MaestroGuard® – The Guardian of Measurement Integrity

MaestroGuard® MMF-80-316L-160

Dual Stage Filter Separator

Installation, Operation & Maintenance Manual



1. Product Overview

The MMF-80 MaestroGuard® Filter is a compact, high-performance gas filter designed for precision gas analysis systems. It combines centrifugal pre-separation with cyclone effect, parallel dual-membrane filtration, and a self-cleaning bypass, resulting in exceptional purity, long service life, and minimal maintenance.

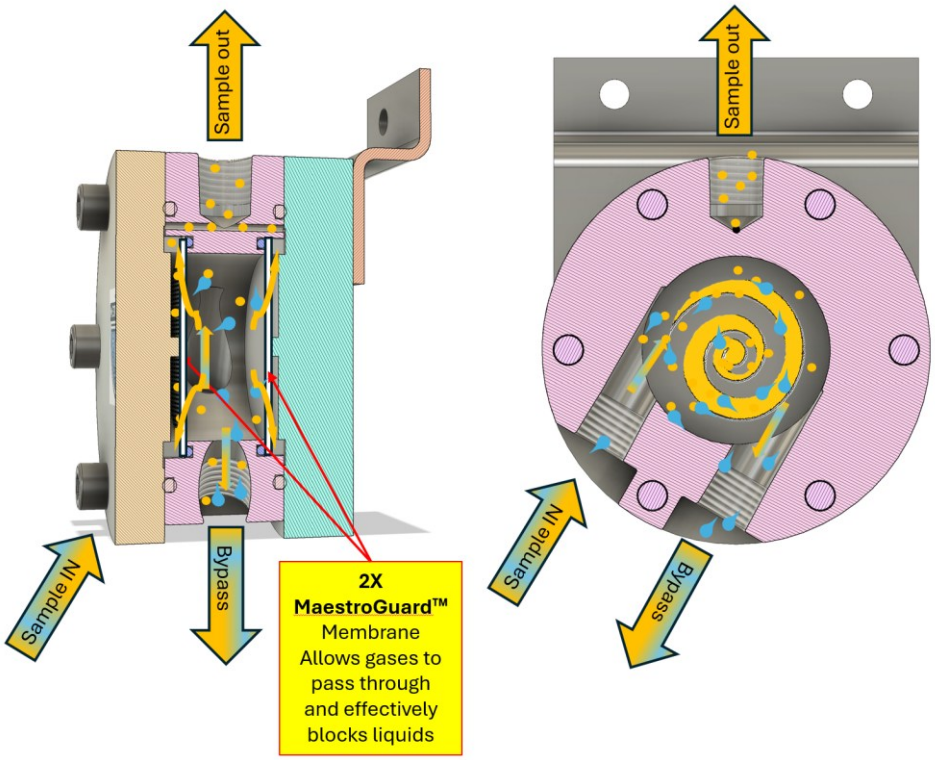
Key Features

- **Dual MaestroGuard™ Membrane System**
  Two parallel PTFE membranes with < 0.1 µm retention.

Analytical Filters Engineering KFT
Rózsa utca 28A, 1077 Budapest, Hungary
+36 1 901 0620 | sales@analytical-filters.com | www.analytical-filters.com

MaestroGuard® – The Guardian of Measurement Integrity

- **Inertial Centrifugal Rotation Pre-Separation**
  Spiral flow path removes liquids and particles mechanically before they reach the membranes.
- **Self-Cleaning Bypass Channel**
  Automatically drains condensed liquids to prevent membrane saturation and fouling.
- **Robust 316L Stainless Steel Housing**
  Corrosion-resistant and suitable for ATEX-rated environments.
- **Low Internal Dead Volume**
  20 ml in the centrifugal chamber and 8 ml post-filtration.
- **Wide Gas Compatibility**
  Suitable for **H_2, CH_4, CO_2, natural gas and inert gases.**
- **No Moving Parts**
  Passive design for maximum reliability and minimal maintenance.
- **Designed for Stable Long-Term Operation**
  Engineered for continuous operation in demanding analytical and process applications.



