

**saes**  
group

# SAES Pure Gas

*The Technology of Pure Gas*

## AMBIENT INLINE PURIFIER 404 PURIFICATION MEDIA SPECIFICATION



**0 – 1,000 slpm Ambient Inline Purifiers.  
For consistent gas quality and  
Impurity removal to pptV levels.**

### MicroTorr Ambient Inline Purifiers:

MicroTorr purifiers are the most complete and reliable solution for Point-of-Use (POU) gas purification. Combining model size with a selection of gas-specific purification materials, MicroTorr purifiers can be tailored to many different customer applications, while maintaining impurity removal to Part-Per-Billion (ppbV) levels or better. Optional valves and a 0.003 micron particle filter are available as well as custom subsystem configurations.

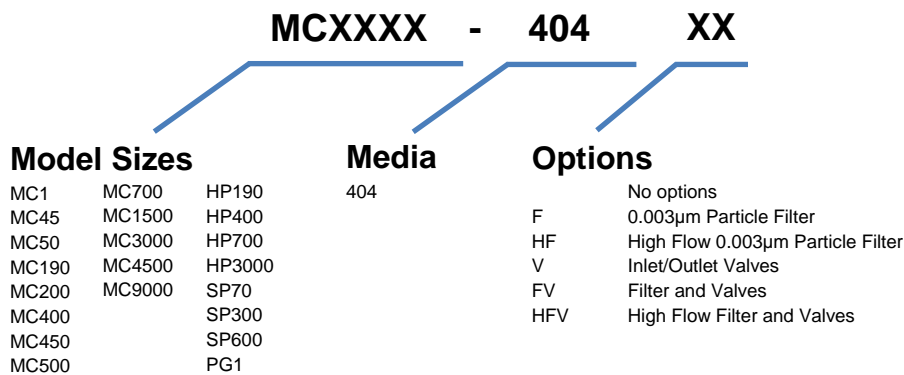
### Competitive Advantages and Benefits:

- **Reliability:** Uncompromised process consistency and yield improvement.
- **Performance:** State-of-the-art purification technology, low pressure drop, and long lifetimes.
- **Regenerability:** Most MicroTorr media are factory regenerable, minimizing potentially hazardous waste.
- **Quality:** 316L stainless steel, Helium leak checked, and analytical testing to part-per-trillion (pptv) levels.
- **Support:** Lifetime estimation and regeneration service available through SAES Pure Gas Sales Network.

### 404 Media Purifier Properties

<b>Gases Purified</b>	<b>N2, Ar, He, Kr, Ne, Xe, H2, CDA, O2, CO2, C2H2, C3H6, C2H4, NH3, C2H6, C3H8, C4H10</b>
<b>Impurities Removed</b>	<b>Organics &lt; 1 pptV, Metals &lt; 1 ppbV</b>
Particle Filtration	2 micron or 0.003 micron metal
Vessel construction	Stainless Steel 316L, electropolished to 10 Ra
Installation Orientation	Vertically with flow downward. Consult factory for other orientations.
Leak Rating	1 x 10 <sup>-9</sup> atm cc/sec of He
Operating temperature	-20 to 65 °C (-4 to 149°F) Lifetime may be effected at higher temperatures
Lifetime	Contact SAES Pure Gas for application specific lifetime calculations
Regenerability	Regenerable at SAES Pure Gas Regeneration Centers
Certification	CE Certified to the Pressure Equipment Directive (PED) Designed in accordance with ASME

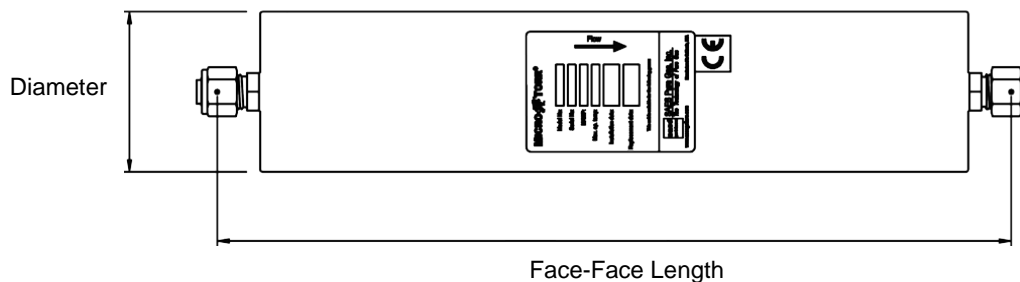
### Part Number Configuration:



