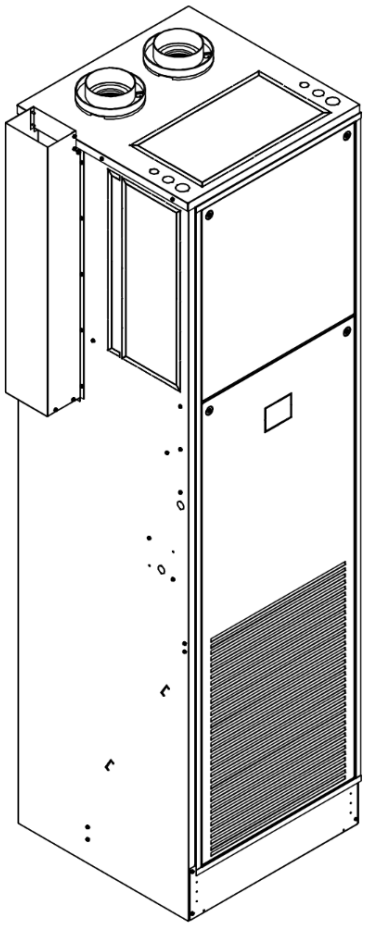
Installation, Operation, & Maintenance Manual

IOM 7001
Rev. F 08/25

*RR



ATTENTION:

Read all instructions thoroughly and retain all manuals for future reference.

Room Fan-Coils
AHRI Standard 440

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The warranty may be void unless the Startup & Performance Checklist is completed and returned to the warrantor. If the HVAC unit is not installed properly, the warranty will be void, as the manufacturer cannot be held accountable for problems that stem from improper installation.

WARNING

This appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety

Children should be supervised to ensure that they do not play with the appliance

Use adequate personal protection equipment when installing and performing maintenance. After switching off and locking-out an electrical disconnect, verify a safe condition with an electrical tester. Discharge a capacitor before handling any PSC motor and wiring. Use eye protection, cut resistant gloves and sleeves to protect against metal edges and screws.

Do not alter this product by using non-authorized parts. Such action voids all warranties or implied warranties and may result in adverse operation and performance and may be hazardous to service personnel and occupants. Company employees and/or contractors are not authorized to waive this warning.

TABLE OF CONTENTS

SAFETY CONSIDERATIONS

1. READ THE ENTIRE MANUAL BEFORE STARTING THE INSTALLATION.
2. These instructions are intended as a general guide and DO NOT supersede national, state, or local codes in any way.
3. These instructions must be left with the property owner
4. Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause personal injury or property damage. Consult a qualified licensed installer, service agency, or your distributor for information or assistance.
5. Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for brazing operations. After switching off and locking-out an electrical disconnect, verify a safe condition with an electrical tester. Discharge a capacitor before handling any PSC motor wiring. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions attached to the unit. Consult local building codes and National Electrical Code (NEC) for special requirements.
6. To assure compliance with existing building codes, the installing contractor must restore original fire resistance rating of the structure by access space around the risers with material having same fire rating as structure.
7. Altering the product, improper installation, or the use of unauthorized factory parts voids all warranty or implied warranty. Company employees or contractors are not authorized to waive this warning.
8. This product should only be installed and serviced by a qualified, licensed, and factory authorized installer or service agency.
9. All “kits” and “accessories” used must be factory authorized when modifying this product. Refer and follow instructions packaged with the kits or accessories when installing.
10. Do not exceed water temperature of 180 F (82°C) on hydronic coil.

RECOGNIZE THE FOLLOWING SAFETY NOTATIONS THROUGHOUT THIS MANUAL AND POSTED ON THE EQUIPMENT:

WARNING

Indicates a potentially hazardous situation or unsafe practices that could result in severe personal injury or death and/or damage to property.

WARNING

ELECTRIC SHOCK HAZARD

Signifies potential electrical shock hazards that could result in personal injury or death.

CAUTION

Indicates a potentially hazardous situation that may result in minor or moderate injury.

IMPORTANT

Suggests important procedure steps to insure proper installation, reliability, or operation.

NOTE

Used to highlight suggestions, which may result in enhanced installation, reliability or operation.

WARNING

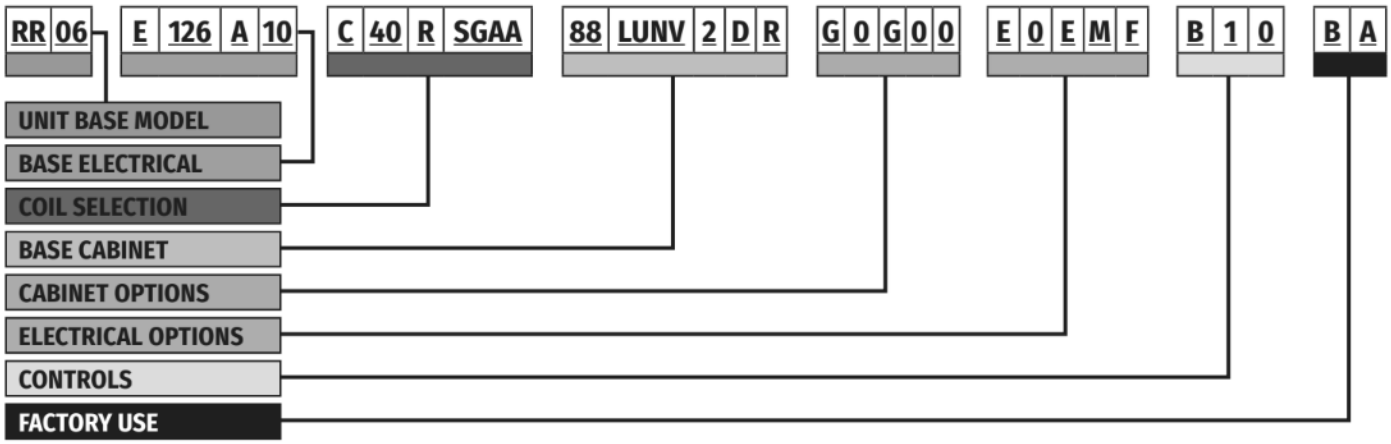
FIRE OR EXPLOSION HAZARD

Failure to follow safety warnings exactly could result in property damage, dangerous operation, serious injury, or death. Improper servicing could result in dangerous operation, serious injury, death, or property damage.

- Before servicing, disconnect all electrical power to the unit.
- When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.

Verify proper operation after servicing

MODEL NOMENCLATURE



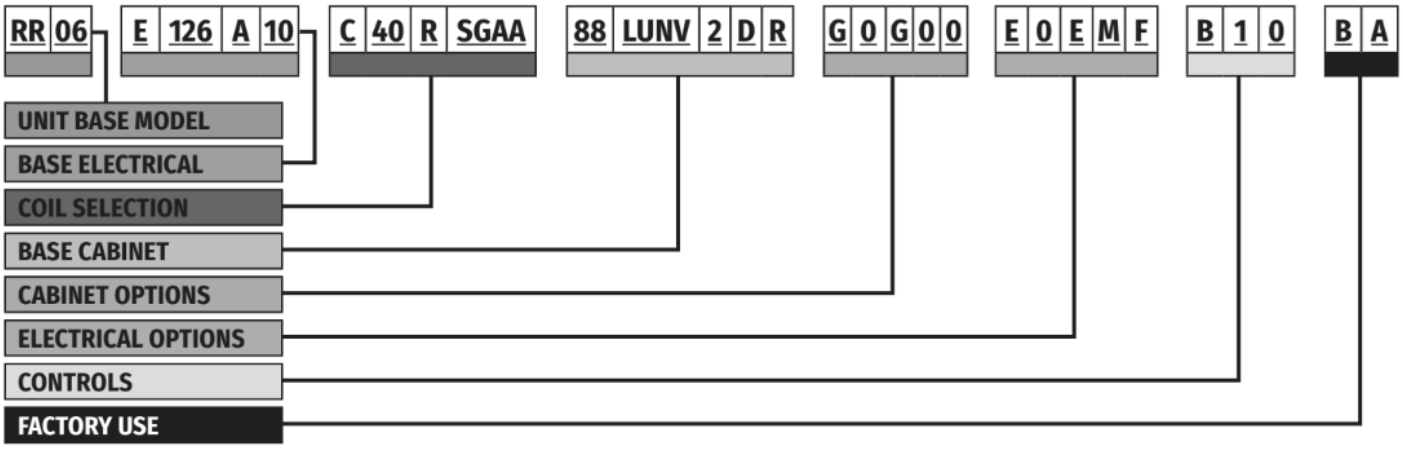
UNIT BASE MODEL	
MODEL	RR – VERTICAL HIGH RISE FAN COIL
SIZE	03 – 300 NOMINAL CFM 04 – 400 NOMINAL CFM 06 – 600 NOMINAL CFM 08 – 800 NOMINAL CFM 10 – 1000 NOMINAL CFM 12 – 1200 NOMINAL CFM

BASE ELECTRICAL	
MOTOR TYPE	E ECM (3 SPEED)
VOLTAGE	126 – 120V / 1PH / 60HZ 246 – 208–230V / 1PH / 60HZ 276 – 277V / 1PH / 60HZ
CONTROL VOLTAGE	A 24V CONTROL
ELECTRIC HEAT	00 – NONE 01 – 1KW 02 – 2KW 03 – 3KW 04 – 4KW 05 – 5KW 06 – 6KW 08 – 8KW 10 – 10KW

COIL SELECTION	
SYSTEM	A – 2 PIPE COOLING B – 2 PIPE HEATING C – 2 PIPE HEAT/COOL D – 2 PIPE HEAT/COOL/AUX HEAT E – 2 PIPE COOL/ELECTRIC HEAT F – 4 PIPE HEAT/COOL
COIL ROWS	30 – 3 ROW 40 – 4 ROW 31 – 3 ROW/1 ROW 32 – 3 ROW/2 ROW 41 – 4 ROW/1 ROW
COIL HANDLING	L – LEFT HAND COIL R – RIGHT HAND COIL
CONNECTION	S – SINGLE HAND SIDE
COIL WRAPPER	G – GALVANIZED STEEL
FIN MATERIAL	A – ALUMINIUM
PRESSURE TEST	A – 350 PSI (2413 KPA)

BASE CABINET	
HEIGHT	88 – 88" STD (STANDARD) 65 – 65" 76 – 76" 80 – 80" XX – SPECIAL SELECTION
CONFIGURATION	RUNV – RIGHT HANDED UNIVERSAL LUNV – LEFT HANDED UNIVERSAL BFLX – REAR RISER, FRONT & LEFT DISHCARGE BFRX – REAR RISER, FRONT & RIGHT DISCHARGE BFXX – REAR RISER, FRONT DISCHARGE BLXX – REAR RISER, LEFT DISCHARGE BRLX – REAR RISER, RIGHT & LEFT DISCHARGE BRXX – REAR RISER, RIGHT DISCHARGE BTFX – REAR RISER, TOP & FRONT DISCHARGE BTLX – REAR RISER, TOP & LEFT DISCHARGE BTRX – REAR RISER, TOP & RIGHT DISCHARGE BTXX – REAR RISER, TOP DISCHARGE LBXX – LEFT RISER, REAR DISCHARGE LFBX – LEFT RISER, FRONT & REAR DISCHARGE LFRX – LEFT RISER, FRONT & RIGHT DISCHARGE LFXX – LEFT RISER, FRONT DISCHARGE LRBX – LEFT RISER, RIGHT & REAR DISCHARGE LRXX – LEFT RISER, RIGHT DISCHARGE LTBX – LEFT RISER, TOP & REAR DISCHARGE LTFX – LEFT RISER, TOP & FRONT DISCHARGE LTRX – LEFT RISER, TOP & RIGHT DISCHARGE LTXX – LEFT RISER, TOP DISCHARGE RBXX – RIGHT RISER, REAR DISCHARGE RFBX – RIGHT RISER, FRONT & REAR DISCHARGE RFLX – RIGHT RISER, FRONT & LEFT DISCHARGE RFXX – RIGHT RISER, FRONT DISCHARGE RLBX – RIGHT RISER, LEFT & REAR RISER RLXX – RIGHT RISER, LEFT DISCHARGE RTBX – RIGHT RISER, TOP & REAR DISCHARGE RTFX – RIGHT RISER, TOP & FRONT DISCHARGE RTLX – RIGHT RISER, TOP & LEFT DISCHARGE RTXX – RIGHT RISER, TOP DISHARGE
INSULATION THICKNESS	2 – 1/2" INSULATION 3 – 3/4" INSULATION
INSULATION TYPE	D – FIBERGLASS DUAL DENSITY F – FOIL FACED
INSTALLATION	F – FURRED IN E – EXPOSED CABINET R – ERV FURRED IN

MODEL NOMENCLATURE



CABINET OPTIONS	
DRAIN PAN	G – GALVANIZED S – STAINLESS STEEL
FILTER FRAME	1 – 1"– 2" FRAME
FILTER OPTION	0 – NONE 1 – 1" MERV 3/MERV 4 G – 1" MERV 10
OPTION 1	0 – STANDARD ACCESS S – SOUND BARRIER
OPTION 2	0 – NONE L – LINE OF SIGHT BAFFLE

CONTROLS	
THERMOSTATS	0 – NONE F – FAN SWITCH ONLY (T422) A – NON PROGRAMMABLE MANUAL (T420) B – NON PROGRAMMABLE AUTO (T421) C – NON PROGRAMMABLE W/LCD (T426) D – PROGRAMMABLE W/LCD (T427) E – PROGRAMMABLE W/LARGE LCD (T428)
TSTAT LOCATION	0 – NONE 1 – UNIT MOUNT 2 – REMOTE MOUNT 3 – ADA UNIT MOUNT
TSTAT OPTION	0 – NONE

ELECTRICAL OPTIONS	
SERVICE SWITCH	0 – NONE A – 15A TOGGLE SWITCH D – 30A TOGGLE SWITCH E – 40A TOGGLE SWITCH F – 50A TOGGLE SWITCH P – 60A PULL SWITCH
FUSES	0 – NONE
HEATER RELAY	0 – NONE E – ELECTRO-MECHANICAL
TSTAT CONNECTION	0 – NONE M – MULTI-PIN CONNECTOR T – TERMINAL BLOCK
FLOAT SWITCH	0 – NONE F – FLOAT SWITCH

FACTORY USE	
REVISION	B – REVISION B
BRAND	A – AE AIR F – FIRST CO.

MODEL NOMENCLATURE

A	2	S	S	4	30	0	0	B	0	U	R

VALVE SIZE	A – 1/2" PIPING	
VALVE TYPE	2 – 2-WAY 3 – 3-WAY	
ACTUATOR TYPE	0 – NONE S – ON/OFF 24V M – MODULATING (0-10VDC)	
PRESSURE DIFFERENTIAL	0 – NONE S – 30 PSI (210KPA) CLOSE OFF	M – 75 PSI (520 KPA) CLOSE OFF H – 125 PSI (860 KPA) CLOSE OFF
FLOW CONTROL	0 – NONE 4 – 1/2" AUTOFLOW M – 1/2" CIRCUIT SETTER N – 3/4" CIRCUIT SETTER	
AUTOFLOW	00 – NONE 05 – 0.50 GPM 06 – 0.63 GPM 07 – 0.75 GPM 10 – 1.00 GPM 11 – 1.13 GPM 12 – 1.25 GPM 15 – 1.50 GPM 16 – 1.63 GPM 17 – 1.75 GPM 20 – 2.00 GPM 22 – 2.25 GPM 25 – 2.50 GPM 30 – 3.00 GPM 32 – 3.25 GPM 35 – 3.50 GPM 40 – 4.00 GPM 45 – 4.50 GPM 50 – 5.00 GPM 55 – 5.50 GPM 60 – 6.00 GPM 65 – 6.50 GPM 70 – 7.00 GPM 75 – 7.50 GPM 80 – 8.00 GPM	

END CONNECTION	M – HOSE* R – HOSE* + BALL VALVE
COIL CONNECTION	B – BRAZED U – UNION
AQUASTAT	0 – NONE 1 – CHANGEOVER 2 – CHANGEOVER AUX. HEAT
STRAINER	0 – NONE S – STRAINER B – STRAINER WITH BLOWDOWN
PRESSURE PORTS	0 – NONE C – PT PORTS COIL MANIFOLD E – PT PORTS WATER CONNECTION
ISOLATION VALVE	0 – NONE

MODEL NOMENCLATURE

R	F	1	L	21	2	S	S	4	119	60

KIT TYPE	R – RISER TUBES E – EXTENSION TUBES
FAMILY TYPE	F – FAN COIL RISERS W – WATER SOURCE RISERS
MODEL	D – DRAIN TUBE 1 – SUPPLY/RETURN TUBE
MATERIAL	L – TYPE L COPPER M – TYPE M COPPER

	BOTTOM SIZE/TOP SIZE	
SIZE	11 – 0.75" / 0.75" 12 – 0.75" / 1.00" 21 – 1.00" / 0.75" 22 – 1.00" / 1.00" 23 – 1.00" / 1.25" 32 – 1.25" / 1.00" 33 – 1.25" / 1.25" 34 – 1.25" / 1.50" 43 – 1.50" / 1.25" 44 – 1.50" / 1.50" 45 – 1.50" / 2.00"	54 – 2.00" / 1.50" 55 – 2.00" / 2.00" 56 – 2.00" / 2.50" 65 – 2.50" / 2.00" 66 – 2.50" / 2.50" 67 – 2.50" / 3.00" 76 – 3.00" / 2.50" 77 – 3.00" / 3.00" 79 – 3.00" / 4.00" 97 – 4.00" / 3.00" 99 – 4.00" / 4.00"

TAKE OFF CONNECTION	0 – 0 STUB: (SPEED RISER) 1 – 1 STUB: BV (STD) 2 – 2 STUB: BV & SWAGED (STD) 4 – 2 STUB: BV & BV 5 – 2 STUB: BV & CUT 6 – 2 STUB: CUT & CUT 7 – 1 STUB: CUT 8 – 1 STUB: SWAGED 9 – 2 STUB: CUT & SWAGED A – 1 STUB 1" OFFSET BV B – 2 STUB 1" OFFSET BV & SWAGED C – 2 STUB 1" OFFSET BV & CUT D – 1 STUB 2" OFFSET BV E – 2 STUB 2" OFFSET BV & SWAGED F – 2 STUB 2" OFFSET BV & CUT G – 1 STUB 3" OFFSET BV H – 2 STUB 3" OFFSET BV & SWAGED I – 2 STUB 3" OFFSET BV & CUT J – 1 STUB 4" OFFSET BV K – 2 STUB 4" OFFSET BV & SWAGED L – 2 STUB 4" OFFSET BV & CUT M – 2 STUB 1" OFFSET BV & BV N – 2 STUB 2" OFFSET BV & BV P – 2 STUB 3" OFFSET BV & BV Q – 2 STUB 4" OFFSET BV & BV

SHIPPING	91 – ATTACHED TO UNIT 60 – SHIPPED LOOSE
TUBE LENGTH	119 – 119" (STANDARD) 120 – 120" (STRAIGHT CUT ONLY) ### – CUSTOM LENGTHS (EXTENSION TUBES 12" – 36")
INSULATION	0 – NONE 4 – ½" THICK 6 – ¾" THICK 7 – 1" THICK
BOTTOM CONNECTION	E – EXPANDED S – STRAIGHT CUT C – CAPPED H – HALF RISER
TOP CONNECTION	E – EXPANDED S – STRAIGHT CUT C – CAPPED H – HALF RISER

MODEL NOMENCLATURE

OUTSIDE AIR OPTIONS

UN	1	0

ACCESS AIR PANELS

A	S	0	0	W

DISCHARGE LOUVERS

1	A	1406	W

OA LOCATION	00 – NONE UN – UNIVERSAL SIDE KNOCKOUT
OA SIZE	0 – NONE 1 – 4" ROUND CONNECTION
OA OPTION	0 - NONE

PANEL TYPE	0 – NONE A – SURFACE MOUNT B – FLUSH MOUNT D – SURFACE ADA-H E – SURFACE ADA-V F – FLUSH MOUNT ADA-H G – FLUSH MOUNT ADA-V
PANEL SIZE	0 – NONE S – SMALL (SIZE 03-04) M – MEDIUM (SIZE 06-08) L – LARGE (SIZE 10-12) F – FULL SIZE CABINET (88")
INSULATION	0 - NONE

IAQ OPTION	0 – NONE
PANEL COLOR	0 – NONE W – WHITE G – GREY

LOUVER TYPE	0 – NONE 1 – ONE DOUBLE DEFLECTION (DD) LOUVER 2 – TWO DD LOUVER 3 – ONE DD / ONE OPPOSED BLADE DAMPER
LOUVER MATERIAL	0 – NONE A – ALUMINIUM S – STEEL
LOUVER SIZE	0000 – NONE 1406 – 14" X 6" 1408 – 14" X 8" 1412 – 14" X 12" 1806 – 18" X 6" 1810 – 18" X 10" 1816 – 18" X 16" 2016 – 20" X 16" 2206 – 22" X 6" 2208 – 22" X 8" 2210 – 22" X 10"
LOUVER COLOR	0 – NONE W – WHITE G – GREY

GENERAL INFORMATION

The manufacturer does not warrant equipment subjected to abuse. Metal chips, dust, drywall tape, paint overspray, etc. can void warranties and liability for equipment failure, personal injury, and property damage. The manufacturer assumes no responsibility for equipment installed in violation of any code requirement.

WARNING

Always wear eye protection when working on equipment.

WARNING

When the air handler is operating, some components are operating at high speeds. Personal injury can result from touching these items with any object.

WARNING

Clear surrounding area of all tools, equipment, and debris before operating unit

WARNING

ELECTRIC SHOCK HAZARD

Before servicing unit, always turn off all power to unit. There may be more than one disconnect switch. Electrical shock can cause personal injury or death.

WARNING

ELECTRIC SHOCK HAZARD

All electrical and service access panels must be secured in their proper place before operating equipment.

CAUTION

Unit must not be operated during building construction due to excessive airborne dust and debris. Also, the unit must never run under any circumstances without an air filter in place.

CAUTION

These instructions give information for installation of these air handlers only. For other related equipment, refer to the manufacturer's instructions.

CAUTION

This unit may be installed at altitudes up to 10,000 ft. (3,048 m)

CAUTION

Material in this shipment has been inspected at the factory and released to the transportation agency in good condition. When received, a visual inspection of all cartons should be made immediately. Any evidence of rough handling or apparent damage should be noted on the delivery receipt and the material inspected in the presence of the carrier's representative. If damage is found, a claim should be filed against the carrier immediately.

CAUTION

All models are designed for indoor installation only. The installation of this unit, field wiring, duct system, and other related equipment must conform to the requirements the National Electric Code, ANSI/NFPA No. 70 (latest edition) in the United States, as well as any state laws and local codes. Local authorities having jurisdiction should be consulted before installation is made. Such applicable regulations take precedence over the general instructions contained in this manual.

INTRODUCTION

Model nomenclature for the air handlers described in this installation instructions are as follows:

RR - Furred-in, single unit designed for concealed applications along room walls or corners.

The air handler units are designed for vertical, "stacked", applications with nominal air capacities of 300 through 1200 CFM. Models incorporate a positive slope metal or plastic removable drain pan with 3/4" copper drain coupling.

Optional equipment includes, multiple coil combinations in three, four, and five row water coils, multiple supply grille and riser position combinations, fresh air inlets and multiple combinations of valve packages. Two pipe heating and cooling, two pipe with auxiliary electric heat are available with manual or automatic changeovers controls with two types of thermostat options.

INSTALLATION PRECAUTIONS

WARNING

Some units are very heavy. Use two or more people when moving and installing these units. Failure to do so could result in personal injury or death. Contact with metal edges and corners while applying excessive force can result in personal injury. Use gloves when handling equipment. Use caution during installation or while servicing equipment.

WARNING

When the air handler is operating, some components are operating at high speeds. Personal injury can result from touching these items with any object.

Installation of this the air handler should be performed only by a licensed contractor to ensure proper installation and the safety of the installer. Observe the following precautions for typical installations:

1. Always use proper tools and equipment.
2. No wiring or other work should be attempted without first ensuring that the air handler is completely disconnected from the power source and locked out.
3. Always verify that a good permanent, uninterrupted ground connection exists prior to energizing any power sources.
4. Always review the nameplate and wiring diagram on each unit for proper voltage and control configurations. This information is determined from the components and wiring of the unit and may vary from unit to unit.
5. When soldering or brazing to the unit, it is recommended to have a fire extinguisher readily available. When soldering close to valve packages or other components, heat shields or wet rags are required to prevent damage.
6. When the air handler unit is in operation components are rotating at high speeds.
7. Units must be installed level or angled toward the drain nipple to ensure proper drainage and operation.
8. Check unit prior to operation to ensure that the condensate water will drain toward the drain connection.
9. Be sure that the drain pan is free from foreign material prior to start up.
10. Check filter media installation to ensure that it is installed correctly.
11. Use the directional arrows or other information on the filter to determine the proper flow direction.
12. Ensure air distribution system does not exceed the external static rating of the unit.

WARNING

Never use the risers to lift the units. Risers are fitted loosely within expansion guides and attached to coil feed pipes which can be damaged.

CAUTION

When securing drywall or other wall treatments to this cabinet take care to avoid penetration into the coil, manifolding or electrical wiring by fasteners which could cause flooding or an electrical shock hazard.

IMPORTANT

This fan-coil must be installed in a location which is not accessible to the general public.

WARNING

Do not exceed water temperature range:
Max 180ºF (82ºC) Min 40ºF (4ºC)

WARNING

Do not exceed the maximum operating pressure or temperature listed on the unit's rating label.

