ERV Series Submittal Data

Models ERV1014 - ERV6585 60Hz

English Language/I-P Units

Rev.: 22 Aug, 2008B

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SUBMITTAL DATA - I-P UNITS

Unit Designation: _____

Job Name: _____

Architect: _____

Engineer: _____

Contractor: _____

PERFORMANCE DATA

Cooling Capacity: _____ Btuh

EER: _____

Heating Capacity: _____ Btuh

COP: _____

Ambient Air Temp: _____ °F

Entering Water Temp (Clg): _____ °F

Entering Air Temp (Clg): _____ °F

Entering Water Temp (Htg): _____ °F

Entering Air Temp (Htg): _____ °F

Airflow: _____ CFM

Fan Speed or Motor/RPM/Turns: _____

Operating Weight: _____ (lb)

ELECTRICAL DATA

Power Supply: _____ Volts _____ Phase _____ Hz

Minimum Circuit Ampacity: _____

Maximum Overcurrent Protection: _____

ERV Series Submittal Data

Models ERV1014 - ERV6585 60Hz

English Language/S-I Units

Rev.: 22 Aug, 2008B

CLIMATEMASTER®

SUBMITTAL DATA - S-I UNITS

Unit Designation: _____

Job Name: _____

Architect: _____

Engineer: _____

Contractor: _____

PERFORMANCE DATA

Cooling Capacity: _____ kW

EER: _____

Heating Capacity: _____ kW

COP: _____

Ambient Air Temp: _____ °C

Entering Water Temp (Clg): _____ °C

Entering Air Temp (Clg): _____ °C

Entering Water Temp (Htg): _____ °C

Entering Air Temp (Htg): _____ °C

Airflow: _____ l/s

Fan Speed or Motor/RPM/Turns: _____

Operating Weight: _____ (kg)

ELECTRICAL DATA

Power Supply: _____ Volts _____ Phase _____ Hz

Minimum Circuit Ampacity: _____

Maximum Overcurrent Protection: _____

ERV Series 60Hz Submittal Data Eng/I-P

CLIMATEMASTER®

The Rx (ERV) Series

The American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) standard 62 requires significantly higher amounts of outside air for building HVAC systems. In extremely warm, cold or humid conditions these requirements create a substantial load management problem. The size of the HVAC unit can be increased to handle the additional outside air load, but this significantly increases the initial project costs and wastes energy. The Rx 100% outside air Water-Source Heat Pump (WSHP) uses ClimateMaster's RE series rooftop units mated with the latest Energy Recovery Ventilator (ERV) technology to provide the most energy efficient Make Up Air (MUA) system on the market today.

The energy recovery wheel inside the ERV unit transfers energy from the warmer to the cooler air stream through counter-flowing supply and exhaust air streams through a slowly rotating wheel (less than 60 revolutions per minute). The large energy-transfer surface is arranged to provide laminar air flow through the wheel causing the constant flow of recovered energy to represent up to 70% of the difference in total energy contained within the two air streams. ClimateMaster uses Airxchange ARI 1060 certified energy recovery wheels, which come with a 5 year limited warranty.

During both summer and winter, the energy recovery wheel transfers moisture entirely in the vapor state. This process eliminates wet surfaces that retain dust and promote fungal growth. The need for a condensate pan and drain is also eliminated. Because it is constantly rotating, the energy recovery wheel is always being cleaned by counter-flowing air streams, first in one direction, and then the other. Because it is always dry, dust or other particles impinging on the surface during one half cycle, are automatically removed during the next half cycle.

When ventilation air is introduced into a building, the cooling and heating equipment must be sized to handle both the building envelope load and the outdoor air ventilation load at the extremes of summer and winter design conditions. The use of an ERV can significantly reduce the outdoor air ventilation load applied to the heating and cooling equipment, effectively decreasing the heating and cooling requirements. Savings of capital equipment cost for ventilation is significant.

The Rx system is unique for many reasons. ERV technology produces impressive results on its own, but when mated to a WSHP, the system is unlike anything else on the market. Whether a water-loop (boiler/tower) or geothermal application, the RE series rooftop has many features and benefits that are not found on traditional gas/electric rooftop units:

- 3 to 20 tons (1,200 to 8,000 cfm – 566 to 3776 l/s)
- 100% OA capability (when ordered as an Rx system)
- Very high efficiencies (average RE series rooftop unit EER of 14.0 Btuh/Watt - 4.12 Watts/Watt)
- Copeland scroll compressors
- Balanced port TXV
- Extended range operation (20 to 110°F, -6.7 to 43.3°C)
- Microprocessor controls standard
- DDC control options (LON/BacNet/Modbus/Johnson N2)
- Belt-drive high efficiency motors
- Economizer option with enthalpy controls ("wheel bypass" with enthalpy controls when ordered as an Rx system)
- Double-walled access doors
- Slide out blower assembly (RE unit)
- Single 14" (356mm) curb for both rooftop and mated ERV application (Rx system)
- Optional horizontal discharge curb for ground mounted applications
- Several filter options

Additional options for ERV units include . . .

- Energy recovery wheel frost protection
- Electric preheaters
- Wheel bypass operation (economizer mode) with stop jog
- Filter maintenance alarm
- Blower/wheel monitor
- Airflow monitor

When selecting a make-up air unit, it is important to consider not only the features/benefits listed above, but also the operation of the ERV unit. Many MUA units with integrated energy recovery wheels are limited by the amount of outside air that can be introduced due to cabinet or wheel size restraints. The Rx system allows 100% outside air to be introduced through the ERV before entering the heat pump, taking full advantage of the Rx's 70% energy recovery capability. Other manufacturer's integrated models bypass as much as 40% of the outside air, resulting in decreased ERV performance and much higher operating costs. Count on ClimateMaster to deliver a make up air system that combines both high efficiency and cost effectiveness into one package.

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ERV Series Nomenclature

ERV Unit Nomenclature

Z23

1 2 3 4	5 6 7	8	9	10	11	12	13	14	15
E R V M	A 1 4	H	A	A	A	A	A	A	B

MODEL TYPE
ERVM = Energy Recovery Ventilator, Mated
ERVS = Energy Recovery Ventilator, Stand Alone

ERV Cabinet Size
A14 = "A" Cabinet, 1,000 - 1,400 CFM (Mated version for RE 3 Ton only)
B20 = "B" Cabinet, 1,400 - 2,000 CFM (Mated version for RE 4 & 5 Ton only)
B32 = "B" Cabinet, 2,500 - 3,200 CFM (Mated version for RE 7 & 8 Ton only)
C50 = "C" Cabinet, 3,600 - 5,000 CFM (Mated version for RE 10 & 12 Ton only)
C60 = "C" Cabinet, 5,000 - 6,000 CFM (Mated version for RE 15 Ton only)
D85 = "D" Cabinet, 6,500 - 8,500 CFM (Mated version for RE 20 Ton only)
E05 = "E" Cabinet, 200-550 CFM (Mated version Not Available)

Voltage
F = 460/60/3
G = 208-230/60/1
H = 208-230/60/3

Disconnect
A = None
B = Non Fused Disconnect
C = Fused Disconnect

Preheater
A = None
B = 5kw
C = 10kw
D = 15kw
E = 20kw

Supply/Exhaust Damper
A = Barometric/Barometric
B = Motorized/Motorized
C = Barometric/Motorized
D = Motorized/Barometric

Option 1
A = None
B = Frost Protection
C = Low Temperature Lockout
D = Frost Protection & Low Temperature Lockout

Option 2
A = None
B = Filter Maintenance Indicator
C = Airflow Monitor
D = Filter Maintenance Indicator & Airflow Monitor

Option 3
A = None
B = Wheel Bypass (Economizer Mode) w/Enthalpy and Stop-Jog Control

Revision Level
B = Current Revision

*ERV is designed for 100% Outdoor Air (OA) application as a "mated" option for the ClimateMaster RE series Rooftops. Cabinets and CFM ranges are selected based upon this application, and may not be used in a stand-alone application.

ERV Full Curb (RE & ERV Unit Nomenclature

1 2 3 4 5	6 7	8 9 10	11 12	13
A C U R B	R E	A A A	A A	A

Curb For RE Series

RE= Rooftop
SA= Stand Alone

Curb Type RE & ERV Cabinet Size
A A A = RE 3 to 7 Ton, UNIT ONLY (Non-ERV Applications)
A A B = RE 08 to 12 Ton, UNIT ONLY (Non-ERV Applications)
A A C = RE 15 to 20 Ton, UNIT ONLY (Non-ERV Applications)
A E A = RE 3 to 7 Ton, Mated to ERV "A" Cabinet
A E B = RE 3 to 7 Ton, Mated to ERV "B" Cabinet
B E B = RE 8 to 12 Ton, Mated to ERV "B" Cabinet
B E C = RE 8 to 12 Ton, Mated to ERV "C" Cabinet
C E C = RE 15 to 20 Ton, Mated to ERV "C" Cabinet
C E D = RE 15 to 20 Ton, Mated to ERV "D" Cabinet

Curb Options
AA = Standard 14" Curb
AB = Standard 24" Curb
HL = Horizontal Left Discharge Curb
HR = Horizontal Right Discharge Curb
SA = Seismic Curb
ZL = Horizontal Left Discharge & Seismic Curb
ZR = Horizontal Right Discharge & Seismic Curb

Revision Level
A = Current Revision

Rev.: 07/24/08B

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ERV Unit Effectiveness & ARI 1060-2001

ARI certified energy recovery wheels insure that published effectiveness (%) has been verified by third party testing. The following certification program ratings are included in the ARI standard:

1. Airflow, scfm
2. Pressure drop, inches H_2O
3. Sensible and net sensible effectiveness (at 100% and 75% rated airflow for heating and cooling conditions)
4. Latent and net latent effectiveness (at 100% and 75% rated airflow for heating and cooling conditions)
5. Total and net total effectiveness (at 100% and 75% rated airflow for heating and cooling conditions)
6. Exhaust air transfer ratio, outdoor air correction factor, and purge angle or setting (if applicable) at 0.00 inches H_2O and two or more pressure differentials.

Test conditions are 95°F DB / 78°F WB outside air in cooling and 35°F DB outside air in heating with return air temperatures of 75°F DB / 63°F WB in cooling and 70°F DB in heating.

ERV Series 60Hz Submittal Data Eng/I-P

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ERV Unit Effectiveness: "A" & "B" Cabinets

ERV Unit	ERV Wheel	CFM	Effectiveness (%)			
			Sensible	Latent	T Cooling	T Heating
ERV1014	ERC-2514 or ERC-2513	900	71.1	65.1	67.9	68.9
		1,000	69.4	62.8	65.8	67.0
		1,100	67.7	60.4	63.8	65.1
		1,200	66.1	58.0	61.7	63.2
		1,300	64.4	55.7	59.6	61.3
		1,400	62.7	53.3	57.5	59.3
ERV1420	ERC-3623	1,400	76.9	68.9	72.5	74.1
		1,500	75.8	67.8	71.4	73.0
		1,600	74.7	66.7	70.3	71.9
		1,700	73.7	65.7	69.2	70.8
		1,800	72.6	64.6	68.1	69.7
		1,900	71.5	63.5	67.1	68.6
		2,000	70.4	62.4	66.0	675
ERV2532	ERC-3628	2,200	71.3	64.3	67.1	68.8
		2,300	70.4	63.2	66.0	67.8
		2,400	69.5	62.0	65.0	66.8
		2,500	68.6	60.9	63.9	65.8
		2,600	67.6	59.7	62.9	64.8
		2,700	66.7	58.6	61.8	63.8
		2,800	65.8	57.4	60.7	62.8
		2,900	64.9	56.2	59.7	61.8
		3,000	64.0	55.1	58.6	60.8
		3,100	63.1	53.9	57.5	59.8
		3,200	62.2	52.7	56.5	58.8
		3,300	61.3	51.6	55.4	57.8

Notes:
1. Effectiveness shown are based on equal supply and exhaust cfm
2. Energy Recovery component is certified in accordance with ARI 1060-2001.
Actual performance in packaged equipment may vary.

ERV Unit Effectiveness: "C" & "D" Cabinets

ERV Unit	ERV Wheel	CFM	Effectiveness (%)			
			Sensible	Latent	T Cooling	T Heating
ERV3650	ERC-5245	3,600	73.6	65.6	69.1	70.7
		3,800	72.5	64.5	68.1	69.7
		4,000	71.5	63.5	67.1	68.6
		4,200	70.5	62.4	66.0	67.6
		4,400	69.4	61.4	65.0	66.5
		4,600	68.4	60.3	64.0	65.5
		4,800	67.3	59.3	62.9	64.4
		5,000	66.3	58.2	61.9	63.4
ERV5060	ERC-5262	4,600	71.5	64.7	67.4	69.0
		4,800	70.7	63.6	66.4	68.1
		5,000	69.8	62.5	65.4	67.2
		5,200	68.9	61.4	64.4	66.2
		5,400	68.1	60.3	63.4	65.3
		5,600	67.2	59.2	62.4	64.4
		5,800	66.4	58.1	61.4	63.4
		6,000	65.5	57.0	60.4	62.5
ERV6585	ERC-6488	6,500	71.8	65.0	67.7	69.4
		7,000	70.3	63.1	66.0	67.7
		7,500	68.8	61.2	64.2	66.1
		8,000	67.3	59.3	62.5	64.4
		8,500	65.8	57.4	60.7	62.8

Notes:
1. Effectiveness shown are based on equal supply and exhaust cfm
2. Energy Recovery component is certified in accordance with ARI 1060-2001.
Actual performance in packaged equipment may vary.

Airflow vs. Pressure Drop Across Wheel - "A" Cabinet

MMC ERV Part #	ERV Wheel	CFM	900	1,000	1,100	1,200	1,300	1,400
ERV1014	ERC-2514 or ERC-2513	▲Ps	0.40	0.45	0.50	0.57	0.63	0.68

Airflow vs. Pressure Drop Across Wheel - "B" Cabinet

MMC ERV Part #	ERV Wheel	CFM	1,400	1,600	1,800	2,000	2,200	
ERV1420	ERC-3623	▲Ps	0.52	0.58	0.65	0.72	0.78	
		CFM	2,300	2,500	2,700	2,900	3,100	3,300
ERV2532	ERC-3628	▲Ps	0.63	0.70	0.75	0.80	0.88	0.93

Airflow vs. Pressure Drop Across Wheel - "C" Cabinet

MMC ERV Part #	ERV Wheel	CFM	3,000	3,400	3,800	4,200	4,600	4,800	5,000
ERV3650	ERC-5245	▲Ps	0.59	0.67	0.81	0.88	0.99	1.04	1.09
		CFM	5,000	5,400	5,800	6,200	6,600	7,000	
ERV5060	ERC-5262	▲Ps	0.86	0.93	1.00	1.04	1.13	1.18	

Airflow vs. Pressure Drop Across Wheel - "D" Cabinet

MMC ERV Part #	ERV Wheel	CFM	7,000	7,500	8,000	8,500
ERV6585	ERC-6488	▲Ps	0.74	0.83	0.90	0.94

Note: Pressure ports are provided on both sides of the ERV wheel for testing and balancing purposes.

Formulas:

BTU = 1.08 X CFM X DELTA T

KW = BTU / 3415

ERV Selection Criteria

1 Unit Selection

Exhaust Air (cfm): _____ Static press: _____

Supply Air (cfm): _____ Static press: _____

Unit Voltage & phase: _____

2 Design Conditions

	Outdoor	Indoor
Summer DB Temp, °F:	_____	_____
Summer WB Temp, °F:	_____	_____
Winter DB Temp, °F:	_____	_____
Winter WB Temp, °F:	_____	_____

3 Rooftop Unit

RE unit model #: _____ based upon 400 cfm/ton from step #1

(RE03, RE04, RE05, RE07, RE08, RE10, RE12, RE15 or RE20 - MODEL # MUST BE CONFIGURED FOR ERV OPTION)

4 Curb

Curb Type / Model #: _____

Note: Curb adapters, seismic curbs, vibration isolation curbs and horizontal discharge curbs are available as engineering specials.

5 ERV Options / Model #:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
E	R	V	M	A	1	4	H	A	A	A	A	A	A	B

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C50 = "C" Cabinet, 3,600 - 5,000 CFM (Mated version for RE 10 & 12 Ton only)
C60 = "C" Cabinet, 5,000 - 6,000 CFM (Mated version for RE 15 Ton only)
D65 = "D" Cabinet, 6,500 - 8,500 CFM (Mated version for RE 20 Ton only)
E05 = "E" Cabinet, 200-250 CFM (Mated version Not Available)

Voltage
F = 460/60/3
G = 208-230/60/1
H = 208-230/60/3

Disconnect
A = None
B = Non Fused Disconnect
C = Fused Disconnect

Preheater
A = None
B = 5kw
C = 10kw
D = 15kw
E = 20kw

Supply/Exhaust Damper
A = Barometric/Barometric
B = Motorized/Motorized
C = Barometric/Motorized
D = Motorized/Barometric

Option 1
A = None
B = Frost Protection
C = Low Temperature Lockout
D = Frost Protection & Low Temperature Lockout

Option 2
A = None
B = Filter Maintenance Indicator
C = Airflow Monitor
D = Filter Maintenance Indicator & Airflow Monitor

Option 3
A = None
B = Wheel Bypass (Economizer Mode) w/Enthalpy and Stop-Jog Control

Revision Level
B = Current Revision

*"ERV" is designed for 100% Outdoor Air (OA) application as a "mated" option for the ClimateMaster RE series Rooftops. Cabinets and CFM ranges are selected based upon this application, and may not be used in a stand-alone application.

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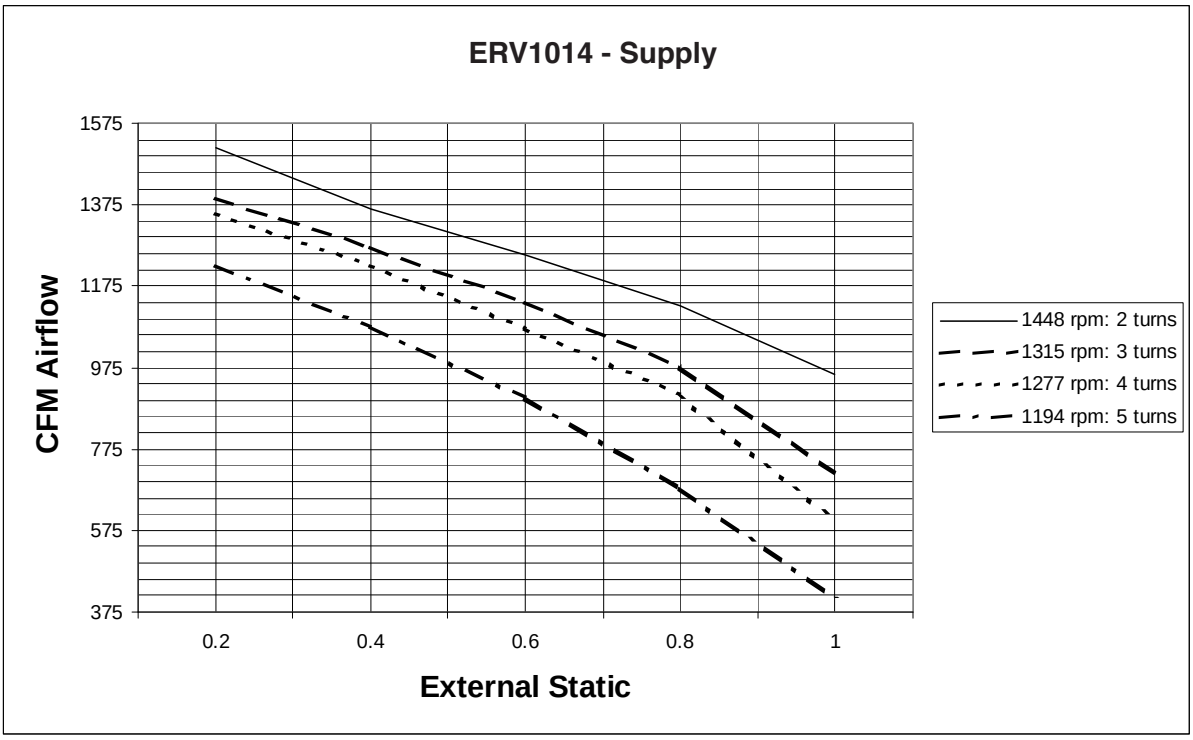
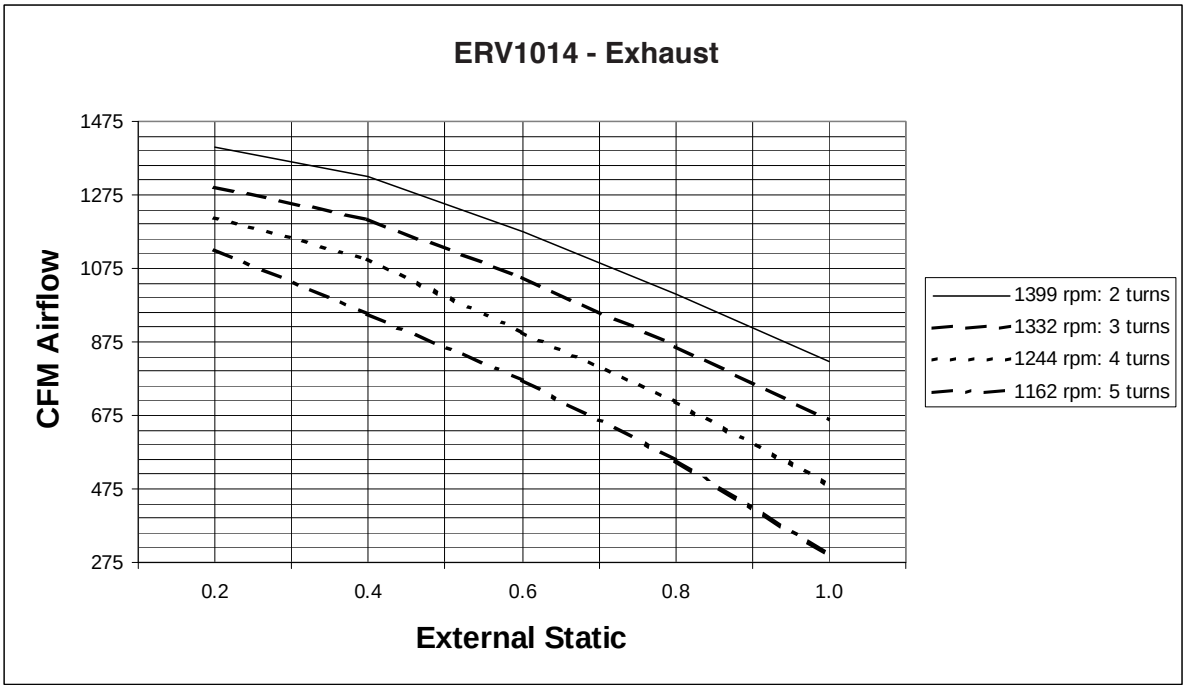
Fan Curves For ERV1014





