SAH

Air Handler

Air Handler Installation Manual

ENERGY STAR

AHRI CERTIFIED
www.ahridirectory.org
Water Source HP
ANSI/AHRI/ASHRAE/ISO13256-1

c UL us LISTED
Heat Pump
E347094

IM2518AG1 03/21

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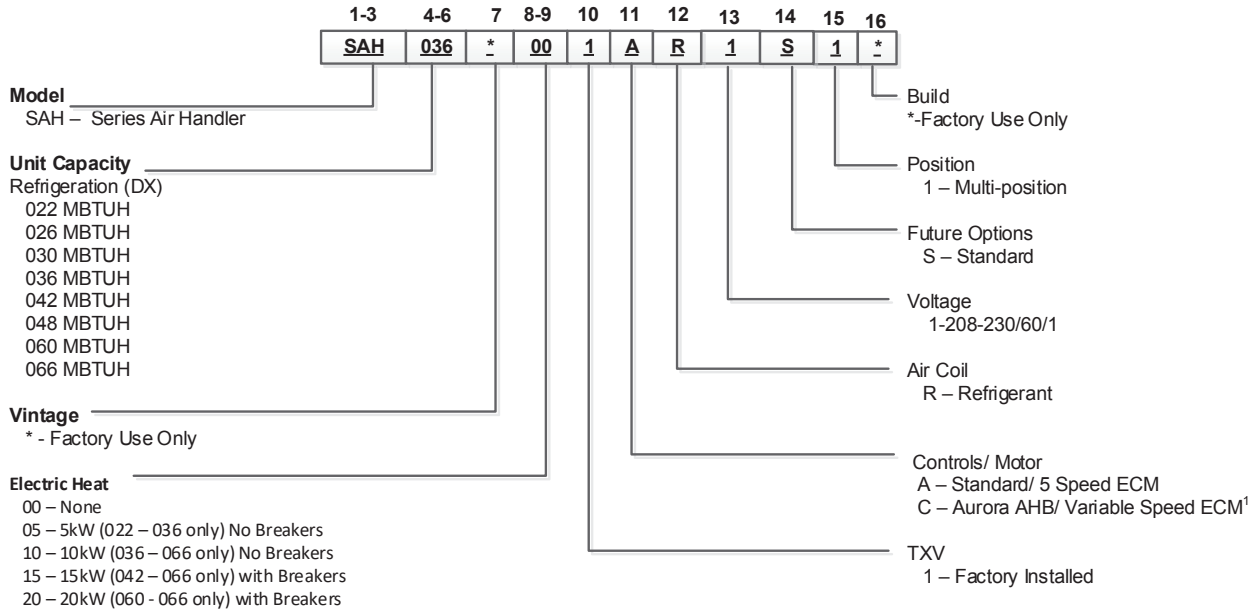
Nomenclature



Note: To field convert the SAH to bottomflow air discharge, the SAHBCK kit must be ordered.

Note: Air flow on the 060 and 066 units in the horizontal configurations should be limited to 1900 cfm in cooling mode, or condensate blow off may occur.

1. Only available with Aurora controls in the compressor section.

Rev.: 2/27/2017

Initial Inspection

When the equipment is received, all items should be carefully checked against the bill of lading to be sure all crates and cartons have been received. Examine units for shipping damage, removing the units from the packaging if necessary. Units in question should also be internally inspected. If any damage is noted, the carrier should make the proper notation on the delivery receipt, acknowledging the damage.

General Installation Information

Safety Considerations

Warning: Before performing service or maintenance operations on a system, turn off main power switches to the equipment. Electrical shock could cause personal injury.

Installing and servicing heating and air conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install, repair or service heating and air conditioning equipment. Untrained personnel can perform the basic maintenance functions of cleaning coils and cleaning and replacing filters. All other operations should be performed by trained service personnel. When working on heating and 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 a quenching cloth for brazing operations and have a fire extinguisher available.

Note: Local codes and regulations take precedent over any recommendations by the manufacturer. In addition to conforming to manufacturer's and local municipal building codes, the equipment should also be installed in accordance with the National Electric Code and National Fire Protection Agency recommendations.

Physical Data

Air Handler Model Number (Refrigerant)		022	026	030	036	042	048	060	066
Evaporator Coil	Air Coil Total Face Area, ft2 [m2]	3.89 [0.36]			4.86 [0.45]	5.83 [0.54]		6.81 [0.63]	
	Tube outside diameter - in. [mm]	3/8 [9.52]							
	Number of rows	3							
	Fins per inch	12							
	Suction line connection - in. [mm] sweat	5/8 [15.87]			3/4 [19.05]			7/8 [22.23]	
	Liquid line connection - in. [mm] sweat	3/8 [9.52]						1/2 [12.7]	
Refrigerant		R-410a							
Nominal cooling capacity - tons [kW]		1.8 [6.44]	2.1 [7.59]	2.5 [8.79]	3 [10.55]	3.5 [12.30]	4 [14.06]	5 [17.58]	5.5 [19.33]
Condensate drain connection - (FPT) in. [mm]		3/4 [19.05]							
Blower Wheel Size (Dia x W), in. [mm]		9 X 7 [229 x 178]]			10 X 8 [254 x 203]	11 x 10 [279 x 254]			
Blower motor type/speeds		Variable Speed ECM/ 5 Speed ECM							
Blower motor output - hp [W]		1/2 [373]				1 [746]			
Filter Standard - 1" [51mm] Field Supplied.		16 X 20 [406 X 508]			20 X 20 [508 x 508]	22 X 20 [559 x 508]			
Electrical characteristics (60hz)		208/230 - 1ph							
Shipping weight - lbs. [kg]		147 [66.7]			168 [76.2]	198 [89.6]		206 [93.4]	
Operating weight - lbs. [kg]		139 [63.0]			150 [68.0]	180 [81.6]		188 [85.3]	

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General Installation Information cont.

Air Handler Sizing Selection

The SAH Air Handlers are designed for R410a refrigerant and should be matched with Indoor/Outdoor Split series compressor section from your manufacturer according to the table below.

Air Handler	Indoor Split Model (Single)	Indoor/Outdoor Split Model (Dual Capacity)	Rated Airflow(CFM)	Electric Heat (kW)
SAH022*1*R1S1***	022	-	800	5
SAH026*1*R1S1***	-	026	850	5
SAH030*1*R1S1***	030	-	1000	5
SAH036*1*R1S1***	036	-	1200	5, 10
SAH036*1*R1S1***	-	038	1200	5, 10
SAH042*1*R1S1***	042	-	1300	10, 15
SAH048*1*R1S1***	048	-	1500	10, 15
SAH048*1*R1S1***	-	049	1500	10, 15
SAH060*1*R1S1***	060	-	1800	10, 15, 20
SAH060*1*R1S1***	-	064	1800	10, 15, 20
SAH066*1*R1S1***	070	-	2000	10, 15, 20
SAH066*1*R1S1***	-	072	2000	10, 15, 20

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Moving and Storage

If the equipment is not needed for immediate installation it should be left in its shipping carton and stored in a clean, dry area. Units must only be stored or moved in the normal “up” orientation.

Unit Location

Locate the unit in an indoor area that allows for easy removal of the filter and access panels (the air handler units are not approved for outdoor installation). Location should have enough space for service personnel to perform maintenance or repair. Provide sufficient room to make refrigerant, electrical and duct connections. If the unit is located in a confined space, such as a closet, provisions must be made for return air to freely enter the space by means of a louvered door, etc. The air handler section may be installed on any level surface strong enough to support its weight. When installed in a closet or on a stand, it should be mounted on vibration absorbing material slightly larger than the base to minimize vibration transmission to the building structure.

When installed in an attic or above a drop ceiling, the installation must conform to all local codes. If the unit is suspended and installed in the horizontal position, the entire length of the unit should be supported. If the application requires the air handler to be installed on the attic floor then the unit should be set in a full size secondary drain pan. In this case the secondary drain pan should be set on top of a vibration absorbing mesh. The secondary drain pan is usually placed on a plywood base.
A secondary drain pan should be used when equipment is installed over a finished living area to provide protection from water damage in case of plugging of the air handler primary drain line. The secondary drain line should terminate somewhere that is easily visible by the homeowner. Be certain to show the homeowner the termination location of the secondary drain line and to explain its purpose.

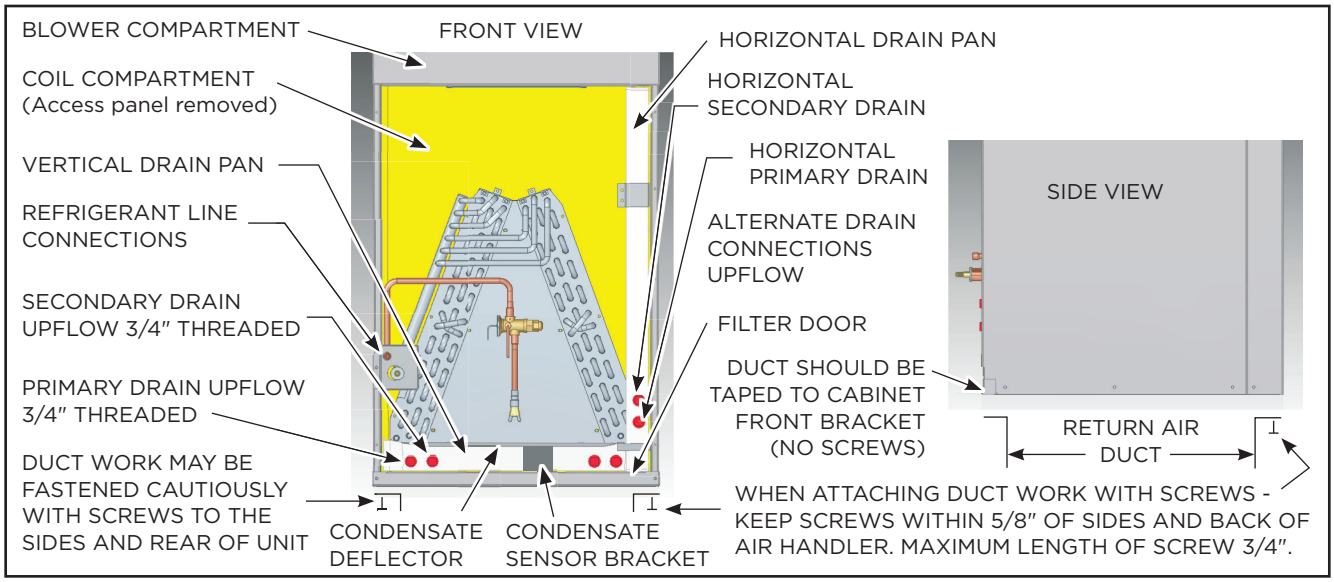
Duct System

Many of the problems encountered with heating and cooling systems can be linked to improperly designed or installed duct systems. It is therefore highly important for a successfully operating system that the duct system be designed and installed properly.

The duct system should be sized to handle the design airflow quietly and efficiently. To maximize sound attenuation of the unit blower, the supply and return plenums should include an internal duct liner of fiberglass or constructed of ductboard for the first few feet. On systems employing a metal duct system, canvas connectors should be used between the unit and the ductwork. If air noise or excessive airflow is a problem, the blower speed can be changed. When installing a central air return grille in or near the living space, it is recommended to design the ductwork so that the grille is not in direct line with the return opening in the air handler. One or two elbows will also assure a quieter installation and system. Application of the unit to un-insulated metal ductwork in an unconditioned space will cause poor unit performance and allow condensation to form on the duct and possibly cause damage to the structure.

If the unit is connected to existing ductwork, check the duct system to ensure that it has the capacity to accommodate the air required for the unit application. If the duct is too small, as in the replacement of heating only systems, larger ductwork should be installed. All existing ductwork should be checked for leaks and repaired as necessary.

General Installation Information cont.



Return Duct Attachment & Component Location

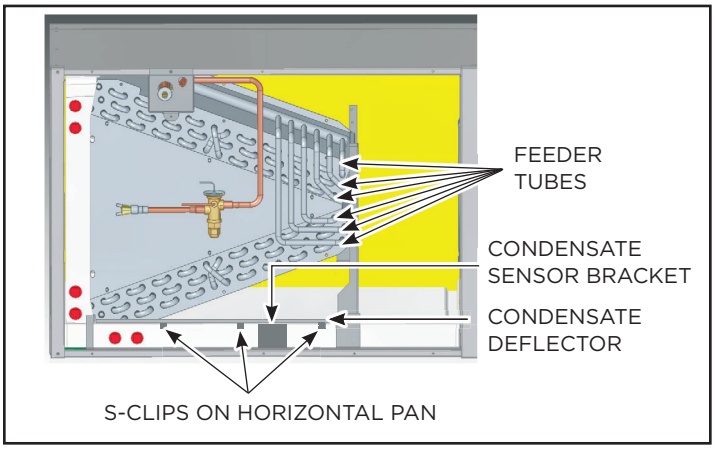
Condensate Deflector Shield

A condensate deflector shield comes attached to the vertical A-coil drain pan. If the unit is being installed in either the top flow or bottom flow configuration, no change is necessary.

If the air handler is being installed in either horizontal position, the condensate deflector shield will need to be removed from the vertical pan and placed on the horizontal pan. Remove the condensate deflector shield and the S-clips that attach it to the vertical pan. Reposition the condensate deflector shield and S-clips on the horizontal drain pan.

On units that have control option 'C' the condensate sensor bracket will also need to be moved and attached to the horizontal pan.

Note: Condensate deflector shield should be installed in the S-clip section which is inside the drain pan edge.



Condensate Deflector on Horizontal Drain Pan Edge

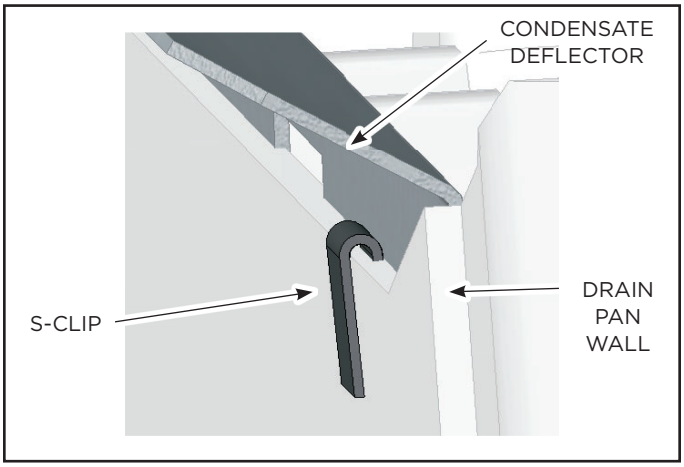


FIGURE 6: S-Clip Installation

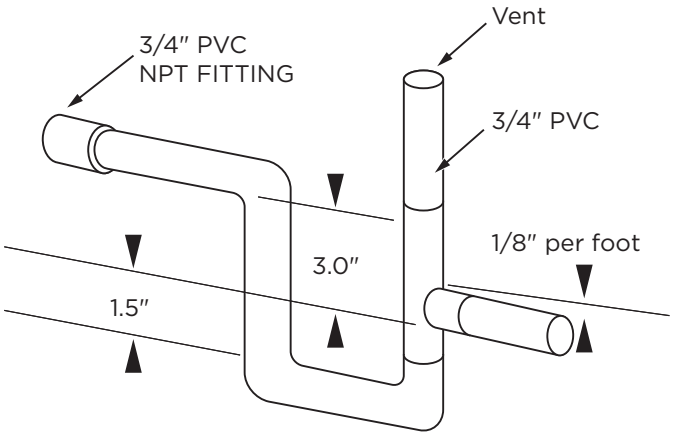
General Installation Information cont.

Condensate Drain

To facilitate complete condensate removal, the air handler should be mounted level or slightly pitched toward the drain. The drain line contains cold water and should be insulated in unconditioned spaces to avoid drain line condensation from dripping on ceiling, etc. The drain pan has a primary and secondary drain connection. The air handler drain connections must be connected to a drain line and pitched away from the unit a minimum of 1/8" per foot to allow the condensate to flow away from the air handler. **A trap must be installed in the drain line** below the bottom of the drain pan to ensure free condensate flow (units are not internally trapped). The primary condensate drain must be terminated to an open drain or sump. Do not connect the condensate drain to a closed waste system. An open vertical air vent should be installed to overcome line length, friction and static pressure. It is recommended that the secondary drain be connected to a drain line for all units. The secondary drain should be run to an area where the homeowner will notice it draining which means that the primary drain is blocked. The drain line should not be smaller than the drain connection at the condensate pan. If the air handler is located in an unconditioned space, water in the trap may freeze. Since the air handler is under negative pressure it is recommended to prime the traps so air is not drawn through the condensate drain. It is recommended that the trap material be of a type that will allow for expansion of water when it freezes. All unused drain ports should be capped. Drain lines must be in conformance with local codes.

CAUTION: Threaded drain connection should be hand-tightened, plus no more than 1/16 turn.

The drain pan connections are designed to ASTM Standard D 2466 Schedule 40. Use 3/4" PVC or non-corrosive metal threaded pipe. Since the drains are not subject to any pressure it is not necessary to use Schedule 40 pipe for drain lines.



Air Handler Configuration

The Air Handler is factory configured for upflow and horizontal right hand air discharge installation. For bottomflow or horizontal right hand discharge, certain field modifications are required.

Warning: Do not lift or reposition the 'A' coil by grasping the almuminum tube header or distributor. This could cause a tubing fracture resulting in a refrigerant leak.

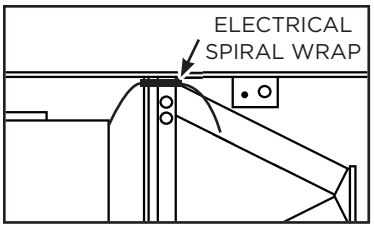
General Installation Information cont.

