

Healthier Buildings: Advanced Economizer Controls and Ventilation in a Pandemic



75F

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Healthier Buildings Webcast Rehearsals
Webinar ID# 871-613-179

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To Ask a Question



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Advanced Economizer Controls and Ventilation

1. News Update and
Guidelines Recap

3. ACI High-Performance
Sensors

2. On the Roof With Matt Blount

4. Outside Air Optimization for
Epidemic Mode and Efficiency

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TEMPERATURE CHECK

Increasing Call for Recognition of Airborne Transmission

The New York Times

The Coronavirus Outbreak >

LIVE

Latest Updates

Maps and Cases

Reopenings and Closings

Risk Factors for Covid-19 Death

239 Experts With One Big Claim: The Coronavirus Is Airborne

Published July 4, 2020 Updated July 7, 2020

The W.H.O. has resisted mounting evidence that viral particles floating indoors are infectious, some scientists say. The agency maintains the research is still inconclusive.

Published July 7, 2020 Updated July 9, 2020



After hundreds of experts urged the World Health Organization to review mounting scientific research, the agency acknowledged on Tuesday that [airborne transmission of the coronavirus](#) may be a threat in indoor spaces.



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COVID-19 (CORONAVIRUS) PREPAREDNESS RESOURCES

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“Transmission of SARS-CoV-2 through the air is sufficiently likely that airborne exposure to the virus should be controlled. Changes to building operations, including the operation of heating, ventilating, and air-conditioning systems, can reduce airborne exposures.”

“Ventilation and filtration provided by heating, ventilating, and air-conditioning systems can reduce the airborne concentration of SARS-CoV-2 and thus the risk of transmission through the air...”

CDC: How COVID-19 Spreads

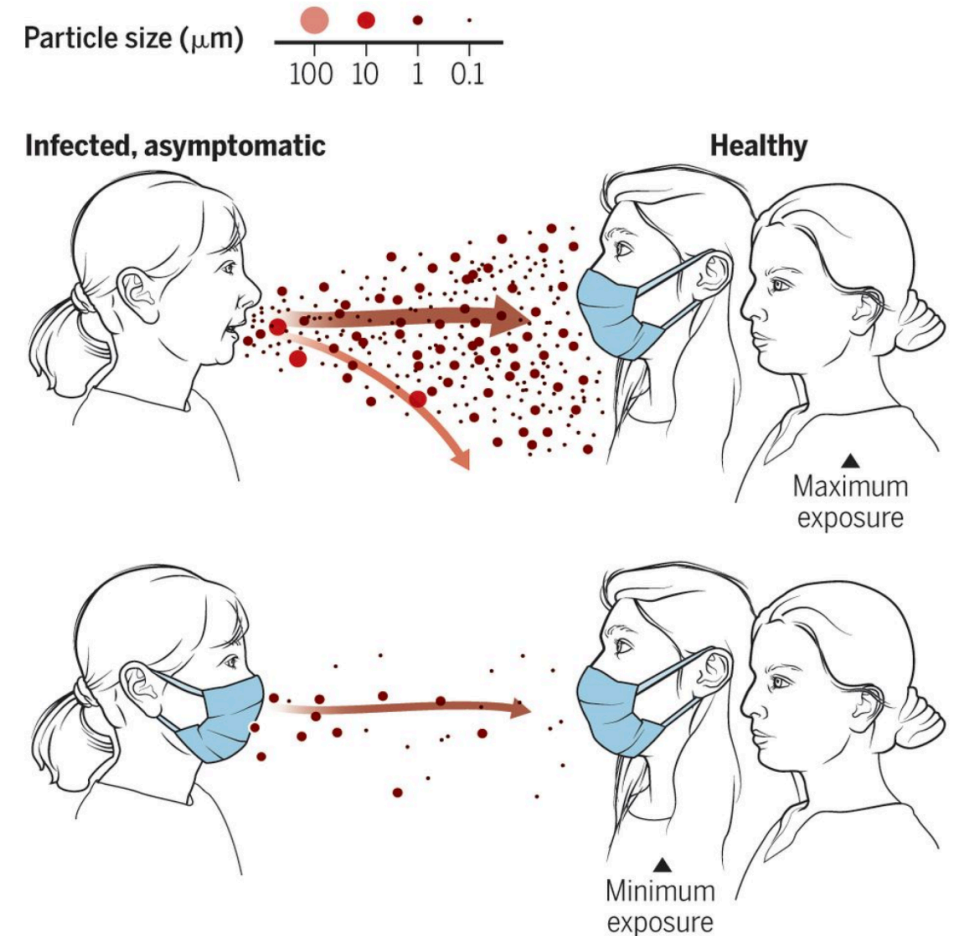
The virus is thought to spread mainly from person to person.

