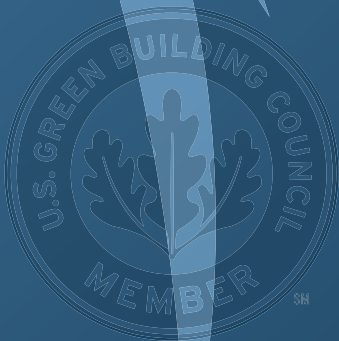


# *A TRUE GAME CHANGER*

*- The Vortex Heat Recovery Center*

CONDENSING EFFICIENCIES FOR TRADITIONAL BOILERS & HEATERS



**ENERVEX**<sup>®</sup>  
VENTING DESIGN SOLUTIONS

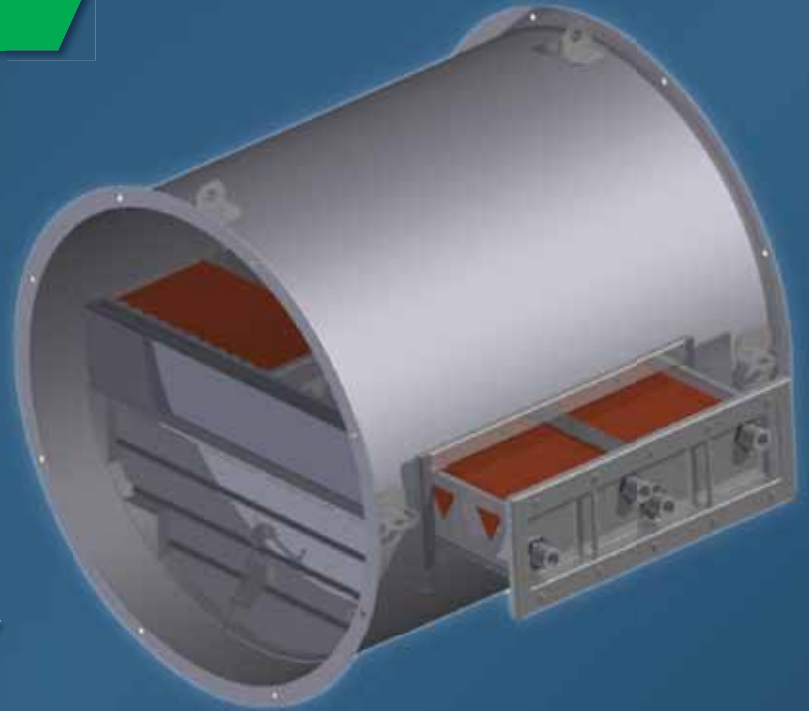


# *Flexibility and Performance*

## *- Unlike any other Heat Recovery System*

### **FEATURES**

- *Exceptional Performance-to-Weight Ratio*
- *Hybrid plate/micro-channel heat modules*
- *All 316L Stainless Steel Construction*
- *Individual Liquid Circuits*
- *Built-In Modulating By-Pass Damper*
- *Water Temp. & Condensate Control*
- *Primary/Secondary Configurations*
- *Modular Design w/ Pull Out Trays*
- *Vertical or Horizontal Installation w/ Drain*
- *High performance asymmetric volume flow*
- *Condensing & Non-condensing application*
- *Sizes from 250,000 Btu/Hr to over 60 Mil. Btu/Hr*



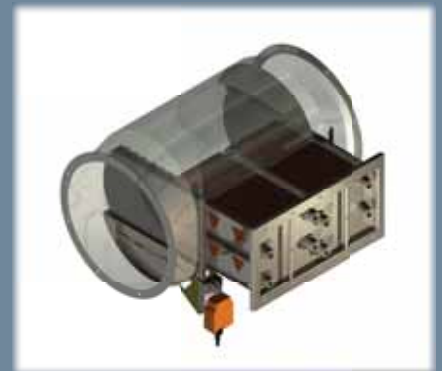
#### **Single Row**

The most compact option, but requires more length. Designed to represent insignificant resistance when in by-pass mode.  
*(applies to all models)*



#### **Double Row**

Occupies more space, but enhances flexibility and capacity. Capable of housing additional heat modules and liquid circuits compared to single row unit.



