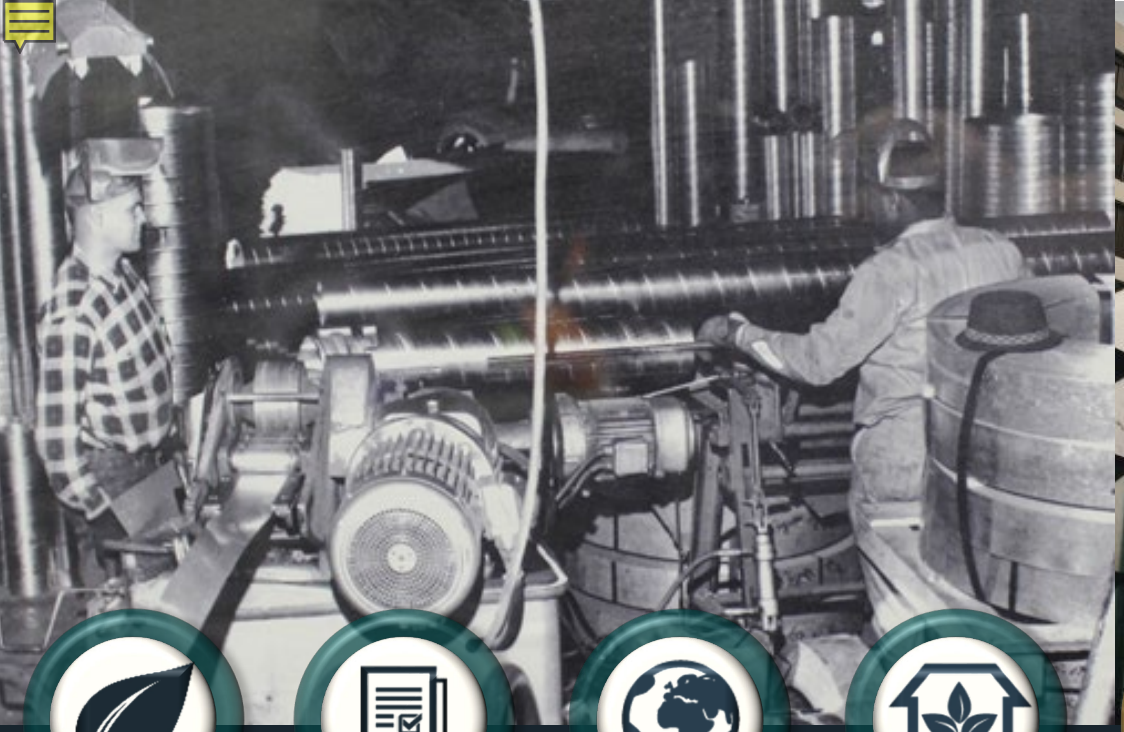
3fficiency™

PINNACLE + NEUTON + CHILLED BEAMS

Corporate Overview

FläktGroup
SEMCO







Energy & Environmental Focus

Patented & Certified Products

U.S & Global Footprint

Engineered Air Quality & Data Center Solutions

Engineered Air Distribution & Sound Solutions

OEM, Key Account & Sales Rep Route To Market

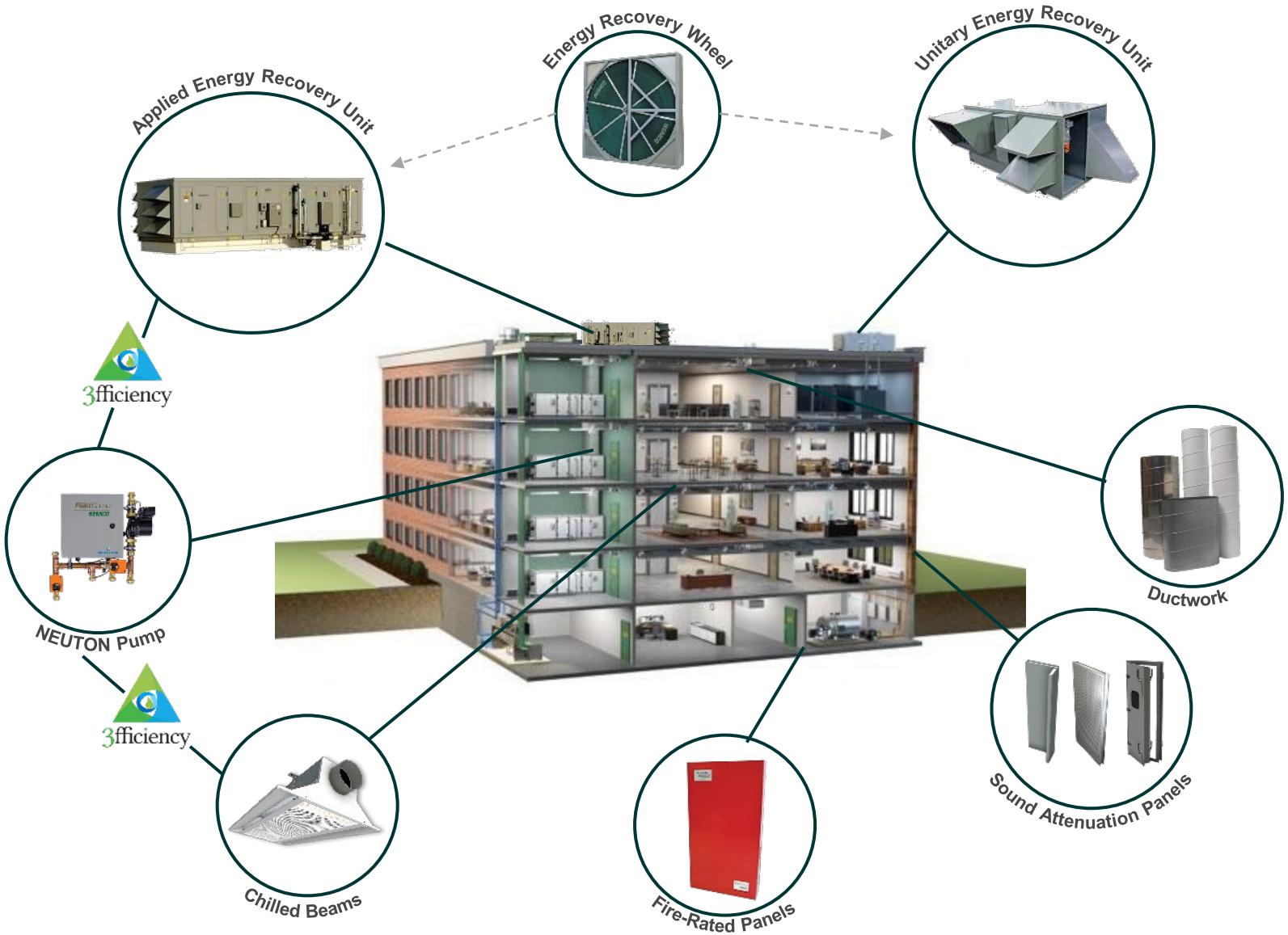
Service & Support

Award Winning & Industry Recognized

Who we are & what we do

FläktGroup SEMCO

FläktGroup SEMCO Products For Commercial Applications



Education



Offices



Healthcare & Labs



Manufacturing & Automotive



Public Buildings & Entertainment



Sports Facilities



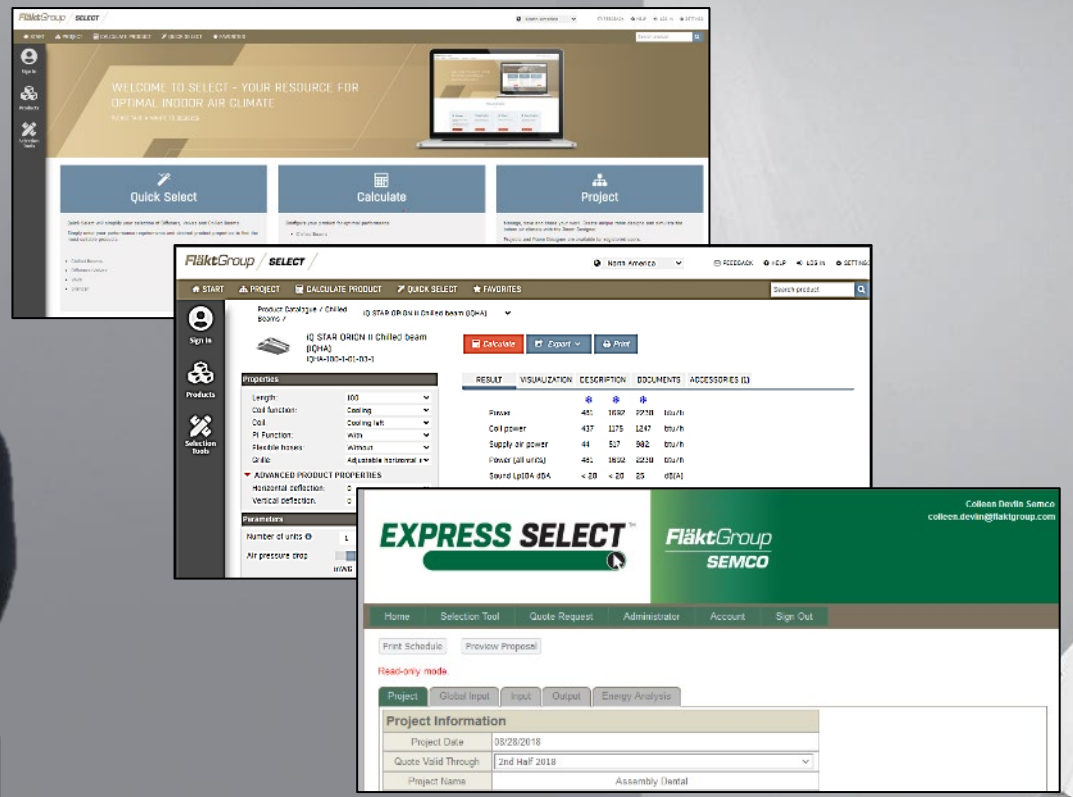
Datacenters



EXCELLENCE IN SOLUTIONS

FläktGroup SEMCO Superior Sales Support & Service









3fficiency® Elements

What is 3fficiency®?

FläktGroup SEMCO

EXCELLENCE IN SOLUTIONS

CHALLENGE:

Build a fully integrated, energy efficient system that exceeds indoor air quality expectations.

