

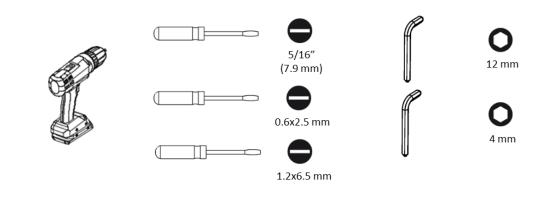
# INSTALLATION, OPERATION & MAINTENANCE MANUAL ENERGY RECOVERY VENTILATORS

ENERGY WALL<sup>™</sup> 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.

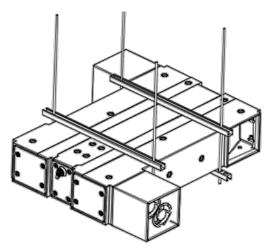


### **INSTALLATON**

### **STEPS 1-4**

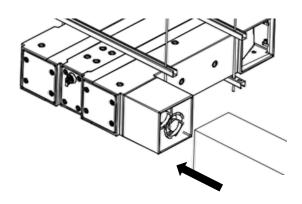
#### Step 1

Mount the system as desired. (Ceiling mount exampled)



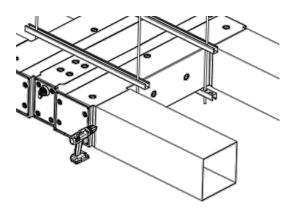
### Step 2

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

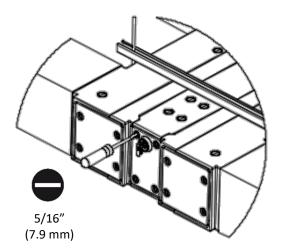


#### Step 3

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



**Step 4** Rotate electrical access panel latches (4).



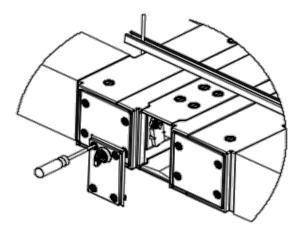


### INSTALLATON

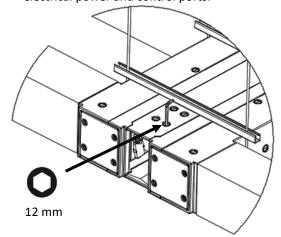
**STEPS 5-8** 

#### Step 5

Remove electrical access panel.

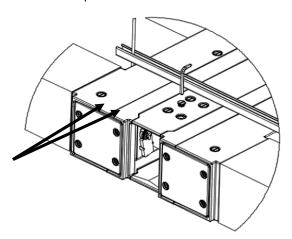


**Step 6** Loosen threaded plugs located in the electrical power and control ports.

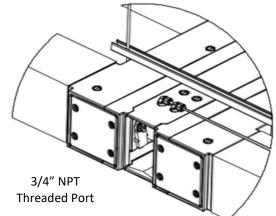


#### Step 7

Remove threaded plugs from power and control ports.



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





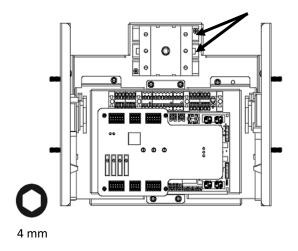


# INSTALLATON

#### **STEPS 9-12**

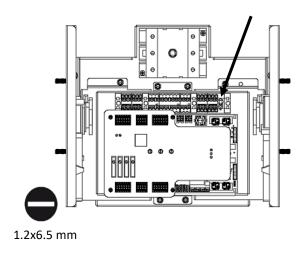
#### Step 9

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

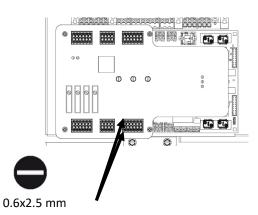


# Step 10

Connect ground wire to green terminal block.

