

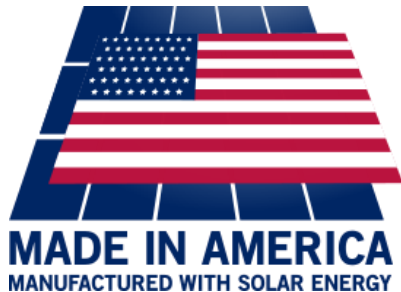


Smart-er Ventilation

Webinar

November 29, 2017

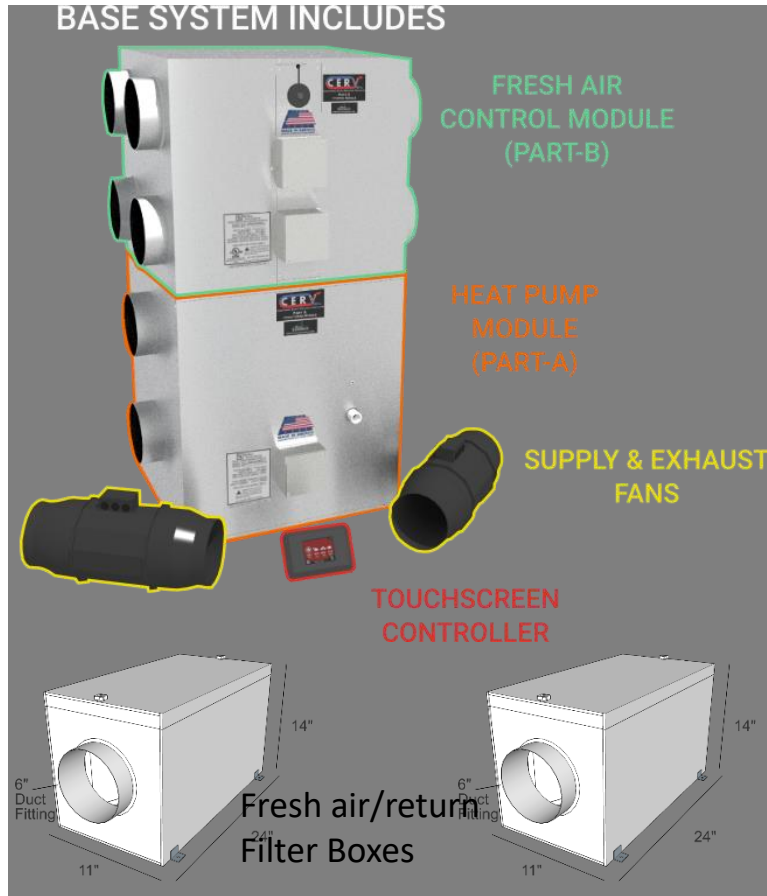
Ben Newell



CERV2 Smart-er Ventilation - Outline

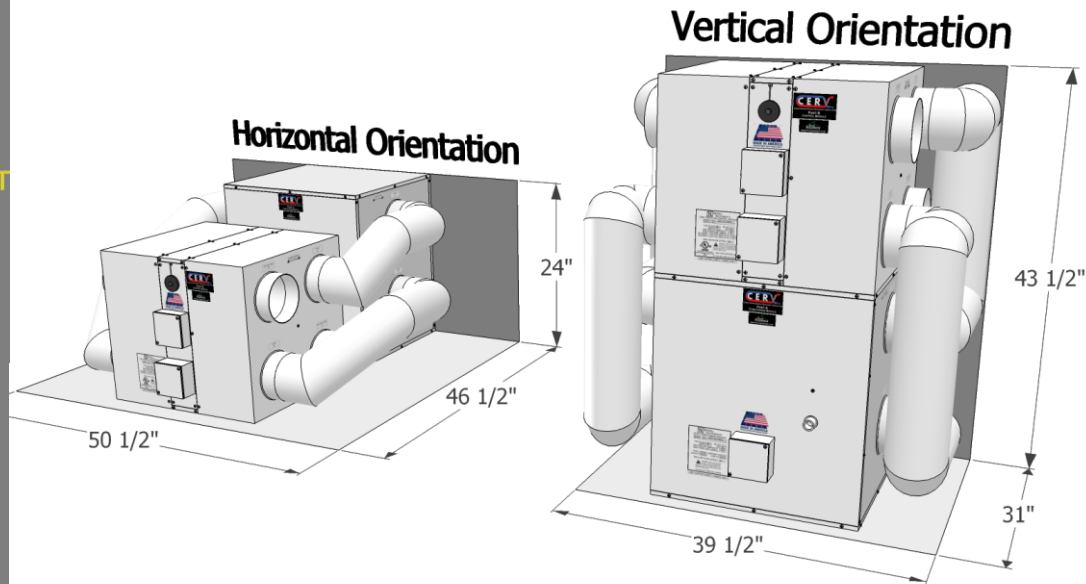
- Configuration
 - Installation
 - Operation
 - Performance
 - New Features
 - Future Tech
 - Availability
-
- Questions (feel free to submit questions during talk)

1st Gen CERV Configuration



Modular configuration allowed for flexible installation

- Interconnecting ducts to connect modules
- External power and control wiring required
- 6" duct connections



