Demand-Controlled Exhaust Systems for Boilers & Water Heaters
If the exhaust system for a heating appliance (boiler or water heaters) does not provide a precise draft for the combustion, it causes the appliance to run inefficiently. An inefficient boiler is not only more expensive to run, but it emits a higher level of emissions.

ENERVEX's demand-controlled exhaust system is designed to optimize the operation of a heating system by maintaining a precise ration of fuel to air, which relies on proper air supply and chimney draft.

With their air louvers and vent terminations, traditional heating appliance exhaust systems can take up a considerable amount of space, which impacts a building's aesthetics. Also, some buildings are constructed in such a way that an optimal venting system seems impossible to install.

ENERVEX's demand-controlled exhaust system offers a flexibility that other system can't. Not only does it take up much less space, but because it's not a gravity-based system, it allows the engineers to place the boilers where they are best suited.
How Demand-Controlled Exhaust Works

In order to operate efficiently, a boiler must maximize heat transfer by maintaining the precise ratio of fuel to air, which relies on proper air supply and draft. Because many factors affect the draft, including the boiler operation and outdoor temperatures and elements, maintaining the appropriate level can be difficult. Too much or too little draft can cause flame roll-outs or pilot light failures, as well as freezing pipes or drains in cold climates.

A demand-controlled exhaust system maintains a precise draft by constantly adjusting the exhaust rate to meet current demands. The following illustration describes the components and operation of a demand-controlled exhaust system:

Proper Draft is Crucial

Improper draft has a major impact on boiler operation. It’s not uncommon to see high-efficiency boilers operating at low-efficiency levels. This is a result of inadequate draft control. A boiler’s draft range is often very narrow and draft control can be made difficult when multiple boilers are exhausted through a common chimney.
Over a 15-year period a typical demand-controlled exhaust system serving 4 high-efficiency boilers in a 20-story building costs 50% less to operate than a combined system without demand-control. Most of these savings are energy savings due to boiler efficiency improvements. And savings can be further enhanced by adding an Economizer.

Multiple boilers using a common chimney operate at higher O₂ levels than when exhausted by individual chimneys. A mechanical draft system provides more precise draft control so the O₂ levels can be lowered. Annual savings can amount to 2-4% and thousands of Dollars. Adding an economizer will improve energy savings by up to 5%.

Combining chimneys and reducing diameters can save material and labor when using a mechanical draft system. Smaller chimneys are less expensive to install. Side wall exhaust can save even more material and labor.

Not only is the ENERVEX system fast in response to demand changes, it’s also able to maintain a +/-2% accuracy from set-point. Alternative solutions using a VFD and a pressure sensor only achieve a +/- 20% accuracy, so their savings are over 20% less than that of an ENERVEX system.
Combining chimneys and reducing diameters can save building space. A smaller footprint could save as much as $15,000 worth of space in a 20-story building. It also reduces clutter on the roof. Even more space can be saved if redirecting the chimney out through a sidewall.

Today’s buildings are designed to be both functional and attractive. While the ENERVEX system provide great space savings, it can also keep chimney terminations out of sight. The same applies for combustion air supply where large outside gravity louvers or intakes can be replaced with small louvers when the combustion air supply is provided by an ENERVEX demand-controlled air supply system.
Chimney Automation System (CASV) - Termination

Application

The Chimney Automation System (CASV) is a demand-controlled exhaust system designed for commercial boilers and water heaters in buildings where the exhaust is powered by a chimney fan on the exterior of the building. The CASV system can be combined with a Modulating Combustion Air-supply System that provides combustion air to a mechanical room. A common EBC can control both systems independently.

The products of combustion are exhausted to the outdoors by a termination fan. The fan can be installed below the parapet for aesthetics.

The common vertical stack is typically located inside a fire-rated chase.

The CASV system is designed to work with almost any type of heating appliance fueled by gas or oil.

The EBC constant pressure controller is located inside the boiler room close to the boilers, which are interlocked with the controller.

The end of the common manifold is often the optimal location of the probe and transducer.

The forced-air louver, located on the building envelope, is substantially smaller than a gravity louver.

The air supply fan, which can be controlled by the EBC constant pressure controller, supplies combustion air at a demand-controlled rate.

