

## Vapor Recovery/ Combustion Units

Consulting, Upgrade and  
Troubleshooting Services

### Maximize the Performance, Efficiency and Reliability of Your System

Let the experts at John Zink Hamworthy Combustion (JZHC) help you get the most from your system. We offer world-class service capabilities from site engineering, pad formation, and complete turnkey services to commissioning, service, preventative maintenance, retrofits, and emergency callout support by factory trained and certified technicians. We service our equipment and competitive equipment as well.

#### Expertise and Process Analysis

With decades of vapor control experience, we bring a high level of expertise to every phase of system optimization—service, process analysis, troubleshooting and more. Our professionals can help maximize the performance of your existing system utilizing new technologies, proven processes, and a wide range of available services and upgrades.

#### Operation and Maintenance Training

Expert operation and maintenance training will give you the best understanding of your equipment and the vapor control process. This training will help improve safety, standardize work practices, and can extend the life of your equipment while reducing operating costs. See our preventive maintenance brochure for more details.

#### Functional Safety in Process Plant

Our experts adhere to HAZOP, SIL classification and ATEX certification guidelines to provide the highest level of safety design.



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*Our experts can upgrade your existing  
system to maximize performance,  
minimize costs, and improve reliability.  
**That's smart. That's JZHC.***



### Our experts can offer full assistance on a variety of special maintenance and services including:

#### Carbon Analysis

Our carbon analysis includes taking a sample from each carbon bed and testing in our laboratory for dust content and working capacity. A complete analysis report is then provided to you.

#### Carbon Replacement/Upgrade

A complete carbon replacement can help restore VRU performance back to its original design capacity, provided that the vacuum pump is performing as designed. The typical life of carbon is about 10 to 15 years, however, after several years of operation we recommend proceeding with carbon analysis in order to keep informed on the carbon condition.

#### Hydrocarbon Analyzer Calibration

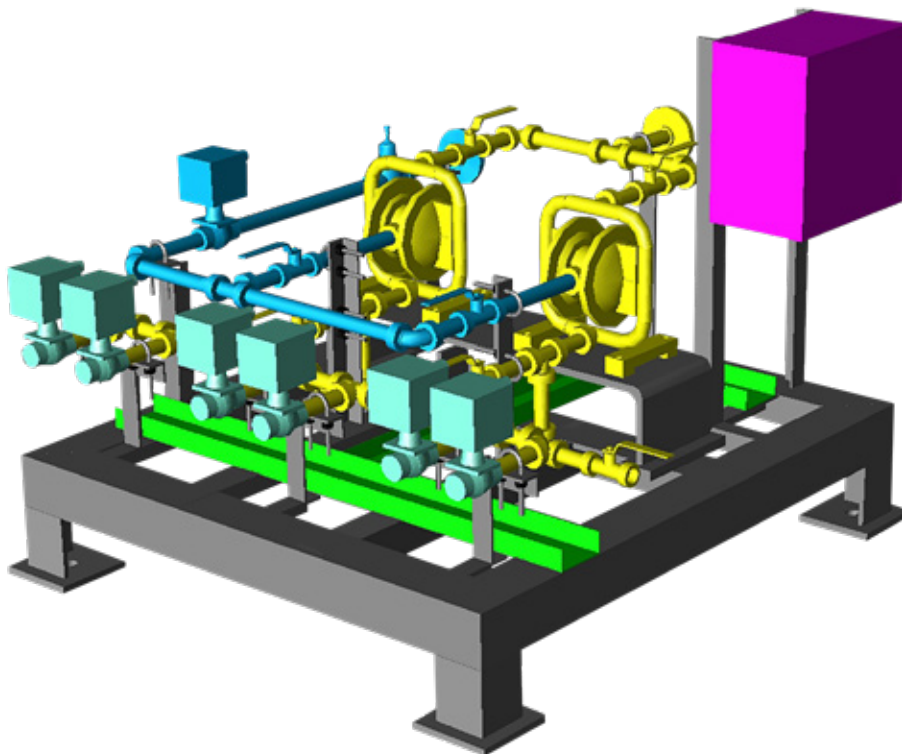
We recommend a yearly calibration for the hydrocarbon analyzer located on the carbon bed exhaust to atmosphere. This will ensure the best control and monitoring of emissions and working capacity. A complete analysis report is then provided to you.

#### Liquid Seal System Cleaning

In order to maintain the best efficiency of your equipment, the complete liquid seal system must be cleaned annually (including the heat exchanger) when replacing the glycol.

#### ATEX Conformity Inspection/Control and Upgrade

Our experts can provide a recommendation on ATEX conformity for your equipment—especially on units built before 1998. This service includes a site visit, inspection and a proposal for upgrades needed to comply with ATEX guidelines.



*We can configure an automatic drain system to remove the possibility of any damages to the vacuum pump due to operator error or incorrect draining procedures.*

## Energy/Costs Savings

### Dry Vacuum Pump Upgrade

This upgrade, which simplifies VRU design by eliminating the separator vessel, glycol, heat exchanger and glycol pump, achieves higher vacuum levels than a liquid ring pump. With no glycol pump, more efficient absorbent circulation, and a VFD to drive the vacuum pump, it reduces power consumption. In addition, eliminating the glycol system decreases maintenance requirements which typically include replacing glycol annually, maintaining proper concentration, cleaning the heat exchanger and separator, and maintaining the glycol pump.

#### **BENEFITS**

*Better time availability of unit, no more glycol management, energy savings up to 30%.*

### Automatic Drain System for DVP Upgrade

An automatic drain upgrade simplifies your VRU's start procedures and reduces operator action on the unit prior to start. With this upgrade, vacuum pump discharge is automatically drained during automatic start of the VRU. This removes the possibility of any damages to the vacuum pump due to operator error or incorrect draining procedures.