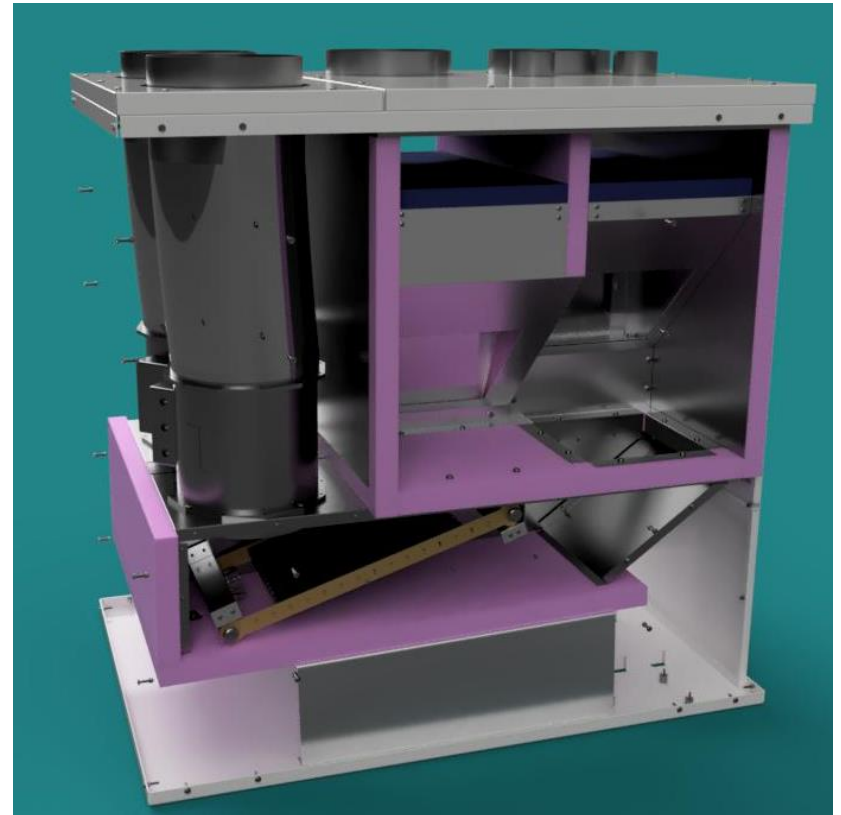
CERV2 Configuration



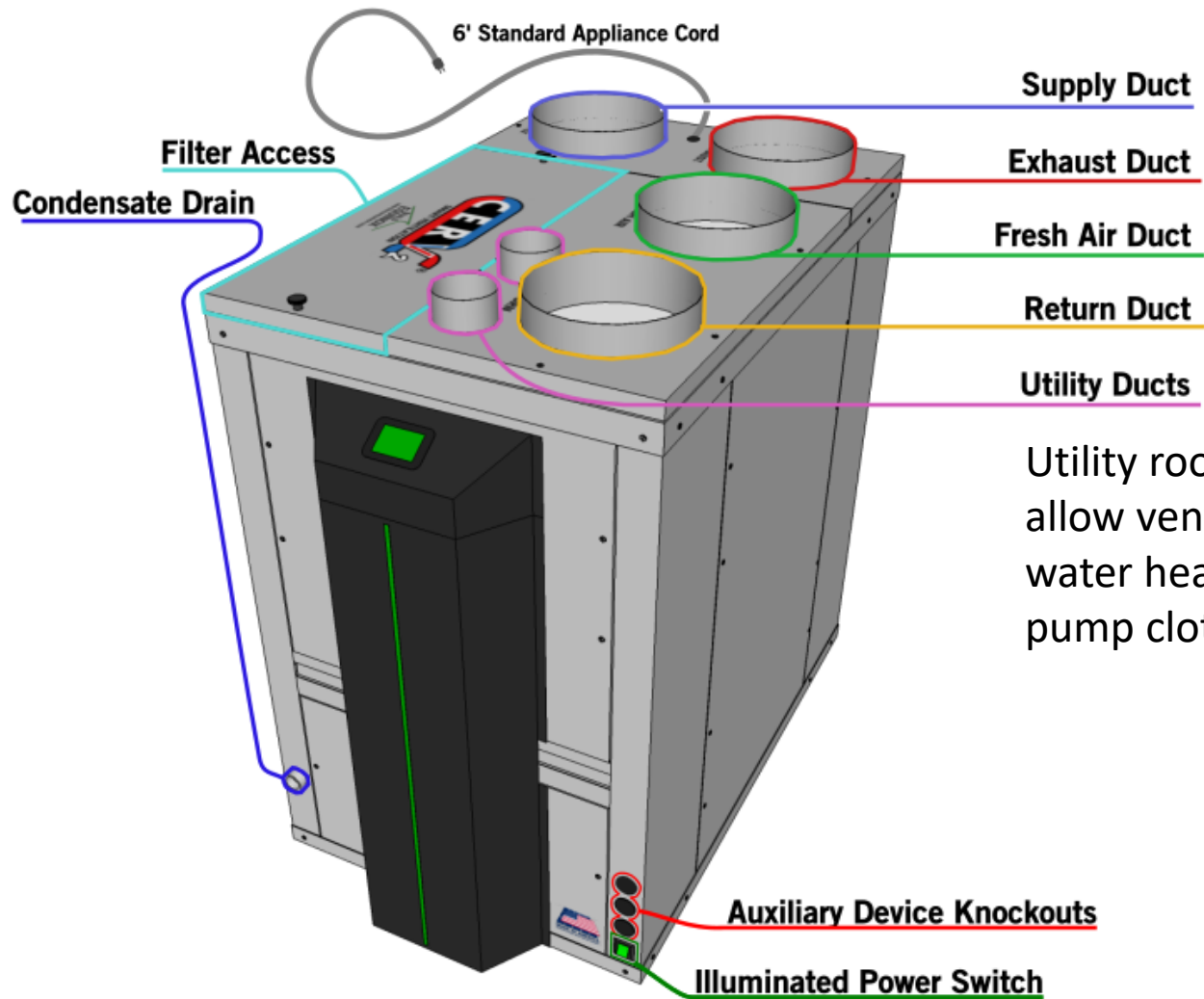
Unitary All-in-One System

- Heat pump and dampers
- Fans – same ECM fans as current CERV
- Fresh air and return filters (nom. 10"x20")
- Integrated color touch screen display

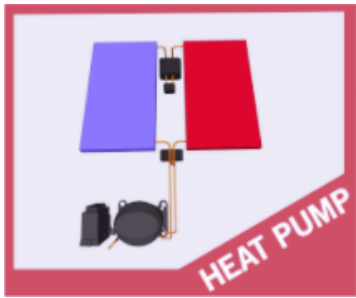
- Unpainted all aluminum construction for sharp look and easy end of life recyclability
- 8" duct connections for improved airflow performance



CERV2 Configuration

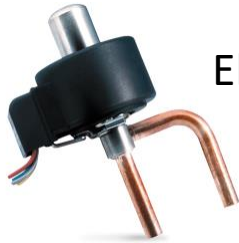


Utility room connections
allow venting for heat pump
water heaters and heat
pump clothes dryers



CERV2 Heat Pump Advancements

Same digitally controlled inverter drive
variable speed compressor



Electronic expansion valve for increased efficiency

Advanced aluminum microchannel heat exchangers

- Lightweight
- Reduced refrigerant charge
- High heat transfer performance
- Fully recyclable