- Between people who are in close contact with one another (within about 6 feet).
- Through respiratory droplets produced when an infected person coughs, sneezes, or talks.
- These droplets can land in the mouths or noses of people who are nearby or possibly be inhaled into the lungs.

The virus may be spread in other ways.

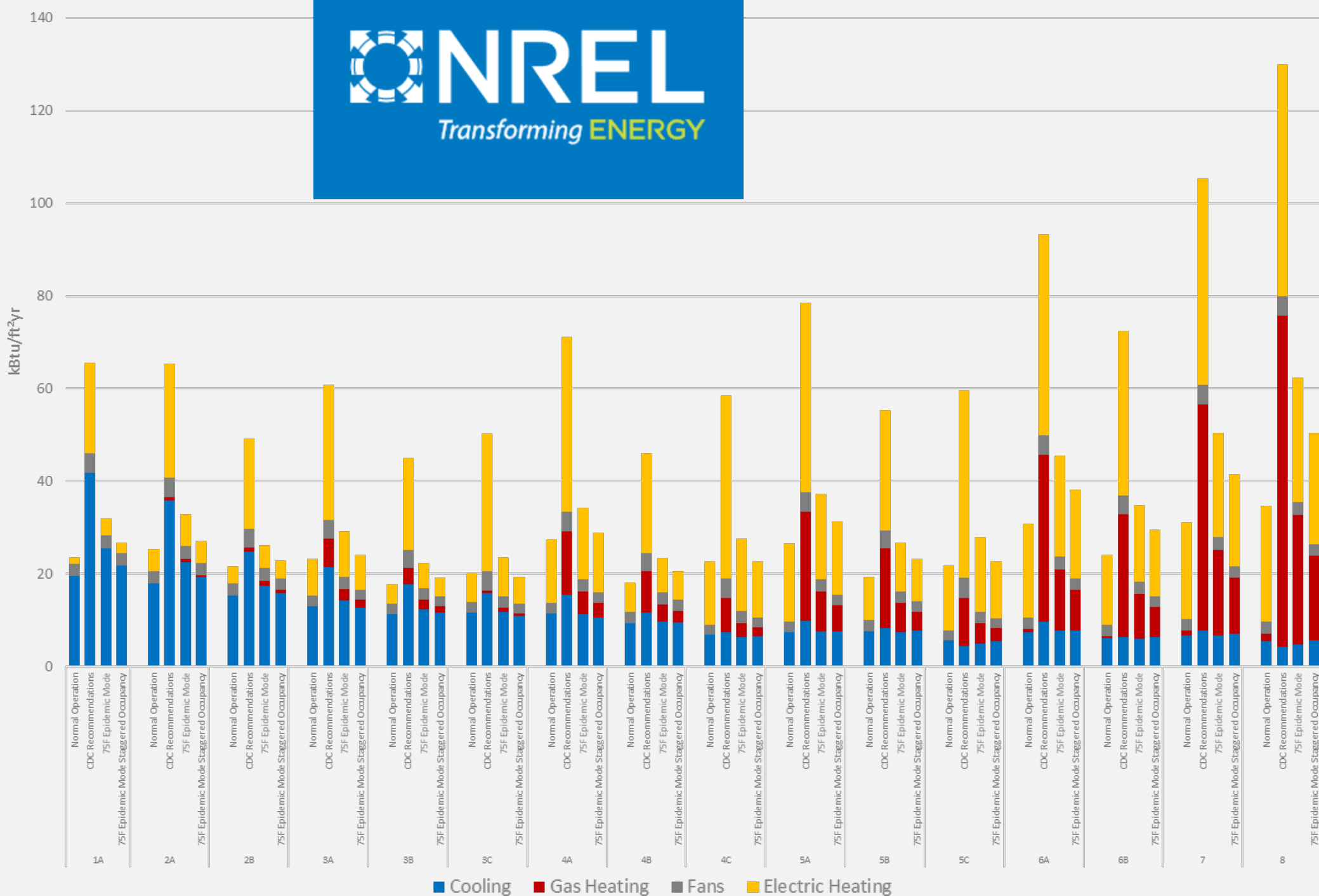
- Touching a surface or object that has the virus on it and then touching their own mouth, nose, or possibly their eyes. This is not thought to be the main way the virus spreads.

