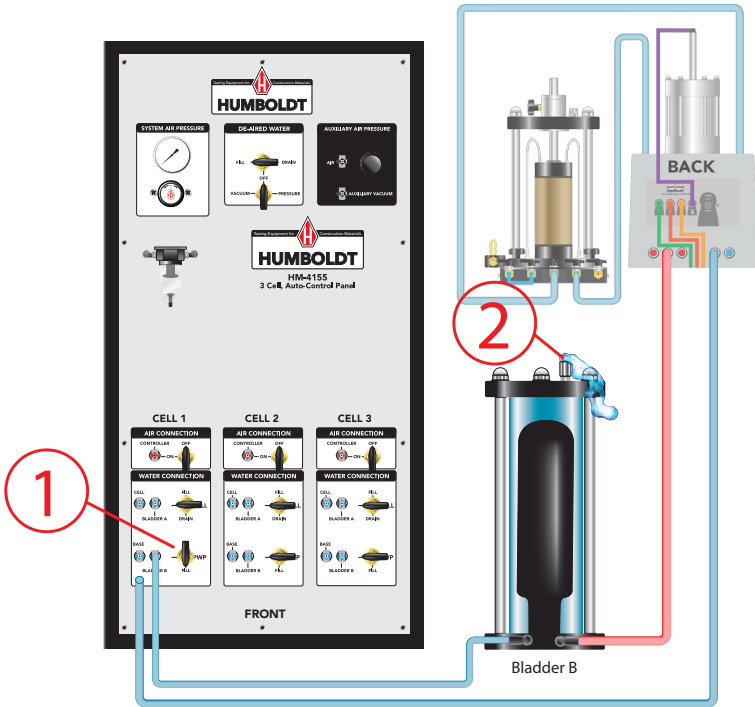
1. Turn Water Connection Valve to Off (pointing left) position.
2. Close the Bleed Screw (Vent) on the Bladder.
3. Reconnect Cell Water line to Panel.



STEP 4

Filling Air/Water Bladder B (Base Bladder)
from HM-4154 or HM-4155 Distribution Panels

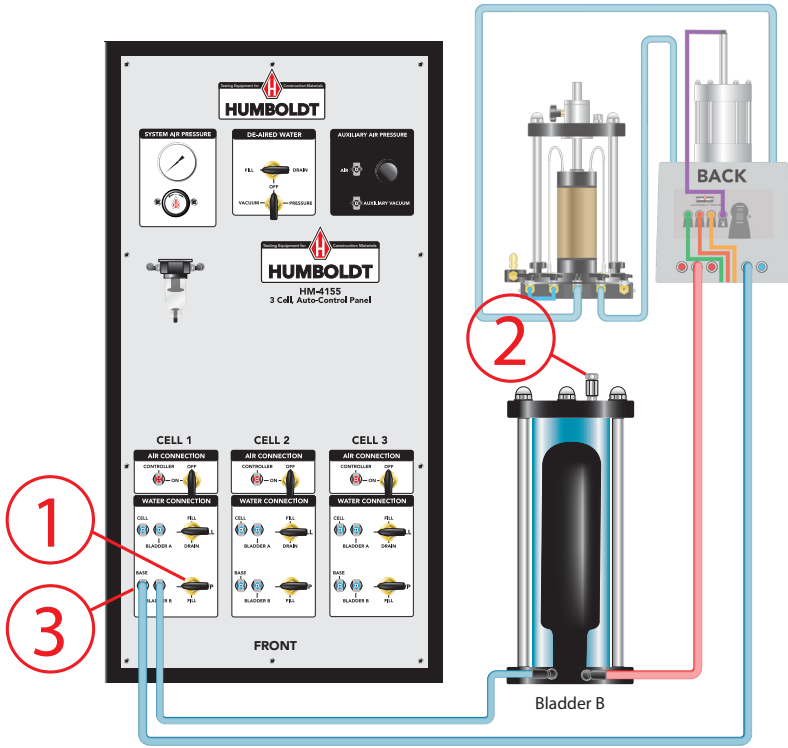
1. Disconnect Base Water line from Panel.
2. Release Bladder Bleed Screw (Vent).



STEP 5

Filling Air/Water Bladder B (Base Bladder)
 from HM-4154 or HM-4155 Distribution Panels

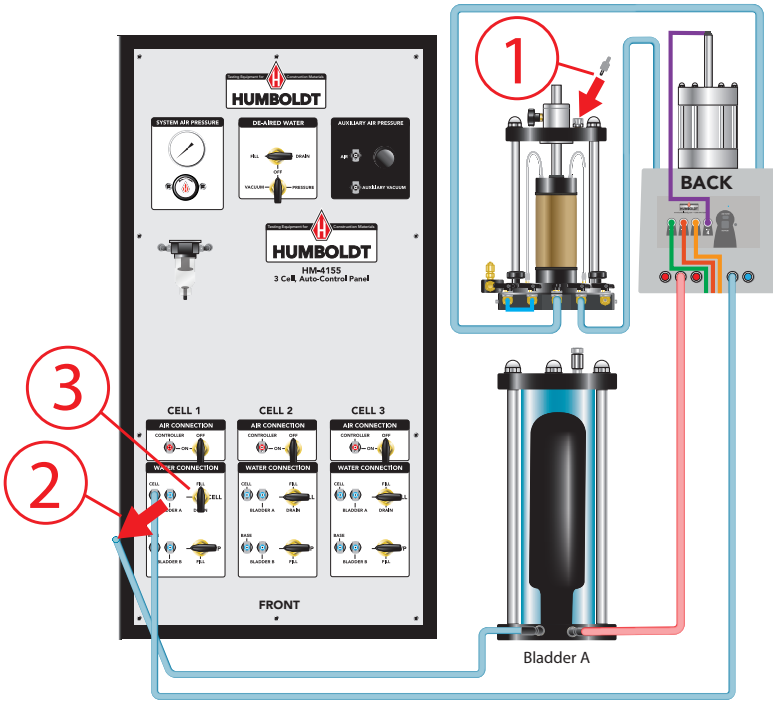
1. Slowly Turn Water Connection Valve to Fill. Slow the water fill rate of the Bladder Chamber as the water level approaches the top of the Chamber.
2. Continue filling the Bladder Chamber until water exits the Chamber Vent.



STEP 6

Filling Air/Water Bladder B (Base Bladder)
From HM-4154 or HM-4155 Distribution Panels

1. Turn Water Connection Valve to Off (pointing left) position.
2. Close the Bleed Screw (Vent) on the Bladder.
3. Reconnect Base Water line to Panel.

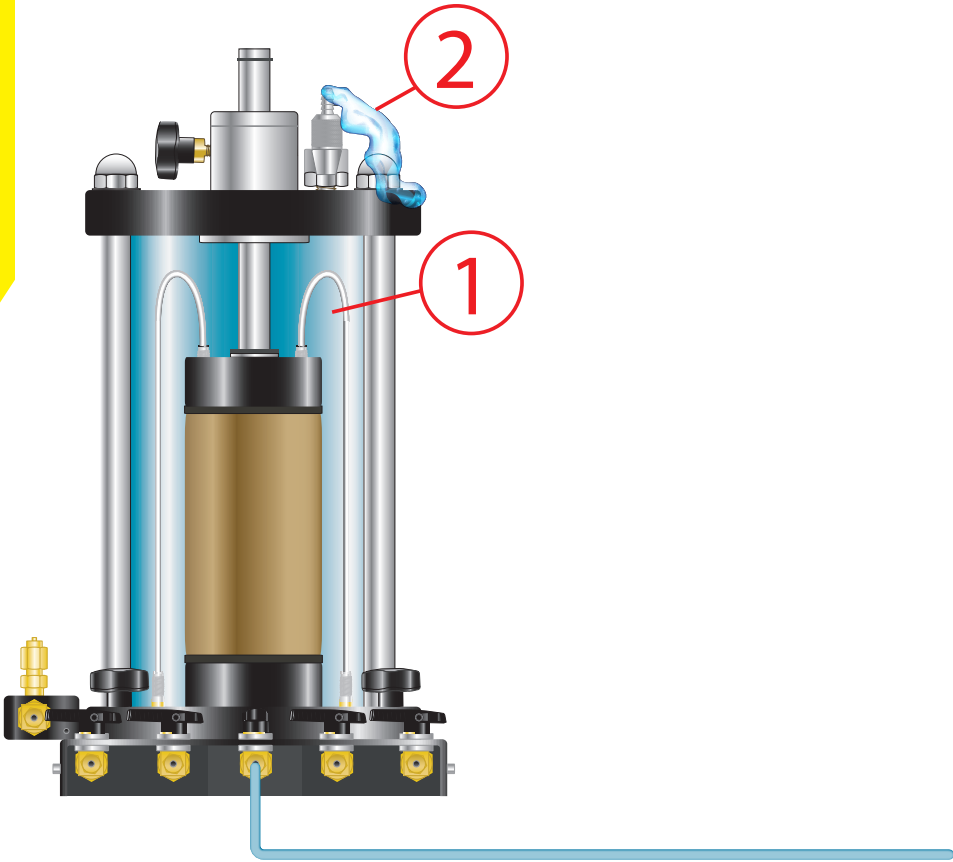


STEP 7

Filling Triaxial Cell Chamber

from HM-4154 or HM-4155 Distribution Panels

1. Insert Vent Adapter into Vent on top of Triaxial Cell Chamber.
2. Disconnect the Bladder A Water line from Panel.
3. Turn Valve slowly to Fill. Slow the water fill rate as the water level in the Cell approaches the top of the chamber.

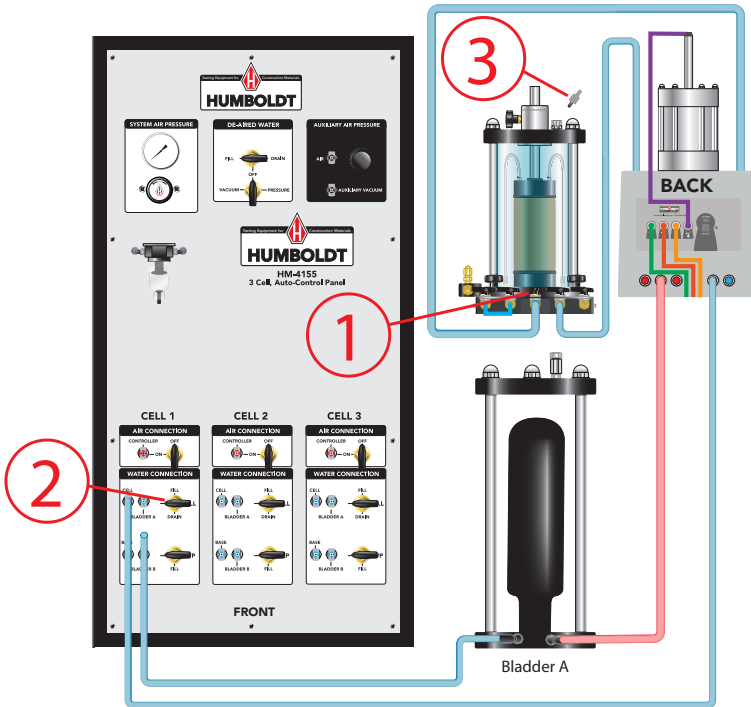


STEP 8

Filling Triaxial Cell Chamber

from HM-4154 or HM-4155 Distribution Panels

1. Slow the water fill rate of the Cell Chamber as the water level reaches the top of the Cell Chamber.
2. Continue filling the cell until water exits the Cell Vent.



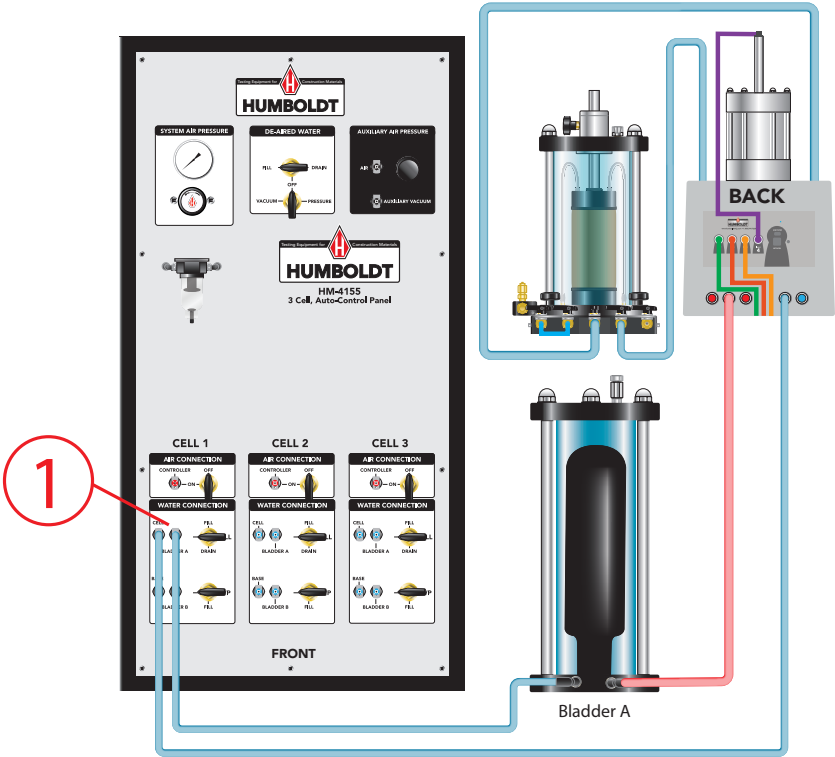
STEP 9

Filling Triaxial Cell Chamber

from HM-4154 or HM-4155 Distribution Panels

1. Close the Tap Water Valve at the base of the Cell.
2. Then, turn the Water Connection Valve Indicator from the Fill position to the Off position (middle position).
3. Finally, remove the Cell Vent Adapter from the Cell Vent on the Triaxial Cell.

These three steps should be done in the described order or tests may not be accurate.

