EnergyWall

INSTALLATION, OPERATION & MAINTENANCE MANUAL

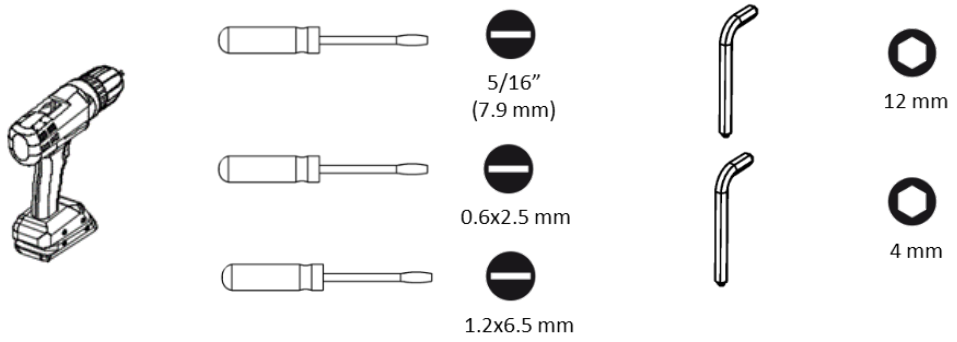
ENERGY RECOVERY VENTILATORS

ENERGY WALL™ ERV-600

MODEL: ERV-600

INSTALLATON

REQUIRED TOOLS



CONTROL MODES

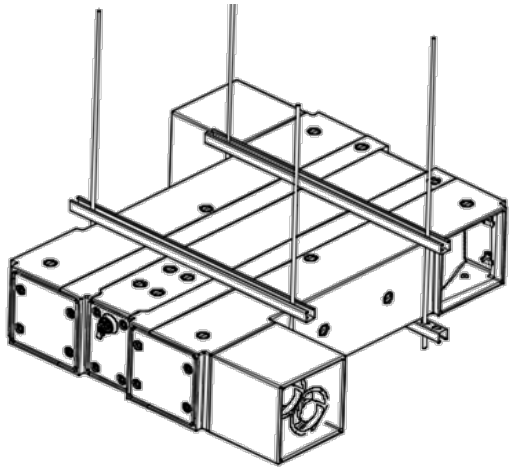
Mode 0 – Remote ON/OFF (Max 24V AC/DC)
Fan speeds are independently controlled by potentiometers located on the front of the controller board. The enable input allows for a simple remote ON/OFF op*era*tion of the system. The system is shipped as always ON by means of a factory installed jumper. This jumper must be removed if external enable control is desired. The enable inputs will accept up to 24VDC/AC. If a DC signal is used ensure to bring both the signal and DC common wire to the controller. A voltage differential must be present across the contacts for the system to turn on.

Mode 1 – Remote Speed Control (0-10 VDC)
The maximum fan speeds are independently controlled by potentiometers located on the front of the controller board. The fans will not exceed this setting, if maximum fan speed is desired ensure that the potentiometers are turn completely clock wise. Two analog input signals allow for remote control of the fan speeds for each airstream. The enable input works the same as in Mode 0. Ensure that the DC common for the signals is connected to the COM terminal on the controller, the inputs are single ended and accept 0-10 VDC.

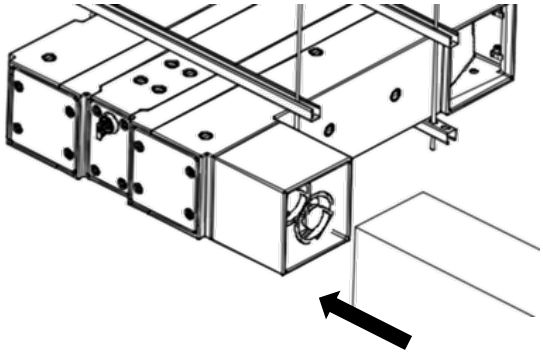
INSTALLATON

STEPS 1-4

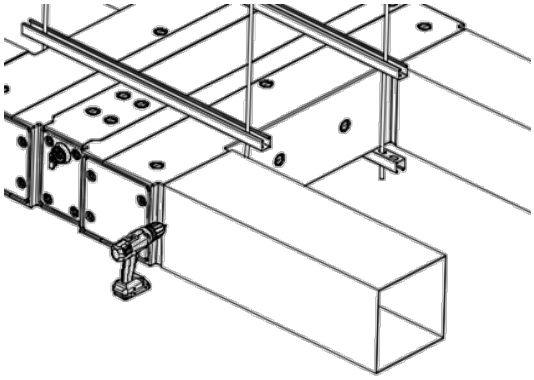
Step 1
Mount the system as desired. (Ceiling mount exampled)



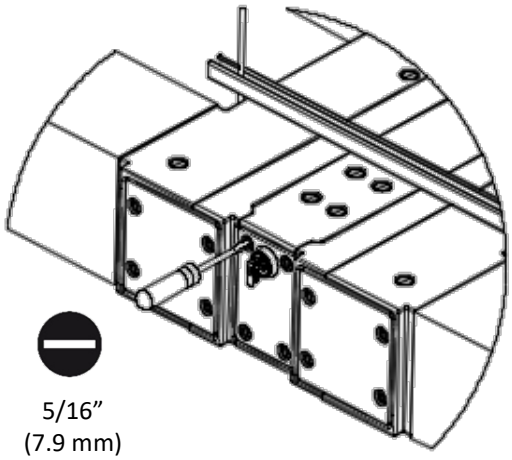
Step 2
Slip duct work over 1” flange. You may have to slide the duct work over a fan cube.



Step 3
Attach the duct work to the plastic flange with self tapping sheet metal screws.



Step 4
Rotate electrical access panel latches (4).

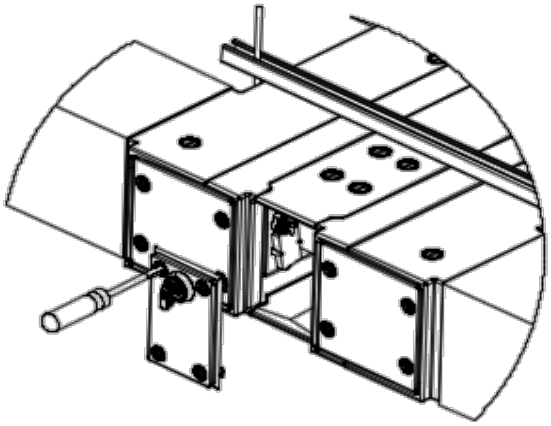


5/16”
(7.9 mm)

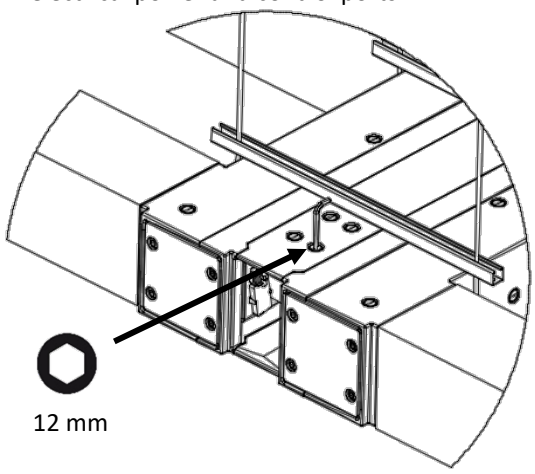
INSTALLATON

STEPS 5-8

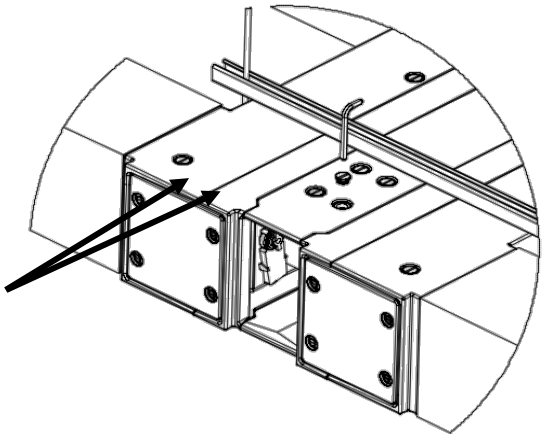
Step 5
Remove electrical access panel.



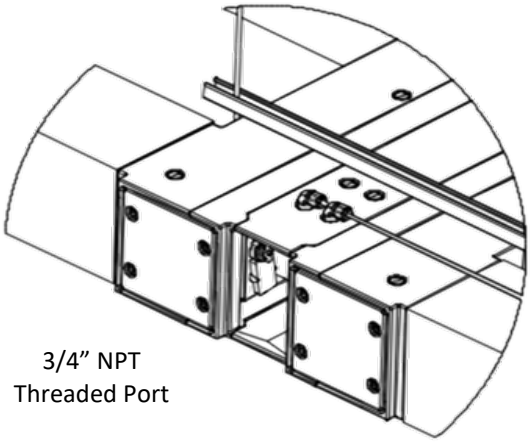
Step 6
Loosen threaded plugs located in the electrical power and control ports.



Step 7
Remove threaded plugs from power and control ports.



Step 8
Install power and control conduit fittings. (customer supplied)



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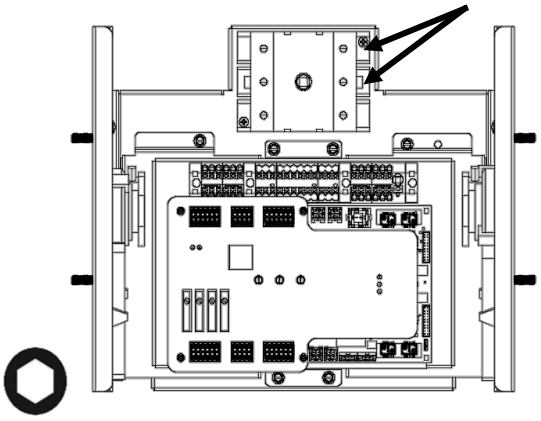
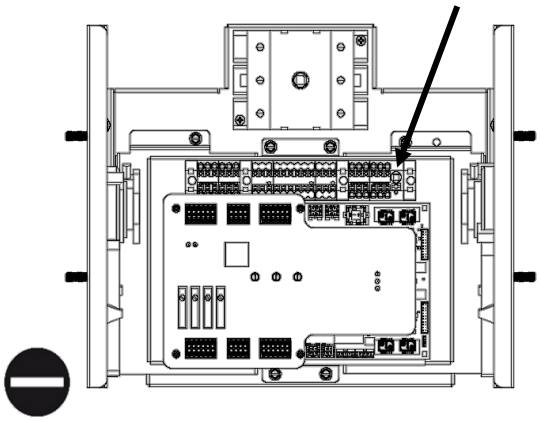
STEPS 9-12

Step 9
Connect power wires to the integrated disconnect. (L1 & L2)



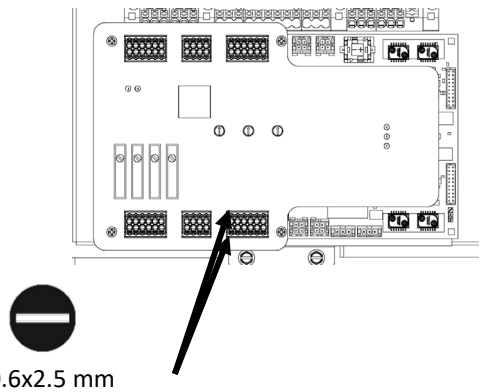
4 mm

Step 10
Connect ground wire to green terminal block.



