

SUPERIOR IAQ

LOW FIRST COST

3fficiency™

ENERGY EFFICIENCY WITH
SUPERIOR INDOOR AIR QUALITY



3fficiency™

PINNACLE + NEUTON + CHILLED BEAMS



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Pinnacle manages 100% of a building's ventilation and indoor humidity load in a single package



Chilled beams have no filters or drain pans meaning less maintenance



System reduces airflow by 50% or more saving motor horsepower



NEUTON pump has active condensation prevention, zone level control and cost savings on pipe and installation



Acknowledged as one of the **Top 10 Green Building Products** for 2018 by Building Green, 3fficiency has been receiving industry recognition for providing an energy-efficient, easy-to-specify integrated system. 3fficiency improves upon a traditional chilled beam design by reducing piping and simplifying building controls.

The three components included in the system package are:

- Pinnacle® Dedicated Outside Air System (DOAS),
- NEUTON™ Chilled Beam Pump Module, and
- SEMCO Active Chilled Beam line.

The NEUTON pump module manages the water system to allow for a building level occupant control that is superior to all other systems. Standard chiller water temperatures can be utilized throughout the building while maintaining the water temperature delta. This will provide for a more efficient and stable central plant operation. Further, this will reduce the pipe size compared to traditional systems that create a separate loop for chilled beam systems. This is especially nice on district cooling or campus loop systems to minimize temperature fluctuations.



A BETTER ALTERNATIVE TO VRF: EXCHANGING REFRIGERANT FOR WATER



Starting from the occupant level and working its way outdoors, 3fficiency looks at any application the same way, making it simpler to specify. The only difference when designing a classroom, hotel, dorm, nursing home, laboratory, library, or office is the percentage of outside air is required, which will vary based the number of occupants in the space. 3fficiency can be adjusted to suit the application and the amount of outdoor air required.

All controls for the building are handled except for chiller operation, boiler operation and the front end. These items can be provided by FläktGroup SEMCO, if desired. This greatly reduces the ATC/BAS requirement for a system.

Low temperature hot water is required so a condensing boiler can be used. More importantly, 3fficiency is a safe and effective alternative to Variable Refrigerant Flow (VRF) and provides even more savings through the use of a water to water chiller and using the condenser water as the hot water for the system. No more concerns with ASHRAE 15, refrigerant leaks, or large electrical wire runs. A whole building Variable **WATER** Flow System!

BENEFITS FOR ALL

Owners

- Very Energy Efficient
- Superior Indoor Air Quality
- Low Maintenance
- Competitive 1st Cost

Occupants

- Healthiest Environment
- Extremely Quiet
- Best Temperature/Humidity Comfort

Consultants

- Simple 7 Step Approach
- Repeatable Layout
- Safe and Conservative
- Acclaimed Design

Contractors

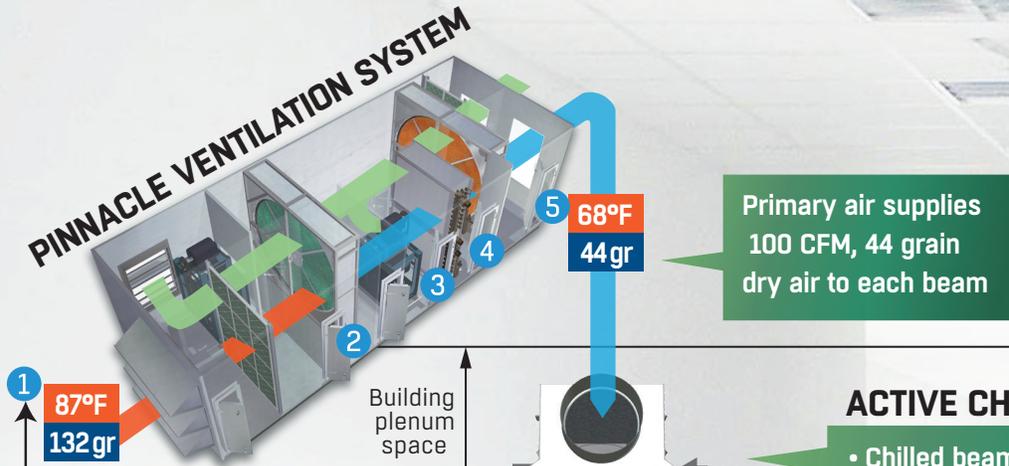
- Easy to Install
- Eliminates Cost (No Drain and Less Piping)
- Field Selectable
- Differentiator