SOLUTION:

The highly energy efficient 3fficiency® system:

- controls humidity
- removes contaminants
- delivers individual room comfort, and
- provides a better alternative to variable refrigerant flow.

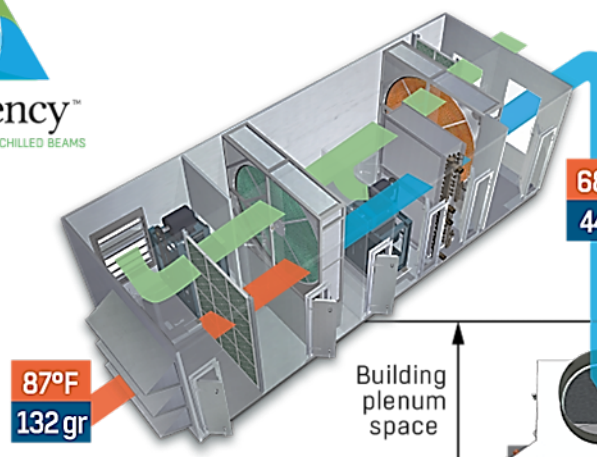
3fficiency components are:

1. The Pinnacle ® Energy Recovery Dedicated Outdoor Air System (DOAS)
2. The Neuton Pump Module, and
3. Any FläktGroup Chilled Beams



How it Works- 3 Elements of 3fficiency

3fficiency
PINNACLE + NEUTON + CHILLED BEAMS



1. PINNACLE® VENTILATION SYSTEM

Provides heating and/or cooling as well as dehumidification

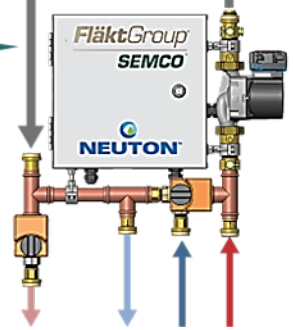
2. ACTIVE CHILLED BEAMS

Quietly and evenly distributes the air to the space

62°F 58°F

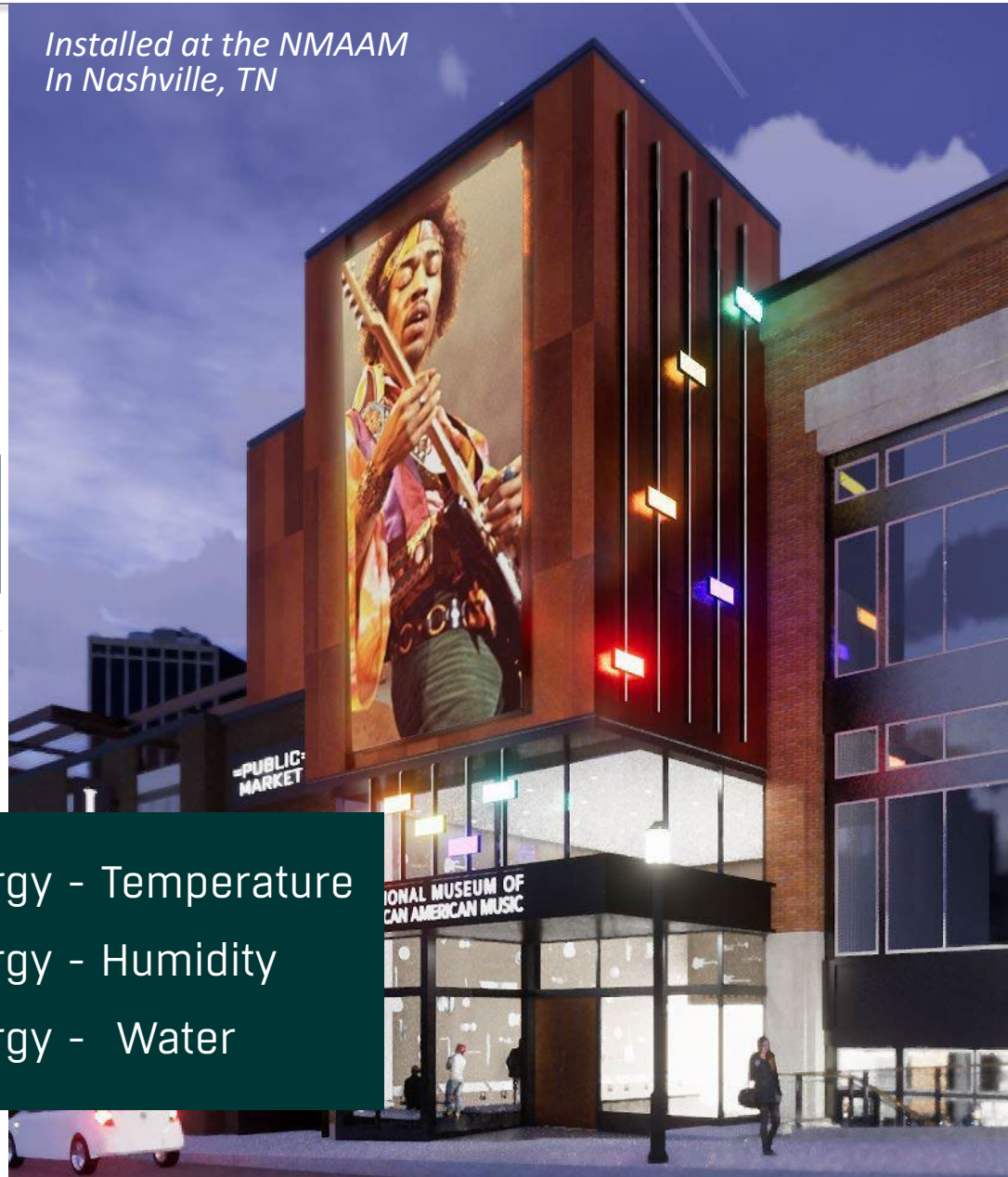
3. NEUTON® PUMP MODULE

Provides condensation control, saves on install costs & energy



- Saves on Energy - Temperature
- Saves on Energy - Humidity
- Saves on Energy - Water