UNITS WITHOUT PUMPS:

Water Pressure:	Max 400 psig (2758 kPa)
	Min 10 psig (69 kPa)
Water Temperature:	Max 180°F (82°C)
	Min 40°F (4°C)

UNITS WITH PUMPS:

Water Pressure:	Max 125 psig (862 kPa)
	Min 2 psig (14 kPa)
Water Temperature:	Max 180°F (82°C)
	Min 40°F (4°C)

UNIT DIMENSIONS AND CONFIGURATION DATA

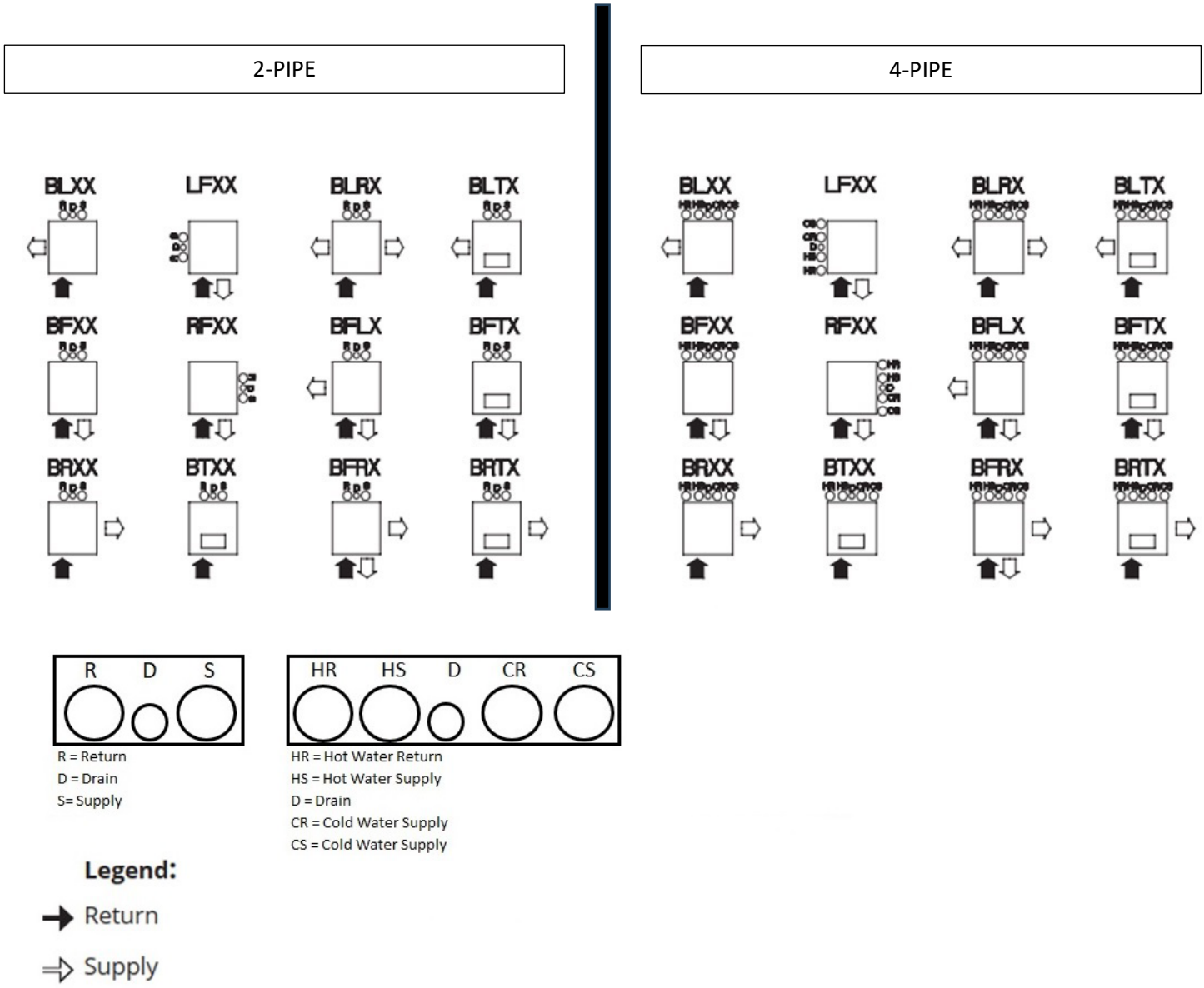
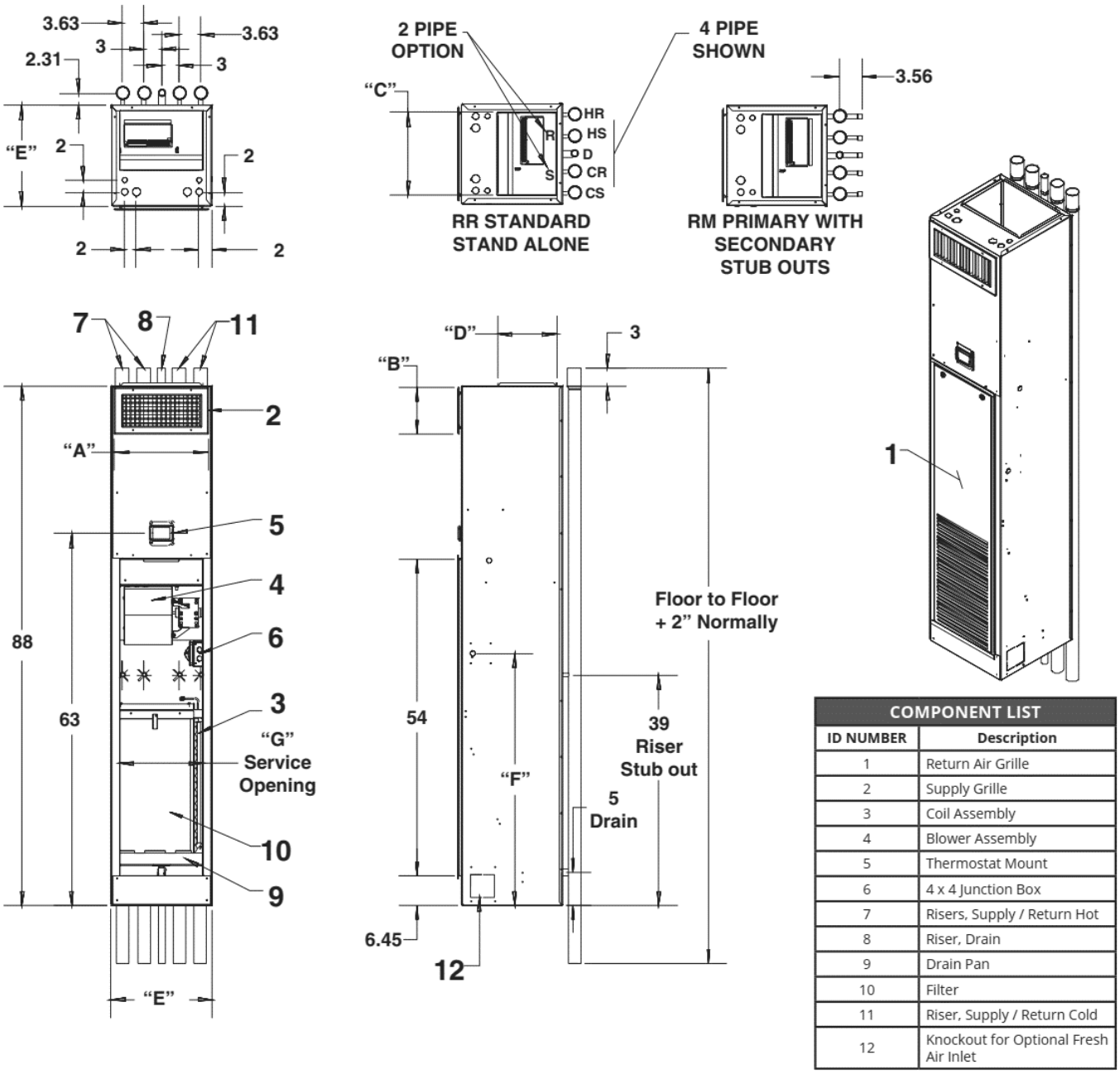


Figure 1 - 2-Pipe and 4-Pipe Configurations

UNIT DIMENSIONS AND CONFIGURATION DATA



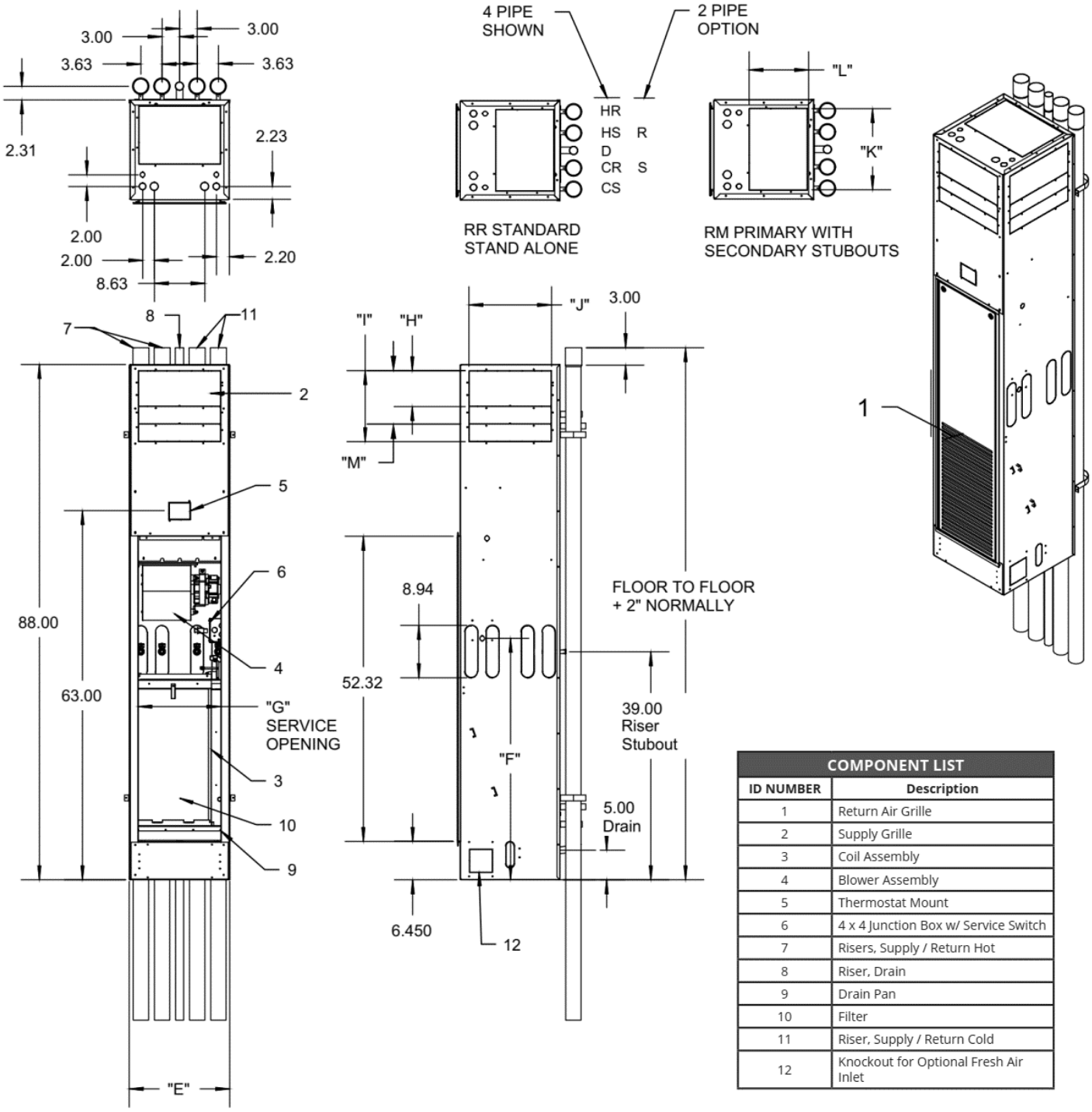
COMPONENT LIST	
ID NUMBER	Description
1	Return Air Grille
2	Supply Grille
3	Coil Assembly
4	Blower Assembly
5	Thermostat Mount
6	4 x 4 Junction Box
7	Risers, Supply / Return Hot
8	Riser, Drain
9	Drain Pan
10	Filter
11	Riser, Supply / Return Cold
12	Knockout for Optional Fresh Air Inlet

Figure 2 - BFTX Configuration

BFTX Configuration													
MODEL	SINGLE SUPPLY OPENING			DOUBLE SUPPLY OPENING			TOP SUPPLY OPENING						
	A	B	SIZE	A	B	SIZE	C	D	SIZE	E	F	G	FILTER SIZE
3RR	14	8	14 X 8	14	6	14 X 6	14	10	14 X 10	17	42.62	14.13	12.5 X 24.25 X 1
4RR	14	12	14 X 12	14	6	14 X 6	14	10	14 X 10	17	42.62	14.13	12.5 X 24.25 X 1
6RR	18	10	18 X 10	18	6	18 X 6	16	12	16 X 12	20	42.62	18.13	16.25 X 26.75 X 1
8RR	18	12	18 X 10	18	6	18 X 6	16	12	16 X 12	20	42.62	18.13	16.25 X 26.75 X 1
10RR	22	16	22 X 16	22	8	22 X 8	18	16	18 X 16	24	42.62	22.13	20.5 X 29.25 X 1
12RR	22	16	22 X 16	22	8	22 X 8	18	16	18 X 16	24	42.62	22.13	20.5 X 29.25 X 1

Table 1 - BFTX Configuration

UNIT DIMENSIONS AND CONFIGURATION DATA (CONTINUED)



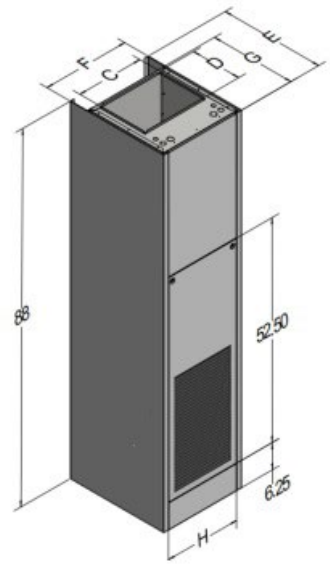
COMPONENT LIST	
ID NUMBER	Description
1	Return Air Grille
2	Supply Grille
3	Coil Assembly
4	Blower Assembly
5	Thermostat Mount
6	4 x 4 Junction Box w/ Service Switch
7	Risers, Supply / Return Hot
8	Riser, Drain
9	Drain Pan
10	Filter
11	Riser, Supply / Return Cold
12	Knockout for Optional Fresh Air Inlet

Figure 3 - Universal Riser Dimensional Data

Universal Riser Dimensional Data															
MODEL	A	B	SIZE	C	D	E	F	G	H	I	J	K	L	M	FILTER SIZE
3/4 RR	14	8	14 X 8	-	-	17	45.62	14.13	6	12	14	10	14	8	12.5 X 24.25 X 1
6/8 RR	14	12	14 X 12	-	-	20	45.62	18.13	6	12	18	12	16	10	16.25 X 26.75 X 1
10/12 RR	18	10	18 X 10	-	-	24	45.62	22.13	8	-	22	16	18	-	20.5 X 29.25

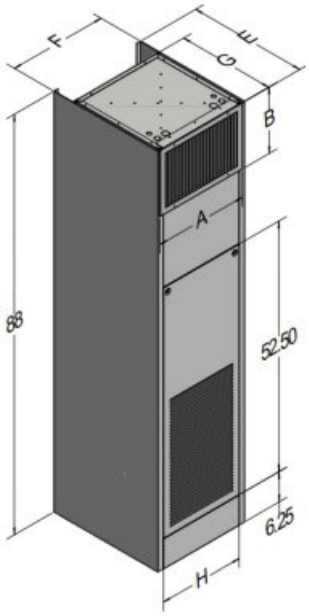
Table 2 – Universal Riser Dimensional Data

UNIT DIMENSIONS AND CONFIGURATION DATA (CONTINUED)



Exposed Cabinet Dimensional Data								
MODEL	TOP SUPPLY OPENING							
	C	D	SIZE	E	F	G	H	FILTER SIZE
3RR	14	10	14 X 10	22.2	18	17	14.13	12.5 X 24.25 X 1
4RR								
6RR	16	12	16 X12	25.2	21	20	18.13	16.25 X 26.75 X 1
8RR								
10RR	18	16	18 X 16	29.2	25	24	22.13	20.50 X 29.25 X 1
12RR								

Table 3 – Exposed Cabinet Dimensional Data



Exposed Cabinet Dimensional Data											
MODEL	SINGLE SUPPLY OPENING			DOUBLE SUPPLY OPENING (2)							
	A	B	SIZE	A	B	SIZE	E	F	G	H	FILTER SIZE
3RR	14	12	12 X 14	14	6	14 X 6	22.20	18	17	14.13	12.5 X 24.5 X 1
4RR											
6RR	18	12	18 X 12	48	6	18 X 6	25.20	21	20	18.13	16.25 X 26.75 X 1
8RR											
10RR	22	22	22 X 16	22	6	22 X 8	29.20	25	24	22.13	20.50 X 29.25 X 1
12RR											

Table 4 – Exposed Cabinet Dimensional Data

Figure 4 - Exposed Cabinet Dimensional Data

UNIT DIMENSIONS AND CONFIGURATION DATA (CONTINUED)

COMPONENT LIST	
ID NUMBER	Description
1	Return Air Grille
2	Supply Discharge
3	Coil Assembly
4	Blower Assembly
5	Thermostat Mount
6	4 x 4 Junction Box w/ Service Switch
7	ERV Box
8	Drain Pan
9	Filter

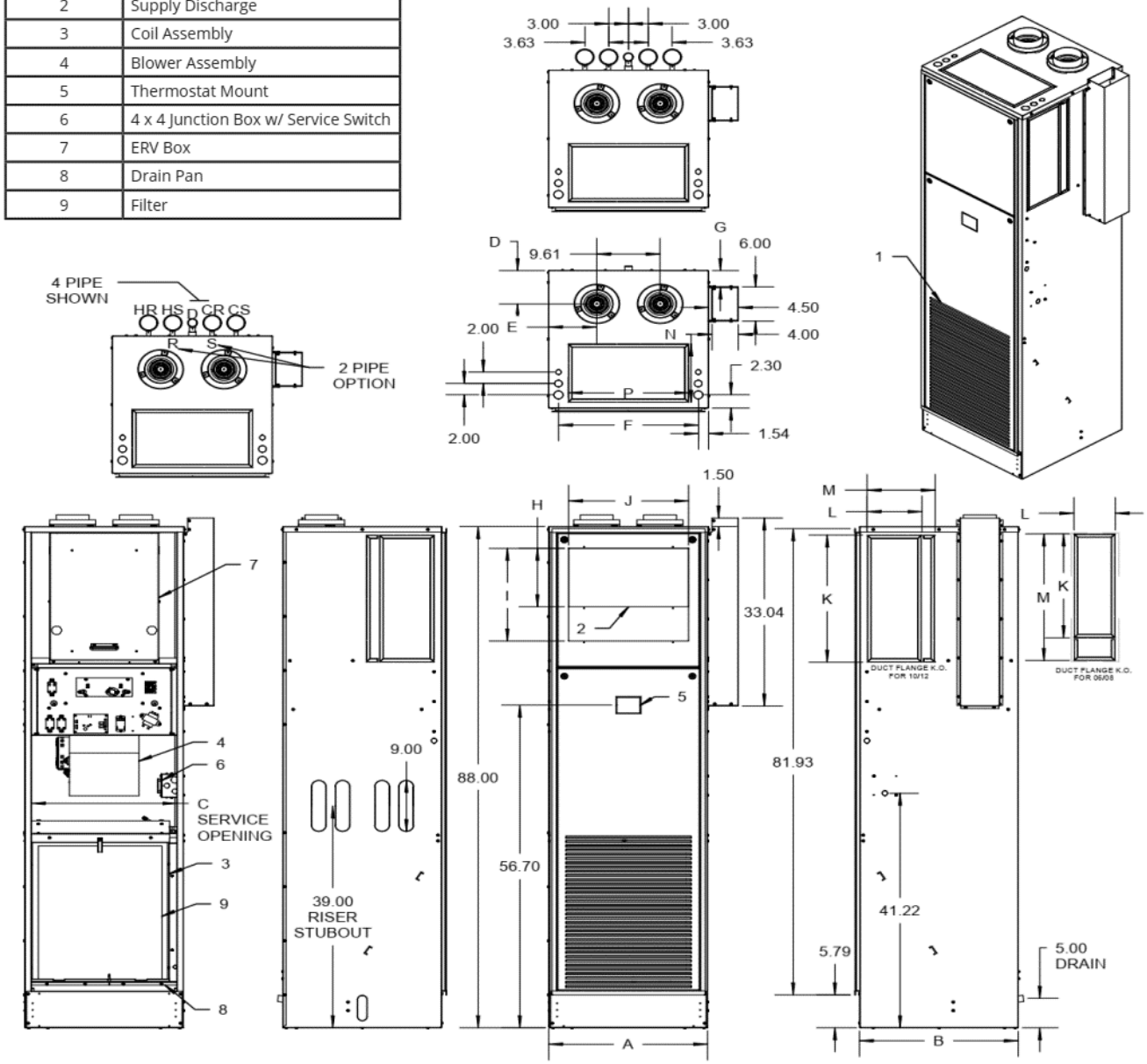


Figure 5 - ERV Riser Dimensional Data

								SUPPLY DISCHARGE			SIDE DISCHARGE			TOP DISCHARGE		
MODEL	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	FILTER SIZE
3/4 RR	20	20	18	6	5	17	3	6	8	14	14	6	-	6	14	12.5 X 24.5 X 1
6/8 RR	20	20	18	6	5	17	3	8	12	14	18	6	22	6	14	16.25 X 26.75 X 1
10/12 RR	24	24	22	6	7	21	3	10	16	18	22	8	10	10	18	10.5 X 29.25 X 1

Table 5 - ERV Riser Dimensional Data

AIR HANDLER UNIT

The installer must adhere strictly to all local and national code requirements pertaining to the installation of this equipment. These units are designed for installation in a vertical position. All units are designed for indoor use only, and are agency listed for installation with zero clearance to combustible materials. This includes the fan coil cabinet, discharge plenum and connecting ducts.

Access must be provided for servicing the unit. If this access is provided by a removable wall panel, ample space must be allowed for removal of the blower and to provide access to electrical and plumbing controls.

The recommended clearance for service on all sides of the unit is 24".

CHECK EQUIPMENT

Unpack unit and move to final location. Remove packaging taking care not to damage unit. Inspect air handler unit for damage prior to installation. File a claim with shipping company if shipment is damaged. Carefully inspect blower for rough handling that can cause misalignment or shaft damage. Check to make sure the valve packages have not been damaged during shipment. Check ID tags for riser tier, floor, and room numbers then ensure proper placement before proceeding with the installation. Blow out risers if protective caps are missing and cover again with tape or foil.

INSTALLING AIR HANDLER

CAUTION

Extreme caution must be taken to ensure that no internal damage will result if screws or holes are drilled into the cabinet. Failure to follow this CAUTION could result in product damage and minor personal injury.

CAUTION

The unit should be leveled in such a way that there is slope toward the condensate drain pan nipple to assure positive drainage. This is taken care of if the unit is level and plumb.

SET UNITS IN PLACE

Begin on the lowest floor and progress upward floor by floor to the top. Remove bottom protective caps and top caps from unit below. Tip unit over riser chase hole in the building floor. As the unit righted, align the risers with the unit below. If required, then install isolator pads, field supplied, beneath the four corners of the cabinet now.

ATTACH UNIT RISERS

Risers may come with 3.0 inch flared or straight opening at the top to accommodate the riser of the unit on the next floor. An insertion of 2" is normal. Bottoming would create a form of preloading which is undesirable. If, due to building characteristics, an extension is required to mate to the previous unit, or the next, then install it now. Level unit to ensure proper condensate drainage. Make plumb in directions and then anchor to the building using the lag screws or bolts. After all units in a vertical column are anchored make unit to unit riser connections. First, center each riser on the cabinet opening. Get as vertical a placement as the riser chase will allow. If using risers with flared openings, a minimum insertion depth of 1.0 inch is required into each flare of previous unit riser. Now solder to seal union using SIL-FOS or appropriate high temperature alloy.

AIR HANDLER UNIT (CONTINUED)

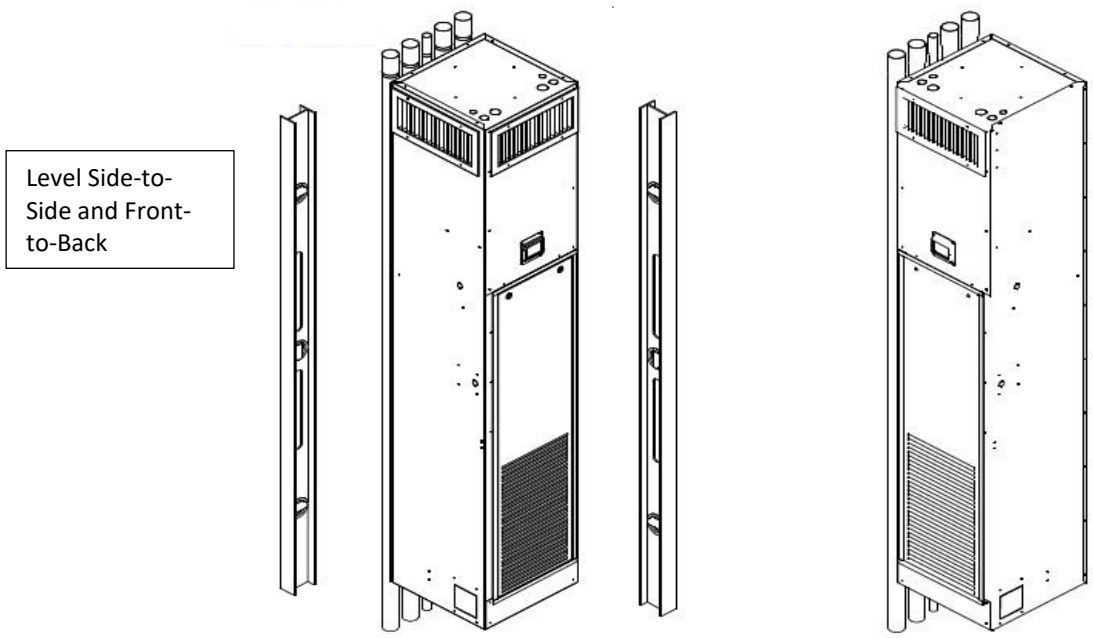


Figure 6 - Air Handler Unit Leveling

WARNING

DO NOT use soft, low temperature solders like 50-50, 60-40 or 85-15. With copper expansion and contraction this type of bond will fail.

ANCHOR RISERS ARE REQUIRED

Risers are not to be rigidly attached to each air handler cabinet. They need to be free to expand and contract as temperatures vary within the pipe and riser chase. They do, however, need to be fastened to the building at strategic points along the column length. Building code will describe frequency and type. Reference ASME B31.9 or similar.

The units are designed to allow movement of +/- 1.0 inch (2 inch total) under normal circumstances. Expansion loops will be required in each riser if the calculated movement is in excess of 2 inch. Expansion loops are described and formulated by the ASHRAE HVAC Systems and Equipment handbook and the website: Copper.org

NOTE

Expansion loop design and placement is a function of and best prescribed by consulting and design engineers.