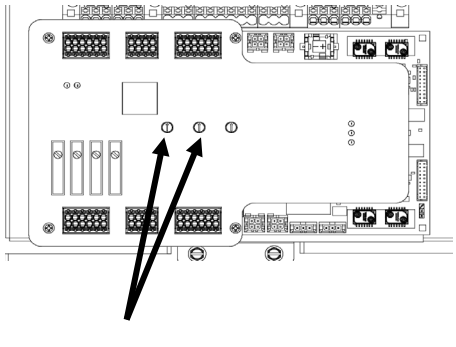
1.2x6.5 mm

Step 11
Connect remote enable wires.
(See controller documentation)



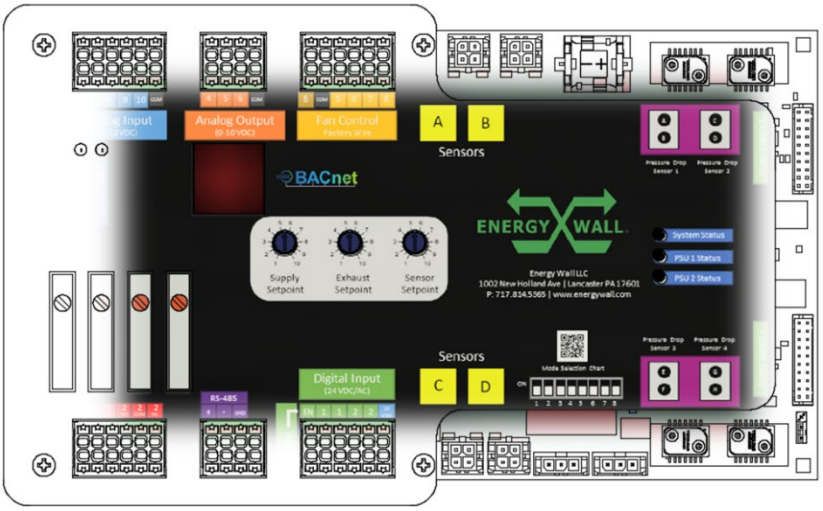
0.6x2.5 mm

Step 12
Adjust exhaust and supply air maximum fan speeds using potentiometers.

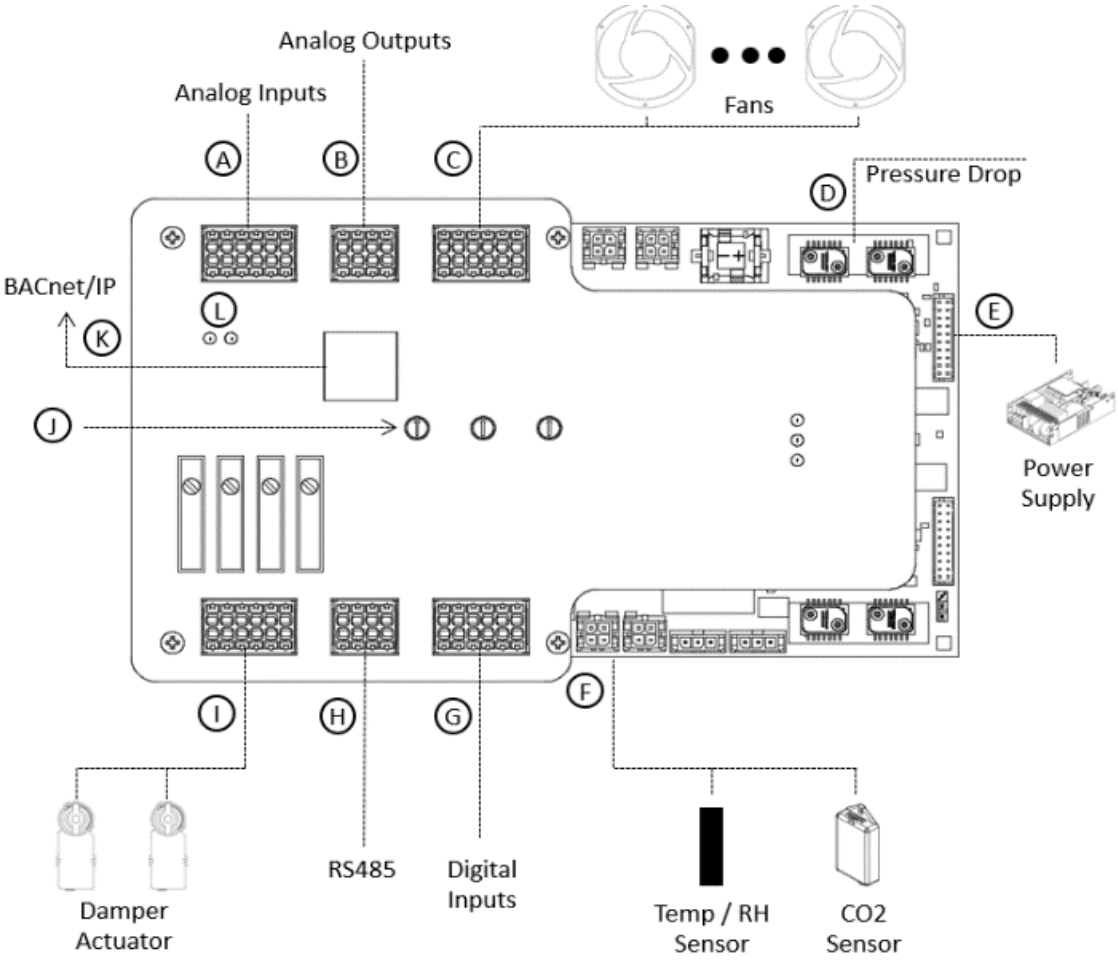


0.6x2.5 mm

OPERATION UNIVERSAL AHU CONTROLLER



Label	IO Type
A	Analog Input
B	Analog Output
C	Fan Control
D	Pressure Drop
E	Power Supplies
F	Local Fieldbus
G	Digital Inputs
H	BMS 1
I	Relay Output
J	Local Setpoint Control
K	BMS 2
L	Cellular Connectivity



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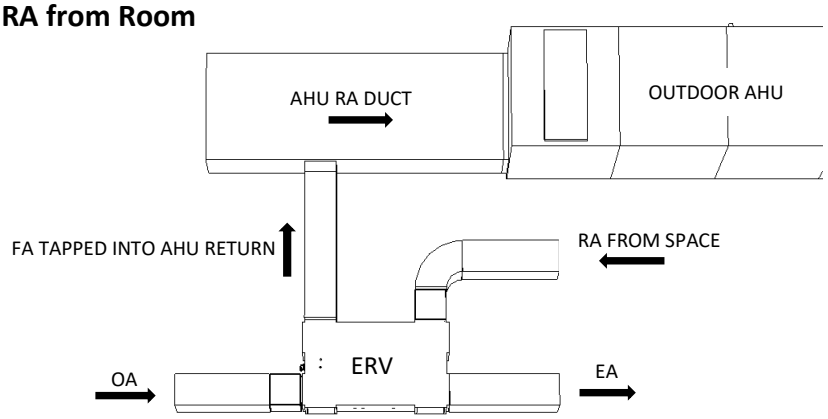
UNIVERSAL AHU CONTROLLER

OPERATIO

Label	IO Type	Description
A	Analog Input	(Qty 10) 0-10 VDC single ended analog inputs Can be used for fan speed control, modulating damper actuator feedback, and customer supplied external sensors
B	Analog Output	(Qty 6) 0-10 VDC single ended analog outputs Can be used for modulating damper control or general customer IO
C	Fan Control	Factory IO used for local fan control and feedback
D	Pressure Drop	(Qty 4) +/- 2 inWG differential pressure drop sensor Used for dirty filter alarm monitoring, external pressure control, and air flow calculation
E	Power Supplies	(Qty 2) Local power supply control and monitoring connections
F	Local Fieldbus	(Qty 4) Local factory sensor connection Used to add temperature, relative humidity, and CO2 sensors to the system.
G	Digital Inputs	(Qty 5) Digital inputs (Max voltage: 24 VAC/DC) One digital input serves as the system enable input the other four inputs may be used by the customer
H	BMS 1	(Qty 1) RS-485 communication port allowing for remote Modbus / BACnet MSPT control and monitoring
I	Relay Output	(Qty 4) Relay outputs Used to control On/Off dampers and may be used by the customer
J	Local Setpoint Control	(Qty 3) Integrated potentiometers Allows local independent adjustment of fan speeds for both airstreams and an external sensor setpoint
K	BMS 2	(Qty 1) Ethernet connection Allows for integration into BMS over BACnet/IP
L	Cellular	(Qty 1) Cellular connectivity Firmware updates, device configuration, and remote data monitoring

