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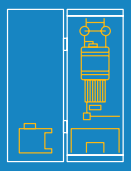


Point-of-Use Purifiers

Gas Purifiers for Low Flow Rate Applications

At Mott, we know that low flow rate applications have big implications. That's why we deliver a full suite of point-of-use purifiers that meet your precise requirements and exceed your expectations.

Mott's point-of-use purifiers offer relatively low flow rates at economical prices. Designed for high purity and ultra high purity applications that require impurity levels in process gases to be 100 PPT or less, Mott's point-of-use purifiers accommodate various flow rates across six different models and uphold the highest standard of purity for gas delivery systems.

At-a-Glance

FEATURES

- Nominal flow rates from 0.3 to 20 slpm
- Maximum flow rates from 4.5 to 300 slpm
- 316L stainless steel construction
- Integral Particle Filtration
- Simple installation

OPTIONS

- Inlet/outlet fittings
- Inlet/outlet valves
- Sub-micron particle filtration

APPLICATIONS

- Weld gas/purge gas
- Pharmaceutical production
- Semiconductor process equipment
- Analytical equipment
- Annealing cover gas
- LED manufacturing
- Flat panel display production
- Solar and energy
- Other emerging technologies

Our Suite of Point-of-Use Gas Purifiers

Vessel Only Purifiers

Operate without requiring heat to remove impurities.

Nova Series In-Line Purifiers

Incorporate a heater, temperature indication, and control.

Pro-Panel Series Purifiers

Offer advanced automation and integration.

Point-of-Use purifier is a name typically given to a purifier that offers a relatively low flow rate serving a single application/tool/use. This brochure outlines the features, benefits, and performance of Mott's Point-of-Use purifiers.

Mott purifiers are categorized into three groups. The primary distinction is based on flow rate of the gas being purified. The following is offered as a general rule:

Category	Flow Rate
Point-of-Use	0.1-100 slpm
Micro-Bulk	100-1200 slpm
Bulk	60->5000 nm^3/hr

Specifications	
Max Operating Pressure	Vessles only - 250 PSIG (17.24 BAR) | Nova & Pro-Panel - 150 PSIG (10.34 BAR)
Max Operating Temperature[1]	400°C
Nominal Flow Rate[2]	0.3 slpm to 20.0 slpm
Maximum Flow Rate[2]	4.5 slpm to 300 slpm
Pressure Drop[2]	<2 psid typical
Filtration	0.1 µm standard, optional 0.003 µm
Wetted Surfaces	Electro-polished, <10Ra, 316L stainless steel
Typical Inlet Gas Purity	99.999%[4]
Outlet Purity	<100 PPT
Input Power	100VAC, 120VAC, 230VAC, 50/60Hz, 600W (max)
Inlet/Outlet Fittings	VCR™ standard, optional Swagelok™ or tube stub
Operating Air Supply[3]	60-90 psig CDA

[1] Applicable to heated vessels in Nova™ Series and Pro-Panel™ Series only.
[2] Dependent on vessel size.
[3] Only applicable with air operated valve option.
[4] 50 PPM maximum.

Output Purity Testing & Certification

When required or desired we can include in the quote APIMS purity testing to verify output purity. When purity testing is purchased with a purifier, a certification of purity, with the test data in a report format, is included with the purifier.

Equivalent Purifier Replacements

Mott also offers replacement of existing purifiers not originally manufactured by us. With information on the purifier to be replaced, we will quote a drop in replacement solution.

Available Upon Request

Mott maintains an active development program. We welcome a challenge and will respond to requests for:

- High pressure purifiers
- Less stringent purity requirements (PPM vs. PPB)
- Customized solutions for atypical requirements

High & Ultra High Purity Performance

Mott's Point-of-Use Vessels, Nova Series and Pro-Panel Series purifiers are designed for high purity and ultra high purity applications that require impurity levels in process gases to be 100 PPT or less. Recommended flow rates are based on a targeted 1 year service life between regeneration or replacement. Actual useful lifetime is influenced by the actual flow rate of the gas being purified, and the inlet impurity concentrations.