Performance Contractors

- An HVAC System With The Shortest Life Cycle Cost and Superior Benefits

SYSTEM CONFIGURATION

PINNACLE VENTILATION SYSTEM



ACTIVE CHILLED BEAMS

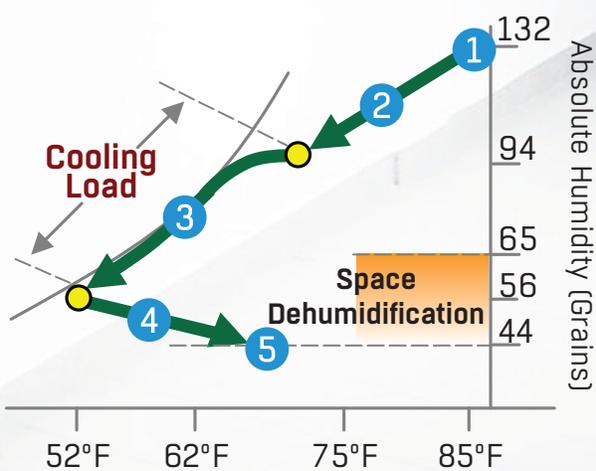
- Chilled beam 4x PA CFM
- Ductwork 50% Smaller
- Reduced plenum height

Serve the beams with conventional chilled/hot water temperatures – no more need for centralized secondary loops for chilled beams.

NEUTON PUMP MODULE

Active condensation control system effectively eliminates condensation concerns, reduces chilled beam install costs, and saves energy.

