Guardian Membrane Separators

PRODUCT FEATURES / BENEFITS

- Integral Porting and Mounting Bracket
- Up to 70 LPM Flow (2.5 SCFM)
- 2200 PSIG Max. Pressure Rating on All SS Units
- Hydrophobic Membrane Bonded to O-Ring for Ease of Service
- Protect On-Line Analyzers
- CNG / LNG Sampling Systems
- Sampling Conditioning

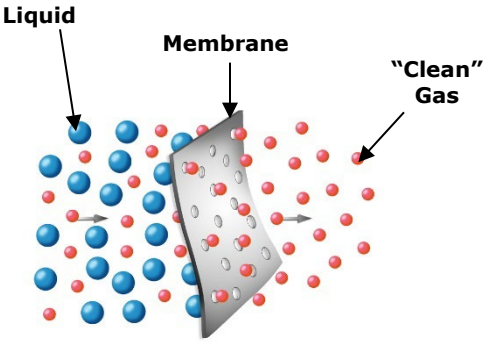
Designed for applications requiring zero liquid entrainment and unaltered sample integrity, our Guardian Membrane Series is built around a precision-engineered PTFE hydrophobic membrane supported by a stainless steel disc. This advanced membrane allows only gas or vapor molecules to pass through—effectively blocking all liquid contaminants.

Key features of the **GMS105** model include:

- **Atomizer Plate Technology**: Introduces a spinning action to the gas stream, removing much of the liquid content before it reaches the membrane. This not only extends membrane life but also helps maintain particle-free operation.
- **Low Internal Volume**: Reduces sample lag time for faster response and increased efficiency.
- **Tool-Free Maintenance**: A threaded cap with knurls and flats enables quick, easy membrane servicing—no need to disconnect tubing or fittings.
- **Integrated Design**: The durable body includes an integral mounting bracket and clearly defined inlet, outlet, drain, and bypass ports for straightforward installation and operation.

Our membrane filters are engineered to provide high-performance filtration while offering superior ease of use and reliability in the field.

"Pull Ring" to easily remove the plug & service the membrane.



Standard Guardian Membrane

The Guardian Membrane Series is engineered to provide complete removal of entrained liquids and solids from gas samples assuring sample integrity and protecting downstream analyzers. Each unit is precision-machined from 316L stainless steel, rated for pressures up to 1,500 PSIG, and optimized for low-flow sampling applications.

Key Features:

- **High-Performance Filtration:** Hydrophobic membrane effectively blocks all liquids and particulates, allowing only gas or vapor to pass through.
- **Compact, Robust Design:** Ideal for space-constrained installations while delivering industrial-grade durability.
- **Tool-Free Maintenance:** Membrane service is fast and easy—just unthread the cap and remove the plug. No tubing or connections need to be disturbed.
- **Premium Seal:** Each unit comes with a bonded Viton O-ring to ensure a reliable, leak-tight seal.

All our Guardian Membranes are available in exotic materials: PTFE, Hastelloy C, Monel 400, and Titanium. As an option we also offer Kalrez, EPDM, Buna and PTFE Encapsulated Viton O-rings.

Stainless Steel Model	**GMS050**	**GMS100**	**GMS105-1/8”**	**GMS105-1/4”**
Port Size (NPT)	1/8”	1/4”	1/8”	1/4”
Drain & Sample Port (NPT)	1/8”	1/4”	1/8”	1/4”
Maximum Pressure (psig)	1500	1500	1500	1500
Internal Volume (cc)				
In Sample Chamber (Behind Membrane)	1.5	3	3.96	3.96
Weight of Housing (lbs)	0.5	1.5	2.0	2.0
Principle Dimensions: (inch)				
Center of Port to Back	0.28	N/A	0.39	0.39
Body Diameter	1.50	1.97	2.48	2.48
Body Depth	1.29	2.01	1.83	1.83
Space Required to Remove Cap	0.79	1.38	0.87	0.87
Maximum Temp. (300ºF) Standard Viton O-Ring	GVGMS050	GVGMS100	GVGMS105	GVGMS105
PTFE Membrane Code (1) **Specify: M1 (Low Flow) or M2 (High Flow)	MT.19.□G	MT.33.□HG	MT.33.□HG	MT.33.□HG
Drawing **For More Detail & Options**	**GMS050**	**GMS100**	**GMS105-1/8”**	**GMS105-1/4”**
PTFE Model Max. Pressure: 100 PSIG, Maximum Temp: 250°F	**N/A**	**N/A**	**GMS105P-1/8”**	**GMS105P-1/4”**