Source: [CDC](https://www.cdc.gov)



GRAPHIC: V. ALTOUNIAN/SCIENCE

Annual Results by HVAC End Use – Medium Office



ASHRAE: Reopening Guidance and Building Readiness

ASHRAE has issued guidance for commercial buildings.

ASHRAE > COVID-19 > Buildings > Commercial

- Flush the air in a building for two full hours before and after occupancy.
- Open Outside Air (OA) to the maximum possible while maintaining acceptable indoor conditions.
- Disable Demand Control Ventilation.
- VAV systems: Increase discharge air temperature to max to encourage open VAV terminal unit dampers.
- Maintain a slightly positive building pressure.
- Divert outside air to occupied spaces.
- Maintain relative humidity levels between 40 and 60%.

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Temperature: Outside

Air & Duct ■

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- Durable construction
- Moisture Resistant
- 5 Year Warranty



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Duct CO2 ■

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- Automatic Background Calibration
- Long, maintenance free life expectancy in typical Demand Control Ventilation Application
- 0-2000 ppm



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Positive & Negative Building Pressure

Positive pressure in a building occurs when the pressure inside is greater than the pressure outside.

Negative pressure occurs when the indoor pressure is less than the pressure outside. Seasonal weather changes, the height of a structure and a room's function, are all factors that determine whether your application requires negative or positive pressure.

POSITIVE PRESSURE



Pressure ■

- Field Selectable Ranges & Outputs
 - 0.1" wc – 40" wc, Uni/Bi-directional)
- Easy Installation
- Variety of options including LCD display, pitot tube, & din-rail bracket
- Standard Accuracy of $\pm 0.5\%$ FSO
 - 0.25% option also available
- Increasing ventilation could cause pressure imbalance
- Potential for doors to prop open; air leaks



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Considerations Relative to New Guidelines

- Sensor Points
- Know the Environment
- Be Strategic while Balancing New Recommendations