User Interface

Current CERV display



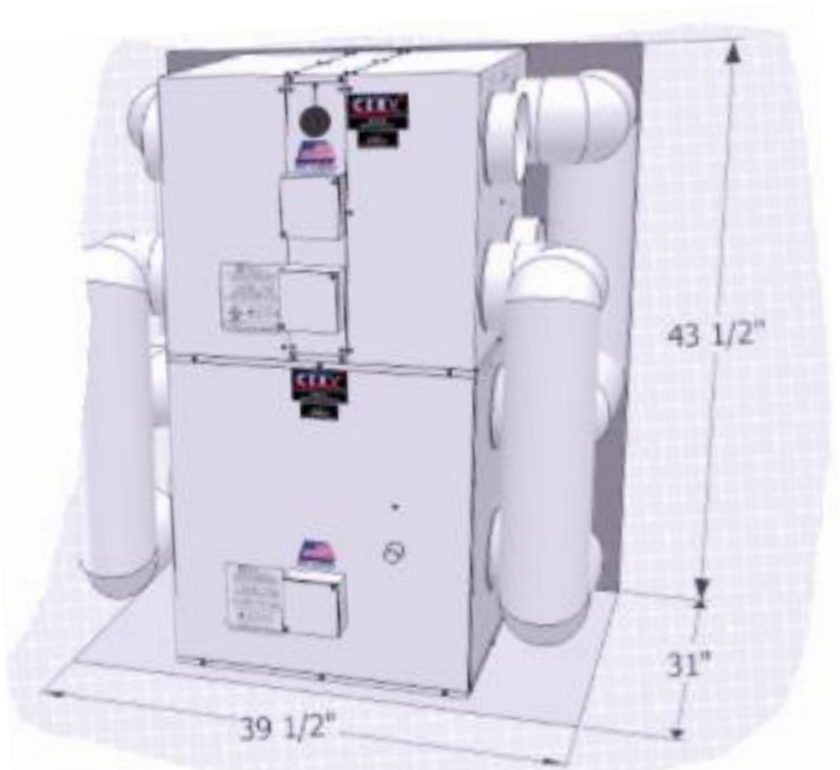
- Wireless remote display standard
- Color resistive touchscreen
- 3.5" screen size

CERV2 display

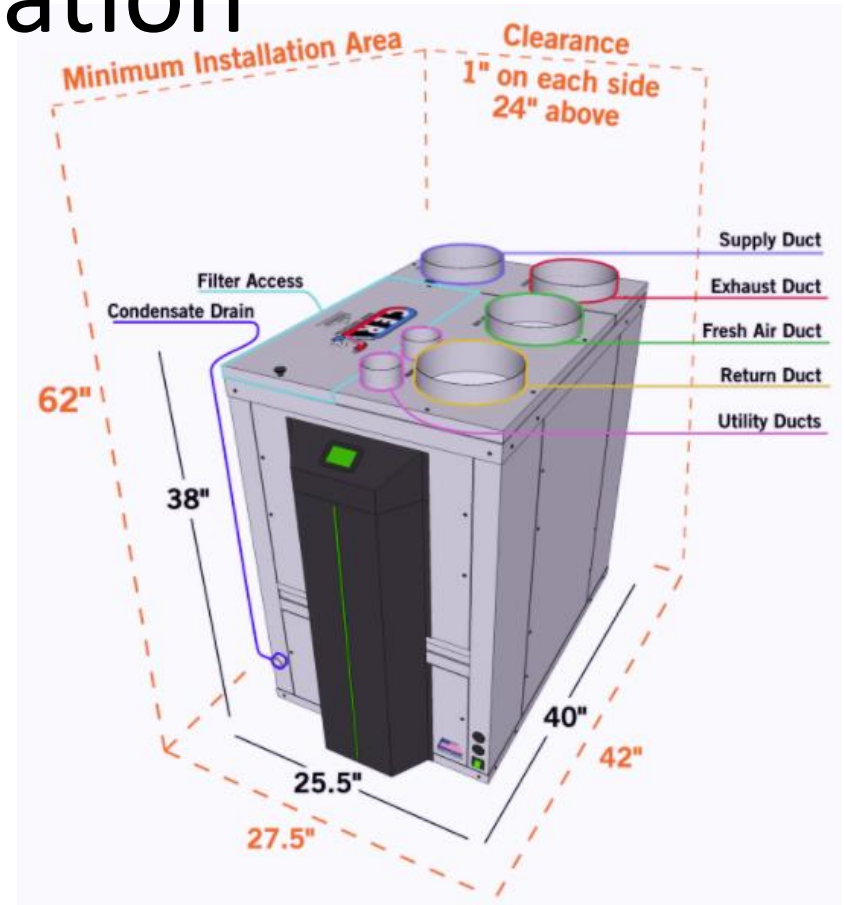


- Screen built into front of unit
 - Color capacitive touchscreen – sharper image, clearer display
 - 3.5" screen size
 - Same easy to navigate and read controls
- * Wireless remote screen offered as an option

Installation



Part A and B Module Weight =122lbs

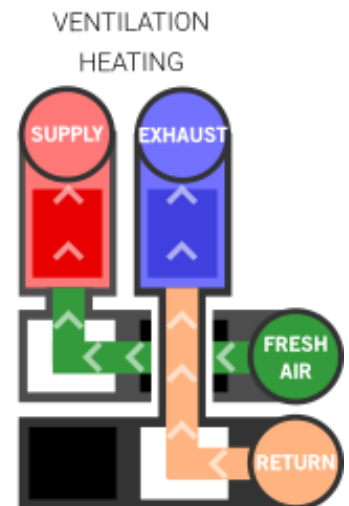
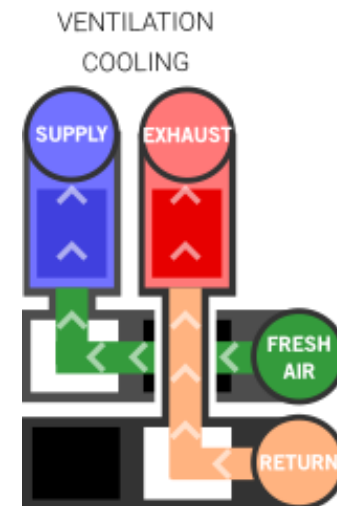
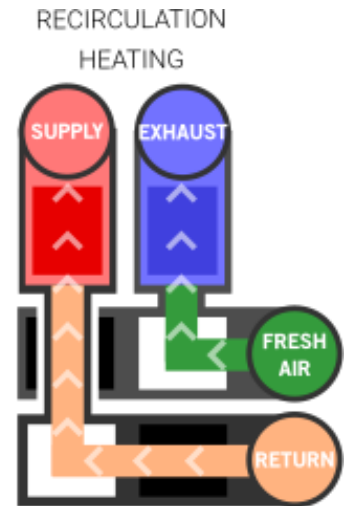
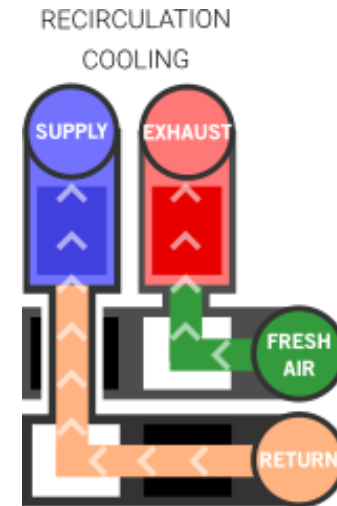


