Atrium Oasis
Dry Suction Water Seal Chest Drain

GETINGE

Set up

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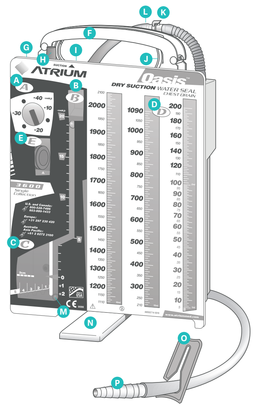
Open floor stand for set up. Move the patient tube clamp next to the in-line connector for set up convenience and patient safety. Follow steps 1-4 and refer to additional details concerning system set up and operation.

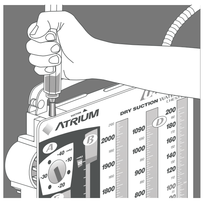


- A Dry Suction Regulator
- B Water Seal Chamber
- C Air Leak Monitor
- D Collection Chamber
- E Suction Monitor Bellows
- F Easy-to-Grip Handle
- G Positive Pressure Release Valve
- H Suction Port
- I Manual High Negativity Vent
- J Multi-position Hangers
- K In-line Connector
- L Needleless Access Port
- M Patient Pressure Float Ball
- N Swing Out Floor Stand
- O Patient Tube Clamp
- P Patient Connector

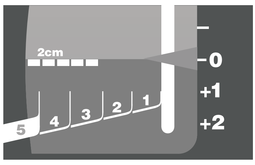
Step 1

Fill water seal (B) to 2 cm line

Add 45 ml of sterile water or sterile saline via the blue suction port located on top of the drain. For models available with sterile fluid, twist top off bottle and insert tip into suction port. Squeeze contents into water seal until fluid reaches 2 cm fill line.



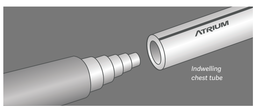
Once filled, water becomes tinted blue for visibility of air leaks and convenient monitoring of patient pressures.



Step 2

Connect chest drain to patient

Connect chest drain to patient prior to initiating suction.



Step 3

Connect suction to chest drain

Attach suction line to the blue suction port on top of chest drain.

Suction source

The suction source should provide a *minimum vacuum pressure of -80 mmHg* at 20 liters of air flow per minute for chest drain operating efficiency at a suction control setting of -20 cmH_2O. The suction source vacuum should be greater than -80 mmHg when multiple chest drains are connected to a single suction source.

Step 4

Turn suction source on

Increase suction source vacuum to -80 mmHg or higher. Suction regulator is preset to -20 cmH_2O. Adjust as required.

Not enough vacuum for -20 cmH_2O or higher suction control setting.

Normal suction operation for -20 cmH_2O or higher.

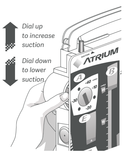
Increase suction source to -80 mmHg or higher.

Suction monitor bellows

When the suction control regulator is set at -20 cmH_2O or higher, the bellows must be expanded to the ▲ mark or beyond when suction is operating. If the bellows is observed to be expanded, but less than the ▲ mark, the suction source vacuum pressure must be increased to -80 mmHg or higher. For a regulator setting less than -20 cmH_2O suction (-10 cmH_2O), any observed bellows expansion across the monitor window will confirm suction operation. The bellows need not be expanded to the ▲ mark for pressures less than -20 cmH$_2$O, just visibly expanded to confirm suction operation.

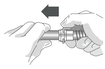
Turn suction source to -80 mmHg or higher. Bellows must be expanded to ▲ mark or beyond for -20 cmH_2O or higher regulator setting.

Continually adjustable dry suction control



The dry suction control regulator provides varying levels of suction for a wide range of chest drainage applications. The regulator design continually and automatically adjusts to changes in patient air leaks and/or fluctuations in hospital wall suction to help maintain a more consistent vacuum level to the patient. Suction pressure can be set to any desired pressure level between -10 cmH_2O and up to a maximum of -40 cmH_2O. Changing the suction pressure is accomplished by adjusting the rotary dry suction control dial located on the side of the drain. Dial down to lower the suction setting and dial up to increase the suction pressure setting.

