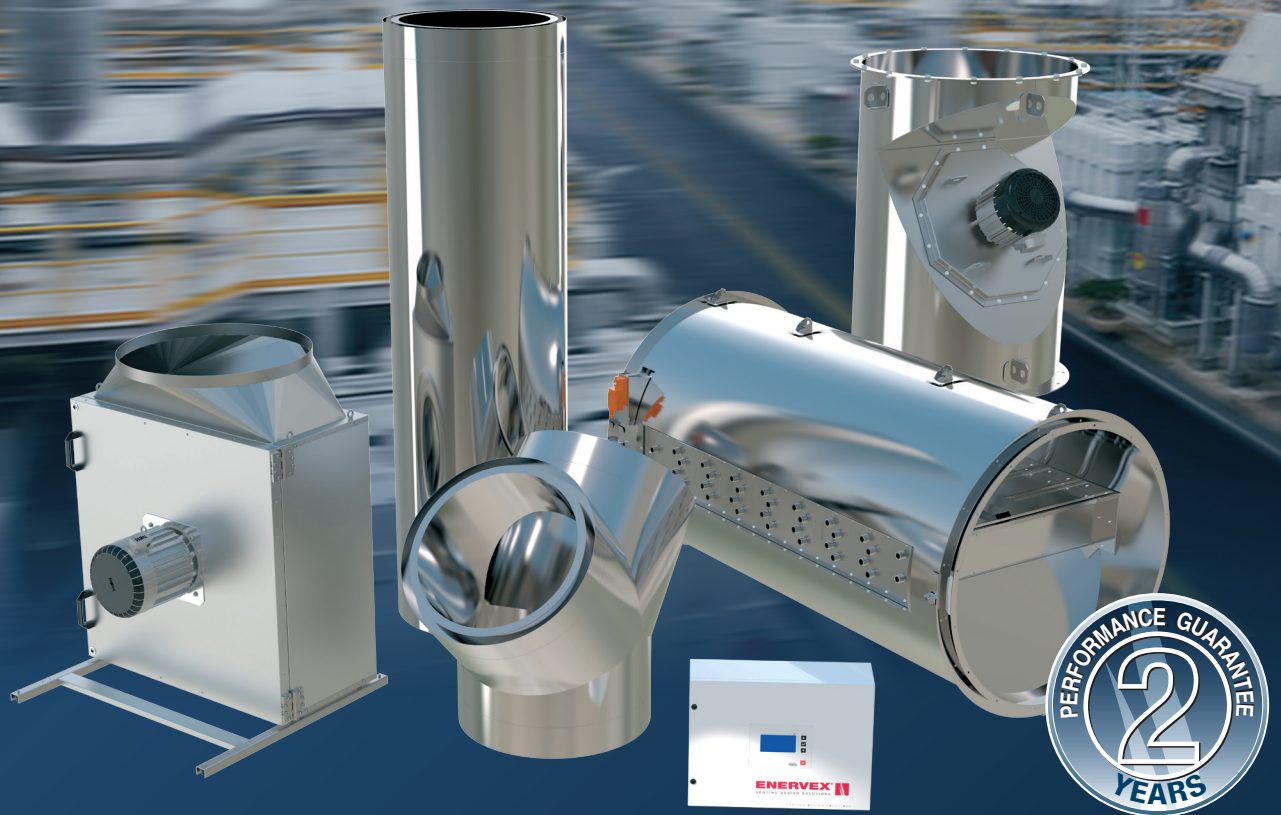


# EXHAUST AND MAKE-UP AIR SYSTEMS WITH WASTE HEAT RECOVERY

INNOVATIVE ONE-STOP EXHAUST DESIGN FOR FUEL CELL PLANTS



Simple. Seamless. Smart.

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

T: +1 800.255.2923 · [www.enervex.com](http://www.enervex.com)

# INDUSTRY-FIRST DESIGN INNOVATION

ENERVEX continues to lead the industry in the original design of powerhouse exhaust and mechanical draft products that deliver consistent savings, ease of installation and performance. Our fan-powered exhaust and make-up air supply systems with heat recovery cover a wide variety of fuel cell applications to meet today's demands.