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Q&A

TEMPERATURE CHECK

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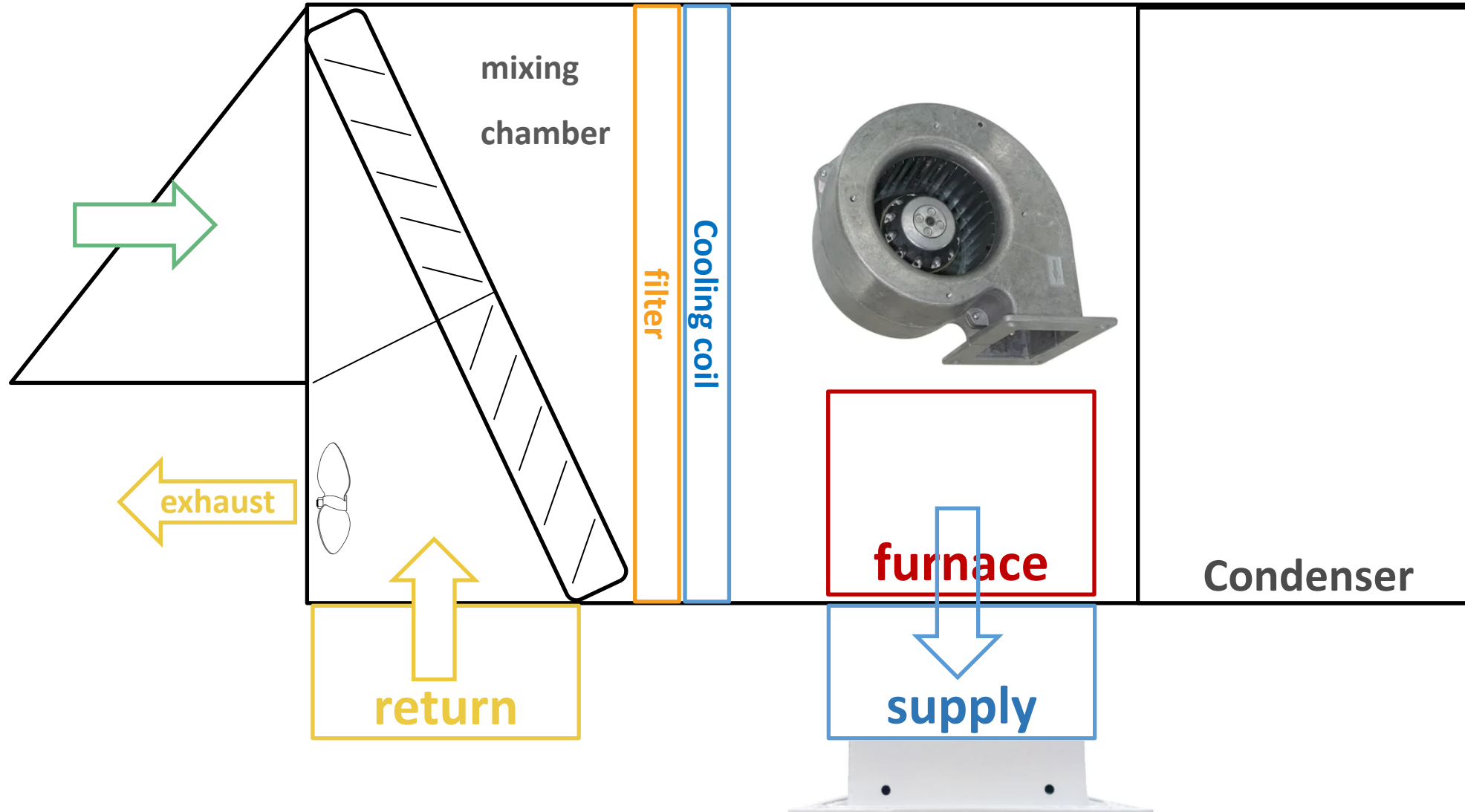
