Installation, Start-Up and Service Instructions

CONTENTS

IMPORTANT: Children should be supervised to ensure that they do not play with appliance.

SAFETY CONSIDERATIONS

Installation and servicing of air-conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install, repair, or service air-conditioning equipment.

Untrained personnel can perform basic maintenance functions of cleaning coils and filters and replacing filters. All other operations should be performed by trained service personnel. When working on air-conditioning equipment, observe precautions in the literature, tags and labels attached to the unit, and other safety precautions that may apply.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for unbrazing operations. Have fire extinguisher available for all brazing operations.

It is important to recognize safety information. This is the safety-alert symbol ⚠. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, CAUTION, and NOTE. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies hazards which **could** result in personal injury or death. CAUTION is used to identify unsafe practices, which **may** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

⚠ CAUTION

When installing this unit, observe precautions in the literature, labels attached to the equipment, and any other safety precautions that apply.

Follow all safety codes.

Wear safety glasses and work gloves. Never wear bulky or loose fitting clothing when working on any mechanical equipment. Gloves should be worn for proper protection against heat and other possible injuries. Safety glasses or goggles should always be worn when drilling, cutting, or working with chemicals such as refrigerants or lubricants.

Use care in handling and installing this unit.

Never pressurize any equipment beyond specified test pressures. Always pressure-test with an inert fluid or gas such as clear water or dry nitrogen to avoid possible damage or injury in the event of a leak or component failure during testing. Always protect adjacent flammable material when welding or soldering. Use a suitable heat-shield material to contain sparks or drops of solder. Have a fire extinguisher readily available.

Refer to Fig. 1 for Proposition 65 Warning Label.

Fig. 1 — Proposition 65 Warning Label

INTRODUCTION

Carrier fan coil units represent a prudent investment offering trouble-free operation and long service with proper installation, operation, and regular maintenance. Your equipment is initially protected under the manufacturer's standard warranty; however, this warranty is provided under the condition that the steps outlined in this manual for initial inspection, proper installation, regular periodic maintenance, and everyday operation of the equipment be followed in detail. This manual should be fully reviewed in advance before initial installation, start-up, and any maintenance. Should any questions arise, please contact your local sales representative or the factory BEFORE proceeding.

This document contains general installation instructions for the 42S unit fan coils. Refer to the unit wiring diagram installed on the blower housing or specific manufacturer literature for any other type of factory-mounted controls. The wiring diagram can also be found using the QR code on the label.

See Fig. 2 for unit clearances and service access. Fig. 3-11 for unit configurations, dimensions, and pipe connections. Refer to unit wiring label for all electrical connections; follow NEC (National Electrical Code) and local codes.

PHYSICAL DATA

Component weight data, shipping weights, and filter data of the 42S units are provided in Table 1.

PRE-INSTALLATION

Unpack and Inspect Units

All units are carefully inspected at the factory throughout the manufacturing process under a strict detailed quality assurance program, and, where possible, ALL major components and subassemblies are carefully tested for proper operation and verified for full compliance with factory standards. Operational testing of some customer-furnished components such as electronic control valves and digital controllers may be a possible exception.

Each unit is carefully packaged for shipment to avoid damage during normal transit and handling. Equipment should always be stored in a dry place, and in the proper orientation as marked on the carton.

All shipments are made FOB (free on board) factory and is the responsibility of the receiving party to inspect the equipment upon arrival. Any obvious damage to the carton and/or its contents should be recorded on the bill of lading and a claim should be filed with the freight carrier and Carrier should be advised.

After determining the condition of the carton exterior, carefully remove each unit from the carton and inspect for hidden damage. At this time, check to make sure that "furnished only" items such as thermostats, grilles etc. are accounted for whether packaged separately or shipped at a later date. Any hidden damage should be recorded and immediately reported to the carrier and a claim should be filed. In the event a claim for shipping damage is filed, the unit, shipping carton, and all packing must be retained for physical inspection by the freight carrier. All equipment should be stored in the factory shipping carton with internal packing in place until installation.

At the time of receipt, the equipment type and arrangement should be verified against the order documents. Should any discrepancy be found, the local sales representative should be notified immediately so that proper action may be taken. Should any questions arise concerning warranty repairs, the factory must be notified BEFORE any corrective action is taken. Where local repairs or alterations can be accomplished, the factory must be fully informed of the extent and expected cost of those repairs before work is begun. Where factory operations are required, the factory must be contacted for authorization to return equipment and a Return Authorization Number will be issued. Unauthorized return shipments of equipment and shipments not marked with an authorization number will be refused. In addition, any claims for unauthorized expenses will not be accepted by the manufacturer.

Unit Protection from Damage

The units covered in this manual are identified by a tag on top of the unit which shows the floor and riser number for which each unit is designed. Units should not be installed at locations other than that marked on the unit identification tag. If no specific detail is shown on tag for unit location then determine configuration for the Universal unit based on information within this IOM. Should

any questions arise regarding unit configuration, contact the sales representative or the factory BEFORE proceeding.

While all equipment is designed and fabricated with sturdy materials and may present a rugged appearance, great care must be taken to assure that no force or pressure be applied to the coil, risers, or piping during handling. Never use the risers to lift the unit. Also, depending on the options and accessories, some units could contain delicate components that may be damaged by improper handling. Lifting or supporting the cabinet only at the top and bottom should be avoided to maintain the straight and square cabinet alignment. The unit must be lowered into the space taking care to properly align the risers to engage the riser swaged sections on the unit below. The risers should never be bent or pushed together to be passed through the floor slot and should never be lifted up or pulled down to meet the risers on the floor below or above. The risers are designed with a 3 in. swage to accommodate a 2 in. overlap and minor floor to floor variations.

The equipment covered in this manual IS NOT suitable for outdoor installations. The equipment should never be stored or installed where it may be subjected to a hostile environment such as rain, snow, or extreme temperatures.

During and after installation, special care must be taken to prevent foreign material such as paint, plaster, and drywall dust from being deposited in the drain pan or on the motor or blower wheels. Failure to do so may have serious adverse effects on unit operation, and in the case of the motor and blower assembly, may result in immediate or premature failure. All manufacturer's warranties are void if foreign material is allowed to be deposited on the motor or blower wheels of any unit. Some units and/or job conditions may require some form of temporary covering during construction.

While the manufacturer does not become involved in the design and selection of support methods and components, it should be noted that unacceptable system operating characteristics and/or performance may result from improper or inadequate unit structural support. Due to variations in building construction, floor plans, and unit configurations, each installation is different. The actual step-by-step method of installation may vary from unit to unit. However, the risers should be moved as little as possible to avoid damage to the unit and internal components.

On certain units, shipping screws or braces must be removed after the unit is installed. Be sure to check all tags on the unit to determine which, if any, of these devices need to be removed.

Prepare Jobsite for Unit Installation

To save time and to reduce the possibility of costly errors, set up a complete sample installation in a typical room at jobsite. Check all critical dimensions such as pipe, wire, and duct connection requirements. Refer to job drawings and product dimension drawings as required (see Fig. 3-14). Instruct all trades in their part of the installation.

Identify and Prepare Units

Be sure power requirements match available power source. Refer to unit nameplate and wiring diagram.

1. Check all tags on unit to determine if shipping screws or braces are to be removed. Remove screws as directed.
2. Rotate the fan wheel by hand to ensure that the fan is unrestricted and can rotate freely. Check for shipping damage and fan obstructions. Adjust blower motor as required.

NOTE: When optional factory-installed risers are ordered, see Appendix A on page 32 for block-out construction dimensions.

Unit Clearance and Service Access

For specific unit dimensions, refer to the product data catalog and submittal drawings for your model. Provide adequate clearance for the removal of the panel, access to controls or replacement of internal serviceable components including air filters. Allow clearances according to local and national codes.

Service access is available from the front on vertical stack units by removing the return air panel. Refer to Fig. 2 for service access and clearance.

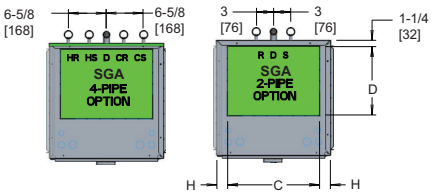
Fig. 2 — Unit Clearance and Service Access

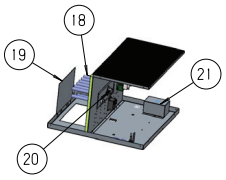
Table 1 — Physical Data — 42S Series Units

UNIT SIZE 42S	03	04	06	08	10	12	14	16	20
NOMINAL AIRFLOW (cfm)	300	400	600	800	1000	1200	1400	1600	2000
SHIPPING WEIGHT (lb)[a]									
42SGA,SGM,SU	180	225	240	260	280	305	—	—	—
42SH	202	247	262	286	311	336	—	—	—
42SJ	360	450	480	520	560	610	—	—	—
42SGS	162	203	216	234	252	275	—	—	—
42SM	—	—	—	—	—	—	390	390	390
COIL WATER WEIGHT (Approx lb per row of coil)	1.79		2.63		3.45		4.09	4.09	4.39
COILS									
FPI	14 fins/inch								
BLOWER (qty)									
42SGA,SH,SU,SGM,SGS,SM	1	1	1	1	1	1	1	1	1
42SJ	2	2	2	2	2	2	—	—	—
FILTERS									
Nominal Size (in.) (1 in.thick)	12-1/2 x 24-1/4		16-1/4 x 26-3/4		20-1/2 x 29-1/4		24-1/2 x 29-1/2		26-1/2 x 29-1/2
Qty	1[b]								
PIPING CONNECTIONS									
Inlet (in. OD)	1/2, unless larger size valve package is selected								

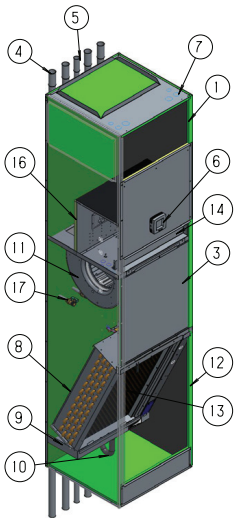
NOTE(S):

a. Calculate Operating Weight of Unit: Shipping Weight + Coil Water Weight x Number of Coil Rows.
b. 42SJ units require two filters, one for the 42SJA side and one for the 42SJB side.

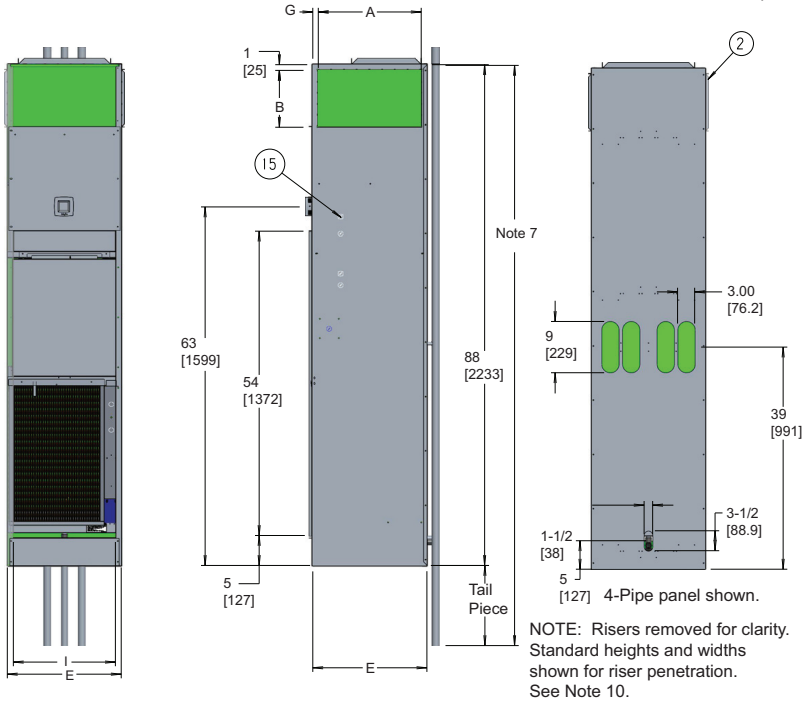




Control Box Option with E Heat



Side panel removed for clarity.



4-Pipe panel shown.

NOTE: Risers removed for clarity. Standard heights and widths shown for riser penetration. See Note 10.

ITEM	DESCRIPTION
1	Supply Opening
2	Duct Colar 1/2 [13] Ext (Typ)
3	RA Acoustical Service Panel
4	Riser, Supply and Return
5	Riser, Drain
6	Thermostat Surface Mnt Location
7	Electrical Knock Outs
8	Coil 1/2 [13] O.D.
9	Drain Pan
10	Flex Drain Tube/P-Trap
11	Motor/Blower Housing
12	Return Air Opening
13	Filter, Throwaway, 1 [25]
14	Access Panel (Control Box)
15	Knockout (Optional Remote Mnt)
16	Control Box
17	1/2 [13] Isolation Valve
18	Strip Heater (Optional E Heat)
19	Heat Limit Switch (Optional E Heat)
20	Heat Shield (Optional E Heat)
21	Service Switch (Optional)

NOTES:

1. Units are fabricated of galvanized steel with a 16 gauge galvanized fan deck.
2. All risers are insulated.
3. Thermostats shipped loose for field installation.
4. Risers are factory piped to coil with valves as specified.
5. Blower, motor, coil, valves, and filter are accessible through the return air opening.
6. Unit and control box are insulated.
7. Riser length = {(floor to floor) +2 in. [51]}, maximum riser length = 119 in. [3023]. Consult riser submittals for specifications.
8. Maximum riser diameter is 2-1/2 in. [64]. If larger diameters are required, consult the factory.
9. Expansion loops in hot water heating circuits as required.
10. Slots provided in the back panel for coil connection to permit expansion and contraction of risers. Coil connections to be at the center of the slots.
11. See unit arrangements for supply and return air orientation.
12. Dimensions are in inches. Dimensions in [ ] are in millimeters.
13. Riser chase available.

LEGEND

CR— Cold Water Return
CS— Cold Water Supply
D — Drain
HR— Hot Water Return
HS— Hot Water Supply
R — Return
S — Supply

UNIT SIZE	DIMENSIONS — in. [mm]									
	SINGLE SUPPLY		DOUBLE SUPPLY		TOP SUPPLY		DIMENSIONS			
	A	B	A	B	C	D	E	G	H	I
03	14 [356]	8 [203]	14 [356]	6 [152]	14 [356]	10 [254]	17 [432]	1-1/2 [38]	1-1/2 [38]	14 [356]
04		12 [305]								
06	18 [457]	10 [254]	18 [457]		16 [406]	12 [305]	20 [508]	1 [25]	2 [51]	18 [457]
08		12 [305]								
10	22 [559]	16 [406]	22 [559]	8 [203]	18 [457]	16 [406]	24 [610]		3 [76]	22 [559]
12										

Fig. 3 — 42SGA Furred-In Single Stack Unit Dimensions

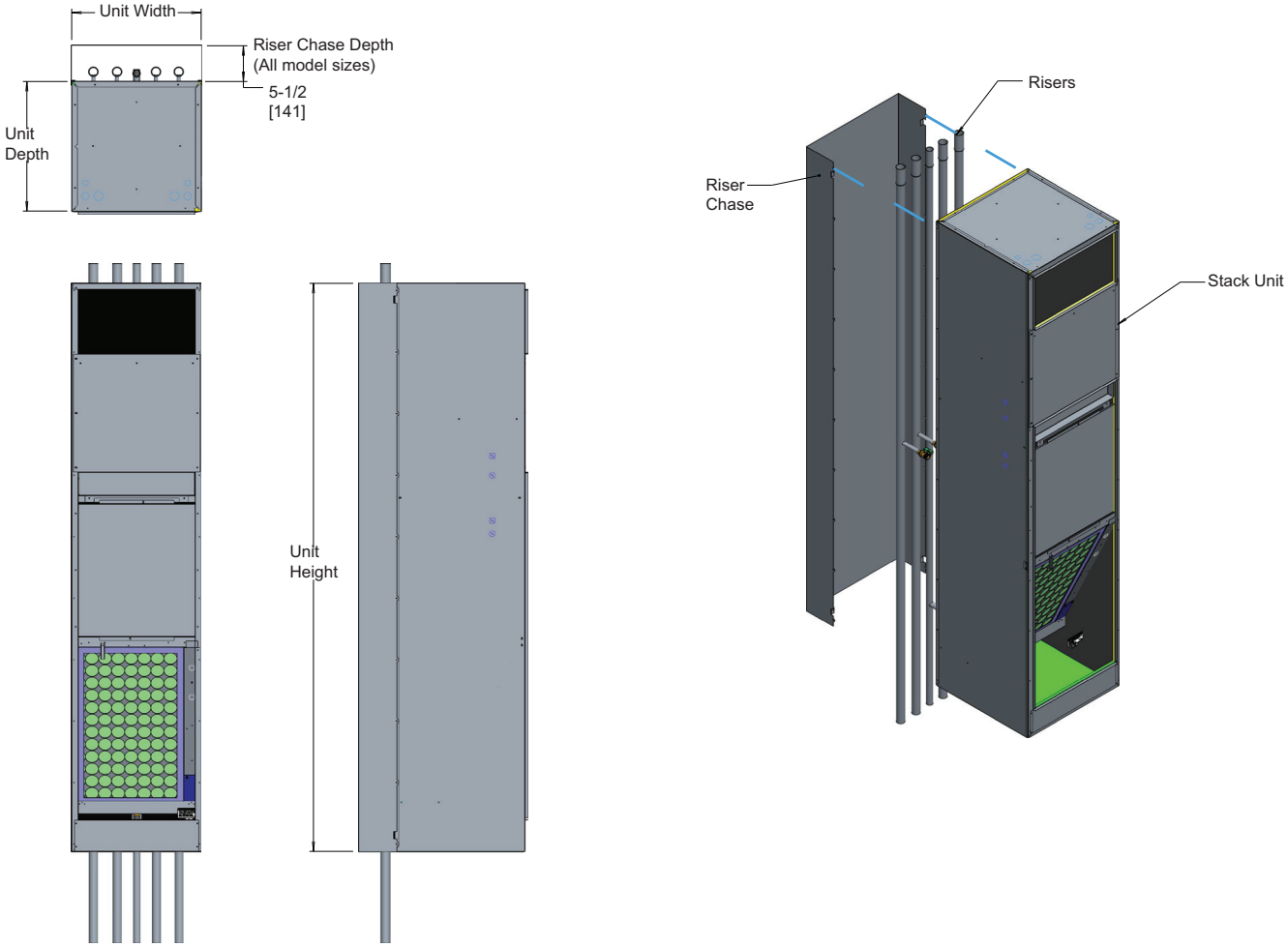
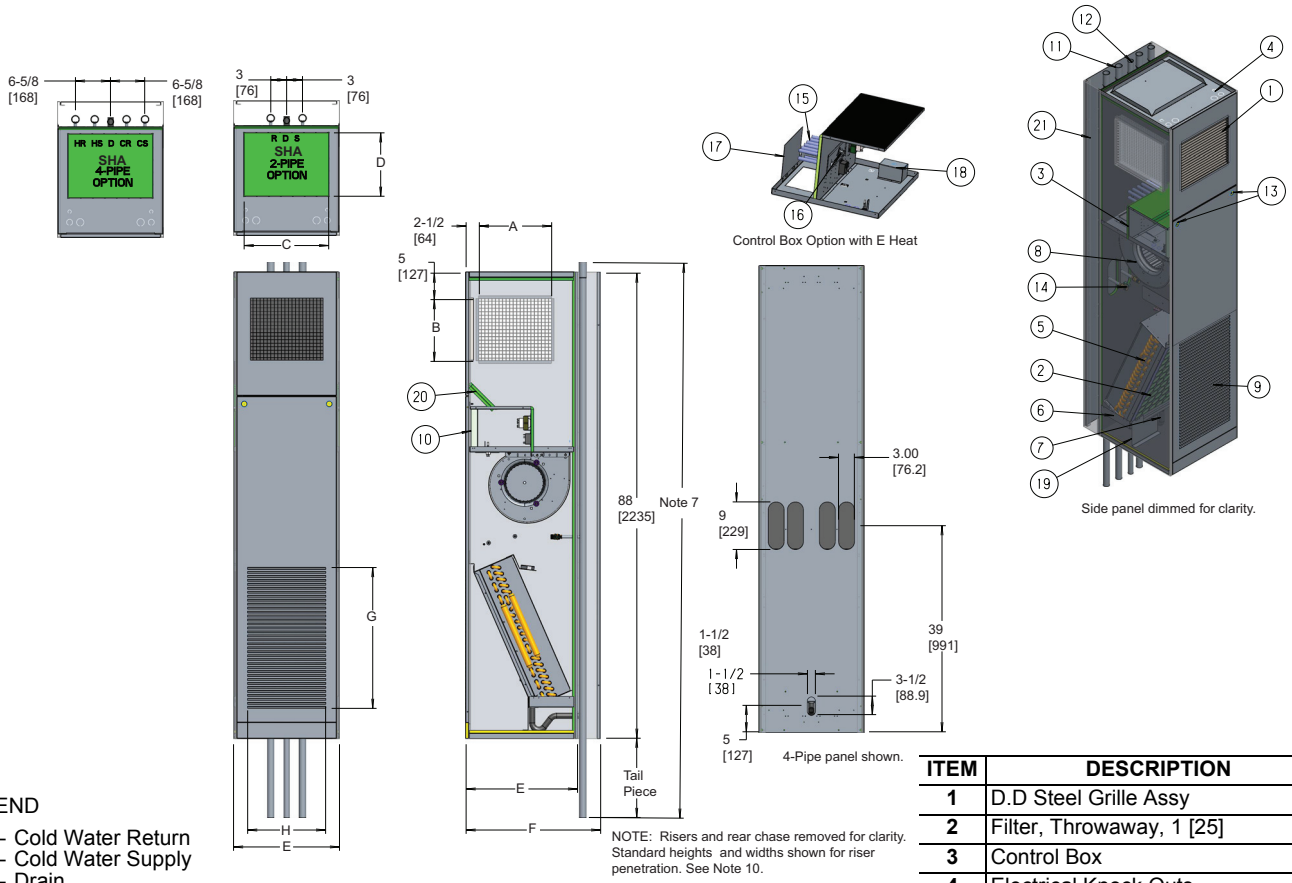


Fig. 4 — Riser Chase



NOTE: Risers and rear chase removed for clarity. Standard heights and widths shown for riser penetration. See Note 10.