## COMPLETE VENTING SOLUTION FOR SINGLE AND MULTIPLE FUEL CELLS

## CONTROL OF PROCESS EXHAUST GAS RATE AND MAKE-UP AIR SUPPLY FOR PERFECT PERFORMANCE

## RECOVER SENSIBLE AND LATENT "WASTE" HEAT FROM PROCESS EXHAUST FOR USE WITH HOT WATER SYSTEMS, SWIMMING POOLS, FEED-WATER ETC.

## COMMUNICATE VIA INTEGRATED BACNET PROTOCOL

## IMPROVE CHP EFFICIENCY

Our innovative demand-controlled systems solve design challenges and drive measurable advantages.

## ENERVEX ADVANTAGES



### ONE-STOP-DESIGN

Products built to work together guarantees seamless integration; single-supplier responsibility eliminates guesswork and blame game.



### DESIGNER FRIENDLY

For any type of fuel cell design. Proven solutions that deliver performance every time. And all components are UL or ETL listed.



### INSTALLER FRIENDLY

Simple and seamless installation with "plug-and-play" makes integration easy.



### PERFECT DRAFT

Consistent performance and reliability. Optimizes equipment performance and fuel efficiency.



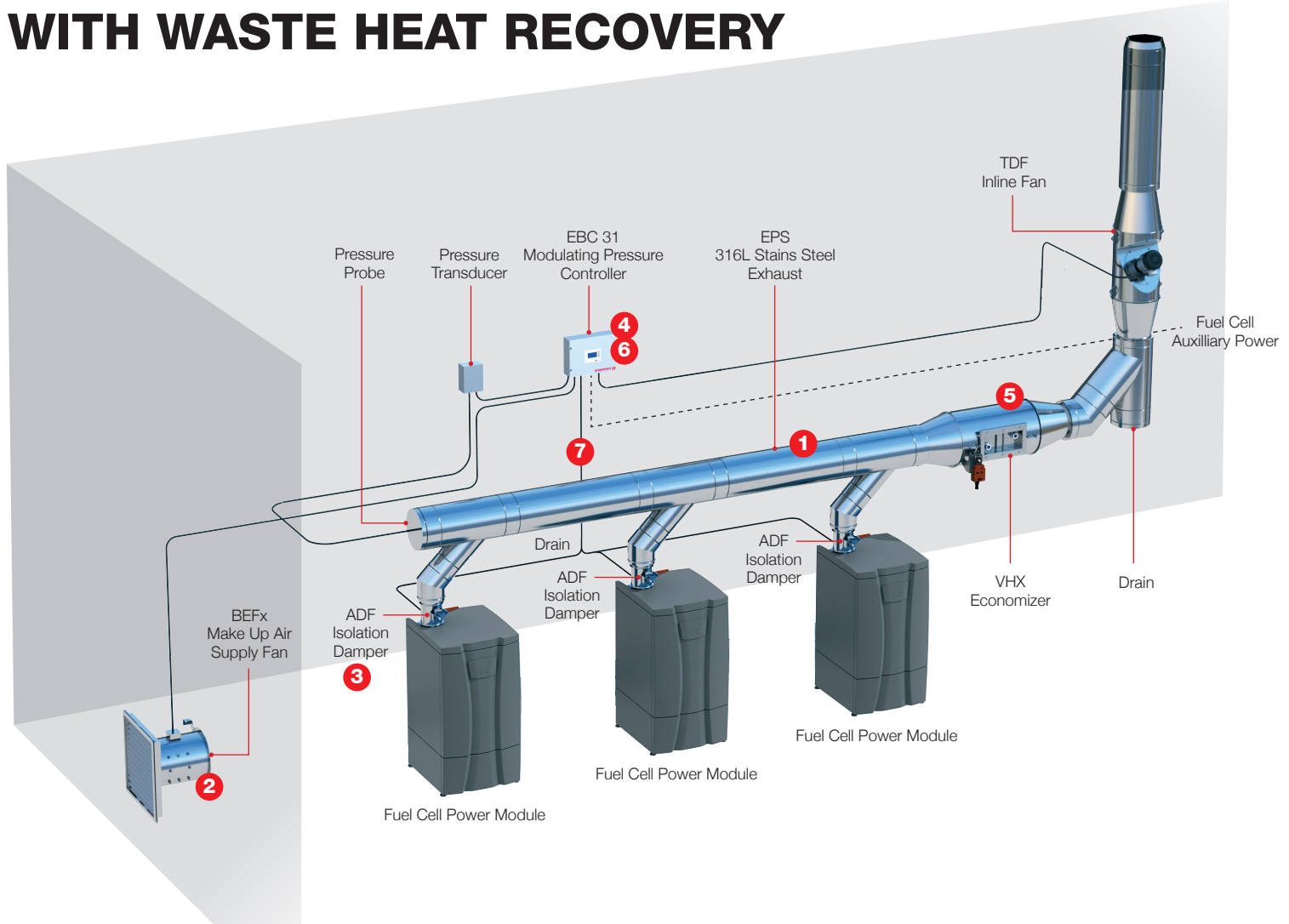
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## INNOVATION