Bottomflow Application

To convert the SAH Series air handler for bottomflow applications follow the steps below:

1. With the air handler in the verticle top flow position remove all access panels and the refrigerant line panel.
2. Carefully slide the air coil assembly out of the cabinet.
3. Rotate the cabinet 180˚ so the blower outlet is facing down.
4. **Install the SAHBCK bottom flow conversaion kit per instructions in the kit. Failure to install this kit will result in condensate blow-off from the 'A' coil into the cabinet and ductwork.**
5. Place the air coil assembly back on the air coil support brackets.
6. Reattach the refrigerant line panel and the other access panels.
7. Bottom air discharge units should be sealed well to the floor to prevent air leakage.

NOTE: Air Handlers with control option 'C', which are installed in the bottomflow or horizontal left position, will have to re-route the condensate sensor and FP2 sensor wires. The wires can be routed as shown below. A section of electrical spiral wrap is included in the Installers Kit. Wrap the section of wire that is placed in the corner with the wrap to protect the wires.



Horizontal Left Air Discharge Application

To convert the SAH Series air handler for horizontal left air discharge applications follow the steps below:

1. With the air handler in the vertical top flow position remove all access panels and the refrigerant line panel
2. Carefully slide the air coil assembly out of the cabinet.
3. Remove and reposition the condensate deflector from the vertical pan to the horizontal pan.
4. Rotate the cabinet 180˚ so the blower outlet is facing down.
5. Place the air coil assembly back on the air coil support brackets.
6. Reattach the refrigerant line panel and the other access panels.
7. Position the air handler in the left hand horizontal application.
8. Remove the drain pan plugs from the horizontal pan and screw them in the vertical drain pan.
9. Reattach the refrigerant line panel and the other access panels.
10. If the unit is suspended, the entire length of the cabinet should be supported.

Important: When removing the coil, there is possible danger of equipment damage and personal injury. Be careful when removing the coil assembly from the unit.

NOTE: To access controls in bottom flow and horizonal left orientation, both access panels need to be removed.

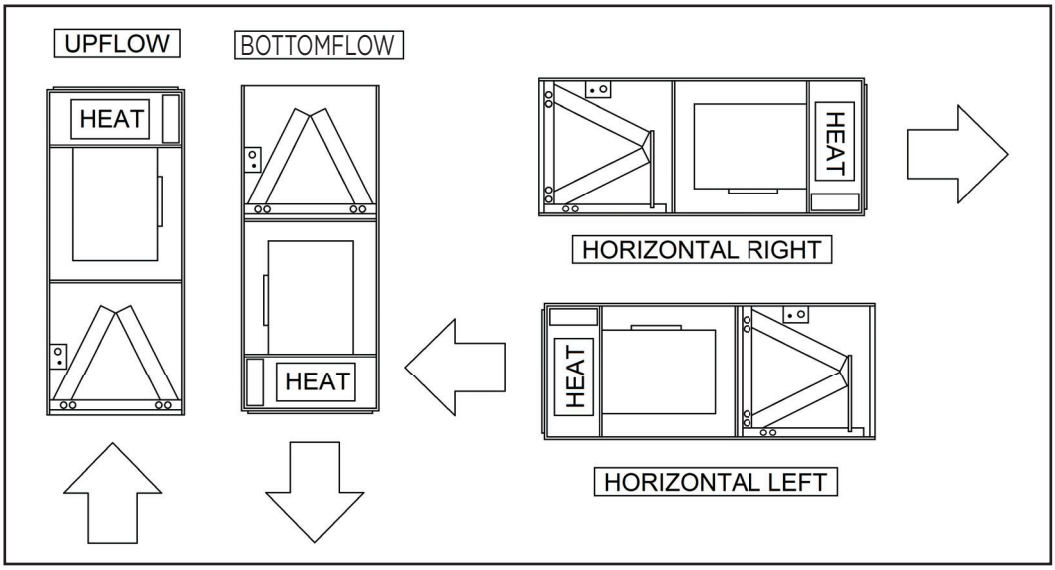


FIGURE 3: Typical Installation
Note: Air flow on the 060 and 066 units in the horizontal configuration should be limited to 1900 CFM in cooling mode, or condensate blow off may occur.

General Installation Information cont.

Air Handler Installation

The air handler is attached to the shipping pallet with four external shipping brackets.

An air filter must always be installed upstream of the air coil on the return air side of the air handler and must be field supplied. Filtration can be added external to the unit or the integral filter rack may be used. A 1" filter access rack has been built into the cabinet. Remove the filter access cover and install the proper sized filter. Standard 1" size permanent or throw away filter may be used. If there is limited access to the filter rack for normal maintenance, it is suggested that a return air filter grille be installed. Be sure that the return duct is properly installed and free of leaks to prevent dirt and debris from bypassing the filter and plugging the air coil.

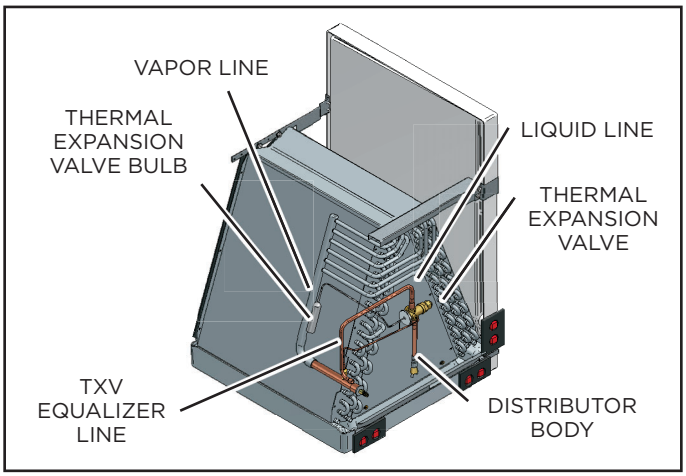
The cabinet should be sealed so that unconditioned warm air can not enter the cabinet. Warm air will introduce moisture into the cabinet which could result in water blow-off problems, especially when installed in an unconditioned space. Make sure that the liquid line, suction line and drain line entry points into the cabinet are well sealed. Use the butyl tape supplied with the air handler to seal around the copper lines entering the cabinet.

All wall penetrations should be sealed properly. The line set should not come into direct contact with water pipes, floor joists, wall studs, duct work, floors, walls and brick. The line set should not be suspended from joists or studs with a rigid wire or strap which comes into direct contact with the tubing. Wide hanger straps which conform to the shape of the tubing are recommended. All line sets should be insulated with a minimum of 3/8" closed cell insulation. The line set insulation should be pliable, and should completely surround the refrigerant line. As in all R-410a equipment, a reversible liquid line filter drier is required to insure all moisture is removed from the system. This drier is factory installed in the Manufacturers Split compressor section. This drier should be replaced whenever "breaking into" the system for service. All exterior insulation should be painted with UV resistant paint or covering to insure long insulation life.

Connection to the Coil

Connect the refrigerant line set to the 'A' coil tubes. Nitrogen should be bled through the system at 2 to 3 PSI to prevent oxidation inside the refrigerant tubing. Use a low silver phos-copper braze alloy on all brazed connections. The Split compressor section is shipped with a factory charge and the service valves are not to be opened until the line set and air handler have been leak tested, purged and evacuated. A damp towel or heat sink should be used on the service valves to prevent damage caused by excessive heat.

Refer to the Refrigerant Line Sizing table to determine the proper line set configuration for the system being installed. Line sets over 80 feet in length are not recommended. If the line set is kinked or deformed and cannot be reformed, the bad section of pipe should be replaced. A restricted line set will affect unit performance. Line sets should be routed as directly as possible, avoiding any unnecessary bends and turns.



Leak Testing

The refrigeration line set must be pressurized and checked for leaks before purging and charging the unit. To pressurize the line set, attach refrigerant gauges to the service ports and add an inert gas (nitrogen or dry carbon dioxide) until pressure reaches 60 to 90 PSIG. Never use oxygen or acetylene to pressure test the system. Use an electronic leak detector or a good quality bubble solution to detect leaks on all connections made in the field. Be sure to check the service valve ports and stems for leaks. If a leak is found, repair it and repeat the above steps. For safety reasons do not pressurize the system above 150 PSIG. Purge pressure from the line set slowly when the pressure test is complete. The system is now ready for evacuation.

System Evacuation

Ensure that the line set and air coil are evacuated before opening service valves. The line set and air coil must be evacuated to 250 microns with a good quality vacuum pump and use a vacuum gauge to ensure that air and moisture are removed. With the system shut off from the vacuum pump a sufficient system vacuum is achieved when a 500 micron vacuum can be held for 30 minutes. A fast rise to atmospheric pressure indicates a leak, while a slower rise to around 1500 microns indicates moisture is still present in the system and further evacuation is required.

General Installation Information cont.

Refrigeration

The SAH Series air handlers are supplied with an expansion device. The txv supplied has an internal check valve so no external check valve is necessary. Check sub-cooling and superheat, refrigerant charge and txv may require further adjustment.

TXV Superheat Adjustment Procedure (see figure 4)

Txv's may require adjustment for a specific application.

1. Remove the seal cap from the bottom of the valve.
2. Turn the adjustment screw counterclockwise to increase superheat and clockwise to decrease superheat. One complete 360° turn changes the superheat approximately 1-2°F. You may need to allow as much as 30 minutes after the adjustment is made for the system to stabilize.
3. Once the proper superheat setting has been achieved replace and tighten the seal cap.

Warning – There are 12 total (360°) turns on the superheat adjustment stem from wide open to fully closed. When adjusting the superheat stem counterclockwise (superheat increase) and the stop is reached, any further counterclockwise turning adjustment will damage the valve.

Charging the System

Refer to the compressor section Installation Manual for charging the system, checking subcooling/superheat and unit operating parameters. Refer to the Refrigerant Line Sizing table for initial refrigeration charge amounts used with the split.

Line Set Sizes

Unit Size	Air Handler	20 feet		40 feet		60 feet		80 feet		NZ Factory Charge (oz.)	*Charge Amount with SAH Air Handler (oz.)
		Suction	Liquid	Suction	Liquid	Suction	Liquid	Suction	Liquid		
022	SAH022	5/8" OD	3/8" OD	5/8" OD	3/8" OD	3/4" OD	3/8" OD	3/4" OD	3/8" OD	56	76
030	SAH030	5/8" OD	3/8" OD	3/4" OD	3/8" OD	3/4" OD	3/8" OD	3/4" OD	3/8" OD	56	82
036	SAH036	5/8" OD	3/8" OD	3/4" OD	3/8" OD	3/4" OD	1/2" OD	3/4" OD	1/2" OD	56	96
042	SAH042	3/4" OD	3/8" OD	3/4" OD	3/8" OD	7/8" OD	1/2" OD	7/8" OD	1/2" OD	74	104
048	SAH048	3/4" OD	3/8" OD	7/8" OD	3/8" OD	7/8" OD	1/2" OD	7/8" OD	1/2" OD	90	112
060	SAH060	7/8" OD	1/2" OD	7/8" OD	1/2" OD	1-1/8" OD	1/2" OD	1-1/8" OD	1/2" OD	92	119
070	SAH066	7/8" OD	1/2" OD	7/8" OD	1/2" OD	1-1/8" OD	1/2" OD	1-1/8" OD	1/2" OD	108	135
026	SAH026	5/8" OD	3/8" OD	3/4" OD	3/8" OD	3/4" OD	1/2" OD	3/4" OD	1/2" OD	52	72
038	SAH036	5/8" OD	3/8" OD	3/4" OD	3/8" OD	3/4" OD	1/2" OD	3/4" OD	1/2" OD	56	96
049	SAH048	3/4" OD	3/8" OD	7/8" OD	3/8" OD	7/8" OD	1/2" OD	7/8" OD	1/2" OD	90	112
064	SAH060	7/8" OD	1/2" OD	7/8" OD	1/2" OD	1-1/8" OD	1/2" OD	1-1/8" OD	1/2" OD	96	119
072	SAH066	7/8" OD	1/2" OD	7/8" OD	1/2" OD	1-1/8" OD	1/2" OD	1-1/8" OD	1/2" OD	104	133
CAPACITY MULTIPLIER		1.00		0.985		0.97		0.955			

Notes: * The "Charge Amount with SAH Air Handler" column is based on the charge amount for a SAH Air Handler + Compressor Section/Split. 1/19/2021

Additional charge will need to be added accordingly for line set length.

After charge is added, additional adjustments can be made to get appropriate subcooling and superheat measurements.

Additional charge for R410A is 0.50 oz. per ft. for 3/8" and 1.0 oz. per ft. for 1/2" tube.

Longer line sets will significantly reduce capacity and efficiency of the system as well as adversely effect the system reliability due to poor oil return.

Vertical separation between compressor section and air handler is limited to 20 feet. This distance is part of the 80 feet maximum distance.

General Installation Information cont.

Refrigerant Piping Limits

The maximum refrigerant total line set length should not exceed 80 feet. The maximum vertical separation between the compressor section and air handler should not exceed 20 feet. As an example; if vertical separation is 20 feet then the rest of the line set can't exceed 60 feet in length, 20' + 60' = 80'. Friction loss of copper elbows or bends should be included in the calculation of the total line set length. Longer line sets require more refrigerant that must be managed throughout the entire operating range of the application. Excess refrigerant in the compressor at start up, or condensed liquid refrigerant in the suction line at start up must be avoided for compressor reliability. Proper line set sizing is crucial for controlling oil return to the compressor and minimizing capacity losses. See Line Set Size table in this manual or Symphony Contractor Connect phone app for proper sizing. Pressure drop in the suction line will increase power consumption and reduce system capacity. A commonly accepted value for the suction line in R-410A systems is 5PSI pressure drop.

The use of long radius ells can reduce the equivalent length of a line and thus reduce the friction loss.
A factory installed filter drier is in the compressor section, do not add a drier or filter in series with the factory installed drier as the added pressure drop may cause "flashing" of liquid refrigerant.

Tube Bend/Fitting Losses in Equivalent Feet

Tube Size O.D. (in)	90° Standard Radius	90° Long Radius	45° Standard Radius
3/8	1.3	0.8	0.3
1/2	1.4	0.9	0.4
5/8	1.5	1.0	0.5
3/4	1.9	1.3	0.6
7/8	2.3	1.5	0.7
1-1/8	2.7	1.8	0.9

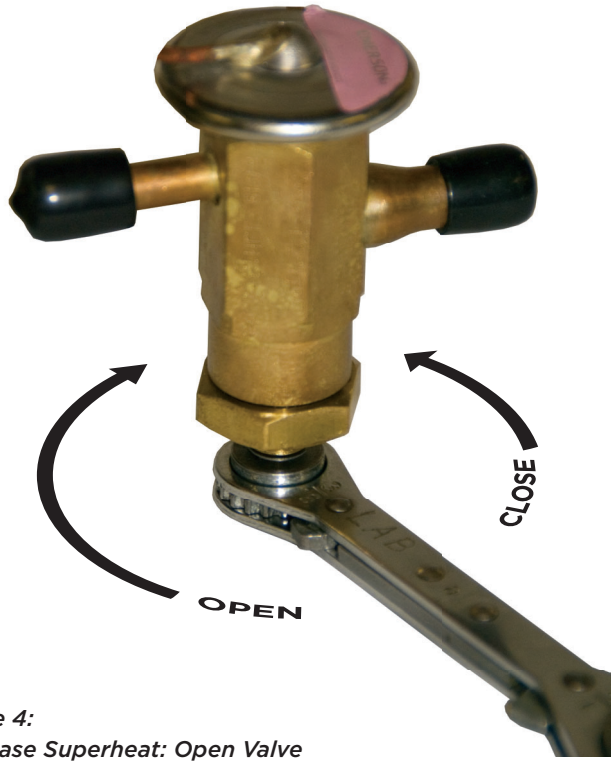


Figure 4:
Decrease Superheat: Open Valve
Increase Superheat: Close Valve

Electrical Data

All field wiring must comply with local and national fire, safety and electrical codes. Be sure the available power is the same voltage and phase as that shown on the unit serial plate. Refer to the unit Electrical Data table for fuse and circuit breaker sizing. Line voltage power should be supplied to the breakers on air handlers with 15kW and 20kW heater kits (see the electric heat control section picture).

15kW and 20kW Wiring Instructions

If two separate circuits are used to supply power to the auxiliary heat kit, the installer will need to verify that each leg of the auxiliary circuit breakers are wired from the power supply correctly in order for the electric heat kit to operate properly. This can be done by measuring the supply side voltage of the auxiliary heat circuit breakers. Put a voltmeter lead on the L2 side of Circuit Breaker One and on the L2 side of Circuit Breaker Two. The voltmeter should read approximately 0 volts. If the meter reads high voltage, the auxiliary heat breakers need to be rewired so that breakers in the auxiliary heat kit match the wiring of the Disconnect Panel breakers. Meaning, L1 and L2 from one breaker in the disconnect panel must connect to L1 and L2 at one of the auxiliary heat circuit breakers and L1 and L2 from the other breaker in the disconnect panel must connect to L1 and L2 of the other auxiliary heat circuit breaker, making sure that the L1 and L2 from each disconnect breaker matches the L1 and L2 at each of the auxiliary heat breakers.

On air handlers with 15 and 20kW heater kits, a circuit breaker cover is provided. The installer can place the cover on the outside of the cabinet to seal the breaker opening. The cover will still allow operation of the breaker switches.

On air handlers with no electric heat installed, or with 5kW and 10kW heater kits the power should be supplied to L1 and L2 lugs on PB (see air handler control section picture).