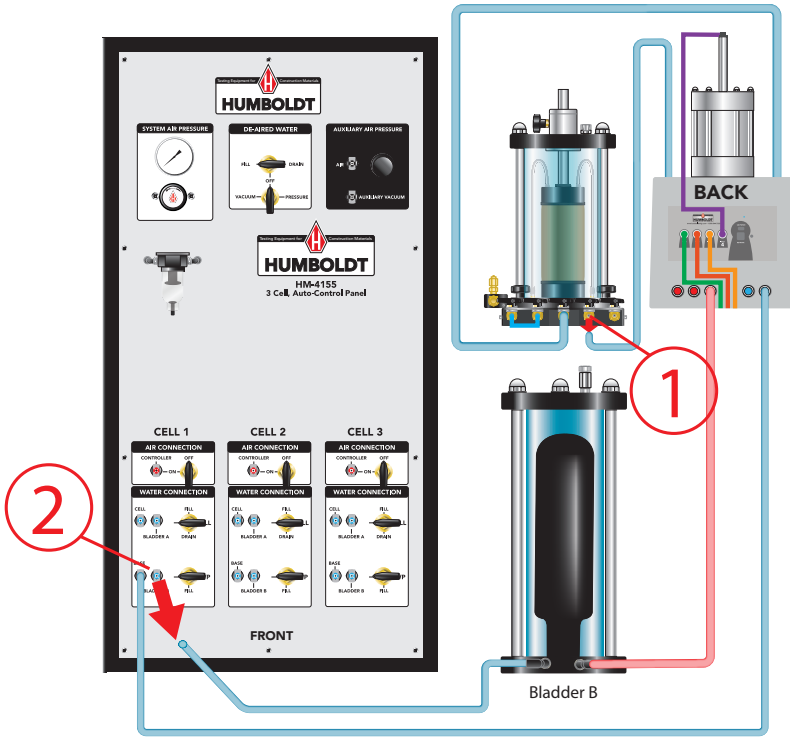


STEP 10

Filling Triaxial Cell Chamber

from HM-4154 or HM-4155 Distribution Panels

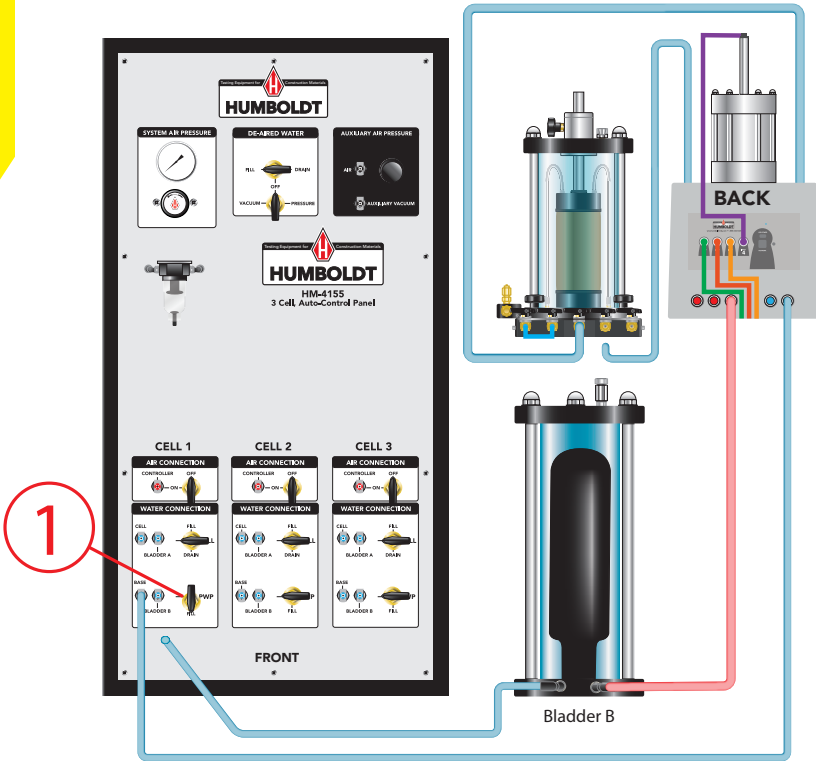
1. Reconnect Bladder A (Cell Bladder) to Panel.



STEP 11

Filling Automatic Volume Change
on HM-5240 Pressure Controller with
HM-4154 or HM-4155 Distribution Panels

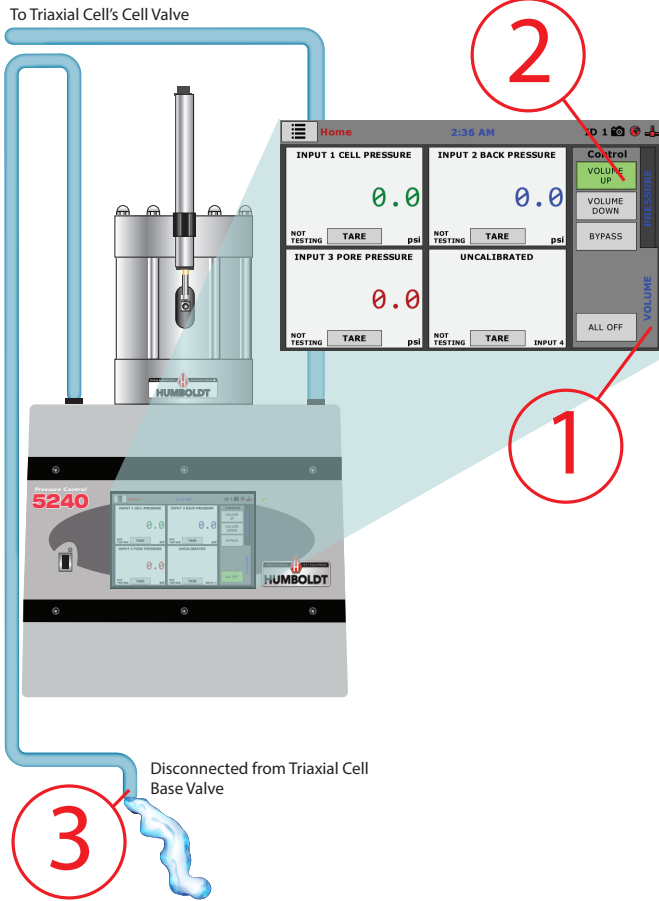
1. Disconnect Base Line from Triaxial Cell.
2. Disconnect Bladder B line from Panel.



STEP 12

Filling Automatic Volume Change
 on HM-5240 Pressure Controller with HM-4154
 or HM-4155 Distribution Panels

1. Turn Valve to Fill position.

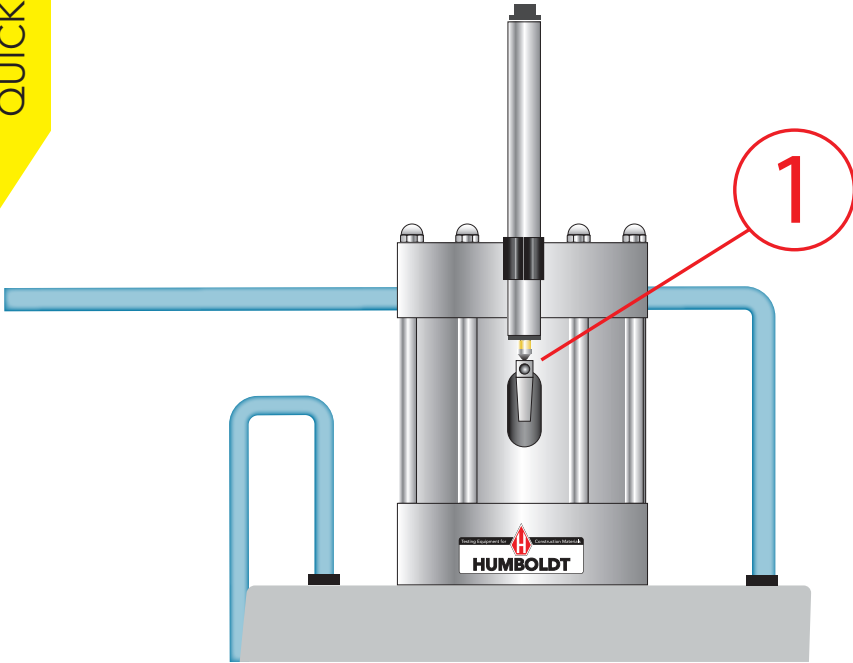


STEP 13

Filling Automatic Volume Change

on HM-5240 Pressure Controller with HM-4154
or HM-4155 Distribution Panels

1. Press Volume Tab on HM-5240 Pressure Controller.
2. Press Volume Up Key.
3. When Volume Up key is pressed, water will begin to drain from top chamber of HM-5240 Pressure Controller. Provide a container or direct the tubing to a drain.

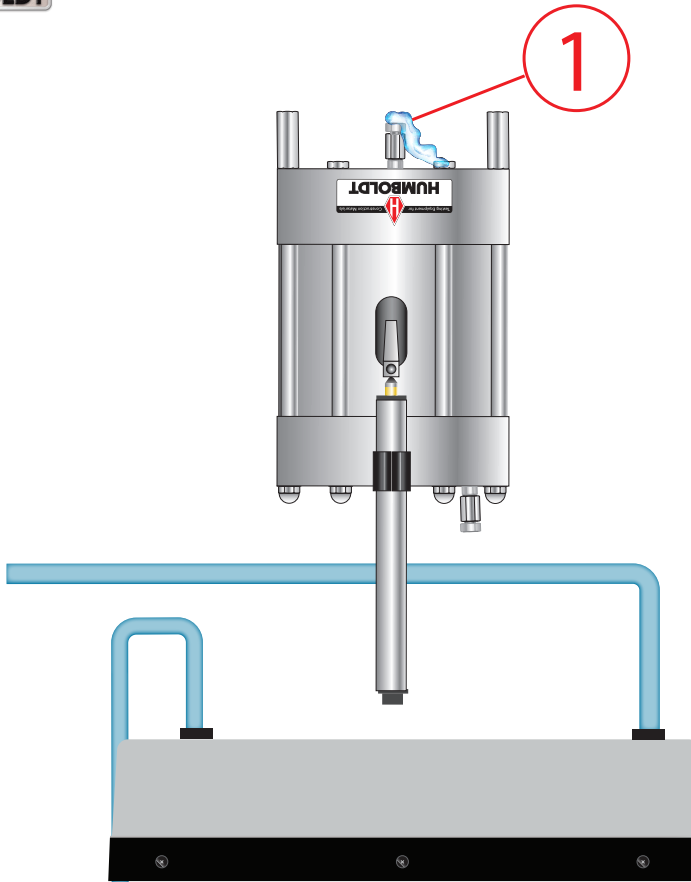


STEP 14

Filling Automatic Volume Change

on HM-5240 Pressure Controller with HM-4154
or HM-4155 Distribution Panels

1. At the same time, the Controller's Volume Change Chamber will rise pushing the Transducer to the top of its travel.



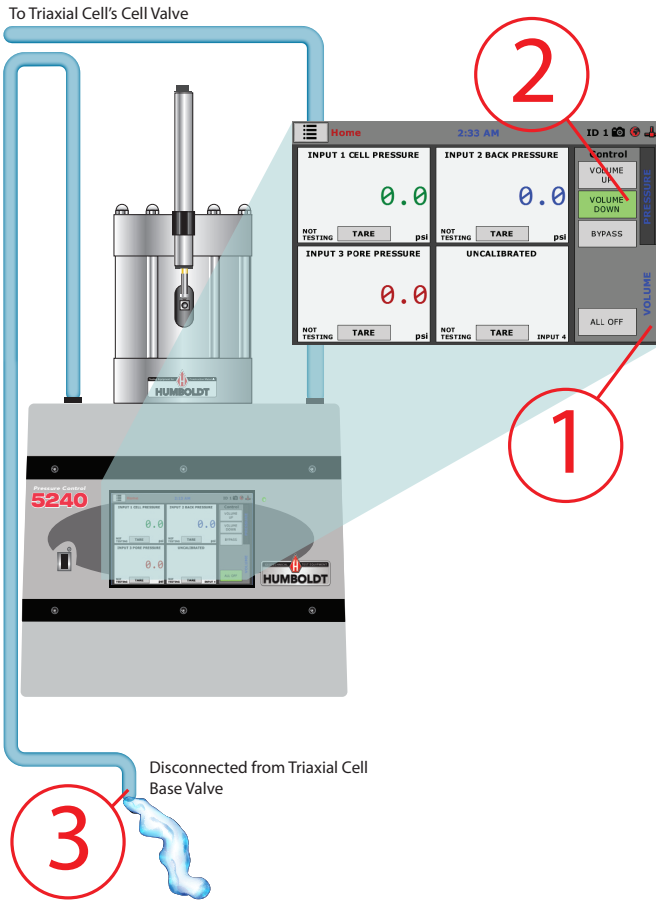
STEP 15

Filling Automatic Volume Change

*on HM-5240 Pressure Controller with HM-4154
or HM-4155 Distribution Panels*

1. To Bleed the Lower Chamber of any air, Lift the Volume Change housing out of the Controller and turn the chamber up-side-down.

Open the Bottom Chamber Valve until water escapes.
Close the Valve and replace the Volume Change housing to its normal position.

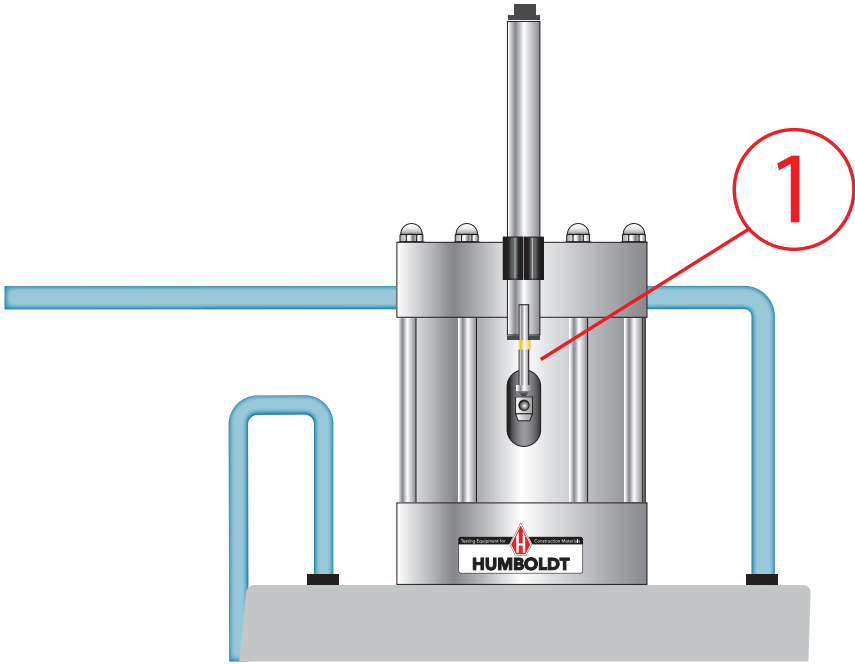


STEP 16

Filling Automatic Volume Change

on HM-5240 Pressure Controller with HM-4154
or HM-4155 Distribution Panels

1. Press Volume Tab on HM-5240 Pressure Controller.
2. Press Volume Down Key.
3. When Volume Down key is pressed, water will begin to drain from bottom chamber of HM-5240 Pressure Controller. Provide a container or direct the tubing to a drain.

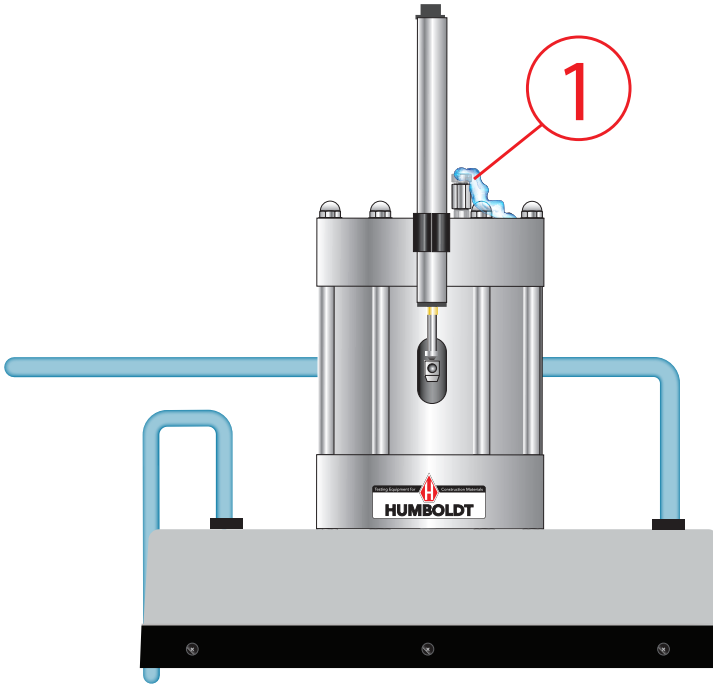


STEP 17

Filling Automatic Volume Change

*on HM-5240 Pressure Controller with HM-4154
or HM-4155 Distribution Panels*

1. At the same time, the Controller's Volume Change Chamber will lower allowing the Transducer to move to the bottom of its travel.