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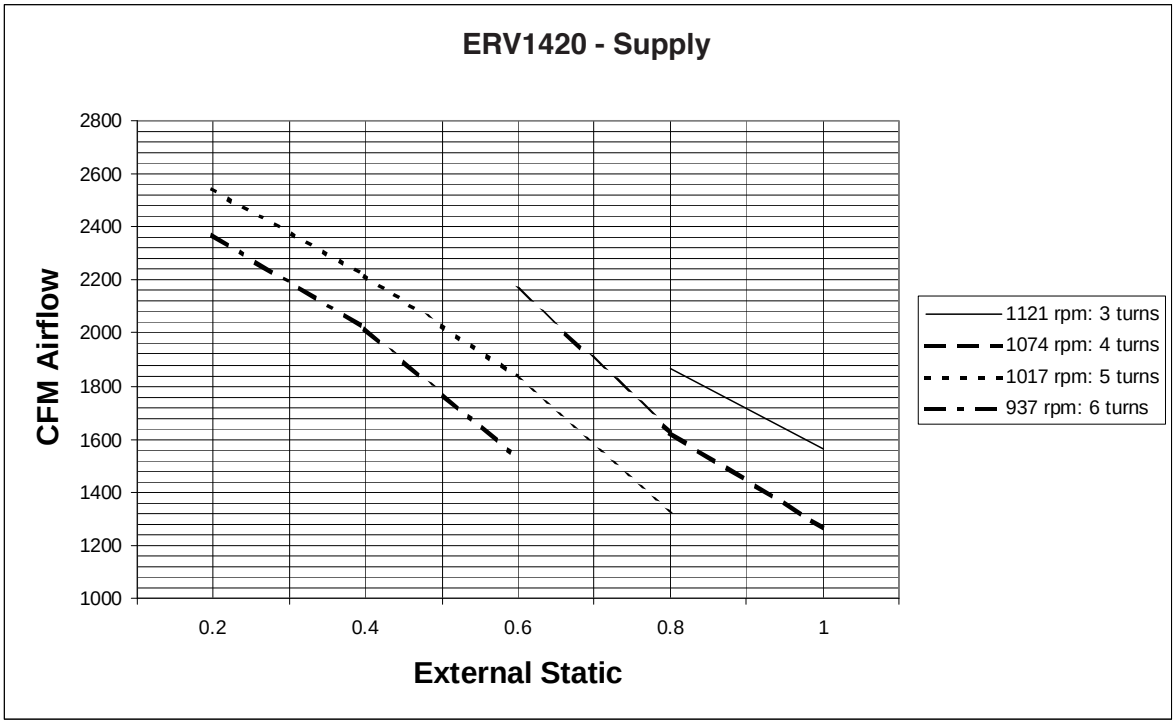
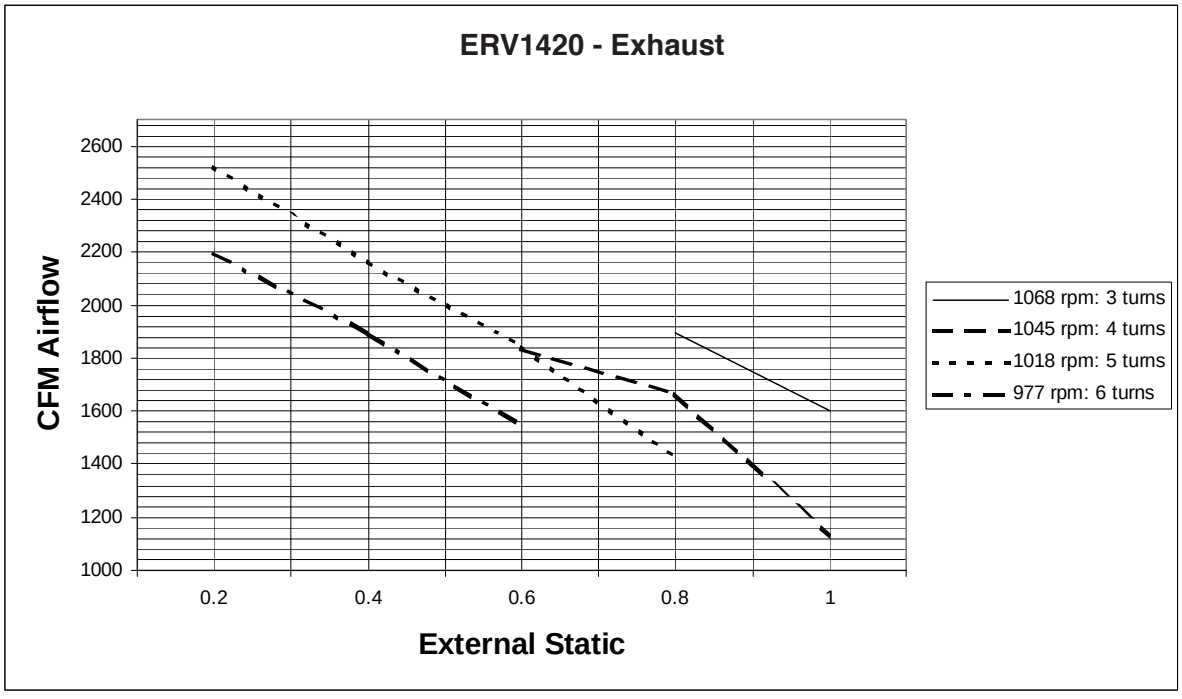
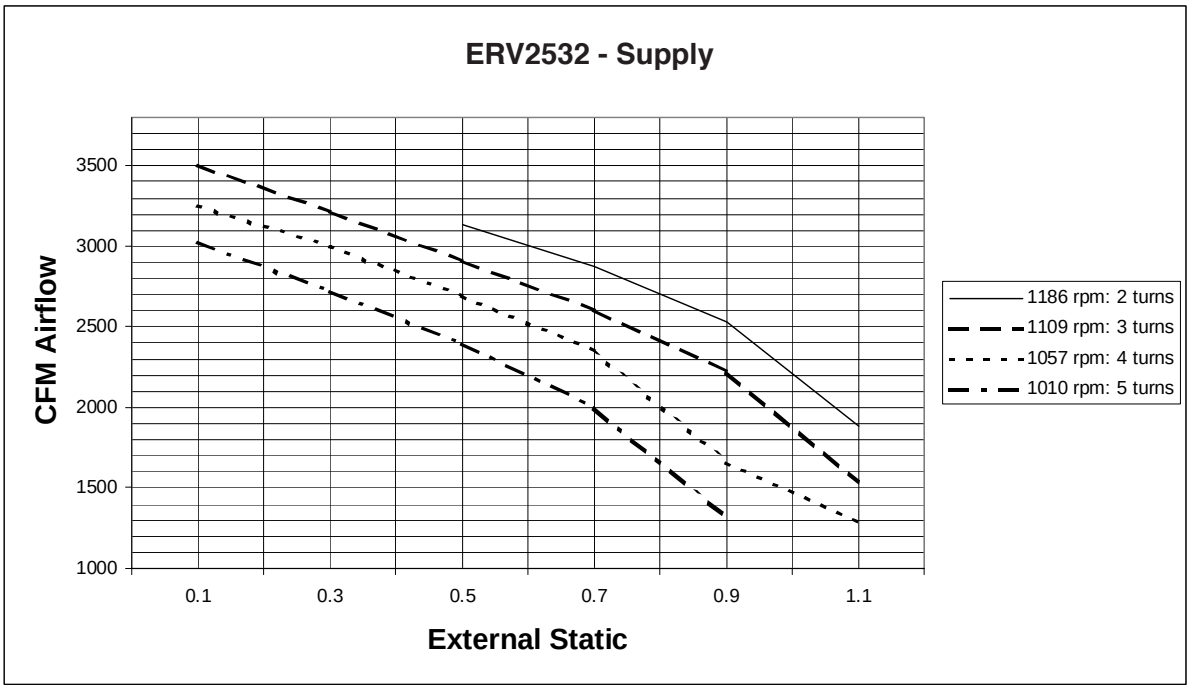
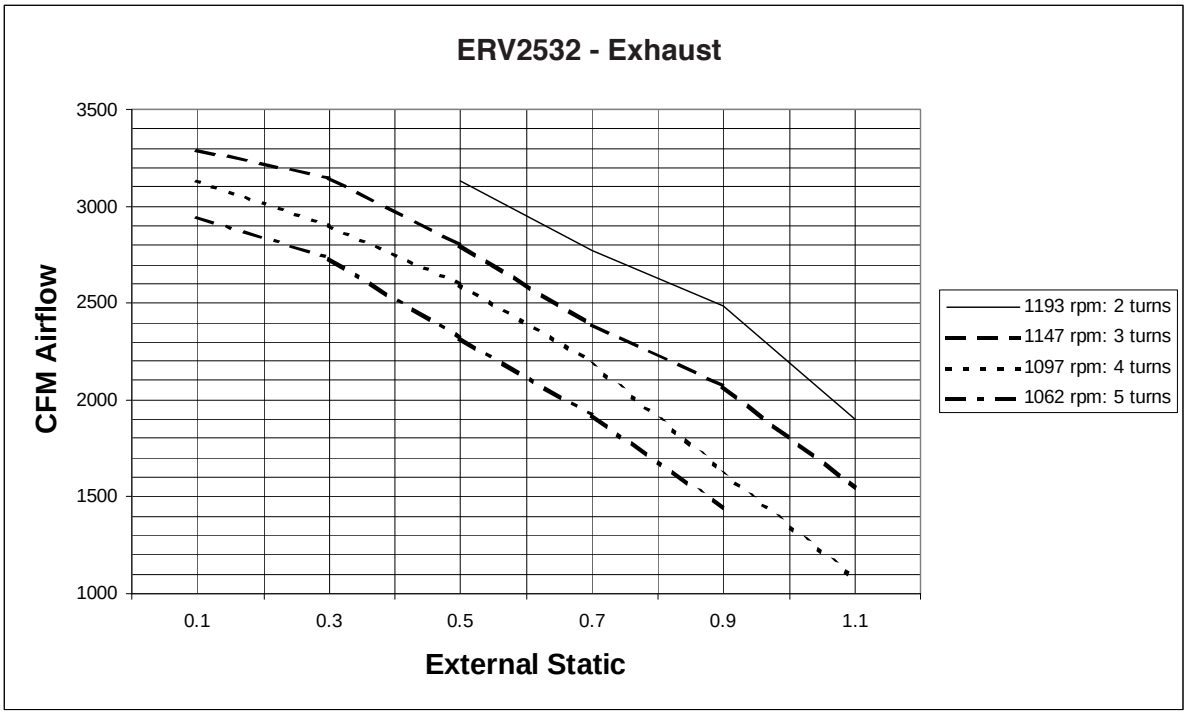
Fan Curves For ERV1420





Fan Curves For ERV2532





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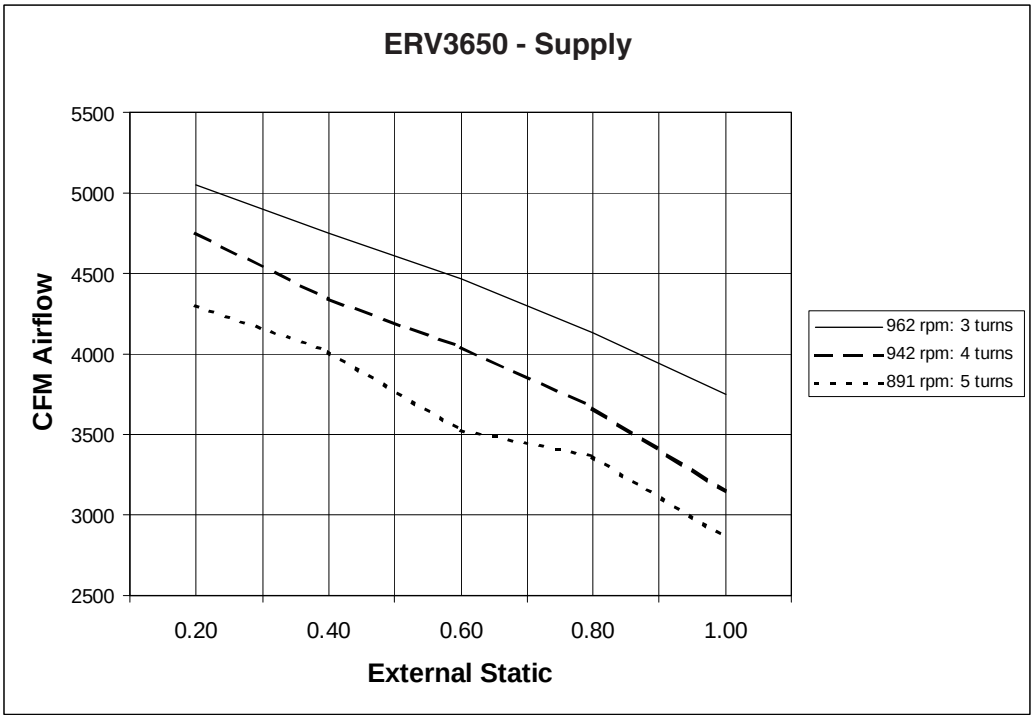
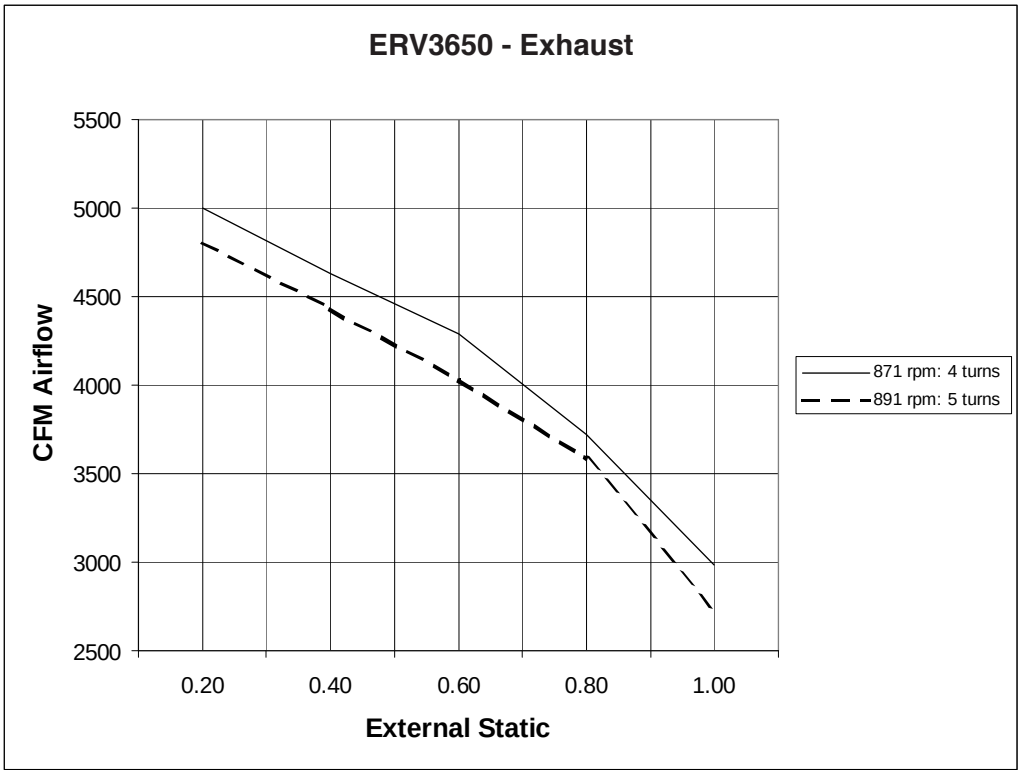
Fan Curves For ERV3650