In-line patient tube connector



The locking in-line patient tube connector provides system replacement, simple disconnection after use, and rapid in-line ATS blood bag attachment when required. The in-line connector must remain **securely connected at all times** during operation and patient connection. **Tube clamp must be closed prior to in-line connector separation.**

Gravity drainage

For gravity drainage applications, the drain should be placed below the patient's chest in an upright position. Disconnect the suction source vacuum line from the suction port.

Patient tube clamp

The patient tube slide clamp must remain open at all times during system operation. It is recommended to move the patient tube clamp closer to the chest drain, next to the in-line connector for set up convenience and routine visual check. **Do not keep patient tube slide clamp closed when system is connected to patient. Tube clamp must be closed prior to in-line connector separation.**

Move clamp closer to drain, next to in-line connector.

CAUTION: Keep clamp open at all times when system is connected to patient.

What to check during system operation

Verifying suction operation via the suction monitor bellows

The bellows located in the suction monitor window will expand only when suction is operating. The bellows will not expand when suction is not operating or is disconnected. The ▲ mark allows quick and easy confirmation of vacuum operation over a wide range of continuously adjustable suction control settings.

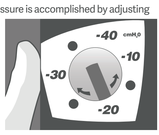
Bellows must be expanded to ▲ mark or beyond for a -20 cmH$_2$O or higher regulator setting.

Increase vacuum source when bellows is not expanded to ▲ mark

If the bellows is observed to be expanded, but less than the ▲ mark, the vacuum source pressure must be increased to -80 mmHg or higher.

Changing suction pressures

Changing suction pressure is accomplished by adjusting the rotary dry suction control dial located on the side of the drain. Dial *down to lower* the suction pressure and dial *up to increase* the suction pressure.



NOTE: When changing suction pressure from a higher to lower level, use of the manual high negativity vent after regulator adjustment will reduce excess vacuum pressure down to the lower prescribed level.

Verifying water seal operation

The water seal must be filled and maintained at the 2 cm level to ensure proper operation and should be checked regularly when used for extended periods. As required, additional water may be added by a 20 gauge or smaller needle and syringe via the grommet located on the back. Fill to the 2 cm line.

Placement of unit

Always place chest drain below the patient's chest in an upright position. To avoid accidental knock-over, open the floor stand for secure placement on floor or hang the system bedside with the hangers provided.

Recording drainage volume

The collection chamber incorporates a writing surface with easy-to-read fluid level graduations. Please refer to individual product inserts for specific model graduations.

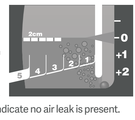
Observing water seal for patient air leaks

The chest drain offers air leak detection with rapid air leak assessment and enhanced visibility due to the tinted water. When air bubbles are observed going from *right to left* in the air leak monitor, this will confirm a patient air leak.

Continuous bubbling in the bottom of the water seal air leak monitor will confirm a persistent air leak.

Intermittent bubbling in the air leak monitor with float ball oscillation will confirm the presence of an intermittent air leak.

No bubbling with minimal float ball oscillation at bottom of the water seal will indicate no air leak is present.



Observing graduated water seal column for changes in patient pressure

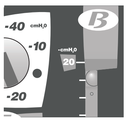
Patient pressure can be determined by observing the level of the blue water and small float ball in the graduated water seal column. With suction operating, patient pressure will equal the suction control setting plus the graduated water seal column level. For gravity drainage (no suction) patient pressure will equal the graduated water seal column level only.

Graduated air leak monitor

For those models with a graduated air leak monitor, air leak bubbling can range from 1 (low) to 5 (high). Air bubbles create an easy to follow air leak pattern for monitoring patient air leak trends.

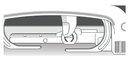
High negativity float valve

The high negativity float valve, with its controlled release action, enables the thoracic patient to draw as much intrathoracic pressure as is required during each respiratory cycle. During prolonged episodes of extreme negative pressure, a controlled release system will automatically relieve excess vacuum to the lower, prescribed pressure level.



Manual high negativity vent

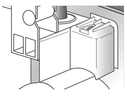
To lower the height of the water seal column or to lower patient pressure when connected to suction, *depress* the manual vent located on top of the drain until the float valve releases and the water column returns to the desired level. **Do not use manual vent to lower water seal column when suction is not operating or when the patient is on gravity drainage.**



Do not use when suction is not operating.

