

ENERGY EFFICIENT

AIR COMFORT

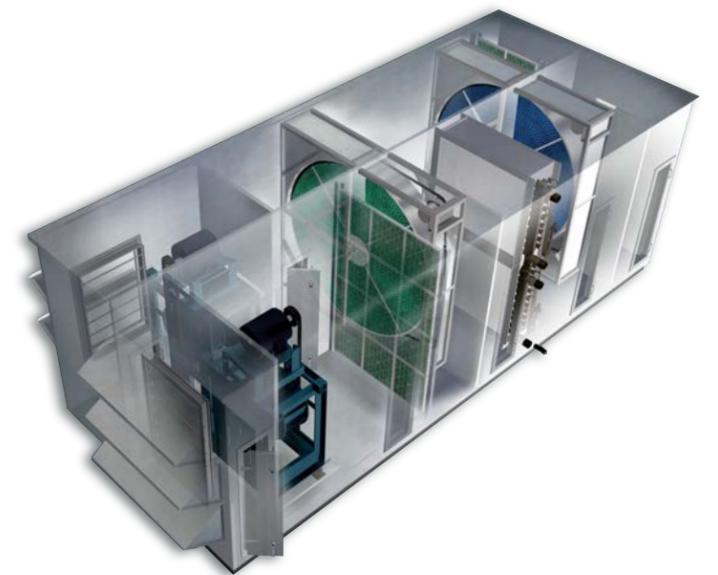
# EP SERIES

PACKAGED ENERGY RECOVERY SYSTEM





## THE EP SYSTEM: ULTIMATE PERFORMANCE IN TRANSFER OF TOTAL ENERGY



Certified total energy recovery performance (sensible and latent) up to 90% efficient.



Double-wall panel construction eliminates exposed insulation and associated risk of bacterial growth.



Airflow capacity ranges from 2,000 scfm to 70,000 scfm

The FläktGroup SEMCO EP packaged energy recovery system offers the ultimate performance in the transfer of total energy (both latent and sensible). Pre-engineered and factory assembled, the EP system also provides the air handling capability for the building's exhaust and supply air. The system can be selected to precondition outdoor air going to other conventional air handling systems or as an integrated system that provides total space conditioning with the additional heating and cooling options available.

The heart of this system is a technologically advanced True 3Å desiccant wheel. In addition to providing superior performance, the wheel's 3Å molecular sieve-desiccant coating is selective in what it adsorbs from an exhaust airstream. The desiccant rejects airborne contaminants while it transfers water vapor, thus providing total energy transfer from the exhaust to the

supply airstream. Selectivity allows True 3Å to be used in critical applications, including recovery from contaminated airstreams. In the past, energy recovery was avoided or limited to sensible-only energy exchange in applications like these.

The True 3Å wheel uses a fluted media with an aluminum substrate, which is coated with a fast-acting, adsorbent desiccant surface. As the transfer media slowly rotates between the outdoor and exhaust airstreams, the warmer air surrenders its sensible energy to the aluminum. This energy is then shifted to the cooler airstream during the second half of the revolution.

Just as the temperature is captured and released, so is the moisture. The True 3Å molecular sieve-desiccant

coating has an enormous internal surface area and strong attraction to water vapor. Since the opposing airstreams have different temperatures and moisture contents, the vapor pressure will also be different. This pressure difference is the driving force in the transferring of latent energy.