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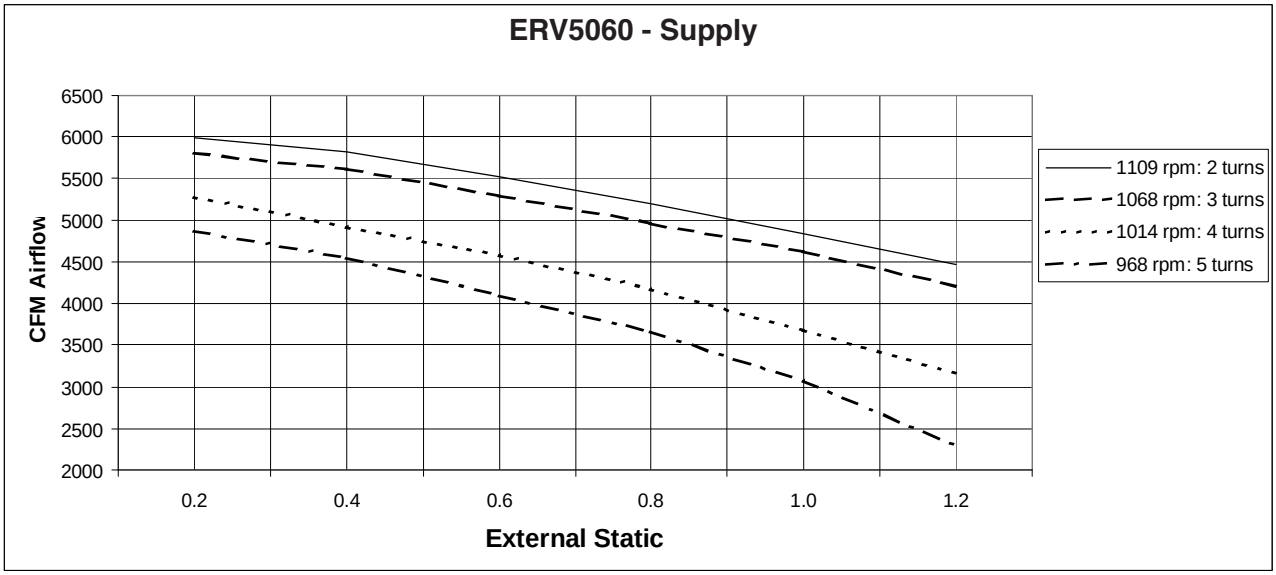
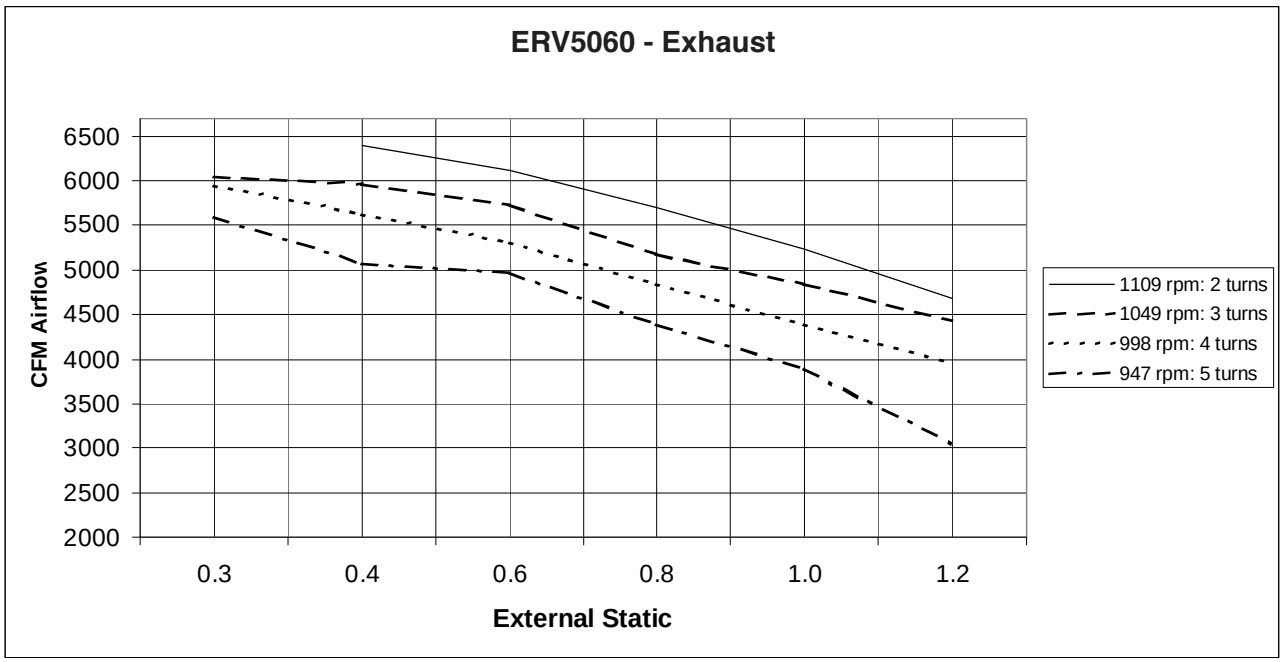
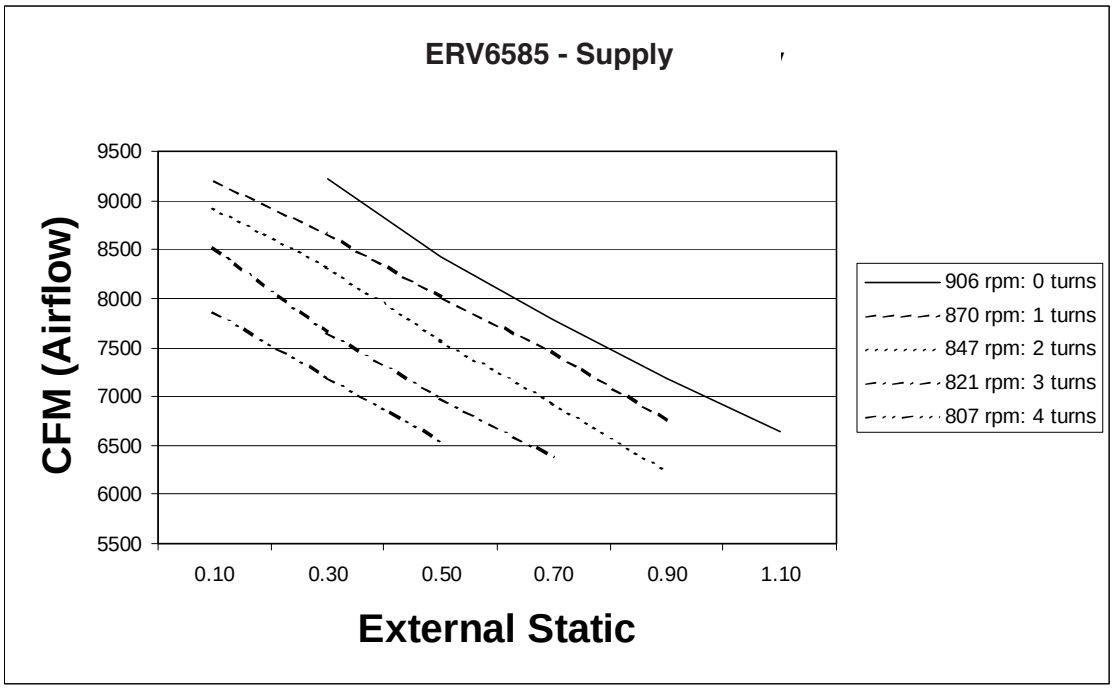
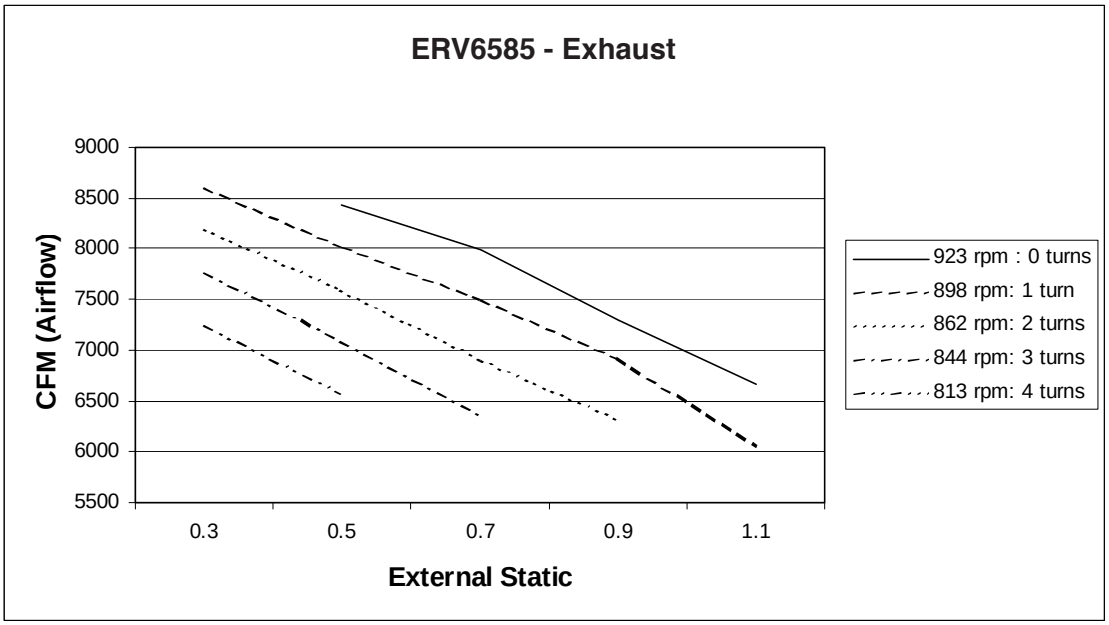
Fan Curves For ERV5060





Fan Curves For ERV6585





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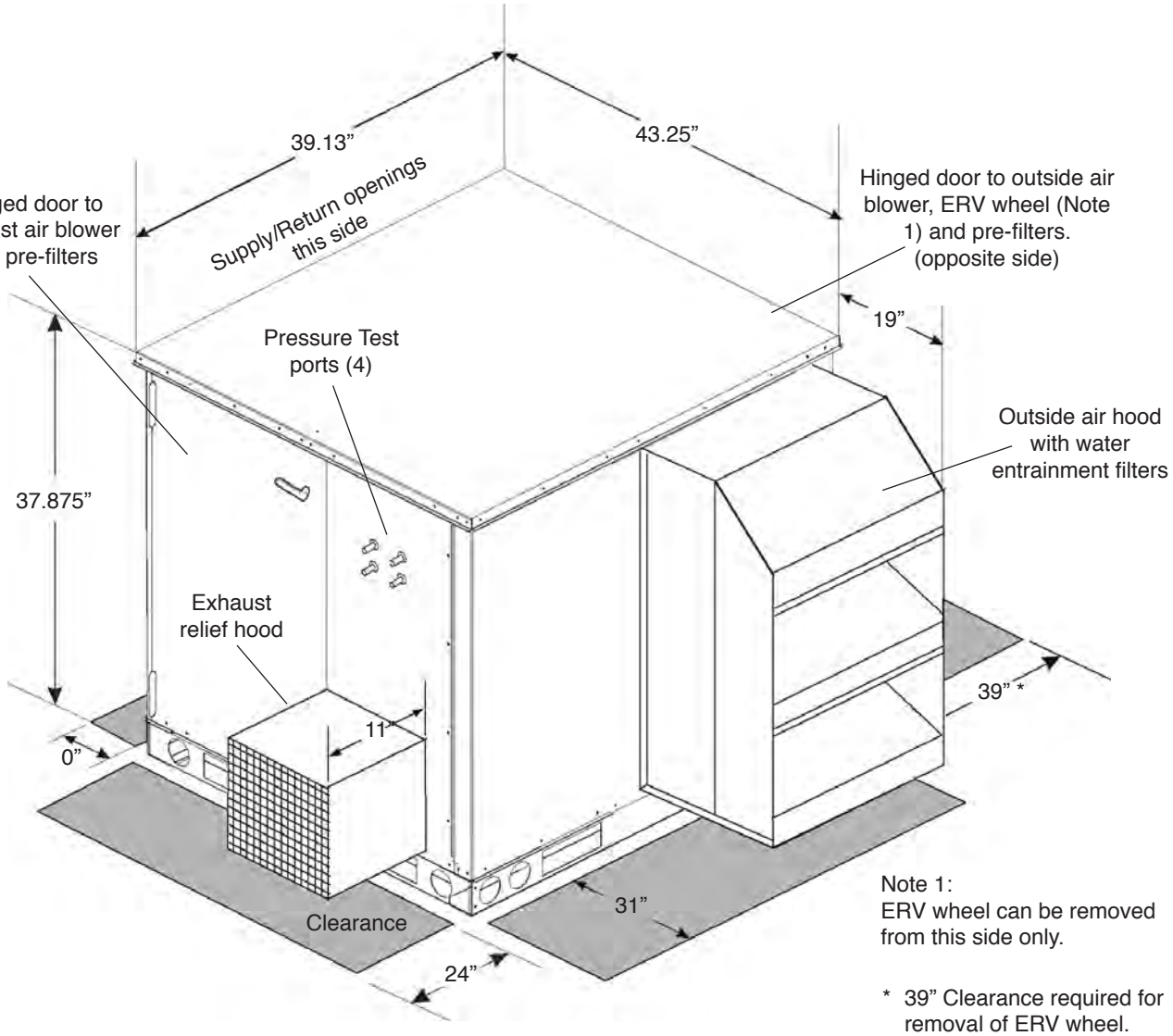
ERV "A" Cabinet Physical Data (900 - 1,400 CFM)



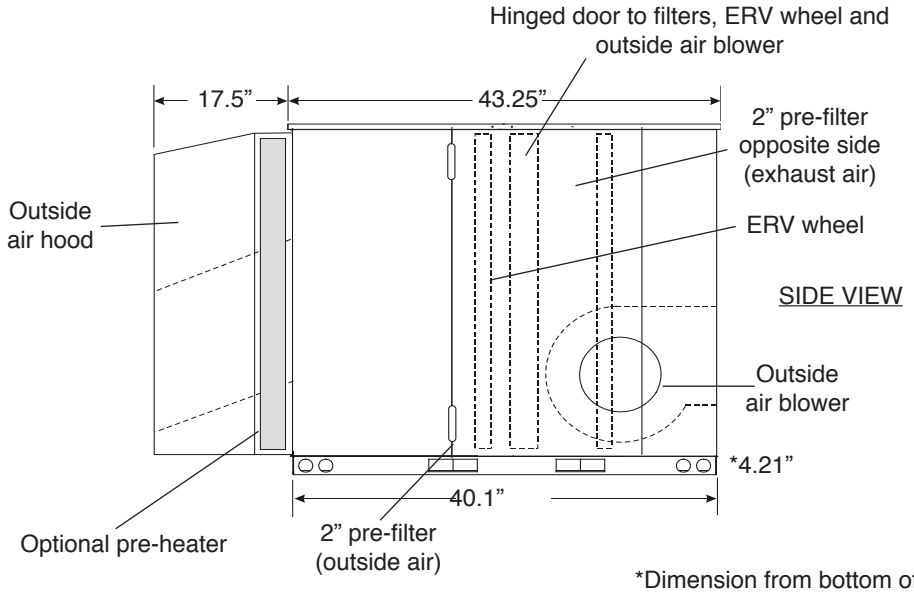
Note 1:
ERV wheel can be removed from this side only.

* 39" Clearance required for removal of ERV wheel.

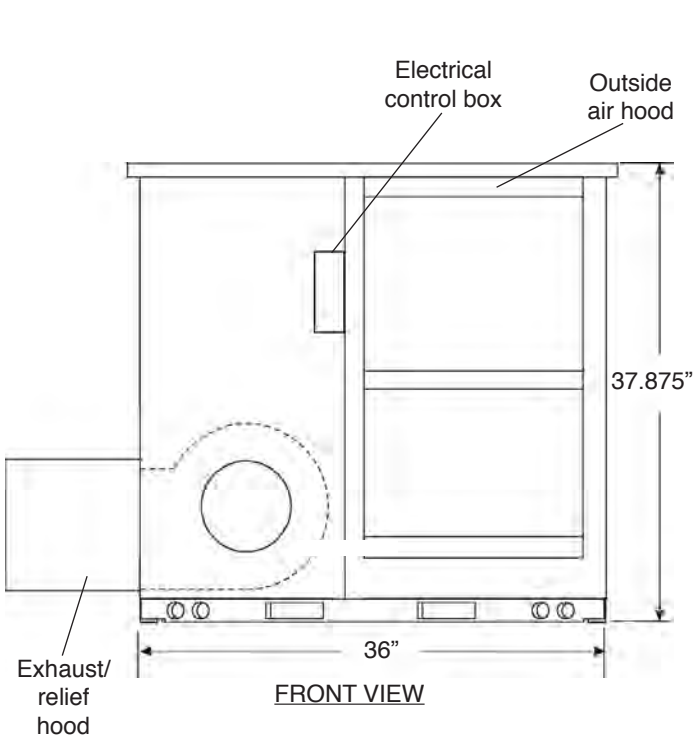
Maximum shipping wt. 470 lbs.

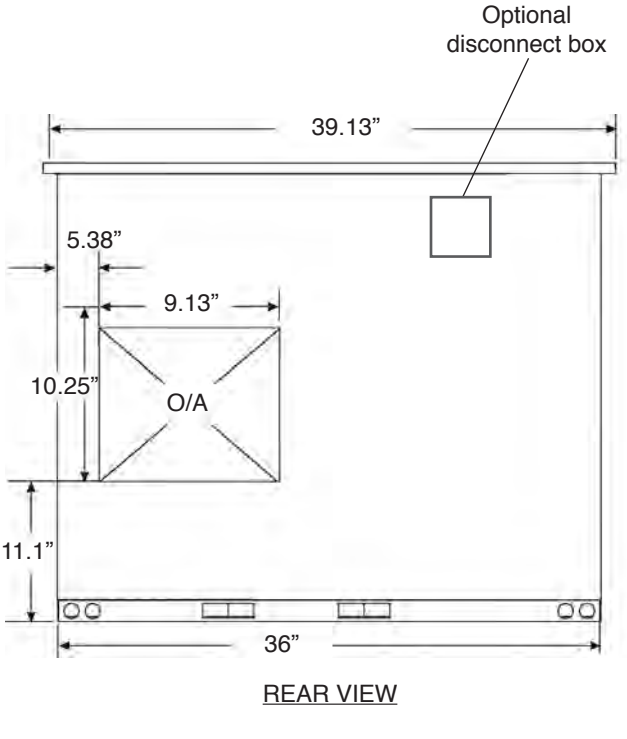
CLIMATEMASTER®

ERV "A" Cabinet Physical Data (900 - 1,400 CFM)



*Dimension from bottom of rail to unit base.





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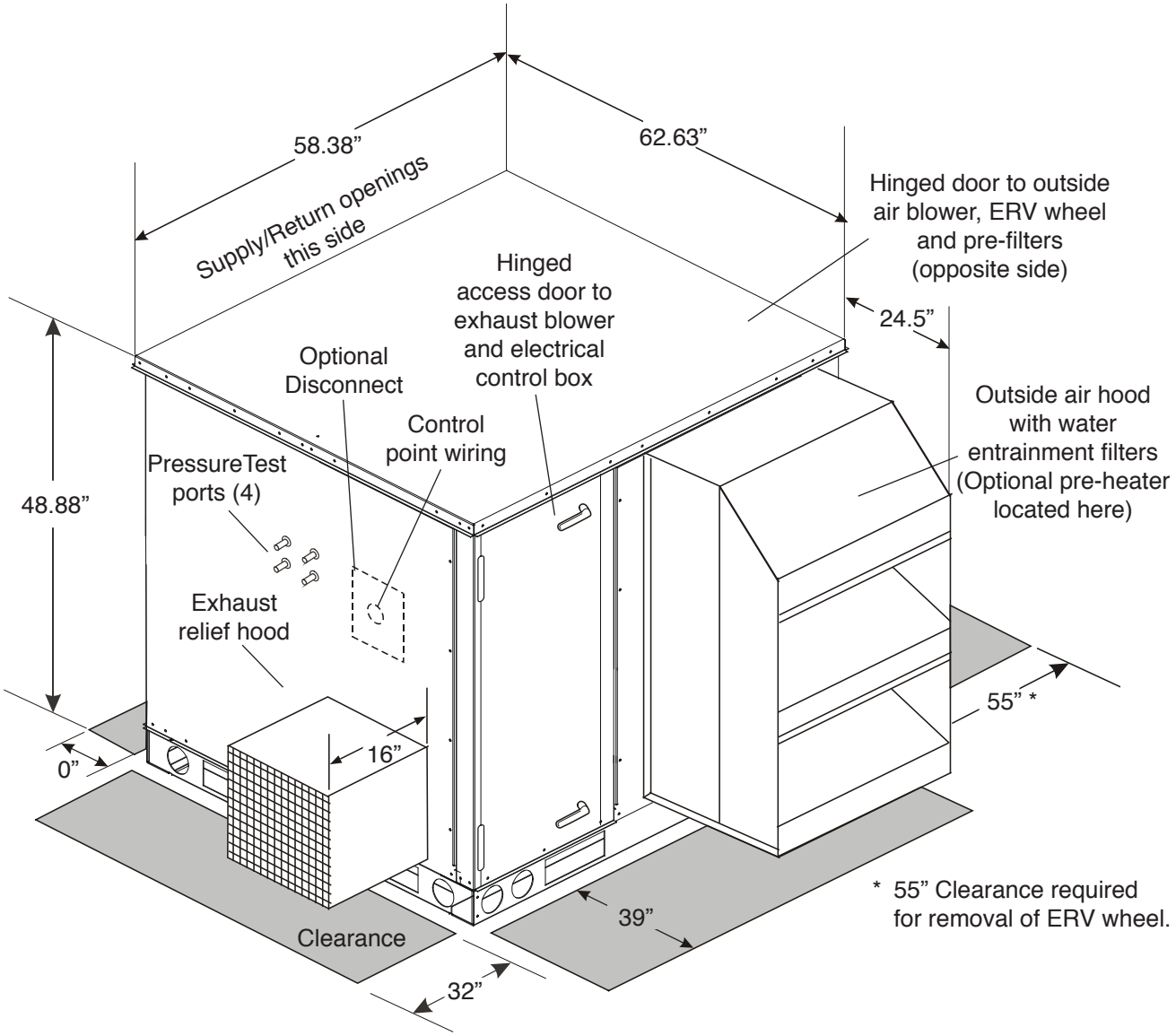
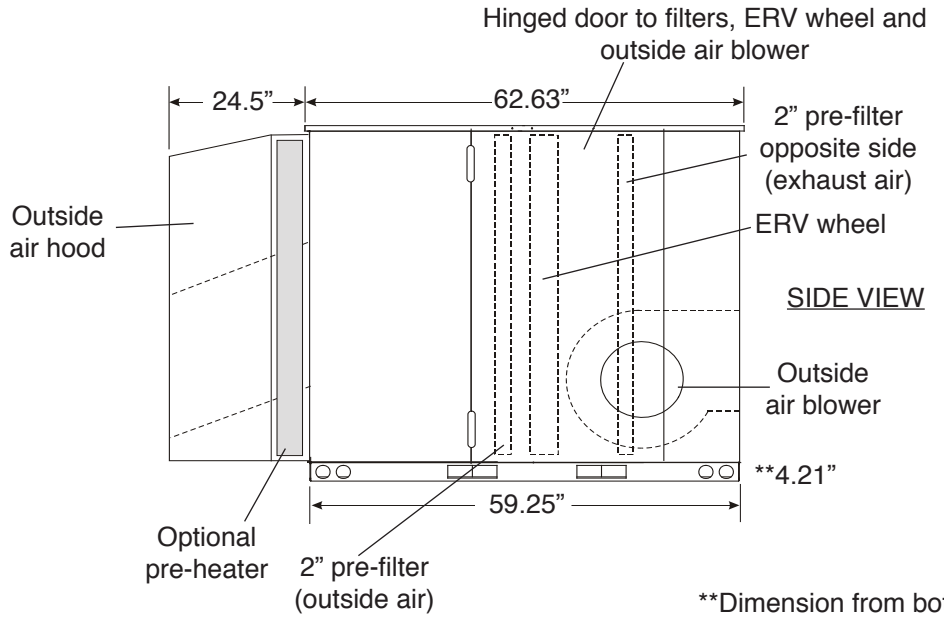
ERV "B" Cabinet Physical Data (1,400 - 3,200 CFM)



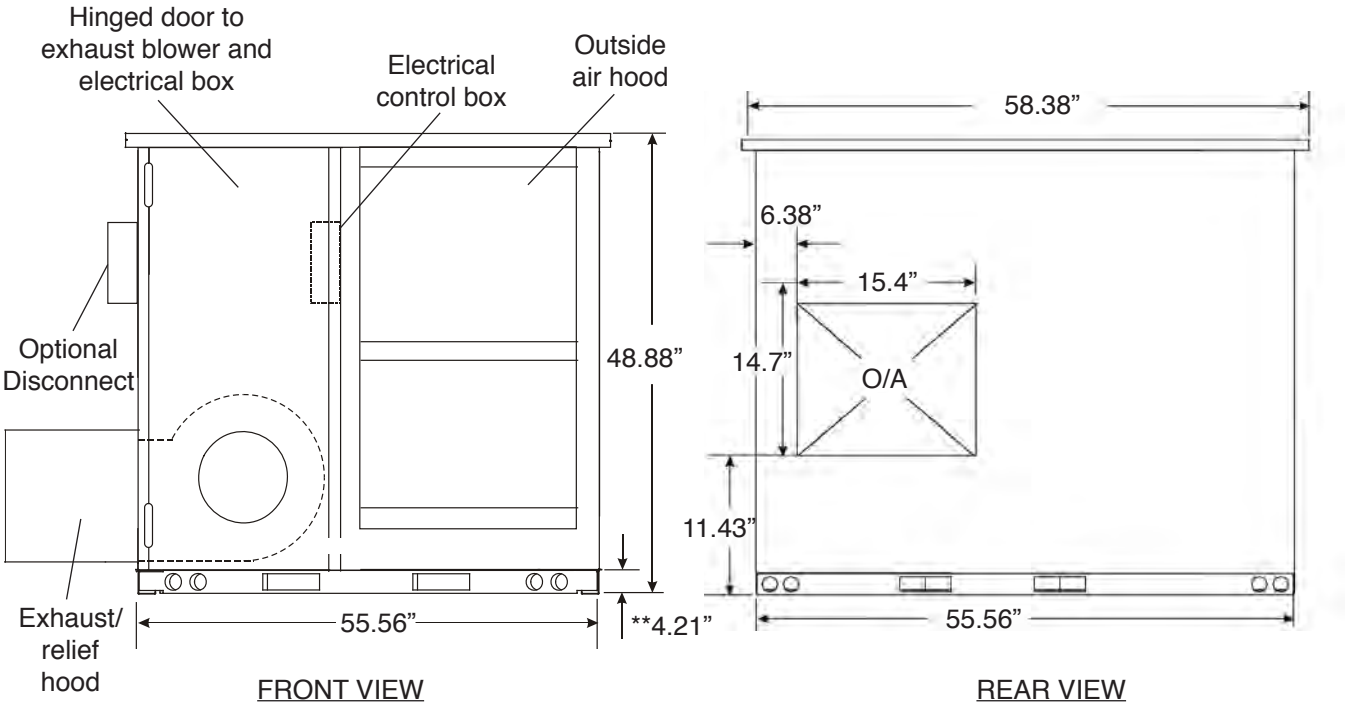
Maximum shipping wt. 730 lbs.