PERFORM HYDROSTATIC TESTING

After all solder joints are made and all risers appropriately anchored perform hydrostatic testing for leaks.

Vent all individual coils while checking for signs of leakage within each cabinet using the manual header vents provided.

Once testing is complete, continue to insulate all unions just brazed so that insulation is now covering all riser surfaces. If required by fire code seal riser chase openings using correct fire rated materials at this time.

ELECTRICAL

WARNING

ELECTRIC SHOCK HAZARD

Disconnect all power supplies before servicing; lock out/tag out to prevent accidental electrical shock.

There may be multiple power sources.

Use copper conductors only.

Install all parts and panels before operating. Failure to follow these warnings can result in injury or death.

NOTE

Before proceeding with electrical connections, make certain that supply voltage, frequency, and phase are as specified on unit rating plate. Be sure that electrical service provided by the utility is sufficient to handle the additional load imposed by this equipment. See unit wiring label for proper field high and low voltage wiring. Make all electrical connections in accordance with NEC and any local codes or ordinances that may apply. Use copper wire only.

LINE VOLTAGE CONNECTIONS

All units have wiring diagrams and nameplate data to provide information required for necessary field wiring. A 4 in. x 4 in. (10.16 cm x 10.16 cm) electrical box is standard on all units for proper connection of power supply.

Unit must be permanently grounded in accordance with NEC and local codes.

Check all factory wiring per unit wiring diagram and inspect factory wiring connections to be sure none were loosened in transit or installation.

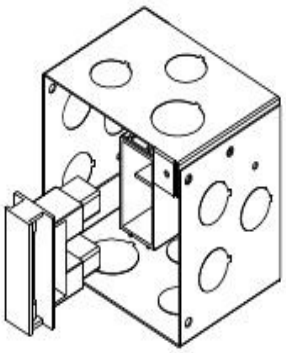


Figure 7 - J- Box with disconnect 120V/240V w/ electric heat

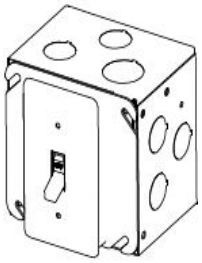


Figure 8 - J-Box with toggle switch: Units w/o Electric Heat & 227V w/ Electric Heat

WARNING

Service and maintenance to internal components and wiring must not be performed until the main disconnect switch is turned off. Any remote mounted devices such as thermostats that have been furnished by the manufacturer for field installation must be wired in strict accordance with the wiring diagram that is supplied with the unit. Failure to do so could result in electrical shock causing personal injury, death or damage to components and will void all warranties.

ELECTRICAL (CONTINUED)

WARNING

The cabinet must have an uninterrupted or unbroken ground according to NEC, ANSI/NFPA 70 and local codes to minimize personal injury if an electrical fault should occur. The ground may consist of electrical wire or metal conduit when installed in accordance with existing electrical codes. (See Ground/Conduit Note below.) Failure to follow this warning could result in an electrical shock, fire, or death

NOTE

Use agency listed conduit and conduit connector to connect supply wire(s) to unit and obtain proper grounding. If conduit connection uses reducing washers, a separate ground wire must be used.

Route field power supply to the junction box at the front of the return air opening. Install in accordance with the unit wiring diagram and all applicable codes. Standard controls are mounted on a 4” x 4” (10.16 cm x 10.16 cm) square junction box on the front of the cabinet where provision has been made for sheet rock installation. These units may be provided with a Class 2 transformer for 24-volt control circuits. Should any add-on equipment also have a Class 2 transformer furnished, care must be taken to prevent interconnecting outputs of the two transformers by using a thermostat with isolating contacts.

CONTROL WIRING

Use 18 AWG wire with color–coded insulation (35°C minimum) up to 100 ft. in length (31 m). Use 16 AWG wire if more than 100 ft. of wire is required. Consult local building codes and current editions of the National Electrical Code (NEC) NFPA 70. In Canada, refer to current editions of the Canadian electrical code CSA CEC22.1.

ELECTRICAL DATA

ELECTRICAL DATA FOR STANDARD RISER WITH ELECTRIC HEAT																
Unit Model	Nom CFM	KW			BTUH			FLA			MCA			MOCP		
		240V	208V	277V	240V	208V	277V	240V	208V	277V	240V	208V	277V	240V	208V	277V
3RR	300	0	0	0	0	0	0	0.6	0.6	0.35	1	1	1	15	15	15
		1	0.75	1	3400	2500	3400	4.8	4.2	4	6	5.5	5	15	15	15
		2	1.5	2	6800	5100	6800	8.9	7.8	7.6	12	10	10	15	15	15
		3	2.25	3	10200	7700	10200	13.1	11.4	11.2	17	15	14	20	15	15
4RR	400	0	0	0	0	0	0	0.6	0.6	0.5	1	1	1	15	15	15
		1	0.75	1	3400	2500	3400	4.8	4.2	4.1	6	5.5	6	15	15	15
		2	1.5	2	6800	5100	6800	8.9	7.8	7.7	12	10	10	15	15	15
		3	2.25	3	10200	7700	10200	13.1	11.4	11.3	17	15	15	20	15	15
		4	3	4	13600	10200	13600	17.3	15	14.9	22	19	19	20	20	20
6RR	600	0	0	0	0	0	0	0.5	0.5	0.7	1	1	1	15	15	15
		2	1.5	2	6800	5100	6800	8.8	7.7	7.9	12	10	10	15	15	15
		3	2.25	3	10200	7700	10200	13	11.3	11.5	17	15	15	20	15	15
		4	3	4	13600	10200	13600	17.2	14.9	15.1	22	19	19	25	20	20
		5	3.75	5	1700	13000	17000	21.3	18.5	18.8	27	24	24	30	35	35
		6	4.5	6	20500	15400	20400	25.5	22.1	22.4	32	28	28	35	30	30
8RR	800	0	0	0	0	0	0	1	1	0.9	2	2	2	15	15	15
		2	1.5	2	6800	5100	6800	9.3	8.2	8.1	12	10	11	15	15	15
		3	2.25	3	10200	7700	10200	13.5	11.8	11.7	17	15	15	20	15	15
		4	3	4	13600	10200	13600	17.7	15.4	15.3	23	20	20	25	20	20
		5	3.75	5	1700	13000	17000	21.8	19	19	28	24	24	30	25	25
		6	4.5	6	20500	15400	20400	26	22.6	22.6	33	29	29	35	30	30
		8	6	8	27300	20500	27200	34.3	29.8	29.8	43	38	38	45	40	40
10RR	1000	0	0	0	0	0	0	2.9	2.9	2.4	4	4	3	15	15	15
		3	2.25	3	10200	7700	10200	15.4	13.7	13.2	20	18	17	20	20	20
		4	3	4	13600	10200	13600	19.6	17.3	16.8	25	22	22	25	25	25
		5	3.75	5	1700	13000	17000	23.7	20.9	20.5	30	27	26	30	30	30
		6	4.5	6	20500	15400	20400	27.9	24.5	24.1	35	31	31	35	35	35
		8	6	8	27300	20500	27200	36.2	31.7	31.3	46	40	40	50	40	40
		10	7.5	10	34100	25600	34000	44.6	39	38.5	56	49	49	60	50	50
12RR	1200	0	0	0	0	0	0	2.9	2.9	2.4	4	4	3	15	15	15
		3	2.25	3	10200	7700	10200	15.4	13.7	13.2	20	18	17	20	20	20
		4	3	4	13600	10200	13600	19.6	17.3	16.8	25	22	22	25	25	25
		5	3.75	5	1700	1300	17000	23.7	20.9	20.5	30	27	26	30	30	30
		6	4.5	6	20500	15400	20400	27.9	24.5	24.1	35	31	31	35	35	35
		8	6	8	27300	20500	27200	36.2	31.7	31.3	46	40	40	50	40	40
		10	7.5	10	34100	25600	34000	44.6	39	38.5	56	49	49	60	50	50

Table 6 - Electrical Data For Standard Riser With Electric Heat

Data is subject to change. Please verify most current information on www.firstco.com or www.AE-Air.com websites.

ELECTRICAL DATA (CONTINUED)

Electrical Data For Riser (No Electric Heat)											
Voltage	Fan Speed	3RR				Voltage	Fan Speed	4RR			
		HP Blower	AMPS Blower	MCA	MOCP			HP Blower	AMPS Blower	MCA	MOCP
120/1/60	HIGH	1/4	3.50	4.4	15	120/1/60	HIGH	1/4	3.50	4.4	15
208/1/60	HIGH	1/4	2.30	2.9	15	208/1/60	HIGH	1/4	2.30	2.9	15
240/1/60	HIGH	1/4	2.30	2.9	15	240/1/60	HIGH	1/4	2.30	2.9	15
277/1/60	HIGH	1/4	2.30	2.9	15	277/1/60	HIGH	1/4	2.30	2.9	15
Voltage	Fan Speed	6RR				Voltage	Fan Speed	8RR			
		HP Blower	AMPS Blower	MCA	MOCP			HP Blower	AMPS Blower	MCA	MOCP
120/1/60	HIGH	1/3	4.80	6.0	15	120/1/60	HIGH	1/3	4.80	6.0	15
208/1/60	HIGH	1/3	2.80	3.5	15	208/1/60	HIGH	1/3	2.80	3.5	15
240/1/60	HIGH	1/3	2.80	3.5	15	240/1/60	HIGH	1/3	2.80	3.5	15
277/1/60	HIGH	1/3	2.60	3.3	15	277/1/60	HIGH	1/3	2.60	3.3	15
Voltage	Fan Speed	10RR				Voltage	Fan Speed	12RR			
		HP Blower	AMPS Blower	MCA	MOCP			HP Blower	AMPS Blower	MCA	MOCP
120/1/60	HIGH	1/2	6.80	8.5	20	120/1/60	HIGH	1/2	6.80	8.5	20
208/1/60	HIGH	1/2	4.10	5.1	15	208/1/60	HIGH	1/2	4.10	5.1	15
240/1/60	HIGH	1/2	4.10	5.1	15	240/1/60	HIGH	1/2	4.10	5.1	15
277/1/60	HIGH	1/2	3.60	4.5	15	277/1/60	HIGH	1/2	3.60	4.5	15

Table 7 – Motor Electrical Data (No Electric Heat)

Data is subject to change. Please verify most current information on www.firstco.com or www.AE-Air.com websites.

ELECTRICAL DATA (CONTINUED)

Electrical Data For Erv Riser With Electric Heat																					
Unit Model	Nom CFM	KW				BTUH				FLA				MCA				MOP			
		120V	208V	240V	277V	120V	208V	240V	277V	120V	208V	240V	277V	120V	208V	240V	277V	120V	208V	240V	277V
3RR	300	0	0	0	0	0	0	0	0	4.42	2.76	2.76	2.76	6.00	4.00	4.00	4.00	15	15	15	15
		1	0.75	1	1	3400	2550	3400	3400	12.75	6.37	6.92	6.37	16.00	8.00	9.00	8.00	20	15	15	15
		2	1.5	2	2	6800	5100	6800	6800	21.08	9.97	11.08	9.98	27.00	13.00	14.00	13.00	30	15	15	15
		-	2.25	3	3	-	7650	10200	10200	-	13.58	15.24	13.59	-	17.00	20.00	17.00	-	20	20	20
4RR	400	0	0	0	0	0	0	0	0	4.42	2.76	2.76	2.76	6.00	4.00	4.00	4.00	15	15	15	15
		1	0.75	1	1	3400	2550	3400	3400	12.75	6.37	6.92	6.37	16.00	8.00	9.00	8.00	20	15	15	15
		2	1.5	2	2	6800	5100	6800	6800	21.08	9.97	11.08	9.98	27.00	13.00	14.00	13.00	30	15	15	15
		-	2.25	3	3	-	7650	10200	10200	-	13.58	15.24	13.59	-	17.00	20.00	17.00	-	20	20	20
		-	3	4	4	-	10200	13600	13600	-	17.18	19.40	17.20	-	22.00	25.00	22.00	-	25	25	25
6RR	600	0	0	0	0	0	0	0	0	5.72	3.26	3.26	3.06	8.00	5.00	5.00	4.00	15	15	15	15
		1	1.5	2	2	3400	5100	6800	6800	14.05	10.47	11.58	10.28	18.00	14.00	15.00	13.00	25	15	20	15
		2	2.25	3	3	6800	7650	10200	10200	22.38	14.08	15.74	13.89	28.00	18.00	20.00	18.00	30	20	20	20
		-	3	4	4	-	10200	13600	13600	-	17.68	19.90	17.50	-	23.00	25.00	22.00	-	25	25	25
		-	3.75	5	5	-	12750	17000	17000	-	21.29	24.06	21.11	-	27.00	31.00	27.00	-	30	35	30
		-	4.5	6	6	-	15300	20400	20400	-	24.89	28.22	24.72	-	32.00	36.00	31.00	-	35	40	35
8RR	800	0	0	0	0	0	0	0	0	5.72	3.26	3.26	3.06	8.00	5.00	5.00	4.00	15	15	15	15
		1	1.5	2	2	3400	5100	6800	6800	14.05	10.47	11.58	10.28	18.00	14.00	15.00	13.00	25	15	20	15
		2	2.25	3	3	6800	7650	10200	10200	22.38	14.08	15.74	13.89	28.00	18.00	20.00	18.00	30	20	20	20
		-	3	4	4	-	10200	13600	13600	-	17.68	19.90	17.50	-	23.00	25.00	22.00	-	25	25	25
		-	3.75	5	5	-	12750	17000	17000	-	21.29	24.06	21.11	-	27.00	31.00	27.00	-	30	35	30
		-	4.5	6	6	-	15300	20400	20400	-	24.89	28.22	24.72	-	32.00	36.00	31.00	-	35	40	35
		-	6	8	8	-	20400	27200	27200	-	32.11	36.54	31.94	-	41.00	46.00	40.00	-	50	50	40
10RR	1000	0	0	0	0	0	0	0	0	7.72	4.56	4.56	4.06	10.00	6.00	6.00	6.00	20	15	15	15
		1	2.25	3	3	3400	7650	10200	10200	16.05	15.38	17.04	14.89	21.00	20.00	22.00	19.00	30	20	25	20
		2	3	4	4	6800	10200	13600	13600	24.38	17.18	21.20	18.50	31.00	22.00	27.00	24.00	35	25	30	25
		-	3.75	5	5	-	12750	17000	17000	-	20.79	25.36	22.11	-	26.00	32.00	28.00	-	30	35	30
		-	4.5	6	6	-	15300	20400	20400	-	24.39	29.52	25.72	-	31.00	37.00	33.00	-	35	40	35
		-	6	8	8	-	20400	27200	27200	-	31.61	37.84	32.94	-	40.00	48.00	42.00	-	40	50	50
		-	7.5	10	10	-	25500	34000	34000	-	38.82	46.16	40.16	-	49.00	58.00	51.00	-	50	60	60
12RR	1200	0	0	0	0	0	0	0	0	7.72	4.56	4.56	4.06	10.00	6.00	6.00	6.00	20	15	15	15
		1	2.25	3	3	3400	7650	10200	10200	16.05	15.38	17.04	14.89	21.00	20.00	22.00	19.00	30	20	25	20
		2	3	4	4	6800	10200	13600	13600	24.38	18.98	21.20	18.50	31.00	24.00	27.00	24.00	35	25	30	25
		-	3.75	5	5	-	12750	17000	17000	-	22.59	25.36	22.11	-	29.00	32.00	28.00	-	30	35	30
		-	4.5	6	6	-	15300	20400	20400	-	26.19	29.52	25.72	-	33.00	37.00	33.00	-	35	40	35
		-	6	8	8	-	20400	27200	27200	-	33.41	37.84	32.94	-	42.00	48.00	42.00	-	50	50	50
		-	7.5	10	10	-	25500	34000	34000	-	40.62	46.16	40.16	-	51.00	58.00	51.00	-	60	60	60

Table 8 – Electrical Data for ERV Riser with Electric Heat

Data is subject to change. Please verify most current information on www.firstco.com or www.AE-Air.com websites.

ELECTRICAL DATA (CONTINUED)

Table 1: Electrical Data for ERV Riser No Electric Heat

Electrical Data for ERV Riser (No Electric Heat)															
Voltage	Fan Speed	3RR						Voltage	Fan Speed	4RR					
		HP		Amps		MCA	MOCP			HP		Amps		MCA	MOCP
		ERV	Blower	ERV	Blower					ERV	Blower	ERV	Blower		
120/1/60	HIGH	1/30	1/4	0.92	3.50	5.3	15	120/1/60	HIGH	1/30	1/4	0.92	3.50	5.3	15
208/1/60	HIGH	1/30	1/4	0.46	2.30	3.3	15	208/1/60	HIGH	1/30	1/4	0.46	2.30	2.3	15
240/1/60	HIGH	1/30	1/4	0.46	2.30	3.3	15	240/1/60	HIGH	1/30	1/4	0.46	2.30	2.3	15
277/1/60	HIGH	1/30	1/4	0.46	2.30	3.3	15	277/1/60	HIGH	1/30	1/4	0.46	2.30	3.3	15
Voltage	Fan Speed	6RR						Voltage	Fan Speed	8RR					
		HP		Amps		MCA	MOCP			HP		Amps		MCA	MOCP
		ERV	Blower	ERV	Blower					ERV	Blower	ERV	Blower		
120/1/60	HIGH	1/30	1/3	0.92	4.80	6.9	15	120/1/60	HIGH	1/30	1/3	0.92	4.80	6.9	15
208/1/60	HIGH	1/30	1/3	0.46	2.80	4.0	15	208/1/60	HIGH	1/30	1/3	0.46	2.80	4.0	15
240/1/60	HIGH	1/30	1/3	0.46	2.80	4.0	15	240/1/60	HIGH	1/30	1/3	0.46	2.80	4.0	15
277/1/60	HIGH	1/30	1/3	0.46	2.60	3.7	15	277/1/60	HIGH	1/30	1/3	0.46	2.60	3.7	15
Voltage	Fan Speed	10RR						Voltage	Fan Speed	12RR					
		HP		Amps		MCA	MOCP			HP		Amps		MCA	MOCP
		ERV	Blower	ERV	Blower					ERV	Blower	ERV	Blower		
120/1/60	HIGH	1/30	1/2	0.92	6.80	9.4	20	120/1/60	HIGH	1/30	1/2	0.92	6.80	9.4	20
208/1/60	HIGH	1/30	1/2	0.46	4.10	5.6	15	208/1/60	HIGH	1/30	1/2	0.46	4.10	5.6	15
240/1/60	HIGH	1/30	1/2	0.46	4.10	5.6	15	240/1/60	HIGH	1/30	1/2	0.46	4.10	5.6	15
277/1/60	HIGH	1/30	1/2	0.46	3.60	5.0	15	277/1/60	HIGH	1/30	1/2	0.46	3.60	5.0	15

Table 9 – Electrical Data For Erv Riser (No Electric Heat)

Data is subject to change. Please verify most current information on www.firstco.com or www.AE-Air.com websites.

ERV CONTROLS

Standard ERV control Module

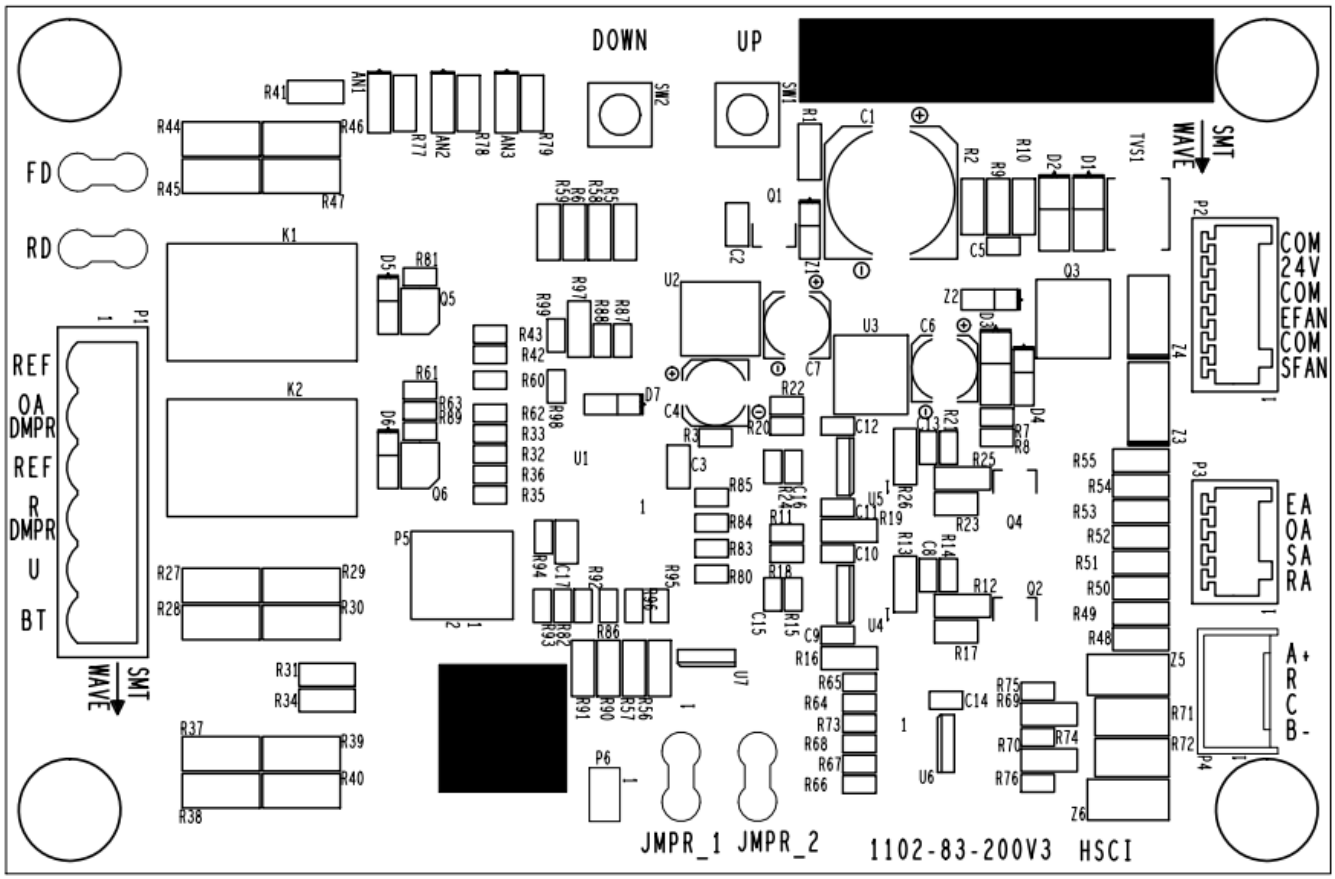


Figure 9: Standard ERV Controller

NORMAL OPERATION MODES

Standby Mode:

All control outputs are off and the control is waiting for a thermostat demand or thermistor threshold. The thermostat and thermistor inputs are continually monitored. The control initiates action when a thermostat call is received or when a thermistor threshold is reached.

When there is no demand from the thermostat or thermistors for defrost, or fan operation, the control shall be considered to be in Standby Mode. In this mode, it shall de-energize all outputs and flash the "heartbeat" status code on the STATUS LED until action is initiated by a thermostat call. In Standby, it shall continually monitor all thermostat and thermistor inputs.

When the control is not in standby mode, the mode priority shall be as shown Table 5

ERV CONTROLS (CONTINUED)

PRIORITY	MODE
1	Front Desk Shutdown
2	Coil Freeze Protection
3	Heating Mode
4	Fan Boost Mode
5	Fan Only Mode (“U”)
6	Continuous Fan Operation

Table 10 - ERV Control Module Mode Priority

Front Desk Shutdown Mode:

If the front desk disconnects “FD” from “R”, the control enters Front Desk Shutdown. The Control immediately de-energizes S FAN, E FAN, and R DMPR. After 10 seconds, the control de-energizes OA DMPR. The control shall resume normal operation when “R” is re-applied to “FD”. The control comes with a factory-installed jumper that must be removed if the use of a “Front Desk Switch” is required in the installation.

Coil Freeze Protection Mode:

If the TSA thermistor falls below 35° then the control will go into a Coil Protection lockout. The S Fan and E Fan are de-energized, and the OA damper is closed. During this time, the RED, YELLOW and GREEN LED’s are flashing and the YELLOW LED is ON . After 30 minutes, the OA damper will open, and the S Fan and E Fan are re-energized to the user-defined set point.

Heating Modes:

The heating modes, First Defrost, Second Defrost, and Third Defrost are designed to reduce frost accumulation during the normal operation based on the temperature of the Fresh Outside Air entering the ERV module. This is done using one of two methods:

- If the P6 connection has a shunt populated, the unit is intended to be paired with a field installed in line duct heater to raise the temperature of the incoming air above a minimum threshold. Selection of the pre-heating device should be considered based on the CFM requirements and minimum design temperature of outdoor air temperature.
- If the P6 connection is not populated, the unit is intended to be paired with a field installed recirculation damper controlled by the board. The board supports a 24V Normally closed damper that is energized during the defrosting modes. Special care shall be made in the installation of the recirculation damper so that the ducting does not recirculate Class II air with Class I air as per ASHRAE 62.1 and 62.2

In all defrost modes, the “use defined set point” refers to the current operating mode set point when the unit enters the defrost mode.

- First Defrost Mode - The control goes into First Defrost Mode if the TOA thermistor falls below 30°F(1.7°C) but stays above 10°F(-6.7°C).

If P6 has a shunt populated*, S Fan and E Fan speeds are reduced by 10% of the current user defined set point for each fan. After 3 minutes, or if the TOA thermistor raises above 40°F, the S Fan and E Fan speeds are returned to the user defined set point, and the control enters a 25 minute defrost lockout. The yellow LED is flashing.

If P6 Shunt does not have the shunt populated, R DMPR is energized and S FAN and E FAN are energized at the user defined set point. The yellow LED is flashing. After 3 minutes, the control de-energizes the R DMPR and enters a 25 minute defrost lockout

If the TOA thermistor falls below 10°F before the control leaves First Defrost Mode, then the control will enter the Second Defrost Mode.

ERV CONTROLS (CONTINUED)

- Second Defrost Mode - The control goes into Second Defrost Mode if the TOA thermistor falls below 10°F but stays above -10°F.