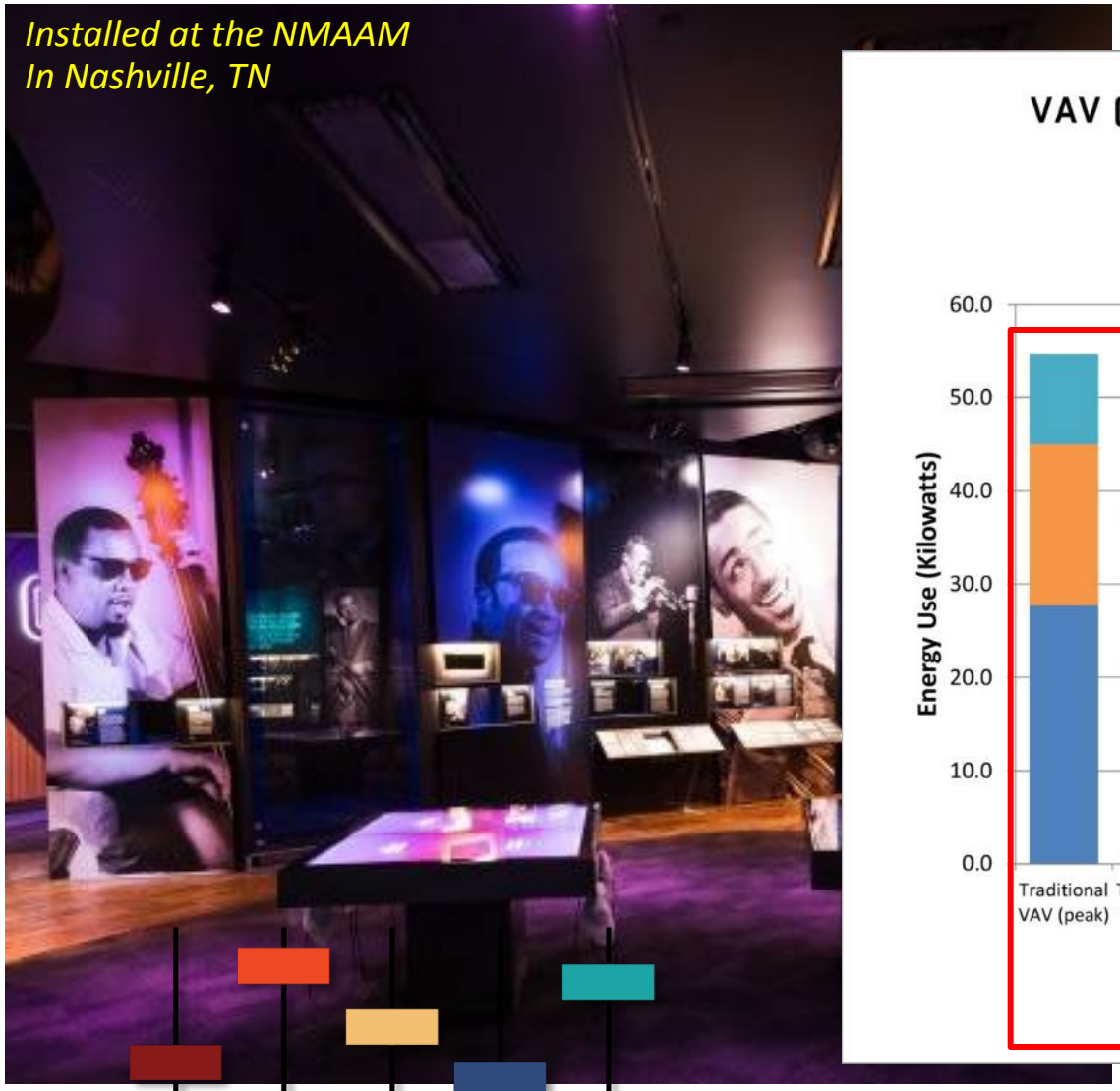
Installed at the NMAAM In Nashville, TN

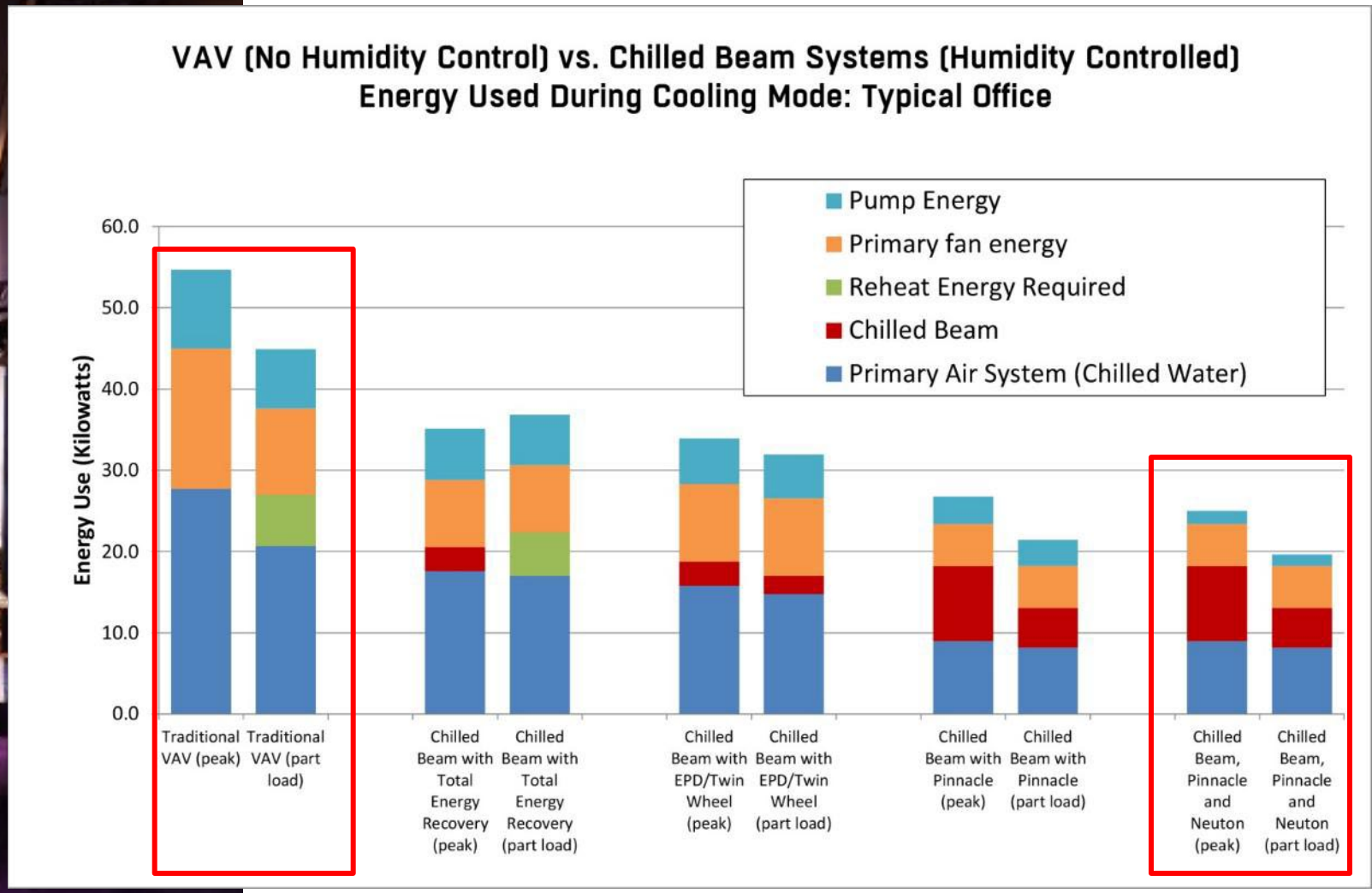


3fficeincy Energy Savings Results

FläktGroup SEMCO

EXCELLENCE IN SOLUTIONS





Each 3fficinecy component is designed to save energy,
but together they are extremely effective.

