INSTALLATION & MAINTENANCE MANUAL

IM 1379-4

SEPTEMBER 2026

SMARTSOURCE®

VERTICAL WATER SOURCE HEAT PUMP



- MODEL WSCV, WSDV, WSMV, WSNV, WSSV, WSTV
- SIZES 007 – 070 (1/2 TO 6 TONS)
- R-32 REFRIGERANT

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Safety Information

Hazard Identification

⚠ DANGER

Danger indicates a hazardous situation, which will result in death or serious injury if not avoided.

⚠ WARNING

Warning indicates a potentially hazardous situation, which can result in property damage, personal injury, or death if not avoided.

⚠ CAUTION

Caution indicates a potentially hazardous situation, which can result in minor injury or equipment damage if not avoided.

NOTICE

Notice indicates practices not related to physical injury.

NOTE: Indicates important details or clarifying statements for information presented in Figures or Tables.

Safety Considerations

This manual provides installation and maintenance information for Daikin Applied SmartSource Vertical Water Source Heat Pump with a MicroTech® controller.

A means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules for stationary appliances not fitted with means for disconnection from the supply mains having a contact separation in all poles that provide full disconnection under overvoltage category III.

⚠ DANGER

LOCKOUT/TAGOUT all power sources prior to service, pressurizing, de-pressuring, or powering down the unit. Failure to follow this warning exactly can result in serious injury or death. Disconnect electrical power before servicing the equipment. More than one disconnect may be required to de-energize the unit. Be sure to read and understand the installation, operation, and service instructions within this manual.

⚠ WARNING

Electric shock hazard. Improper handling of this equipment can cause personal injury or equipment damage. This equipment must be properly grounded. Connections to and service of the MicroTech control panel must be performed only by personnel that are knowledgeable in the operation of the equipment being controlled.

⚠ WARNING

Polyolester Oil, commonly known as POE oil is a synthetic oil used in many refrigeration systems, and may be present in this Daikin Applied product. POE oil, if ever in contact with PVC/CPVC, will coat the inside wall of PVC/CPVC pipe causing environmental stress fractures. Although there is no PVC/CPVC piping in this product, please keep this in mind when selecting piping materials for your application, as system failure and property damage could result. Refer to the pipe manufacturer's recommendations to determine suitable applications of the pipe.

⚠ WARNING



This unit contains R-32, a class A2L refrigerant that is flammable. This unit should only be installed, serviced, repaired, and disposed of by qualified personnel licensed or certified in their jurisdiction to work with R-32 refrigerant. Installation and maintenance must be done in accordance with this manual. Improper handling of this equipment can cause equipment damage or personal injury.

For installation only in locations not accessible to the general public.

Be aware that R-32 refrigerant may not contain an odor. Place in a well ventilated area to prevent accumulation of refrigerant. When installing the unit in a small room, take measures to keep the refrigerant concentration from exceeding allowable safety limits. Excessive refrigerant leaks, in the event of an accident in a closed ambient space, can lead to oxygen deficiency.

Do not pierce or burn this unit.

Never use an open flame during service or repair. Never store in a room with continuously operating ignition sources (for example: open flames, an operating gas appliance, or and operating electric heater.), where there is ignitable dust suspension in the air, or where volatile flammables such as thinner or gasoline are handled.

Only use pipes, nuts, and tools intended for exclusive use with R-32 refrigerant in compliance with national codes (ASHRAE15 or IRC).

Do not mix air or gas other than R-32 in the refrigerant system. If air enters the refrigerant system, an excessively high pressure results, which may cause equipment damage or injury.

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

For more information, consult "Refrigerant Information" on page 67.

⚠ WARNING

This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with this instruction manual, it may cause interference with radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the owner will be required to correct the interference at the owner's own expense.

Daikin Applied disclaims any liability resulting from any interference or for the correction thereof.

⚠ WARNING

When moving flammable A2L refrigerant to/from the unit from an auxiliary tank, a grounding strap must be used. An electrical charge builds when halo-carbon refrigerant travels in a rubber hose. A grounding strap must be used between the auxiliary refrigerant tank and the unit's end sheet (earth ground), which will safely take the charge to the ground. A fire risk could occur if this procedure is not followed.

⚠ CAUTION

Static sensitive components. A static discharge while handling electronic circuit boards can cause damage to the components. Discharge any static electrical charge by touching the bare metal inside the control panel before performing any service work. Never unplug any cables, circuit board terminal blocks, or power plugs while power is applied to the panel.

NOTICE

Installation and maintenance are to be performed only by licensed, if required by local codes and regulations, or qualified personnel who are familiar with local codes and regulations and are experienced with this type of equipment.

NOTICE

QUEBEC DISCLOSURE REGARDING AVAILABILITY OF REPLACEMENT PARTS, REPAIR SERVICES AND INFORMATION FOR MAINTENANCE AND REPAIR: Daikin Applied Americas Inc. (Daikin Applied) does not guarantee the availability of (1) replacement parts; (2) repair services; and (3) information necessary to maintain or repair products, within the meaning of section 39.1 of the Consumer Protection Act, CQLR, c P-40.1 and section 79.18 of the Regulation respecting the application of the Consumer Protection Act, CQLR, c P-40.1, r. 3.

AVIS POUR LE QUÉBEC CONCERNANT LA DISPONIBILITÉ DES PIÈCES DE RECHANGE, DES SERVICES DE RÉPARATION ET DES RENSEIGNEMENTS POUR L'ENTRETIEN ET LA RÉPARATION : Daikin Applied Americas Inc. (Daikin Applied) ne garantit pas la disponibilité (1) des pièces de rechange, (2) des services de réparation et (3) des renseignements pour l'entretien et la réparation, au sens de l'article 39.1 de la Loi sur la protection du consommateur, RLRQ c P-40.1 et de l'article 79.18 du Règlement d'application de la Loi sur la protection du consommateur, RLRQ c P-40.1, r 3.

UL Compliance Statements for Unit Work

- All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.
- Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.
- The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e., non-sparking, adequately sealed or intrinsically safe.
- If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available at hand. Have a dry powder or CO2 fire extinguisher adjacent to the charging area.
- No person carrying out work in relation to a refrigeration system which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space.
- Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards. Safety checks are necessary to ensure that the risk of ignition is minimized and “No Smoking” signs shall be displayed.

- Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.
- Equipment not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.
- Children shall not be allowed to play on or with equipment.
- If unit is permanently connected to water main; hose sets are not to be used.

Unit Labels

Pictogram warning and informational labels may be present on the unit. Consult the table below for reference.

Label	Description
	WARNING - flammable refrigerant present
	Read the technical manual for service instructions
	WARNING - A2L low-burning velocity refrigerant present
	Pressurized medium present
	Ultraviolet (UV) radiation present
	Read the operator’s manual for operating instructions
	WARNING - flammable refrigerant present
	Per- and Poly-Fluoroalkyl Substances
	Read the operator’s manual

Introduction

Model Nomenclature

1	2-3	4	5-7	8	9	10	11-12	13	14	15	16	17	18	19	20	21-22	23	24	25	26	27	28	29	30	31	32	33	34
W	SC	V	007	E	1	F	RS	C	M	T	P	A	Y	Y	1	YY	A	Y	Y	Y	Y	Y	S	S	Y	E	Y	Y

Category	Code Option	Code	=	Description
Product Category	1	W	=	Water Source Heat Pump
Model Type	2-3	SC	=	SmartSource Small Capacity Compact - 1 Stage
		SD	=	SmartSource Small Capacity Compact - 2 Stage (Sizes 024-070)
		SM	=	SmartSource Small Capacity Plus - 1 Stage
		SN	=	SmartSource Small Capacity Plus - 2 Stage (Sizes 024-060)
		SS	=	SmartSource Small Capacity Premium - 1 Stage
		ST	=	SmartSource Small Capacity Premium - 2 Stage (Sizes 024-070)
Configuration	4	V	=	Vertical
Nominal Capacity	5-7	007	=	7,000 Btuh Nominal Cooling
		009	=	9,000 Btuh Nominal Cooling
		012	=	12,000 Btuh Nominal Cooling
		015	=	15,000 Btuh Nominal Cooling
		019	=	19,000 Btuh Nominal Cooling
		024	=	24,000 Btuh Nominal Cooling
		030	=	30,000 Btuh Nominal Cooling
		036	=	36,000 Btuh Nominal Cooling
		042	=	42,000 Btuh Nominal Cooling
		048	=	48,000 Btuh Nominal Cooling
		060	=	60,000 Btuh Nominal Cooling
		070	=	70,000 Btuh Nominal Cooling (WSCV, WSDV, WSSV, & WSTV)
Voltage	8	A	=	115/60/1 (Sizes 007-015)
		E	=	208-230/60/1 (Sizes 007-070)
		F	=	208-230/60/3 (Sizes 024-070)
		J	=	265/60/1 (Sizes 007-036)
		K	=	460/60/3 (Sizes 024-070)
		L	=	575/60/3 (Sizes 048-070)
Design Series (Vintage)	9	1	=	Design Series 1
Piping Hand	10	F	=	Front
Cabinet Configuration	11-12	LT	=	Left Hand Return / Top Discharge
		RT	=	Right Hand Return / Top Discharge
Water Coil Type	13	C	=	Copper Inner Tube
		G	=	Copper Inner Tube (Geothermal)
		B	=	Brazed Plate Heat Exchanger (WSS 015-070 & WST)
		H	=	Brazed Plate Heat Exchanger - Geothermal (WSS 015-070 & WST)
		S	=	Cupro-Nickel Inner Tube
		J	=	Cupro-Nickel Inner Tube (Geothermal)
Unit Control	14	M	=	MicroTech Unit Controller
		B	=	MicroTech Unit Controller + BACnet
Controller Options	15	T	=	Thermostat Control
		S	=	Sensor Control

1	2-3	4	5-7	8	9	10	11-12	13	14	15	16	17	18	19	20	21-22	23	24	25	26	27	28	29	30	31	32	33	34
W	SC	V	007	E	1	F	RS	C	M	T	P	A	Y	Y	1	YY	A	Y	Y	Y	Y	Y	S	S	Y	E	Y	Y

Category	Code Option	Code	=	Description
Fan Motor Options	16	P	=	PSC (WSCV and WSMV)
		C	=	ECM Constant CFM (Sizes 015-070) (575V on WSSV & WSTV Only)
		T	=	ECM Constant Torque (WSCV, WSMV, & WSSV) (575V on WSSV Only)
Insulation (Compressor Side and Air Side)	17	A	=	Standard - Fiberglass
		B	=	IAQ - Closed Cell Foam
		C	=	Sound Package - Dual Layer Fiberglass
		D	=	Sound Blanket + Fiberglass (Sizes 024-070)
		E	=	Sound Blanket + IAQ - Closed Cell Foam (Sizes 024-070)
		F	=	Sound Blanket + Sound Package - Dual Layer Fiberglass (Sizes 024-070)
Water Coil - Indoor Coil	18	Y	=	None
		W	=	Waterside Economizer
		R	=	Hydronic Heat
Dehumidification	19	Y	=	None
		R	=	Hot Gas Reheat (WSCV024-070, WSM*015-060, WSS, WSD, WSN, WST)
		S	=	Simplified Dehumidification
Transformer	20	1	=	50VA Transformer
		2	=	75VA Transformer
Options	21-22	YY	=	None
		0A	=	Freeze Fault
		0C	=	Water Pressure Differential Switch (N/A for WSCV & WSMV Sizes 007-012)
		0F	=	Freeze Fault + Water Pressure Differential Switch (N/A for WSCV & WSMV Sizes 007-012)
Filter Racks & Filter	23	A	=	1″ Rack - 1″ Disposable Filter
		D	=	2″ Rack - 2″ MERV 8 Filter
		H	=	4″ Rack - 4″ MERV 13 Filter
		Y	=	None
Water Flow Options	24	Y	=	None
		A	=	Isolation Valve (NO) (N/A for WSCV & WSMV Sizes 007-012)
		B	=	Isolation Valve (NC) (N/A for WSCV & WSMV Sizes 007-012)
		C	=	Head Pressure Control - Refrigerant Tap

1	2-3	4	5-7	8	9	10	11-12	13	14	15	16	17	18	19	20	21-22	23	24	25	26	27	28	29	30	31	32	33	34
W	SC	V	007	E	1	F	RS	C	M	T	P	A	Y	Y	1	YY	A	Y	Y	Y	Y	Y	S	S	Y	E	Y	Y

Category	Code Option	Code	=	Description	
Piping Package	25	Y	=	None	
		A	=	Auto Flow Control - 1.5 GPM	WSSV & WSTV Models Only
		B	=	Auto Flow Control - 2.0 GPM	
		C	=	Auto Flow Control - 2.5 GPM	
		D	=	Auto Flow Control - 3.0 GPM	
		E	=	Auto Flow Control - 4.0 GPM	
		F	=	Auto Flow Control - 4.5 GPM	
		G	=	Auto Flow Control - 5.0 GPM	
		H	=	Auto Flow Control - 6.0 GPM	
		J	=	Auto Flow Control - 7.0 GPM	
		K	=	Auto Flow Control - 8.0 GPM	
		L	=	Auto Flow Control - 9.0 GPM	
		M	=	Auto Flow Control - 10.0 GPM	
		N	=	Auto Flow Control - 11.0 GPM	
		P	=	Auto Flow Control - 12.0 GPM	
		Q	=	Auto Flow Control - 13.0 GPM	
		S	=	Auto Flow Control - 15.0 GPM	
Electric Heat Size	26	Y	=	None	
		F	=	Electric Heat Control Harness - 24V Signal (Field Installed Duct Heater)	
Electric Heat Control (Board Configuration)	27	Y	=	None	
		B	=	Boilerless Electric Heat	
		P	=	Primary Electric Heat (No Heat Pump Heating)	
		S	=	Supplemental Heat	
Cabinet Color	28	Y	=	Galvanized	
		B	=	Textured Charcoal Bronze	WSMV, WSNV, WSSV, & WSTV Models Only
		W	=	Off White	
		S	=	Antique Ivory	
		D	=	Cupola White	
		V	=	Soft Grey	
		K	=	Putty Beige	
Standard or Special	29	S	=	Standard	
		X	=	Special	
Drain Pan Material	30	S	=	Stainless Steel Drain Pan	
Electrical Options	31	Y	=	None	
		D	=	Non-Fused Disconnect Switch	
Corrosion Protection	32	Y	=	None	
		C	=	Corrosion Protection	
Future Use	33	Y	=	None	

1	2-3	4	5-7	8	9	10	11-12	13	14	15	16	17	18	19	20	21-22	23	24	25	26	27	28	29	30	31	32	33	34
W	SC	V	007	E	1	F	RS	C	M	T	P	A	Y	Y	1	YY	A	Y	Y	Y	Y	Y	S	S	Y	E	Y	Y

Category	Code Option	Code	=	Description
Extended Warranty	34	Y	=	None
		V	=	1 Year Extended Compressor Only Parts Warranty
		W	=	1 Year Extended Refrigerant Circuit Parts Warranty
		M	=	1 Year Extended Compressor Only Parts Warranty with 1st Year Labor Allowance
		N	=	1 Year Extended Refrigerant Circuit Parts Warranty with 1st Year Labor Allowance
		S	=	1 Year Extended Complete Unit Parts Warranty with 1st Year Labor Allowance
		E	=	1 Year Extended Complete Unit Parts Warranty
		C	=	4 Year Extended Compressor Only Parts Warranty
		R	=	4 Year Extended Refrigerant Circuit Parts Warranty
		P	=	4 Year Extended Complete Unit Parts Warranty
		F	=	4 Year Extended Compressor Only Parts Warranty with 1st Year Labor Allowance
		H	=	4 Year Extended Refrigerant Circuit Parts Warranty with 1st Year Labor Allowance
		J	=	4 Year Extended Complete Unit Parts Warranty with 1st Year Labor Allowance
		L	=	First Year Labor Allowance
		T	=	4 Year Extended Complete Unit Parts Warranty with 5 Year Labor Allowance

Installation

⚠ WARNING

The installer must determine and follow all applicable local and national codes and regulations. This equipment presents hazards of electricity, rotating parts, sharp edges, heat and weight. Failure to read and follow these instructions can result in property damage, personal injury, or death. This equipment must be installed by experienced, trained personnel only.

⚠ WARNING

This appliance shall be installed in accordance with national wiring regulations (national electric code, Canadian electric code).

Receiving and Handling

⚠ CAUTION

Sharp edges can cause minor injury. Avoid contact with them.

Carefully check equipment against the bill of lading to ensure all items have been received. Before unloading any unit, check the nameplate to make sure the voltage complies with the power supply available.

Inspect all units for damage upon arrival. If a unit has become dirty during shipment, carefully clean it prior to completing the inspection. Daikin Applied is not responsible for physical damage after the unit leaves the factory unless the contract with Daikin Applied states otherwise.

NOTICE

All units should be carefully inspected for damage when received. Report all loss or shipping damage using a claim form supplied by Daikin Applied.

VISIBLE LOSS OR DAMAGE: Any external evidence of loss or damage must be noted on the freight bill or carrier's receipt, and signed by the carrier's agent. Failure to adequately describe such external evidence of loss or damage may result in the carrier's refusal to honor a damage claim.

CONCEALED LOSS OR DAMAGE: Concealed loss or damage means loss or damage which does not become apparent until the unit has been unpacked or unwrapped. The contents may be damaged in transit due to rough handling even though the exterior may not show damages. When the damage is discovered, make a written request for inspection by the carrier's agent within **five (5) days** of the delivery date and file a claim with the form provided by Daikin Applied. Refer to the Daikin Applied Freight Policy for further information.

For storing, each carton is marked with "up" arrows.

The unit should be shipped or stored in the normal up-right position. Do not operate the machine until it has been in the normal upright position for at least 24 hours.

Temporary storage at the job site must be indoor, completely sheltered from rain, snow, etc. Units should not be installed in environments that fall below freezing or exceed 140°F (60°C) ambient.

The contractor shall cover the units to protect the machines during finishing of the building. This is critical while spraying fireproofing material on bar joists, sandblasting, spray painting and plastering. If plastic film is not available, the shipping carton may be modified to cover the units during construction.

Operating Limits

Environmental Limits

This equipment is designed for indoor installation only. Sheltered locations such as attics, garages, etc., will not provide sufficient protection against extremes in temperature and/or humidity, and equipment performance, reliability, and service life may be adversely affected.

NOTICE

Altitude Limits: Maximum applied altitude not to exceed 3,000 meters/ 9,843 feet.

Initial Unit Start-Up Temperature Range

NOTICE

This is not for continuous operation. It is assumed that such a start-up is for the purpose of bringing the building space up to occupancy temperature.

Standard range units

Units are designed to start in an ambient of 50ºF (10ºC), with entering air at 50ºF (10ºC), with entering water at 70ºF (21ºC), with both air and water at the flow rates used in the ISO 13256-1 rating test, for initial start-up in winter.

Extended range units

Extended range heat pump conditioners are designed to start in an ambient of 40ºF (4ºC), with entering air at 40ºF (4ºC), with entering water at 40ºF (4ºC), with both air and water at the flow rates used in the ISO 13256-1 rating test, for initial start-up in winter.

Table 1: Air Limits in °F (°C)

Air Limits	Standard Range Units		Extended Range (Geothermal) Units	
	Cooling (DB/WB)	Heating	Cooling (DB/WB)	Heating
Minimum Ambient Air[1]	50°F (10°C)	50°F (10°C)	40°F (4°C)	40°F (4°C)
Maximum Ambient Air[2]	100°F/77°F (38°C/25°C)	85°F (29°C)	100°F/77°F (38°C/25°C)	85°F (29°C)
Minimum Entering Air[1]	65°F/55°F (18°C/13°C)	50°F (10°C)	65°F/55°F (18°C/13°C)	50°F (10°C)
Common Design Entering Air	75°F/63°F (24°C/17°C)	70°F (21°C)	75°F/63°F (24°C/17°C)	70°F (21°C)
Maximum Entering Air[2]	85°F/71°F (29°C/22°C)	80°F (27°C)	85°F/71°F (29°C/22°C)	80°F (27°C)

[1] Maximum and minimum values may not be combined. If one value is at maximum or minimum, the other conditions may not exceed the normal condition for standard units. Extended range units may combine any two maximum conditions, but not more than two, with all other conditions being normal conditions.

[2] This is not for continuous operation. It is assumed that such a start-up is for the purpose of bringing the building space up to occupancy temperature.

Table 2: Fluid Limits

Fluid Limits	Standard Range Units		Extended Range (Geothermal) Units	
	Cooling	Heating	Cooling	Heating
Minimum Entering Fluid	55°F (13°C)	55°F (13°C)	30°F (-1°C)	25°F (-4°C)
Common Design Entering Fluid	85-90°F (29-32°C)	70°F (21°C)	90°F (32°C)	35-60°F (1.5-16°C)
Maximum Entering Fluid	120°F (49°C)	90°F (32°C)	120°F (49°C)	90°F (32°C)
Minimum GPM/Ton	1.5			
Nominal GPM/Ton	3.0			
Maximum GPM/Ton	4.0			

Antifreeze

⚠ CAUTION

Do not use an automotive-grade antifreeze. Industrial grade glycols must be used. Automotive antifreeze contains inhibitors which will cause plating on the copper components used with the unit. The type and handling of glycol used must be consistent with local codes.

Glycols and other alcohols are commonly used as antifreeze; however higher percentage mixtures of alcohols such as ethanol and methanol are not recommended due to increased flammability. Your local sales office should be consulted to determine the antifreeze best suited to your area. The use of antifreeze may impact system performance depending on its concentration and should be considered during initial system design. When antifreeze is added to the water system for freeze protection, recognize that the refrigerant suction pressure will be lower, capacity will be less, and water side pressure drop will be higher. The reduction in performance depends upon the antifreeze concentration and temperature.

In areas where minimum entering loop temperatures drop below 50°F (10°C) or where piping will be routed through areas subject to freezing, antifreeze is required. If 3 GPM/ton is maintained, this limit can be lowered to 42°F (6°C). Care must be given to maintain proper water flow.

Freeze protection should be maintained to 15°F (9°C) below the lowest expected entering loop temperature. For example, if 30°F (-1°C) is the minimum expected entering loop temperature, the leaving loop temperature would be 22 to 25°F (-6 to -4°C) and freeze protection should be at 15°F (-10°C). Calculation is as follows: 30°F - 15°F = 15°F (-1°C - 9°C = -10°C).

All alcohols should be premixed and pumped from a reservoir outside of the building when possible or introduced under the water level to prevent fumes. Calculate the total volume of fluid in the piping system. Then use the percentage by volume shown in Table 3 for the amount of antifreeze needed. Antifreeze concentration should be checked from a well mixed sample using a hydrometer to measure specific gravity.

Table 3: Antifreeze Percentage by Volume

Type	Minimum Temperature for Low Temperature Protection			
	10°F (-12.2°C)	15°F (-9.4°C)	20°F (-6.7°C)	25°F (-3.9°C)
Propylene Glycol	38%	25%	22%	15%
Ethanol[1]	29%	25%	20%	14%
Methanol	25%	21%	16%	10%

[1] Must not be denatured with any petroleum product.

Table 4: Antifreeze Correction Factors

Ethylene Glycol					
	10%	20%	30%	40%	50%
Cooling Capacity	0.995	0.992	0.987	0.983	0.979
Heating Capacity	0.991	0.982	0.977	0.969	0.961
Pressure Drop	1.07	1.13	1.18	1.26	1.28
Propylene Glycol					
	10%	20%	30%	40%	50%
Cooling Capacity	0.99	0.98	0.97	0.96	0.95
Heating Capacity	0.987	0.975	0.962	0.942	0.93
Pressure Drop	1.07	1.15	1.25	1.37	1.42
Ethanol					
	10%	20%	30%	40%	50%
Cooling Capacity	0.991	0.951	–	–	–
Heating Capacity	0.995	0.96	–	–	–
Pressure Drop	1.035	0.96	–	–	–
Methanol					
	10%	20%	30%	40%	50%
Cooling Capacity	0.998	0.972	–	–	–
Heating Capacity	0.995	0.97	–	–	–
Pressure Drop	1.023	1.057	–	–	–

NOTE: Higher percentage mixtures of ethanol and methanol are not recommended due to increased flammability.

Pre-Installation

- To prevent damage, do not operate this equipment for supplementary ventilation, heating and cooling during the construction period.
- Inspect the carton for any specific tagging numbers indicated by the factory per a request from the installing contractor.

NOTICE

Check the unit data plate for correct voltage (See Table 17), phase and capacity with the plans before installing the equipment. Also, make sure all electrical ground connections are made in accordance with local code.

- If 460/60/3 unit includes a constant CFM ECM, verify that a 4-wire power supply is field provided with a neutral wire to provide 265 volt electrical to the fan motor.
- Check the unit size against the plans to verify that the unit is being installed in the correct location.
- Before installation, check the available ceiling height versus the height of the unit.

- Note the location and routing of water piping, condensate drain piping, and electrical wiring. The locations of these items are clearly marked on submittal drawings. The installing contractor will find it beneficial to confer with piping, sheet metal, and electrical foremen before installing any unit.
- Remove shipping brackets securing unit to skid.
- Remove all shipping blocks from the fan wheel if present. See Figure 1.

Unit Location and Clearances

⚠ WARNING

Clearance should be maintained to meet local and national code requirements.

- Locate the unit in an area that allows for easy removal of the filter and access panels. Allow clearance around the heat pump for easy removal of the entire unit (if necessary), and to perform routine maintenance, or troubleshooting. Provide sufficient room to make water, electrical and duct connections. See Figure 2.
- Unit condensate drains are not internally trapped. External trap is required for vertical units. Allow adequate room for condensate piping.
- If the unit is installed in a confined space, such as a closet, provisions must be made for return air to freely enter the face of the unit's air coil.
- It is recommended that the unit be installed level on top of a vibration absorbing pad. The isolation pad should be the same size or larger than the base of the unit to minimize sound and vibration transmission from the unit to the building structure. See Figure 3.

Figure 1: Remove Foam Shipping Block From Fan Housing

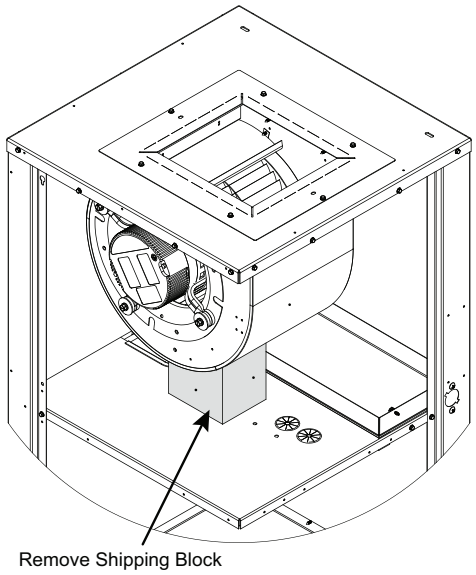
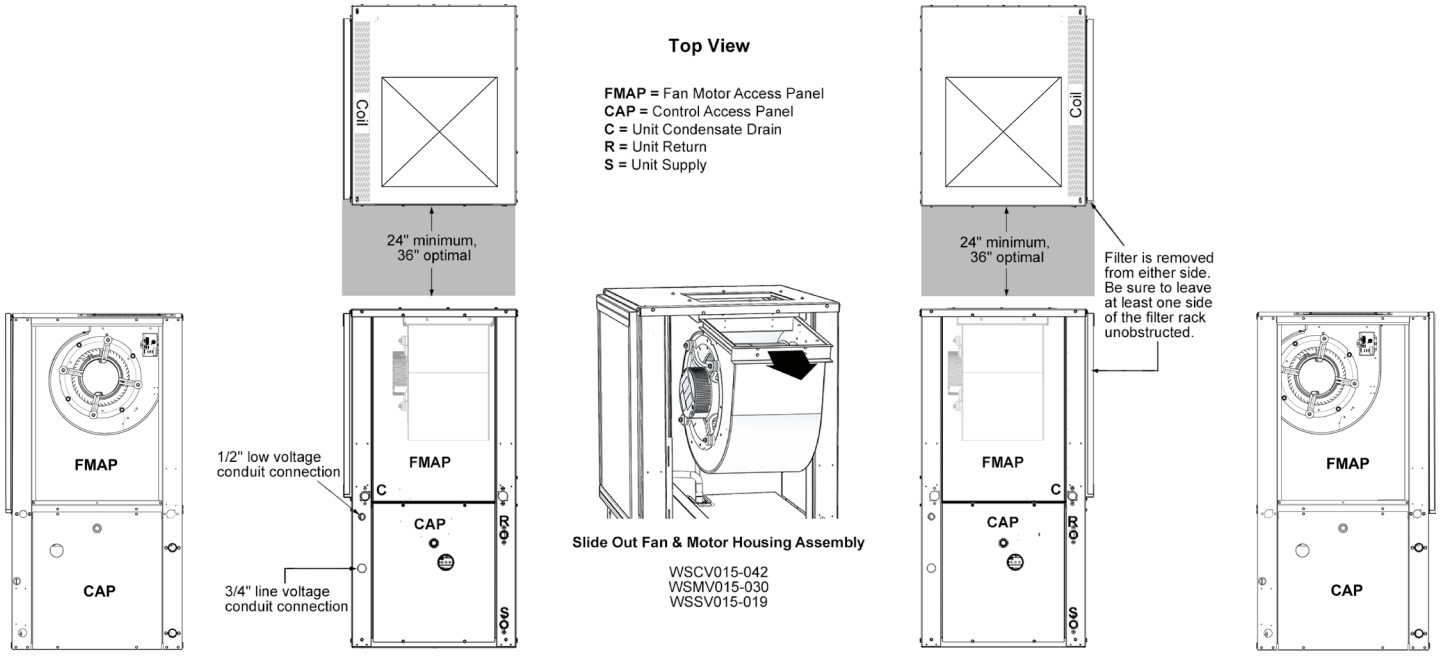
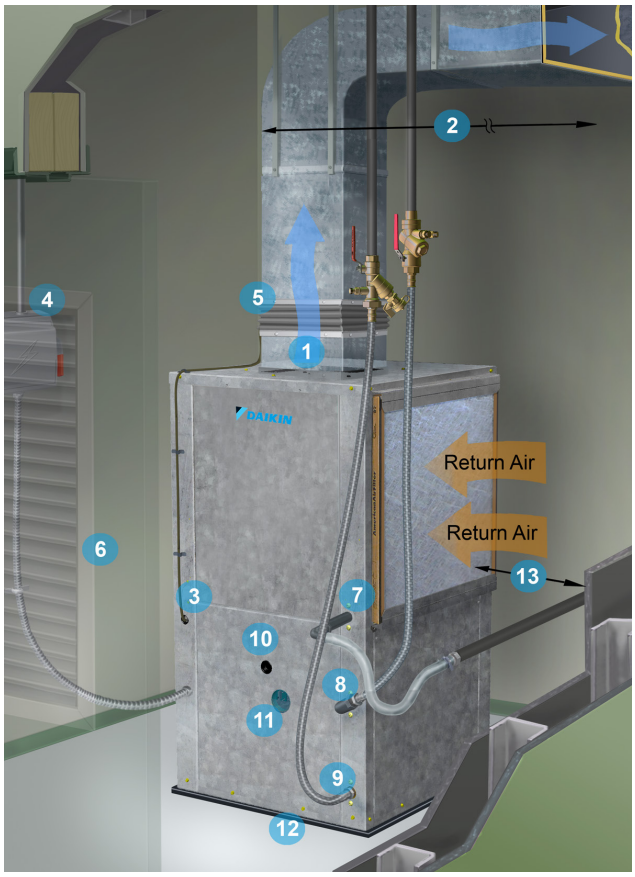


Figure 2: Recommended Clearances for Service Access



NOTE: All units are designed for front service access.