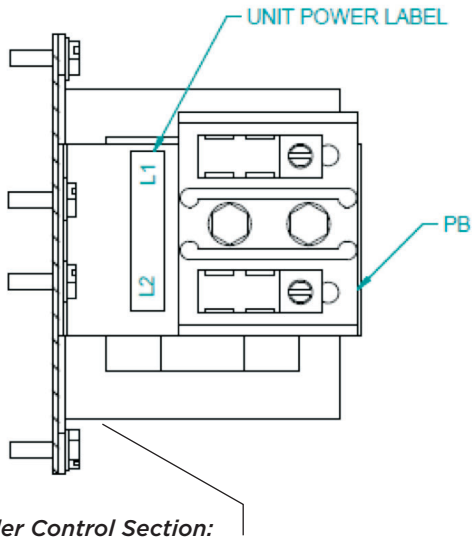
15kW and 20kW Heater Kits with Control Option C

On units with control option C that are equipped with factory installed 15 or 20kW heater kits, the installer will need to route the wires through the electric heat current transducer that is connected to the BLACK wires. The wires that are identified with a label will need to pass through the center of the transducer, and will need to be disconnected from the breakers screw lugs. Once the wires are passed through the transducer, reconnect to the breakers and secure tightly in the screw lugs. On 5 and 10kW heater kits, the electric heat current transducer is factory installed.

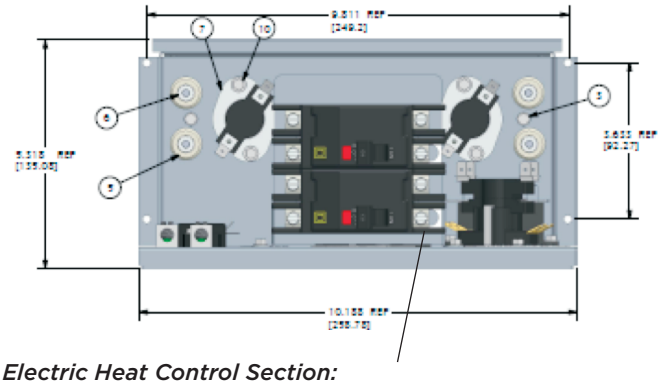
SAH Auxiliary Heat Minimum Blower Settings

SAH Model	5-Speed ECM Minimum Blower Setting	VS ECM Minimum Blower Setting	Heater kW
022	5	9	5
026	5	9	5
030	5	9	5
036	4	9	5
036	5	11	10
042	4	9	10
042	5	12	15
048	4	9	10
048	5	12	15
060	4	7	10
060	4	8	15
060	5	10	20
066	4	7	10
066	4	8	15
066	5	10	20

Air flow level for auxiliary heat (Aux) must be equal to or above the minimum setting in this table 3/10/2017



Air Handler Control Section:
Power should be supplied to PB on air handlers with no electric heat and 5kW or 10kW heaters.



Electric Heat Control Section:
Power should be supplied to the breakers on air handlers with 15kW and 20kW heaters.

Electrical Data cont.

Model	Electric Heat Capacity		Supply Circuit	Rated Voltage	Voltage Min/Max	Fan Motor FLA	Heater Ampacity		Total Unit FLA		Minimum Circuit Ampacity		Maximum Fuse/ HACR	
	KW	BTUH												
	240v	240v					208v	240v	208v	240v	208v	240v	208v	240v
022	0	0	-	208-230/60/1	197/253	4.0	-	-	4.0	4.0	5.0	5.0	10	10
	4.8	16,382	single			4.0	17.3	20.0	21.3	24.0	26.6	30.0	30	30
026	0	0	-			4.0	-	-	4.0	4.0	5.0	5.0	10	10
	4.8	16,382	single			4.0	17.3	20.0	21.3	24.0	26.6	30.0	30	30
030	0	0	-			4.0	-	-	4.0	4.0	5.0	5.0	10	10
	4.8	16,382	single			4.0	17.3	20.0	21.3	24.0	26.6	30.0	30	30
036	0	0	-			4.0	-	-	4.0	4.0	5.0	5.0	10	10
	4.8	16,382	single			4.0	17.3	20.0	21.3	24.0	26.6	30.0	30	30
	9.6	32,765	single			4.0	34.7	40.0	38.7	44.0	48.4	55.0	50	60
042	0	0	-			7.0	-	-	7.0	7.0	8.8	8.8	15	15
	9.6	32,765	single			7.0	34.7	40.0	41.7	47.0	52.1	58.8	60	60
	14.4	49,147	single			7.0	52.0	60.0	59.0	67.0	73.8	83.8	80	90
	14.4	49,147	L1/L2			7.0	34.7	40.0	41.7	47.0	52.1	58.8	60	60
			L3/L4			-	17.3	20.0	17.3	20.0	21.6	25.0	25	25
048	0	0	-			7.0	-	-	7.0	7.0	8.8	8.8	15	15
	9.6	32,765	single			7.0	34.7	40.0	41.7	47.0	52.1	58.8	60	60
	14.4	49,147	single			7.0	52.0	60.0	59.0	67.0	73.8	83.8	80	90
	14.4	49,147	L1/L2			7.0	34.7	40.0	41.7	47.0	52.1	58.8	60	60
			L3/L4			-	17.3	20.0	17.3	20.0	21.6	25.0	25	25
060	0	0	-			7.0	-	-	7.0	7.0	8.8	8.8	15	15
	9.6	32,765	single			7.0	34.7	40.0	41.7	47.0	52.1	58.8	60	60
	14.4	49,147	single			7.0	52.0	60.0	59.0	67.0	73.8	83.8	80	90
	14.4	49,147	L1/L2			7.0	34.7	40.0	41.7	47.0	52.1	58.8	60	60
			L3/L4			-	17.3	20.0	17.3	20.0	21.6	25.0	25	25
	19.2	65,530	single			7.0	69.3	80.0	76.3	87.0	95.4	108.8	100	110
	19.2	65,530	L1/L2			7.0	34.7	40.0	41.7	47.0	52.1	58.8	60	60
			L3/L4			-	34.7	40.0	34.7	40.0	43.4	50.0	50	50
066	0	0	-			7.0	-	-	7.0	7.0	8.8	8.8	15	15
	9.6	32,765	single			7.0	34.7	40.0	41.7	47.0	52.1	58.8	60	60
	14.4	49,147	single			7.0	52.0	60.0	59.0	67.0	73.8	83.8	80	90
	14.4	49,147	L1/L2			7.0	34.7	40.0	41.7	47.0	52.1	58.8	60	60
			L3/L4			-	17.3	20.0	17.3	20.0	21.6	25.0	25	25
	19.2	65,530	single			7.0	69.3	80.0	76.3	87.0	95.4	108.8	100	110
	19.2	65,530	L1/L2			7.0	34.7	40.0	41.7	47.0	52.1	58.8	60	60
			L3/L4			-	34.7	40.0	34.7	40.0	43.4	50.0	50	50

Rev. 1/10/17
Rated Voltage of 208/230/60/1
HACR circuit breaker in USA only

Electrical Data cont.

Standard Non-Communicating Control Option A

Field low voltage point to point wiring:

From Thermostat	To Air Handler	To Compressor Section
C	C	C
R	R	R
G	G	
O	O	O
Y1	Y1	Y1
Y2	Y2	Y2
W2	W	
L	L	L

Air Handler transformer must be 75VA. 5/02/2017

Communicating Thermostat Control Option A

Field low voltage point to point wiring:

From Communicating Thermostat	To ABC P7 in Compressor Section
C	C
R	R
-	-
+	+

From ABC Outputs	To Air Handler
C	C
R	R
F	G
CC	Y1
CC2	Y2
EH1	W
	O
	L

Air Handler transformer must be 75VA.

Note: Refer to the SAH A control schematics with auxilliary heat for more details on connecting a communicating thermostat with and without a W output.

8/31/20

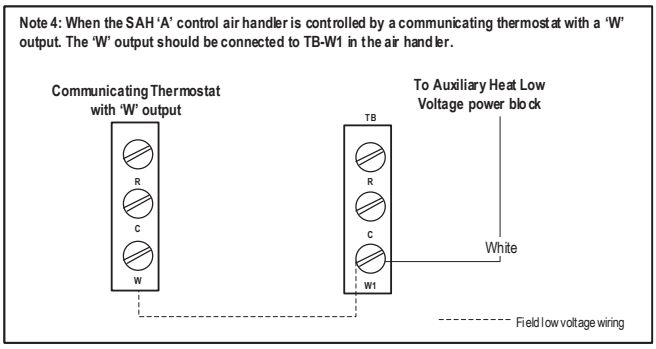
Non-Communicating Thermostat Control Option C

Field low voltage point to point wiring:

From Thermostat	To ABC in Compressor Section
C	C
R	R
G	G
O	O
Y1	Y1
Y2	Y2
W2	W
L	L

From ABC P7 in Compressor Section	To PB2 in Air Handler
C	C
R	R
-	-
+	+

Air Handler transformer must be 100VA. 3/7/2017

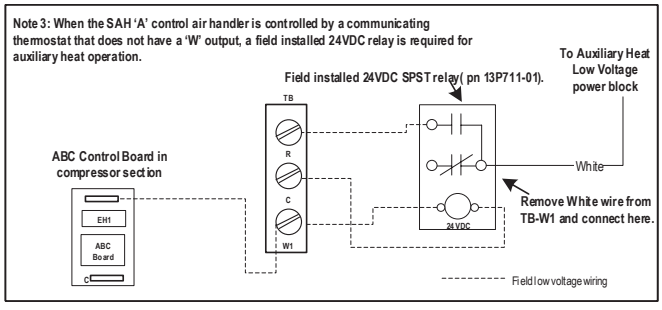


Communicating Thermostat Control Option C

Field low voltage point to point wiring:

From Communicating Thermostat	To Air Handler PB3	To Compressor Section ABC Board P7
C	C	C
R	R	R
-	-	-
+	+	+

Air Handler transformer must be 100VA. 1/10/2017

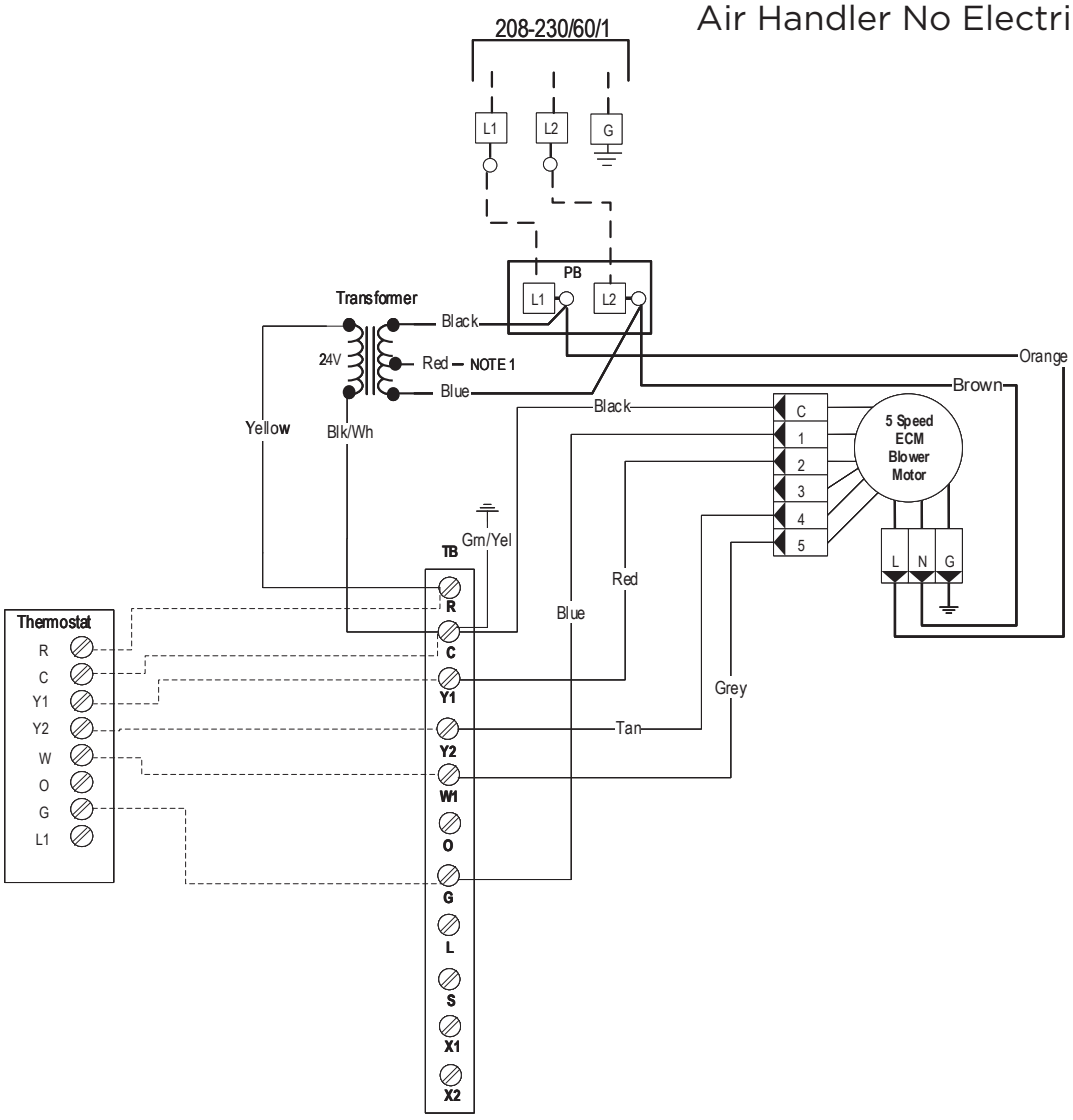


Wiring Schematics

SAH Air Handler Control Option A Schematic

97P901-01

Air Handler No Electric Heat



Notes:

1 – To operate in 208V mode replace the blue transformer wire connected to PB-L2 with red transformer wire.

2 – Low voltage wiring CLASS 2.

Legend

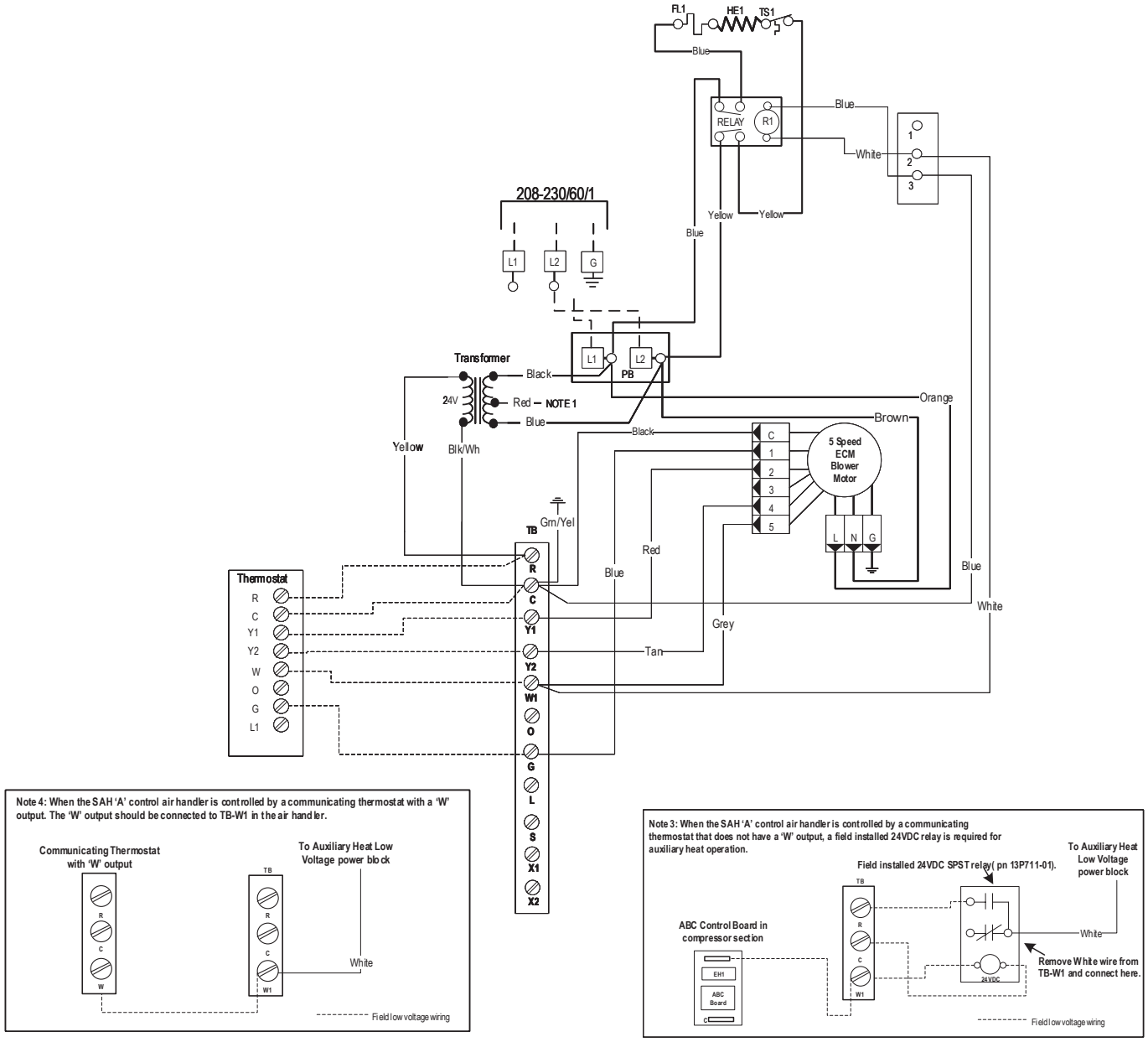
- Factory Low voltage wiring
- Factory Line voltage wiring
- Field low voltage wiring
- Field line voltage wiring
- Optional block
- DC Voltage PCB traces
- Internal junction
- Quick connect terminal
- TS — Thermal Limit Switch
- L1 — Field wire lug
- Ground
- N.O., N.C.
- G — Light emitting diode - Green
- FL — Fused Limit
- Breaker
- P (1 2 3) — Polarized connector
- PB - Power block
- SW1 - DIP package 4 position
- HE - Heater element
- Current Transducer

Wiring Schematics cont.

