PROTECT TW

Carbon Adsorber Canisters

Description

The PROTECT TW carbon adsorber canisters are economical water treatment units for short term usage applications. PROTECT TW canisters contain all of the operating elements required for utilization of granular activated carbon in water treatment, including a corrosion resistant underdrain for effective treated water collection. The PROTECT TW canisters are constructed of carbon steel with a corrosion resistant inner coating for use with granular activated carbon in water treatment.

The PROTECT TW carbon adsorber canisters are available in three convenient sizes that will contain 500, 1000, and 2000 pounds of granular activated carbon for treating water sources up to 80 gpm.

The PROTECT TW canisters can be provided with any of Calgon Carbon's wide variety of liquid phase granular activated carbon products that can be individually selected for a specific water or liquid treatment application. Most commonly used are Filtrasorb grade virgin activated carbon for higher purity water or optimal carbon usage for low levels of organic contamination, or DSR series quality controlled reactivated grade carbon for a more economical carbon product or wastewater treatment.

Features / Benefits

The PROTECT carbon adsorber canisters offer several important features that make it an effective value driven option for many water treatment applications:

- Sturdy carbon steel construction
- Capable of operating up to 75 psig as canisters are shop hydrotested at higher pressures after fabrication.
- Interior is coated with a corrosion resistant high solids epoxy coating
- Exterior painted with a durable urethane finish
- Operating temperature up to 140 degrees F
- Top 12X16 access port for activated carbon media fill and removal
- Lower PVC laterals with carbon retention slots for even water collection and maximum activated carbon utilization.
- Top inlet flow defector to allow introduction of influent water above the carbon bed
- Top lifting lugs and bottom forklift guides for portability

Specifications	PROTECT TW
Canister	Sturdy carbon steel canister with flat bottom and dished top head
Pressure	Recommended 75 psig maximum operating pressure; shop hydrotested in excess of recommended pressure
Temperature	Recommended 140°F (max)
Internal Coating	High solids epoxy
External Coating	Direct-to-Metal polyurethane
Inlet	2" FPT coupling (all sizes) shipped with plug
Inlet Distributor	PVC inlet flow deflector
Vent	¾" FPT coupling with ¾" brass ball valve
Outlet	2" FPT coupling (all sizes) shipped with plug
Outlet Collector	PVC pipe with slotted laterals
Drain	¾" FPT coupling with ¾" threaded plug
Access Port	12"x16" access port with EPDM gasket
Dimensions	Refer to Model Chart

Safety Message

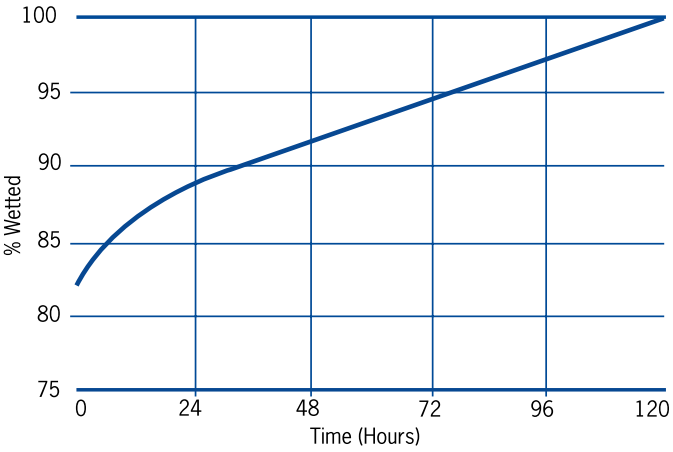
Wet activated carbon can deplete oxygen from air in enclosed spaces. If use in an enclosed space is required, procedures for work in an oxygen deficient environment should be followed.

Installation

PROTECT TW canisters are shipped with dry activated carbon installed in the vessel; the carbon must be wetted and de-aerated prior to use. This procedure displaces air from the internal structure of the carbon granule, assuring that the liquid to be treated is in contact with the carbon surface.

Prior to operation, each canister must be filled with clean water; the water should be introduced into the bottom effluent connection. The canister should sit for approximately 48 hours to allow most of the carbon's internal surface to become wetted as shown on the wetting curve.

