

# Service Facts

## ERVR-SF-2E

### Energy Recovery Ventilator

Model: \*ERVR100,200,300A9P00A

\*First letter may be "A" or "T"

**IMPORTANT** --- This document contains a wiring diagram and service information. This is customer property and is to remain with this unit. Please return to service information pack upon completion of work.

Library	Service Literature
Product Section	Unitary
Product	Energy Recovery Ventilator
Model	ERVR
Literature Type	Service Facts
Sequence	1
Date	August 2006
File No.	ERVR-SF-2E 08/06
Supercedes	ERVR-SF-2D

**⚠ WARNING: HAZARDOUS VOLTAGE - DISCONNECT POWER BEFORE SERVICING**

#### PRODUCT SPECIFICATIONS

MODEL	*ERVR100A9P00A	*ERVR200A9P00A	*ERVR300A9P00A
<b>RATINGS ①</b>	See Note ①	See Note ①	See Note ①
<b>AIRFLOW RANGE (cfm)</b>	50-130	100-210	150-320
<b>BLOWER ASSEMBLY</b>			
Diameter x Width	6.75" x 1.89"	6.75" x 1.89"	7.67" x 1.89"
No. Blower Wheels Used	2	2	2
Speeds ②	1	1	1
No. Motors — H.P.	1 - 0.09	1 - 0.09	1 - 0.25
Nominal Motor Speed (R.P.M.)	1750	1750	1550
<b>POWER CONNECTIONS</b>			
Volts/Ph/Hz	120/1/60	120/1/60	120/1/60
Ampacity (in Amps)	15	15	15
Fuse Size - Max (Amps)	15	15	15
F.L. Amps	1.2	1.5	3.5
<b>FILTER</b>			
Filter Furnished?	Yes	Yes	Yes
Type Recommended	Cleanable Polyester	Cleanable Polyester	Cleanable Polyester
No.-Size-Thickness	2 - 10.5" x 10.5"	2 - 10.5" x 21.75"	2 - 10.5" x 21.75"
<b>Defrost</b>	Passive	Passive	Passive
<b>Duct Connections</b>	See Note ②	See Note ②	8" oval connection for flex or rigid
Heat Exchanger	See Note ③	See Note ③	See Note ③
Insulation - Thermal/Sound	See Note ④	See Note ④	See Note ④
<b>DIMENSIONS</b>			
	H x W x D	H x W x D	H x W x D
Crated (In.)	21-1/2 x 32 x 17-1/2	21-1/2 x 32 x 28-1/2	21-1/2 x 32 x 28-1/2
Uncrated (In.) (Not including duct collars)	20-1/8 x 28-3/4 x 13	20-1/8 x 28-3/4 x 23-7/8	20-1/8 x 28-3/4 x 23-7/8
<b>WEIGHT</b>			
Shipping (Lbs.)/Net (Lbs) Including collars)	65 / 58	91 / 78	95 / 82

\* The first letter may be "A" or "T"

① These Energy Recovery Ventilators are HVI certified (HVI 2100 PER CSA 439). UL certified (UL 1812).

② Insulating double collars with 6" round connections for flex or rigid duct.

③ Cross flow - fixed plate enthalpic heat transfer core. Sensible and latent heat transfer.

④ Cabinet - 1" foil face fiberglass. Access door - 1/4" foam insulation over 1" fiberglass.