If P6 has a shunt populated*, S Fan and E Fan speeds are reduced by 30% of the current user defined set point for each fan. After 5 minutes, the S Fan and E Fan speeds are returned to the user defined set point, and the control enters a 17 minute defrost lockout. The yellow LED is solid.

If P6 does not have a shunt populated, R DMPR is energized and S FAN and E FAN are energized at the user defined set point. The yellow LED is Solid. After 5 minutes, the control de-energizes the R DMPR and enters a 17 minute defrost lockout.

If the TOA thermistor falls below -10°F before the control leaves Second Defrost Mode, then the control will enter Third Defrost Mode.

- Third Defrost Mode - The control goes into Third Defrost Mode if the TOA thermistor falls below -10°F.

If P6 has a shunt populated*, S Fan and E Fan speeds are reduced by 50% of the current user defined set point for each fan. After 7 minutes, the S Fan and E Fan speeds are returned to the user-defined set point, and the control enters a 15 minute defrost lockout. The yellow and green LEDs are solid.

If P6 does not have a shunt populated, R DMPR is energized and S FAN and E FAN are energized at the user defined set point. After 7 minutes, the control de-energizes the R DMPR and enters a 15 minute defrost lockout The yellow and green LEDs are Solid.

NOTE

P6 is a terminal that determines if R DMPR is present. If a shunt is present, then the R DMPR is not connected. If no shunt is present, then R DMPR is connected.

Fan Boost Mode:
The thermostat calls for fan boost by connecting “BT” to “R”. The control energizes the OADMPR. After 10 seconds, the S FAN and E FAN are energized to the fan boost speed set point.

The Fan Boost Mode set point can be adjusted as detailed in the balancing mode section; the factory default is 100%.

Fan Only Mode:
The thermostat calls for fan by connecting “U” to “R”. The OA DMPR is energized immediately. After 10 seconds, the S FAN and E FAN are ran at the user-defined set point for normal operation.
The Fan Only Mode set point can be adjusted as detailed in the balancing mode section. The factory default is 50%.

Continuous Fan Operation:
When the JMPR terminals have been connected, and the control is in no other mode, the control enters continuous fan mode. OA DMPR is energized immediately. After 10 seconds, the S FAN and E FAN are ran at the Continuous Fan Operation set point. If the installation does not require Continuous Fan Operation, the installer must remove the factory installed jumper wire.
The Continuous Fan Operation set point can be adjusted as detailed in the balancing mode section, the factory default is 30%.

Control Lockout Modes:
Some operating conditions may cause the controller to enter a lockout period in order to protect the functionality of the ERV module.

- Defrost Lockout - When in Defrost Lockout, the control cannot enter any of the defrost modes. All other modes may be accessed. Lockout ends when the specified time elapses in the defrost modes.

- Thermistor Lockout - In the event of a thermistor failure where the thermistor is open or shorted, the control enters a Thermistor Lockout. All outputs are de-energized and no other modes shall be accessed. After 30 minutes, the control resumes normal operation. If the error occurs 3 times within a 2-hour period, the control will enter the Thermistor Lockout Mode indefinitely, and will require maintenance.

ERV CONTROLS (CONTINUED)

Balancing Mode:

To adjust the fan speed of the Supply and Exhaust fans simultaneously.

- Press the UP/DOWN button to increase/decrease the fan speed set point of both fans by 10% for each time the button is pressed (from 10%-100%) The red LED flashes with each button press.

- When both buttons are pressed simultaneously for 5 seconds, the yellow LED will be solid, the green LED will flash a number of times equal to the SUPPLY FAN speed set point, then the red LED will flash a number of times equal to the EXHAUST FAN speed set point.

To individually adjust the fan speeds:

- Depress the UP button for 5 seconds to enter Supply Fan Adjustment mode. The red LED is solid, and the green LED is flashing. In this mode, pressing the UP/DOWN button will only adjust the SUPPLY FAN speed set point by 10% for each time the button is pressed. The yellow LED will flash a number of times equal to the new Supply Fan speed set point (1-10). To exit this mode, depress the UP button for 5 seconds to return to standard control operation.

- Depress the DOWN button for 5 seconds to enter Exhaust Fan Adjustment mode. The green LED is solid, and the red LED is flashing. In this mode, pressing the UP/DOWN button will only adjust the EXHAUST FAN speed set point by 10% for each time the button is pressed. The yellow LED will flash a number of times equal to the new Exhaust Fan speed set point (1-10). To exit this mode, depress the DOWN button for 5 seconds to return to standard control operation.

The Fan speed set point is only adjusted for the mode the control is currently in. Adjusting the fan speed during Fan Only Mode will not adjust the fan speed in Continuous Fan Operation or Fan Boost Mode.

The ERV Control features three LEDs located next to the UP/DOWN push buttons to indicated the controllers current operating mode. The LED mode behavior can be found in Table 6

Mode/Function	LED Color		
	Red	Yellow	Green
Standby Mode	Flashing (Heartbeat)*	Off	Off
Continuous Fan Operation	Off	Off	Flashing**
Coil Freeze Protection	Flashing**	Flashing**	Flashing**
Fan Only Mode (“U”)	Off	Off	Solid
First Defrost	Off	Flashing**	Off
Second Defrost	Off	Solid	Off
Third Defrost	Off	Solid	Solid
Front Desk Switch	Solid	Off	Off
Fan Boost Mode	Off	Flashing (alternate)***	Flashing (alternate)***
TOA Thermistor Lockout	Flashing (alternate)***	Off	Flashing (alternate)***
TSA Thermistor Lockout	Flashing (alternate)***	Solid	Flashing (alternate)***
Balancing Mode-E FAN	Off	Flashing (1-10)**	Solid
Balancing Mode-S FAN	Solid	Flashing (1-10)**	Off
Fan Speed Check	Flashing: 1-10 (E Fan Speed)	Solid	Flashing: 1-10 (S Fan Speed)

Table 11 - LED Mode Behavior

Note*: Heartbeat flashing shall be 1 second on followed by 1 second off.
Note**: A single LED flashing shall be ½ second on followed by ½ second off.
Note***: For alternate flashing LED’s, each LED shall be on for ½ second and off for ½ second. An LED will only be on if the other is off.

FRAMING AND FINISHING

SHIPPING INSTRUCTIONS

Model RR has a factory enclosures suitable for normally accepted wall coverings. If drywall is the covering of choice, then low profile sheet metal screws are needed. Units are typically installed behind drywall, requiring no additional clearances/distance between the wall panels of the unit and adjacent structures. A minimum distance of 30 inches. (76.2 cm.) should be provided from the return panel to any obstruction to not affect the performance of the unit.

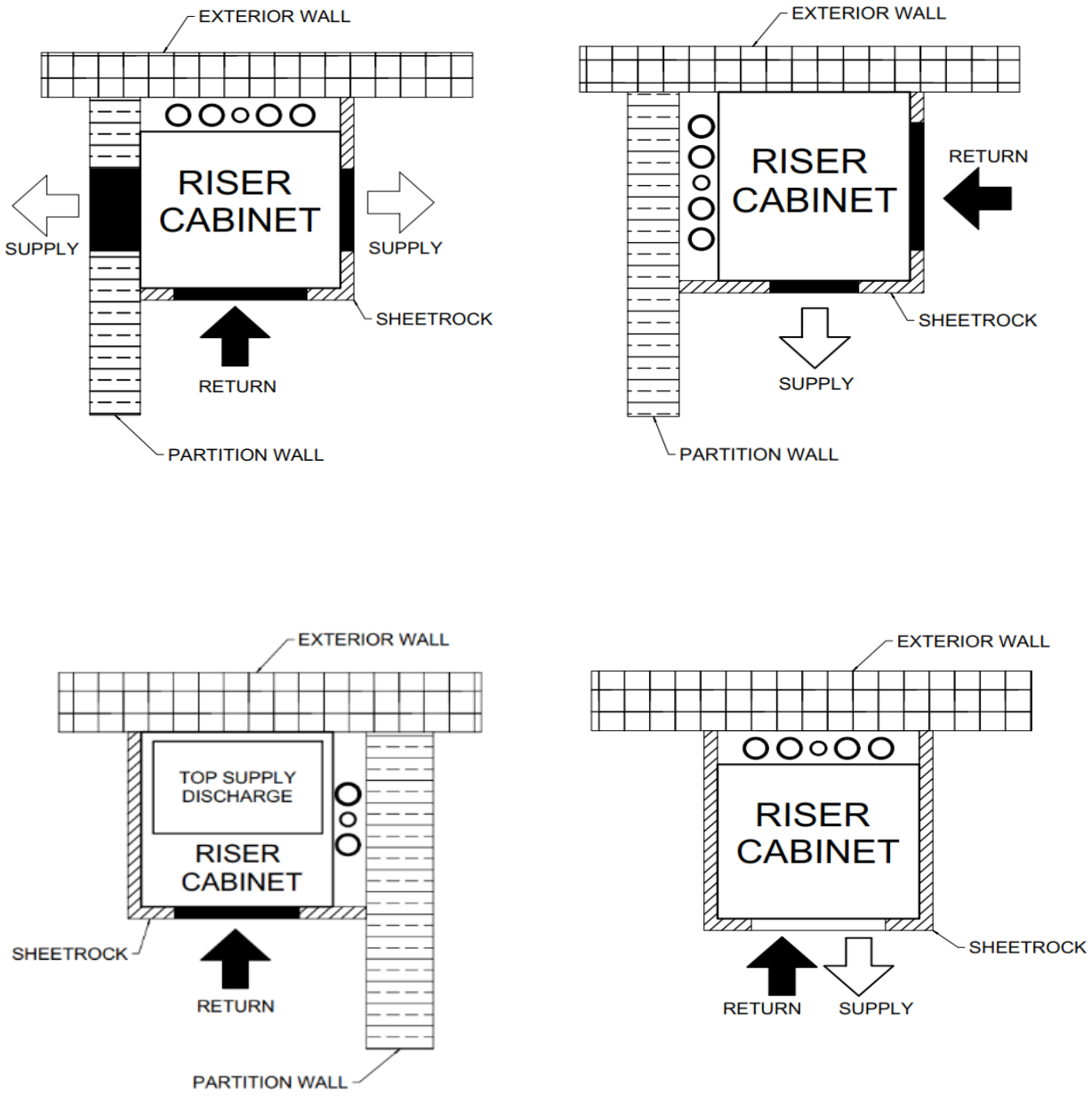


Figure 10 - Typical Riser Installations

FRAMING AND FINISHING (CONTINUED)

RR Models with the optional exposed cabinet panels are intended for installations that DO NOT require wall coverings. Special care should be taken during the installation process to avoid damage to painted panels.

CAUTION

DO NOT apply sheet metal screws or nails where they can penetrate the coil, risers, drain pan or electrical conduits. If possible secure at the corners of the cabinet once component placement is verified.

CAUTION

Ensure that sheet rock dust and debris DO NOT enter the unit during construction and finishing. This will compromise the performance, general cleanliness of the cabinet and draining ability.

CAUTION

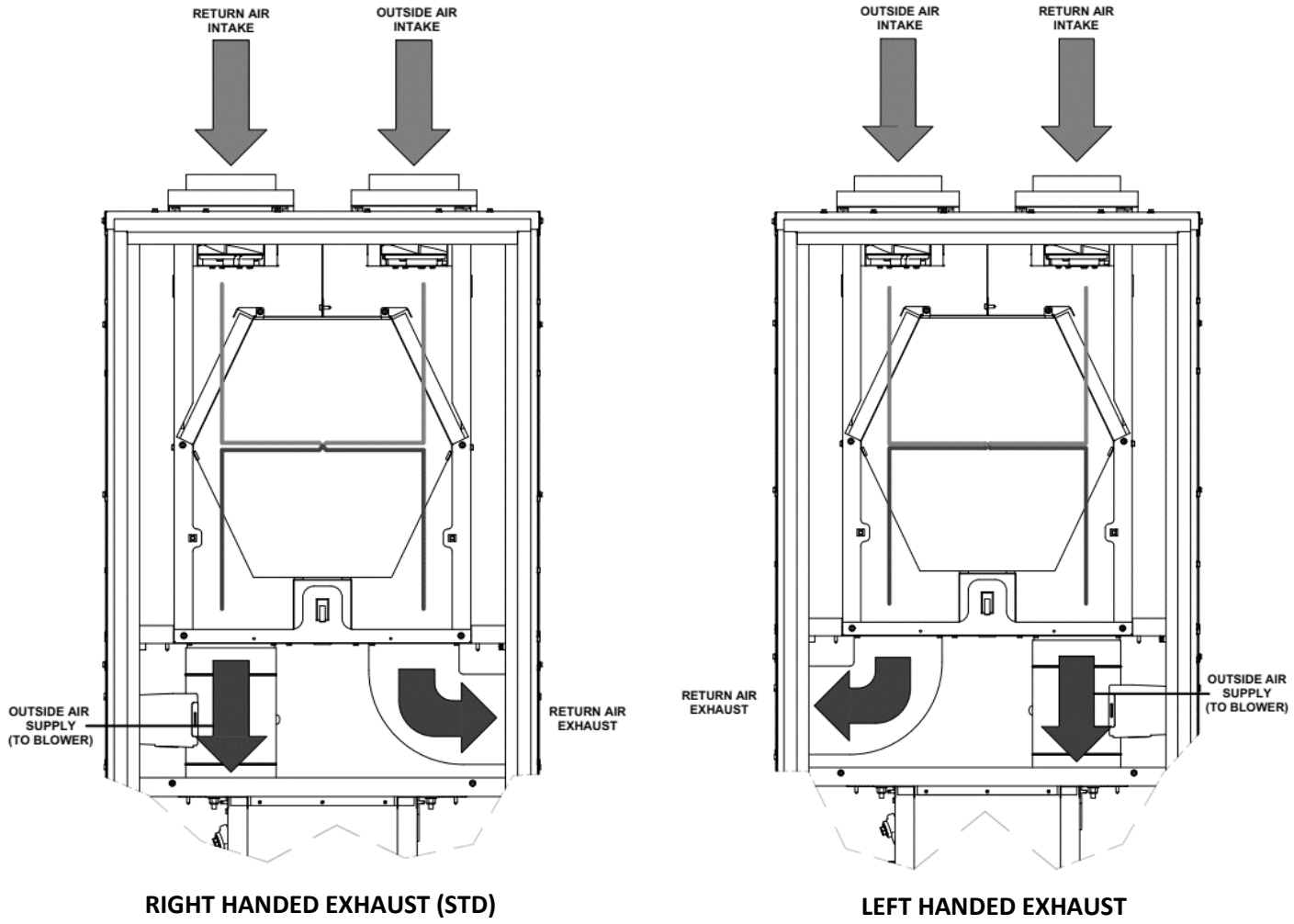
Use care when making openings for the supply grilles to avoid debris penetration into the cabinet. It is not likely but possible to contact the power cables in the corners where the conduit knockouts are placed, so take care to avoid these as well. Once done, cover these openings to prevent foreign material from entering the cabinet.

WARNING

The manufacturer does not warrant equipment subjected to abuse. Metal chips, dust, drywall tape, paint over spray, etc. can void warranties and liability for equipment failure, personal injury and property damage.

ERV DUCTING / CONFIGURATIONS

The ERV Riser ductwork can be shipped with either left handed or right handed exhaust, with no changes required in the field, depending on the riser locations, the standard configuration is shipped with the exhaust ducting to the right side (cabinet facing) of the unit.



RIGHT HANDED EXHAUST (STD) **LEFT HANDED EXHAUST**

Figure 11 - ERV DUCT CONFIGURATIONS

The exhaust air is ducted via a factory installed chimney to the top of the cabinet so that connections can be made at the same location for the Outside Air supply (5” Duct Collar), Return Air Intake (5” Duct Collar), and Return Air Exhaust (6”X4” Duct), While the Outside Air Supply is ducted through a motorized damper, internally controlled, into the supply of the unit blower. The blower operates so that the blower will not pull air through the ERV, should the ERV be in an inactive state.

DEFROST DUCTING CONSIDERATIONS

Units with the ERV option require additional ducting considerations for the fresh air supply and return air supply. The ERV module comes with two options for integrated defrost controls; **Pre-heat defrost** in tandem with a field installed pre-heating device, or **recirculation defrost** combined with a field installed recirculation damper controlled by the unit's control module.

Pre-heat Defrost

When using a in line duct heater to prevent frost accumulation, special care should be taken to select the proper sized heater dependent on the design temperature for outdoor air and the CFM requirements. **Table 7** can be used to determine the proper sizing of the pre-heater, ensuring that the design temperature conditions do not bring the entering Air Temperature (EAT) below 30°F (-1°C). When the controller detects the Outside Air Temperature is below the threshold it will automatically reduce the fan speed of the Fresh Air intake and Return Air streams, so as not to bring the occupied space into a negative pressure, increasing the temperature of incoming air to prevent the buildup of frost on the ERV CORE. An example of ductwork with the pre-heating device can be seen in **Figure 12**.

KW	EAT (°F)	FRESH AIR CFM														
		30	**35**	**40**	**45**	**50**	**55**	**60**	**65**	**70**	**75**	**80**	**85**	**90**	**95**	**100**
1	-10	95.3	80.3	69.0	60.2	53.2	47.5	42.7	38.6	35.1	32.1	29.5	27.2	25.1	23.3	21.6
	-20	85.3	70.3	59.0	50.2	43.2	37.5	32.7	28.6	25.1	22.1	19.5	17.2	15.1	13.3	11.6
	-30	75.3	60.3	49.0	40.2	33.2	27.5	22.7	18.6	15.1	12.1	9.5	7.2	5.1	3.3	1.6
	-40	65.3	50.3	39.0	30.2	23.2	17.5	12.7	8.6	5.1	2.1	-0.5	-2.8	-4.9	-6.7	-8.4
	-50	55.3	40.3	29.0	20.2	13.2	7.5	2.7	-1.4	-4.9	-7.9	-10.5	-12.8	-14.9	-16.7	-18.4
1.5	-10	148.0	125.4	108.5	95.3	84.8	76.2	69.0	62.9	57.7	53.2	49.3	45.8	42.7	39.9	37.4
	-20	138.0	115.4	98.5	85.3	74.8	66.2	59.0	52.9	47.7	43.2	39.3	35.8	32.7	29.9	27.4
	-30	128.0	105.4	88.5	75.3	64.8	56.2	49.0	42.9	37.7	33.2	29.3	25.8	22.7	19.9	17.4
	-40	118.0	95.4	78.5	65.3	54.8	46.2	39.0	32.9	27.7	23.2	19.3	15.8	12.7	9.9	7.4
	-50	108.0	85.4	68.5	55.3	44.8	36.2	29.0	22.9	17.7	13.2	9.3	5.8	2.7	-0.1	-2.6
2	-10	200.7	170.6	148.0	130.4	116.4	104.9	95.3	87.2	80.3	74.3	69.0	64.4	60.2	56.5	53.2
	-20	190.7	160.6	138.0	120.4	106.4	94.9	85.3	77.2	70.3	64.3	59.0	54.4	50.2	46.5	43.2
	-30	180.7	150.6	128.0	110.4	96.4	84.9	75.3	67.2	60.3	54.3	49.0	44.4	40.2	36.5	33.2
	-40	170.7	140.6	118.0	100.4	86.4	74.9	65.3	57.2	50.3	44.3	39.0	34.4	30.2	26.5	23.2
	-50	160.7	130.6	108.0	90.4	76.4	64.9	55.3	47.2	40.3	34.3	29.0	24.4	20.2	16.5	13.2
3	-10	306.0	260.9	227.0	200.7	179.6	162.4	148.0	135.8	125.4	116.4	108.5	101.5	95.3	89.8	84.8
	-20	296.0	250.9	217.0	190.7	169.6	152.4	138.0	125.8	115.4	106.4	98.5	91.5	85.3	79.8	74.8
	-30	286.0	240.9	207.0	180.7	159.6	142.4	128.0	115.8	105.4	96.4	88.5	81.5	75.3	69.8	64.8
	-40	276.0	230.9	197.0	170.7	149.6	132.4	118.0	105.8	95.4	86.4	78.5	71.5	65.3	59.8	54.8
	-50	266.0	220.9	187.0	160.7	139.6	122.4	108.0	95.8	85.4	76.4	68.5	61.5	55.3	49.8	44.8

TABLE 12 – FRESH AIR CFM

Data is subject to change. Please verify most current information on www.firstco.com or www.AE-Air.com websites.

DEFROST DUCTING CONSIDERATIONS (CONTINUED)

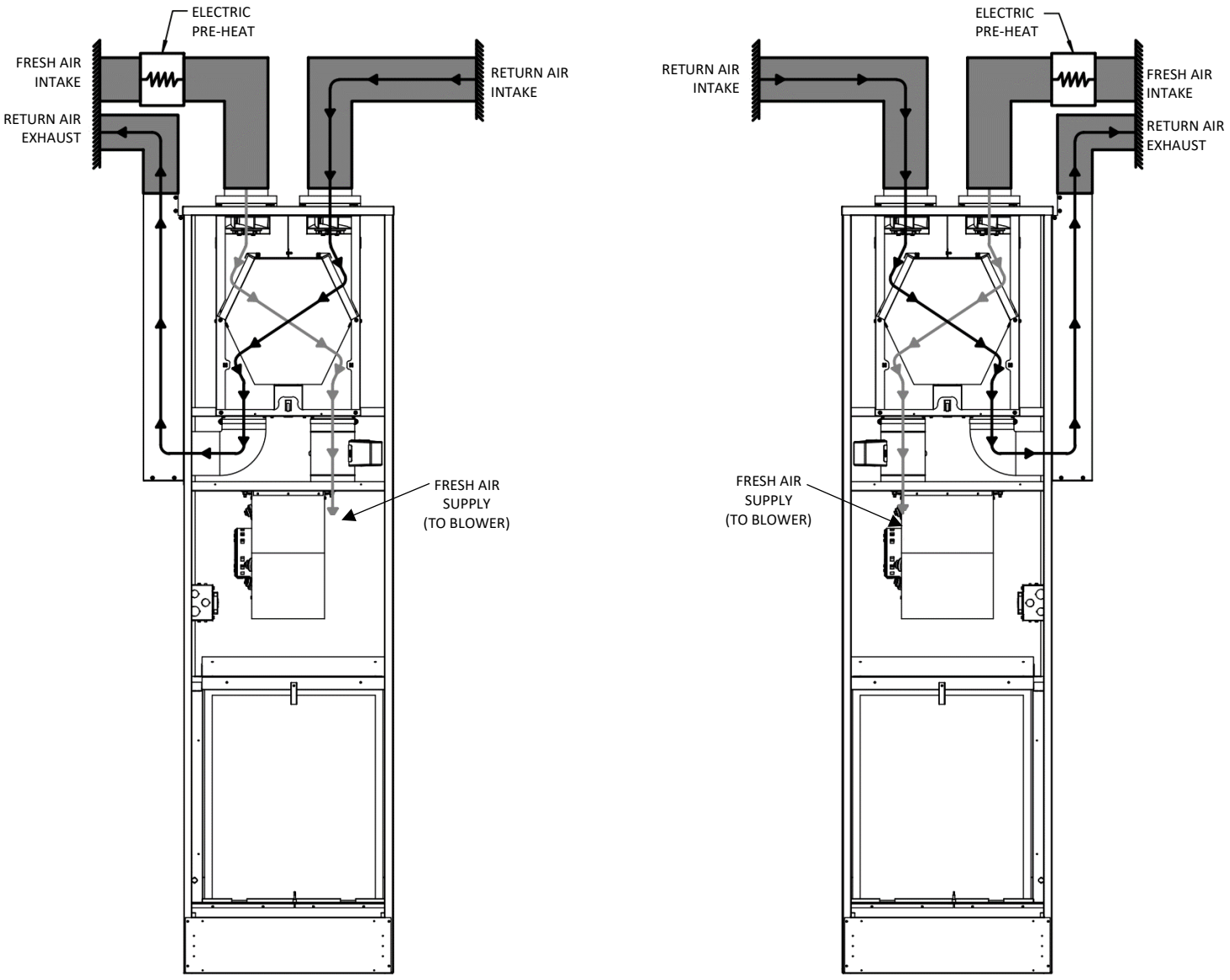


Figure 12 - DUCTWORK WITH PRE-HEATING

Recirculation Defrost

For Installations without pre-heating devices, a recirculation damper can be installed that allows the recirculation of air from the occupied space into the Fresh Air supply of the ERV. Special care should be taken to ensure that class II air is not recirculated with Class I air in installations where the ERV return is ducted from areas such as a kitchen fan hood or bathroom fan. To control the recirculation damper, the installer must remove the shunt connection the P6 terminal (see figure 9) to allow the controller to recognize the presence of a recirculation damper in the system. An example of a typical installation for the recirculation defrost can be seen in Figure 13 and 14.