LEGEND

CR— Cold Water Return
CS— Cold Water Supply
D — Drain
HR— Hot Water Return
HS— Hot Water Supply
R — Return
S — Supply

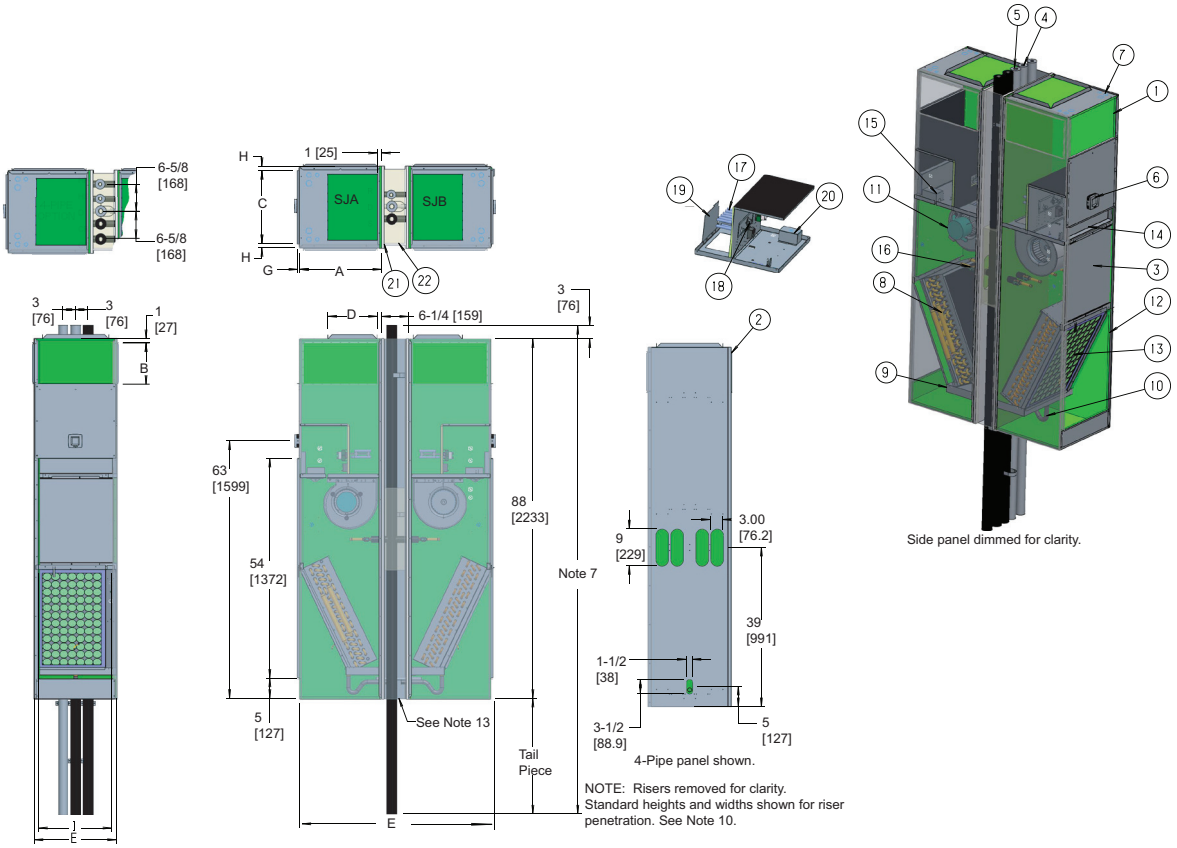
ITEM	DESCRIPTION
1	D.D Steel Grille Assy
2	Filter, Throwaway, 1 [25]
3	Control Box
4	Electrical Knock Outs
5	Coil 1/2 [13] O.D.
6	Drain Pan
7	Flex Drain Tube/P-Trap
8	Motor/Blower Housing
9	Return Air Opening
10	Access Panel (Control Box)
11	Riser, Supply and Return
12	Riser, Drain
13	Cabinet Camlocks
14	1/2 [13] Isolation Ball Valves
15	Strip Heater (Optional E Heat)
16	Heat Limit Switch (Optional E Heat)
17	Heat Shield (Optional)
18	Service Switch (Optional)
19	Drain Pan Support
20	Control Air Baffle Assy
21	Riser Chase

NOTES:

1. Units are fabricated of galvanized steel with a 16 gauge galvanized fan deck.
2. All risers are insulated.
3. Thermostats shipped loose for field installation.
4. Risers are factory piped to coil with valve as specified.
5. Blower, motor, coil, valves, and filter are accessible through the return air opening.
6. Unit and control box are insulated.
7. Riser length = {(floor to floor) + 2 in. [51]}, maximum riser length = 119 in. [3023]. Consult riser submittals for specifications.
8. Maximum riser size is 2-1/2 in. [64] diameter. If larger size is required, consult the factory.
9. Expansion loops in hot water heating circuits as required.
10. Slots provided in the back panel for coil connection to permit expansion and contraction of risers. Coil connections to be at the center of the slots.
11. See unit arrangements for supply and return air orientation.
12. Dimensions are in inches. Dimensions in [ ] are in millimeters.

UNIT SIZE	DIMENSIONS — in. [mm]									
	SIDE/FRONT SUPPLY		DOUBLE SUPPLY		TOP SUPPLY SINGLE		DIMENSIONS			
	A	B	A	B	C	D	E	F	G	H
03	14 [356]	8 [203]	14 [356]	6 [152]	14 [356]	10 [254]	17 [432]	22-1/8 [562]	22-1/8 [562]	14-3/4 [375]
04		12 [305]		8 [203]						
06					16 [406]	12 [305]	20 [508]	26-5/8 [676]	26-5/8 [676]	17-3/4 [451]
08		16 [406]		10 [254]						
10	18 [457]			12 [305]	18 [457]	16 [406]	24 [610]	31-1/8 [791]	31-1/8 [791]	
12										

Fig. 5 — 42SHA Exposed Cabinet Stack Unit Dimensions



LEGEND

CR — Cold Water Return
CS — Cold Water Supply
D — Drain
HR — Hot Water Return
HS — Hot Water Supply
R — Return
S — Supply

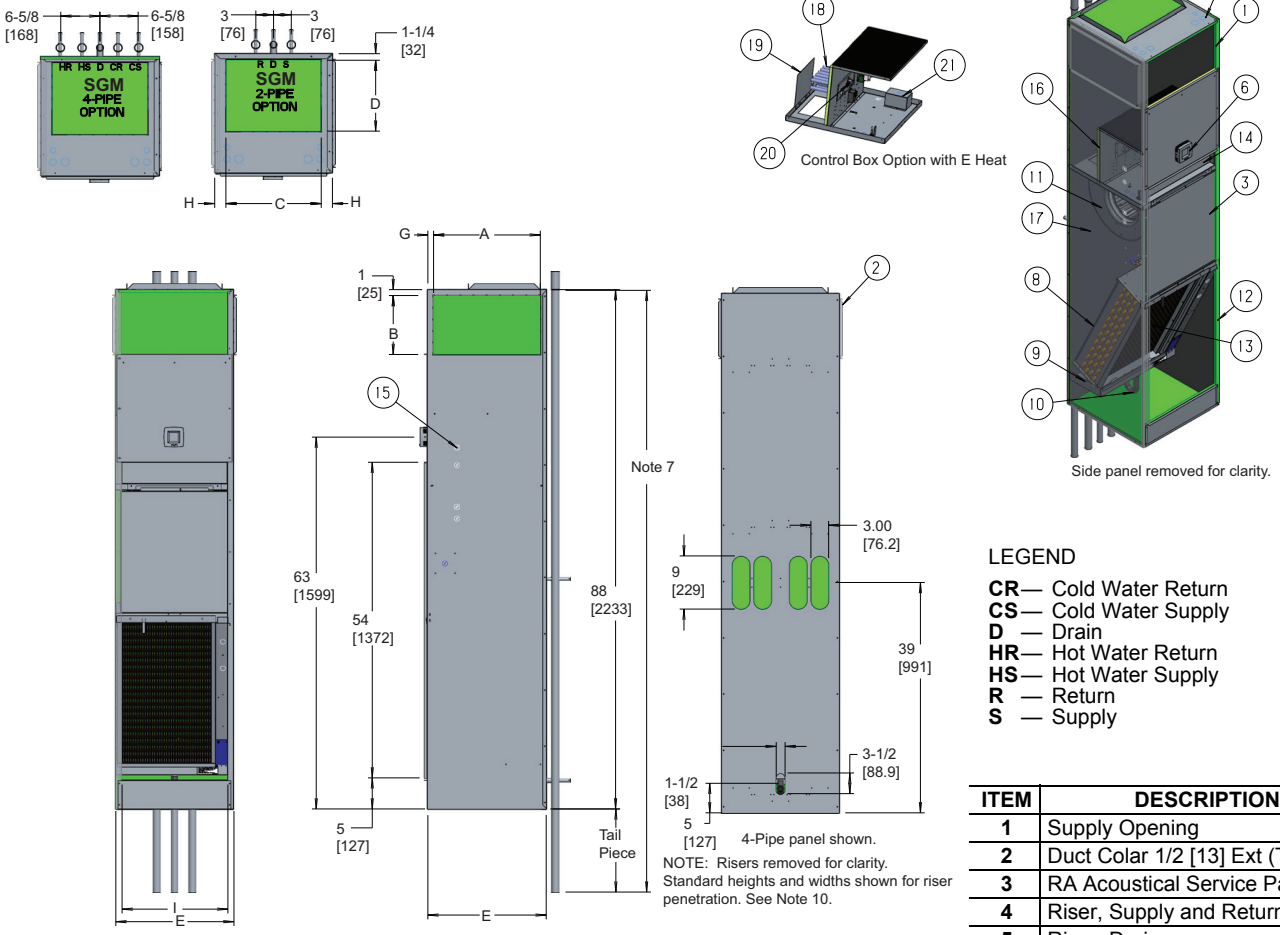
NOTES:

1. Units are fabricated of galvanized steel with a 16 gauge galvanized fan deck.
2. All risers are insulated.
3. Thermostats shipped loose for field installation.
4. Risers are factory piped to coil with valve as specified.
5. Blower, motor, coil, valves, and filter are accessible through the return air opening.
6. Unit and control box are insulated.
7. Riser length = {(floor to floor) +2 in. [51]}, maximum riser length = 119 in. [3023]. Consult riser submittals for specifications.
8. Maximum riser size is 2-1/2 in. [64] diameter. If larger size is required, consult the factory.
9. Expansion loops in hot water heating circuits as required.
10. Slots provided in the back panel for coil connection to permit expansion and contraction of risers. Coil connections to be at the center of the slots.
11. See unit arrangements for supply and return air orientation.
12. Dimensions are in inches. Dimensions in [ ] are in millimeters.
13. 18 gauge riser chase.

ITEM	DESCRIPTION
1	Supply Opening
2	Duct Colar 1/2 [13] Ext (Typ)
3	RA Acoustical Service Panel
4	Riser, Supply and Return
5	Riser, Drain
6	Thermostat Surface Mnt Location
7	Electrical Knockouts
8	Coil 1/2 [13] O.D.
9	Drain Pan
10	Flex Drain Tube/P-Trap
11	Motor/Blower Housing
12	Return Air Opening
13	Filter, Throwaway, 1 [25]
14	Access Panel (Control Box)
15	Control Box
16	1/2 [13] Isolation Valve
17	Strip Heater (Optional E Heat)
18	Heat Limit Switch (Optional E Heat)
19	Heat Shield (Optional E Heat)
20	Service Switch (Optional)
21	Gypsum Board 5/8 [16] Typ "X"
22	Thermafiber Insulation

UNIT SIZE	DIMENSIONS — in. [mm]										
	SINGLE SUPPLY		DOUBLE SUPPLY		TOP SUPPLY		DIMENSIONS				
	A	B	A	B	C	D	E	G	H	I	J
03	14 [356]	8 [203]	14 [356]	6 [152]	14 [356]	10 [254]	17 [432]	1-1/2 [38]	1-1/2 [38]	14 [356]	40-1/4 [1022]
04		12 [305]									
06	18 [457]	10 [254]	18 [457]		16 [406]	12 [305]	20 [508]	1 [25]	2 [51]	18 [457]	46-1/4 [1175]
08		12 [305]									
10	22 [559]	16 [406]	22 [559]	8 [203]	18 [457]	16 [406]	24 [610]		3 [76]	22 [559]	54-1/4 [1378]
12											

Fig. 6 — 42SJA/SJB Furred-In Stack Ditto Primary/Secondary Unit (UL-1 Hr. Fire Rated)



NOTE: Risers removed for clarity. Standard heights and widths shown for riser penetration. See Note 10.

LEGEND

CR— Cold Water Return
CS— Cold Water Supply
D — Drain
HR— Hot Water Return
HS— Hot Water Supply
R — Return
S — Supply

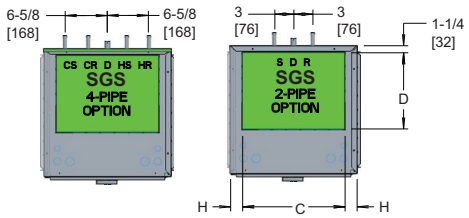
ITEM	DESCRIPTION
1	Supply Opening
2	Duct Colar 1/2 [13] Ext (Typ)
3	RA Acoustical Service Panel
4	Riser, Supply and Return
5	Riser, Drain
6	Thermostat Surface Mnt Location
7	Electrical Knock Outs
8	Coil 1/2 [13] O.D.
9	Drain Pan
10	Flex Drain Tube/P-Trap
11	Motor/Blower Housing
12	Return Air Opening
13	Filter, Throwaway, 1 [25]
14	Access Panel (Control Box)
15	Knockout (Optional Remote Mnt)
16	Control Box
17	1/2 [13] Isolation Valve
18	Strip Heater (Optional E Heat)
19	Heat Limit Switch (Optional E Heat)
20	Heat Shield (Optional E Heat)
21	Service Switch (Optional)

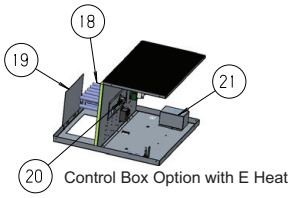
NOTES:

1. Units are fabricated of galvanized steel with a 16 gauge galvanized fan deck.
2. All risers are insulated.
3. Thermostats shipped loose for field installation.
4. Risers are factory piped to coil with valve as specified.
5. Blower, motor, coil, valves, and filter are accessible through the return air opening.
6. Unit and control box are insulated.
7. Riser length = {(floor to floor) +2 in. [51]}, maximum riser length = 119 in. [3023]. Consult riser submittals for specifications.
8. Maximum riser size is 2-1/2 in. [64] diameter. If larger size is required, consult the factory.
9. Expansion loops in hot water heating circuits as required.
10. Slots provided in the back panel for coil connection to permit expansion and contraction of risers. Coil connections to be at the center of the slots.
11. See unit arrangements for supply and return air orientation.
12. Dimensions are in inches. Dimensions in [ ] are in millimeters.

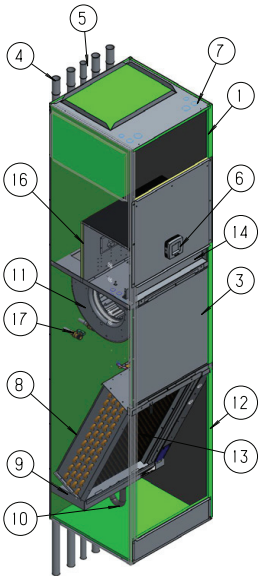
UNIT SIZE	DIMENSIONS — in. [mm]									
	SINGLE SUPPLY		DOUBLE SUPPLY		TOP SUPPLY		DIMENSIONS			
	A	B	A	B	C	D	E	G	H	I
03	14 [356]	8 [203]	14 [356]	6 [152]	14 [356]	10 [254]	17 [432]	1-1/2 [38]	1-1/2 [38]	14 [356]
04		12 [305]								
06	18 [457]	10 [254]	18 [457]	6 [152]	16 [406]	12 [305]	20 [508]	1 [25]	2 [51]	18 [457]
08		12 [305]								
10	22 [559]	16 [406]	22 [559]	8 [203]	18 [457]	16 [406]	24 [610]		3 [76]	22 [559]
12										

Fig. 7 — 42SGM Furred-In Primary Stack Unit Dimensions

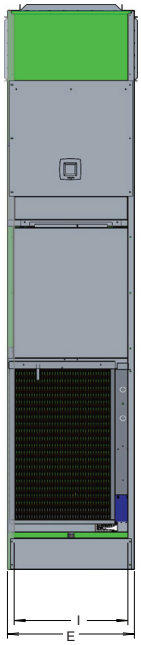


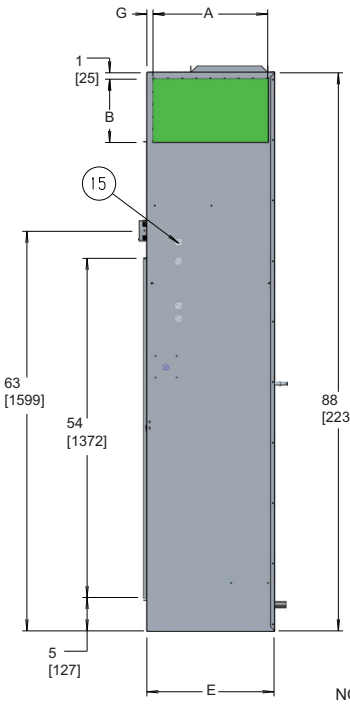


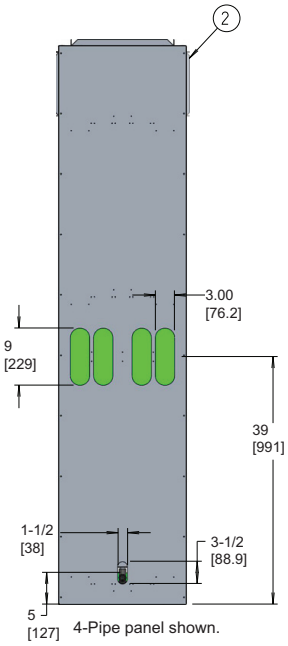
Control Box Option with E Heat



Side panel removed for clarity.







4-Pipe panel shown.

NOTE: Risers removed for clarity. Standard heights and widths shown for riser penetration. See Note 7.

LEGEND

CR— Cold Water Return
CS— Cold Water Supply
D — Drain
HR— Hot Water Return
HS— Hot Water Supply
R — Return
S — Supply

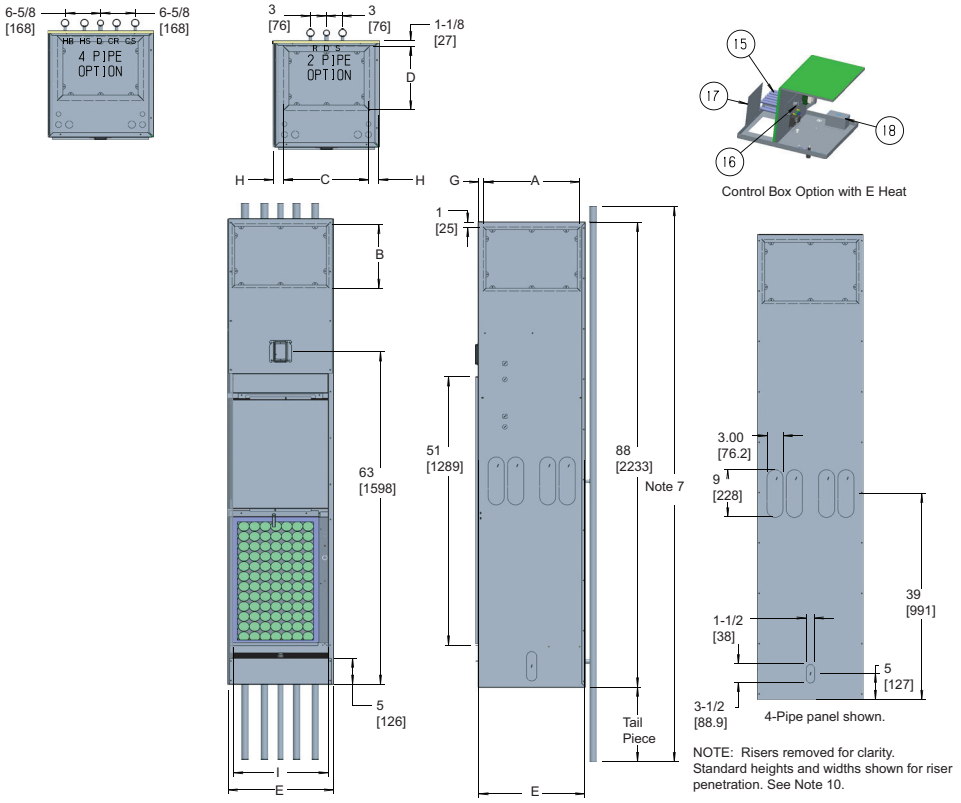
NOTES:

1. Units are fabricated of galvanized steel with a 16 gauge galvanized fan deck.
2. All risers are insulated.
3. Coil with valves is specified.
4. Blower, motor, coil, valves, and filter are accessible through the return air opening.
5. Unit and control box are insulated.
6. Expansion loops in hot water heating circuits as required.
7. Slots provided in the back panel for coil connection to permit expansion and contraction of risers. Coil connections to be at the center of the slots.
8. See unit arrangements for supply and return air orientation.
9. Dimensions are in inches. Dimensions in [ ] are in millimeters.

ITEM	DESCRIPTION
1	Supply Opening
2	Duct Colar 1/2 [13] Ext (Typ)
3	RA Acoustical Service Panel
4	Riser, Supply and Return
5	Riser, Drain
6	Thermostat Surface Mnt Location
7	Electrical Knock Outs
8	Coil 1/2 [13] O.D.
9	Drain Pan
10	Flex Drain Tube/P-Trap
11	Motor/Blower Housing
12	Return Air Opening
13	Filter, Throwaway, 1 [25]
14	Access Panel (Control Box)
15	Knockout (Optional Remote Mnt)
16	Control Box
17	1/2 [13] Isolation Valve
18	Strip Heater (Optional E Heat)
19	Heat Limit Switch (Optional E Heat)
20	Heat Shield (Optional E Heat)
21	Service Switch (Optional)

UNIT SIZE	DIMENSIONS — in. [mm]									
	SINGLE SUPPLY		DOUBLE SUPPLY		TOP SUPPLY		DIMENSIONS			
	A	B	A	B	C	D	E	G	H	I
03	14 [356]	8 [203]	14 [356]	6 [152]	14 [356]	10 [254]	17 [432]	1-1/2 [38]	1-1/2 [38]	14 [356]
04		12 [305]								
06	18 [457]	10 [254]	18 [457]		16 [406]	12 [305]	20 [508]	1 [25]	2 [51]	18 [457]
08		12 [305]								
10	22 [559]	16 [406]	22 [559]	8 [203]	18 [457]	16 [406]	24 [610]		3 [76]	22 [559]
12										

Fig. 8 — 42SGS Furred-In Secondary Unit Stack Dimensions



ITEM	DESCRIPTION
1	Supply KO's Top/Sides
2	Filter
3	Control Box
4	Electrical Knock Outs
5	Coil 1/2 [13] O.D.
6	Drain Pan
7	Flex Drain Tube/P-Trap
8	Motor/Blower Housing
9	Return Air Opening
10	Drain Knockout(s) Side Panels
11	Access Panel (Control Box)
12	Riser, Supply and Return
13	Riser, Drain
14	Isolation Ball Valves
15	Strip Heater (Optional E Heat)
16	Heat Limit Switch (Optional E Heat)
17	Heat Shield (Optional E Heat)
18	Service Switch (Optional)

LEGEND

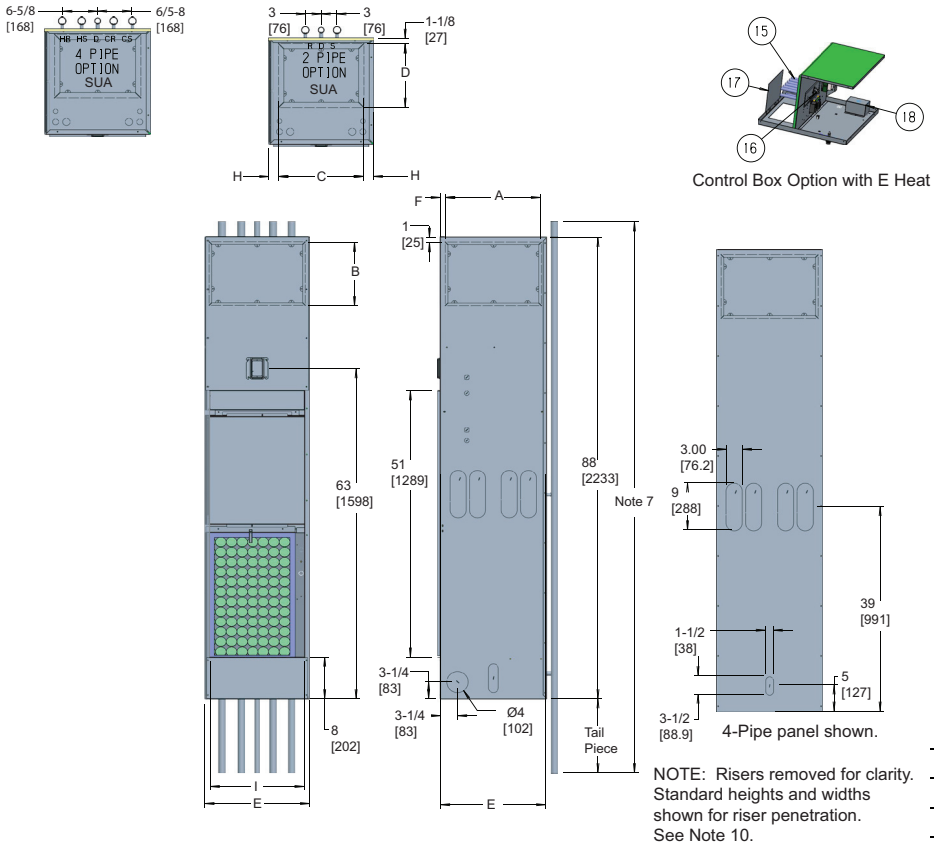
CR — Cold Water Return
CS — Cold Water Supply
D — Drain
HR — Hot Water Return
HS — Hot Water Supply
R — Return
S — Supply

NOTES:

1. Units are fabricated of galvanized steel with a 16 gauge galvanized fan deck.
2. All risers are insulated.
3. Thermostats shipped loose for field installation.
4. Risers are factory piped to coil with valve as specified.
5. Blower, motor, coil, valves, and filter are accessible through the return air opening.
6. Unit and control box are insulated.
7. Riser length = {(floor to floor) +2 in. [51]}, maximum riser length = 119 in. [3023]. Consult riser submittals for specifications.
8. Maximum riser size is 2-1/2 in. [64] diameter. If larger size is required, consult the factory.
9. Expansion loops in hot water heating circuits as required.
10. Riser slots knock-outs provided on 3 sides of cabinet for coil connection to permit expansion and contraction of risers. Coil connections to be at the center of the slots.
11. Drain knock-outs on 3 sides of cabinet.
12. Dimensions are in inches. Dimensions in [ ] are in millimeters.
13. U0 arrangement also available for SGM and SGS models.