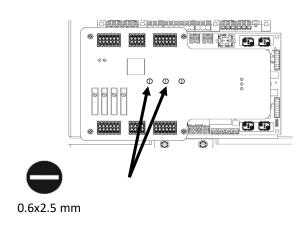


#### **Step 11** Connect remote enable wires. (See controller documentation)



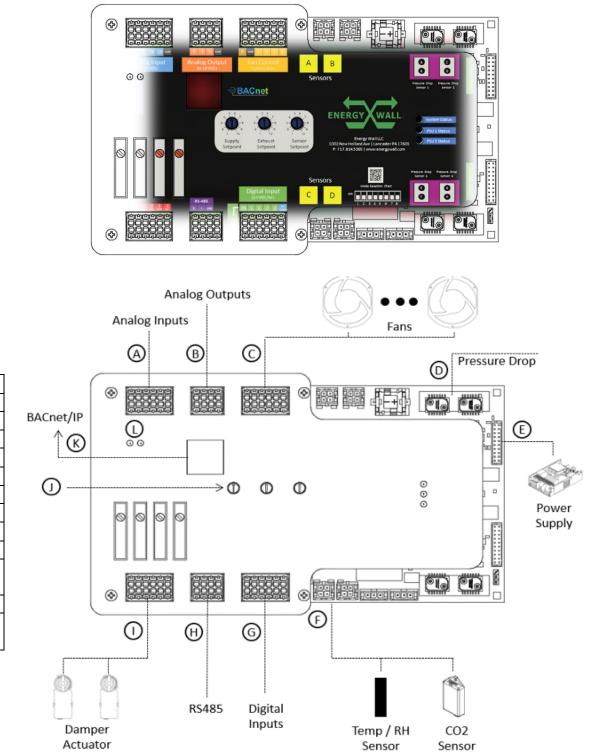
#### Step 12

Adjust exhaust and supply air maximum fan speeds using potentiometers.





# OPERATION UNIVERSAL AHU CONTROLLER



Label	Ю Туре
А	Analog Input
В	Analog Output
С	Fan Control
D	Pressure Drop
E	Power Supplies
F	Local Fieldbus
G	Digital Inputs
Н	BMS 1
I	Relay Output
J	Local Setpoint
J	Control
К	BMS 2
1	Cellular
	Connectivity



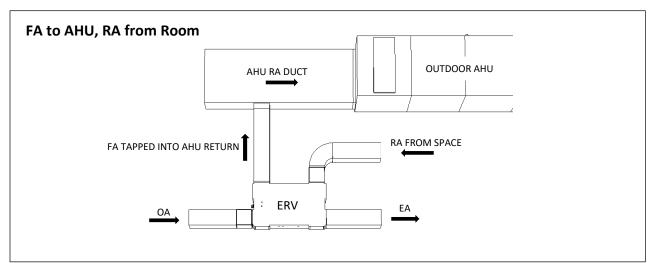
# UNIVERSAL AHU CONTROLLER

**OPERATIO** 

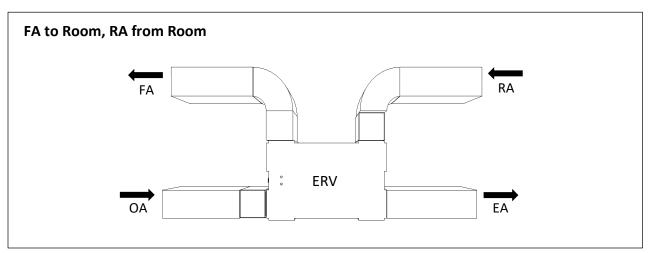
Label	Ю Туре	Description
A	Analog Input	(Qty 10) 0-10 VDC single ended analog inputs Can be used for fan speed control, modulating damper actuator feedback, and customer supplied external sensors
В	Analog Output	(Qty 6) 0-10 VDC single ended analog outputs Can be used for modulating damper control or general customer IO
С	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
Н	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
К	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