Notes: (1) Replace the “□” with the flow required. i.e. MT.19.M1G, MT.33.M2HG

Small Footprint – GMS100

The GMS100 assembly features a straight-through flow path, with the inlet port and drain positioned on the same plane. The clean sample outlet is located on the opposite plane, enhancing flow efficiency and reducing the risk of flooding. A simple collar secures both planes of the assembly, allowing for easy disassembly and maintenance without disconnecting any process lines. This user-friendly and compact design is well-suited for space-constrained environments, and the membrane can be mounted either vertically (as shown) or horizontally to accommodate various installation needs.

Integral Coalescing Pre-Filter Membranes

The GMS120/122 series features a traditional T-type design with an integrated coalescing pre-filter housed within the assembly. The GMS127G model adds a Pyrex bowl, enabling easy visual inspection of filter condition at a glance. In this series, the membrane is mounted on top with a vertical outlet, which helps maintain membrane cleanliness by promoting drainage.

A key feature of this series is its unique membrane holder plate, designed for easy maintenance. Once the collar is loosened and lifted, the plate slides out from underneath—allowing for quick membrane replacement without the need to disconnect any fittings.

Guardian Membranes are also available with integrated coalescing pre-filters. A 50C-grade element is positioned upstream of the membrane to effectively remove the majority of liquids and particulates, thereby extending membrane life. This all-in-one design minimizes dead volume, conserves panel space, and reduces potential leak points. These combination units are compatible with the same membrane kits used in our standard Guardian models. Corresponding part numbers can be found at the bottom of the attached chart.

Stainless Steel Model	**GMS120**	**GMS122**	**GMS127G**
Port Size (NPT)	1/8"	1/4"	1/4"
Drain & Sample Port (NPT)	1/8"	1/4"	1/8" / 1/4"
Maximum Pressure (psig)	1500	1500	100
Internal Volume (cc)			
Upstream (Downstream)	0.118	0.118	0.118
Weight of Housing (lbs)	2.0	2.0	2.0
Principle Dimensions: (inch)			
Body Diameter	2.00	2.00	2.00
Overall Length	5.08	5.08	5.52
Space Required to Coalescing Element	2.36	2.36	2.64
Maximum Temp. (300ºF) Standard Viton O-Ring	GVGMS120	GVGMS120	GVGMS120
Coalescing Element PTFE Membrane Code (1) **Specify: M1 (Low Flow) or M2 (High Flow)	12-57-50C MT.33.□HG/50C	12-57-50C MT.33.□HG/50C	12-57-50C MT.33.□HG/50C
Drawing **For More Detail & Options**	**GMS120**	**GMS122**	**GMS127G**
PTFE Model Max. Pressure: 100 PSIG, Maximum Temp: 250°F	**GMS120P**	**GMS122P**	**N/A**

Notes: (1) Replace the "□" with the flow required. i.e. MT.33.M1HG/50C, MT.33.M2HG/50C

Pyrex Glass T-Type

For low-pressure systems up to 100 PSIG, the Model 127G with a Pyrex bowl provides at-a-glance visibility of the coalescing filter element chamber, allowing clear and accurate assessment of sampling conditions. The filter element can be quickly serviced by hand using the knurled base plate, while the captured O-ring design ensures a reliable, leak-free seal every time. For applications where larger amounts of liquid condensate are expected, specify the GMS137 series, which maintains the same user-friendly design.

Combination Membrane Separators

The GMS170 series of integral coalescing membrane separators delivers superior protection for online sampling analyzers. Designed with a unique all-in-one base (head) porting configuration, these units simplify service, minimize leak points, and maintain a compact footprint. Ideal for space-constrained applications. While the GMS170 series can be mounted horizontally, vertical installation is recommended for optimal performance.

GMS170

Two models are available:

- **GMS170**: Optimized for installations with limited space.
- **GMS170-4791**: A slightly larger model featuring an upgraded microfiber coalescing filter for enhanced removal of excessive liquids and particulates. This integrated coalescing-membrane design eliminates the need for a separate coalescing filter, offering efficient, all-in-one protection.