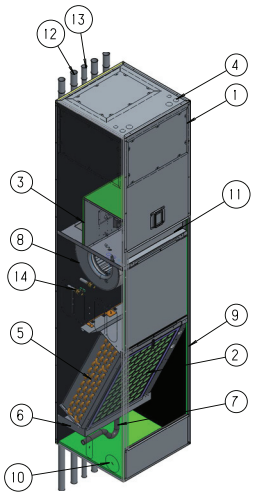
UNIT SIZE 42SGA/SGM/SGS	DIMENSIONS — in. [mm]									
	SINGLE SUPPLY		DOUBLE SUPPLY		TOP SUPPLY		DIMENSIONS			
	A	B	A	B	C	D	E	G	H	I
03	14 [356]	8 [203]	14 [356]	6 [152]	14 [356]	10 [254]	17 [432]	1-1/2 [38]	1-1/2 [38]	14 [356]
04		12 [305]								
06	18 [457]	10 [254]	18 [457]		16 [406]	12 [305]	20 [508]	1 [25]	2 [51]	18 [457]
08		12 [305]								
10	22 [559]	16 [406]	22 [559]	8 [203]	18 [457]	16 [406]	24 [610]		3 [76]	22 [559]
12										

Fig. 9 — 42SGA/SGM/SGS Furred-In Stack, Universal Arrangement



NOTE: Risers removed for clarity. Standard heights and widths shown for riser penetration. See Note 10.

Control Box Option with E Heat



Side panel dimmed for clarity.

LEGEND

CR— Cold Water Return
CS— Cold Water Supply
D — Drain
HR— Hot Water Return
HS— Hot Water Supply
R — Return
S — Supply

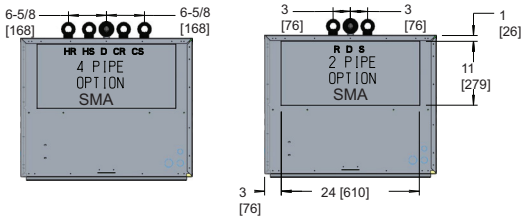
ITEM	DESCRIPTION
1	Supply KO's Top/Sides
2	Filter
3	Control Box
4	Electrical Knock Outs
5	Coil 1/2 in. [13] O.D.
6	Drain Pan
7	Flex Drain Tube/P-Trap
8	Motor/Blower Housing
9	Return Air Opening
10	Outside Air Knockout(s) Side Panels
11	Access Panel (Control Box)
12	Riser, Supply and Return
13	Riser, Drain
14	Isolation Ball Valves
15	Strip Heater (Optional E Heat)
16	Heat Limit Switch (Optional E Heat)
17	Heat Shield (Optional E Heat)
18	Service Switch (Optional)

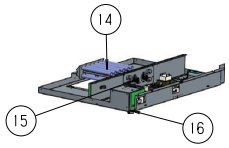
NOTES:

1. Units are fabricated of galvanized steel with a 16 gauge galvanized fan deck.
2. All risers are insulated.
3. Thermostats shipped loose for field connection.
4. Risers are factory piped to coil with valves as specified.
5. Blower, motor, valves, coil, and filter are accessible through the return air opening.
6. Unit and control box are insulated.
7. Riser length = [(floor to floor) + 2 in. (51)], maximum riser length = 119 in. [3023]. Consult project submittal for riser specifications.
8. Maximum riser size is 3 in. (76). If larger sizes are required, please consult the factory.
9. Expansion loops in hot water heating circuits as required.
10. Riser slot knock-outs provided on 3 sides of the cabinet for coil connection to permit expansion and contraction of risers. Coil connections to be at the center of slots.
11. Drain and riser knock-outs on 3 sides of cabinet.
12. Dimensions are in inches. Dimensions in [ ] are in millimeters.

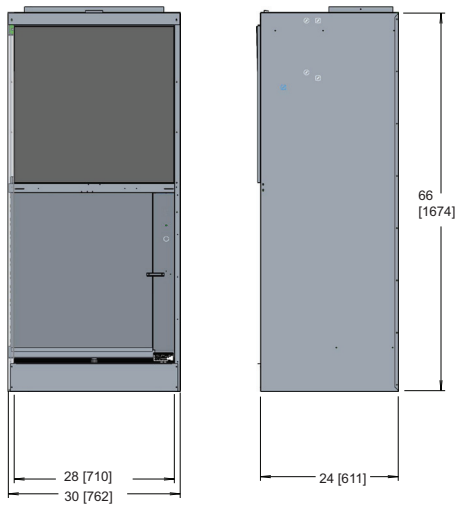
UNIT SIZE	DIMENSIONS — in. [mm]									
	SIDE/FRONT SUPPLY		TOP SUPPLY		DIMENSIONS				CONNECTIONS	
	A	B	C	D	E	F	H	I	Coil	Drain
03	14 [356]	12 [305]	14 [356]	10 [254]	17 [432]	1-1/2 [38]	1-1/2 [38]	14 [356]	1/2 [13] SWT x Hose Adapter	7/8 [22] ID EPDM Tube
04										
06	18 [457]	12 [305]	16 [406]	12 [305]	20 [508]	1 [25]	2 [51]	18 [457]		
08										
10	22 [559]	16 [406]	18 [457]	16 [406]	24 [610]		3 [76]	22 [559]		
12										

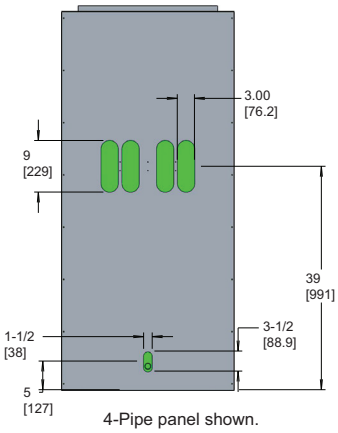
Fig. 10 — 42SUA Universal Furred-In Stack Unit Dimensions





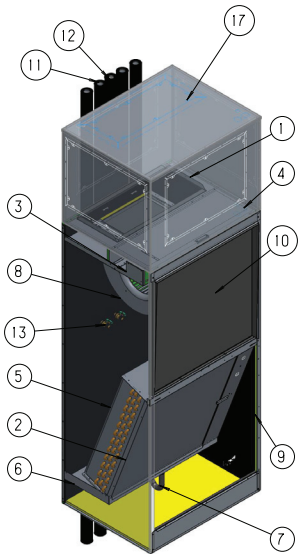
Control Box Option with E Heat





4-Pipe panel shown.

NOTE: Risers removed for clarity. Standard heights and widths shown for riser penetration. See Note 10.



Side panel dimmed for clarity.

LEGEND

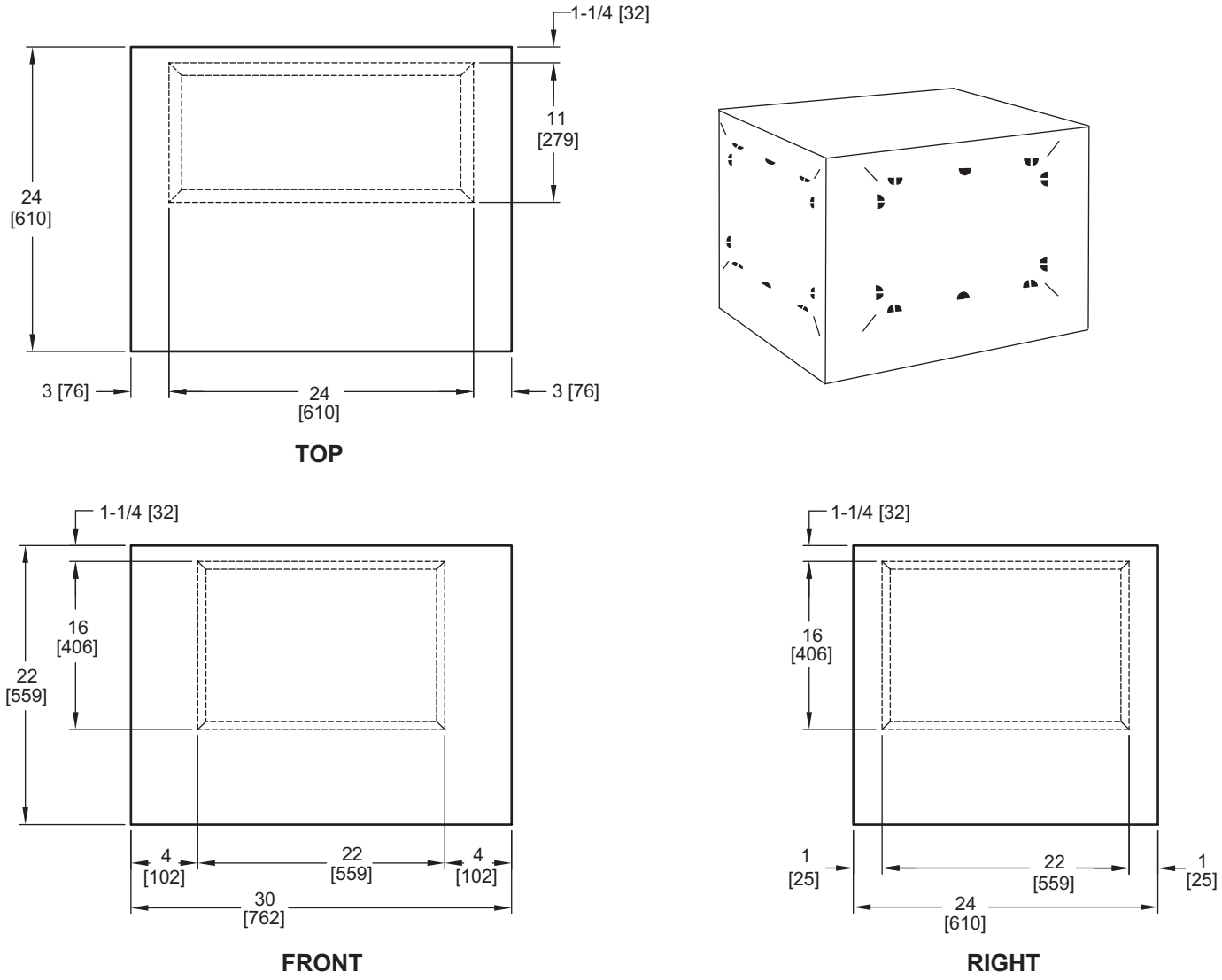
CR — Cold Water Return
CS — Cold Water Supply
D — Drain
HR — Hot Water Return
HS — Hot Water Supply
R — Return
S — Supply

ITEM	DESCRIPTION
1	1 in. [25] Flanged Supply Air Opening
2	Filter, Throwaway, 1 in. [25]
3	Control Box Hinged with Slam Latch
4	Electrical Knock Outs
5	Coil 1/2 in. [13] O.D.
6	Drain Pan
7	Flex Drain Tube/P-Trap
8	Motor/Blower Housing
9	Return Air Opening
10	RA Acoustical Service Panel
11	Riser, Supply, and Return
12	Riser, Drain
13	Isolation Ball Valves
14	Strip Heater (Optional E Heat)
15	Heat Limit Switch (Optional E Heat)
16	Disconnect Switch
17	Optional 22 in. Supply Plenum

NOTES:

1. Units are fabricated of galvanized steel with a 16 gauge galvanized fan deck.
2. All risers are insulated.
3. Thermostats shipped loose for field installation.
4. Risers are factory piped to coil with valves as specified.
5. Blower, motor, valves, coil, and filter are accessible through the return air opening.
6. Unit and control box are insulated.
7. Riser length = {floor to floor + 2 in. [51 mm}. Maximum riser length is 119 in. [3023 mm].
8. Maximum riser size is 2-1/2 in. [64 mm] diameter. If larger sizes are required, please consult the factory.
9. Expansion loops in hot water heating circuits are required.
10. Slots provided in the back panel for coil connection to permit expansion and contraction of risers. Coil connections to be at the center of the slots.
11. See unit arrangements for supply and return air orientation.
12. Dimensions are in inches, dimensions in [ ] are in millimeters.

Fig. 11 — 42SMA Furred-In Stack Mega Dimensions (Sizes 14-20)



NOTES:

1. Plenum box adds 22 in. (559 mm) to unit height, adds 26 lb (11.8 kg) to unit weight, and is factory installed.
2. 1/4 in. closed cell insulation is standard for the plenum box.
3. Side supply is 22 in. [559 mm] x 16 in. [406 mm] on all four sides.
4. Top supply is 24 in. [610 mm] x 11 in. [279 mm] which matches unit top ducted discharge.
5. Dimensions are in inches, dimensions in [ ] are in millimeters.

Fig. 12 — 42SM Optional Supply Plenum

Panel and Frame Dimensions (in.)[a]

PANEL NO.	UNIT	SIZE	A
1	42SG,SJ, SU	03, 04	15.5
		06, 08	19.5
		10, 12	23.5
	42SM	14,16,20	29.5
2	42SG,SJ	03, 04	15.5
		06, 08	19.5
		10, 12	23.5
3	42SG,SJ	03, 04	15.2
		06, 08	19.2
		10, 12	23.2

NOTE(S):

a. Dimensions in inches.

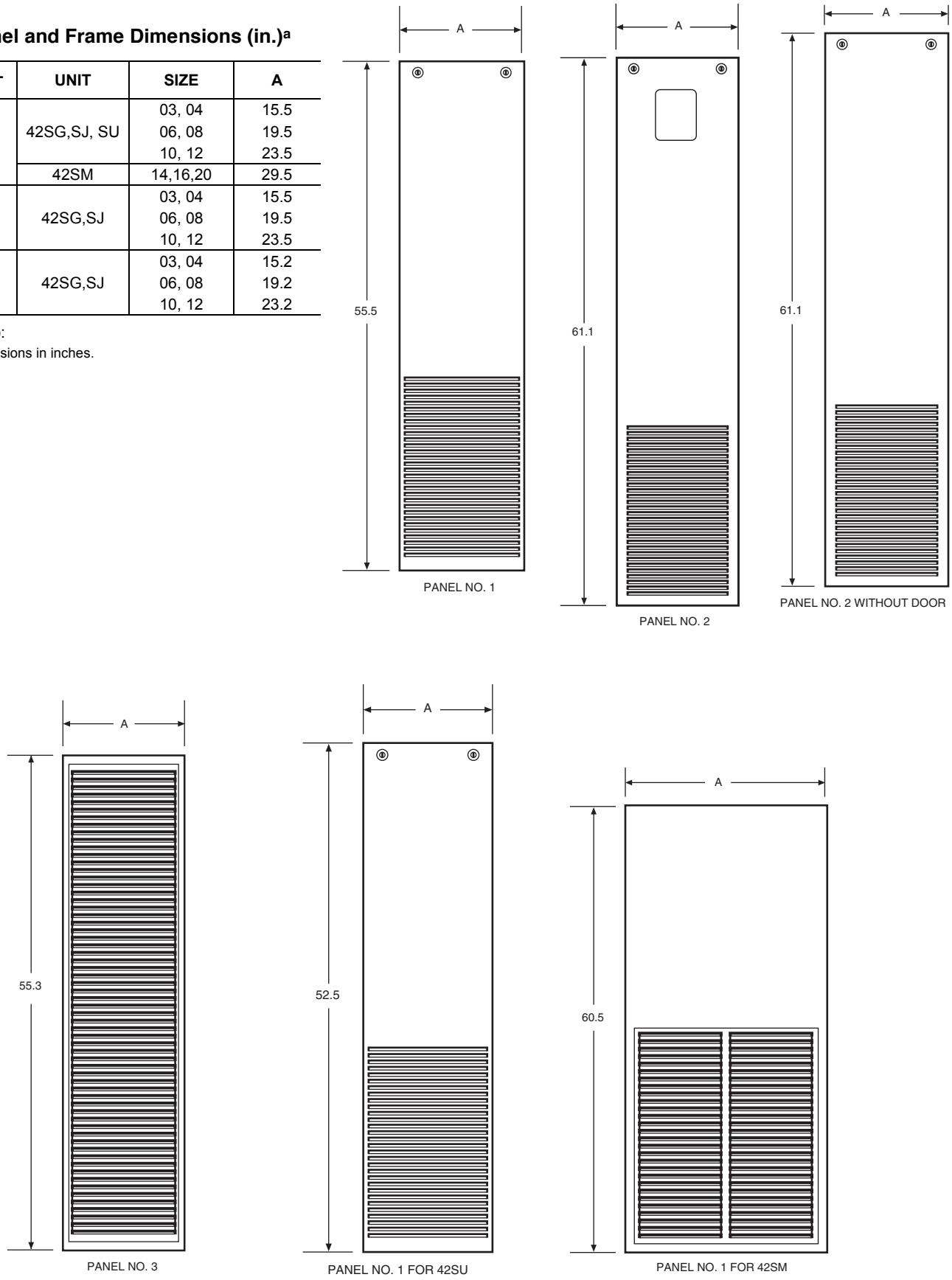
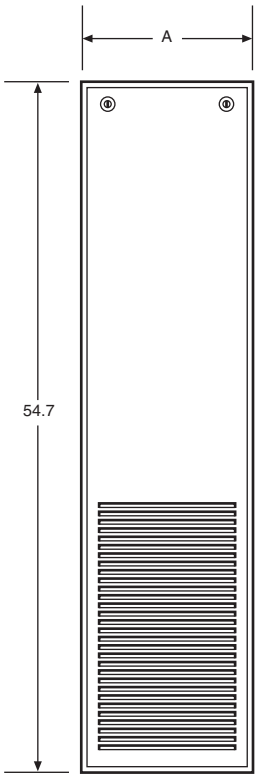


Fig. 13 — Return-Air Wall Panels for Furred-In Unit Dimensions (Panels with No Frame)

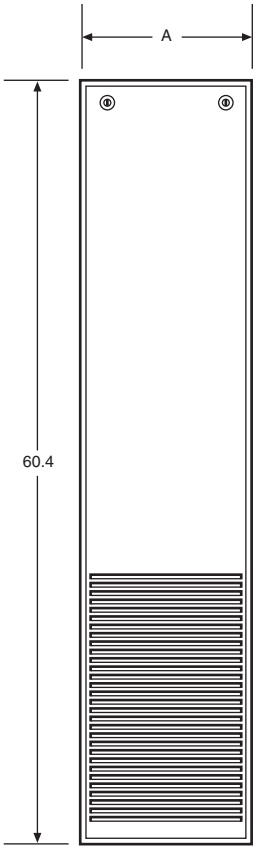
Panel and Frame Dimensions (in.)[a]

PANEL NO.	UNIT	UNIT SIZE	A
4	42SG,SJ, SU	03, 04	15.1
		06, 08	19.1
		10, 12	23.1
5	42SG,SJ	03, 04	15.1
		06, 08	19.1
		10, 12	23.1
6	42SG,SJ	03, 04	16.7
		06, 08	20.7
		10, 12	24.7

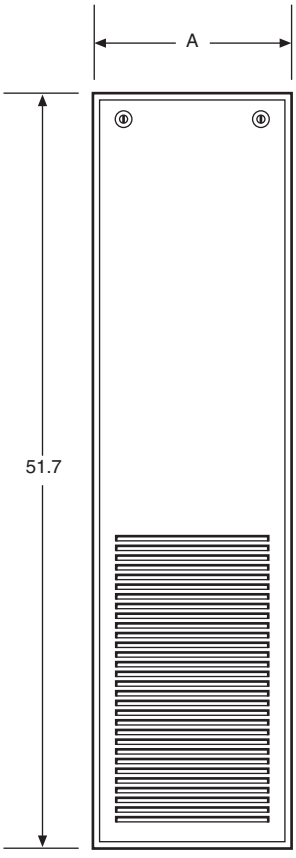
NOTE(S):
a. Dimensions in inches.



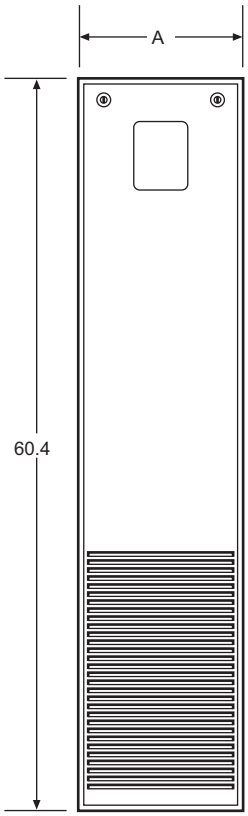
PANEL NO. 4



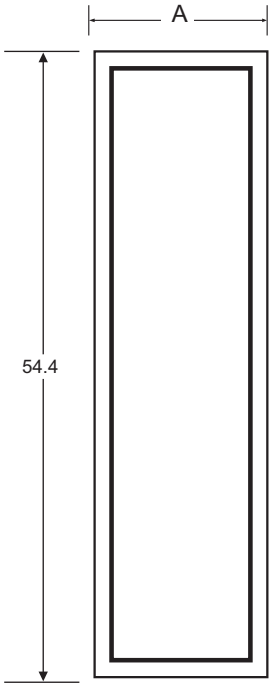
PANEL NO. 5 WITHOUT DOOR



PANEL NO. 4 FOR 42SU



PANEL NO. 5 WITH CONTROL DOOR



PANEL NO. 6

Fig. 14 — Return-Air Wall Panels for Furred-In Unit Dimensions (Panels with Frame)

INSTALLATION

Step 1 — Place Units in Position

A factory tag is on top of each unit. The tag states riser tier number, floor, room number (if furnished), and supply-air arrangement. Check unit for any other labels that apply to installation. Units should not be installed at locations other than that marked on the unit identification tag. If no specific detail is shown on tag for unit location, then determine configuration for the Universal unit based on information within this manual. Should any questions arise regarding unit configuration, contact the sales representative or the factory BEFORE proceeding. Remove unit from pallet and take directly to assigned space for installation. While all equipment is designed and fabricated with sturdy materials and may present a rugged appearance, great care must be taken to assure that no force or pressure be applied to the coil, risers or piping during handling. Never use the riser to lift the unit. To maintain the straight and square cabinet alignment, avoid lifting or supporting the cabinet only at the top and bottom.

While the manufacturer does not become involved in the design and selection of support methods and components, it should be noted that unacceptable system operating characteristics and/or performance may result from improper or inadequate unit structural support. Due to variations in building construction, floor plans, and unit configurations, each installation is different. The actual step-by-step method of installation may vary from unit to unit. However, the risers should be moved as little as possible to avoid damage to the unit and internal components.

42SG, SH, AND SJ UNITS

1. Begin on lowest floor and progress upward, floor by floor, to top.
2. Examine drain line (Fig. 3-11). Be sure both ends are in place and that it forms a trap. Avoid pinching drain line.
3. Tip unit over riser hole in building floor. As unit is righted, align riser with unit below.