DEFROST DUCTING CONSIDERATIONS (CONTINUED)

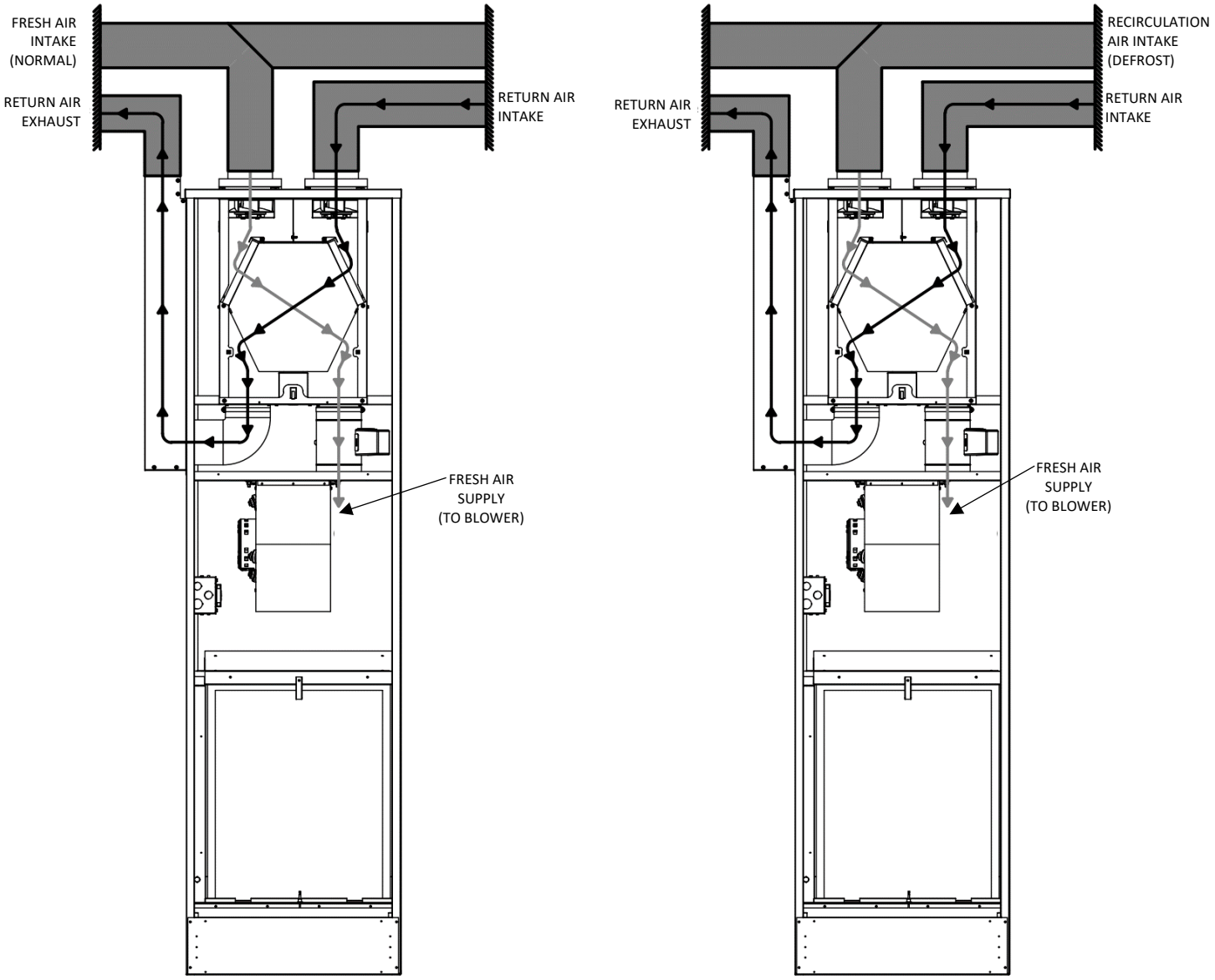


Figure 13 – LEFT HAND RECIRCULATION DEFROST

DEFROST DUCTING CONSIDERATIONS (CONTINUED)

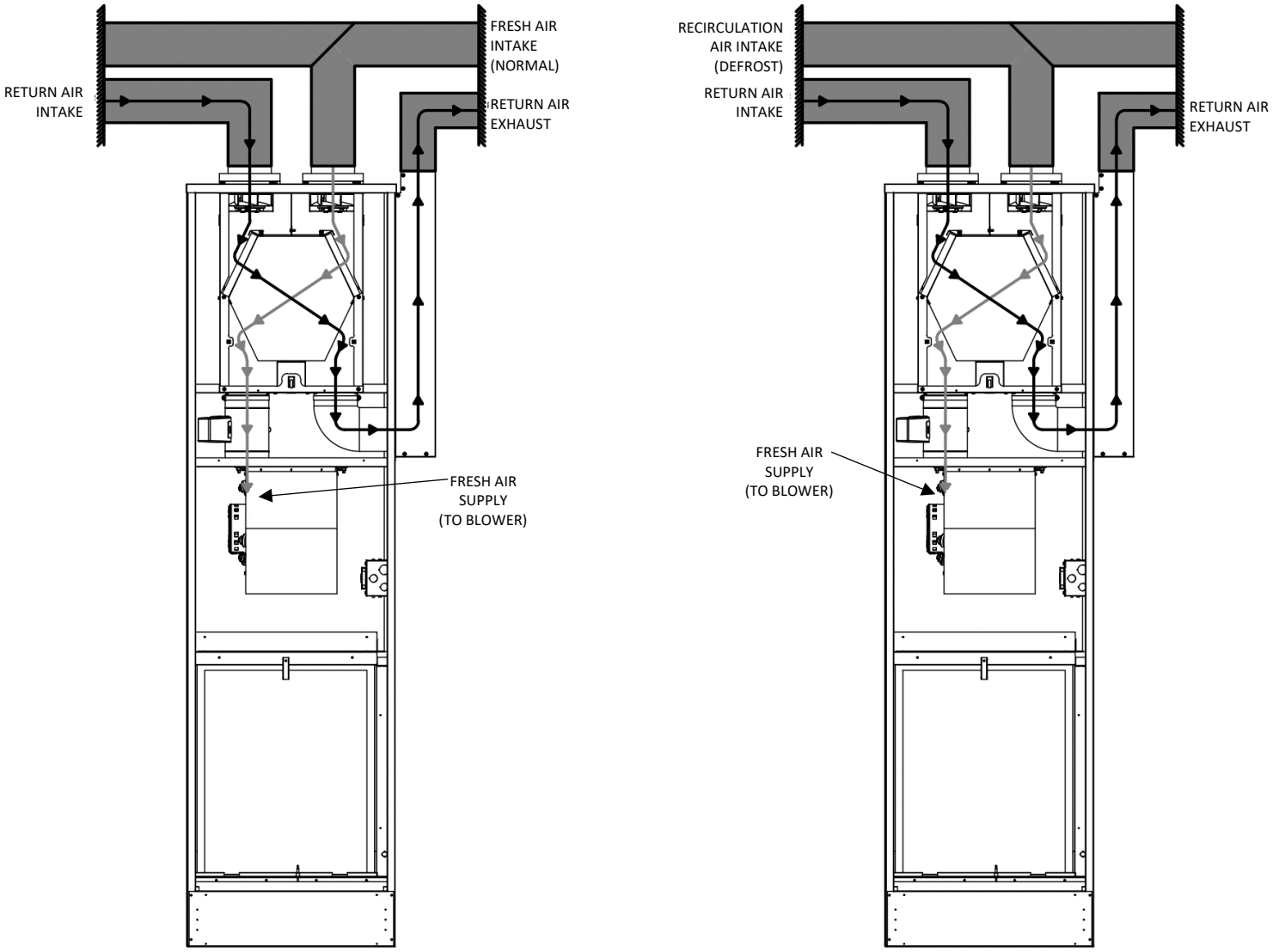


Figure 14 - RIGHT HAND RECIRCULATION DUCT WORK

NOTE

When using recirculation defrost, special care should be taken to ensure that the recirculation duct is not connected to a bathroom fan, kitchen hood or other source of air that does not meet the requirements for Class I air per ASHRAE 62.1 and 62.2.

DEFROST DUCTING CONSIDERATIONS (CONTINUED)

ERV FAN BALANCING

To Ensure optimal performance of the ERV, each of the air streams should be balanced during installation. The ERV Access panel comes with 4, 1/4" (0.635cm) holes, to facilitate pressure probe balancing in each of the ERV quadrants. To access the ports for balancing, remove the plug bushing for the required airflow quadrant as shown in Figure 15. Adjust the fan speeds using the push button controls detailed in the Balancing Mode section of the ERV controls on page 26.

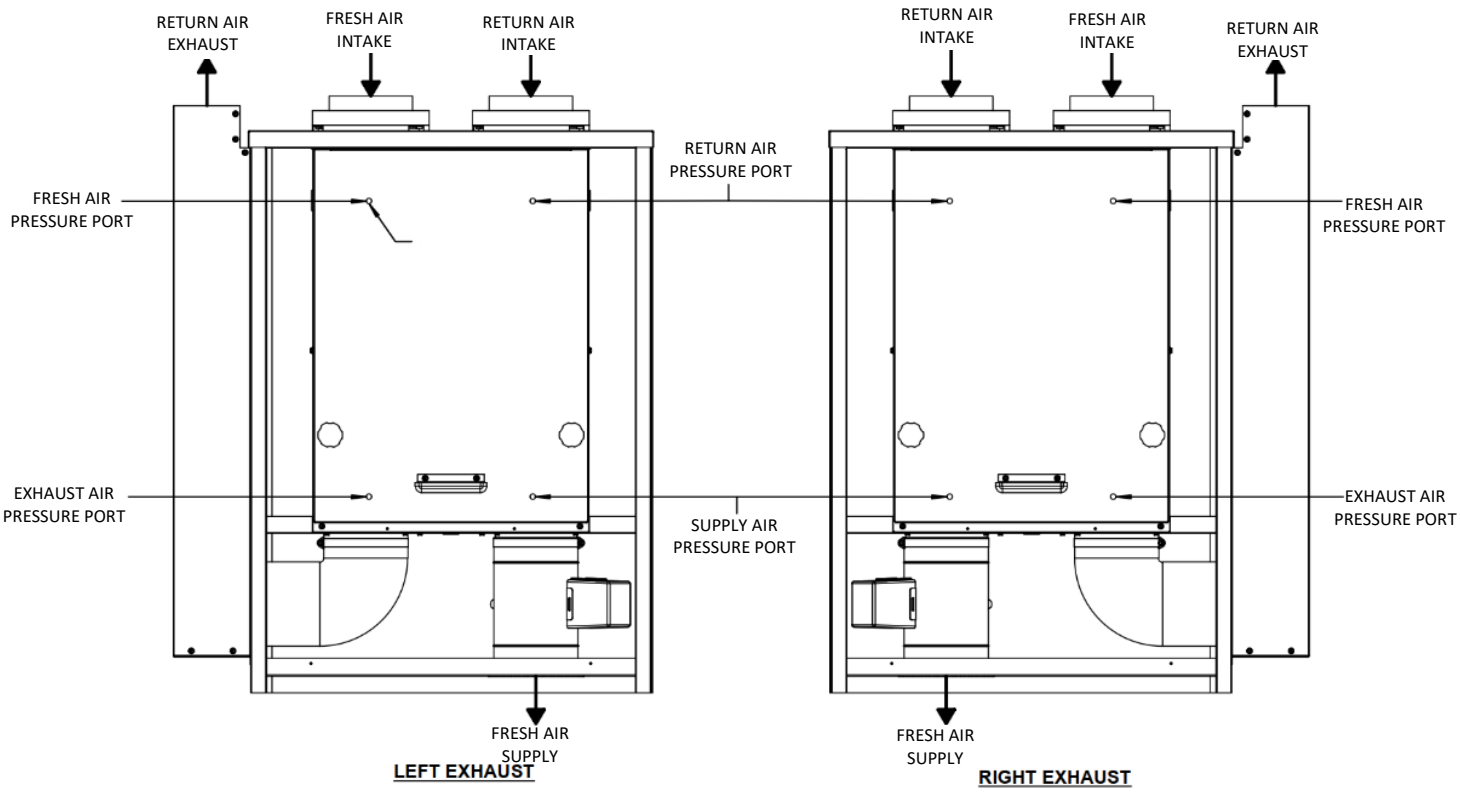


Figure 15 - PRESSURE PORTS

FINAL PREPARATION

Install thermostats and perform any other final wiring required.

Vacuum dirt and debris from cabinet interior and check blower housing and wheel.

Give the blower wheel a quick spin to verify freedom of movement.

Verify that drain pan is clear and all connections tight. Pour a pint of water into the pan and see that it drains away. This can be best done by temporarily removing the air filter and slowly pouring the water through the slots ahead of the coil. Replace air filter when done.

Make one last air purging of the coil and related piping. Make sure service valves are now open and that motorized valves are set to automatic.

If equipped with a balance valve in the return line then set it for the required flow.

Check the filter for direction and seating ahead of the coil.

Install and set the return and supply grilles which are shipped separately.

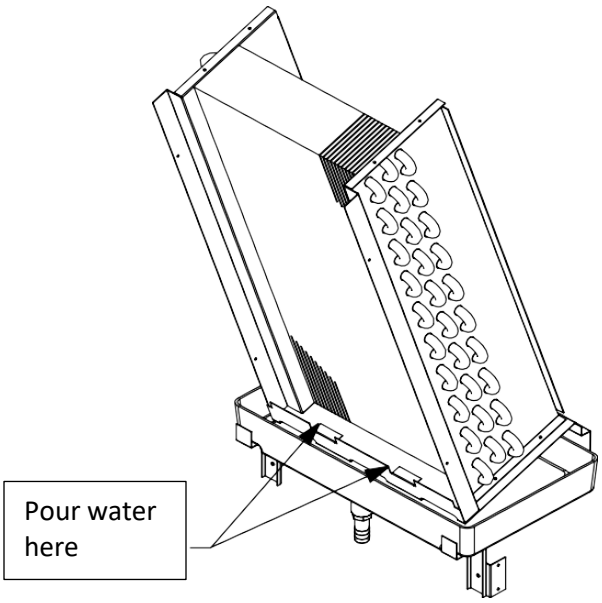


Figure -16

CONDENSATION

After installation and prior to startup care must be taken to avoid condensation problems within units which are allowed to cool down below room air dew point, remain at high humidity and have little or no fan operation.

It can actually “rain” condensation inside of the cabinets and create water damage issues if not addressed. Automatic waterflow valves address this issue and their use is recommended by the manufacturer. They allow the cold water to bypass a coil that is not in use with no air circulation. Two- and three-way automatic valves accomplish this task.

If the system has been installed without the benefit of an automatic water flow control valve, constant fan operation, or a positive coil shut off that operates when unit is not in operation, then it is the responsibility of the installing contractor to properly start up the system in such a way as to avoid any such problems. It is then the buildings engineer’s responsibility thereafter.

PRE-START UP CHECKS

WARNING

ELECTRIC SHOCK HAZARD

Electrically ground air handler. Connect ground wire to ground terminal marked by the protective earthing symbol IEC 60417-5019.

Failure to do so can result in injury or death.

WARNING

DO NOT touch any rotating component with any object. Damage to the equipment and personal injury can occur.

CAUTION

Any device such as a fan switch or thermostat that has been furnished by the factory for field installation must be wired in strict accordance with the wiring diagram that is supplied with the unit. Failure to do so could result in damage to components and will void all warranties.

Prior to starting the unit:

1. Ensure supply voltage matches nameplate data.
2. Ensure unit is properly grounded.
3. With power off, check blower wheel set-screws for tightness and ensure blower wheels rotate freely and quietly.
4. Ensure the air handler is properly and securely installed.
5. Ensure unit is sloped toward drain line.
6. Ensure unit will be accessible for servicing.
7. Ensure condensate line is properly sized, run, trapped, pitched, and tested.
8. Ensure all cabinet openings and wiring connections have been sealed.
9. Ensure a clean filter is in place and of adequate size.
10. Ensure all access panels are in place and secured.

CAUTION

High efficiency brushless DC motors are wired with power applied at all times. Low voltage thermostat demand will control its use. Refer to unit Wiring Diagram for proper wiring connections.

WARNING

Transformers are multi voltage, It is crucial to refer to unit wiring diagram, transformers wiring diagram as well as unit voltage to ensure proper connections and operation safety.

START UP

COOLING SEASON

The requirement here is to lower the water temperature gradually while avoiding the introduction of high humidity air into the building. Generally, here are the steps:

1. In the spring or early summer start chilled water at about 70°F (21°C). Set the fan speed control at low to medium fan speed on all participating air handlers.
2. Make sure the building is closed to outside air circulation.
3. Reduce chilled water temperature at a rate of 2°F (1.1°C) per day until design temperature is reached.

PERFORMANCE DATA

RR							
CFM							
UNIT MODEL	FAN SPEED	EXTERNAL STATIC PRESSURE					
		0	0.1	0.2	0.3	0.4	0.5
3	HIGH	340	260	220	180	140	70
	MED	320	230	190	145	100	-
	LOW	300	195	150	110	70	-
4	HIGH	400	345	305	270	230	170
	MED	350	280	240	200	160	90
	LOW	320	230	190	145	100	-
6	HIGH	620	580	550	520	500	470
	MED	520	470	440	410	380	340
	LOW	430	370	320	290	250	150
8	HIGH	800	765	715	680	625	570
	MED	690	660	630	600	560	530
	LOW	550	520	480	460	430	400
10	MED HIGH	1100	1060	1020	985	965	930
	MED LOW	1035	1000	960	930	910	885
	LOW	880	850	800	780	770	735
12	HIGH	1260	1190	1165	1130	1100	1050
	MED LOW	1000	910	860	840	830	800
	LOW	790	760	710	670	650	610

TABLE 13 – BLOWER PERFORMANCE DATA

NOTES:
Based on a maximum of 5 rows
Deduct 10% for operations at 208V

Data is subject to change. Please verify most current information on www.firstco.com or www.AE-Air.com websites.

PERFORMANCE DATA (CONTINUED)

MODEL	NOMINAL CFM	GPM	P.D. (FT. WTR.)	75°F DB/ 63°F WB								
				40°F EWT			45°F EWT			50°F EWT		
				TH	SH	TR	TH	SH	TR	TH	SH	TR
03	300	1.5	2.6	10.0	7.7	13.2	8.2	6.9	10.9	6.5	6.1	8.6
		2.5	6.9	12.0	8.6	9.5	9.7	7.6	7.7	7.5	6.7	6.0
		3.5	13.1	13.2	9.2	7.5	10.6	8.0	6.0	8.1	6.9	4.6
04	400	1.5	2.6	11.3	9.3	14.9	9.4	8.5	12.4	7.6	7.4	10.1
		2.5	6.9	13.9	10.5	10.5	11.4	9.4	9.0	8.9	8.3	7.1
		3.5	13.1	15.5	11.3	11.3	12.6	10.0	7.2	9.7	8.7	5.5
06	600	2.5	3.3	15.1	13.1	12.1	13.2	12.3	10.5	11.5	11.5	9.3
		3.5	6.1	17.6	14.4	10.0	15.3	13.1	8.7	13.0	12.3	7.4
		4.5	9.7	19.3	14.7	8.6	16.8	13.7	7.4	14.2	12.7	6.3
08	800	4.0	7.8	20.8	17.6	10.4	18.1	16.5	9.0	15.5	15.5	7.7
		5.0	11.8	22.7	18.3	9.1	19.7	17.1	7.9	16.8	16.0	6.7
		6.0	16.5	24.0	18.8	8.0	20.9	17.6	7.0	17.7	16.4	5.9
10	1000	4.0	9.7	24.2	21.2	12.1	21.0	20.0	10.5	18.9	18.9	9.4
		5.0	14.7	26.7	22.2	10.7	23.2	20.9	9.3	19.7	19.5	7.9
		6.0	20.6	28.5	23.0	9.5	24.8	21.5	8.3	21.1	20.1	7.0
12	1200	4.0	9.7	26.2	24.3	13.1	23.1	23.1	11.5	21.8	21.8	10.9
		5.0	14.7	29.3	25.5	11.7	25.5	24.1	10.2	22.6	22.6	9.1
		6.0	20.6	31.6	26.4	10.6	27.5	24.8	9.2	23.4	23.2	7.8

TABLE 14 – COOLING CAPACITIES - 1

MODEL	NOMINAL CFM	GPM	P.D. (FT. WTR.)	80°F DB 67°F WB								
				40°F EWT			45°F EWT			50°F EWT		
				TH	SH	TR	TH	SH	TR	TH	SH	TR
03	300	1.5	2.6	11.9	8.5	15.8	10.0	7.8	13.3	8.2	7.0	10.9
		2.5	6.9	14.5	9.6	11.5	12.2	8.6	9.7	9.8	7.7	7.8
		3.5	13.1	16.0	10.3	9.1	13.4	9.1	7.6	10.7	8.0	6.1
04	400	1.5	2.6	13.4	10.3	17.7	11.3	9.4	15.1	9.4	8.6	12.5
		2.5	6.9	16.7	11.7	13.3	14.0	10.6	11.1	11.4	9.5	9.1
		3.5	13.1	18.8	12.6	10.6	15.7	11.3	8.9	12.6	10.0	7.2
06	600	2.5	3.3	19.8	14.9	15.8	17.2	14.0	13.8	14.6	13.0	11.7
		3.5	6.1	23.0	16.2	13.1	20.0	15.0	11.4	17.0	13.9	9.7
		4.5	9.7	25.2	17.0	11.2	21.9	15.7	9.8	18.7	14.5	8.3
08	800	4.0	7.8	27.2	20.0	13.6	23.7	18.8	11.8	20.1	17.5	10.1
		5.0	11.8	29.7	21.0	11.9	25.8	19.5	10.3	21.9	18.1	8.8
		6.0	16.5	31.4	21.7	10.5	27.3	20.1	9.1	23.2	18.6	7.7
10	1000	4.0	9.7	31.6	24.2	15.8	27.5	22.7	13.8	23.4	21.2	11.7
		5.0	14.7	34.9	25.2	14.0	30.4	23.8	12.2	25.8	22.1	10.3
		6.0	20.6	37.4	26.4	12.5	32.5	24.5	10.8	27.6	22.7	9.2
12	1200	4.0	9.7	34.3	27.6	17.2	29.8	25.9	14.9	25.4	24.4	12.7
		5.0	14.7	38.4	29.1	15.4	33.4	27.3	13.4	28.4	25.4	11.4
		6.0	20.6	41.4	30.3	13.8	36.0	28.2	12.0	30.6	26.2	10.0

TABLE 15 – COOLING CAPACITIES - 1

Note:
Maximum Water Pressure: 300 PSI (2068.4 kPa)

Data is subject to change. Please verify most current information on www.firstco.com or www.AE-Air.com websites.

PERFORMANCE DATA (CONTINUED)

MODEL	NOMINAL CFM	GPM	P.D. (FT. WTR.)	75°F DB/ 63°F WB								
				40°F EWT			45°F EWT			50°F EWT		
				TH	SH	TR	TH	SH	TR	TH	SH	TR
03	300	1.5	2.1	9.3	7.3	12.5	8.2	6.9	10.9	6.9	6.4	9.2
		2.5	5.6	11.3	8.1	9.1	9.9	7.6	7.9	8.4	7.0	6.7
		3.5	10.8	12.5	8.6	7.2	10.9	8.0	6.2	9.3	7.2	5.3
04	400	1.5	2.1	10.4	8.9	13.8	9.1	8.4	12.0	7.9	7.9	10.5
		2.5	5.6	13.1	10.0	10.5	11.4	9.3	9.1	9.7	8.7	7.7
		3.5	10.8	14.7	10.7	8.4	12.7	10.0	7.3	10.8	9.1	6.2
06	600	2.5	3.6	16.8	13.9	13.4	14.6	13.0	11.7	12.4	12.2	9.9
		3.5	6.8	19.5	15.0	11.2	17.0	14.0	9.7	14.4	13.0	8.3
		4.5	10.8	21.4	15.8	9.5	18.6	14.6	8.3	15.8	13.5	7.0
08	800	3.0	5.1	20.6	17.8	13.7	17.9	16.8	12.0	15.7	15.7	10.5
		4.5	10.8	24.7	19.4	11.0	21.5	18.2	9.6	18.3	16.9	8.1
		6.0	18.4	27.2	20.4	9.1	23.7	19.0	7.9	20.1	17.6	6.7
10	1000	4.0	7.9	26.7	22.6	13.3	23.2	21.2	11.6	19.9	19.9	10.0
		5.5	14.0	30.7	24.2	11.2	26.7	22.6	9.7	22.7	21.1	8.3
		7.0	21.6	33.5	25.3	9.6	29.1	23.6	8.3	24.7	21.9	7.1
12	1200	4.5	9.7	29.7	26.2	13.2	25.9	24.7	11.5	23.2	23.2	10.3
		5.5	14.0	32.8	27.4	11.9	28.5	25.7	10.4	24.2	24.0	8.8
		6.5	18.9	35.1	28.3	10.8	30.5	26.5	9.4	25.9	24.7	8.0

TABLE 16 – COOLING CAPACITIES - 2

MODEL	NOMINAL CFM	GPM	P.D. (FT. WTR.)	80°F DB 67°F WB								
				40°F EWT			45°F EWT			50°F EWT		
				TH	SH	TR	TH	SH	TR	TH	SH	TR
03	300	1.5	2.1	11.5	8.3	15.3	9.7	7.6	12.9	7.9	6.8	10.5
		2.5	5.6	14.0	9.4	11.1	11.7	8.4	9.3	9.4	7.4	7.5
		3.5	10.8	15.5	10.0	8.8	12.9	8.9	7.3	10.3	7.8	5.9
04	400	1.5	2.1	12.9	10.0	17.1	11.0	9.2	14.5	9.1	8.3	12.1
		2.5	5.6	16.1	11.3	12.8	13.5	10.3	10.7	10.9	9.2	8.7
		3.5	10.8	18.1	12.2	10.2	15.1	10.9	8.6	12.1	9.7	6.9
06	600	2.5	3.6	18.9	14.1	15.1	16.5	13.2	13.2	14.0	12.3	11.2
		3.5	6.8	22.0	15.2	12.6	19.2	14.2	10.9	16.3	13.1	9.3
		4.5	10.8	24.2	16.1	10.7	21.0	14.9	9.3	17.9	13.7	7.9
08	800	3.0	5.1	25.7	18.7	12.9	23.7	17.0	11.9	19.0	16.2	9.5
		4.5	10.8	28.1	19.6	11.2	25.9	17.8	10.4	20.7	16.8	8.3
		6.0	18.4	29.7	20.2	9.9	27.4	18.3	9.1	21.9	17.3	7.3
10	1000	4.0	7.9	30.0	22.6	15.0	26.1	21.2	13.0	22.1	19.8	11.1
		5.5	14.0	33.1	23.8	13.2	28.8	22.2	11.5	24.5	20.6	9.8
		7.0	21.6	35.4	24.7	11.8	30.8	22.9	10.3	26.1	21.2	8.7
12	1200	4.5	9.7	32.3	25.5	16.2	28.1	24.0	14.1	23.9	22.5	11.9
		5.5	14.0	36.2	26.9	14.5	31.5	25.2	12.6	26.8	23.5	10.7
		6.5	18.9	39.1	28.0	13.0	34.0	26.1	11.3	28.9	24.2	9.6

TABLE 17 – COOLING CAPACITIES - 2

Note:

Maximum Water Pressure: 300 PSI (2068.4 kPa)

Data is subject to change. Please verify most current information on www.firstco.com or www.AE-Air.com websites.