Total Weight =~120lbs

- CERV2 installed volume smaller than current CERV
- No interconnecting ducts between modules – only 4 external system duct connections
- With unified system, all external electrical wiring eliminated – standard 120VAC plug
- Condensate drain

CERV2 Operation

CERV2 Operational Modes Unchanged

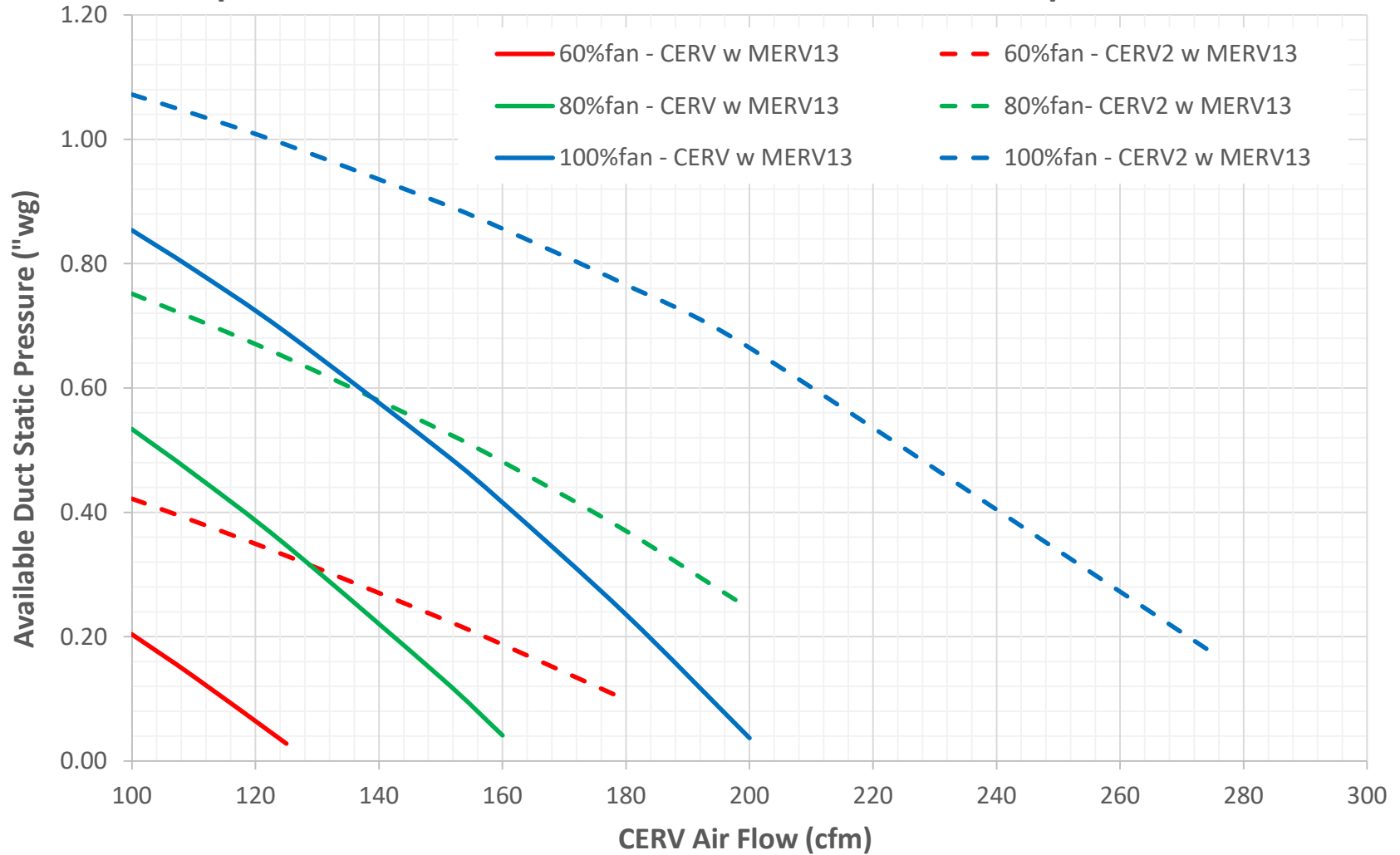


Performance Summary

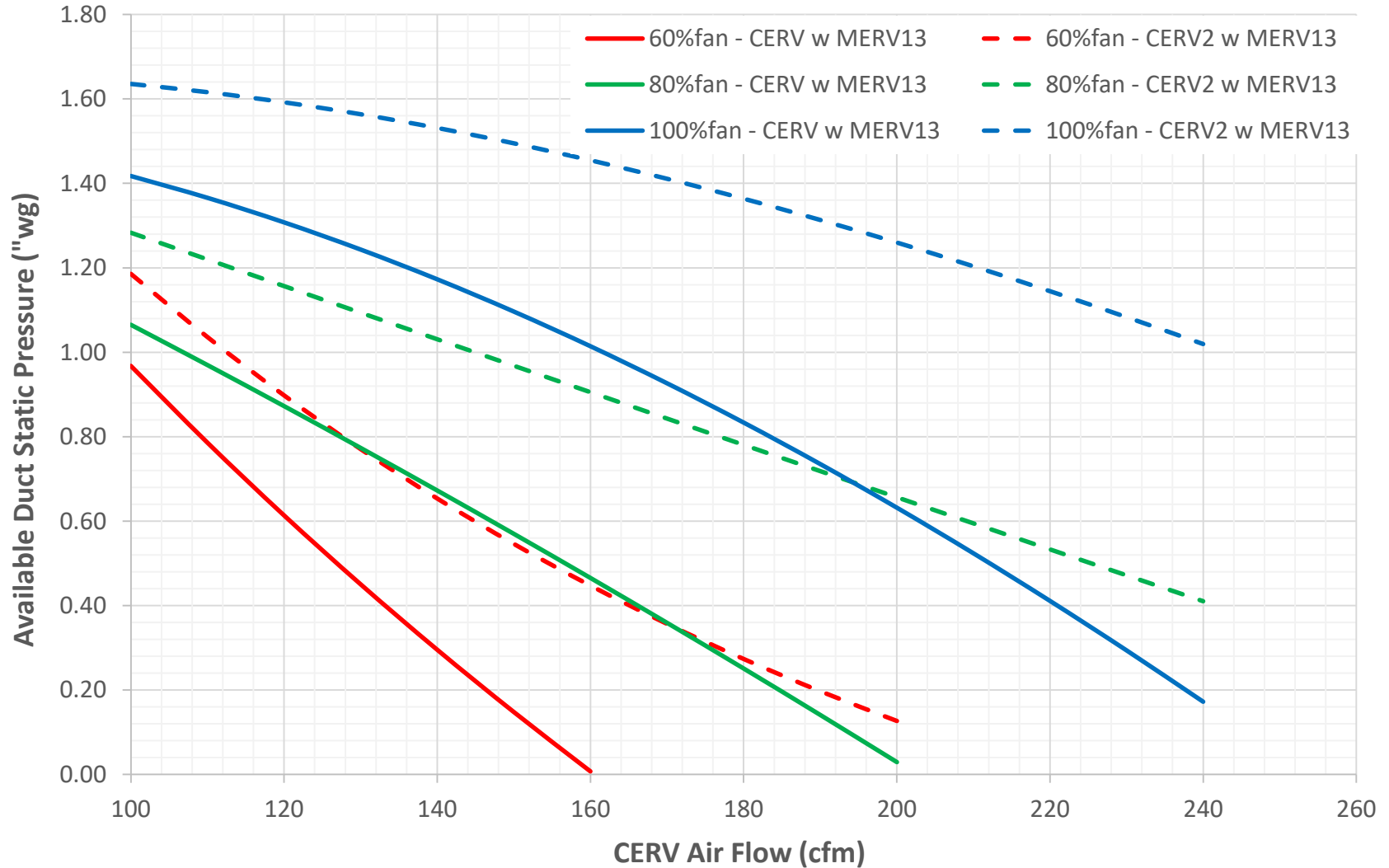
- Internal pressure loss is reduced