#### **BENEFITS**

*Avoids severe vacuum pump damage/replacement, increases VRU uptime, reduces manpower maintenance/operation requirements.*

### VFD Absorber Level Control Upgrade

A VFD level control upgrade offers better performance and reliability than a mechanical level control valve and will also help reduce power consumption. The VFD will adjust the speed of the return pump to bring the level in the absorber up or down. A VFD level control system is not affected by debris in the line and will also yield a tighter control than a mechanical system.

#### **BENEFITS**

*Energy savings up to 10%, lower maintenance costs, increased pump life.*

### Continuous Emission Monitoring Upgrade

A CEM upgrade will measure hydrocarbon emissions from the VRU vent and will help prevent high emission violations by alarming before emission limits are exceeded. It can also be used in CEM mode to limit VRU runtime and reduce power consumption.

#### **BENEFITS**

*High energy savings up to 50% (depending on loading condition), increased equipment life especially for active carbon and vacuum pump.*

A CEM mode upgrade will reduce system energy consumption by more effectively utilizing the adsorption capacity of each carbon bed before turning on the VRU's regeneration equipment. In CEM start mode, all the pumps will initially be off with one carbon bed receiving vapors. As loading continues, the hydrocarbon vent concentration will increase until it reaches a specific limit at which point the pumps will turn on and regenerate the saturated carbon bed.



## Capacity Increase/Process Conditions Evolution

### Vacuum Booster Blower Upgrade .....

This upgrade regenerates the activated carbon more thoroughly and, as a result, can provide several potential benefits including the use of less carbon, the achievement of lower emission levels, or an increase in loading throughput. The vacuum booster operates in series with the vacuum pump and allows the carbon beds to be regenerated under a higher vacuum (lower absolute pressure) and provides significantly higher pumping capacity at high vacuums than is possible through the use of only the vacuum pump.

#### **BENEFITS**

*Reduces emission levels and increases capacity up to 35%.*

### Glycol Temperature Control Valve Upgrade .....

Reduce glycol losses due to the presence of ethanol in gasoline with a temperature control valve upgrade. A temperature control valve will help maintain a constant, slightly elevated temperature for the glycol entering the vacuum pump which will help keep contaminants like ethanol 'flashed' out of the glycol.

#### **BENEFITS**

*Allows up to 25% ethanol content in gasoline, continues using liquid ring vacuum pump.*

### Pressurized Absorber Upgrade .....

A pressurized absorber upgrade can help reduce recycle concentrations, lower emission concentrations, and slightly increase the capacity of the VRU. By placing the absorber in a pressurized state, the vapor in the absorber is more likely to form into a liquid, thereby lowering recycle concentrations which in turn helps to lower emissions.

#### **BENEFITS**

*Reduces emission levels.*

### Cooling of the Absorbent .....

Cooling the absorbent also helps reduce recycle concentrations, lower emission concentrations, and slightly increase the capacity of the VRU. By cooling the absorbent, the vapor in the absorber is more likely to form into a liquid, which reduces recycle concentrations and helps to lower emissions.

#### **BENEFITS**

*Reduces emission levels.*

## Technology Upgrades

### Programmable Logic Controller Upgrade

A PLC upgrade will help improve reliable equipment operation, simplify troubleshooting, improve performance-monitoring capabilities, and make it easier to add instrumentation. Current PLC models are based on newer technologies and operating systems. These offer improved operation and features over PLC systems that are only a few years old. We recommend replacing aging PLCs before they reach a mature or obsolete stage and become difficult to support.

#### **BENEFITS**

*Better functionality, availability of spare parts, remote connection.*

### Operator Interface Panel Upgrade

An OIP (HMI) upgrade will help make monitoring overall VRU performance easier. It provides easily adjustable set points, provides alarm history, and is an excellent maintenance and troubleshooting tool. A touchscreen monitor (OIP) will conveniently display process variables allowing the user an easier way to view all the process information in one place. The user can change set points as needed to improve performance and view the time and data of alarms that have occurred. The user can also jog motors and open/close valves for maintenance or testing purposes.

#### **BENEFITS**

*Better functionality/visibility.*

### SCADA Monitoring System

A SCADA monitoring system upgrade includes a desktop computer and a proprietary software package that allows process variables to be monitored and recorded. Key VRU operating parameters such as pressures, temperatures, flow rates, valve status, motor run status, etc., can easily be monitored in real time from a graphical process flow diagram. Additional real-time and historical trending screens allow the user to more readily diagnose equipment performance and can aid in troubleshooting. The SCADA application can also be monitored over the web if desired for remote access.

#### **BENEFITS**

*Remote control and process view.*





**RESEARCH AND DEVELOPMENT TEST CENTER**

*JZHC upgrade solutions are tested at our Research and Development Test Center, the largest and most advanced testing complex of its kind.*

*Put the world's most advanced vapor recovery technology to work for you.  
Call JZHC today.*

**Worldwide Support**

The John Zink Hamworthy Combustion worldwide service organization is the largest, most technically savvy team of its kind. Our service technicians are trained in the latest technologies to evaluate existing systems for upgrades and retrofits, to troubleshoot operations, and to help plan your next turnaround. Our experts are available on emergency call-out 24 hours a day, 7 days a week. We also provide additional support by offering world-class education through comprehensive vapor control courses held at the John Zink Institute<sup>SM</sup>. These courses help vapor control operators and engineers optimize their equipment and address issues at their facilities.

**Trading Partner / Aliado Comercial:**

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**FERRUM ENERGY**  
We Build Trust  
Generamos Confianza



**GLOBAL REACH**

**JZHC has locations all over the map, with thousands of employees worldwide.**

A KOCH ENGINEERED SOLUTIONS COMPANY



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