Figure 3: Vertical Unit - Typical Installation in Small Mechanical Room or Closet



No.	Description
1	Discharge air
2	Acoustic thermal duct lining - 10 feet
3	Low voltage wiring to unit control box
4	Line voltage disconnect
5	Flexible duct collar
6	Louvered closet door
7	Condensate drain (field-supplied trap)
8	Flexible, braided, stainless steel return hose with flow controller/ball valve with port
9	Flexible, braided, stainless steel supply hose with Y-strainer/ball valve with port
10	Access to unit control box
11	LED annunciator view port to view unit operation status and faults
12	Full vibration isolation pad between unit and floor
13	Minimum distance between return air (filter) and wall for non-ducted return applications: Size 007-012 – 5 in. Size 015-024 – 5 in. Size 030-036 – 6 in. Size 042-048 – 8 in. Size 060-070 – 10 in.

Water Piping

⚠ WARNING

Polyolester Oil, commonly known as POE oil is a synthetic oil used in many refrigeration systems, and may be present in this Daikin Applied product. POE oil, if ever in contact with PVC/CPVC, will coat the inside wall of PVC/CPVC pipe causing environmental stress fractures. Although there is no PVC/CPVC piping in this product, please keep this in mind when selecting piping materials for your application, as system failure and property damage could result. Refer to the pipe manufacturer's recommendations to determine suitable applications of the pipe.

Pre-Installation Considerations

All units should be connected to supply and return piping in a two-pipe reverse return configuration which includes a flow control device so that flow requirements are met for each zone. A reverse return system is inherently self-balancing and requires only trim balancing where multiple quantities of units with different flow and pressure drop characteristics exist in the same loop. Refer to Figure 6.

A direct return system may also work acceptably, but proper water flow balancing is more difficult to achieve and maintain.

1. The piping must comply with local codes. The piping can be steel or copper. Daikin Applied does not recommend the use of PVC/CPVC water piping.
2. A short, high pressure "flexible hose" is used to connect the unit to the building's hard piping and acts as a sound attenuator for both the unit operating noise and hydronic pumping noise.
3. One end of the hose should have a swivel fitting to facilitate removal of the unit for replacement or service.
4. Daikin Applied has optional hose kit combinations available to better facilitate system flow balancing. These flexible hoses reduce vibration between the unit and the rigid piping system. See Figure 4.

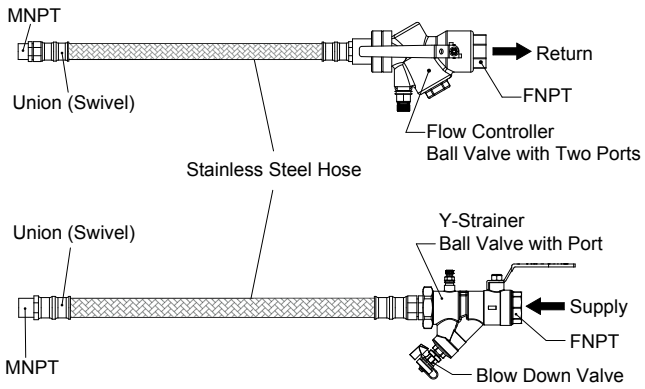
NOTICE

Hard or rigid piping directly to the unit water connections is not recommended. This piping arrangement will not provide noise or vibration isolation to the unit.

NOTICE

Do not over-torque fittings. The maximum torque without damage to fittings is 30 foot pounds. If a torque wrench is not available, use as a rule of thumb, finger tight plus one quarter turn.

Figure 4: Flexible Hose Kit #7



5. No unit should be connected to the supply and return piping until the water system has been cleaned and flushed completely, see "Cleaning & Flushing System" on page 17. After the cleaning and flushing has taken place, the initial connection should have all valves wide open in preparation for water system flushing.
6. Supply and return shutoff valves are required at each unit to allow removal of a unit without the need to shut down the entire heat pump system. The return valve may be used for balancing and should have a “memory stop” so that it can be closed off and reopened to the proper position for the required flow.
7. Fixed flow devices are commercially available and can be installed to eliminate the need for memory stop shut off valves. Include Pressure/Temperature ports to allow the service technician to measure water flow and unit operation.

NOTICE

Improper trapping can lead to several problems. If the trap is too tall, negative pressure will prevent drainage, causing condensate backup. If the trap is too short the seal will be destroyed or nonexistent, producing the same effect as a non-trapped system.

8. Each water source heat pump is provided with a 3/4" FPT flush mount fitting for connection of a condensate drain. Copper or steel condensate piping should be insulated to prevent sweating. Do not locate any point in the drain system above the condensate drain connection of any unit.

NOTICE

It may be necessary to manually fill the trap at system startup, or to run the unit for sufficient time to build a condensate seal. The condensate trap and condensate piping drainage should be free of any foreign debris. Debris can prevent proper drainage and unit operation and result in condensate buildup.

Condensate Drain

A field provided condensate trap must be installed on each water source heat pump. Condensate removal piping must be pitched away from the unit not less than 1/8″ per foot (10.33 mm per meter). A field installed air vent may be required after the condensate trap to prevent air pockets from forming and to allow the condensate to drain away from the unit. The vent should extend at least 1-1/4″ (32 mm) above the unit condensate fitting. See Figure 5. The vent can also act as a clean out if the trap becomes clogged. To avoid having waste gases entering the building, the condensate drain should not be directly piped to a drain/waste/vent stack, etc. Check the local building or plumbing codes for the proper condensate requirements in your area.

Figure 5: Unit Condensate Drain Pipe Trap Detail

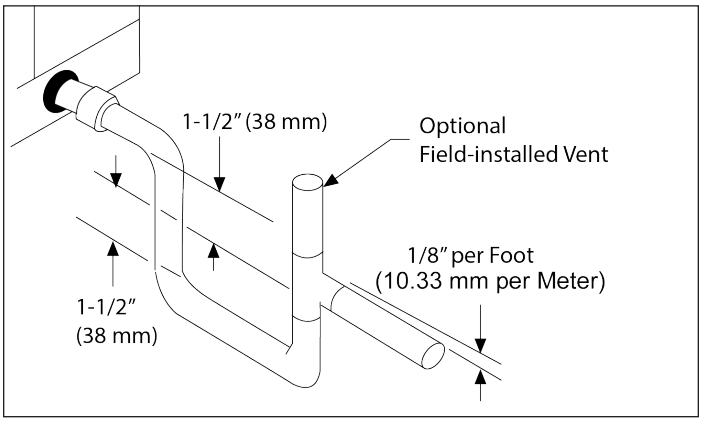
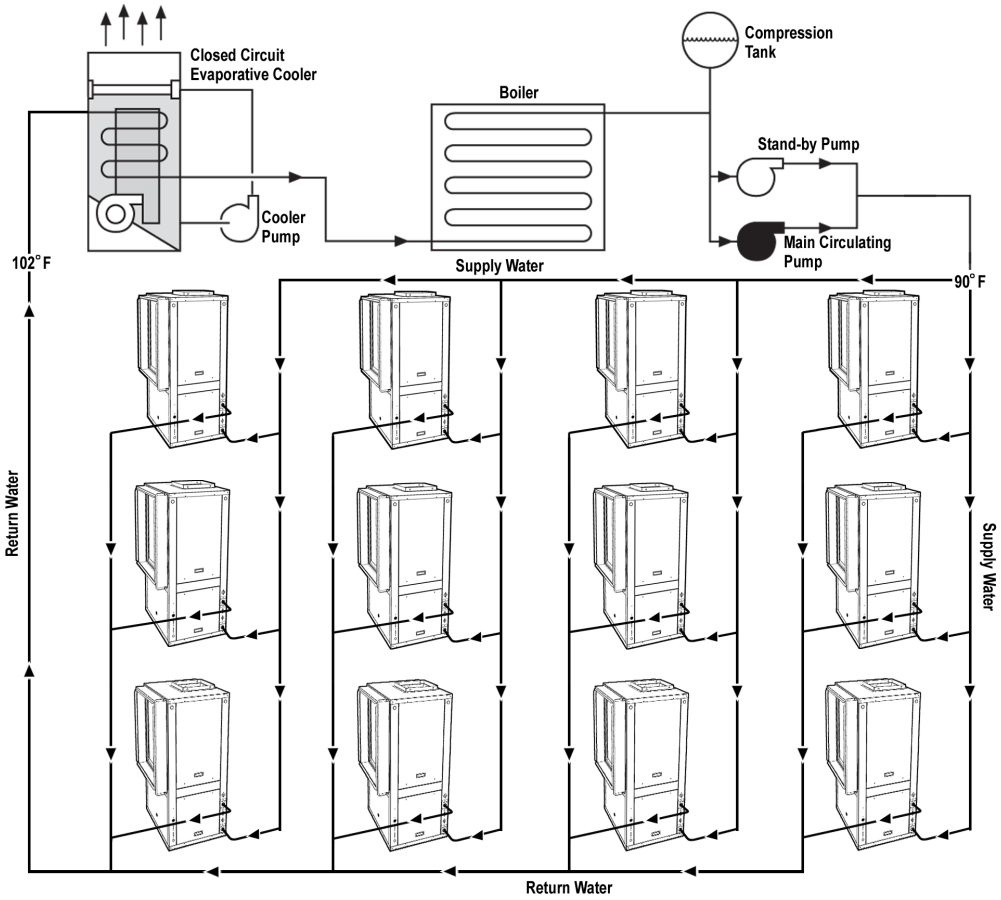


Figure 6: Example of a Reverse Return Piping System



Water System Quality

The cleaning, flushing and chemical treatment of a water source heat pump system is fundamental to efficient operation and the life expectancy of the system.

Potential system problems produced by the use of water fall into three general categories:

1. Scale formation – Mineral deposits which result from the crystallization and precipitation of dissolved salts in the water. The deposits form an insulating barrier, reducing the heat transfer rate and impeding the circulation of fluids due to increased pressure drop.
2. Corrosion – Decomposition of the metal caused by absorption of gases from the air. Corrosion may occur in any metal component of the system.
3. Organic growths – Slime and algae which form under certain environmental conditions, and can reduce the heat transfer rate by forming an insulating coating or can promote corrosion by pitting.

The system water should be evaluated for degrees of impurity, with testing available from independent testing labs, health departments or state agencies. For units with coaxial heat exchangers, refer to Table 5 on page 16. For units with brazed plate heat exchangers (WSSV and WSTV), refer to Table 6 on page 16.

NOTICE

Units with a brazed plate heat exchanger must include a field provided and installed strainer with a minimum of a 20-mesh rating in the supply piping to prevent heat exchanger clogging. For units with a coaxial heat exchanger, the same 20-mesh strainer is recommended.

Table 5: Water Quality Conditions and Applications for Units with a Coaxial Heat Exchanger

Potential Problem	Chemical(s) or Condition	Range for Copper Heat Exchangers	Range for Cupronickel Heat Exchanger
Scaling	Calcium & Magnesium Carbonate	Less than 350 ppm	Less than 350 ppm
Corrosion	pH Range	7 – 9	5 – 9
	Total Dissolved Solids	Less than 1000 ppm	Less than 1500 ppm
	Ammonia, Ammonium Hydroxide	Less than 0.5 ppm	Less than 0.5 ppm
	Ammonium Chloride, Ammonium Nitrate	Less than 0.5 ppm	Less than 0.5 ppm
	Calcium Chloride/ Sodium Chloride	Less than 125 ppm	Less than 125 ppm[4]
	Chlorine	Less than 0.5 ppm	Less than 0.5 ppm
	Hydrogen Sulfide	None Allowed	None Allowed
	Iron Oxide	Less than 1 ppm	Less than 1 ppm
Biological Growth	Iron Bacteria	None Allowed	None Allowed
Erosion	Suspended Solids	Less than 10 ppm	Less than 10 ppm
	Water Velocity	Less than 8 ft/s	Less than 12 ft/s

NOTE 1: Water hardness in ppm is equivalent to hardness in mg/L.

NOTE 2: Grains/gallon = ppm divided by 17.1.

NOTE 3: Copper and cupronickel heat exchangers are not recommended for pool applications for water outside the range of the table. Secondary heat exchangers are required for applications not meeting the requirements shown above.

NOTE 4: Salt water applications (approx. 25,000 ppm) require secondary heat exchangers due to copper piping between the heat exchanger and the unit fittings.

Table 6: Water Quality Conditions and Applications for WSSV and WSTV Units with a Brazed Plate Heat Exchanger

Potential Problem	Chemical(s) or Condition	Range for Brazed Plate Heat Exchanger
		Sizes 015-070 (ANSI 316 Stainless Steel)
Scaling	Alkalinity	70-300 ppm
	Total Hardness	70-200 ppm
Corrosion	pH Range	7.5-9.0
	Sulfate	Less than 70 ppm
	Ammonium	Less than 2 ppm
	Chlorides	Less than 300 ppm
	Free Chlorine	Less than 1 ppm
	Hydrogen Sulfide	Less than 0.05 ppm
	Free (Aggressive) Carbon Dioxide	Less than 5 ppm
	Nitrate	Less than 100 ppm
	Iron Oxide[1]	Less than 0.2 ppm
	Aluminium	Less than 0.2 ppm
	Manganese[1]	Less than 0.1 ppm
	Electrical Conductivity	10-500 µS/cm
	Total Dissolved Solids	Less than 1000 ppm
Biological Growth	Iron Bacteria	None Allowed
Erosion	Water Velocity	Less than 16 ft/s

NOTE 1: Iron and manganese are strong oxidants and may increase the risk for localized corrosion on stainless steels in combination with brazing material copper.

NOTE 2: Varying combinations of pH, TDS, calcium, alkalinity and water temperature can affect the likelihood of scaling. To determine if the system is at risk for scaling, use the Langelier Saturation Index.

Cleaning & Flushing System

1. Prior to first operation of any conditioner, the water circulating system must be cleaned and flushed of all construction dirt and debris.

   If the conditioners are equipped with water shutoff valves, either electric or pressure operated, the supply and return runouts must be connected together at each conditioner location. This will prevent the introduction of dirt into the unit. See Figure 7.

2. Fill the system at the city water makeup connection with all air vents open. After filling, close all air vents.

   The contractor should start main circulator with the pressure reducing valve open. Check vents in sequence to bleed off any trapped air, ensuring circulation through all components of the system. Power to the heat rejector unit should be off, and the supplementary heat control set at 80°F (27°C).While circulating water, the contractor should check and repair any leaks in the piping. Drains at the lowest point(s) in the system should be opened for initial flush and blowdown, making sure city water fill valves are set to make up water at the same rate. Check the pressure gauge at pump suction and manually adjust the makeup to hold the same positive steady pressure both before and after opening the drain valves. Flush should continue for at least two hours, or longer if required, to see clear, clean drain water.

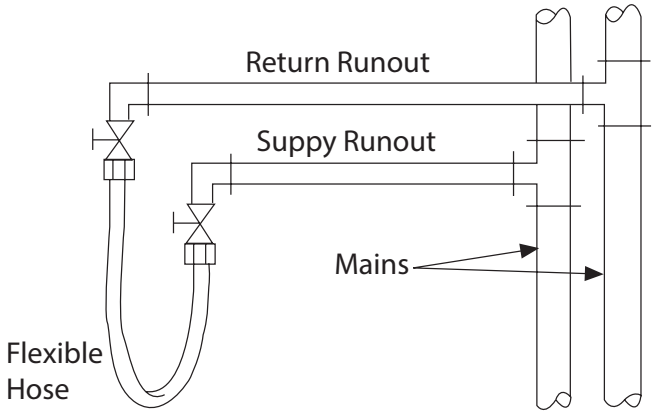
3. Shut off supplemental heater and circulator pump and open all drains and vents to completely drain down the system. Short circuited supply and return runouts should now be connected to the conditioner supply and return connections. Do not use sealers at the swivel flare connections of hoses. Trisodium phosphate was formerly recommended as a cleaning agent during flushing. However, many states and localities ban the introduction of phosphates into their sewage systems. The current recommendation is to simply flush longer with warm 80°F (27°C) water.

4. Refill the system with clean water. Test the water using litmus paper for acidity, and treat as required to leave the water slightly alkaline (pH 7.5 to 8.5). The specified percentage of antifreeze may also be added at this time. See Table 4. Use commercial grade antifreeze designed for HVAC systems only. Do not use automotive grade antifreeze.

   Once the system has been filled with clean water and antifreeze (if used), precautions should be taken to protect the system from dirty water conditions. Dirty water will result in system wide degradation of performance and solids may clog valves, strainers, flow regulators, etc. Additionally, the heat exchanger may become clogged which reduces compressor service life or causes premature failure.

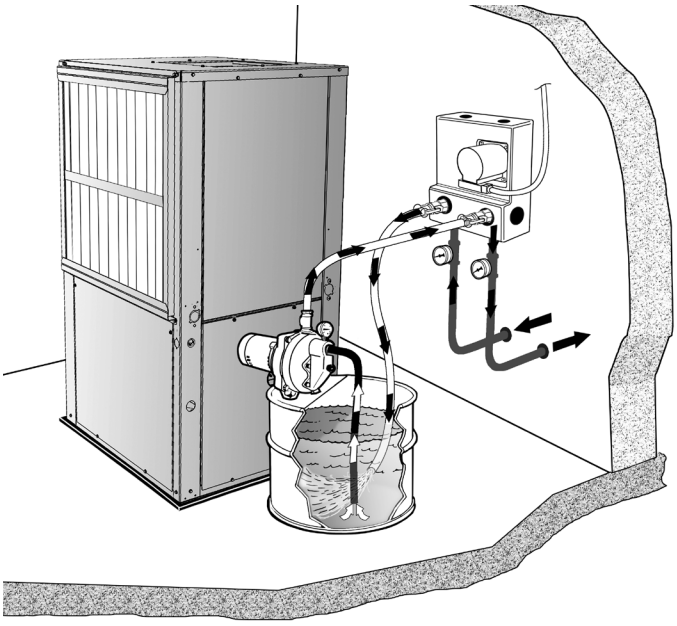
5. Set the loop water controller heat add setpoint to 70°F (21°C) and the heat rejection setpoint to 85°F (29°C). Supply power to all motors and start the circulating pumps. After full flow has been established through all components including the heat rejector (regardless of season) and air vented and loop temperatures stabilized, each of the conditioners will be ready for check, test and start-up, air balancing, and water balancing.

Figure 7: Supply and Return Runouts Connected Together



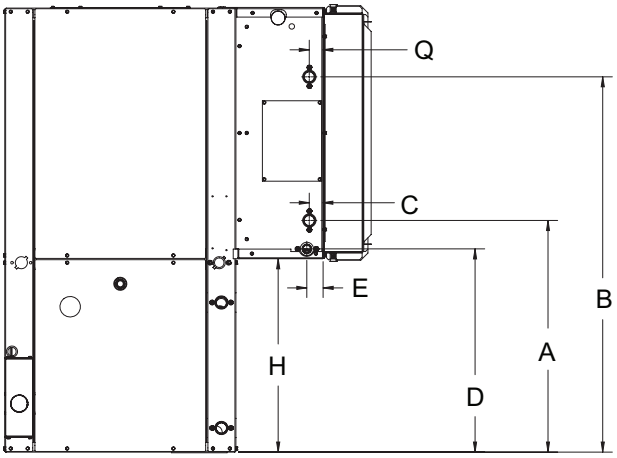
Runouts Initially Connected Together

Figure 8: Flushing the Loop

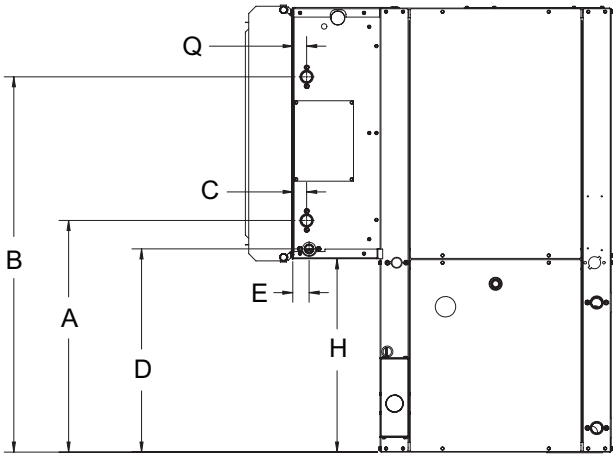


Piping Considerations for Units With Waterside Economizer / Hydronic Heating

Figure 9: Waterside Economizer / Hydronic Heating Unit Descriptions



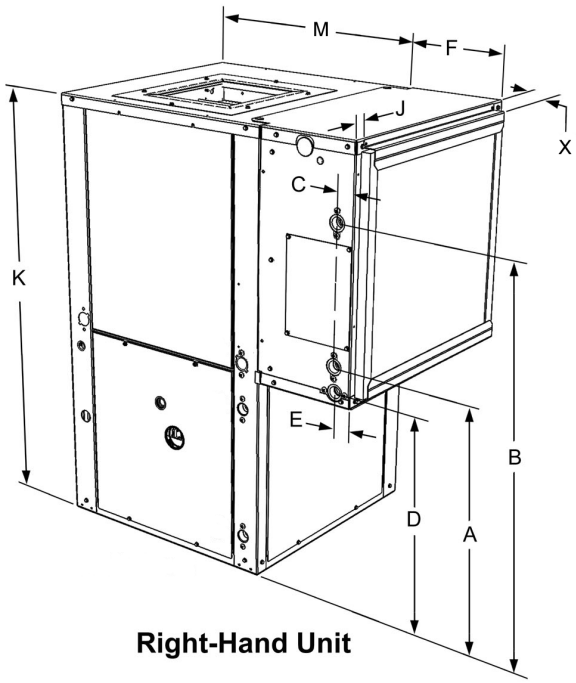
Right Hand Unit



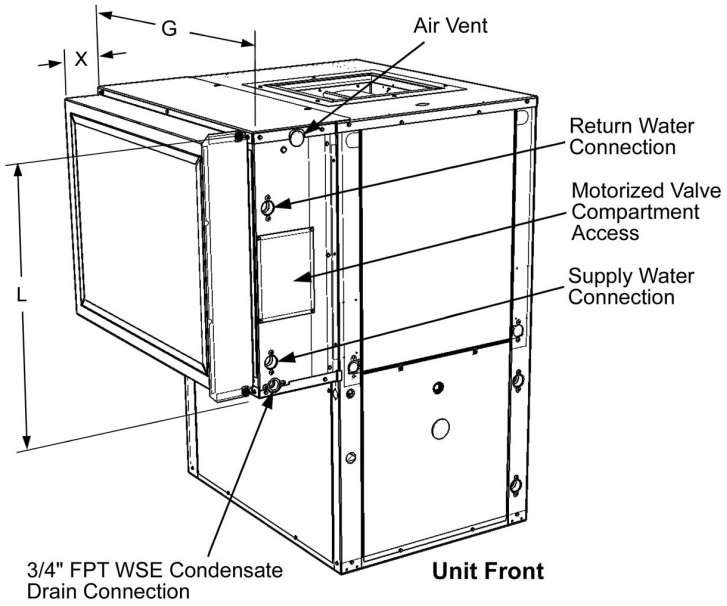
Left Hand Unit

NOTE: The economizer package incorporates its own drain pan to collect condensate from the coil when utilized for economizer cooling operation. This pan MUST be independently trapped and can be piped into the drain line for the heat pump.

Figure 10: Waterside Economizer / Hydronic Heating Piping Locations and Dimensions



Right-Hand Unit



Left-Hand Unit

Table 7: Unit Waterside Economizer/Hydronic Heating Connection Dimensions for Figure 9 and Figure 10

Unit Model	Unit Size	Waterside Economizer / Hydronic Heating Connections					3/4" FPT Condensate Drain	
		Connection Size (FPT)	Supply		Return			
			A	C	B	Q	D	E
WSCV, WSDV	007, 009, 012	1/2"	16.23	1.69	24.44	1.69	13.93	1.69
	015, 019	1/2"	21.54	1.69	31.19	1.69	19.55	1.69
	024, 030	3/4"	23.42	1.81	34.85	1.81	20.05	1.69
	036, 042	3/4"	27.3	1.8	38.7	1.81	21.05	1.69
	048, 060, 070	1"	24.0	1.43	38.88	1.43	21.05	1.69
WSMV, WSNV	007, 009, 012	1/2"	15.62	1.69	27.57	1.69	13.93	1.69
	015, 019	3/4"	23.42	1.81	34.85	1.81	20.05	1.69
	024, 030	3/4"	27.3	1.8	38.7	1.81	21.05	1.69
	036,042	1"	24.0	1.43	38.88	1.43	21.05	1.69
	048, 060	1"	33.81	1.66	45.24	1.66	22.05	1.69
WSSV, WSTV	007, 009, 012	1/2"	21.54	1.69	31.19	1.69	19.55	1.69
	015, 019	1"	27.3	1.8	38.7	1.81	21.05	1.69
	024, 030	1"	24.0	1.43	38.88	1.43	21.05	1.69
	036, 042	1"	33.81	1.66	45.24	1.66	22.05	1.69
	048, 060, 070	1"	36.81	1.66	48.24	1.66	22.05	1.69

NOTE: All dimensions within ± 0.10 inches (2.5 mm).

Figure 11: Waterside Economizer/Hydronic Heating Overall Cabinet Section

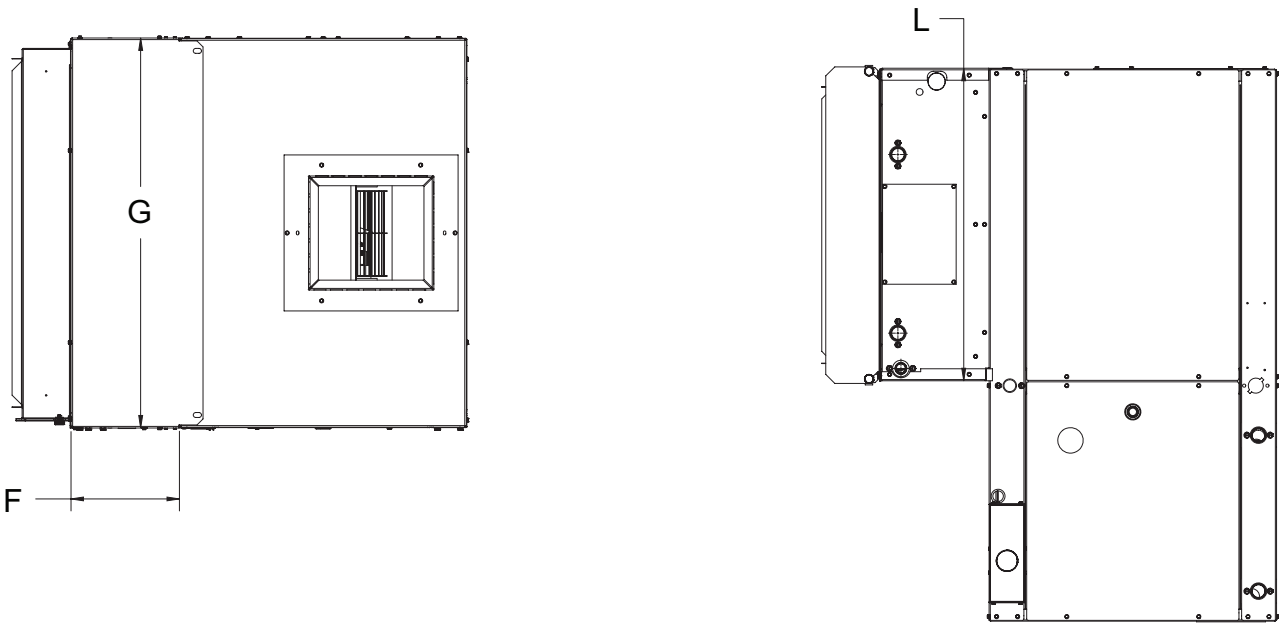


Table 8: Unit Cabinet With Waterside Economizer / Hydronic Heating Dimensions for Figure 9, Figure 10, and Figure 11

Unit Model	Unit Size	Waterside Economizer/Hydronic Heating Overall Cabinet Section			Floor to WSE	Unit Height	Unit Width
		Width	Depth	Height			
		F	G	L	H	K	M
WSCV, WSDV	007, 009, 012	9.0	19.0	12.16	13.5	24.0	19.0
	015, 019	9.0	21.5	15.54	18.5	34.0	21.5
	024, 030	9.0	21.5	21.04	19.0	38.0	21.5
	036, 042	9.0	26.0	24.04	20.0	44.0	26.0
	048, 060, 070	9.0	32.5	26.04	20.0	46.0	32.5
WSMV, WSNV	007, 009, 012	9.0	19.0	17.42	12.9	30.25	19.0
	015, 019	9.0	21.5	21.04	19.0	38.0	21.5
	024, 030	9.0	26.0	24.04	20.0	44.0	26.0
	036,042	9.0	32.5	26.04	20.0	46.0	32.5
	048, 060	9.0	32.5	29.54	21.0	50.5	32.5
WSSV, WSTV	007, 009, 012	9.0	21.5	15.54	18.5	34.0	21.5
	015, 019	9.0	26.0	24.04	20.0	44.0	26.0
	024, 030	9.0	32.5	26.04	20.0	46.0	32.5
	036, 042	9.0	32.5	29.54	21.0	50.5	32.5
	048, 060, 070	9.0	32.5	33.04	21.0	54.0	32.5

NOTE: All dimensions within ± 0.10 inches (2.5 mm).