Complete Code Compliance

ENERVEX's demand-controlled exhaust systems comply with all national building codes and standards. In most cases a non-compliant venting installation can be brought into compliance by the addition of a mechanical draft system.
The EBC constant pressure controller is located inside the boiler room close to the boilers, which are interlocked with the controller.

Chimney Automation System (CASI) - Inline

Application

The Chimney Automation System (CASI) is a demand-controlled exhaust system designed for commercial boilers and water heaters in buildings where the exhaust is powered by a fan in the boiler room. This system is an option for tall buildings or a building that features sidewall ventilation.

The CASI system can be combined with a Modulating Combustion Air-supply System that provides combustion air to a mechanical room. A common EBC can control both systems independently.

When an inline draft fan is used the chimney is often terminated with a stack cap.

The CASI system is designed to work with virtually any type of heating appliance fueled by gas or oil.

When an inline draft fan is used the chimney is often terminated with a stack cap.

Exhaust is ventilated to the outdoors by a true inline fan installed in the boiler room.

Add Value to the Building

An ENERVEX system can add real value to a building. Through the energy savings generated via the improved boiler operating efficiency value is added by lowering the utility bill. Added value can be as much as six times the annual energy savings. Boiler maintenance cost is reduced while extending equipment life expectancy.
Modulating Over-Draft Damper (MODS)

Application

The Modulating Over-Draft System (MODS) is a demand-controlled exhaust system that’s designed for buildings that experience excessive draft in the chimney, which impacts the ability of the heating system to operate efficiently.

The MODS system can be combined with a CASV or CASI Chimney Automation System or/and a MCAS Modulating Combustion Air-supply System that provides combustion air to a mechanical room.

Exhaust is ventilated to the outdoors with or without a draft fan. The fan may be needed for multiple boiler applications and can be installed below the parapet for aesthetics.

The common vertical stack is typically located inside a fire-rated chase.

The modulating multi-blade draft damper is located in the horizontal manifold between the first boiler and the vertical stack.

The EBC constant pressure controller is interlocked with the boilers and is located close to them inside the boiler room.

The MODS system is designed to work with almost any type of heating appliance fueled by gas or oil, but it’s mostly used with forced-draft type of boilers.

Eliminate Large Air Louvers

Combustion air supply louvers require a large amount of wall space and can compromise the aesthetics of a building. Although it may be impossible to eliminate them, a mechanical air supply system can reduce the louver size dramatically. This can also eliminate the risk for frozen water pipes and drains in cold climates.
The unique, patent-pending IPVB-ECO Power Venter with integrated Boiler Economizer is designed for use with any boiler or water heater with round stacks. The combustion source can be any steam boiler or hot water boiler whether of atmospheric or forced draft design.

For the first time, the IPVB-ECO allows atmospheric appliances to utilize a boiler economizer. The extremely compact economizer represents a substantial pressure loss in the stack system, but with the assistance of the IPVB power venter, the loss is negated and an EBC30/35 draft controller assures perfect draft at all times and thus perfect boiler operation.

And - a single economizer can handle multiple boilers. There is no longer a need for individual boiler economizers in commonly vented boiler systems. Downsizing of the stack system is also possible.

The power vented economizer is available in 7 “off the shell” sizes and can be installed on any size of boiler stack. It is also possible to down-size the chimney system for additional savings in space and materials.

Typical applications are: boiler feedwater, makeup water, hot water return, hot water storage tank, condensate tank, process water, potable water

- Compact and highly efficient
- A single IPVB-ECO economizer can handle multiple appliances
- Condensing or non-condensing
- Natural gas or LP
- Entering gas temperatures: 300°F (150°C) to 700°F (370°C)
- Ultra-quiet
- Variable speed and direct drive
- Copper or stainless steel fin-tubes
- Simple installation
- Mounting flanges for bolting to mating flanges or adapters

**Installation Inside**

**– Vertically or Horizontally**

The patent pending design provides a great deal of flexibility. The IPVB-ECO can be installed in virtually any part of the chimney system because it is a true in-line fan. It can be installed inside in the vertical section or the horizontal section of the chimney.

It can also be installed just inside a wall for sidewall vented applications.
Redundancy for Critical Installations

Extra Safety and Guaranteed Uptime

Redundancy is critical in many applications such as hospitals and hotels – just to mention a couple. These are applications where possible downtime during repair, maintenance or system failure is not acceptable. Examples of other redundant systems are pumps, steam boilers, water heaters, generators etc. ENERVEX offers redundant mechanical draft systems, over-draft damper systems and combustion air supply systems – or a combination of all.