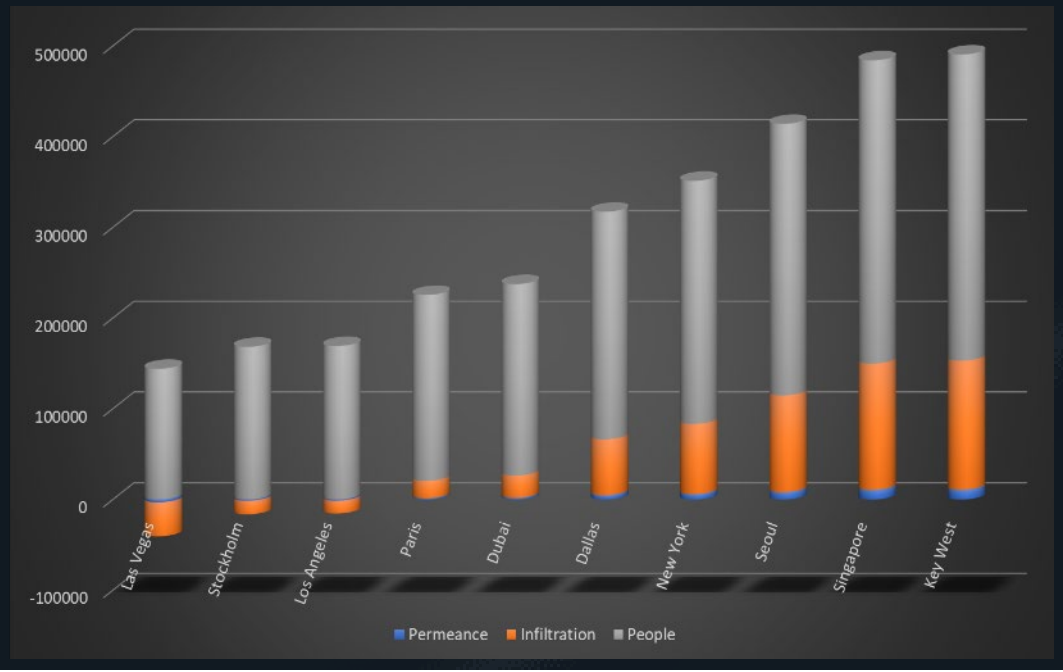
Taking a step back

What 4 Components Determine Primary Air Flow?

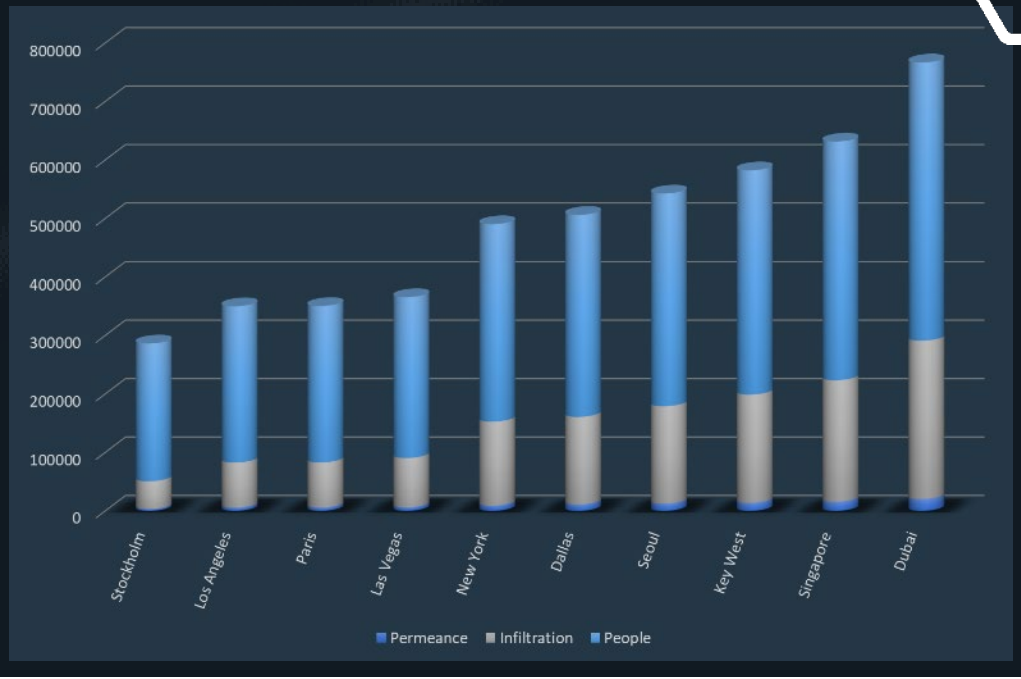
1. ASHRAE 62 minimum ventilation requirement
2. Minimum to satisfy space latent load
3. Minimum to satisfy space sensible load
4. Make-up air requirement- laboratory, kitchen exhaust make-up, etc.

Regardless of Location, Controlling Space Humidity Is Relevant to Achieving Desired Comfort