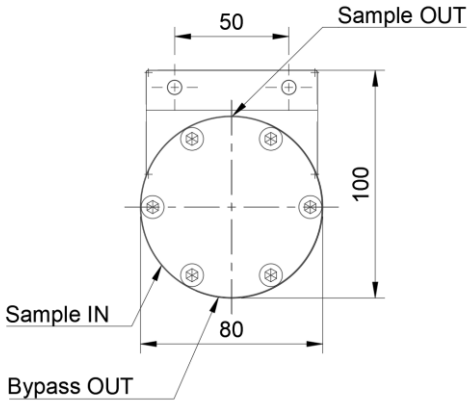
Analytical Filters Engineering KFT
Rózsa utca 28A, 1077 Budapest, Hungary
+36 1 901 0620 | sales@analytical-filters.com | www.analytical-filters.com

2. Technical Specifications

Model: MMF-80-316L-160-x
Housing material: 316L stainless steel
Membrane: 2x MaestroGuard® PTFE Membranes, pore size < 0.1 µm different pore size on request
Pressure rating: up to 160 bar
Temperature range: –40 to +260 °C (depending on sealing material)
Flow Rate: 210l/h air @ 100mbar
Bypass Flow: up to 5l/min
Connections: NPT Female or on request
Seal Materials FKM, FFKM, or PTFE
Internal volume: < 28 ml, including 8 ml downstream of the membrane
Certifications : CE, ATEX, PED, ISO 11114-4, ISO 15156

3. Dimensions

- Diameter: 80, mm
- Height: 80 mm
- Effective membrane diameter: 2 x 36,6 mm
- Connection types: 1/4" NPT male / 1/8 NPT male



4. Application Areas

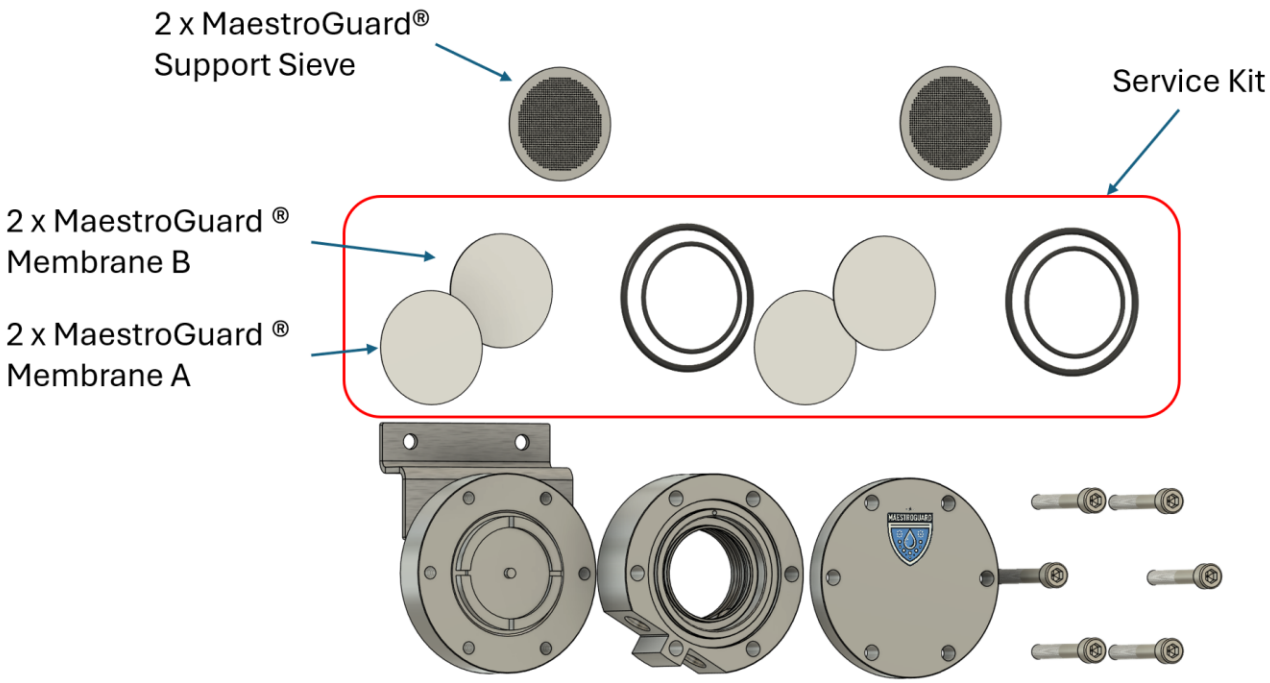
- **Gas Analysis Systems**
  Removes liquids and fine particulates from explosive, corrosive or inert gas samples.

Analytical Filters Engineering KFT
Rózsa utca 28A, 1077 Budapest, Hungary
+36 1 901 0620 | sales@analytical-filters.com | www.analytical-filters.com

- **Hydrogen & Alternative Fuel Monitoring**
  Ensures droplet-free samples for fuel cells and H_2 purity checks.
- **Oil & Fuel Vapor Sampling**
  Separates free water and contaminants from oil or diesel vapor streams.
- **Environmental & Stack Gas Monitoring**
  Reliable even under wet or humid conditions.
- **Process Gas Control**
  Ideal for wet, oily, or particle-rich process gases.
- **Pharmaceutical & Chemical Plants**
  Delivers dry, clean gas to analytical instruments.