A typical redundant mechanical draft system consists of two individually operated CASI, Chimney Automation Systems, where the inline IPVB Power Venters are installed in a serial or parallel configuration. Each system is individually powered and has its own EBC30 or 35 control, Variable Frequency Drive, and Pressure Sensor. One is designated the “Primary” and the other the “Secondary” system.

The two systems are connected to an EBC25 Redundancy Controller, which monitors the operation of both systems. In case of a component failure, a general mechanical failure or an electrical failure, the EBC25 immediately switches the operation to the “Secondary” system while signaling the Building Management system and/or sending an audible alarm.

Improve Boiler Room Safety with CO Monitoring

For the Safety of Your Employees

Boiler room safety is becoming increasingly important due to the number of accidents occurring every year.

The EBC 35 Draft Control and CO Monitor is an easy way to safeproof your boiler facility. Installation is simple and the control can be interlocked with up to six (6) boilers in a standard configuration and a virtually unlimited number of boilers in a custom configuration.

An integrated Proven Draft Switch function assures that if sufficient draft cannot be maintained, the control will lock out the boiler(s) within an adjustable time period.

The CO transmitter with LCD display monitors CO levels on location and can be daisy-chained, if needed. The CO monitor meets OSHA and other safety requirements and can be set specifically for the individual application. If a dangerously high CO level – or the pre predetermined max. level – is reached the control automatically locks out the boiler(s) within an adjustable time. Automatic reset avoids nuisance lockouts and the need for manual reset.

The pressure sensor has dual pressure transducers for monitoring of safe sensor operation. Sensor failure generates an alarm and locks out appliance operation.
**RSV Chimney Fan**

- Rugged and compact design
- High-efficiency aluminum centrifugal impeller
- Made in cast aluminum for outdoor installation
- Variable speed, direct drive, TEFC motor
- 5 sizes available, ETL and ETLc listed to UL378

### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Power Supply (VAC)</th>
<th>Amperage (Amp)</th>
<th>Motor Output (HP)</th>
<th>RPM</th>
<th>Weight (Lbs)</th>
<th>Duct Connections (Inch)</th>
<th>Max Capacity (CFM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSV 200</td>
<td>1 X 120 (1x220-240)</td>
<td>1.4 (0.4)</td>
<td>0.15 (0.1)</td>
<td>1600</td>
<td>47 (18)</td>
<td>8 (200)</td>
<td>500 (850)</td>
</tr>
<tr>
<td>RSV 250</td>
<td>1 X 220-240</td>
<td>2.9 (0.8)</td>
<td>0.2 (0.16)</td>
<td>1720</td>
<td>60 (26)</td>
<td>10 (250)</td>
<td>600 (1,050)</td>
</tr>
<tr>
<td>RSV 315</td>
<td>3 X 220-240 / 3 x 380-400</td>
<td>5.8 (1.8)</td>
<td>0.5 (0.35)</td>
<td></td>
<td>88 (35)</td>
<td>12 (315)</td>
<td>1,150 (1,955)</td>
</tr>
<tr>
<td>RSV 400</td>
<td>3 X 380-400</td>
<td>3.5 / 2.1</td>
<td>1.0 (0.75)</td>
<td></td>
<td>97 (44)</td>
<td>16 (400)</td>
<td>2,000 (3,400)</td>
</tr>
<tr>
<td>RSV 450</td>
<td>6 X 380-400</td>
<td>6.5 / 3.8</td>
<td>2.0 (1.5)</td>
<td></td>
<td>128 (71)</td>
<td>16 (500)</td>
<td>2,900 (4,930)</td>
</tr>
</tbody>
</table>

**BESB Low Energy Supply Fan**

- Low energy fan in compact design
- High-efficiency aluminum centrifugal impeller
- Made in corrosion resistant material for indoor and outdoor installation
- Variable speed, direct drive, TEFC motor
- 4 sizes available, ETL and ETLc listed to UL705

### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Power Supply (VAC)</th>
<th>Amperage (Amp)</th>
<th>Motor Output (HP)</th>
<th>RPM</th>
<th>Weight (Lbs)</th>
<th>Duct Connections (Inch)</th>
<th>Max Capacity (CFM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BESB 250</td>
<td>1 X 120 (1x220-240)</td>
<td>5.8</td>
<td>0.5 (0.35)</td>
<td>1600</td>
<td>70 (32)</td>
<td>10 (250)</td>
<td>1,500 (2,550)</td>
</tr>
<tr>
<td>BESB 250</td>
<td>1 X 220-240</td>
<td>2.9</td>
<td>0.5 (0.35)</td>
<td>1400</td>
<td>70 (32)</td>
<td>10 (250)</td>
<td>1,200 (2,040)</td>
</tr>
<tr>
<td>BESB 315</td>
<td>3 X 220-240 / 3 x 380-400</td>
<td>3.1 / 1.7</td>
<td>1.0 (0.75)</td>
<td>1720</td>
<td>84 (38)</td>
<td>12 (315)</td>
<td>2,400 (4,080)</td>
</tr>
<tr>
<td>BESB 400</td>
<td>3 X 380-400</td>
<td>6.5 / 3.9</td>
<td>2.0 (1.5)</td>
<td></td>
<td>132 (60)</td>
<td>16 (400)</td>
<td>4,300 (7,300)</td>
</tr>
<tr>
<td>BESB 500</td>
<td>6 X 380-400</td>
<td>9.0 / 4.0</td>
<td>3.0 (2.25)</td>
<td></td>
<td>170 (77)</td>
<td>20 (500)</td>
<td>5,800 (9,860)</td>
</tr>
</tbody>
</table>

**SFTA Supply Fan**

- Tubaxial fan in compact design
- Steel housing and cast aluminum propeller
- Variable speed, direct drive, TEFC motor
- 6 sizes available, ETL and ETLc listed to UL705

### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Power Supply (VAC)</th>
<th>Amperage (Amp)</th>
<th>Motor Output (HP)</th>
<th>RPM</th>
<th>Weight (Lbs)</th>
<th>Duct Connections (Inch)</th>
<th>Max Capacity (CFM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SFTA 16</td>
<td>3 X 200-240 OR 3 x 440-480</td>
<td>2.8 / 1.4</td>
<td>1.0 (0.75)</td>
<td>1750</td>
<td>53 (24)</td>
<td>16 (400)</td>
<td>4,000 (6,800)</td>
</tr>
<tr>
<td>SFTA 18</td>
<td>3 X 220-240</td>
<td>2.9 / 1.4</td>
<td>1.0 (0.75)</td>
<td></td>
<td>60 (27)</td>
<td>18 (450)</td>
<td>5,000 (8,500)</td>
</tr>
<tr>
<td>SFTA 21</td>
<td>3 X 380-400</td>
<td>4.0 / 2.0</td>
<td>1.5 (1.3)</td>
<td></td>
<td>85 (39)</td>
<td>21 (530)</td>
<td>7,000 (11,900)</td>
</tr>
<tr>
<td>SFTA 24</td>
<td>6 X 380-400</td>
<td>8.2 / 4.1</td>
<td>3.0 (2.25)</td>
<td></td>
<td>97 (54)</td>
<td>24 (600)</td>
<td>11,000 (18,700)</td>
</tr>
<tr>
<td>SFTA 30</td>
<td>9 X 380-400</td>
<td>14.2 / 7.1</td>
<td>5.0 (3.75)</td>
<td></td>
<td>149 (77)</td>
<td>30 (750)</td>
<td>17,000 (28,900)</td>
</tr>
<tr>
<td>SFTA 36</td>
<td>12 X 380-400</td>
<td>23.0 / 11.5</td>
<td>10.0 (7.5)</td>
<td></td>
<td>234 (117)</td>
<td>36 (910)</td>
<td>31,000 (52,700)</td>
</tr>
</tbody>
</table>
**IPVB Power Venter**

- True inline exhaust fan in compact design
- High-efficiency aluminum centrifugal impeller (stainless steel in 620-models)
- Made in 316SS for indoor and outdoor installation
- Variable speed, direct drive, TEFC motor
- 7 sizes available, ETL and ETLc listed to UL378