Based on 0.04% ASHRAE Peak
DRY BULB Design

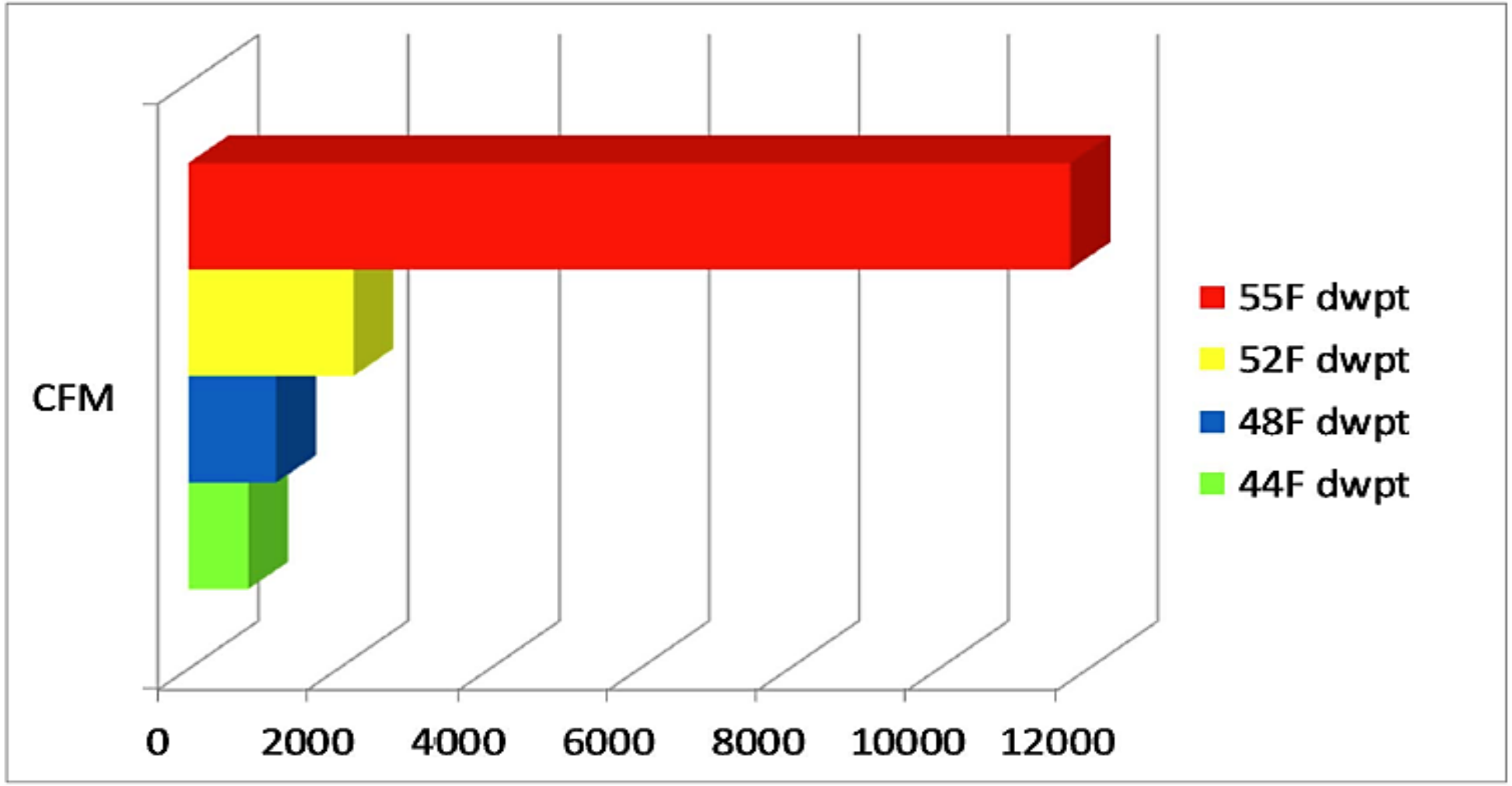


Based on 0.04% ASHRAE Peak
DEWPOINT Design



Effect of Lower Dew Point on Primary Airflow

Maintaining space @ 75F dry bulb / 50% RH. Based on 3-ton space latent load

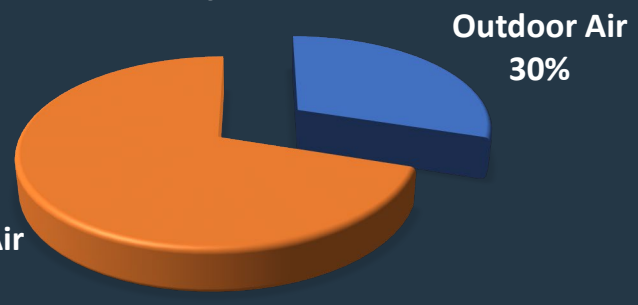


EXCELLENCE IN SOLUTIONS

How Occupancy Impacts Primary Air

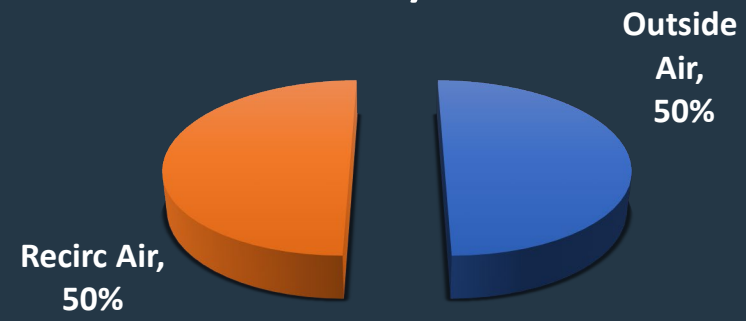
VAV OFFICE (LOW OCCUPANCY)

10K CFM



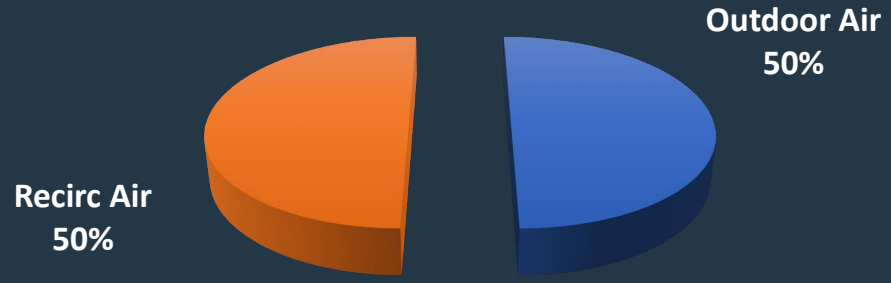
VAV SCHOOL (HIGH OCCUPANCY)

10K CFM



PVS/CHILLED BEAM OFFICE (LOW OCCUPANCY)

6K CFM



PVS/CHILLED BEAM SCHOOL (HIGH OCCUPANCY)

5K CFM



A well-designed chilled beam system requires 1/2 to 1/3 of the primary airflow of a traditional VAV system

EXCELLENCE IN SOLUTIONS

1. Pinnacle® Series Dedicated Outdoor Air System

FläktGroup SEMCO

CHALLENGE: Address temperature, outdoor air humidity and contaminants.



SOLUTION: The Pinnacle Series dehumidifies and eliminates contaminants.

EXCELLENCE IN SOLUTIONS

Containments Results

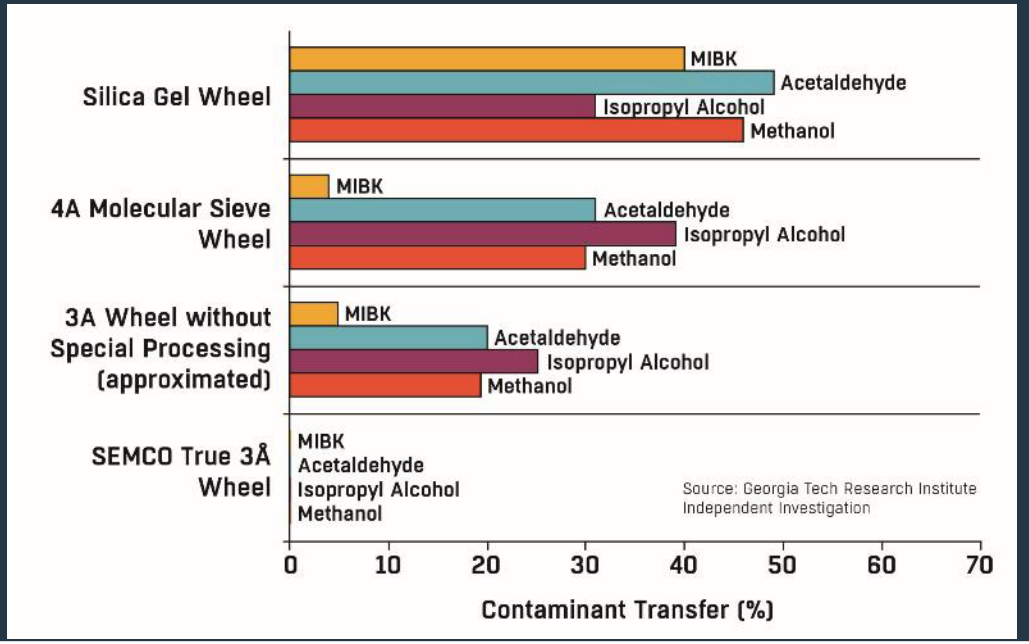


Electron microscopic image of a 3Å molecular sieve

CHALLENGE: Clean the air of contaminants.

SOLUTION: The Pinnacle Series eliminates contaminant

- The Pinnacle brings in large amounts of fresh air into your building.
- Air is passed through the True 3Å energy recovery wheel which has a 3 Ångstrom desiccant molecular-sieve that limits contaminant carry-over to less than .045%.



EXCELLENCE IN SOLUTIONS

2. Active Chilled Beams

CHALLENGE: Quiet, even, individualized room comfort for occupants

SOLUTION: Leverage a chilled beam in lieu of a fan coil for a quiet, low temperature gradient that does not have areas of uneven air dissemination.



FULLY MIXED AIR
Low-temperature gradient



LOW NOISE
No fan in Chilled Beams



FRESH AIR
Right humidity & temperature

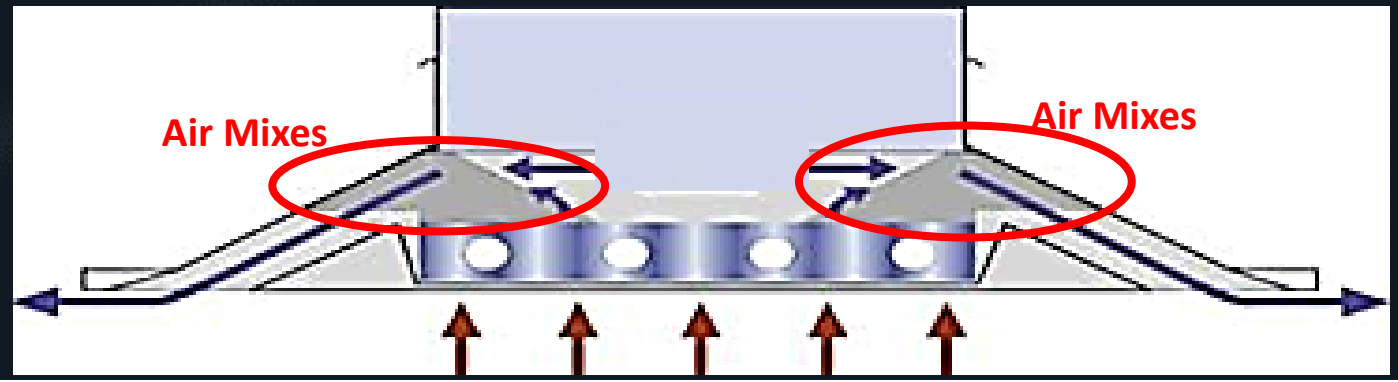


EVEN AIR DISSEMINATION
No pockets of concentrated air

EXCELLENCE IN SOLUTIONS

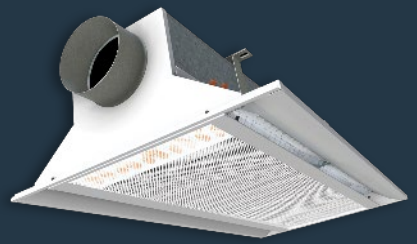
Active Chilled Beam- How it Works

- Fresh outdoor air via Pinnacle
- Uses the Coanda Effect
- Water coils adjust the individual temperature of the room
- No fans, drip pans, filters required for energy efficiency and minimal maintenance.
- Ideal for hotels, dorms, and education classrooms.
- Technology available since 1996