Key Benefits:

- Protects analyzers from liquids and sub-micron particles
- Reduces system complexity with an integrated coalescing and membrane design
- Simplifies maintenance with quick-service porting and minimal leak points
- Compact and efficient – ideal for both standard and demanding applications

The coalescing membrane combination filter is engineered to remove entrained liquids and particulates in gas service across a wide range of applications, thereby protecting analyzers and sample system components from contamination. Unlike traditional setups, this design eliminates the need for prefiltration, reducing system volume, minimizing installation space requirements, and lowering the risk of leaks.

Stainless Steel Model	**GMS170**	**GMS170-4791**
Port Size (NPT)	1/4"	1/4"
Drain & Sample Port (NPT)	1/4"	1/4"
Maximum Pressure (psig)	2000	2000
Internal Volume (cc)		
Upstream (Downstream)	33.23 (1.53)	48 (2)
Weight of Housing (lbs)	1.5	1.5
Principle Dimensions: (inch)		
Body Diameter	2.12	2.12
Overall Length	3.23	3.23
Space Required to Coalescing Element	1.61	1.61
Maximum Temp. (300ºF) Standard Viton O-Ring	GVGMS170	GVGMS170
Coalescing Element PTFE Membrane Code (1) **Specify: M1 (Low Flow) or M2 (High Flow)	22/32-27-50CS MT.33.□HG/170	22/32-27-50CS MT.33.□HG/170
Drawing **For More Detail & Options**	**GMS170**	**GMS170-4791**

Notes: (1) Replace the "□" with the flow required. i.e. MT.33.M1HG/50C, MT.33.M2HG/50C

High Flow Membranes

For flow rates up to 15 LPM, we offer the GMS205 Series. This series maintains the user-friendly design of our GMS105 model, but incorporates a larger membrane. The increased surface area not only supports higher flow rates, but also extends service intervals by reducing membrane loading.
Standard assemblies are precision-machined from 316L stainless steel and come equipped with Viton® seals. Each unit is supplied with a hydrophobic/oleophobic membrane permanently bonded to a Viton® O-ring for reliable sealing and chemical resistance.

Material Options for Demanding Applications

All Guardian Membrane assemblies are also available in a range of exotic materials to suit challenging environments, including PTFE, Hastelloy® C, Monel® 400, and Titanium. Optional O-ring materials include Kalrez®, EPDM, Buna-N, and PTFE-encapsulated Viton® to meet specific chemical compatibility or temperature requirements.

Stainless Steel Model	**GMS205-1/4"**	**GMS205-1/2"**	**GMS305-1/8"**	**GMS305-1/4"**
Port Size (NPT)	1/4"	1/2"	1/8"	1/4"
Drain & Sample Port (NPT)	1/4"	1/2"	1/8"	1/4"
Maximum Pressure (psig)	2200	2200	1500	1500
Internal Volume (cc)				
In Sample Chamber - Behind Membrane	19.69	19.69	28.00	28.00
Weight of Housing (lbs)	7.0	7.0	9.0	9.0
Principle Dimensions: (inch)				
Center of Port to Back	0.63	0.63	0.39	0.39
Body Diameter	3.94	3.94	4.49	4.49
Body Depth (with knob)	3.03	3.03	1.85	1.85
Space Required to Remove Cap	1.38	1.38	3.70	3.70
Maximum Temp. (300ºF) Standard Viton O-Ring	GVGMS205	GVGMS205	GVGMS305	GVGMS305
PTFE Membrane Code (1) **Specify: M1 (Low Flow) or M2 (High Flow)	MT.61.□HG	MT.61.□HG	MT.89.□G	MT.89.□G
Drawing **For More Detail & Options**	**GMS205-1/4"**	**GMS205-1/2"**	**GMS305-1/8"**	**GMS305-1/4"**
PTFE Model Max. Pressure:100 PSIG, Max.Temp: 250°F	**GMS205P-1/4"**	**GMS205P-1/2"**	**GMS305P-1/8"**	**GMS305P-1/4"**

Notes: (1) Replace the "□" with the flow required. i.e. MT.61.M1HG, MT.61.M2HG

* We also offer a GMS205ST (Straight Through / Fast Loop) version is which the inlet/outlet ports are directly connected and the membrane only filters what the analyzer requires. *

GMS305-High Volume

The GMS305 Series features an 89 mm membrane, making it ideal for high-flow sampling systems that demand zero liquid entrainment. This model is available with either 1/8" or 1/4" FNPT connections to accommodate a variety of installation requirements.