SAH Air Handler Control Option A Schematic

97P901-02

Air Handler 5kW Electric Heat



Notes:

1 – To operate in 208V mode replace the blue transformer wire connected to PB-L2 with red transformer wire.

2 – Low voltage wiring CLASS 2.

3 – When the SAH 'A' control air handler is controlled by a communicating thermostat a field installed 24VDC relay is required for auxiliary heat operation.

4 – When the SAH 'A' control air handler is controlled by a communicating thermostat with a 'W' output. The 'W' output should be connected to TB-W1 in the air handler.

Legend

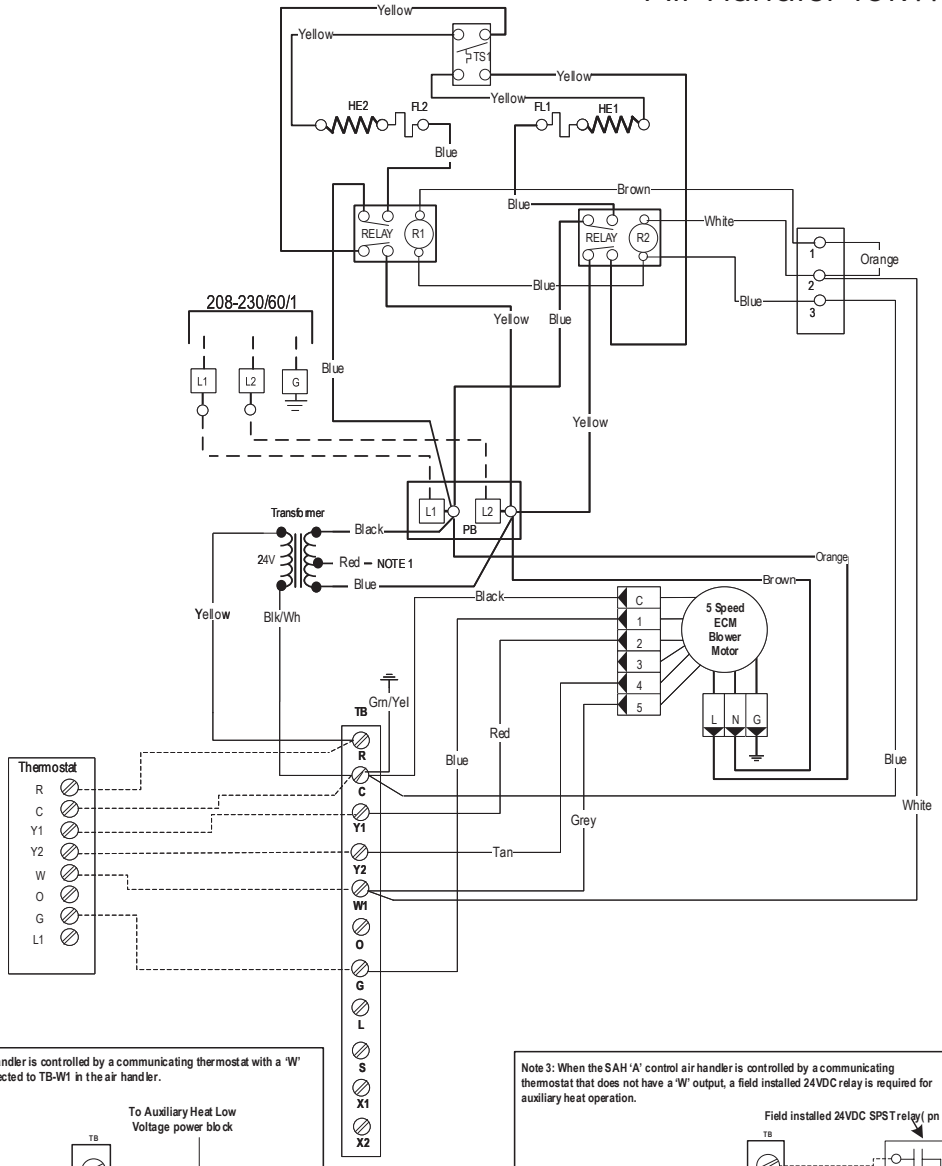
	Factory Low voltage wiring	G	Light emitting diode - Green
	Factory Line voltage wiring	FL	Fused Limit
	Field low voltage wiring		Breaker
	Field line voltage wiring	P	Polarized connector
	Optional block	PB -	Power block
	DC Voltage PCB traces	SW1 -	DIP package 4 position
	Internal junction	HE -	Heater element
	Quick connect terminal		Current Transducer
TS	Thermal Limit Switch		
L1	Field wire lug		
	Ground		
	N.O., N.C.		

Wiring Schematics cont.

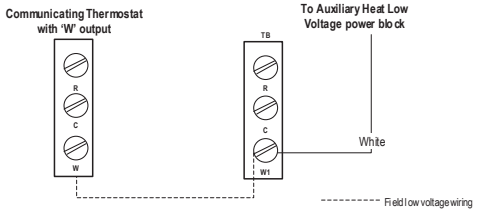
SAH Air Handler Control Option A Schematic

97P901-03

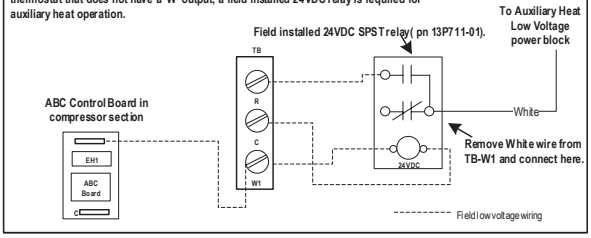
Air Handler 10kW Electric Heat



Note 4: When the SAH 'A' control air handler is controlled by a communicating thermostat with a 'W' output. The 'W' output should be connected to TB-W1 in the air handler.



Note 3: When the SAH 'A' control air handler is controlled by a communicating thermostat that does not have a 'W' output, a field installed 24VDC relay is required for auxiliary heat operation.



Notes:

1 – To operate in 208V mode replace the blue transformer wire connected to PB-L2 with red transformer wire.

2 – Low voltage wiring CLASS 2.

3 – When the SAH 'A' control air handler is controlled by a communicating thermostat a field installed 24VDC relay is required for auxiliary heat operation.

4 – When the SAH 'A' control air handler is controlled by a communicating thermostat with a 'W' output. The 'W' output should be connected to TB-W1 in the air handler.

Legend

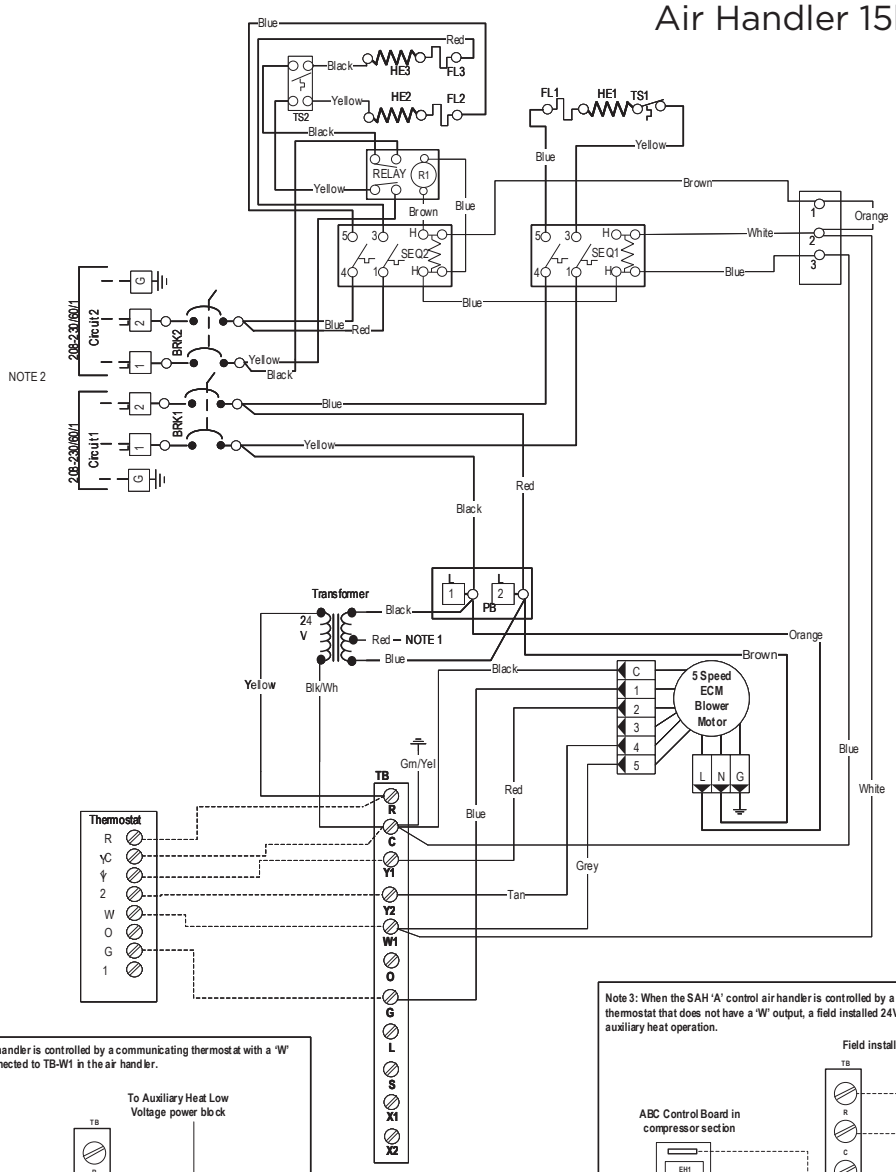
———	Factory Low voltage wiring	G	Light emitting diode - Green
———	Factory Line voltage wiring	FL	Fused Limit
- - - -	Field low voltage wiring		Breaker
— — —	Field line voltage wiring	P 1 2 3	Polarized connector
-·-·-	Optional block	PB -	Power block
	DC Voltage PCB traces	SW1 -	DIP package 4 position
•	Internal junction	HE -	Heater element
○	Quick connect terminal		Current Transducer
TS	Thermal Limit Switch		
L1	Field wire lug		
⏚	Ground		
⊣⊢	N.O., N.C.		

Wiring Schematics cont.

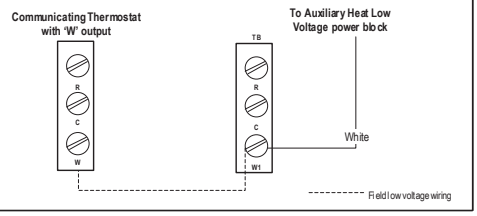
SAH Air Handler Control Option A Schematic

97P901-04

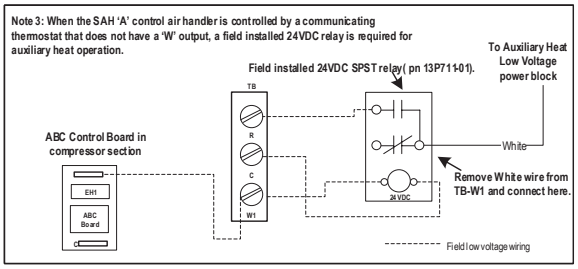
Air Handler 15kW Electric Heat



Note 4: When the SAH 'A' control air handler is controlled by a communicating thermostat with a 'W' output. The 'W' output should be connected to TB-W1 in the air handler.



Note 3: When the SAH 'A' control air handler is controlled by a communicating thermostat that does not have a 'W' output, a field installed 24VDC relay is required for auxiliary heat operation.



Notes:

1 – To operate in 208V mode replace the blue transformer wire connected to PB-L2 with red transformer wire.

2 – Use manufacturer's part number 19P592-01 (jumper bar assembly) when single source power is required.

3 – Low voltage wiring CLASS 2.

4 – When the SAH 'A' control air handler is controlled by a communicating thermostat a field installed 24VDC relay is required for auxiliary heat operation.

5 – When the SAH 'A' control air handler is controlled by a communicating thermostat with a 'W' output. The 'W' output should be connected to TB-W1 in the air handler.

Legend

Factory Low voltage wiring	Light emitting diode - Green
Factory Line voltage wiring	FL Fused Limit
Field low voltage wiring	Breaker
Field line voltage wiring	P Polarized connector
Optional block	PB - Power block
DC Voltage PCB traces	SW1 - DIP package 4 position
Internal junction	HE - Heater element
Quick connect terminal	Current Transducer
TS Thermal Limit Switch	
Field wire lug	
Ground	
N.O., N.C.	

Dual Power Supply Connections

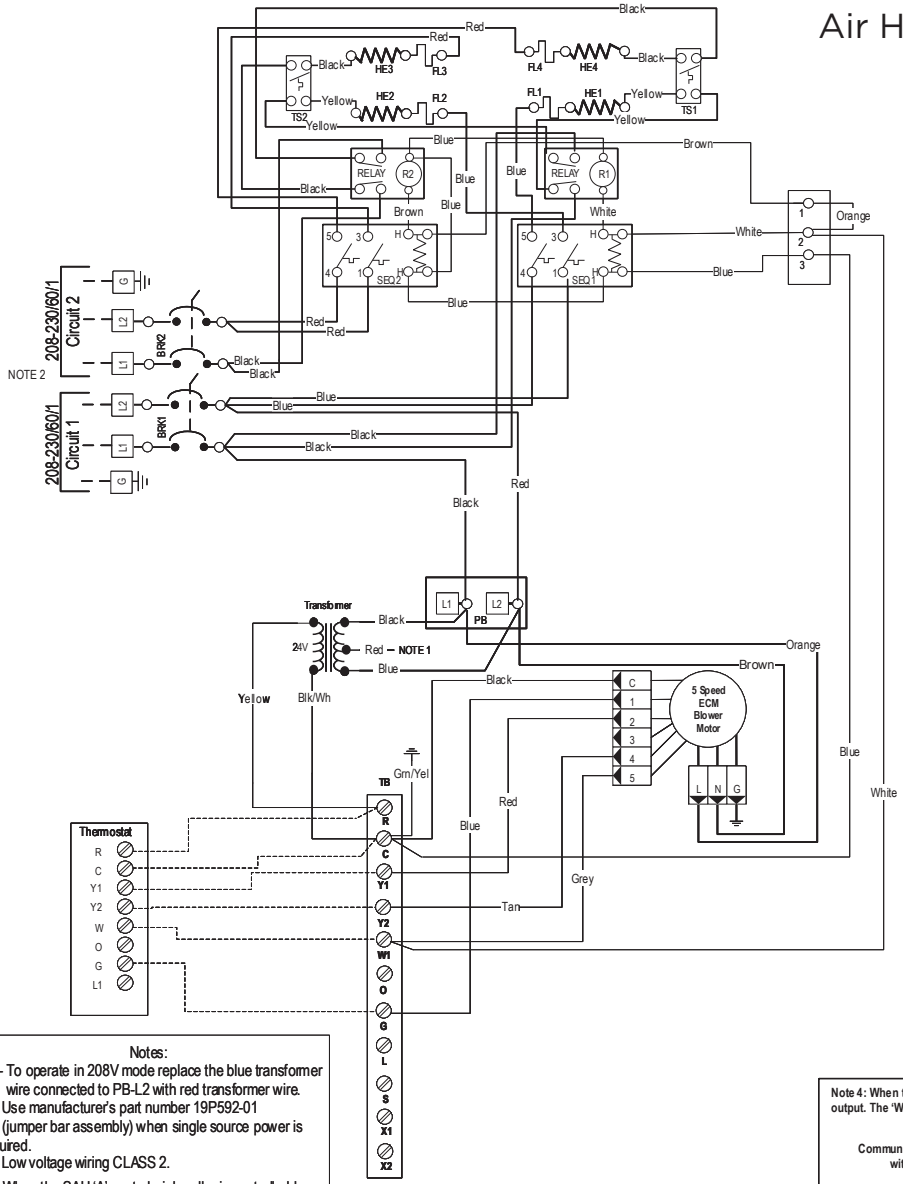
If two separate circuits are used to supply power to the auxiliary heat kit, the Installer will need to verify that each leg of the auxiliary heat circuit breakers are wired from the power supply correctly in order for the electric heat kit to operate properly. This can be done by measuring the supply side voltage of the auxiliary heat circuit breakers. Put a voltmeter on the L2 side of Circuit Breaker One and on the L2 side of Circuit Breaker Two. The voltmeter should read approximately 0 volts. If the meter reads high voltage, the auxiliary heat breakers need to be rewired so that breakers in the auxiliary heat kit match the wiring of the Disconnect Panel breakers. Meaning, L1 and L2 from one breaker in the disconnect panel must connect to L1 and L2 at one of the auxiliary heat circuit breakers and L1 and L2 from the other breaker in the disconnect panel must connect to L1 and L2 of the other auxiliary heat circuit breaker, making sure that the L1 and L2 from each disconnect breaker matches the L1 and L2 at each of the auxiliary heat breakers.

Wiring Schematics cont.

SAH Air Handler Control Option A Schematic

97P901-05

Air Handler 20kW Electric Heat



Notes:

1 – To operate in 208V mode replace the blue transformer wire connected to PB-L2 with red transformer wire.

2 – Use manufacturer's part number 19P592-01 (jumper bar assembly) when single source power is required.

3 – Low voltage wiring CLASS 2.

