



100 cfm

**PROTECT™ V Range**

750 cfm

## **PROTECT™ V**

### **Description**

PROTECT™ V vapor-phase carbon adsorber canisters are air or vapor treatment units for use in applications requiring high pressures or slight vacuum conditions. PROTECT™ V canisters contain all of the operating elements required for utilization of granular activated carbon in air or vapor treatment, including a flat carbon bed support across the entire bed's cross sectional area and plenum area below this support for effective air introduction and distribution across the bed. The canisters are constructed of unlined carbon steel with a stainless steel screen bed support for use with activated carbon in air treatment.

PROTECT™ V vapor-phase carbon adsorber canisters are available in two convenient sizes that will contain 1,000 or 2,000 pounds of granular activated carbon for treating air or vapor sources typically up to 750 cfm at pressures up to 15 psig and up to 15 inches of mercury of vacuum.

PROTECT™ V vapor-phase adsorbers can be provided with any of Calgon Carbon's wide variety of vapor-phase activated carbon products that can be selected for a specific air or vapor treatment application.

### **Features**

PROTECT™ V vapor-phase carbon adsorber canisters offer several important features that make them an effective value-driven option for higher pressure air or vapor-phase treatment applications:

- Sturdy carbon steel construction.
- Capable of operating up to 15 psig, which will manage most vent or higher-pressure exhaust fan situations.
- Capable of operating up to 5 inches of mercury vacuum.
- Exterior painted with a durable urethane finish.
- Operating temperature up to 200° F.
- Top 16-inch diameter access port for activated carbon media fill and removal.



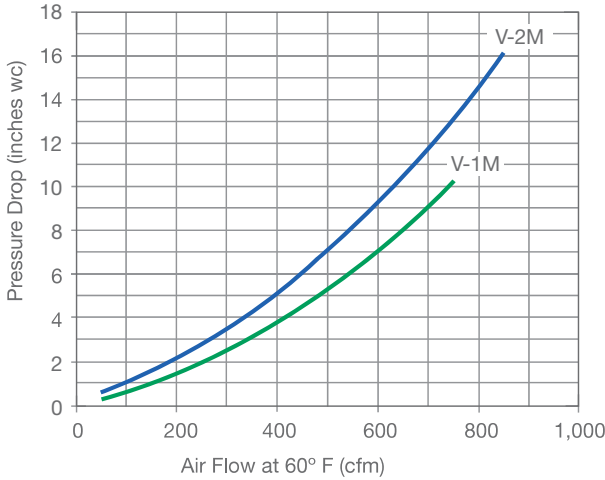
- Carbon bed support across the full canister cross sectional area, consisting of 20 mesh type 316 stainless steel screen placed on slotted steel plate for vapor distribution across the entire bed for maximum activated carbon utilization and low pressure drop.
- Top lifting lugs and bottom fork guides for portability.

### **Installation**

PROTECT™ V canisters are shipped ready for installation with the dry activated carbon fill installed in the unit. The canisters are self-supporting and should be set on a level accessible area as near as possible to the emission source. Standard installation does not utilize any anchoring devices. Installation is simple, requiring a flexible hose, duct or pipe to connect the vent or emission source to the 6-inch FPT bottom inlet of the canister.

The PROTECT™ V canister's treated air discharge is a 6-inch FPT connection on the upper side of the vessel that can be left open or equipped with flexible hose, duct or pipe to direct the treated air to a desired discharge point. If the canister is located outside and to be vented directly, then a U-shaped outlet pipe or rain hat (such as a pipe tee) is recommended to be installed to prevent precipitation from entering the unit.

### Pressure Drop Curve



The recommended air flow for PROTECT™ V canisters is listed in the table. If higher flows are anticipated, then either a larger canister should be utilized or two or more PROTECT™ V canisters can be placed in parallel operation.

The recommended maximum static pressure and vacuum capabilities are also listed. These ratings should not be exceeded, as the canister could be irreparably damaged.

### Pressure Drop Curve

Pressure drop through a PROTECT™ V canister is a function of the process air flow. If higher flows or lower pressure drop are needed, multiple canisters can be installed in parallel operation. The maximum pressure in the canister should not exceed 15 psig, regardless of the pressure drop across the unit.