### ⚠ WARNING

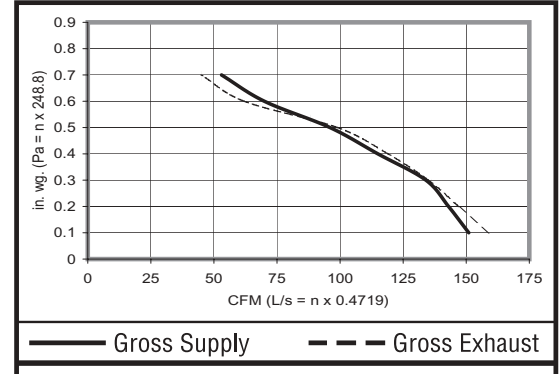
**THIS INFORMATION IS FOR USE BY INDIVIDUALS HAVING ADEQUATE BACKGROUNDS OF ELECTRICAL AND MECHANICAL EXPERIENCE. ANY ATTEMPT TO REPAIR A CENTRAL AIR CONDITIONING PRODUCT MAY RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE. THE MANUFACTURER OR SELLER CANNOT BE RESPONSIBLE FOR THE INTERPRETATION OF THIS INFORMATION, NOR CAN IT ASSUME ANY LIABILITY IN CONNECTION WITH ITS USE.**

**NOTICE:** Since the manufacturer has a policy of continuous product and product data improvement, it reserves the right to change design and specifications without notice.

ERVR-SF-2E

# Performance Data

*ERVR100 - Ventilation Performance							
Ext. Static Pressure		Net Supply Airflow		Gross Airflow			
				Supply		Exhaust	
Pa	in. wg	L/S	CFM	L/S	CFM	L/S	CFM
25	0.1	70	148	71	151	75	159
50	0.2	66	141	67	143	69	147
75	0.3	62	132	63	134	64	135
100	0.4	53	113	54	115	56	119
125	0.5	44	94	45	96	47	99
150	0.6	32	69	33	70	29	62
175	0.7	24	52	25	53	21	45

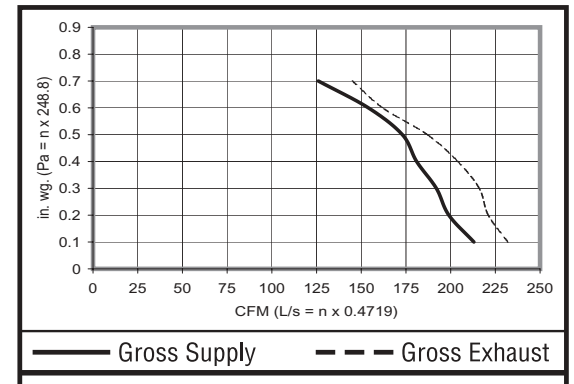


Electrical Requirements Volts 120 Amps 1.3

Exhaust Air Transfer Ratio = 2% @ 0.2 in. wg (50 PA) and 2% @ 0.4 in. wg (100 PA)

*ERVR100 - Energy Performance							
Supply Temperature		Net Airflow		Average Power Watts	Sensible Recovery Efficiency %	Apparent Sensible Effectiveness %	Net Moisture Transfer %
C°	F°	L/S	CFM				
Heating							
0°	32°	58	124	121	72	80	55
Cooling							Total Recovery Efficiency %
35°	95°	59	126	121			46

*ERVR200 - Ventilation Performance							
Ext. Static Pressure		Net Supply Airflow		Gross Airflow			
				Supply		Exhaust	
Pa	in. wg	L/S	CFM	L/S	CFM	L/S	CFM
25	0.1	97	207	100	213	109	232
50	0.2	90	192	93	199	104	221
75	0.3	88	186	90	192	101	216
100	0.4	83	176	85	181	96	204
125	0.5	79	168	81	173	88	187
150	0.6	70	149	72	154	76	162
175	0.7	57	122	59	126	68	145



Electrical Requirements Volts 120 Amps 1.5

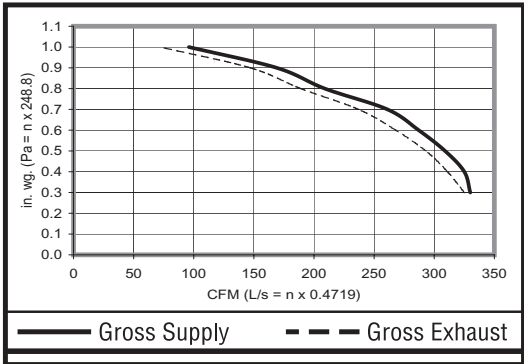
Exhaust Air Transfer Ratio = 3% @ 0.2 in. wg (50 PA) and 3% @ 0.4 in. wg (100 PA)