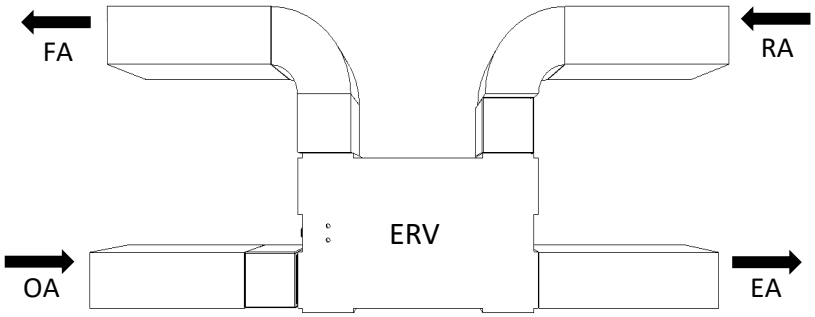
INSTALLATIO APPLICATIONS

FA to AHU, RA from Room



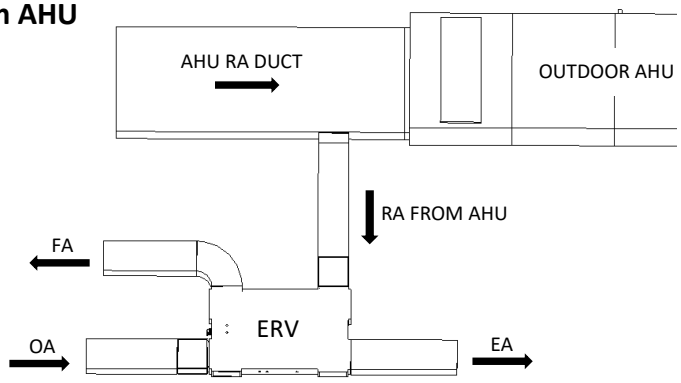
EA Exhaust Air **OA** Outside Air **RA** Return Air **FA** Fresh Air

FA to Room, RA from Room



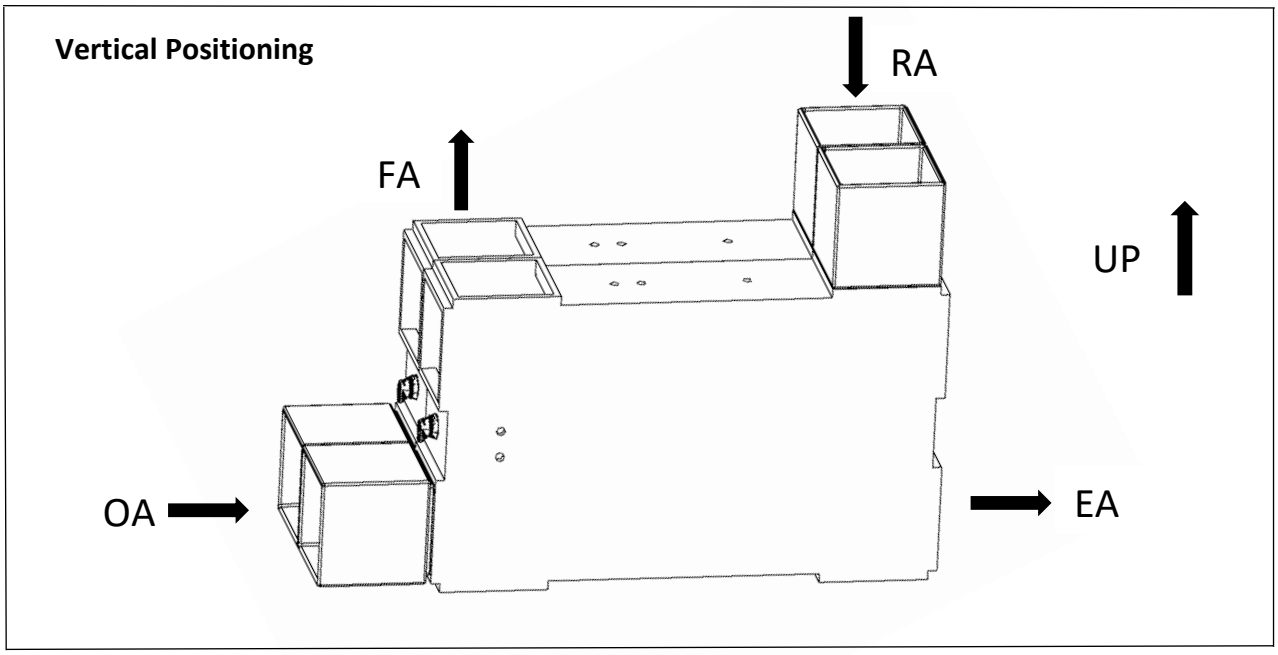
EA Exhaust Air **OA** Outside Air **RA** Return Air **FA** Fresh Air

FA to Room, RA from AHU

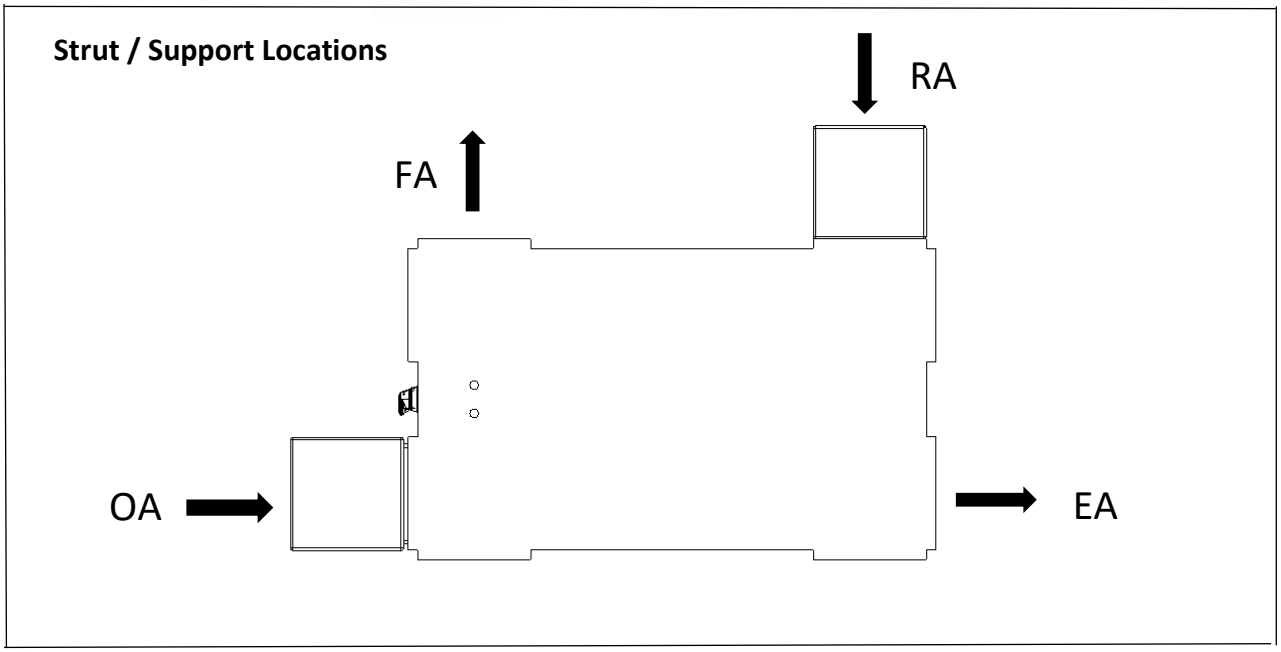


EA Exhaust Air **OA** Outside Air **RA** Return Air **FA** Fresh Air

STRUT AND SUPPORT LOCATIONS



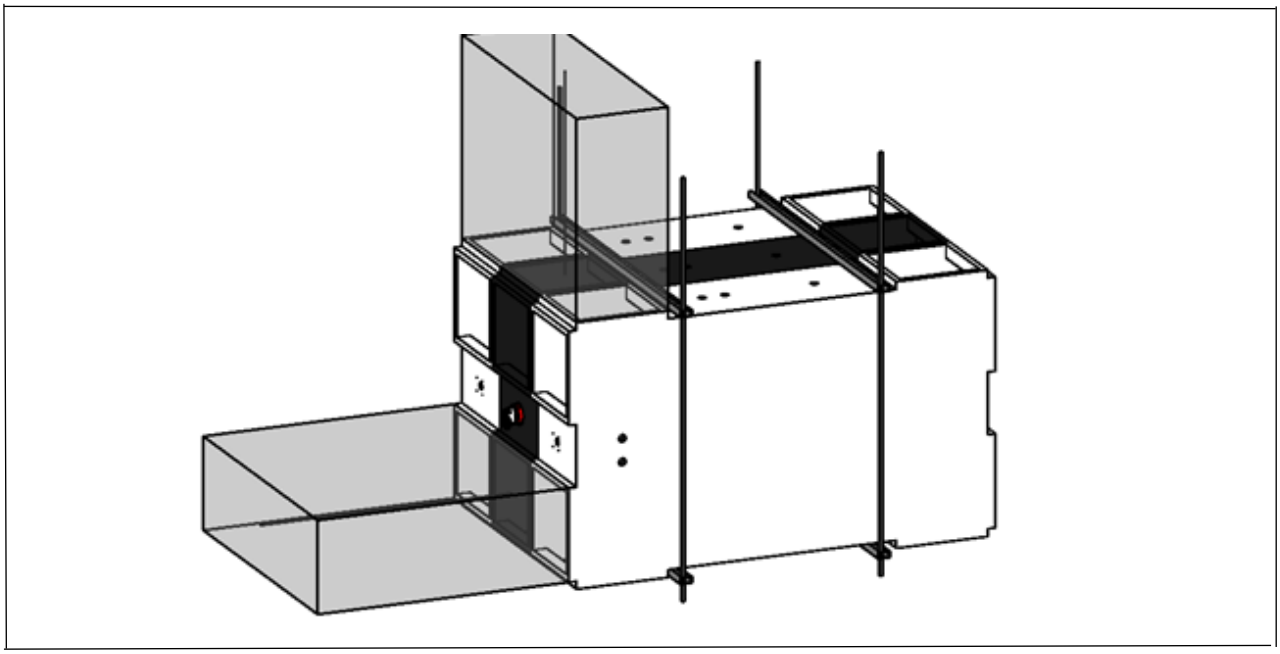
EA Exhaust Air **OA** Outside Air **RA** Return Air **FA** Fresh Air