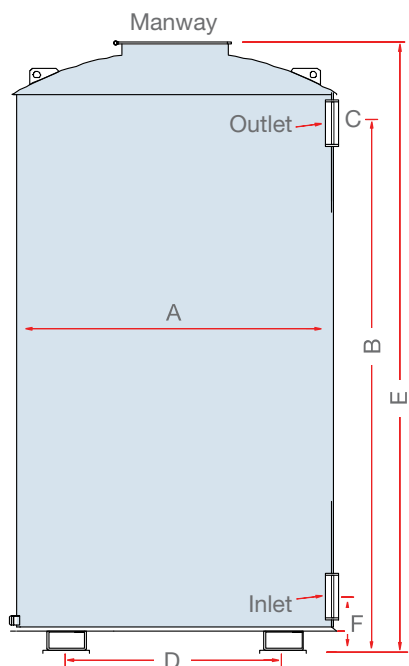
### Carbon Exchange or Replacement

When the treated air or vapor exceeds the desired contaminant concentration, the granular activated carbon in the PROTECT™ V canister should be replaced with fresh activated carbon. The canister is to be isolated from the process by either closing and locking the inlet and outlet valves, or physically disconnecting the canister from the inlet and outlet pipe or hose. The carbon exchange procedure can either take place where the canister is installed, or the disconnected canister can be moved to another location for this activity.

Contact Calgon Carbon Corporation for resupply of the activated carbon and complete turnkey services, including removal and management of the spent carbon and refilling the canister with the fresh carbon.

### Specifications

<b>Canister</b>	Sturdy 3/16" thick carbon steel canister with 3/16" thick steel concave bottom head (inside flat bottom) and top dished head
<b>Pressure</b>	Recommended 15 psig maximum operating pressure (shop hydrotested in excess of recommended pressure)
<b>Vacuum</b>	Recommended maximum 15" Hg vacuum operation
<b>Temperature</b>	Recommended 200° F maximum
<b>Internal Coating</b>	None – unfinished steel
<b>External Coating</b>	Direct-to-Metal polyurethane
<b>Inlet (bottom side)</b>	6" FPT coupling (shipped with plug)
<b>Inlet Distributor</b>	Stainless steel screen bed support on slotted steel plate
<b>Vent/Sample Port</b>	3/4" FPT coupling
<b>Outlet (top head)</b>	6" FPT coupling (shipped with plug)
<b>Access Port</b>	16" diameter access port with threaded clamp ring and BUNA-N gasket
<b>Dimensions</b>	Refer to Model chart



### Calgon Carbon Air Purification Systems

PROTECT™ V canisters are designed for a variety of higher pressure air or vapor applications at low-to-moderate air flows.

Calgon Carbon Corporation offers a wide range of carbon adsorption systems and services for a range of air or vapor flow rates and carbon usages to meet specific applications.

### Model Information

Model Number	V-1M	V-2M
GAC or media volume (cu ft)	36	72
GAC amount (lbs.)	1,000	2,000
Recommended max flow rate (cfm)	675	750
Weight, empty (lbs.)	1,000	1,150
Approximate operating weight (lbs.)	2,000	3,150
Diameter (A) in.	45.5	48
Height to outlet (B) in. (approx)	70.5	82.5
Inlet/Outlet (C) fpt, in.	6	6
Forkguides (D) in.	33	33
Overall height (E) in. (approx)	84	96
Height to inlet (F) in. (approx)	8	8
Overall width; in. (approx)	45.5	48

### Safety Considerations

While complying with the recommended installation instructions, plant operators should also be aware of these additional heat-related safety considerations:

- When in contact with activated carbon, some types of organic chemical compounds, such as those from the ketone and aldehyde families and some organic acids or organic sulfur compounds, may react on the carbon surface causing severe exotherms or temperature excursions. **If you are unaware or unsure of the reaction of an organic compound on activated carbon, appropriate tests should be performed before placing a PROTECT™ V canister in service.**
- Heat of adsorption can lead to severe temperature excursions at high concentrations of organic compounds in the inlet air or vapor. Heating may be controlled by diluting the inlet air or adding water vapor as a heat sink, by time weighting the inlet concentration to allow heat to dissipate, or by prewetting the carbon.
- STI-X carbon can liberate heat by reacting chemically with oxygen. To prevent heat buildup within a canister, the carbon must not be confined without adequate air flow to dissipate the heat. In situations where there is insufficient or disrupted air flow through the vessel, the chemical reaction can be prevented by sealing the inlet and outlet connections to the canister.

