Atrium OASIS
Dry Suction Water Seal Chest Drain

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.

- **Increase vacuum source when bellows is not expanded to a 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.

- **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.

- **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.

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

• **Set up**

**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.

**Step 2. Connect chest drain to patient**
Connect chest drain to patient prior to initiating suction.

**Step 3. Connect chest drain to suction**
Attach suction line to the blue suction port on top of chest drain.

**Step 4. Turn suction source on**
Increase suction source vacuum to ~80 mmHg or higher. Suction regulator is preset to ~20 cmH₂O. Adjust as required.

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- **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.

**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. 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 cmH₂O suction setting, and the graduated water seal column reads –15 cmH₂O, patient pressure is –35 cmH₂O (–20 cmH₂O + –15 cmH₂O = –35 cmH₂O). 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 cmH₂O 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 cmH₂O or higher suction regulator setting.

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’sair leak is resolved, you will generally observe moderate tidal action in the water seal column. Increases in intrathoracic pressure will cause the water seal level to rise (the ball rises) during patient inspiration and will lower 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 ball?

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 ball, the float ball up and “seats” up against a valve seal. This valve seal has been engineered to allow a specific amount of water to pass through it during a defined period of time. When vacuum pressures greater than –20 cmH₂O on gravity or –40 cmH₂O on suction occur for an extended period of time, water will pass through the valve seal and float ball to allow the water seal to release automatically. The benefit of the controlled release design is that during normal or deep inspiration, the float ball will float up and down with each respiratory cycle, not allowing the water seal to release.

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

- There is no bubbling in the water seal?
  The suction source 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 connection or the patient’s chest. Check the catheter connectors and patient dressing for a partially withdrawn catheter. If bubbling continues then temporarily clamp the patient tube, this will indicate a system air leak requiring system replacement.

- 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. Observation 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 connection or the patient’s chest. Check the catheter connectors and patient dressing for a partially withdrawn catheter. If bubbling continues then temporarily clamp 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.

How do I locate the water seal column?

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.

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