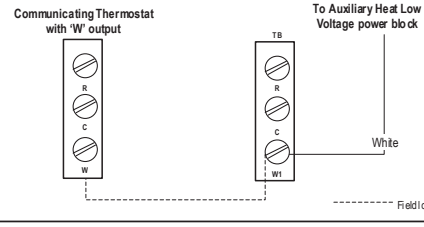
4 – When the SAH 'A' control air handler is controlled by a communicating thermostat a field installed 24VDC relay is required for auxiliary heat operation.

5 – When the SAH 'A' control air handler is controlled by a communicating thermostat with a 'W' output. The 'W' output should be connected to TB-W1 in the air handler.

Dual Power Supply Connections

If two separate circuits are used to supply power to the auxiliary heat kit, the Installer will need to verify that each leg of the auxiliary heat circuit breakers are wired from the power supply correctly in order for the electric heat kit to operate properly. This can be done by measuring the supply side voltage of the auxiliary heat circuit breakers. Put a voltmeter on the L2 side of Circuit Breaker One and on the L2 side of Circuit Breaker Two. The voltmeter should read approximately 0 volts. If the meter reads high voltage, the auxiliary heat breakers need to be rewired so that breakers in the auxiliary heat kit match the wiring of the Disconnect Panel breakers. Meaning, L1 and L2 from one breaker in the disconnect panel must connect to L1 and L2 at one of the auxiliary heat circuit breakers and L1 and L2 from the other breaker in the disconnect panel must connect to L1 and L2 of the other auxiliary heat circuit breaker, making sure that the L1 and L2 from each disconnect breaker matches the L1 and L2 at each of the auxiliary heat breakers.

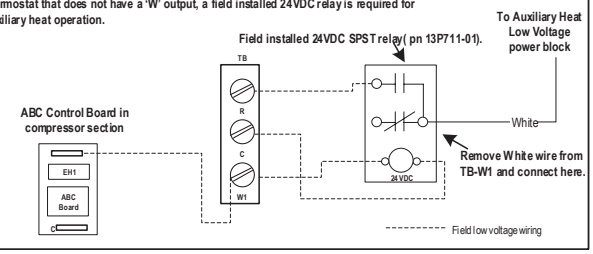
Note 4: When the SAH 'A' control air handler is controlled by a communicating thermostat with a 'W' output. The 'W' output should be connected to TB-W1 in the air handler.



Legend

- Factory Low voltage wiring
- Factory Line voltage wiring
- Field low voltage wiring
- Field line voltage wiring
- Optional block
- DC Voltage PCB traces
- Internal junction
- Quick connect terminal
- TS – Thermal Limit Switch
- L1 – Field wire lug
- Ground
- N.O., N.C.
- G – Light emitting diode - Green
- FL – Fused Limit
- Breaker
- P – Polarized connector (1 2 3)
- PB – Power block
- SW1 – DIP package 4 position
- HE – Heater element
- Current Transducer

Note 3: When the SAH 'A' control air handler is controlled by a communicating thermostat that does not have a 'W' output, a field installed 24VDC relay is required for auxiliary heat operation.

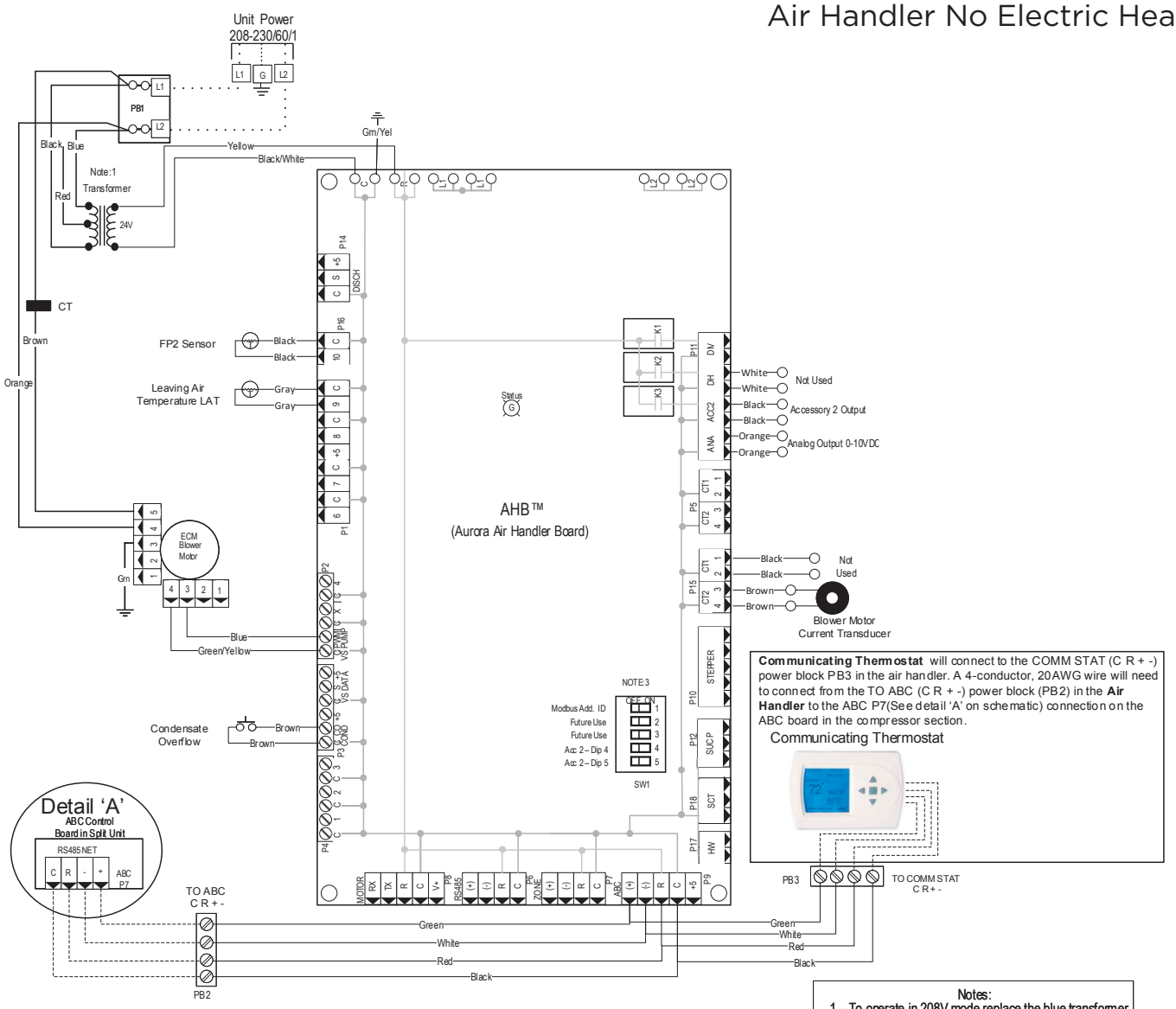


Wiring Schematics cont.

SAH Air Handler Control Option C Schematic

97P903-01

Air Handler No Electric Heat



Communicating Thermostat will connect to the COMM STAT (C R + -) power block PB3 in the air handler. A 4-conductor, 20AWG wire will need to connect from the TO ABC (C R + -) power block (PB2) in the **Air Handler** to the ABC P7(See detail 'A' on schematic) connection on the ABC board in the compressor section.

Communicating Thermostat

Note: On the AID Tool Configure Aurora Screen, confirm the AHB is added and communicating.

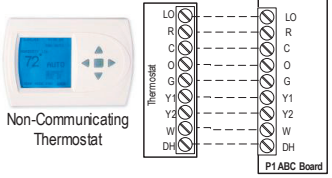
Notes:

1 – To operate in 208V mode replace the blue transformer wire connected to PB1-L2 with red transformer wire.

2 – Low voltage wiring CLASS 2.

3 – DIP switch 1 on SW1 must be set in the OFF position.

Non-Communicating Thermostat will connect to the P1 connection on the ABC board in the compressor section. A 4-conductor, 20AWG wire will need to connect from the ABC P7 (See detail 'A' on schematic) connection to the TO ABC (C R + -) power block (PB2) in the **Air Handler.**



Legend

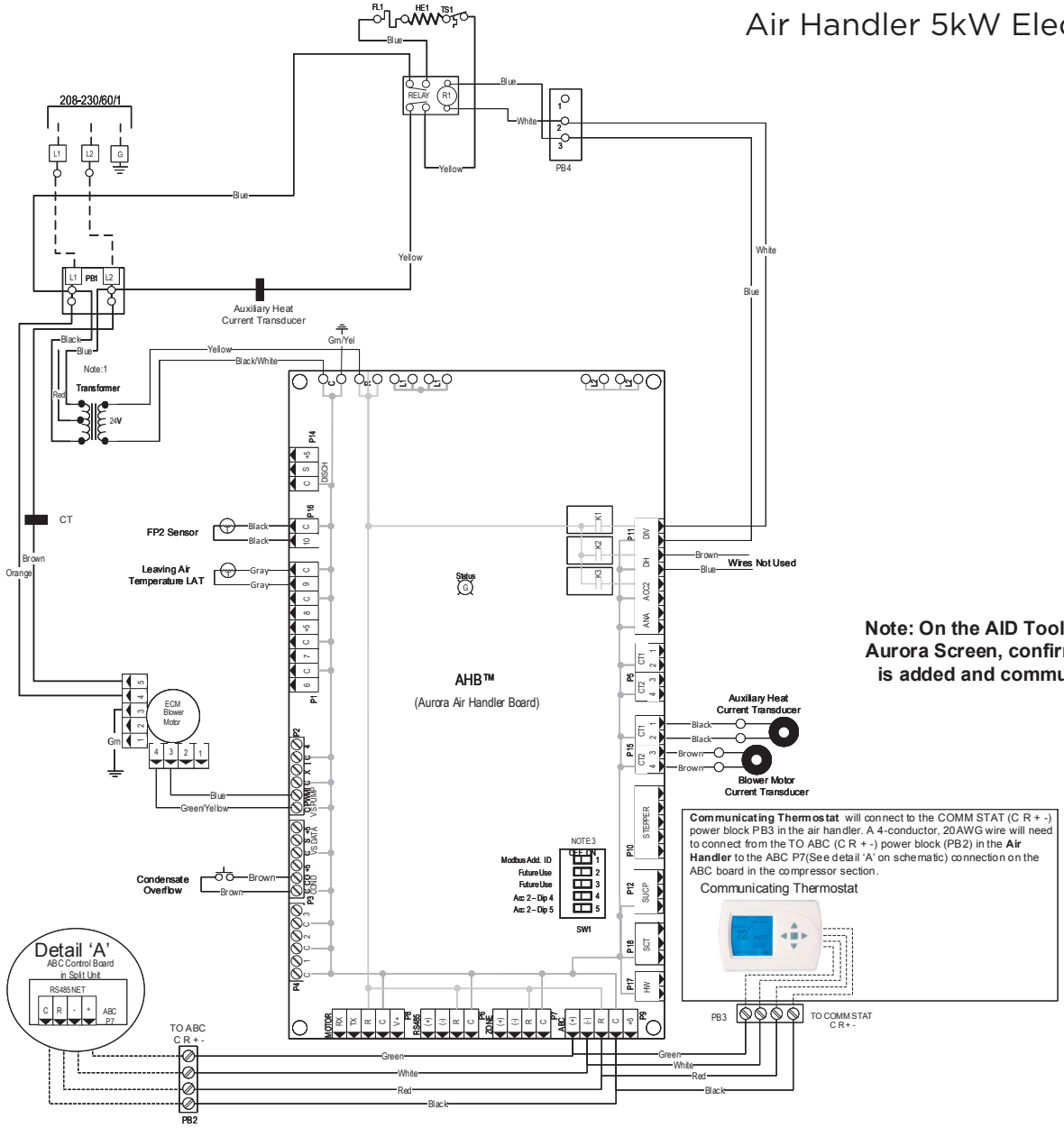
Factory Low voltage wiring	Light emitting diode - Green
Factory Line voltage wiring	
Field low voltage wiring	
Field line voltage wiring	FL Fused Limit
Optional block	
DC Voltage PCB traces	Breaker
Internal junction	
Quick connect terminal	P Polarized connector
TS Thermal Limit Switch	
Field wire lug	PB - Power block
Ground	SW1 - DIP package 4 position
N.O., N.C.	HE - Heater element
	Current Transducer

Wiring Schematics cont.

SAH Air Handler Control Option C Schematic

97P903-02

Air Handler 5kW Electric Heat



Note: On the AID Tool Configure Aurora Screen, confirm the AHB is added and communicating.

Communicating Thermostat will connect to the COMM STAT (C R + -) power block PB3 in the air handler. A 4-conductor, 20AWG wire will need to connect from the TO ABC (C R + -) power block (PB2) in the **Air Handler** to the ABC P7(See detail 'A' on schematic) connection on the ABC board in the compressor section.

Communicating Thermostat

Notes:

1 – To operate in 208V mode replace the blue transformer wire connected to PB1-L2 with red transformer wire.

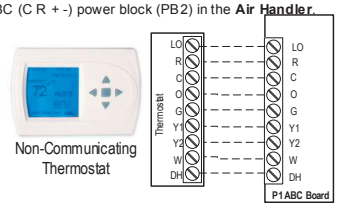
2 – Low voltage wiring CLASS 2.

3 – DIP switch 1 on SW1 must be set in the OFF position.

Legend

Factory Low voltage wiring	Light emitting diode - Green
Factory Line voltage wiring	FL Fused Limit
Field low voltage wiring	Breaker
Field line voltage wiring	Polarized connector
Optional block	PB - Power block
DC Voltage PCB traces	SW1 - DIP package 4 position
Internal junction	HE - Heater element
Quick connect terminal	Current Transducer
TS Thermal Limit Switch	
Field wire lug	
Ground	
N.O., N.C.	

Non-Communicating Thermostat will connect to the P1 connection on the ABC board in the compressor section. A 4-conductor, 20AWG wire will need to connect from the ABC P7 (See detail 'A' on schematic) connection to the TO ABC (C R + -) power block (PB2) in the **Air Handler.**

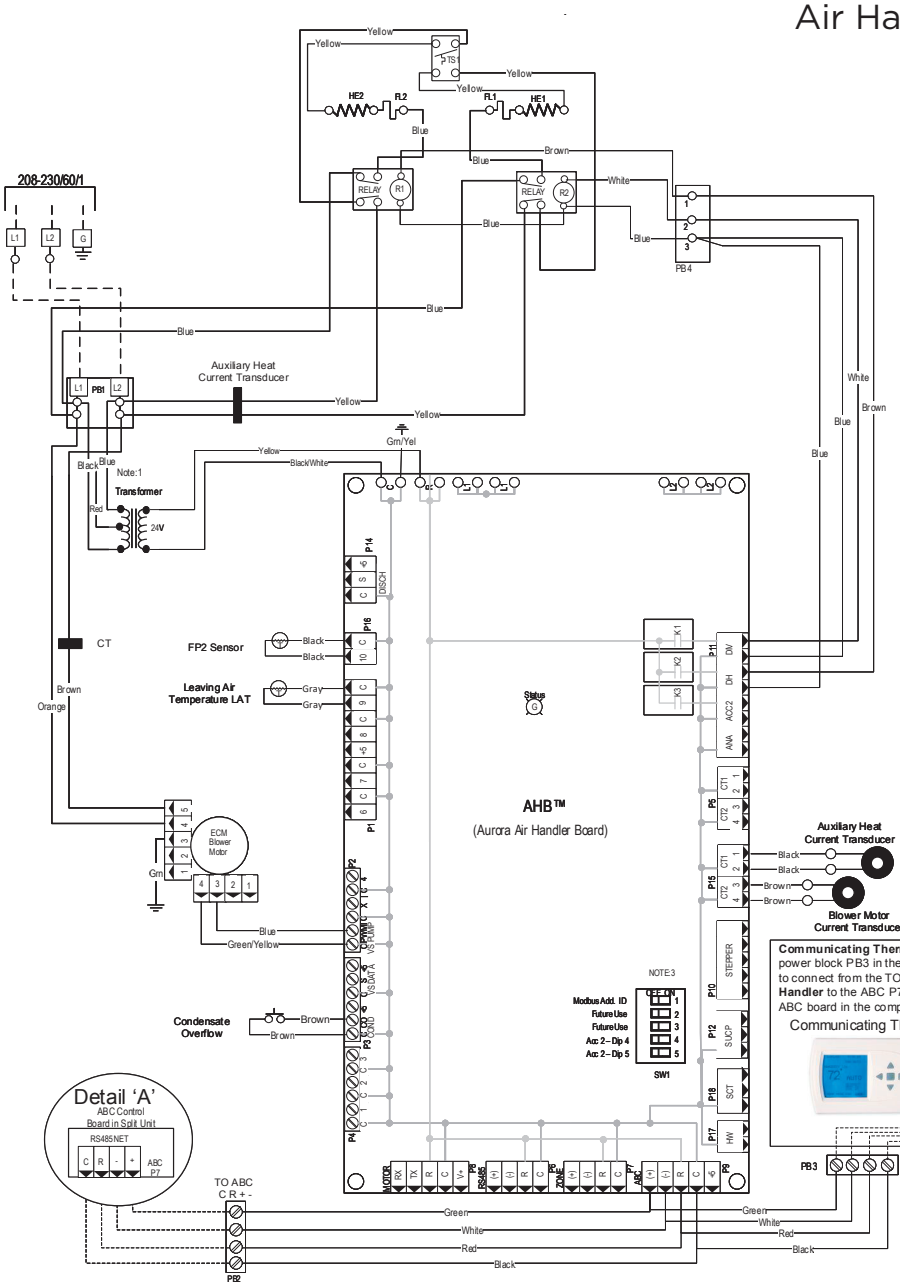


Wiring Schematics cont.

SAH Air Handler Control Option C Schematic

97P903-03

Air Handler 10kW Electric Heat



Note: On the AID Tool Configure Aurora Screen, confirm the AHB is added and communicating.