CLIMATEMASTER®

ERV "B" Cabinet Physical Data (1,400 - 3,200 CFM)

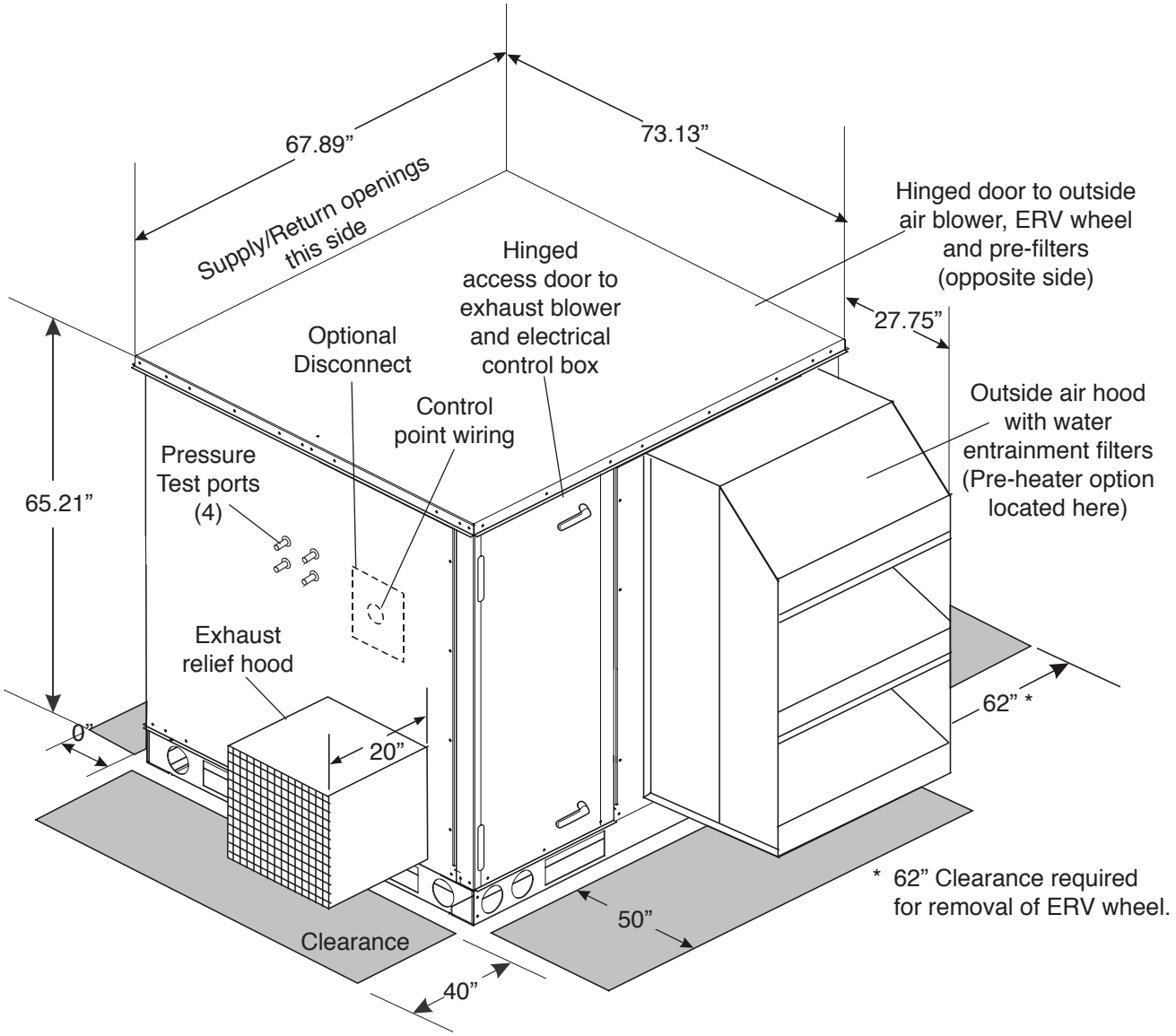


**Dimension from bottom of rail to unit base.



CLIMATEMASTER®

ERV "C" Cabinet Physical Data (3,000 - 6,800 CFM)



Maximum shipping wt. 1,600 lbs.

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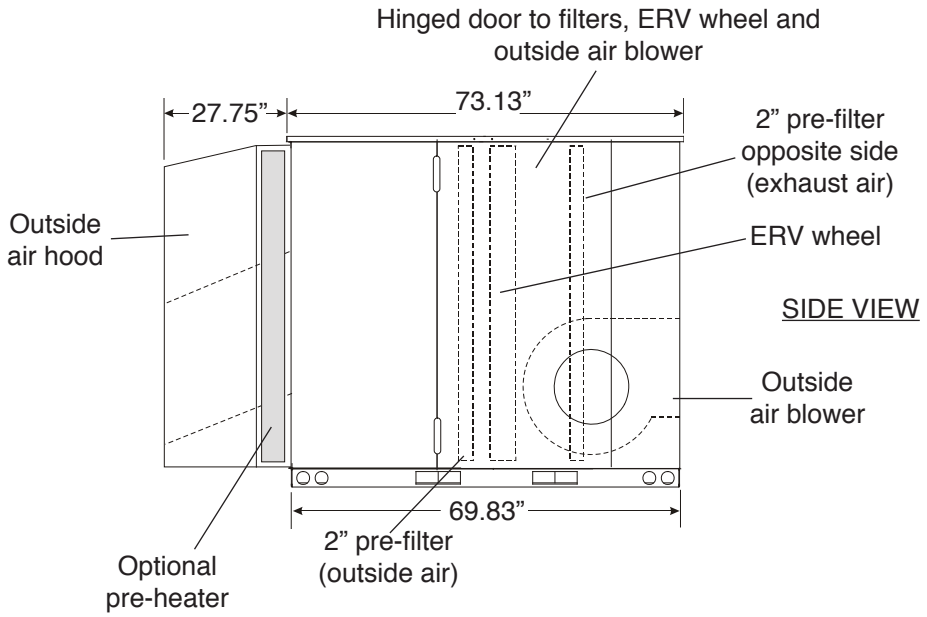
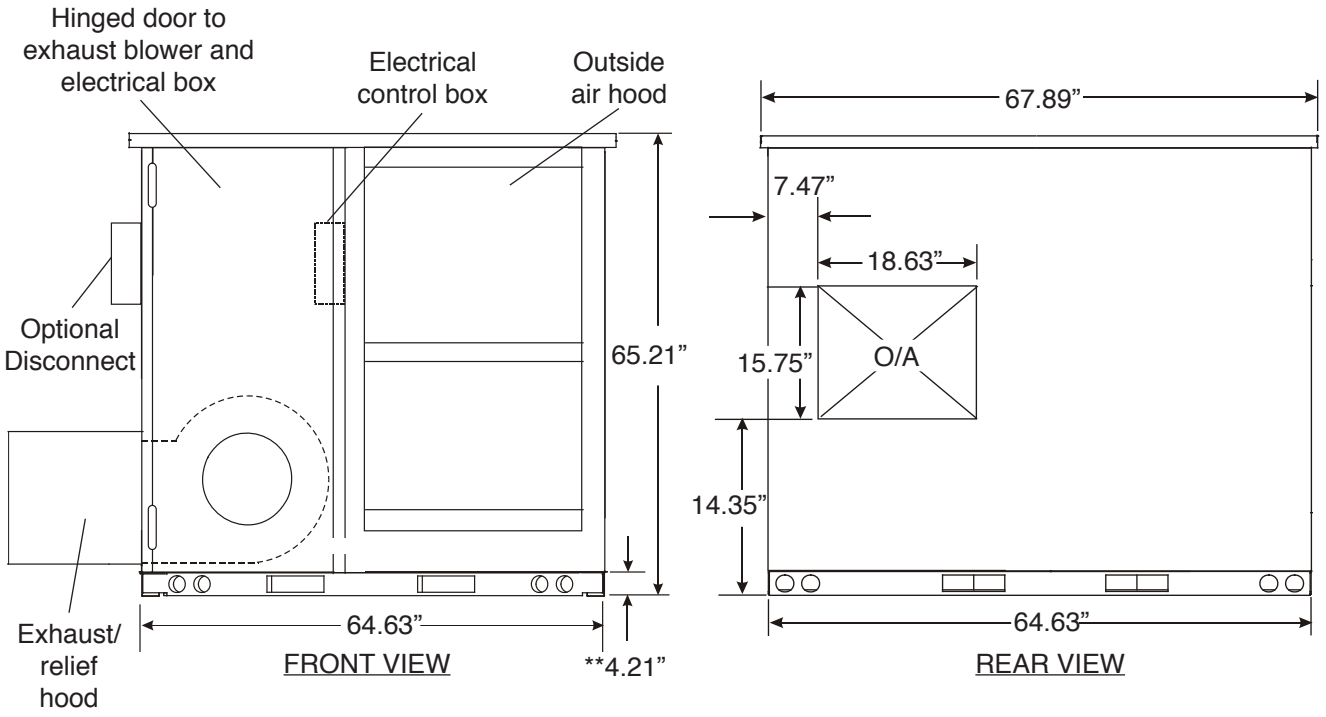
ERV "C" Cabinet Physical Data (3,000 - 6,800 CFM)





**From bottom of rail to unit base.

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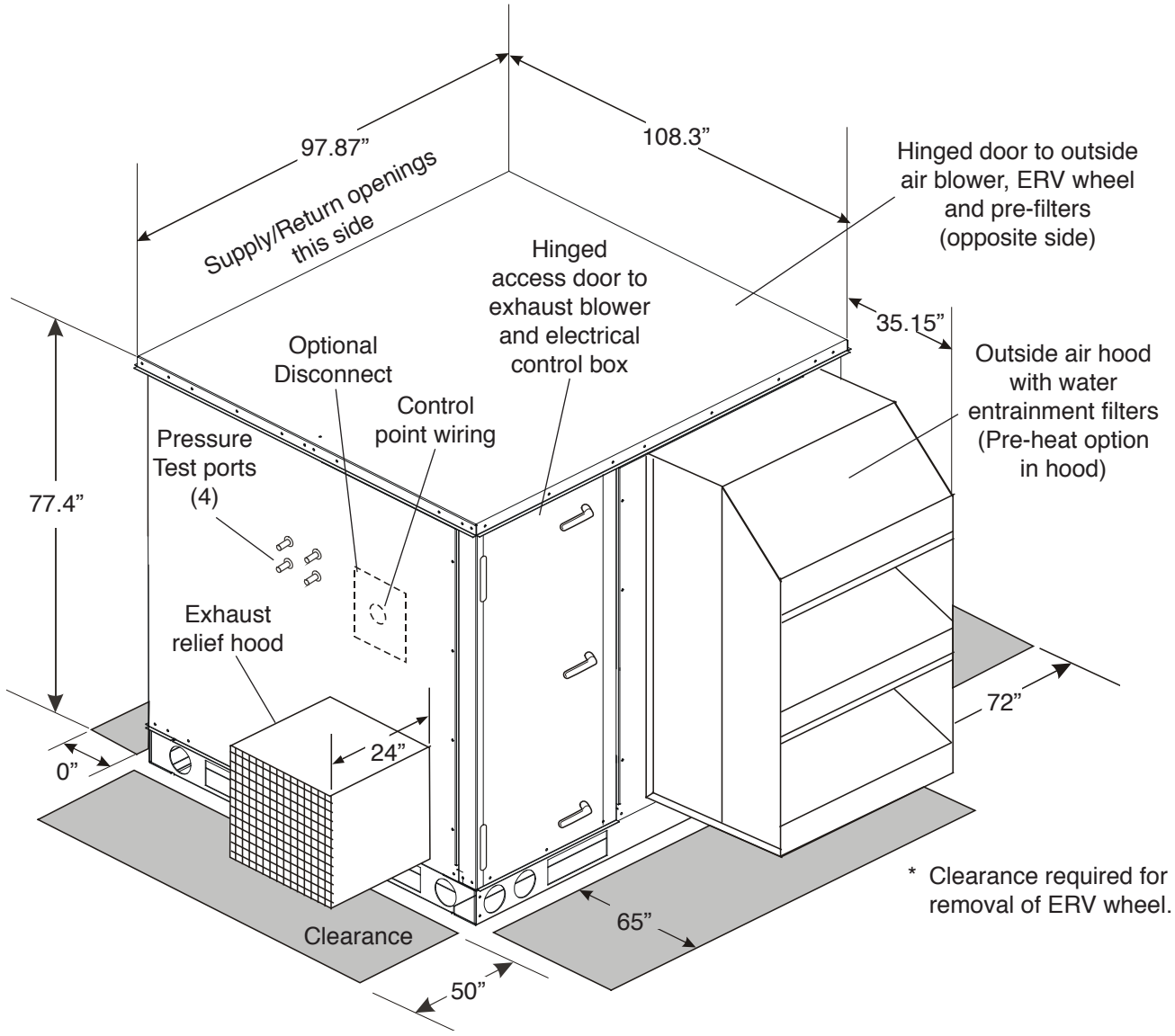
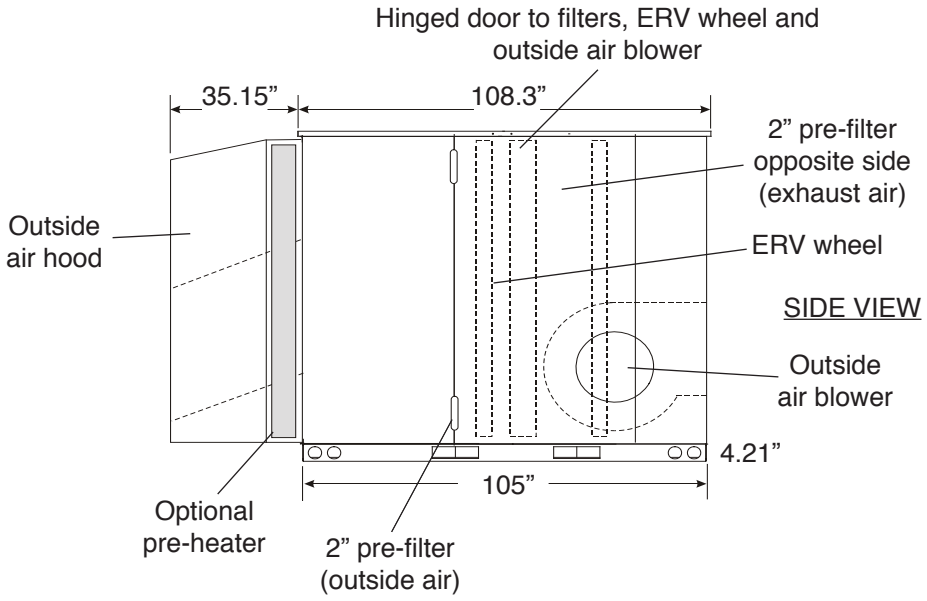
ERV "D" Cabinet Physical Data (6,500 - 8,500 CFM)

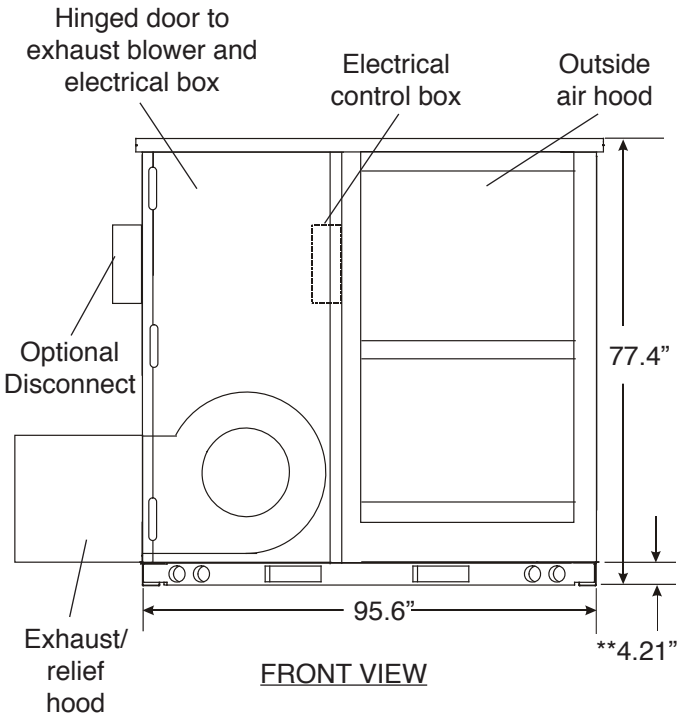


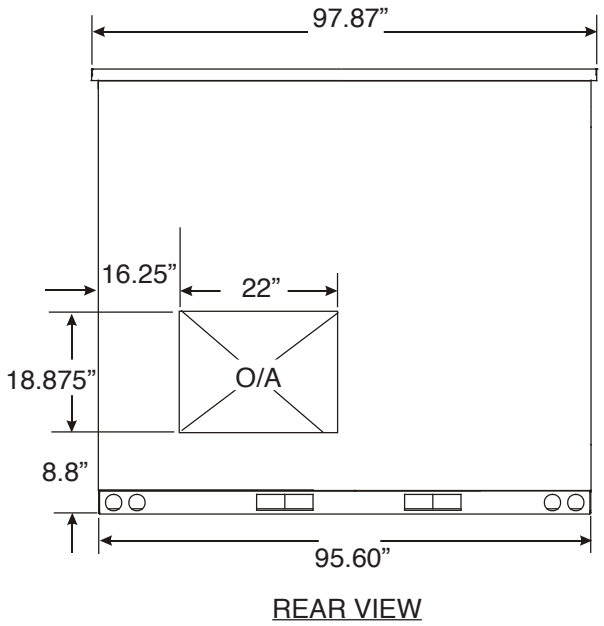
Maximum shipping wt. 2,200 lbs.