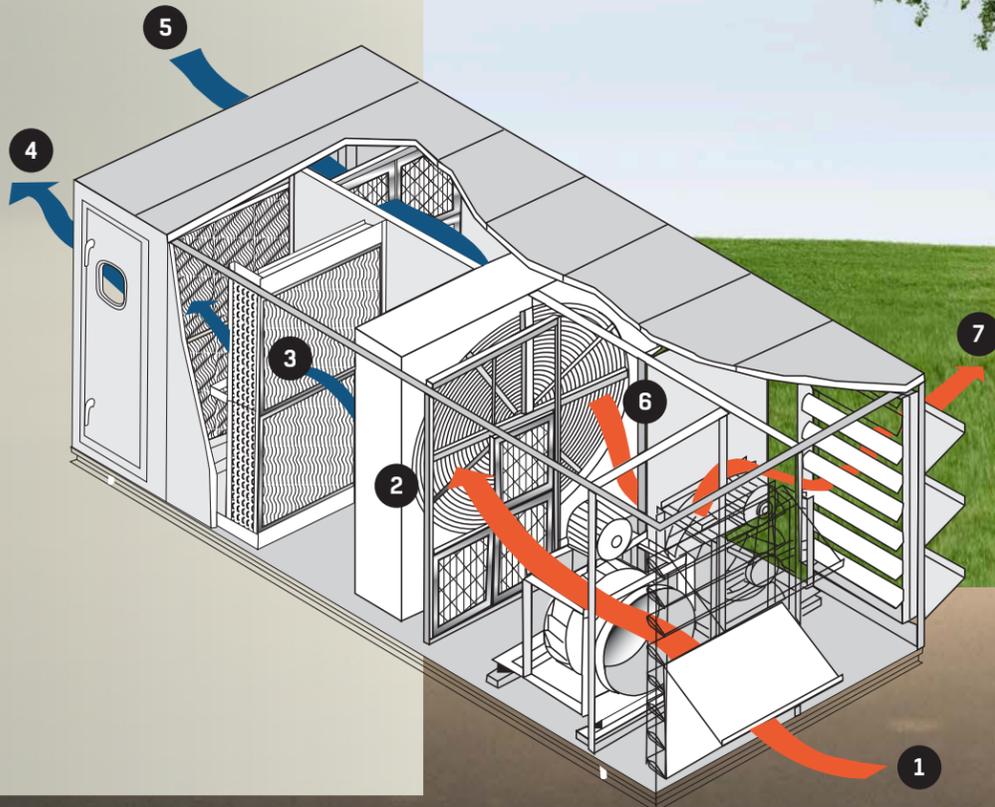
By using the desiccant coating, the True 3Å wheel recovers the moisture from the exhaust airstream to the supply airstream without the airborne pollutants exchanging. This very important and unique feature has been well documented through independent laboratory and field testing. (A copy of the Georgia Tech Research Institute study is available free of charge.)