For optimal protection and performance, the GMS305 is typically paired with a coalescing pre-filter. We recommend our 130 or 137G Series filters, depending on your system's pressure specifications.

Flexible Port Configurations

Across the Guardian product line, mixed-port configurations are available—such as 1/8" and 1/4" FNPT on the same body—to provide installation flexibility and reduce inventory needs.

Integral Coalescing High Flow Pre-Filter Membranes

The GMS130 Series builds on the proven design of our GMS120 Series, offering the same functionality with a physically larger membrane and coalescing element. The increased surface area of both components significantly extends service intervals, making it ideal for demanding or continuous sampling applications.
By integrating the coalescing filter and membrane into a single assembly, the GMS130 minimizes sample lag time, conserves panel space (one housing instead of two), and reduces the number of potential leak points by limiting connection interfaces.

Stainless Steel Model	GMS130	GMS132	GMS137G	GMS138G
Port Size (NPT)	1/4"	1/2"	1/4"	1/2"
Drain & Sample Port (NPT)	1/4"	1/4"	1/4"	1/4"
Maximum Pressure (psig)	1500	1500	100	100
Internal Volume (cc)				
In Sample Chamber - Behind Membrane	2.2	2.2	2.2	2.2
Weight of Housing (lbs)	9.0	9.0	9.0	9.0
Principle Dimensions: (inch)				
Body Diameter	3.38	3.38	3.38	3.38
Overall Length	5.73	5.73	6.25	6.25
Space Required to Coalescing Element	2.95	2.95	3.15	3.15
Maximum Temp. (300ºF) Standard Viton O-Ring	GVGMS130	GVGMS130	GVGMS137	GVGMS137
Coalescing Element PTFE Membrane Code (1) **Specify: M1 (Low Flow) or M2 (High Flow)	25-64-50C MT.61.□HG/50C	25-64-50C MT.61.□HG/50C	25-64-50C MT.61.□HG/50C	25-64-50C MT.61.□HG/50C
Drawing **For More Detail & Options**	**GMS130-61**	**GMS132**	**GMS137G**	**GMS138G**

Notes: (1) Replace the "□" with the flow required. i.e. MT.61.M1HG/50C, MT.61.M2GH/50C

Pyrex Bowl For Visual Monitoring

The GMS137G and GMS138G Series are low-pressure variants of the GMS130 Series, designed for applications where visual monitoring is essential. These models utilize the same large membrane and coalescing element as the GMS130 but feature a durable Pyrex® glass bowl for clear, at-a-glance inspection of liquid accumulation.
This design is ideal for systems requiring immediate visual confirmation of filter performance and liquid breakthrough, particularly in low-pressure environments.

Technical Details

Our porous membranes are manufactured from pure PTFE, offering exceptional chemical inertness and extremely low absorption characteristics. Designed for reliability across a wide range of applications, these membranes are available in two standard grades to suit various flow and fluid requirements:

- **M1 (0.1 micron):** A low-flow membrane ideal for most liquid applications.
- **M2 (0.8 micron):** A high-flow variant recommended for higher surface tension liquids, enabling faster processing without compromising separation integrity.

Membrane Size	MT.19.M1G	MT.19.M2G
Membrane Type	Low Flow	High Flow
Material	PTFE	PTFE
Diameter (mm)	19	19
Thickness (µm)	152	152
Maximum Temperature (ºF)	300	300
Recommended Flow Rate (LPM)	0.25	6
Membrane Micron Size	0.1	0.8

Membrane Size	MT.33.M1G	MT.33.M2G
Membrane Type	Low Flow	High Flow
Material	PTFE	PTFE
Diameter (mm)	33	33
Thickness (µm)	152	152
Maximum Temperature (ºF)	300	300
Recommended Flow Rate (LPM)	0.35	10
Membrane Micron Size	0.1	0.8