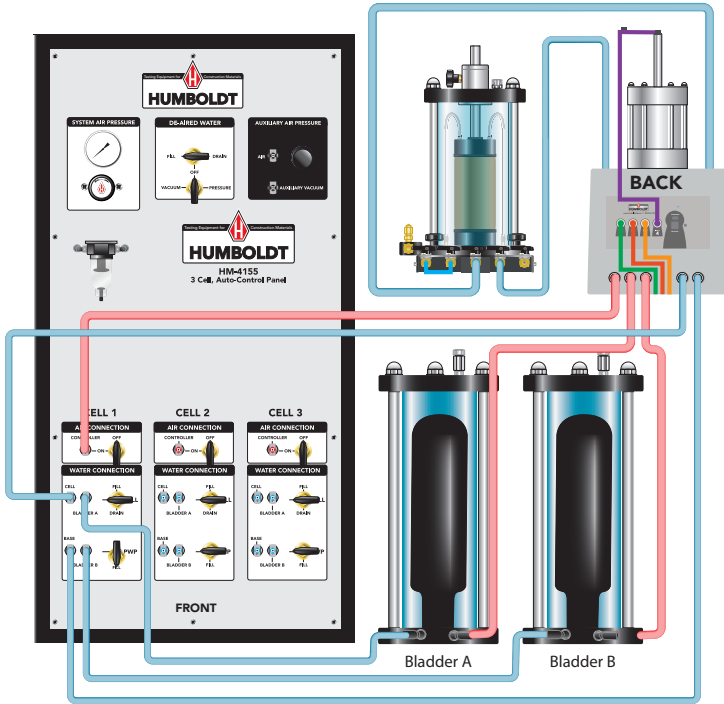


STEP 18

Filling Automatic Volume Change

on HM-5240 Pressure Controller with HM-4154
or HM-4155 Distribution Panels

1. To Bleed the Upper Chamber of air, Open the Top Chamber Valve until water escapes. Then Close the Valve.
2. Repeat this procedure for both Chambers several times until all visible air in the apparatus has been removed.
3. It is advisable to leave the apparatus under a pressure of about 50 psi (700kpa) at least overnight. This will cause any remaining trapped air to go into solution.

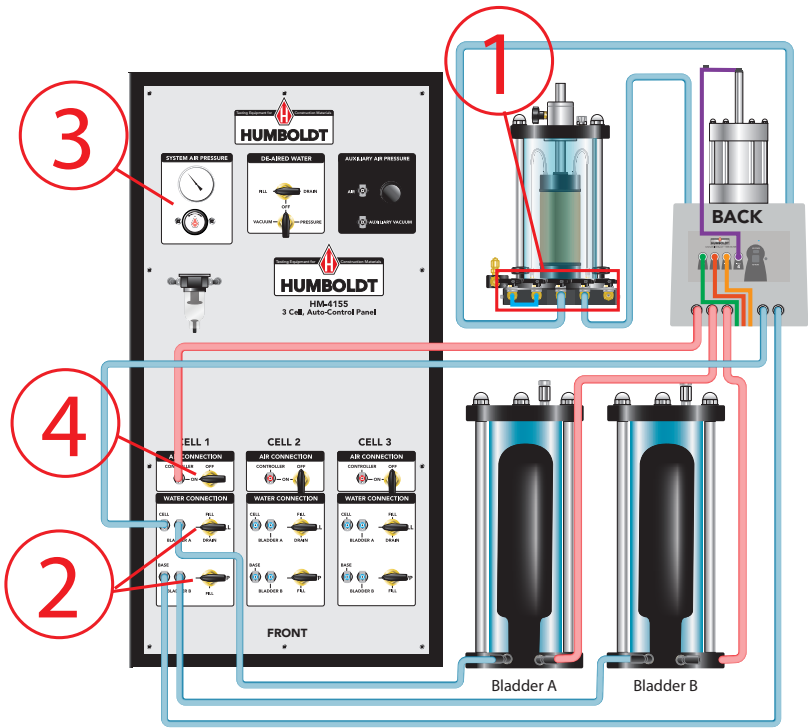


STEP 19

Filling Automatic Volume Change

on HM-5240 Pressure Controller with HM-4154
or HM-4155 Distribution Panels

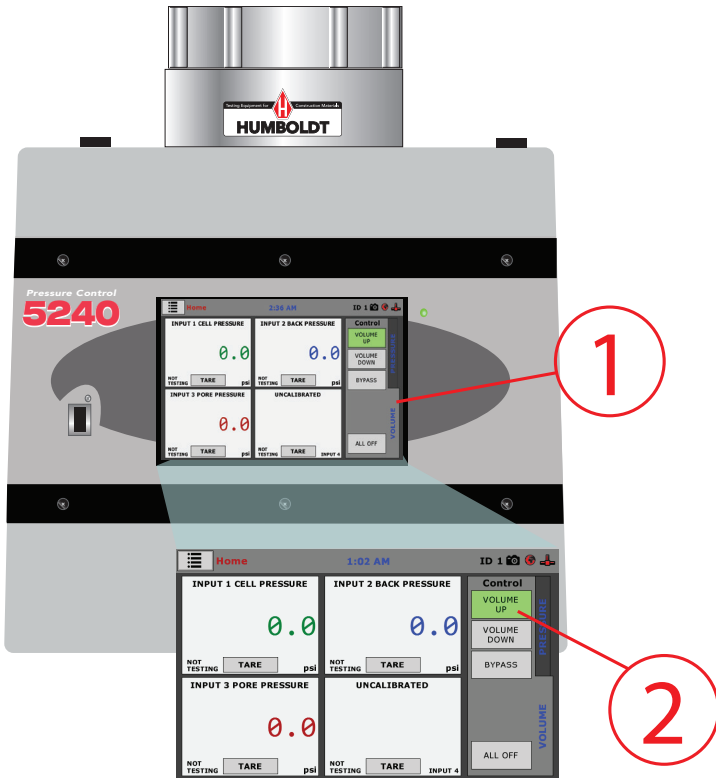
Reconnect all tubing so that your hookup matches this schematic.



STEP 20

Filling Automatic Volume Change on HM-5240 Pressure Controller with HM-4154 or HM-4155 Distribution Panels

1. Turn all Valves to the Off position on Triaxial Cell.
2. Turn the Valve for Bladder A and B to the Off position (pointing left).
3. Apply 120 psi pressure.
4. Turn the Air Connection Valve to the On position.