# HOW IT WORKS

## COOLING SEASON AND HEATING SEASON

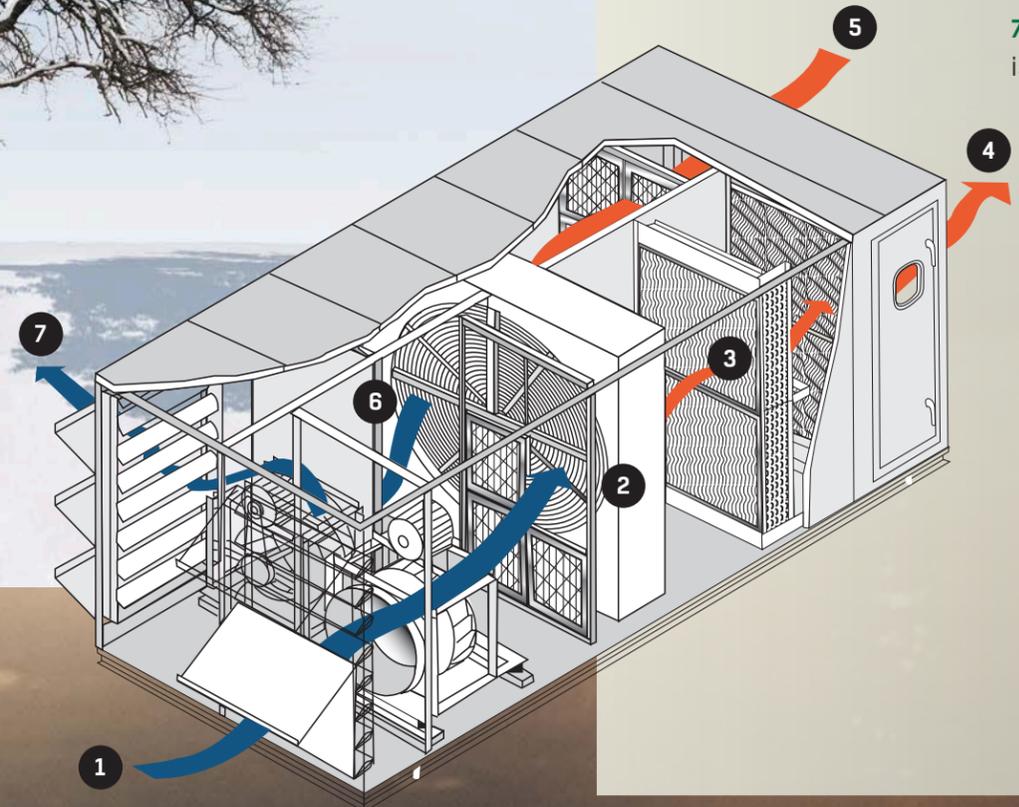
### EP: COOLING SEASON

- 1:** Hot, humid outside air is drawn in.
- 2:** Fresh air is blown in through the slowly rotating True 3Å wheel. The desiccant-coated fluted media captures heat and moisture from the supply side and transfers it to the exhaust side.
- 3:** The air can be further cooled or heated to space neutral conditions.
- 4:** The cooled and dehumidified air enters the HVAC system or is delivered directly to the occupied space.
- 5:** Cool, dry return air that is exhausted from the building enters the EP Total Energy Recovery System.
- 6:** As return air passes through the True 3Å wheel, it removes the heat and humidity captured by the wheel from the fresh air stream.
- 7:** Warm, humidified exhaust air is blown out.



### EP: HEATING SEASON

- 1:** Cold, dry outside air is drawn in.
- 2:** Fresh air is blown in through the slowly rotating True 3Å wheel. The desiccant-coated fluted media captures heat and moisture from the exhaust air and transfers it to the supply side.
- 3:** The air can be further cooled or heated to space neutral conditions.
- 4:** The warmed and humidified air enters the HVAC system or is delivered directly to the occupied space.
- 5:** Warm, humid return air that is exhausted from the building enters the EP Total Energy Recovery System.
- 6:** As return air passes through the True 3Å wheel, it captures the heat and moisture to be transferred back to the supply air.
- 7:** Cool, dry exhaust air is blown out.



# FEATURES & BENEFITS

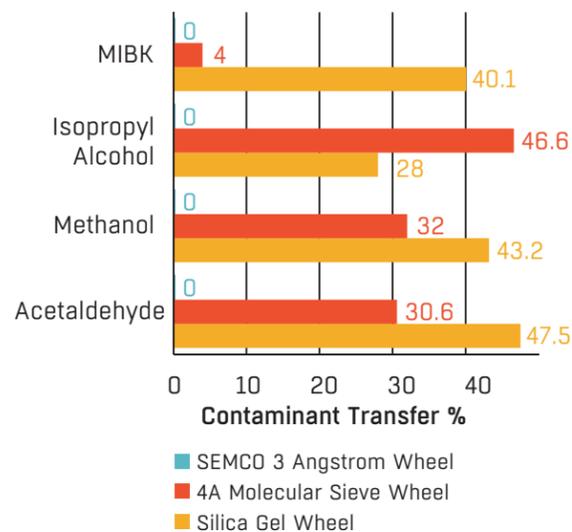
## EFFICIENCY STANDARD WITH OPTIONAL UPGRADES



### The True 3Å Total Energy Wheel

- Certified total energy recovery performance (sensible and latent) up to 90% efficient
- Patented 3Å molecular sieve-desiccant coating to avoid desiccant cross-contamination (see below)\*
- Wheel faces are coated to ensure long lasting corrosion protection
- Sensible-only wheel is polymer coated to avoid oxidation and future transferring of moisture
- All aluminum, structural spoke system eliminates mechanical fatigue and allows media replacement (sizes 13 and up)
- Non-wearing labyrinth seals (sizes 13 and up)

\*FläktGroup SEMCO pioneered an application of a 3 angstrom desiccant on wheels to improve indoor air quality in buildings by not transferring exhausted VOCs back into the fresh outdoor air.



Source: Georgia Tech Research Institute Independent Investigation. Bayer, Charlene W and Hendry, Robert. "The Importance of the Desiccant in Total Energy Wheel Cross-contamination."