 - Better airflow capability
 - Fans operate at lower speed
 - Reduction in fan power
- CERV2 heating heat pump COP increase of 150%
- CERV2 has increased low temperature heating capacity
- CERV2 cooling heat pump COP increase 150%
- CERV2 cooling capacity similar to current 600-800W
- Latent removal ~10 liters per day

*Performance parameters are preliminary

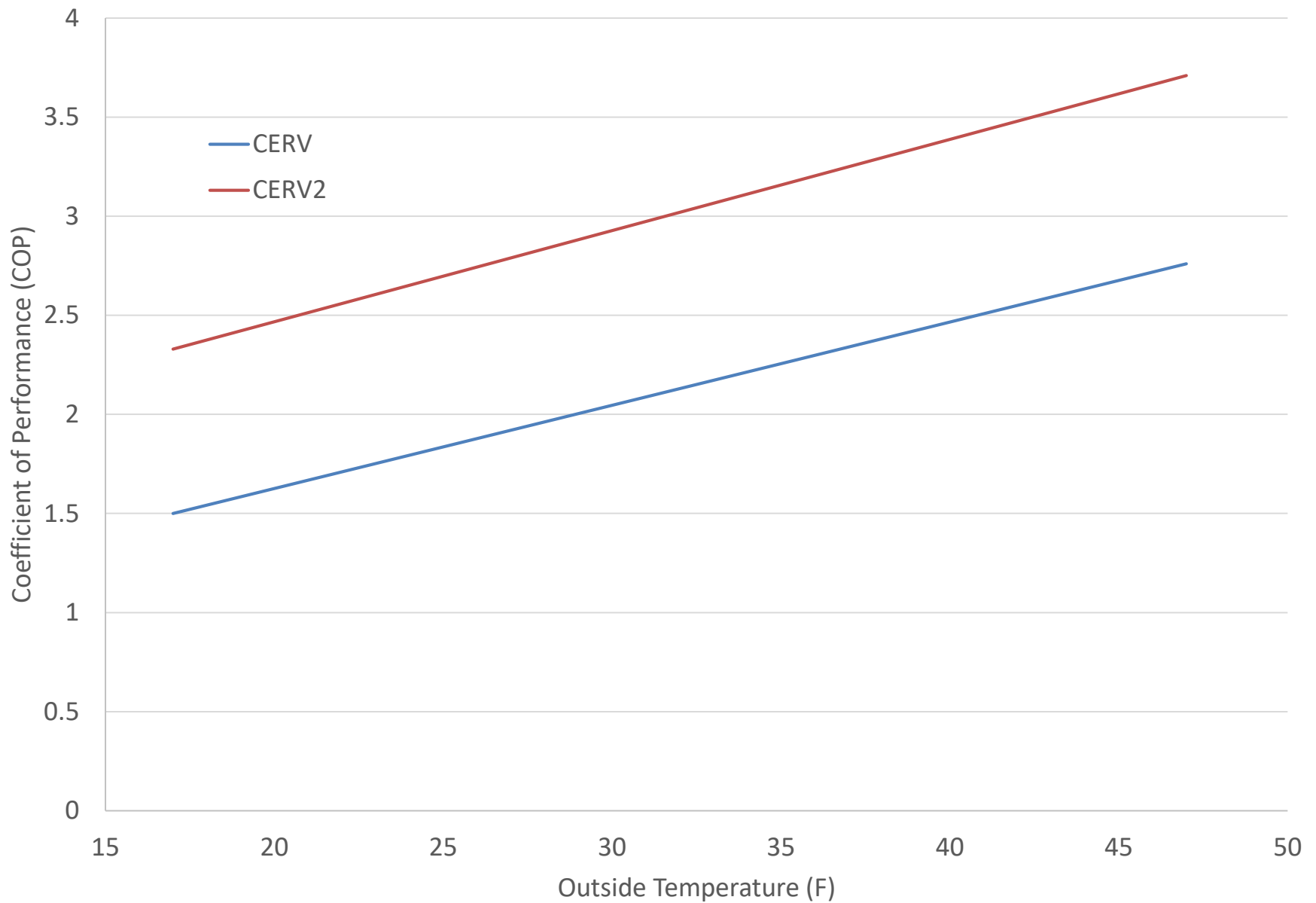
Comparison CERV & CERV2 Available Static Pressure w prioAir6 fans