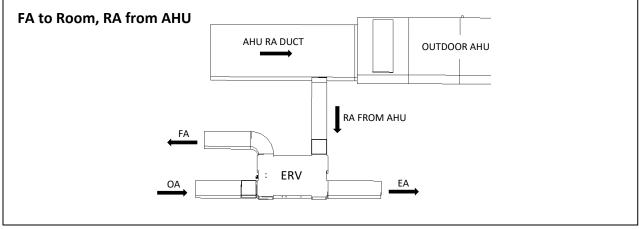
# INSTALLATIO APPLICATIONS



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



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

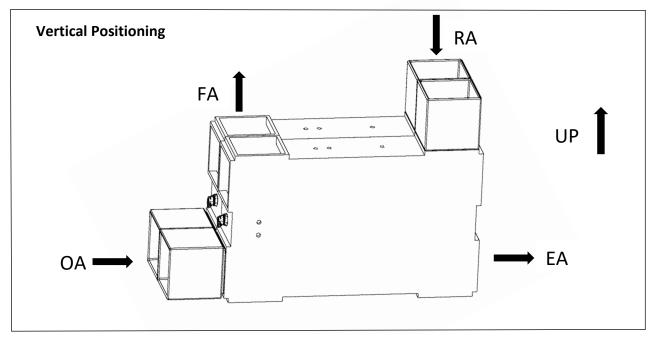


EA Exhaust Air OA Outside Air RA Return Air FA Fresh Air

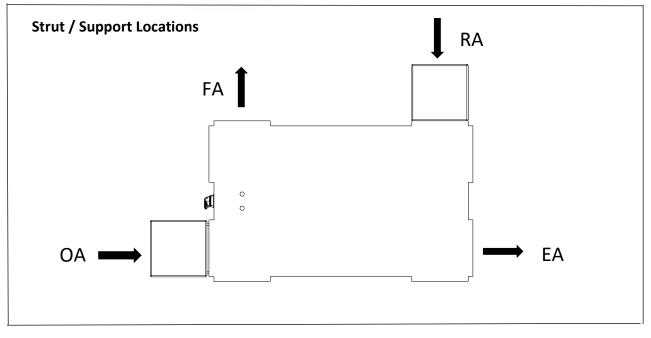


# STRUT AND SUPPORT LOCATIONS

INSTALLATION

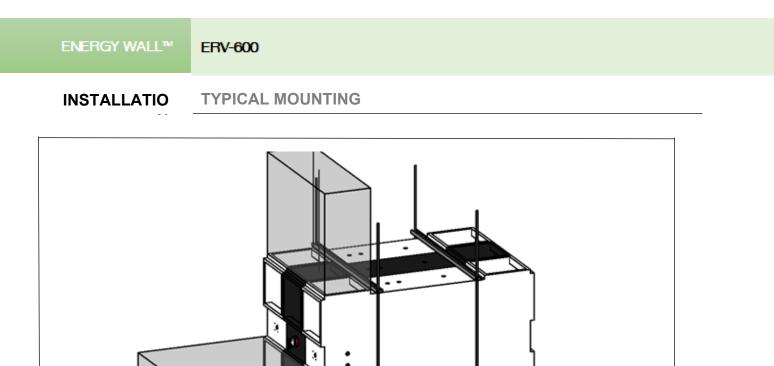


EA Exhaust Air OA Outside Air RA Return Air FA Fresh Air



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





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

🖅 🗖 Unit Cor	figuration × + ×			-		×
> O	https://fw.energywall.com/unit-config/publish.htm	□ ☆	մ≡	R	È	
Energy	/ Wall, LLC					
	onfiguration					
Name:	Unit Configuration					
Version:	1.2.0.17					
Publisher:	Energy Wall, LLC					
The following	prerequisites are required:					
•	Microsoft .NET Framework 4.6.1 (x86 and x64)					
	onents are already installed, you can launch the application now. Otherwise, click the to install the prerequisites and run the application.					
Install	1					
Install	J					

**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.*)

🖥 🖅 🗖 Unit Co	figuration × + v			-		×
$\leftrightarrow \rightarrow \circ$	https://fw.energywall.com/unit-config/publish.htm	☆	դ≞	h	È	
Enera	y Wall, LLC					
	onfiguration					
Name:	Unit Configuration					
Version:	1.2.0.17					
Publisher:	Energy Wall, LLC					
The following	prerequisites are required:					
•	Microsoft .NET Framework 4.6.1 (x86 and x64)					
	ponents are already installed, you can <u>launch</u> the application now. Otherwise, click the to install the prerequisites and run the application.					
Install						
-						





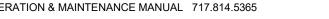
STEP 3 The installer will start downloading. Once complete, open the installer. (Depending on your browser, the download may be in your computer's downloads folder.)