### SEMCO Panel Systems

- Double-wall panel construction (2 inches thick with 18-gauge outer skin) eliminates exposed insulation and the associated risk of bacterial growth
- Double-wall removable panels provided for large internal components
- Gasketed double-wall access doors for all compartments
- Secondary roof of continuous standing-seam panels standard on units designed for outdoor installation
- Welded cabinet floor with integrated drain pan

### Supply and Exhaust Air Fans

- AMCA rated fans sized for quiet and efficient operation, backward inclined (up to 16 inches diameter) and airfoil (18 inches diameter and greater)
- Mounted, balanced, tested and internally isolated for vibration
- Motors are NEMA frame, high-efficiency with a 1.15 service factor

### Filter Sections

- Filters that are 30% (MERV 8) efficient are provided for the outdoor air and return airstreams
- Optional 65, 85 or 95% (MERV 11, 13, 14) cartridge filters can be provided in addition to standard 30% filters

### Hoods and Dampers

- Low-leakage motorized fresh air damper and gravity exhaust air damper
- Optional motorized exhaust damper available
- Outdoor units provided with an intake and exhaust hood with bird screen

### Electrical Package with Single Point Connection

- Power distribution panel with non-fused disconnect and branch circuit protection for each motor and transformer. Motors are wired to starters or VFDs.
- Custom control packages available
- 208 or 480V single-point connections available.

### Optional Variable Speed Wheel Control

- Digital reading of temperatures
- Proportional heating control
- Automatic summer/winter changeover

### Reheat Options

- Hot water coil
- Steam coil, non-freeze type
- Electric coil (requires a separate electrical connection point)

### Cooling Options

- Chilled water
- Direct expansion (DX) coil

### Key Benefits

- Standard, cataloged energy wheel products and wheel systems
- Independently certified wheel performance in accordance with ASHRAE Standard 84-91 and ARI Standard 1060 with regard to:
  - latent heat transfer efficiency
  - sensible heat transfer efficiency
  - pressure loss across wheel
- Equal latent and sensible heat transfer
- Highest performing wheel on the market
- Independently certified cross-contamination of less than 0.04%
- Field adjustable purge section
- Wheel media independently certified to pass NFPA 90A requirements for flame spread and smoke generation based upon ASTM E84 fire test method
- Reliable operation
- Minimal maintenance
- Over 20 years of successful installations
- Extended 3 and 5-year service contract available for wheel

FLÄKTGROUP SEMCO PACKAGED ENERGY RECOVERY SYSTEMS ARE AVAILABLE IN NINE CABINET SIZES RANGING IN AIRFLOW CAPACITY FROM 2,000 SCFM TO 40,000 SCFM.

# CONFIGURATIONS

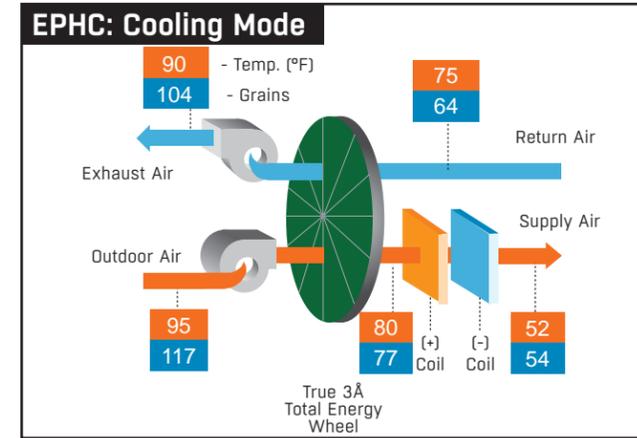
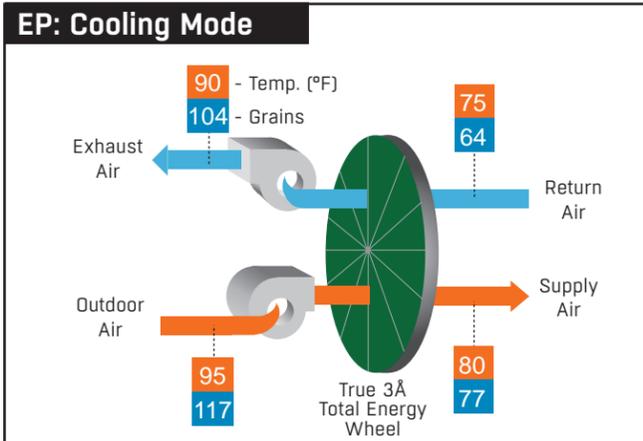
## MATCHING TECHNOLOGY WITH APPLICATION