CLIMATEMASTER®

ERV "D" Cabinet Physical Data (6,500 - 8,500 CFM)







**From bottom of rail to unit base.

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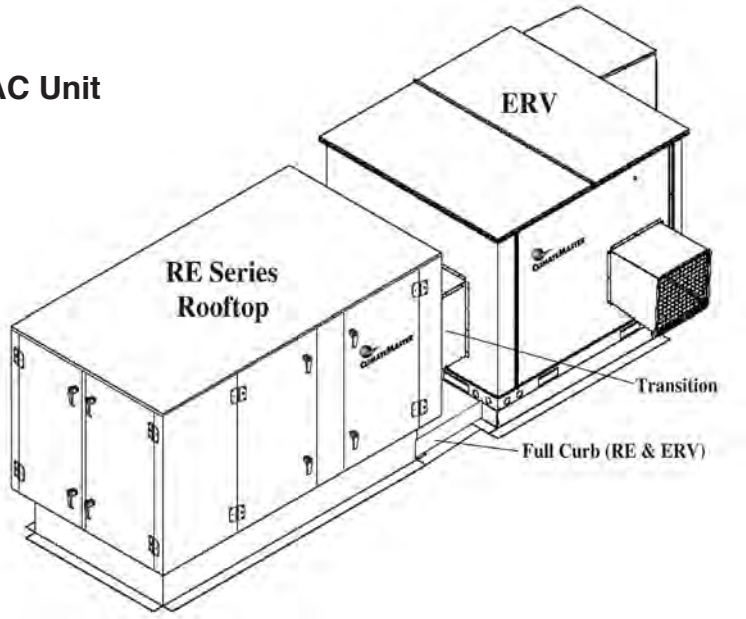
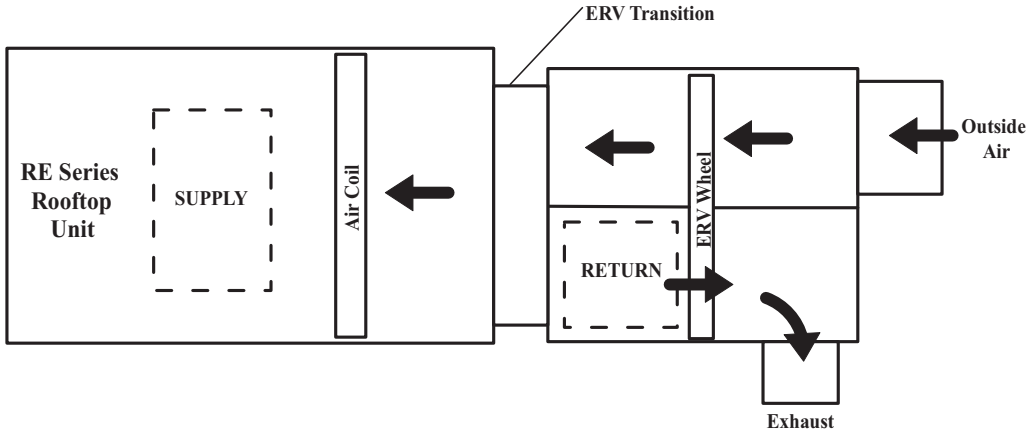
ERV Mated To RE Series Rooftop WSHP - Cabinet Layout

Mated To Down Discharge 3 - 20 Ton HVAC Unit





ERV Match Up Guide

Rooftop Unit*	ERV	Full Curb (ERV & RE)
RE03	ERV1014	ACURBREAEAA
RE04	ERV1420	ACURBREAEBA
RE05	ERV1420	ACURBREAEBA
RE07	ERV2532	ACURBREAEBA
RE08	ERV2532	ACURBREBEBA
RE10	ERV3650	ACURBREBECA
RE12	ERV3650	ACURBREBECA
RE15	ERV5060	ACURBRECECA
RE20	ERV6585	ACURBRECEDA

*Must be configured for 100% OA

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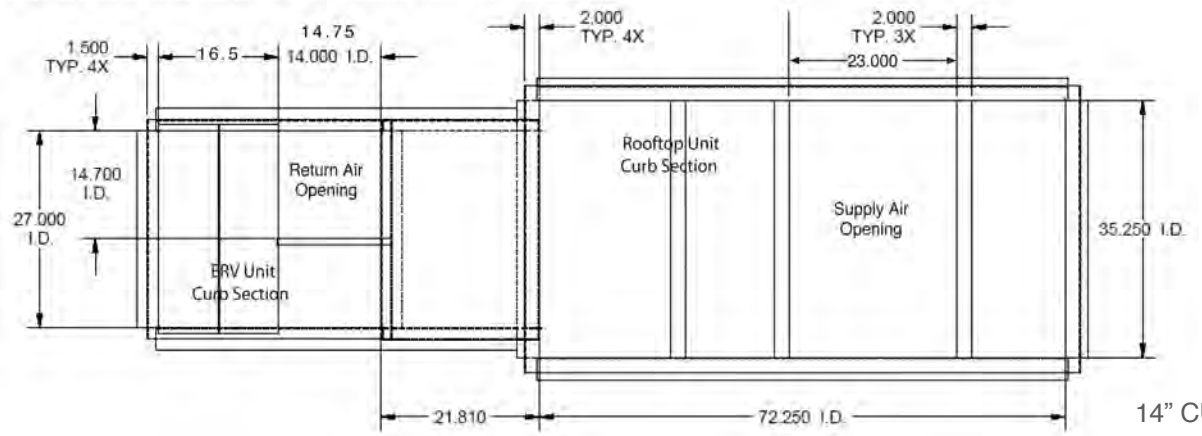
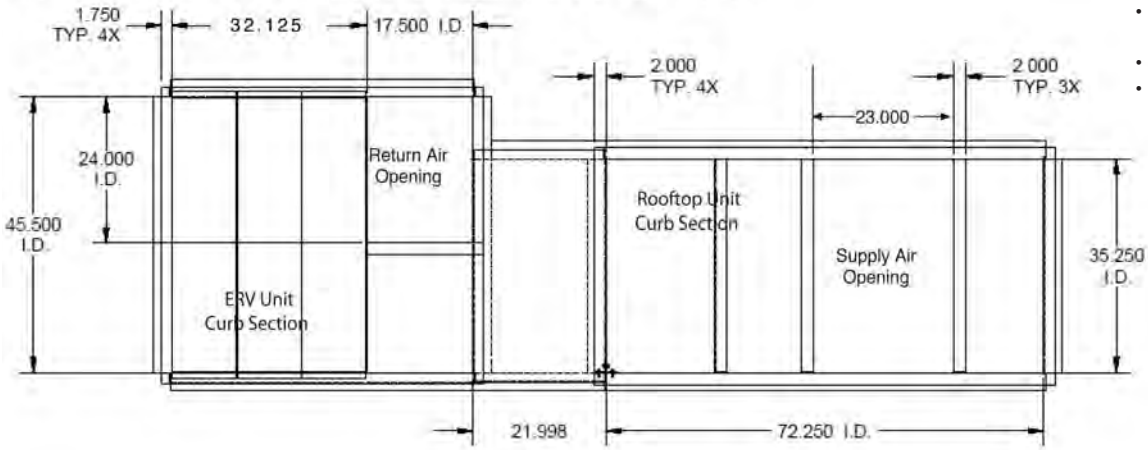
Roofcurbs For Mated Applications

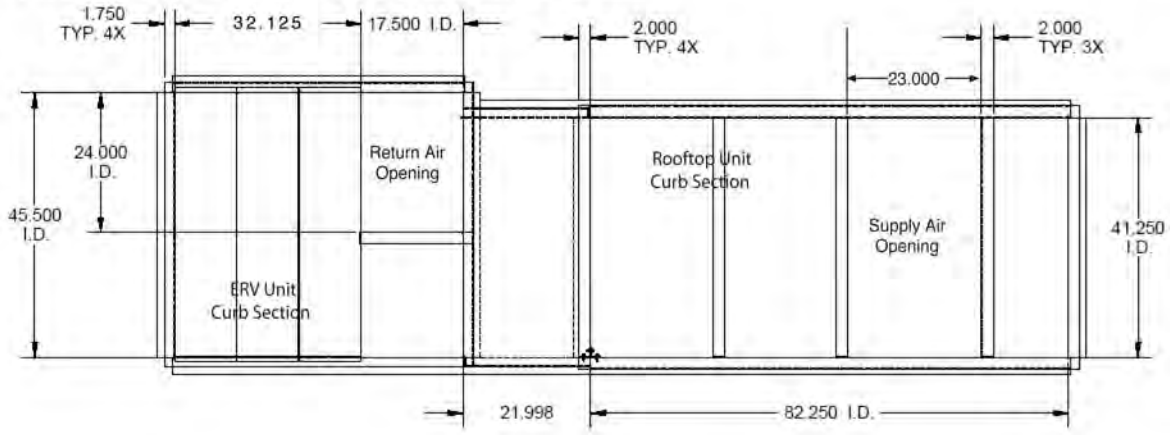
Full Curb for RE03 Mated to ERV "A" Cabinet (Part # ACURBREAEAA)



Full Curb for RE04 to RE07 Mated to ERV "B" Cabinet (Part # ACURBREAEBA)



Full Curb for RE08 Mated to ERV "B" Cabinet (Part # ACURBREBEBA)



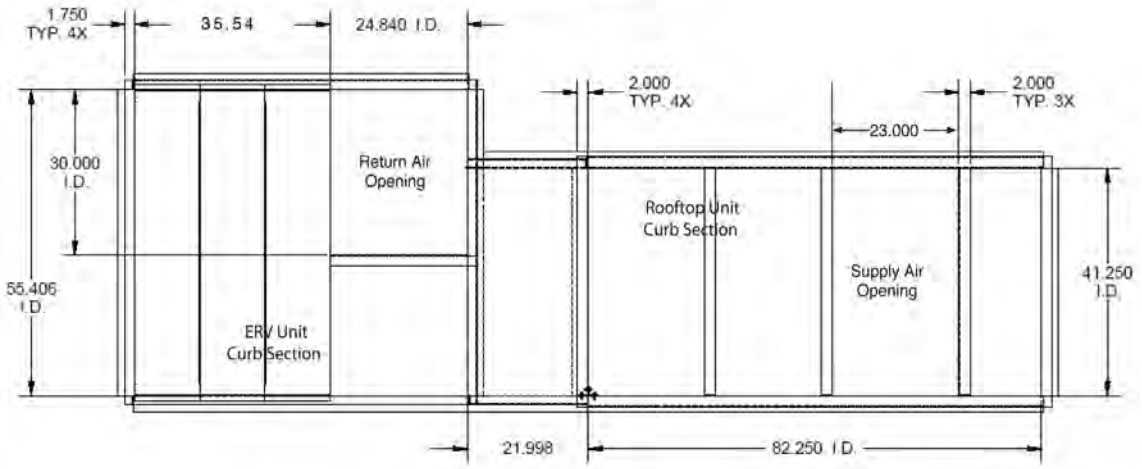
14" CURB FEATURES

- Curbs ship knocked down and are designed for easy assembly
- Wood nailer included
- Constructed of heavy gage galvanized
- Gasket package included
- Vibration isolation curbs are availiable

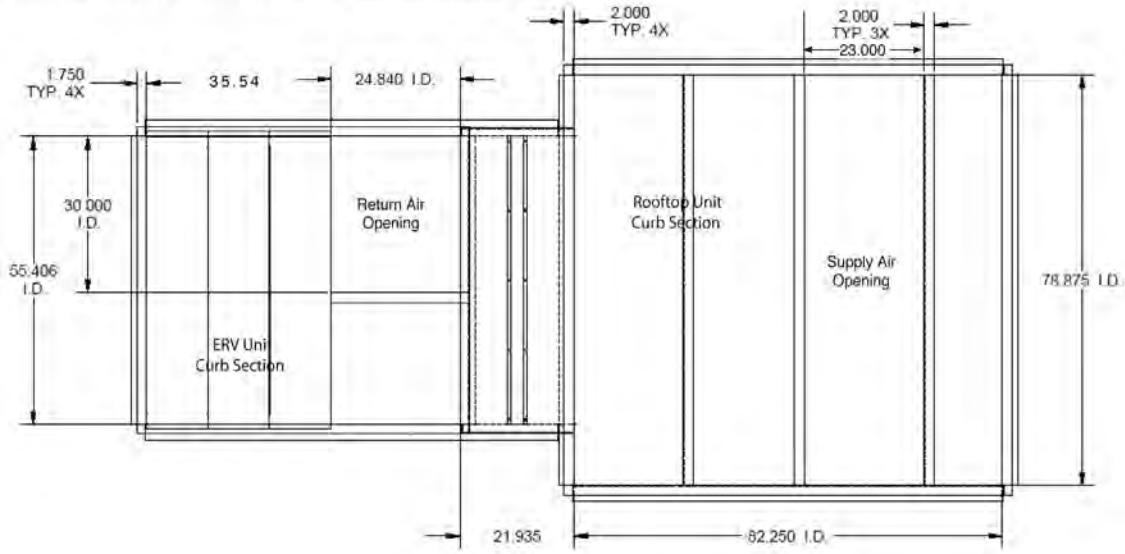
CLIMATEMASTER®

Roofcurbs For Mated Applications

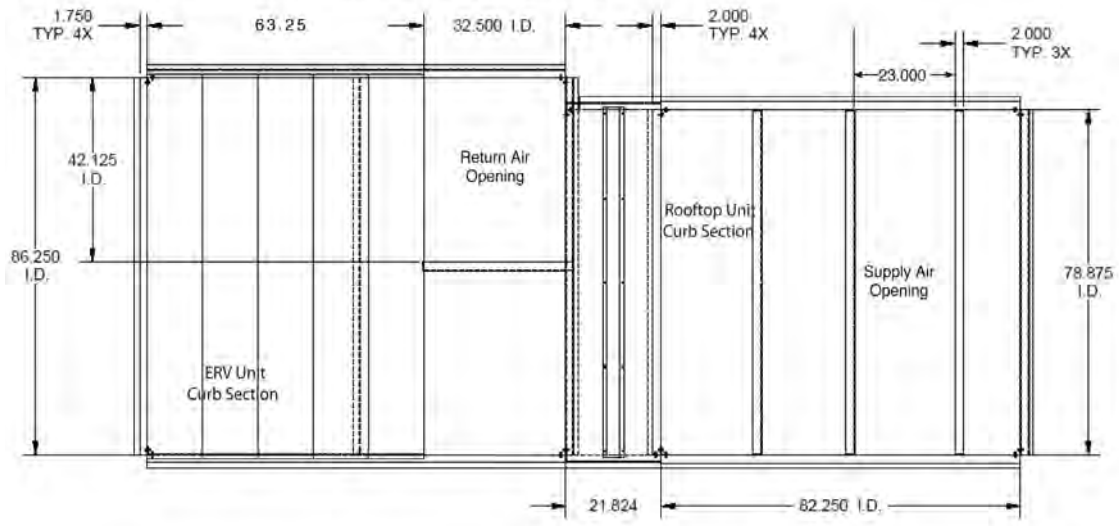
Full Curb for RE10 to RE12 Mated to ERV "C" Cabinet (Part # ACURBREBECA)



Full Curb for RE15 Mated to ERV "C" Cabinet (Part # ACURBRECECA)



Full Curb for RE20 Mated to ERV "D" Cabinet (Part # ACURBRECEDA)



ERV Series 60Hz Submittal Data Eng/I-P

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Electrical Data

Model Number	ERV Wheel Data*			Optional Preheater	Exhaust and Supply Motor Data			Complete ERV Unit Data			Optional Disconnect	Internal Fusing RK5
	Part No.	FLA	HP Wheel	FLA	NEC - FLA (ea.)	HP	Voltage	FLA	MCA	MOP		
ERV1014H	ERC-2513 or ERC-2514	0.3	N/A	-	4.2	1	230/60/3	9.03	10.50	13.65	30 Amp	12 Amp
5KW Preheater	ERC-2513 or ERC-2514	0.3	N/A	12.57	4.2	1	230/60/3	21.59	26.21	26.22	40 Amp	25 Amp
ERV1014F	ERC-2513 or ERC-2514	0.3	N/A	-	2.1	1	460/60/3	4.53	5.25	6.83	30 Amp	6 Amp
5KW Preheater	ERC-2513 or ERC-2514	0.3	N/A	6.28	2.1	1	460/60/3	10.81	13.10	13.11	30 Amp	12 Amp
ERV1420H	ERC-3623	0.6	N/A	-	4.2	1	230/60/3	9.33	10.50	13.65	30 Amp	12 Amp
5KW Preheater	ERC-3623	0.6	N/A	12.57	4.2	1	230/60/3	21.90	26.21	26.22	40 Amp	25 Amp
10KW Preheater	ERC-3623	0.6	N/A	25.13	4.2	1	230/60/3	34.46	41.92	41.92	60 Amp	40 Amp
ERV1420F	ERC-3623	0.6	N/A	-	2.1	1	460/60/3	4.69	5.25	6.83	30 Amp	6 Amp
5KW Preheater	ERC-3623	0.6	N/A	6.28	2.1	1	460/60/3	10.97	13.10	13.11	30 Amp	12 Amp
10KW Preheater	ERC-3623	0.6	N/A	12.57	2.1	1	460/60/3	17.26	20.96	20.96	30 Amp	20 Amp
ERV2532H	ERC-3628	0.6	N/A	-	6.8	2	230/60/3	14.53	17.00	22.10	30 Amp	20 Amp
5KW Preheater	ERC-3628	0.6	N/A	12.57	6.8	2	230/60/3	27.01	32.71	34.67	40 Amp	30 Amp
10KW Preheater	ERC-3628	0.6	N/A	25.13	6.8	2	230/60/3	39.66	48.42	48.42	60 Amp	45 Amp
ERV2532F	ERC-3628	0.6	N/A	-	3.4	2	460/60/3	7.29	8.50	11.05	30 Amp	10 Amp
5KW Preheater	ERC-3628	0.6	N/A	6.28	3.4	2	460/60/3	13.57	16.35	17.33	30 Amp	15 Amp
10KW Preheater	ERC-3628	0.6	N/A	12.57	3.4	2	460/60/3	19.86	24.21	24.21	30 Amp	20 Amp
ERV3650H	ERC-5245	1.2	0.17	-	9.6	3	230/60/3	20.73	25.50	32.40	40 Amp	30 Amp
10KW Preheater	ERC-5245	1.2	0.17	25.13	9.6	3	230/60/3	45.86	56.92	57.53	80 Amp	50 Amp
15KW Preheater	ERC-5245	1.2	0.17	37.70	9.6	3	230/60/3	58.43	72.62	72.62	100 Amp	70 Amp
ERV3650F	ERC-5245	1.2	0.17	-	4.8	3	460/60/3	10.42	13.50	16.80	30 Amp	15 Amp
10KW Preheater	ERC-5245	1.2	0.17	12.57	4.8	3	460/60/3	22.98	29.21	29.37	40 Amp	25 Amp
15KW Preheater	ERC-5245	1.2	0.17	18.85	4.8	3	460/60/3	29.26	37.06	37.06	60 Amp	35 Amp
ERV5060H	ERC-5262	1.2	0.17	-	15.2	5	230/60/3	31.93	39.50	50.60	60 Amp	50 Amp
10KW Preheater	ERC-5262	1.2	0.17	25.13	15.2	5	230/60/3	57.06	70.92	75.73	100 Amp	70 Amp
15KW Preheater	ERC-5262	1.2	0.17	37.70	15.2	5	230/60/3	69.63	86.62	88.30	200 Amp	80 Amp
ERV5060F	ERC-5262	1.2	0.17	-	7.6	5	460/60/3	16.02	20.50	25.90	30 Amp	25 Amp
10KW Preheater	ERC-5262	1.2	0.17	12.57	7.6	5	460/60/3	28.58	36.21	38.47	60 Amp	35 Amp
15KW Preheater	ERC-5262	1.2	0.17	18.85	7.6	5	460/60/3	34.86	44.06	44.75	60 Amp	40 Amp
ERV6585H	ERC-6488	2.5	1/4	-	22	7.5	230/60/3	46.83	58.13	74.00	100 Amp	70 Amp
10KW Preheater	ERC-6488	2.5	1/4	25.13	22	7.5	230/60/3	71.96	89.54	99.13	200 Amp	90 Amp
15KW Preheater	ERC-6488	2.5	1/4	37.70	22	7.5	230/60/3	84.53	105.25	111.70	200 Amp	110 Amp
20KW Preheater	ERC-6488	2.5	1/4	50.26	22	7.5	230/60/3	97.09	120.95	124.26	200 Amp	110 Amp
ERV6585F	ERC-6488	1.2	1/4	-	11	7.5	460/60/3	23.36	29.00	36.95	60 Amp	35 Amp
10KW Preheater	ERC-6488	1.2	1/4	12.57	11	7.5	460/60/3	35.93	44.71	49.52	60 Amp	45 Amp
15KW Preheater	ERC-6488	1.2	1/4	18.85	11	7.5	460/60/3	42.21	52.56	55.80	80 Amp	50 Amp
20KW Preheater	ERC-6488	1.2	1/4	25.13	11	7.5	460/60/3	48.50	60.42	62.08	80 Amp	60 Amp

*Note: The ERC 2514 non-segmented wheel is being replaced by the ERC 2513 segmented wheel