*ERVR200 - Energy Performance							
Supply Temperature		Net Airflow		Average Power Watts	Sensible Recovery Efficiency %	Apparent Sensible Effectiveness %	Net Moisture Transfer %
C°	F°	L/S	CFM				
Heating							
0°	32°	85	181	157	78	85	62
Cooling							Total Recovery Efficiency %
35°	95°	85	180	155			52

\*May be "A" or "T"

# Performance Data

*ERVR300 - Ventilation Performance							
Ext. Static Pressure		Net Supply Airflow		Gross Airflow			
Pa	in. wg	L/S	CFM	Supply		Exhaust	
Pa	in. wg	L/S	CFM	L/S	CFM	L/S	CFM
100	0.4	148	315	153	325	146	311
125	0.5	141	299	145	309	138	293
150	0.6	131	279	135	287	126	268
175	0.7	119	253	123	261	111	237
200	0.8	95	202	98	209	89	189
225	0.9	77	163	79	169	69	147
250	1.0	44	93	45	96	34	72

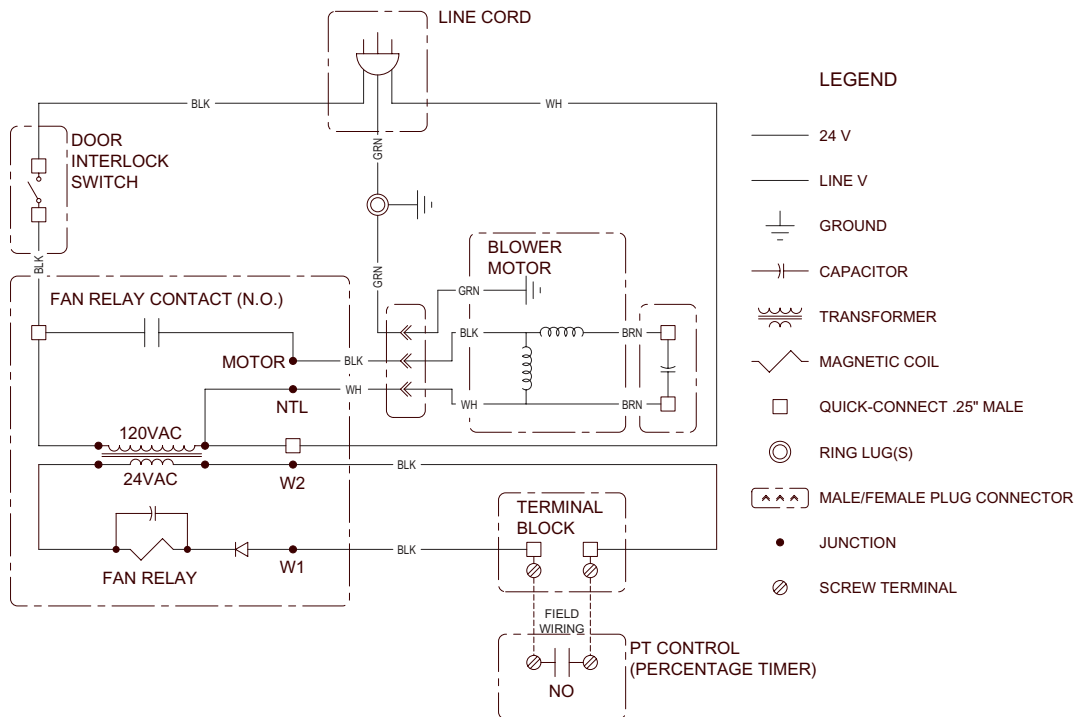


Electrical Requirements Volts 120 Amps 3.3  
 Exhaust Air Transfer Ratio = 3% @ 0.4 in. wg (50 PA)