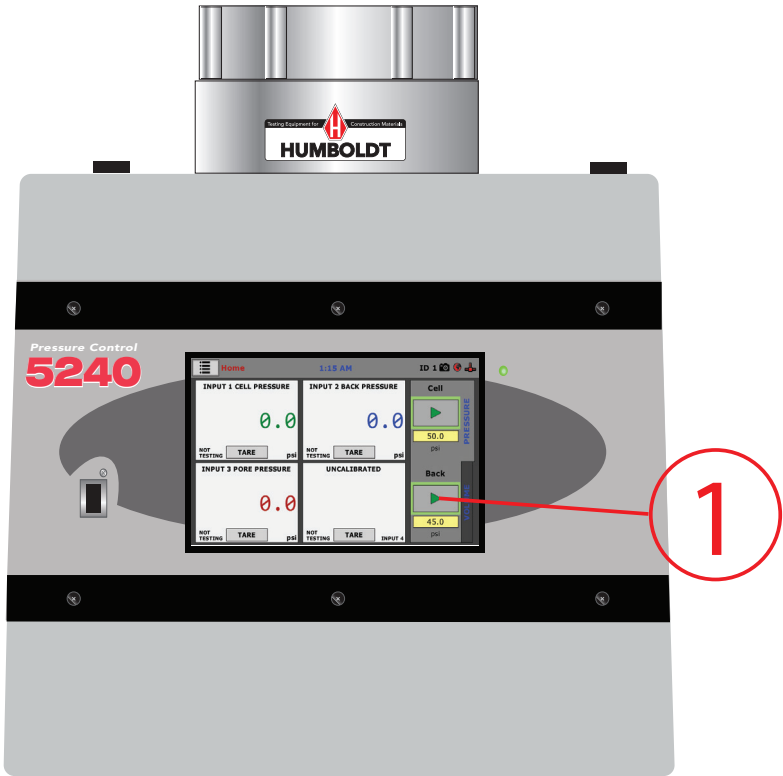


STEP 21

Filling Automatic Volume Change

on HM-5240 Pressure Controller with HM-4154 or HM-4155 Distribution Panels

1. Select the Volume Tab. Press Volume Up.
2. Press the Volume Up Button.

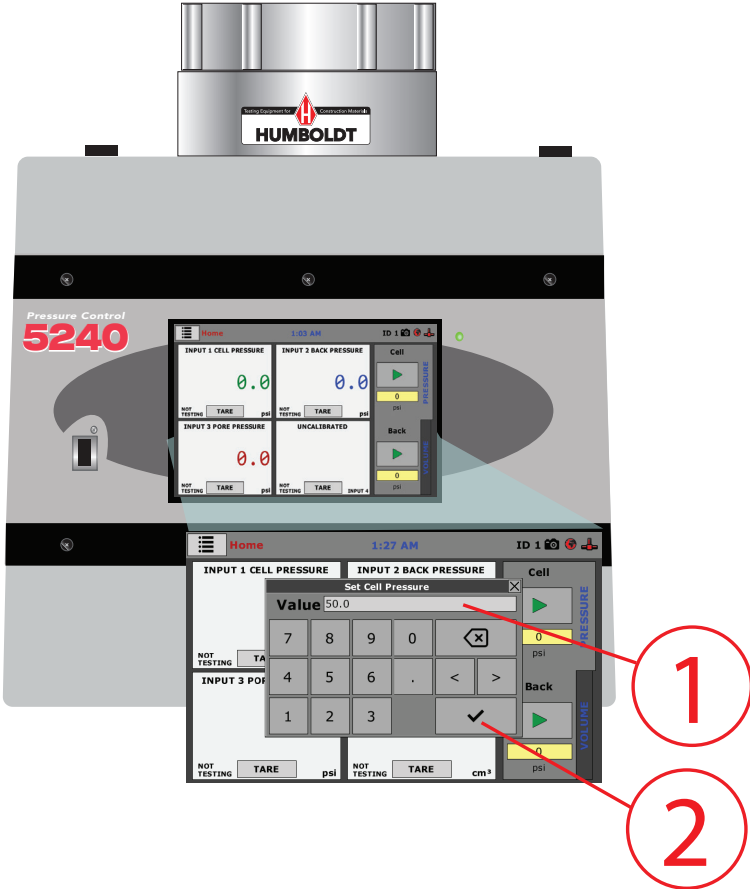


STEP 22

Filling Automatic Volume Change

on HM-5240 Pressure Controller with HM-4154
or HM-4155 Distribution Panels

1. Press Run on the Pressure Tab under Back.

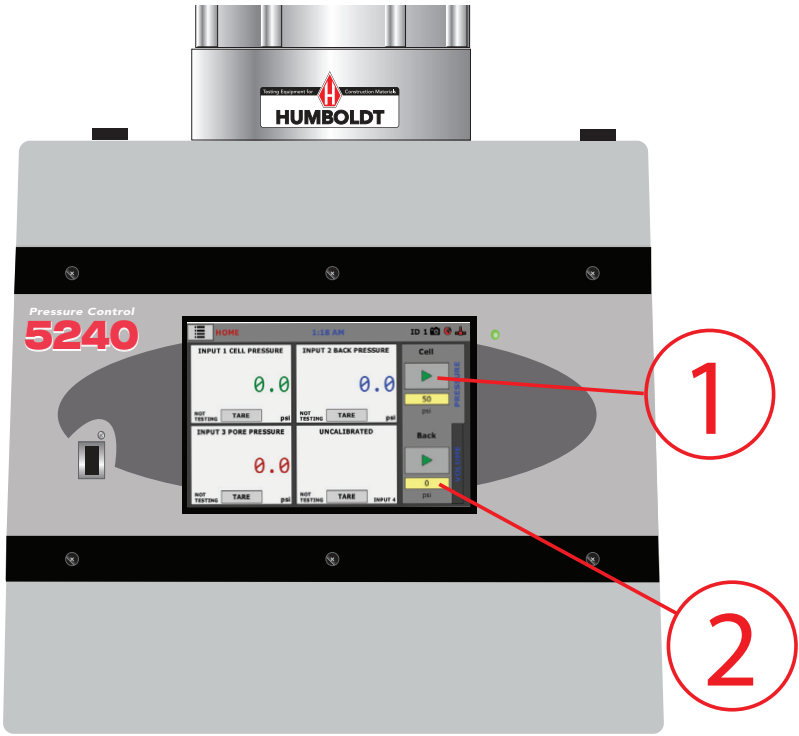


STEP 23

Filling Automatic Volume Change

on HM-5240 Pressure Controller with HM-4154
or HM-4155 Distribution Panels

1. The bottom screen will appear. Enter 50 psi in the Value field.
2. Then, Click on the Check Mark of the popup window.

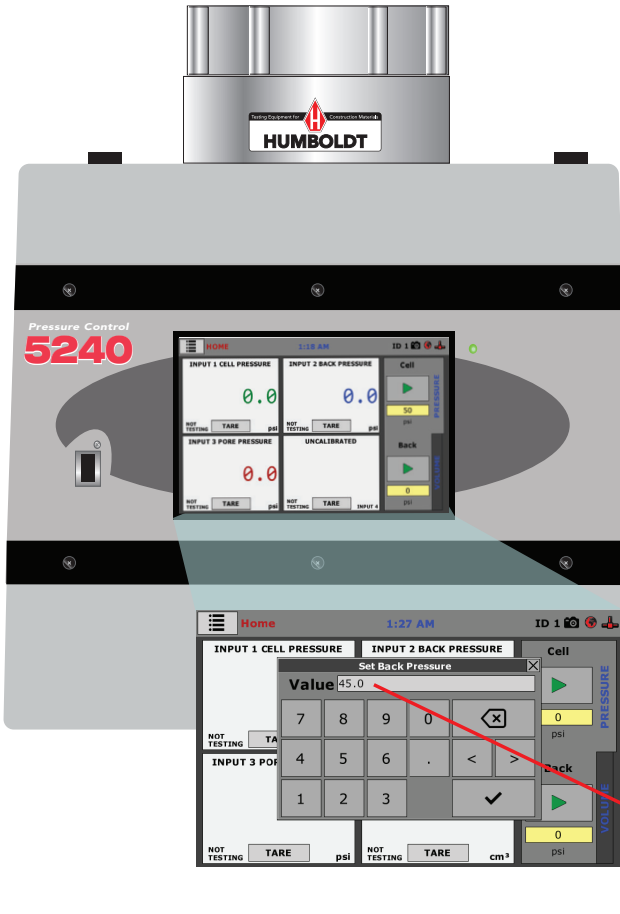


STEP 24

Filling Automatic Volume Change

on HM-5240 Pressure Controller with HM-4154
or HM-4155 Distribution Panels

1. Press the Green Arrow, Run Button on the Pressure Tab under Cell.
2. Click on the psi field under Back.

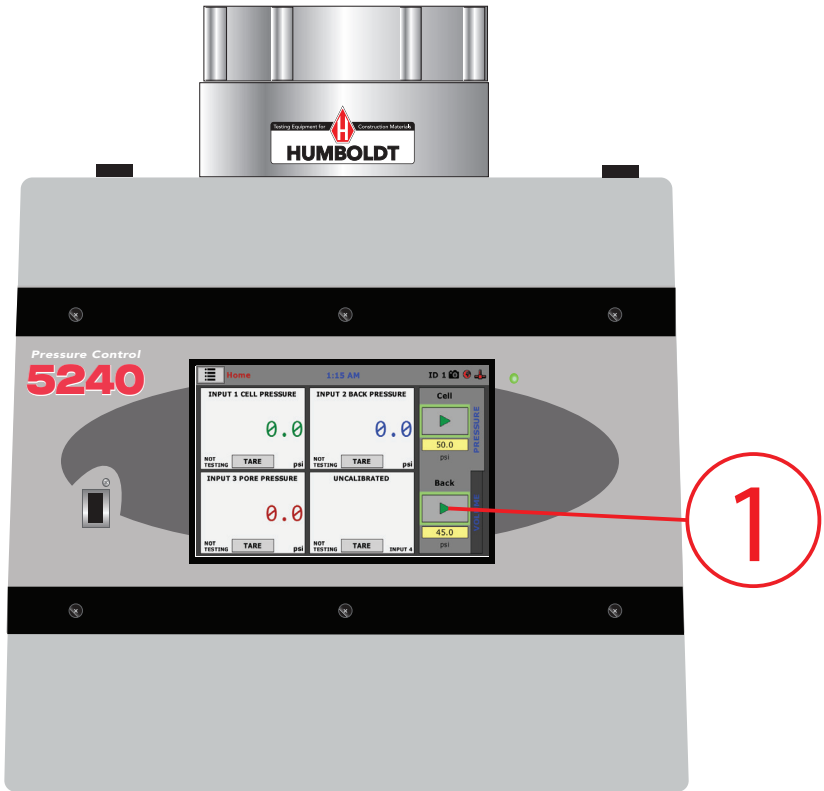


STEP 25

Filling Automatic Volume Change

on HM-5240 Pressure Controller with HM-4154 or HM-4155 Distribution Panels

1. Enter 45 psi for the Back Pressure of the popup window.

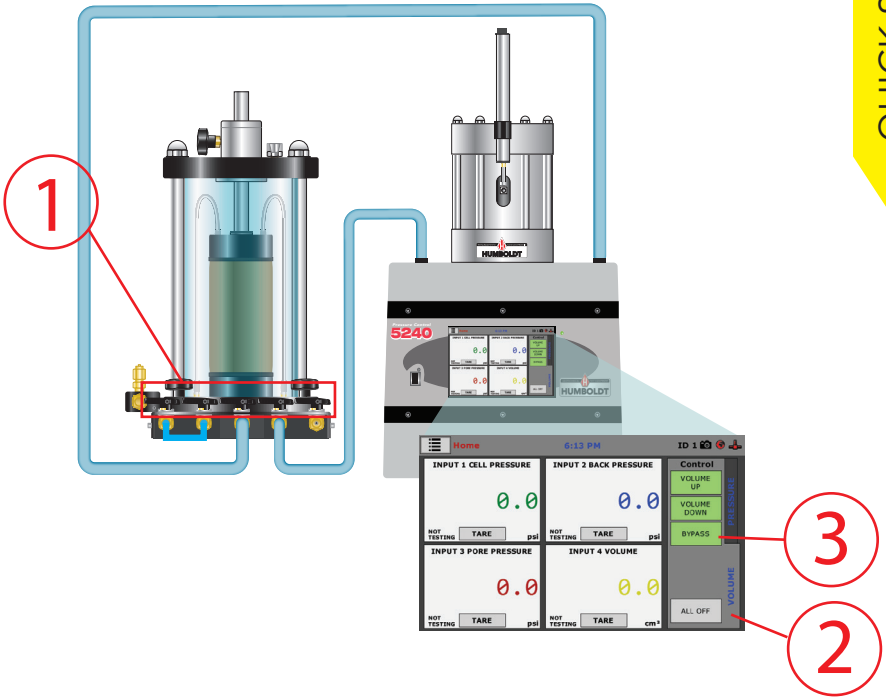


STEP 26

Filling Automatic Volume Change

on HM-5240 Pressure Controller with HM-4154
or HM-4155 Distribution Panels

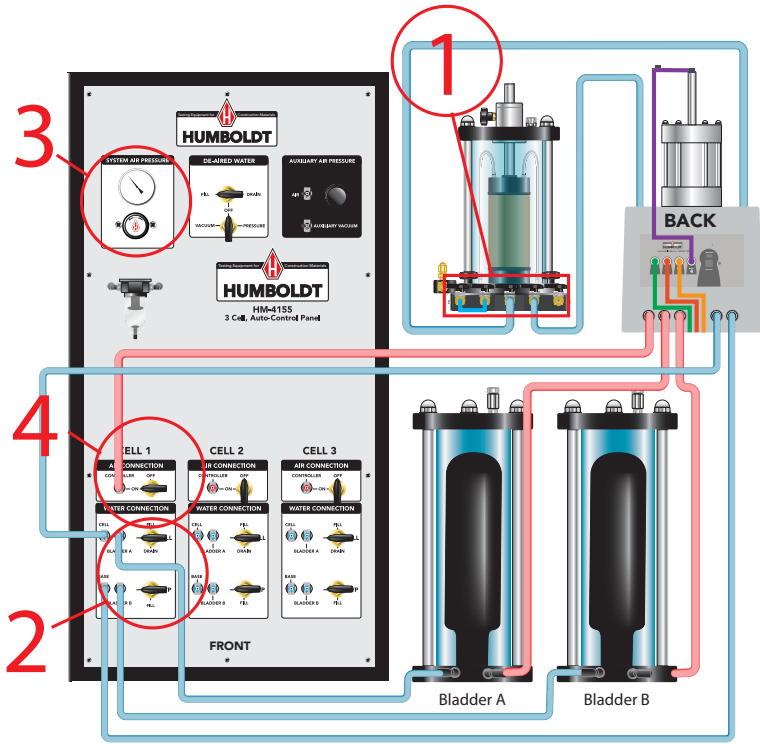
1. Press the Green Arrow, Run Button on the Pressure Tab under Back.



STEP 27

Saturating (De-airing) Drainage Lines

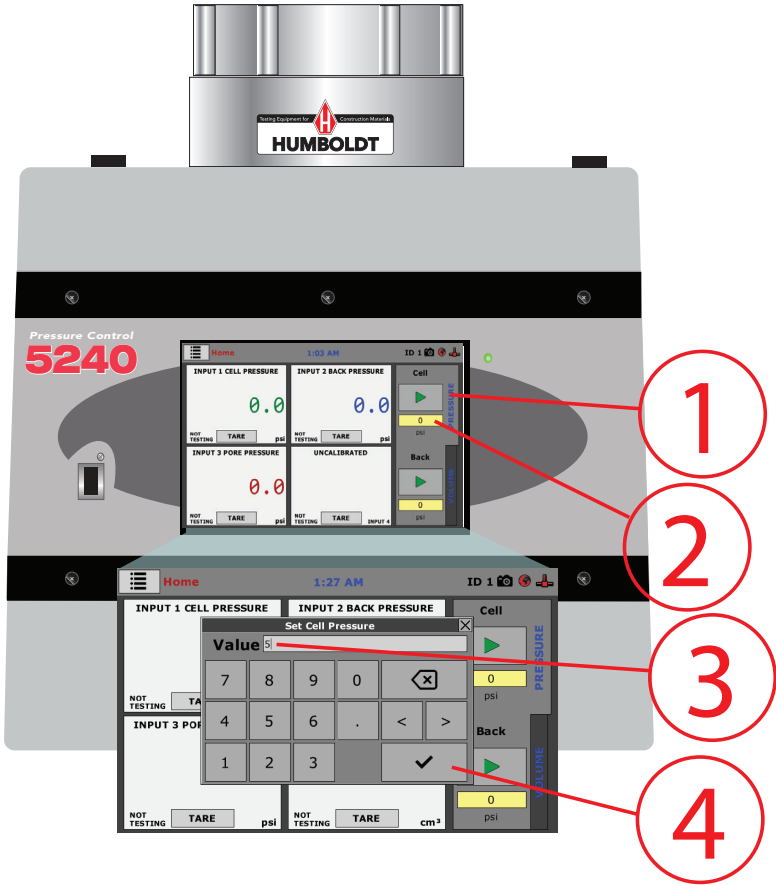
1. All Valves on the Triaxial Cell should be turned to the Off position.
2. Click on the Volume Tab.
3. Press the Bypass button.



STEP 28

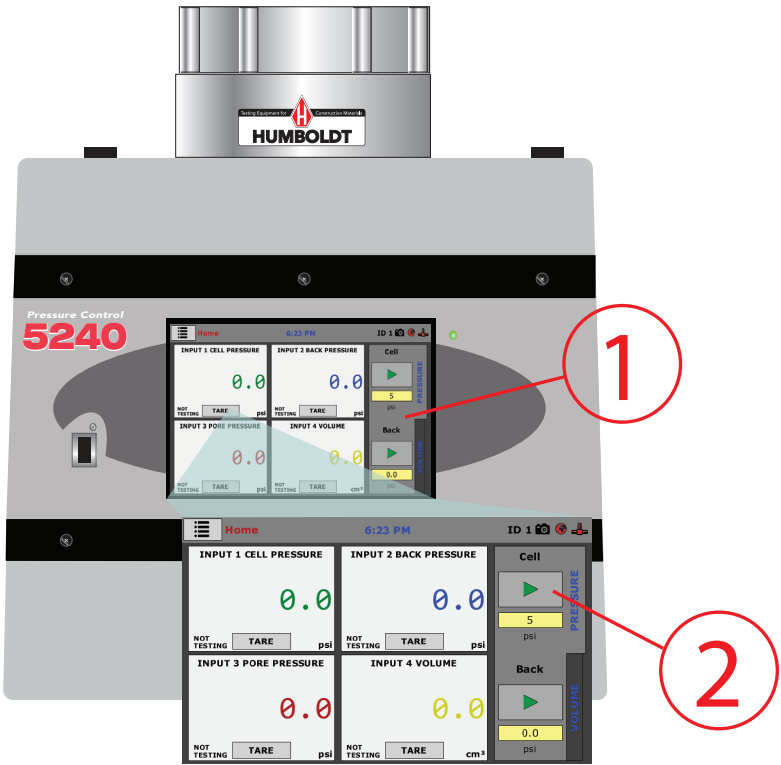
Saturating (De-airing) Drainage Lines

1. Valves should be in the Off position.
2. Valves for Bladder A and B should be in the Off position (pointing left).
3. Pressure should already be set to 120 psi.
4. The Air Connection Valve should be in the On position.



STEP 29 Saturating (De-airing) Drainage Lines

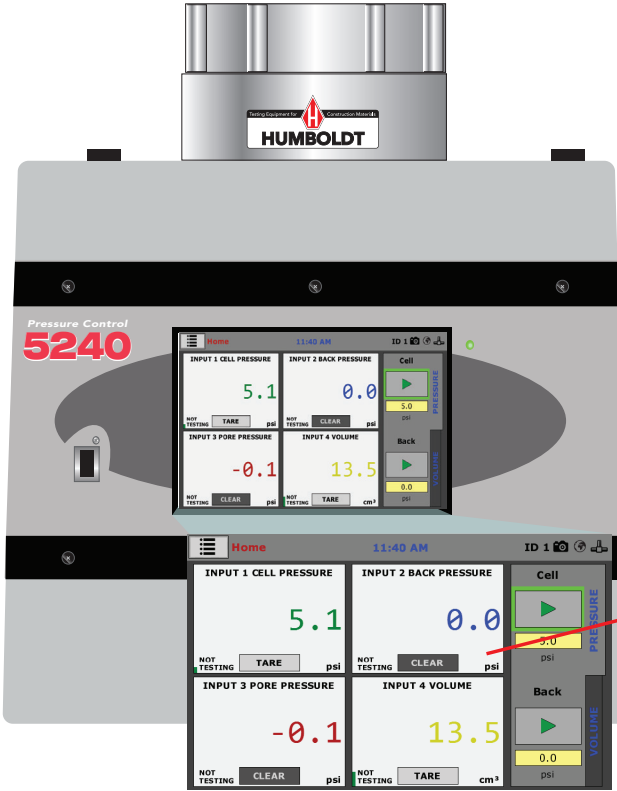
1. Select the Pressure Tab.
2. Click on the psi field to set the pressure.
3. Enter 3-5 psi in the psi field of the pop-up window.
4. Click on the Check Mark button.



STEP 30

Saturating (De-airing) Drainage Lines

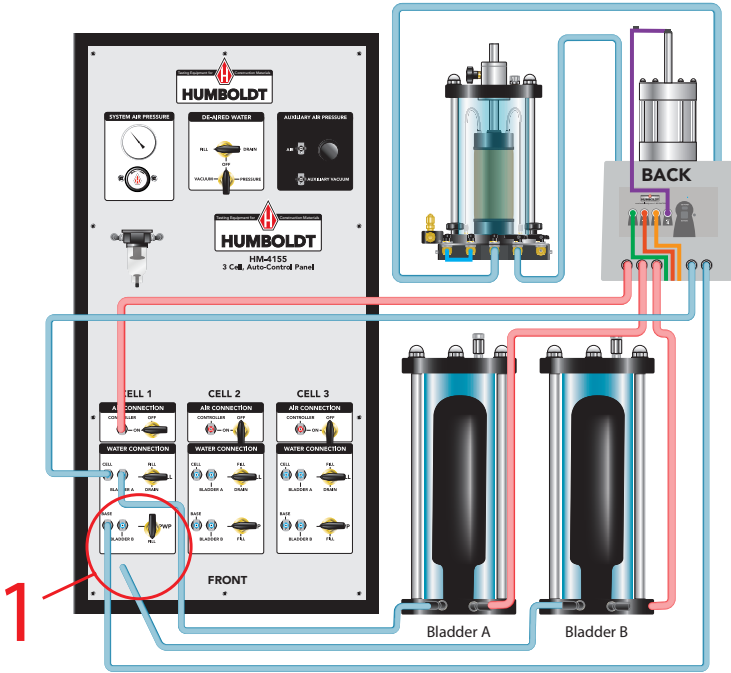
1. Screen will look like this.
2. On the Pressure Tab, Click the Green Arrow, Run button, under Cell.