Membrane Size	MT.61.M1G	MT.61.M2G
Membrane Type	Low Flow	High Flow
Material	PTFE	PTFE
Diameter (mm)	61	61
Thickness (µm)	152	152
Maximum Temperature (ºF)	300	300
Recommended Flow Rate (LPM)	2	15
Membrane Micron Size	0.1	0.8

Membrane Size	MT.89.M1	MT.89.M2
Membrane Type	Low Flow	High Flow
Material	PTFE	PTFE
Diameter (mm)	89	89
Thickness (µm)	152	152
Maximum Temperature (ºF)	300	300
Recommended Flow Rate (LPM)	3	43
Membrane Micron Size	0.1	0.8

The flow rates referenced above are based on a 3 PSID (pounds per square inch differential) across the membrane and are provided for general reference only. While flow can be increased by raising the pressure differential, we do not recommend exceeding 5 PSID, as doing so may compromise membrane integrity.
Membrane Application Guidance

- **M1 Membrane (0.1 micron):** Ideal for separating most liquids from gas streams.
- **M2 Membrane (0.8 micron):** Optimized for separating water and other high surface tension liquids from gases.

Guardian Membrane Liquid Separator

PRODUCT FEATURES / BENEFITS

- 316L Stainless Steel Standard: NACE MR-01-75 Compliant
- Integral Porting and Mounting Bracket
- Up to 70 LPM Flow (2.5 SCFM)
- 1500 PSIG Maximum Pressure Rating
- Liquid / Liquid Separation
- CNG / LNG Sampling Systems
- Protect Liquid Analyzers
- Separate Water from Liquid Hydrocarbon Streams

For best performance and membrane longevity, ensure proper pre-filtration and avoid pressure surges that could stress the membrane structure.
The **GMSL205 Series** is specifically designed to remove water and other high surface tension liquids from liquid hydrocarbon streams. Utilizing a specialized **M3 membrane**, the system selectively blocks water while allowing hydrocarbon liquids to pass freely through **microscopic channels** engineered for optimal separation.

The membrane incorporates a unique **support layer** that increases pressure drop tolerance, enhancing separation efficiency and durability under process conditions.

This advanced liquid/liquid separation technology effectively removes fine, immiscible water droplets without altering the properties of the hydrocarbon stream—making the GMSL205 ideal for refining, petrochemical, and fuel handling applications.

Stainless Steel Housing Model	**GMSL205-1/4”**	**GMSL205-1/2”**
Port Size (NPT)	1/4”	1/2”
Drain & Gauge Port (NPT)	1/4”	1/2”
Maximum Pressure (psig)	1500	1500
Internal Volume (cc) In Sample Chamber – Behind Membrane	19.69	19.69
Principle Dimensions: (inch)		
Center of Port to Back	0.60	0.60
Body Diameter	3.94	3.94
Body Depth (with knob)	3.03	3.03
Space Required to Remove Cap	1.30	1.30
Maximum Temp. (300ºF) Standard Viton O-Ring	GVGMS205	GVGMS205
PTFE Membrane Code	MT.61.M3	MT.61.M3
Drawing **For More Detail & Options**	**GMSL205-1/4”**	**GMSL205-1/2”**

Stream	1.5 PSID	15 PSID
Gasoline	65 CC / Minute	650 CC / Minute
Kerosene	29 CC / Minute	290 CC / Minute
Diesel	22 CC / Minute	220 CC / Minute

Flow Rate In CC / Minute At 1.5 PSID And 15 PSID Across M3 Liquid / Liquid Membrane.
Note The Differential Must Be Lower Than Stream Pressure
For Best Results Do Not Exceed 15 PSIG Differential To Eliminate Water Breakthrough On Membrane.