EA Exhaust Air **OA** Outside Air **RA** Return Air **FA** Fresh Air

INSTALLATIO

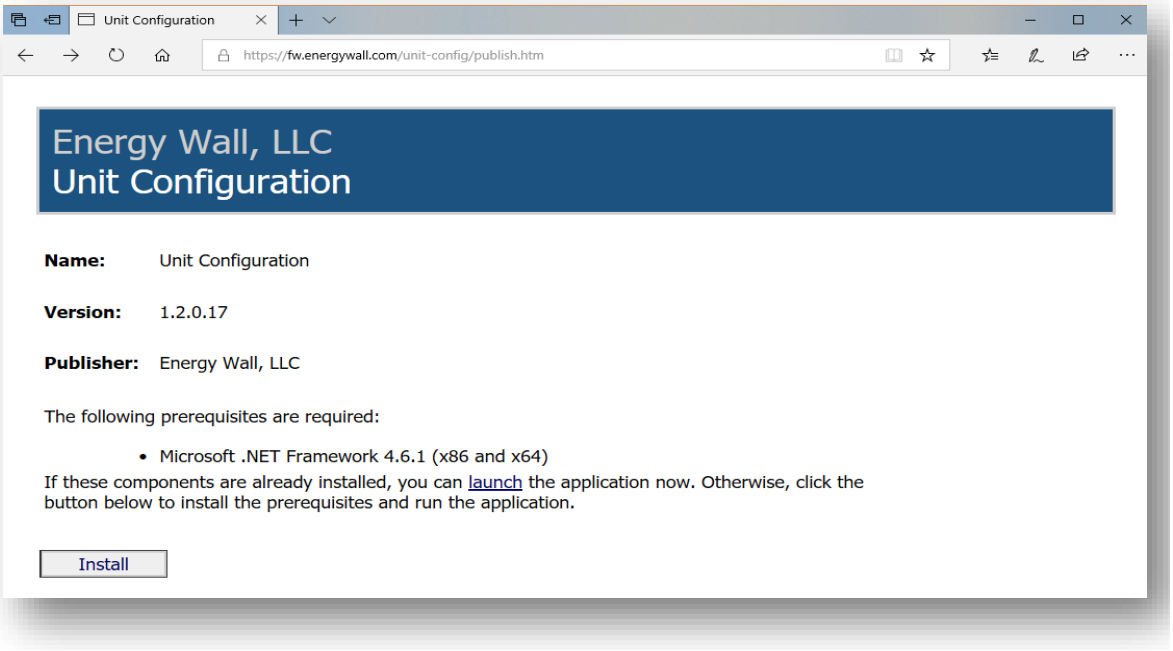
TYPICAL MOUNTING



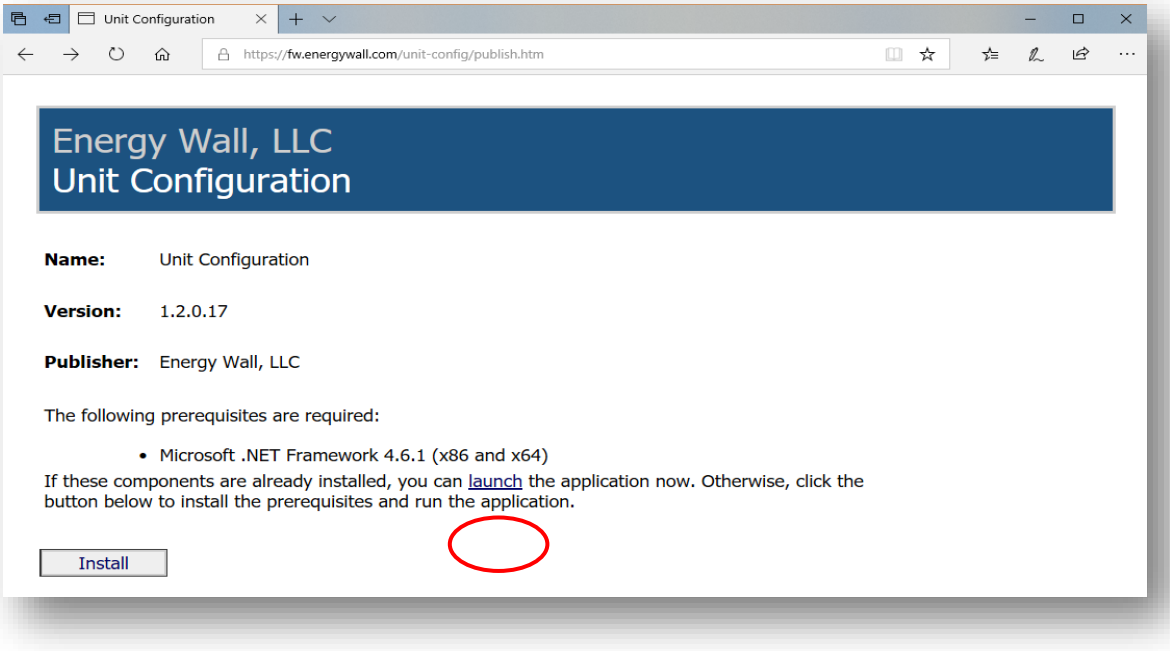
Units Can Be Suspended Using Threaded Rod and Strut Arrangement

STEP 1 Navigate to the following website URL to download the configuration software:

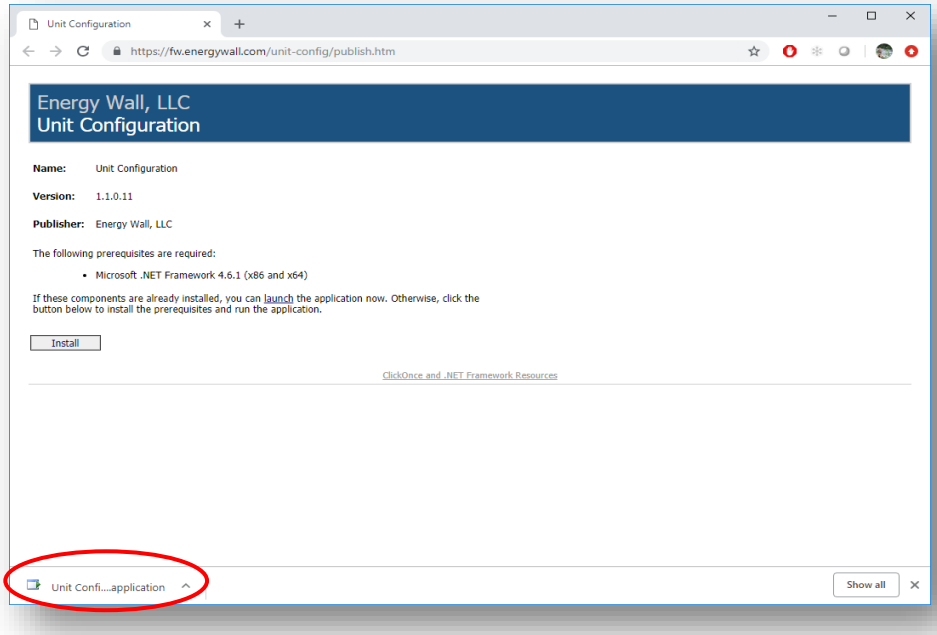
https://fw.energywall.com/unit-config/publish.htm



STEP 2 Download installer by clicking "launch" link. *(The "install" button at the bottom is only necessary if Microsoft .NET Framework 4.6.1 is not already installed on your computer.)*

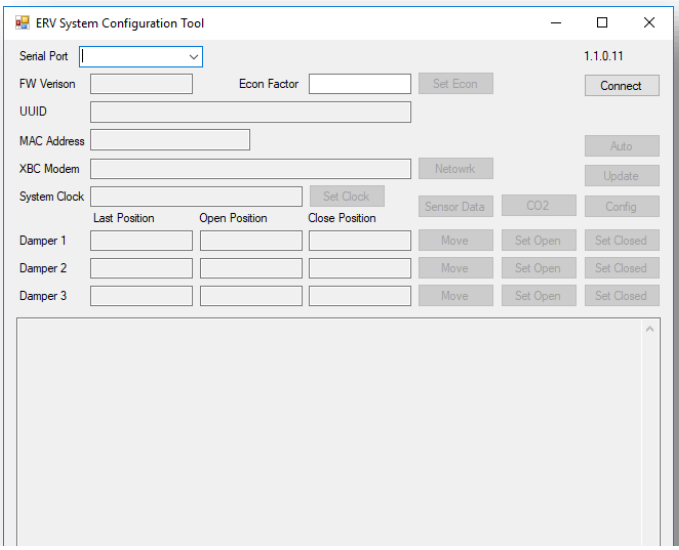


STEP 3 The installer will start downloading. Once complete, open the installer. *(Depending on your browser, the download may be in your computer's downloads folder.)*



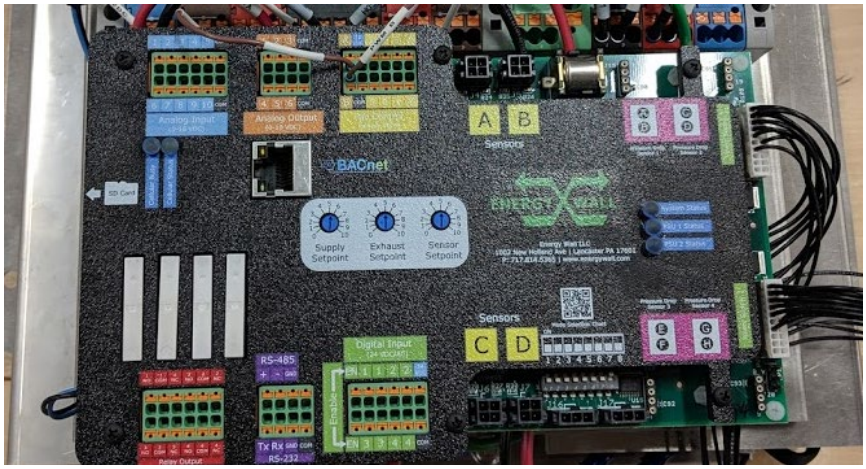
STEP 4 Upon opening the installer, a Microsoft Security Warning dialog window may appear. Click "Run" to continue installing the software

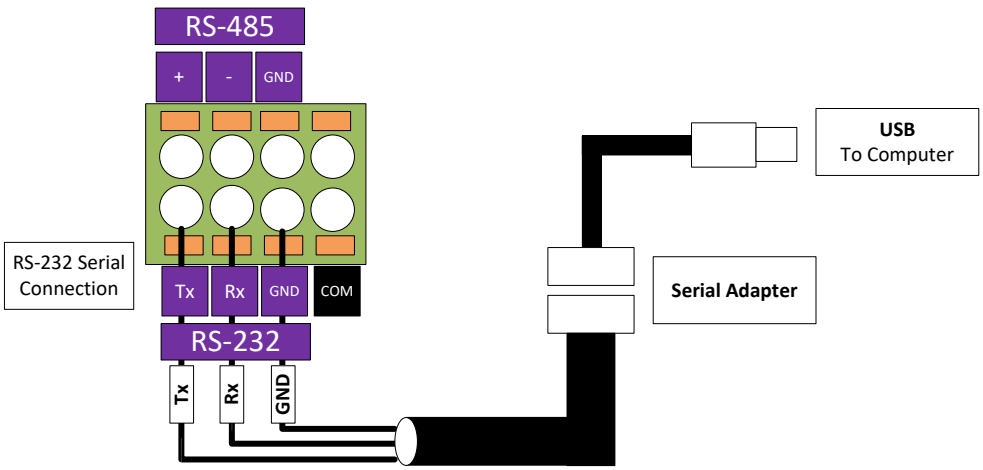
STEP 5 Upon completion of the install, the "Unit Configuration" application will automatically open.