PERFORMANCE DATA (CONTINUED)

COOLING CAPACITY (1000 BTUH) (3 ROW and 3/2)																				
MODEL	NOMINAL CFM	GPM	P.D. (FT. WTR.)	75°F DB/ 63°F WB									80°F DB 67°F WB							
				40°F EWT			45°F EWT			50°F EWT			40°F EWT			45°F EWT			50°F EWT		
				TH	SH	TR	TH	SH	TR	TH	SH	TR	TH	SH	TR	TH	SH	TR	TH	SH	TR
03	300	1.5	2.6	9.6	7.5	12.8	7.9	6.7	10.5	6.3	5.9	8.3	11.5	8.3	15.3	9.7	7.6	12.9	7.9	6.8	10.5
		2.5	7	11.6	8.4	9.2	9.4	7.4	7.4	7.2	6.5	5.7	14.0	9.4	11.1	11.7	8.4	9.3	9.4	7.4	7.5
		3.5	13.3	12.7	8.9	7.2	10.2	7.8	5.8	7.8	6.7	4.4	15.5	10.0	8.8	12.9	8.9	7.3	10.3	7.8	5.9
04	400	1.5	2.6	10.9	9.1	14.4	9.0	8.2	12.0	7.3	7.2	9.7	12.9	10.0	17.1	11.0	9.2	14.5	9.1	8.3	12.1
		2.5	7	13.4	10.2	10.6	10.9	9.1	8.7	8.5	8.0	6.8	16.1	11.3	12.8	13.5	10.3	10.7	10.9	9.2	8.7
		3.5	13.3	14.9	10.9	8.5	12.1	9.6	6.9	9.3	8.4	5.3	18.1	12.2	10.2	15.1	10.9	8.6	12.1	9.7	6.9
06	600	2.5	3.3	14.5	12.3	11.6	12.6	11.6	10.1	10.9	10.9	8.7	18.9	14.1	15.1	16.5	13.2	13.2	14.0	12.3	11.2
		3.5	6.1	16.8	13.3	9.6	14.6	12.4	8.4	12.4	11.6	7.1	22.0	15.2	12.6	19.2	14.2	10.9	16.3	13.1	9.3
		4.5	9.7	18.4	13.9	8.2	16.0	13.0	7.1	13.6	12.0	6.1	24.2	16.1	10.7	21.0	14.9	9.3	17.9	13.7	7.9
08	800	4.0	7.8	19.7	16.4	9.8	17.1	15.4	8.6	14.5	14.5	7.3	25.7	18.7	12.9	23.7	17.0	11.9	19.0	16.2	9.5
		5.0	11.8	21.4	17.1	8.6	18.6	16.0	7.5	15.8	14.9	6.3	28.1	19.6	11.2	25.9	17.8	10.4	20.7	16.8	8.3
		6.0	16.5	22.7	17.6	7.6	19.7	16.4	6.6	16.8	15.2	5.6	29.7	20.2	9.9	27.4	18.3	9.1	21.9	17.3	7.3
10	1000	4.0	9.7	22.9	19.9	11.4	19.9	18.7	9.9	17.6	17.6	8.8	30.0	22.6	15.0	26.1	21.2	13.0	22.1	19.8	11.1
		5.0	14.7	25.3	20.8	10.1	22.0	19.5	8.8	18.7	18.2	7.5	33.1	23.8	13.2	28.8	22.2	11.5	24.5	20.6	9.8
		6.0	20.6	27.0	21.5	9.0	23.5	20.1	7.8	20.0	18.7	6.7	35.4	24.7	11.8	30.8	22.9	10.3	26.1	21.2	8.7
12	1200	4.0	9.7	24.7	22.5	12.3	21.5	21.3	1.7	20.1	20.1	10.1	32.3	25.5	16.2	28.1	24.0	14.1	23.9	22.5	11.9
		5.0	14.7	27.7	23.7	11.1	24.1	24.1	9.6	20.9	20.9	8.4	36.2	26.9	14.5	31.5	25.2	12.6	26.8	23.5	10.7
		6.0	20.6	29.8	24.5	9.9	25.9	25.9	8.6	22.1	21.5	7.4	39.1	28.0	13.0	34.0	26.1	11.3	28.9	24.2	9.6

TABLE 18 – COOLING CAPACITIES - 3

Note:

Maximum Water Pressure: 300 PSI (2068.4 kPa)

Data is subject to change. Please verify most current information on www.firstco.com or www.AE-Air.com websites.

PERFORMANCE DATA (CONTINUED)

HEATING CAPACITY (1000 BTUH) (3 ROW)							
MODEL	NOMINAL CFM	GPM	P.D. (FT. WTR.)	ENTERING WATER TEMPERATURE			
				180°F	160°F	140°F	120°F
03	300	1.0	1.1	25.5	20.8	16.2	11.5
		1.5	3.9	30.8	25.2	19.5	13.9
		2.0	8.4	32.6	26.7	20.7	14.7
04	400	1.0	1.1	29.4	24.0	18.6	13.2
		2.0	3.9	37.6	30.7	23.8	16.9
		3.0	8.4	40.7	33.3	25.8	18.4
06	600	3.0	4.6	56.3	46.1	35.8	25.6
		4.0	7.8	58.8	48.1	37.4	26.7
		5.0	11.8	60.5	49.5	38.5	27.5
08	800	4.0	7.8	72.0	58.9	45.8	32.7
		5.0	11.8	74.4	60.9	47.4	33.8
		6.0	16.5	76.2	62.3	48.5	34.6
10	1000	4.0	9.7	88.9	72.7	56.8	40.4
		5.0	14.7	92.3	75.5	58.7	42.0
		6.0	20.6	94.7	77.5	60.3	43.1
12	1200	4.0	9.7	100.2	82.0	63.7	45.6
		5.0	14.7	104.5	85.5	66.5	47.5
		6.0	20.6	107.6	88.0	68.4	48.9

TABLE 19 – HEATING CAPACITIES - 1

HEATING CAPACITY (1000 BTUH) (3/1 ROW)							
MODEL	NOMINAL CFM	GPM	P.D. (FT. WTR.)	ENTERING WATER TEMPERATURE			
				180°F	160°F	140°F	120°F
03	300	1.0	1.4	17.7	14.5	11.2	8.0
		2.0	5.2	19.8	16.2	12.6	9.0
		3.0	11.1	20.5	16.8	13.1	9.3
04	400	1.0	1.4	19.1	15.7	12.2	8.7
		2.0	5.2	21.9	17.9	13.9	9.9
		3.0	11.1	22.9	18.7	14.6	10.4
06	600	1.0	2.1	26.4	21.6	16.8	12.0
		2.0	7.3	31.4	25.7	20.0	14.3
		3.0	15.2	33.2	27.2	21.2	15.1
08	800	1.0	2.1	28.2	23.1	18.0	12.8
		2.0	7.3	34.5	28.2	21.9	15.7
		3.0	15.2	37.0	30.3	23.6	16.8
10	1000	1.0	1.1	34.0	27.8	21.7	15.5
		2.0	5.4	42.3	34.6	26.9	19.2
		3.0	13.8	46.0	37.7	29.3	20.9
12	1200	1.5	2.8	40.8	33.4	26.0	18.5
		2.5	9.1	47.3	38.7	30.1	21.5
		3.4	19.6	50.4	41.2	32.1	22.9

TABLE 20 – HEATING CAPACITIES -1

Note:

Maximum Water Pressure: 300 PSI (2068.4 kPa)

Data is subject to change. Please verify most current information on www.firstco.com or www.AE-Air.com websites.

PERFORMANCE DATA (CONTINUED)

HEATING CAPACITY (1000 BTUH) (4 ROW)							
MODEL	NOMINAL CFM	GPM	P.D. (FT. WTR.)	ENTERING WATER TEMPERATURE			
				180°F	160°F	140°F	120°F
03	300	2.0	3.6	32.0	26.2	20.4	14.5
		3.0	8.0	33.7	27.6	21.4	15.3
		4.0	17.3	34.7	28.6	22.1	15.8
04	400	2.0	3.6	40.4	33.0	25.7	18.3
		3.0	8.0	42.8	35.0	27.2	19.5
		4.0	14.0	44.2	36.2	28.2	20.1
06	600	3.0	5.1	60.5	49.5	38.5	27.5
		4.0	8.7	63.2	51.7	40.2	28.7
		5.0	13.1	65.0	53.2	41.4	29.6
08	800	4.0	8.7	79.2	64.8	50.4	36.0
		5.0	13.1	81.8	67.0	52.1	37.2
		6.0	18.4	83.7	68.5	53.3	38.1
10	1000	4.0	7.9	95.5	78.1	60.8	43.4
		5.0	11.8	99.2	81.2	63.1	45.1
		6.0	16.4	102.0	83.5	64.9	46.4
12	1200	4.0	7.9	108.8	89.1	69.3	49.5
		5.0	11.8	113.6	92.9	72.3	51.6
		6.0	16.4	117.1	95.8	74.5	53.2

TABLE 21 – HEATING CAPACITIES - 2

HEATING CAPACITY (1000 BTUH) (4/1 ROW)							
MODEL	NOMINAL CFM	GPM	P.D. (FT. WTR.)	ENTERING WATER TEMPERATURE			
				180°F	160°F	140°F	120°F
03	300	1.0	1.4	16.0	13.1	10.2	7.3
		2.0	17.9	17.9	14.6	11.4	8.1
		3.0	11.1	18.5	15.2	11.8	8.4
04	400	1.0	1.4	17.3	14.2	11.0	7.9
		2.0	5.2	19.8	16.2	12.6	9.0
		3.0	11.1	20.7	16.9	13.2	9.4
06	600	1.0	2.1	23.9	19.6	15.2	10.9
		2.0	7.3	28.4	23.2	18.1	12.9
		3.0	15.2	30.1	24.6	19.2	13.7
08	800	1.0	2.1	25.6	20.9	16.3	11.6
		2.0	7.3	31.3	25.6	19.9	14.2
		3.0	15.2	33.6	27.5	21.4	15.3
10	1000	1.0	1.1	30.9	25.2	19.6	14.0
		2.0	5.4	38.4	31.4	24.4	17.4
		3.0	13.8	41.7	34.2	26.6	19.0
12	1200	1.5	2.8	37.0	30.3	23.6	16.8
		2.5	9.1	42.9	35.1	27.3	19.5
		3.5	19.6	45.7	37.4	29.1	20.8

TABLE 22 – HEATING CAPACITIES - 2

Note:
Maximum Water Pressure: 300 PSI (2068.4 kPa)

Data is subject to change. Please verify most current information on www.firstco.com or www.AE-Air.com websites.

PERFORMANCE DATA (CONTINUED)

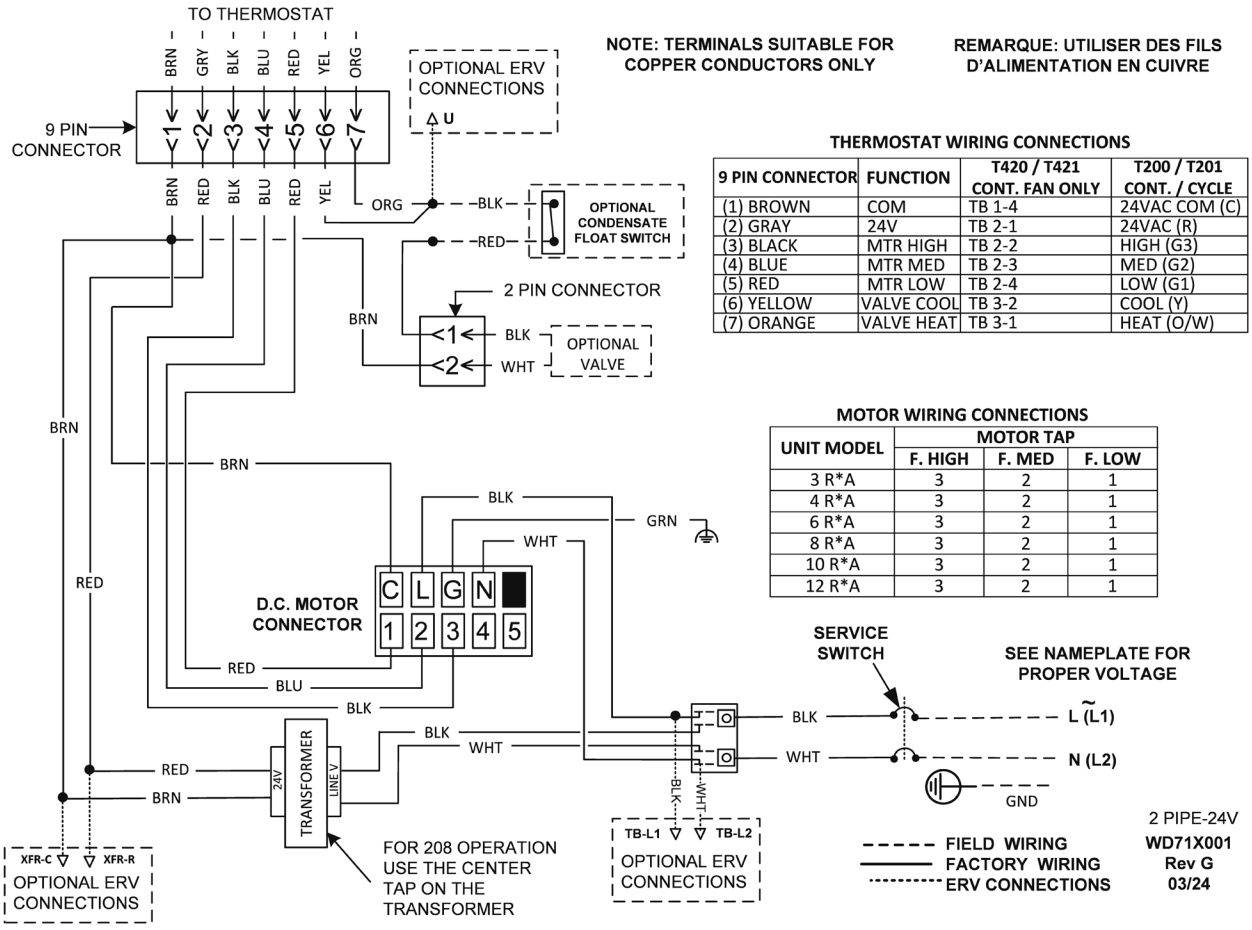
HEATING CAPACITY (1000 BTUH) (3/2 ROW)							
MODEL	NOMINAL CFM	GPM	P.D. (FT. WTR.)	ENTERING WATER TEMPERATURE			
				180°F	160°F	140°F	120°F
03	300	1.0	0.8	21.9	17.8	13.8	9.8
		1.5	3.1	26.1	21.3	16.5	11.7
		2.0	6.7	27.8	22.7	17.6	12.5
04	400	1.0	0.8	25.2	20.5	15.8	11.2
		2.0	3.1	31.3	25.5	19.7	14.0
		3.0	6.7	33.9	27.6	21.4	15.2
06	600	1.0	0.7	27.0	21.9	16.9	11.9
		2.0	2.6	35.5	28.8	22.2	15.7
		3.0	5.6	39.5	32.1	24.8	17.5
08	800	1.0	0.7	29.3	23.7	18.3	12.9
		2.0	2.6	39.8	32.3	24.9	17.5
		3.0	5.6	45.1	36.6	28.2	19.9
10	1000	3.0	5.8	66.6	54.5	42.4	30.3
		4.0	10.3	70.4	57.6	44.8	32.0
		5.0	15.9	72.6	59.4	46.2	33.0
12	1200	3.0	5.8	73.7	30.3	46.9	33.5
		4.0	10.3	78.3	64.1	49.8	35.6
		5.0	15.9	81.2	66.4	51.7	36.9

TABLE 23 – HEATING CAPACITIES - 3

Note:
Maximum Water Pressure: 300 PSI (2068.4 kPa)

Data is subject to change. Please verify most current information on www.firstco.com or www.AE-Air.com websites.

WIRING DIAGRAMS



THERMOSTAT WIRING CONNECTIONS

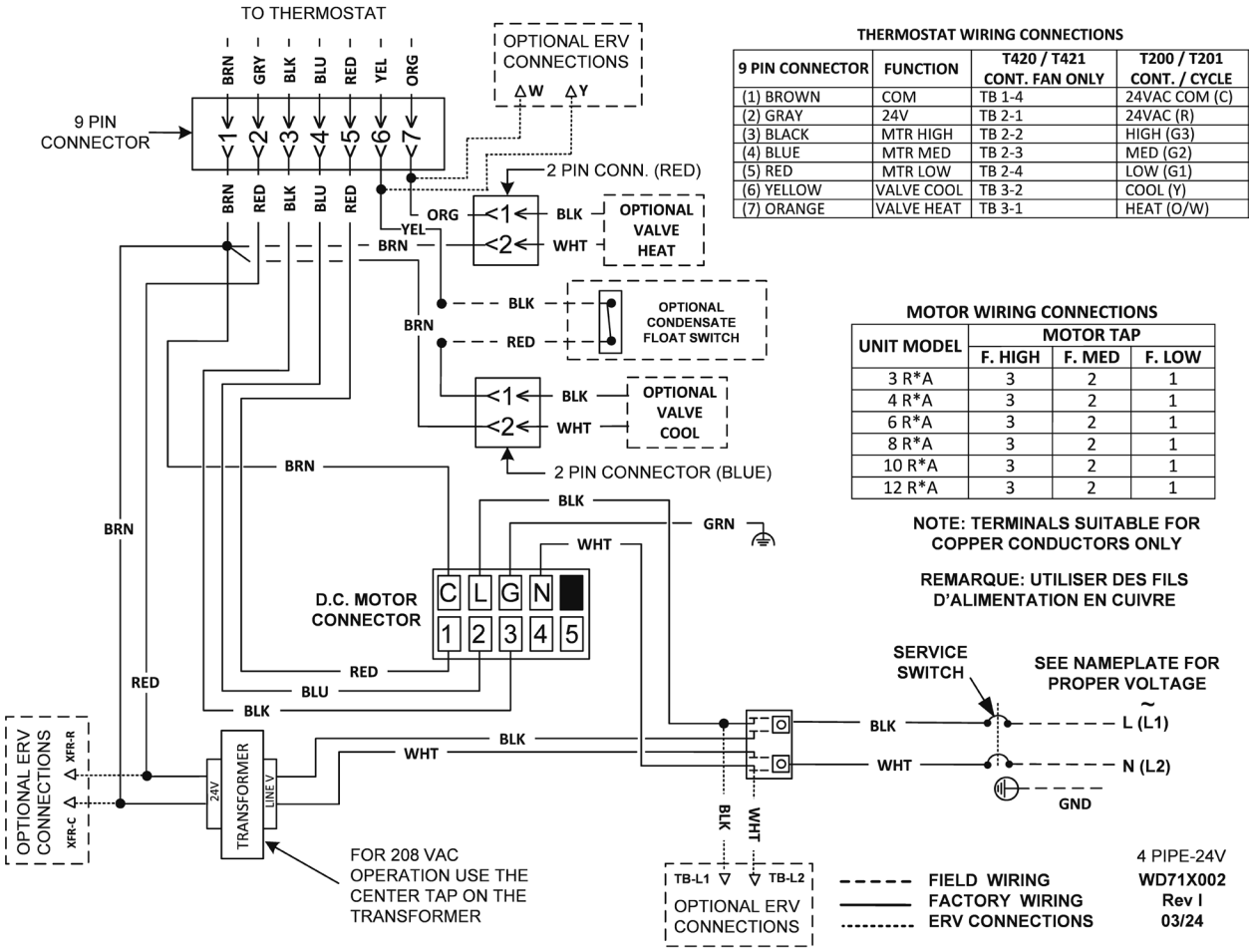
9 PIN CONNECTOR	FUNCTION	T420 / T421 CONT. FAN ONLY	T200 / T201 CONT. / CYCLE
(1) BROWN	COM	TB 1-4	24VAC COM (C)
(2) GRAY	24V	TB 2-1	24VAC (R)
(3) BLACK	MTR HIGH	TB 2-2	HIGH (G3)
(4) BLUE	MTR MED	TB 2-3	MED (G2)
(5) RED	MTR LOW	TB 2-4	LOW (G1)
(6) YELLOW	VALVE COOL	TB 3-2	COOL (Y)
(7) ORANGE	VALVE HEAT	TB 3-1	HEAT (O/W)

MOTOR WIRING CONNECTIONS

UNIT MODEL	MOTOR TAP		
	F. HIGH	F. MED	F. LOW
3 R*A	3	2	1
4 R*A	3	2	1
6 R*A	3	2	1
8 R*A	3	2	1
10 R*A	3	2	1
12 R*A	3	2	1

Figure 17: Riser Wiring Diagram 2 Pipe 24V ECM (WD71X001)

WIRING DIAGRAMS (CONTINUED)



THERMOSTAT WIRING CONNECTIONS

9 PIN CONNECTOR	FUNCTION	T420 / T421 CONT. FAN ONLY	T200 / T201 CONT. / CYCLE
(1) BROWN	COM	TB 1-4	24VAC COM (C)
(2) GRAY	24V	TB 2-1	24VAC (R)
(3) BLACK	MTR HIGH	TB 2-2	HIGH (G3)
(4) BLUE	MTR MED	TB 2-3	MED (G2)
(5) RED	MTR LOW	TB 2-4	LOW (G1)
(6) YELLOW	VALVE COOL	TB 3-2	COOL (Y)
(7) ORANGE	VALVE HEAT	TB 3-1	HEAT (O/W)

MOTOR WIRING CONNECTIONS

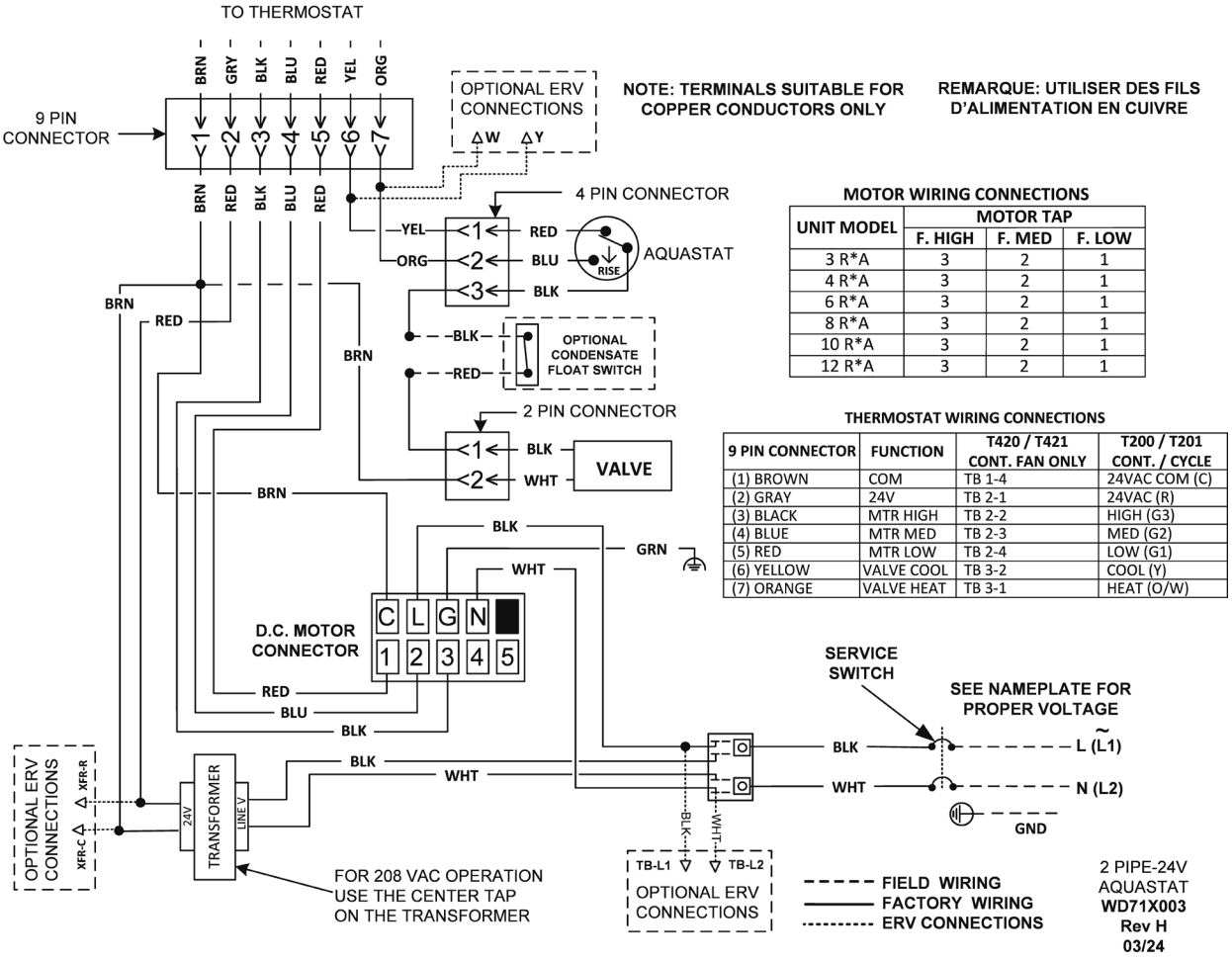
UNIT MODEL	MOTOR TAP		
	F. HIGH	F. MED	F. LOW
3 R*A	3	2	1
4 R*A	3	2	1
6 R*A	3	2	1
8 R*A	3	2	1
10 R*A	3	2	1
12 R*A	3	2	1

NOTE: TERMINALS SUITABLE FOR COPPER CONDUCTORS ONLY

REMARQUE: UTILISER DES FILS D'ALIMENTATION EN CUIVRE

Figure 18- Riser Wiring Diagram 4-Pipe 24V ECM (WD71X002)

WIRING DIAGRAMS (CONTINUED)