   NOTE: The unit must be lowered into the space, taking care to properly align the risers to engage the riser swaged section on the unit below. The riser should never be bent or pushed together to be passed through the floor slot and should never be lifted up or pulled down to meet the riser on the floor below or above.
4. Install isolator pads beneath the four corners of unit if applicable.
5. Before anchoring the equipment in place, the unit must be leveled, and the cabinet must be squared and brought into line with any adjacent or included walls. The unit may be anchored in place by bolting directly through the unit floor or attaching to the cabinet in some location that will not interfere with drywall or other items such as the supply grille, thermostat, or return access panel. When attaching to the unit cabinet, care must be taken to not penetrate the cabinet in locations that may damage internal components or wiring. The mounting technique is a matter of choice; however, the unit should always be anchored securely to prevent movement during construction and riser expansion and contraction. On certain units, shipping screws or braces must be removed after the unit is installed. Be sure to check all tags on the unit to determine which, if any, of these devices need to be removed.
6. If installing a 42SJ unit, follow Steps a-h. For 42SG and 42SH units, continue to Step 7.

NOTE: The 42SJ ditto and primary/secondary fan coils have been designed to serve two separate rooms. These products are classified by Underwriters Laboratories Inc. for use in penetration firestop systems, control number 27WL when ordered with 1 hour rated chase. See UL Fire Resistance Directory for more information. Figure 15 shows the 42SJ unit with standard risers and with Siamese risers.

a. Lay out the control lines for the drywall track and studs in the floor and ceiling (see Fig. 16).

NOTE: Tracking may be installed now or after the unit is set.

b. Position the 42SJ fan coil assembly between two rooms with the unit drywall separation spotted over the wall control lines.

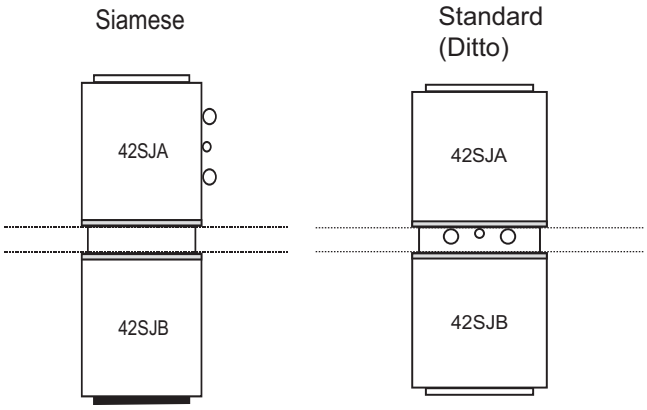


Fig. 15 — 42SJA/SJB Unit with Standard and Siamese Risers

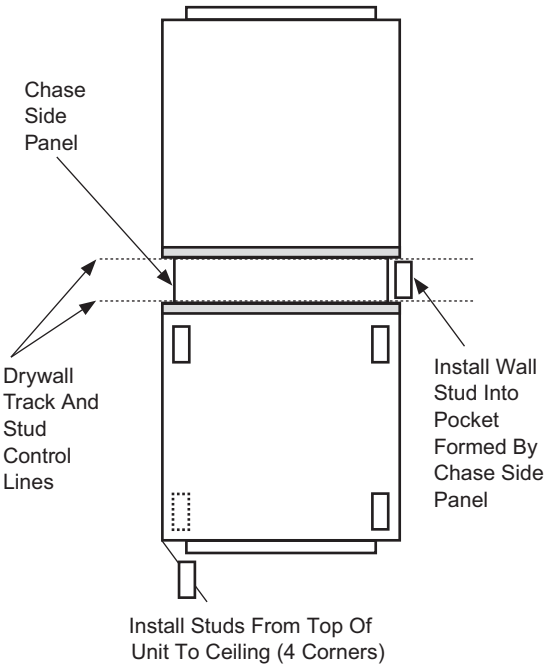


Fig. 16 — 42SJA/SJB Wall Board Installation

c. If not already installed, install the floor and ceiling tracks up to and over the 42SJ fan coil unit.

d. Position the vertical studs and fasten into each of the stud pockets formed into the chase side panels (see Fig. 16).

NOTE: The studs may be mechanically fastened to the 42SJ fan coil. Care should be taken, however, not to penetrate the supply or return water risers or internal piping. Given the levelness of the floor and/or the fan coil assembly, some shimming may be necessary.

e. Assemble the specified wall construction up to and over the top of the fan coil unit (see Fig. 17).

f. With the fire-wall separation being complete, the drywall skin on the surface of the individual fan coils can be applied. Drywall can be applied directly to the surface, or, if necessary, studding may be installed on the corners for vertical control (see Fig. 17).

g. For ease of installation of the access panel, apply drywall on the return-air side directly to the surface of the unit (see Fig. 17). When applying the wall board directly to the unit cabinet, it may be necessary to shim the wall board in some areas to achieve the desired finished wall surface.

h. After all drywalling and painting is complete, install thermostats, supply air grilles and return air panels.

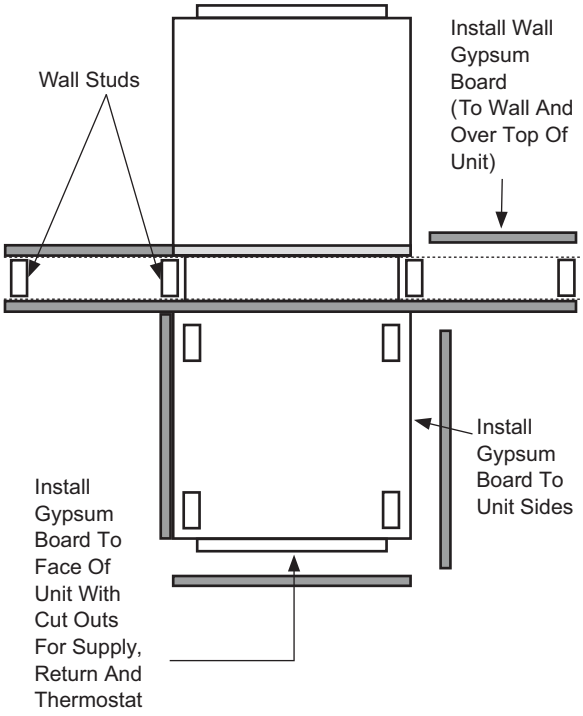


Fig. 17 — 42SJ Unit Installation

⚠ CAUTION

Toxic residues and loose particles resulting from manufacturing and field piping techniques such as joint compounds, soldering flux, and metal shavings may be present in the unit and the piping system. Special consideration must be given to system cleanliness when connecting to solar, domestic or potable water systems. Failure to heed this warning could result in equipment damage.

7. Attach unit risers:

NOTE: Submittals and product literature detailing unit operation, controls, and connections should be thoroughly reviewed BEFORE beginning the connection and testing of risers and piping. The supply and return connections are marked on the coil stub-outs and the valve package with an "S" meaning supply or inlet and "R" meaning return or outlet indicating flow direction to and from the coil. Blue letters mark the chilled water connections and red letters mark the hot water connections.

a. Each riser has a 3 in. swaged portion at top and sufficient extension at bottom for an inserted length of approximately 2 in. This unit-to-unit joint is NOT intended for full bottoming in the joint, but allows for variations in floor-to-floor dimensions and for correct riser positioning.
If job requires that unit risers be supplemented with between-the-floor extensions, pieces may be field-supplied or factory-supplied. If factory-supplied, insulation is also provided.

b. Level unit to ensure proper coil operation and condensate drainage. Proper riser installation and vertical positioning in the unit provides for a unit piping run-out to the service valves, which are centered in the access slots and level or sloping down slightly away from the riser. This prevents condensation from running back to the riser and possible damage from dripping at the bottom of a riser column. Each job has specific requirements, and satisfying those requirements is the responsibility of the installer. After units are positioned and riser centered in pipe chase, make unit plumb in two directions, using unit frame as a reference.

c. Anchor unit to building. Use bolts or lag screws through holes provided in unit frame.

d. After all units in a stack are anchored, make unit-to-unit riser joints. First, center each coil-to-riser line within the expansion slot in the unit back panel. Each riser joint must be in vertical alignment with at least 1 in. penetration into the swaged joint. This condition is met if floor-to-floor dimension is as specified and coil-to-riser lines are properly centered. Wide variations in floor-to-floor dimensions may necessitate cutting off or extending individual risers. Such modifications are the full responsibility of the installing contractor.

e. Before making the riser joints, the riser insulation must be pulled back away from the joint and protected from heat during the brazing process. The riser joint filler material must be selected to withstand the total operating pressure (both static and pumping head) to which the system will be subjected. Low temperature lead alloy solders such as "50/50" and "60/40" are normally not suitable.

IMPORTANT: Chilled water and hot water risers should never be piped to drain down into the condensate riser. Extensive water damage can occur due to drain overflow. Drain chilled and hot water risers to a remote location away from the unit such as sink, room, or floor drains.

8. Anchor risers as required:

a. Do not fasten risers rigidly within each unit. Risers must be free to move within pipe chase in response to normal vertical expansion and contraction. The unit internal piping is designed to accommodate a total riser vertical movement of ± 3/4 in., due to thermal expansion and/or contraction, when positioned properly at the jobsite.

b. Built-in risers must be anchored at some point to building structure. Unit design accommodates up to 1-1/2 in. expansion and contraction in riser assemblies when positioned properly at the job-site. Risers must be anchored to the building structure to limit expansion and contraction movement to a maximum of 1-1/2 in. Riser anchoring and expansion compensation is not included in the factory-supplied unit and must be field-provided. While some special riser features are available from the factory, riser end caps, air vents, and/or flushing loops are normally provided on the job by the installer.

9. Test the system for leaks after the connections are completed. When testing with air or some other gas, it might be necessary to tighten stem packing nuts on some valves to maintain

air pressure in the riser. Pressure testing risers with water should be done with the unit service valves closed to prevent flushing debris into the unit valve packages. This will also allow risers to be drained down after testing in the winter to avoid freeze-up problems. In the event that leaking or defective components are discovered, the sales representative must be notified before any repairs are attempted. All leaks should be repaired before proceeding with the installation.

10. After system integrity has been established, pull the riser insulation back into place over the joint and glue or seal to prevent sweating and heat loss or gain. Internal chilled water piping and valves are located over the drain pan and need not be insulated.
11. If required, fireproof where necessary. Any fireproofing requirements where risers or piping penetrate floors or walls are the responsibility of the installer. This work should be done only after all pressure testing is completed. The fireproofing method used must accommodate pipe expansion and contraction and the piping must be protected from abrasion and chemical attack. The pipe insulation also must be maintained to prevent sweating and must be protected from wear or erosion at the joint between the insulation and the fireproofing material.

42SUA UNIVERSAL STACK ARRANGEMENT

The unique design of the universal stack fan coil unit allows for field configuration for each unit. Air discharge, riser, drain, and outside air knockouts have been strategically located on each unit. Risers, shown with unit, are for reference only. All risers are factory fabricated and shipped loose for field installation.

It is important that you identify all of the unit feature locations and which knockouts you intend to use before proceeding with the installation. See Fig. 18-22. Also, it must be determined whether your application requires a Mating Unit (primary/secondary) and its configuration. Consult your local sales representative or the factory for further details on primary/secondary arrangements.

Potential Universal Arrangement Unit Configurations

Risers: Three Locations

The pre-installed supply, return, and drain risers (2-pipe or 4-pipe applications) can be oriented on any of three sides of the unit (see Fig. 18).

NOTE: Risers cannot be installed on the return air side of the cabinet.

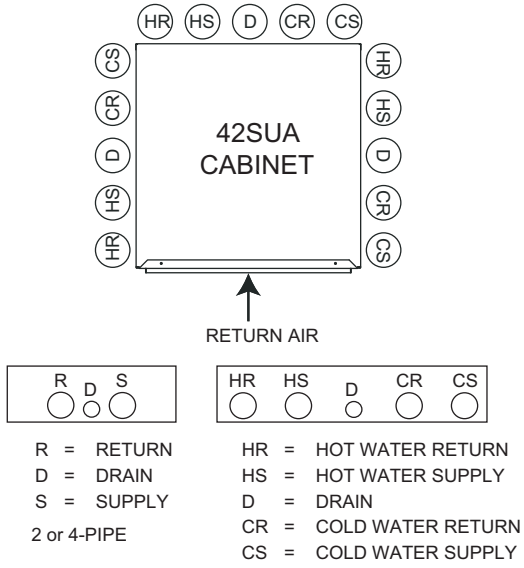


Fig. 18 — 42SUA Unit Configuration

Unit orientation is determined based on the location of the risers in the building. The riser side of the universal stack unit always determines the rear of the unit. See Fig. 19.

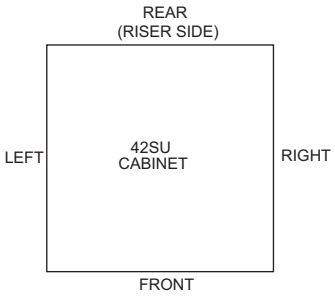


Fig. 19 — 42SUA Unit Orientation

Return Air: Single Location

The return air/access panel may then be oriented on the left, right, or front of the unit.

Supply Air: Five Locations (4 sides and top)

Includes stitched design for 1/2 in. (12 mm) duct flanges.

Outside Air: Two Locations

Either side adjacent to the return air opening.

NOTE: Outside air opening may be used on a side if risers are configured on that same side.

Supply, Return, and Drain Riser Installation

1. Three sides of each universal stack unit have four supply and return riser knockouts along the center and one drain knockout near the lower part of the unit (see Fig. 20). Identify whether your application uses a 2-pipe or 4-pipe configuration.
   a. 2-pipe configurations typically use the two inner riser knockouts.
   b. 4-pipe configurations will use all four riser knockouts.
2. Locate and mark the riser and drain knockouts that apply to your particular unit application, ensuring proper orientation of the return air opening in room.
3. Insert a flat head screw driver into knockout slot shown in Fig. 21.
4. Pry screw driver back and forth until knockout tabs break away from the unit.
5. Discard knockout. Be careful of sharp edges.
6. Use a sharp retractable knife (see Fig. 22) and vertically cut the insulation down the center of the riser and drain knockouts the full length of the knockout.
7. Use adhesive or glue to re-attach insulation that has pulled away from the unit during knockout removal process.

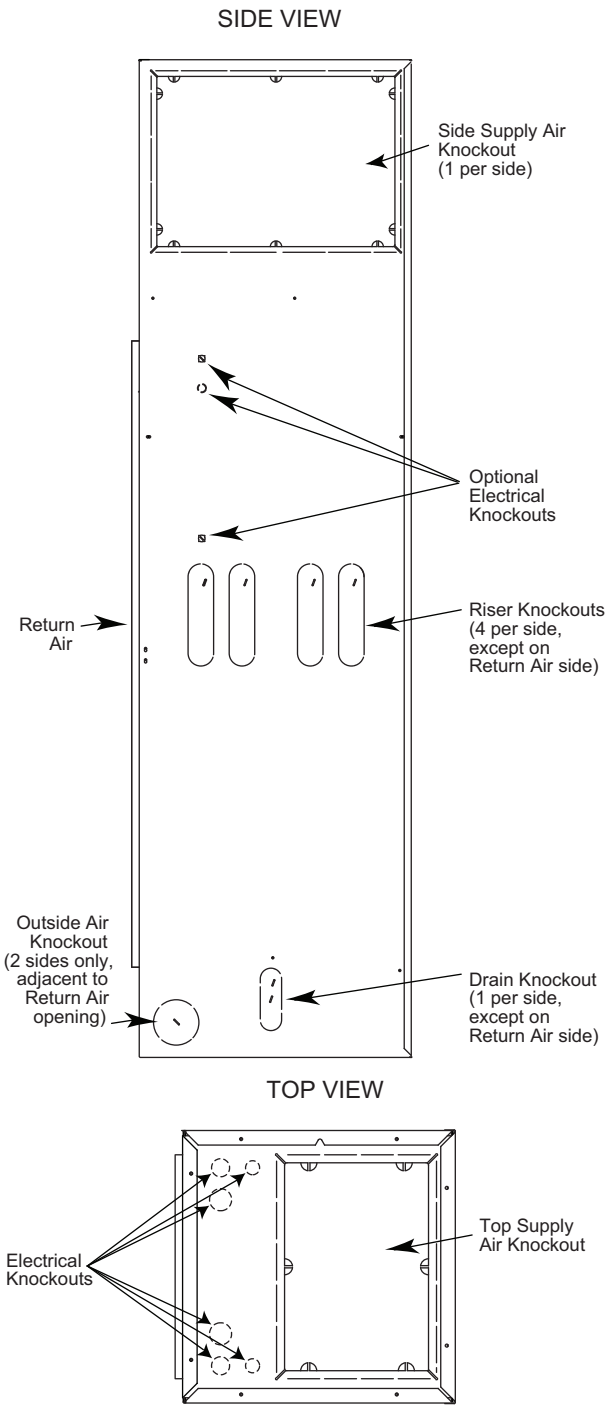


Fig. 20 — Locate 42SUA Unit Knockouts

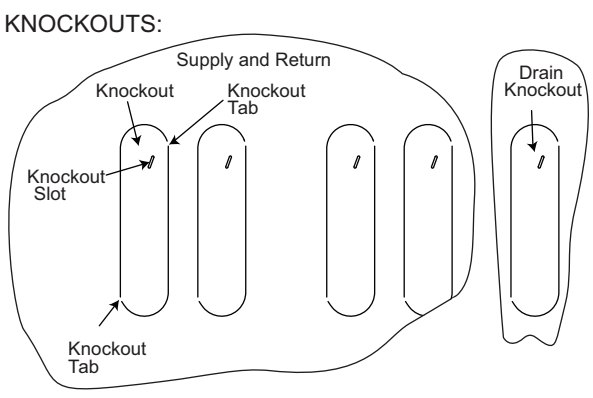


Fig. 21 — Remove 42SUA Unit Knockouts

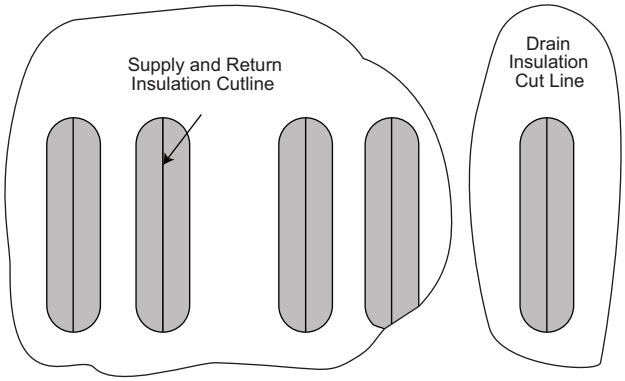


Fig. 22 — 42SUA Unit Knockout Insulation Removal

⚠ CAUTION

Toxic residues and loose particles resulting from manufacturing and field piping techniques such as joint compounds, soldering flux, and metal shavings may be present in the unit and the piping system. Special consideration must be given to system cleanliness when connecting to solar, domestic, or potable water systems. Coil not rated for potable use.

NOTE: Submittals and product literature detailing unit operation, controls, and connections should be thoroughly reviewed BEFORE beginning the connection and testing of risers and piping.

To assure optimal unit performance, the supply connection(s) are marked on the unit's coil with an "S" meaning supply or inlet and "R" meaning return or outlet indicating flow direction to and from the coil. Blue letters mark the chilled water connections and red letters mark the hot water connections.

The unit's internal piping is designed to accommodate a total riser vertical movement of ±1-1/2 in., due to thermal expansion and/or contraction, when positioned properly at the jobsite. Risers must be anchored to the building structure to limit expansion and contraction movement to a maximum of 3 inches. Riser anchoring and expansion compensation is not included in the unit and must be provided. Riser end caps, air vents, and/or flushing loops must be provided at the jobsite by the installer.

Proper field riser installation and vertical positioning in the unit should have a pipe run-out to the service valves which are centered in the knockout access slots and that slope down slightly away from the riser (see Fig. 23). This prevents condensation from running back to the riser and possible damage from dripping at the bottom of a riser column. Each job has specific requirements and satisfying those requirements is the responsibility of the installer.

Riser to Unit Installation

Before making the riser joints, the riser insulation must be pulled back away from the joint and protected from heat during the brazing process. Each riser joint must be in vertical alignment. Variations in floor-to-floor dimensions may require field work such as cutting off or extending the risers. This operation is the responsibility of the installer. The riser joint filler material must be selected to withstand the total operating pressure (both static and pumping head) to which the system will be subjected. Low temperature lead alloy solders such as "50/50" and "60/40" are normally not suitable.

Riser to Drain Installation

1. After the applicable supply, return, and drain knockouts have been removed, carefully position the unit so that the riser ball valves penetrate into the unit through the riser knockouts, making sure the insulation penetrates into the unit as shown in Fig. 23-26.

2. Before anchoring the equipment in place, the unit must be leveled and the cabinet must be plumb and squared. The unit may be anchored in place by bolting directly through the unit floor or attaching to the cabinet in some location that will not interfere with drywall or other items such as the supply grille, thermostat, or return access panel. When attaching to the unit cabinet, care must be taken to not penetrate the cabinet in locations that may damage internal components or wiring. The mounting technique is a matter of choice; however, the unit should always be anchored securely to prevent movement during construction and riser expansion and contraction. After anchoring the unit, it is then ready for the various service connections such as riser connections and electrical.
3. The plastic flare caps on the end of the riser ball valves should be removed and discarded.
4. All universal stack units use reinforced braided stainless steel flexible hose kits for piping between field-installed risers and unit water coils as shown in Fig. 24. The hose kit design has threaded connections on each end. The hose kits allow for riser fluctuations due to thermal expansion.

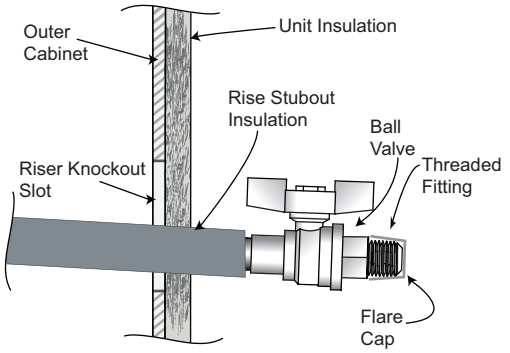


Fig. 23 — 42SUA Unit Riser to Unit Installation Setup

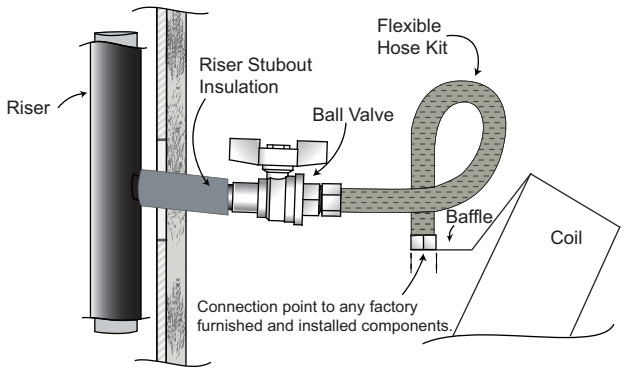


Fig. 24 — 42SUA Unit Riser to Unit Installation

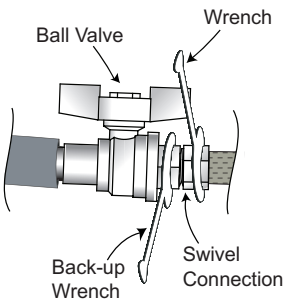


Fig. 25 — 42SUA Unit Riser to Unit Installation (Tighten Swivel Connections)

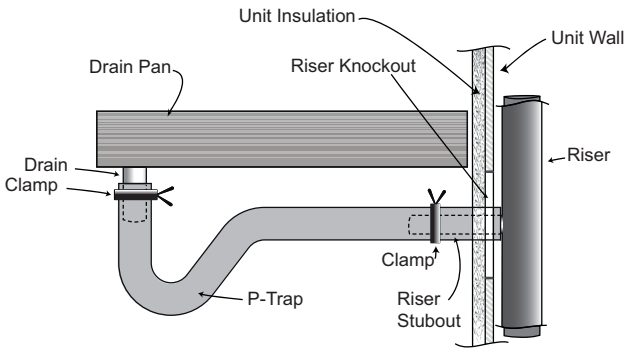


Fig. 26 — 42SUA Unit Riser to Drain Installation

5. Use a wrench to tighten the swivel connections. Use a backup wrench to hold the riser ball valve stationary to prevent it from bending or twisting during installation as shown in Fig. 25. Be careful not to over-tighten swivel connections.
6. Locate the unit's coil fitting.
7. The plastic flare caps on the end of the coil fitting should be removed and discarded.
8. Use a wrench to tighten the swivel connections. The baffle acts as a secondary wrench. Be careful not to over-tighten swivel connections.