Wetting Curve for GAC (77°F/25°C)



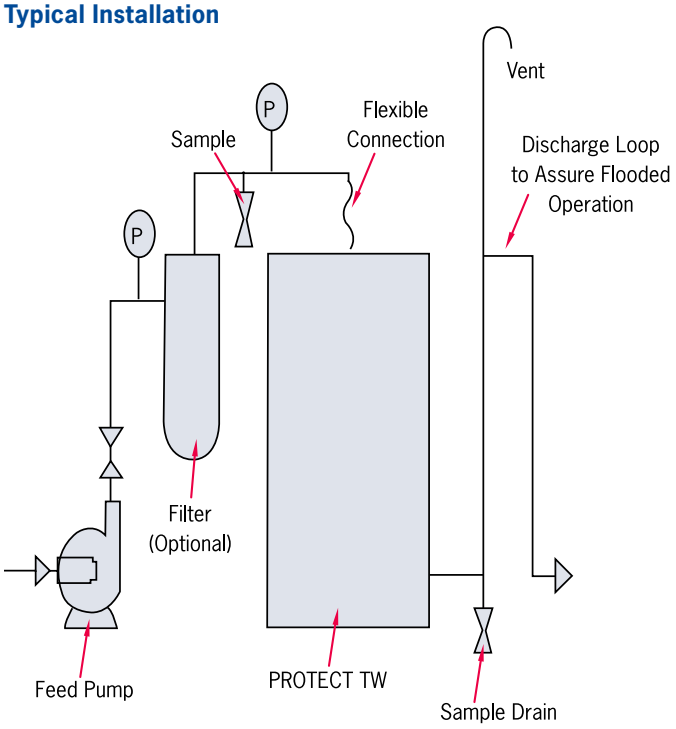
After wetting, the carbon bed can be de-aerated by draining the canister from the effluent line, and then refilling the canister upflow with clean water. This procedure will eliminate any air pockets which may have formed between the carbon granules. The PROTECT TW canister is now ready for operation.

The PROTECT TW canister should be set on a flat level surface and piped as recommended in the installation illustration. The influent pipe should be attached to the unit by using a flexible connection to allow minor deflection in the piping to vessel connection or the vessel top head.

The PROTECT TW canister discharge piping should include an elevated piping loop to ensure that the canister remains flooded with water at all times. In addition to the piping loop, a drain connection is recommended on the discharge piping to allow for drainage of the canister prior to disconnection or during a temporary shutdown.

A filter should be installed prior to the canister if the liquid to be treated contains substantial amounts of suspended solids. A simple cartridge of screen filter helps prevent pressure buildup in the carbon bed. A pressure relief device should be installed in a line open to the canister if the system can potentially be subject to pressures beyond the design point. Consult plant and/or local OSHA codes for guidance.

Typical Installation



Operation

PROTECT TW canisters should be full of clean water before treatment begins. Flow rate to the unit should be determined based on required contact time between the liquid and the carbon media. In groundwater treatment applications, the recommended contact time, calculated on an "empty bed basis", is typically 8-10 minutes. Consult your Calgon Carbon Corporation Technical Sales Representative for advice about proper contact time for your application.

PROTECT TW canisters can be manifolded in parallel operation for higher flow rates. For series operation, two PROTECT TW canisters can be piped together sequentially, as normal pressure drop will not exceed the recommended operating pressure.

The PROTECT TW canisters have adequate space for bed expansion and can be backflushed by introducing clean water or process liquid at approx 2-3 gpm/ft^2 to the effluent connection and taking backflush water from either the influent connection, and directing this water to a drain suitable for receiving contaminated water with suspended solids and carbon particles.

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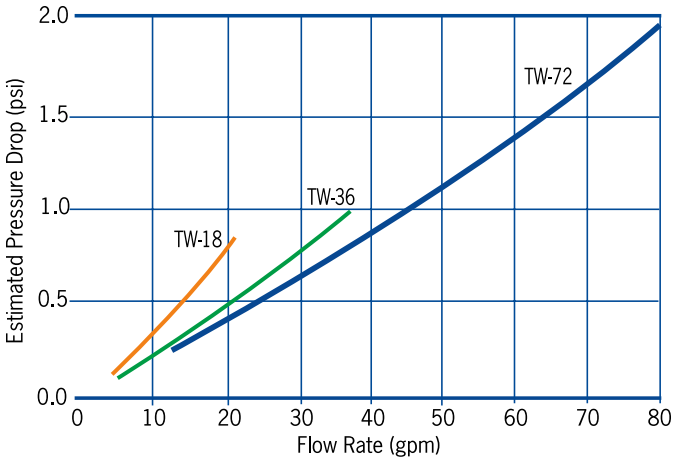
Pressure Drop

Pressure drop through a PROTECT TW canister is a function of the water or process liquid flow as shown in the graph. If higher flows or lower pressure drop is needed, multiple units can be installed in parallel operation. The maximum pressure in the canister should not exceed 75 psig, regardless of the pressure drop across the unit.