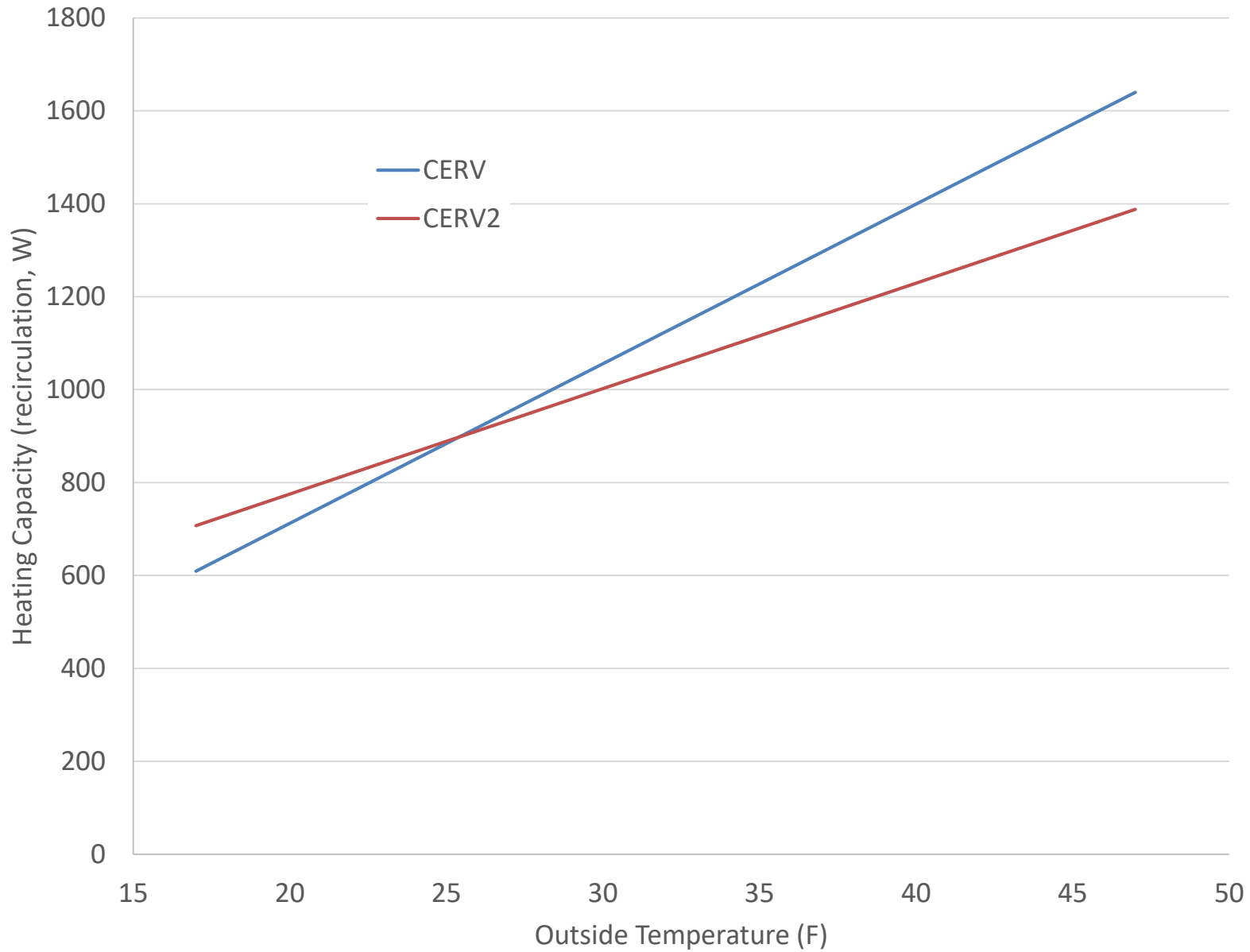
Comparison CERV & CERV2 Available Static Pressure w prioAir8 fans



Comparison of CERV and CERV2 Recirculation Heat Efficiency



Comparison of CERV and CERV2 Recirculation Heat Capacity





New Features

Built-In Communication

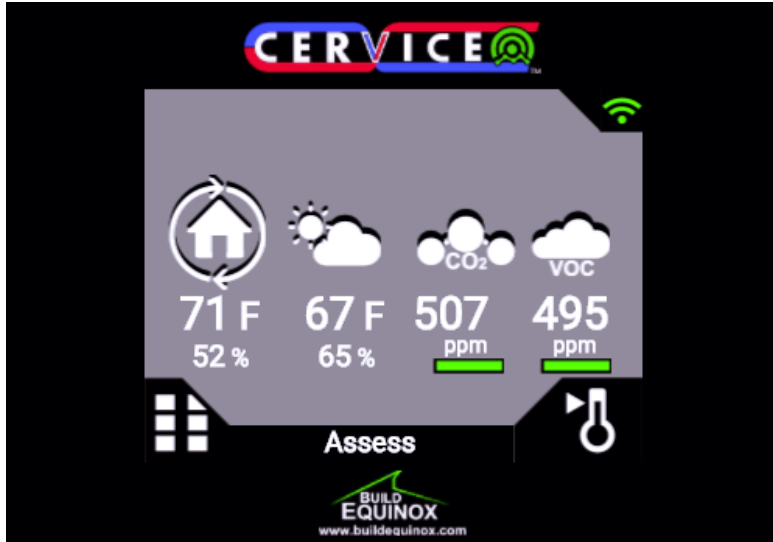


- Wifi and EnOcean communication are now built-in standard
- Internet gateway no longer needed to connect CERV online
- Wireless switch relay is not needed for wireless switch options
- Access to CERV-ICE online interface remains free
- OTA (over the air) software updates