#### **Stacked Rows**

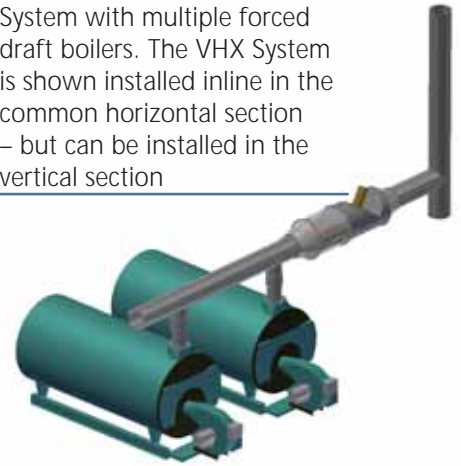
Has a primary/secondary heat module design with unmatched performance.  
*(Integrated mechanical draft system may be required.)*

# Any Way You Want It!

System with multiple atmospheric appliances. The VHX System is shown installed inline in the horizontal section allowing the system to be sidewall vented to save space and material.



System with multiple forced draft boilers. The VHX System is shown installed inline in the common horizontal section – but can be installed in the vertical section



System with multiple atmospheric appliances. The VHX System is shown installed inline in the vertical section – but can be installed in the horizontal section.



System with an existing forced draft boiler and an atmospheric appliance. The VHX System is shown installed inline in the common horizontal section – but can be installed in the vertical section.



## Applications

**The VHX system can be used for a number of reasons and purposes:**

- Stack temperature reduction
- Boiler feed water pre-heating
- Process water heating
- Sanitary water heating
- Pool water heating
- Boiler efficiency improvement
- Fuel consumption reduction
- Emissions control and reduction
- Improve existing boiler performance and reach “near-condensing” efficiency
- Emissions control and reduction

**It can be used with virtually any heat-producing equipment such as:**

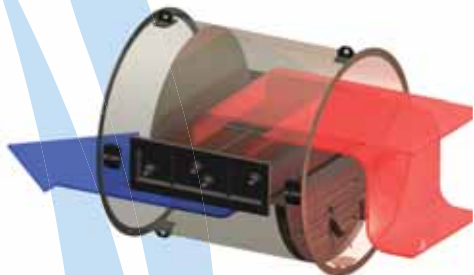
- Single or multiple boilers
- Forced draft or atmospheric boilers
- Condensing or non-condensing boilers
- Baking Ovens
- Process Applications
- Absorption Chillers
- Thermal oxidizers
- Engine and turbine exhaust systems
- Other high-temperature exhaust applications

# Modulating Heating Control

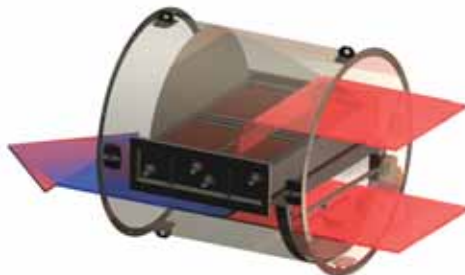
- Full Control of all functions

## Integrated By-Pass/Temperature Control

The modulating damper design provides by-pass capabilities for use with dual fuel applications, and also prevents over-heating of the heat modules, while eliminating nuisance shut downs. It can operate with the purpose of eliminating stack condensation. If the flue gas condenses down-stream from the heat modules, the damper will modulate to increase the stack temperature above the dew-point. It also assists in maintaining a constant water temperature by controlling the flow over the heat modules versus the flow through the by-pass.



*Closed Damper (No By-Pass)*



*Partial Damper (50% By-Pass)*



*Open Damper (100% By-Pass)*

## Heating Modules

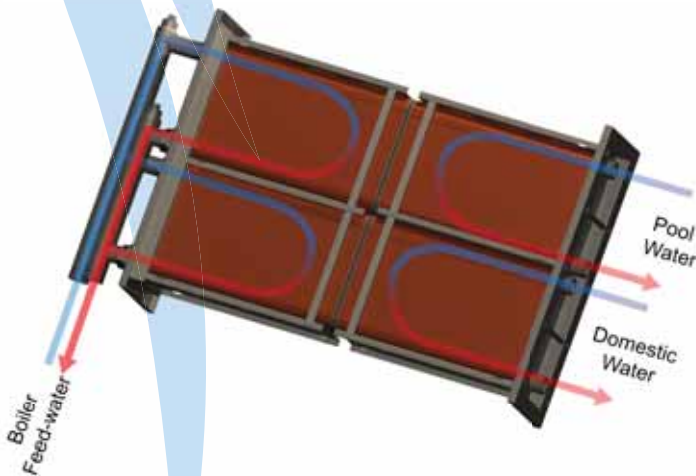


### Single Heat Exchanger

- Used in multiples when needed
- Multiple configurations
- Stainless steel 316L housing and plates
- Coated with a fine layer of copper for better heat transfer
- No risk of scaling etc.
- Low flow resistance
- Patented