Diverse Purification Media Options

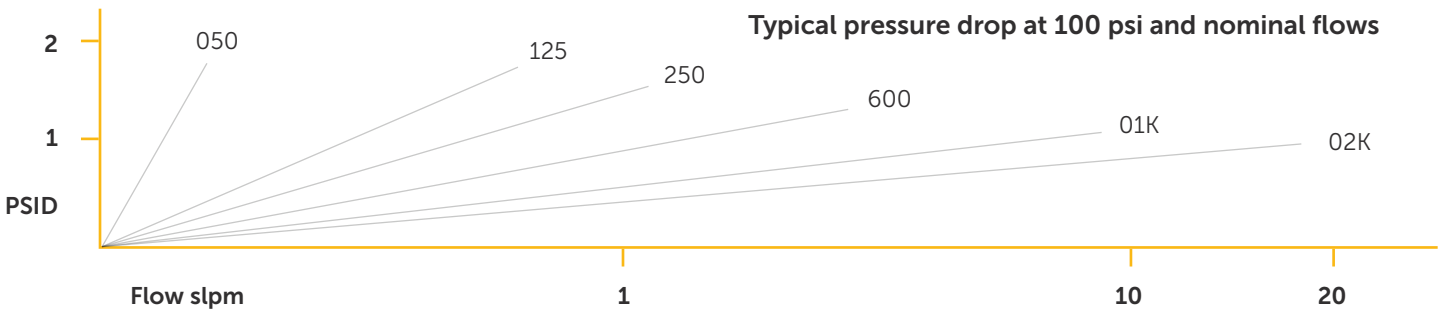
Various fill materials are offered and recommended based on the gas to be purified and the impurities to be removed. Options range from heated getters, to catalyst for reactive gases, to absorbers/adsorbers for moisture and hydrocarbon removal. See the chart on page 7 for media designations for specific gases and impurities removed.

Flexible Sizes & Configurations

Six different vessel sizes are available to accommodate various flow rates. Inlet/outlet fitting, filtration, addition of valves, and addition of a hydrogen removal stage in some configurations are all available. Power supply voltage and, in some cases, whether valves are manual or electro-pneumatic, can also be specified.

Features	Vessel Only	Nova™ Series	Pro-Panel™ Series
Heated Operation	No	Yes	Yes
Optional Inlet/Outlet/ Bypass Valves	Yes	Yes	Yes
Optional Pneumatic Inlet/Outlet Valves	N/A	Yes	Yes
Power Status LED	N/A	Yes	Yes
Ready (for Operation) LED	N/A	Yes	Yes
Thermocouple Fault LED	N/A	Yes	Yes
Process LED	N/A	No	Yes
Alarm LED	N/A	No	Yes
Valves Open LED	No	No	Yes

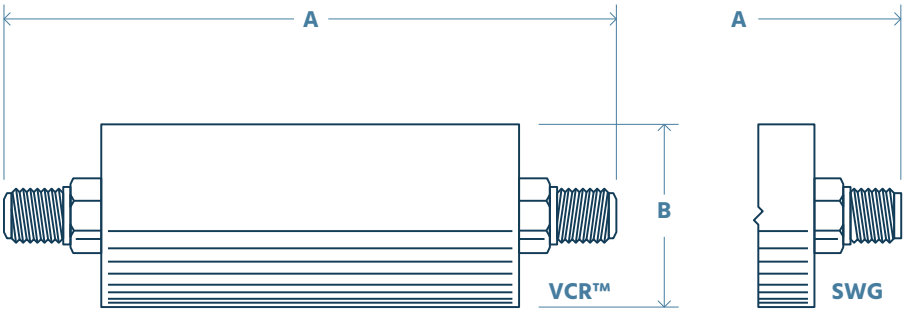
Typical pressure drop at 100 psi and nominal flows



Vessel Only

Mott purifiers are manufactured to exacting standards including use of low sulfur 316L stainless steel with internal surfaces electro-polished to meet a <10Ra finish. Semi-automated welding of the components is conducted in class 100 clean zones using purified Argon cover gas. All finished assemblies are Helium leak checked to <2x10^{-9}atm cc/sec. The purifiers are shipped cleaned, purged, and capped for immediate use.

Mott's Point-of-Use vessel only purifiers are designed to operate without requiring heat to remove impurities. Factory regeneration is available for applicable models. The six different model sizes indicated are standard, with other dimensions available for drop in replacement of existing purifiers. They are also available with the Nova In-Line Series purifiers and Pro-Panel Series purifiers. *(Note: the 02K vessel is not available in the Nova Series.)*



