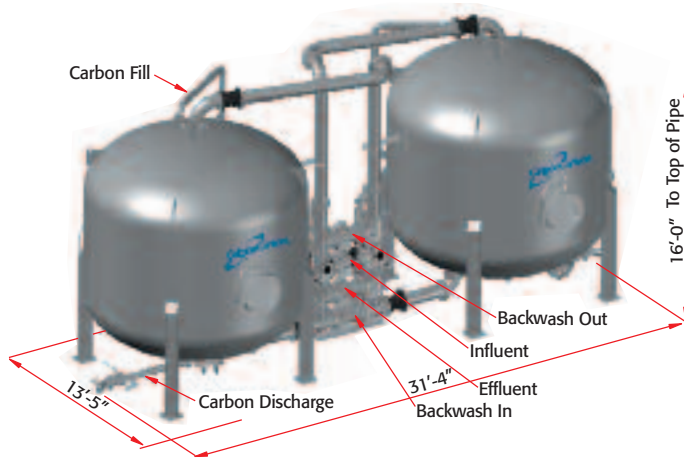


MODEL 12 Modular Carbon Adsorption System



Description

The Calgon Carbon MODEL 12 is an adsorption system designed for the removal of dissolved organic contaminants from liquids using granular activated carbon. The modular design concept allows the selection of options, additional accessories or alternate materials to best meet the requirements of the site and treatment application.

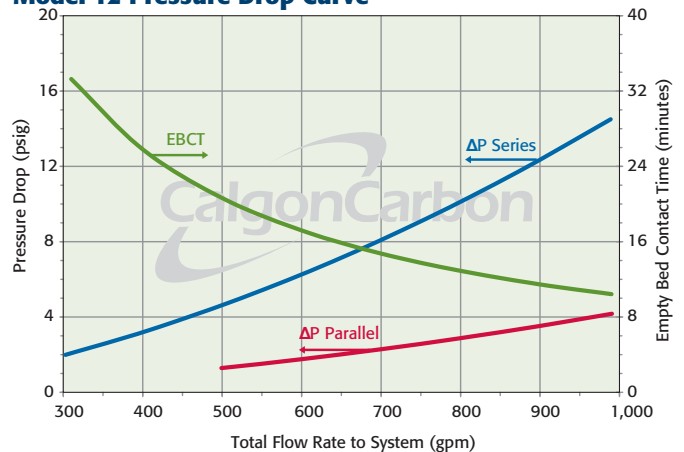
The MODEL 12 system is delivered as two adsorbers and a separate compact center piping network and interconnecting piping requiring minimal space and field assembly. The pre-engineered MODEL 12 design assures that adsorption system functions can be performed with the system as provided. The design has the benefit of Calgon Carbon's extensive expertise and has been proven in numerous applications. The engineering package can be provided quickly and the system expedited through Calgon Carbon's production capabilities.

The process piping network for the MODEL 12 accommodates operation of the adsorbers in parallel or series (with either adsorber placed in first stage). The piping can also isolate either adsorber from the flow. This permits carbon exchange or backwash operations to be performed on one adsorber without interrupting treatment. All valves and accessories are located at low elevations for ease of operation and maintenance.

The unique internal cone under-drain design provides for the efficient collection of treated water and the distribution of backwash water. The internal cone also insures efficient and complete discharge of spent carbon from the adsorber.

The MODEL 12 system is designed for use with Calgon Carbon's closed loop carbon exchange service. Using specially designed carbon transport trailers, the spent carbon can be removed from the adsorber via a pressurized carbon-water slurry; and fresh carbon refilled in the same manner. This closed loop transfer is accomplished without exposure of personnel to either spent or fresh carbon. Calgon Carbon can also manage the disposition of the spent carbon; typically returned to Calgon Carbon for reactivation avoiding the need for the site to arrange for disposal.

Model 12 Pressure Drop Curve



Carbon Adsorbers

- Carbon steel ASME code pressure vessels
- Internal vinyl ester lining (nominal 35-45 mil dft) where GAC contacts steel for potable water and most liquid applications
- Polypropylene slotted nozzles for water collection and backwash distribution

Standard Adsorption System Piping

- Schedule 40 carbon steel process piping with cast iron fittings
- Cast iron butterfly valves for process piping
- Full bore stainless steel ball valves for GAC fill and discharge
- PPL lined steel pipe for GAC discharge
- Pressure relief using graphite rupture discs
- Pressure gauges to measure pressure drop across system and each adsorber
- Rupture discs open to each vessel for emergency pressure relief

System External Coating

- High solids epoxy paint system

Available Options

- System skid, shipped separately, upon which system components can be assembled
- In-bed water sample collection probes

MODEL 12

Modular Carbon Adsorption System



Dimensions and Field Conditions

Adsorber Vessel Diameter	12' (3,660 mm)
Process and Backwash Pipe	8"
Process Pipe Connection	125# ANSI flange
Utility Water Connection	3/4" hose connection
Utility Air Connection	3/4" hose connection
Carbon Hose Connection	4" Kamlock type
Backwash Connections	8" flange
Drain/Vent Connection	8" flange
Adsorber Maintenance Access	20" round flanged man-way, 14" x 18" man-way below cone
Adsorber Shipping Weight	19,500 lbs. empty (8,850 kg)
System Operating Weight	265,000 lbs. (123,250 kg)

Safety Message

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

Operating Conditions

Carbon per Adsorber	20,000 lbs. (9,080 kg)
Pressure Rating	125 psig (862 kPa) @ 140°F
Pressure Relief	Graphite rupture disk (100 psig)
Temperature Rating	140°F maximum (60°C)
Backwash Rate	Typical 1,700 gpm (25% expansion)
Carbon Transfer	Air pressure slurry transfer
Utility Air	100 scfm at 30 psig (reduce to 15 psig for trailer)
Utility Water	100 gpm at 30 psig
Freeze Protection	None provided; enclosure or protection recommended



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