STEP 6 Connect your computer to the U-ERV system controller using the Energy Wall supplied configuration kit (Part #EE-20043-01). This kit will include a USB to Serial cable and a serial to flying lead.

STEP 7 Terminate the flying lead end of the cable to the U-ERV controller. Connect the ferruled ends to the corresponding "Tx", "Rx", and "GND" terminals for RS-232 communication.

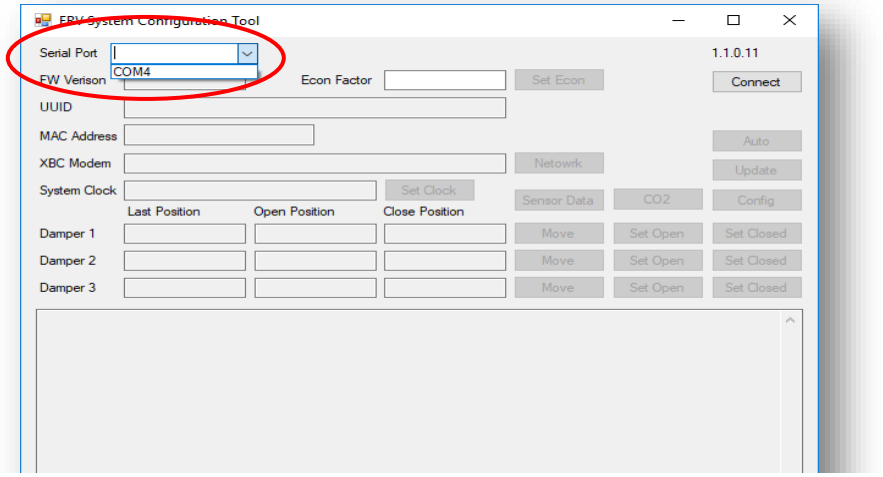




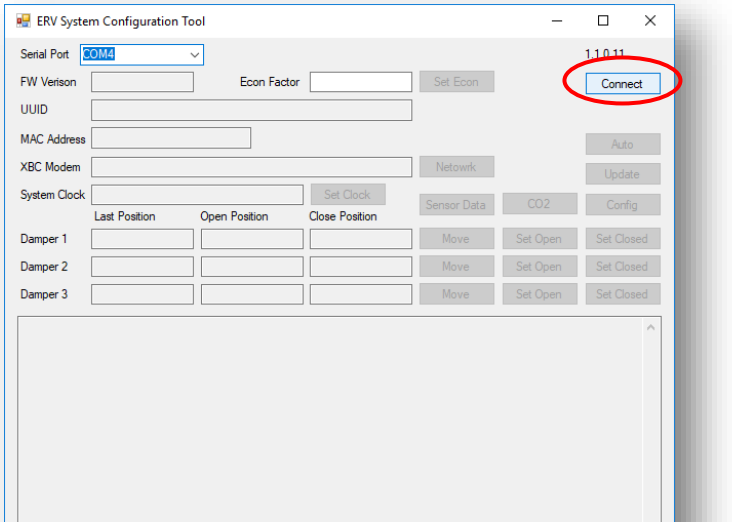
INSTALLATION CONFIGURING SOFTWARE

STEP 8 Secure the electrical access panel and turn power on to the unit.

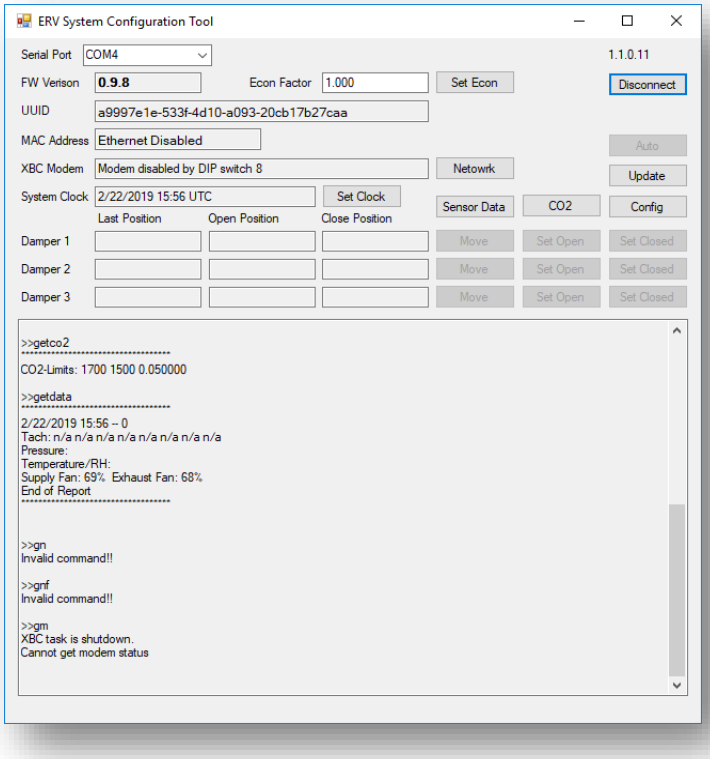
STEP 9 Once the serial cable is properly connected to the controller and the system is powered on, connect the USB end of the cable to your computer. Open the Unit Configuration software previously installed. At the top of the application there is a drop-down selection box specifying the serial port. From the drop-down menu select the correct port for the USB to serial cable you just connected. If you are unsure of the exact port number, you may navigate to the Windows Device Manager to see a list of currently connected serial ports. (*The example below shows COM4, however your port may be different.)*



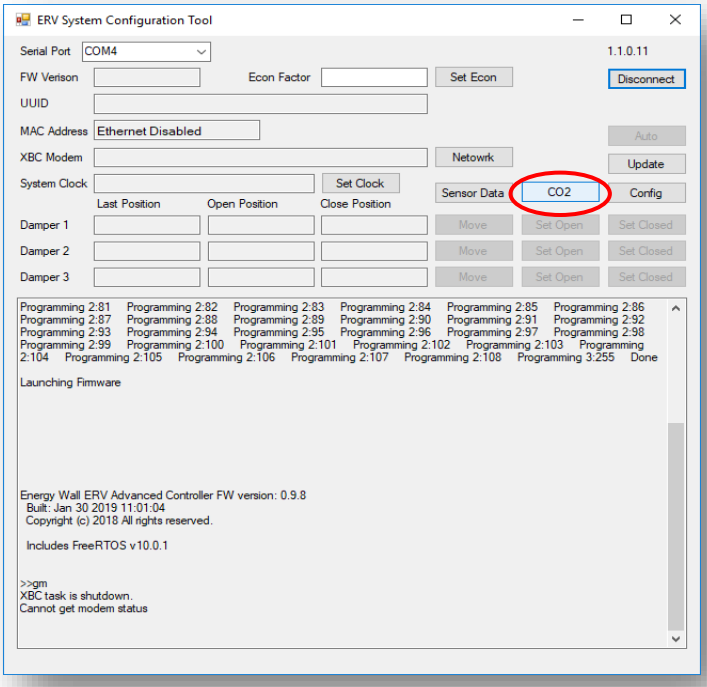
STEP 10 Connect to the U-ERV controller. Upon selecting the correct serial port, press the "Connect" button to begin the serial communication.



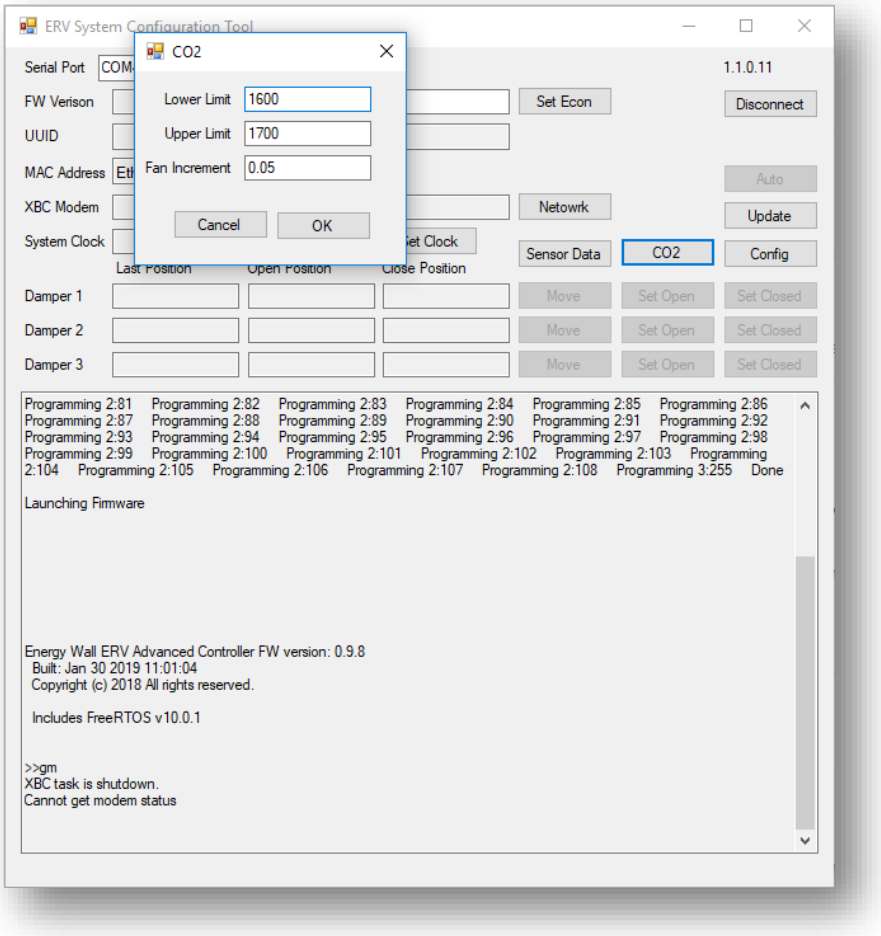
STEP 11 If connection is successful, the controller data will populate the Unit Configuration application. You can now monitor and configure several attributes of the controller.