		Dimensions			Flow slpm		
MODEL	UNITS	A		B	NOMINAL	MAX FP	MAX CR
		VCR™	SWG				
050	mm	84.0	72.1	25.4	0.3	1.5	4.5
	inch	3.3	2.84	1.0			
125	mm	84.0	72.1	38.0	1.0	5.0	15.0
	inch	3.3	2.84	1.5			
250	mm	122.0	110.2	38.0	2.0	10.0	30.0
	inch	4.8	4.34	1.5			
600	mm	160.0	148.3	51.0	6.0	30.0	90.0
	inch	6.3	5.84	2.0			
01K	mm	224.0	211.8	51.0	10.0	50.0	150.0
	inch	8.8	8.34	2.0			
02K	mm	317.0	305.8	64.0	20.0	100.0	300.0
	inch	12.5	12.04	2.5			

- Nominal flow rates are based on 1 yr service life.
- Max flow rates are at 150 psig gas pressure.
- Weights range from 1 to 10 lbs based on size and fill material.

Nova Series In-Line Purifiers

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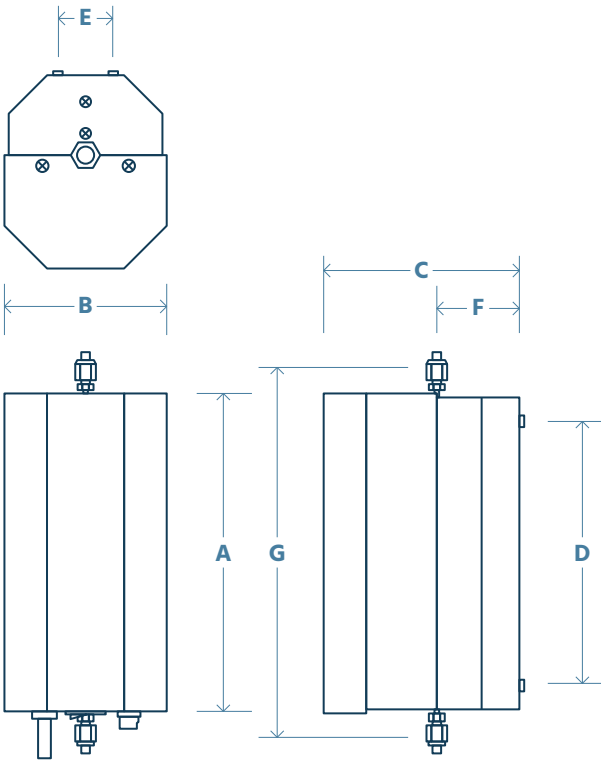
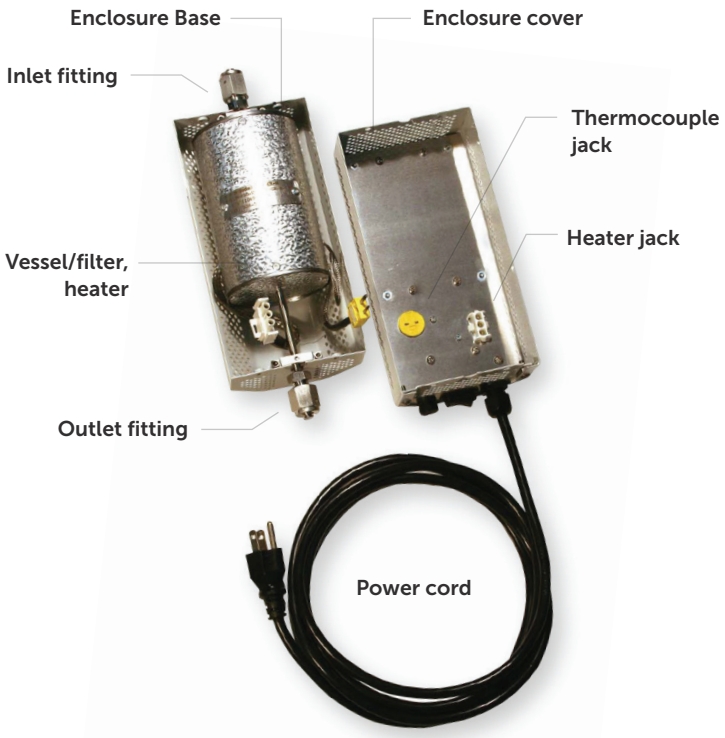
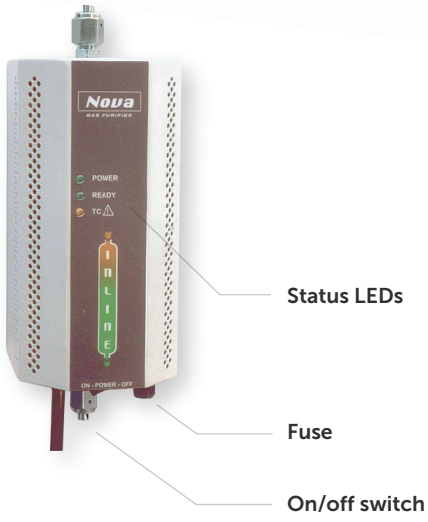
The Nova Series purifiers incorporate a heater, temperature indication and control. They are typically used when the process gas and impurities to be removed indicate a heated operation is required. Manual inlet/outlet and bypass valves are typical options specified for ease of vessel replacement or regeneration. See the chart on page 3 for flow rates.