MOTOR WIRING CONNECTIONS

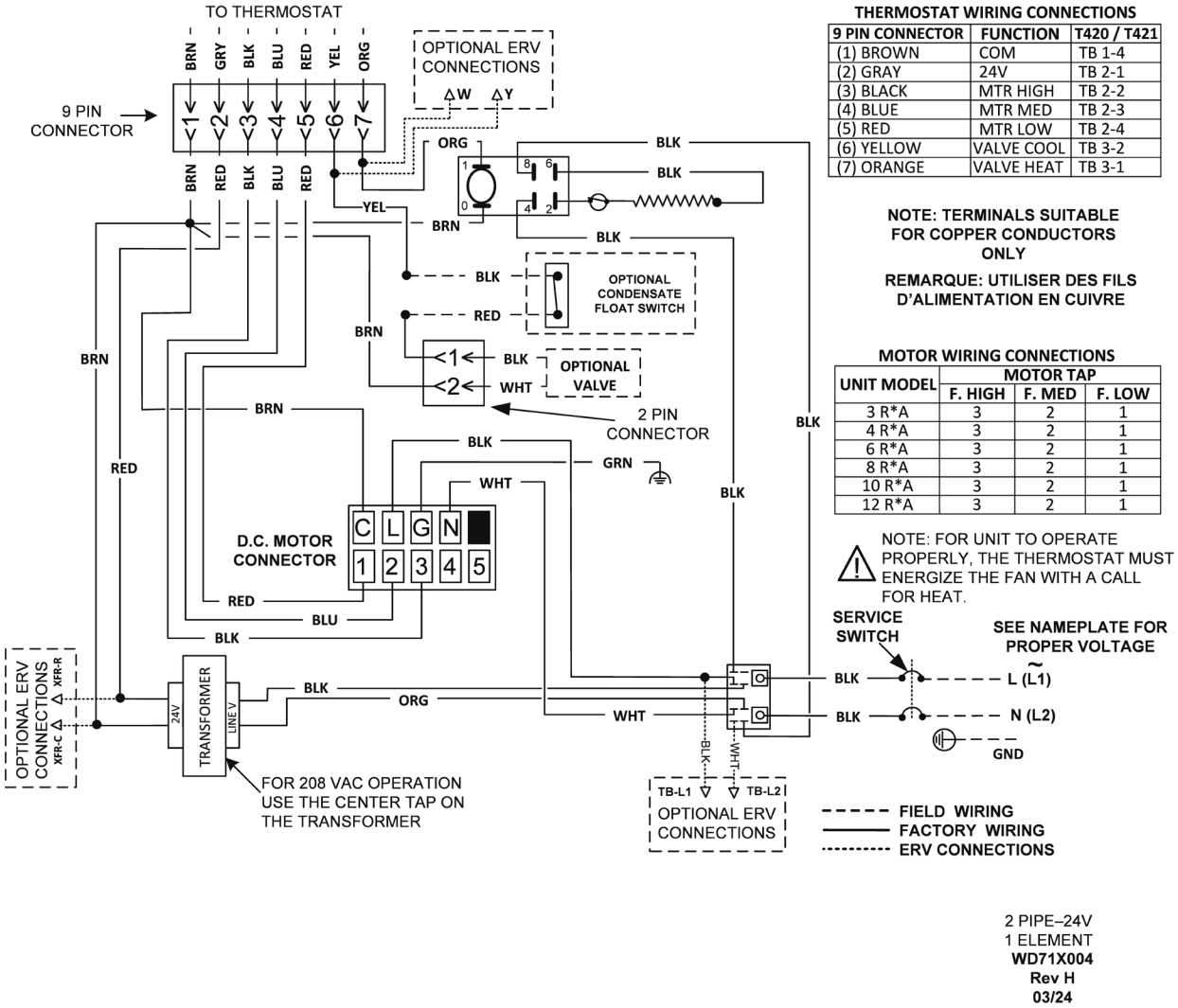
UNIT MODEL	MOTOR TAP		
	F. HIGH	F. MED	F. LOW
3 R*A	3	2	1
4 R*A	3	2	1
6 R*A	3	2	1
8 R*A	3	2	1
10 R*A	3	2	1
12 R*A	3	2	1

THERMOSTAT WIRING CONNECTIONS

9 PIN CONNECTOR	FUNCTION	T420 / T421 CONT. FAN ONLY	T200 / T201 CONT. / CYCLE
(1) BROWN	COM	TB 1-4	24VAC COM (C)
(2) GRAY	24V	TB 2-1	24VAC (R)
(3) BLACK	MTR HIGH	TB 2-2	HIGH (G3)
(4) BLUE	MTR MED	TB 2-3	MED (G2)
(5) RED	MTR LOW	TB 2-4	LOW (G1)
(6) YELLOW	VALVE COOL	TB 3-2	COOL (Y)
(7) ORANGE	VALVE HEAT	TB 3-1	HEAT (O/W)

Figure 19- Riser Wiring Diagram 2-Pipe 24V ECM W/Aquastat (WD71X003)

WIRING DIAGRAMS (CONTINUED)



THERMOSTAT WIRING CONNECTIONS

9 PIN CONNECTOR	FUNCTION	T420 / T421
(1) BROWN	COM	TB 1-4
(2) GRAY	24V	TB 2-1
(3) BLACK	MTR HIGH	TB 2-2
(4) BLUE	MTR MED	TB 2-3
(5) RED	MTR LOW	TB 2-4
(6) YELLOW	VALVE COOL	TB 3-2
(7) ORANGE	VALVE HEAT	TB 3-1

NOTE: TERMINALS SUITABLE FOR COPPER CONDUCTORS ONLY

REMARQUE: UTILISER DES FILS D'ALIMENTATION EN CUIVRE

MOTOR WIRING CONNECTIONS

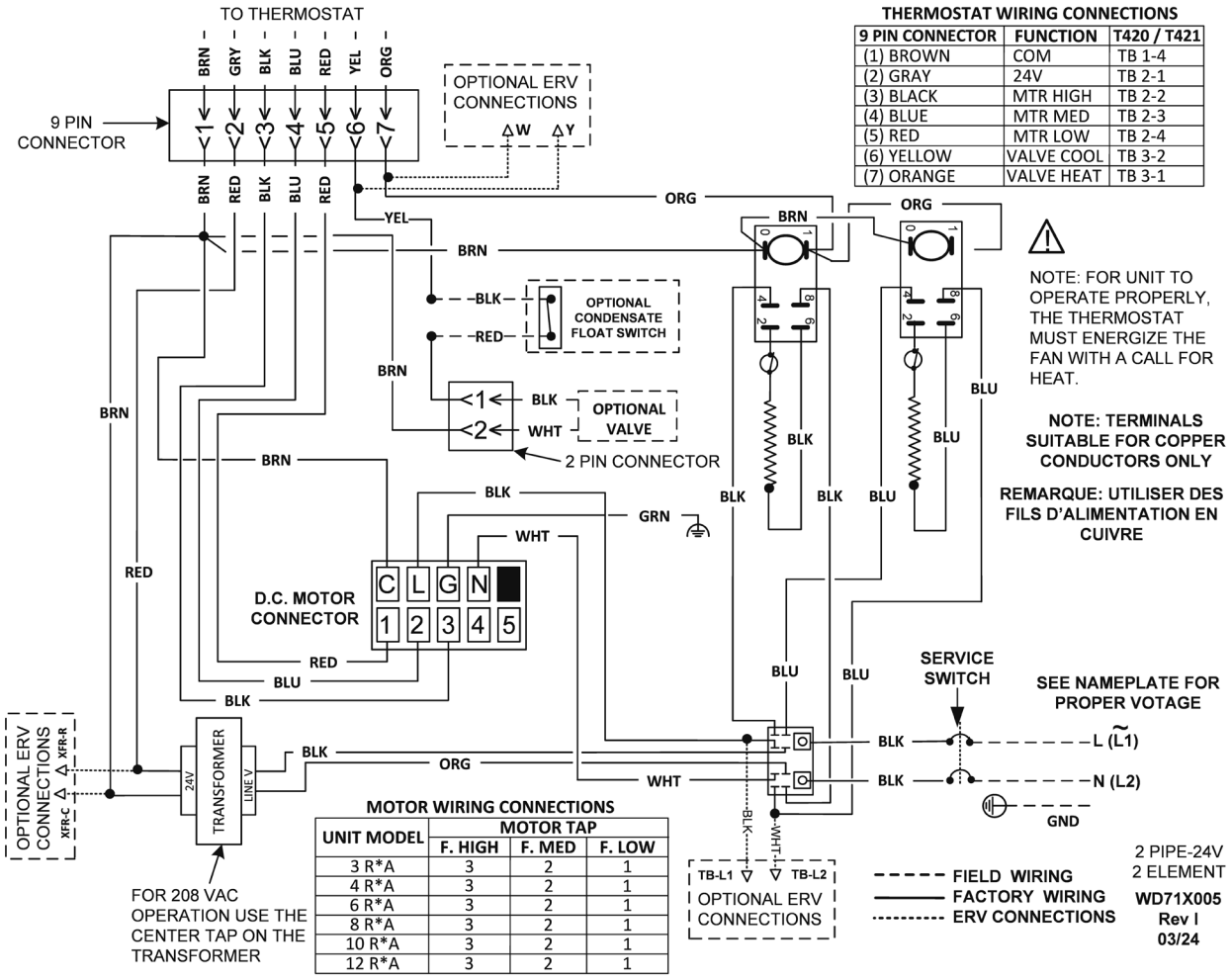
UNIT MODEL	MOTOR TAP		
	F. HIGH	F. MED	F. LOW
3 R*A	3	2	1
4 R*A	3	2	1
6 R*A	3	2	1
8 R*A	3	2	1
10 R*A	3	2	1
12 R*A	3	2	1

NOTE: FOR UNIT TO OPERATE PROPERLY, THE THERMOSTAT MUST ENERGIZE THE FAN WITH A CALL FOR HEAT.

2 PIPE–24V
1 ELEMENT
WD71X004
Rev H
03/24

Figure 20- Riser Wiring Diagram 2-Pipe 24V ECM Single Element (WD71X004)

WIRING DIAGRAMS (CONTINUED)



THERMOSTAT WIRING CONNECTIONS

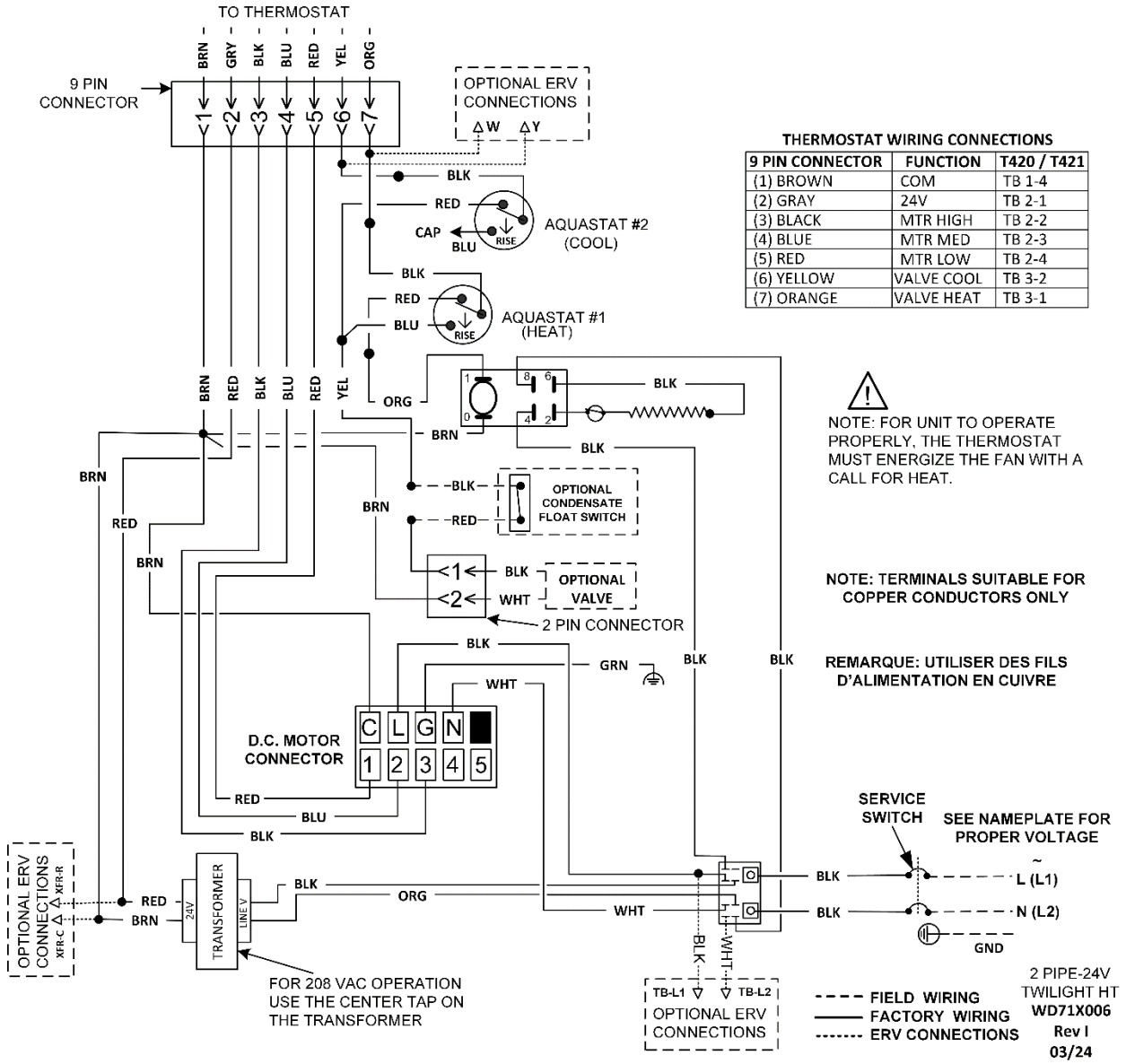
9 PIN CONNECTOR	FUNCTION	T420 / T421
(1) BROWN	COM	TB 1-4
(2) GRAY	24V	TB 2-1
(3) BLACK	MTR HIGH	TB 2-2
(4) BLUE	MTR MED	TB 2-3
(5) RED	MTR LOW	TB 2-4
(6) YELLOW	VALVE COOL	TB 3-2
(7) ORANGE	VALVE HEAT	TB 3-1

MOTOR WIRING CONNECTIONS

UNIT MODEL	MOTOR TAP		
	F. HIGH	F. MED	F. LOW
3 R*A	3	2	1
4 R*A	3	2	1
6 R*A	3	2	1
8 R*A	3	2	1
10 R*A	3	2	1
12 R*A	3	2	1

Figure 21- Riser Wiring Diagram 2-Pipe 24V ECM Double Element (WD71X005)

WIRING DIAGRAMS (CONTINUED)

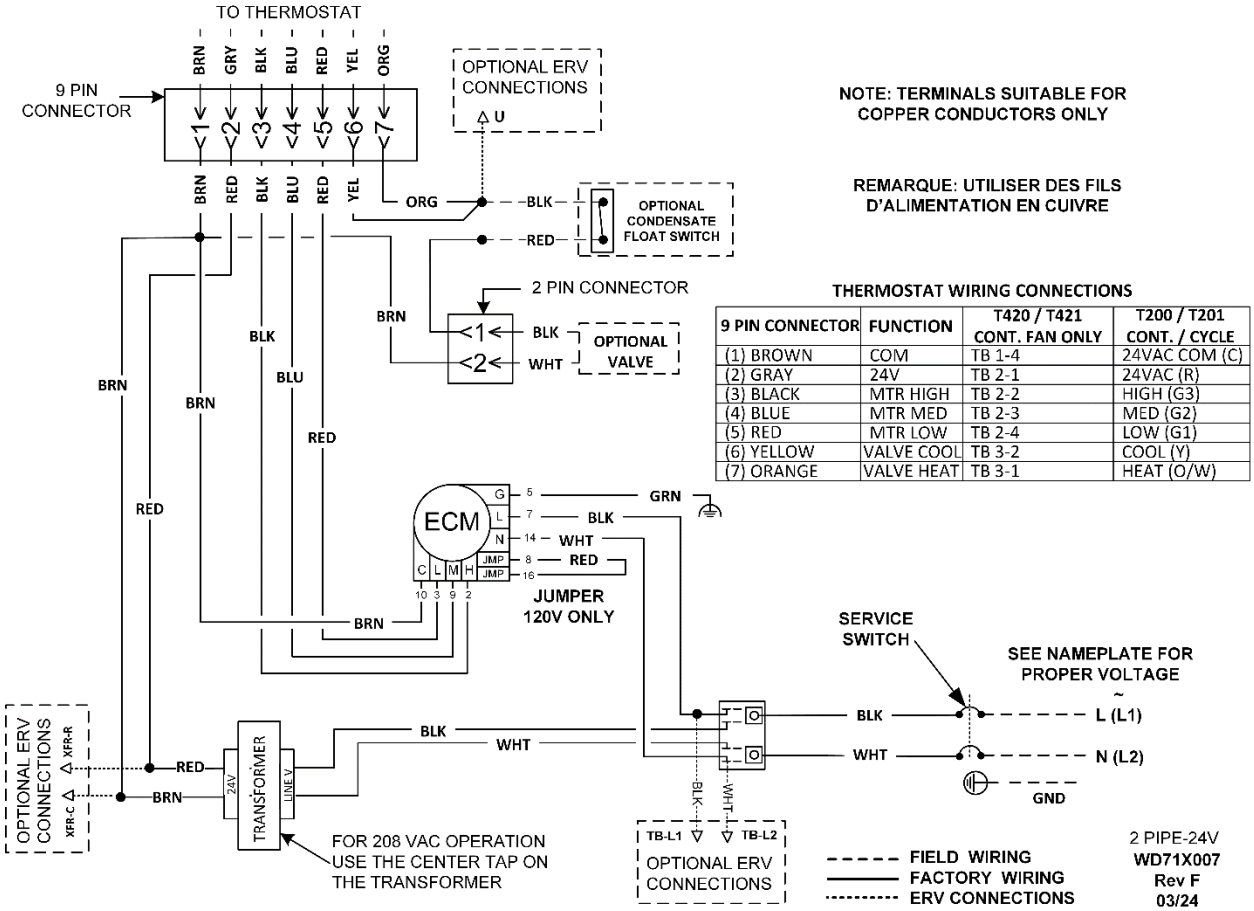


THERMOSTAT WIRING CONNECTIONS

9 PIN CONNECTOR	FUNCTION	T420 / T421
(1) BROWN	COM	TB 1-4
(2) GRAY	24V	TB 2-1
(3) BLACK	MTR HIGH	TB 2-2
(4) BLUE	MTR MED	TB 2-3
(5) RED	MTR LOW	TB 2-4
(6) YELLOW	VALVE COOL	TB 3-2
(7) ORANGE	VALVE HEAT	TB 3-1

Figure 22: Riser Wiring Diagram 2-Pipe 24V ECM TWILIGHT HT (WD71X006)

WIRING DIAGRAMS (CONTINUED)

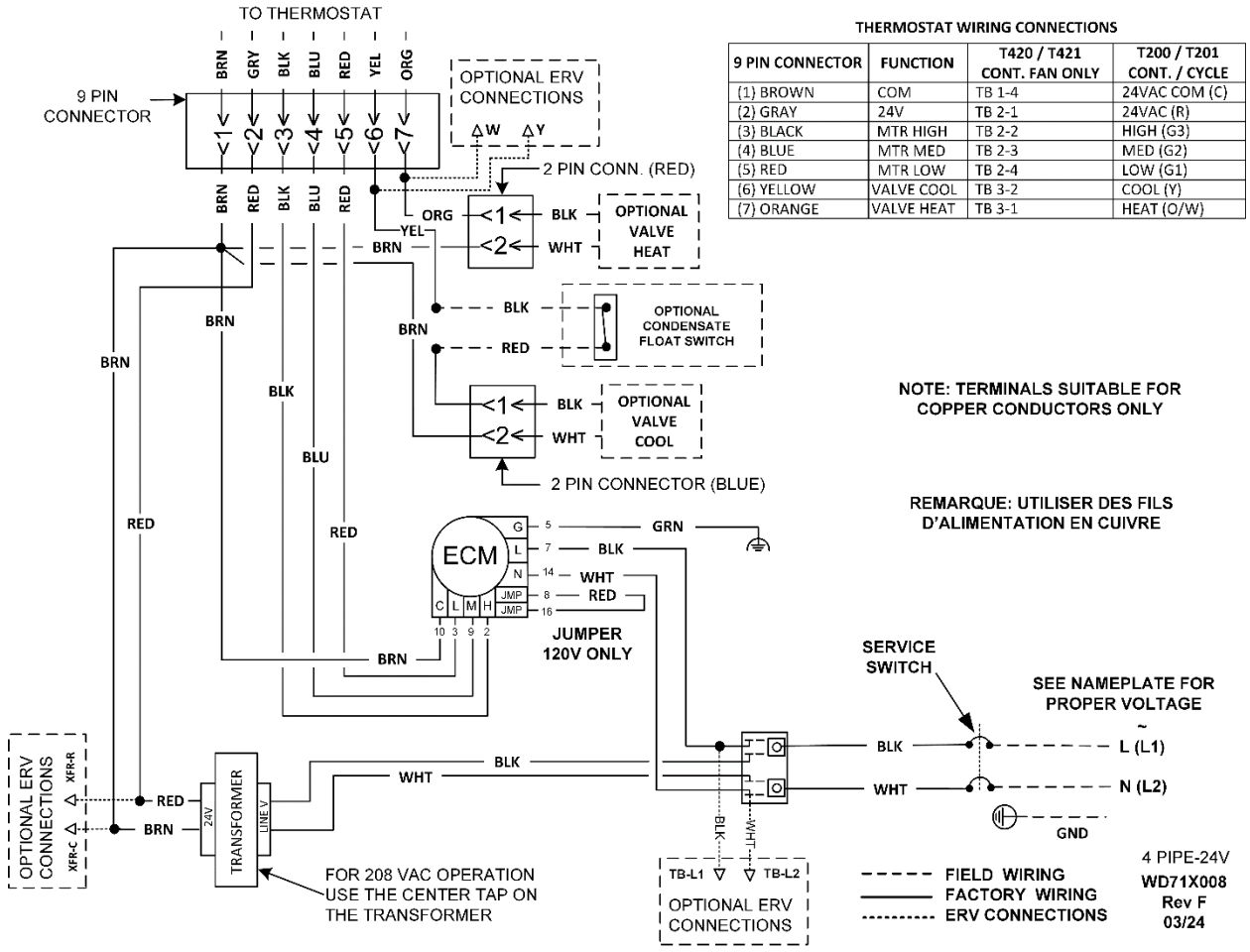


THERMOSTAT WIRING CONNECTIONS

9 PIN CONNECTOR	FUNCTION	T420 / T421 CONT. FAN ONLY	T200 / T201 CONT. / CYCLE
(1) BROWN	COM	TB 1-4	24VAC COM (C)
(2) GRAY	24V	TB 2-1	24VAC (R)
(3) BLACK	MTR HIGH	TB 2-2	HIGH (G3)
(4) BLUE	MTR MED	TB 2-3	MED (G2)
(5) RED	MTR LOW	TB 2-4	LOW (G1)
(6) YELLOW	VALVE COOL	TB 3-2	COOL (Y)
(7) ORANGE	VALVE HEAT	TB 3-1	HEAT (O/W)

Figure 23: Riser Wiring Diagram 2-Pipe 24V PIKA (WD71X007)

WIRING DIAGRAMS (CONTINUED)



THERMOSTAT WIRING CONNECTIONS

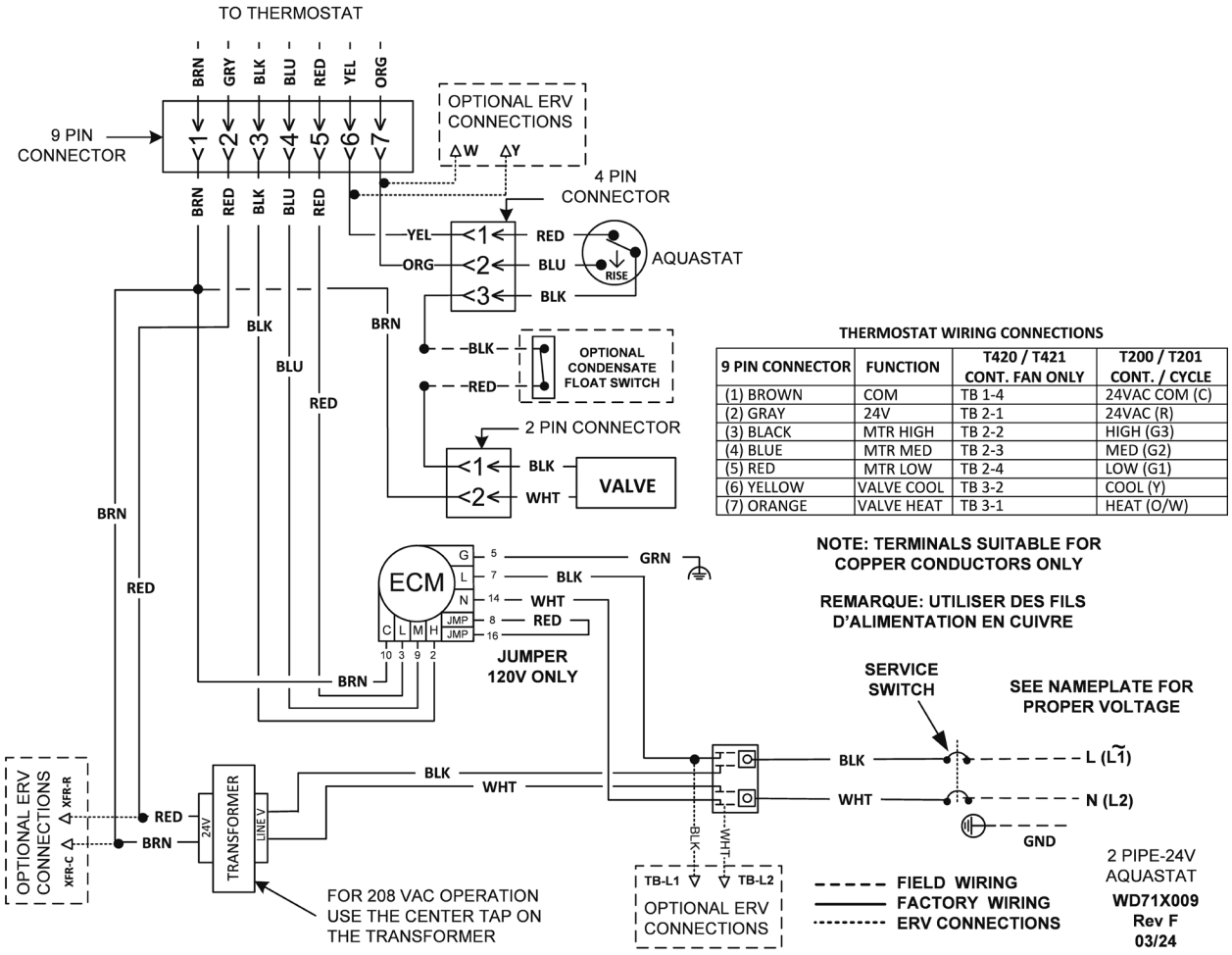
9 PIN CONNECTOR	FUNCTION	T420 / T421 CONT. FAN ONLY	T200 / T201 CONT. / CYCLE
(1) BROWN	COM	TB 1-4	24VAC COM (C)
(2) GRAY	24V	TB 2-1	24VAC (R)
(3) BLACK	MTR HIGH	TB 2-2	HIGH (G3)
(4) BLUE	MTR MED	TB 2-3	MED (G2)
(5) RED	MTR LOW	TB 2-4	LOW (G1)
(6) YELLOW	VALVE COOL	TB 3-2	COOL (Y)
(7) ORANGE	VALVE HEAT	TB 3-1	HEAT (O/W)

