

# AQUAKNIGHT™ GC 12-40

Carbon Adsorption System



**CalgonCarbon**  
A Kuraray Company

An NSF-certified (National Sanitation Foundation) drinking water treatment system is crucial. When you seek to procure an NSF system, you can either purchase a pre-formulated NSF system or assemble a custom system with individual components. Calgon Carbon's AquaKnight Gold Certified (GC) System leverages our four decades of expertise in designing top-tier equipment, providing a certified system that helps to minimize costs, ensure reliable performance, and reduce lead times. If customization is necessary, we also offer tailored solutions.

## 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 AquaKnight GC and CC [12-40] options offer the superior 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 is 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.

Each system incorporates two adsorber pressure vessels with a compact pipe rack engineered to minimize space, cost, and field assembly while allowing for operational flexibility. 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 Adsorbers

Carbon steel ASME code stamped pressure vessels

NSF internal lining for potable water & durable GAC/IX 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



# AQUAKNIGHT GC 12-40

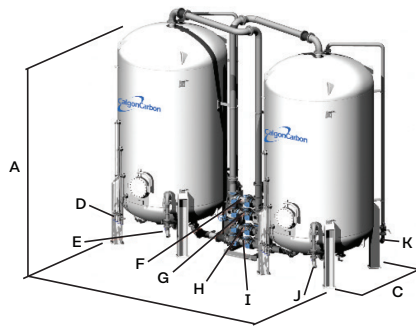
Carbon Adsorption System

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. Alternatively, an uneven bed expansion during backwash initiation disrupts the mass transfer zone leading to premature breakthrough, carbon attrition, longer backwash durations, more backwash water and greater amounts of fines and losses. The internal cone maximizes bed life efficiency while minimizing abrasion on the carbon and shortening backwash run times. The internal cone underdrain also thoroughly removes spent carbon.

## 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. The cone bottom design eliminates the need to open the vessel for further rinse-down. This closed loop process eliminates the need for disinfection, the potential for spills, and exposure to contaminants. Calgon Carbon manages 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



## 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
Backwash Connections	8" flange
Drain/Vent Connection	8" flange
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) empty
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

## 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.