STEP 12 Click the CO2 button to open the CO2 configuration window.



STEP 13 Adjust the desired CO2 settings.



Mode 2

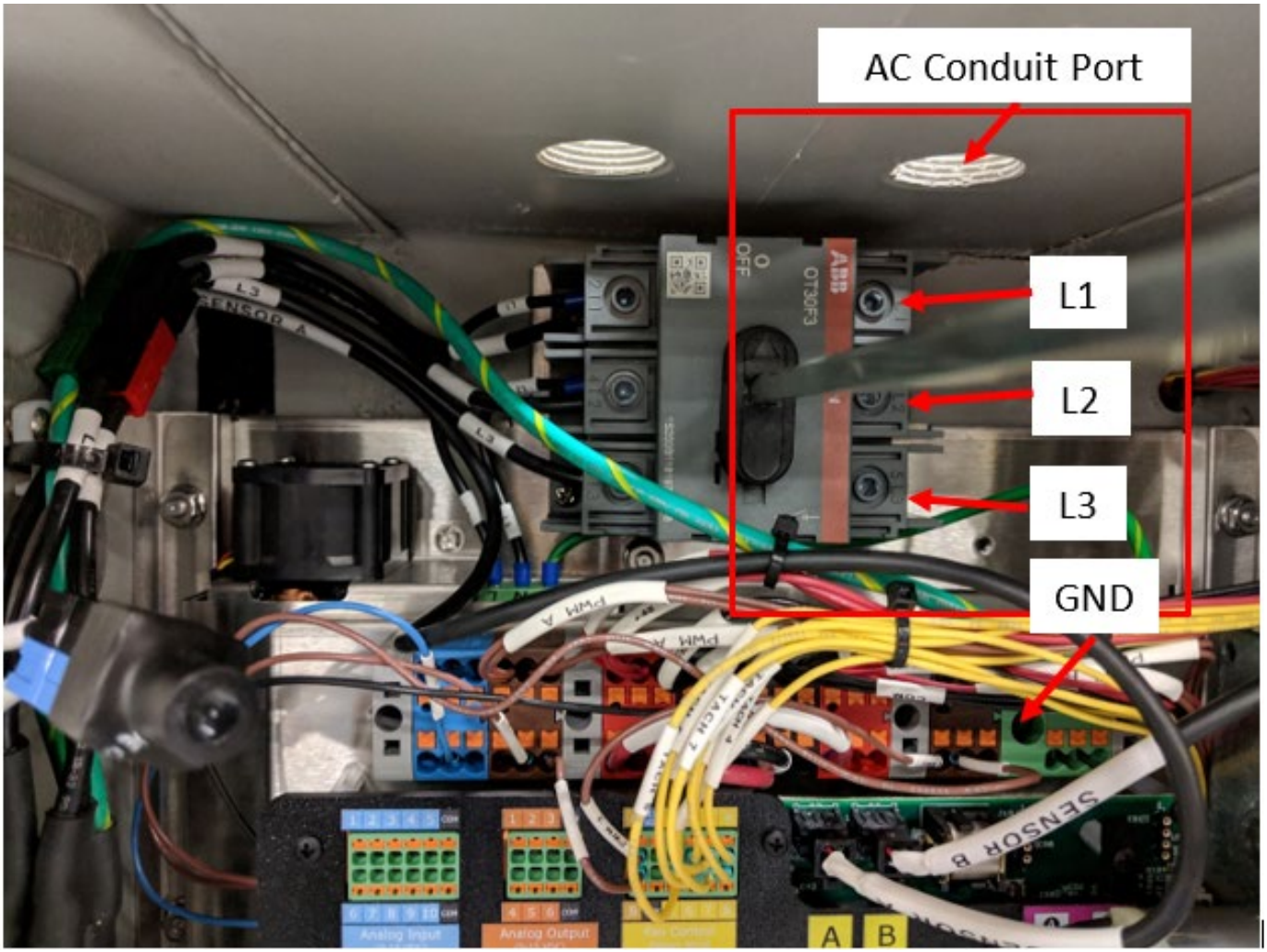
In this operation mode, the system will automatically vary the fan speeds (Supply and Exhaust) in response to CO2 levels. The CO2 level can be supplied by one or two i2c sensors on channels A and/or B; if there are two they will be averaged. Alternatively, if no CO2 sensor is provided on the i2c channels, the CO2 level will be read from Analog Input 1. 0 volts will indicate 0 PPM; the PPM indicated by 10 volts is set by TP3 (from 2,000 to 10,000). The default low and high CO2 set points are 800 PPM and 1000 PPM. These values can be changed by including values in the co2.txt file in the config folder.

The system will control the fan speeds according to the following rules:

- If the CO2 is less than the low set point, the fan speeds will gradually be reduced until they reach their minimum speed.
- If the CO2 levels are between the low and high set point, the fan speeds will remain constant.
- If the CO2 levels are above the high set point, the fans speeds will gradually be increased until they reach 100%.
- If the CO2 levels exceed the high point by the difference between the low and high set points (1200 PPM with the default values), the fans we be set directly at 100%.
- The default rate of change for the fan speeds is 5% per minute. This value is changeable by setting the third line in co2.txt.

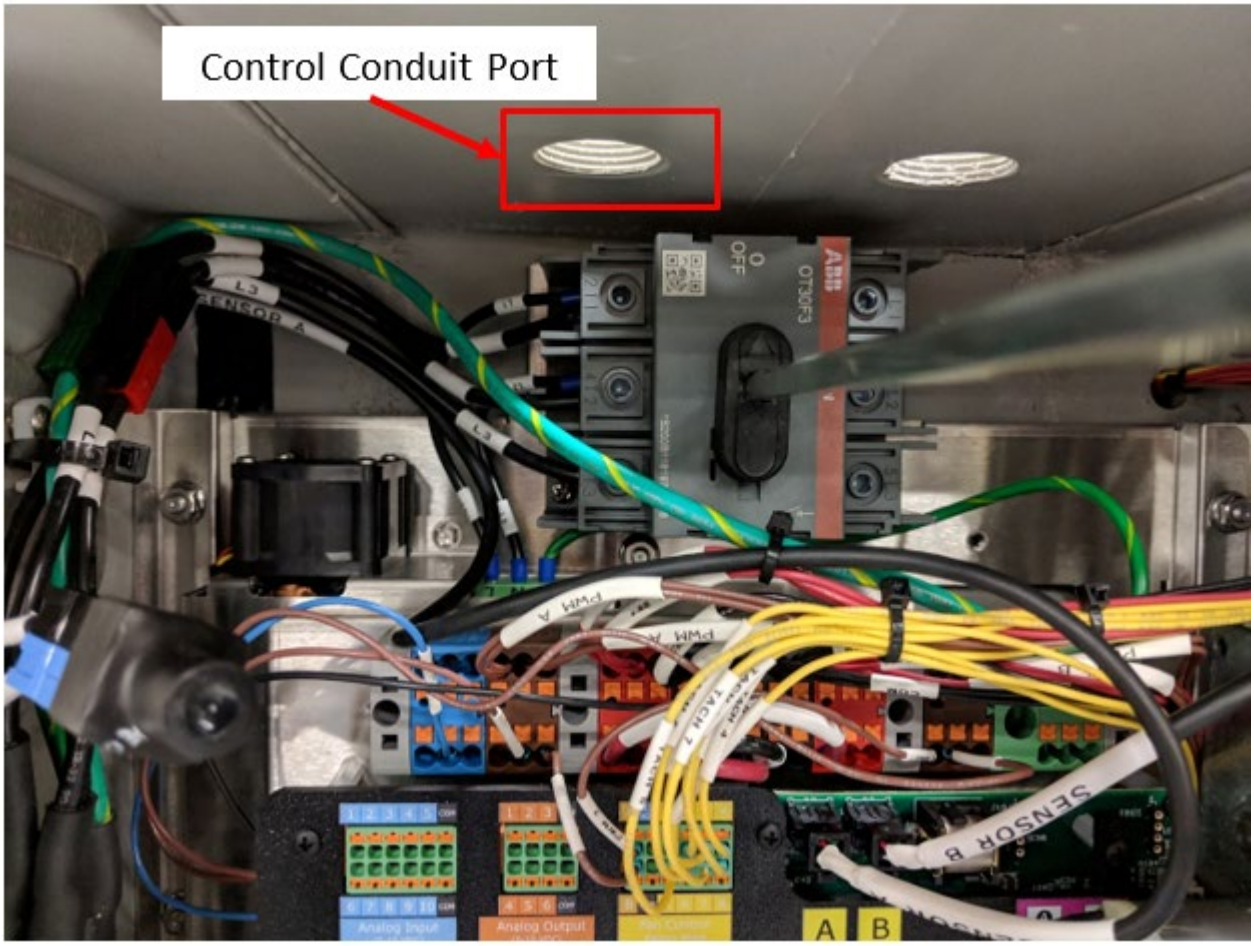
AC Power Connection

Attach conduit or wire fitting to included threaded port. Feed AC power wires (1P or 3P) into electrical enclosure. Terminate the AC wires at the included disconnect. Terminate the ground in the large green ground distribution block.