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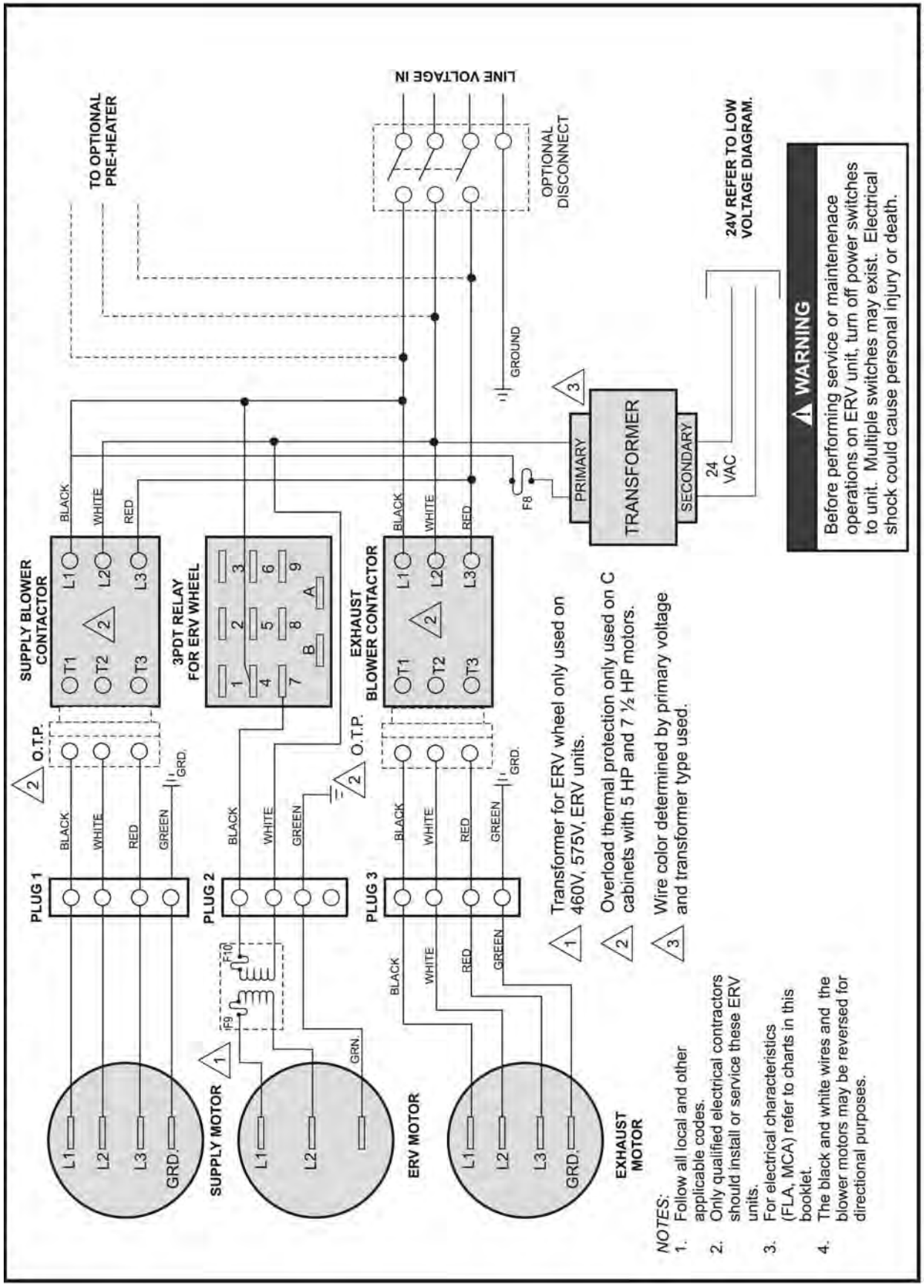
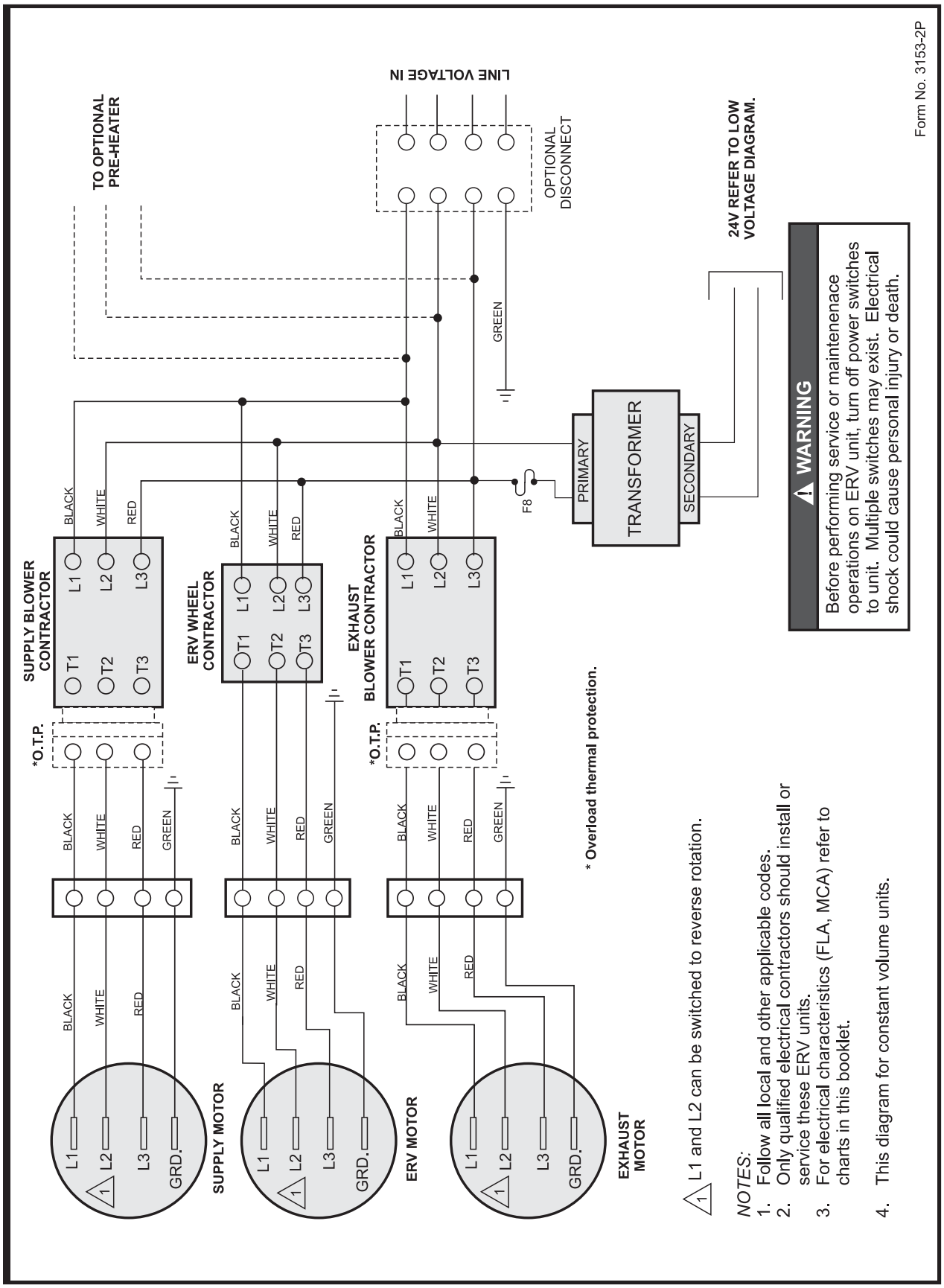
Typical Wiring Diagram
ERV Units - High Voltage Wiring
"A", "B", & "C" Cabinets



Form No. 3126-2P

CLIMATEMASTER®

Typical Wiring Diagram
ERV Units - High Voltage Wiring
"D" Cabinets



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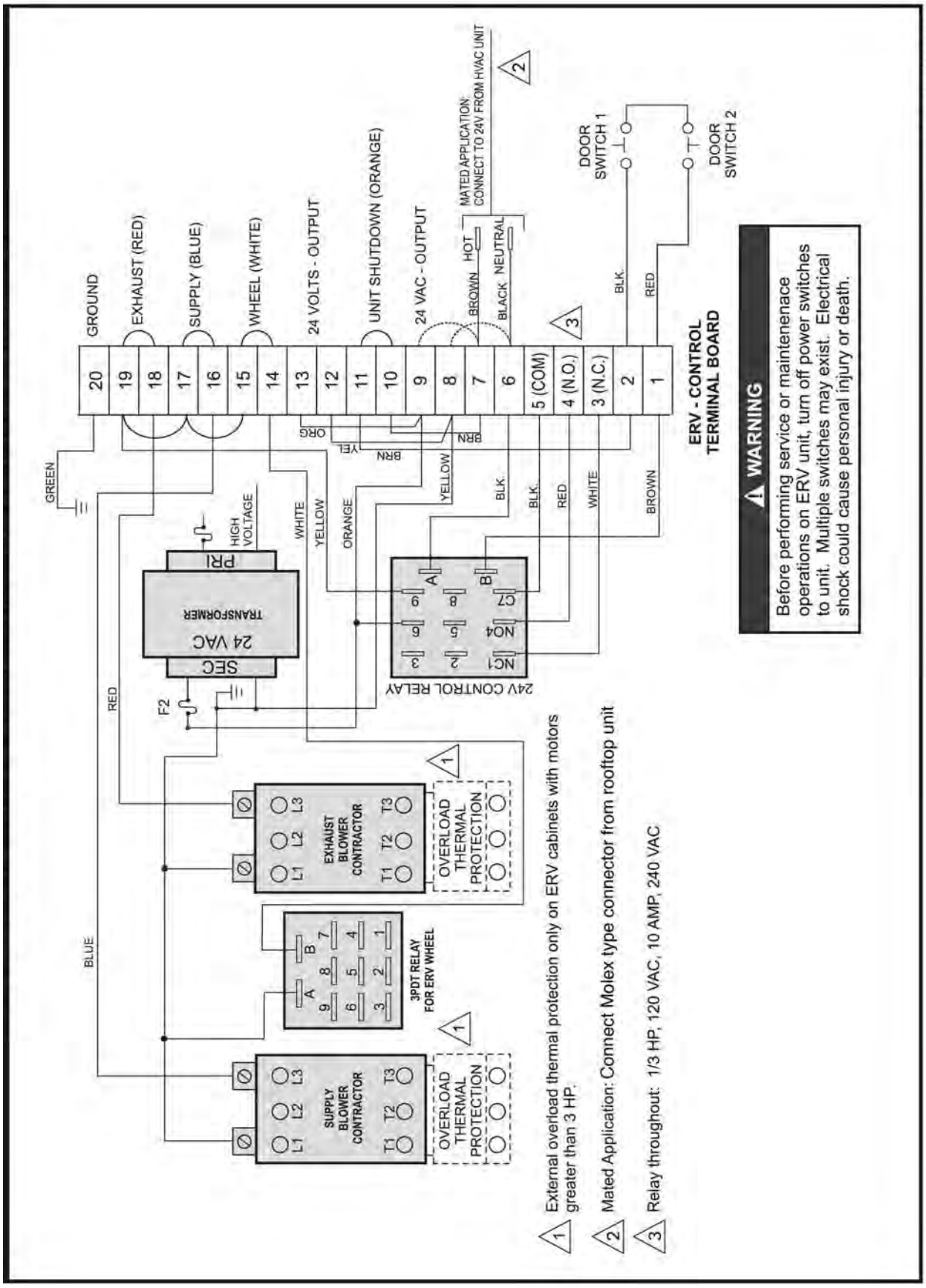
Typical Wiring Diagram
ERV Units - 24V Wiring
All Cabinets



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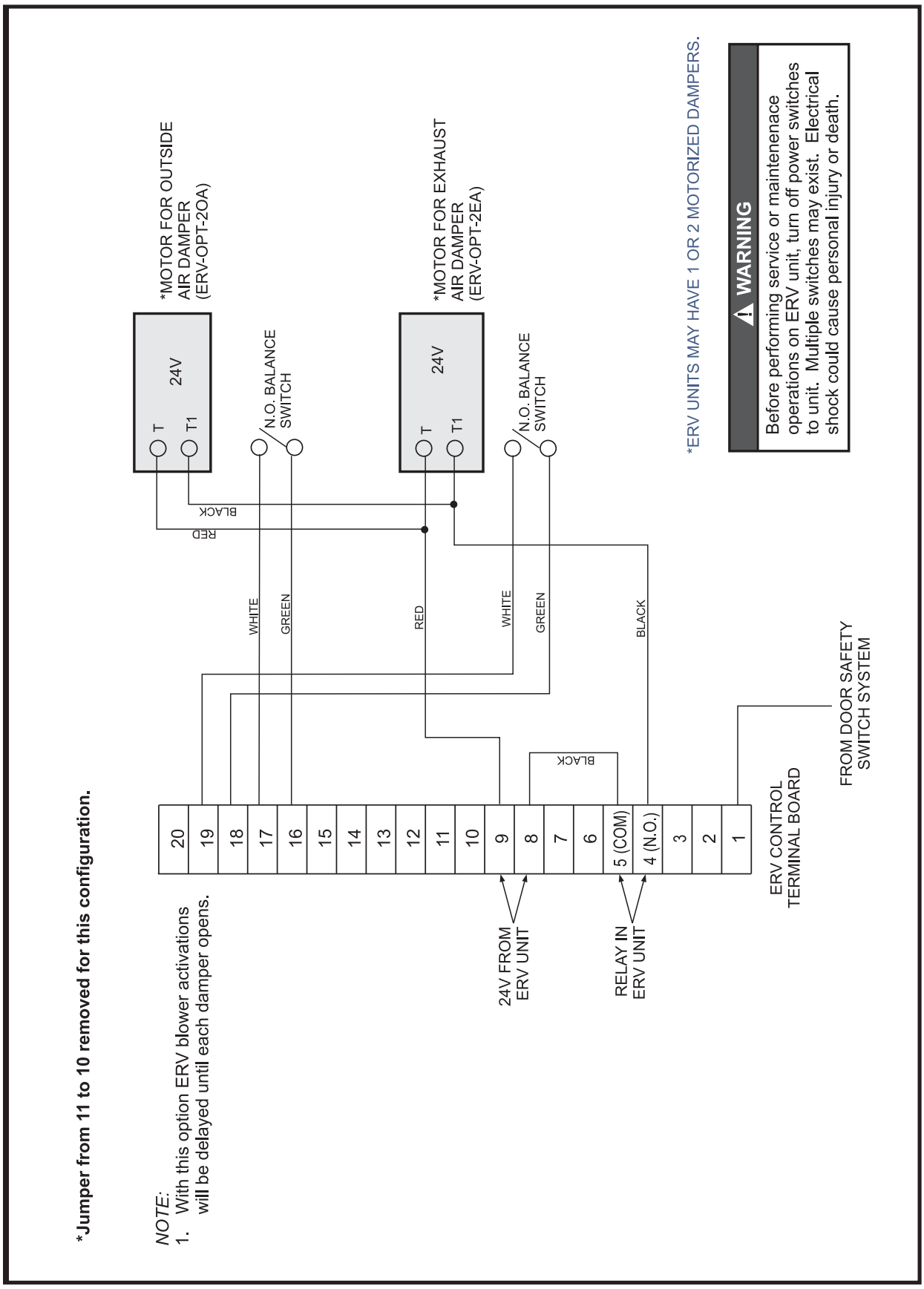
Typical Wiring Diagram
ERV Units - Motorized Damper Option
All Cabinets



Form No. 3128-3P

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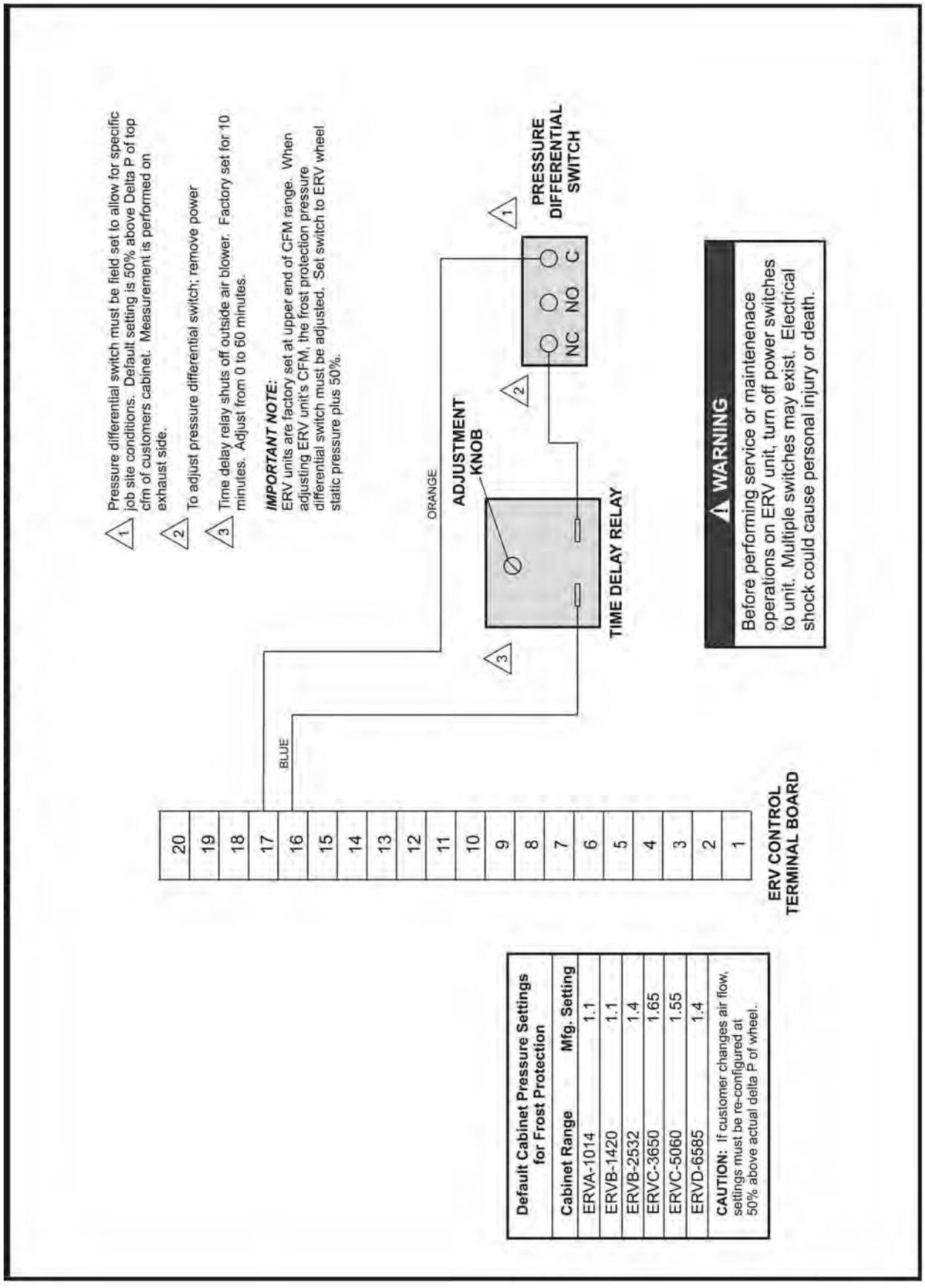
Typical Wiring Diagram
ERV Units - Frost Protection Option
All Cabinets



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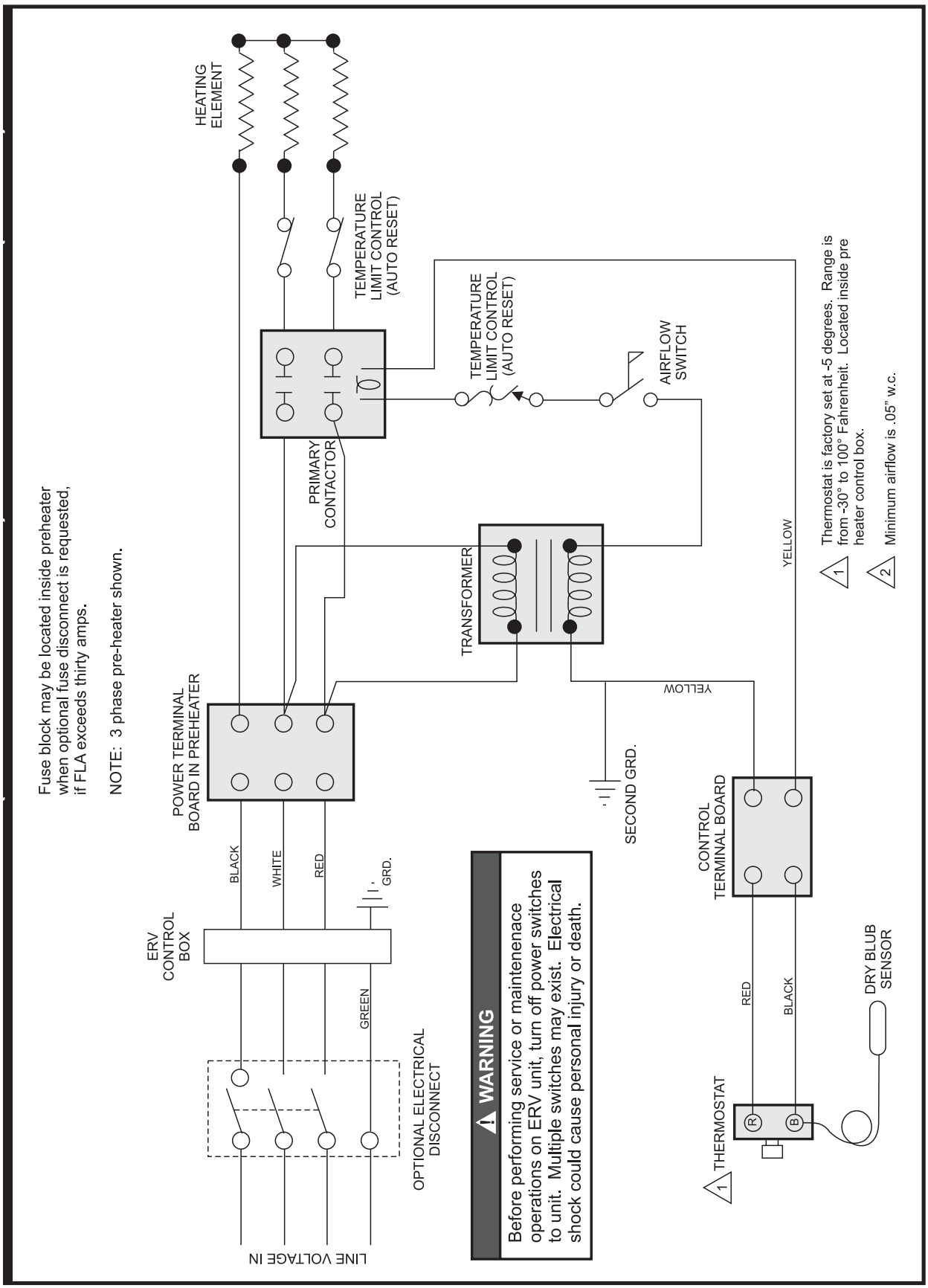
Typical Wiring Diagram
ERV Units - Pre-Heater Option
All Cabinets