<table>
<thead>
<tr>
<th>Power Supply VAC</th>
<th>IPVB 300</th>
<th>IPVB 300</th>
<th>IPVB 350</th>
<th>IPVB 400</th>
<th>IPVB 500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amperage</td>
<td>5.8</td>
<td>2.9</td>
<td>3.1 / 1.7</td>
<td>6.5 / 2.9</td>
<td>9.0 / 4.0</td>
</tr>
<tr>
<td>Motor Output HP (kW)</td>
<td>0.5 (0.35)</td>
<td>0.5 (0.35)</td>
<td>1.0 (0.75)</td>
<td>2.0 (1.5)</td>
<td>3.0 (2.25)</td>
</tr>
<tr>
<td>RPM</td>
<td>1600</td>
<td>1400</td>
<td>1720</td>
<td>1720</td>
<td>1720</td>
</tr>
<tr>
<td>Weight Lbs (kg)</td>
<td>34 (75)</td>
<td>34 (75)</td>
<td>43 (94)</td>
<td>58 (128)</td>
<td>83 (183)</td>
</tr>
<tr>
<td>Duct Connections Inch (mm)</td>
<td>12 (300)</td>
<td>12 (300)</td>
<td>14 (350)</td>
<td>16 (400)</td>
<td>20 (500)</td>
</tr>
<tr>
<td>Max Capacity CFM (m³/h)</td>
<td>1,350 (2,300)</td>
<td>1,200 (2,000)</td>
<td>1,200 (2,000)</td>
<td>3,600 (6,100)</td>
<td>5,400 (8,700)</td>
</tr>
</tbody>
</table>

**IPVB-ECO Power Venter with Economizer**

- True inline exhaust fan in compact design
- High-efficiency cast alu impeller (stainless steel in 620-models)
- Made in 316SS
- Variable speed, direct drive, TEFC motor
- Economizer coil in copper or stainless steel
- 7 sizes available, ETL and ETLc listed to UL378

<table>
<thead>
<tr>
<th>Power Supply VAC</th>
<th>IPVB 620-5</th>
<th>IPVB 620-7</th>
<th>IPVB 620-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amperage</td>
<td>7.5</td>
<td>11.3</td>
<td>15.0</td>
</tr>
<tr>
<td>Motor Output HP (kW)</td>
<td>5.0 (3.7)</td>
<td>7.5 (5.6)</td>
<td>10.0 (7.4)</td>
</tr>
<tr>
<td>Max RPM (Hz)</td>
<td>1,350 (45)</td>
<td>1,500 (51)</td>
<td>1,740 (60)</td>
</tr>
<tr>
<td>Weight Lbs (kg)</td>
<td>434 (240)</td>
<td>434 (240)</td>
<td>444 (202)</td>
</tr>
<tr>
<td>Duct Connections Inch (mm)</td>
<td>24 (610)</td>
<td>24 (610)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>Max Capacity CFM (m³/h)</td>
<td>10,000 (17,000)</td>
<td>11,500 (19,500)</td>
<td>13,500 (22,900)</td>
</tr>
</tbody>
</table>

* Depending on boiler type
EBC30 Modulating Pressure Controller

- Constant pressure fan speed controller for fan or ventilator
- Used with single, modulating heating appliance
- Provides 0-10V or 10-120V signal
- ETL and ETLc listed

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>VAC (Hz)</th>
<th>1x120 (60Hz) / 1x240 (50-60Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amperage</td>
<td>Amp</td>
<td>6.3 / 3.15</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>℉ (℃)</td>
<td>-4 to 104 (-20 to 50)</td>
</tr>
<tr>
<td>Range of Operation</td>
<td>In WC (Pa)</td>
<td>0-0.6 (0-150)</td>
</tr>
<tr>
<td>Output</td>
<td>VAC</td>
<td>10-120 / 20-240</td>
</tr>
<tr>
<td></td>
<td>VDC</td>
<td>0-10</td>
</tr>
<tr>
<td>Weight</td>
<td>Lbs (kg)</td>
<td>3.0 (1.5)</td>
</tr>
</tbody>
</table>

EBC35 Draft and CO Safety Controller

- Constant monitoring of CO-level and draft
- Can be used as constant pressure fan speed controller as the EBC 30
- Used with single, modulating heating appliance
- Provides 0-10V or 10-120V signal
- ETL and ETLc listed
- With CO monitoring