*ERVR300 - Energy Performance							
Supply Temperature		Net Airflow		Average Power Watts	Sensible Recovery Efficiency %	Apparent Sensible Effectiveness %	Net Moisture Transfer %
C°	F°	L/S	CFM				
Heating							
0°	32°	139	295	317	70	78	51
Cooling							
35°	95°	134	285	311	Total Recovery Efficiency %		43

\*May be "A" or "T"

# Wiring Schematic



# Sequence of Operation

## ERV with PT Control

The ERV unit is fully installed, line cord plugged into properly-wired 120VAC receptacle, and door is closed and latched. No PB controls are installed. Two (2) 18-22GA non-polar wires are attached between the ERV exterior terminal strip and the (C) and (R) connections on the back of the PT control.

Starting with the PT control in the “zero” setting:

(If PT control RUNNING LED is ON, press and hold down the control until the SETTING LED indicates zero and the RUNNING LED is OFF. In this condition the PT control is pulling a very small amount of low-voltage current from the ERV unit control board: enough to maintain the PT control’s microprocessor, but not enough to pull in the ERV control board’s FAN RELAY.)

- 1 With SETTING LED indicating zero and the RUNNING LED off, press the control until the SETTING LED indicates 10%.
- 2 At 0.3 seconds after control is pressed, the RUNNING LED lights and the SETTING LED indicates 10%. This initiates an ERV operation cycle with six minutes on followed by fifty-four minutes off.
- 3 At 1 second after the control is released, a low-resistance contact in the PT control closes, allowing sufficient current to flow to close the ERV control board’s FAN RELAY CONTACT.
- 4 120VAC power is immediately applied through the FAN RELAY CONTACT to the BLOWER MOTOR. The ERV unit is now operating.
- 5 At the end of the operating cycle the low-resistance contact in the PT control opens, current through the FAN RELAY drops below the level required to hold the FAN RELAY CONTACTS closed, power to the BLOWER MOTOR is interrupted, and ERV unit stops operating. The PT control continues to draw very low current from the ERV control board. (Note length of ON period equals SETTING PERCENTAGE X 60 minutes.
- 6 60 minutes after the start of the operation cycle initiated in step 1, the PT control initiates another cycle as in steps 3 & 4 above.

Starting with the PT control at a setting above zero:

- 7 Press the control to advance the SETTING LED to a higher setting.
- 8 RUNNING LED flashes once, then remains lit. A new sixty-minute cycle begins, with length of ON period equal to SETTING PERCENTAGE X 60 minutes.

- 9 If unit was not running before, it starts as in steps 3 through 5, above. If it was already running it continues to do so.
  - 10 If SETTING LED indicates less than 100%, unit will turn off at the end of the ON period.
  - 11 60 minutes after the start of the new operation cycle initiated in step 8, the PT control initiates another cycle as in steps 3 & 4 above.
- OR
- 12 Press and hold the control so SETTING LED goes to a lower setting that is greater than zero (the setting will first advance to 100%, then retreat back towards zero).
  - 13 RUNNING LED flashes once, then turns off.
  - 14 Unit stops running as in step 5 above.
  - 15 PT control will initiate another 60-minute cycle starting in (60 minutes less PERCENTAGE SETTING X 60 minutes).
- OR
- 16 Press and hold the control so SETTING LED goes to zero.
  - 17 RUNNING LED goes off.
  - 18 Unit stops running as in step 5 above. Unit remains off until user sets PT control to a non-zero setting.

## ERV with (1) PT Control and (1) or more PB Control(s)

The ERV unit is fully installed, line cord plugged into properly-wired 120VAC receptacle, and door is closed and latched. Note that PB controls are momentary-contact switches. For the PB control, two (2) 18-22 ga non-polar wires are attached between the PB terminal block on the back of the PB control and the two (PB) connections on the back of the PT control.