	MT.33.M3	MT.61.M3
Membrane Type	H20 / HC	H20 / HC
Material	PTFE	PTFE
Diameter (mm)	33	61
Thickness (µm)	150	150
Maximum Temperature (ºF)	300	300
Membrane Micron Size	0.8	0.8

Guardian Spin Clean

PRODUCT FEATURES / BENEFITS

- 316L Stainless Steel
- 1/4” and 1/2” Ports Available
- 1500 PSIG Maximum Pressure
- Integral Porting
- Protect Liquid and Vapor Analyzers From Small Particles
- Remove Iron Sulfide Particles
- Ideal for Control Sample Applications

The **Guardian Spin Clean (GSC)** is engineered around our proprietary Guardian Membrane Series platform, delivering a highly serviceable, field-friendly solution for particulate removal.
All connections are conveniently located on one side of the housing, eliminating the need to disconnect fittings during maintenance. The inlet port is angled to induce a **cyclonic spinning action**, which significantly reduces particulate loading on the filter element. This spinning motion is enhanced by a gently curved vertex edge in the chamber, increasing cyclone velocity and effectively directing heavier particles toward the **bypass drain**.

The **porous stainless steel disc** is housed in an encapsulated, removable plug for quick and clean replacement. This efficient design minimizes downtime and simplifies in-field servicing.

Available Filtration Grades:
005, 1, 3, 10, 25, 50, and 100 micron

Stainless Steel Model	**GSC205.31101.□**	**GSC205.32201.□**	**GSC205.32202.□**
Inlet / Outlet (NPT)	1/4”	1/2”	1/2”
Sample Port (NPT)	1/4”	1/4”	1/2”
Maximum Pressure (psig)	1500	1500	1500
Internal Volume (Behind Membrane Chamber–Clean Side) (cc)	20	20	20
Weight of Housing (lbs)	7	7	7
Principle Dimensions: (inch)			
Center of Port to Back	0.50	0.63	0.63
Body Diameter	3.94	3.94	3.94
Body Depth (With Hex)	2.70 (3.00)	2.70 (3.00)	2.70 (3.00)
Space Required to Remove Cap	1.80	1.80	1.80
Maximum Temp. (400ºF) Standard Viton O-Ring	GVGSC205	GVGSC205	GVGSC205
Stainless Steel Disc Included with Housing (1)(2)	FDGSC205-□	FDGSC205-□	FDGSC205-□
Drawing **For More Detail & Options**	GSC205.31101	GSC205.32201	GSC205.32202

Notes: (1) Add Micron Rating Required, e.g. FDGSC205-01, FDGSC205-10, FDGSC205-25 and FDGSC205-50
(2) If ordering Micron Size 005, a minimum order is required.

HOW TO ORDER A GUARDIAN SPIN CLEAN HOUSING

Base Part Number	Number of Ports	Inlet	Outlet	Optional Bypass	Sample	Micron Size
GSC205	3 = 3 Ports 4 = 4 Ports	0 = No 1 = 1/4” 2 = 1/2”	0 = No 1 = 1/4” 2 = 1/2”	0 = No 1 = 1/4” 2 = 1/2”	0 = No 1 = 1/4” 2 = 1/2”	005 = 0.5 Micron 01 = 1 Micron 03 = 3 Micron 10 = 10 Micron 25 = 25 Micron 50 = 50 Micron 100 = 100 Micron

Example Part Number: (GSC205.31101.50)

GSC205 FLOW RATES (1)

	Inlet Flow (LPM) (Port 1)	Outlet Sample Flow (LPM) (Port 2)	Bypass Flow (LPM) (Port 3)	Filter Differential Pressure Across Ports 1 and 2 (PSID)
Empty Housing	3.78	1.89	1.89	0.22
	11.17	5.68	5.49	1.82
	18.56	9.46	9.10	4.32
3 Micron	3.84	1.89	1.95	0.27
	11.40	5.68	5.72	2.14
	18.97	9.46	9.51	5.60
50 Micron	3.86	1.89	1.97	0.26
	11.43	5.68	5.75	2.07
	19.04	9.46	9.58	5.40

Notes: (1) Higher microns result in a reduced pressure drop across the filter disc.

The flow rates referenced above are based on a 3 PSID (pounds per square inch differential) across the membrane and are provided for general reference only. While flow can be increased by raising the pressure differential, we do not recommend exceeding 5 PSID, as doing so may compromise membrane integrity.
Membrane Application Guidance

- **M1 Membrane (0.1 micron):** Ideal for separating most liquids from gas streams.
- **M2 Membrane (0.8 micron):** Optimized for separating water and other high surface tension liquids from gases.

For best performance and membrane longevity, ensure proper pre-filtration and avoid pressure surges that could stress the membrane structure.