	EP	EPH	EPC	EPHC	EPCH	EPD
New & Retrofit Projects	X	X	X	X	X	X
Indoor/Outdoor Mounting	X	X	X	X	X	X
Pre-cools and dehumidifies in cooling season	X	X	X	X	X	X
Pre-heats and humidifies in heating season	X	X	X	X	X	X
Can be used with central HVAC system	X	X	X	X	X	X
Applications needing high percentage of outdoor air		X	X	X	X	X
Applications needing 100% outdoor air		X	X	X		
Primary source for winter temperature control		X		X	X	X
Primary source for summer temperature control			X	X	X	X
Primary source for controlling supply air humidity			X	X	X	X
Various post heating sources available		X		X		
Various post cooling sources available			X	X		
Controls latent loads					X	
Integrated full cooling and re-heating					X	X
Provides a precise humidity controlled environment						X
Provides free re-heat						X

### EP

In addition to the SEMCO True 3Å energy recovery wheel, this dual-wall system contains backward curved supply and exhaust fans, outdoor air and return air filtration and an optional, full-electrical package with a single-point electrical connection. All EP family products are designed for either indoor or outdoor mounting.

- Precools and dehumidifies outdoor air during the cooling season.
- Preheats and pre-humidifies the outdoor air during the heating season.
- Supplies preconditioned outdoor air to conventional HVAC systems, allowing them to effectively increase outdoor air percentages.
- Preconditioned outdoor air can be introduced to the return air plenum serving a central HVAC system.
- It can also be supplied directly to the conditioned space since the system's recovery efficiency ranges between 74 and 85% (in balanced flow operation).



### EPH, EPC, EPHC

These products build on the EP product. However, unlike the EP, they integrate full heating and cooling options. The cooling options include either chilled water or DX cooling coils, with options regarding the number of fins per inch and the number of row options. The heating options include either hot water, steam or electric coils.

These configurations are applied to installations where there is a need for 100% outdoor air. The FläktGroup SEMCO system is the primary source for temperature and/or humidity control. This includes hospitals, manufacturing areas, laboratories and casinos. These products are also used to precondition buildings where the outdoor air goes directly to the space, but requires additional post heating or cooling to supplement what is being provided by the energy recovery wheel.

### EPD

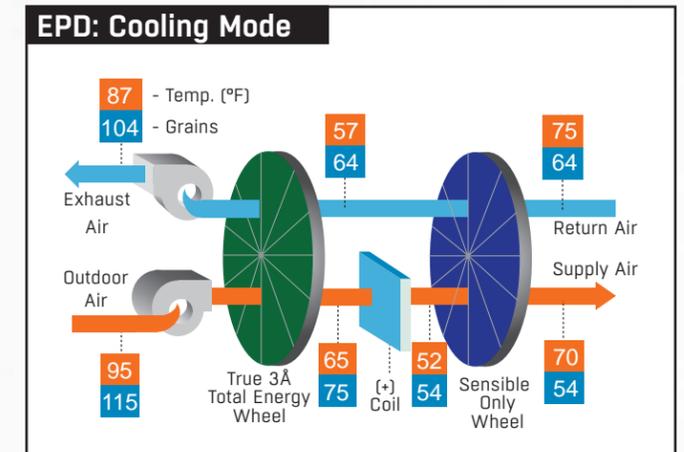
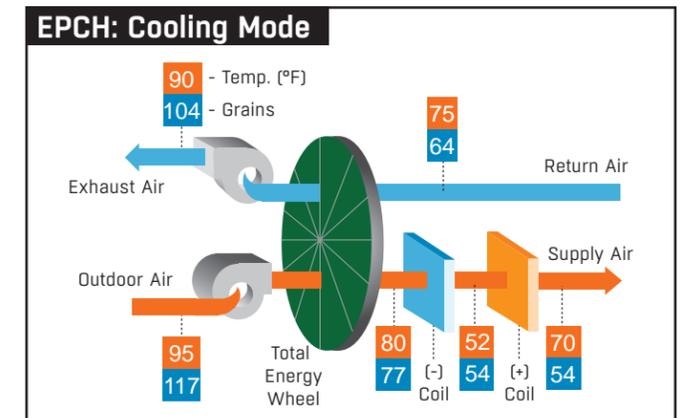
This product builds on the EP product but integrates full cooling for humidity control and a sensible energy wheel to provide free reheat. This dual-wall system contains a True 3Å energy recovery wheel, a sensible energy wheel, backward curved, supply and exhaust fans, outdoor air and return air filtration, cooling coil, limited capacity reheat coil and an optional full-electrical package including a single-point electrical connection. The EPD offers the same heating and cooling options as listed for the EPHC.