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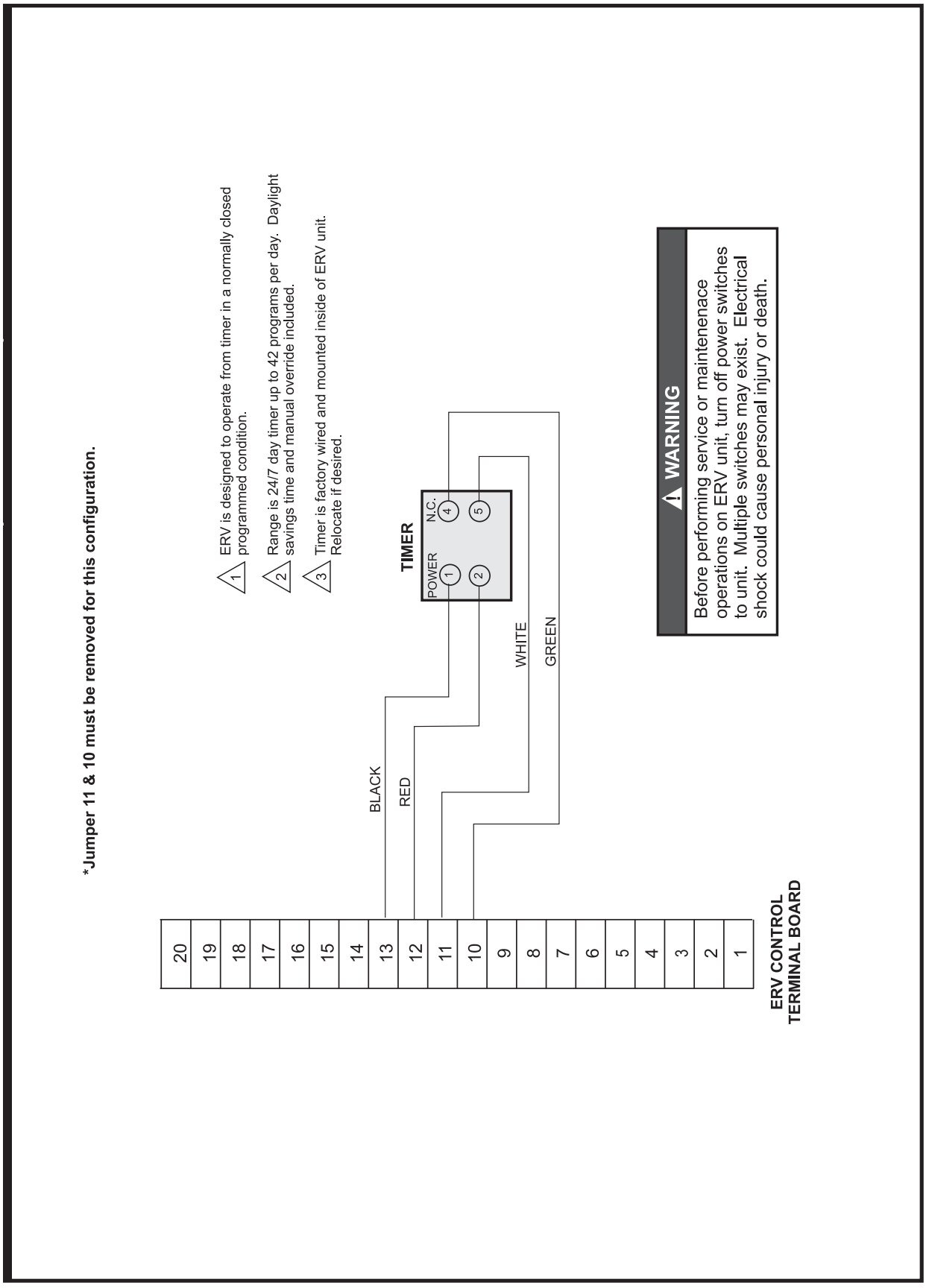
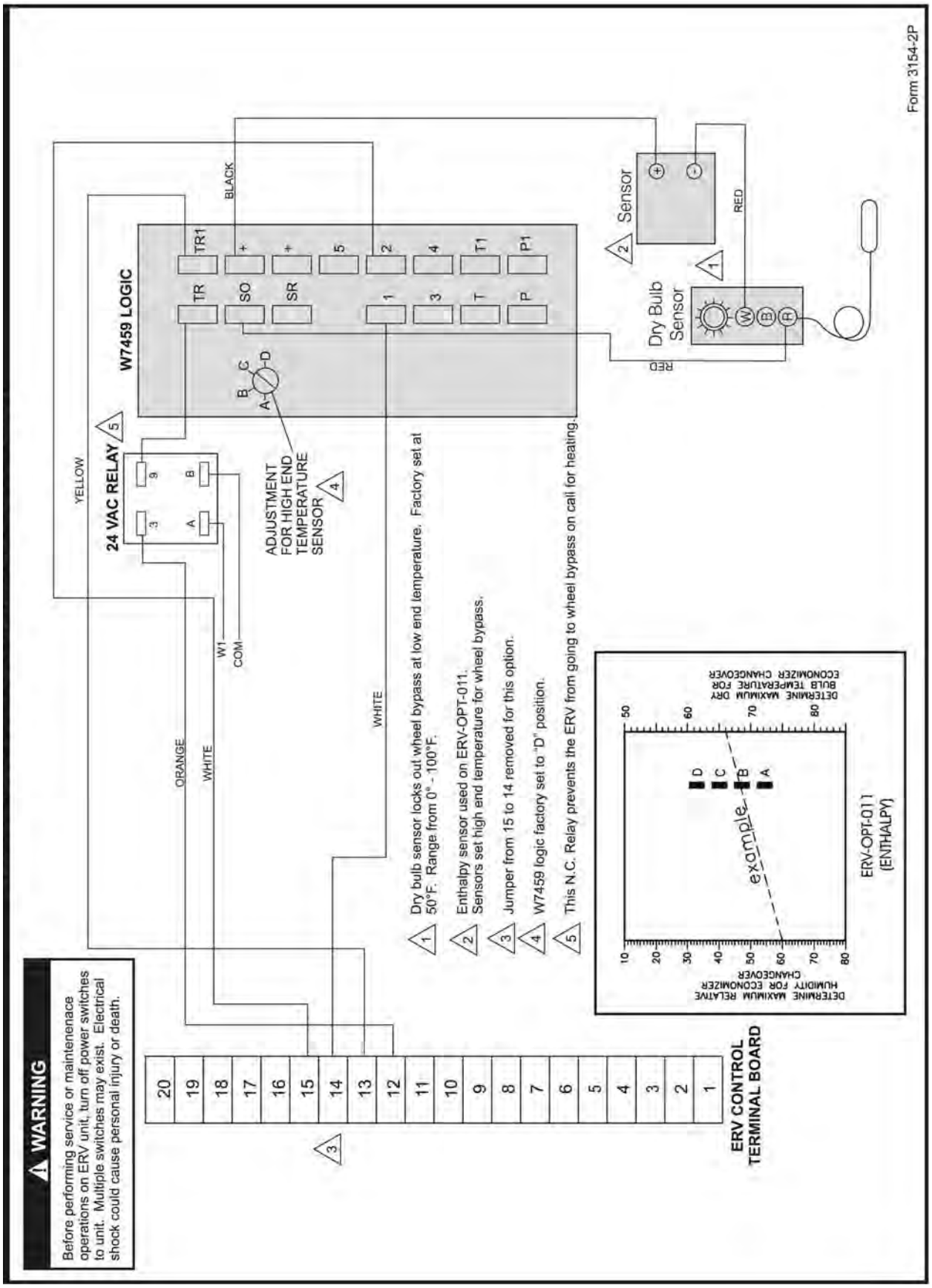
Typical Wiring Diagram
ERV Units - ERV Control Timer
All Cabinets

Form No. 3300-2P



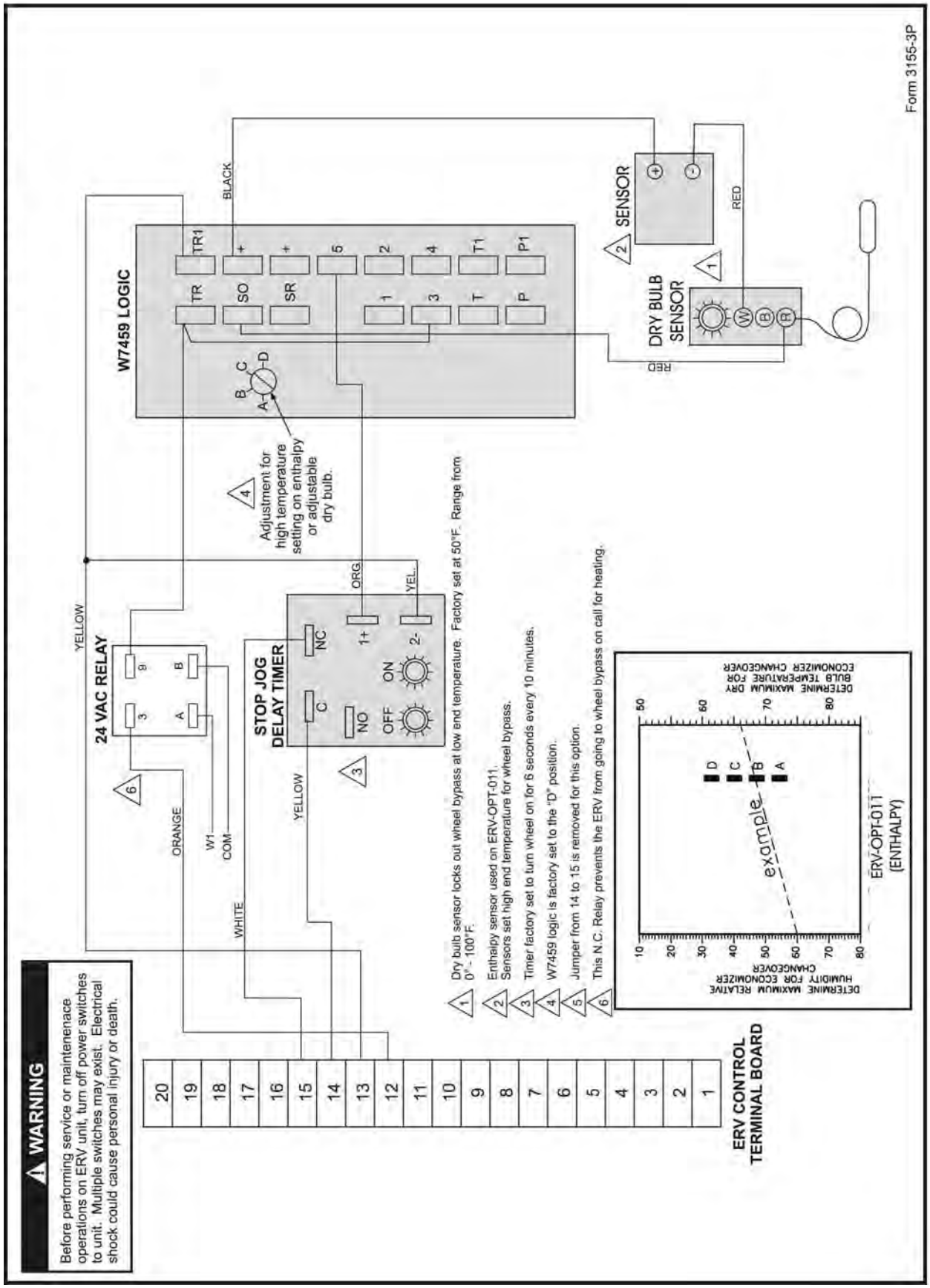
CLIMATEMASTER®

Typical Wiring Diagram
ERV Units - Wheel Bypass Option
All Cabinets



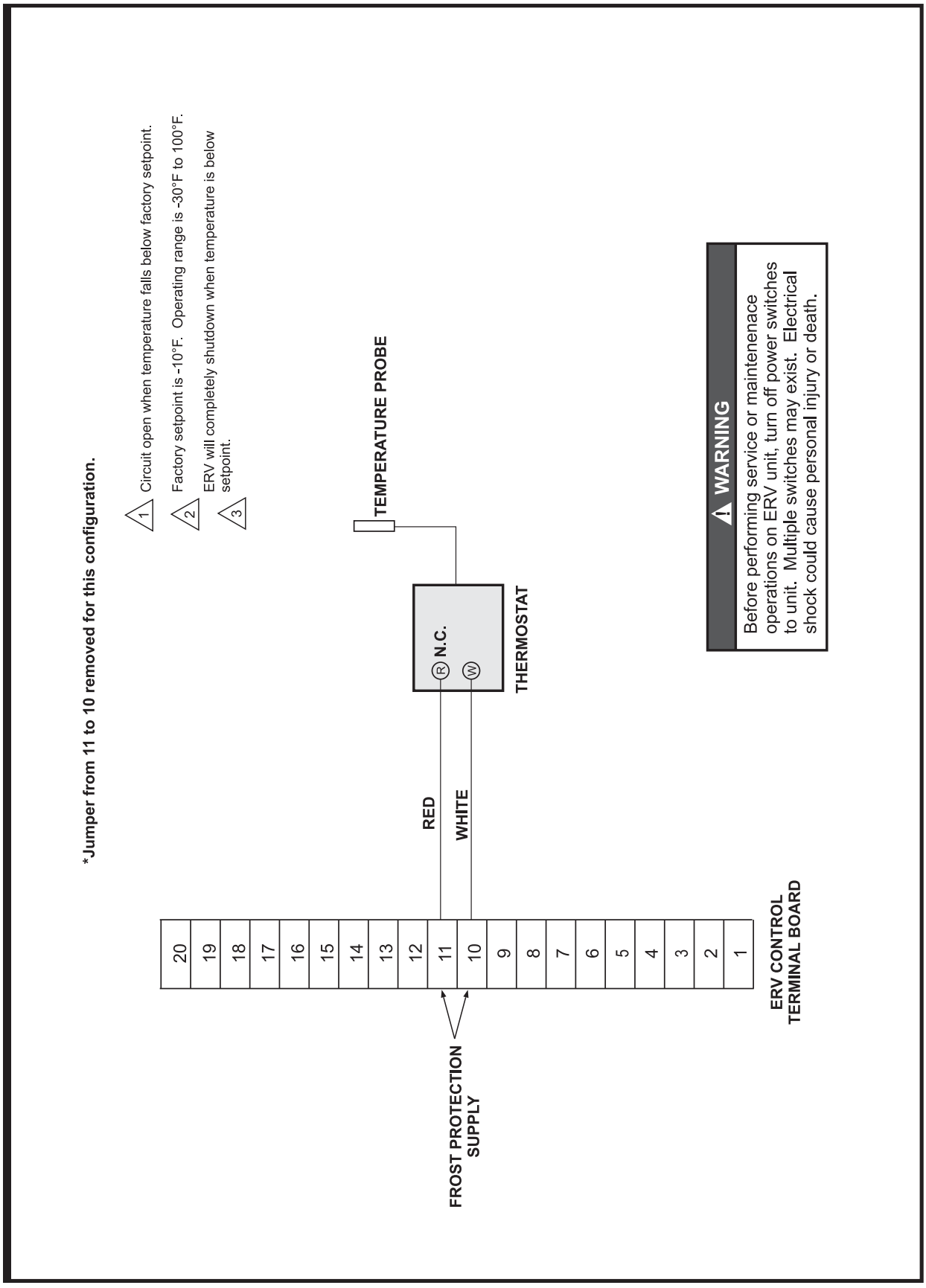
CLIMATEMASTER®

Typical Wiring Diagram
ERV Units - Wheel Bypass Option With Stop Jog Delay Timer - All Cabinets



CLIMATEMASTER®

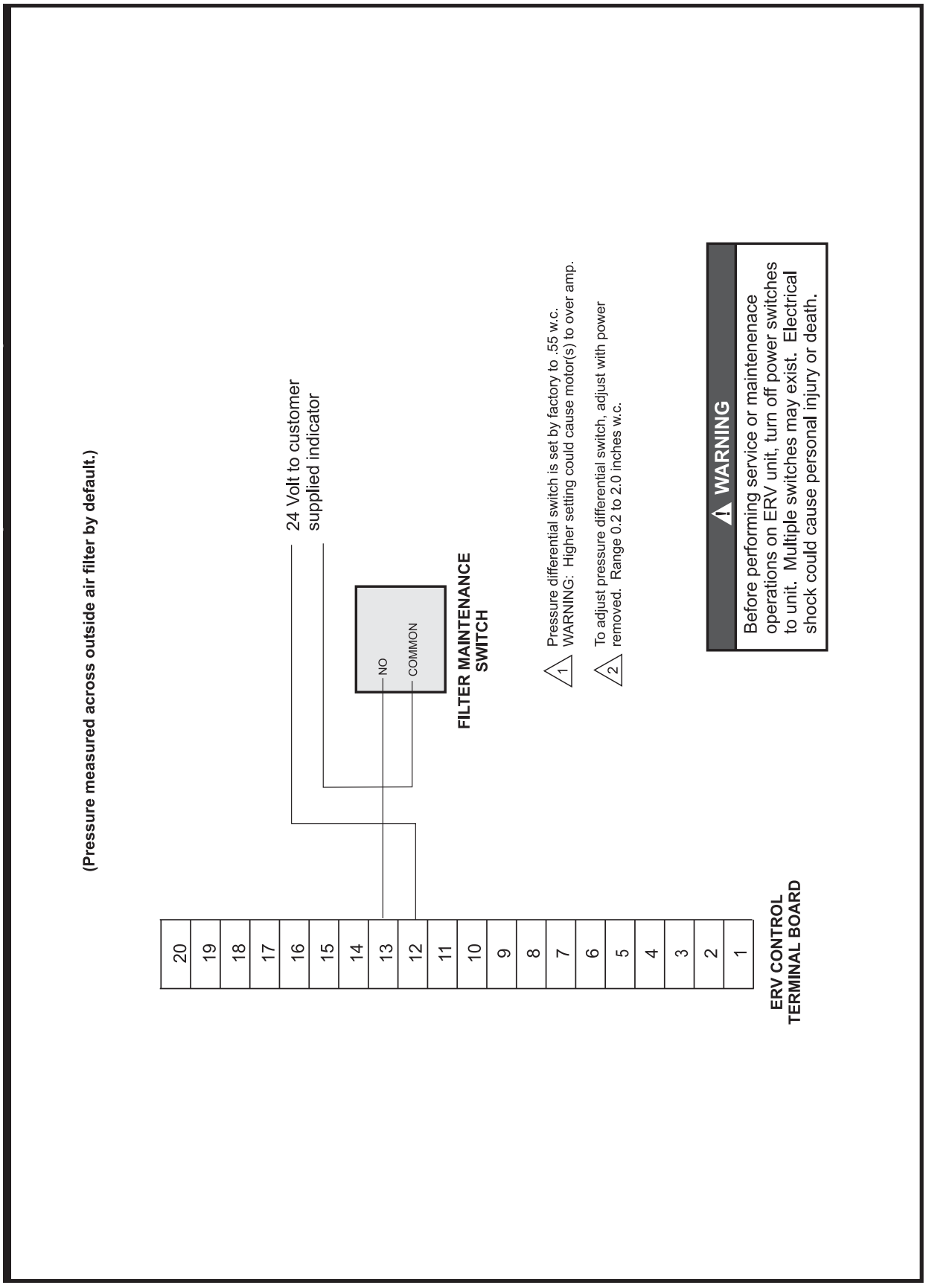
Typical Wiring Diagram
ERV Units - Low Temperature Lock-Out Option
All Cabinets