System Components





Model	50/125/250		600/01K	
Dim	mm	inch	mm	inch
a	207.0	8.15	362.0	14.25
b	105.4	4.15	156.2	6.15
c	127.0	5.0	196.9	7.75
d	177.8	7.0	276.9	10.9
e	38.1	1.5	50.4	2.0
f	50.8	2.0	86.4	3.4
g	254.0	10.0	412.8	16.25

- Weights range from 3-15 lbs based on size, fill material, and options selected.

Pro-Panel Series Purifiers

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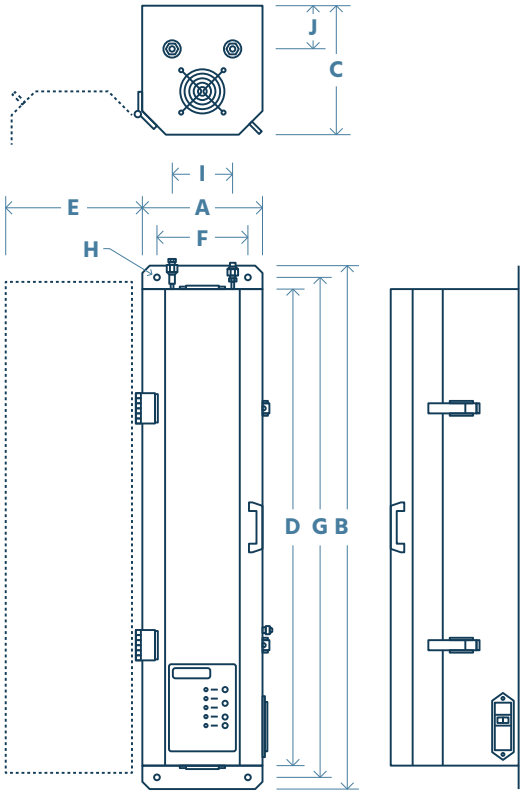
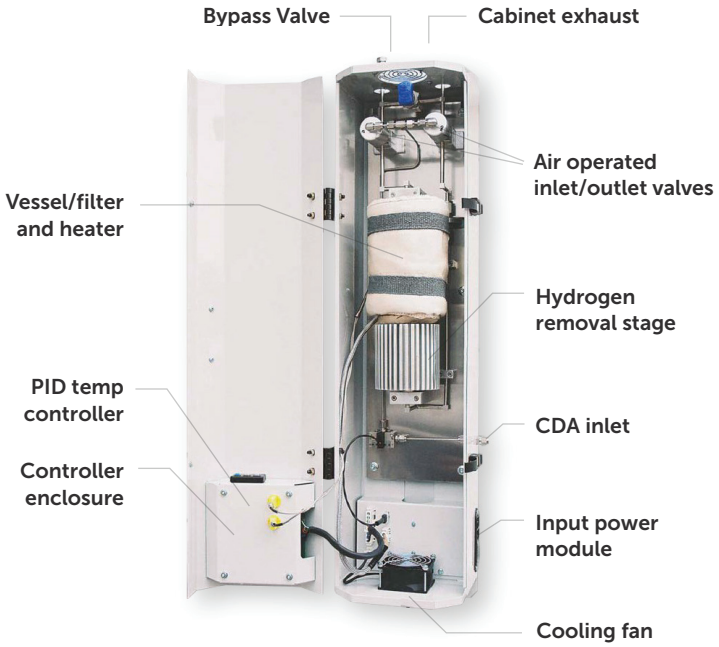
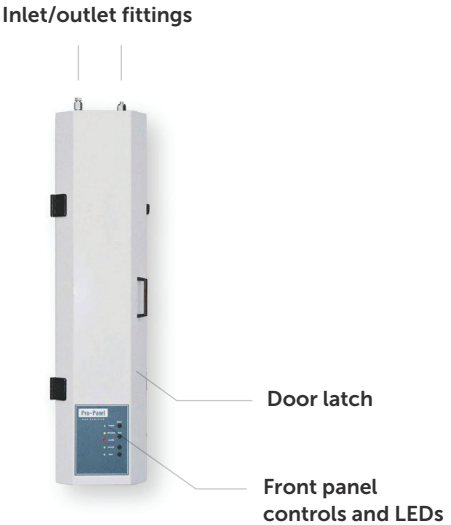
The Pro-Panel Series purifiers are similar to the Nova Series purifiers, but offer more automation and integration. Automated heater control, pneumatic inlet/outlet valves, and customer contacts for interfacing with a host for alarm/indication are standard with the Pro-Panel Series. Pneumatic bypass valve operation is an option.