⚠ CAUTION

Hose connection torque requirements are 350 in. lb +10/–0 in. lb to prevent leaks.

9. Locate the p-trap drain and rubber hose factory installed to the drain pan connection in the bottom of the unit as shown in Fig. 26.
10. Push the rubber drain hose over the riser drain stubout. Be careful not to bend the drain stubout.
11. Adjust the hose clamp over the riser stubout and rubber hose to hold in place as shown in Fig. 26.
12. Test for leaks. Any and all leaks should be repaired before proceeding with installation. When testing with air or some other gas, it might be necessary to tighten stem packing nuts on some valves to maintain air pressure in the riser. Pressure testing risers with water should be done with the unit service valves closed to prevent flushing debris into the unit valve packages. This will also allow risers to be drained down after testing in the winter to avoid freeze-up problems. In the event that leaking or defective components are discovered, the sales representative must be notified BEFORE any repairs are attempted. All leaks should be repaired before proceeding with the unit installation.
13. After system integrity has been established, the riser insulation must be pulled back into place over the joint and glued or sealed to prevent sweating and heat loss or gain. All of the risers, including the riser stubouts, should be properly covered with insulation. Internally mounted chilled water piping and valves are located over the drain pan and need not be insulated.

Any fireproofing requirements where risers or piping penetrate floors or walls are the responsibility of the installer. This work should be done only after all pressure testing is completed. The fireproofing method used must accommodate pipe expansion and contraction and the piping must be protected from abrasion and chemical attack. The pipe insulation also must be maintained to

prevent sweating and must be protected from wear or erosion at the joint between the insulation and the fireproofing material.

When no risers are ordered for the universal stack unit, it is the responsibility of the installer to make sure that an isolation ball valve is installed between each supply and return piping connection to the unit. Flare fittings are factory provided to allow connection between the ball valves and the hoses.

Supply Air Installation

Each side of the unit has one supply air knockout as well as a supply air knockout on the top of the unit (refer to Fig. 20).

1. Determine which supply air opening/openings are required for your application.

NOTE: The supply air opening on the riser side of the unit should not be used.

2. Use a sharp retractable knife to trim insulation using center knockout slot/trim line as pattern (see Fig. 27).
3. Use a sharp standard needle nose pliers and grab knockout tab (see Fig. 27).

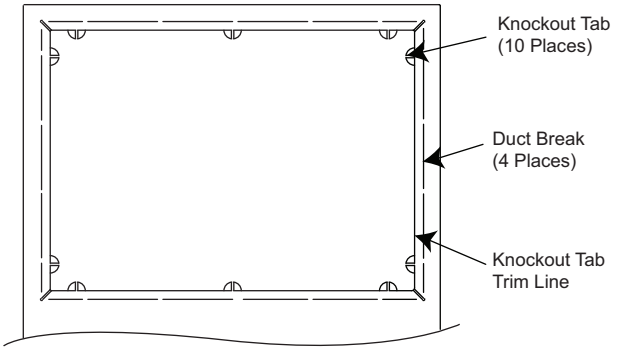


Fig. 27 — 42SUA Unit Supply Air Knockout Tab Location

4. Twist or pry pliers back and forth until knockout tab breaks away from unit.
5. Repeat for all supply air tabs until all have been broken.
6. Discard center knockout piece. Be careful of sharp edges.
7. Use a sharp retractable knife to trim any excess insulation using knockout hole as pattern.
8. Use duct pliers (hand seamers) to fold duct flange out of the unit 90 degrees for each side of the supply air opening along duct break (see Fig. 27). The 90-degree flanges can now be used as drywall stops to prevent coverage of discharge opening (see Fig. 28).

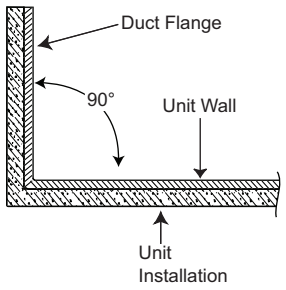


Fig. 28 — 42SUA Supply Air Installation

9. Use adhesive or glue to re-attach insulation that has pulled away from the unit during knockout removal process.
10. For ducted applications tape should be applied along and around all of the supply air opening knockouts to prevent air leakage.

All installations should be made in compliance with all governing codes and ordinances. Compliance with all codes is the responsibility of the installing contractor.

42SMA FURRED-IN MEGA UNITS

The unique design of the mega stack fan coil unit allows for field-configuration of each unit. Risers, shown with unit, are for reference only. All risers are factory-fabricated and shipped loose for field installation. It is important that you identify all of the unit feature locations before proceeding with the installation (see Fig. 11).

Unit orientation is determined based on the location of the risers in the building. Risers can only be installed on the rear side of the unit and always determine the rear of the mega stack unit. The return air is always on the front (see Fig. 29).

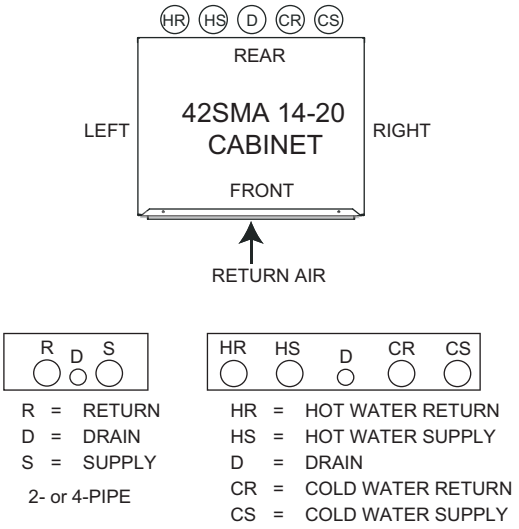


Fig. 29 — 42SM Unit Installation

Supply, Return, and Drain Risers

⚠ CAUTION

Toxic residues and loose particles resulting from manufacturing and field piping techniques such as joint compounds, soldering flux, and metal shavings may be present in the unit and the piping system. Special consideration must be given to system cleanliness when connecting to solar, domestic or potable water systems. Coil not rated for portable use.

NOTE: Submittals and product literature detailing unit operation, controls, and connections should be thoroughly reviewed BEFORE beginning the connection and testing of risers and piping.

The supply and return connections are marked on the coil stubouts and the valve package depending on your configuration. “CS” means cold water supply, “CR” means cold water return, “HS” means hot water supply, and “HR” means hot water return to indicate flow direction to and from the coil. Blue letters mark the chilled water connections and red letters mark the hot water connections.

The unit internal piping is designed to accommodate a total riser vertical movement of ±1-1/2 in., due to thermal expansion and/or contraction, when positioned properly at the jobsite. Risers must be anchored to the building structure to limit riser expansion and contraction movement to a maximum of 3 inches. Riser anchoring and expansion compensation is not included in the factory-supplied unit and must be field-provided. While some special riser features are available from the factory, riser end caps, air vents, and/or flushing loops are normally provided on the job by the installer.

Riser to Unit Installation

Proper riser installation and vertical positioning in the unit provides for a unit piping run-out to the service valves which are centered in the access slots and level or sloping down slightly away from the riser. This prevents condensation from running back to the riser and possible damage from dripping at the bottom of a riser column. Each job has specific requirements and satisfying those requirements is the responsibility of the installer.

Riser to Drain Installation

1. Carefully position the unit so that the riser ball valves penetrate into the unit through the riser slot making sure the insulation penetrates into the unit as shown in Fig. 30 and 31.

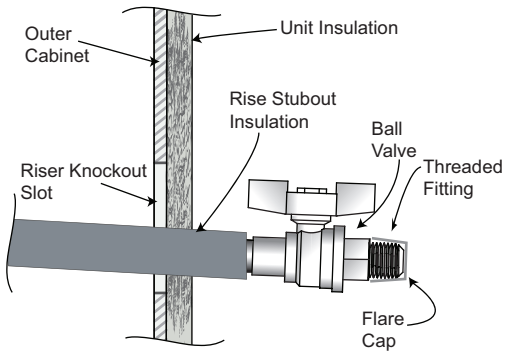


Fig. 30 — 42SMA Riser to Unit Installation

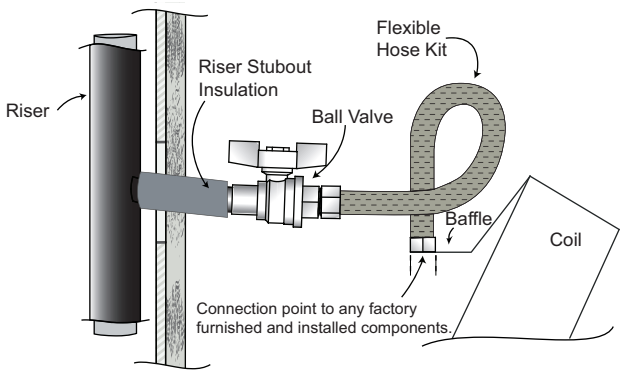


Fig. 31 — 42SMA Riser to Unit Connection

2. Before anchoring the equipment in place, the unit must be leveled and the cabinet must be plumb and squared. The unit may be anchored in place by bolting directly through the unit's floor or attaching to the building walls through the cabinet walls in some location that will not interfere with drywall or other items such as the supply grille, thermostat, or return access panel. When attaching sheet rock to the unit cabinet, care must be taken to not penetrate the cabinet in locations that may damage internal components or wiring. The mounting technique is a matter of choice; however, the unit should always be anchored securely to the building to prevent movement during construction and riser expansion and contraction. After anchoring the unit, it is then ready for the various service connections such as riser connections and electrical.
3. The plastic flare caps on the end of the riser ball valves should be removed and discarded.
4. All mega stack units use reinforced braided stainless steel flexible hose kits for piping between field-installed risers and unit water coils as shown in Fig. 31. Each hose has threaded connections on each end. The hose kits allow for riser fluctuations due to thermal expansion.
5. Use a wrench to tighten the swivel connections. Use a backup wrench to hold the riser ball valve stationary to prevent it from bending or twisting during installation as shown in Fig. 32. Be careful not to over-tighten swivel connections.

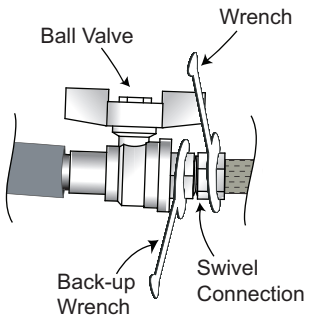


Fig. 32 — 42SMA Riser to Unit Installation (Tighten Swivel Connections)

6. Locate the unit's coil fitting.
7. The plastic flare caps on the end of the coil fitting should be removed and discarded.
8. Use a wrench to tighten the swivel connections. The baffle acts as a secondary wrench. Be careful not to over-tighten swivel connections.

⚠ CAUTION

Hose connection torque requirements are 350 in. lb +10/–0 in. lb to prevent leaks.

9. Locate the p-trap drain and rubber hose factory installed to the drain pan connection in the bottom of the unit as shown in Fig. 33.
10. Push the rubber drain hose over the riser drain stubout. Be careful that you do not bend the drain stubout.
11. Adjust the hose clamp over the riser stubout and rubber hose to hold in place as shown in Fig. 33.

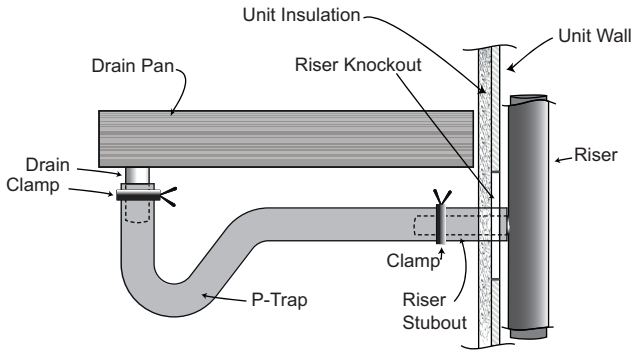


Fig. 33 — 42SMA Riser to Drain Installation

12. Test for leaks. Any and all leaks should be repaired before proceeding with installation. When testing with air or some other gas, it might be necessary to tighten stem packing nuts on some valves to maintain air pressure in the riser. Pressure testing risers with water should be done with the unit service valves closed to prevent flushing debris into the unit valve packages. These valves will also allow risers to be drained down after testing in the winter to avoid freeze-up problems. In the event that leaking or defective components are discovered, the sales representative must be notified BEFORE any repairs are attempted. All leaks should be repaired before proceeding with the unit installation.
13. After system integrity has been established, the riser insulation must be pulled back into place over the joint and glued or sealed to prevent sweating and heat loss or gain. All of the risers including the riser stubouts should be properly covered with insulation. Internally mounted chilled water piping and valves are located over the drain pan and need not be insulated.

    Any fireproofing requirements where risers or piping penetrate floors or walls are the responsibility of the installer. This work should be done only after all pressure testing is completed. The fireproofing method used must accommodate pipe expansion and contraction and the piping must be protected from abrasion and chemical attack. The pipe insulation also must be maintained to prevent sweating and must be protected from wear or erosion at the joint between the insulation and the fireproofing material.

    When no risers are ordered for the mega stack unit, it is the responsibility of the installer to make sure that a field-supplied isolation ball valve is installed between each supply and return piping connection to the unit. Flare fittings are factory provided to allow connection between the ball valves and the hoses.

    Variations in floor-to-floor dimensions may require field work such as cutting off or extending the risers. This operation is the responsibility of the installer. The riser joint filler material must be selected to withstand the total operating pressure (both static and pumping head) to which the system will be subjected. Low temperature lead alloy solders such as "50/50" and "60/40" are normally not suitable.

    Chilled water and hot water risers should never be piped to drain down into the condensate riser. Extensive water damage can occur due to drain overflow. Drain chilled and hot water risers to a remote location away from the unit such as sink, room, or floor drains.

    All installations should be made in compliance with all governing codes and ordinances. Compliance with all codes is the responsibility of the installing contractor.

Supply Air Installation

1. If the unit has been ordered with a supply air plenum, then each side of the unit has one supply air knockout as well as a supply air knockout on the top of the unit (see Fig. 34 and 35).
2. Determine which supply air opening/openings are required for your application.

NOTE: The supply air opening on the riser side of the unit should not be used.

3. Use a sharp retractable knife to trim insulation using center knockout slot/trim line as pattern (see Fig. 36).
4. Use a sharp standard needle nose pliers and grab knockout tab (see Fig. 36).
5. Twist or pry pliers back and forth until knockout tab breaks away from unit.
6. Repeat for all supply air tabs until all have been broken.
7. Discard center knockout piece. Be careful of sharp edges.
8. Use a sharp retractable knife to trim any excess insulation using knockout hole as pattern.
9. Use duct pliers (hand seamers) to fold duct flange out of the unit 90 degrees for each side of the supply air opening along duct break (see Fig. 36). The 90-degree flanges can now be used as drywall stops to prevent coverage of discharge opening (see Fig. 37).
10. Use adhesive or glue to re-attach insulation that has pulled away from the unit during knockout removal process.
11. For ducted applications, tape should be applied along and around all of the supply air opening knockouts to prevent air leakage.

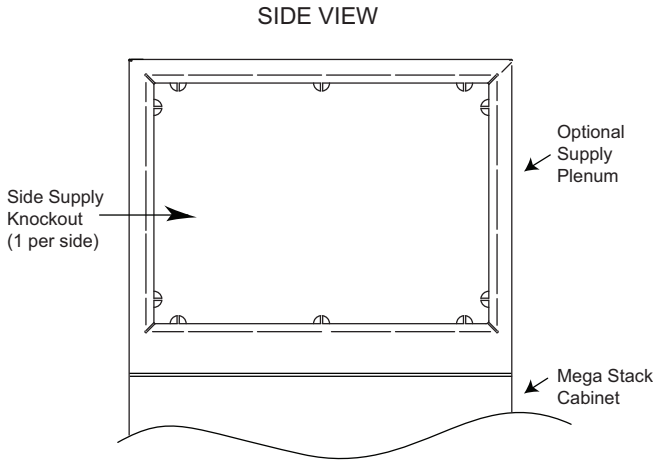


Fig. 34 — 42SMA Unit Knockout Locations Side View (Typical)

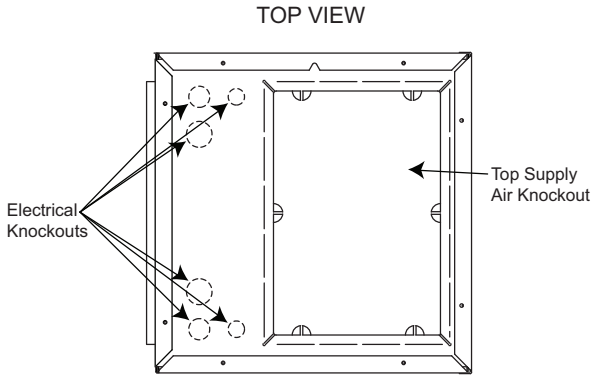


Fig. 35 — 42SMA Unit Knockout Locations Top View (Typical)

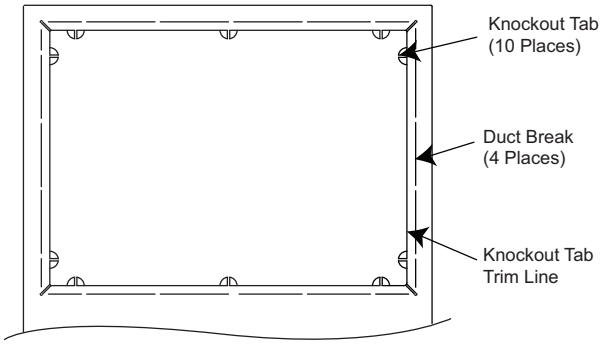


Fig. 36 — 42SMA Unit Supply Air Knockout Tab Location

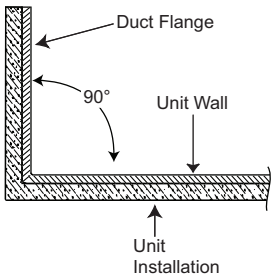


Fig. 37 — 42S Unit Supply Air Installation (All Units)

Step 2 — Make Electrical Connections

Refer to unit nameplate for required supply voltage, fan and heater amperage, and required circuit ampacity. Refer to unit wiring diagram for unit and field wiring. Since each project is different and each unit on a project may be different, the installer must be familiar with the wiring diagram and nameplate on the unit before beginning any wiring. Make sure all electrical connections are in accordance with unit wiring diagram and all applicable codes. The type and sizing of all wiring and other electrical components such as circuit breakers, disconnect switches, etc. should be determined by the individual job requirements, and should not be based on the size and/or type of connection provided on the equipment. All installations should be made in compliance with all governing codes and ordinances. Compliance with all codes is the responsibility of the installing contractor.

The fan motor(s) should never be controlled by any wiring or device other than the factory-supplied switch or thermostat/switch combination unless prior factory authorization is obtained. Fan motor(s) may be temporarily wired for use during construction only with prior factory approval and only in strict accordance with the instructions issued at that time.

The unit electrical supply is designed to enter through knockouts provided in the top of the unit and pass down through matching knockouts in the control section top. Where space allows, power may be pulled directly through the side of the cabinet into the control section.

All components furnished for field installation by either the factory or the controls contractor should be located and checked for proper function and compatibility. All internal components should be checked for shipping damage, and any loose connections should be tightened to minimize problems during start-up.

Any devices such as fan switches or thermostats that have been furnished from the factory for field installation must be wired in strict accordance with the wiring diagram that appears on the unit. Failure to do so could result in personal injury or damage to components, and will void all manufacturer's warranties.

The manufacturer assumes no responsibility for any damages and/or injuries resulting from improper field installation and/or wiring.

FACTORY-INSTALLED OPTIONS

Condensate Overflow Switch

The condensate overflow switch is used to detect a clogged condensate drain pan. The condensate switch uses a normally closed contact to allow the system control power to pass through the switch energizing the water valves and fans allowing normal operation. When an overflow condition is detected by the switch, it opens the NC contact and de-energizes the water valve and fans.

Aquastat

The aquastat must be able to sense whether the flowing water is being chilled or heated and switches a contact closed to provide automatic summer or winter changeover for the system. When a two-pipe cooling/heating system with optional auxiliary electric heat is desired, an additional aquastat is required.

If the valve package is field-supplied, the aquastat must be installed in a location where it will sense the water temperature regardless of control valve position. A bleed bypass should be provided for proper operation of aquastat. The bleed line allows a small amount of water to flow from supply to return piping when the control valve is closed for loop temperature sensing.

All field wiring must be in accordance with governing codes and ordinances. Any modification of unit wiring without factory authorization will invalidate all factory warranties and nullify any agency listings. The manufacturer assumes no responsibility for any damages and/or injuries resulting from improper field installation and/or wiring.

IMPORTANT: Refer to unit wiring label for specific functions. Standard wiring diagram configurations are maintained in separate Fan Coil Wiring Diagram literature. Refer to unit wiring label for specific functions.

Units may be equipped with line voltage controls or 24 vac control systems. The following descriptions are for typical control sequences only. For detailed control operating sequence, refer to thermostat operating instructions.

STANDARD WIRING PACKAGES

Thermostatic Electric Valve Control, 2-Pipe

A thermostatically controlled 2-position valve provides superior control to fan cycling. With this control, the fan runs continuously unless it is manually switched to the OFF or AUTO position. The fan must be on before the valve can be opened to supply water to the coil.

This system can be used for normal 2-pipe changeover systems and can also be furnished for cooling-only or heating-only applications by omitting the changeover and specifying which application is intended. Wiring diagrams show typical applications. Refer to wiring diagram on unit blower housing for unit specific wiring.

Thermostatic 2-Pipe Auxiliary Electric Heat with Valve Control

This system, also called twilight or intermediate season electric heat, goes a long way towards solving the spring and fall control problems of 2-pipe systems.

Chilled water can be run late into the fall, turned on early in the spring, and electric heat will still be available to all units whenever required.

In winter, the system is switched over to hot water. Two changeover devices are required for this. One device switches the action of the thermostat and the other locks out the electric heat when hot water is in the coil.

With this system, the fan runs continuously unless manually switched to OFF or AUTO position. Fan must be on before thermostat can send signal to open chilled water valve or turn on electric heater.

Two control methods are available:

1. Use the standard automatic changeover thermostat with a dead band between heating and cooling.
2. Use a manual changeover thermostat. With this method only one changeover is required.

Be sure to include a 2-way or 3-way electric valve with this system.

NOTE: Wiring diagrams are for typical applications. If other voltages for heaters or controls are specified, wiring may differ from that shown. Refer to wiring diagram on unit blower housing for unit specific wiring.

Thermostat 2-Pipe Total Electric Heat with Valve Control

With this system, the complete heating requirement for the space is provided by the electric heater; the water system is never changed over for heating. It is therefore possible, just as with 4-pipe systems, to have heating or cooling at any time of the year.

The fan runs continuously unless it is manually switched to OFF or AUTO position. Fan must be on before thermostat can send signal to open chilled water valve or turn on electric heater.

Normally, an automatic changeover thermostat with a dead band between heating and cooling is used, but a manual changeover thermostat is also suitable. A 2-way or 3-way valve must also be used so that the chilled water is off whenever the heater is on. No changeover device to sense water temperature is necessary.

NOTE: Wiring diagrams are for typical applications. If other voltages for heaters or controls are specified, wiring may differ from that shown. Refer to wiring diagram on unit blower housing for unit specific wiring.

Thermostatic Valve Control, 4-Pipe

The 4-pipe system provides the ultimate in economy and room temperature control. Both hot water and chilled water are available at any time.

Normally an automatic changeover thermostat is used, but a manual changeover thermostat is also suitable. Two 2-way valves, two 3-way valves, or one 2-way plus one 3-way valve must be selected. An automatic changeover device to sense water temperature is not required.

With this system, the fan runs continuously unless it is manually switched to OFF/AUTO position. Fan must be on before thermostat can send signal to open the chilled water or hot water valve.

NOTE: Wiring diagrams are for typical applications. If other voltages for heaters or controls are specified, wiring may differ from that shown. Refer to wiring diagram on unit blower housing for unit specific wiring.

Step 3 — Make Duct Connections

Install all ductwork to and from unit in accordance with project plans, specifications, and all applicable codes. Duct construction must allow unit to operate within duct external static pressure limits as shown on job submittals. Units designed to operate with ductwork may be damaged if operated without intended ductwork attached.