### Multiple Circuits

- Individual circuits w/return and supply
- Multiple circuits can be combined with headers



# Advanced Features

## - The Leading Heat Recovery Technology at a Glance



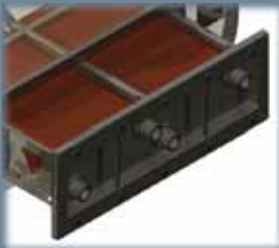
### **Built-In By-Pass**

The modulating, multi-blade damper provides a by-pass for dual fuel applications, prevents over-heating of the heat modules and eliminates unnecessary shut downs.



### **Individual Liquid Circuits**

The heat modules can be used for multiple applications simultaneously: i.e. one for preheating feed-water, one for domestic hot water, and one for direct pool heating.



### **Pull-out Heat Modules**

The light-weight (less than 25 lbs) modules are in pull-out trays for easy service and cleaning. Keeping a spare tray with heat modules virtually eliminates any down-time.



### **Vertical Installation**

The economizer can be installed vertically. During condensing operations, the rail system serves as a drain pan. A drain fitting can be installed on the side of the housing.



### **Horizontal Installation**

The economizer can be installed horizontally. During condensing operations, a drain fitting can be installed at the bottom of the housing.



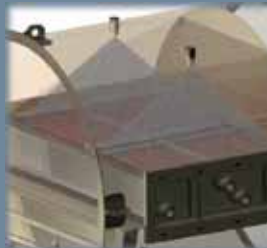
### **Condensate Control**

The damper can reduce or eliminate stack condensation. If flue gas condenses downstream, the damper modulates to increase stack temperature above the dew-point.



### **Constant Water Temperature Control**

The damper can maintain a constant water temperature by controlling the flow over the heat modules versus the flow through the by-pass.



### **Internal Liquid Spray/ Air Pressure System**

This optional feature is for applications with dirty or contaminated exhaust air. A drain system is required for liquid spray installations.



### **Condensing Efficiencies**

The economizer can convert conventional heating appliances to condensing efficiencies. This may eliminate costly investments in condensing boilers.