### Purifier Sizes

Part Number	Maximum Flow (slpm)	Average Flow (slpm)	Operating Pressure (psig) Must be in gas phase	Inlet Connection	Outlet Connection	Diameter (inches [mm])	Face to Face Length (inches [mm])	Weight (lb. [kg])
<b>Standard Models</b>								
MC1-404F	5	0.5	1,000	1/4" MVCR	1/4" MVCR	1.5 [38.1]	3.31 [84.1]	< 0.7 [0.3]
MC45-404 MC45-404F	10	1.5	1,000	1/4" MVCR	1/4" MVCR	1.5 [38.1]	4.50 [114.3]	< 0.9 [0.4]
MC50-404F	10	1.5	1,000	1/4" MVCR	1/4" MVCR	1.5 [38.1]	5.00 [127.0]	< 0.9 [0.4]
MC190-404F	50	5	250	1/4" MVCR	1/4" MVCR	2.0 [50.8]	8.20 [208.3]	< 1.6 [0.7]
MC200-404F	50	5	250	1/4" MVCR	1/4" MVCR	2.0 [50.8]	6.30 [160.0]	< 1.8 [0.8]
MC400-404F	60	9	250	1/4" MVCR	1/4" MVCR	3.0 [76.2]	8.20 [208.3]	< 4.9 [2.2]
MC450-404F	75	10	250	1/4" MVCR	1/4" MVCR	3.0 [76.2]	7.94 [201.7]	< 4.1 [1.8]
MC500-404F	100	12	250	1/4" MVCR	1/4" MVCR	2.0 [50.8]	12.50 [317.5]	< 2.8 [1.2]
MC700-404F	120	25	250	1/4" MVCR	1/4" MVCR	3.0 [76.2]	10.00 [254.0]	< 7.6 [3.4]
MC1500-404F	250	40	250	1/2" MVCR	1/2" MVCR	3.0 [76.2]	18.20 [462.3]	< 8.0 [3.6]
MC3000-404 MC3000-404F	500	80	250	1/2" MVCR	1/2" MVCR	4.0 [101.6]	20.00 [508.0]	< 14.0 [6.4]
MC4500-404F	500	200	250	1/2" MVCR	1/2" MVCR	6.0 [152.4]	27.64 [702.6]	< 43.0 [19.5]
MC4500-404 MC4500-404HF	1,000	200	250	1/2" MVCR	1/2" MVCR	6.0 [152.4]	27.64 [702.6]	< 43.0 [19.5]
MC9000-404 MC9000-404F	1,000	300	250	1/2" MVCR	1/2" MVCR	6.0 [152.4]	39.34 [999.7]	< 60.4 [27.4]
<b>High Pressure Models</b>								
HP190-404F	50	5	1,000	1/4" MVCR	1/4" MVCR	2.0 [50.8]	8.20 [208.3]	< 2.1 [0.9]
HP400-404F	60	9	1,000	1/4" MVCR	1/4" MVCR	3.0 [76.2]	8.20 [208.3]	< 4.9 [2.2]
HP700-404F	120	25	1,000	1/4" MVCR	1/4" MVCR	3.0 [50.8]	10.0 [254.0]	< 7.6 [3.4]
HP3000-404F	500	80	1,000	1/2" MVCR	1/2" MVCR	3.9 [100.1]	20.0 [508.0]	< 26.0 [11.8]
SP70-404F	20 (<2,000 psig) 40 (>2,000 psig)	1.5	3,000	1/4" MVCR	1/4" MVCR	2.0 [50.8]	5.00 [127.0]	< 2.3 [1.0]
SP300-404F	100 (<2,000 psig) 200 (>2,000 psig)	10	3,000	1/4" MVCR	1/4" MVCR	2.0 [50.8]	15.00 [381.0]	< 6.6 [3.0]
SP600-404F	200 (<2,000 psig) 400 (>2,000 psig)	15	3,000	1/4" MVCR	1/4" MVCR	2.0 [50.8]	25.00 [635.0]	< 11.0 [5.0]