Table 9: Filter Rack Dimensions for Figure 10 and Figure 12

Unit Model	Unit Size	Filter Rack Dimensions							
		Front Offset	Frame Width	Frame Height	Depth			Duct Flange Width	Duct Flange Height
					1″	2″	4″		
		J	V	W	X			Y	Z
WSCV, WSDV	007, 009, 012	0.56	17.54	10.88	1.00	2.125	4.125	15.57	9.2
	015, 019		20.04	14.24				18.07	12.57
	024, 030		20.04	19.75				18.07	18.07
	036, 042		24.54	22.75				22.57	21.07
	048, 060, 070		31.04	24.75				29.07	23.07
WSMV, WSNV	007, 009, 012	0.56	17.54	16.13	1.00	2.125	4.125	15.57	14.45
	015, 019		20.04	19.75				18.07	18.07
	024, 030		24.54	22.75				22.57	21.07
	036,042		31.04	24.75				29.07	23.07
	048, 060		31.04	28.25				29.07	26.57
WSSV, WSTV	007, 009, 012	0.56	20.04	14.25	1.00	2.125	4.125	18.07	12.57
	015, 019		24.54	22.75				22.57	21.07
	024, 030		31.04	24.75				29.07	23.07
	036, 042		31.04	28.25				29.07	26.57
	048, 060, 070		31.04	31.75				29.07	30.07

NOTE: All dimensions within ± 0.10 inches (2.5 mm).

Figure 12: Filter Rack Dimensions

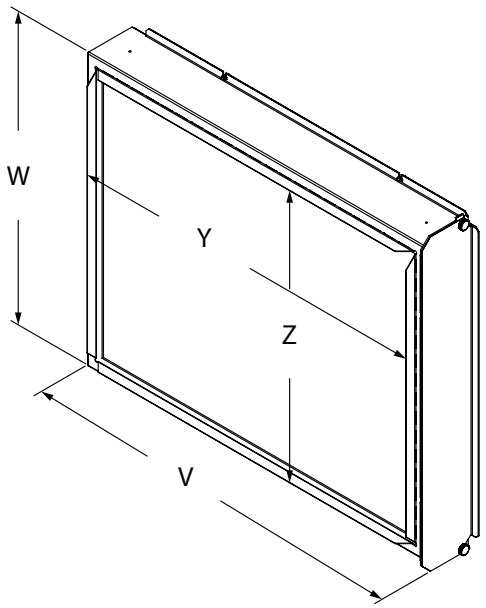
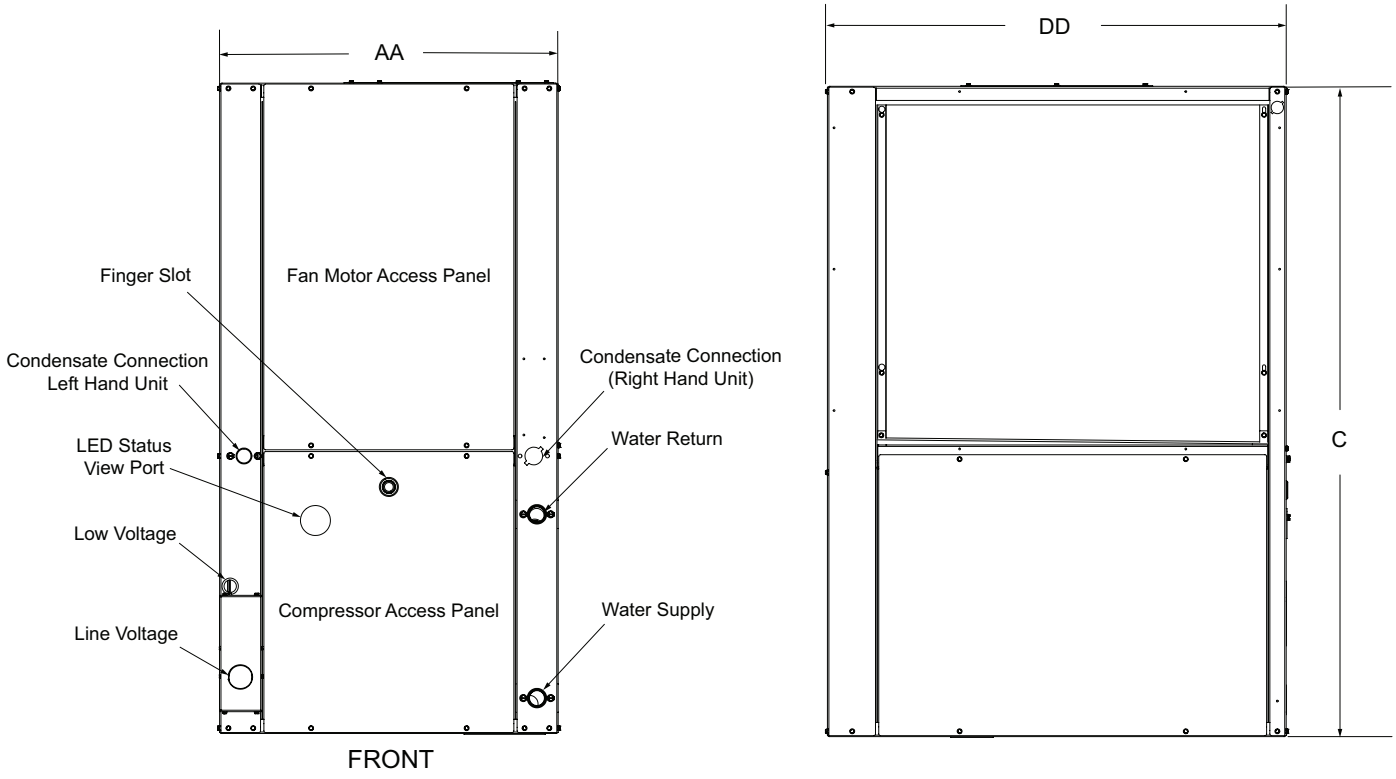
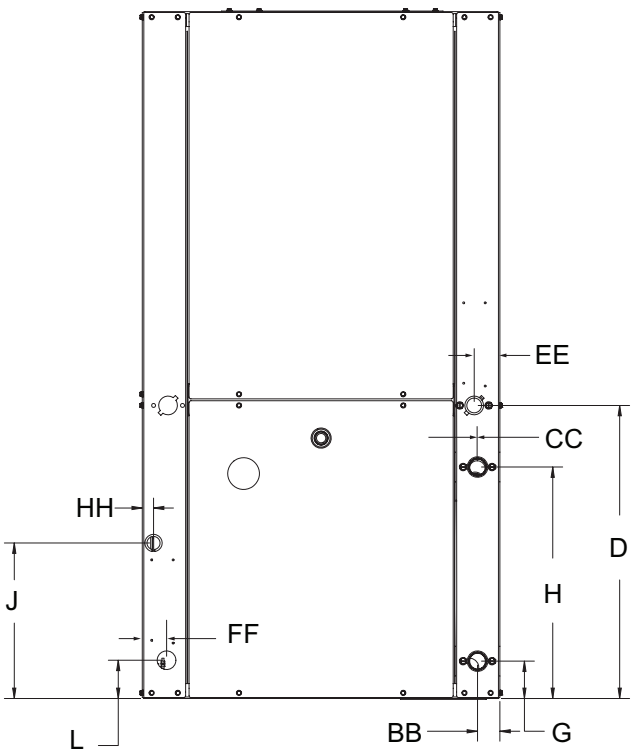
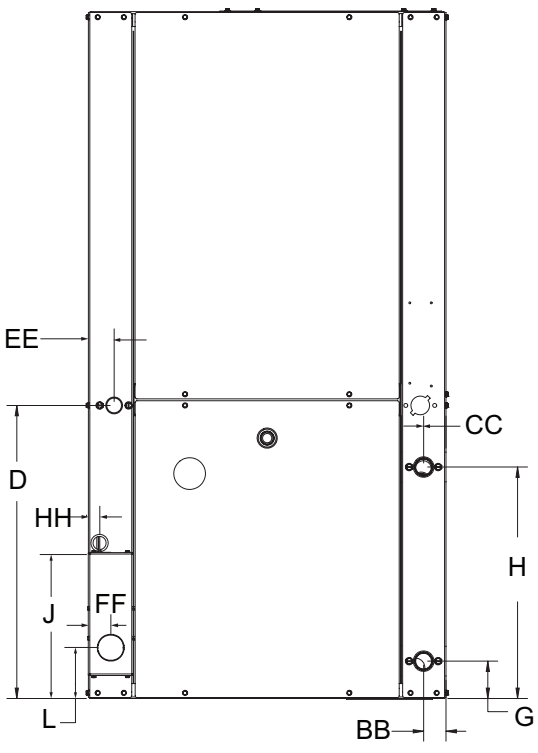


Figure 13: Piping & Electrical Connections Locations





Front View
Right Hand



Front View
Left Hand

Table 10: Unit Supply, Return, and Condensate Dimensions for Figure 13

Unit Model	Unit Size	Heat Exchanger Type	Condenser Water Piping Dimensions					Condensate Drain 3/4" FPT	
			Connection Size (FPT)	Water Supply		Water Return		D	EE
				G	BB	H	CC		
WSCV, WSDV	007, 009, 012	N/A	1/2"	1.63	2.5	10.25	1.38	12.5	1.72
	015, 019		1/2"	3.13	1.5	9.18	1.5	18.13	1.72
	024, 030		3/4"	2.5	1.5	11.25	1.5	18.63	1.72
	036, 042		3/4"	2.5	1.5	15.5	1.5	19.63	1.72
	048, 060, 070		1"	2.5	1.5	15.5	1.5	19.63	1.72
WSMV, WSNV	007, 009, 012		1/2"	1.63	2.5	10.25	1.38	12.5	1.72
	015, 019		3/4"	2.5	1.5	11.25	1.5	18.63	1.72
	024, 030		3/4"	2.5	1.5	15.5	1.5	19.63	1.72
	036, 042		1"	2.5	1.5	15.5	1.5	19.63	1.72
	048, 060		1"	2.5	1.5	15.5	1.5	20.63	1.72
WSSV, WSTV	015, 019	Brazed Plate	1"	2.5	1.5	15.5	1.5	19.63	1.72
	024, 030		1"	2.5	1.5	15.5	1.5	19.63	1.72
	036, 042		1"	2.5	1.5	15.5	1.5	20.63	1.72
	048, 060, 070		1"	2.5	1.5	15.5	1.5	20.63	1.72
	007, 009, 012	Coaxial Coil	1/2"	3.13	1.5	9.18	1.5	18.13	1.72
	015, 019		3/4"	2.5	1.5	15.5	1.5	19.63	1.72
	024, 030		3/4"	2.5	1.5	15.5	1.0	19.63	1.72
	036, 042		1"	2.5	1.5	15.5	1.5	20.63	1.72
	048, 060, 070		1"	2.5	1.5	15.5	1.5	20.63	1.72

NOTE: All dimensions within ± 0.10 inches.

Table 11: Unit Cabinet Dimensions and Electrical Connections for Figure 13

Unit Model	Unit Size	Overall Cabinet Dimensions			Electrical Connections					
		Width	Depth	Height	Line Voltage		Low Voltage		Conduit Connection Size	
		AA	DD	C	L	FF	J	HH	Line Voltage	Low Voltage
WSCV, WSDV	007, 009, 012	19.0	19.0	24.0	2.56	1.63	10.41	0.75	1-1/4"	1-3/32"
	015, 019	21.5	21.5	34.0						
	024, 030	21.5	21.5	38.0						
	036, 042	21.5	26.0	44.0						
	048, 060, 070	24.0	32.5	46.0						
WSMV, WSNV	007, 009, 012	19.0	19.0	30.25	2.56	1.63	10.41	0.75	1-1/4"	1-3/32"
	015, 019	21.5	21.5	38.0						
	024, 030	21.5	26.0	44.0						
	036, 042	24.0	32.5	46.0						
	048, 060	26.0	32.5	50.5						
WSSV, WSTV	007, 009, 012	21.5	21.5	34.0	2.56	1.63	10.41	0.75	1-1/4"	1-3/32"
	015, 019	21.5	26.0	44.0						
	024, 030	24.0	32.5	46.0						
	036, 042	26.0	32.5	50.5						
	048, 060, 070	26.0	32.5	54.0						

NOTE: All dimensions within ± 0.10 inches.

Ductwork and Attenuation

Discharge duct shall be used with these units. Where return air ductwork is required, the unit comes standard with a 1″ thick, factory-installed disposable filter, mounted in a 2-sided filter rack. The filter can be easily removed from either side. A 2″ deep 4-sided, gasketed filter rack is available as a factory-installed option to accept a 2″ disposable or a 2″ MERV 8 filter. Also available is a 4″ deep, 4-sided, gasketed filter rack with a 2″ disposable or a 4″ MERV 13 filter.

All ductwork should conform to industry standards of good practice as described in ASHRAE Systems Guide.

A field supplied discharge duct system will normally consist of:

- a flexible connector at the unit
- a 90-degree elbow without vanes
- a 10 foot length of insulated duct
- and a trunk duct teeing into a branch circuit with discharge diffusers

Air Duct Connections

⚠ WARNING

If for any reason the perforated supply or return duct flanges are not required they must be bent out 90 degrees or removed.

1. Bend the perforated supply and return air duct flanges out 90 degrees with wide duct pliers.

NOTICE

It is recommended that a field supplied flexible (boot) connector is attached to the flanges to isolate vibration. See Figure 15.

2. Connect the flexible boot connector and duct to the flanges. Screws used to secure supply duct should be inserted in the duct flange only.

NOTICE

Screws should not be installed through the unit cabinet. Installation of screws through the unit cabinet may contact with refrigerant piping, voiding warranty. The unit cabinet should not be cut or altered for installation of accessories.

Figure 14: Bend Duct Flanges out 90 Degrees

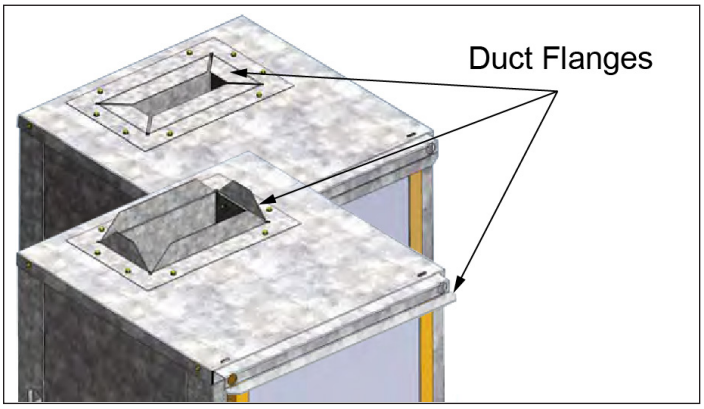
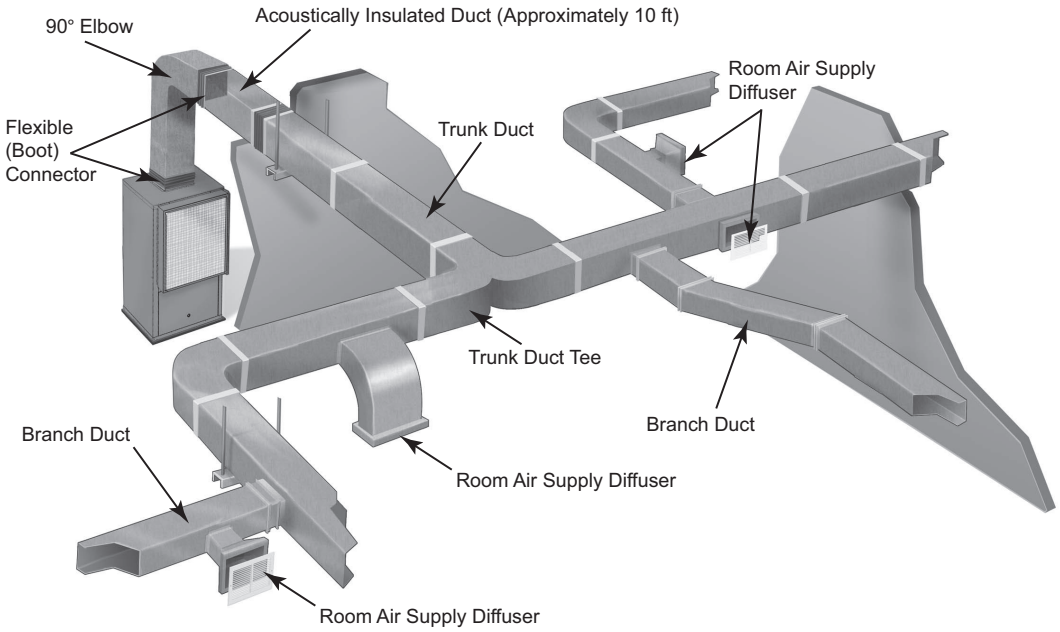


Figure 15: Typical Ducting for Vertical Unit



NOTE 1: Transformation to supply duct have maximum slope of 1″ in 7″.

NOTE 2: Square elbows with double thickness vanes may be substituted.

NOTE 3: Do not install ducts so that the air flow is counter to fan rotation.

NOTE 4: Transformations and units must be adequately supported so no weight is on the flexible fan connection.

Figure 16: Discharge Duct Collar Locations

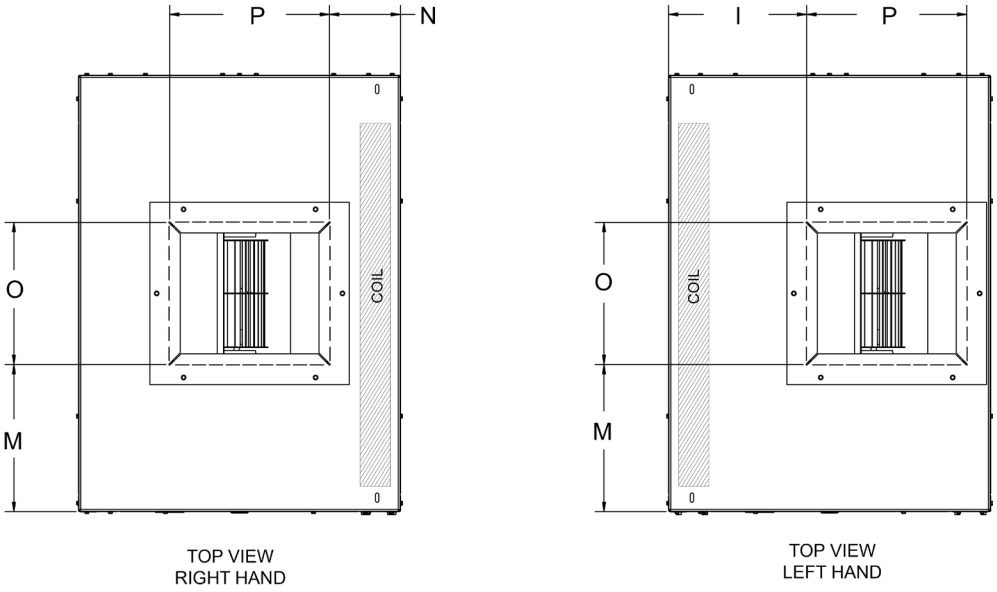


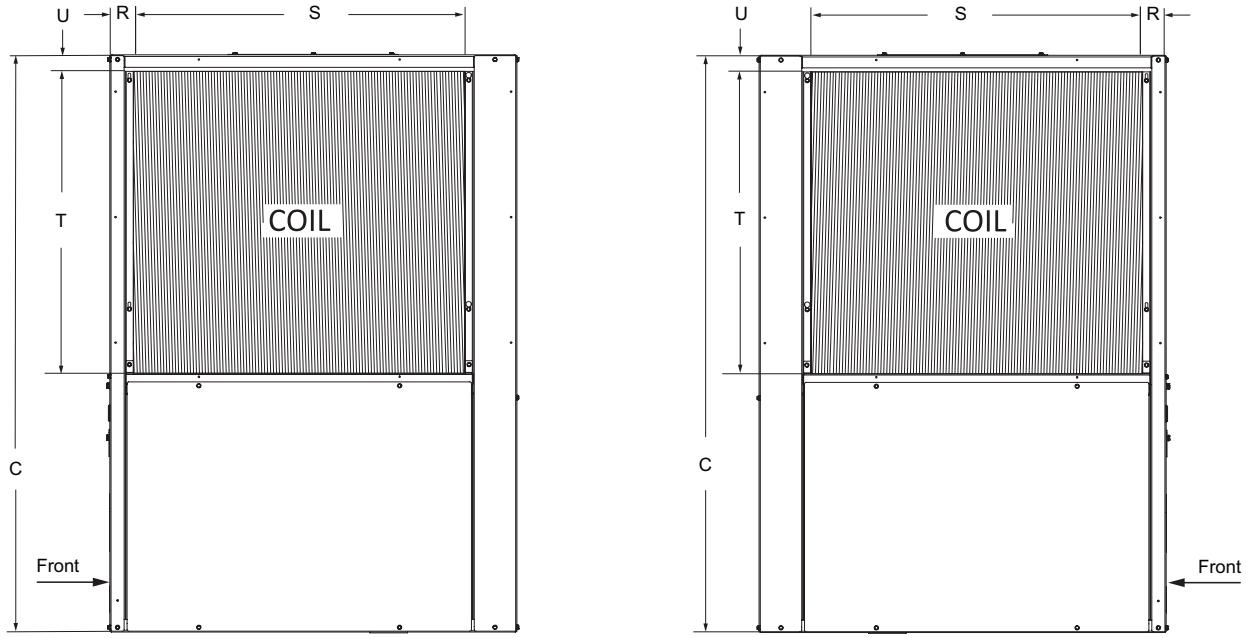
Table 12: Discharge Duct Collar Dimensions in Figure 16

Unit Model	Unit Size	Discharge Opening* - in inches				
		M	O	P	N	I
					Right-Hand	Left-Hand
WSCV, WSDV	007, 009, 012	4.58	9.78	5.22	8.9	4.84
	015, 019, 024, 030	3.75	10.38	9.43	7.72	7.72
	036	6.0	10.38	9.43	5.97	5.97
	042	3.24	11.89	10.56	4.66	6.16
	048	10.91	10.56	11.89	5.24	10.24
	060, 070	9.53	13.32	13.89	4.99	7.99
WSMV, WSNV	007, 009, 012	4.58	9.78	5.22	8.9	4.84
	015, 019	3.75	10.38	9.43	7.72	7.72
	024, 030	6.0	10.38	9.43	5.97	5.97
	036	11.47	9.43	10.38	6.75	10.75
	042	10.91	10.56	11.89	5.24	10.24
	048	10.91	10.56	11.89	6.99	11.49
	060	9.53	13.32	13.89	6.99	9.49
WSSV, WSTV	007, 009, 012	5.79	9.78	5.22	9.58	6.58
	015, 019	6.0	10.38	9.43	5.97	5.97
	024, 030	11.47	9.43	10.38	6.75	10.75
	036	11.47	9.43	10.38	5.75	9.75
	042	10.91	10.56	11.89	6.99	11.49
	048	10.91	10.56	11.89	6.99	11.89
	060, 070	9.53	13.32	13.89	6.99	9.49

NOTE 1: *Discharge opening dimensions are with the flanges bent up along the perforations at 90 degrees.

NOTE 2: Dimensions within ± 0.10 inches (2.5 mm).

Figure 17: No Filter Rack & Duct Collar Connections



Right Side View - Right Return

Left Side View - Left Return

Table 13: Unit with No Filter Rack Dimensions in Figure 17

Unit Model	Unit Size	Unit Height	Air Coil Return Air Opening			
			Offset Side	Coil Width	Coil Height	Offset Top
		C	R	S	T	U
WSCV, WSDV	007, 009, 012	24.0	3.63	14.0	12.13	1.0
	015, 019	34.0	3.63	16.5	15.59	1.0
	024, 030	38.0	3.63	16.5	20.79	1.0
	036, 042	44.0	3.63	21.0	24.25	1.0
	048, 060, 070	46.0	4.15	27.0	25.98	1.0
WSMV, WSNV	007, 009, 012	30.3	3.63	14.0	17.32	1.0
	015, 019	38.0	3.63	16.5	19.06	2.4
	024, 030	44.0	3.63	21.0	24.25	1.0
	036, 042	46.0	4.15	27.0	25.98	1.0
	048, 060	50.5	4.13	27.0	29.45	1.0
WSSV, WSTV	007, 009, 012	34.0	3.63	16.5	15.59	1.0
	015, 019	44.0	3.63	21.0	19.06	5.4
	024, 030	46.0	4.15	27.0	25.98	1.0
	036, 042	50.5	4.13	27.0	29.45	1.0
	048, 060, 070	54.0	4.13	27.0	32.91	1.0

NOTE: Dimensions are in inches.

Figure 18: 1" Filter Rack & Duct Collar Connections

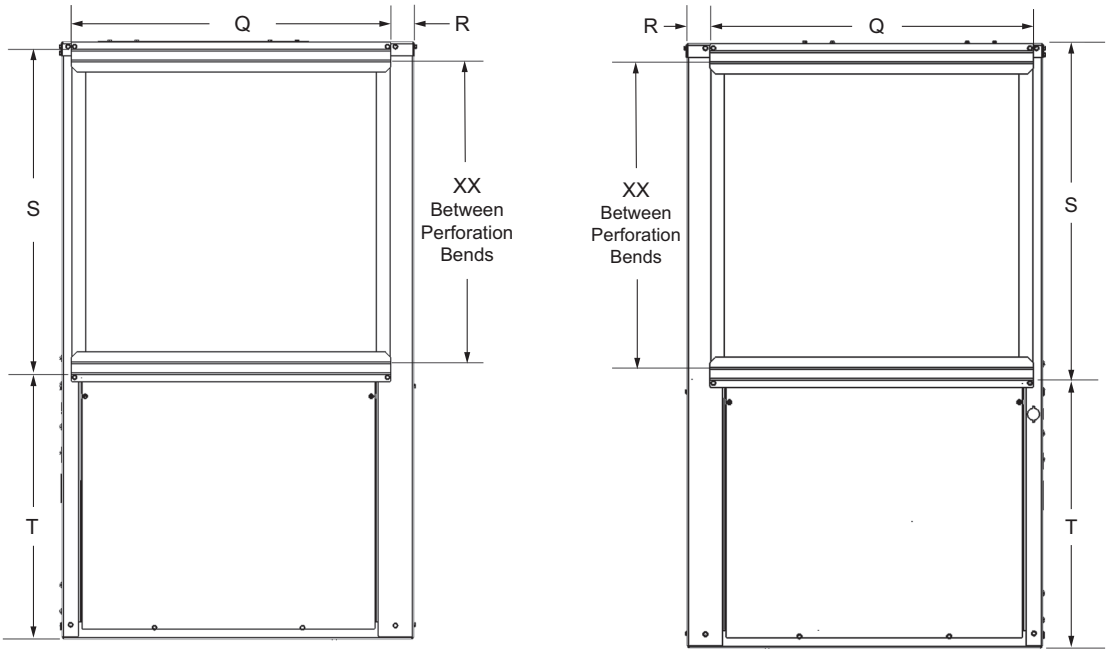


Table 14: 1" Filter Rack Dimensions in Figure 18

Unit Model	Unit Size	Filter Rails Location				Dimensions Between 90-Degree Perforation Bends
		Q	R	S	T	XX
WSCV, WSDV	007, 009, 012	17.53	0.71	11.92	13.01	9.78
	015, 019	20.03	0.71	15.29	18.63	13.16
	024, 030	20.03	0.71	20.76	19.16	18.63
	036, 042	24.53	0.71	23.76	20.16	21.63
	048, 060, 070	31.0	0.85	25.82	20.1	23.69
WSMV, WSNV	007, 009, 012	17.53	0.71	17.17	13.01	15.03
	015, 019	20.03	0.71	20.76	19.16	18.63
	024, 030	24.53	0.71	23.76	20.16	21.63
	036, 042	31.0	0.85	25.82	20.1	23.69
	048, 060	31.0	0.85	29.26	21.16	27.13
WSSV, WSTV	007, 009, 012	20.03	0.71	15.29	18.63	13.16
	015, 019	24.53	0.71	23.76	20.16	21.63
	024, 030	31.0	0.85	25.82	20.1	23.69
	036, 042	31.0	0.85	29.26	21.16	27.13
	048, 060, 070	31.0	0.85	32.76	21.16	30.63

NOTE 1: Filter rack flange dimensions are to the outside edge of the flange. Dimensions are approximate as the return air duct flanges are bent out along the perforations by the installing contractor.

NOTE 2: Dimensions are in inches.

Figure 19: 2" and 4" Filter Rack Dimensions

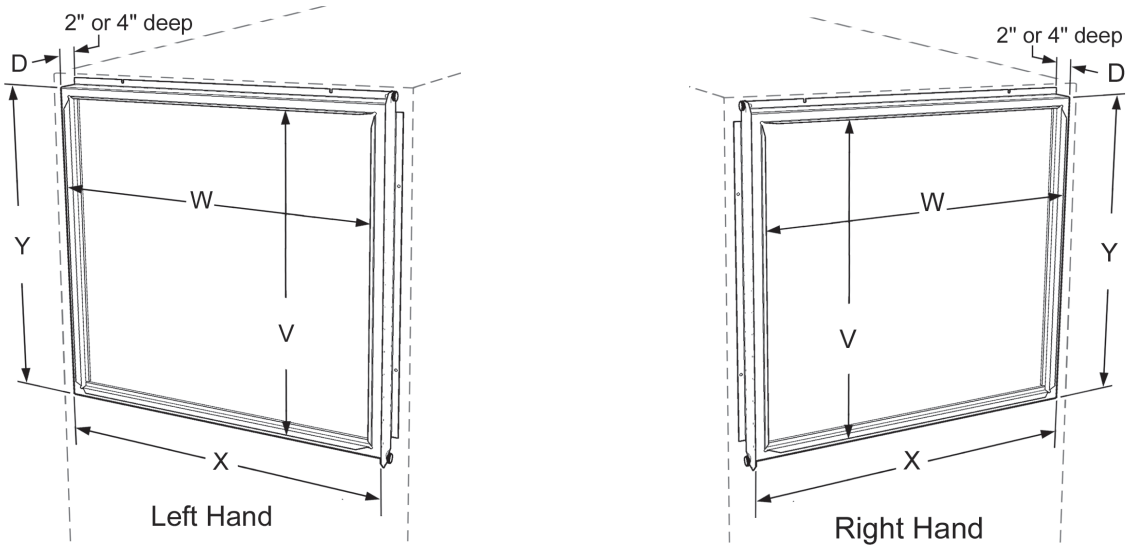


Table 15: 2" and 4" Filter Rack Dimensions in Figure 19

Unit Model	Unit Size	Air Coil Return Air Opening					
		Duct Flange Width	Duct Flange Height	2″	4″	Filter Rack Width	Filter Rack Height
		W	V	D		X	Y
WSCV, WSDV	007, 009, 012	15.57	9.2	2.125	4.125	17.54	10.88
	015, 019	18.07	12.57	2.125	4.125	20.04	14.24
	024, 030	18.07	18.07	2.125	4.125	20.04	19.75
	036, 042	22.6	21.07	2.125	4.125	24.5	22.8
	048, 060, 070	29.07	23.07	2.125	4.125	31.0	24.75
WSMV, WSNV	007, 009, 012	15.57	14.45	2.125	4.125	17.54	16.13
	015, 019	18.07	18.07	2.125	4.125	20.04	19.75
	024, 030	22.6	21.07	2.125	4.125	24.5	22.8
	036, 042	29.07	23.07	2.125	4.125	31.0	24.75
	048, 060	29.07	26.57	2.125	4.125	31.04	28.25
WSSV, WSTV	007, 009, 012	18.07	12.57	2.125	4.125	20.04	14.25
	015, 019	22.6	21.07	2.125	4.125	24.5	22.8
	024, 030	29.07	23.07	2.125	4.125	31.04	24.75
	036, 042	29.07	26.57	2.125	4.125	31.04	28.25
	048, 060, 070	29.07	30.07	2.125	4.125	31.04	31.75

NOTE 1: Filter rack flange dimensions are to the outside edge of the flange. Dimensions are approximate as the return air duct flanges are bent out along the perforations by the installing contractor.