NOTE: TERMINALS SUITABLE FOR COPPER CONDUCTORS ONLY

REMARQUE: UTILISER DES FILS D'ALIMENTATION EN CUIVRE

Figure 24- Riser Wiring Diagram 4-Pipe 24V PIKA (WD71X008)

WIRING DIAGRAMS (CONTINUED)

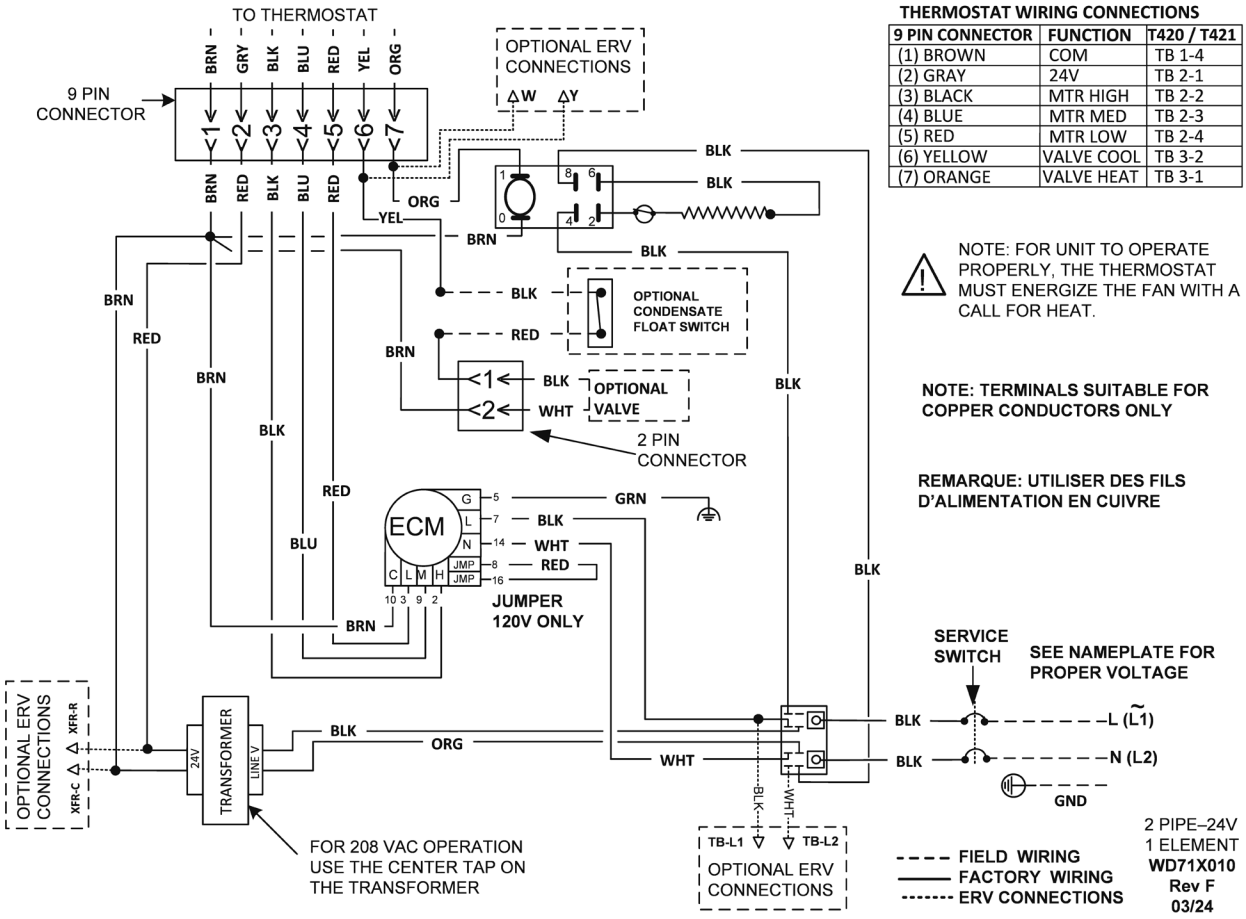


THERMOSTAT WIRING CONNECTIONS

9 PIN CONNECTOR	FUNCTION	T420 / T421 CONT. FAN ONLY	T200 / T201 CONT. / CYCLE
(1) BROWN	COM	TB 1-4	24VAC COM (C)
(2) GRAY	24V	TB 2-1	24VAC (R)
(3) BLACK	MTR HIGH	TB 2-2	HIGH (G3)
(4) BLUE	MTR MED	TB 2-3	MED (G2)
(5) RED	MTR LOW	TB 2-4	LOW (G1)
(6) YELLOW	VALVE COOL	TB 3-2	COOL (Y)
(7) ORANGE	VALVE HEAT	TB 3-1	HEAT (O/W)

Figure 25- Riser Wiring Diagram 2-Pipe 24V PIKA W/Aquastat (WD71X009)

WIRING DIAGRAMS (CONTINUED)



THERMOSTAT WIRING CONNECTIONS

9 PIN CONNECTOR	FUNCTION	T420 / T421
(1) BROWN	COM	TB 1-4
(2) GRAY	24V	TB 2-1
(3) BLACK	MTR HIGH	TB 2-2
(4) BLUE	MTR MED	TB 2-3
(5) RED	MTR LOW	TB 2-4
(6) YELLOW	VALVE COOL	TB 3-2
(7) ORANGE	VALVE HEAT	TB 3-1

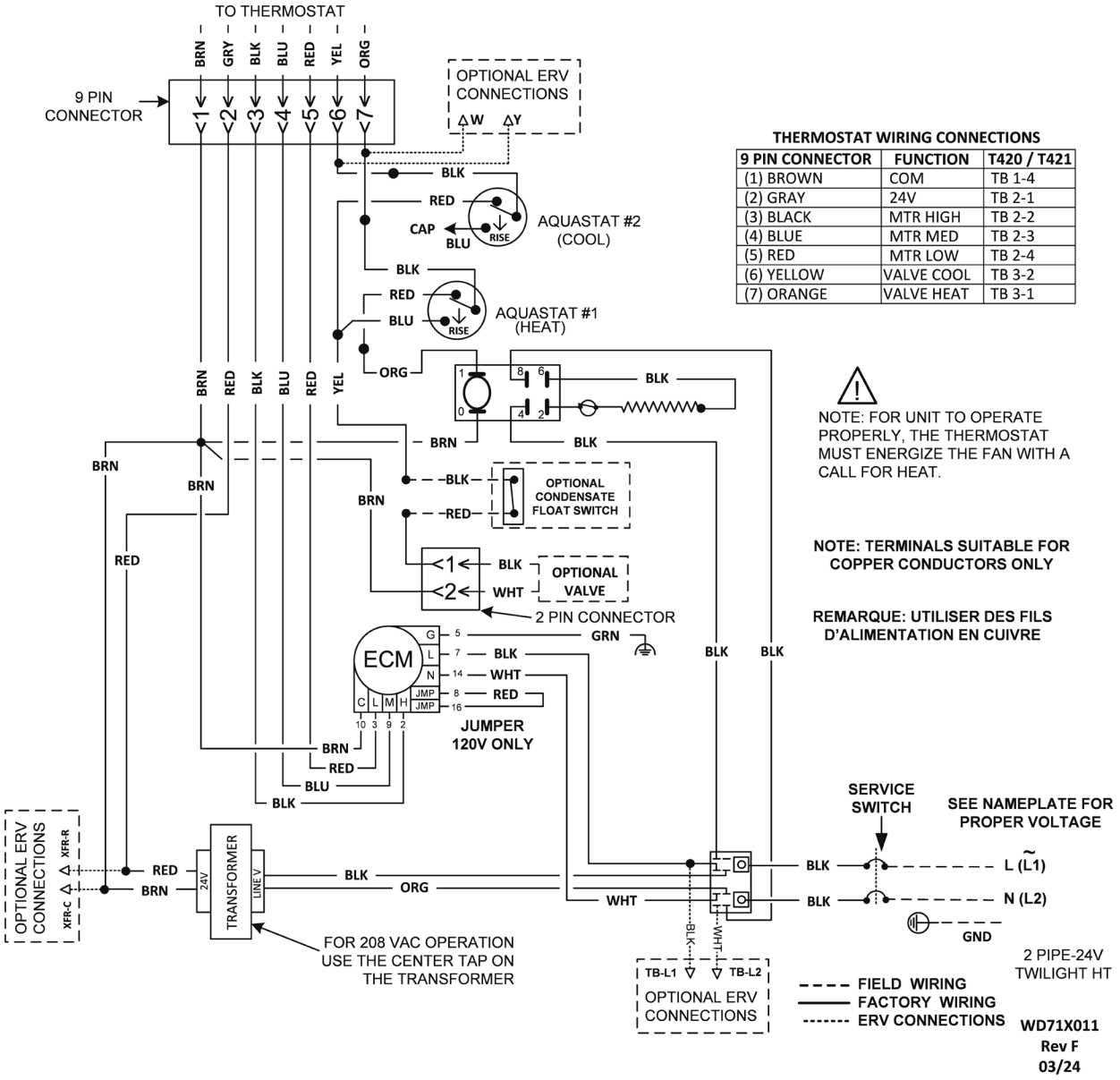
NOTE: FOR UNIT TO OPERATE PROPERLY, THE THERMOSTAT MUST ENERGIZE THE FAN WITH A CALL FOR HEAT.

NOTE: TERMINALS SUITABLE FOR COPPER CONDUCTORS ONLY

REMARQUE: UTILISER DES FILS D'ALIMENTATION EN CUIVRE

Figure 26- Riser Wiring Diagram 2-Pipe 24V PIKA Single Element (WD71X010)

WIRING DIAGRAMS (CONTINUED)



THERMOSTAT WIRING CONNECTIONS

9 PIN CONNECTOR	FUNCTION	T420 / T421
(1) BROWN	COM	TB 1-4
(2) GRAY	24V	TB 2-1
(3) BLACK	MTR HIGH	TB 2-2
(4) BLUE	MTR MED	TB 2-3
(5) RED	MTR LOW	TB 2-4
(6) YELLOW	VALVE COOL	TB 3-2
(7) ORANGE	VALVE HEAT	TB 3-1

NOTE: FOR UNIT TO OPERATE PROPERLY, THE THERMOSTAT MUST ENERGIZE THE FAN WITH A CALL FOR HEAT.

NOTE: TERMINALS SUITABLE FOR COPPER CONDUCTORS ONLY

REMARQUE: UTILISER DES FILS D'ALIMENTATION EN CUIVRE

Figure 27- Riser Wiring Diagram 2-Pipe 24V ECM TWILIGHT HT (WD71X011)

WIRING DIAGRAMS (CONTINUED)

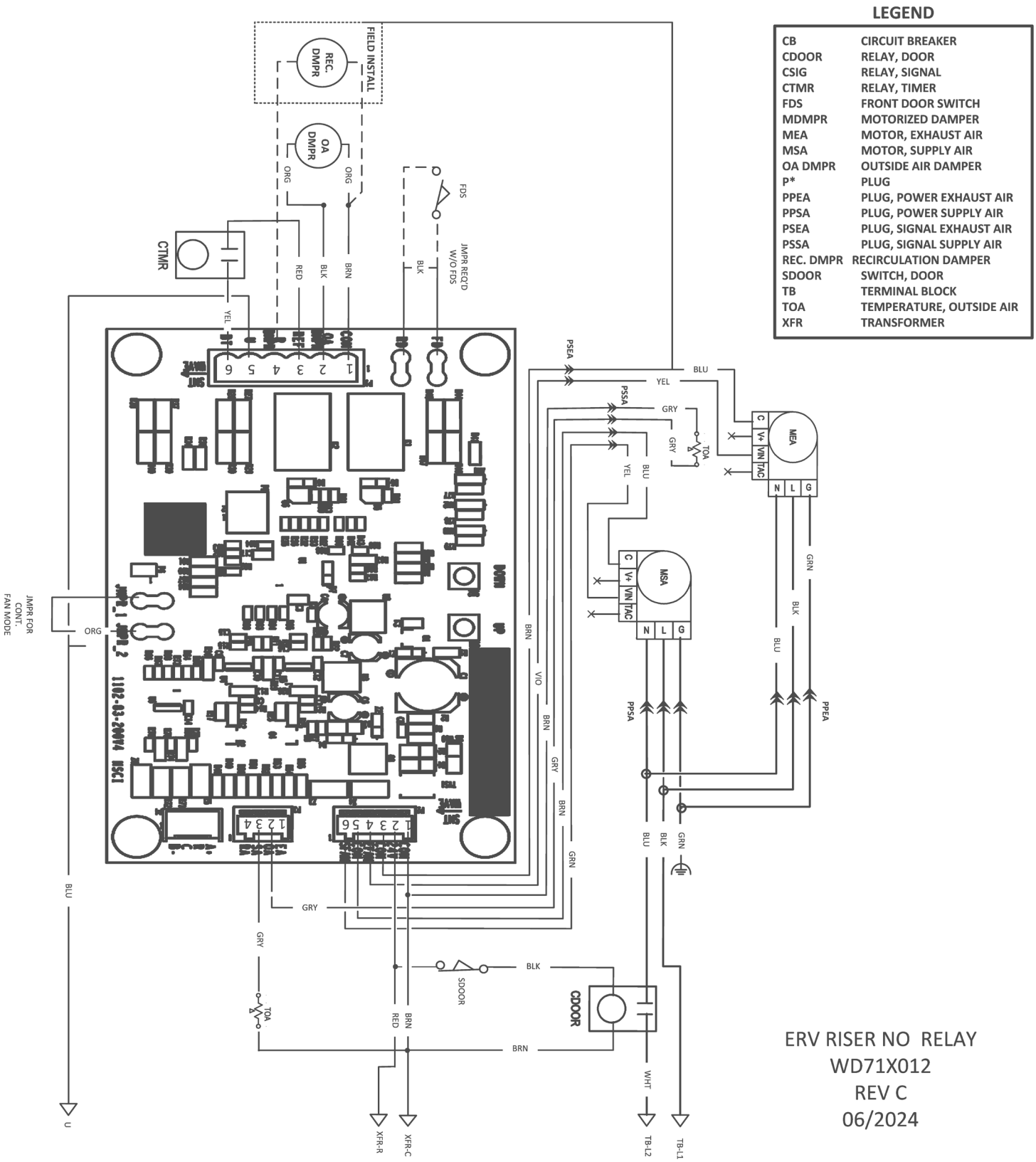


Figure 28: Riser ERV Wiring Diagram W/O Signal Relay (WD71X012)

WIRING DIAGRAMS (CONTINUED)

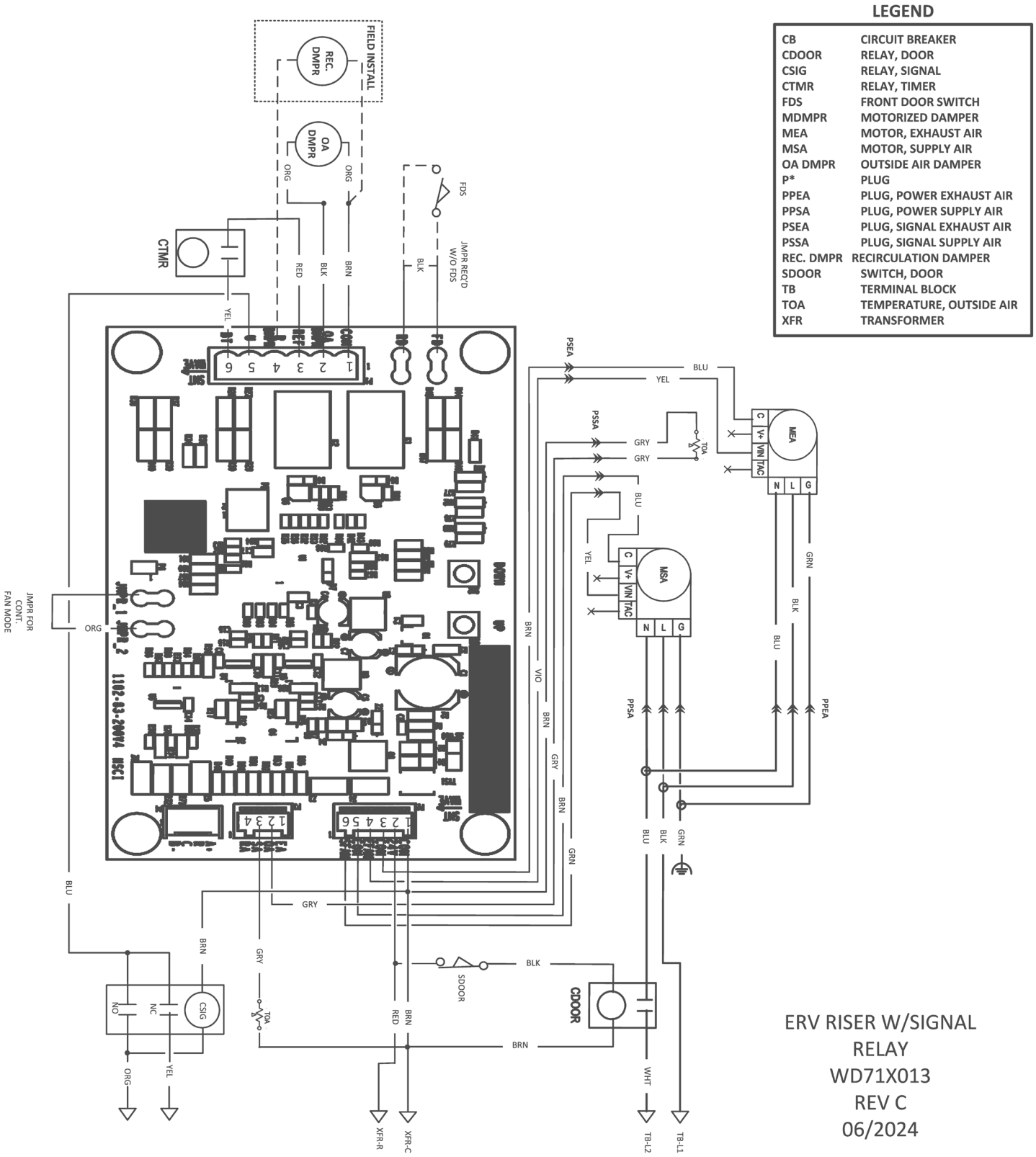


Figure 29: Riser ERV Wiring Diagram With Signal Relay (WD71X013)

MAINTENANCE

WARNING

ELECTRIC SHOCK HAZARD

Service and maintenance to internal components and wiring must not be performed until the main disconnect switch is turned off. Failure to do so will result in electrical shock causing personal injury or death.

NOTE

For continuing high performance, and to minimize possible equipment failure, it is essential that periodic maintenance be performed on this equipment. To achieve maximum performance and service life of each piece of equipment a formal schedule of regular maintenance should be established and maintained by a certified contractor. The following is provided as a recommended maintenance schedule.

MONTHLY CHECK LIST

1. If unit has ERV; Inspect the coil and ERV air filters. Clean or replace as required.
2. Inspect the drain pan to be sure it is clean to permit the flow of condensate through the drain lines.
3. Inspect the supply and return air grilles for dust and fiber accumulation.

YEARLY CHECK LIST

1. Clean the blower motor and oil if required.
2. Inspect the air handler unit casing for corrosion and loose fasteners.
3. If unit has ERV; Inspect ERV CORE for damage and dust/particulate build up at least two (2) times per year
4. If unit has ERV; The ERV interior should be inspected with the CORE (2 times a year). Check and clean the cabinet interior of all dirt and debris. Also check to ensure the ERV fans spin freely.
5. Inspect the blower wheel and housing for cleanliness and/or looseness. Clean if necessary. Adjust and tighten if necessary.
6. Inspect all coil connections for leaks. Inspect the coil fins for excessive dirt or damage. Clean or repair if required.
7. Inspect all hoses for any wear or decay. Replace if necessary or replace every 7 years.
8. Inspect electrical connections for tightness and controls for proper operating each heating and cooling season.
9. If strainers are installed in the valve packages, clean per manufactures directions.

BLOWER ASSEMBLY

The Blower should be inspected and cleaned annually, in conjunction with maintenance of the motor and bearings. It is important to keep the wheels clean in order to avoid imbalance and vibration.

Check the blower wheel for accumulation of dirt, debris or filter fibers. Clean with brush and/or high-pressure air.

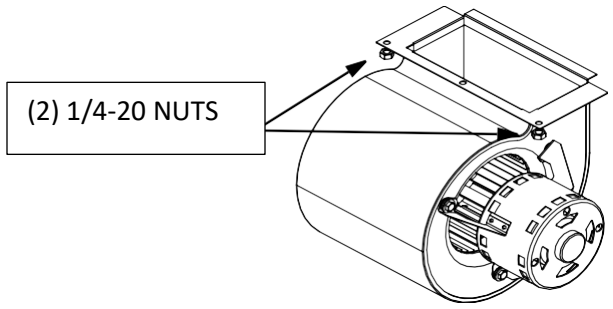


FIGURE 30

BLOWER HOUSING REMOVAL

Disconnect fan harness, from the motor, with the quick release tab on the connector at the right end of the motor. Be prepared to support the weight of the blower housing and motor. Remove two nuts in the front of the blower housing assembly to release the fan from the blower deck above. Rotate down and then pull assembly out.

MOTOR

Check motor connections to ensure that they are secure and made in accordance with the wiring diagram.

The blower motor should be cleaned annually.

WARNING

ELECTRIC SHOCK HAZARD

Units with ECM motors have line voltage power applied at all times. Make sure power is disconnected before servicing.

MAINTENANCE (CONTINUED)

FILTER

The air filter should be cleaned or replaced every 30 days or more frequently if severe conditions exist. Always replace the filter with the same type as originally furnished.

To replace filter, remove return air grille, move filter forward and then lift up and out.

CAUTION

Never operate unit without a filter or with filter not fully seated. Damage to blower motor or coil can result. Failure to follow this CAUTION could result in personal injury or product and property damage.

COIL

Any dust or other contaminants which accumulate on the heat transfer surfaces interferes with the air flow and impairs heat transfer.

COIL CLEANING

Remove return air grille and filter, then brush fins up and down, not side to side, with a stiff bristle brush. Follow with a vacuum cleaner.

This method is preferred over compressed air since the dirt can be driven deeper into the coil with no benefit.

Replace filter or preferably install a new one and then the return air grille once finished.

ERV MAINTENANCE

The ERV CORE should be cleaned at least once per year, or more frequently if it accumulates significant dust/particulates during normal operation. To Clean to CORE, remove it from the system and orient the plates vertically to ensure drainage. Use Low pressure water to rinse both paths (supply and exhaust) and ensure exposure to all layers. If the CORE is heavily soiled, a solution of less than 1:100 parts water to a mild detergent, such as Dawn or Palmolive, can be used to help clean the CORE. DO NOT USE Hydroxide based cleaners or coil cleaning agents to clean the CORE exchanger as it may void the warranty.

If a detergent solution was used, thoroughly rinse with clean tap water until there are no more bubbles in the exiting water. Allow the CORE to completely dry, remaining in the vertical orientation before placing it back into the unit.

STEEL BRAIDED HOSES

1. Inspect hoses under pressure. Check for strain, be it severe tension, twisting or too small a bend radius.
2. Check for drips or incursion of subsequently installed equipment or structures. These can affect the hoses' ability to absorb movement or reduce required bend radii.
3. Immediately relieve pressure and replace hose assembly if visual inspection shows damage to the exterior braid such as fraying or broken wires.

Replace Steel Braided Hoses every 7 years.

MAINTENANCE (CONTINUED)

DRAIN PIPING

The drain should always be:

1. Connected or piped to an acceptable disposal point sloped away from the unit at least 1/8-inch per foot.
2. Checked before summer operation.
3. Periodically checked during summer operation

DRAIN CHECK

Check drain pan and “P” trap at the beginning of each cooling season since it is possible for dust and debris to fall into the unit through the supply grille. The rubber “P” trap is secured to the drain pan nipple and drain riser by way of two clamps, one spring and one worm gear, which can be opened with pliers adjusted for a maximum grasp and a 5/16” nut driver.

The drain pan is removed by unscrewing the two mounting brackets on the sides of the cabinet. Set the brackets aside. Disconnect the “P” trap from the drain pan. By pulling down and then up remove the drain pan first. Observe the “P” trap insertion depth on the drain riser and save this information for reinstallation. Remove “P” trap.
Material will naturally settle to the bottom of the trap so wash thoroughly in a utility container or sink with soap and water.

When ready, reattach the “P” trap to the drain riser using the worm gear clamp and the depth setting observed above. Slip the spring clamp over the drain pan end of the hose a few inches back from this end with the clamp tangs facing forward. Replace the pan in its cradle and secure the brackets. Reattach the hose to the drain pan and secure by sliding the clamp back in place.

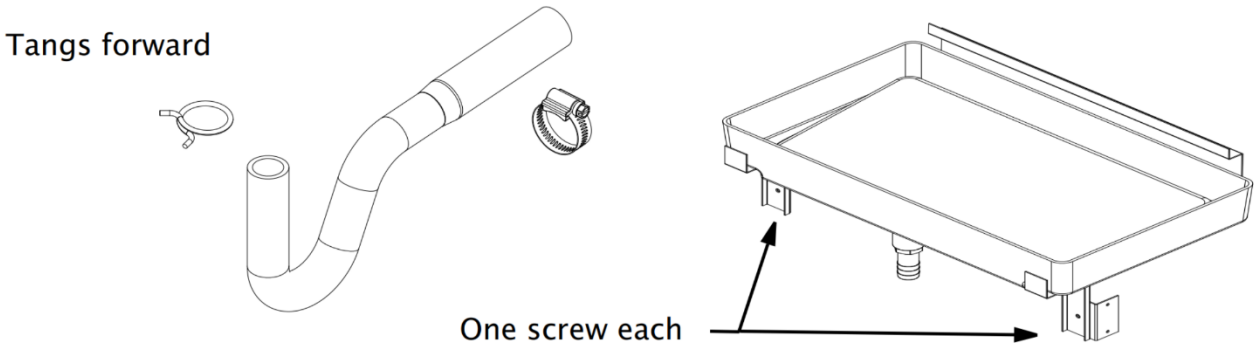


FIGURE 31

LABORATORY TESTING

When the unit has less than 100 operational hours and the coils have not had sufficient time to be “seasoned”, it is necessary to clean the coils with mild surfactant such as calgon to remove the oils left by manufacturing processes.

NOTES

P.O. Box 270969 Dallas, TX 75227
www.firstco.com or **www.ae-air.com**