If PB Controls are not touched:

System behaves the same as described for ERV with PT Control

If PB Control is touched (for less than 5 seconds) while PT RUNNING LED is ON and unit is operating:

- 19 PT Control microprocessor is signaled by momentarily-closed circuit through PB to begin a twenty-minute ERV operation cycle. This twenty-minute cycle overlaps the in-progress percentage operating cycle.
- 20 The ERV unit continues to operate for twenty minutes after the PB control is touched, or till the end of the in-progress operating cycle invoked

# Sequence of Operation

by the PT's SETTING PERCENTAGE, whichever lasts longer. The RUNNING LED then turns off and unit stops running as in step 5.

- 21 The PT control will start another operating cycle 60 minutes after the start of the previous operating cycle invoked by the PT's SETTING PERCENTAGE.

If PB Control is touched (for less than 5 seconds) while PT RUNNING LED is OFF and unit is not operating regardless of setting on PT control:

- 22 PT Control microprocessor is signaled by momentarily closed circuit through PB to begin a twenty-minute ERV operation cycle. RUNNING LED lights up.
- 23 ERV unit operation begins as in steps 3 & 4.
- 24 At the end of twenty minutes the PT control ends unit operation – unless an operating cycle has been invoked by the PT control PERCENTAGE SETTING. In that case the operating cycle proceeds for the duration determined by the PERCENTAGE SETTING starting at whatever point in time it began.

## Additional PB Features

Twenty-minute operation cycles invoked by touching the PB control(s) are superimposed on the sixty-minute cycles of the PT control and do not change those cycles.

If the PB control is touched twice a forty-minute ERV operation cycle occurs. If the PB control is touched three or more times a sixty-minute ERV operation cycle occurs.

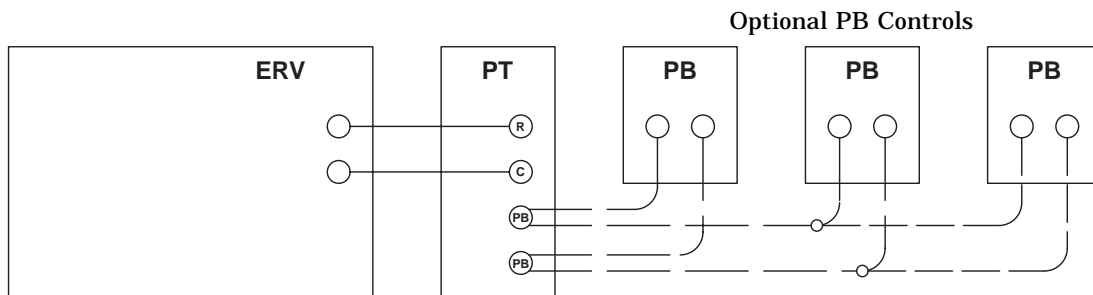
Pressing the PB control for longer than 5 seconds cancels the PB requested cycle.

## System behavior during power interruption

Power interruption can take the form of a power failure to the home; unplugging the ERV unit; or unlatching and opening the ERV unit door (a door interlock switch interrupts power to the ERV unit control board).

- 25 If ERV unit was operating it will stop when power is interrupted.
- 26 RUNNING and PERCENTAGE LEDES on PT control go out.
- 27 On restoration of power, PT returns to its last PERCENTAGE SETTING. It will start a new sixty-minute cycle. If the last PERCENTAGE SETTING was non-zero, unit will start running.

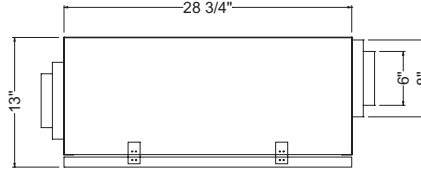
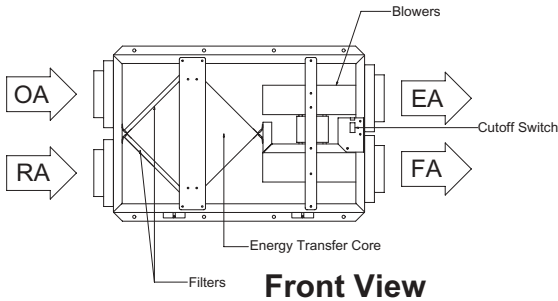
## Electrical Hook up Diagram