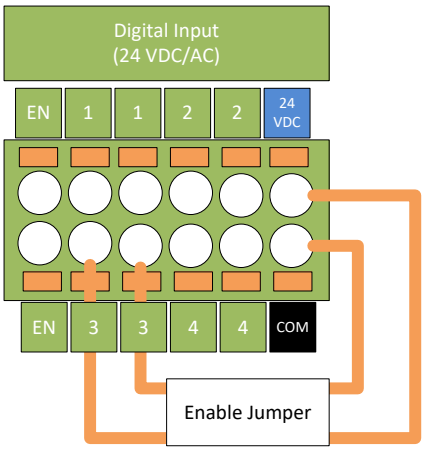
Control Connection

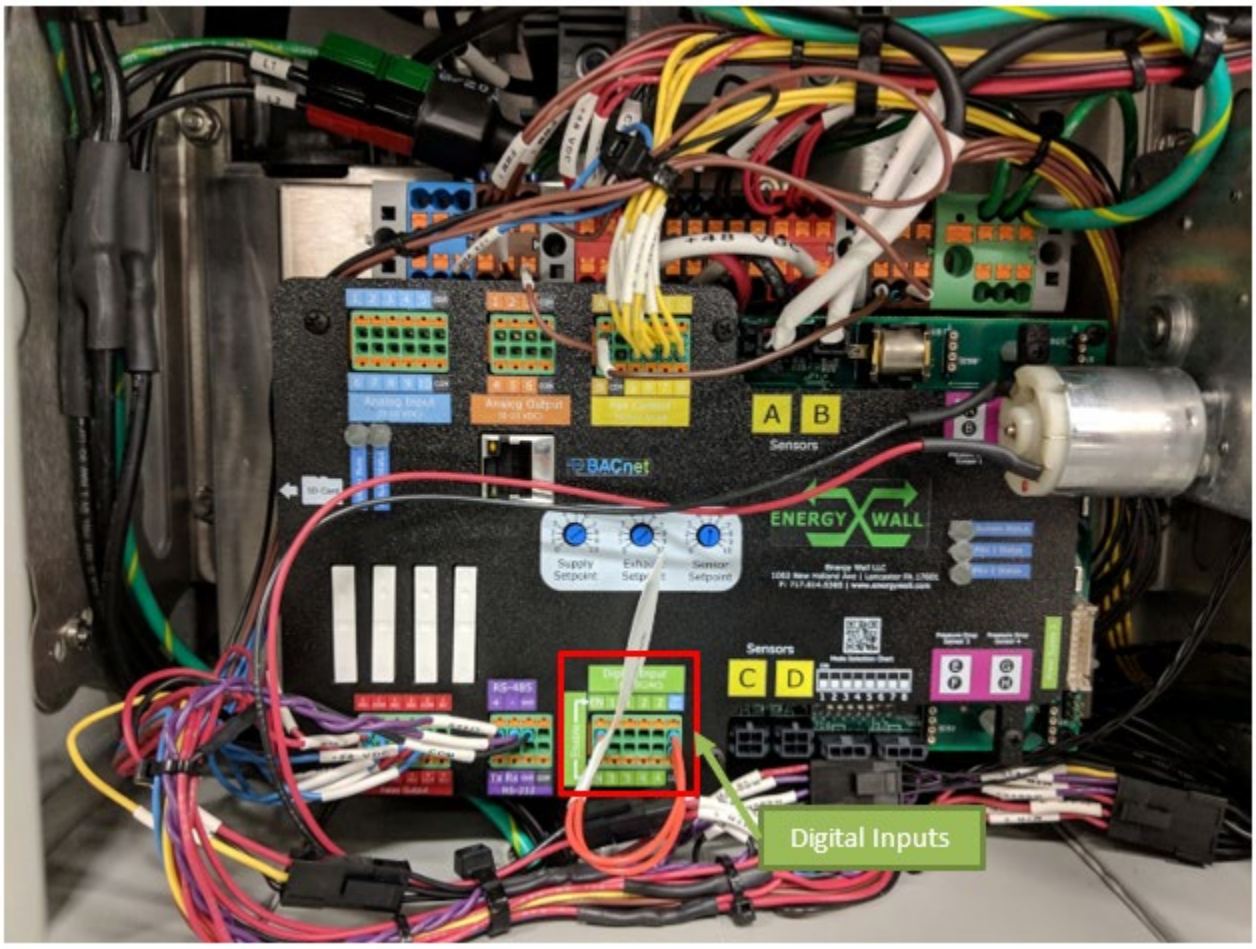
Attach conduit or wire fitting to included threaded port. Feed control wire into electrical enclosure. Terminate the control wires per the application requirements.



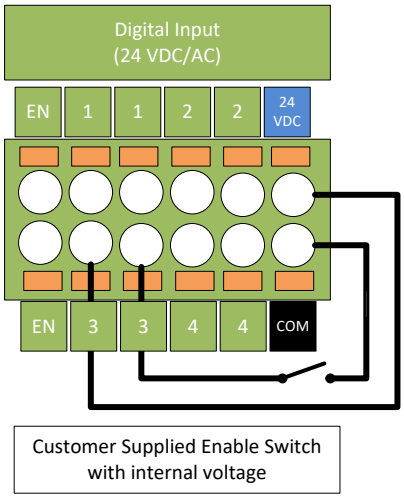
Enable Circuit

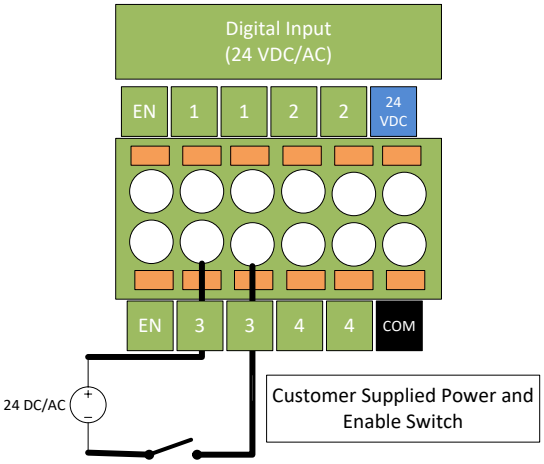
An enable circuit signal must be present for the system to operate. The fans will not turn on if the enable input is not properly connected. A factory installed orange jumper wire is shipped with the unit. This jumper will allow the system to operate normally so long as the main disconnect is turn on.



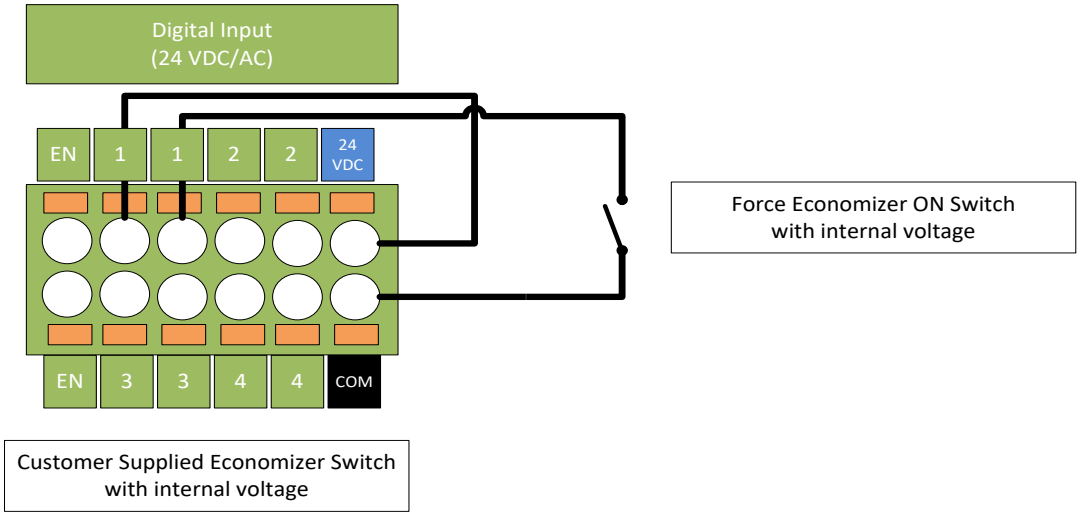


An external switch may be used with either external or internal voltage. This switch will enable / disable the fans in the system. Digital input labeled “3” is designated to the enable input. A 24 VDC/AC voltage must be present between the “3” inputs for the fans to operate.





The controller will also accept a digital input signal to force the system into economizer mode. Digital input 1 is designated to the Force Economizer mode. A 24 VDC/AC voltage must be present between digital input 1 terminals.



The controller will accept an override input signal to force the system to full fan speed and economizer off. Digital input 4 is designated to the override mode. A 24 VDC/AC voltage must be present between the digital input 4 terminals.

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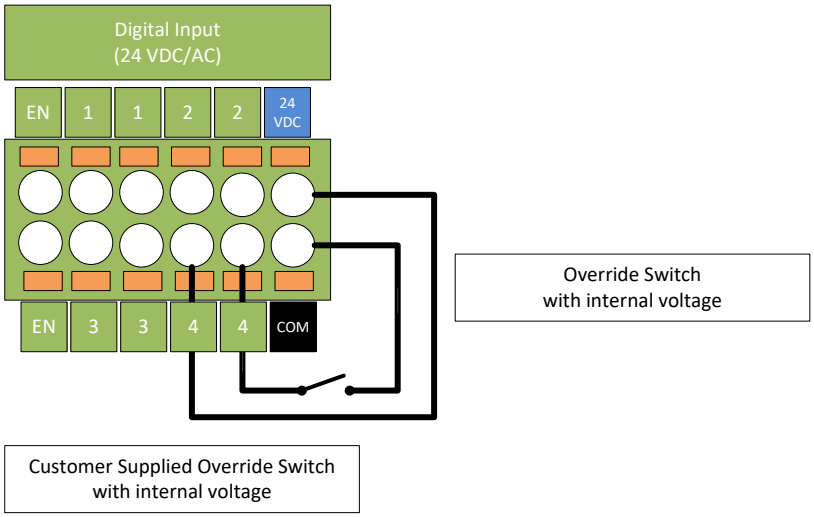
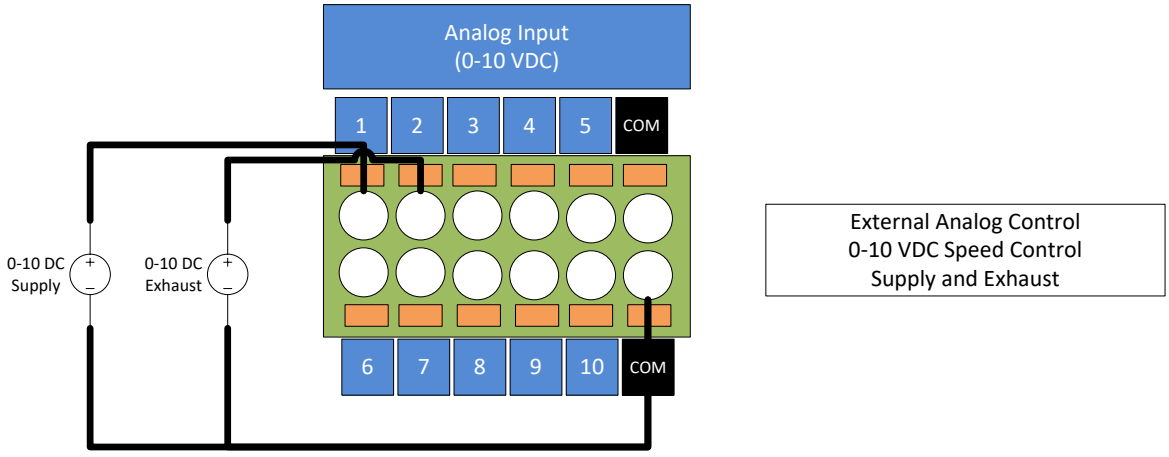