- 1 OUTDOOR AIR
- 2 ENTHALPY WHEEL SAVINGS
- 3 COOLING COIL
- 4 PD WHEEL SAVINGS
- 5 SUPPLY CONDITION

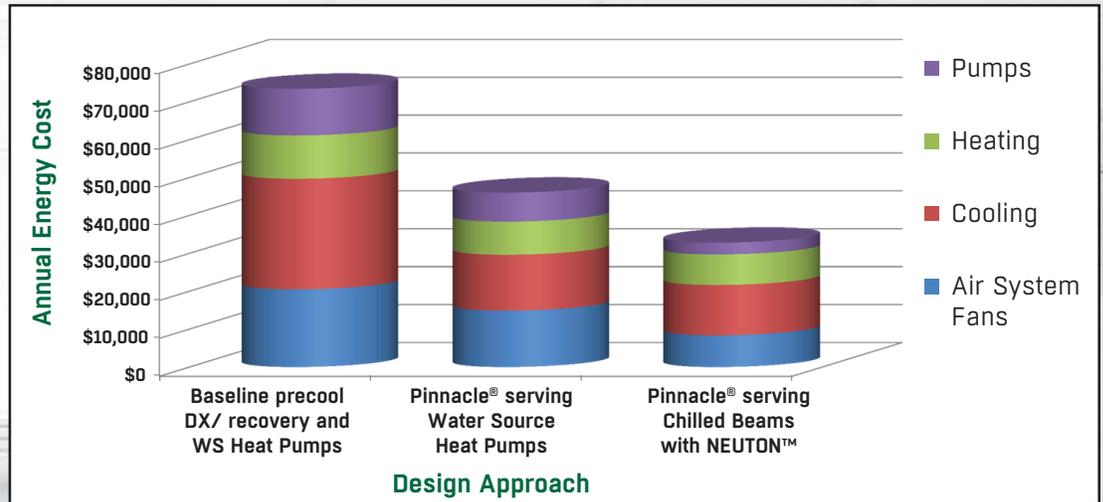


3fficiency™

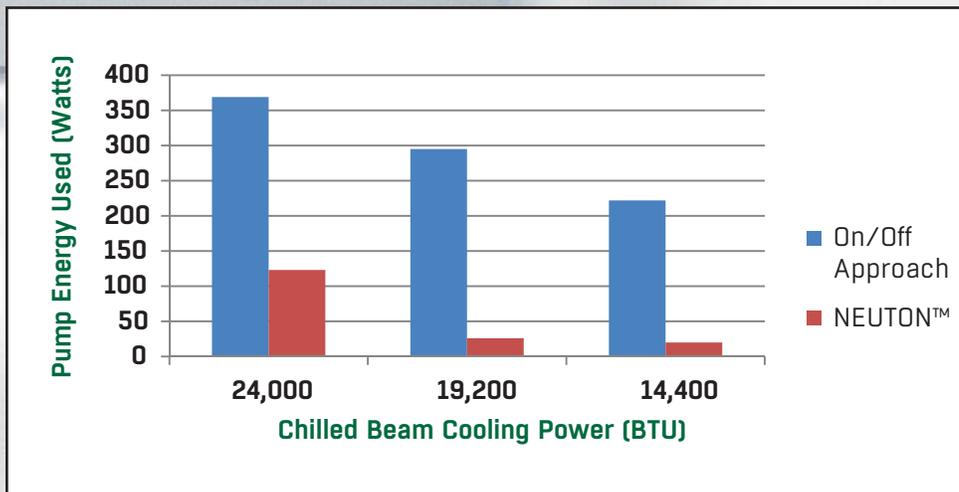
PINNACLE + NEUTON + CHILLED BEAMS

ENERGY SAVINGS

Energy modeling completed for an actual High School project comparing three design approaches which highlights the significant fan and pump energy savings offered by the Pinnacle, chilled beam and NEUTON combination.



Standard efficiency pump (on/off) vs. high efficiency ECM variable speed pump served by the NEUTON pump module control logic



Variable flow using high efficiency pump vs. conventional approach shown graphically

A high-efficiency ECM motor combined with substantial power reduction offered by the NEUTON variable flow pump results in significant energy savings over a traditional, constant flow – on/off design approach.

- Three cooling conditions are analyzed above: peak coil cooling power (24,000 BTUs), 80% of peak (19,200 BTUs) and 60% of peak (14,400 BTUs).

- The constant speed pump operates to deliver a constant flow of 6 gpm at a 13 foot pressure head – cycled on and off during part load.
- The NEUTON ECM variable flow pump runs continuously, but varies the flow from 6 gpm down to 3 gpm, greatly reducing the pump energy used.

Results: 3fficiency uses an average of 70% less pump energy to achieve better comfort than traditional equipment



STANDARD FEATURES

Pinnacle Ventilation System:

- True 3Å Wheel
- Passive Dehumidification Wheel
- Chilled Water/DX
- Hot water, Steam, Gas, Electric Heat
- Plenum fans
- Single point Electric
- Variety of Filtration



Chilled Beams:

- Field selectable duct connection
- Adjustable slot for induction control
- Flow pattern control
- High capacity 2 pipe dual temp coil
- Easy access coil
- No need for filters
- No need for drains



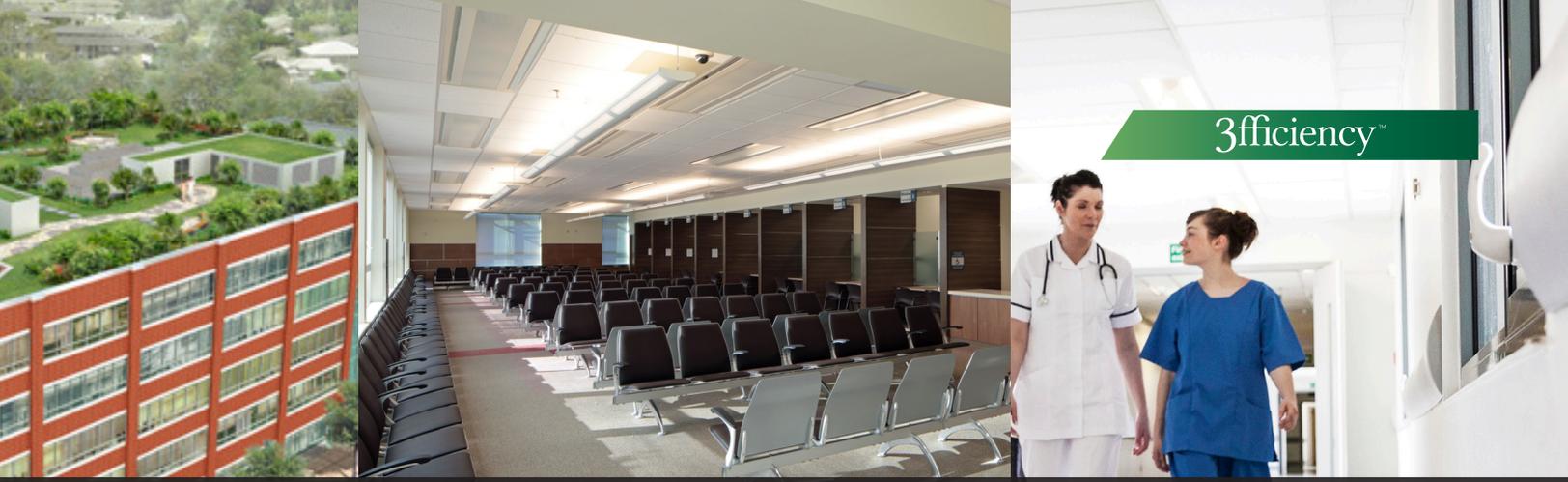
LYRA II CHILLED BEAM



NEUTON:

