

How does the Genie® Supreme Series™ design differ from other Genie® Membrane Separators™?

In the **Supreme Series**,™ the housing body can be back mounted for easy front access. The threaded housing cover eliminates screws so that tools are not required for internal access. All ports are located on the body allowing the cover to be removed without disconnecting tubing or piping. The straight bypass path and built in membrane retention plate both contribute to increase membrane life. A **Liquid Block**™ option is available to provide a higher level of protection.

What is the Liquid Block™?

The **Liquid Block**™ is an option in some models and a feature in other models. It provides the ultimate safeguard against liquid and particulate break-through that occurs during inadvertent circumstances. The **Liquid Block**™ has an internal valve that actuates and limits flow through the membrane in the event that the membrane differential pressure setting is exceeded. Also, it blocks flow in the presence of excess liquids adding the highest level of protection possible against liquid break-through.

Under what conditions will the Liquid Block™ be activated?

If the **Liquid Block**™ Max ΔP is at the factory setting, then any condition that increases the membrane differential pressure above approximately 2 psi will result in actuating the **Liquid Block**.™

How is the Liquid Block™ reset after it is actuated shut?

When the upset condition has been corrected and the separator inlet port pressure is below the maximum **Liquid Block**™ valve auto-reset pressure, then the **Liquid Block**™ will automatically reset itself. In the event that the inlet port pressure is not below the maximum auto-reset pressure, then the **Liquid Block**™ can be manually reset by momentarily depressurizing the inlet port pressure below the maximum auto-reset pressure.

What does “maximum Liquid Block™ valve auto-reset pressure” mean?

It is the maximum pressure at the separator inlet port that will allow the **Liquid Block**™ valve to auto reset itself after having been actuated to a complete shut off condition.

What does the term “membrane differential pressure” mean?

It is the **difference between the inlet port pressure and the pressure immediately downstream of the membrane**. When the flow rate through the outlet port is below the model’s maximum recommended flow rate for a given membrane, then the membrane differential pressure will typically be below 2 psig providing that all of the membrane area is available for flow.

Why would the membrane area available for gas flow change after installation?

If liquid contaminates or particulates accumulate on the membrane surface, then the membrane area available for gas flow will decrease.

Why is there a concern for the membrane differential pressure?

A high differential pressure across the membrane could force some liquid through.

What affects the membrane differential pressure?

Prior to installation, the model selected and membrane type chosen both have an effect on the general range of pressure drop that will occur. Once the separator is installed, the flow rate and membrane area available for gas flow are the only influencing factors.

What is the maximum recommended membrane differential pressure?

Very few liquids will flow through the membrane when the membrane differential

pressure is below 2 psig. Some applications allow for a much higher membrane differential pressure.

What is the minimum recommended membrane differential pressure?

There is not a minimum differential pressure requirement for separation to occur.

What is the purpose of the bypass port?

The bypass port provides a path of flow for the liquid and particulates rejected. It may also be utilized for reducing sample lag time. It should not be plugged, left open to the atmosphere, or used to control flow.

What is inertial pre-separation?

It is the partial phase separation that occurs at the bypass port prior to contact with the membrane.

How does inertial pre-separation occur?

In most of the **Genie® 100 and 200 Series models**, the sample flow path starts at the inlet port, allows fluid to sweep across the membrane, then reaches the bypass port. As a result, the membrane is exposed to the full liquid and particulate load. In the **Supreme Series**,™ there is a direct flow path from the inlet port to the bypass port. As a result, inertia separates and forces liquid and particulate out of the bypass port as a portion of the gaseous components flow upward toward the membrane.

How does inertial pre-separation increase membrane life and contribute to analyzer protection?

Since inertial pre-separation provides a means for bulk separation, less liquid and particulate comes in contact with the membrane surface. As a result, there is more membrane area available for gas flow, which results in increased membrane life and decreased possibility of liquid and particulate break-through

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due to high membrane differential pressure.

What is Genie® Membrane Technology™?

Fundamentally, **Genie® Membrane Technology™** implements membrane separation for use in sample conditioning. It has been proven to be the optimum method for removing liquid entrainment, and has been in use globally for over fifteen years.

How does Genie® Membrane Technology™ work?

The porous membrane utilizes surface tension to allow individual gas molecules to flow through while impeding liquid. This surface tension property can vary in liquids of different types, but it is always much greater in liquids than in gases because of the intermolecular bonding that occurs in the liquid phase. The net result is removal of liquids without alteration of the gas phase composition.

What is the membrane retention feature?

It is a built-in feature that prevents the membrane from “ballooning” into the inlet cavity and rupturing should reverse flow occur in the system.

How does reverse flow occur in a system?

Reverse flow will occur if the supply pressure upstream of the separator is depressurized below the pressure downstream of the separator. For example, rapidly opening the bypass valve to atmospheric pressure will result in a reverse flow condition.

How does the membrane retention feature reduce maintenance costs, reduce maintenance time, and increase protection?

Since it protects the membrane under reverse flow conditions, it increases membrane life resulting in fewer membrane replacement purchases, less service to the separator, and increased analyzer protection.

Why would I see liquid downstream of the separator?

Any of the following conditions could result in liquid downstream: a damaged membrane, excessive membrane differential pressure, condensation downstream of the separator, or an incorrect membrane type for the application. The Liquid Block™ option, built-in membrane retention feature, and inert membrane construction protect the membrane and reduce the chance of liquid downstream at such a high level that the most likely cause is condensation. For more information regarding liquid downstream, please refer to the troubleshooting guide shipped with the product or contact the distributor for assistance.

What does the term “pressure rating” refer to?

The **pressure rating** is the maximum pressure that can safely occur within the separator. **Genie®** products are designed with a safety factor of approximately four to one (4:1). Each design is proof tested according to the ASME code establishing the maximum allowable working pressure, which means that a pressure of approximately four times the designated pressure rating was sustained without equipment failure. Specific model pressure ratings can be found in the technical specifications table of the product sheet or in the product installation and operation manual.

What does the term “maximum recommended supply pressure” refer to?

The maximum recommended supply pressure refers to the pressure that best suits the functionality of the model. Supply pressures that exceed the maximum recommended supply pressure yet stay below the designated pressure rating could have an effect on functionality, but will not result in equipment failure.

What does the term “maximum recommended membrane flow rate” refer to?

The maximum recommended membrane flow rate refers to the flow rate that best

suits the functionality of the model. Flow rates that exceed the maximum recommended membrane flow rate could have an effect on functionality, but will not result in equipment failure as long as the pressure ratings are not exceeded as well. Flow rates are set to prevent excessive membrane differential pressure.

What is available in the Genie® Supreme Series™?

Currently available are the **Model 120** and **Model 123\123HP**, which are **Supreme Series™** counterparts for the **Model 101** and **Model 130** respectively. **Supreme Series™** counterparts for the **Genie® Models 102, 205, and 210** are currently being designed and prototyped.

Will the Genie® 100 and 200 Series models still be available?

Yes, all of the current **100 and 200 series models** will remain in production.

What is the primary difference between the Model 120A and the Model 123?

The **Model 123** accommodates higher flow rates because it has a larger membrane cross-sectional area than the **Model 120**.

What is the primary difference between Model 123 and Model 123HP?

The **Model 123 Liquid Block™** valve has an O-ring seal and a maximum auto-reset pressure of 85 psi, while the **Model 123HP Liquid Block™** valve has a metal-to-metal seal and a maximum auto-reset pressure of 2000 psig.