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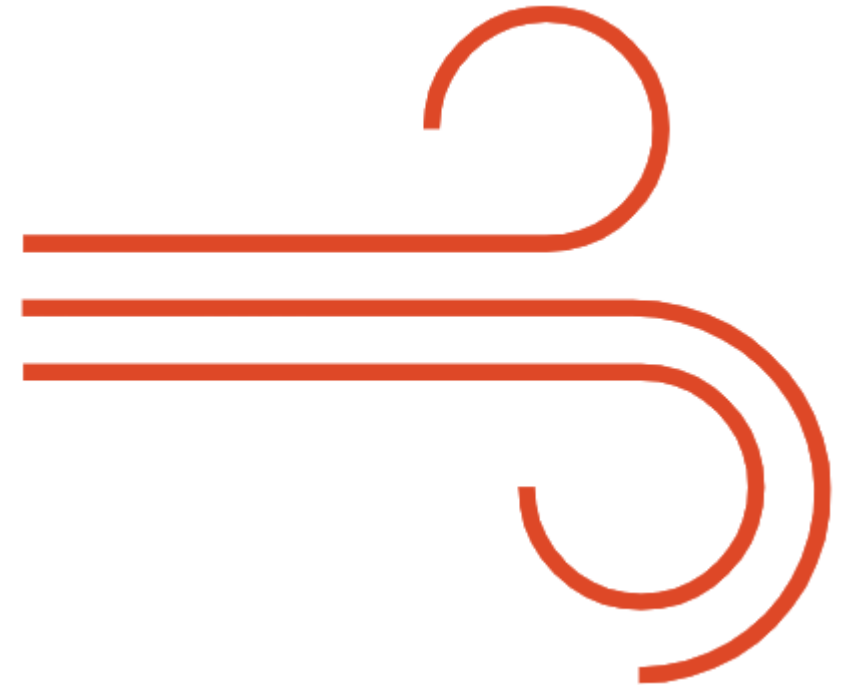
How Outside Air Fractions are Managed