STEP 31

Saturating (De-airing) Drainage Lines

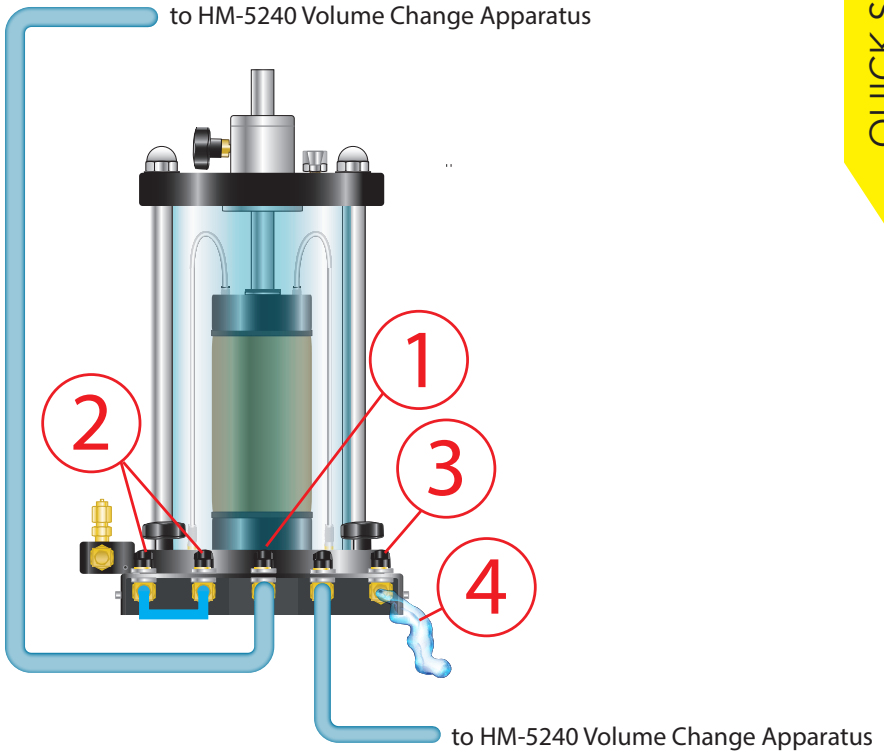
1. You will begin to see readings on the screen.



STEP 32

Saturating (De-airing) Drainage Lines

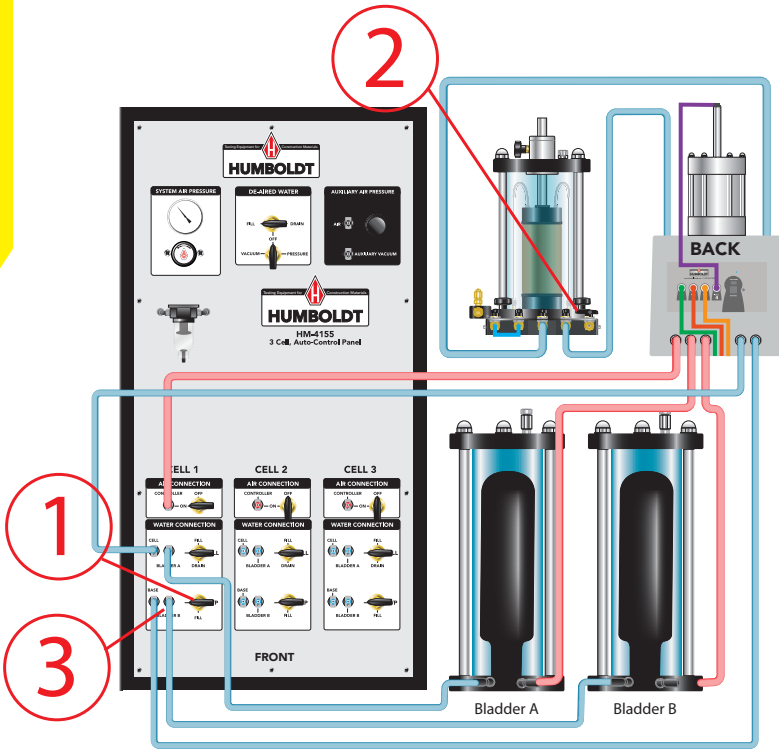
1. Disconnect Bladder B Line from the Distribution Panel.
Turn Bladder B Valve to the Fill position.



STEP 33

Saturating (De-airing) Drainage Lines

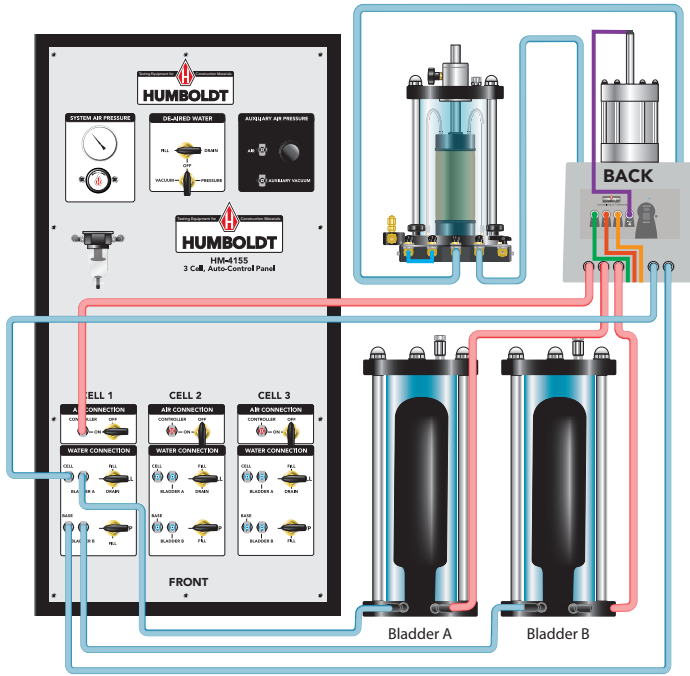
1. Turn the Cell Valve on the Triaxial Cell to the Open position.
2. Turn the Left-hand Base and Top Valves to the Open position.
3. Turn Right-hand Top Valve to the Open position.
4. To catch the water flowing out of the Top Valve, provide a container or direct connected tubing to a drain.



STEP 34

Saturating (De-airing) Drainage Lines

1. When air bubbles are no longer evident in the drainage line coming from the Cell Right-hand Top Valve, turn Bladder B Valve to the Off position.
2. Turn Right-hand side Top Valve to Off position.
3. Reconnect Bladder B line to Distribution Panel.



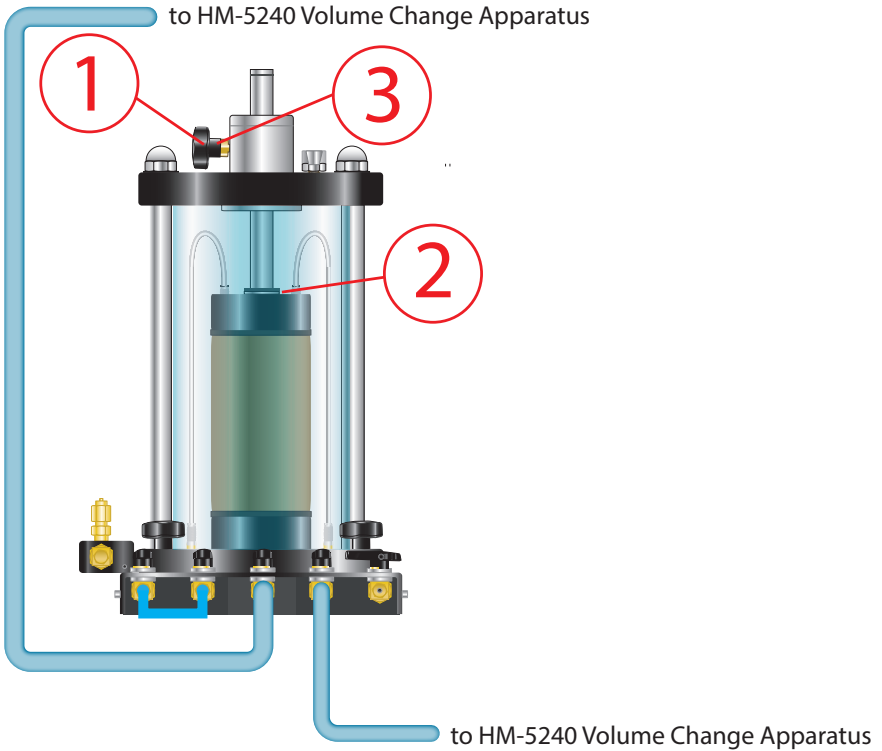
STEP 35

Saturating and Recording B Values

Assumptions:

1. The Sample has been set up in the Triaxial Cell.
2. The Bladders A & B have been filled.
3. The Triaxial Cell Chamber has been filled.
4. The Volume Change has been filled.
5. The Drainage Line been Saturated (De-aired).

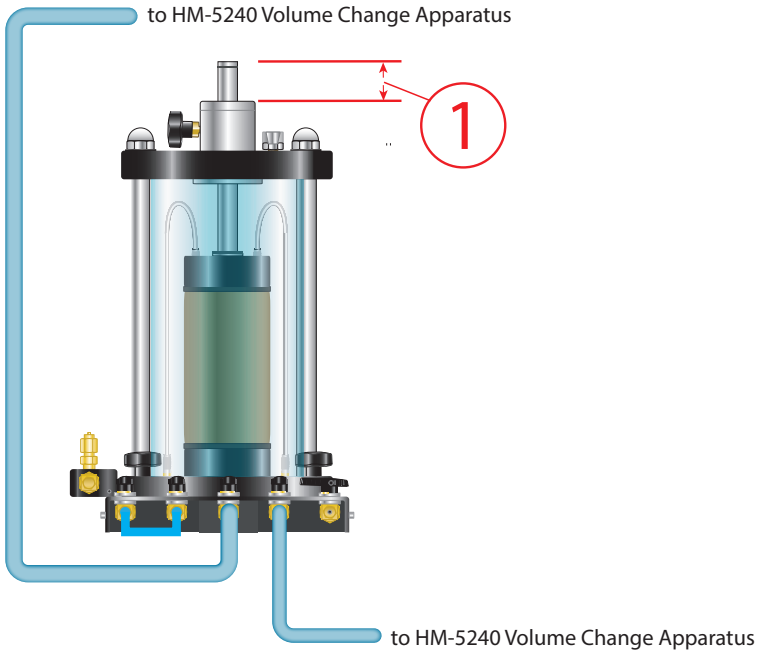
If these steps have not been completed, refer to the appropriate step-by-step instructions.



STEP 36

Saturating and Recording B Values

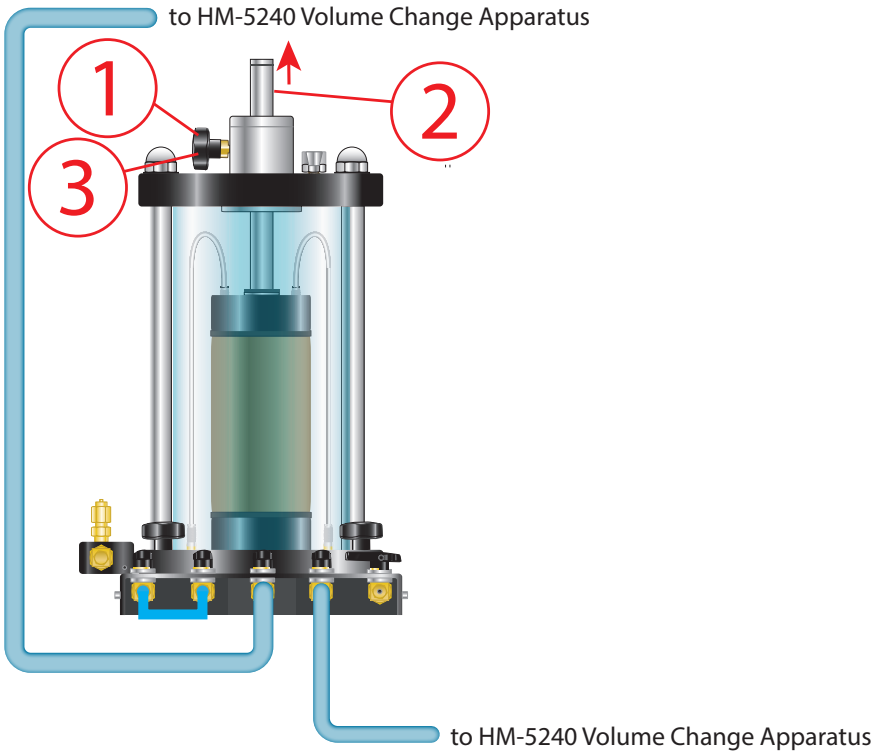
1. Unlock the Set Screw.
2. Lower the Triaxial Cell Piston into contact with the Specimen Top Cap without applying a load to the Specimen.
3. Retighten the Set Screw.