Units provided with outside air should have some method of low-temperature protection to prevent freeze-up. This protection may be any of several methods, such as a low temperature thermostat to close the outside air damper or a preheat coil to temper the outside air before it reaches the unit. It should be noted that none of these methods will adequately protect the coil in the event of power failure. The safest method of freeze protection is to use glycol in the proper percent solution for the coldest expected air temperature.

Insulate ductwork as required. Use flexible connections to minimize duct-to-unit alignment problems and noise transmission where specified.

The manufacturer assumes no responsibility for undesirable system operation due to improper system design, equipment or component selection, and/or installation of ductwork, grilles, and other related components.

⚠ CAUTION

Prevent dust and debris from settling in unit. If wall finish or color is to be spray-applied, *cover all openings to prevent spray from entering unit.* Failure to do so could result in damage to the unit and/or the reduction of unit efficiency.

Step 4 — Frame and Finish Unit

Models 42SG, SH, SJ, SU and SM have factory enclosures and may be finished with normally accepted wall covering. However, drywall secured with adhesive bonding alone is NOT recommended.

CONCEALED UNIT ENCLOSURE

Concealed units are designed to have gypsum board or other types of wall board applied directly to the unit cabinet surface to a maximum combined thickness of 5/8 in. Use low-profile sheet metal panhead screws to secure wallboard to unit frame. Fasteners may penetrate the cabinet no more than 1/2 in.

These fasteners must be located to avoid damage to internal components and wiring in the same manner as anchoring fasteners. Do not apply sheet metal screw or nails where they can penetrate coil, riser pipes, or electrical junction box and raceways.

Do not secure wallboard to drain pan edges or to control box enclosure. Condensate leaks or electrical shorts may result.

An alternate method of enclosing the unit is to frame one or more sides with studding and apply the wall board to this framing. This method requires specific unit features and return access panels when used on the return-air side of a unit. Units not properly equipped will exhibit poor cooling and/or heating performance and could experience excessive or premature component failures.

Prevent sheetrock dust or other debris from settling on coil fins, motor-blower assembly, or other unit interior surfaces.

EXPOSED UNIT FINISH, TOUCH-UP AND REPAINT

Return access and exposed cabinet units may be furnished with a baked enamel finish. Small scratches in this finish may be repaired with touch-up paint available from the factory. Some colors of touch-up paint are available in aerosol containers and all touch-up paint is available in pint, quart, and gallon cans.

⚠ CAUTION

Proper safety procedures should be followed regarding ventilation and safety equipment during touch-up and repainting since materials may pose a health hazard. The manufacturer's directions should be followed for the products being used.

To repaint the factory-baked enamel, the finish should be prepared by light sanding with no. 280 grit sand paper or no. 000 or no. 0000 fine steel wool. The surface may also be wiped with a liquid surface etch cleaning product such as “No Sand” or “Pasceo.” These items should be available at most paint product stores. It should be noted that the more conscientiously this preparation is done, the more effective it will be.

After this preparation is accomplished, the factory finish should provide excellent adhesion for a variety of air-dried top coats. Enamel will give a more durable, higher gloss finish, while latex will not adhere as well and will give a dull, softer finish. Top coats involving an exothermic chemical process between two components, such as epoxies and urethanes, should be avoided.

Factory aerosol touch-up paint may require a number of light “dust coats” to isolate the factory-baked enamel finish from the quick drying touch-up paint.

Step 5 — Cut Out Openings for Grilles and Thermostats

On all units with optional supply-air or return-air grilles, dampers, thermostats, and switch plates, cut out openings where specified on the job plans. Be careful not to cut wires, piping or structural supports.

For remote-mounted thermostats, use a steel thermostat shield ring to protect drywall from thermostat wiring where applicable.

If not included on the unit or furnished from the factory, supply and return grilles should be provided as recommended in the product catalog.

Step 6 — Make Final Preparations

1. Turn off power to the unit (open unit electrical disconnect).
2. Install thermostats and perform any other final wiring as applicable. Check the unit for any loose wires.
3. Perform a final visual inspection. All equipment, plenums, ductwork, and piping should be inspected to verify that all systems are complete and properly installed and mounted, and that no debris or foreign articles such as paper or drink cans are left in the units or other areas. Clean dirt, dust, and other construction debris from unit interior. Be sure to check fan wheel and housing.
4. Rotate fan wheel by hand to be sure it is free and does not rub housing. Check that wing nuts securing fan assembly to fan deck are tight.
5. Ensure all panels and filters are installed before checking fan operation. Turn on power to the unit.
6. Install filter in frame at front of coil. If field-supplied filters are used, be sure size is as specified in Table 1.

⚠ CAUTION

Do not start up or operate unit without filter. Be sure filter and unit interior are clean. Failure to do so could result in damage to the equipment or building.

7. ECM (Electronically Commutated Motor) Blower:
   If the unit is equipped with an ECM blower, additional steps may be required during the air balancing process. The ECM blower is controlled by one of three control boards, depending on the options ordered with the unit. Review project submittals or order acknowledgment to determine which ECM control scheme the unit has. Alternatively, match the control board to the illustrations identified in the Control Board Type section.
8. Check the fan and motor operation.
9. Be sure drain line is properly and securely positioned and that the line is clear. Pour water into drain to check operation.
10. Prior to the water system start-up and balancing, the chilled/hot water systems should be flushed to clean out dirt and debris which may have collected in the piping during construction. During this procedure, the system should be flushed from the supply riser to the return riser through a cross-over loop at the end of the riser column, and all unit service valves must be in the closed position. This prevents foreign matter from entering the unit and clogging the valves and metering devices. Strainers should be installed in the piping mains to prevent this material from entering the units during normal operation. Vent all air from unit coil and related piping. Air venting from the unit is accomplished by the use of the standard manual air vent fitting, or the optional automatic air vent fitting installed on the coil. Venting can be accomplished by depressing the needle valve core. Automatic air vents may be unscrewed one turn counterclockwise to speed initial venting, but should be screwed in for automatic venting after start-up operations. When steady steam of water begins to escape, close valve. Vent release air slowly, usually dripping water into drain pan in the process.

    Make sure all service valves are open and that the motorized control valves, if supplied, are set for automatic operation.

⚠ CAUTION

The air vent provided on the unit is not intended to replace the main system air vents and may not release air trapped in other parts of the system. Inspect the entire system for potential air traps and vent those areas as required, independently. In addition, some systems may require repeated venting over a period of time to properly eliminate air from the system. Failure to properly vent system may negatively affect operation.

11. Check all control valves in the system for proper operation in accordance with valve manufacturer's instructions.
12. For units with factory-installed ball valves with lever handles: When handle is perpendicular to valve body, there is no flow through valve. Ball valves may be used as shutoff valves.

ECM (ELECTRONICALLY COMMUTATED MOTOR) CONTROL OPTION

⚠ CAUTION

Both of the procedures described below require the control box to be powered while adjustments are made. Line voltage components are concealed behind a secondary cover. However, installer should still take all reasonable precautions to prevent electrical shock.

3-Discrete Speed Rheostat Field Adjustment (42SM Only)

The unit has been factory-configured to produce PSC equivalent airflow on high speed, with medium and low speed set at 80% and 60% of high, respectively. If these setting are acceptable, then no further configuring is required. Board mounted rheostats are provided to adjust the airflow pertaining to each output. Each output can be adjusted from 0 to 100% of the motor's factory programmed operating range. To set airflow, connect a volt-meter between "common" (near the red status LED) and Flo1 through Flo4. See Fig. 38.

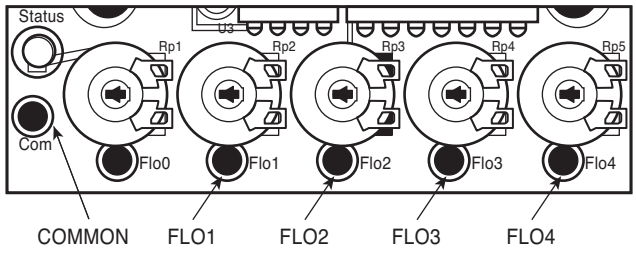


Fig. 38 — ECM Rheostat Speed Board (42SM Only)

Carrier's convention is to preset and wire Flo1 for high speed, Flo2 for medium, and Flo3 for low. Flo4 is not used with any standard thermostat, but may be employed for a more advanced application. The chart on the control box cover associates airflow rates with the voltage indicated on your volt-meter. For each speed, adjust the rheostat until indicated voltage matches the desired value from the airflow table.

3-Discrete Speed Potentiometer Field Adjustment

Depending on the configuration, the 3-discrete will come with the legacy control board or the 85 control board. The unit has been factory configured to produce PSC (permanent split capacitor) equivalent airflow on high speed, with medium and low speed set at 80% and 60% of high, respectively. If these settings are acceptable, then no further configuring is required.

If alternative airflows are desired, use board-mounted pots to adjust the airflow associated with each input. Each output can be adjusted from 0 to 100% of the motor's factory programmed operating range. Use voltmeter and airflow chart (on control box cover) to set values. Refer to Appendix B on page 35 for adjustment procedure on the legacy board. Refer to Appendix C on page 36 for the 85 board and Appendix D for 4-Speed solid state field adjustment. See Fig. 39-41.

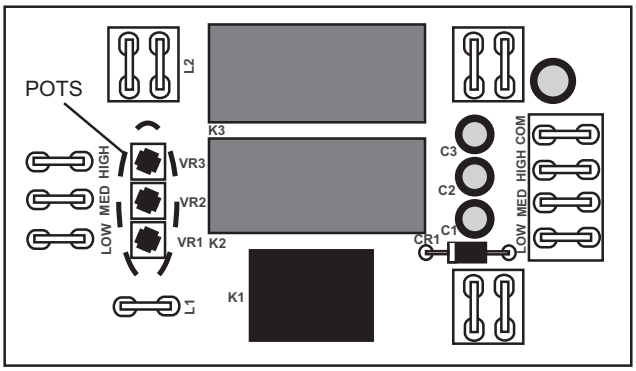


Fig. 39 — 3-Speed Potentiometer Adjustment (Legacy)

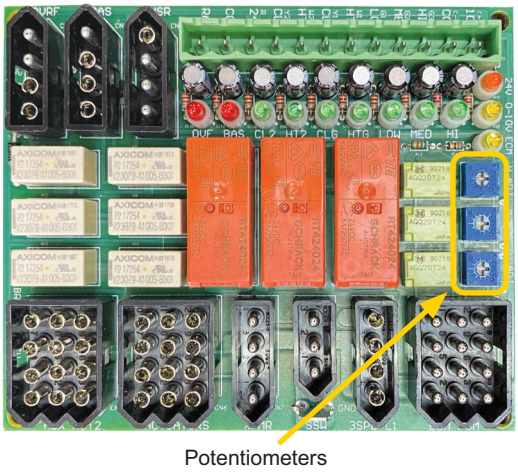


Fig. 40 — 3-Speed Potentiometer Adjustment (85 Board)

4-Discrete Speed Potentiometer Field Adjustment, Solid State

The unit has been factory configured to produce PSC equivalent airflow on high speed, with medium and low speed set at 80% and 60% of high, respectively. If these settings are acceptable, then no further configuring is required.

Board mounted pots are provided to adjust the airflow pertaining to each output. Each output can be adjusted from 0 to 100% of the motor's factory programmed operating range. Use voltmeter and airflow chart (on the control box cover) to set values. Refer to Appendix D on page 41 for adjustment procedure. See Fig. 41.

Variable Airflow for 0-10 vdc Input

If a factory provided thermostat or DDC controller is utilized, then the unit is already correctly configured. Carrier recommends using the specified thermostat or DDC controller to commission the unit whenever possible. However, the blower can be started and operated without the thermostat. Consult factory for further instruction.

ECM Variable Airflow for 0-10 vdc

No control board is required and no field adjustments are possible. Motor uses 0-10 vdc signal directly. See control box label. Fan enable at 1.5 vdc.

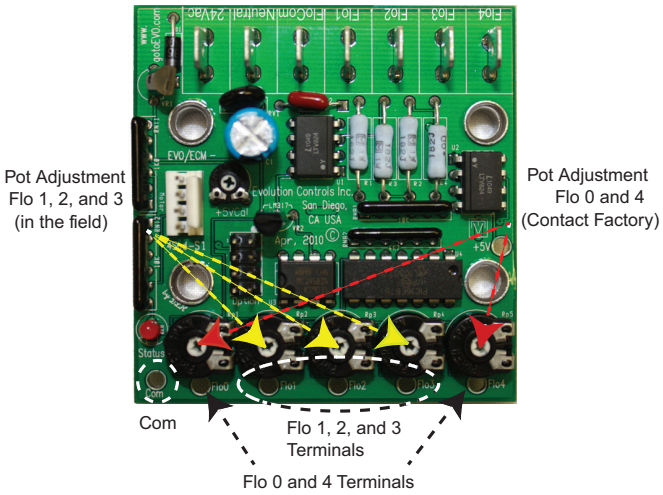


Fig. 41 — 4-Speed Potentiometer Field Adjustment (Solid State)

START-UP

⚠ CAUTION

Both of the start-up and servicing procedures described below require the control box to be powered while adjustments are made. Line voltage components are concealed behind a secondary cover. However, installer should still take all reasonable precautions.

Before beginning any start-up operation, the start-up personnel should familiarize themselves with the unit, options and accessories, and control sequence to understand the proper system operation. All personnel should have a good working knowledge of general start-up procedures and have the appropriate start-up and balancing guides available for consultation.

The building must be completely finished including doors, windows, and insulation. All internal walls and doors should be in place and in the normal position. In some cases the interior decorations and furniture may influence overall system performance. The entire building should be as complete as possible before beginning any system balancing.

The initial step in any start-up operation should be a final visual inspection. All equipment, plenums, ductwork, and piping should be inspected to verify that all systems are complete and properly installed and mounted, and that no debris or foreign articles such as paper or drink cans are left in the units or other areas.

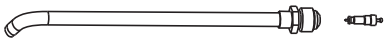
Each unit should be checked for loose wires, free blower wheel operation, and loose or missing access panels or doors. Except as required during start-up and balancing operations, no fan coil units should be operated without all the proper ductwork attached, supply and return grilles in place, and all access doors and panels in place and secure. A clean filter of the proper size and type must also be installed. Failure to do so could result in damage to the equipment or building and furnishings and/or void all manufacture's warranties.

Maximum operating altitude for units is 13,400 ft (4 km). All units are IPX0 rated.

COOLING/HEATING SYSTEM

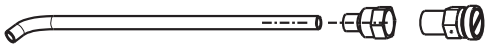
Prior to the water system start-up and balancing, the chilled/hot water systems should be flushed to clean out dirt and debris which may have collected in the piping during construction. During this procedure, the system should be flushed from the supply riser to the return riser through a cross-over loop at the end of the riser column, and all unit service valves must be in the closed position. This prevents foreign matter from entering the unit and clogging the valves and metering devices. Strainers should be installed in the piping mains to prevent this material from entering the units during normal operation.

During system filling, air venting from the unit is accomplished by the use of the standard, manual air vent fitting, or the optional, automatic air vent fitting installed on the coil. Venting can be accomplished by depressing the needle valve core. Automatic air vents may be unscrewed one turn counterclockwise to speed initial venting, but should be screwed in for automatic venting after start-up operations. See Fig. 42 and 43.



Manual Air Vent

Fig. 42 — Manual Air Vent



Automatic Air Vent

Fig. 43 — Automatic Air Vent

⚠ CAUTION

The air vent provided on the unit is not intended to replace the main system air vents and may not release air trapped in other parts of the system. Inspect the entire system for potential air traps and vent those areas as required, independently. In addition, some systems may require repeated venting over a period of time to properly eliminate air from the system.

Direct Expansion (DX) Systems

NOTE: Operation of DX equipped fan coils at any fan speed other than high fan speed is not approved and will void the manufacturer's limited warranty.

IMPORTANT: Do not operate fan coils with a DX evaporator coil plus contiguous hydronic coil without use of a suitable glycol solution that is approved for use by the manufacturer. Failure to follow this instruction will void the manufacturer's limited warranty.

IMPORTANT: Should the evaporator freeze due to inadequate airflow for any reason, damage may occur to adjacent water or steam coil tubing. This type of issue is due to product misapplication and voids the manufacturer's limited warranty.

Air System Balancing

All duct stubs, grilles, filters, and return-access panels must be properly installed to establish actual system operating conditions BEFORE beginning air balancing operations. Refer to Table 2.

Each individual unit and the attached ductwork is a unique system with its own operating characteristics. For this reason, air balancing is normally done by balance specialists who are familiar with all procedures required to properly establish air distribution and fan-system operating conditions. These procedures should not be attempted by unqualified personnel.

Units with no ductwork have air volumes predetermined at the factory by supply grille size and normally do not require air balancing other than selecting the desired fan speed. Units furnished with optional dampers on supply grilles may require some small adjustments to "fine tune" the air delivery to each grille. Opposed blade balancing dampers are not available for all grilles on a unit with electric heat.

After proper system operation is established, the actual unit air delivery and the actual fan motor amperage draw for each unit should be recorded in a convenient place for future reference.

Table 2 — Maximum External Static Pressures

42SG/SJ/SH	ESP
Max at High Speed	0.40
Max at High Speed	0.30
Max at High Speed	0.20
42SMA	**ESP**
Max at High Speed	0.60
Max at High Speed	0.40
Max at High Speed	0.25

Water System Balancing

A complete knowledge of the hydronic system, along with its components and controls, is essential to proper water system balancing. This procedure should not be attempted by unqualified personnel. The system must be complete, and all components must be in operating condition BEFORE beginning water system balancing operations.

Each hydronic system has different operating characteristics depending on the devices and controls used in the system. The actual balancing technique may vary from one system to another.

After the proper system operation is established, the appropriate system operating conditions such as various water temperatures and flow rates should be recorded in a convenient place for future reference.

Before and during water system balancing, conditions may exist due to incorrect system pressures which may result in noticeable water noise or undesired valve operation. After the entire system is balanced, these conditions will not exist on properly designed systems.

Water Treatment

Proper water treatment is a specialized industry. Carrier recommends consulting an expert in this field to analyze the water for compliance with the water quality parameters listed below, and to specify the appropriate water treatment regimen. The expert may recommend typical additives such as rust inhibitors, scaling preventative, antimicrobial growth agents, or algae preventatives. Anti-freeze solutions may also be used to lower the freezing point.

Carrier water coil tubes and headers are constructed of pure copper. Multiple brass alloys may be present in the valve package, depending on unit configuration. It is the user's responsibility to ensure the tube and piping materials furnished by Carrier, are compatible with the treated water. See Table 3 for water quality parameters.

IMPORTANT: Failure to provide proper water quality may affect the fan coil unit's warranty.

Table 3 — Water Quality Parameters[a,b]

WATER CONTAINING	REQUIRED CONCENTRATION
Sulphate	Less than 200 ppm
pH	7.0 to 8.5
Chlorides	Less than 200 ppm
Nitrate	Less than 100 ppm
Iron	Less than 4.5 mg/l
Ammonia	Less than 2.0 mg/l
Manganese	Less than 0.1 mg/l
Dissolved Solids	Less than 1000 mg/l
$CaCO_3$ Hardness	300 to 500 ppm
$CaCO_3$ Alkalinity	300 to 500 ppm
Particulate Quantity	Less than 10 ppm
Particulate Size	800 micron max

NOTE(S):

a. Maximum water operating temperature: 190°F (98°C).
b. Maximum allowable water pressure: 500 psig (3447 kpa).

Controls Operation

Before proper control operation can be verified, all other systems must be operating properly. The correct water and air temperatures must be present for the control function being tested. Some controls and features are designed to not operate under certain conditions. For example, on a two-pipe cooling/heating system with auxiliary electric heat, the electric heater cannot be energized with hot water in the system.

A wide range of controls, electrical options and accessories may be used with the equipment covered in this manual. Consult the approved unit submittals, order acknowledgments, and other literature for detailed information regarding each individual unit and its controls. Since controls and features may vary from one unit to another, care should be taken to identify the controls used on each unit and their proper control sequence. Information provided by component manufacturers regarding installation, operation, and maintenance of their individual controls is available upon request.

When changing from one mode to another (cooling to heating or heating to cooling), it may take some time to actually notice a change in the leaving air temperature. In addition, some units may be designed for a very low air temperature rise in heating. Before declaring a unit inoperative or a component defective, it may be necessary to verify operation by more than one method.

SERVICE

Each unit on a job will have its own unique operating environment and conditions which may dictate a maintenance schedule that differs from other units on a job. A formal schedule of regular maintenance and an individual unit log should be established and maintained. This will help to achieve the maximum performance and service life of each unit on the job.

IMPORTANT: Information regarding safety precautions contained in the preface at the beginning of this manual should be followed during any service and maintenance operations.

Excessive Condensation on Unit

Running chilled water through a fan coil unit with the unit fan off can cause excessive condensation. If fan cycling is used, a water flow control valve should be installed to shut off the water when the fan stops.

Other methods of control that avoid condensation problems are as follows:

1. Continuous fan operation with motorized chilled water valve controlled by a thermostat.
2. Continuous fan operation with thermostat control to switch fan from high to low speed (instead of off).

To Clean Coil

Coils may be cleaned by removing the filter and brushing the entering air face between fins with a stiff brush. Care should be taken to not damage coil fins. Brushing should be followed by cleaning with a vacuum cleaner. If a compressed air source is available, the coil may also be cleaned by blowing air through the coil fins from the leaving air face. This should again be followed by vacuuming. Units provided with the proper type of air filters, replaced regularly, will require less frequent coil cleaning.

Check Drain

Lock open and tag unit electrical service switch.

Check drain pan, drain line and trap before initial start-up and at start of each cooling season. A standard type pipe cleaner for 3/4 in. ID (Inside Dimensions) pipe can be used to ensure that pipe is clear of obstruction so that condensate is carried away. Check the drain line at filter cleaning time during the cooling season. Be sure that debris has not fallen into unit through supply-air grille. Should the growth of algae and/or bacteria be a concern, consult an air conditioning and refrigeration supply organization familiar with local conditions for chemicals or other solutions available to control these agents.

Fan Motor Bearings

Lock open and tag unit electrical service switch.

Standard motors are permanently sealed and lubricated. No lubrication is required unless special motors have been supplied or unusual operating conditions exist.

Motor/Blower Assembly

The type of fan operation is determined by the control components and their method of wiring. This may vary from unit to unit. Refer to the wiring diagram that is attached to each unit for that unit's individual operating characteristics.

All motors have permanently lubricated bearings. No field lubrication is required.

Should the assembly require more extensive service, the motor/blower assembly may be removed from the unit to facilitate such operations as motor or blower wheel/housing replacement, etc.

Dirt and dust should not be allowed to accumulate on the blower wheel or housing. This can result in an unbalanced blower wheel condition which can damage a blower wheel or motor. The wheel and housing may be cleaned periodically using a vacuum cleaner and a brush taking care not to dislodge the factory balancing weights on the blower wheel blades.

Clean Fan Wheel

Lock open and tag unit electrical service switch.

For access to fan assembly, remove front or bottom panel. Fan assembly may be removed from its tracks if unit has a long conduit lead. Dirt and debris should not be allowed to accumulate on the blower wheel or housing. This can result in an unbalanced blower wheel condition which can damage a blower wheel or motor. The wheel and housing may be cleaned periodically using a vacuum cleaner and a brush, taking care not to dislodge the factory balancing weights on the blower wheel blades.

Electric Resistance Heater Assembly

Electric resistance heaters typically require no normal periodic maintenance when unit air filters are changed properly. The operation and service life may be affected by other conditions and equipment in the system. The two most important operating conditions for an electric heater are proper air flow and proper supply voltage. High supply voltage and/or poorly distributed or insufficient air flow over the element will result in element overheating. This condition may result in the heater cycling on the high-limit thermal cutout. The high-limit thermal cutout device is a safety device only and is not intended for continuous operation. With proper unit application and operation, the high-limit thermal cutout will not operate. This device only operates when a problem exists, and ANY condition that causes high-limit cutout MUST be corrected immediately. High supply voltage also causes excessive amperage draw and may trip the circuit breaker or blow the fuses on the incoming power supply.

After proper air flow and supply power are assured, regular filter maintenance is important to provide clean air over the heater. Dirt that is allowed to deposit on the heating element will cause hot spots and eventual element burn through. These hot spots will normally not be enough to trip the high-limit thermal cutout device and may not be evident until actual heater element failure.