How Much Outside Air is Needed?

Sequences that change the fraction of outside air:

- Normal operation – minimum ventilation requirements determined by design parameters such as size of the space and maximum occupancy.
- Demand Control Ventilation – improving efficiency by determining actual occupancy instead of maximum occupancy assumption.
- 75F® Epidemic Mode™ – pre and post-purging and enhanced ventilation following ASHRAE guidance.
- Free Cooling – using outside air to cool spaces instead of DX or CW cooling.
- Building pressure management – adjusting OA when exhaust fans such as those in a kitchen would create negative pressure.



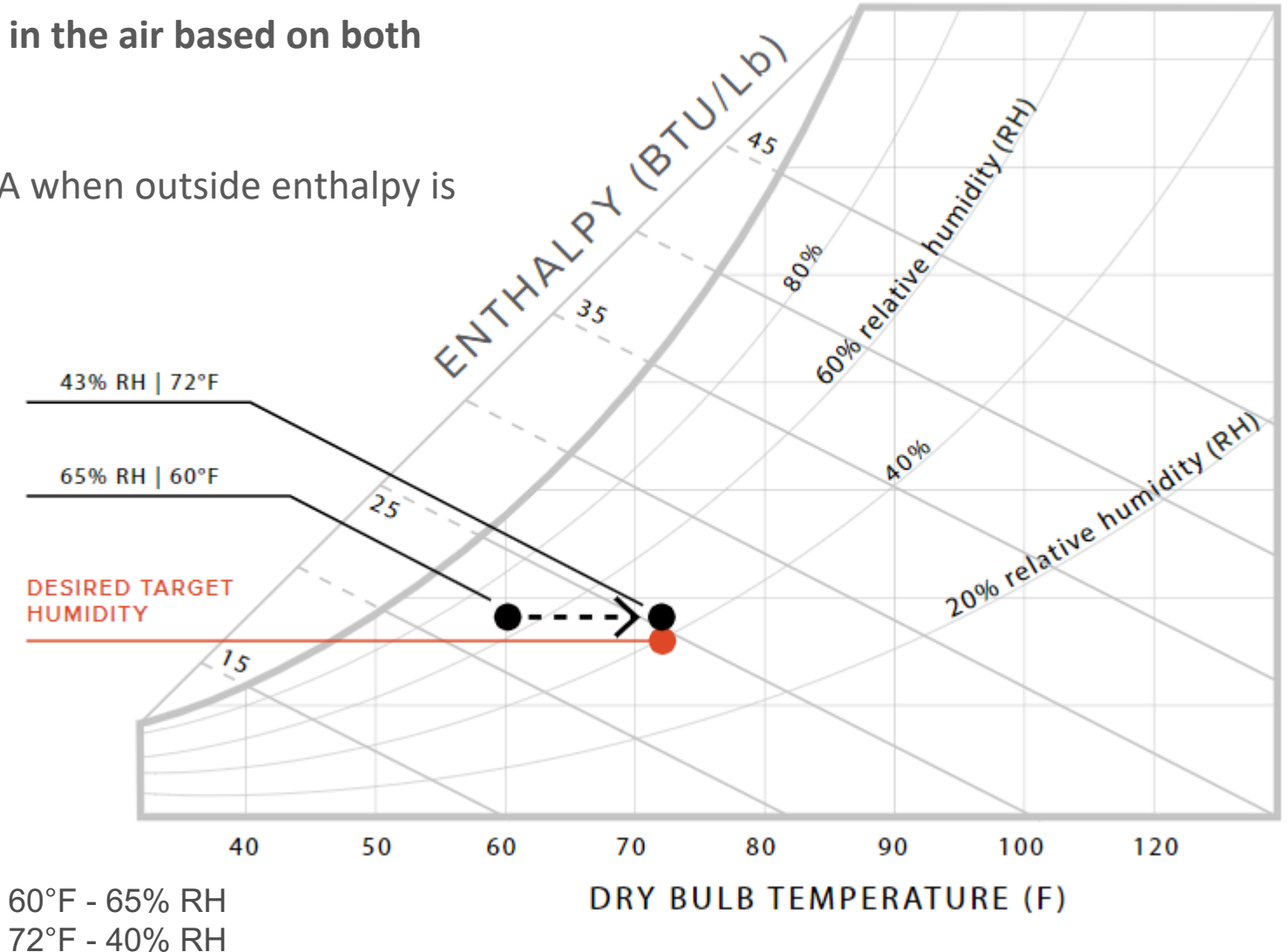
Comparative Enthalpy and Target Relative Humidity (RH)

Enthalpy: a measure of the total energy in the air based on both temperature and humidity.

- Comparative enthalpy will bring in OA when outside enthalpy is less than inside enthalpy.

Target Humidity accounts for the change in supply air when it gets warmed up with the inside air.

- Comparative enthalpy alone is not the best sequence. We need to also account for target humidity so that we don't increase inside RH