**Safety Considerations**

For temperatures greater than 140° F, Calgon Carbon recommends that personnel protection be provided. The form of protection is determined per the end user’s specific plant practices and standards. Also note that at elevated temperatures, the paint may discolor.

**Safety Message**

Activated carbon will preferentially remove oxygen from air. In closed or partially closed containers or vessels, oxygen depletion may reach hazardous levels. If workers are to enter a container or vessel containing activated carbon, appropriate air sampling and work procedures for potentially low-oxygen-content spaces should be followed, including all applicable Federal and State requirements.

**Limitation of Liability**

Notwithstanding any provision to the contrary herein, in no event shall Supplier or its contractors or suppliers of any tier be liable to Purchaser for any indirect, special, consequential, incidental or punitive damages as a result of a breach of any provision hereunder or for any other claim of any kind arising out of or relating to this document, whether in contract, in tort (including without limitation, negligence or strict liability), indemnification or otherwise. Notwithstanding any provision to the contrary herein, for all losses, damages, liabilities or expenses (including attorney’s fees and costs), whether for indemnity or negligence, including errors, omissions or other acts, or willful misconduct, or based in contract, warranty (including any costs and fees for repairing, replacing or re-performing services or curing a breach hereof), or for any other cause of action (individually, a “Claim”; collectively, “Claims”), Supplier’s liability, including the liability of its insurers, employees, agents, directors, and officers and all other persons for whom Supplier is legally responsible, shall not, to the maximum extent permitted by law, exceed in the cumulative aggregate with respect to all Claims arising out of or related to this document, the total amount of compensation paid to Supplier hereunder. All Claims of whatsoever nature shall be deemed waived unless made in writing within forty-five (45) days of the occurrence giving rise to the Claim.

**Warranty Disclaimer**

Calgon Carbon Corporation warrants that the PROTECT™ V will be free from defects in materials and workmanship for a period of 90 days following the date of purchase. In the event of a breach of this warranty, Calgon Carbon Corporation will, in its discretion, repair or replace any defective parts or the complete unit during the warranty period. This warranty does not apply to defects caused by (i) normal wear and tear, (ii) accident, disaster or event of force majeure, (iii) misuse, fault or negligence of or by Buyer, (iv) use of PROTECT™ V in a manner for which it is not designed, (v) external causes such as, but not limited to, power failure or electrical power surges, or (vi) improper storage and handling of the PROTECT™ V. EXCEPT AS EXPRESSLY PROVIDED IN THIS WARRANTY STATEMENT, CALGON CARBON CORPORATION DISCLAIMS ALL OTHER WARRANTIES, WHETHER STATUTORY, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. CALGON CARBON CORPORATION DOES NOT WARRANT THAT THE PROTECT™ V ARE ERROR-FREE OR WILL ACCOMPLISH ANY PARTICULAR RESULT. ANY ADVICE OR ASSISTANCE FURNISHED BY CALGON CARBON CORPORATION IN RELATION TO THE PROTECT™ V PROVIDED FOR HEREUNDER SHALL NOT GIVE RISE TO ANY WARRANTY OR GUARANTEE OF ANY KIND. THIS WARRANTY WILL TAKE PRECEDENCE OVER ANY AND ALL OTHER WARRANTIES UNLESS SPECIFICALLY DISCLAIMED AND REFERENCED BY CALGON CARBON CORPORATION.

Calgon Carbon Corporation is constantly striving to improve its products and capabilities and to provide the best product to its customers.

Calgon Carbon Corporation may from time to time develop product improvements or alterations (including, without limitation, revisions to product specifications), and may implement such Product Improvements without notice to the Buyer.