STEP 37

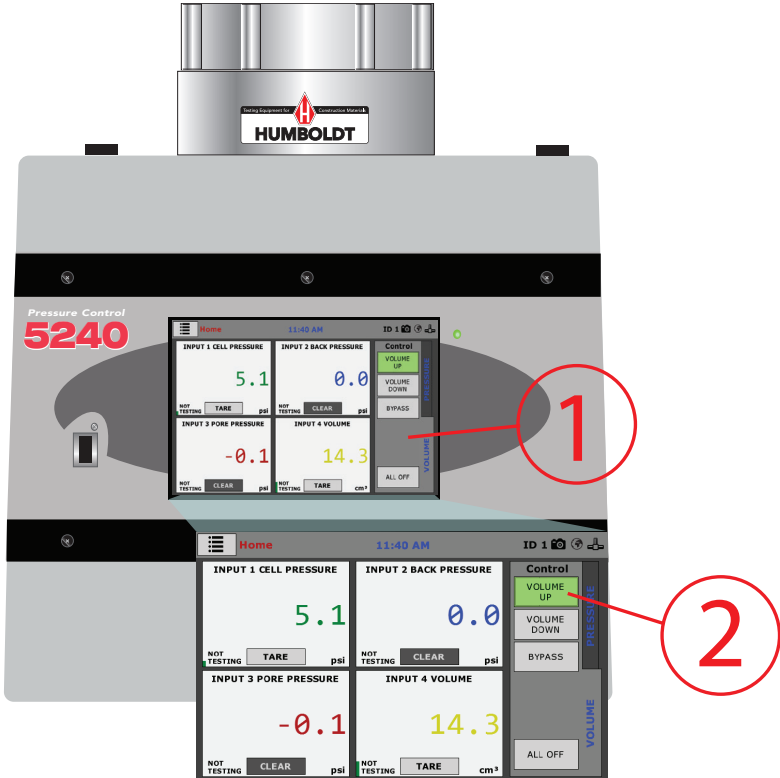
Saturating and Recording B Values

1. Measure the Specimen Reference Height.



STEP 38
Saturating and Recording B Values

1. Unlock the Set Screw.
2. Move Piston up 1/8".
3. ReLock the Set Screw.



STEP 39

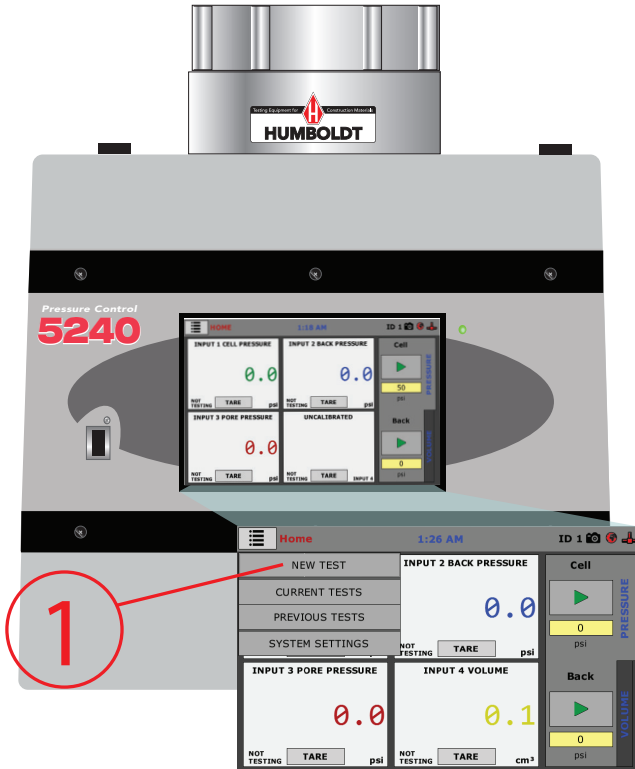
Saturating and Recording B Values

1. Select the Volume Tab.
2. Click on the Volume Up Button.



STEP 40 Saturating and Recording B Values

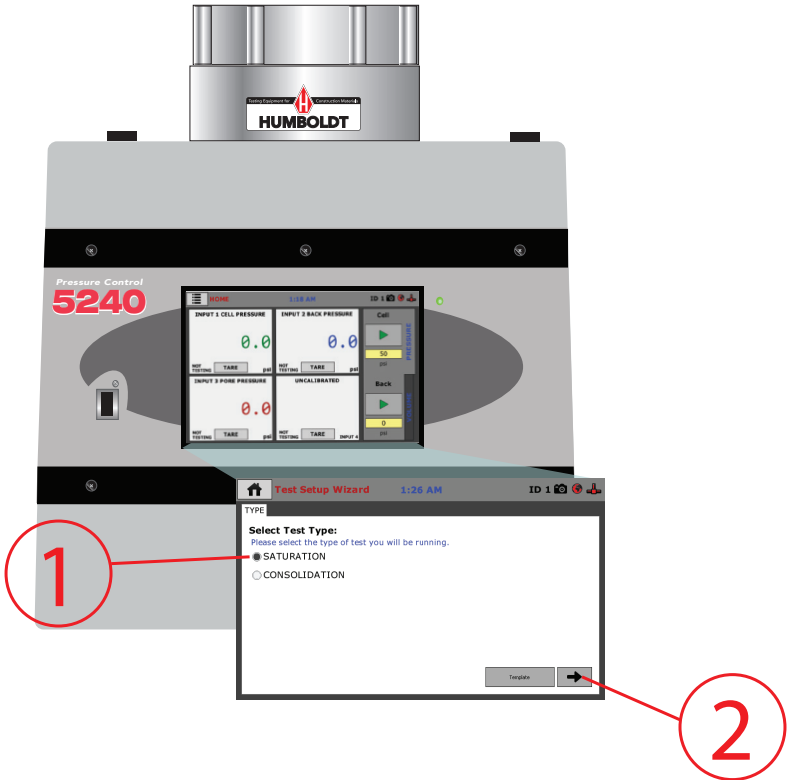
1. To begin a new Saturation Test, Click on the Menu Icon in the top left corner of the screen.



STEP 41

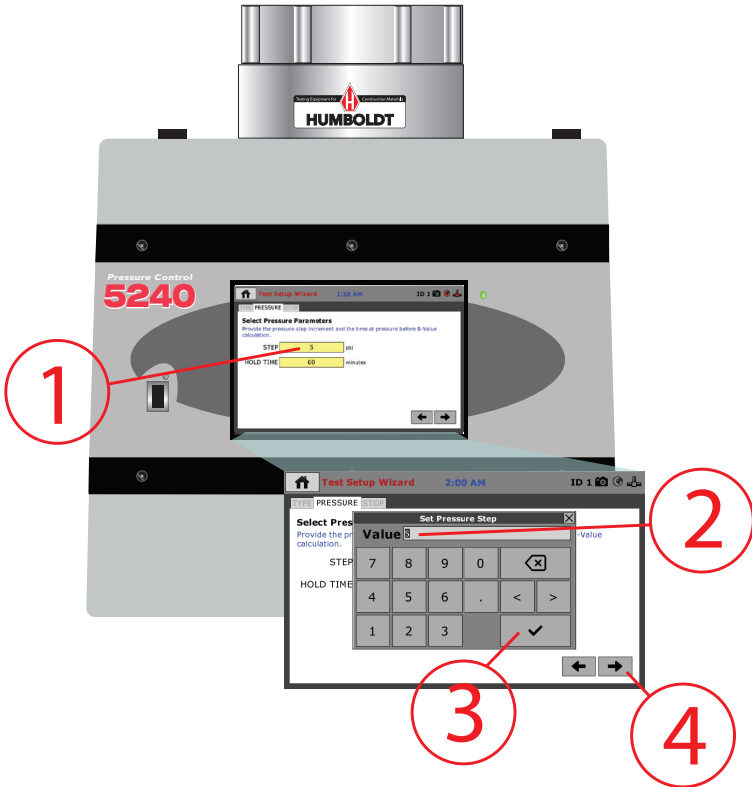
Saturating and Recording B Values

1. To begin a new Saturation Test, Click on the NEW TEST Tab from the Drop-down menu.



STEP 42 Saturating and Recording B Values

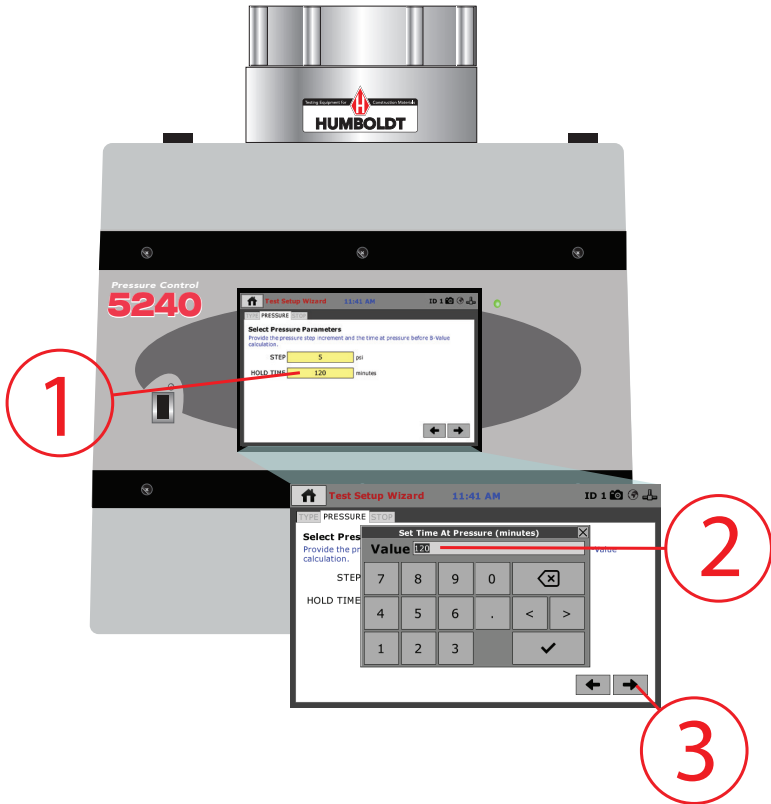
1. Select the Type of Test. Here, we have selected Saturation.
2. Then, Click on the Arrow in the bottom right-hand corner.



STEP 43

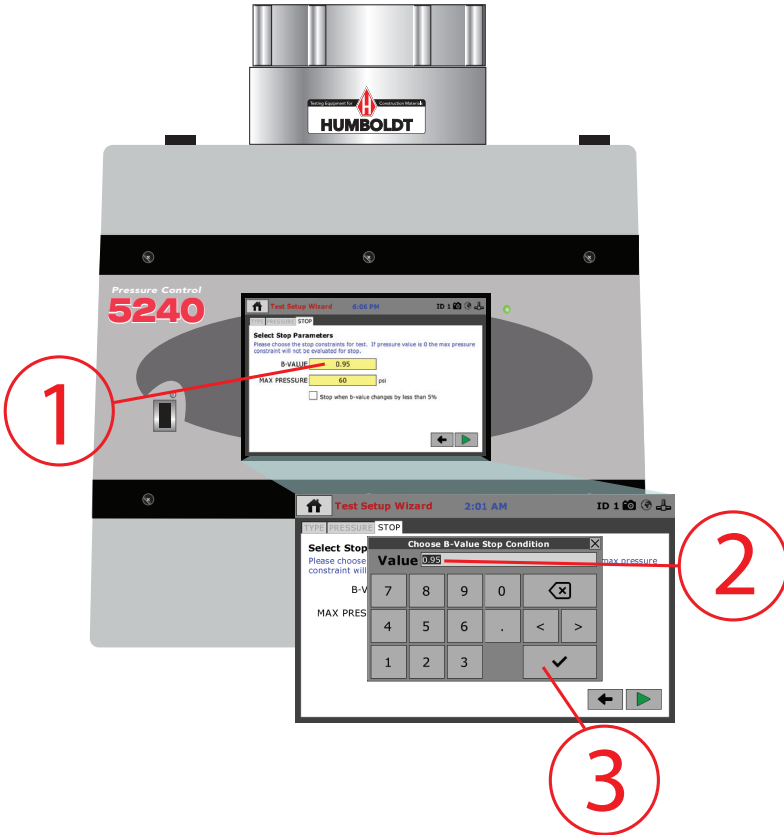
Saturating and Recording B Values

1. Click on the Step field to enter the size of the pressure increment.
2. In the window that appears enter your value, it can be between 5 and 20 psi. Here, we have chosen 5 psi.
3. Click on the Check Mark Key.
4. Then, Click the Right Arrow at the bottom.



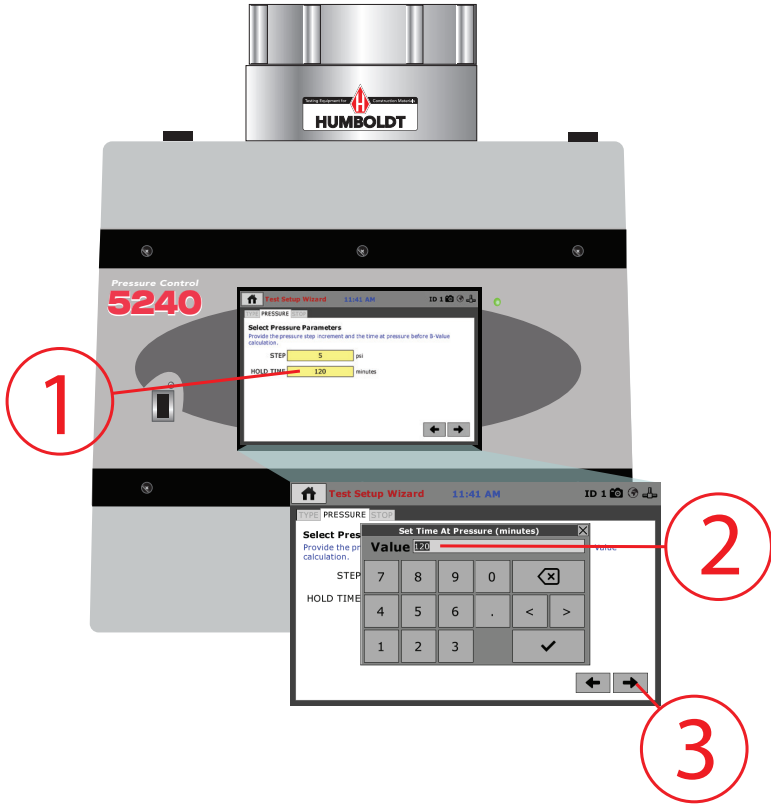
STEP 44 Saturating and Recording B Values

1. Click on the Hold Time field to enter the desired time between each increment.
2. In the window that appears enter your value for Hold Time, it can be between 120 and 240 minutes. Here, we have chosen 120 minutes.
3. Then, Click the Right Arrow at the bottom.



STEP 45 Saturating and Recording B Values

1. Click on the B-Value field to enter the desired value.
2. In the window that appears enter a desired B-Value to achieve 95% Degree of Saturation.
3. Then, Click the Check Box.



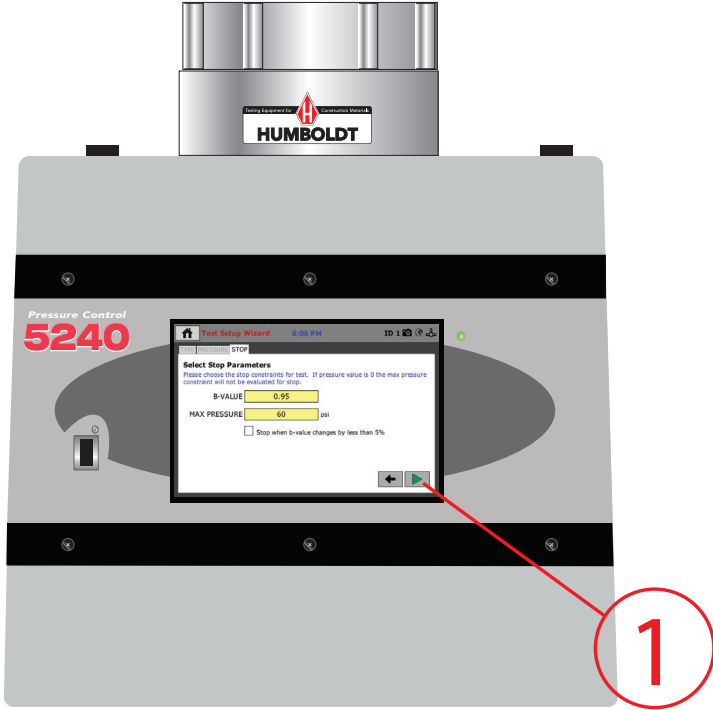
STEP 46 Saturating and Recording B Values

1. Click on the Max Pressure field to enter the desired Maximum Back Pressure.

2. Enter Maximum Back Pressure to achieve 95% Degree of Saturation.

Very Important Note: Make sure that after reaching the Maximum Back Pressure stop condition there will be enough pressure in the system to apply the desired effective Consolidation Pressure. Here, we have chosen 60 psi.