System Components



Dimensions	Dim	mm	inch
Overall	a	203.3	8.0
	b	882.7	34.75
	c	215.9	8.5
Door Clearance	d	806.5	31.75
	e	228.6	9.0
Mounting	f	152.4	6.0
	g	844.6	33.25
	h	9.0 dia	0.38 dia
Connections	i	101.6	4.0
	j	69.9	2.75



- Weights range from 37-52 lbs based on size, fill material, and options selected.

Specifying a Point-of-Use Purifier

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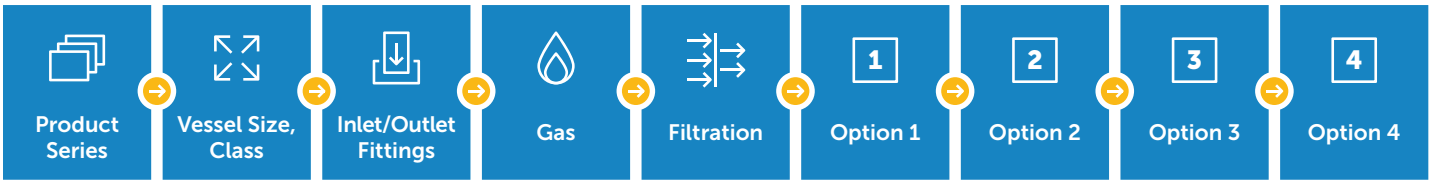
Purifiers are specified and ordered based on a constructed model number as described below.

Please note:

- Not all options listed are available with all products.
- Vessel Only purifiers do not require electrical power, but options include manual valves and panel mounting.
- Nova In-Line Series purifiers are used when heated operation is required and self contained control and personnel safety are concerns.
- Pro-Panel Series purifiers are also used when heated operation is required, automated control is required and/or when interfacing with a host is desired for small area control.



Product Series

The product series defines one of the three options available.

(blank) Point-of-Use, vessel only (options available)
N Nova Series
P Pro-Panel Series

Vessel Size & Class

The vessel size and class are required. The vessel size is typically selected based on the anticipated flow rate of the gas being purified. In some cases, it is desirable to oversize the vessel to enhance purity or lifetime performance. The chart below lists nominal flow rates at 150 psi line pressures to achieve specified impurity removal to <100 PPT for a nominal 1 year service life. Max flow rates listed are based on filtration option specified, FP=0.003um, CR=0.1um.

Vessel Size	Nominal Flow for 1 Year Life	Maximum Flow FP	Maximum Flow CR	Available with Series
050	0.3 slpm	1.5 slpm	4.5 slpm	(blank), N, P
125	1.0 slpm	5.0 slpm	15.0 slpm	(blank), N, P
250	2.0 slpm	10.0 slpm	30.0 slpm	(blank), N, P
600	6.0 slpm	30.0 slpm	90.0 slpm	(blank), N, P
01K	10.0 slpm	50.0 slpm	150.0 slpm	(blank), N, P
02K	20.0 slpm	100.0 slpm	300.0 slpm	(blank), P

The vessel size and class descriptor ends with a designation for the fill material required to remove specific impurities from specific gas streams. See the chart below to complete the vessel size and class descriptor for common gases and impurities. This is not a complete list of every possible impurity that can be removed from every possible gas. If the gas to be purified or impurities are not listed, contact Mott for assistance.