Unit Configuration × +			-	-		×
C A https://fw.energywall.com/unit-config/publish.htm	☆	0	*	0	1	0
Energy Wall, LLC						
Unit Configuration						
Name: Unit Configuration						
Version: 1.1.0.11						
Publisher: Energy Wall, LLC						
The following prerequisites are required:						
<ul> <li>Microsoft .NET Framework 4.6.1 (x86 and x64)</li> </ul>						
If these components are already installed, you can <u>launch</u> the application now. Otherwise, click the button below to install the prerequisites and run the application.						
Install						
ClickOnce and .NET Framework Resources						
$\frown$						
Unit Confiapplication				Sh	ow all	×

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.

Serial Port		×		0.15		1.1.0.11
FW Verison		Econ Fact	or	Set Econ		Connect
UUID						
MAC Address						Auto
XBC Modem			_	Netowrk		Update
System Clock	Last Position	0.0.7	Set Clock Close Position	Sensor Data	CO2	Config
Damper 1	Last Position	Open Position		Move	Set Open	Set Closed
Damper 2				Move	Set Open	Set Closed
Damper 3				Move	Set Open	Set Closed
						^

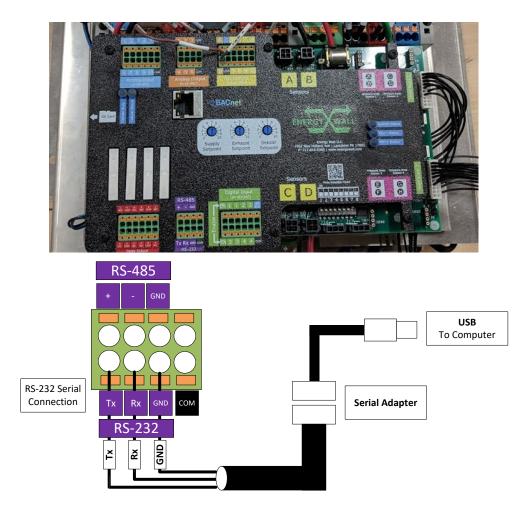




STEP 6 Connect your computer to the U-ERV system controller using the Energy Wall supplied configuration kit (Part #EE-20043-01). This kit will include a USB to Serial cable and a serial to flying lead.



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.*)

V Verison	OM4	Econ Fact	tor	Set Econ		Connect
AC Address						Auto
C Modem				Netowrk		Update
stem Clock	Last Position	Open Position	Set Clock Close Position	Sensor Data	CO2	Config
mper 1				Move	Set Open	Set Closed
mper 2				Move	Set Open	Set Closed
mper 3				Move	Set Open	Set Closed
						~

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

FW Verison UUID		Econ Facto	or	Set Econ		Connect
MAC Address						Auto
XBC Modem				Netowrk		Update
System Clock	Last Position	Open Position	Set Clock Close Position	Sensor Data	CO2	Config
Damper 1				Move	Set Open	Set Closed
Damper 2				Move	Set Open	Set Closed
Damper 3				Move	Set Open	Set Closed
						^



INSTALLATIO

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.

Serial Port	OM4	~				1.1.0.11
FW Verison	0.9.8	Econ Facto	r 1.000	Set Econ		Disconnect
UUID	a9997e1e-533f-		p27caa			
MAC Address	Ethernet Disable	ed				Auto
XBC Modem	Modem disabled by	y DIP switch 8		Netowrk		Update
System Clock	2/22/2019 15:56	UTC	Set Clock		CO2	
	Last Position	Open Position	Close Position	Sensor Data	02	Config
Damper 1				Move	Set Open	Set Closed
Damper 2				Move	Set Open	Set Closed
Damper 3				Move	Set Open	Set Closed
>>getdata						Â
CO2-Limits: 17 >>getdata 2/22/2019 15 Tach: n/a n/a Pressure: Temperature/f Supply Fan: 63 End of Report	00 1500 0.050000  :56 0 n/a n/a n/a n/a n/a n/ RH: 2% Exhaust Fan: 68					
CO2-Limits: 17 >>getdata 2/22/2019 15 Tach: n/a n/a Pressure: Temperature/f Supply Fan: 63 End of Report	00 1500 0.050000 					