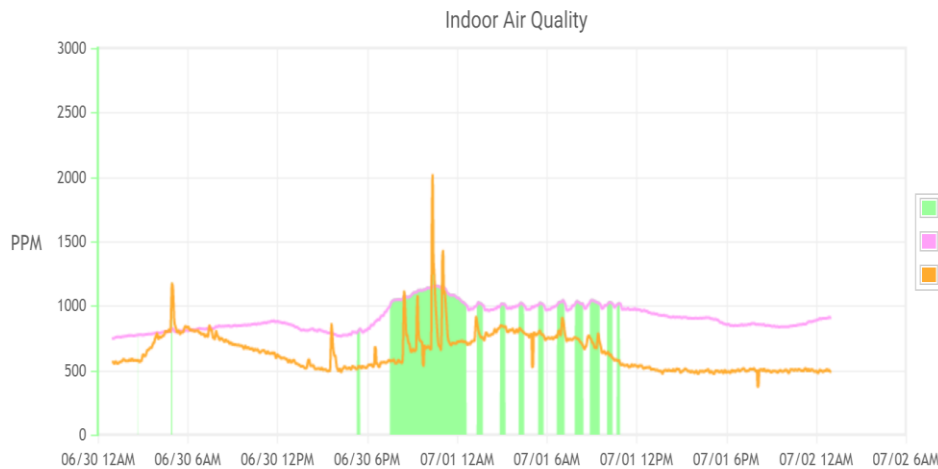


CERV-ICE will be a point of emphasis with expansion in future

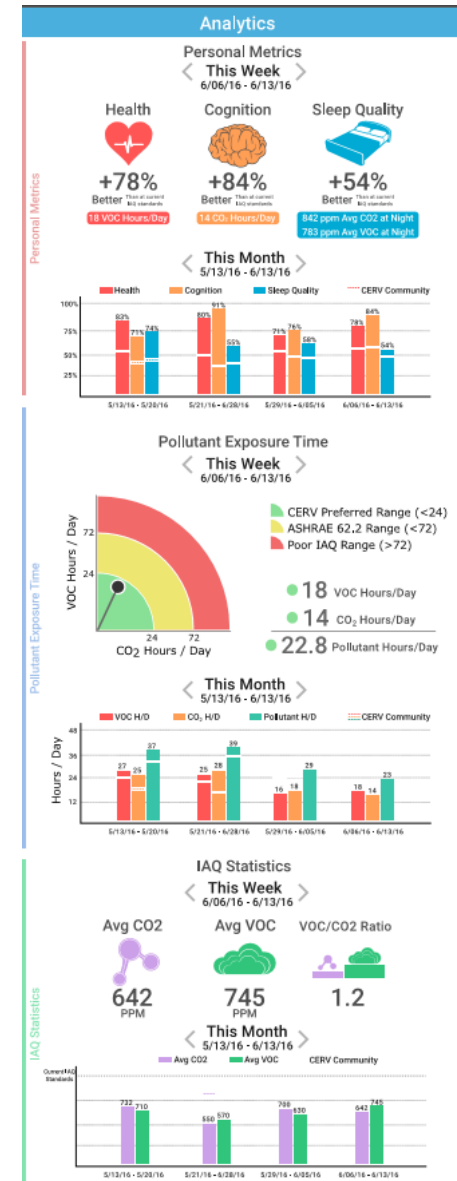
Analytics home health reporting



Online control



View and download historic data



Monitoring

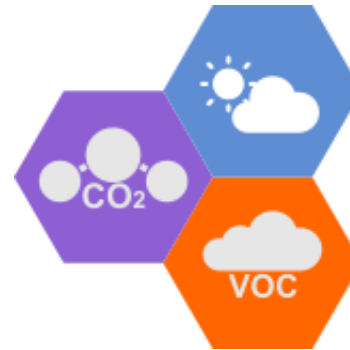
Indoor Air Quality



Temperature/Humidity



Optional Outdoor Air Quality



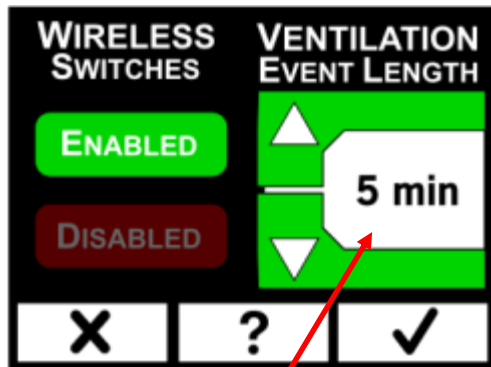
- Add on CO2 and/or VOC sensors for fresh air quality monitoring
- Locations with concerns about outdoor air pollution (wildfires, smog, etc)
- Modify ventilation based on outdoor air quality
- Change filters (charcoal) during outdoor pollution events

Remote Venting



Wireless, battery free switch option for on-demand timed ventilation (i.e. kitchen, bathroom spot ventilation)

Current Switch Configuration



All share same vent length

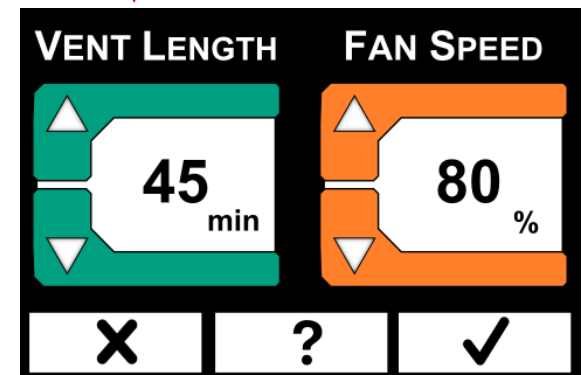
CERV2 Switch Configuration

Custom Name

Switch Parameters



- Set vent length
- Set fan speed

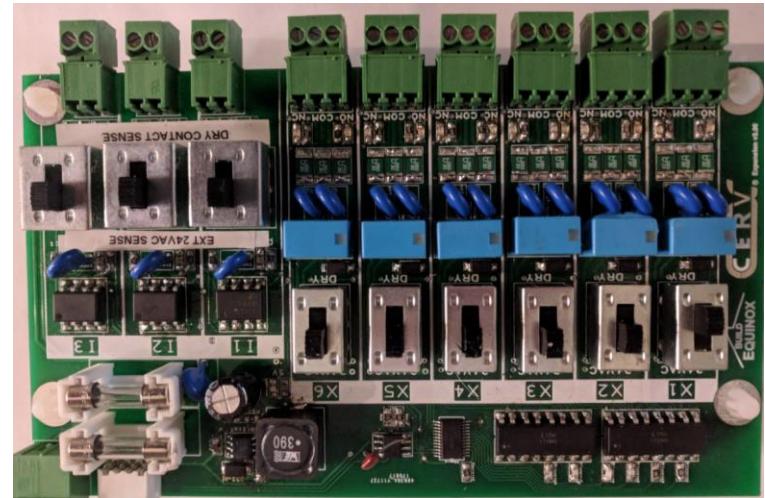




New Expansion Board Option

3 Input Channels and 6 Output Channels

- Set to either dry contact or 24VAC
- CERV2 can receive signal from external device
- CERV2 can trigger external devices