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>VAC (Hz)</th>
<th>1x120 (60Hz) / 1x240 (50-60Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amperage</td>
<td>Amp</td>
<td>6.3 / 3.15</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>℉ (℃)</td>
<td>-4 to 104 (-20 to 50)</td>
</tr>
<tr>
<td>Range of Operation</td>
<td>In WC (Pa)</td>
<td>0-0.6 (0-150)</td>
</tr>
<tr>
<td>Output</td>
<td>VAC</td>
<td>10-120 / 20-240</td>
</tr>
<tr>
<td></td>
<td>VDC</td>
<td>0-10</td>
</tr>
<tr>
<td>Relays</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Range</td>
<td>ppm</td>
<td>0-125</td>
</tr>
<tr>
<td>Response time</td>
<td>seconds</td>
<td>&lt; 60</td>
</tr>
<tr>
<td>Weight</td>
<td>Lbs (kg)</td>
<td>3.0 (1.5)</td>
</tr>
</tbody>
</table>

MicroVLT Variable Frequency Drive

- Variable speed drive for use with 3-phase fans and power venters
- Pre-programmed from factory – no field programming needed
- Available for 200-240VAC and 400-480VAC

MDF Modulating Damper Control

- Multiblade damper in 304 stainless steel (316SS available)
- Stainless steel shaft and bearings
- Fast-acting damper motor with brushless DC motor
- Operating temperatures up to 750°F (400°C)
- Equipped with EnerDrive failsafe system
- 16 sizes available
**Burj Khalifa Tower**

Formerly known as Burj Dubai Tower, this tower was designed by Skidmore, Owings and Merrill in Chicago. The mixed-use tower features the world's first Armani Hotel Dubai and Armani Residences, alongside corporate suites, residences, retail and leisure facilities. Burj Khalifa Tower is at the centre of Downtown Burj Dubai, a 500-acre mega-development by Emaar Properties.

At 828 metres (2,716 feet), the Burj Khalifa has already achieved the distinction of being the world's tallest structure.

ENERVEX designed and supplied six (6)demand-controlled inline mechanical draft systems for the building's water heaters and steam boilers. The many heating appliances are exhausted via six chimney flues - each with an integrated RSIB mechanical draft system. The chimney flues are mostly running horizontally through the building and terminate to the outside via sidewalls and through the ground for aesthetics.

The mechanical draft systems also provide some ventilation to the mechanical room by maintaining an air exhaust rate while controlling the chimney flue draft as well as the combustion air intake.

---

**Lutheran General Hospital**

OWP/P and CannonDesign recently completed a new US$201 million, eight-storey patient care tower for Advocate Lutheran General Hospital in Park Ridge, IL. The 192-bed facility, designed to the highest standards of patient and staff safety and environmental sustainability, is the first hospital in Illinois expected to achieve LEED Gold certification and will be one of a handful in the country with this designation. Sustainability was pinned as a key objective from conception and as a result, the building's mechanical and electrical systems will reduce energy use by 21 percent.

The heating system consisted of two banks of Aerco Benchmark 3.0 boilers with seven (7) and eight (8) boilers respectively, exhausted by redundant ENERVEX Chimney Automation Systems. Due to long horizontal and vertical chimney sections with many elbows, the mechanical draft system is needed in order for the boilers to operate at their rated efficiency.

Being a critical part of the hospital's HVAC system, it was imperative that the mechanical draft system was of a redundant design, and ENERVEX is known as one of the few experts in the mechanical draft field. The installed system consists of two (2) redundant systems – one for each bank of boilers. Each system consists of two RSIB Power Venters with modulating over-draft dampers and a redundant control system with redundant VFD’s, EBC 30 Modulating Draft Controls and logistics for switching between the two redundant systems in case of a component failure.

In addition to providing perfect draft so the boilers operate efficiently, the system design assures that if any component – fan, damper, VFD, EBC30, pressure sensor etc. – fails, then it automatically switches to a redundant component while alarming the building management system.

---

**Heinz Stadium**

Venting the heating appliances at a sports facility is always a challenge, as was the case with Heinz Field in Pittsburgh, PA. The stadium featured a field heating system and domestic water heaters, which ran both horizontally and vertically, along with many elbows.