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

Serial Port O	OM4	~				1.1.0.11
FW Verison		Econ Facto	or	Set Econ		Disconnect
UUID						
MAC Address	Ethernet Disable	d				Auto
XBC Modem				Netowrk		Update
System Clock			Set Clock	Sensor Data	C02	Config
	Last Position	Open Position	Close Position			
Damper 1				Move	Set Open	Set Closed
Damper 2				Move	Set Open	Set Closed
Damper 3				Move		
Programming 2 Programming 2 Programming 2 Programming 2 2:104 Progra	2:87 Programming 2:93 Programming 2:99 Programming amming 2:105 Prog	2:88 Programming 2:94 Programming 2:100 Programming	2:89 Programming 2:90	0 Programming 6 Programming 2:102 Programm	2:91 Programm 2:97 Programm ing 2:103 Prog	ning 2:86 A ning 2:92 ning 2:98 gramming 255 Done
Programming 2 Programming 2 Programming 2 2:104 Programming 2 2:104 Programming 1 Launching Fim Energy Wall El Built: Jan 30	2:87 Programming 2:99 Programming 2:99 Programming amming 2:105 Pro nware	2:88 Programming 2:94 Programming 2:100 Programming gramming 2:106 Pr	2:89 Programming 2:99 2:95 Programming 2:99 g 2:101 Programming 2:9 g g:101 Programming 2 ggramming 2:107 Prog	0 Programming 6 Programming 2:102 Programm	2:91 Programm 2:97 Programm ing 2:103 Prog	ming 2:92 ming 2:98 gramming
Programming 2 Programming 2 Programming 2 Programming 2 2:104 Progra Launching Fim Launching Fim Energy Wall El Built: Jan 30 Copyright (c)	2:07 Programming 2:39 Programming 2:39 Programming amming 2:105 Prog nware RV Advanced Contrr 2019 11:01:04	2:88 Programming 2:94 Programming 2:100 Programming gramming 2:106 Pr	2:89 Programming 2:99 2:95 Programming 2:99 g 2:101 Programming 2:99 g 2:107 Programming 2 ogramming 2:107 Prog	0 Programming 6 Programming 2:102 Programm	2:91 Programm 2:97 Programm ing 2:103 Prog	ming 2:92 ming 2:98 gramming



# INSTALLATION CONFIGURING SOFTWARE

#### STEP 13 Adjust the desired CO2 settings.

Serial Port COM	🖳 CO2		×			1.1.0.11
FW Verison	Lower Limit	1600		Set Econ		Disconnect
	Upper Limit	1700				Disconnect
MAC Address Eth	Fan Increment	0.05	]	]		Auto
XBC Modem		011		Netowrk		Update
System Clock	Cance		iet Clock	Sensor Data	CO2	Config
Last Damper 1	Position	Open Position	Close Position	Move	Set Open	Set Closed
Damper 2			]	Move	Set Open	Set Closed
Damper 3 Programming 2:81 Programming 2:87 Programming 2:93 2:104 Programmin Launching Firmware	ng 2:105 Prog	2:88 Programming 2 2:94 Programming 2 2:100 Programming 3	Rogramming 2:8     Programming 2:9     Programming 2:9     Programming 2:9     Programming 2:101     Programming 2:107     Programming 2:107	0 Programming 6 Programming 2:102 Programm	2:97 Programm ing 2:103 Prog	ning 2:92 ning 2:98 gramming
Programming 2:81 Programming 2:87 Programming 2:93 Programming 2:99 2:104 Programmi	Programming 2 Programming 2 Programming 2 ng 2:105 Prog	2:88 Programming 2 2:94 Programming 2 2:100 Programming 3	89 Programming 2:9 95 Programming 2:9 2:101 Programming 2	4 Programming : 0 Programming : 6 Programming : 2:102 Programm	2:85 Program 2:91 Program 2:97 Program ing 2:103 Pro	ning 2:86 A ning 2:92 ning 2:98 gramming
Programming 2:81 Programming 2:87 Programming 2:98 Programming 2:99 2:104 Programmi Launching Firmware	Programming 2 Programming 2 Programming 2 gg 2:105 Prog gg 2:105 Prog dvanced Contro 11:01:04 All rights reserve	188 Programming 2 194 Programming 2 100 Programming ramming 2:106 Prog ramming 2:106 Prog	89 Programming 2:9 95 Programming 2:9 2:101 Programming 2	4 Programming : 0 Programming : 6 Programming : 2:102 Programm	2:85 Program 2:91 Program 2:97 Program ing 2:103 Pro	ning 2:86 A ning 2:92 ning 2:98 gramming
Programming 2:81 Programming 2:93 Programming 2:93 2:104 Programmi Launching Firmware Energy Wall ERV A Built: Jan 30 2019 Copyright (c) 2018	Programming 2 Programming 2 Programming 2 gg 2:105 Prog gg 2:105 Prog dvanced Contro 11:01:04 All rights reserve S v10.0.1	188 Programming 2 194 Programming 2 100 Programming ramming 2:106 Prog ramming 2:106 Prog	89 Programming 2:9 95 Programming 2:9 2:101 Programming 2	4 Programming : 0 Programming : 6 Programming : 2:102 Programm	2:85 Program 2:91 Program 2:97 Program ing 2:103 Pro	ning 2:86 A ning 2:92 ning 2:98 gramming