Electrical Wiring and Controls

The electrical operation of each unit is determined by the components and wiring of the unit. This may vary from unit to unit. Consult the wiring diagram attached to the unit for the actual type and number of controls provided on each unit.

The integrity of all electrical connections should be verified at least twice during the first year of operation.

Afterwards, all controls should be inspected regularly for proper operation. Some components may experience erratic operation or failure due to age. Wall thermostats may also become clogged with dust and lint and should be periodically inspected and cleaned to provide reliable operation.

When replacing any components such as fuses, contractors, or relays, use only the exact type, size and voltage component as furnished from the factory. Any deviation without factory authorization could result in personal injury or damage to the unit. This will also void all factory warranties. All repair work should be done in such a manner as to maintain the equipment in compliance with governing codes, ordinances and testing agency listings.

More specific information regarding the use and operating characteristics of the standard controls offered by the manufacturer are contained in other manuals.

Valves and Piping

No formal maintenance is required on the valve-package components most commonly used with fan coil units other than a visual inspection for possible leaks in the course of other normal periodic maintenance. In the event that a valve should need replacement, the same precautions taken during the initial installation to protect the valve package from excessive heat should also be used during replacement.

Filters, Throwaway

The type of throwaway filter most commonly used on fan coil units should be replaced on a regular basis. The time interval between each replacement should be established based on regular inspection of the filter and should be recorded in the log for each unit. Refer to the product catalog for the recommended filter size for each product type and size. If the replacement filters are not purchased from the factory, the filters used should be the same type and size as those furnished from or recommended by the factory. Pleated media or extended surface filters should not be used since the high air pressure drops encountered with these types of filters are not compatible with the type of fan coil unit covered in this manual. Consult the factory for applications using filter types other than the factory standard or optional product.

Filters, Permanent

A maintenance schedule for permanent filters should be developed in the same manner as throwaway filters.

Unlike throwaway filters, permanent filters may be cleaned and re-installed in the unit instead of being discarded when dirty. The optional factory permanent filter may be cleaned in hot soapy water to remove any trapped dirt. It should then be set aside on edge to dry.

Before replacing the filter in the unit, it should be recharged with some type of entrapment film such as “Film-Cor Recharging Oil” The filter should be sprayed on both sides or submerged in the film to assure complete coverage. The filter should not be allowed to soak in the film, but should be immediately removed and the excess film drained from the filter before re.installation in the unit.

Consult a local filter supplier for types of available cleaning solutions and charging films.

NOTE: Permanent filters normally have less static pressure loss than throwaway filters.

Drain

The drain should be checked before initial start-up and at the beginning of each cooling season to assure that the drain trap and riser are clear. If it is clogged, steps should be taken to clear the debris so that condensate will flow easily.

Periodic checks of the drain should be made during the cooling season to maintain a free-flowing condensate.

Should the growth of algae and/or bacteria be a concern, consult an air conditioning and refrigeration supply organization familiar with local conditions for chemicals or other solutions available to control these agents.

Replacement Parts

Factory replacement parts should be used wherever possible to maintain unit performance, it’s normal operating characteristics, and the testing agency listings.

Replacement parts may be purchased through a local Sales Representative. Contact the local Sales Representative or the factory before attempting any unit modifications. Any modifications not authorized by the factory could result in personnel injury, damage to the unit, and could void all factory warranties.

When ordering parts, the following information must be supplied to ensure proper part identification:

1. Complete unit model number
2. Unit serial number
3. Complete part description, including any numbers

Warranty

All equipment and components sold through the Parts Department are warranted under the same conditions as the standard manufacturer’s warranty with the exception that the warranty period is twelve (12) months unless the component is furnished as a warranty replacement. Parts furnished as warranty replacements are warranted for the remaining term of the original unit warranty or not less than thirty (30) days.

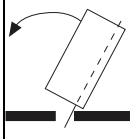
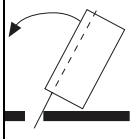
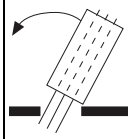
APPENDIX A — BLOCK-OUT CONSTRUCTION

This section provides rough guidelines for the block-out slot size for 42S units with risers included. Therefore, the floor block-out slot dimensions listed in this document should be considered estimates. The engineer for the project is ultimately responsible for the actual dimensions and meeting local code requirements.

To select using the following Tables A-D, locate the appropriate unit size in the cabinet charts (dimensions are given in inches). Then, follow the row across to locate the clear height (if the clear height exceeds 96 in. use the 96 in. block-out size). Under type of installation, read the block-out size. If the clear height is lower than listed or is not recommended (NR) in the standard 88 in. cabinet chart, use the short 79 in. cabinet chart. If the clear height is lower than listed or is not recommended (NR) in the short 79 in. cabinet chart, please contact the factory.

For examples of clearance height, unit placement, and riser length see Fig. A. For possible piping arrangements of the 42SJ unit see Fig. B.

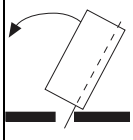
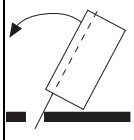
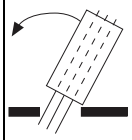
Table A — Standard 88 in. Cabinet, 2-pipe Units[a,b,c,d]

UNIT SIZE	CLEAR HEIGHT (in.)	BLOCK-OUT CONSTRUCTION SIZE TYPE OF INSTALLATION		
		TYPE 1	TYPE 2	TYPE 3[e]
				
		W x L (in.)	W x L (in.)	W x L (in.)
Single Unit and Siamese Ditto				
03, 04	96	5-7/8 x 15	5-1/8 x 15	5 x 15
	95	6-1/4 x 15	5-3/8 x 15	
	94	6-5/8 x 15	5-5/8 x 15	
	93	7 x 15	NR	
	92	7-1/2 x 15		NR
06, 08	96	6-1/4 x 18	5-3/8 x 18	5 x 18
	95	6-3/4 x 18		
	94	7-1/8 x 18	NR	
	93	7-5/8 x 18		
10, 12	96	7-1/2 x 22	5-1/8 x 18	5 x 22
	95	7-1/2 x 22	NR	
	94	8 x 22		
42SJ Ditto				
03, 04	93 and above	Not recommended for standard 42SJ. For Siamese 42SJ use Single unit guidelines.		5 x 15
06, 08	93 and above			5 x 18
10, 12	93 and above			5 x 22

NOTE(S):

a. CLEAR HEIGHT is the dimension from the floor to ceiling (See Fig. A of this appendix).
b. The above charts allow 1 in. tolerance in clear height to allow for variance in floor-to-floor dimensions.
c. Consult factory for applications with 3 in. and 4 in. risers and insulations exceeding 3/4 in.
d. See Fig. B for 42SJ unit and piping arrangements.
e. Not recommended for Siamese Ditto Installation.

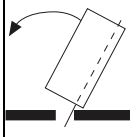
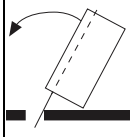
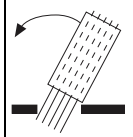
Table B — Short 79 in. Cabinet, 2-pipe Units[a,b,c,d]

UNIT SIZE	CLEAR HEIGHT (in.)	BLOCK-OUT CONSTRUCTION SIZE TYPE OF INSTALLATION		
		TYPE 1	TYPE 2	TYPE 3[e]
				
		W x L (in.)	W x L (in.)	W x L (in.)
Single Unit and Siamese Ditto				
03, 04	91	4-1/8 x 15	4-1/4 x 15	5 x 15
	90	5 x 15	4-1/2 x 15	
	89	5-1/8 x 15	4-5/8 x 15	
	88	5-1/8 x 15	5 x 15	
06, 08	91	5 x 18	4-1/4 x 18	5 x 18
	90	5-1/8 x 18	4-1/2 x 18	
	89	5-1/8 x 18	4-5/8 x 18	
	88	6-1/8 x 18	5 x 18	
10, 12	91	5-1/8 x 22	4-1/4 x 22	5 x 22
	90	6 x 22	4-1/2 x 22	
	89	6-1/8 x 22	4-5/8 x 22	
	88	7 x 22	5 x 22	
42SJ Ditto				
03, 04	88 and above	Not recommended for standard 42SJ. For Siamese 42SJ use Single unit guidelines.		5 x 15
06, 08	88 and above			5 x 18
10, 12	88 and above			5 x 22

NOTE(S):

a. CLEAR HEIGHT is the dimension from the floor to ceiling (See Fig. A of this appendix).
b. The above charts allow 1 in. tolerance in clear height to allow for variance in floor-to-floor dimensions.
c. Consult factory for applications with 3 in. and 4 in. risers and insulations exceeding 3/4 in.
d. See Fig. B for 42SJ unit and piping arrangements.
e. Not recommended for Siamese Ditto Installation.

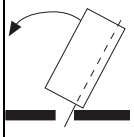
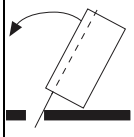
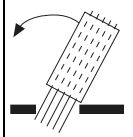
Table C — Standard 88 in. Cabinet (4-Pipe 42S Units)[a,b,c,d]

UNIT SIZE	CLEAR HEIGHT (in.)	BLOCK-OUT CONSTRUCTION SIZE TYPE OF INSTALLATION		
		TYPE 1	TYPE 2	TYPE 3[e]
				
		W x L (in.)	W x L (in.)	W x L (in.)
Single Unit and Siamese Ditto				
03, 04	96	5-7/8 x 16[f]	5-1/8 x 16[f]	5 x 18[g]
	95	6-1/4 x 16[f]	5-3/8 x 16[f]	5 x 18-1/4[g]
	94	6-5/8 x 16[f]	5-5/8 x 16[f]	5 x 18-5/8[g]
	93	7 x 16[f]	NR	
	92	7-1/2 x 16[f]		
06, 08	96	6-1/4 x 18	5-3/8 x 18	5 x 18[h]
	95	6-3/4 x 18		5 x 18-1/4[h]
	94	7-1/8 x 18	NR	5 x 18-5/8[h]
	93	7-5/8 x 18		NR
10, 12	96	7-1/2 x 22	5-1/8 x 22	5 x 22
	95	7-1/2 x 22	NR	
	94	8 x 22		NR
42SJ Ditto				
03, 04	96	Not recommended for standard 42SJ. For Siamese 42SJ use Single unit guidelines.		5 x 18
	95			5 x 18-1/4
	94			5 x 18-5/8
06, 08	96			5 x 18
	95			5 x 18-1/4
	94			5 x 18-5/8
10, 12	96			5 x 22
	95			

NOTE(S):

a. CLEAR HEIGHT is the dimension from the floor to ceiling (See Fig. A of this appendix).
b. The above charts allow 1 in. tolerance in clear height to allow for variance in floor-to-floor dimensions.
c. Consult factory for applications with 3 in. and 4 in. risers and insulations exceeding 3/4 in.
d. See Fig. B for 42SJ unit and piping arrangements.
e. Not recommended for Siamese Ditto Installation.
f. Use 16 in. block-out length for risers up to 1-1/2 in. in diameter. Use 17 in. block-out length for risers up to 2-1/2 in. in diameter. Since the cabinet is 17 in. wide, it may be necessary to cover the exposed block-out if the cabinet is not centered.
g. This block-out length is for risers up to 1-1/2 in. in diameter. Add 1 in. to the block-out length for risers up to 2-1/2 in. in diameter. Both block-out lengths are greater than the cabinet width. It will be necessary to cover the exposed block-out at the side(s) of the cabinet.
h. This block-out length is for risers up to 1-1/2 in. in diameter. Add 1 in. to block-out length for risers up to 2-1/2 in. in diameter.

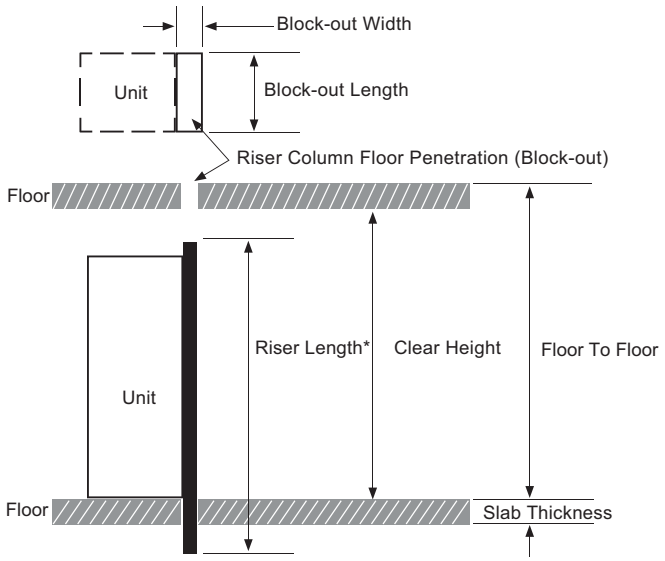
Table D — Short 79 in. Cabinet (4-Pipe 42S Units)[a,b,c,d]

UNIT SIZE	CLEAR HEIGHT (in.)	BLOCK-OUT CONSTRUCTION SIZE TYPE OF INSTALLATION		
		TYPE 1	TYPE 2	TYPE 3[e]
				
		W x L (in.)	W x L (in.)	W x L (in.)
Single Unit and Siamese Ditto				
03, 04	91	4-1/8 x 16[f]	4-1/4 x 16[f]	5 x 17[g]
	90	5 x 16[f]	4-1/2 x 16[f]	
	89	5-1/8 x 16[f]	4-5/8 x 16[f]	5 x 17-1/2[h]
	88	5-1/8 x 16[f]	5 x 16[f]	5 x 17-3/4[h]
06, 08	91	5 x 18	4-1/4 x 18	5 x 18
	90	5-3/8 x 18	4-1/2 x 18	
	89	5-3/4 x 18	4-5/8 x 18	5 x 18-1/2
	88	6-1/8 x 18	5 x 18	5 x 18-3/4
10, 12	91	5-5/8 x 22	4-1/4 x 22	5 x 22
	90	6 x 22	4-1/2 x 22	
	89	6-1/2 x 22	4-5/8 x 22	
	88	7 x 22	5 x 22	
42SJ Ditto				
03, 04	91	Not recommended for standard 42SJ. For Siamese 42SJ use Single unit guidelines.		5 x 17
	90			
	89			5 x 17-1/2
	88			5 x 17-3/4
06, 08	91			5 x 18
	90			
	89			5 x 18-1/2
	88			5 x 18-3/4
10, 12	91			5 x 22
	90			
	89			
	88			

NOTE(S):

a. CLEAR HEIGHT is the dimension from the floor to ceiling (See Fig. A of this appendix).
b. The above charts allow 1 in. tolerance in clear height to allow for variance in floor-to-floor dimensions.
c. Consult factory for applications with 3 in. and 4 in. risers and insulations exceeding 3/4 in.
d. See Fig. B for 42SJ unit and piping arrangements.
e. Not recommended for Siamese Ditto Installation.
f. Use 16 in. block-out length for risers up to 1-1/2 in. in diameter. Use 17 in. block-out length for risers up to 21/2-in. in diameter. Since the cabinet is 17 in. wide, it may be necessary to cover the exposed block-out if the cabinet is not centered.
g. Use 17 in. block-out length for risers up to 1-1/2 in. in diameter. Since the cabinet is 17 in. wide, it may be necessary to cover the exposed block-out if the cabinet is not centered. Use 18 in. block-out length for risers up to 2-1/2 in. in diameter. It will be necessary to cover the exposed block-out at the side(s) of the cabinet.
h. This block-out length is for risers up to 1-1/2 in. in diameter. Add 1 in. to the block-out length for risers up to 2-1/2 in. in diameter. Both block-out lengths are greater than the cabinet width. It will be necessary to cover the exposed block-out at the side(s) of the cabinet.

APPENDIX A — BLOCK-OUT CONSTRUCTION (CONT)



* Riser Length = Floor-to-floor dimensions ± 2 in. (maximum riser length of 115 in. When riser length must exceed 115 in. use 104 in. riser length and extensions. Extension length = floor-to-floor dimension ± 4 in. to 104 in.

Fig. A — Block-Out Construction Clear Height

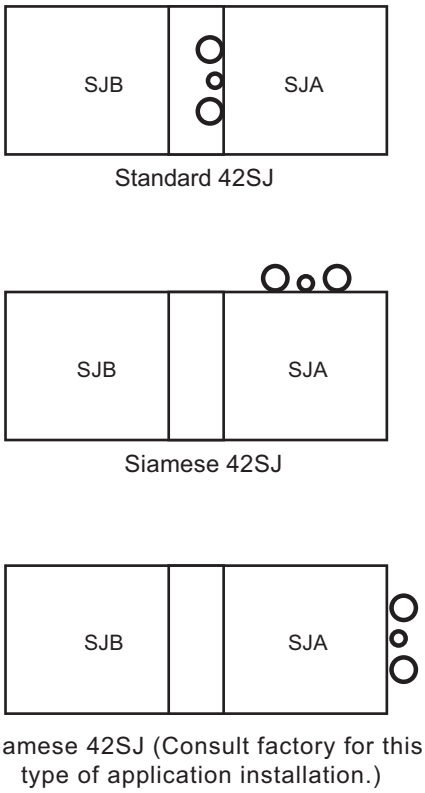


Fig. B — 42SJ Block-Out Construction Piping Arrangement

APPENDIX B — POTENTIOMETER ADJUSTMENT

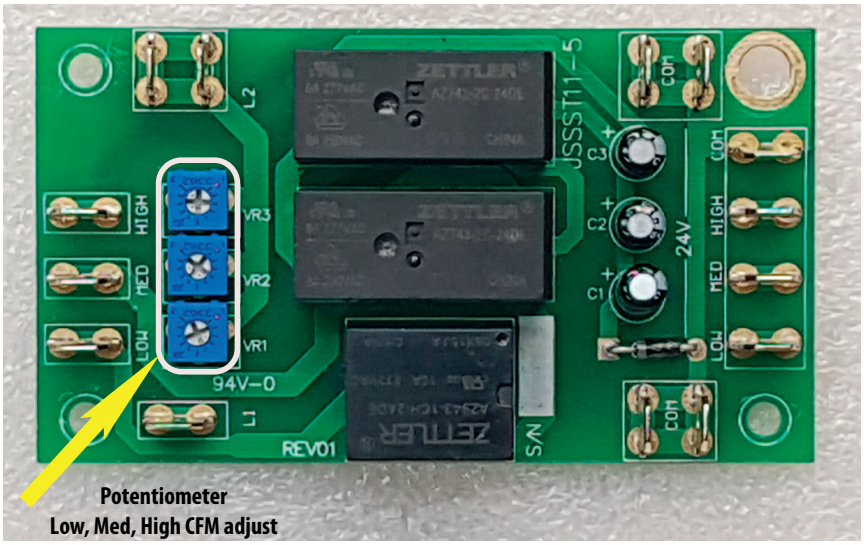


Fig. C — 3-Speed ECM

Adjusting the low, medium, and high potentiometers requires the use of a multi-meter capable of measuring 0~5 vdc (See Fig. C). When unit is shipped from the factory with motor control board (which has Hi, Med, and Low airflow settings), it is pre-programmed at the factory to "High" speed and delivers the airflow and cooling/heating capacity specified at the time of order, while Medium and Low Speeds are set to defaults based on High speed. Should airflow require adjustment after installation, the control board settings for Low, Medium, and High could be adjusted by turning screws (as shown in the picture) using a small Phillips Screwdriver. It will adjust the control voltage to the motor. A clockwise rotation increases the voltage to the motor, while counter clockwise rotation reduces it.

⚠ CAUTION

Only trained and qualified individuals should attempt to adjust or service components on any energized electrical equipment. Failure to follow established safety rules and guidelines could result in serious injury or death.

⚠ CAUTION

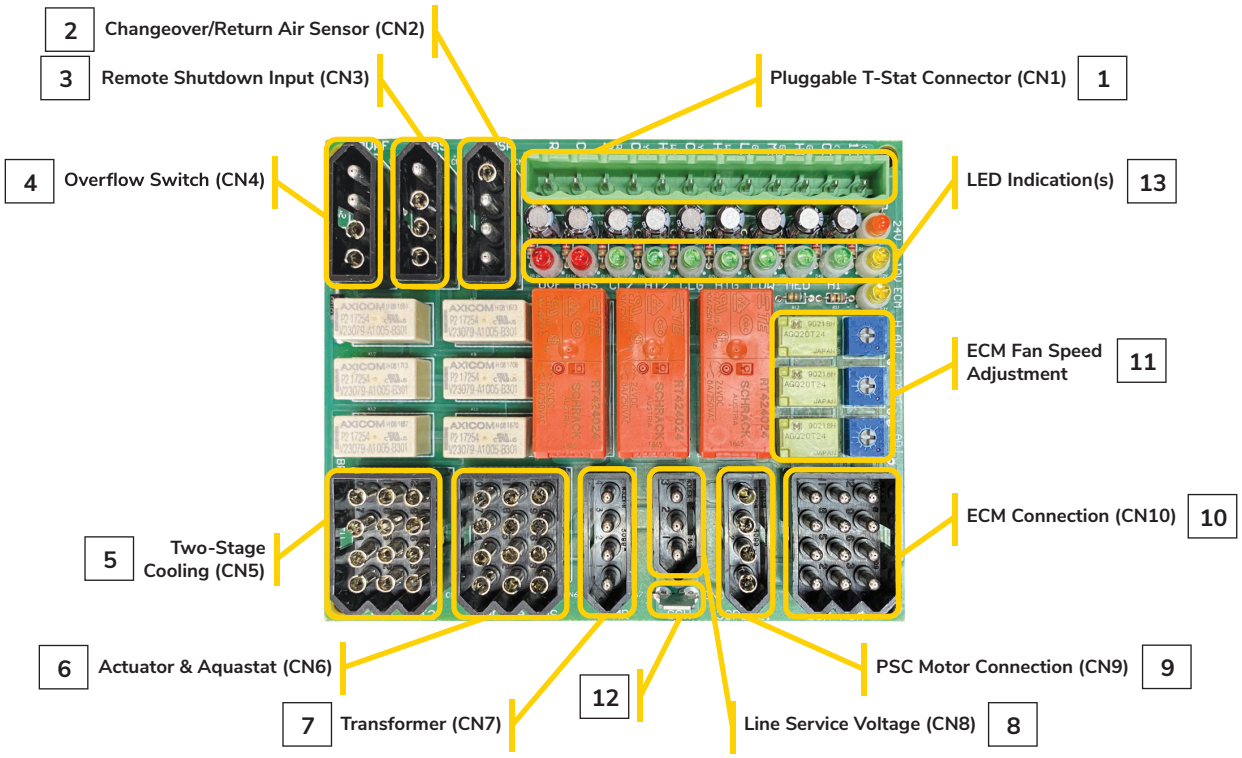
Only trained and qualified individuals should attempt to adjust or service components on any electrical component. Failure to follow safety rules could result in electrical shock or hazard.

⚠ CAUTION

Both of the procedures described below require the control box to be powered while adjustments are made. Line voltage components are concealed behind a secondary cover. However, installer should still take all reasonable precautions.

1. Unit must be powered to perform the following procedure. If main power is not available, connecting a temporary 24v-40VA power supply to parallel with a secondary outputs of the unit's transformer is recommended.
2. Set the electrical multi-meter to volts direct current (vdc) on the 0~5 or 0~20 vdc scale.
3. Attach black (negative) lead of meter to the DC common terminal, labeled "L2" above the potentiometer and to the left of the orange relay.
4. Attach the red (positive) lead of the meter to the red wire that bridges the 0-10 vdc outputs: high, medium, and low.
5. High Speed: Close high speed relay by applying 24-v to the high terminal. Using a small screwdriver, turn the VR3 potentiometer so the meter measures 4.51 vdc. This will set the ECM speed to 90% of maximum for high speed. Open the high speed relay.
6. Medium Speed: close medium speed relay by applying 24-v to the medium terminal. Using a small screwdriver, turn the VR2 potentiometer so the meter measures 3.53 vdc. This will set the ECM speed to 70% of maximum for medium speed. Open the medium speed relay.
7. Low Speed: Close low speed relay by applying 24-v to the low terminal. Using a small screwdriver, turn the VR1 potentiometer so the meter measures 2.06 vdc. This will set the ECM speed to 40% of maximum speed for low speed operation. Open the low speed relay.