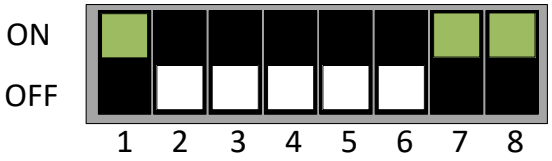
Speed Control

The controller will accept two (2) 0-10 VDC analog signals at inputs # 1 and # 2. These signals will control the speed of the supply and exhaust fans respectfully.



Control Modes

The controllers operating mode can be configured using the bank of dip switches located on the controller board. There is a total of 8 dip switches whose position, OFF or ON, determine the operating mode of the system. The first 4 switches numbered 1-4 determine the operational mode, the remaining 4 dip switches numbered 5-8 are for hardware configuration. A variety of operating modes are supported: local speed control, remote analog control, and demand control ventilation. The following figure illustrates the default factory dip switch configuration. Additionally, the table below outlines the purpose of each of the dip switches



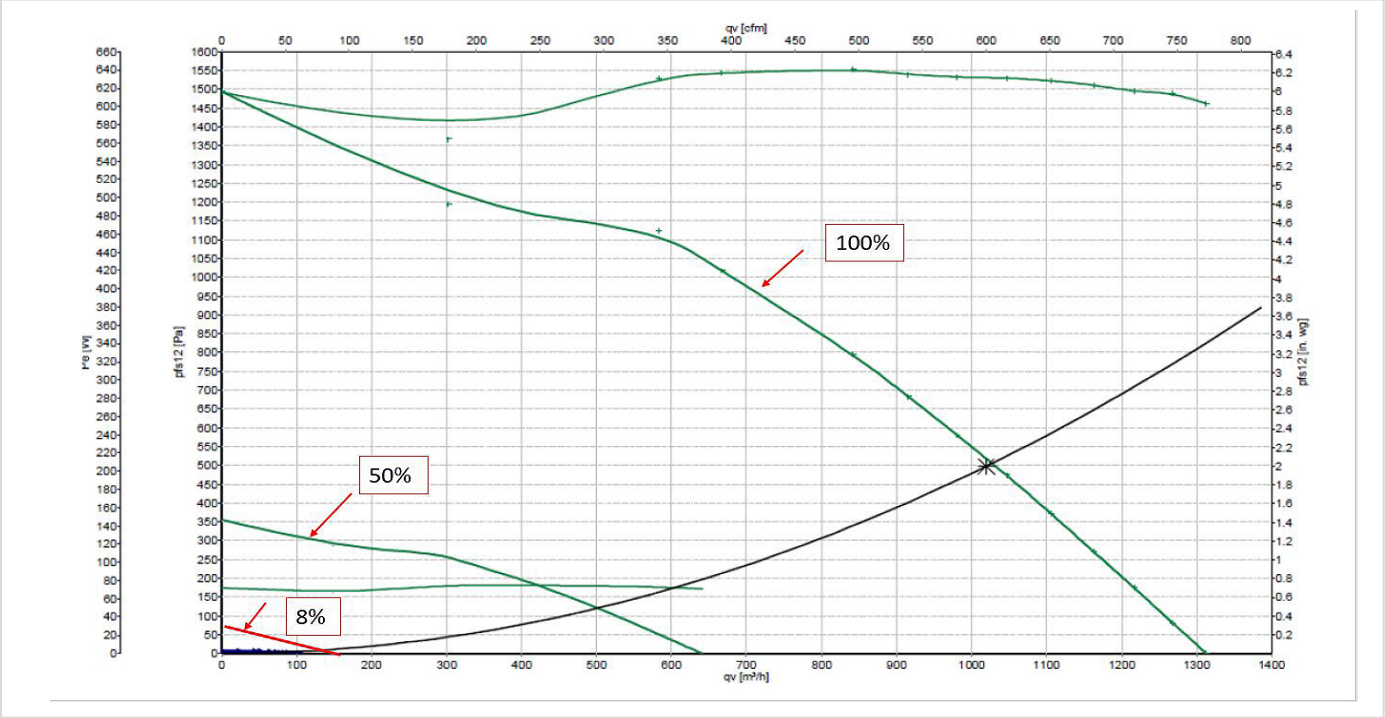
Switch Position	OFF	ON
1	Local Fan Speed Control	Remote 0-10 VDC Fan Speed Control
2	N/A	CO2 Demand Control Ventilation Mode
3	N/A	N/A
4	N/A	N/A
5	1 Power Supply	2 Power Supplies
6	N/A	N/A
7	N/A	Fan 100% Override via Digital Input 4
8	Cellular Modem Connected	No Cellular Modem

Shaded items are set to ON by factory default

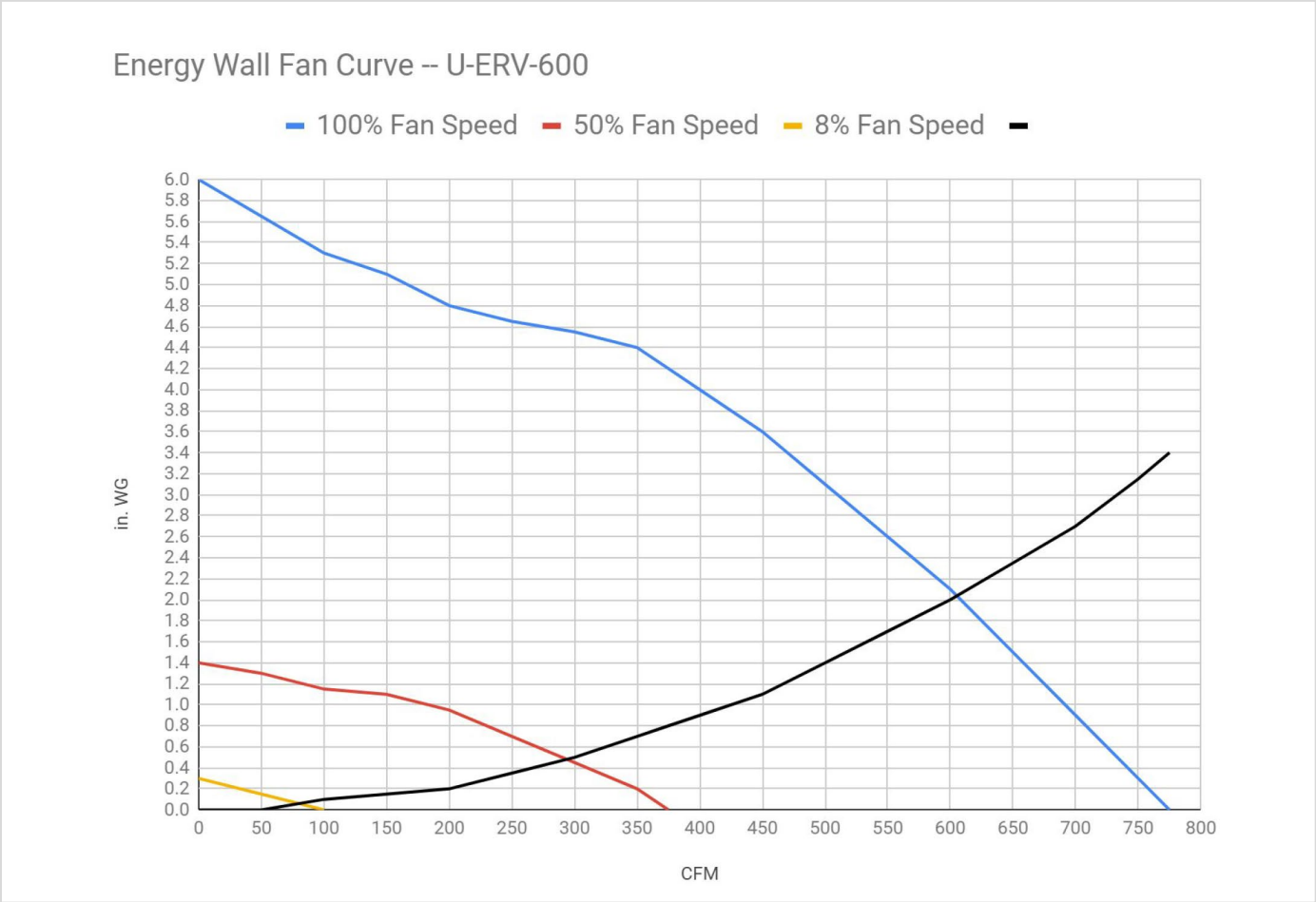
OPERATION

Sound Data

	Db With Lined Duct	Db No Duct	
Fan Speed %	At 1M	At 1M	At 4M
0	38.0	40.5	38.2
10	38.5	41.5	38.4
20	38.7	48.0	41.2
30	39.2	51.8	48.1
40	41.8	56.2	51.4
50	42.2	57.4	54.2
60	49.7	60.5	57.0
70	54.9	66.5	64.3
80	58.4	69.6	66.8
90	59.0	76.0	73.9
100	64.5	82.5	75.4



OPERATION



EnergyWall