#### 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.

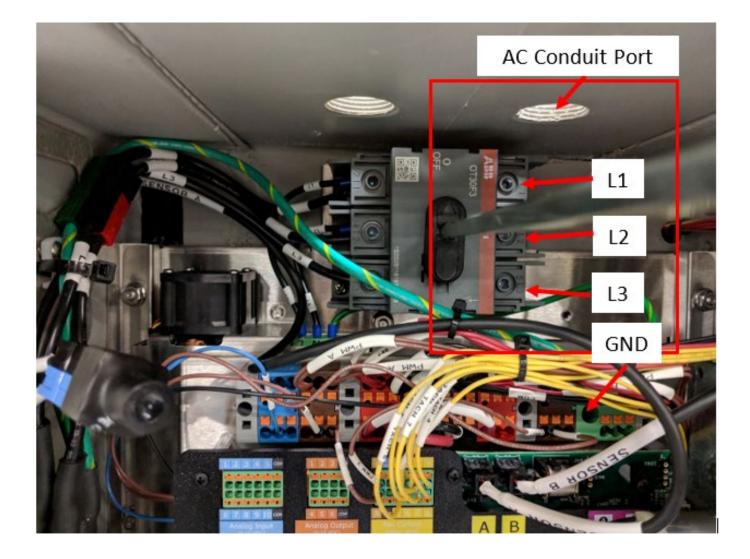


# **U-HRV ELECTRICAL**

INSTALLATION

### **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.

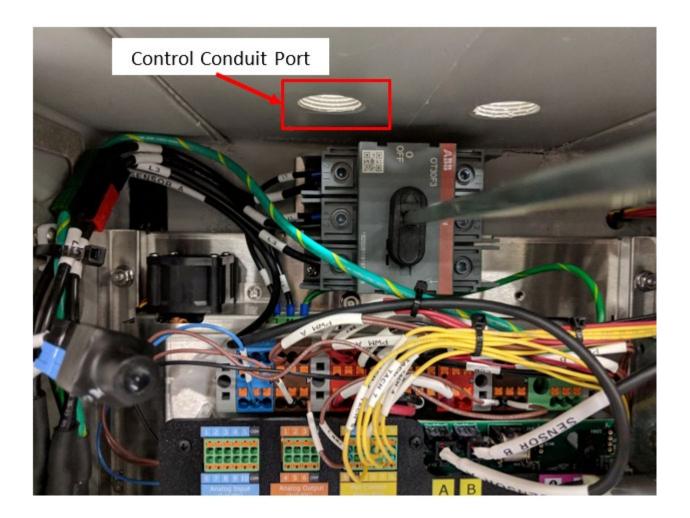


ENERGY

ENERGY WALL™	ERV-600
INSTALLATION	U-HRV

# **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.



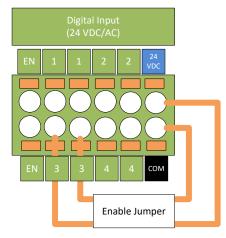


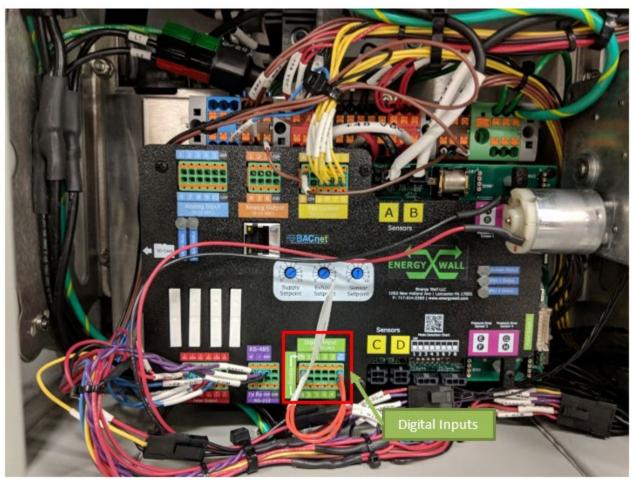
# **U-HRV ELECTRICAL**

# INSTALLATION

### **Enable Circuit**

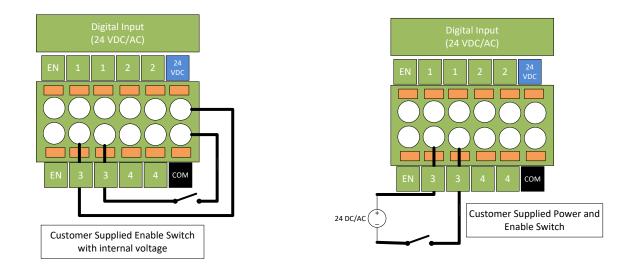
An enable circuit signal must be present for the system to operate. The fans will not turn on if the enable input is not properly connected. A factory installed orange jumper wire is shipped with the unit. This jumper will allow the system to operate normally so long as the main disconnect is turn on.



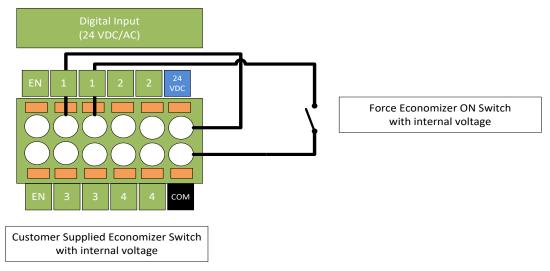