FläktGroup SEMCO Chilled Beam Solutions

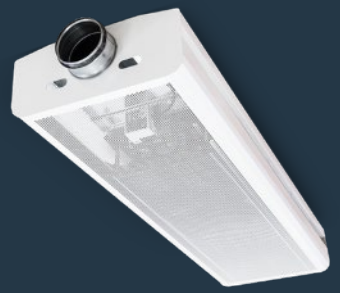
EXCELLENCE IN SOLUTIONS



JUNO IQHC
Highest cooling with lowest air & water pressure drop



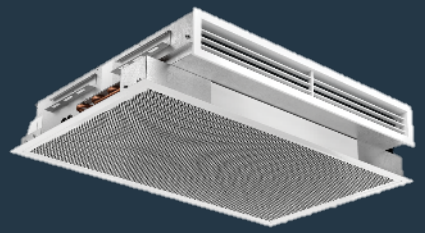
LYRA II IQCC
Low noise level with high flexibility & high cooling capacity- 4 Way Throw



NOVA II IQFI
Exposed active chilled beam suitable for many ductwork system types



AURORA IQSA
Narrow 1-foot-wide active beam for ceiling mount



ORION II IQHA
For bulkhead applications. Very low noise level – perfect for hotel & hospital rooms



NEUTON
Active condensation control for chilled beams

2. Neuton® Pump Module

EXCELLENCE IN SOLUTIONS

AHR EXPO INNOVATION AWARDS 2016 WINNER

2017 DEALER DESIGN AWARDS theNEWS | SILVER

SCHOOL Planning & Management NEW PRODUCT AWARD 2016

COLLEGE Planning & Management NEW PRODUCT AWARD 2016



CHALLENGE:

How to keep chilled beams from forming condensation and saving on the overall job in both piping and energy.

SOLUTION:

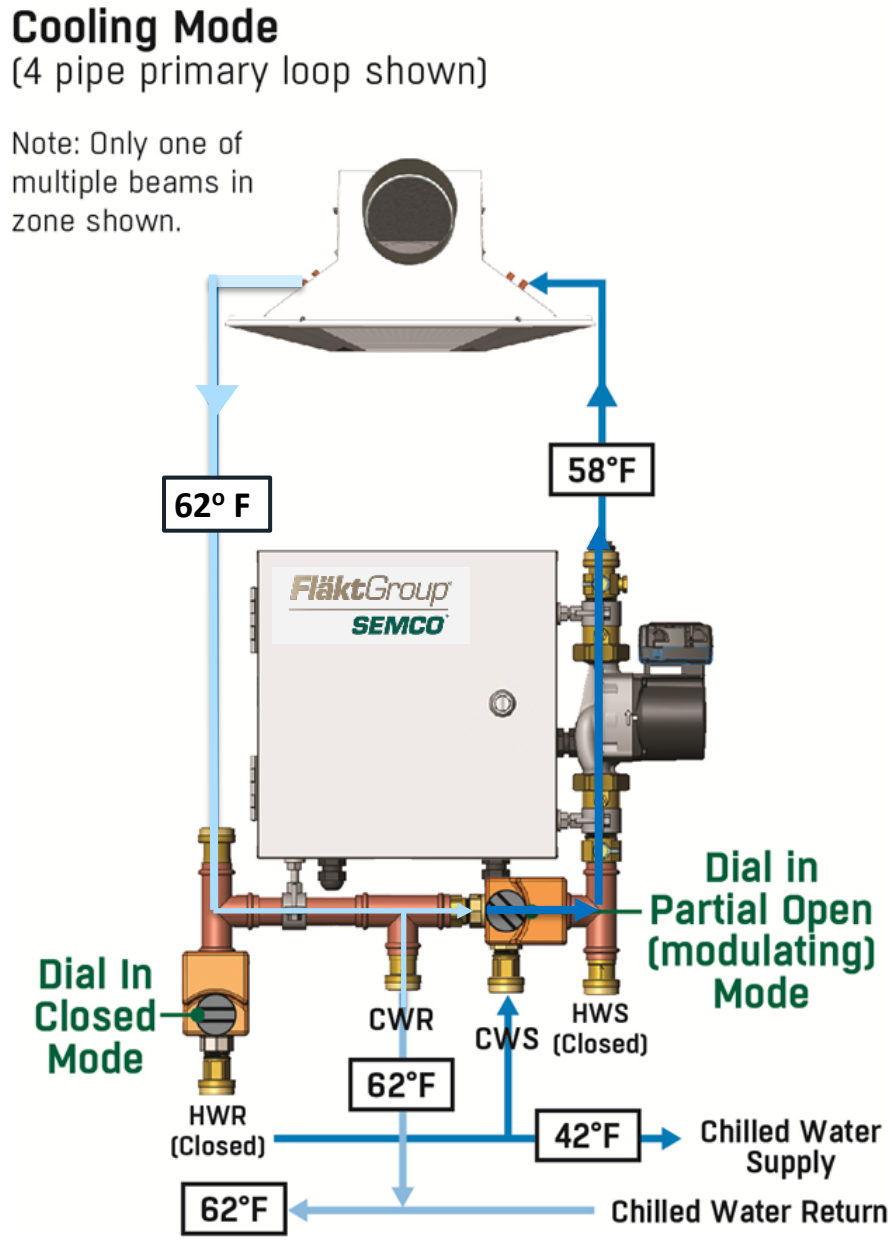
- Effectively prevent condensation formation on beams.
- Provides remote access control to the flow and temperature of the water supplied to the beams.
- If the water temperature is properly controlled, condensation will not form.
- Saves investment:
  - Smaller pipe diameters, fittings, & feet of pipe
  - Eliminates need for building-level secondary loops

How It Works: Cooling Mode- 4 Pipe

- The Neuton pump controls a looping system to the chilled beam.