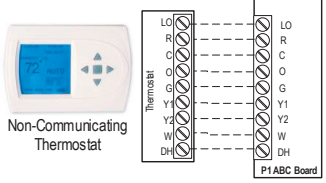
Notes:

1 – To operate in 208V mode replace the blue transformer wire connected to PB1-L2 with red transformer wire.

2 – Low voltage wiring CLASS 2.

3 – DIP switch 1 on SW1 must be set in the OFF position.

Non-Communicating Thermostat will connect to the P1 connection on the ABC board in the compressor section. A 4-conductor, 20AWG wire will need to connect from the ABC P7 (See detail 'A' on schematic) connection to the TO ABC (C R + -) power block (PB2) in the **Air Handler**.



Legend

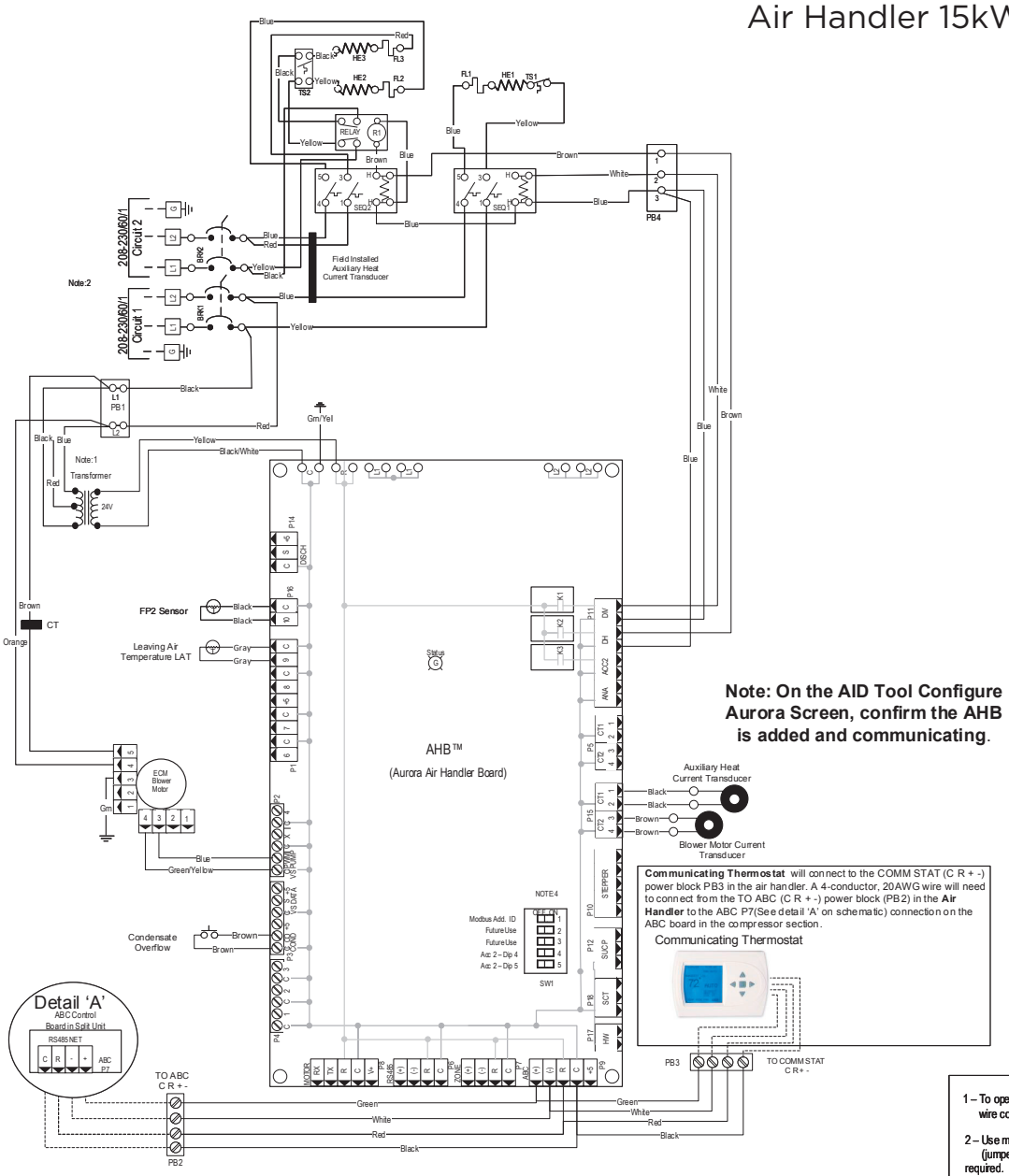
- Factory Low voltage wiring
- Factory Line voltage wiring
- Field low voltage wiring
- Field line voltage wiring
- Optional block
- DC Voltage PCB traces
- Internal junction
- Quick connect terminal
- TS – Thermal Limit Switch
- L1 – Field wire lug
- Ground
- N.O., N.C.
- Light emitting diode - Green
- FL – Fused Limit
- Breaker
- P – Polarized connector
- PB - Power block
- SW1 - DIP package 4 position
- HE - Heater element
- Current Transducer

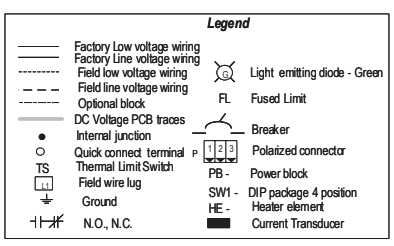
Wiring Schematics cont.

SAH Air Handler Control Option C Schematic

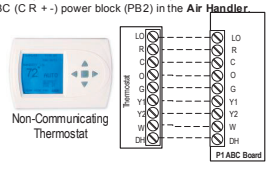
97P903-04

Air Handler 15kW Electric Heat





Non-Communicating Thermostat will connect to the P1 connection on the ABC board in the compressor section. A 4-conductor, 20AWG wire will need to connect from the ABC P7 (See detail 'A' on schematic) connection to the TO ABC (C R + -) power block (PB2) in the **Air Handler**.



Dual Power Supply Connections

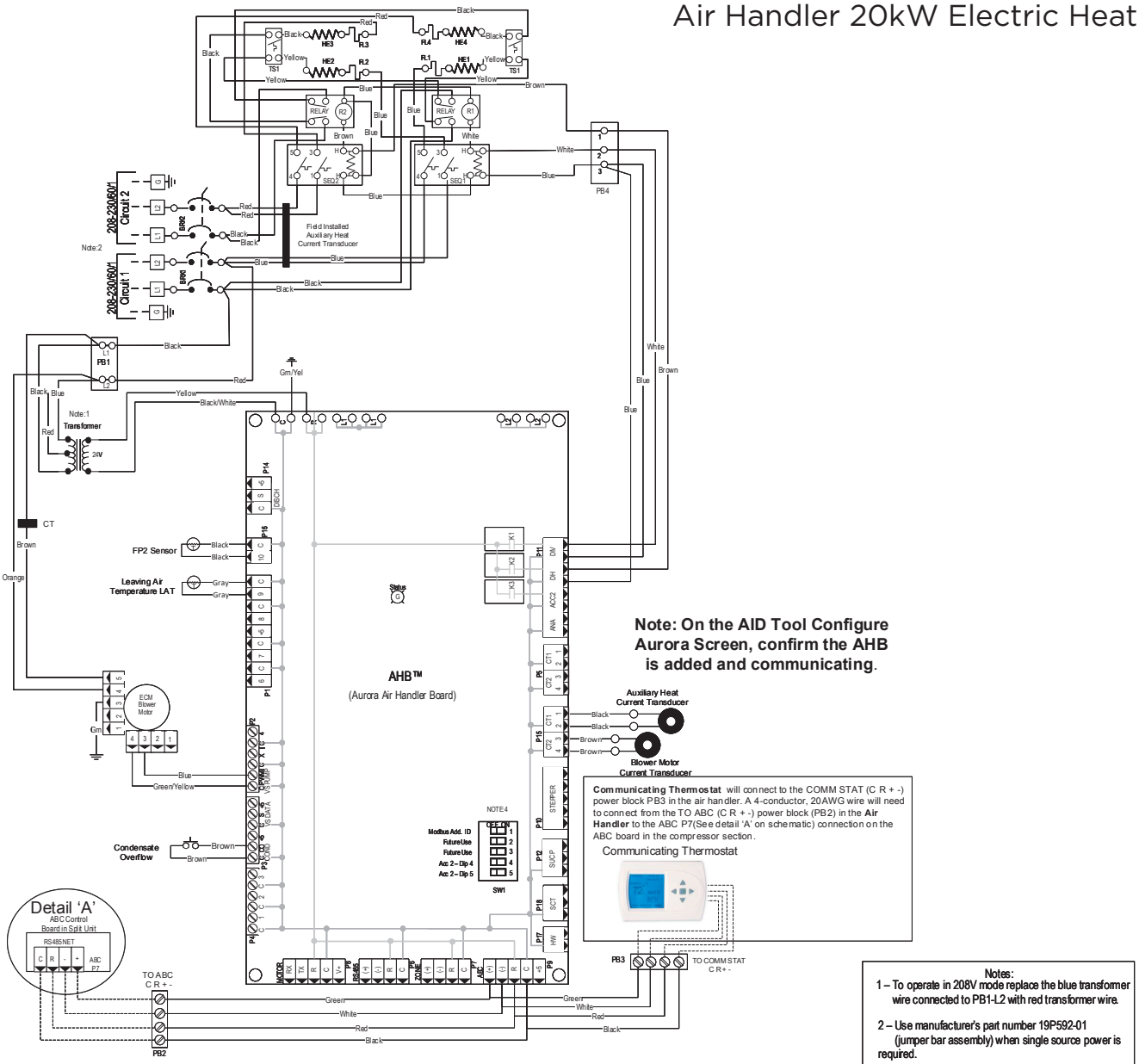
If two separate circuits are used to supply power to the auxiliary heat kit, the Installer will need to verify that each leg of the auxiliary heat circuit breakers are wired from the power supply correctly in order for the electric heat kit to operate properly. This can be done by measuring the supply side voltage of the auxiliary heat circuit breakers. Put a voltmeter on the L2 side of Circuit Breaker One and on the L2 side of Circuit Breaker Two. The voltmeter should read approximately 0 volts. If the meter reads high voltage, the auxiliary heat breakers need to be rewired so that breakers in the auxiliary heat kit match the wiring of the Disconnect Panel breakers. Meaning, L1 and L2 from one breaker in the disconnect panel must connect to L1 and L2 at one of the auxiliary heat circuit breakers and L1 and L2 from the other breaker in the disconnect panel must connect to L1 and L2 of the other auxiliary heat circuit breaker, making sure that the L1 and L2 from each disconnect breaker matches the L1 and L2 at each of the auxiliary heat breakers.

Wiring Schematics cont.

SAH Air Handler Control Option C Schematic

97P903-05

Air Handler 20kW Electric Heat



Notes:

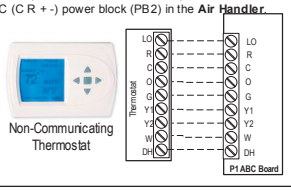
1 – To operate in 208V mode replace the blue transformer wire connected to PB1-L2 with red transformer wire.

2 – Use manufacturer's part number 19P592-01 (jumper bar assembly) when single source power is required.

3 – Low voltage wiring CLASS 2.

4 – DIP switch 1 on SW1 must be set in the OFF position.

Non-Communicating Thermostat will connect to the P1 connection on the ABC board in the compressor section. A 4-conductor, 20AWG wire will need to connect from the ABC P7 (See detail 'A' on schematic) connection to the TO ABC (C R + -) power block (PB2) in the **Air Handler**.



Legend

Factory Low voltage wiring	Light emitting diode - Green
Factory Line voltage wiring	FL Fused Limit
Field low voltage wiring	Breaker
Field line voltage wiring	P Polarized connector
Optional block	PB - Power block
DC Voltage PCB traces	SW1 - DIP package 4 position
Internal junction	HE - Heater element
Quick connect terminal	Current Transducer
TS Thermal Limit Switch	
L1 Field wire lug	
Ground	
N.O., N.C.	

Dual Power Supply Connections

If two separate circuits are used to supply power to the auxiliary heat kit, the Installer will need to verify that each leg of the auxiliary heat circuit breakers are wired from the power supply correctly in order for the electric heat kit to operate properly. This can be done by measuring the supply side voltage of the auxiliary heat circuit breakers. Put a voltmeter on the L2 side of Circuit Breaker One and on the L2 side of Circuit Breaker Two. The voltmeter should read approximately 0 volts. If the meter reads high voltage, the auxiliary heat breakers need to be rewired so that breakers in the auxiliary heat kit match the wiring of the Disconnect Panel breakers. Meaning, L1 and L2 from one breaker in the disconnect panel must connect to L1 and L2 at one of the auxiliary heat circuit breakers and L1 and L2 from the other breaker in the disconnect panel must connect to L1 and L2 of the other auxiliary heat circuit breaker, making sure that the L1 and L2 from each disconnect breaker matches the L1 and L2 at each of the auxiliary heat breakers.

SAH 5 Speed ECM Blower Performance Data Option A

Blower Performance 5 Speed ECM Control Option A

Model	Motor Speed	Motor Tap	T'stat Connection	Blower Size	Motor HP	Airflow (cfm) at External Static Pressure (in. wg)															
						0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.60	0.70	0.80	0.90	1.00
022	**High**	**5**	W	9 x 7	1/2	1130	1115	1100	1090	1080	1065	1050	1040	1030	1015	1000	980	950	-	-	-
	Med High	**4**	Y2*			1040	1025	1010	1000	990	975	960	945	930	915	900	880	850	-	-	-
	Med	3				950	935	920	905	890	875	860	845	830	815	800	760	730	-	-	-
	Med Low	**2**	Y1			860	845	830	815	800	785	770	755	740	720	700	660	590	-	-	-
	Low	**1**	G			740	720	700	680	660	645	630	605	580	540	500	460	-	-	-	-
026	**High**	**5**	W	9 x 7	1/2	1130	1115	1100	1090	1080	1065	1050	1040	1030	1015	1000	980	950	-	-	-
	Med High	**4**	Y2*			1040	1025	1010	1000	990	975	960	945	930	915	900	880	850	-	-	-
	Med	3				950	935	920	905	890	875	860	845	830	815	800	760	730	-	-	-
	Med Low	**2**	Y1			860	845	830	815	800	785	770	755	740	720	700	660	590	-	-	-
	Low	**1**	G			740	720	700	680	660	645	630	605	580	540	500	460	-	-	-	-
030	**High**	**5**	W	9 x 7	1/2	1220	1205	1190	1180	1170	1160	1150	1140	1130	1115	1100	1050	930	-	-	-
	Med High	**4**	Y2*			1130	1115	1100	1090	1080	1070	1060	1045	1030	1015	1000	980	950	-	-	-
	Med	3				1040	1030	1020	1005	990	975	960	945	930	915	900	890	850	-	-	-
	Med Low	**2**	Y1			950	935	920	905	890	875	860	845	830	815	800	770	730	-	-	-
	Low	**1**	G			790	770	750	735	720	700	680	660	640	620	600	530	500	-	-	-
036	**High**	**5**	W	10 x 8	1/2	1450	1435	1420	1405	1390	1375	1360	1345	1330	1315	1300	1270	1250	1210	-	-
	Med High	**4**	Y2*			1350	1335	1320	1305	1290	1275	1260	1245	1230	1215	1200	1170	1140	1100	-	-
	Med	**3**	Y1			1170	1150	1130	1115	1100	1080	1060	1045	1030	1015	1000	960	920	880	-	-
	Med Low	2				1000	980	960	940	920	905	890	870	850	825	800	760	710	650	-	-
	Low	**1**	G			990	915	840	800	760	730	700	680	660	630	600	520	470	430	-	-
042	**High**	**5**	W	11 x 10	1	1960	1945	1930	1915	1900	1880	1860	1845	1830	1810	1790	1750	1700	1660	-	-
	Med High	**4**	Y2*			1790	1775	1760	1745	1730	1710	1690	1670	1650	1535	1420	1560	1500	1450	-	-
	Med	3				1700	1685	1670	1650	1630	1615	1600	1575	1550	1525	1500	1450	1400	1350	-	-
	Med Low	**2**	Y1			1630	1560	1600	1520	1560	1535	1510	1490	1470	1445	1420	1370	1300	1250	-	-
	Low	**1**	G			1490	1445	1400	1375	1350	1325	1300	1270	1240	1210	1180	1120	1000	930	-	-
048	**High**	**5**	W	11 x 10	1	1960	1945	1930	1915	1900	1880	1860	1845	1830	1810	1790	1750	1700	1660	1600	-
	Med High	**4**	Y2*			1790	1775	1760	1745	1730	1710	1690	1670	1650	1535	1420	1560	1500	1450	1450	-
	Med	3				1700	1685	1670	1650	1630	1615	1600	1575	1550	1525	1500	1450	1400	1350	1350	
	Med Low	**2**	Y1			1630	1560	1600	1520	1560	1535	1510	1490	1470	1445	1420	1370	1300	1250	1250	-
	Low	**1**	G			1490	1445	1400	1375	1350	1325	1300	1270	1240	1210	1180	1120	1000	930	930	-
060	**High**	**5**	W	11 x 10	1	2210	2230	2190	2194	2170	2155	2130	2120	2100	2087	2060	2020	2000	1960	1920	1890
	Med High	**4**	Y2*			2030	2073	2000	2035	1970	1995	1940	1958	1910	1922	1870	1840	1800	1760	1720	1680
	Med	3				1850	1931	1820	1889	1790	1850	1760	1812	1730	1774	1680	1640	1600	1560	1510	1450
	Med Low	**2**	Y1			1770	1796	1740	1761	1710	1718	1680	1682	1630	1651	1590	1560	1500	1450	1400	1340
	Low	**1**	G			1570	1661	1540	1616	1510	1573	1460	1533	1420	1495	1370	1320	1250	1200	1100	1020
066	**High**	**5**	W	11 x 10	1	2390	2454	2370	2414	2340	2371	2320	2328	2290	2289	2270	2230	2200	2170	2140	2100
	Med High	**4**	Y2*			2210	2248	2180	2205	2160	2166	2140	2129	2100	2094	2070	2040	2000	1960	1940	1890
	Med	**3**	Y1			2030	2115	2010	2072	1980	2030	1950	1996	1900	1965	1880	1840	1800	1760	1720	1680
	Med Low	2				1860	1985	1830	1939	1800	1898	1770	1862	1730	1828	1690	1640	1600	1570	1510	1460
	Low	**1**	G			1780	1784	1750	1742	1720	1696	1680	1656	1640	1625	1600	1550	1500	1460	1400	1380

Factory speed settings are in Bold 1/10/17

Air flow values are with dry coil and standard filter

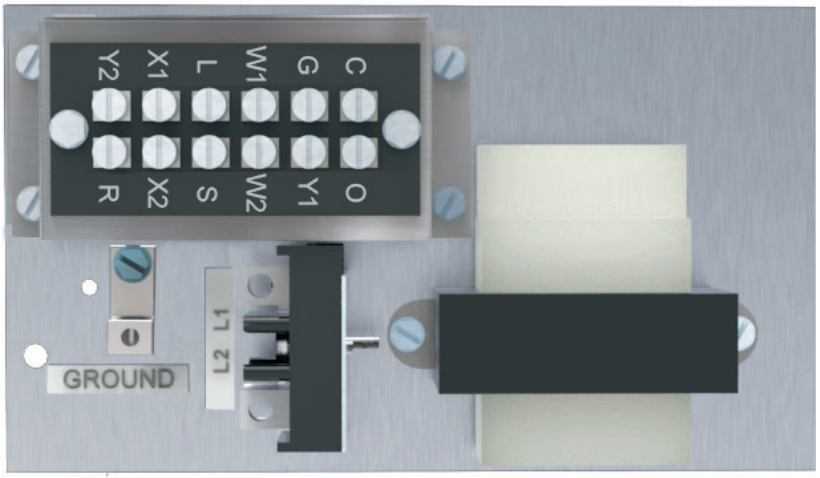
For wet coil performance first calculate the face velocity of the air coil (Face Velocity [fpm] = Airflow [cfm] / Face Area [sq ft]).