NOTE 2: Dimensions are in inches.

Field Installed Accessories

Motorized Isolation Valve & Relay

Motorized Isolation Valve

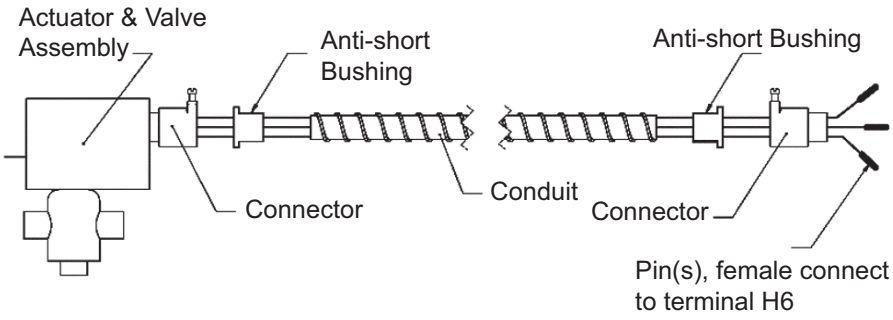
The motorized valve kit is available as a factory-installed or a field-installed option. Wired as shown in Figure 21, the motorized valve will open on a call for compressor operation. The motorized isolation valve actuator (ISO) has both a 24 V power connection and a 24V end switch connection.

1. Install the supplied wire harness into plug H6 on the main control board.
2. Run wires between the ISO actuator and the supplied wire harness ends.
3. Connect N.O. & N.C. actuators as shown on the schematic.
4. The end switch should be wired in series with the 24V compressor signal wire. Connect the end switch wires as shown in the schematic. The end switch will close when the valve is fully open.

NOTICE

For detailed installation instructions for the motorized valve, refer to IM 1151.

Figure 20: Normally Opened, Power Closed Motorized Valve



Pump Request Relay

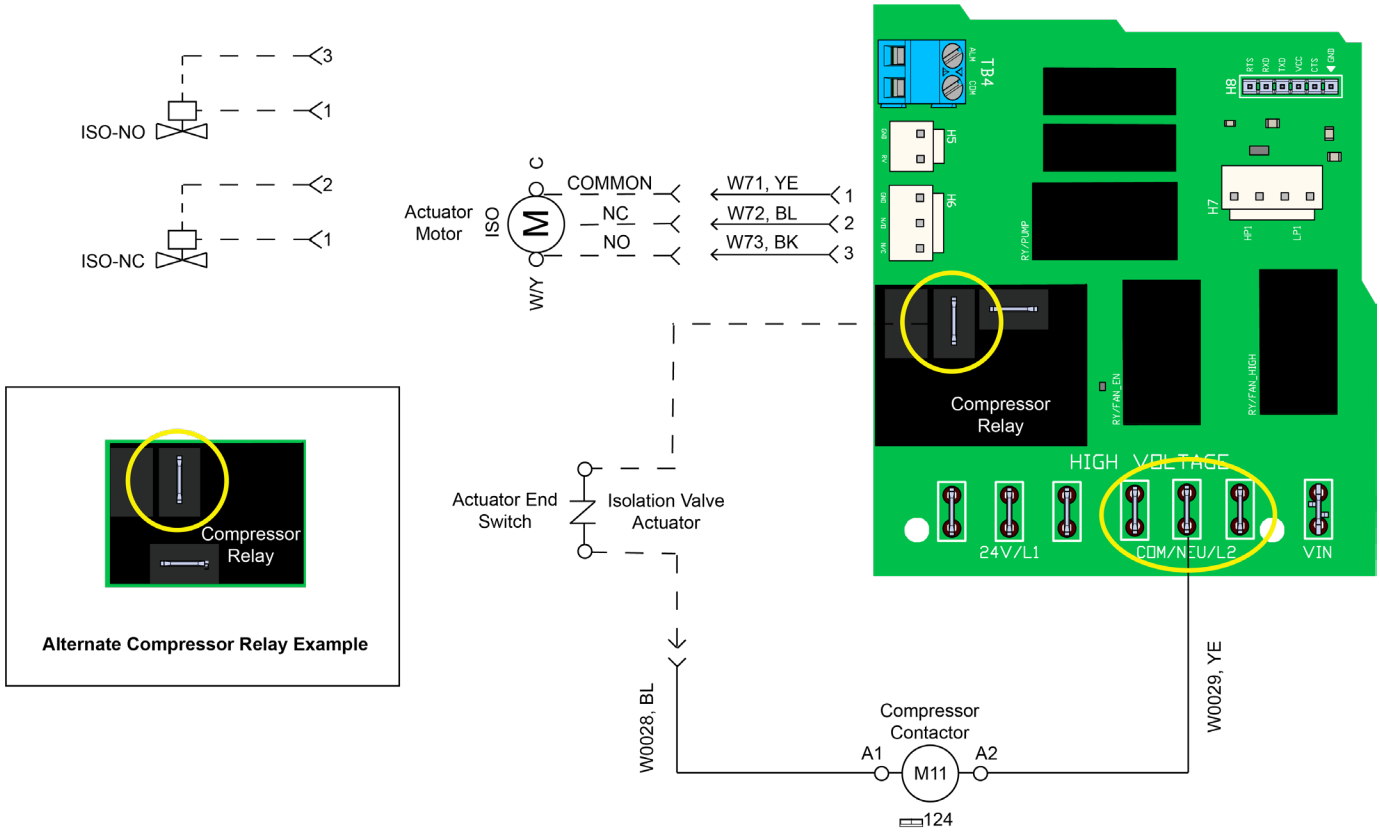
The MicroTech unit controller includes an internal Pump Request Relay connected to terminal H6 with three output connections. See Table 16 for control operation:

The output of the internal pump request relay is 24 VAC. The output is not available when the H6 connection is used to control a motorized valve.

Table 16: Pump Request Relay

Terminal Connection	Signal	Output	Description
H6-1	Common	Ground	Pump Request - Common (Ground) Terminal
H6-2	24 VAC	N.O.	Pump Request - Normally Open (N.O.) Terminal. Energized when cooling or heating demand is required.
H6-3	24 VAC	N.C.	Pump Request - Normally Closed (N.C.) Terminal. Energized when cooling or heating demand is no longer required.

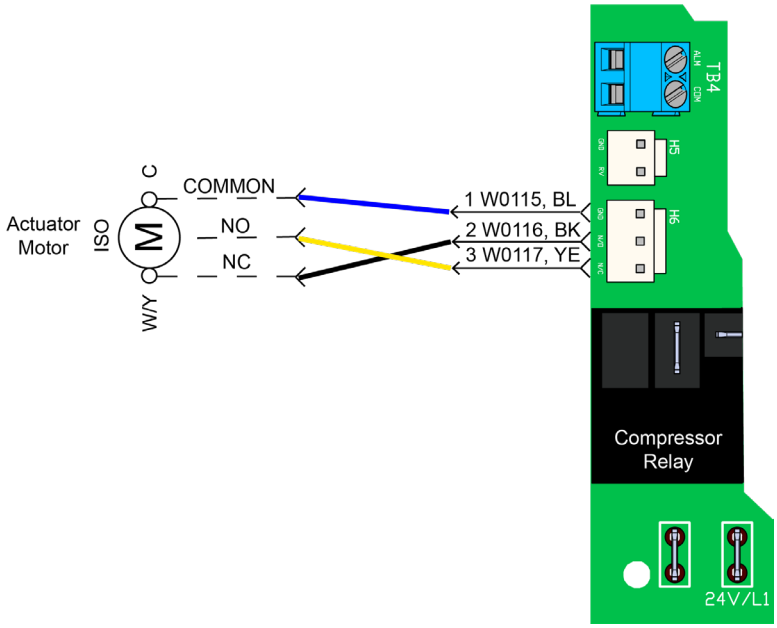
Figure 21: Motorized Valve Wiring



NOTE 1: Connectors on valve must be cut off and stripped back and the wires twisted to make connections to the H6 (IV/PR) terminals on the MT2300 controller.

NOTE 2: All plumbing connections are made the same, whether or not the unit has valve packages. Plumbing connections must conform with local piping and building codes. The ability to remove the unit in order to perform repairs is imperative.

Figure 22: MT2300 wiring to an existing motorized valve from a previously installed unit with MicroTech III controller



NOTE: If reusing a motorized valve on an existing Daikin Applied R-410A unit, the wiring harness for connections 1, 2, and 3 for the R32 product are different. Therefore, the wiring connections (Common, N.O., and N.C.) to the motorized valve must be rewired.

Electrical

⚠ WARNING

All field installed wiring must comply with local and national electrical codes. This equipment presents hazards of electricity, rotating parts, sharp edges, heat and weight. Failure to read and follow these instructions can result in property damage, personal injury, or death. This equipment must be installed by experienced, trained personnel only.

⚠ WARNING

Use copper conductors only. Conductor insulation must be rated for a minimum temperature of 167°F (75°C).

⚠ CAUTION

Fasteners should not be screwed into and penetrate the unit enclosure to avoid damage to internal electrical and mechanical components.

Table 17: Operating Voltages

Voltage	Minimum	Maximum
115/60/1	103	126
208-230/60/1	197	253
265/60/1	238	292
208-230/60/3	197	253
460/60/3	414	506
575/60/3	515	632

NOTE 1: Three-phase system imbalance shall not exceed 2%.

NOTE 2: Use a short length of flexible conduit at the unit connection to minimize and isolate vibration to the building. All conduit should be supported to avoid contact with unit cabinet or immediate building structure to prevent unnecessary noise.

NOTE 3: All 208-230 volt single-phase and three-phase units are factory wired for 208 volt operation. When installing a 208-230 volt unit, ensure the correct wire is connected to the transformer.

230 Volt Operation

All 208-230 volt single-phase and three-phase units are factory wired for 208 volt operation. For 230 volt operation, the RED primary lead wire from the transformer must be disconnected from contactor, and replaced with the ORANGE wire from the transformer. See Figure 23.

Three-Phase Line Voltage (208-230, 460, 575V)

⚠ DANGER

LOCKOUT/TAGOUT all power sources prior to wiring or servicing the unit. Hazardous voltage can cause serious injury or death. Disconnect electric power before servicing equipment. More than one disconnect may be required to de-energize the unit.

1. Route line voltage supply wiring through the lower 1-1/8″ diameter knockout in the left corner post.
2. Wires should extend through the lower left side of the control box. Route wires through wire ties where provided.
3. Remove and discard the factory provided stripped wire leads from the left side unit contactor screw terminals (not shown).
4. Connect the field supplied wires to the left side contactor screw terminals as shown in Figure 24.
5. Connect ground wire to provided (green) ground screw.
6. Twist neutral wires and wire nut (460V units only).

Figure 23: For 230 Volt Operation, Disconnect the RED Transformer Wire at the Contactor and Replace with the ORANGE Wire

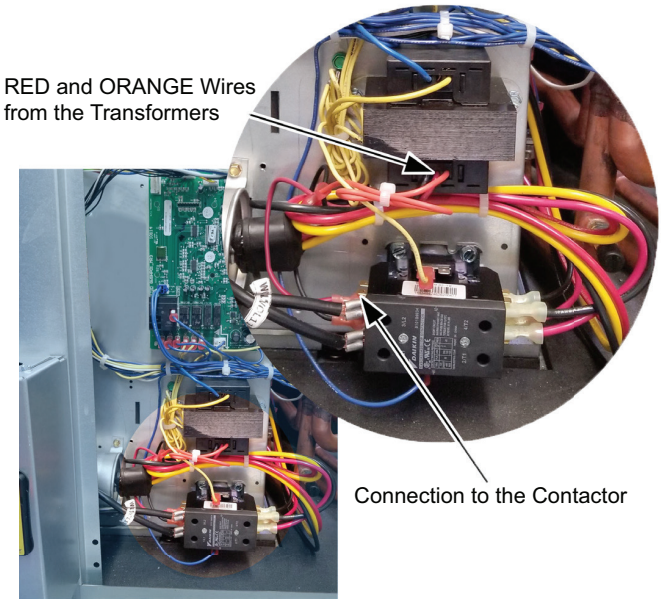
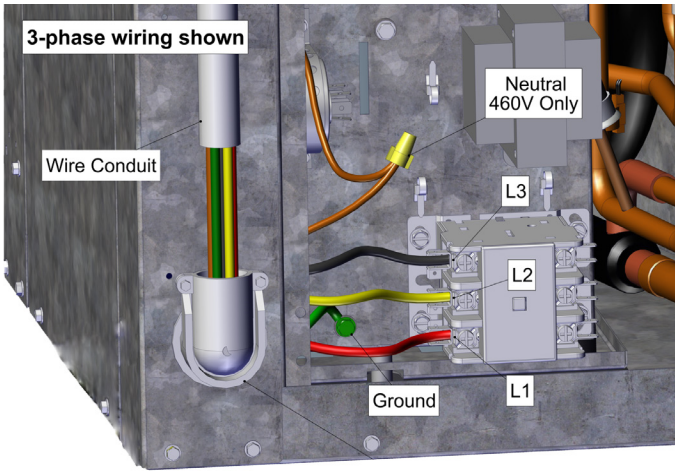


Figure 24: Route Line Voltage Wires to Terminal Screws



NOTE: Units without constant CFM ECM will not include a neutral conductor. For clarity, not all unit wires are shown in the unit line voltage connection area.

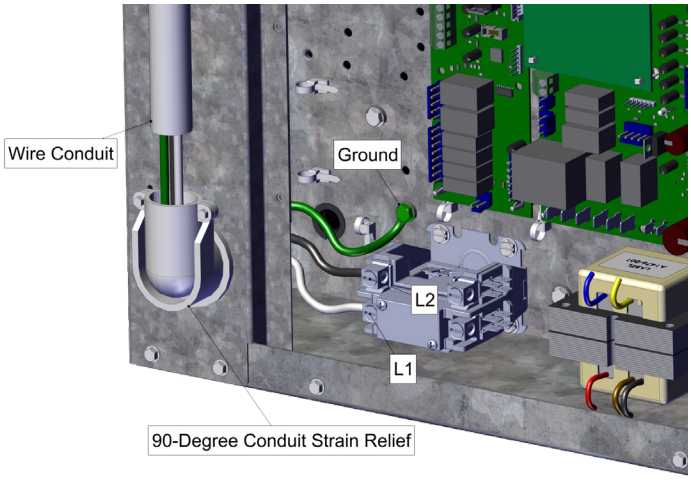
Single Phase Line Voltage (115, 208-230, 265V)

⚠ DANGER

LOCKOUT/TAGOUT all power sources prior to wiring or servicing the unit. Hazardous voltage can cause serious injury or death. Disconnect electric power before servicing equipment. More than one disconnect may be required to de-energize the unit.

1. Route line voltage supply wiring through the lower 1-1/8″ diameter electrical knockout in the left corner post.
2. Route wires through wire ties where provided.
3. Connect the field supplied wires to the left side contactor screw terminals as shown in Figure 25.
4. Secure ground wire to (green) ground screw.

Figure 25: Line Voltage Wiring Route to Wire Connections



Line Voltage Electrical Connections with Disconnect – 115-575V

⚠ DANGER

LOCKOUT/TAGOUT all power sources prior to wiring or servicing the unit. Hazardous voltage can cause serious injury or death. Disconnect electric power before servicing equipment. More than one disconnect may be required to de-energize the unit.

When units are equipped with the optional non-fused disconnect switch, the line voltage supply is brought in through the top of the junction box. Disconnect location and dimension details are provided in Figure 26.

NOTICE

The disconnect location may vary depending on the return air handing. See Figure 26. Right-hand unit shown, with switch mounted on the opposite corner post from return air.

460V units with constant CFM ECM require a neutral conductor. See number bubble “6” in Figure 26.

1. Remove screws from the top and bottom locations on the disconnect switch cover.
2. These are the factory-installed wires from the switch to the line voltage terminals in the unit control box.
3. Connect wires to the upper unused terminals.
4. Tighten terminal screws to secure wires.
5. Connect ground wire to provided green ground screw.
6. Connect field provided neutral conductor, if required.
7. Replace cover and secure with screws.

Figure 26: 460V Wiring with Neutral Wire (Constant CFM ECMs Only) to The Non-Fused Disconnect Switch

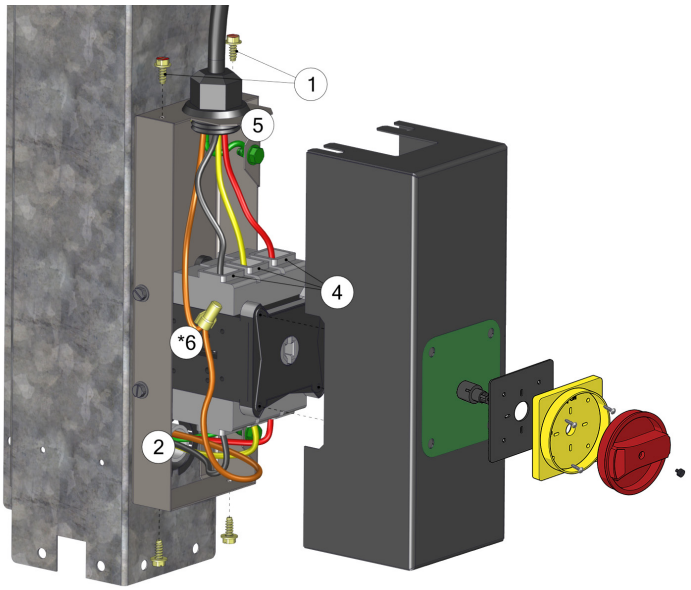


Figure 27: Unit with Optional Non-Fused Disconnect Switch

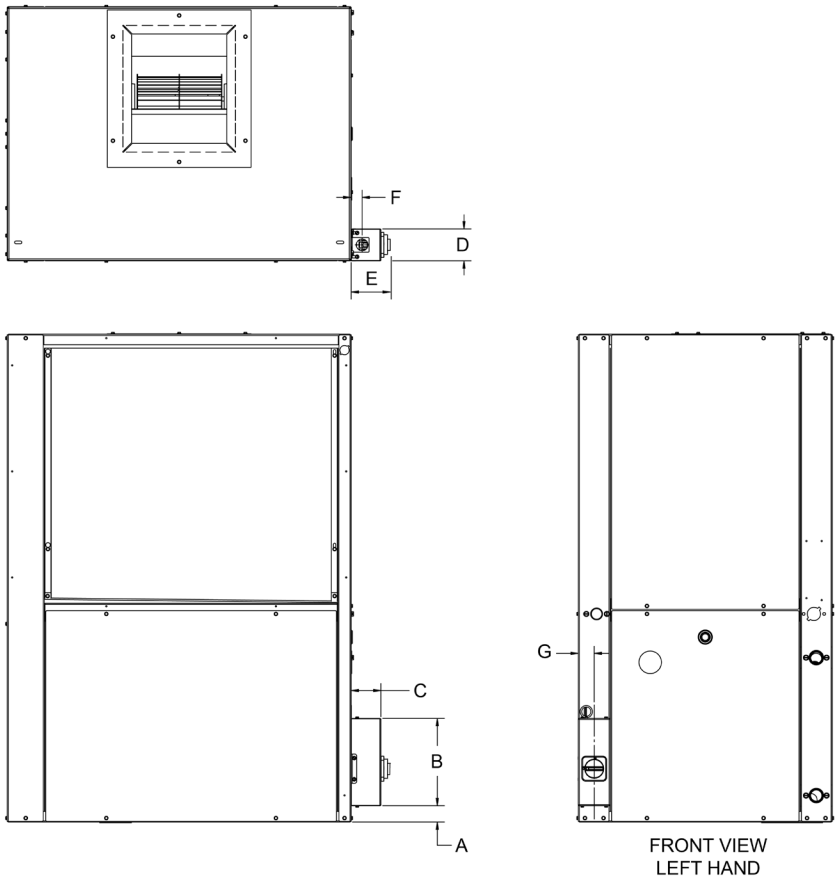


Table 18: Optional Non-Fused Disconnect Switch Dimensions (in) for Figure 27

Unit	A	B	C	D	E	F	G
WSCV, WSDV	2	8	3	3	4	1	2
WSMV, WSNV	2	8	3	3	4	1	2
WSSV, WSTV	2	8	3	3	4	1	2

NOTE: Dimensions are approximate.

Low Voltage Wire Connections

NOTICE

Never install relay coils in series or parallel with the thermostat inputs.

NOTICE

Units equipped with dehumidification control require installation of a factory supplied return air sensor connected to I/O H4-3/4 terminal. See Figure 49 on page 53 for details.

1. Route the field-supplied low voltage wiring through the upper knockout in the left corner post as shown in Figure 13.
2. Secure the low voltage wire connections to the terminals shown in Figure 28 and Figure 29. Refer to "Typical Connections for Thermostats & Temperature Sensors Applications" on page 53 for I/O Expansion Module terminal TB1 connections.

Figure 28: Terminal Connection Locations on the MicroTech Board

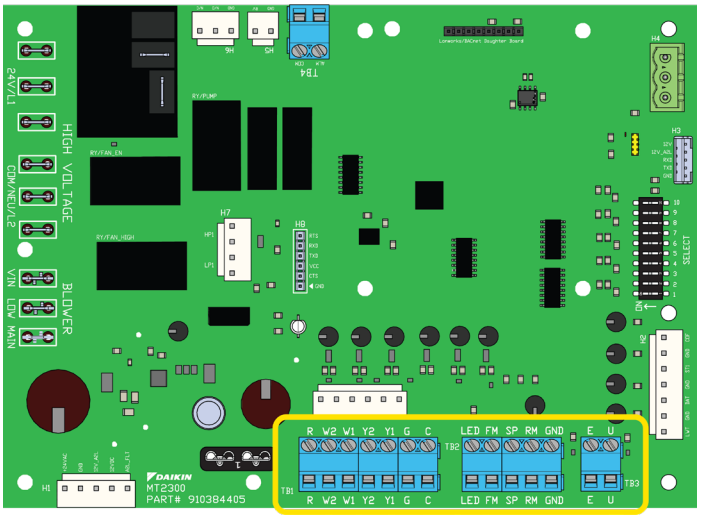
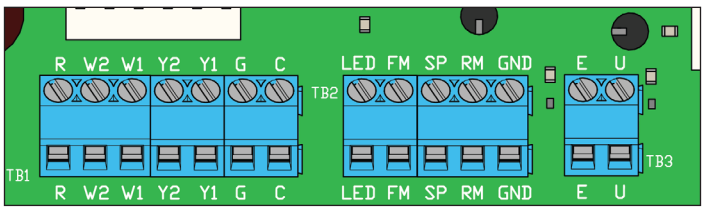


Figure 29: Terminal Connections TB1 (Thermostat Control) and TB2 (Sensor Control) on the MicroTech Board



