

# AQUAKNIGHT™ GC 12-40

Carbon Adsorption System



## THE AQUAKNIGHT SYSTEM

The AquaKnight Gold Certified (GC) 12-40 series of adsorption systems are the gold standard and designed with the highest level of drinking water purification and safety in mind. Each system incorporates two pressure vessels along with a compact pipe rack engineered to minimize space and cost while allowing for maximum operational flexibility. Each system is formulated and certified to meet National Sanitation Foundation 61 (NSF-61) drinking water standards.

In addition, AquaKnight also has another offering, which is the Custom Certified or CC. The AquaKnight CC 12-40 series of pressure vessels provides customizable options to the standard system design while still meeting NSF-61 criteria through certification of all individual components that are in direct contact with the process water being treated. Both the Calgon Carbon design; one in a pre-engineered, top quality package system, the other a more customizable alternative to allow for potential design preferences.

## PRODUCT DESCRIPTION

The AquaKnight adsorption system designed for the removal of dissolved organic compounds from water or other liquids using granular activated carbon (GAC) or resin. The modular design concept allows for selection of options or alternate materials to best meet the requirements of the site and treatment application.

The AquaKnight system is delivered as two adsorbers and a separate compact center piping network and interconnecting piping requiring minimal space and field assembly. The engineering package can be provided expeditiously and the system is quality-controlled through Calgon Carbon's in-house production and testing processes.

The process piping network for the AquaKnight system offers operation of the two adsorbers in parallel or two-stage series flow, with either adsorber in the lead position. The piping can isolate either adsorber for carbon exchange or backwash operations while maintaining flow through the other adsorber. Furthermore, the Calgon Carbon internal cone underdrain design provides for efficient use of the carbon through uniform collection of water at the bottom of the bed, and even distribution of backwash water to minimize carbon bed disturbance. The internal cone underdrain design offers an additional advantage by enabling thorough removal of spent carbon.

## Carbon Adsorbers

- Carbon steel ASME code stamped pressure vessels
- NSF certified internal lining for potable water & durable GAC applications
- Standardized with internal cone underdrain design
- Underdrain septa located one per every square foot

## Standard Adsorption System Piping

- Schedule 40 carbon steel piping with cast iron fittings
- Cast iron butterfly valves in process piping
- Polypropylene lined steel pipe for carbon discharge pipe
- Full bore stainless steel ball valves for carbon fill and discharge piping
- Pressure gauges measure pressure drop across system & each adsorber
- Rupture discs open to each vessel for emergency pressure relief
- Pressure differential switch
- In-bed water sample collection probes

## System External Coating

- High solids epoxy paint system with polyurethane top coat

## Typical System Options

- Air release valve
- System skid sold separately upon request
- Instrumentation
- Automation



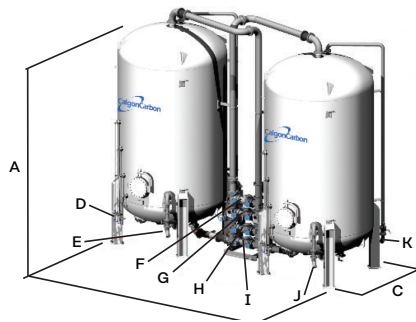
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## MEDIA EXCHANGE SERVICES

The AquaKnight 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 disposal of the spent carbon. It is typically returned to Calgon Carbon for reactivation, avoiding the need for the site to arrange for disposal.

A - 26'7" Overall Height
B - 31'6" Overall Length
C - 13'3" Overall Width
D - Sample Points
E - Carbon Outlet
F - Backwash Outlet
G - Influent
H - Effluent
I - Backwash Inlet
J - Out
K - Fill



## NSF CERTIFIED

Calgon Carbon's AquaKnight equipment systems are formulated to be certified to the requirements of NSF 61 for use in municipal water treatment facilities. Only products bearing NSF documentation are certified to the NSF/ANSI/CAN 61 - Drinking Water System Components - Health Effects standard.

## 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.

## Dimensions and Field Conditions

Adsorber Vessel Diameter	12' (3,660 mm)
Cross-Sectional Surface Area	113.1 sq. ft.
Process, Backwash, Drain/Vent	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
Adsorber Maintenance Access	20" round flanged manway, 14" x 18" manway below cone
Adsorber Shipping Weight	Single Vessel 31,000 lbs (14,100 kg)
Total System Weight	(69,000 lbs (31,400 kg)
System Operating Weight filled with water	391,000 lbs (177,730 kg)

## Operating Conditions

Carbon per Adsorber	40,000 lbs (18,200 kg)
Pressure Rating	125 psig (862 kPa) @ 140°F
Pressure Relief	Graphite rupture disk (125 psig)
Temperature Rating	140°F maximum (60°C)
Backwash Expansion Capability	30% contained within the straight side of the vessel w/ FILTRASORB® GAC
Carbon Transfer	Air pressure slurry transfer
Utility Air Requirement for Media Transfer	100 scfm at 30 psig (reduce to 15 psig for trailer)
Utility Water Requirement for Media Transfer	100 gpm at 30 psig
Freeze Protection	None provided; enclosure or protection recommended