

DUAL MODULE CARBON ADSORPTION SYSTEM

Calgon Carbon Adsorption Service



Description

The Calgon Carbon Dual Module is specifically designed to provide a full scale, industrial quality adsorption system on short notice or for temporary service. The system applies carbon adsorption technology for the removal of dissolved organic contaminants from water, wastewater or other liquids.

The Dual Module system is delivered to the site as two 10 foot diameter adsorbers mounted on a common skid, with each adsorber vessel capable of containing up to 20,000 lbs of granular activated carbon (GAC). The skid mounted adsorbers are equipped with process piping to facilitate two stage operation, and other utility and carbon transfer piping to provide for a complete system. The system requires minimal piping additions and support provisions in the field, which can be supervised by Calgon Carbon personnel. The carbon is delivered in Calgon Carbon's bulk GAC delivery trailers for convenient slurry filling of the adsorbers.

When the carbon becomes fully utilized in service, the Dual Module adsorbers are designed for removal of the spent carbon and replacement with fresh carbon utilizing Calgon Carbon's closed loop carbon exchange service. Using the specially designed trailers, the spent carbon is removed from the adsorbers minimizing contact with the spent media and returned to Calgon Carbon for reactivation or disposal. The trailers are also used to recharge the adsorbers with fresh carbon to minimize downtime.

Features / Benefits

- Versatility
- Effective Carbon Utilization
- Robust Construction
- Rapid Response
- Cost Effective
- The Dual Module uses activated carbon adsorption in a downflow fixed bed of GAC, which is proven effective in removing a wide spectrum of organic compounds in varying concentrations and a wide range of flows.
- The two-stage design provides for more complete utilization of activated carbon in the first stage, while the second stage maintains effluent quality. When the first stage has carbon replaced, it is returned to service in the second stage to fully utilize the carbon bed in the other adsorber vessel.
- The Dual Module is fabricated to withstand heavy use, using ASME Code steel pressure vessels and lined steel piping. The corrosion resistant materials also withstand most corrosive water or wastewater applications.
- Dual Modules are maintained in inventory by Calgon Carbon for deployment on short notice. The skid mounted design also makes requirement for foundations unnecessary, requiring only temporary wood supports. With the addition of bulk carbon delivery, treatment can begin within only a few days of notification.
- Calgon Carbon provides the Dual Module, activated carbon and supervision only as required and as long as needed. Calgon Carbon also retains ownership and responsibility for maintenance on the system. The site avoids cost associated with system purchase or ongoing maintenance expenses.

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.

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System Operating Conditions

Carbon per adsorber	20,000 lbs GAC (9080 kg)
Pressure rating	75 psig (517 kPa)
Temperature rating	150°F (65°C)
Carbon transfer	Air pressurized carbon-water slurry
Utility air	100 scfm @ 30 psig Reduce to 15 psig for trailer pressurization
Utility water	100 gpm @ 15 psig
Freeze protection	None provided; recommend enclosure or protection for below freezing environment

System Specifications

Adsorber vessels

Sturdy carbon steel pressure vessels with dished heads
ASME Code design and Code Stamped for 75 psig
Internal thick film vinyl ester lining (35-45 mil) recommended for most water and wastewater applications and for granular activated carbon service
Underdrain system of polypropylene pipe laterals with slotted PVC septa to maximize water collection efficiency
Vessel access of 20" round, flanged manway with davit
Adsorber vessel capacity for 20,000 lbs GAC

Adsorber System Pipe Network

Process piping of 3" or 4" PPL lined Schedule 40 carbon steel; flanged.
Carbon transfer piping of 4" PPL lined Schedule 40 carbon steel; flanged.
Process / GAC valves Tetrafluoroethylene (TFE) lined plug valves
Influent / effluent connections 3" or 4" 125# ANSI flange
GAC connections of 4" Kamlock type connectors
Pressure gages with 4" face; 0-100 psig
Pressure relief with 75 psig graphite rupture disc open to vessel

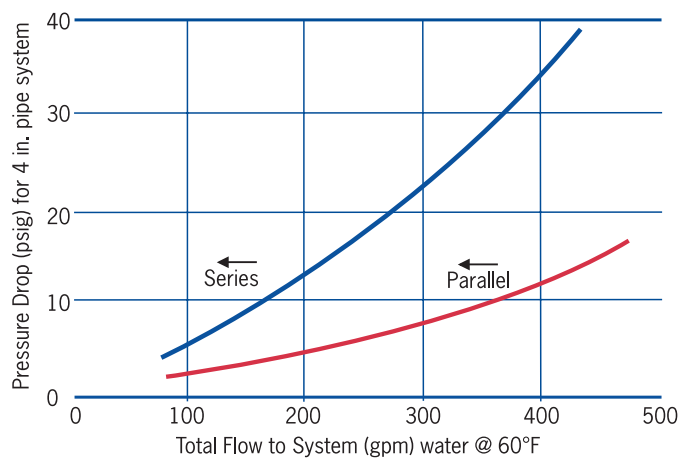
System External Coating

High solids epoxy exterior paint

Dimensions and Field Connections

Adsorber vessel diameter	10 ft (3050 mm)
System length	21 ft (6405 mm)
System width	12 ft (3660 mm)
System height	15 ft (4575 mm) on supports
Process piping	3" or 4" diameter
Process pipe connection	125# ANSI flange
Utility water connection	2" threaded connection
Utility air connection	1.5" threaded connection
Carbon hose connection	4" Kamlock type
Vent connection	3" flange
System shipping weight	40,000 lbs empty (18,160 kg)
System operating weight	160,000 lbs (72,640 kg)

Pressure Drop Curve



Calgon Carbon Systems and Services

The Dual Module Systems are designed for a variety of higher pressure water or process liquid applications moderate to high 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. Calgon Carbon also provides additional services for support of water treatment systems, including supply of virgin and reactivated grades of granular activated carbon, or exchange of carbon in the treatment system, including disposal or reactivation of the spent activated carbon.

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