---

4. Installation Instructions



4.1 Preparation:

- Verify all parts are clean.

- Check that O-rings are undamaged

4.2 Assembly (refer to exploded drawing):

1. Prepare the **bottom housing part** (with optional wall bracket).
2. Insert the **first membranes, O-rings and support sieve** into the **middle section** (centrifugal chamber).
3. Mount the **middle section** (centrifugal chamber).
4. Insert the **second membranes, O-rings and support sieve** into the **middle section** (centrifugal chamber).
5. Close the housing using 6 M6x1 bolts – tighten in a cross pattern.

Note: Membrane A is positioned between a colored, dust-free protective sheet and Membrane B, and is packed together with its corresponding sealing components.

All surfaces in contact with the membrane must be clean and dust-free.

---

6. Operation

- **Gas Inlet**: tangential from the side/bottom (initiates spiral flow).
- **Clean Gas Outlet**: vertical top outlet.
  - **Flow Rate:** 210l/h air @ 100mbar with standard 0,1µm membrane, higher flow with higher micron membrane elements available
- **Bypass Outlet**: tangential from bottom — may drain or recirculate.
  - **Recommended Operation:** Bypass flow:0,2 – 5.0 L/min (application dependent)
    Practical Selection Guide
    - Standard gas analysis (clean / slightly humid): 0.5 – 1.5 L/min
    - High humidity / oil mist / frequent condensation: 1.5 – 3.0 L/min
    - Very dirty or multiphase streams: 3.0 – 5.0 L/min
- **Periodic inspection recommended for dirty or aggressive streams.**

---

7. Maintenance

7.1 Replacement Interval

The membrane replacement interval depends on the level of contamination and operating conditions.
Typical service interval is 6 months in analytical applications.

7.2 Service Kit Contents

The service kit consists of **two sets of O-rings** and **two MaestroGuard® membrane sets (Membrane A and Membrane B).**

Membrane A is positioned **between a colored, dust-free protective sheet and Membrane B**, and is packed together with its corresponding sealing components.
The colored protective sheet prevents contamination and mechanical damage during handling and installation.

7.3 Membrane Replacement Procedure

1. Fully depressurize the system.
2. Remove the housing screws.
3. Carefully lift the cover.
4. Remove the used membranes.
5. Install the new membranes from the official service kit.
6. Ensure all sealing surfaces are clean and undamaged.
7. Reassemble the housing and tighten screws to the specified torque.

Handling & Installation Instructions (Important)

- ⚠ Use tweezers when handling MaestroGuard® Membrane.
- ⚠ Avoid direct contact with the membrane surface at all times.
- ⚠ The side of Membrane A facing the colored protective sheet must be oriented toward the center section (middle part) of the filter.

Direct contact or incorrect orientation may contaminate or damage the membrane and negatively affect filtration performance.
Remove the colored protective sheet immediately before installation only.

7.4 Service Kits:

Kit Name	Contents
MK-MMF-80-FKM-V1	2x MaestroGuard® membrane set, 4x FKM O-rings

Analytical Filters Engineering KFT
Rózsa utca 28A, 1077 Budapest, Hungary
📞 +36 1 901 0620 | ✉ sales@analytical-filters.com | 🌐 www.analytical-filters.com

Kit Name	Contents
MK-MMF-80-FFKM-V1	2x MaestroGuard® membrane set, 4x FFKM O-rings
MK-MMF-80-PTFE-V1	2x MaestroGuard® membrane set, 4x PTFE O-rings

---

8. Safety & Compliance

- **ATEX Compliant** – no ignition source
- **PED Certified** – Pressure Equipment Directive
- **ISO 15156 / NACE MR0175** – H_2S service compliant
- **Material Certificate EN 10204-3.1** available

Always purge with clean gas before first use

---

9. Ordering Information

Part Number	Description
MMF-80-316L-160-FKM-V1	Filter with FKM seals, 160 bar
MMF-80-316L-160-FFKM-V1	Filter with FFKM seals, 160 bar
MMF-80-316L-160-PTFE-V1	Filter with PTFE seals, 160 bar
MB-MMF-80	Stainless steel mounting bracket
SS-MMF-80	Stainless steel membrane support screen
LP-MG-01	

---

10. Contact & Support

Analytical Filters Engineering KFT
Rózsa utca 28A, 1077 Budapest, Hungary
📞 +36 1 901 0620
✉️ sales@analytical-filters.com
🌐 www.analytical-filters.com