Then for velocities of 200 fpm reduce the static capability by 0.03 in. wg, 300 fpm by 0.08 in. wg, 400 fpm by 0.12in. wg., and 500 fpm by 0.16 in. wg.

Highest setting is for auxiliary heat (W) and lowest setting is for constant blower (G). The "Y1" and "Y2" settings must be between the "G" and "W" settings.

***Single speed compressor section units will need to remove the TAN wire on the 5 speed motor and replace it with the RED wire. Tape end and secure the TAN wire.**

The SAH Air Handler blower is factory wired for dual speed compressor section operation.



SAH 5 Speed ECM Blower Performance Data Option A cont.

5-Speed ECM Constant Torque Motors

The 5-Speed ECM is a 'Constant Torque' ECM motor and delivers air flow similar to a PSC but operates as efficiently as an ECM Motor. Because it's an ECM Motor, the 5-Speed ECM can ramp slowly up to down like the ECM motor. There are 5 possible speed taps available on the 5-Speed ECM motor with #1 being the lowest airflow and #5 being the highest airflow. These speed selections are preset at the time of manufacture and are easily changed in the field if necessary.

If more than one tap are energized at the same time, built in logic gives precedence to the highest tap number and allows air flow to change with G, Y1, Y2 and W signals. Each of those 5 speeds has a specific 'Torque' value programmed into the motor for each speed selection. As static pressure increases, airflow decreases resulting in less torque on the rotor. The motor responds only to changes in torque and adjusts its speed accordingly.

The 5-Speed ECM motor is powered by line voltage but the motor speed is energized by 24 VAC.

5-Speed ECM Benefits:

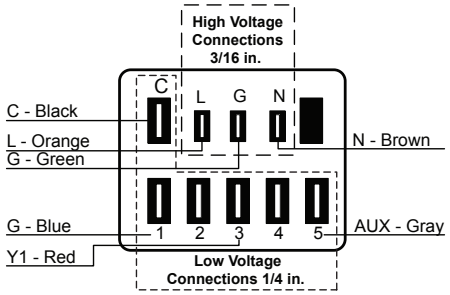
- High Efficiency
- Soft Start
- 5 speeds with up to 4 speeds on-line
- Built-in logic allows air flow to change with G, Y1, Y2 and W signals
- Super efficient low airflow continuous blower setting.

Setting Blower Speed - 5-Speed ECM

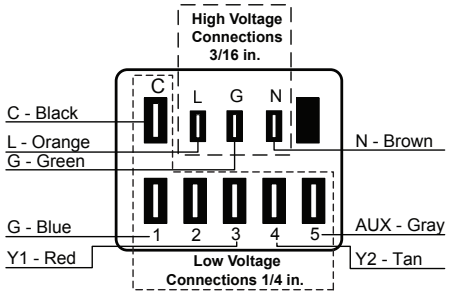
5-Speed ECM blower motors have five (5) speeds of which three (3) are selectable on single speed and four (4) are selectable on dual capacity.

Caution: Disconnect all power before performing this operation.

5-Speed ECM Motor Connections - Single Speed Splits



5-Speed ECM Motor Connections - Dual Capacity Splits

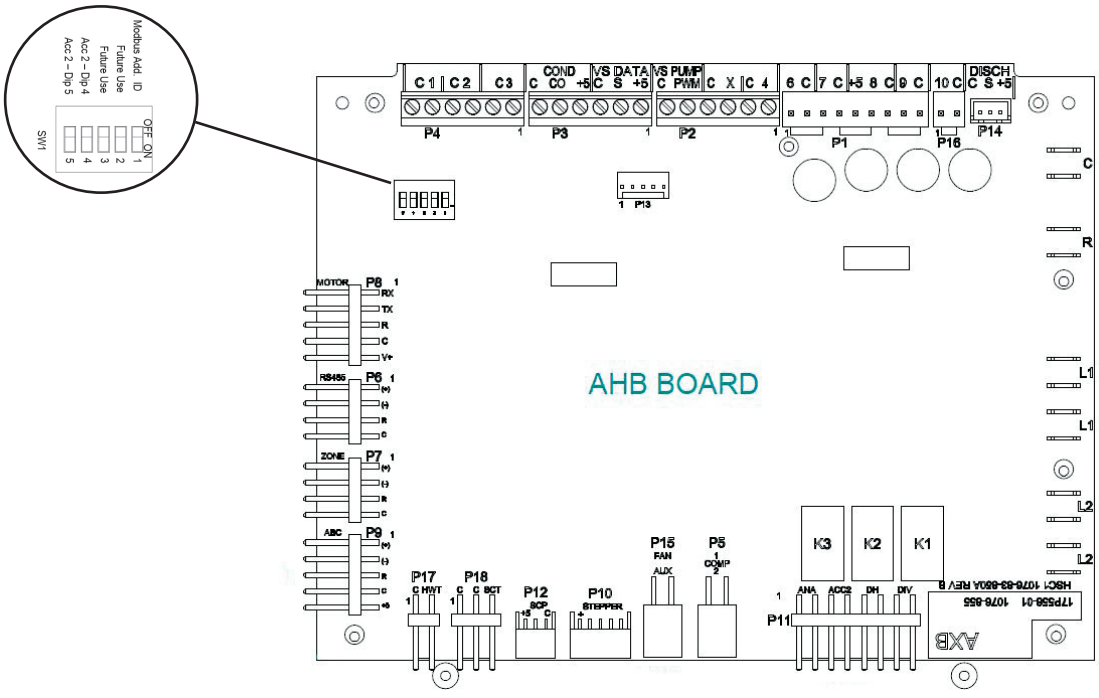


Blower Performance Data Option C

Blower Performance Variable Speed ECM Control Option C

MODEL	MAX ESP	AIR FLOW SPEED SETTINGS											
		1	2	3	4	5	6	7	8	9	10	11	12
022	**0.50**		400	500 G	**600 L**	**700**	**800 H**	**900**	1000 Aux	1100	1200		
026	**0.50**		400	500 G	600	**700 L**	**800**	**900 H**	**1000 Aux**	1100	1200		
030	**0.50**		400	500 G	600	**700 L**	**800**	**900 H**	**1000 Aux**	1100	1200		
036	**0.50**	550	650	700 G	**800**	**850**	**900**	**950 L**	**1050**	**1100 H**	1200	1300 Aux	
042	**0.75**	650	750	800	900 G	**1000**	**1150**	**1200 L**	**1300**	**1400 H**	**1500**	1600	1700 Aux
048	**0.75**	650	750	800	900 G	**1000**	**1150**	**1200**	**1300 L**	**1400**	**1500 H**	1600	1700 Aux
060	**0.75**	950	1100 G	1200	**1350**	**1500**	**1650 L**	**1700**	**1800 H**	**2000 Aux**	2100	2200	
066	**0.75**	950	1100 G	1200	**1350**	**1500**	**1650 L**	**1700**	**1800**	**2000 H**	2100 Aux	2200	

Factory settings are at recommended G-L-H-Aux speed settings 1/10/17
L-H settings MUST be located within boldface CFM range
"Aux" is factory setting for auxiliary/emergency heat and must be equal to or above the "H" setting as well as at least the minimum required for the auxiliary heat package
"G" may be located anywhere within the airflow table
CFM is controlled within 5% up to the maximum ESP
Max ESP includes allowance for wet coil.



Blower Performance Data Option C cont.

SAH Control Option C AHB Board

The SAH Air Handler with the 'Advanced' control option expands on the capability of the Aurora 'Advanced' Control (ABC and AXB) in the compressor section, by adding the AHB board in the air handler.

NOTE: The Energy Monitoring and Leaving Air Temperature features at the AHB board are dependent on the AXB board in the compressor section.

It is highly recommended that the installing/servicing contractor use an Aurora Interface and Diagnosic Tool (AID) when installing and servicing an Aurora 'Advanced' control system.

The AHB board includes the following features:

AHB DIP Switch

DIP 1 - ID: This is the AHB ModBus ID and should always read Off.

DIP 2 & 3 - Future Use

DIP 4 & 5 - Accessory Relay2: A second, DIP configurable, accessory relay is provided that can be cycled with the compressor 1 or 2 , blower, or the Dehumidifier (DH) input. This is to complement the Accessory 1 Relay on the ABC board.

Position	DIP 4	DIP 5	Description
1	ON	ON	Cycles with Fan or ECM (or G)
2	OFF	ON	Cycles with CC1 first stage of compressor or compressor spd 1-6
3	ON	OFF	Cycles with CC2 second stage of compressor or compressor spd 7-12
4	OFF	OFF	Cycles with DH input from ABC board

IntelliZone2 Zoning Compatibility (Optional IntelliZone2 Communicating Zoning)

A dedicated input to connect and communicate with the IntelliZone2 (IZ2) zoning system is provided on P7 on the AHB and AXB. This is a dedicated communication port using a proprietary ModBus protocol. An AXB in the compressor section or an AHB in the air handler is required. Consult the Intellizone2 literature for more information.

Communicating Digital Thermostats

The Aurora controls system also features either mono-chromatic or color touch screen graphic display thermostats for user interface. These displays not only feature easy to use graphical interface but display alerts and faults in plain English. Many of the features discussed here may not be applicable without these thermostats.

Energy Monitoring (AXB Board Required in Compressor Section) (Standard Sensor Kit on 'Advanced' models)

The Energy Monitoring Kit includes two current transducers (blower and electric heat) so that the complete power usage of the air handler can be measured. The AID Tool provides configuration detail for the type of blower motor, power adjustment and a line voltage calibration procedure to improve the accuracy. The information can be displayed on the AID Tool or selected communicating thermostats. The TPCM32U03A(*)/04A(*) will display instantaneous energy use while the color touchscreen TPCC32U01(*) will in addition display a 13 month history in graph form. Refer to Compressor Section Start Up Energy Monitoring for configuration details.

Freeze Detection (Air Coil) – uses the FP2 input to protect against ice formation on the air coil. The FP2 input will operate exactly like FP1 except that the set point is 30 degrees and is not field adjustable.

Condensate Overflow – fault is recognized when the impedance between this line and 24 VAC common or chassis ground drops below 100K ohms for 30 seconds continuously.

Leaving Air Temperature (AXB Board Required in Compressor Section)

A leaving air temperature (LAT) thermistor is located near the blower inlet and can be read via the AID tool or AWL.

Electric Heat Staging

The AHB board provides two stages of auxiliary heat operation. During normal operation, the first stage of electric heat is energized 10 seconds after the W command is received. If the demand continues the second stage is of electric heat will be energized after 5 minutes. In an Emergency heat operation the time delay between stage one and stage two will be 2 minutes.

Blower Performance Data Option C cont.

Setting Blower Speed - Variable Speed ECM

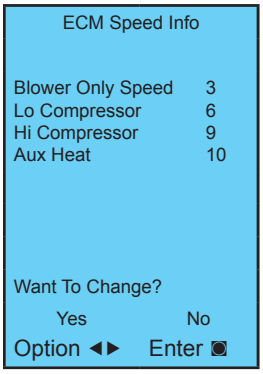
The ABC board's Yellow Config LED will flash the current ECM blower speed selections for "G", low, and high continuously with a short pause in between. The speeds can also be confirmed with the AID Tool under the Setup/ ECM Setup screen. The Aux will not be flashed but can be viewed in the AID Tool. The ECM blower motor speeds can be field adjusted with or without using an AID Tool.

ECM Setup without an AID Tool

The blower speeds for "G", Low (Y1), High (Y2), and Aux can be adjusted directly at the Aurora ABC board which utilizes the push button (SW1) on the ABC board. This procedure is outlined in the ECM Configuration Mode portion of the Aurora 'Base' Control System section. The Aux cannot be set manually without an AID Tool.

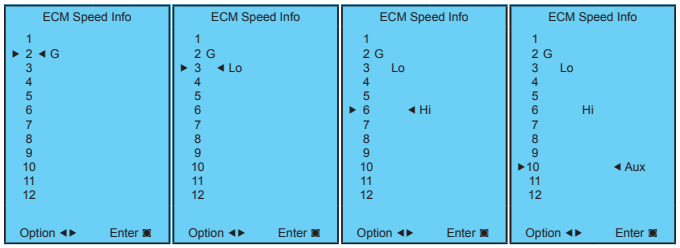
ECM Setup with an AID Tool

A much easier method utilizes the AID Tool to change the airflow using the procedure below. First navigate to the Setup screen and then select ECM Setup. This screen displays the current ECM settings. It allows the technician to enter the setup screens to change the ECM settings. Change the highlighted item using the ◄ and ► buttons and then press the ◙ button to select the item.



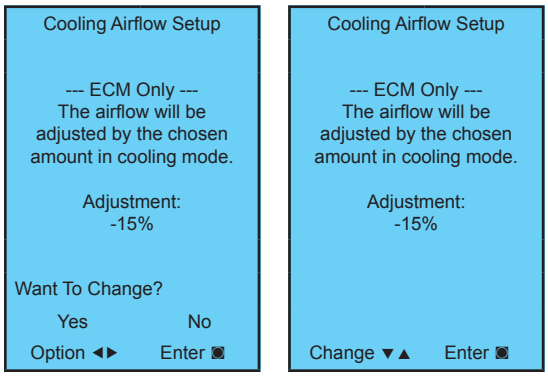
Selecting YES will enter ECM speed setup, while selecting NO will return to the previous screen.

ECM Speed Setup - These screens allow the technician to select the "G", low, high, and auxiliary heat blower speed for the ECM blower motor. Change the highlighted item using the ▲ and ▼ buttons. Press the ◙ button to select the speed.



After the auxiliary heat speed setting is selected the AID Tool will automatically transfer back to the ECM Setup screen.

Cooling Airflow Setup - These screens allow the technician to select -15%, -10%, -5%, None or +5%. Change the adjustment percentage using the ▲ and ▼ buttons. Press the ◙ button to save the change.



Unit Start Up

- **Check that supply voltage matches nameplate data.**
- **Fuses, breakers and wire size are correct.**
- **Confirm that the 15kW or 20kW auxiliary heat kit is wired correctly (see "Electrical Data" section if applicable).**
- **Low voltage wiring is complete.**
- Piping is complete and water system is cleaned and flushed.
- Air is purged from the closed loop system.
- Isolation valves are open, water control valves or pumps are wired.
- Condensate line is open and correctly pitched.
- Transformer switched to 208v if applicable.
- DIP switches are set correctly.
- Blower rotates freely.
- Blower speed is correct.
- Air filter/cleaner is clean and in position.
- Service/access panels are in place.
- Return air temperature is between 50-80°F heating and 60-95° cooling.
- Check air coil cleanliness to insure optimum performance. Clean as needed according to maintenance guidelines. To obtain maximum performance the air coil should be cleaned before startup. A 10 percent solution of dishwasher detergent and water is recommended for both sides of coil. A thorough water rinse should follow.

Maintenance Filters

Filters must be clean to obtain maximum performance. They should be inspected monthly under normal operating conditions and be replaced when necessary. Units should never be operated without a filter. Always replace the filter with the same type as originally furnished.

Condensate Drain

In areas where airborne bacteria produce slime in the drain pan, it may be necessary to treat chemically to minimize the problem. The condensate drain can pick up lint and dirt, especially with dirty filters.