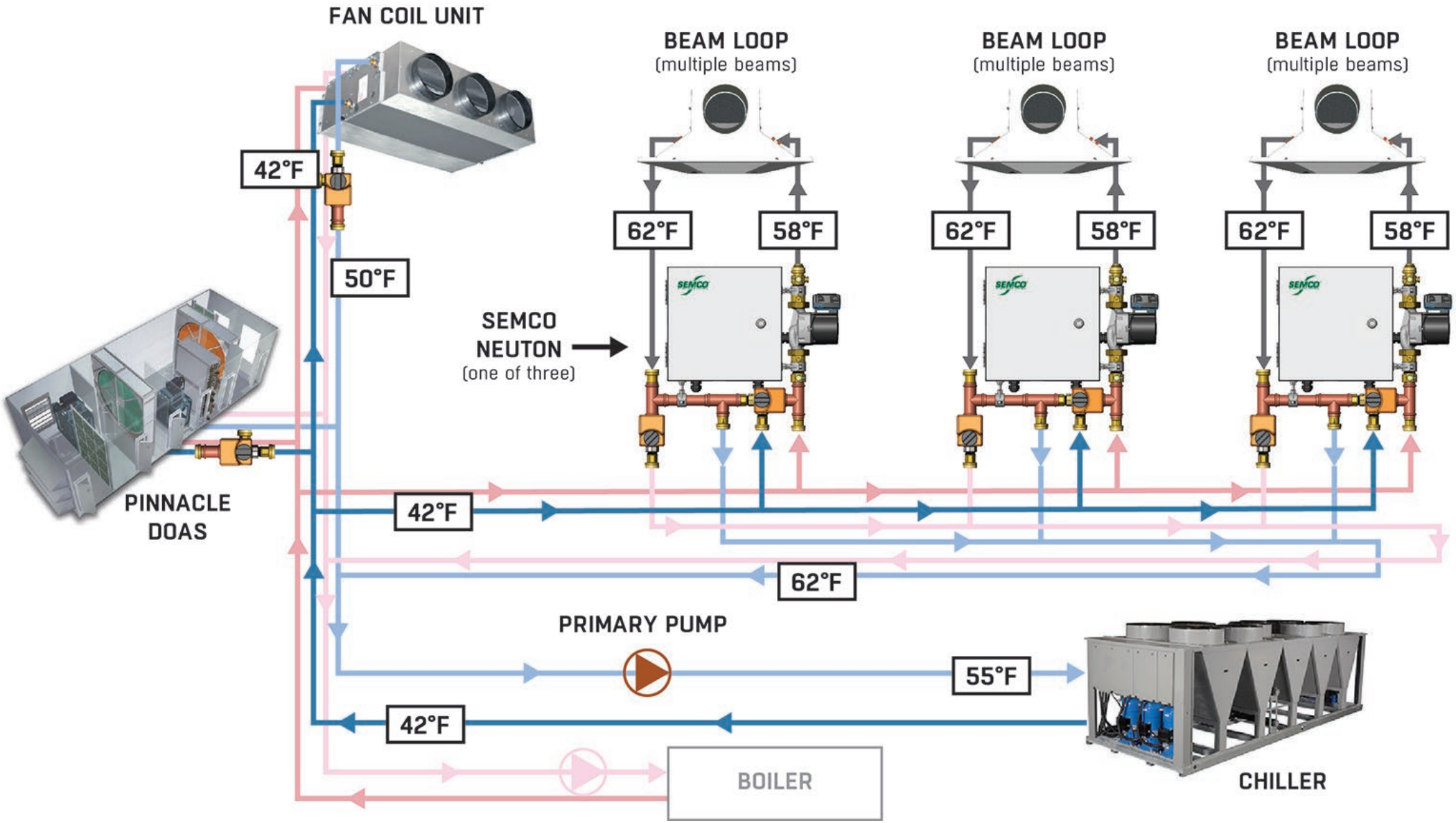
In this example:

- The Chilled Water Supply (CHS) feeds into Neuton at 42°F.
- The 42°F water meets the 62°F Chilled Water Return (CHR) water, and blends to 58°F.
- The ECM pump brings it to the beam.
- The 58°F feeds the water coils in the chilled beams. Cooling the water coils.
- After cooling, the water leaves warmer than when it came in at 62°F. Some of the 62°F leaves through the CWR, the rest moves forward to meet the 42°F Chilled Water Supply.
- Repeat in a loop.
- The Hot Water Supply (HWS) and Hot Water Return (HWR) are closed off in cooling mode. In heating mode, those are turned on and the CWR & CHS are turned off instead.