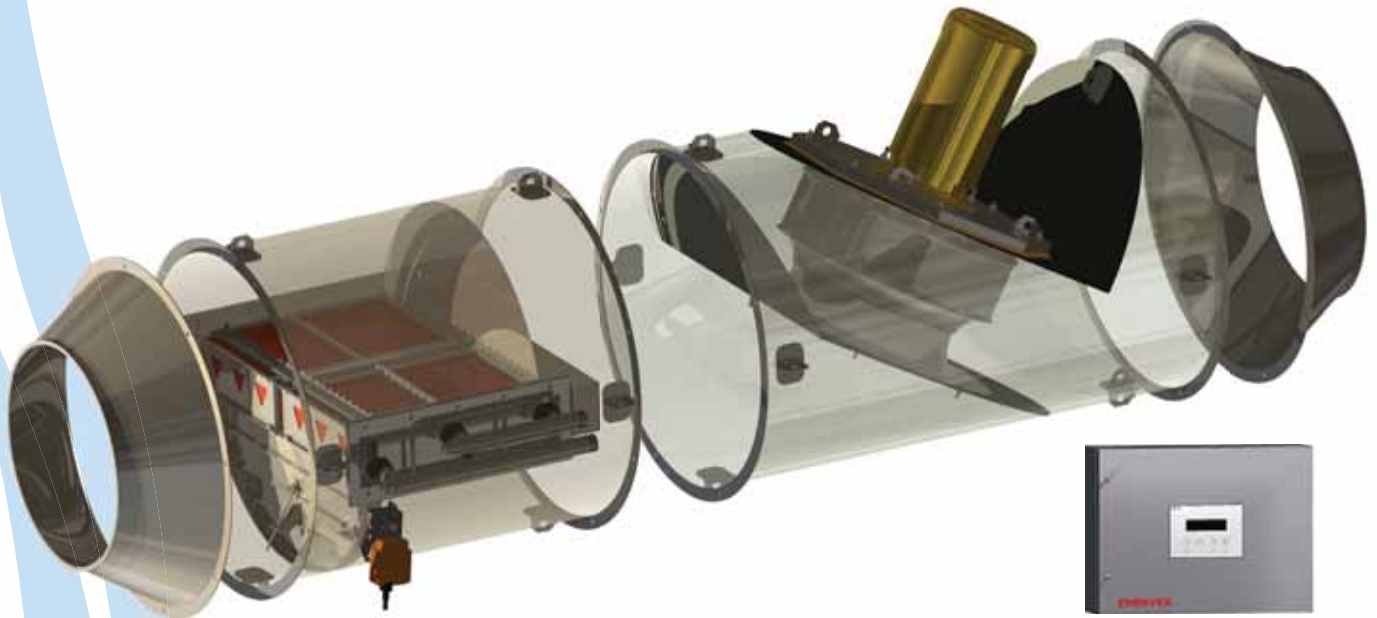


### **Natural vs Mechanical**

The economizer can be designed for natural draft or mechanical draft. Mechanical draft are recommended as it guarantees optimal heating appliance operation.

# Enhanced Performance

## - with Integrated Mechanical Draft System



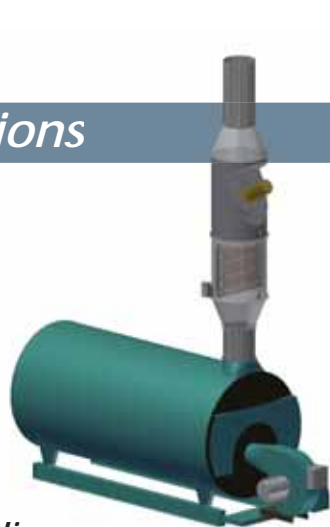
Using a mechanical draft system in conjunction with the VHX Heat Recovery System enhances the performance greatly – and saves space! Any gravity assisted heat recovery system is large in size in order to reduce the airflow resistance through the heat exchanger. A mechanical draft system forces airflow through the heat exchanger, so a smaller system can be used while improving efficiency even more. It also improves the operation of the appliance served. Appliances connected to a heat recovery system often suffer from the pressure loss introduced, which can be detrimental to operating efficiency and emissions. With a mechanical draft system draft will never again be an issue.

An ENERVEX mechanical draft system can take full control of the operation of the VHX and assure proper draft under all conditions. The EBC30 control modulates the mechanical draft fan to continuously meet the load. An add-on controller can control the operation of the VHX modulating by-pass damper. Altogether, the complete system supports design flexibility, reduced emissions, improved heat recovery and a high return on the investment.

## Mechanical Venting Options

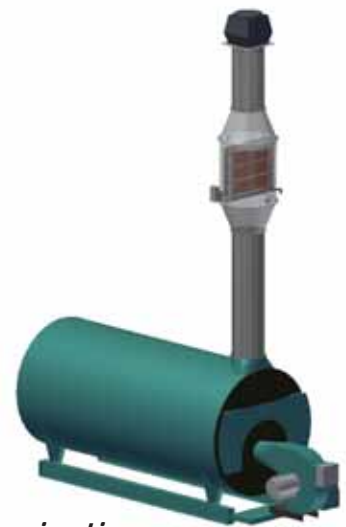
The VHX can be used in conjunction with a Inline Power Venter or Termination Exhaust Fan for versatility and convenience.

The VHX and Inline Power Venter can be supplied with a tapered inlet and a straight outlet or with tapered inlet and outlet which allows diverse configurations in a vertical and/or horizontal layout.



### **Inline**

The Inline Power Venter installed in conjunction with the VHX.



### **Termination**

The VHX installed inline with the Exhaust Fan at the termination point.

# Success Stories

## *Sabormex Processing Plant - Puebla, MX*



Sabormex's Puebla food processing plant has a number of steam boilers that provides steam for several processes. The plant uses plenty of hot water as well. ENERVEX designed an economizer system for a 900HP Cleaver-Brooks boiler that is now supplying hot water generated from the transfer of heat from the hot flue gases.

The VHX system was designed for a water flow of 30 GPM, entering at 80°F and leaving at 178°F, and exhaust flow entering at 400°F and leaving at 246°F. The heat recovery amounted to 1,958,000 BTU/hr or \$150,000 per year at an energy rate of \$0.70 per Therm. The payback was less than 5 months.

## *Health Care Facility, Upstate Pennsylvania*



The facility used to purchase steam from a COGEN plan but decided to produce their own. Three high-pressure steam boilers, each rated at 9,990,000 Btu/Hr, were installed and the exhaust routed outside via a common chimney system.