An external switch may be used with either external or internal voltage. This switch will enable / disable the fans in the system. Digital input labeled "3" is designated to the enable input. A 24 VDC/AC voltage must be present between the "3" inputs for the fans to operate.



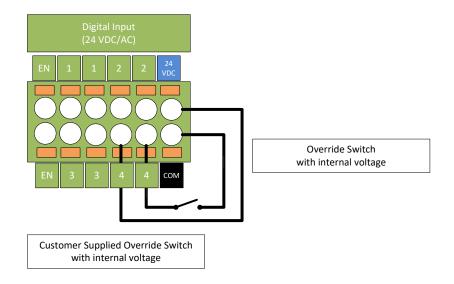
The controller will also accept a digital input signal to force the system into economizer mode. Digital input 1 is designated to the Force Economizer mode. A 24 VDC/AC voltage must be present between digital input 1 terminals.





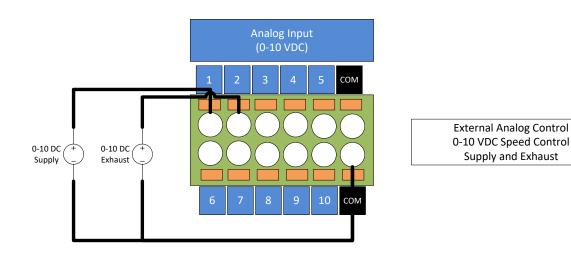
INSTALLATION

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.



# **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.

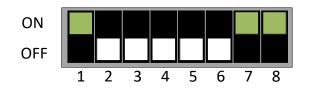




ENERGY WALL™	ERV-600
INSTALLATION	U-HRV ELECTRICAL

#### **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

