

Technical Bulletin VAC 105555

Modular Inert Gas Purification System – 40, 80, 120, 160 CFM



Figure 1 – 40 CFM Modular Purifier

to fit the installation requirements. Each of the PMs is a dual column inert gas purifier with variable speed blower, automatic circulation valves and control valves to allow simultaneous purification and regeneration. If properly sized, the modular system can achieve less than 1-PPM oxygen and moisture equilibrium. The system will also control antechamber evacuation/refill, glovebox pressure and glovebox purge. The 5.7" TFT touch screen operator interface (10.1" TFT optional) provides monitoring and control. The modularity and minimal footprint of the system gives unprecedented flexibility in size, capacity, flow rate, installation and cost.

Flow Rate: 0 to 160 CFM (272 m³/h) (Nitrogen, Helium or Argon) in 40 CFM increments. For example, one CM, three PM's, one VP and one DM will provide 120 CFM. See Figure 4 for depiction of 120 CFM system.

Purification Capacity: 20 liters of O₂ and 1.2 Kg of H₂O absorption capacity per PM (catalyst mfg. specs.)

Regeneration: System has a completely automatic regeneration cycle using evacuation and purging the off-line purifier. Available with user selectable special solvent regeneration cycle. Requires 3-6% hydrogen mixture gas (nitrogen or argon).

Control System: Easy to use TFT color interface provides complete system monitoring and control. Built in programmed control of purifier

General Description: The Nexus Modular Purification System can be configured to provide flow rates of 40 CFM, 80 CFM, 120 CFM and 160 CFM. The Nexus modular is comprised of four basic units; the Control Module (CM), the Purification Module (PM), the Display Module (DM) and the Vacuum Pump (VP). Each Modular System will have one CM, DM and VP. The Nexus Modular will have one or more PMs, each of which has a 40 CFM capability. The small size of each module makes this system the ideal choice for any installation. The size is only 30" (w) X 22.5" (d) X 26" (h) plus plumbing for a 40 cfm installation. The modularity allows the system designer to configure the modules

regeneration, glovebox pressure and purging. Controls antechamber evacuation, refill and purge automatically or manually. There are built in system diagnostics.

System Dimensions:

- 1) CM: 6.0" (w) X 21.3" (d) X 24.5" (h)
- 2) PM: 24.0" (w) X 21.3" (d) X 26.0" (h)
- 3) DM: 9.5" (w) X 4.0" (d) X 8.5" (h)

Installation: The small size will enable easy installations under gloveboxes, under antechambers or on top of gloveboxes. The CM may be separated from the PM for more flexibility, see Figure 2. For large flow installations, each PM may be distributed along the glovebox.

System and Analyzer Display: The TFT touch screen displays glovebox pressure, blower speed, analyzer levels (with appropriate sensors) and system status, see Figure 2. The operator may note antechamber operation and regeneration status at a glance. An alarm window shows any out of tolerance condition for operator acknowledgement or correction. There are 5.7" or 10.4" screen sizes available. The system interfaces to VAC Oxygen and/or Moisture Analyzer Assemblies (see option ordering, next page). Analyzers install into user's glovebox and will mate with supplied wiring harness. The system will also interface to Delta F and other oxygen sensor technologies; Contact factory for information.

GB Press	0.3" WC	O ₂	0.5 PPM
Blower	30 %	H ₂ O	0.7 PPM
Glovebox		Antechamber	
Purifier Circ P1			
GB Pressure	Purifier	GB Purge	Auto Blower
Oxygen	Moisture	AC 1	More Menus

Figure 2, Typical 10.4" Touch Screen Display

Antechamber Control: Controls antechamber evacuation and refill. Will provide 24 VAC, 500 ma signals to control antechamber mounted solenoid valves. User may program the timed purge and evacuation or control the evacuation or refill manually. Optional valve kits available (see ordering information, next page).



Figure 3, Purifier and Control Module, Separate

Pressure Control: Controls glovebox pressure (if desired). The user may program both the high and low pressure control points. User may specify a special negative only control process. The glovebox pressure and pressure control points are displayed on the LCD panel. The system includes a footswitch for manual pressure control.



Figure 4 – 120 CFM Configuration

Safety Pressure Limit: Will sound built-in alarm and shut down electrical power to all valves if glovebox exceeds user programmed over/under pressure limits.

Cooling: No water or special cooling required. Inert gas temperature rise less than 3 °C @ 50% flow.

Leak Certification: Helium leak check per ASTM 498 & ASTM 499 to 1 X 10⁻⁶ cc/sec.

Safety Certification: Conforms and certified to UL Std 61010-1 and CSA Std C22.2 NO 1010.1

Power: CM, DM, PM and VP (40 cfm configuration), 110 VAC, 60 Hz, 20 amps.

System Weight: 370 lbs. (168 kg) for CM, PM and DM. Additional 43 to 58 lbs for VP.

Vacuum Pump: See below for choices.