ENERVEX's venting system included a demand controlled mechanical draft system. The eight Thermal Solution EVH-2000 boilers are vented with a ENERVEX CASV demand-controlled mechanical draft system. The domestic water heating system is using a venting system that includes a CASV450-2 demand controlled mechanical draft system. The system controls the draft of the two A.O. Smith 4,000MBH domestic water heaters. In addition, two water heaters on the concourse levels are vented with two CASV demand controlled mechanical draft systems.
Georgia Aquarium

The Georgia Aquarium, which opened in November of 2005, is one of the largest aquariums in the world, featuring more than 55,000 fish from approximately 500 species and an estimated 8 million gallons of fresh and saltwater. With a project of this magnitude, it's critical that the boiler system that heats the water operates efficiently with the appropriate ventilation. To ensure this, the developers opted to install a demand-controlled ENERVEX mechanical draft system.

Because the boiler system is located under the parking structure, the fans are installed in an enclosed casing, out of sight, on the top of the parking building.

The Westin Diplomat Resort & Spa

A project that literally stands out is the “Diplomat Hotel” in Ft. Lauderdale, FL.

The hotel’s main heating plant was originally located across Highway A1A - on the west side. It originally of a dual Kewanee boiler system that supplied the resort across the street through underground pipes. In recent years the pipes had started leaking and repairs were estimated to run into the millions of dollars.

A new boiler system was designed on the 4th floor of the parking garage on the east side of Hwy A1A where the hotel property is located. The new system consists of 11 Hydrotherm KN20 2,000 MBtu High Efficiency condensing boilers.

Since it was not practical to design a vertical flue system, it was decided to exhaust horizontally. However, the owner didn’t want to see a 22 inch pipe out in front of the building.

It was decided to design a dual mechanical draft system that included two RSIB500 Power Venters and venting through AL29-4c venting systems.

The system has a continuous loop drawing air from the outside and feeding all the direct air intakes for the boilers. It continues by making a 180° loop and then it picks up the exhaust of each boiler, and ultimately tie into the dual RSIB500. They exhaust to the outside through a plenum with a decorative louver. This hides the termination and makes it aesthetically pleasing.

Khalidiya Palace
Rayhaan by Rotana

This is the first property to open in Abu Dhabi under Rayhaan Hotels & Resorts by Rotana brand. The 5 star property offers 443 splendid rooms and suites with their modern design complementing the values of the contemporary Arabian culture.

The hotel's laundry facility is served by three BIB Cochran Wee Chieftain steam boilers. The original design called for individual venting of the boilers with 16 inch chimney flue, but long horizontal runs and space restraints made this impossible.

The chimney flue was redesigned by ENERVEX and all three boilers were connected to a common 20 inch chimney flue powered by a CASI Chimney Automation System and an IPVB 500 inline power venter. The chimney flue was reduced from a common 30 inch to a 20 inch diameter. The discharge is located in a small housing right above the entry to the garage (see picture to the left).

The installation saved valuable space as well as chimney flue material. It was estimated that the total material savings including the Chimney Automation System exceeded US$10,000.
ENERVEX combines quality components, superior technology and experienced personnel to deliver a system that is economical, environmentally sustainable, aesthetically pleasing and reliable. In addition, our custom engineering and space saving design ensure that the project meets code requirements, as well as the high standards of today's builders. At ENERVEX, we don't build a one-size-fits-all venting system. We understand that each project is unique and our three-step process allows us to design a venting system that meets the specific requirements of a given job.

The ENERVEX Performance Guarantee

Because ENERVEX designs the entire venting system, we take full responsibility for its operation. Contact ENERVEX for details.

The ENERVEX Process

1. Pre-sales analysis
   This phase allows us to gather requirements and create a customized sizing report.

2. System design
   Using our FanCalc software, our engineers design a system that takes into consideration proper vent type application, operating temperatures, pressure losses and the risk of condensation. It also provides specific wiring diagrams.

3. Engineering and installation support
   Every ENERVEX system comes complete with job-specific AutoCAD installation instructions and wiring diagrams. Our engineering support teams have access to these files and are available to answer any questions that come up during installation.

ENERVEX and LEED

ENERVEX's systems qualify for LEED points under the Energy & Atmosphere (EA), Materials & Resources (MR), Indoor Environmental Quality (EQ) and Innovation & Design Process (ID) sections. ENERVEX has actively promoted low-energy installations, energy savings, indoor air quality and recycling for decades – long before it became "in". For years ENERVEX has been involved in the European legislation processes and has been a member of United States Green Building Council (USGBC) since 2005. Unlike most manufacturers we didn’t have to come up with “new” GREEN solutions – we have made them for decades!