The applications for this product include buildings that need high percentages of outdoor air for a humidity controlled environment where the FläktGroup SEMCO system provides 45-55 grains of water/pound of dry air and a neutral temperature of 65-70 degrees to the space. This approach allows conventional HVAC systems to operate most efficiently by cycling on and off, while using all recirculated air and handling only sensible loads. Good applications for the EPD systems

### EPCH

This product builds on the EPHC product, integrating full heating and cooling options.

Applications for this product include buildings that need high percentages of outdoor air for a humidity controlled environment, where the FläktGroup SEMCO system is the primary source. This product may be the sole source for temperature and humidity control. It also handles primarily latent loads by over-drying the outdoor air with the cooling coil and then reheating to a temperature that is comfortable to the occupants.



# ENERGY-SAVINGS SYSTEM



At FläktGroup SEMCO, we design products that fit together to maximize indoor air quality and energy efficiency. When specified with a FläktGroup SEMCO chilled beam system and efficient NEUTON pump modules, the EP series can produce even greater savings.

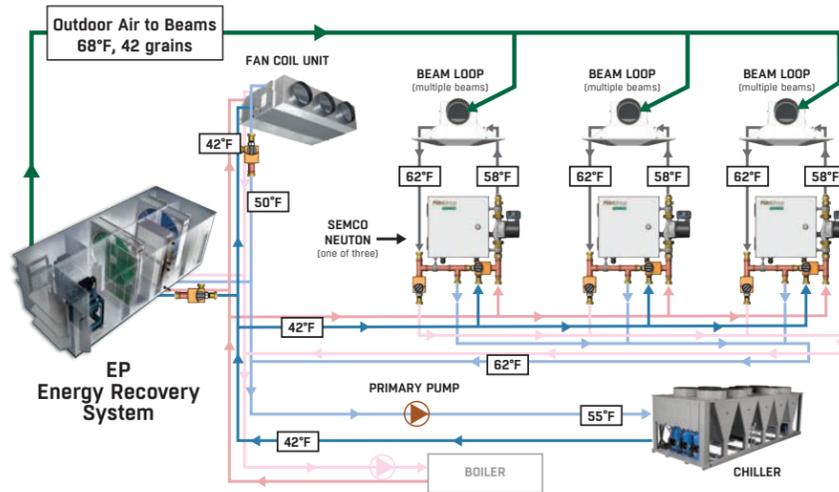
## IQHC ACTIVE CHILLED BEAM

- Industry best capacity to energy consumption ratio
- Utilizes the lowest air and water pressure to enhance the overall energy benefit of chilled beams
- Universal duct and water connections for easy to installation
- Superior indoor air quality and energy efficiency.

## NEUTON™ CONTROLLED CHILLED BEAM PUMP MODULE

- Reduces cost of a chilled beam installation by 30% or more by allowing for smaller pipe diameters, fittings, and fewer feet of pipe
- Cuts the amount of zone piping and fittings in half
- Reduces beam loop pump energy by up to 90% - high efficiency, variable speed pump uses a fraction of the energy used by traditional pump loops