75F Outside Air Optimization (OAO) Kit



75F® Facilisight™ & Occupant App™



75F® Smart Node™



75F® Duct Sensor™



Current Switch & Sensor



Airflow Temperature
Sensor



CO₂ Sensor



Outdoor Air Thermistor

75F Outside Air Optimization (OAO) Kit



75F® Facilisight™ & Occupant App™



75F® Smart Node™



75F® Duct Sensor™



OA/RA
Actuator



Current Switch & Sensor



Airflow Temperature
Sensor



CO₂ Sensor



Outdoor Air Thermistor



Central Control Unit

OAo Wiring and Cooling Sequence

Central Control Unit

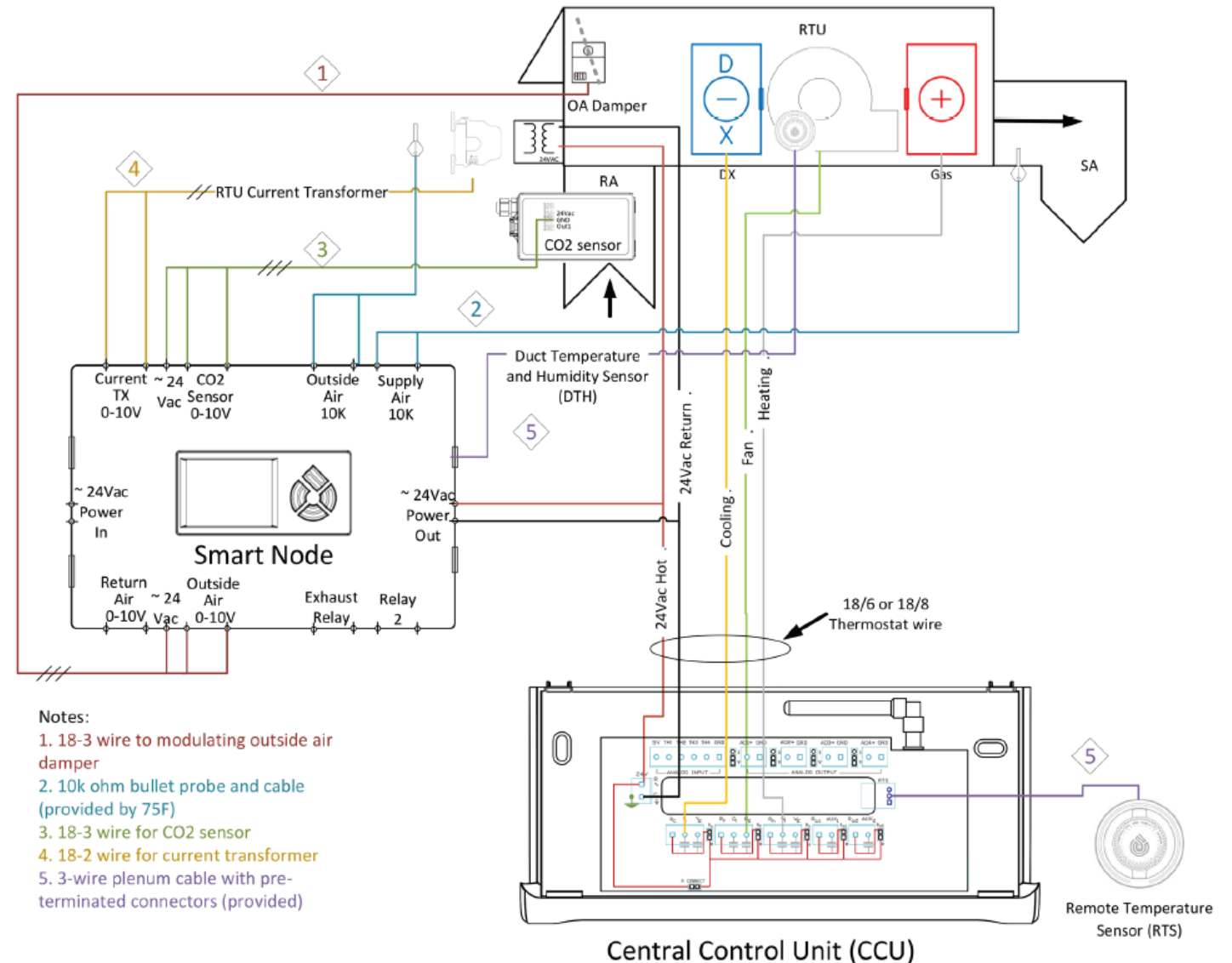
- Obtains zone data to determine entire system load
- Calculates the required conditioning
 - Recirculation
 - Free Cooling (comparative enthalpy plus target humidity)
 - Stage 1-5 DX or CW valve
- Controls fan (VFD or stages)
- Resets OA fraction