ENERVEX is the single-most innovative manufacturer of exhaust system designs. We're not just rebranding existing designs; ENERVEX has a long list of industry firsts in the design of original exhaust products that have a purpose.

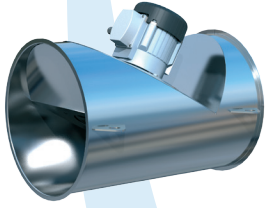
From the first chimney fan in 1958, the first modulating mechanical draft system in 1991, the first multi-purpose draft and pressure controller in 1998, the first true inline mechanical draft fan in 2006, the first multi-purpose chimney system in 2014, the first full-line mechanical draft fans with EC-motor technology (2015), the first BACnet and Modbus draft controllers (2016) and beyond – ENERVEX continues a history of creating authentic firsts.

# THE ANATOMY OF A FUEL CELL EXHAUST AND MAKE-UP AIR SUPPLY SYSTEM WITH WASTE HEAT RECOVERY



- 1** A stainless steel (316L) EPS Powerstack contains the flow of process exhaust and conveys it to the outdoors and drains the excess condensate. A variable speed TDF inline fan provides flow.
- 2** A variable speed BEF make-up air supply fan provides combustion and ventilation air to the mechanical room.
- 3** ADF isolation dampers serve as back-draft/balancing dampers for the fuel cell power modules and close off the exhaust when not in use.
- 4** An EBC 31 Modulating Pressure Controller controls the outlet pressure at the fuel cell power module outlets via a pressure differential transducer. The pressure can be set from  $-0.5$  inWC to  $+0.5$  inWC in  $0.01$  inWC increments. The pressure is maintained by TDF fan modulation controlled by the EBC 31. The EBC 31 also controls the supply of make-up and ventilation air. The room pressure versus outside pressure differential is monitored by a differential pressure sensor and the EBC 31 can maintain a positive or negative room pressure from  $-0.5$  inWC to  $+0.5$  inWC in  $0.01$  inWC increments. The pressure is maintained by BEF fan modulation controlled by the EBC 31.
- 5** Waste heat from the process exhaust flows through the VHX Economizer. Water flowing through the heat modules is heated by the waste heat and can be used for heating purposes.
- 6** The EBC 31 has a built-in BACnet protocol and web server and can communicate with a building management system or equivalent. It will also accept signals from a number of sensors (oxygen, temperature, pressure etc.) which can be conveyed to external monitors or shut down the fuel cell power modules for safety.
- 7** The fuel cell can provide start/stop signal to the EBC 31 for fan system activations.

# THE COMPONENTS



## TDF INLINE FAN

The TDF is ruggedly built true inline mechanical draft fan made entirely in stainless steel 316L. It uses an EC-motor and is supplied with a pre-programmed EDrive for motor speed control.