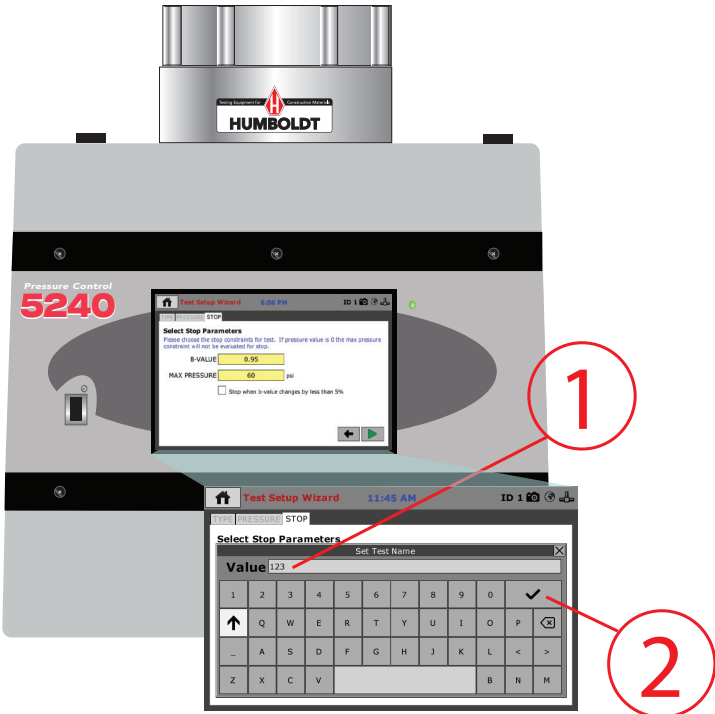
3. Then, Click the Check Box.



STEP 47

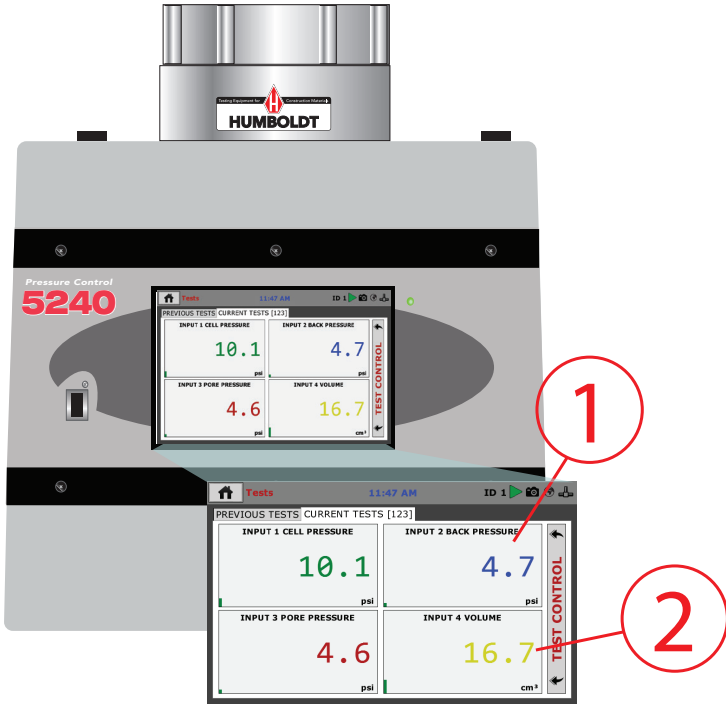
Saturating and Recording B Values

1. You're now ready to Start the Saturation Stage, Press the Green Arrow at the bottom, right-hand corner of the screen.



STEP 48 Saturating and Recording B Values

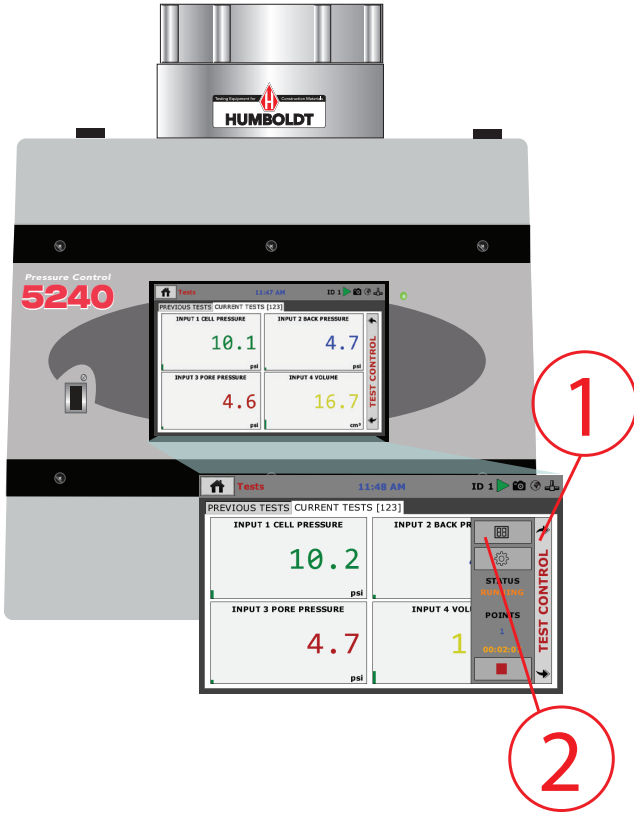
1. Enter a Name for your Test. Here, we've chosen 123.
2. Click on the Check Mark to proceed.



STEP 49

Saturating and Recording B Values

1. You can see that the first increment of 5 psi has been applied.
2. You can also see that the Volume Measurement is reading 16.7cm³.



STEP 50 Saturating and Recording B Values

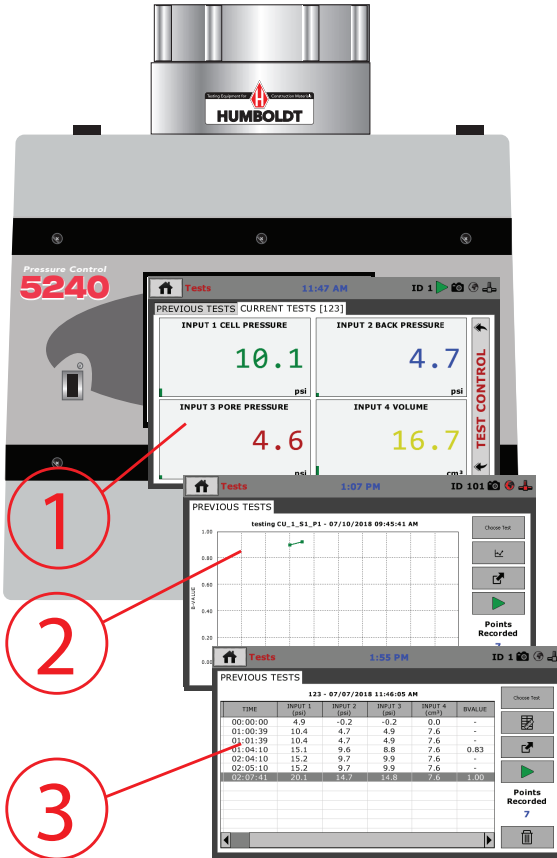
1. Click on the Test Control tab at the right of the screen. This opens the Test Control panel.

2. To access different views of the Current Test's information, Click on the Views button, which will toggle you through the different views of your current test.

The views that are available are:

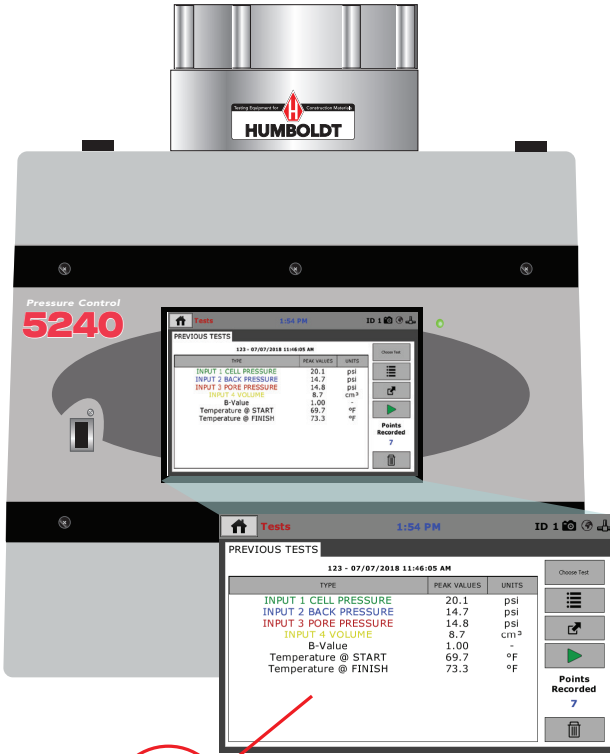
Live Readouts, Graph or Tabulation.

The following screens show these three views.



STEP 51 Saturating and Recording B Values

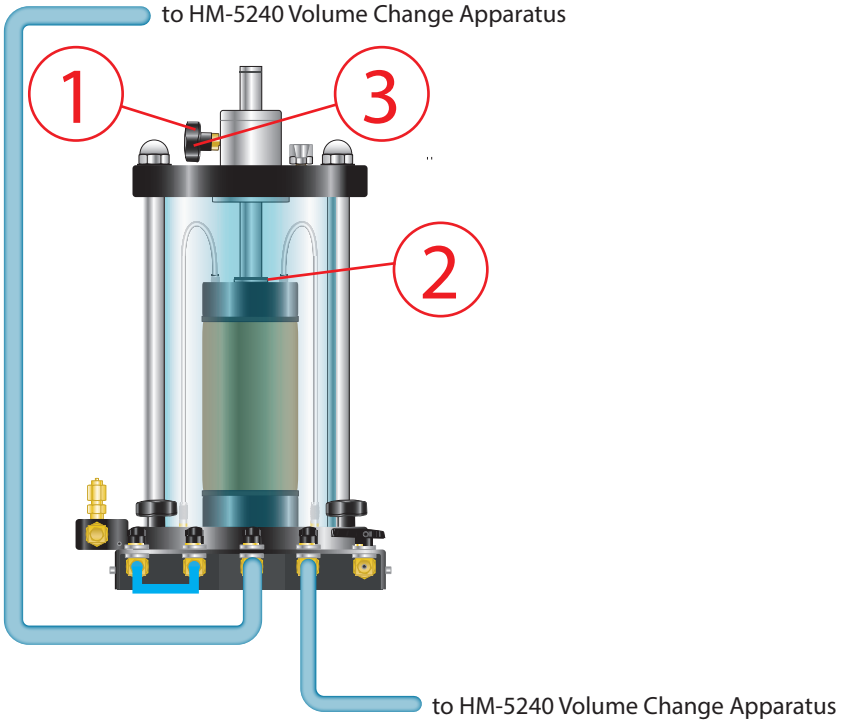
1. Live Readouts.
2. Graph.
3. Tabulation.



1

STEP 52 Saturating and Recording B Values

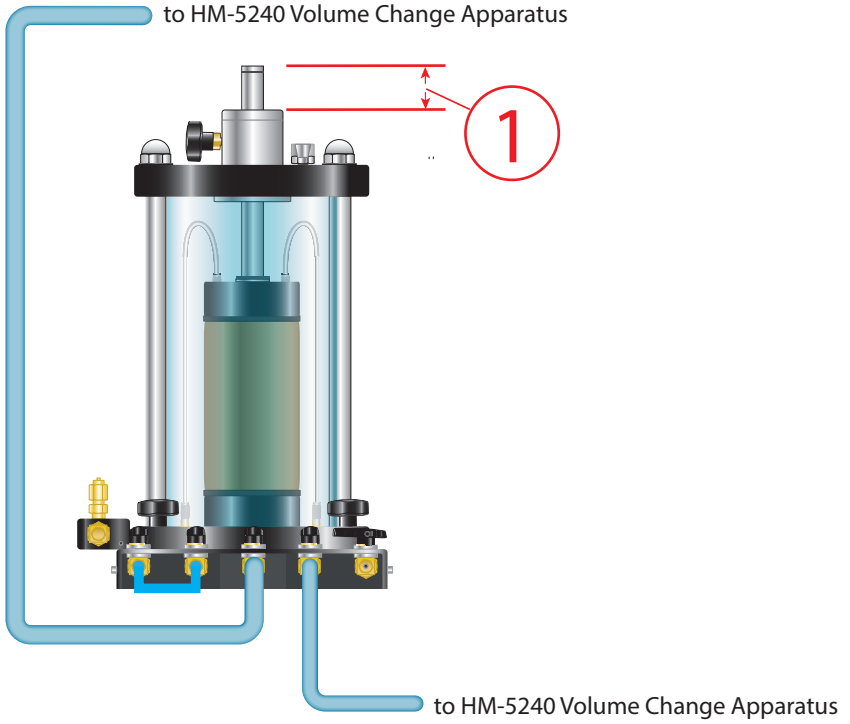
1. Here is the Results Screen of the Test.



STEP 53

Consolidation & Recording Volume Change

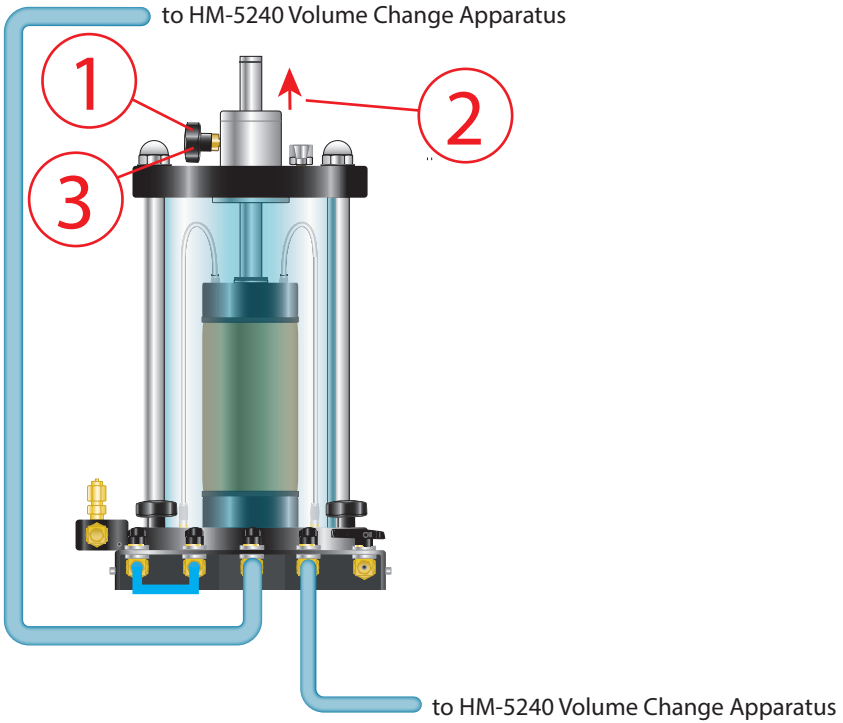
1. Unlock the Set Screw.
2. Position the Triaxial Cell Piston into contact with the Specimen Top Cap without applying a load to the Specimen.
3. Retighten the Set Screw.