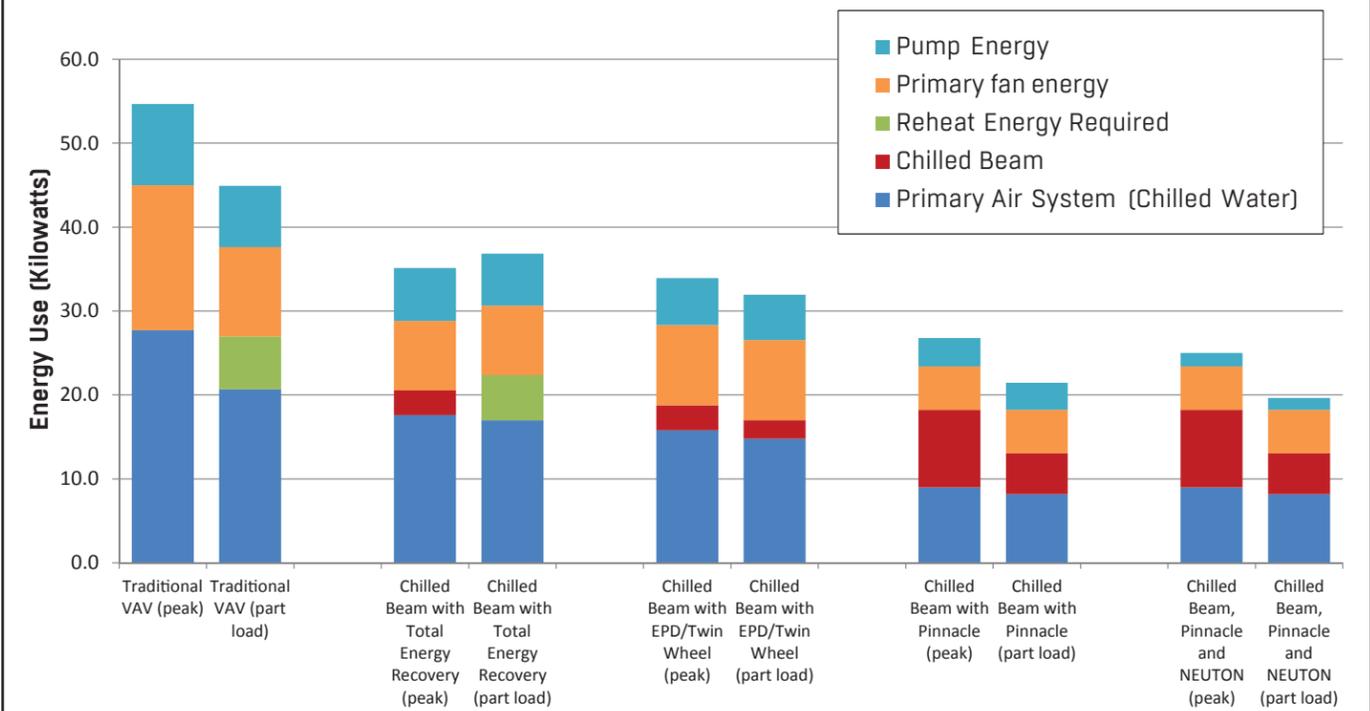
## EP SYSTEM IN COOLING MODE



“Most chilled beam manufacturers don’t make DOAS units. A manufacturer making both the active chilled beams and the outdoor air unit to supply them dehumidified air was integral for synergy and purposes of single source responsibility.”

- Scott Mazo, principal, University Partnership Associates, Philadelphia, which developed the first Pre-Certified LEED Platinum building in Philadelphia, 2.0 University Place

## VAV (No Humidity Control) vs. Chilled Beam Systems (Humidity Controlled) Energy Used During Cooling Mode: Typical Office



# APPLICATIONS

DATA CENTERS - HOSPITALS - UNIVERSITIES - CLASSROOMS - HOTELS - CASINOS - LABORATORIES - MANUFACTURING - OFFICE BUILDINGS - RETAIL - NURSING HOMES - DORMITORIES - AND MORE



## EXCELLENCE IN SOLUTIONS

WWW.SEMCOHVAC.COM / EP / 20220903

FläktGroup SEMCO delivers smart and energy efficient Indoor Air and Critical Air solutions to support every application area. We offer our customers innovative technologies, high quality and outstanding performance supported by more than fifty years of accumulated industry experience. The widest product range in the market, and strong market presence in 65 countries worldwide, guarantee that we are always by your side, ready to deliver Excellence in Solutions.

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