- Multiple piping configurations
- 208/230 volt 1 phase
- Single EC pump
- Isolation valves
- Actuated Blend Valve(s)
- Small footprint
- Horizontal/Vertical Installation



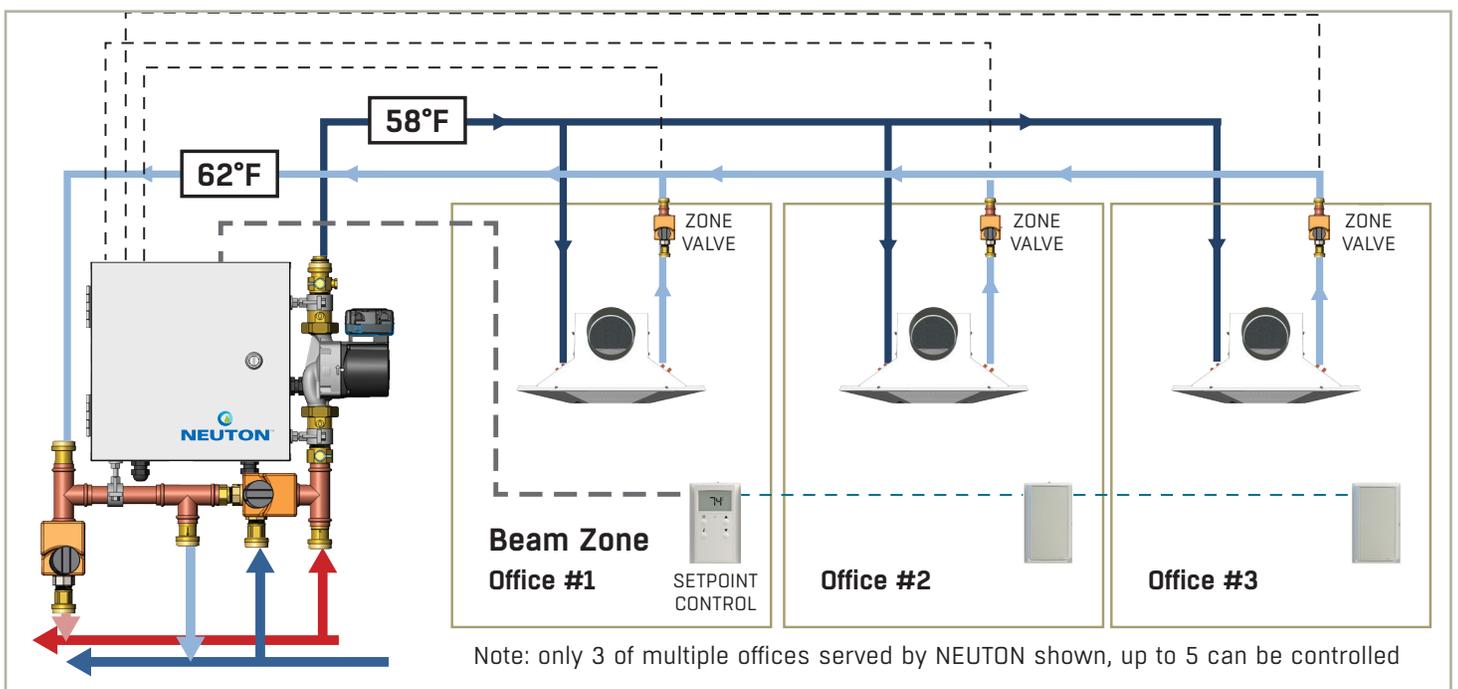


SYSTEM CONFIGURATION

Feature set includes:

1. The outside air portion of the system will be treated by a Pinnacle
2. Each zone has a combination of:
 - A chilled beam
 - Diffuser
 - Return grill
 - Temp and humidity sensor
 - Optional 2-way valve (if multiple zones are required)
3. Each 1-5 zones will have a NEUTON (See below)
4. Controls are all native Bacnet

Example - NEUTON applied to serve multiple offices with one device



EXCELLENCE IN SOLUTIONS

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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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