STEP 54

Consolidation & Recording Volume Change

1. Measure Specimen Reference Height.



STEP 55

Consolidation & Recording Volume Change

1. Unlock the Set Screw.
2. Move Piston up 1/8".
3. ReLock the Set Screw.



STEP 56

Consolidation & Recording Volume Change

1. To begin a new Consolidation Test, Click on the Menu Icon in the top left corner of the screen.



STEP 57

Consolidation & Recording Volume Change

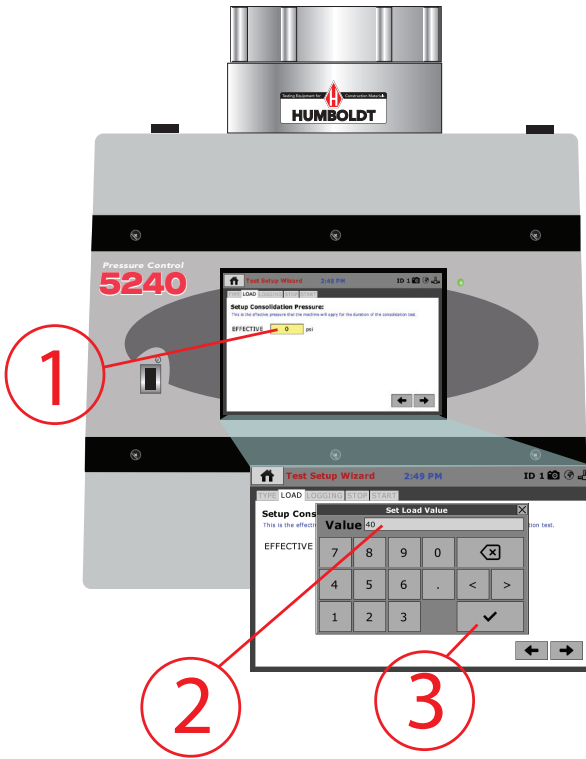
1. To begin a new Consolidation Test, Click on the NEW TEST Tab.



STEP 58

Consolidation & Recording Volume Change

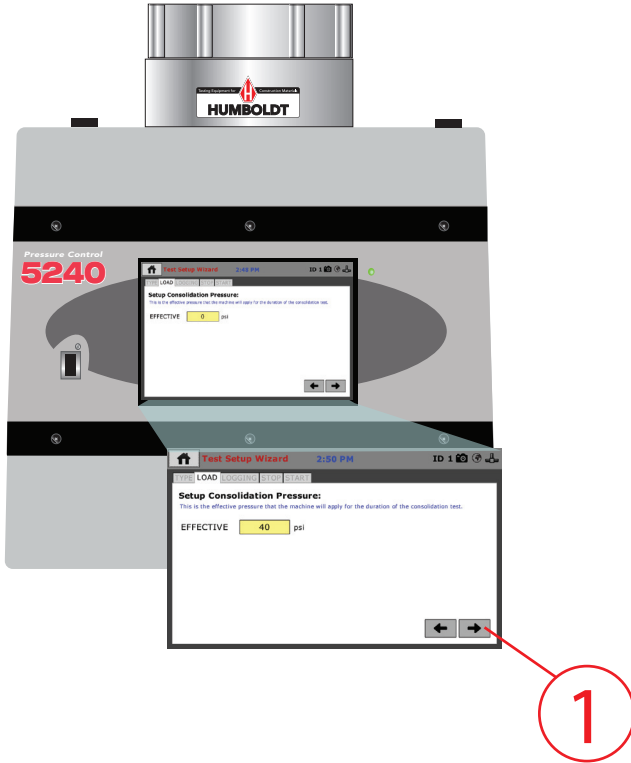
1. Select the Type of Test. Here, we have selected Consolidation.
2. Then, Click on the Arrow in the bottom right-hand corner.



STEP 59

Consolidation & Recording Volume Change

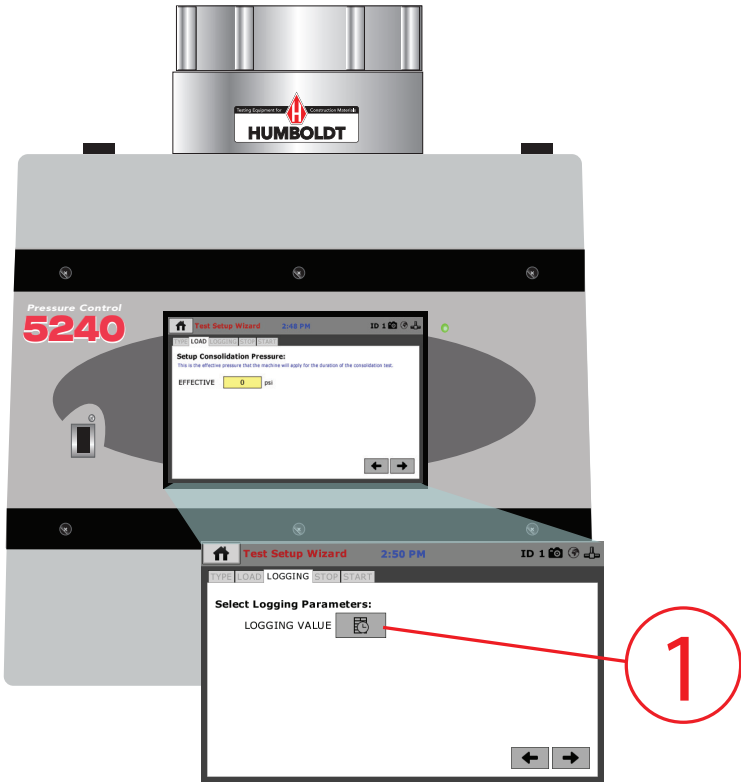
1. Click on the Effective field.
2. In the window that appears enter a desired Effective Consolidation Pressure. Here, we've entered 40 psi.
3. Click on the Check Mark Key.



STEP 60

Consolidation & Recording Volume Change

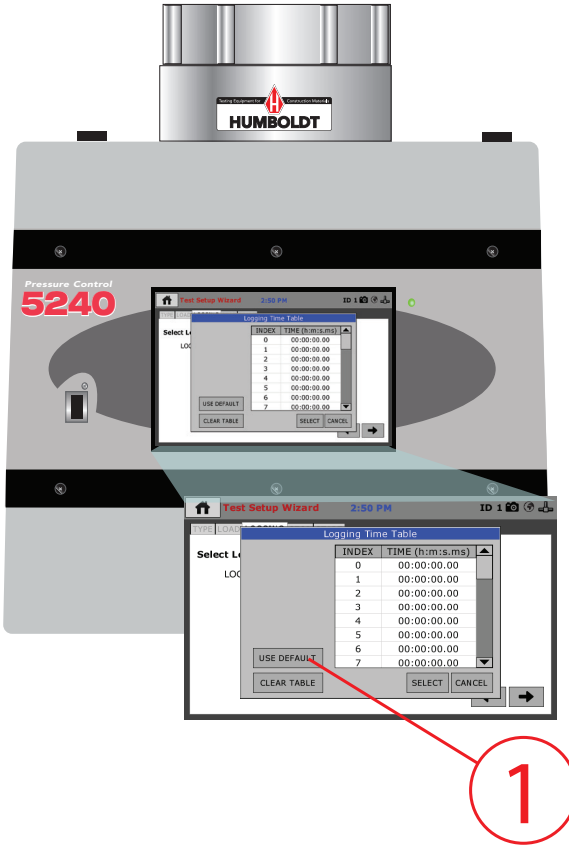
1. Click on the Right Arrow at the bottom Right of the screen.



STEP 61

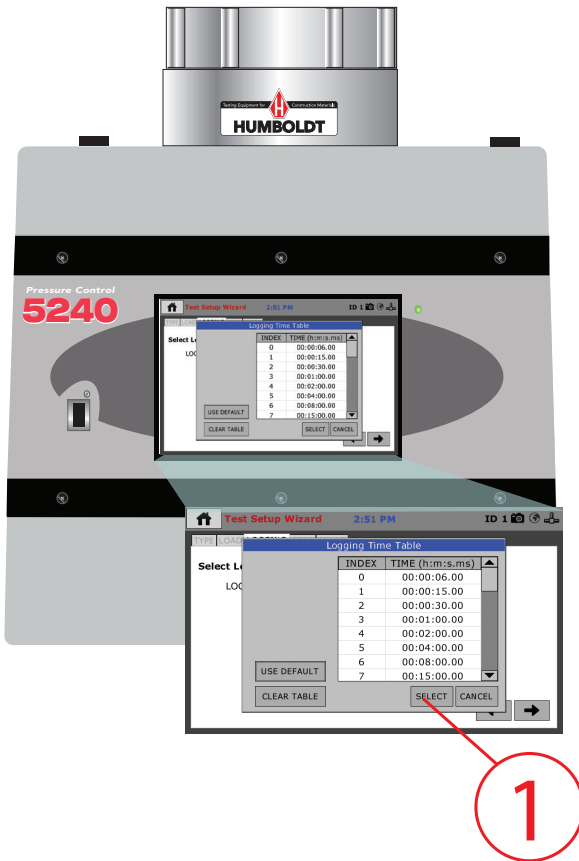
Consolidation & Recording Volume Change

1. Click on the Logging Value Icon.



STEP 62 Consolidation & Recording Volume Change

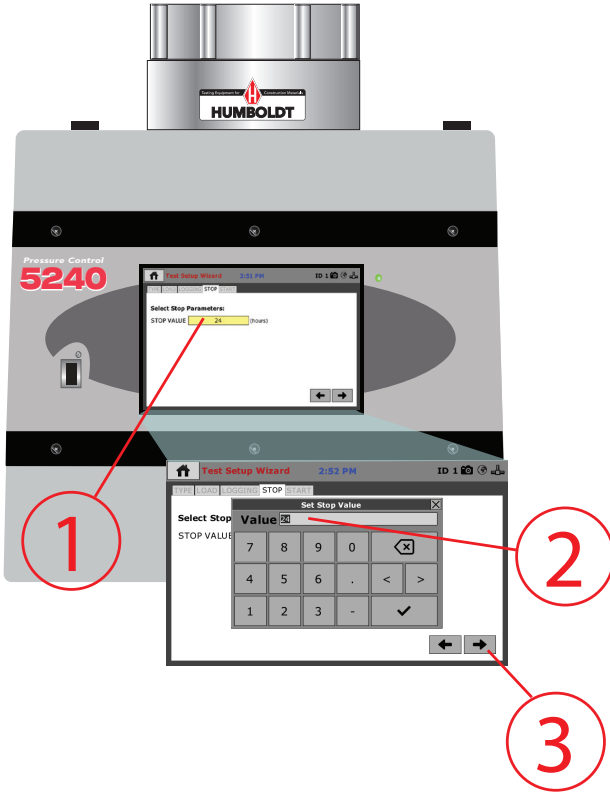
1. The Logging Time Table will appear. Click on Use Default to populate the table with increasing intervals of elapsed time.



STEP 63

Consolidation & Recording Volume Change

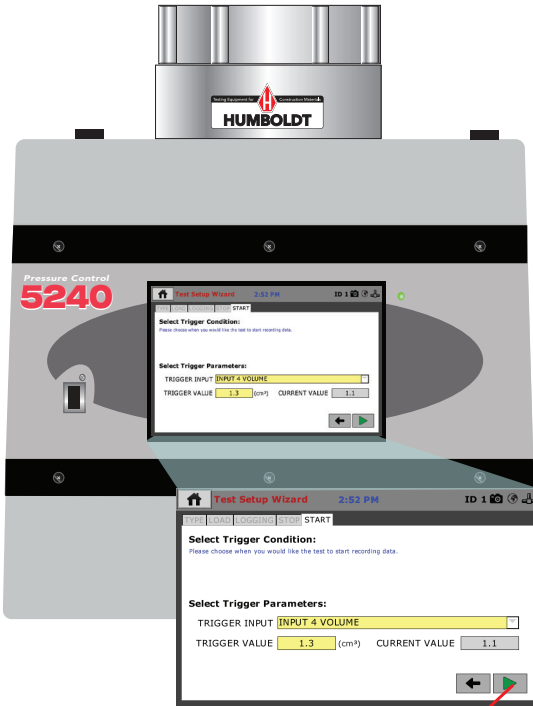
1. Now, Click on the Select button and the Select Stop Parameters field will appear.



STEP 64 Consolidation & Recording Volume Change

1. Click on the Select Stop Parameters field and the Set Stop Value window will appear.
2. Enter the desired stop time you'd like to use for the consolidation stage.
3. Click the Right Arrow at the bottom right of the window to continue.

As is always the case, a user can stop the consolidation stage at any time during this stop condition by just ending the test.



1

STEP 65

Consolidation & Recording Volume Change

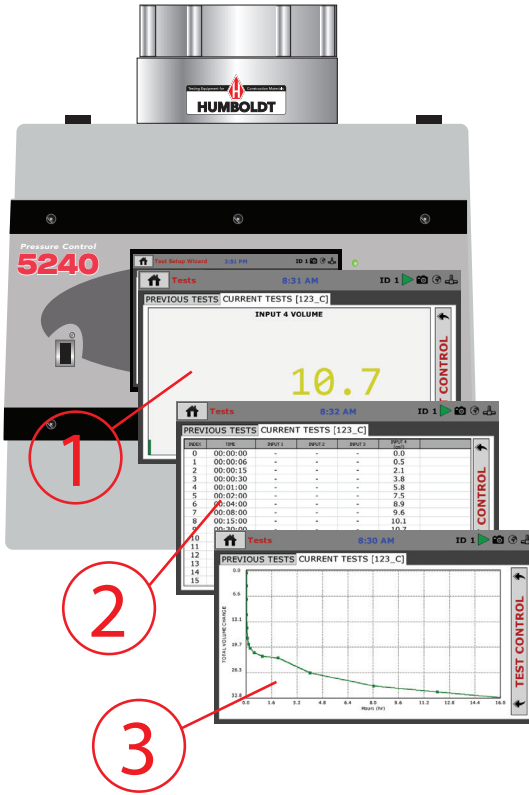
1. This Screen is the start of the recording condition.

Press the Green Arrow to start the Consolidation Stage.



STEP 66
Consolidation & Recording Volume Change

1. Enter a Name for the test, which will be stored in the Pressure Controller.
2. Click the Check Mark to proceed.

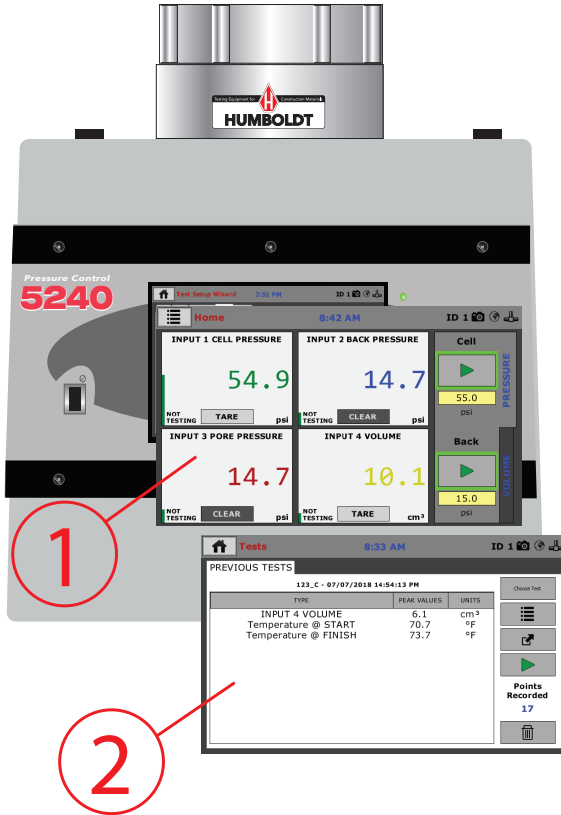


STEP 67

Consolidation & Recording Volume Change

Here are the three available LIVE views of your test as it runs.

1. Live Readout Value View.
2. Live Tabulation View.
3. Live Graph View.



STEP 68 Consolidation & Recording Volume Change

Here are the Results Screens from the most recent test.

1. Live Readout Value View of most recent test.
2. Peak Values View of most recent test.

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