Class	Available with Product Series	Gases Purified	Impurities Removed	Removal Efficiency	Heated Operation	Regen Capable
C	(blank)	Ar, He, Kr, Ne, Xe, N_2, H_2	CO, CO_2, H_2, H_2O, NMHC, O_2	<100 PPT	No	Yes
CA	(blank)	Ar, He, Kr, Ne, Xe, N_2, H_2	CO, CO_2, H_2, H_2O, NMHC, O_2	<100 PPT	No	Yes
F	(blank)	C_2F_6, C_3F_8, C_4F_8, $CClF_3$, CCl_2F_2, CCl_4, CF_4, $CHClF_2$, CHF_3, CH_3F	CO, CO_2, H_2, H_2O, NMHC, O_2	<100 PPT	No	No
H	N, P	H_2	CO, CO_2, H_2O, N_2, O_2	<100 PPT	Yes	No
N	N, P	N_2, N_2/Noble gas mix	CO, CO_2, H_2, H_2O, O_2, THC	<100 PPT	Yes	N/A
O	N, P	CDA, O_2	CO, H_2, THC	<100 PPT	Yes	N/A
OX	(blank), N, P	CDA, O_2	CO_2, H_2O, NMHC, Amines, NOx	<100 PPT	No	Yes
R	N, P	Ar, He, Kr, Ne, Xe	CO, CO_2, H_2, H_2O, N_2, O_2, THC	<100 PPT	Yes	No
T	(blank)	BCl_3, BF_3, CL_2, ClF_3, F_2, HBr, HCl, HF, NF_3, SF_4, WF_6	H_2O	<100 PPT	No	No
W	(blank), N, P	Ar, He, Kr, Ne, Xe, H_2, N_2	H_2O	<100 PPT	No	Yes
Y	(blank)	AsH_3, B_2H_6, CH_4, D.C.S.(SiH_2Cl_2), Ge_2H_6, GeH_4, H_2Se, NH_3, PH_3, SF_6, SiH_2, SiH_4, Si_2H_6, DMHZ, Hydride/Carrier gas mix	CO_2, H_2O, O_2	<100 PPT	No	Yes
V	(blank), N, P	Ar, He, Kr, Ne, Xe, N_2	O_2	<100 PPT	Yes/No	Yes

Inlet/Outlet Connections

Options are VCR™ face seal fittings (**V**), Swagelok™ fittings (**S**), and tube stubs (**T**) if the vessel will be welded into place. Two sizes of each are offered, 1/4" (**04**), 1/2" (**08**). Not all vessels support all sizes.

*Example: 1/4" VCR™ fittings would be **V04**, 1/2" tube stub would be **T08**.*

Vessel Size	Types	Sizes
50	V, S, T	04
125	V, S, T	04
250	V, S, T	04
600	V, S, T	04, 08
01K	V, S, T	04, 08
02K	V, S, T	04, 08

Gas

Gas options are listed in the above Vessel Class chart.

Example: Argon would be Ar and Nitrogen would be N_2.

Filtration

All purifiers include an integral filter. Two standard options are available: **CR**-0.1 micron and a **FP**-0.003 micron. These filter particles down to the size specified to less than 1 particle per cubit foot of gas.

Configurable Options

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The options listed below will fill the remaining blocks in the model number. If an option is not desired or applicable, simply skip it and use the next option chosen in sequence. Not all options are available with all product series.

Hydrogen Removal

If a Hydrogen removal stage is required/desired, use designator **H**.

Input Power

With the Nova and Pro-Panel Series purifiers, the controllers require power for operation. If power is required, the following voltages are available. Selection is based on available power at the installation and, in some instances, the country where the purifier will be used. In all cases, the frequency is 50/60KHz. Designators to use are **100**-100VAC, **120**-120VAC, **230**-230VAC.

Isolation Valves

If adding isolation valves to the purifiers is desired, the following designators are used: **I**-Inlet only, **O**-Outlet only, and **IO** for both inlet and outlet valves. Depending on which type of purifier is selected, these valves will be manually operated or automatically operated.

Valve Operation

If valves are selected or included, use designators **M**-manual operation and **A**-air operation.

Panel Mounting

The panel mounting option is not applicable for the Pro-Panel Series purifiers. For point-of-use purifiers, it is sometimes convenient to mount the vessel and valves if selected onto an aluminum panel with mounting holes to facilitate mounting the purifier to a wall or other structure. If the panel mounting option is required/desired, the designator is **P**-panel mount.

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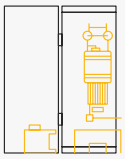
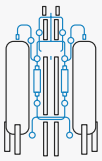
We deliver a full range of point-of-use and micro-bulk urifier solutions for high and ultra high purity applications. Our proven purifiers have been trusted by the world's innovators to uphold the most stringent purity requirements for more than two decades.



Point-of-Use
0.1-100 slpm



Micro-Bulk
100-1200 slpm