Control Wiring Schematics

Figure 30: MicroTech Unit Control with PSC Motor - 115 Volt

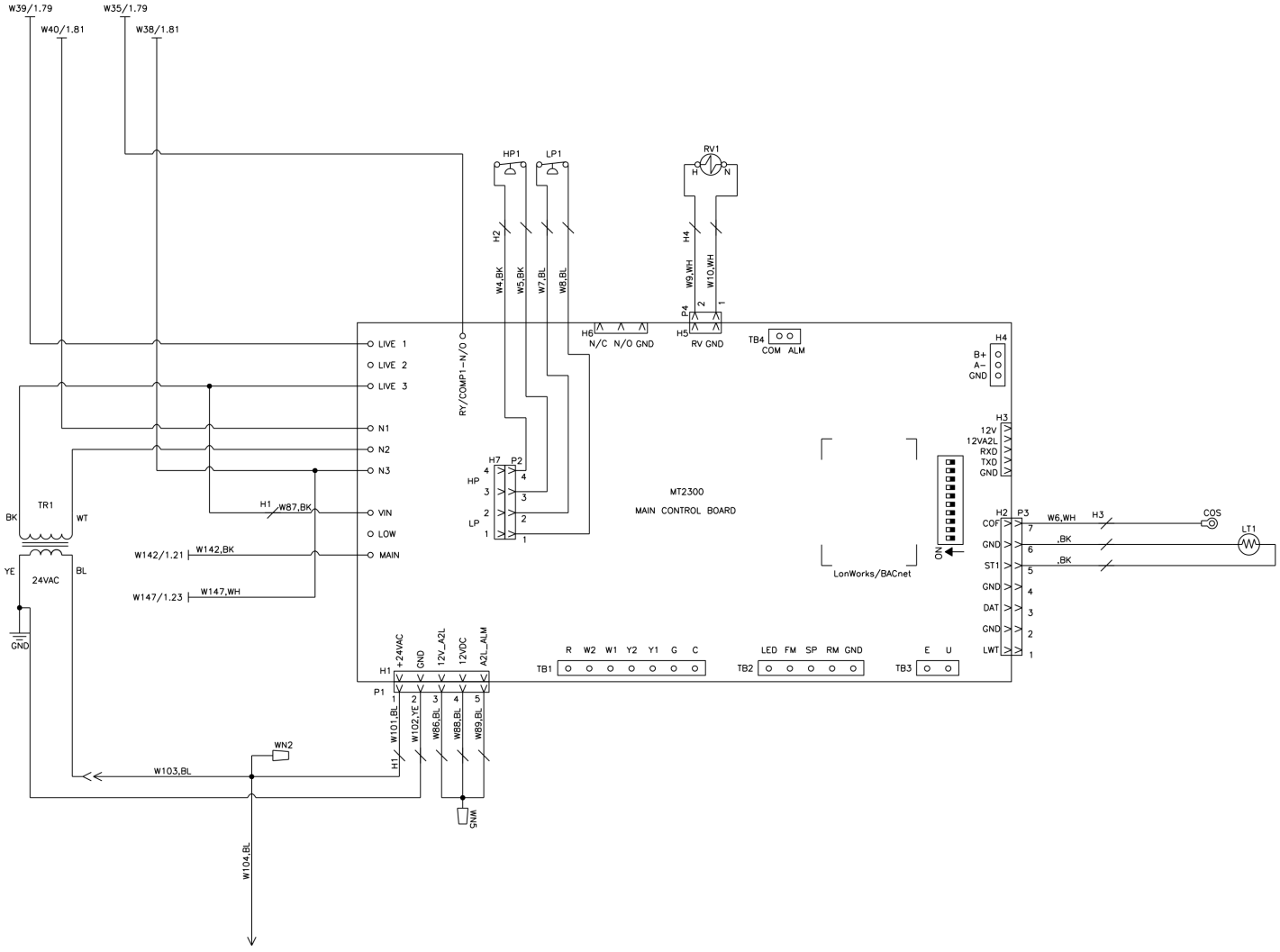


Figure 31: MicroTech Unit Control with PSC Motor - 208-230, 265, 460, 575 Volt

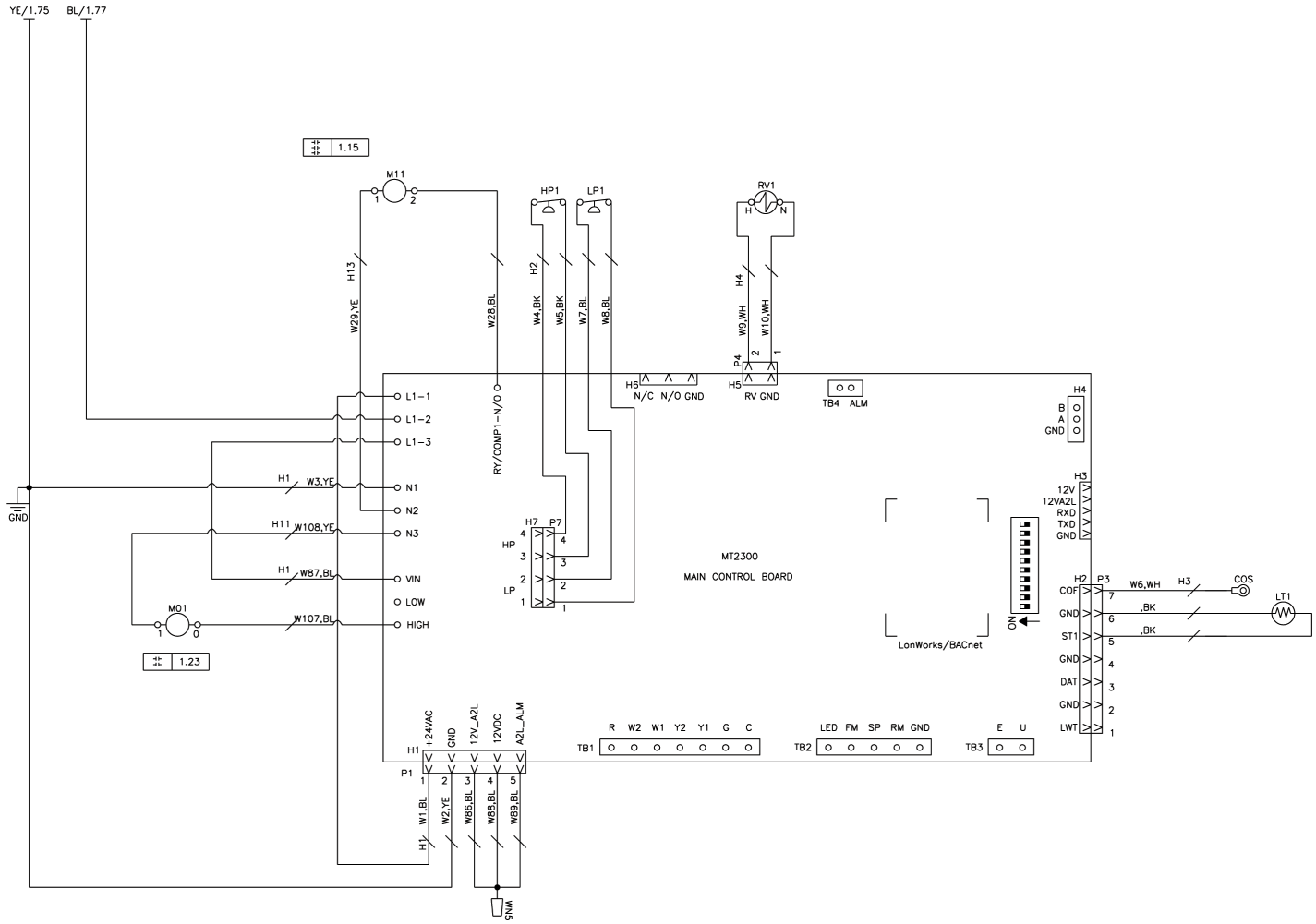


Figure 32: MicroTech Unit Control with Constant Torque ECM - Sizes 007-012

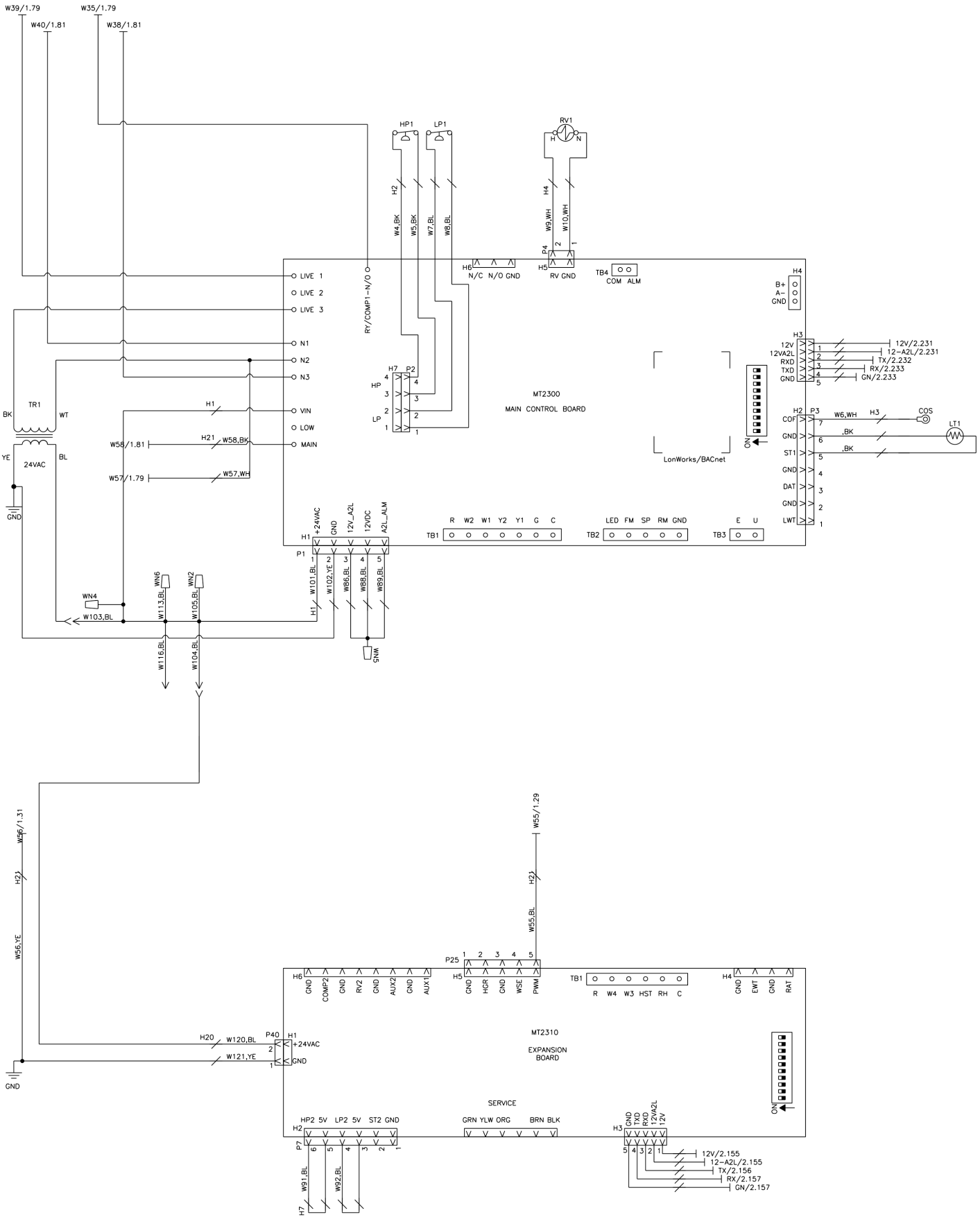


Figure 33: MicroTech Unit Control with Constant Torque ECM with Waterside Economizer

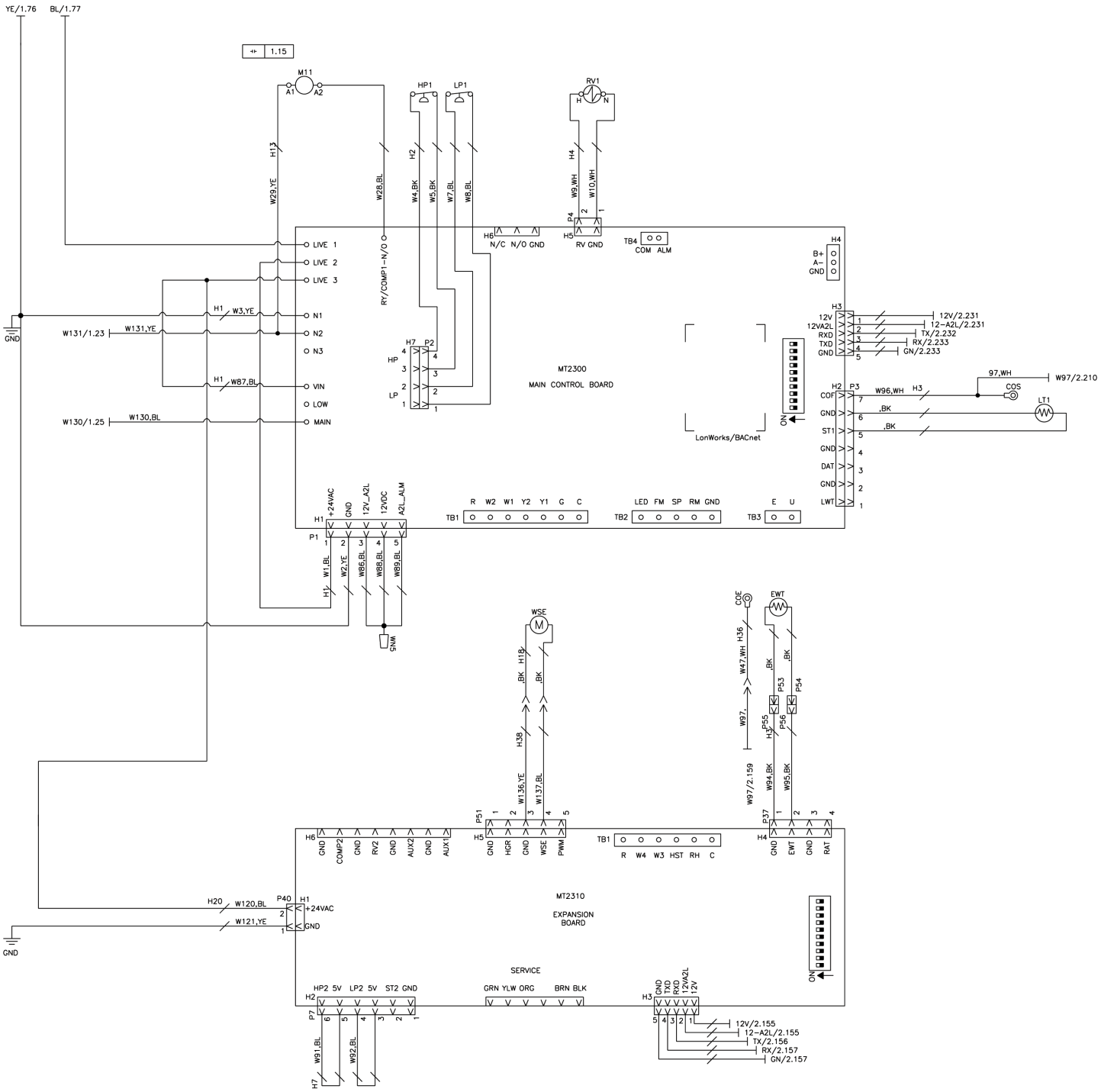


Figure 34: MicroTech Unit Control with Constant CFM ECM with Hot Gas Reheat

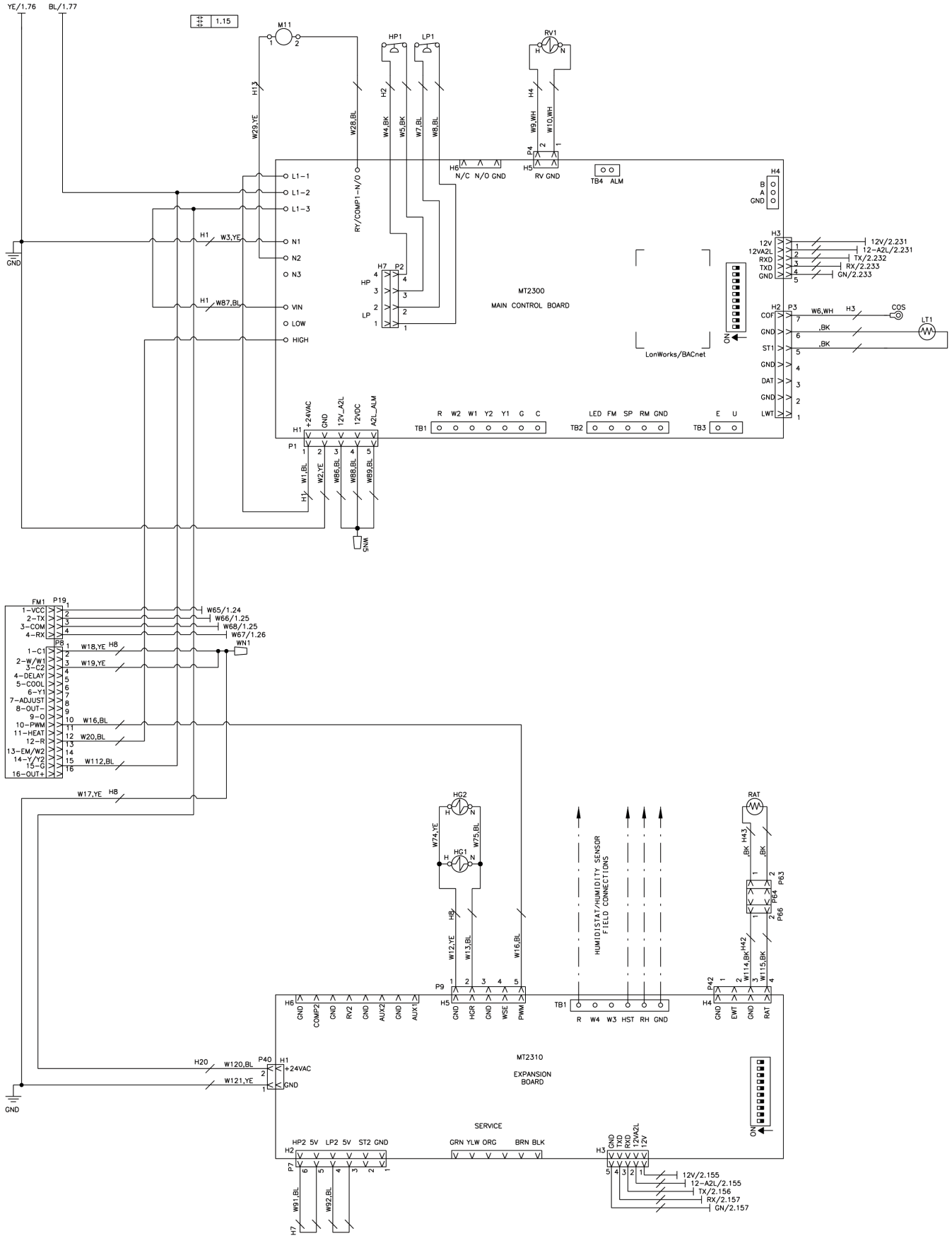


Figure 35: MicroTech Unit Control with Constant CFM ECM - Two Stage Unit

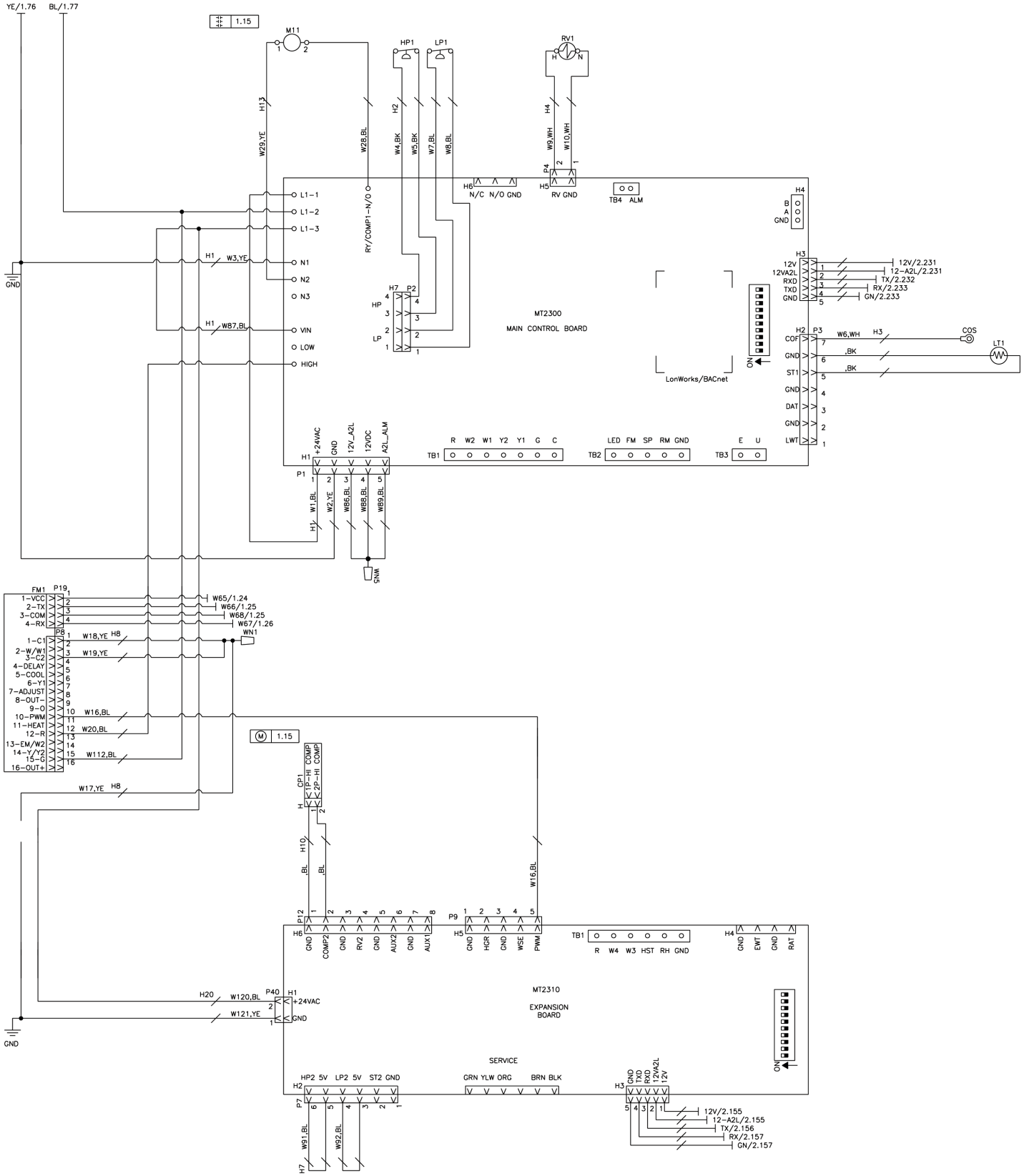


Figure 36: MicroTech Unit Control with Constant CFM ECM with Electric Heat Control Wiring

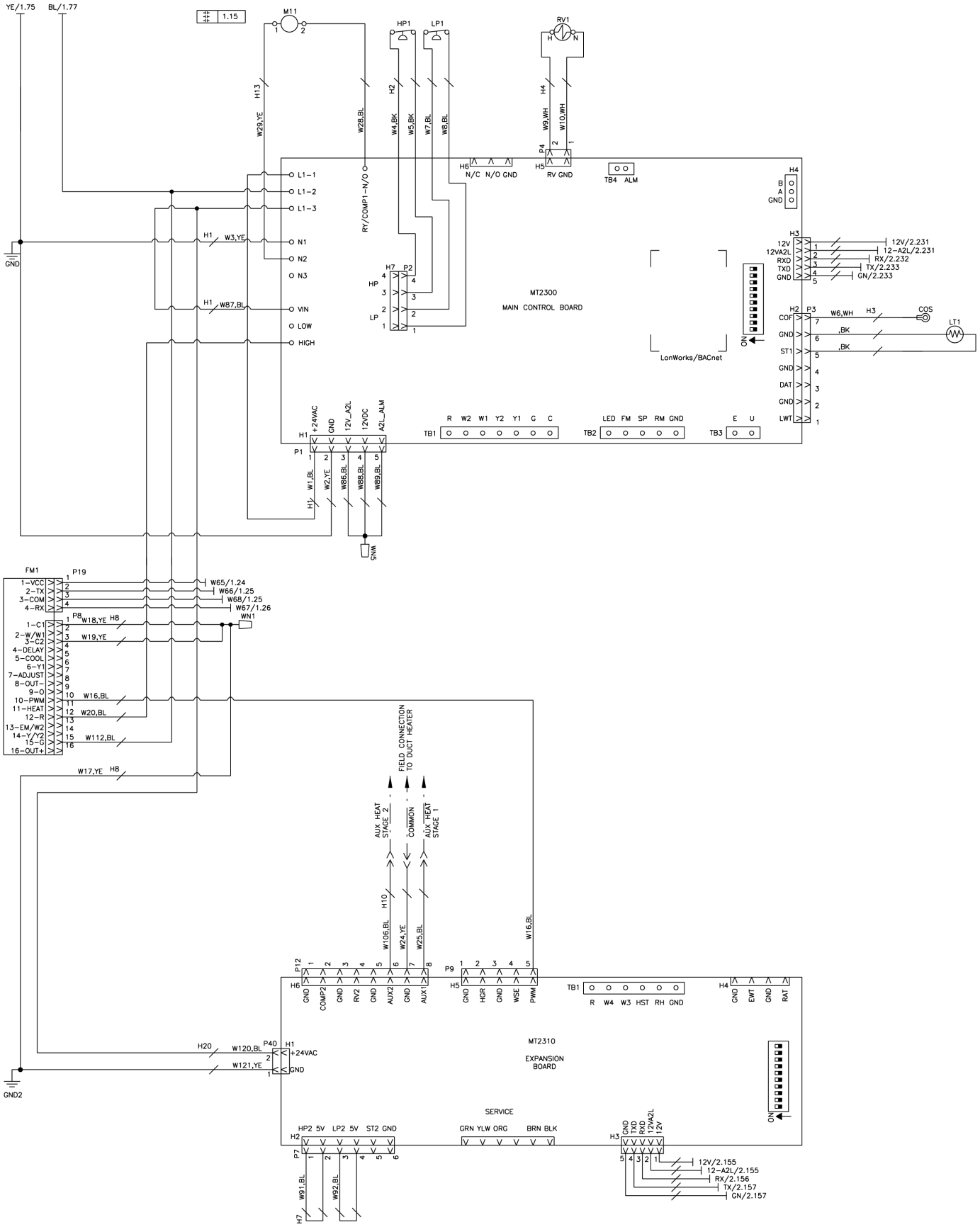
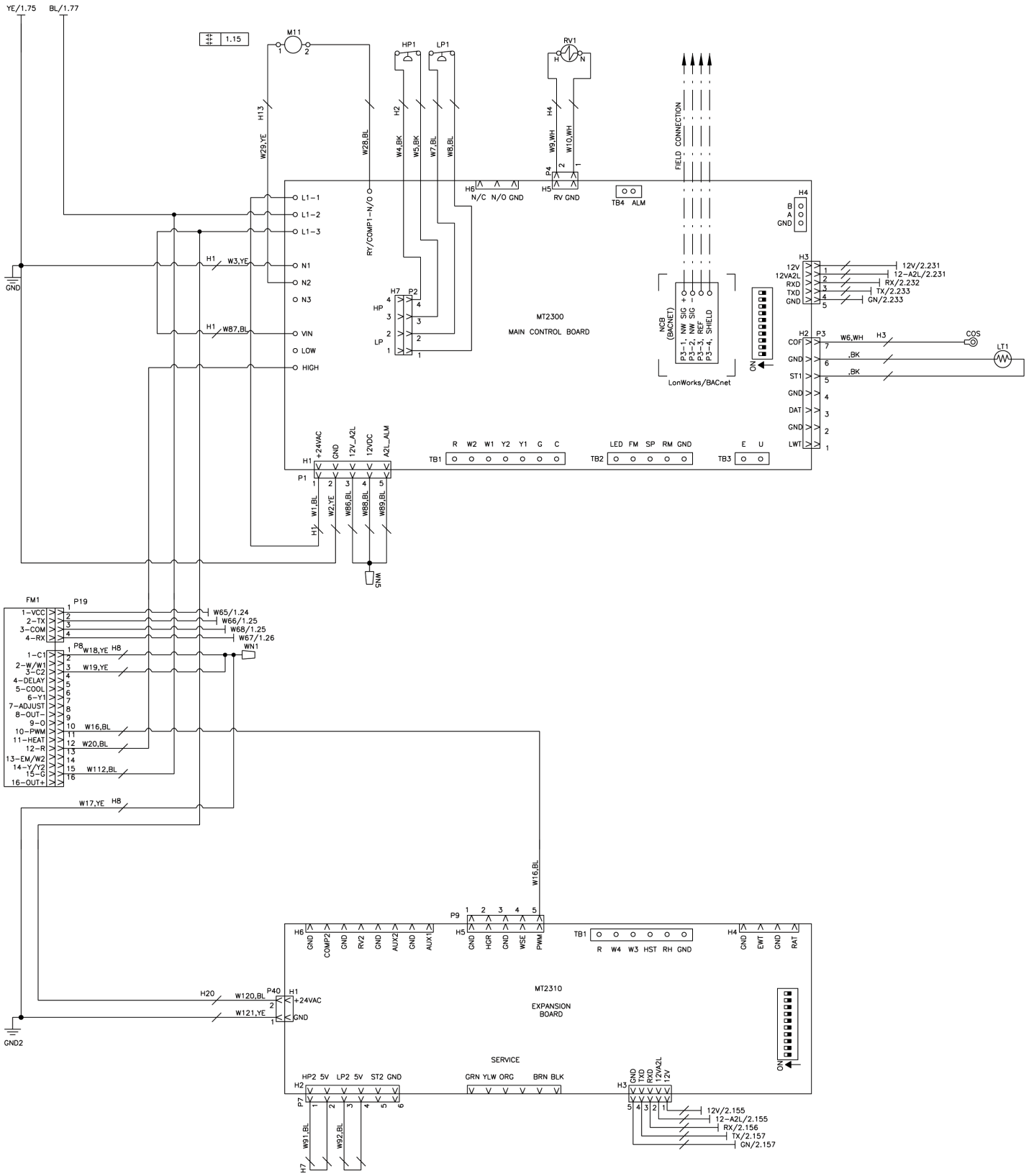


Figure 37: MicroTech Unit Control with Constant CFM ECM with BACnet Communication Module