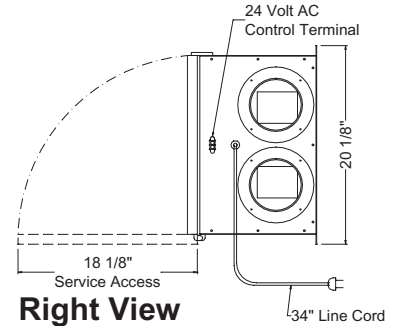
(2) PB controls can be directly connected to the PT control  
Up to (6) PB controls, wired in parallel, may be used.

# Dimensions

## \*ERVR100A9P00A

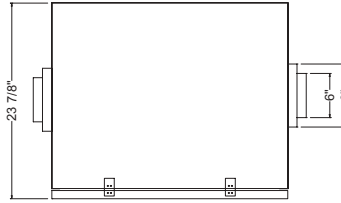
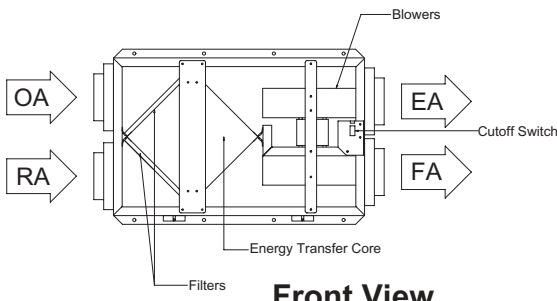


Top View

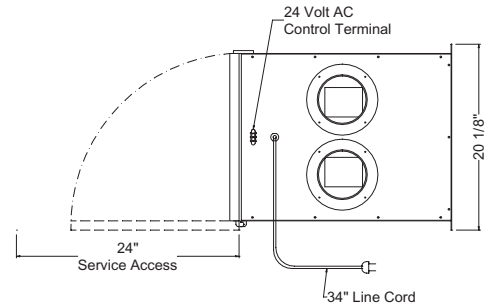


Right View

## \*ERVR200A9P00A

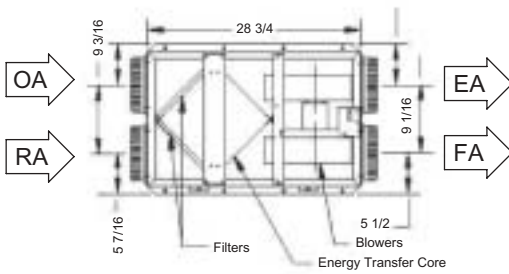


Top View

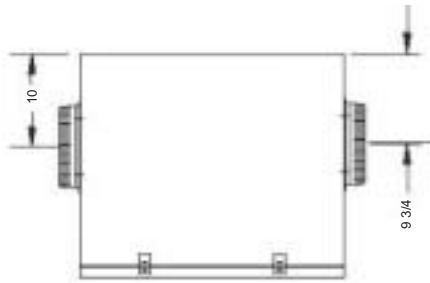


Right View

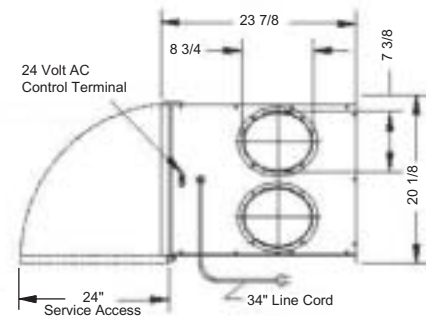
## \*ERVR300A9P00A



Front View



Top View



Right View

# Notes

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**American Standard Inc.**  
**6200 Troup Highway**  
**Tyler, TX 75707**

*For more information contact  
your local dealer (distributor)*

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