Mechanical Interface to Glovebox:

Inlet and Outlet Circulation (40 CFM config.)	NW40-KF standard
Inlet and Outlet Circulation (80,120,160 cfm config.)	Customer specified for size and flange type
Glovebox Pressure Sense	1/4" NPT female, for 3/8" copper or s/s line
Glovebox Pressure Control	1/4" NPT female, for 3/8" copper or s/s line

Customer Utility Service Interface:

Inert Gas: 35 psi, N ₂ , Ar or He	1/4" NPT female, for 3/8" copper or s/s line
Regeneration Gas; inert gas, 35 psi, with 3-5% H ₂	1/4" NPT female, for 3/8" copper or s/s line
Purifier Purge Vent	1/4" NPT female, for 3/8" copper or s/s line
Vacuum exhaust vent, direct connection to exhaust pump exhaust	VAC 400711: ¼" NPT or NW16-KF, All others: NW25-KF

Ordering:

Type	Part Number	Note
40 CFM Modular System, 110 VAC	VAC 105555	Includes PM, CM, DM, 4.1 CFM vacuum pump (VAC 100617)
Purification Module (PM), 40 CFM	VAC 104841	
Control Module (CM)	VAC 104843	
Display Module (DM), 5.7 inch TFT Touch Screen	VAC 104986	
Display Module, 10.1 inch TFT Touch Screen	VAC 104845	
Vacuum Pump Assy, Rotary, 4.1 CFM (7.0 m ³ /h)	VAC 100617	
Vacuum Pump Assy, Dry Scroll, 6.6 CFM (11 m ³ /h)	VAC 400711	
Vacuum Pump Assy, Dry Scroll, 8.8 CFM (15 m ³ /h)	VAC 400006	
Vacuum Pump Assy, Rotary, 6.9 CFM (11.7 m ³ /h)	VAC 100618	
Vacuum Pump Assy, Rotary, 10 CFM (17.0 m ³ /h)	VAC 100619	

Accessories:

Type	Part Number	Note
Analyzer Assy, Oxygen	VAC 105629	Auto ranging display reading on DM with a range from 0.1 ppm to 25%
Analyzer Assy, Moisture	VAC 108662	Auto ranging display reading on DM with a range from 0.5 ppm to 23,000 ppm.
Antechamber Valve Kit, Basic	VAC 105631	Adds timed, multi-cycle auto evacuation and refill (from glovebox) to antechamber
Antechamber Valve Kit, Pirani	VAC 105635	Adds Pirani gauge pressure sensing to auto antechamber control
Antechamber Valve Kit, Purge/Inert Gas Refill	VAC 105636	Adds antechamber purge and inert gas refill (from pressurized source) to auto antechamber control
Manifold, Circulation	Contact VAC	Circulation manifold to combine inert gas flow from 2 to 4 PMs for 80 to 160 cfm capability

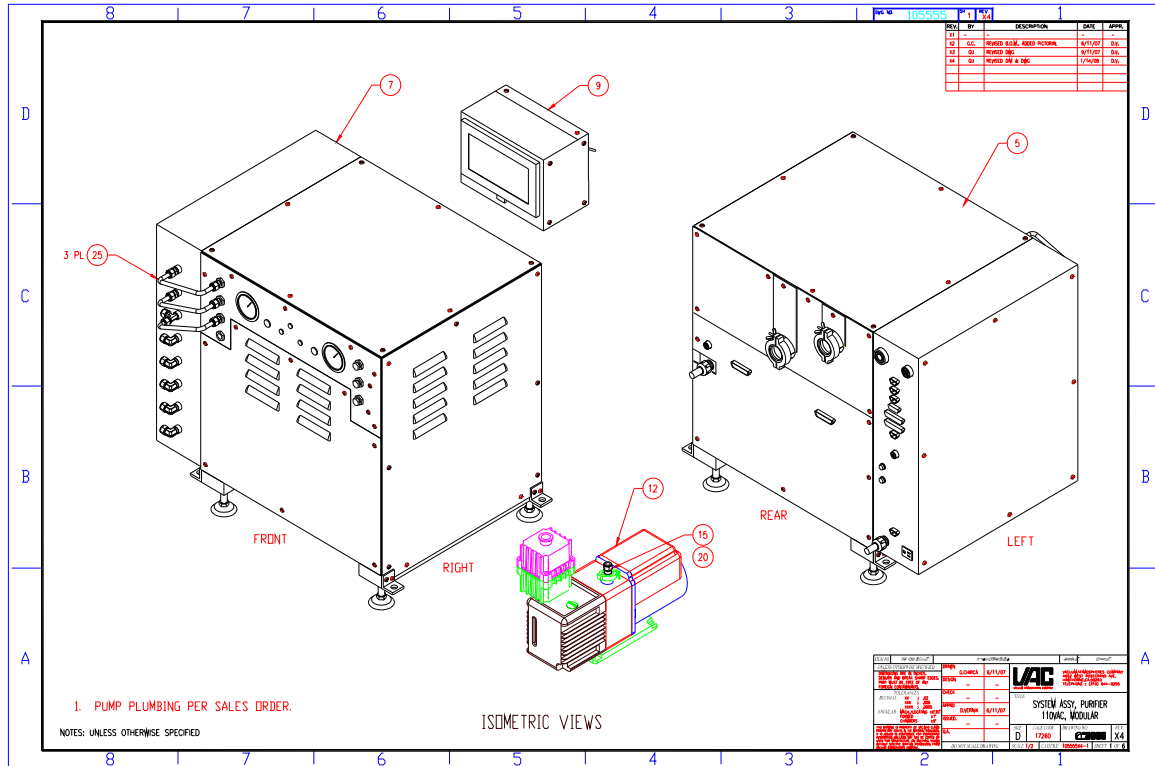


Figure 5, Configuration, Overall System, 40 CFM



Vacuum Atmospheres Company
 4652 W. Rosecrans Ave.
 P.O. Box 1043
 Hawthorne, CA 90251-1043
 Telephone: (310) 644-0255
 Fax: (310) 970-0980
 e-mail: info@vac-atm.com

Vacuum Atmospheres Company
 US East Coast Office
 458 Boston Street, 1-4
 Topsfield, MA 01983
 Telephone: (978) 561-1763
 Fax: (978) 561-1842
 e-mail: info@vac-atm.com

Web site: <http://www.vac-atm.com>