NOTE: For specific voltages adjustment contact a Carrier representative.



1	CN1 – 24V Customer Input (Thermostat)
2	CN2 – Changeover/Return Air Sensor
3	CN3 – Remote Shutdown Input
4	CN4 – Condensate Overflow Switch
5	CN5 –Two-Stage Cooling
6	CN6 – Actuator 7 Aquastat
7	CN7 – Transformer
8	CN8 – Line Service Voltage
9	CN9 – PSC Motor Connection
10	CN10 – ECM Connection
11	ECM Fan Speed Adjustment
12	Ground Connection
13	LED Diagnostics (for Multimeter Diagnostics)

Fig. D — 85 Control Board

Board Function and Diagnostics

Unplug the blue connector from control board. Make appropriate thermostat wiring connections and plug connector back to control board. Refer to Tables E-F and Appendix Fig. D-F.

CN1 – 24V CUSTOMER INPUT (THERMOSTAT)

Use proper wire gauge and insulation type based on application and local code requirements. For detailed 24-v thermostat control wiring diagrams, Refer to thermostat installation manuals.

CN2 – CHANGEOVER/RETURN AIR SENSOR

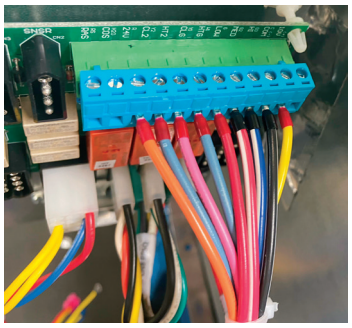
1. Power connector for 24-v or Common-powered sensors
   a. 24-v Powered Sensors are applicable for Carrier-supplied air sensor.
   b. Common-powered Sensors are applicable for thermostats by others.
2. Sensor/switch
   a. 10k thermistor
   b. Bimetal switch

CN3 – REMOTE SHUTDOWN INPUT

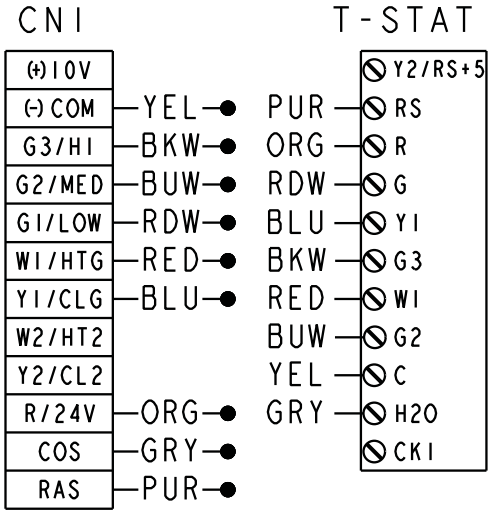
(85 Board will not be used with 0-10 vdc Motor. Contact Factory for remote shutdown when using 0-10 vdc Motor.)

1. Provides dry contact for signal to BAS system – I/O
   a. Dry Normally Open
   b. Wet Normally Open
   c. Discrete Coil
2. When contact activated
   a. Motor OFF
   b. Actuator OFF (85 Board will not be used with 0-10 vdc Actuators)
   c. Electric Heat OFF
   d. Power to controller remains ON
3. BAS LED indication when BAS relay circuit activated.

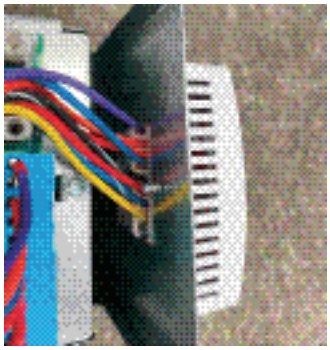
Thermostat Wire Harness Connection



NOTE: Image depicts thermostat wired to control board.

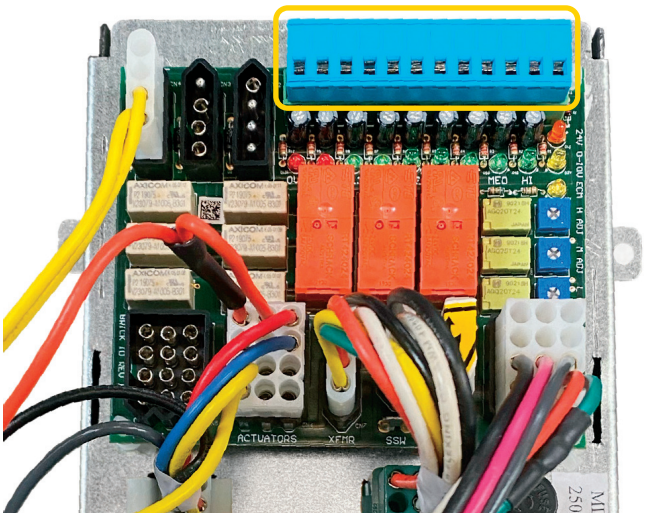


Mounted Thermostat Connection



NOTE: Image depicts a unit-mounted Venture Wi-Fi Thermostat.

Fig. E — Mounted Thermostat Connection and Controls



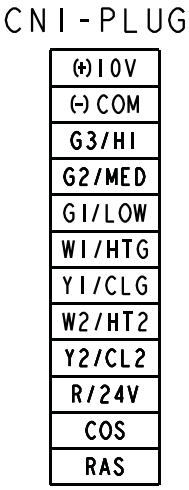


Fig. F — Thermostat Control Board (By Others or Remote Mounted)

Table E — 3-Speed ECM or PSC

CONNNECTION	FUNCTION/DESCRIPTION
(+) 10V	Not Used
(-) COM	Ground Control Power
G3/HI	Fan High Speed
G2/MED	Fan Medium Speed
G1/LOW	Fan Low Speed
W1/HTG	Heat
Y1/CLG	Cool
W2/HT2	Heat Stage 2
Y2/CL2	Cool Stage 2
R/24V	24V Controller Power
COS	Changeover Sensor
RAS	Room Air Sensor

Table F — 0-10 Variable Airflow ECM

CONNNECTION	FUNCTION/DESCRIPTION
(+) 10V	Apply 0-10V signal for proportional fan speed control
(-) COM	Ground Control Power
G3/HI	Not Used
G2/MED	Not Used
G1/LOW	Not Used
W1/HTG	Apply 24V for Stage 1 Heat
Y1/CLG	Apply 24V for Stage 1 Cool
W2/HT2	Apply 24V for Stage 2 Heat
Y2/CL2	Apply 24V for Stage 2 Cool
R/24V	24V Controller Power
COS	Changeover Sensor
RAS	Room Air Sensor

CN4 – CONDENSATE OVERFLOW SWITCH

(85 Board will not be used with 0-10 vdc Motor to meet sequence outlined below)

1. Low voltage condensate switch shuts down the unit when the water level in the drain pan reaches an unsafe level.
   a. Switch is normally closed and opens on an increase in water level.
2. When contact activated, then
   a. Motor OFF
   b. Valve Actuator OFF (85 Board will not be used with 0-10 vdc Actuators)
   c. Electric Heat OFF
   d. Power to controller remains ON
3. OVF LED indication when condensate switch activated

CN5 – 2-STAGE COOLING/HEATING

1. Available with 2-stage coil for part load
2. 24V On/Off, 24V Floating, 0-10V Proportional control
3. CL2 or HT2 LED indication when either 2- stage cooling or heating activated

CN6 – 1-STAGE COOLING/HEATING

1. 24V On/Off, 24V Floating, 0-10V Proportional control, Line voltage
2. CLG or HTG LED indication when either 1-stage cooling or heating activated.

CN7 – CLASS II TRANSFORMER

1. 40VA, 75VA option
2. 24V LED activated when powered

CN8 – INCOMING POWER

CN9 – PSC MOTOR

1. 3-Speed application
2. Either LOW/MED/HI activated when a speed is selected

CN10 – EC MOTOR

1. 3-Speed application
2. Solid State switching
3. Either LOW/MED/HI activated when a speed is selected
4. ECM LED indicates speed control is powered
5. 0-10V LED intensity indicates increasing speed

ECM Fan Speed Adjustment

1. If the unit is equipped with an ECM blower, additional steps may be required during the air balancing process. Review project submittals or order acknowledgment to determine which ECM control scheme the unit has. Alternatively, match the control board to the illustrations.

⚠ CAUTION

Both of the procedures described below require the control box to be powered while adjustments are made. Line voltage components are concealed behind a secondary cover. However, installer should still take all reasonable precautions.

NOTE: The unit has been factory configured to produce PSC equivalent airflow on high speed, with medium and low speed set at 80% and 60% of high, respectively. If these setting are acceptable, then no further configuring is required.

If alternative airflows are desired, use board mounted pots to adjust the airflow associated with each input.

To reset to initial factory settings, reference the voltages found on the sticker next to the pots.

Each output can be adjusted from 0 to 100% of the motor's factory programmed operating range. Use voltmeter and airflow chart (on control box cover) to set values.

Adjusting the potentiometers requires the use of a Multi-meter capable of measuring 0~5 vdc. See steps below.

1. Only trained and qualified individuals should attempt to adjust or service components on any electrical component. Failure to follow safety rules could result in electrical shock or hazard.
2. 24 vac power must be supplied to ECM board to make adjustments.
3. Set the electrical multimeter to Volts Direct Current (vdc) on the 0~5 or 0~20 vdc scale.
4. Attach black (negative) lead of meter to the "Com" terminal to the left of the potentiometers and below the Status light.
5. Attach the red (positive) lead of the meter to the terminal below the Potentiometer needing adjustment.
   a. High Speed: Using a small screwdriver, turn the H ADJ potentiometer (CW for increasing speed, CCW for decreasing speed).
   b. Medium Speed: Using a small screwdriver, turn the M ADJ potentiometer (CW for increasing speed, CCW for decreasing speed).

c. Low Speed: Using a small screwdriver, turn the L ADJ potentiometer (CS for increasing speed, CCW for decreasing speed).

VARIABLE AIRFLOW FOR 0-10 VDC

If a factory provided thermostat or DDC controller is utilized, then the unit is already correctly configured. Carrier recommends using the specified thermostat or DDC controller to commission the unit whenever possible. However, the blower can be started and operated without the thermostat. Consult factory for further instruction.

ECM VARIABLE AIRFLOW FOR 0-10 VDC

No control board is required and no field adjustments are possible. Motor uses 0-10 vdc signal directly. See control box label. Fan enable at 1.5 vdc.

GROUND TAB CONNECTION

Used for mulitmeter diagnostics.

LED Function and Outcomes

See Table G and Fig. G for functions and commands.

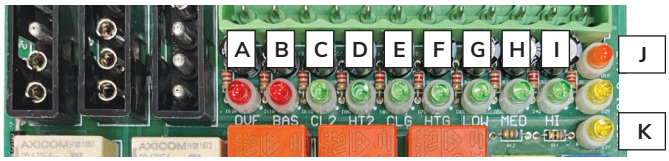


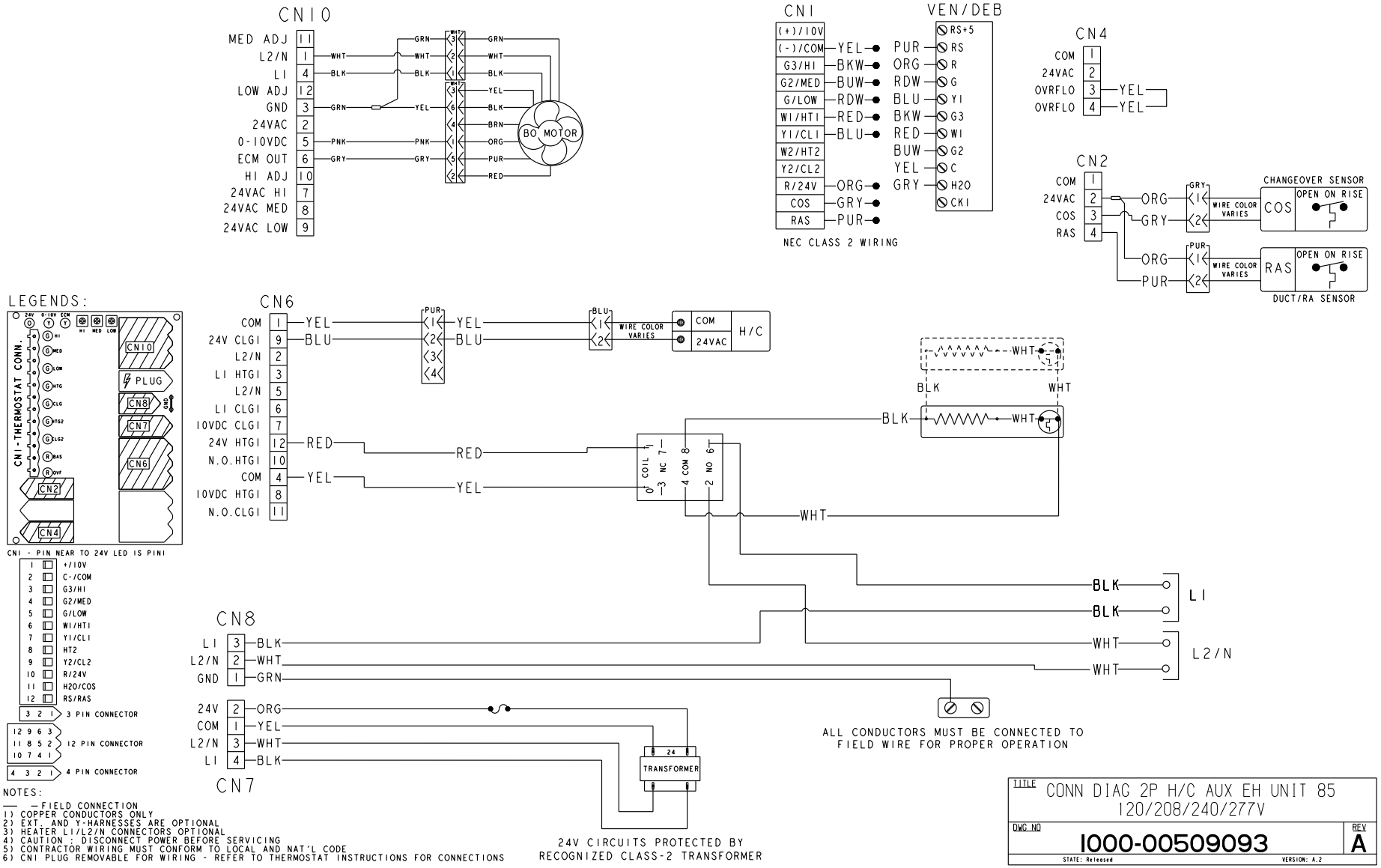
Fig. G — LED Functions

Table G — LED Function and Outcomes (Sequence of Operation)[a,b]

ITEM		DESCRIPTION	OUTCOME
A	Condensate Overflow Switch (OVF)	Condensate switch is tripped by increasing water level in the drain pan.	OVF LED Shows Red Motor OFF Actuator OFF Electric Heat Off Power to controller remains ON
B	Remote Shutdown Input (BAS)	24 vac externally applied to BAS CN3 or the internally-powered BAS CN3 loop is closed.	BAS LED shows RED Motor OFF Actuator OFF Electric Heat Off Power to controller remains ON
C	Cooling 2-Stage (24 vac and 0-10 vdc) (CL2)	24 vac signal applied to CL2 of CN1. 2nd stage cooling relay (CL2) will actuate and supply 24 vac to Pin 9 of connector CN5. When 0-10 vdc is applied to CL2, control signal will passively be present at Pin 7 of the CN5 connector.	CL2 LED shows GREEN Signal for 2nd stage cooling valve present
D	Heating 2-Stage (24 vac and 10 vdc) (HT2)	24 vac signal applied to HT2 of CN1. 2nd stage heating relay (HT2) will actuate and supply 24 vac to Pin 9 of connector CN5. When 0-10 vdc is applied to HT2, control signal will passively be present at Pin 7 of the CN5 connector.	HT2 LED shows GREEN Signal for 2nd stage heating valve present
E	Cooling 1st Stage (24 vac and 0-10 vdc) (CLG)	24 vac signal applied to CLG of CN1. 1st stage cooling relay (CLG) will actuate and supply 24 vac to Pin 9 of connector CN5. When 0-10 vdc is applied to CLG, that control signal will passively be present at Pin 7 of the CN6 connector.	CLG LED shows GREEN Signal for 1st stage cooling valve present
F	Heating 1st Stage (24 vac and 10 vdc) (HTG)	24 vac signal applied to HTG of CN1. 1st stage HTG relay will actuate and supply 24 vac to Pin 12 of connector CN5. When 0-10 vdc is applied to HTG, that control signal will passively be present at Pin 8 of the CN6 connector.	HTG LED shows GREEN Signal for 1st stage cooling valve present
G	Fan Low Speed (24 vac) (LOW)	24 vac signal applied to LOW of CN1. The low speed PSC motor power relay and the low speed ECM signal relays will be activated. Line voltage will be present at Pin 2 of CN9 and the adjustable low speed ECM DC signal will be present at Pin 5 of the CN10 connector.	LOW LED shows GREEN Signal for low speed present
H	Fan Med Speed (24 vac) (MED)	24 vac signal applied to MED of CN1. The medium speed PSC motor power relay and the medium speed ECM signal relays will be activated. Line voltage will be present at Pin 3 of CN9 and the adjustable medium speed ECM DC signal will be present at Pin 5 of the CN10 connector.	MED LED shows GREEN Signal for medium speed present
I	Fan High Speed (24 vac) (HI)	24 vac signal applied to HI of CN1. High speed PSC motor power relay and the high speed ECM signal relays will be activated. Line voltage will be present at Pin 4 of CN9 and the adjustable high speed ECM DC signal will be present at Pin 5 of the CN10 connector..	HI LED shows GREEN Signal for high speed present
J	24 vac Board Power (24V)	24 vac signal supplied from internal transformer. 24 vac required for board operation.	24V LED shows ORANGE
K	Power Supply by ECM (ECM)	ECM Motor connected to CN10 and powered by line voltage. Signal from the ECM regulator is present at Pin 6 of the CN10 connector.	ECM LED shows YELLOW

NOTE(S):

a. 85 Board not used with 0-10 vdc Motor
b. 85 Board will not be used with 0-10 vdc Actuators



NOTE: Wiring diagram also available through QR code found on the unit serialized name plate label.

Fig. H — Typical Wiring Diagram

APPENDIX D — EVO/ECM 4-SPEED ADJUSTMENT

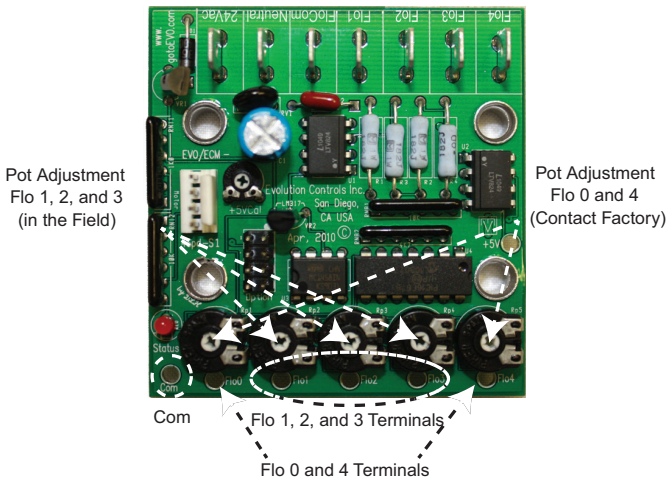


Fig. I — 4-Speed ECM

Adjusting the Flo1, Flo2, Flo3 potentiometers requires the use of a multi-meter capable of measuring 0~5 vdc.

1. Only trained and qualified individuals should attempt to adjust or service components on any electrical component. Failure to follow safety rules could result in electrical shock or hazard.
2. 24 vac power must be supplied to ECM board to make adjustments.
3. Set the electrical multi-meter to volts direct current (vdc) on the 0~5 or 0~20 vdc scale.
4. Attach black (negative) lead of meter to the "Com" terminal to the left of the potentiometers and below the status light.
5. Attach the red (positive) lead of the meter to the high speed "Flo1" terminal below the potentiometer.
6. High Speed: Using a small screwdriver, turn the Flo1 potentiometer so the meter measures 4.51 vdc. This will set the ECM speed to 90% of maximum for high speed operation.
7. Medium Speed: Using a small screwdriver, turn the Flo2 potentiometer so the meter measures 3.53 vdc. This will set the ECM speed to 70% of maximum speed for medium speed operation.
8. Low Speed: Using a small screwdriver, turn the Flo3 potentiometer so the meter measures 2.06 vdc. This will set the ECM speed to 40% of maximum speed for low speed operation.
9. For setting of Flo0 and Flo4, contact Carrier, otherwise these potentiometers should be set to full counter-clockwise rotation.

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

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START-UP CHECKLIST FOR 42S SERIES FAN COIL AIR CONDITIONERS

NOTE: To avoid injury to personnel and damage to equipment or property when completing the procedures listed in this start-up checklist, use good judgment, follow safe practices, and adhere to the safety considerations/information as outlined in preceding sections of this Installation, Start-Up, and Service Instructions document.

I. Project Information

Job Name _____

Address _____

City _____State _____ Zip _____

Installing Contractor _____

Sales Office _____

Start-up Performed By _____

INSPECTION, INSTALLATION, AND START-UP CHECKLIST

ITEM	COMPLETE
Receiving & Inspection	
1. Unit received undamaged	
2. Unit received complete as ordered	
3. "Furnish only" parts accounted for	
4. Unit arrangement/hand correct	
5. Unit structural support complete and correct	
Handling & Installation	
6. Mounting grommets/isolators used	
7. Unit mounted level and square	
8. Proper access provided for unit and accessories	
9. Proper electrical service provided	
10. Proper overcurrent protection provided	
11. Proper service switch/disconnect provided	
12. Proper chilled water line size to unit	
13. Proper hot water line size to unit	
14. Proper refrigerant line sizes to unit	
15. All service to unit in code compliance	
16. All shipping screws and braces removed	
17. Unit protected from dirt and foreign matter	
Cooling/Heating Connections	
18. Protect valve package components from heat	
19. Connect field piping to unit	
20. Pressure-test all piping for leaks	
21. Install drain line and traps as required	
22. Insulate all piping as required	
23. Connect risers from 42SGM to 42SGS models	
24. Connect risers to unit coil valve package (if risers are shipped/installed separately)	
Ductwork Connections	
25. Install ductwork, fittings, and grilles as required	
26. Flexible duct connections at unit	
27. Proper supply and return grille type and size used	
28. Control outside air for freeze protection	
29. Insulate all ductwork as required	

ITEM	COMPLETE
Electrical Connections	
30. Refer to unit wiring diagram	
31. Connection incoming power service(s)	
32. Install and connect "furnish only" parts	
33. All field wiring in code compliance	
Unit Start-Up	
34. General visual unit and system inspection	
35. Check for proper fan rotation	
36. Record electrical supply voltage	
37. Record ambient temperatures	
38. Check all wiring for secure connections	
39. Close all unit isolation valves	
40. Flush water systems	
41. Fill systems with water/refrigerant	
42. Vent water systems as required	
43. All ductwork and grilles in place	
44. All unit panels and filters in place	
45. Start fans, pumps, chillers, etc.	
46. Check for overload condition of all units	
47. Check all ductwork and units for air leaks	
48. Balance water systems as required	
49. Balance air systems as required	
50. Record all final settings for future use	
51. Check piping and ductwork for vibration	
52. Check all dampers for proper operation	
53. Verify proper cooling operation	
54. Verify proper heating operation	
55. Reinstall all covers and access panels	
56. Verify proper condensate drainage	

42 Series Fan Coil Air Conditioner Maintenance Data Log

MODEL NUMBER	SERIAL NUMBER	QTY		FAN AND MOTOR			FILTER TYPE	COOLING						HEATING							
		RH	LH	CFM	ESP	WATTS		EAT db/wb °F	EWT °F	GPM	PD H_2O	TOTAL BTUH	SENSIBLE BTUH	EAT db/wb °F	EWT °F	GPM	PD H_2O	STEAM PSI	BTUH	kW	VOLTAGE

NOTE: Indicate repairs made, refrigerant added or removed (include amounts), field controls and valve packages added.

_____

_____

_____

_____

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CUT ALONG DOTTED LINE CUT ALONG DOTTED LINE