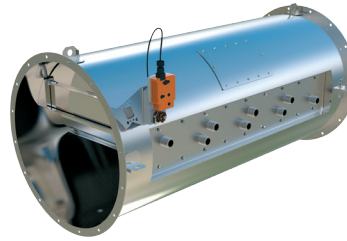
- 0-29,000 CFM (450-49,300 m3/h)
- ½" flanges or bolt-flanges
- Stainless Steel 316L Housing and Backward-curved Impeller
- EC-Motor, TEFC, Class H w/ insulated rotor/shaft system and stainless-steel shaft
- 1400°F (760°C)
- 2-Year Factory Warranty, 10-Year Warranty Against Corrosion Perforation
- UL 378, UL 705, CSA3-B255-M81, CSA C22.2 No. 113-12 Listings



## BEFX MAKE-UP AIR SUPPLY FAN

The BEF<sub>x</sub> is an insulated box ventilator made in aluminized steel with an aluminum backward inclined impeller. It uses an EC-motor and is supplied with a pre-programmed EDrive for motor speed control.

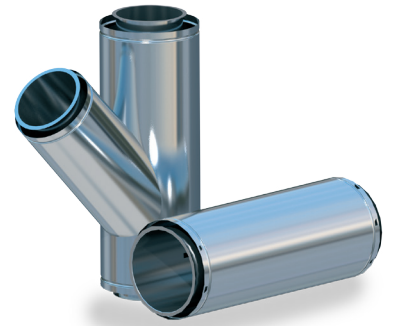
- 0-29,000 CFM (450-49,300 m3/h)
- Slip fittings
- EC-Motor, TEFC, Class H w/ insulated rotor/shaft system and stainless-steel shaft
- 2-Year Factory Warranty, 10-Year Warranty Against Corrosion Perforation
- UL 705, CSA C22.2 No. 113-12 Listings



## VHX ECONOMIZER

A versatile and highly efficient flue gas economizer for condensing and non-condensing applications. Has removable heat modules for easy inspection, cleaning and maintenance. Can be used in horizontal and vertical positions.

- 30+ sizes and configurations available
- Stainless steel 316L housing and heat modules
- Bolt-flange connections
- Heat module design
- Compact design/light weight
- Easy installation



## EPS POWERSTACK

A state-of-the-art chimney exhaust product designed to convey gases, fumes, smoke and products of combustion under negative, positive or neutral pressure. Available in single-wall or insulated double-wall designs

- 4" to 48" diameter
- Stainless steel 316L-PCM inner liner, stainless steel 304 outer jacket
- Easy assembly with ½" flanges, graphite gasket and U-Band assembly.
- UL listed to 1400°F (760°C)
- UL 103, 1738, 2561. ULC S635, S636. Complies with NFPA 54 and 211.



## EBC 31 PRESSURE CONTROLLER

The EBC 31 is a multi-use pressure controller used with fans to monitor and maintain a constant pressure by varying the speed of a fan(s).

- Controls exhaust fan and supply fan via individual PID loops.
- "Plug-n-Play" monitors all terminals and registers components attached
- 0-10V signal for EDrive control
- LCD Graphical Display
- Integrated webserver for remote monitoring, configuration and firmware upgrade
- USB interface
- Interlock with up to 6 fuel cells power modules
- Programmable operating range and bi-directional or uni-directional pressure sensing
- Integrated safety system with priority operation function
- Intermittent or continuous operation
- Integrated BACnet protocol

## WHY ENERVEX

Every ENERVEX solution is built from the ground up with careful evaluation of the unique cost variables and long-term savings. Through superior manufacturing innovation and decades of experience, we're delivering highest-quality, listed and certified exhaust solutions that are:

**ECONOMICAL.** Up to 10% fuel savings & 90% lower energy consumption - plus space, materials & labor savings.

**PLUG-AND-PLAY.** One-stop design offers seamless installation, flexibility & confidence that everything will fit together..

**SUSTAINABLE.** Low-energy installations with EC-motors; active participant of green building initiatives around the globe..

**AESTHETICALLY PLEASING.** Smaller footprint & design flexibility; put air louvers/terminations where you want.

**SAFE & RELIABLE.** Tested, listed and certified materials means no code problems from boiler outlet to chimney termination..

**GUARANTEED.** One supplier to call for the entire system, backed by the industry's only real 100% performance guarantee.