Line Voltage Wiring Schematics

Figure 38: 115V/60Hz/1Ph with PSC Motor

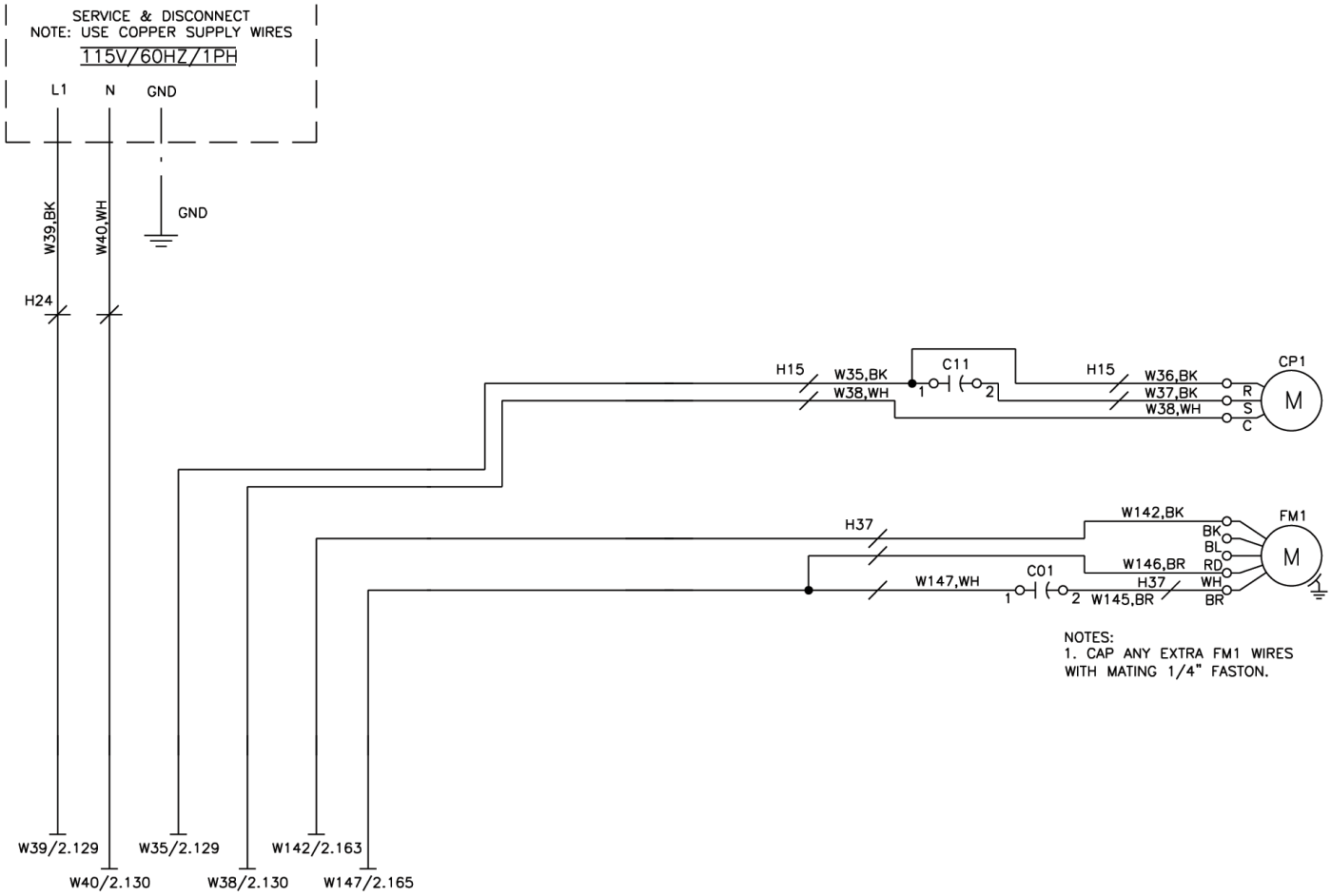


Figure 39: 115V/60Hz/1Ph with Constant Torque ECM - Sizes 007-012

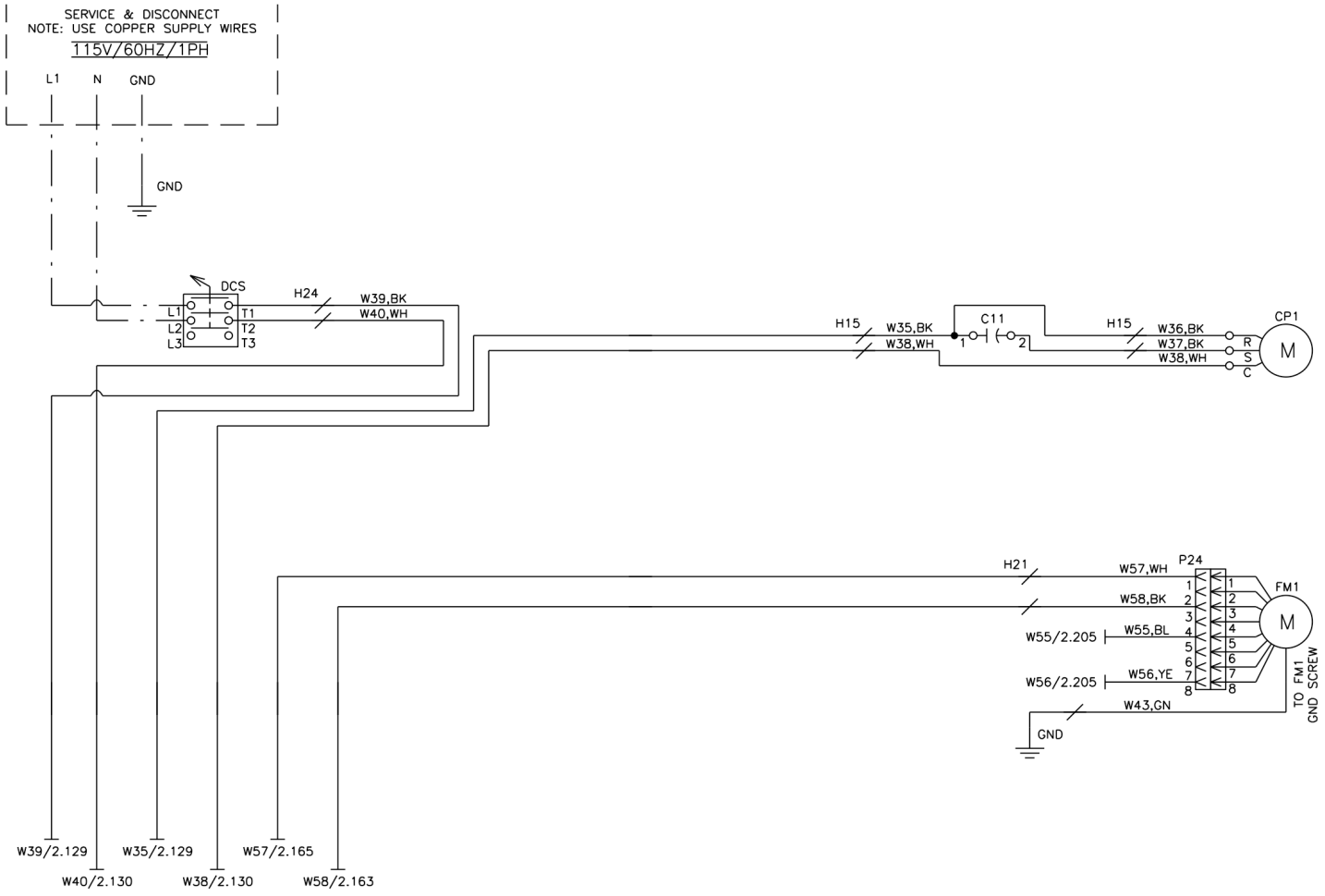


Figure 40: 265V/60Hz/1Ph with Constant Torque ECM - Sizes 015-070

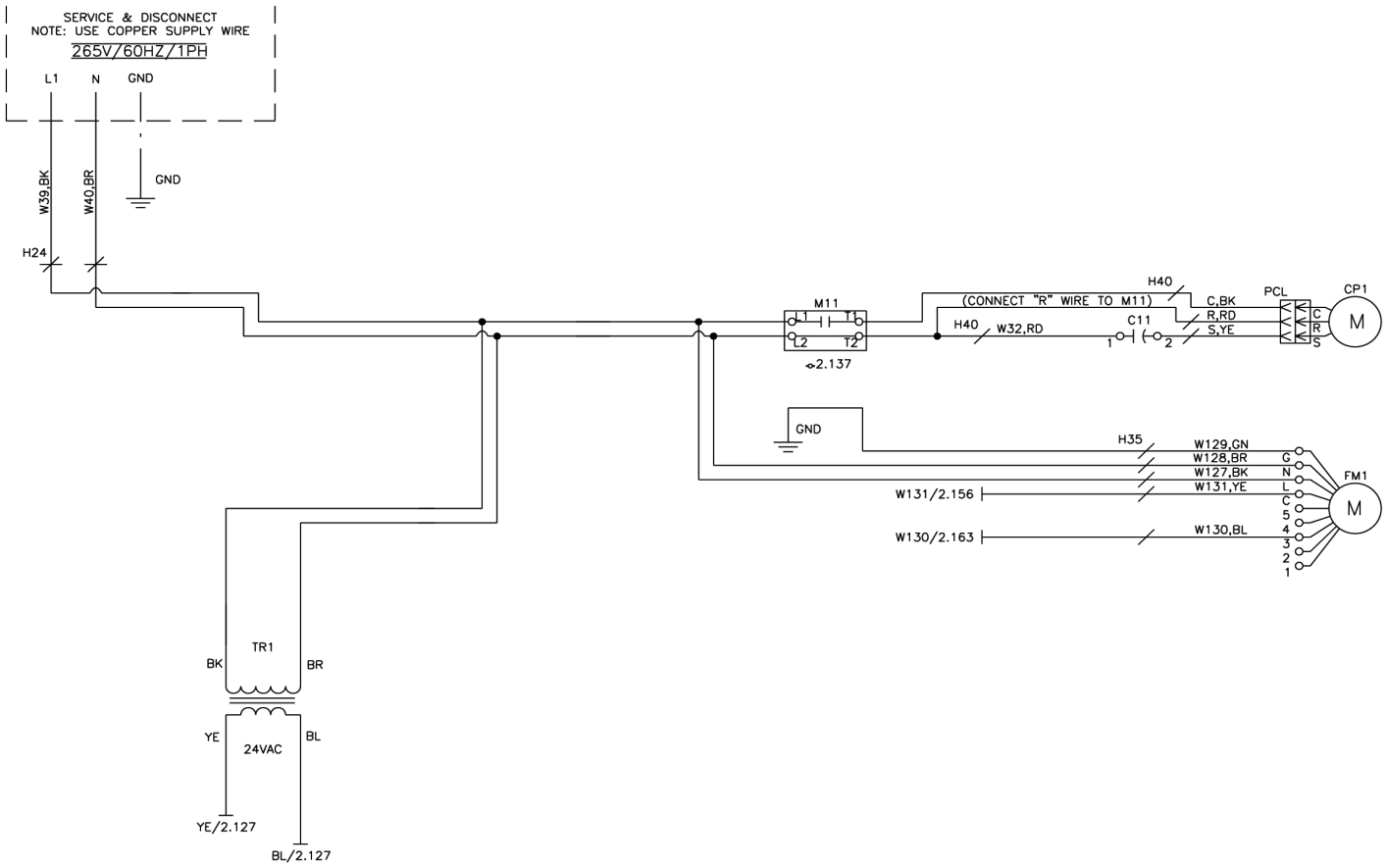


Figure 41: 208-230V/60Hz/3Ph with Constant Torque ECM - Sizes 015-070

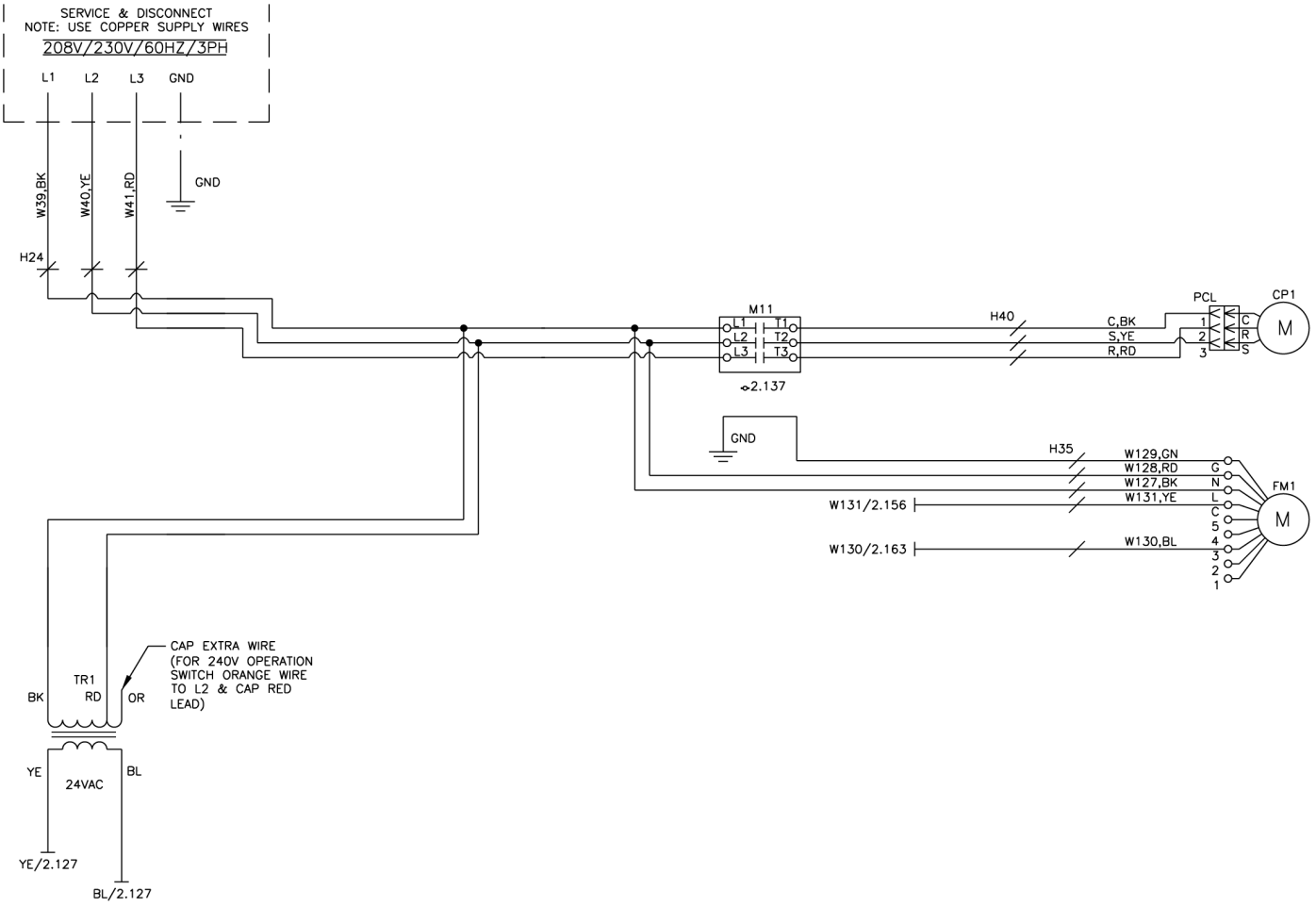


Figure 42: 265V/60Hz/1Ph, 208-230V/60Hz/1Ph with PSC Motor

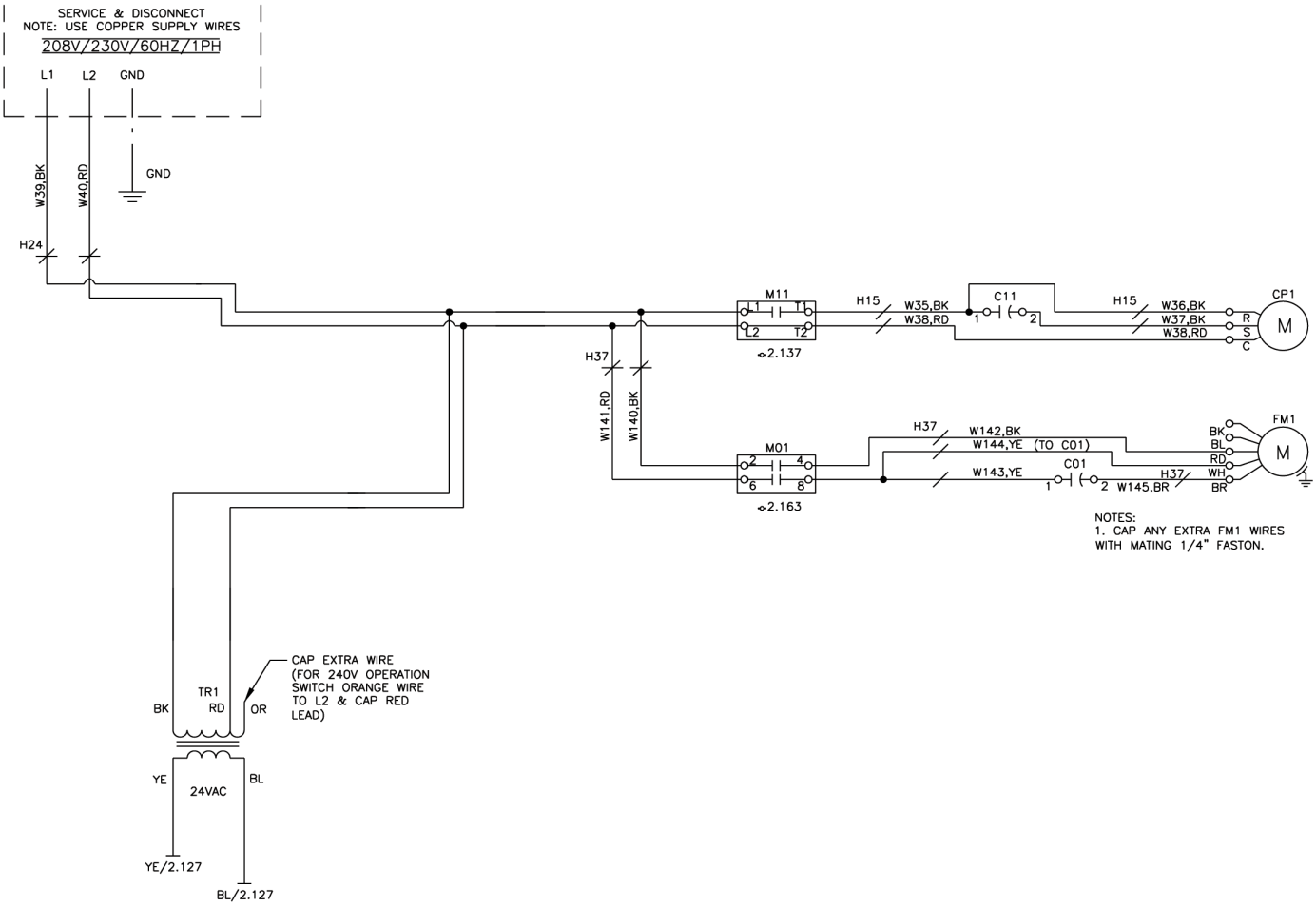


Figure 43: 460V/60Hz/3Ph, 575V/60Hz/3Ph, 208-230V/60Hz/3Ph with PSC Motor

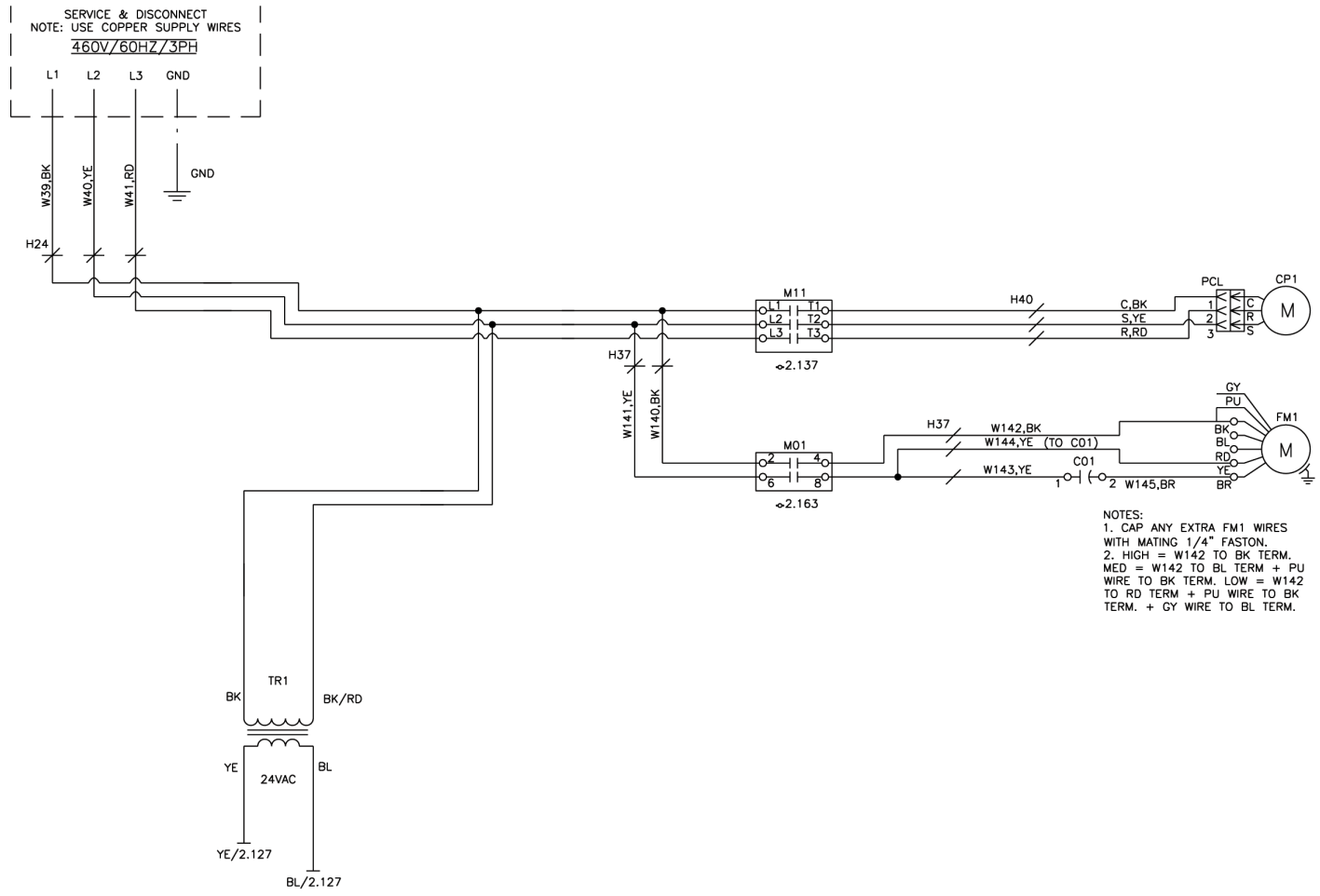


Figure 44: 208-230V/60Hz/3Ph with Constant CFM ECM Two Stage

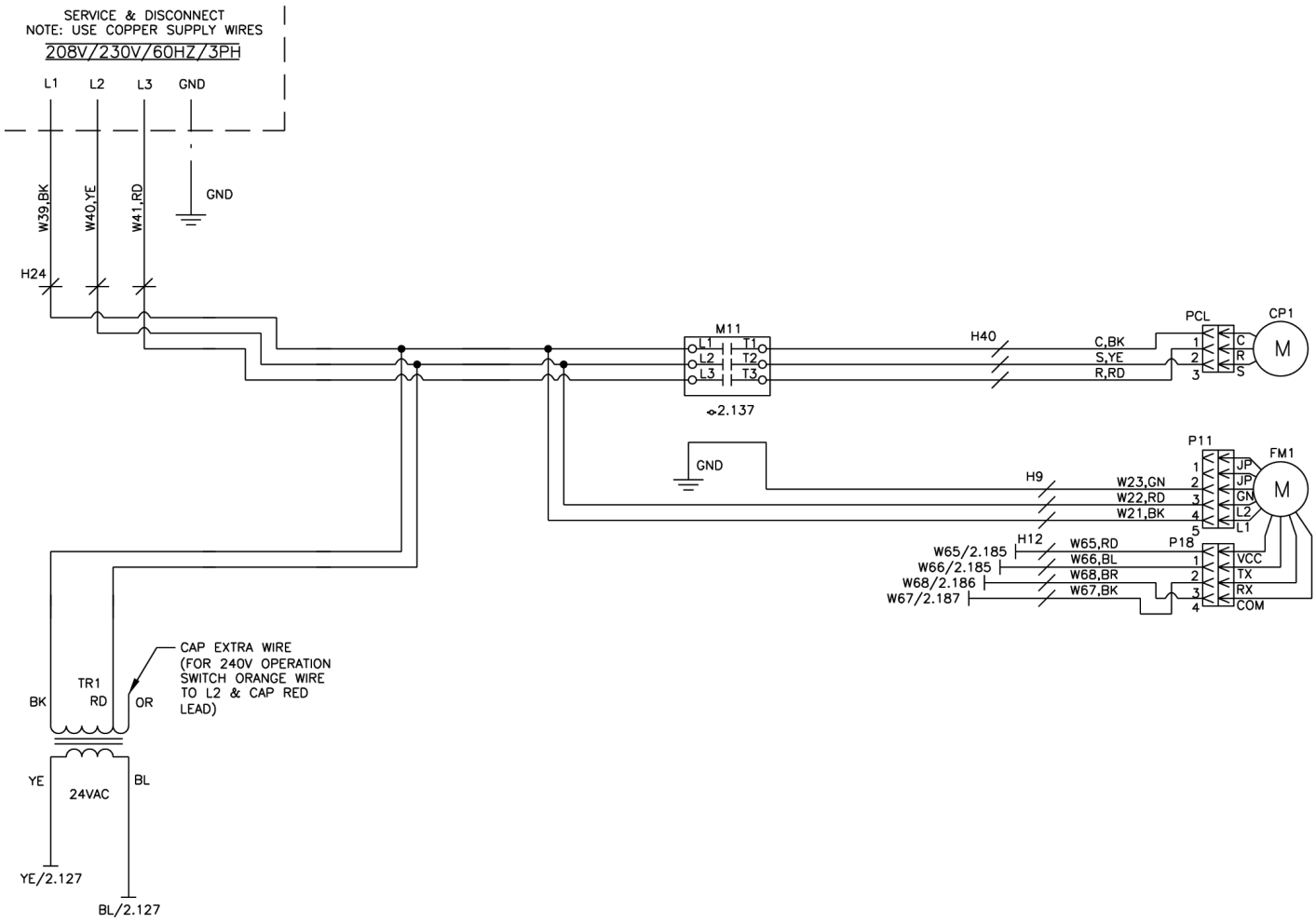
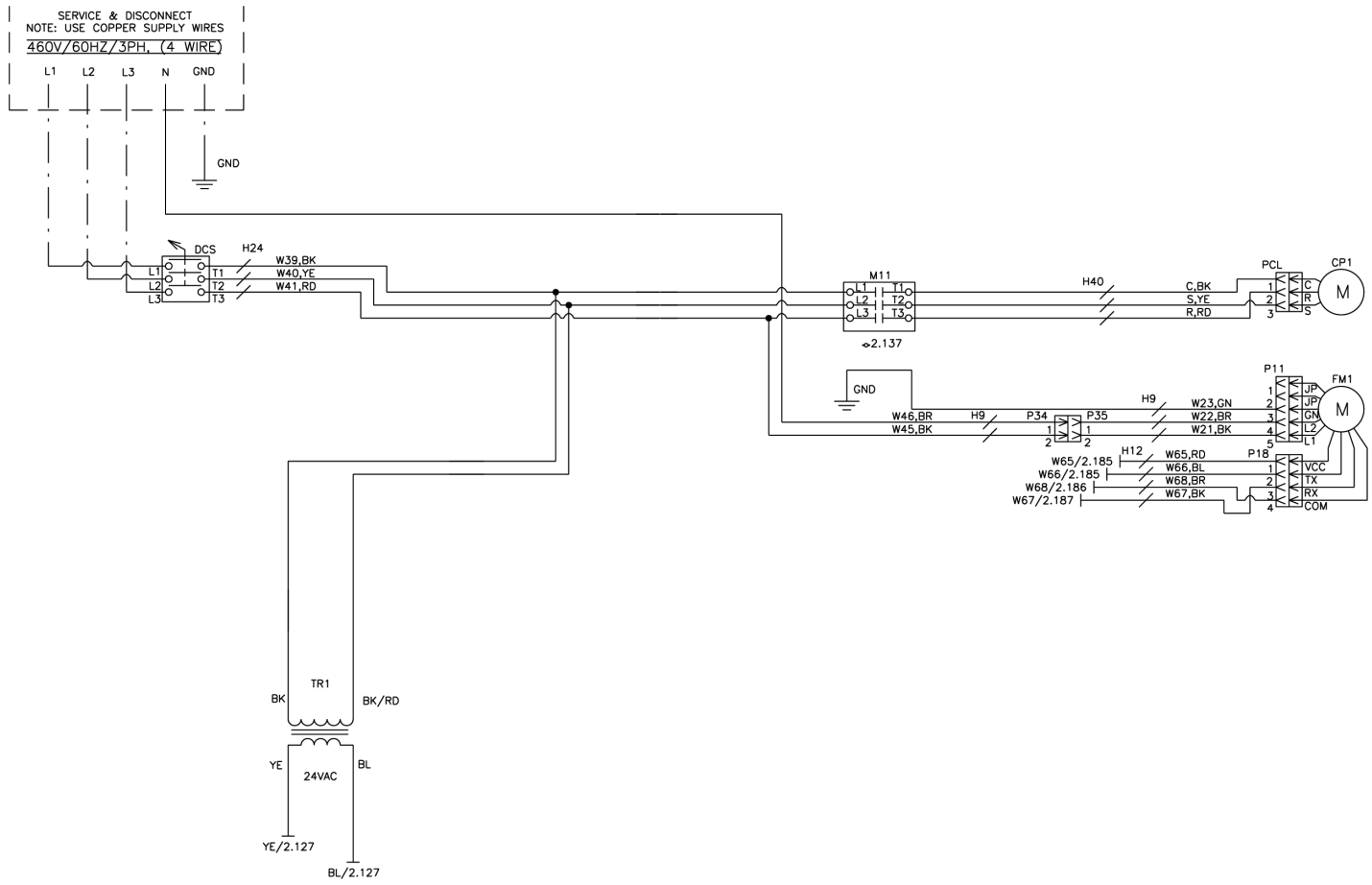


Figure 45: 460V/60Hz/3Ph with Constant CFM ECM with Electric Heat Control



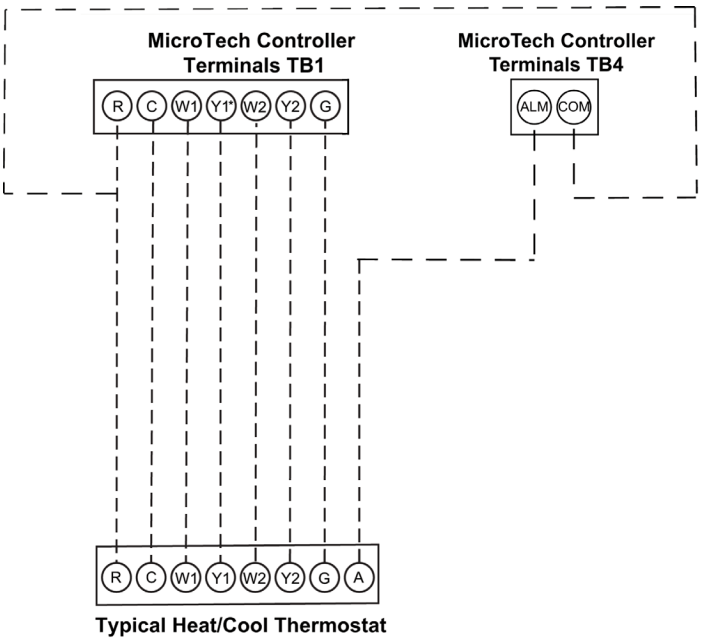
Wiring Schematics Legend for "Control Wiring Schematics"

LEGEND			
C01-04	Fan Motor 1-4 Capacitor	**MCB**	Main Control Board
C11	Compressor 1 Capacitor	**NCB**	Network Control Board
CP1	Compressor 1	**OLP**	Overload Protector - Compressor Motor
COE	Condensate Overflow Protection Sensor - WSE	**P1-^**	Wire Plug
COS	Condensate Overflow Protection Sensor	**PCL**	Wire Plug Assy - Compressor Power
DAT	Discharge Air Temperature Sensor	**PCL2**	Wire Plug Assy - Two Stage Comp Ctrl
DCS	Disconnect Switch	**PDS**	Pressure Differential Switch
EB1	Expansion Control Board 1	**R15**	Relay, Field Contacts, Alarm Output
EH1	Electric Heat	**R25**	Relay, Hot Gas Reheat
EWT	Entering Water Temperature Sensor	**RAT**	Return Air Temperature Sensor
FM1-4	Fan Motor 1-4	**RV1**	Reversing Valve 1
FU1-4	Fuse 1-4	**TB1**	Terminal Block, Line Voltage
GND	Ground	**TB2**	Terminal Block, 24V
H1-^	Wire Harness	**TB3**	Terminal Block, EH1 Line Voltage
HG1	Hot Gas Reheat Valve Actuator	**TR1**	Transformer - Control
HP1	High Pressure Switch 1	**TR2**	Transformer - Fan Motor
HUM	Humidistat Sensor	**TSL**	Thermostat, Wireless
HYH	Hot Water Heat Valve Actuator	**TSW**	Thermostat, Wired (Unit Mounted)
ISO	Water Flow Isolation Valve Actuator	**W0001**	Wire
LAT	Leaving Air Temperature Sensor	**W1-^**	Wire
LP1	Low Pressure Switch 1	**WH001**	Wire Harness
LT1	Compressor Suction Line Temperature Sensor 1	**WN1**	Wire Nut
LWT	Leaving Water Temperature Sensor	**WN1-^**	Wire Nut
M01-04	Fan Motor Contactor 1-4	**WP001**	Wire Plug
M11	Compressor 1 Contactor	**WSE**	Waterside Economizer Actuator
M70,71	Secondary Heat Contactor		

NOTE: Devices in legend may or may not be on unit.

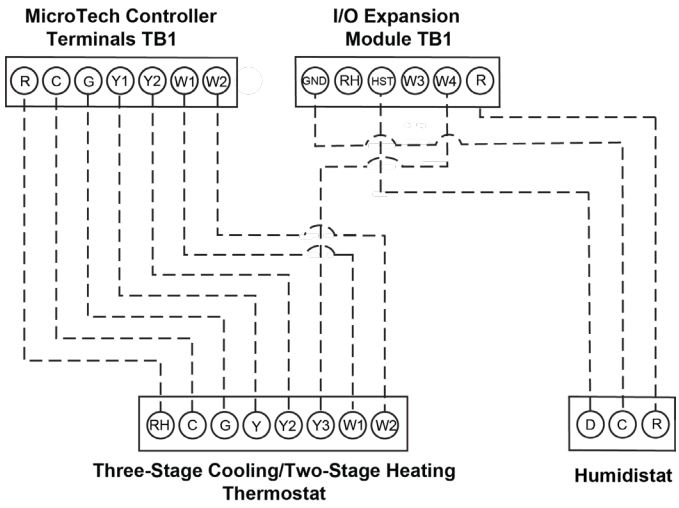
Typical Connections for Thermostats & Temperature Sensors Applications

Figure 46: Wiring Example of Typical Heat/Cool Thermostat Connections



NOTE: *For single stage operation, wire Y1 from thermostat to Y2 terminal on the MicroTech control board.

Figure 47: Wiring Example for Three-Stage Thermostat with Waterside Economizer and Hot Gas Reheat



NOTE: For dehumidification with waterside economizer applications, the W4 connection On I/O Expansion Module is used as the third stage of cooling and to achieve rated capacity.

Figure 48: Return Air Temperature Sensor (RAT) Locations

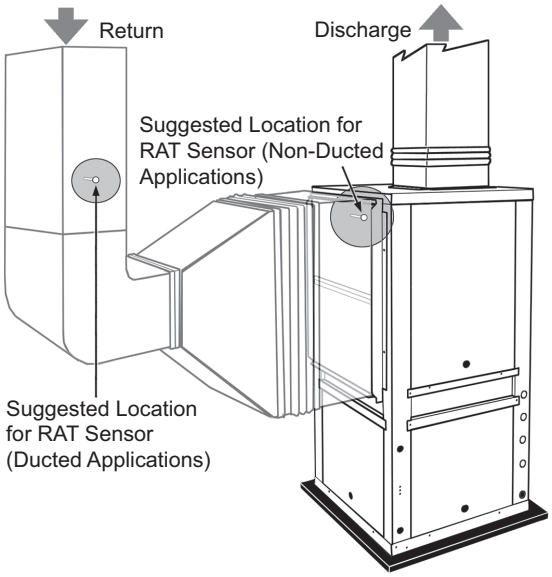
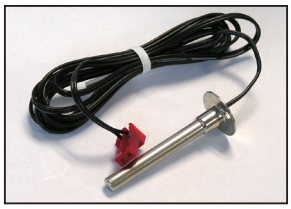
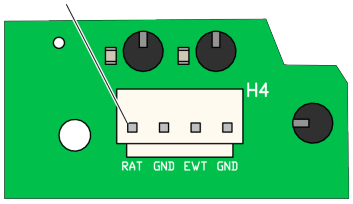
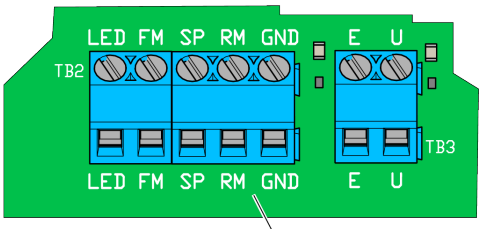


Figure 49: Units Equipped with Dehumidification and Thermostat Control



H4-4 Return Air Temp (RAT) for units with the I/O Expansion Board





TB2 RM and GND on the main MicroTech board

NOTE 1: For units with the I/O expansion board, the factory supplied return air sensor (RAT) connects to I/O H4-3/4 terminal. For units without an I/O expansion board, the RAT can be wired to the RM and GND inputs of TB2 located on the main MicroTech board.