Smart Node

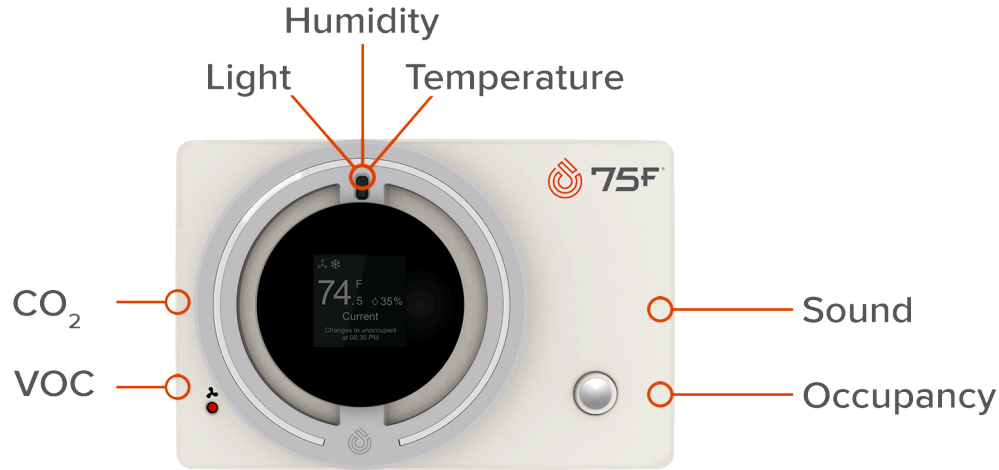
- Reads temperature and CT sensors
- Controls OA / RA damper actuator
- Controls exhaust fan

Additional Smart Node

- Reads differential building pressure



75F IAQ and Wellness Rapid-Results Test Kit



Streaming IAQ data in 15 minutes

Selection Pane

Select Site

- ☐ Select all
- ☐ Diamond Hill
- ☐ Flipkart ETV
- ☒ Mikros Engineering

zone

- ☐ Select all
- ☒ Main_Floor_Smart_Stat
- ☐ Main_Zone_2

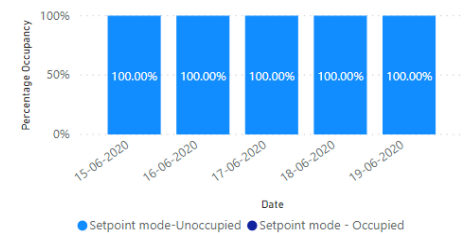
Select Date:

6/8/2020 6/29/2020

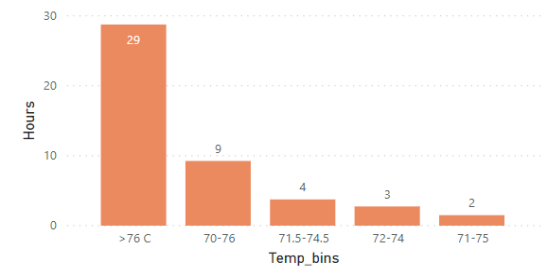


Indoor Air Quality Monitoring

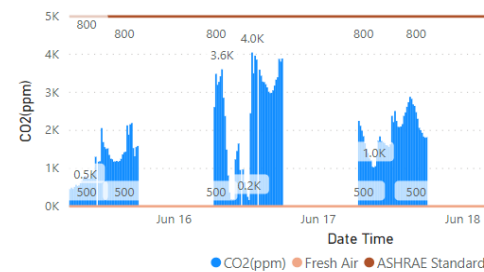
Zone occupied duration in Setpoint mode (Minutes)



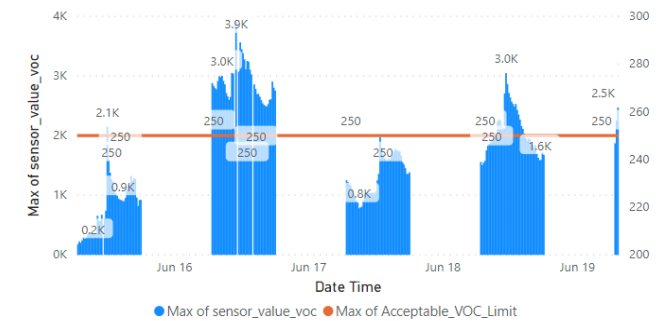
Comfort -Temperature based



CO2 Monitoring



VOC Monitoring



Q&A