Blower Motors

The ECM motors are equipped with sealed ball bearings and requires no periodic lubrication.

Air Coil

The air coil must be cleaned to obtain maximum performance. Check once a year under normal operating conditions and, if dirty, brush or vacuum clean. Care must be taken not to damage the aluminum fins while cleaning.

Caution: Fin edges are sharp.

Ethernet Cable

A 100 foot Cat6 Ethernet cable is shipped with the air handler in the 98S506-01 SAH Installation Kit. This cable can be plugged into the backside of the Ethernet port located on the top panel of the air handler. The cable then can be routed and connected into the AID Tool port on the compressor section. The installer will then be able to plug the AID Tool into the Ethernet port on the air handler giving him control of the compressor section. If the compressor section is connected to Symphony, the Ethernet cable would connect to the AID Tool port on the back of the Symphony router. If the installer was using the AID Tool and the compressor section equipped with Symphony, the Ethernet cable from the air handler would need to be unplugged, and replaced with the AID Tool cable. The maximum Cat6 cable length should be kept to 150ft or less.

Powering The Controls For Control Option C

Initial Configuration of the Unit

Before operating the unit, apply power and complete the following Aurora Startup procedure for the controls configuration. An AID Tool is recommended for setup, configuration and troubleshooting, especially with an Aurora 'Advanced' Control. AID Tool version 2.06 or greater is necessary for AHB setup.

1. Confirm that Dipswitch 1 on SW1 on the AHB board is set in the OFF position.

2. Configure Aurora Screen

a. In advanced controls - Confirm AHB is added and communicating.

b, In advanced controls - If using a communicating thermostat confirm the communicating thermostat is added and communicating. Set thermostat mode to off.

c. In advanced controls - Confirm IntelliZone2, if installed, is added and communicating. Set Zoning system to off mode.

3. Aurora Setup Screen

a. ECM Setup for Heating Airflow - select "G", low, high and aux blower speeds as appropriate for the unit and electric heat.

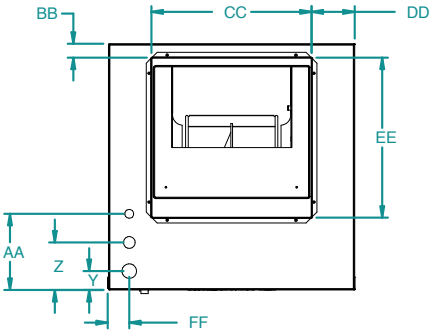
b. Cooling Airflow % - sets the cooling airflow % from heating airflow. Factory setting is -15%.

See Compressor Section installation manual for more control instructions.

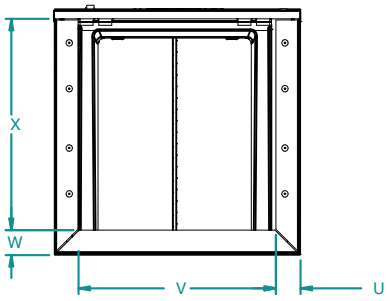
Dimensional Data - DX Air Handler

Top Flow/Horizontal Unit Configuration

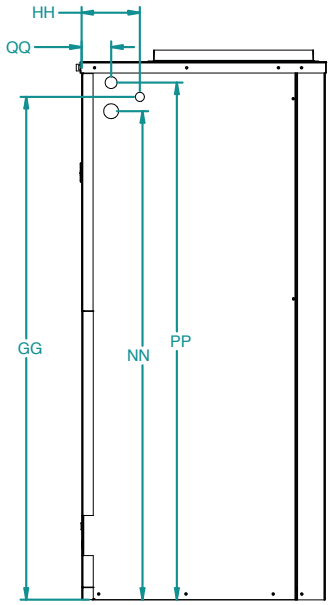
TOP VIEW 3-6 TON



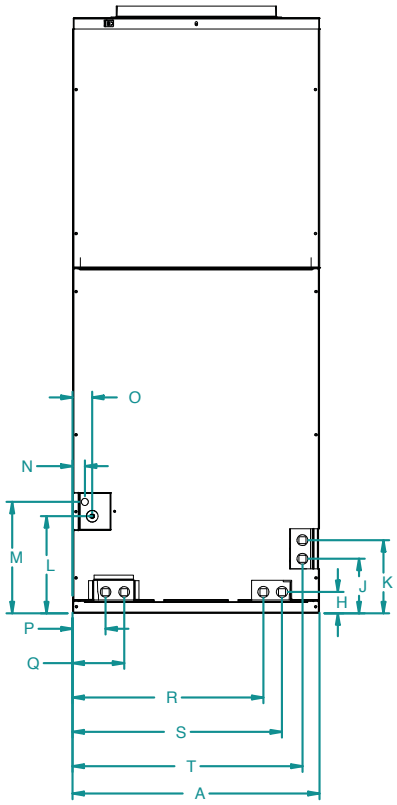
BOTTOM VIEW



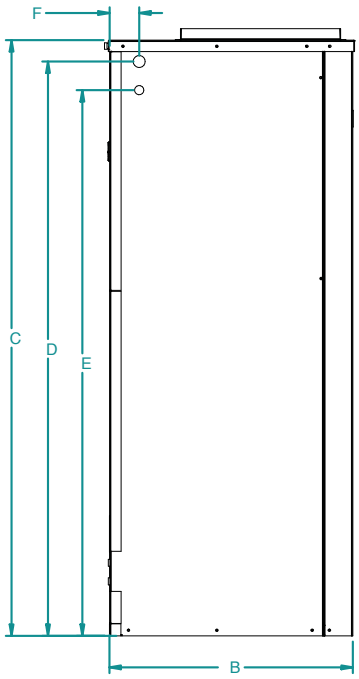
R.SIDE VIEW 2 TON



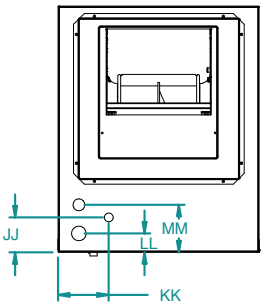
FRONT VIEW



RIGHT SIDE VIEW 3-6 TON



TOP VIEW 2 TON



SAH Air Handler - Topflow/Horizontal

Topflow/ Horizontal Configuration		Overall Cabinet			D	E					Refrigerant Connections																					024 CABINET DIMENSIONS ONLY								
		A	B	C	3/4" cond	1/2" cond	F	H	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF	GG	HH	JJ	KK	LL	MM	NN	PP	QQ
		Width	Depth	Height	Power Supply	Low Voltage					Suction	Liquid												Power Supply		Low Voltage						POWER SUPPLY								
024	in.	17.5	21.2	47.0	42.6	45.1	2.5	1.9	4.8	6.4	8.8	10.1	1.1	1.7	2.9	4.5	13.0	14.6	16.2	2.1	13.3	2.1	18.4	1.7	3.1	4.1	1.1	14.0	1.8	14.0	1.8	43.9	5.1	3.0	4.4	1.7	4.2	42.6	45.1	2.5
	cm.	44.5	53.8	119.4	108.2	114.6	6.4	4.8	12.2	16.3	22.4	25.7	2.8	4.3	7.4	11.4	33.0	37.1	41.1	5.3	33.8	5.3	46.7	4.3	7.9	10.4	2.8	35.6	4.6	35.6	4.6	111.5	13.0	7.6	11.2	4.2	10.5	108.2	114.6	6.4
036	in.	21.6	21.2	52.0	50.1	47.6	2.6	1.9	4.8	6.4	8.5	9.7	1.1	1.7	2.9	4.5	16.7	18.3	20.1	2.2	17.2	2.2	18.5	1.6	4.2	6.7	1.2	14.0	3.8	14.0	1.9									
	cm.	54.9	53.8	132.1	127.3	120.9	6.6	4.7	12.1	16.3	21.6	24.6	2.8	4.4	7.3	11.4	42.4	46.5	51.1	5.5	43.8	5.6	46.9	4.1	10.5	16.9	3.0	35.5	9.6	35.5	4.8									
048-060	in.	24.9	21.2	58.0	56.1	53.2	2.6	1.9	4.8	6.4	9.6	10.8	1.1	1.7	2.9	4.5	20.3	21.9	23.5	2.2	20.6	2.2	18.4	1.7	4.2	6.7	1.5	18.0	3.4	18.0	1.8									
	cm.	63.2	53.8	147.3	142.5	135.1	6.6	4.8	12.2	16.3	24.4	27.4	2.8	4.3	7.4	11.4	51.6	55.6	59.7	5.6	52.3	5.6	46.7	4.3	10.7	17.0	3.8	45.7	8.6	45.7	4.6									

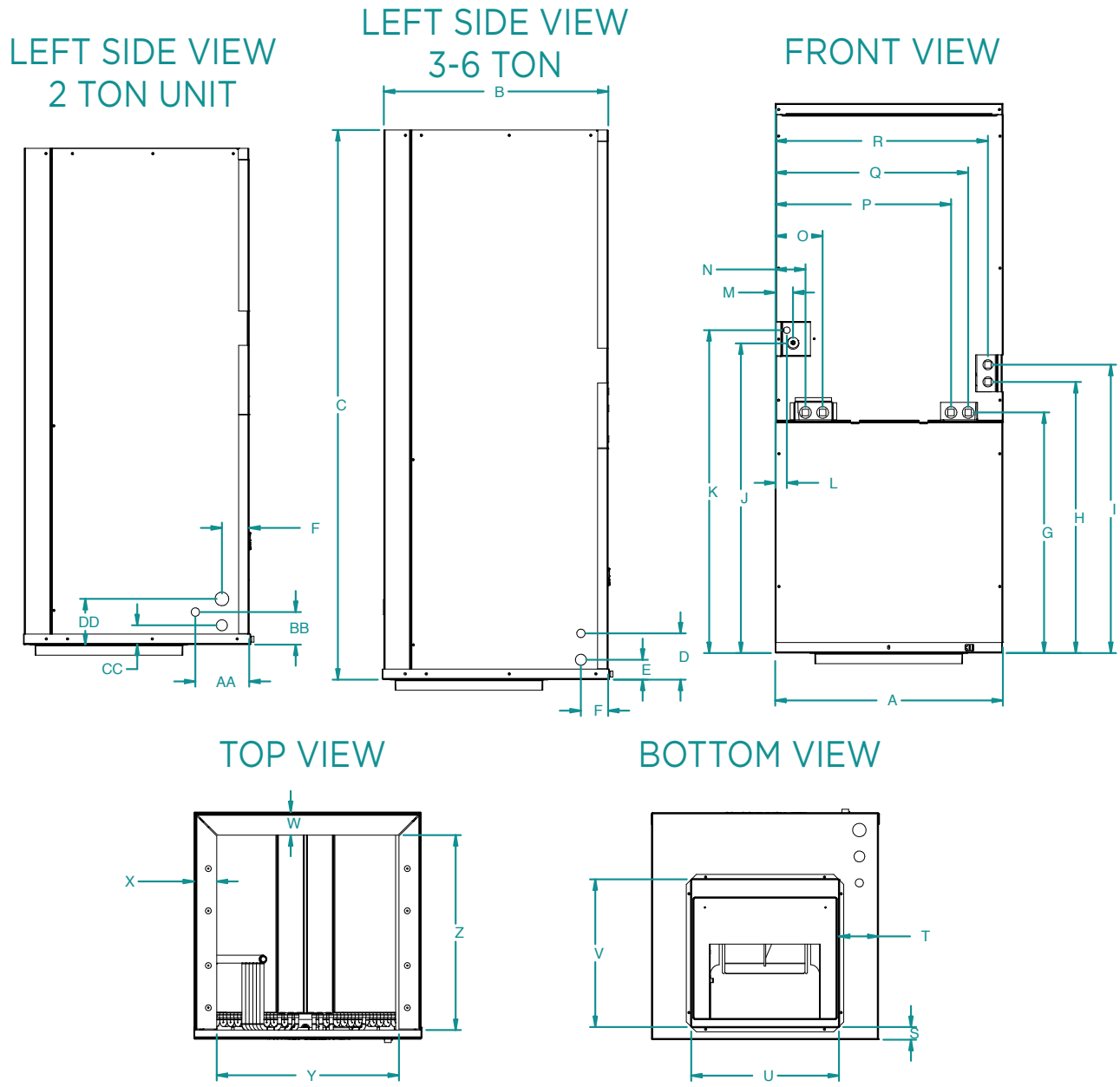
Condensate is plastic 3/4" FPT

Discharge flange is field installed and extends 1" (25.4 mm) from cabinet

" Y" IS 1 3/8 KNOCKOUT HIGH VOLTAGE
"Z" IS 1 1/8 KNOCKOUT HIGH VOLTAGE
"AA" IS 7/8 KNOCKOUT LOW VOLTAGE

Dimensional Data - DX Air Handler

Bottom Flow Unit Configuration



SAH Air Handler - Bottom flow

Bottomflow Configuration		Overall Cabinet			D	E	F				Refrigerant Connections																	POWER SUPPLY 024 ONLY			
		A	B	C	1/2" cond	3/4" cond		G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD
		Width	Depth	Height	Low Voltage	Power Supply	Power Supply				Suction	Liquid																			
024	in.	17.5	21.2	47.0	4.4	1.9	2.5	22.8	25.7	27.3	29.5	30.8	1.1	1.7	2.8	4.5	13.0	14.5	16.2	1.1	1.8	14.0	18.0	2.2	2.2	13.7	18.5	5.0	3.1	1.8	4.3
	cm.	44.5	53.8	119.4	11.2	4.8	6.4	57.9	65.3	69.3	74.9	78.2	2.8	4.3	7.1	11.4	33.0	36.8	41.1	2.8	4.6	35.6	45.7	5.6	5.6	34.8	47.0	12.7	7.9	4.6	11.0
036	in.	21.5	21.2	52.0	4.4	1.9	2.6	22.8	25.7	27.3	29.3	30.6	1.1	1.7	2.8	4.5	16.6	18.2	20.1	1.2	3.8	14.0	14.0	2.2	2.2	17.3	18.5				
	cm.	54.6	53.8	132.1	11.2	4.8	6.6	57.9	65.3	69.3	74.5	77.7	2.7	4.3	7.2	11.4	42.2	46.3	51.1	3.0	9.7	35.6	35.6	5.6	5.6	43.8	46.9				
048-060	in.	24.9	21.2	58.0	4.4	1.9	2.6	24.0	27.0	28.5	31.3	32.8	1.1	1.7	2.8	4.5	20.2	21.9	23.5	1.2	3.4	18.0	18.0	2.1	2.2	20.5	18.5				
	cm.	63.2	53.8	147.3	11.2	4.8	6.6	61.0	68.6	72.4	79.5	83.3	2.8	4.3	7.1	11.4	51.3	55.6	59.7	3.0	8.6	45.7	45.7	5.3	5.6	52.1	47.0				

Condensate is plastic 3/4" FPT
Discharge flange is field installed and extends 1" (25.4 mm) from cabinet

Replacement Procedures

Obtaining Parts

When ordering service or replacement parts, refer to the model number and serial number of the unit as stamped on the serial plate attached to the unit. If replacement parts are required, mention the date of installation of the unit and the date of failure, along with an explanation of the malfunctions and a description of the replacement parts required.

In Warranty Material Return

Material may not be returned except by permission of authorized warranty personnel.

Service Parts

	Part Description	SAH Air Handler Refrigerant Models							
		022	026	030	036	042	048	060	066
Refrigeration	Air Coil	61P740-41			61P738-41	61P747-41		61P737-41	
	TXV	33P626-01				33P626-02		33P626-03	33P626-04
5 Speed ECM Motor & Blower/ Control Option A	Blower Assembly	54S561-03		54S561-04	54S562-03	54S563-05		54S563-06	54S563-07
	ECM Blower Housing	53P529-01			53P528-01	53P526-01			
	ECM Motor 208-230/60/1	14S562-01		14S562-02	14S562-03	14S563-01		14S563-02	14S563-03
	ECM Power Harness	11P810-05							
	ECM Control Harness	11P811-05							
Variable Speed ECM Motor & Blower/ Control Option C	Blower Assembly	54S561-01			54S562-02	54S563-01		54S563-02	
	ECM Blower Housing	53P529-01			53P528-01	53P526-01			
	ECM Motor 208-230/60/1	14S558-01			14S558-02	14S559-01		14S559-02	
	ECM Power Harness	11P922-01							
	ECM Control Harness	11P940-01							
Electrical Control Option A	Terminal Board	12P561-01							
	Transformer 75VAC	15P501B01							
	Power Block	12P501A02							
	Ground Lug	12P004A							
Electrical Control Option C	AHB Board	17X558-01							
	Transformer 100VAC	15P519-01							
	Power Block	12P501A02							
	Ground Lug	12P004A							
	Condensate Sensor	12P504A01							
	FP2 Sensor	12P550-01							
	Leaving Air Thermistor	12P555-06							
	Current Transducer(s)	12P557-01							
	4 Pole Low Voltage Block	12P570-01							
Misc.	Cat6 Ethernet Cable (100')	11P951-01							
5kW Auxiliary Heat	Limit	13P725-05							
	Fused Backup	13P735-02							
10kW Auxiliary Heat	Limit	13P725-05							
	Fused Backup	13P735-01							
15kW Auxiliary Heat	Limit	13P725-05							
	Limit DPST	13P734-01							
	Fused Backup	13P735-02							
20 kW Auxiliary Heat	Limit DPST	13P734-01							
	Fused Backup	13P735-02							

1/31/2017

Revision Guide

Pages:	Description:	Date:	By:
15-20	Updated Wiring Schematics	30 Mar 2021	JM
15-20	Updated Wiring Schematics	02 May 2017	MA
All	Document Creation	01 Mar. 2017	JM

Product:	**Standard Series Air Handler**
Type:	R-410A
Size:	2-6 Tons
Document:	Installation Manual

IM2518AG1 03/21