NOTE 2: If connecting the RAT to the room sensor's input, note

that the BACnet will register a reading for local space temperature instead of return air temperature.

Figure 50: Basic Room Sensor Wiring

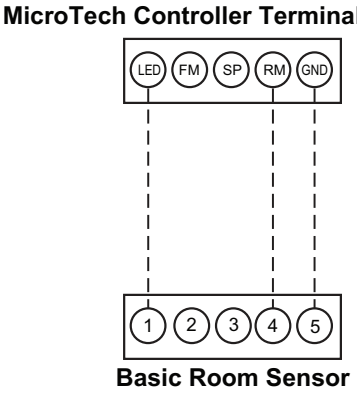


Figure 51: Example Wiring of SmartSource MicroTech Board to Basic Temperature Sensor Wiring

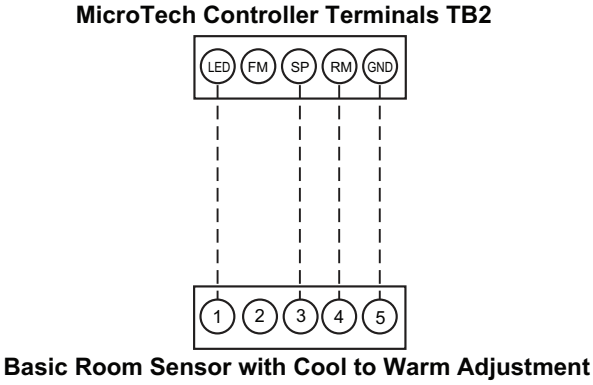


Figure 52: Room Sensor with Temperature Adjustment Wiring

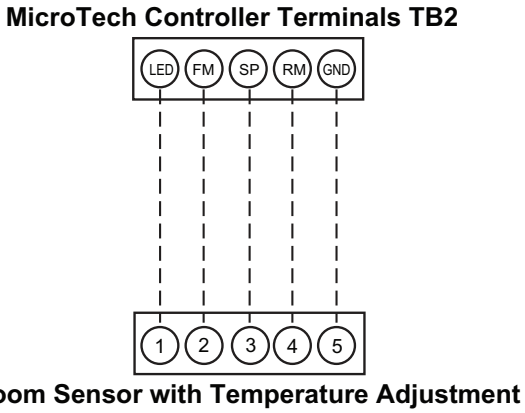


Figure 53: Digitally Adjustable Room Temperature Sensor Wiring

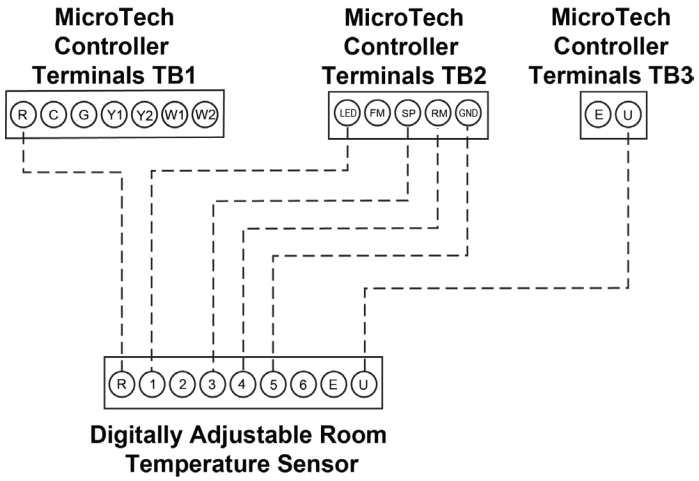
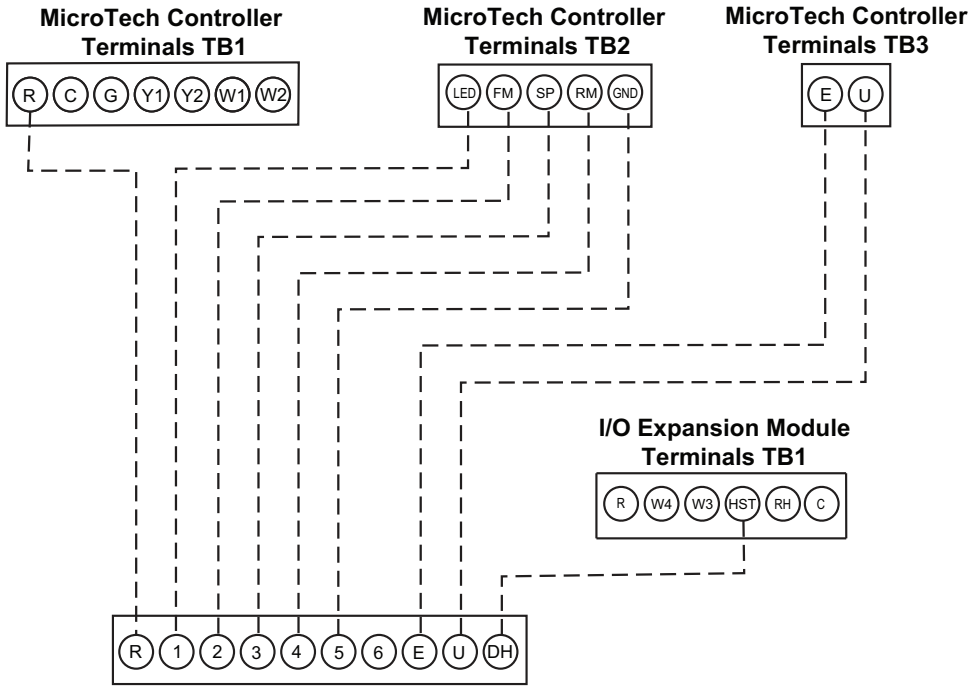


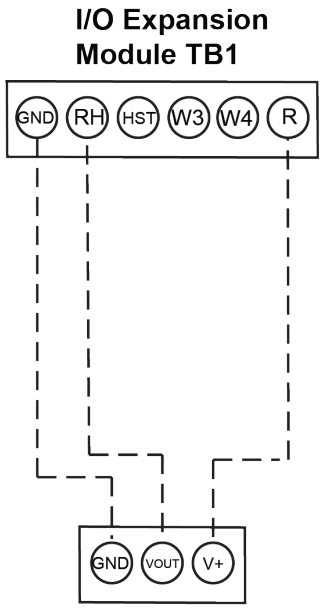
Figure 54: Digitally Adjustable Room Temperature and Humidity Sensor Wiring



Digitally Adjustable Room Temperature Sensor

NOTE: Terminal TB1 is used for optional dehumidification operation.

Figure 55: Analog Humidity Sensor Wiring



Analog Relative Humidity Sensor

NOTE: Analog humidity sensors are intended to be used in conjunction with a building management system to allow monitoring of relative humidity levels and adjustment of relative humidity setpoints for dehumidification. For standalone controller applications, a humidistat is recommended.

Operation

Start-Up

⚠ CAUTION

Units must be checked for water leaks upon initial water system start-up. Water leaks may be a result of mishandling or damage during shipping. Failure by the installing contractor to check for leaks upon start-up of the water system could result in property damage.

Check, Test & Start Procedure

NOTICE

Complete the "Water Source Heat Pump Equipment Check, Test and Start Form" on page 72.

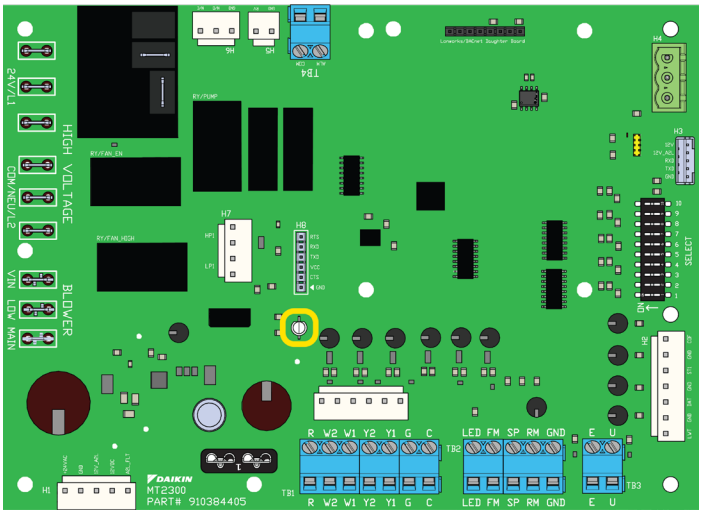
MT2300 Board LED Indicator

When the unit controller is communicating a certain fault or mode, the LED indicator will flash a designated pattern or sequence. See Figure 56 for the location of the MT2300 board LED indicator. Table 19 gives a description of the LED activity. Refer to OM 1364 for additional information.

Table 19: MT2300 Board LED Indicator Sequence

LED Activity	Type	Color	Description
1 Flash	Mode	Green	No Call for Heating/Cooling/ Dehumidification
2 Flash	Mode	Green	Call for Cooling
3 Flash	Mode	Green	Call for Heating
4 Flash	Mode	Green	Call for Fan Only

Figure 56: LED Indicator on MT2300 Board



Check as completed:

NOTICE

To prevent compressor cycling and all compressors from starting up together after loss of power, the required minimum on/off time default is 300 seconds plus the random restart of 0 to 60 seconds.

- □ Open all valves to full open position and turn on power to the unit.
- □ Set thermostat for "Fan Only" operation by selecting "Off" at the system switch and "On" at the fan switch. If "Auto" fan operation is selected, the fan will cycle with the compressor. Check for proper air delivery.
- □ Check the unit controller LED indicator for "Fan Only" mode operation.
- □ Set thermostat to "Cool." If the thermostat is an automatic changeover type, simply set the cooling temperature to the coolest position. On manual changeover types additionally select "Cool" at the system switch.
- □ Check the unit controller LED indicator for "Cool" mode operation.
- □ After a few minutes of operation, check the discharge grilles for cool air delivery. To insure proper water flow, measure the temperature difference between entering and leaving water. The temperature differential should be 10°F to 14°F (5°C to 8°C) for units in cooling mode. It should be approximately 1½ times greater than the heating mode temperature difference. For example, if the cooling temperature difference is 15°F (8°C), the heating temperature difference should have been 10°F (5°C).
- □ Without automatic flow control valves, target a cooling temperature difference of 10°F to 14°F (5°C to 8°C). Adjust the combination shutoff/balancing valve in the return line to a water flow rate which will result in the 10˚F to 14°F (5°C to 8°C) difference.
- □ Set thermostat to "Heat." If the thermostat is the automatic changeover type, set system switch to the "Auto" position and depress the heat setting to the warmest selection. With most control schemes, the fan will start immediately. After a few minutes of compressor operation, check for warm air delivery at discharge grille. If this is a "cold building" start-up, leave unit running until return air to the unit is at least 65°F (18°C).
- □ Check the unit controller LED indicator for "Heat" mode operation.
- □ Measure the temperature difference between entering and leaving air and entering and leaving water. With entering water of 60°F to 80°F (16°C to 27°C), leaving water should be 6°F to 12°F (3.3°C to 6.6°C) cooler, and the air temperature rise through the machine should not exceed 35°F (19°C). If the air temperature rise exceeds 35°F (19°C), then the air flow rate is inadequate.
- □ Check the elevation and cleanliness of the condensate line. If the air is too dry for sufficient dehumidification, slowly pour enough water into the condensate pan to ensure proper drainage.

- □ If the unit does not operate, check the following points:
  - — Is supply voltage to the machine compatible?
  - — Is thermostat type appropriate?
  - — Is thermostat wiring correct?
- □ If the unit operates but stops after a brief period:
  - — Is there proper airflow? Check for dirty filter or incorrect ductwork.
  - — Is there proper water flow rate within temperature limits? Check water balancing; back flush unit if dirt-clogged.
- □ Check for refrigerant piping rubbing against cabinet or other piping causing vibration. Check fan wheels, set screws, shaft, etc.

Controls

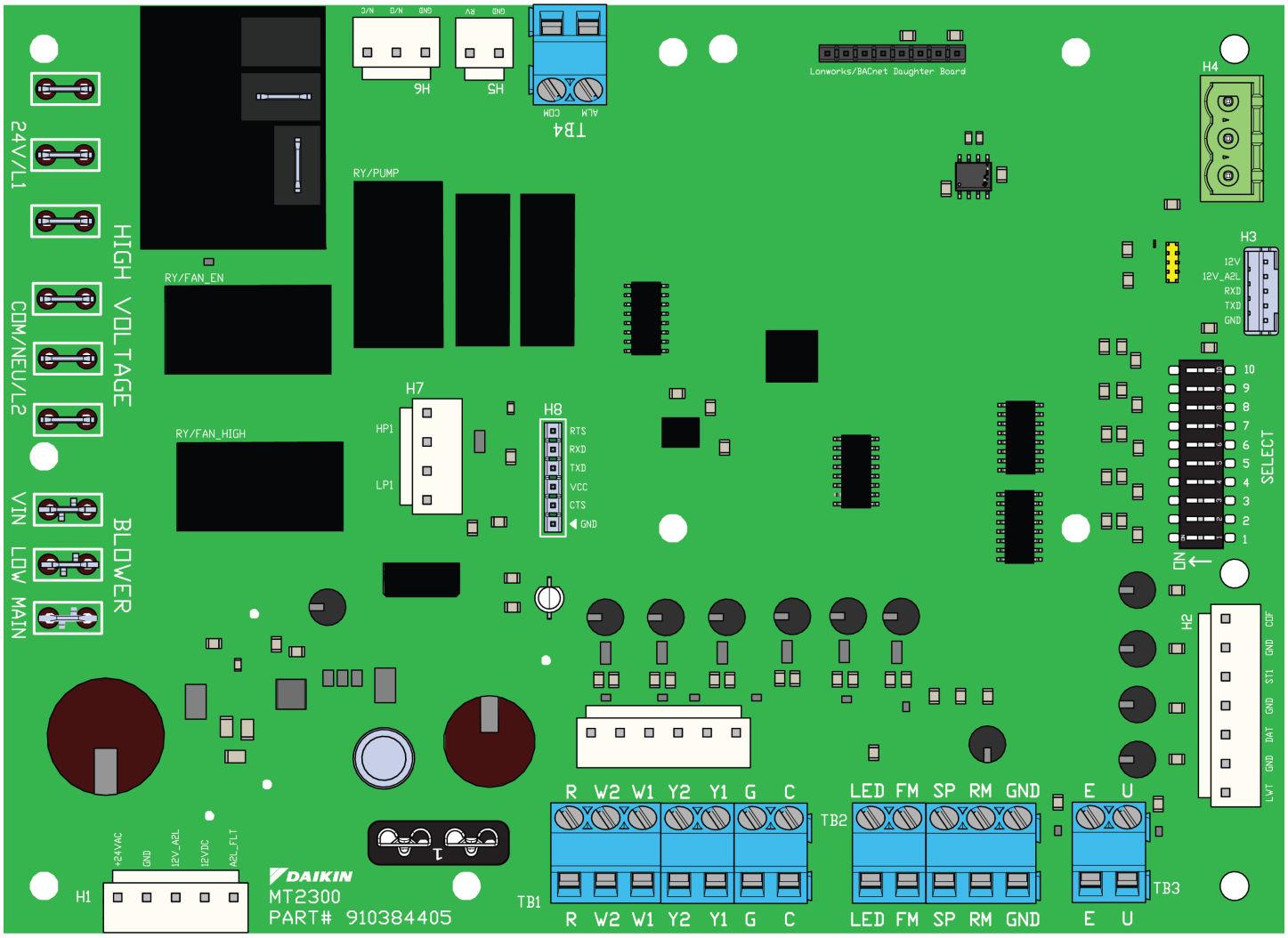
Table 20: MicroTech 2300 Unit Controller Connector and Terminal Descriptions

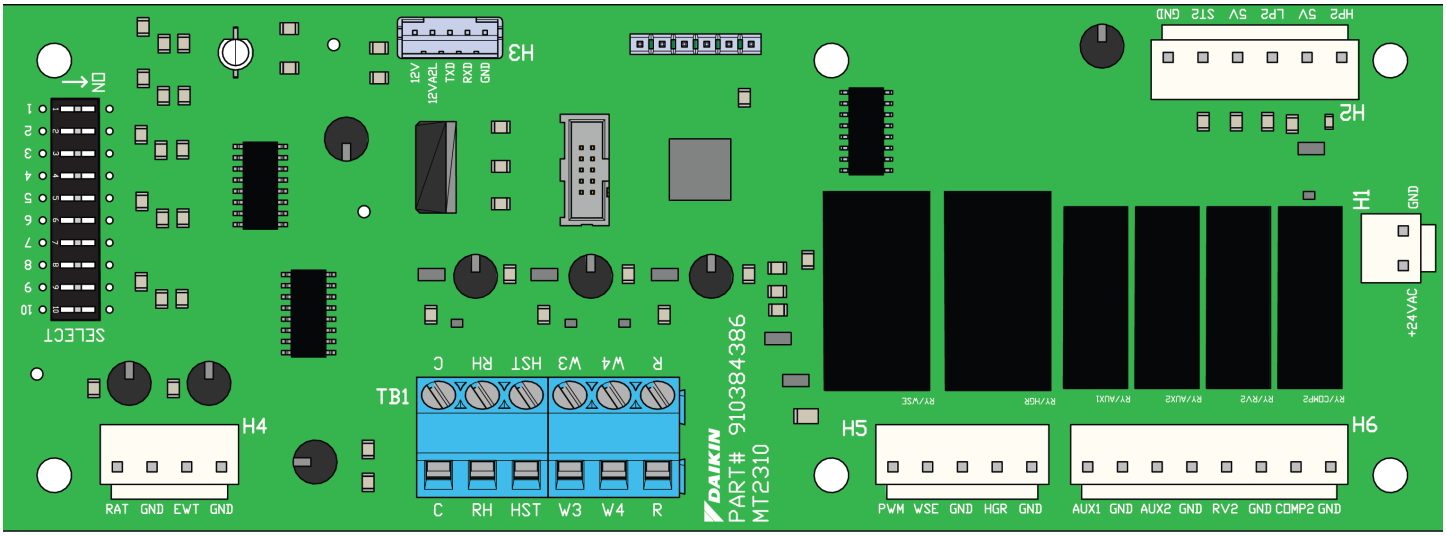
Connector	I/O	Type	Signal	Description
H1-1	+24VAC	Power	VAC	Control Power Voltage
H1-2	GND	Power	Ground	Control Power Common
H1-3	12V_A2L	Input	VDC	A2L Sense Voltage
H1-4	12 VDC	Output	VDC	A2L Mitigation Voltage
H1-5	A2L_ALM	Input	Digital	A2L Fault Alarm
H2-1	LWT	Input	Analog	Leaving Water Temperature
H2-2	GND	REF	Common	
H2-3	DAT	Input	Analog	Discharge Air Temperature
H2-4	GND	REF	Common	
H2-5	ST1	Input	Analog	Comp1 Suction Temperature
H2-6	GND	REF	Common	
H2-7	COF	Input	Analog	Condensate Overflow
H3-1	12V	Output	VDC	Base/Expansion Board Interface
H3-2	12V_A2L	Output	VDC	
H3-3	RXD	COM	UART	
H3-4	TXD	COM	UART	
H3-5	GND	COM	UART	
H4-1	B(+)	COM	N/A	Future Use
H4-2	A(-)	COM	N/A	
H4-3	GND	COM	N/A	
H5-1	GND	REF	Common	Comp1 Reversing Valve
H5-2	RV	Output	24 VAC	
H6-1	GND	REF	Common	Pump Request - Common (Ground) Terminal
H6-2	NO	Output	24 VAC	Pump Request - Normally Open Terminal for Normally Closed Valves
H6-3	NC	Output	24 VAC	Pump Request - Normally Closed Terminal for Normally Open Valves
H7-1,2	LP1	Input	Digital	Comp1 Low Pressure
H7-3,4	HP1	Input	Digital	Comp1 High Pressure
TB1-1	R	Output	24 VAC	Thermostat 24 VAC Power
TB1-2	W2	Input	24 VAC	Thermostat Heat Stage 2
TB1-3	W1	Input	24 VAC	Thermostat Heat Stage 1
TB1-4	Y2	Input	24 VAC	Thermostat Cool Stage 2
TB1-5	Y1	Input	24 VAC	Thermostat Cool Stage 1
TB1-6	G	Input	24 VAC	Thermostat Fan
TB1-7	C	REF	Common	Thermostat Common
TB2-1	LED	Output	5 VDC	Room Sensor LED
TB2-2	FM	Input	Analog	Room Sensor Fan/Mode
TB2-3	SP	Input	Analog	Room Sensor Setpoint Adjust
TB2-4	RM	Input	Analog	Room Sensor Air Temp / Tenant Override
TB2-5	GND	REF	Common	Room Sensor Common
TB3-1	E	Input	Digital	Emergency Shutdown
TB3-2	U	Input	Digital	Unoccupied Sensor
TB4-1,2	ALM	Output	Digital	Alarm Output - Contact Closure
BLOWER	VIN	Input	VAC	Blower Motor Voltage
BLOWER	LOW	Output	VIN	Blower Motor Low Speed
BLOWER	MAIN	Output	VIN	Blower Motor High Speed or ECM
LIVE (Relay)	Comp1	Output	L1/24V	Compressor Stage 1
LIVE x 3	24V/L1	Input	VAC	COMP1 Line1 Control Voltage
LIVE x 3	COM/ NEU/L2	Input	VAC	COMP1 Line2 Control Voltage
Daughter Board	BACnet	COM	SPI	BACnet MS/TP Only

Table 21: MT2310 I/O Board Connectors and Terminals

Connector	I/O	Type	Signal	Description
H1-1	GND	Power	Ground	Control Power Common
H1-2	+24VAC	Power	VAC	Control Power Voltage
H2-1	GND	REF	Common	Comp2 Suction Temperature
H2-2	ST2	Input	Analog	
H2-3,4	LP2	Input	Digital	Comp2 Low Pressure
H2-5,6	HP2	Input	Digital	Comp2 High Pressure
H3-1	12V	Input	VDC	Base/Expansion Interface
H3-2	12V_A2L	Input	VDC	
H3-3	TXD	COM	UART	
H3-4	RXD	COM	UART	
H3-5	GND	REF	Common	
H4-1	RAT	Input	Analog	Return Air Temperature
H4-2	GND	REF	Common	
H4-3	EWT	Input	Analog	Entering Water Temperature
H4-4	GND	REF	Common	
H5-1	GND	REF	Common	Hot Gas Reheat Valve
H5-2	HGR	Output	24 VAC	
H5-3	GND	REF	Common	Waterside Economizer Valve
H5-4	WSE	Output	24 VAC	
H5-5	PWM	Output	PWM	Variable Speed Blower Motor
H6-1	GND	REF	Common	Compressor Stage 2
H6-2	COMP2	Output	24 VAC	
H6-3	GND	REF	Common	Comp2 Reversing Valve
H6-4	RV2	Output	24 VAC	
H6-5	GND	REF	Common	Auxiliary Heat 2
H6-6	AUX2	Output	24 VAC	
H6-7	GND	REF	Common	Auxiliary Heat 1 / Hydronic Heat
H6-8	AUX1	Output	24 VAC	
TB1-1	C	REF	Common	Input Common
TB1-2	RH	Input	Analog	Space Relative Humidity
TB1-3	HST	Input	24 VAC	Humidistat
TB1-4	W3	Input	24 VAC	Thermostat - Stage 3 Heat
TB1-5	W4	Input	24 VAC	Thermostat - Stage 4 Heat or Stage 3 Cool
TB1-6	R	Output	24 VAC	Thermostat - 24 VAC Power

Figure 57: MicroTech2300 Unit Controller and MicroTech 2310 I/O Expansion Board Terminal Location


24V/L1
COM/NEU/L2
VIN
LOW
MAIN
HIGH VOLTAGE
BLOWER
RY/PUMP
RY/FAN_EN
RY/FAN_HIGH
H1
H2
H3
H4
H5
H6
H7
H8
TB1
TB2
TB3
TB4
Lonworks/BACnet Daughter Board
SELECT
R W2 W1 Y2 Y1 G C
LED FM SP RM GND
E U
DAIKIN
MT2300
PART# 910384405

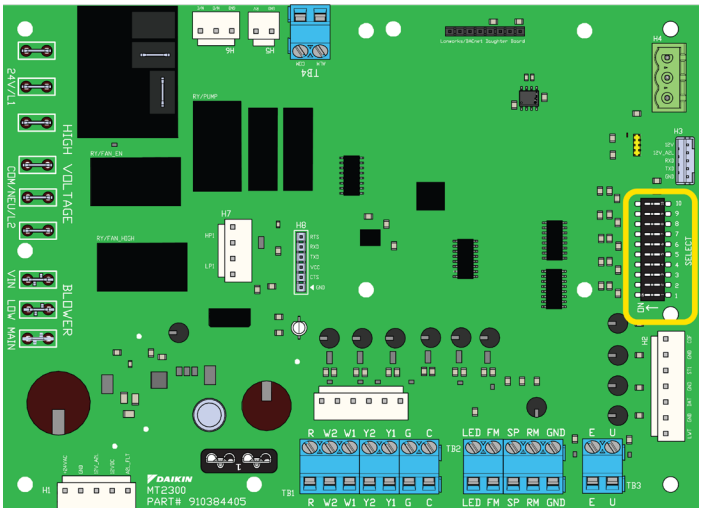

H1
H2
H3
H4
H5
H6
TB1
SELECT
RAT GND EWT GND
C RH HST W3 W4 R
PWM WSE GND HGR GND
AUX1 GND AUX2 GND RV2 GND COMP2 GND
+24VAC
DAIKIN
PART# 910384386
MT2310

Configuration DIP Switches

⚠ WARNING

Proper antifreeze/water solution is required to minimize the potential of fluid freeze-up. Switch SW3 is factory set for water freeze protection with the switch closed. Operation at fluid temperatures below 32°F (0°C) with anti-freeze protection requires SW3 to be field configured for the switch on. If unit is employing a fresh water system (no anti-freeze protection), it is extremely important that SW3 switch setting remains in the off position (factory default setting) in order to shut down the unit at the appropriate water temperature to protect your heat pump from freezing. Failure to do so can result in unit damage or property damage and will void unit warranty.

Figure 58: Location of Configuration DIP Switches on the MT2300 Unit Controller



⚠ CAUTION

The MT2300 unit controller incorporates static sensitive devices. A static charge from touching the device can damage the electronic components. To help prevent damage during service, use static discharge wrist straps. Static discharge wrist straps are grounded to the heat pump chassis through a 1M ohm resistor.

Table 22: MT2300 Main Board DIP Switch Settings

Switch	Description	Position	Model/Options
SW1	Normal/Test Mode	SW1 = OFF (0)	Normal Operation
		SW1 = ON (1)	Service/Test Mode
SW2	Fan Operation	SW2 = OFF (0)	Continuous Fan Operation (On)
		SW2 = ON (1)	Cycling Fan Operation (Auto)
SW3[1]	Loop Fluid	SW3 = OFF (0)	Water Loop Fluid
		SW3 = ON (1)	Glycol Loop Fluid
SW4	Freeze Fault Detect (FFD)	SW4 = OFF (0)	Disabled FFD
		SW4 = ON (1)	Enabled FFD with LWT sensor installed
SW5	Room Sensor Setpoint Adjust Range	SW5 = OFF (0)	Short Range -5 to +5 F (-2.78 to +2.78 C)
		SW5 = ON (1)	Long Range 55 to 95 F (12.78 to 35 C)
SW6	Thermostat/ Room Sensor Control	SW6 = OFF (0)	Thermostat Control
		SW6 = ON (1)	Room Sensor Control
SW7/ SW8[2]	Single Compressor Heating Source	SW7 = OFF (0)	Allow Compressor in Heating Mode
		SW7 = ON (1)	Disable Compressor in Heating Mode
	Single Compressor I/O Expansion Module	SW8 = OFF (0)	I/O Expansion Module Not Required
		SW8 = ON (1)	I/O Expansion Module is Required
	Two Compressor Availability	SW7 = OFF (0) SW8 = OFF (0)	Both Compressors Available (Automatic Compressor Fail Replace)
		SW7 = ON (1) SW8 = OFF (0)	Lead Compressor Available (Lag Compressor is Off-Line)
		SW7 = OFF (0) SW8 = ON (1)	No Compressors Available
SW9	WSHP Base Board Application Select	SW9 = OFF (0)	Single Compressor WSHP Application
		SW9 = ON (1)	Two Compressor Application
SW10	Discrete/Variable Speed Fan Select	SW10 = OFF (0)	Fan Single (Fan Main Output) or Variable (PWM) Speed
		SW10 = ON (1)	Dual Speed Fan (Low & High Discrete Outputs)

[1] See Warning under "Configuration DIP Switches" for DIP switch 3 (SW3) setting information.

[2] The functionality of SW7 and SW8 depends on the setting of SW9. If SW9 is OFF, SW7 and SW8 will be for Heating Source and I/O Expansion Module functionality. If SW9 is ON, SW7 and SW8 will be for Compressor Availability functionality.