CLIMATEMASTER®

Typical Wiring Diagram
ERV Units - Filter Maintenance Switch
All Cabinets

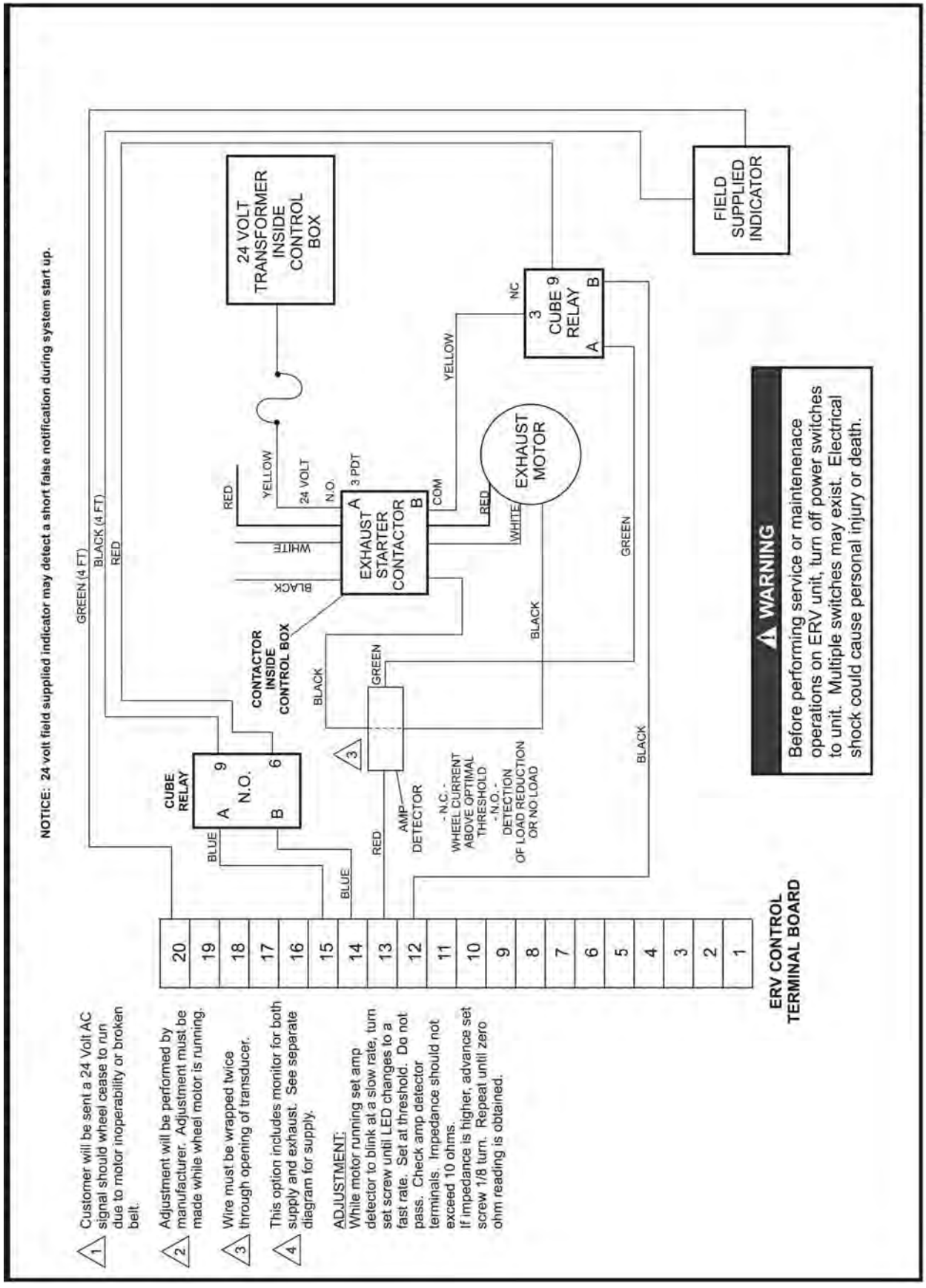
Form No. 3298-2P



CLIMATEMASTER®

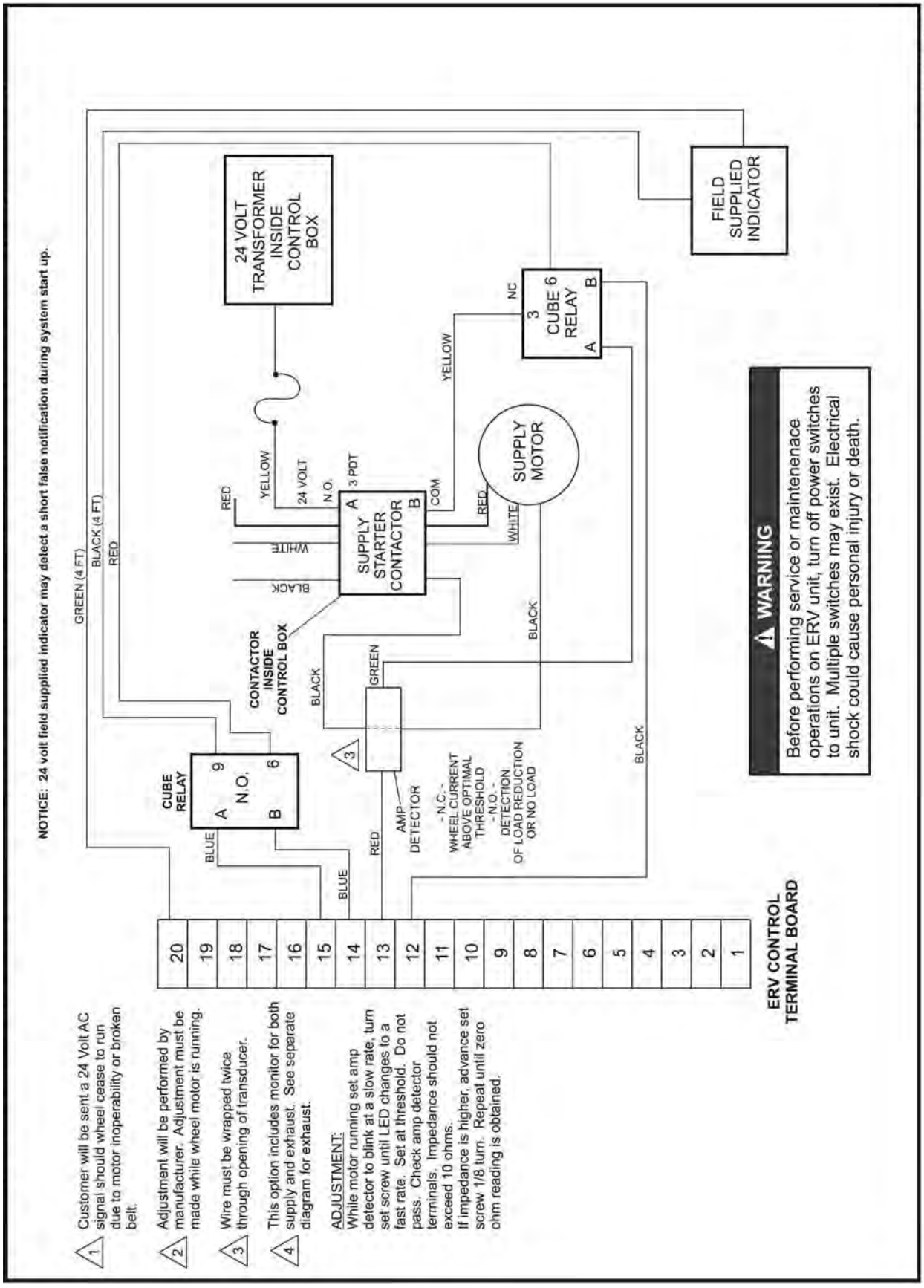
Typical Wiring Diagram
ERV Units - Exhaust Motor / Blower Monitor
All Cabinets (1 of 2)

Form No. 3652-1P



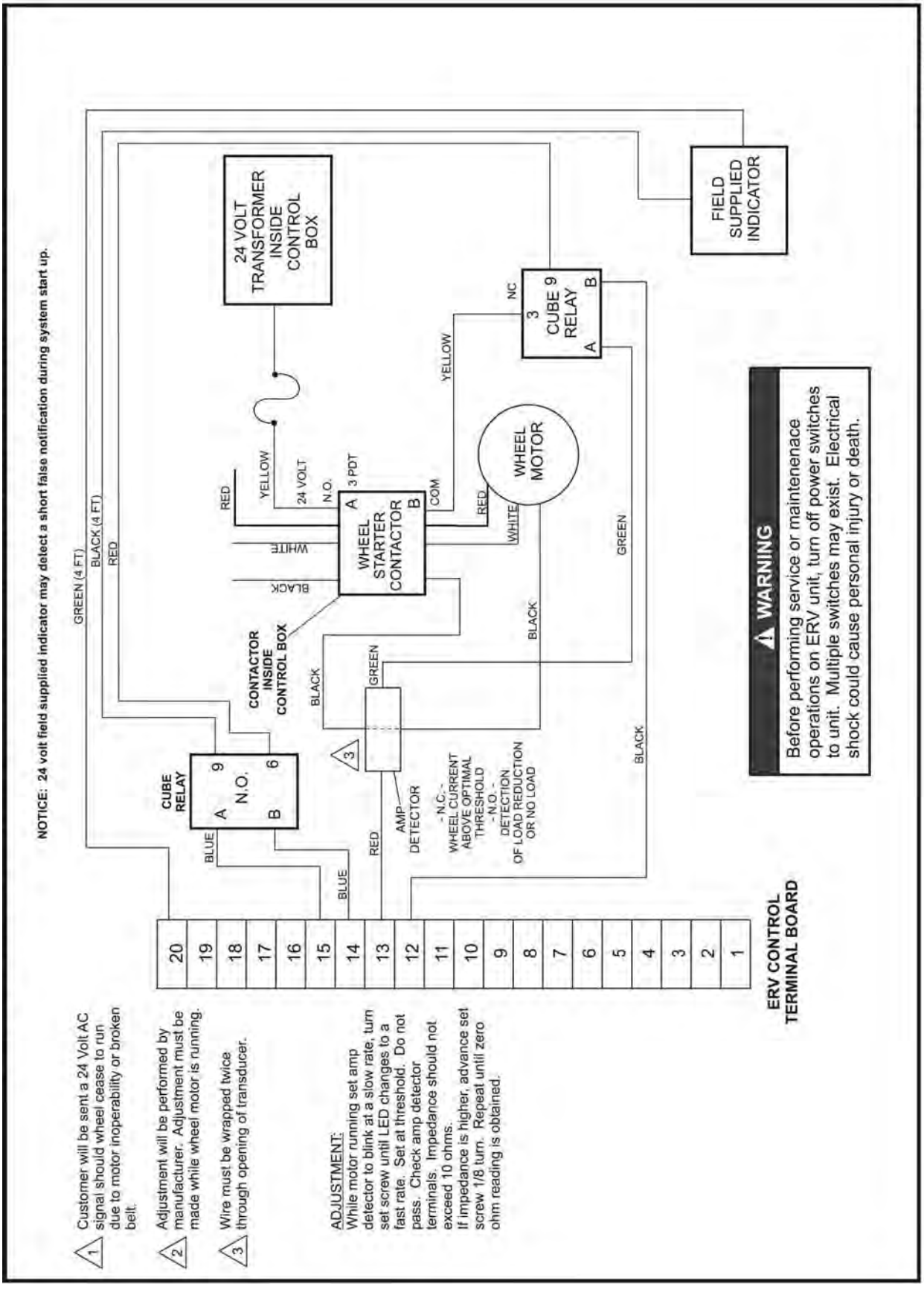
CLIMATEMASTER®

Typical Wiring Diagram
ERV Units - Exhaust Motor / Blower Monitor
All Cabinets (2 of 2)



CLIMATEMASTER®

Typical Wiring Diagram
ERV Units - ERV Wheel Motor Monitor
All Cabinets



Form No. 3653-1P

All ventilated spaces are good candidates for energy recovery systems. The best applications are when a large amount of outside air is required for a space that has a low internal load. This is true because most outside air loads are latent - which requires the upsizing of the unit to meet both internal and ventilation loads. The advantages of the ERV unit are the ability to reduce the size of the HVAC unit, to provide better humidity levels and to provide a stable, tempered space.

Examples of ERV applications are classrooms, churches, conference rooms, casinos, auditoriums, movie theaters, day care centers, nursing homes, funeral homes, dormitories, and clinics. Retrofits of existing systems to handle outside air represent excellent ERV applications.

Other examples are bars, restaurants, casino, barber-beauty shops, bingo halls, locker rooms, recreational facilities and health clubs. Animal shelters such as veterinary clinics, kennels, retail spaces and manufacturing facilities are also good candidates for ERV systems.

If the outside air requirement is greater than 10% of the HVAC unit's supply air rating an ERV unit should be considered to enhance the comfort of the occupants and reduce the tonnage of the HVAC unit. The ClimateMaster/Airxchange selection program offers a quick, simple look at the advantages and payback of an ERV system.

The following pages contain a sample application and examples of the ClimateMaster/Airxchange selection program. The weather data is for Oklahoma City, Oklahoma at 1% ASHRAE weather conditions.

Choosing the proper airflow is essential. The ClimateMaster part numbers include the airflow range that the cabinet blowers are manufactured to operate within. This airflow range can be determined from digits 4 through 7 of the part number: digits 1 and 2 (multiplied by 100) indicate the minimum airflow while digits 3 and 4 indicate the maximum airflow. For example, an ERV1014 unit has an airflow range of 1000 cfm to 1400 cfm.

Although performance is optimized at equal exhaust and supply airflow rates, the ClimateMaster/Airxchange selection program and the ERV unit can be used with unequal airflow amounts. The ClimateMaster ERV system is specifically designed for 100% OA application with ClimateMaster RE Series rooftop units. See the ERV match-up guide (page 30) for details.

Sample Application

The following is a typical application for an ERV unit.

A consulting engineering firm has specified a make-up air unit requiring 4,000 cfm of outside air for a building in Oklahoma City (99°F summer design and 9°F winter design). This system as specified would require 13 tons of equipment for cooling (plus hot gas reheat, hot gas bypass and the controls associated with handling outside air) and 348,000 Btu/hr of heating. In order to reduce outside air load, lower operating costs and avoid complicated controls, an ERV will be considered.

1. Obtain the design conditions from the consulting engineer.
2. Enter design conditions into the ClimateMaster/Airxchange selection program.
3. Select model ERV3650 ERV unit at 4,000 cfm.
4. The ClimateMaster/Airxchange selection specifies that the cooling outside air load is 153,784 Btu/hr without the ERV unit. The ERV unit recovers 108,336 Btu/hr, resulting in an outside air load of only 45,448 Btu/hr.
5. The heating outside air load is 347,948 Btu/hr without the ERV unit. The ERV unit recovers 239,476 Btu/hr, resulting in an outside air load of only 108,471 Btu/hr.
6. The RE10 (4,000 cfm) unit can easily handle the remaining 45,448 Btu/hr of cooling required with only one refrigeration circuit operating (full load cooling capacity is 119,100 Btu/hr at WLHP conditions). Both refrigeration circuits will be required to handle the heating load of 108,471 (full load heating capacity is 129,900 Btu/hr at WLHP conditions).
7. The combination RE10/ERV system now handles 100% of the outside air, while downsizing the cooling equipment needed by three tons and significantly reducing the heating makeup air requirements.
8. Air leaving the ERV at design conditions is 81/66°F (DB/WB) in the summer and 54°F in the winter. Therefore, the system will be able to provide neutral air to the space even at design conditions with control from a simple leaving air temperature thermostat (ERV leaving air).
9. If required, the selection software contains an hourly bin analysis option that will provide operational data.
10. It is recommended that the wheel bypass option be used as well to provide "free cooling" when conditions will allow.

CLIMATEMASTER®

ERV Series 60Hz
Engineering Specifications
Rev.: 12/06/04 **Page 1**

ERV Guide Specifications
Size Range: 1,200 to 8,000 CFM
70 % Nominal Effectiveness (Variable)

Part 1 - General

1.1 System Description

ERV unit is an outdoor rooftop mounted, electrically controlled outdoor air pre-conditioner utilizing an Airxchange Energy Recovery Cassette to reduce the heating and cooling load placed on the HVAC unit by untreated outdoor air. Exhaust air shall be introduced to the ERV unit through a transition connected to the HVAC unit, which utilizes either a horizontal or vertical return. Supply air will be introduced to the HVAC unit through the HVAC economizer opening.

1.2 Quality Assurance

a. Unit shall be designed in accordance with UL Standard 1995.
b. Unit shall be ETL tested and certified.
c. Roof curb shall be designed to conform to NRCA Standards.
d. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.
e. Unit casing shall be capable of withstanding Federal Test Method Standard No. 141 (Method 6061) 500-hour salt spray test.

Part 2 - Products

2.1 Equipment (Stamdard)

A. General

The ERV unit shall be a factory assembled, single piece unit. Contained within the unit enclosure shall be all factory wiring with a single, pre-determined point of power input and a single point of 24 volt control wiring.

B. Unit Cabinet

1. Unit cabinet shall be constructed of galvanized steel coated with a prepainted baked enamel finish.
2. The pre-conditioned area of the exhaust air stream and post-conditioned area of the supply air stream shall be insulated with a 1 inch, 2 pound density foiled faced insulation. Insulation contained within a double walled panel, with equivalent R values may be substituted.
3. Cabinet panels shall be hinged.
4. Exhaust and supply air streams shall have back-draft dampers to prevent air penetration during off cycles.
5. Holes shall be provided in the base rails for rigging shackles to facilitate overhead rigging.

C. Blowers

1. Blower shall be belt driven. Belt shall include an adjustable pulley.
2. Blower wheel shall be made from steel with a corrosion resistant finish. It shall be a dynamically balanced, double-inlet type with forward-curved blades.

D. Filter Section

1. Standard filter section shall consist of commercially available, 2 inch pleated filter(s).

E. Controls and Safeties

1. Control box power out must be interrupted when the access panel is opened.
2. ERV unit shall operate in conjunction with HVAC unit fan. Factory wired plug will be provided.
3. Frost protection to prevent supply motor overload (optional).
4. Motorized Dampers - supply and/or return (optional).
5. Wheel by-pass (Economizer Mode) switch based upon outside air temperature or enthalpy (optional).
6. Stop-jog timer for wheel by-pass option (optional).

F. Electrical Requirements

1. All unit power wiring shall enter unit cabinet at a single location.

G. Energy Recovery Cassette

1. The energy recovery media (lightweight polymer) shall be a nominal 70% effective. Efficiency ratings shall be ARI 1060 certified.
2. The wheel must have desiccant permanently integrated into the media of the wheel.
3. The energy recovery cassette shall be an UL Recognized component for electrical and fire safety.

Note:
One spare wheel segment should be provided for maintenance purposes. The spare segment will allow one segment of the wheel to be cleaned at a time without shutting down the ventilation system.

H. Special Features

1. Roofcurb Option

a. Formed of heavy gage galvanized steel with wood nailer strip and shall be capable of supporting entire unit weight.

2. Transition Option

a. ERV unit has a specially designed transition to mate the ERV unit with the HVAC unit. Transition must be ordered with the ERV unit.

3. Fused Disconnect Switch Option

a. For 460 volt power, a 30 amp, 600 volt, 3 pole, NEMA3R fused disconnect switch shall be factory installed.
b. For 208/230 volt power, a 30 amp, 250 volt, 3 pole, NEMA3R fused disconnect switch shall be factory installed.

4. Switch Disconnect Option

a. For 460 volt power, a 30 amp, 600 volt, 3 pole, NEMA3R disconnect switch shall be factory installed.
b. For 208/230 volt power, a 30 amp, 250 volt, 3 pole, NEMA3R disconnect switch shall be factory installed.

5. Frost Protection Option

a. Frost protection module shall sense pressure differential across the energy recovery cassette
b. Supply blower must be shut-off if the pressure differential across the energy recovery cassette exceeds a factory set point. Blower will remain off for an adjustable period of time.
c. Exhaust blower and wheel shall remain in operation in order to remove any frost build-up on the wheel.

6. Remote Control Option

a. Remote control option shall provide a 24 volt output signal to the ERV unit (wiring from control panel to ERV plug field supplied).
b. Remote control panel shall provide a 24 hour timer to only operate ERV unit during occupied times.
c. Remote control panel shall have a switch to override the 24 hour timer.

7. **Filter Maintenance Indicator** – A pressure switch is provided to indicate that the pressure across the outside air filter has increased and the filter should be serviced.

8. **Low Temperature Lockout** – A lockout thermostat used in extreme conditions to de-energize the ERV preventing outside air from entering the space if the air is too cold.

9. **Wheel By-pass Option** – Air sensor used to prevent the wheel from rotating if the outside air conditions are acceptable for free cooling. Both exhaust and supply blowers will remain on.

10. **Motorized Supply Damper** – The supply dampers are motorized with 24 volt motors.

11. **Motorized Exhaust Damper** – The exhaust dampers are motorized with 24 volt motors.

12. **Stop-Jog-Control** – Used in conjunction with the wheel by-pass option to energize the wheel periodically during the free cooling operation of the ERV. This option is used to prevent dirt build-up on the wheel.

13. **Pre-heater Option (ERVPH)** - Preheaters are factory installed in outside air hood. Refer to ERV software for pre-heat requirements.

14. **Airflow monitor** - Flush mount gages measure airflow across wheel.

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Submittal Change Log

Date:	Item:	Action:
07/24/08	ERV Narrative on Page 3	Added
11/16/06	Roofcurb Data	Added missing dimensional information
11/30/05	Various	Formatting changes
08/18/05	Unit Effectiveness	Changed “Efficiences” to “Effectiveness:
08/18/05	Cabinet Physical Size (All Cabinets)	Removed “(horizontal units)”
08/18/05	Added Change Log	