Pressure Drop Curve



Carbon Exchange or Replacement

When the treated water exceeds the desired contaminant concentration, the granular activated carbon in the PROTECT TW canister should be replaced with fresh activated carbon. The PROTECT TW 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.

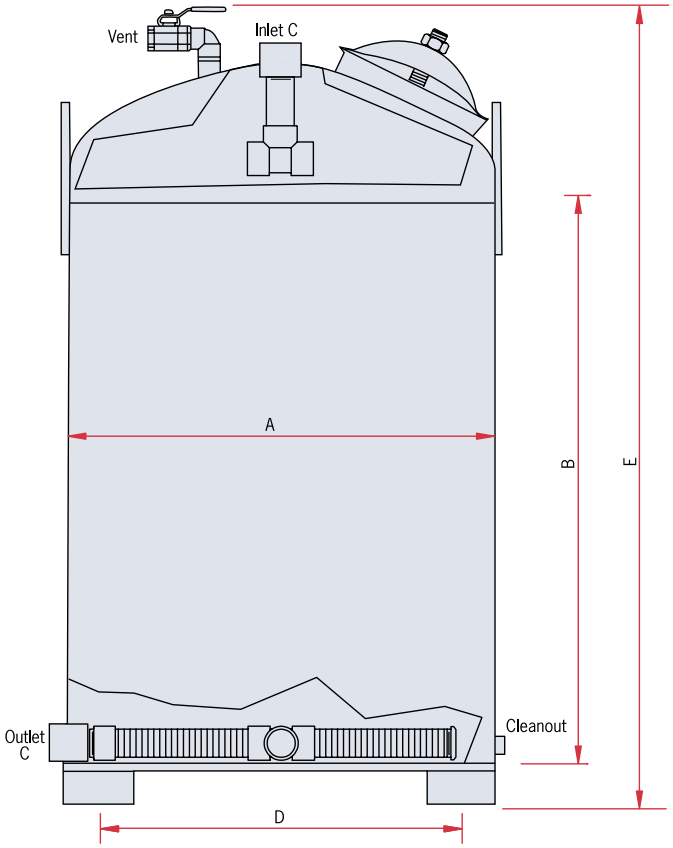
The spent granular activated carbon can be removed by using a vacuum media removal procedure through the top access port. All of the spent carbon must be completely removed from the canister prior to refilling the unit with fresh carbon to assure effluent water quality after the unit is started back up again.

Fresh granular activated carbon can be filled using bags or “supersacks” by loading into the canister through the top access port. In order to prevent damage to the PVC underdrain system, a “water cushion” is to be added to the canister such that the water covers the underdrain system by approximately 1-2 feet. Once the fresh carbon is installed, the access port securely closed, and the inlet and outlet connections are reestablished, follow the startup procedures under the Installation section to wet the carbon.

Contact Calgon Carbon for resupply of the carbon products for effective water treatment. Calgon Carbon can also provide complete turnkey services, including removal and management of the spent carbon and refilling the unit with the fresh carbon.

Calgon Carbon Water Treatment Systems

The PROTECT TW canisters are designed for a variety of higher pressure water or process liquid applications at low to moderate flowrates. Calgon Carbon Corporation offers a wide range of carbon adsorption systems and services for a range of water or liquid flow rates and carbon usages to meet specific applications.



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Model Number	TW 18	TW 36	TW 72
GAC or media volume	18 cu ft	36 cu ft	72 cu ft
GAC amount	500 lbs	1,000 lbs	2,000 lbs
Recommended max flow rate (gpm)	20 gpm	40 gpm	80 gpm
Weight, empty	500 lbs	750 lbs	1,050 lbs
Approximate operating weight	2,000 lbs	3,500 lbs	4,800 lbs
Diameter (A)	30 in	42 in	48 in
Can length (B)	48 in	48 in	72 in
Inlet/Outlet (C)	2 fpt	2 fpt	2 fpt
Forkguides (D)	25 in	37 in	43 in
Overall Height (E)	60 in (approx)	67 in (approx)	91 in (approx)
Overall width	32 in (approx)	44 in (approx)	50 in (approx)

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