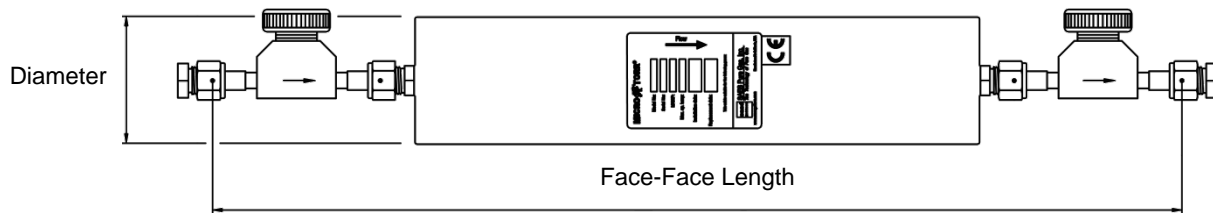
F = 0.003 micron particle filter



**Purifier Sizes, with inlet and outlet isolation valves**

Part Number	Maximum Flow (slpm)	Average Flow (slpm)	Operating Pressure (psig) Must be in gas phase	Inlet Connection	Outlet Connection	Diameter (inches [mm])	Face to Face Length with valves (inches [mm])	Weight with valves (lb. [kg])
<b>Standard Models</b>								
MC1-404FV	5	0.5	1,000	1/4" FVCR	1/4" FVCR	1.5 [38.1]	8.91 [226.3]	< 2.6 [1.2]
MC45-404V MC45-404FV	10	1.5	1,000	1/4" FVCR	1/4" FVCR	1.5 [38.1]	10.10 [256.5]	< 2.9 [1.3]
MC50-404FV	10	1.5	1,000	1/4" FVCR	1/4" FVCR	1.5 [38.1]	10.60 [269.2]	< 2.9 [1.3]
MC190-404FV	50	5	250	1/4" FVCR	1/4" FVCR	2.0 [50.8]	13.80 [350.5]	< 3.7 [1.7]
MC200-404FV	50	5	250	1/4" FVCR	1/4" FVCR	2.0 [50.8]	11.90 [302.3]	< 3.8 [1.8]
MC400-404FV	60	9	250	1/4" FVCR	1/4" FVCR	3.0 [76.2]	13.80 [350.5]	< 6.8 [3.1]
MC450-404FV	75	10	250	1/4" FVCR	1/4" FVCR	3.0 [76.2]	13.54 [343.9]	< 6.0 [2.7]
MC500-404FV	100	12	250	1/4" FVCR	1/4" FVCR	2.0 [50.8]	18.10 [459.7]	< 4.5 [2.0]
MC700-404FV	120	25	250	1/4" FVCR	1/4" FVCR	3.0 [76.2]	15.60 [396.2]	< 9.6 [4.4]
MC1500-404FV	250	40	250	1/2" FVCR	1/2" FVCR	3.0 [76.2]	28.84 [732.5]	< 12.5 [5.8]
MC3000-404V MC3000-404FV	500	80	250	1/2" FVCR	1/2" FVCR	4.0 [101.6]	30.64 [778.3]	< 18.7 [8.5]
MC4500-404FV	500	200	250	1/2" FVCR	1/2" MVCR	6.0 [152.4]	38.30 [972.8]	< 48.7 [22.1]
MC4500-404V MC4500-404HFV	1,000	200	250	1/2 FVCR	1/2 MVCR	6.0 [152.4]	38.30 [972.8]	< 48.7 [22.1]
MC9000-404V MC9000-404FV	1,000	300	250	1/2" FVCR	1/2" MVCR	6.0 [152.4]	50.00 [1270.0]	< 66.0 [29.9]
<b>High Pressure Models</b>								
HP190-404FV	50	5	1,000	1/4" FVCR	1/4" FVCR	2.0 [50.8]	13.80 [350.5]	< 4.1 [1.8]
HP400-404FV	60	9	1,000	1/4" FVCR	1/4" FVCR	3.0 [76.2]	13.80 [350.5]	< 6.8 [3.1]
HP700-404FV	120	25	1,000	1/4" FVCR	1/4" FVCR	3.0 [50.8]	15.60 [396.2]	< 9.6 [4.4]
HP3000-404FV	500	80	1,000	1/2" FVCR	1/2" FVCR	3.9 [100.1]	28.90 [756.0]	< 30.7 [13.9]
SP70-404FV	20 (<2,000 psig) 40 (>2,000 psig)	1.5	3,000	1/4" FVCR	1/4" FVCR	2.0 [50.8]	10.60 [270.0]	< 4.3 [1.9]
SP300-404FV	100 (<2,000 psig) 200 (>2,000 psig)	10	3,000	1/4" FVCR	1/4" FVCR	2.0 [50.8]	20.60 [524.0]	< 8.6 [3.9]
SP600-404FV	200 (<2,000 psig) 400 (>2,000 psig)	15	3,000	1/4" FVCR	1/4" FVCR	2.0 [50.8]	30.60 [778.0]	< 13.0 [13.9]
<b>"U" Shaped Manifold</b>								
PG1-404FV	15	10	250	1/4" FVCR	1/4" MVCR	2.0 [50.8]	13.80 [350.5]	< 5.1 [2.3]