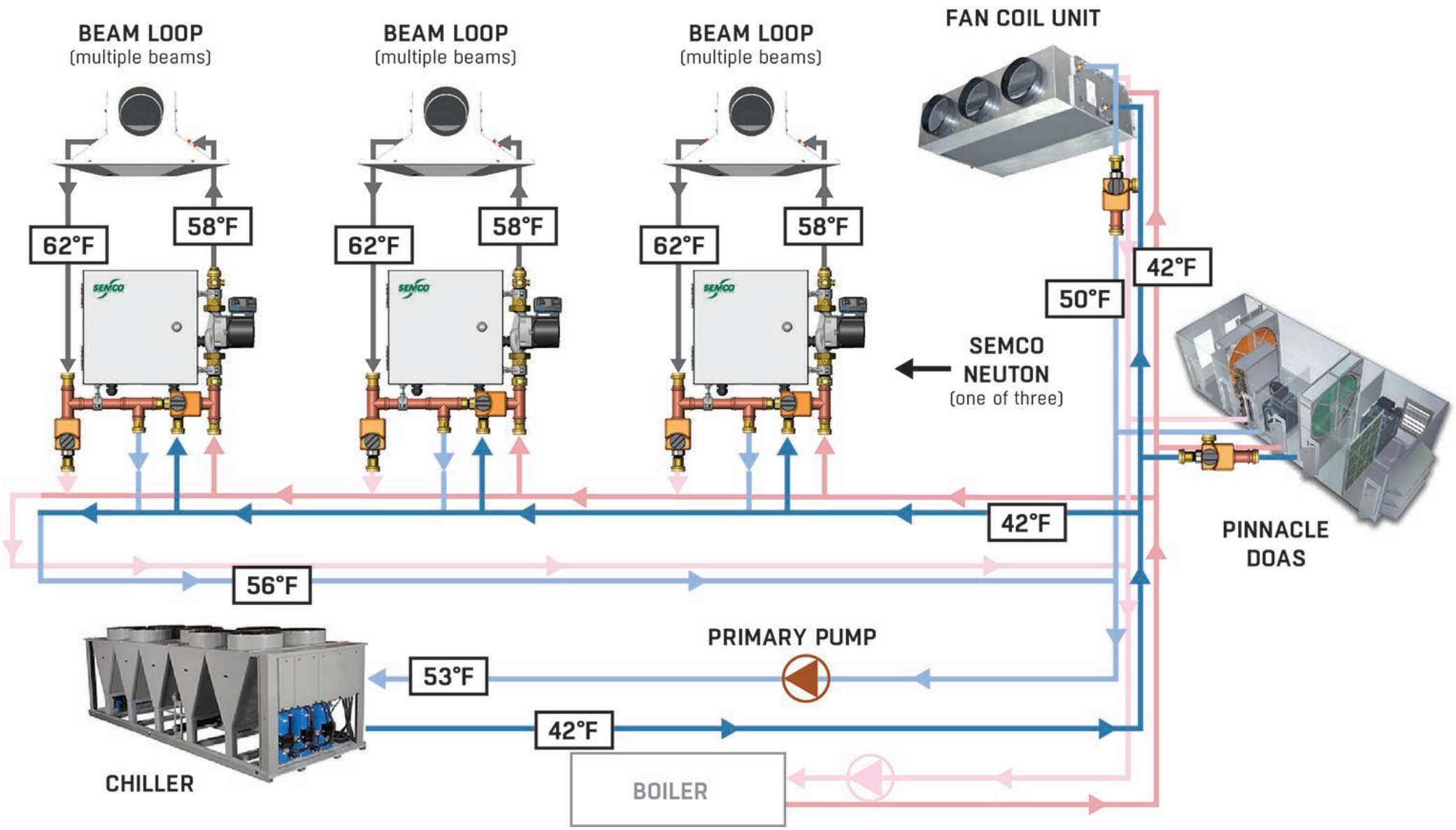
EXCELLENCE IN SOLUTIONS

Chilled Beam Pipe Layout with NEUTON: 4 pipe Approach



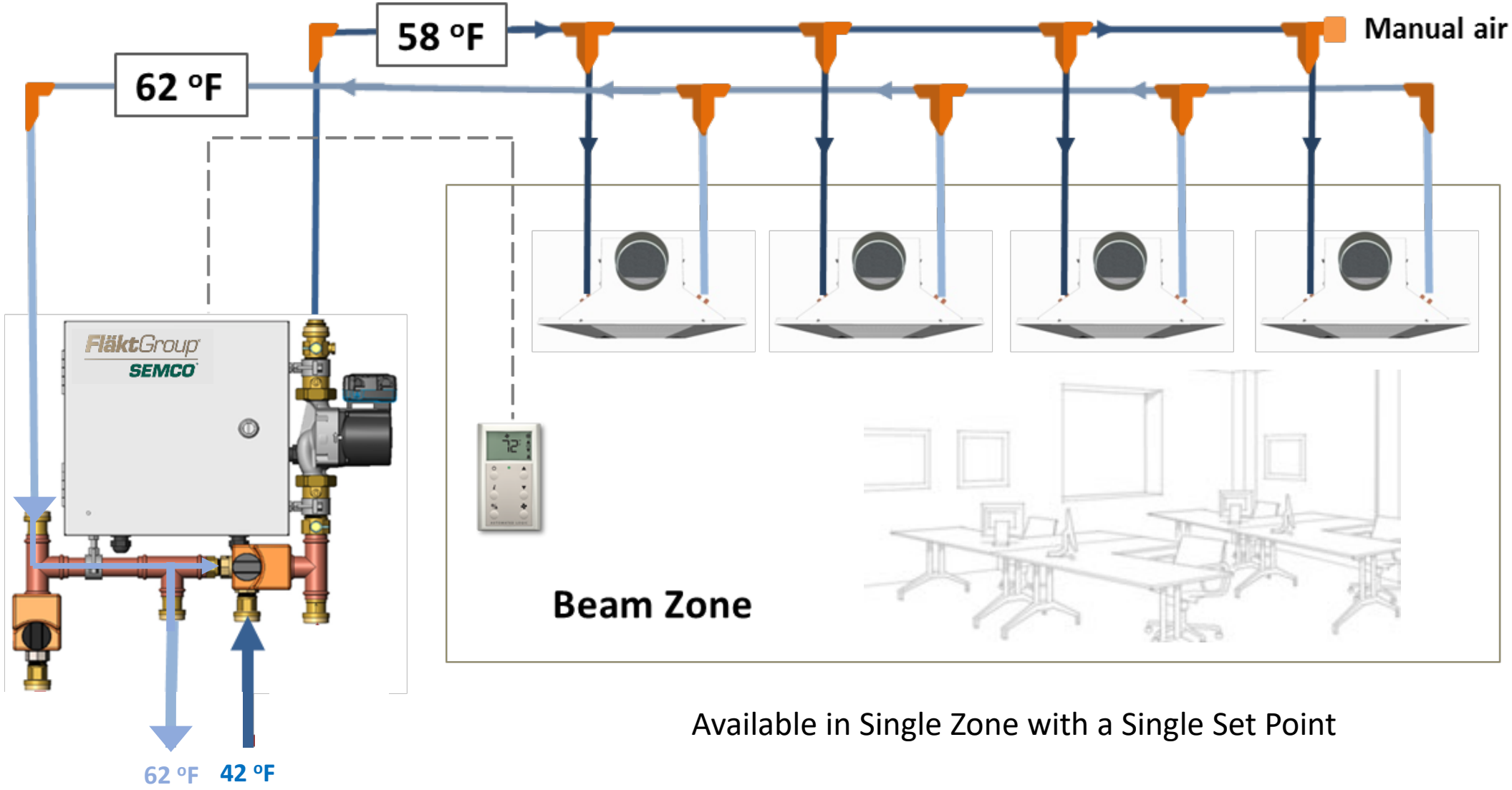
EXCELLENCE IN SOLUTIONS

Chilled Beam Pipe Layout with NEUTON: 2 pipe Approach



EXCELLENCE IN SOLUTIONS

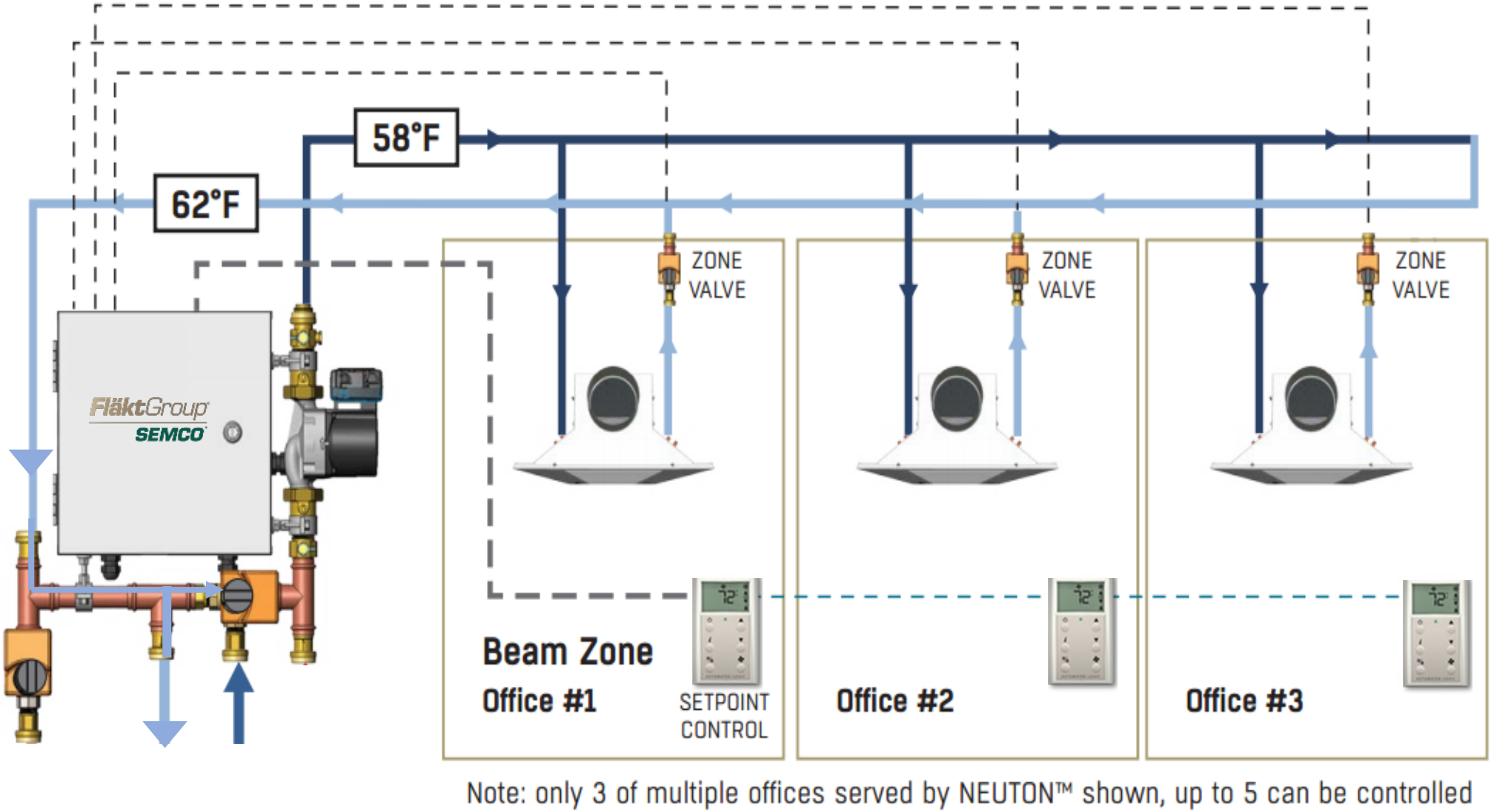
Single Zone Pump Scheme: Cooling Mode



Available in Single Zone with a Single Set Point

EXCELLENCE IN SOLUTIONS

Multi-Zone Pump: Cooling Mode



Note: only 3 of multiple offices served by NEUTON™ shown, up to 5 can be controlled

Available in Multiple Zone with a Multi Set Point Multiple Zones with Multiple Set Points. Multiple Zone with Single Set Point is also available.

Questions?

Contact Information & Thank You

Chilled Beams & Neuton Pumps: chilledbeams.semco@flaktgroup.com

Applied Products (Pinnacle, Ascendant, EnergyPackage, Custom): applied.semco@flaktgroup.com

Unitary: unitary.semco@flaktgroup.com

ElitePro: elite.semco@flaktgroup.com

Duct: duct.semco@flaktgroup.com

Panels: panels.semco@flaktgroup.com

Refresh Wheels & Components: refresh.semco@flaktgroup.com

OEM Energy Wheel: oem.semco@flaktgroup.com

Datacenters: datacenters.semco@flaktgroup.com

Parts/Service Contact Information: service.semco2@flaktgroup.com

Warranty/Quality Claims: https://info.semcohvac.com/claim-form

Service Request: https://info.semcohvac.com/service-request

Parts Request: https://info.semcohvac.com/parts-request



Thank you for your attention!

EXCELLENCE IN SOLUTIONS

Thank you for your attention!