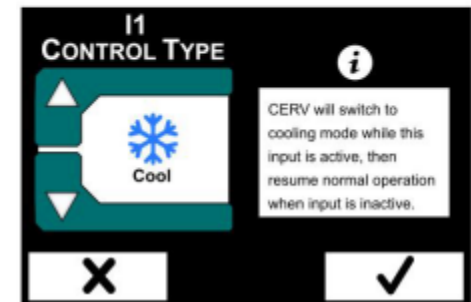
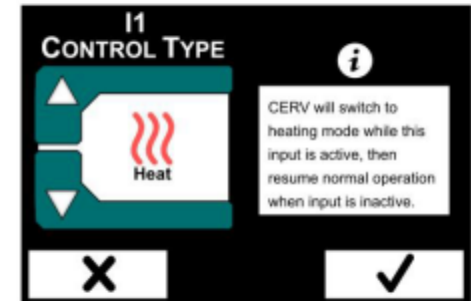
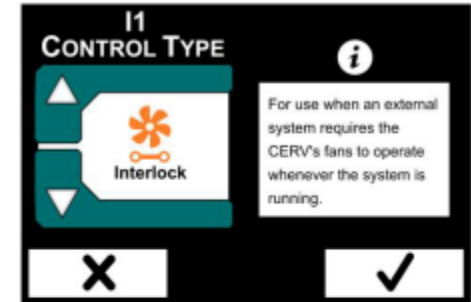
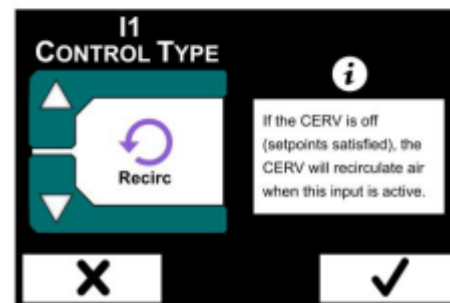
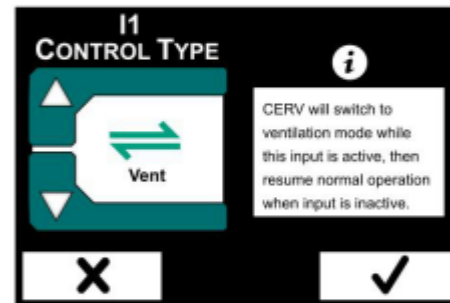
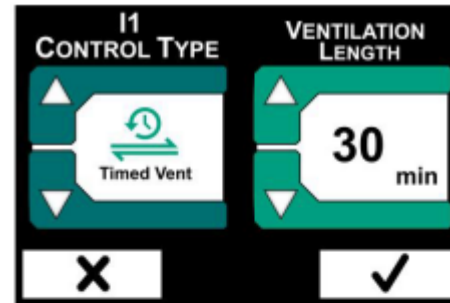




3 Input Channels

- Set to either dry contact contacts or 24VAC sense
- CERV detects inputs from external devices to trigger operation modes
- Trigger Modes
 - Timed vent
 - Vent
 - Recirc
 - Fan Interlock
 - Heat
 - Cool

Inputs





Outputs

6 Output Channels

- Set to either dry contact or 24VAC output
- CERV triggers an external device
 - Geo-Boost
 - Fan Interlock
 - Heating
 - Cooling
 - Venting
 - Humidity
 - Zoning

A1 DEVICE TYPE Heat HEAT SETPOINT OFFSET Heating Setpoint + 5 External Heating System Enabled At 88 X ? ✓	A1 DEVICE TYPE Dehumidification % RH SETPOINT 55 % X ? ✓
A1 DEVICE TYPE Cool COOL SETPOINT OFFSET Cooling Setpoint - 5 External Cooling System Enabled At 64 X ? ✓	A1 DEVICE TYPE Humidification % RH SETPOINT 55 % X ? ✓
A1 DEVICE TYPE Vent VENT SETPOINT OFFSET Vent Setpoint + 100 External Vent System Enabled At 1200 X ? ✓	A1 DEVICE TYPE GEO BOOST X ? ✓
I1 CONTROL TYPE Interlock For use when an external system requires the CERV's fans to operate whenever the system is running. X ✓	A1 DEVICE TYPE SELECT ZONE Zone 1 X ? ✓

Remote Sensing



Remote Temperature, RH, & CO₂

Remote measurement for bedrooms & bathrooms
RH and CO₂ may be used to trigger ventilation
Solar powered, no batteries required!

Greater flexibility in venting

- Wireless switches
- Active circuit transmitters
- Remote humidity

RH SETPOINT		FAN SPEED	
▲	70 %	▲	80 %
▼			
X	?	✓	

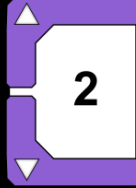

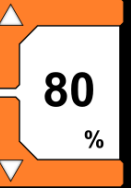


Zoning

Expansion Board allows the CERV2 to control zone dampers

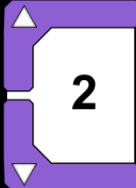
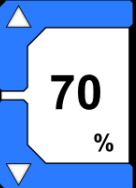
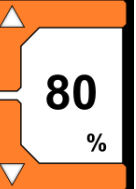
- Increases airflow to the specific zone when active
 - Add zones to remote ventilation options
 - Supply zones can direct fresh air to certain locations

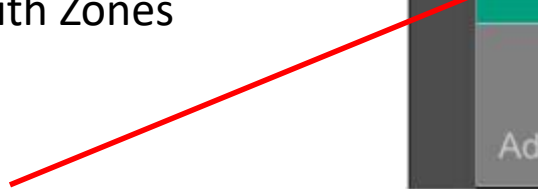
Wireless Switch Venting with Zones

SELECT ZONE	VENT LENGTH	FAN SPEED
 2	 45 min	 80 %
X	?	✓



Remote Humidity Venting with Zones

SELECT ZONE	RH SETPOINT	FAN SPEED
 2	 70 %	 80 %
X	?	✓



SW1 Guest Bath 30m ZONE 1	SW2 Mast Bath 20m ZONE 2	SEN1 Mast BR 72F 43%
SEN2 Guest BR 75F 55%	ACT1 Kitch Hood Disabled	SEN3 Bath 3 73F 67% ZONE 1 >75%
+		
Add Device		

Future



Availability

- Early Dec '17 CERV2 starting production – non-UL Listed systems
- Mid/late Dec '17 CERV2 pricing released and open for orders – non UL only
- Late Dec '17 CERV2 UL Certification submission
- Jan '18 CERV2 begin fulfilling initial orders – non UL only
- Q1 '18 CERV2 UL Listing expected completion
- Q1 '18 transition to UL Listed units, open orders

Stay Informed:

- Monthly Newsletter signup on our website
<http://buildequinox.com/#learnmore>
- On website under “News” find past newsletter articles, archived webinar videos, and reports/publications
 - “New IAQ Metrics Webinar” has in depth information on air quality and CERV-ICE Analytics
- Contact us with any questions or for more information

Thank you!