A single VHX Heat Recovery System along with an inline mechanical draft system was installed in the vertical part of the chimney, where it serves all the steam boilers. The economizer serves a laundry facility, a heating load and domestic water production. The estimated savings of the project exceeds \$20,000 per year.

## *Baldwin Wallace University Recreational Center - Cleveland, OH*



The objective was to recover heat from flue gases from three (3) Hydrotherm KN-30 boilers and use the heated water for hydronic (comfort), domestic hot water and pool water.

The boilers are vented into a common chimney that integrates a VHX1200-30 economizer and an inline TDF mechanical draft fan. The VHX is set up so each of the three heat modules works as its own circuit. The first one serves the hydronic heating system, the second the domestic hot water and the third one, the pool water heating. At full load, the economizer saves 311,668 BTU/Hr and brings the boiler efficiency up in the mid-90%.

## *Baking Factory - Midwest, US*



The plant operates a massive tunnel oven for the production of pretzels etc. One part of the oven exhausts 6,720 lbs/hr at 455°F and it was decided to use the re-captured heat in an open loop boiler feed-water system.

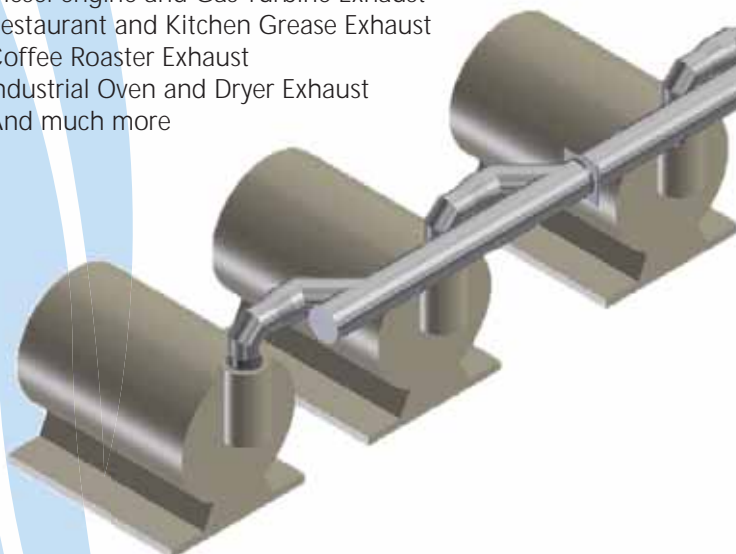
The VHX system was designed for a water flow of 30 GPM, entering at 50°F and leaving at 79°F, and exhaust flow entering at 455°F and leaving at 187°F. The heat recovery amounts to 432,156 BTU/hr or \$22,000 per year at an energy rate of \$0.70 per Therm.

# ENERVEX

## - A Complete Venting Design Solution

The PowerStack EPS system is a UL-listed multi-application single or twin-walled exhaust product in sizes 4" ID to 48" ID designed to convey exhaust and products of combustion from a wide range of combustion and process equipment under negative, positive or neutral pressure:

- Condensing and non-condensing Boiler Exhaust
- Diesel engine and Gas Turbine Exhaust
- Restaurant and Kitchen Grease Exhaust
- Coffee Roaster Exhaust
- Industrial Oven and Dryer Exhaust
- And much more



A wide range of mechanical draft fans are available to enhance the performance of boilers, water heaters, chimneys and economizers. They are designed to be part of a PowerStack system, and just like the VHX, they can be installed in virtually any type of chimney system – horizontally or vertically, condensing and non-condensing.

The VHX Vortex Heat Recovery Center is an extremely flexible and highly efficient economizer system that can serve systems from 250,000 Btu/Hr. to more than 60 Mil. Btu/Hr. It is designed to be part of a PowerStack system, but can be installed in virtually any type of chimney system – horizontally or vertically, condensing and non-condensing.

### Warranty

2 year factory warranty 10 year warranty against corrosion perforation.

### Contact ENERVEX

Next time you design a boiler or water heater system for a project, contact us for a non-binding venting or heat recovery design proposal. In most cases we can offer you a better and less expensive solution.

### Made By Experience

ENERVEX combines quality components, superior technology and experienced personnel to deliver a system that is economical environmentally sustainable, aesthetically pleasing and reliable.

Our custom engineering and space saving designs ensure that the project meets code requirements, as well as the high standards of today's architects, engineers and contractors. We don't build a one-size-fits-all draft system - we understand each project is unique.