Positive pressure protection

The positive pressure release valve, located on top of drain, opens to release accumulated positive pressure. **Do not obstruct the positive pressure release valve.**



Sampling patient drainage

Sampling of patient drainage must be in accordance with approved hospital infection control standards. Selected models include a needleless Luer port on the patient tube connector for sampling patient drainage. Alcohol swab the Luer port prior to syringe attachment (no needle). Fluid samples can also be taken directly from the patient tube by forming a temporary dependent loop and inserting a 19 gauge needle at an oblique angle. Alcohol swab the patient tube prior to inserting syringe at a shallow angle. **Do not puncture patient tube with an 18 gauge or larger needle.**

System disconnection

For models equipped with an in-line connector, **close the patient tube clamp prior to disconnecting** the chest drain patient tube from patient. Clamp off all indwelling thoracic catheters prior to disconnecting chest drain from patient.

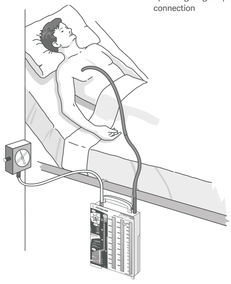
System disposal

Disposal of chest drain and its contents should be in accordance with all applicable regulations.

Problems to check for during CDU use

Potential problems can be avoided by routinely checking the patient, tube connectors, and drainage system at regularly scheduled intervals. Listed below are many of the common problems that can be corrected:

- clot in chest tube inside patient
- clot in the patient tube
- dependent loop in patient tube with fluid
- kink in patient tube from bed rail or patient position
- partial dislodgement of catheter from patient
- partial disconnection of patient tube from chest tube connector
- overfilled water seal (water is above 2 cm line)
- in-line connectors not properly secured
- patient tube clamp may be closed
- floor stand is not fully opened
- chest drain is not upright
- chest drain is not positioned sufficiently below patient's chest
- suction monitor bellows does not fully expand because source suction falls below the minimum operating range or poor connection



Troubleshooting

How do I determine patient pressure with a dry suction chest drain?

Whether using a traditional wet or dry suction operating system, one cannot overemphasize the importance of the graduated water seal column when it comes to diagnosing the patient's condition or monitoring normal system operation. Patient pressure can be determined by observing the level of the blue water and small float ball in the graduated water seal column. With suction operating and the bellows expanded across the suction monitor window, patient pressure will equal the suction control setting (read directly from the regulator dial) plus the graduated water seal column level. For example, when the suction monitor bellows is expanded to the ▲ mark or beyond to confirm a -20 cmH_2O suction setting, and the graduated water seal column reads -15 cmH_2O, patient pressure is -35 cmH_2O (-20 cmH_2O + -15 cmH_2O = -35 cmH_2O). For gravity drainage (no suction) patient pressure will equal the graduated water seal column only.

What should I do when the suction monitor bellows is not expanded to the ▲ mark when the regulator is set at -20 cmH_2O or higher?

The position of the bellows across the suction monitor window will alert the operator that the suction source has fallen below the minimum operating range for the prescribed suction control setting. Simply increase the vacuum source to -80 mmHg or higher. The suction monitor bellows must expand to the ▲ mark or beyond for -20 cmH_2O or higher suction regulator setting.

Not enough vacuum for -20 cmH_2O or higher suction control setting.

Normal suction operation for -20 cmH_2O or higher.

Increase suction source to -80 mmHg or higher.

What should I do when the bellows does not fully expand to ▲ the mark after I increase the suction source vacuum?

Dry suction chest drains require higher levels of vacuum pressure and air flow from the suction source to operate properly at each suction control setting as compared to traditional water controlled operating systems. The suction source should provide a minimum vacuum pressure of -80 mmHg at 20 liters of air flow per minute for chest drain operating efficiency at a suction control setting of -20 cmH_2O. The suction source should be greater than -80 mmHg when multiple chest drains are connected to a single suction source. If the bellows does not fully expand to the ▲ mark, it may simply be that the suction source is not functioning to its full potential to provide the minimum vacuum pressure or air flow required to "drive" the suction control regulator. Additionally, conditions may exist that can reduce, or "restrict" air flow from the suction source. A restrictive clamp, connector, or kink in the suction line tubing can potentially "starve" the chest drain of air flow. A leak in a connection or wall canister, along with extensive lengths of suction tubing can also reduce air flow to the unit.