F = 0.003 micron particle filter  
V = inlet and outlet isolation valves



**Bypass and Dual Purifier Manifold Assemblies:**

Many configurations are available; please consult the factory for details.

**Other Purification Media's Available:**

Media	Gases Purified	Impurities Removed
202	CDA, O2, N2, Ar, He, Kr, Ne, Xe, H2, D2, CO2, N2O, NO, CF4	H2O to < 1 ppb
203	CDA, O2, N2, Ar, He, Kr, Ne, Xe, H2, D2, N2O, NO, CF4	H2O, CO2 to < 100 ppt; Volatile Acids, Organics, Refractory Compounds to < 1 ppt; Volatile Bases < 5 ppt, Metals < 1 ppb
302	HCl, Cl2, B2H6, BCl3, CClH3, GeCl4, GeH4, H2S, H2Se, HBr, NF3, SiCl4, SiF4, SiH2Cl2, SiHCl3, SO2, CHClF2, BF3,	H2O to < 1 ppb; Metals < 1 ppb
403	N2, Ar, He, Kr, Ne, Xe, H2, CDA, O2	Volatile Acids, Organics, Refractory Compounds to < 1 ppt; Volatile Bases < 5 ppt, Metals < 1 ppb
<b>404 Covered by this Specification</b>	<b>N2, Ar, He, Kr, Ne, Xe, H2, CDA, O2, CO2, C2H2, C3H6, C2H4, NH3, C2H6, C3H8, C4H10</b>	<b>Organics &lt; 1 pptV, Metals &lt; 1 ppbV</b>
502	AsH3, PH3	H2O, O2 to < 1 ppb, Metals < 1 ppbV
503	H2 with up to 1% O2; O2 with up to 2% H2	H2 in O2 or O2 in H2 < 1 ppmV
602	CO	H2O, O2, CO2, Acids, Bases, Organics, Refractory Compounds, Metals < 1 ppbV
702	NH3, C2H7N, C2H8N2, C2H4, C3H6, CH3SiH3, GeH4, SF6, SiH4, H2/SiH4 mixtures	H2O, O2, CO2, NMHCs, Metals to < 1 ppb
802	SiH4	H2O, O2, CO, CO2, NMHCs, Sulphur compounds, Metals removal < 1 ppb
804	CO2	H2O, O2, CO, H2 to < 100 ppt; Volatile Acids, Organics, Refractory Compounds to < 1 ppt; Volatile Bases < 5 ppt, Metals < 1 ppbV
805	CO2	H2O < 100 ppt; Volatile Acids, Organics, Refractory Compounds to < 1 ppt; Volatile Bases < 5 ppt, Metals < 1 ppbV
902	N2, Ar, He, Kr, Ne, Xe, CH4, C2H6, C3H8, C4H10, SF6, Fluorocarbons	H2O, O2, CO, CO2, H2 to < 100 ppt; Volatile Acids, Organics, Refractory Compounds to < 1 ppt; Volatile Bases < 5 ppt, Metals < 1 ppbV
904	H2, D2, H2-Inerts Mix	H2O, O2, CO, CO2 to < 100 ppt; Volatile Acids, Organics, Refractory Compounds to < 1 ppt; Volatile Bases < 5 ppt, Metals < 1 ppbV
906	CDA, O2, N2O	H2O, CO, CO2, NMHC to < 1 ppb, Metals < 1 ppbV

**Purifier Regeneration:**

Available from any SAES Pure Gas Regeneration Center.



**CE Directive:**

All MicroTorr Purifiers meet CE directive requirements and come with the CE Marking.