To troubleshoot this situation, first check to be sure that all connections are air-tight. Inspect the suction tubing and connections for possible cracks, leaks, kinks, or occlusion. You may need to simply bypass a "leaky" wall canister. Try connecting the chest drain to a different suction source or wall regulator. When multiple chest drains are "Y" connected to a single suction source, if possible, reconnect the drains to separate suction sources. Finally, replace the chest drain if you suspect the unit is cracked or damaged.

Does the bellows need to expand beyond the ▲ mark for a -10 cmH_2O regulator setting?

No. For a regulator setting less than -20 cmH_2O suction (-10 cmH_2O), **any** observed bellows expansion across the monitor window will confirm suction operation. The bellows need not be expanded to the ▲ mark for suction pressures less than -20 cmH_2O, just visibly expanded to confirm suction operation.

How do I confirm my patient has an air leak when:

- **There is no bubbling in the water seal?** If there are no air bubbles observed going from right to left in the air leak monitor, there is no patient air leak. In order to confirm that your patient's chest catheter is patent, temporarily turn suction off and check for oscillation of the patient pressure float ball in the water seal column coinciding with patient respiration.
- **Bubbling is present in the water seal?** Whenever **constant or intermittent bubbling** is present in the water seal air leak monitor, this will **confirm an air leak is present.** Oscillation of the patient pressure float ball at the bottom of the water seal **without bubbling will indicate no apparent air leak.** Bubbling from right to left must be present to confirm an air leak. To determine the source of the air leak (patient or catheter connection), **momentarily** clamp the patient tube close to the chest drain and observe the water seal. If bubbling stops, the air leak may be from the catheter connections or the patient's chest. Check the catheter connectors and patient dressing for a partially withdrawn catheter. If bubbling continues after temporarily clamping the patient tube, this will indicate a system air leak requiring system replacement.

What does it mean when the small float ball is located at the bottom of the water seal column?

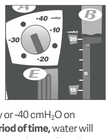
If the small float ball is located and oscillating at the bottom of the water seal column **with no bubbling**, there is no apparent patient air leak. However, the water seal should be carefully monitored for the presence of an **occasional** or **intermittent** air leak.

Is it normal for the patient pressure float ball to fluctuate up and down (tidal) near the bottom of the water seal column?

Yes. Once your patient's air leak is resolved, you will generally observe moderate tidaling in the water seal column. Increases in intrathoracic pressure will cause the water level to rise (the ball rises) during patient inspiration and will lower or decrease (the ball drops) during expiration. This diagnostic tool will help to confirm patency of your patient's catheter(s).

What happens when the water rises to the top of the water seal float valve?

The water seal column is a diagnostic manometer for monitoring your patient's intrathoracic pressure. When intrathoracic pressures increase, causing the water to rise to the top of the water seal float valve, the ball floats up and **"seats"** up against a valve seat. This valve seat has been engineered to allow a specific amount of water to pass through it during a defined amount of time. When vacuum pressures greater than -20 cmH_2O on gravity or -40 cmH_2O on suction occur for an **extended period of time,** water will pass through the valve seat and float valve to allow the water seal to release **automatically.** The benefit of the **controlled release** design is that during normal or deep inspiration, the float valve will float up and down with each respiratory cycle, not allowing the water seal to release. This enables thoracic patients to draw as much intrathoracic pressure as they may require during each respiratory cycle.



How do I lower the water seal column?

Changes in your patient's intrathoracic pressure will be reflected by the height of the water in the water seal column. These changes are usually due to mechanical means such as milking or stripping patient drainage tubes, or simply by deep inspiration by your patient after all air leaks have subsided. If desired, the height of the water column and patient pressure can be reduced by temporarily depressing the filtered manual vent located on top of the drain, until the float valve releases and the water column lowers to the desired level. **Do not lower water seal column when suction is not operating, or when patient is on gravity drainage.**

If the chest drainage system has been knocked over, can I use it and what should I do?

After a chest drainage system has been knocked over, set it upright and immediately check the fluid level of the water seal for proper volume. The drain provides a convenient diaphragm for access by a 20 gauge or smaller needle and syringe to adjust the water level in the water seal chamber, if required. Alcohol swab the needle access area and aspirate any overfill that may have occurred. If the water seal has an inadequate fluid level, simply replace the lost volume. If a significant amount of blood has entered the water seal, it may be advisable to change the system for a new one.

Have a question or need help in a hurry? Call Getinge toll free at 1-800-528-7486.