Figure 59: MT2310 I/O Expansion DIP Switches

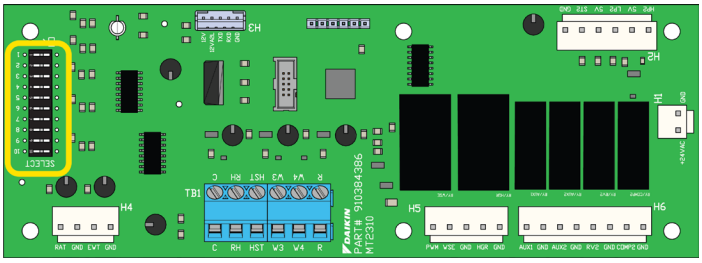


Table 23: MT2310 I/O Expansion Module DIP Switch Settings

Switch	Description	Position	Model/Options
SW1-4	Variable Fan Speed Row Selection	0000 to 1111 Binary	Variable Speed Fan Row Selection (1 to 16), used when "nciVsNetCnfgEn" is set to "Disable" the network override.
SW5/ SW6	Secondary Heating Options	SW5 = OFF (0) SW6 = OFF (0)	None
		SW5 = ON (1) SW6 = OFF (0)	Supplemental Electric Heat
		SW5 = OFF (0) SW6 = ON (1)	Boilerless Electric Heat
		SW5 = ON (1) SW6 = ON (1)	Hydronic Heating

Switch	Description	Position	Model/Options
SW7	Hot Gas Reheat (HGRH)	SW7 = OFF (0)	HGRH Disabled
		SW7 = ON (1)	HGRH Enabled
SW8	Waterside Economizer (WSE)	SW8 = OFF (0)	Waterside Economizer Disabled
		SW8 = ON (1)	Waterside Economizer Enabled
SW9	WSHP I/O Expansion Application Select	SW9 = OFF (0)	Single Compressor Application
		SW9 = ON (1)	Two Compressor Application
SW10	Single Compressor: Speed	SW10 = OFF (0)	Single Speed Compressor
		SW10 = ON (1)	Dual Speed Compressor
	Two Compressor: Lead Compressor Select	SW10 = OFF (0)	Compressor #1 is Lead
		SW10 = ON (1)	Compressor #2 is Lead

NOTE: The functionality of SW10 depends on the setting of SW9. If SW9 is OFF, SW10 will be for Single Compressor Speed. If SW9 is ON, SW10 will be for Lead Compressor Select.

MicroTech SmartSource Unit Controller

The MicroTech SmartSource unit controller allows thermostat, Daikin Applied sensor and DDC standalone operation. The R (24VAC) terminal is used to operate thermostat inputs G, Y1, Y2, W1, W2, W3, W4 and TB2. The C (common) terminal is used to control inputs U and E. No external power sources may be used to operate the MicroTech controller. All units must be properly grounded per local code requirements.

NOTICE

For information on sequence of operation and troubleshooting refer to OM 1364.

Remote Reset of Automatic Lockouts

The Remote Reset feature provides the means to remotely reset automatic lockouts. There are three (3) ways to accomplish a unit reset once the fault condition has been remedied:

- Using the thermostat cycle from cool or heat to off and back to heat or cool two times within 30 seconds
- Press the Room Sensor or Thermostat Timed Override/ Reset Button for more than 10 seconds
- Turn the unit power off and wait 10 seconds to turn back on.

When the cause of the fault condition has been remedied, and the unit is cycled from not requiring heating or cooling to needing heating or cooling twice within 30 seconds (accomplished by user manipulation of the Heat/Cool/ Auto/Off switch on the thermostat), an alarm reset equivalent to a tenant override button reset is generated. The intelligent reset counter and the 24 hour timer are cleared when this type of alarm reset is generated.

NOTICE

This feature only applies to thermostat controlled systems.

For room sensor controlled units, pressing the “Override” or “Reset” button for more than 10 seconds will apply a ground signal to the Room Temperature Sensor connection at TB2 pin 4, RS clearing the lockout alarm once the cause of the fault condition has been remedied.

A unit power cycle can also be used to clear an automatic lockout if the conditions causing the fault have been remedied.

Table 24: MT2300 Unit Controller Status LEDs

LED Activity	Type	Color	Description
Steady ON	Fault	Yellow	MCU Not Programmed
Steady ON	Fault	Red	MCU Hardware Failure
1 Flash	Fault	R–Y–G	Invalid Configuration
2 Flash	Fault	R–Y–G	Incompatible Software
1 Flash	Fault	R–Y	I/O Exp Board Communications Fail
1 Flash	Mode	G–Y	Service / Test Mode Active
Rapid Flash	Fault	Red	A2L Mitigation – Refrigerant Leak
1 Flash	Fault	Red	Compressor #1 High Pressure
2 Flash	Fault	Red	Compressor #1 Low Pressure
3 Flash	Fault	Red	Compressor #1 Suction Temp Sensor Fail
4 Flash	Fault	Red	Compressor #1 Low Suction Temp
5 Flash	Fault	Red	Compressor #2 High Pressure
6 Flash	Fault	Red	Compressor #2 Low Pressure
7 Flash	Fault	Red	Compressor #2 Suction Temp Sensor Out of Range
8 Flash	Fault	Red	Compressor #2 Low Suction Temp
9 Flash	Fault	Red	A2L Mitigation – Control Board Without Power
Rapid Flash	Mode	Yellow	A2L Mitigation – Refrigerant Sensor Out of Range
1 Flash	Fault	Yellow	Compressor Low Voltage Brownout
2 Flash	Fault	Yellow	Freeze Fault Detect (FFD)
3 Flash	Fault	Yellow	Control Temp Sensor Out of Range
4 Flash	Fault	Yellow	Entering Water Temp Sensor Out of Range
5 Flash	Fault	Yellow	Leaving Water Temp Sensor Out of Range
6 Flash	Fault	Yellow	Relative Humidity Sensor Out of Range
7 Flash	Fault	Yellow	Condensate Overflow
8 Flash	Fault	Yellow	Space Temp Sensor Out of Range
9 Flash	Fault	Yellow	Return Air Temp Sensor Out of Range
Rapid Flash	Mode	Green	Emergency Shutdown
1 Flash	Mode	Green	No Call for Heating / Cooling / Dehumidification
2 Flash	Mode	Green	Call for Cooling
3 Flash	Mode	Green	Call for Heating

LED Activity	Type	Color	Description
4 Flash	Mode	Green	Call for Fan Only
5 Flash	Mode	Green	Unoccupied Mode Active
6 Flash	Mode	Green	Call for Dehumidification
7 Flash	Mode	Green	Low Entering Water Temp
8 Flash	Mode	Green	HGRH Low Return Air Temp Cutout
9 Flash	Mode	Green	WSE Low Temp Cutout

Table 25: MT2310 I/O Expansion Board Status LEDs

LED Activity	Type	Color	Description
1 Flash	Mode[1]	Green	Variable Speed Fan OFF
2 Flash	Mode[1]	Green	Variable Speed Fan ON: 0 to 20%
3 Flash	Mode[1]	Green	Variable Speed Fan ON: 21 to 30%
4 Flash	Mode[1]	Green	Variable Speed Fan ON: 31 to 40%
5 Flash	Mode[1]	Green	Variable Speed Fan ON: 41 to 50%
6 Flash	Mode[1]	Green	Variable Speed Fan ON: 51 to 60%
7 Flash	Mode[1]	Green	Variable Speed Fan ON: 61 to 70%
8 Flash	Mode[1]	Green	Variable Speed Fan ON: 71 to 80%
9 Flash	Mode[1]	Green	Variable Speed Fan ON: 81 to 90%
10 Flash	Mode[1]	Green	Variable Speed Fan ON: 91 to 100%
Steady ON	Fault	Yellow	MCU Not Programmed
Steady ON	Fault	Red	MCU Hardware Failure
1 Flash	Fault	R–Y–G	Invalid Configuration
2 Flash	Fault	R–Y–G	Incompatible Software
1 Flash	Fault	R–Y	Base Board Communications Failure
Rapid Flash	Fault	Red	A2L Mitigation - Alarm Condition

[1] When the BACnet network is overriding the fan speed DIP switch selection, the LED interval color will be yellow instead of OFF.

Table 26: Priority Level of Faults and Modes with Resets

Alarm Enumeration (BACnet)	Fault	Indication	Reset[1]
1	No Alarm	Normal operation	NA
2	MT2310 Communication Failure	Single compressor unit with SW #8 set to ON position	A
3	Incompatible Software	Incorrect Software Part or Version Numbers	P
4	Invalid Configuration	Base & IO Exp Application Mismatch or MT2310 detected but not required (SW #8)	P
5	A2L Alarm	A2L refrigerant leak detected	A
6	A2L Error - Power	A2L mitigation control is not powered	A
7	Compressor Low Voltage	"Brownout" condition exists	A
8	Comp #1 High Pressure	Compressor #1 high pressure switch opened	T,N
9	Comp #2 High Pressure	Compressor #2 high pressure switch opened	T,N
10	Comp #1 Low Pressure	Compressor #1 low pressure switch opened	T,N
11	Comp #2 Low Pressure	Compressor #2 low pressure switch opened	T,N
12	Comp #1 Suction Temp Sensor	Compressor #1 suction temp sensor failure	N
13	Comp #2 Suction Temp Sensor	Compressor #2 suction temp sensor failure	N
14	Leaving Water Temp (LWT) Sensor	LWT sensor not present (SW #4 = ON)	N
15	Freeze Fault Detect (FFD)	LWT sensor temp below freeze setpoint (SW #4 = ON)	T,N
16	Comp #1 Low Suction Temp (ST1)	ST1 sensor temp below minimum setpoint	A,T,N[2]
17	Comp #2 Low Suction Temp (ST2)	ST2 sensor temp below minimum setpoint	A,T,N[2]
18	A2L Error - Sensor	A2L sensor lost communication or reported failure	A
19	Control Temp Sensor Failure	Room Temp and Return Air Temp sensor reading "out of range"	N
20	Entering Water Temp (EWT) Sensor Failure	EWT sensor reading "out of range"	N
21	Room Temp Sensor Failure	Room temp sensor reading "out of range"	N
22	Return Air Temp Sensor Failure	RAT sensor reading "out of range"	N
23	Space RH Sensor Failure	Space RH sensor reading "out of range"	N
24	Low Entering Water Temp (EWT)	EWT sensor reading below minimum setpoint	A
25	Condensate Overflow	Condensate overflow sensor indicates water present	A,N
26	Waterside Economizer (WSE) Low Temp	WSE temp sensor reading below minimum setpoint	A

[1] "A" = Auto Reset, "T" = Tenant Override Button Reset, "N" = Network Reset, "P" = power cycle only

[2] Low suction temperature faults have "Intelligent Reset" logic - 3 faults in a 24 hour period disables the auto reset function.

Table 27: I/O Expansion Module Configuration Switch

Fan Speed Row	Switch 1	Switch 2	Switch 3	Fan Only[1]	Cool Stage 1	Cool Stage 2	Heat Stage 1	Heat Stage 2
1	OFF	OFF	OFF	20%	80%	100%	80%	100%
2	ON	OFF	OFF	20%	70%	90%	70%	90%
3	OFF	ON	OFF	20%	60%	80%	60%	80%
4	ON	ON	OFF	20%	50%	70%	50%	70%
5	OFF	OFF	ON	20%	65%	85%	65%	85%
6	ON	OFF	ON	20%	55%	75%	55%	75%
7	OFF	ON	ON	20%	50%	65%	50%	65%
8	ON	ON	ON	20%	50%	55%	50%	55%

[1] When in Fan Only (SW4) mode, OFF = 20% and ON = Cool Stage 1 speed (heat or cool mode fan speeds not affected).

Fan Speed Configuration Switches (SW1, SW2, SW3)

Configuration Switches on the I/O expansion module allow maximum CFM settings to be field adjustable. Fan speed control optimizes unit fan speed (CFM) based on thermostat/room sensor inputs. The fan speed switch allows for manually setting an optimal CFM specific to the application requirements. Each setting on the fan speed configuration switches represents settings 1-8. See Table 27 on page 61 for the complete list of fan speed selector switch settings. Additionally SW3 can be used to reduce the CFM setting. Setting the SW3 to On will reduce the out put signal by 15% of it's maximum value, with a minimum output of 50% of the maximum value while heating, cooling, or dehumidifying.

NOTICE

Always disconnect power to the unit prior to making changes to the DIP switch settings on the interface board. The new settings will take effect once power is restored to the unit.

BACnet Communication Module

On units with an optional BACnet communication module, fan speeds can be set through network communications to 1% resolution of duty cycle. For hydronic or compressorized modes, the range is 50-100%, and for fan only mode, the range is 10-100%. When enabled, the network fan speed settings will override the local configuration switches. When the MT2310 status LED interval is yellow instead of Off (for example: green-off-green-off-yellow), this indicates that the network is overriding the fan speed settings.

Variable CFM

All units have the capability to deliver variable CFM based on the thermostat wiring. By using a multi-stage wall thermostat, the unit can deliver lower CFM as the space temperature is satisfied. For example, unit size 036 with SW1 and SW2 switches at setting 3 and a 3-stage cooling wall thermostat will deliver 975 CFM at stage 1 cooling, 1050 CFM at stage 2 cooling and 1200 CFM at stage 3 cooling. All of this is accomplished by wiring the thermostat to the appropriate terminal on the MicroTech controller terminal strip. The variable CFM feature allows for improved humidity levels by increasing latent cooling capacity through reduced CFM. Here, we are attempting to satisfy cooling at the lowest airflow, 975 CFM, but having the capability to deliver higher airflow, 1200 CFM, if needed.

Fan Only Speed Configuration Switch (SW4)

In addition to the SW1, SW2, and SW3 switches, all units have the capability to set Fan Only CFM values independent to those associated with other modes of operation using the SW4 switch. When the SW4 switch is Off the fan only speed will be fixed at the speed associated with a low 20% duty cycle output. When the SW4 switch is On, the Fan Only speed will match the speed for the Stage 1/Low CFM output.

For example, unit size 036 with SW1 and SW2 switches set at Setting #3, SW3 set at Off, and SW4 set at On, will deliver 1200 CFM at stage 2 compressor operation mode, 1050 CFM at stage 1 compressor operation, 1350 CFM in electric heat mode, 1050 CFM in fan only mode, 975 CFM in dehumidification mode, 1050 CFM in hydronic heat mode, and 1050 CFM in waterside economizer mode.

Figure 60: SW1 & SW2 Location on The I/O Expansion Module

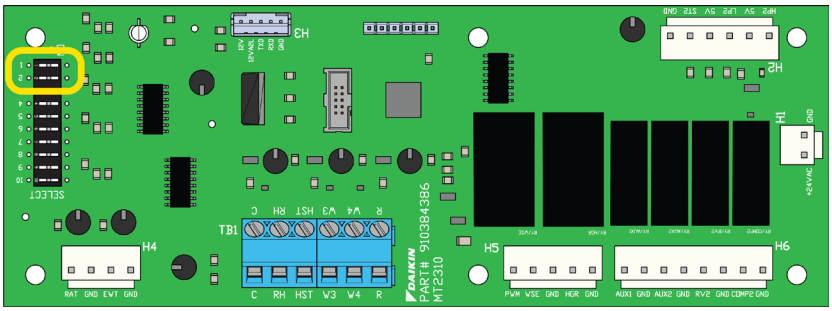


Table 28: Representative Data for Size 036, Constant CFM

Unit Size	Fan Setting	Maximum ESP (in. wg.)[2]	Low CFM Heat[1]	High CFM Heat[1]	Low CFM Cool[1]	High CFM Cool[1]	Dehumidification	Electric Heat	Fan Only SW4[3]	Hydronic Heat	Waterside Economizer
036	Fan Speed 1	1.0	1200	1350	1200	1350	1125	1350	750	1200	1200
	Fan Speed 2		1125	1275	1125	1275	1050	1350	750	1125	1125
	Fan Speed 3		1050	1200	1050	1200	975	1350	750	1050	1050
	Fan Speed 4		975	1125	975	1125	975	1350	750	975	975
	Fan Speed 5		1088	1238	1088	1238	1013	1350	750	1088	1088
	Fan Speed 6		1013	1163	1013	1163	975	1350	750	1013	1013
	Fan Speed 7		975	1088	975	1088	975	1350	750	975	975
	Fan Speed 8		975	1013	975	1013	975	1350	750	975	975

[1] The unit is capable of high-low fan performance through the use of a 2-stage thermostat wired to specific terminals for High-Low CFM fan performance. Standard operation with a 1-stage thermostat is indicated as High CFM fan performance.

[2] Applications above 0.7" ESP (in. wg.) are possible. However, increased fan noise should be anticipated and appropriate noise attenuation should be considered.
[3] Fan Only speed in the above table is when SW4 is Off. When SW4 is On, the Fan Only speed will match Cool Low CFM (Stage 1) speed.

MT2300 Controller with an Optional BACnet Communication Module

For installation and operation information on MT2300 unit controller and other ancillary components, see:

- OM 1364 - MT2300 Unit Controller with MT2310 I/O Expansion Board MicroTech® Controller
- IM 956 - Temperature Sensors for Units with MicroTech®III or MT2300 Unit Controller and LonWorks® or BACnet® Communication Module
- IM 1363 - MicroTech MT2300 Water Source Heat Pump Unit Controller BACnet® MS/TP Communication Module
- ED 19129 - MicroTech MT2300 Water Source Heat Pump Unit Controller BACnet® Protocol Information

Daikin Applied water source heat pumps are available with an optional BACnet MS/TP communication module that is designed to communicate over a BACnet MS/TP communications network to a building automation system (BAS). It can be factory or field-installed.

The unit controller is programmed and tested with all the logic required to monitor and control the unit. An optional wall sensor may be used with the communication module to provide limited local control of the water source heat pump. The unit controller monitors water and air temperatures and passes information to the communication module. The module communicates with the BAS, to provide network control of the water source heat pump.

The module makes operational data and commands available on a communications network using BACnet objects and properties:

- The network cable is a shielded twisted-pair cable
- Network communications run up to 76.8 kbps
- DIP switches on the controller enable the MS/TP MAC address to be set in the range 0-127
- Four green status LEDs on the communication module indicate communication activity on the MS/TP communication network and with the unit controller

MT2300 unit controller with BACnet MS/TP communication module orchestrates the following unit operations:

- Enable heating and cooling to maintain setpoint based on a room sensor
- Enable fan and compressor operation
- Monitors all equipment protection controls
- Monitors room and discharge air temperatures
- Monitors leaving water temperature
- Relays status of all vital unit functions

The MT2300 unit controller with an optional communication module includes:

- Return Air Temperature sensor (RAT) (field-installed)
- Discharge Air Temperature sensor (DAT) (field-installed)
- Leaving Water Temperature sensor (LWT)

NOTICE
Refer to IM 956 for details to install RAT & DAT sensors.

The communication module provides access to setpoints for operational control.

Available wall sensors include:

- Room sensor with LED status and tenant override button
- Room sensor with LED status, tenant override button, and ±5°F setpoint adjustment
- Room sensor with LED status, tenant override button, 55° to 95°F (13° to 35°C) setpoint adjustment

Maintenance

1. Normal maintenance on all units is generally limited to filter changes. Units are provided with permanently lubricated motors and require no oiling even though oil caps may be provided.
2. Filter changes are required at regular intervals. The time period between changes will depend upon the project requirements. Some applications such as motels produce a lot of lint from carpeting and linen changes, and will require more frequent filter changes. Check filters at 60-day intervals for the first year until experience is acquired. If light cannot be seen through the filter when held up to sunlight or a bright light, it should be changed. A more critical standard may be desirable.
3. The condensate drain pan should be checked annually and cleaned and flushed as required.
4. Record performance measurements of volts, amps, and water temperature differences (both heating and cooling). A comparison of logged data with start-up and other annual data is useful as an indicator of general equipment condition.
5. Periodic lockouts are almost always caused by air or water problems. The lockout (shutdown) of the unit is a normal protective result. Check for dirt in the water system, water flow rates, water temperatures, airflow rates (may be a dirty filter), and air temperatures. If the lockout occurs in the morning following a return from night setback, entering air below machine limits may be the cause.

NOTICE

Strainers should be inspected regularly and cleaned as needed.

6. Should motor replacement become necessary in the future, refer to "Fan Motor Removal" for the motor removal process.

Fan Motor Removal

For Units with Side Fan Motor Access

Figure 61: Remove Screws Securing Fan Housing to Mounting Rails

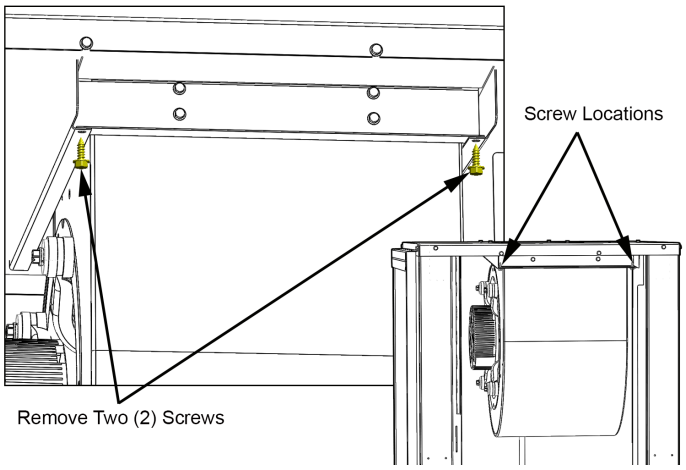
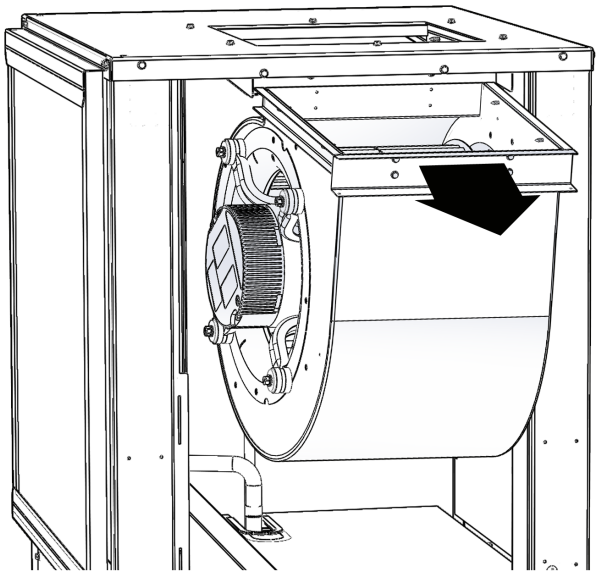


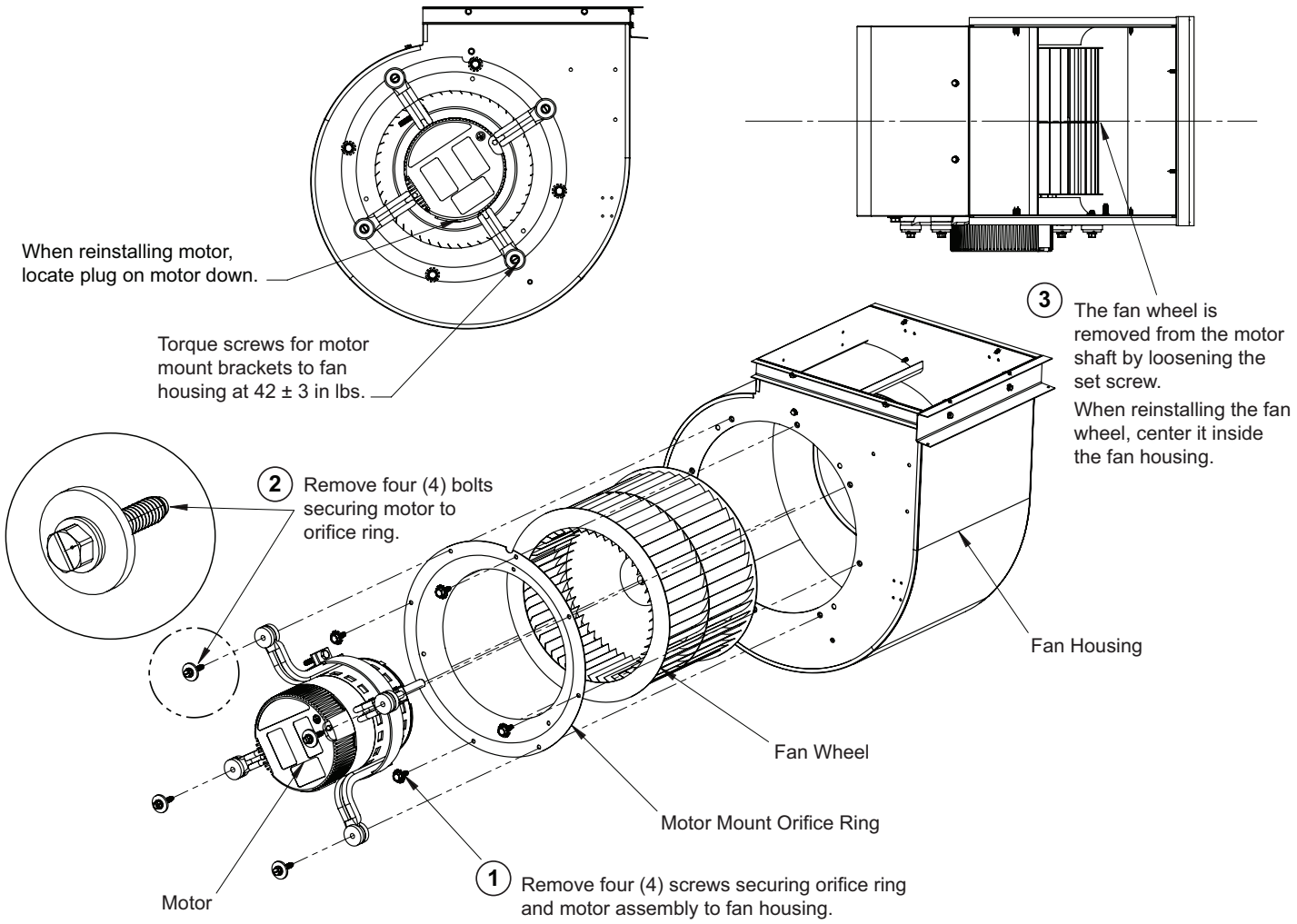
Figure 62: Slide Out Fan and Motor Housing Assembly



NOTE: Disconnect power wiring plug from motor.

Removing Fan Motor From Housing

Figure 63: Disassemble Motor Orifice Ring and Motor Mount Screws From Fan Housing



NOTE: Motor for unit sizes 015-070 shown. Motor for unit sizes 007-012 have only three motor legs.

Troubleshooting

Table 29: Troubleshooting Refrigeration Circuit

Symptom	Head Pressure	Suction Pressure	Compressor Amp Draw	Super Heat	Subcooling	Air Temp Differential	Water (Loops) Temp Differential	Safety Lock Out
Undercharge System (Possible Leak)	Low	Low	Low	High	Low	Low	Low	Low Pressure
Overcharge System	High	High	High	Normal	High	Normal/Low	Normal	High Pressure
Low Air Flow Heating	High	High	High	High/Normal	Low	High	Low	High Pressure
Low Air Flow Cooling	Low	Low	Low	Low/Normal	High	High	Low	Low Temp
Low Water Flow Heating	Low/Normal	Low/Normal	Low	Low	High	Low	High	Low Temp
Low Water Flow Cooling	High	High	High	High	Low	Low	High	High Pressure
High Air Flow Heating	Low	Low	Low	Low	High	Low	Low	Low Temp
High Air Flow Cooling	Low	High	Normal	High	Low	Low	Normal	High Pressure
High Water Flow Heating	Normal	Low	Normal	High	Normal	Normal	Low	High Pressure
High Water Flow Cooling	Low	Low	Low	Low	High	Normal	Low	Low Temp
TXV Restricted	High	Low	Normal/Low	High	High	Low	Low	Low Temp/High Pressure

NOTE 1: While the Thermostatic Expansion Valves (TXVs) are adjustable, they are preset at the factory to optimize system performance. Do not attempt to adjust TXVs in the field.

Troubleshooting the Water Source Heat Pump Unit

Compressor runs in short cycle

- Check wiring - loose or broken and check for faulty connection.
- Check relays and contacts, also capacitor and wiring.
- Check high pressure switch, low pressure switch and low temperature switch to see if unit is cycling on the safety.
- Check to see if the reversing valve is not hung up and is operating correctly.
- Check condensate overflow sensor in cool/dehumidification mode of operation.
- Check thermostat or room sensor for proper location.

Neither fan, nor compressor runs and all LED lights are off

- Unit control, check thermostat for correct wiring or faulty thermostat.
- Wire may be loose or broken. Replace or tighten wires.
- Fuse may be blown, circuit breaker is open.
- Low voltage, check power supply voltage.

Fan operates, compressor does not

- Check wiring - loose or broken and check for bad connection.
- High or Low pressure lockout:
  a. Cool mode, check water flow.
  b. Heating mode, check air flow.
  c. Check reversing valve for proper valve position.
- Check compressor overload - make sure it is closed.
- Check compressor to ground, or for internal short to ground.
- Compressor winding may be open. Check continuity with ohm meter.

Compressor attempts to start but does not

- Check compressor wiring for defective wiring or loose connection.
- Check for defective compressor internal windings with ohm meter.
- Check for faulty compressor capacitor.
- Check for lock rotor amp draw.

Insufficient cooling or heating

- Check thermostat for improper location.
- Check for proper air flow - filter could be dirty.
- Check blower assembly for dirt or faulty fan motor capacity.
- Check for low refrigerant charge.
- Check amp draw on blower assembly.
- Check for proper water flow and delta T (°F).

Refrigerant Information

Refrigerant Guidelines

⚠ WARNING



This unit contains R-32, a class A2L refrigerant that is flammable. This unit should only be installed, serviced, repaired, and disposed of by qualified personnel licensed or certified in their jurisdiction to work with R-32 refrigerant. Installation and maintenance must be done in accordance with this manual. Improper handling of this equipment can cause equipment damage or personal injury.

For installation only in locations not accessible to the general public.

Be aware that R-32 refrigerant may not contain an odor. Place in a well ventilated area to prevent accumulation of refrigerant. When installing the unit in a small room, take measures to keep the refrigerant concentration from exceeding allowable safety limits. Excessive refrigerant leaks, in the event of an accident in a closed ambient space, can lead to oxygen deficiency.

Do not pierce or burn this unit.

Never use an open flame during service or repair. Never store in a room with continuously operating ignition sources (for example: open flames, an operating gas appliance, or an operating electric heater), where there is ignitable dust suspension in the air, or where volatile flammables such as thinner or gasoline are handled.

Only use pipes, nuts, and tools intended for exclusive use with R-32 refrigerant in compliance with national codes (ASHRAE15 or IRC).

Do not mix air or gas other than R-32 in the refrigerant system. If air enters the refrigerant system, an excessively high pressure results, which may cause equipment damage or injury.

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

Lubrication

R-32 should be used only with polyolester (POE) oil. The HFC refrigerant components in R-32 will not be compatible with mineral oil or alkylbenzene lubricants. R-32 systems will be charged with the OEM recommended lubricant, ready for use with R-32.

Competence of Personnel

Information of procedures additional to usual information for refrigerating equipment installation, repair, maintenance and decommission procedures is required when equipment with flammable refrigerants is affected.

The training of these procedures is carried out by national training organizations or manufacturers that are accredited to teach the relevant national competency standards that may be set in legislation. The achieved competence should be documented by a certificate.

⚠ WARNING

Service on this equipment is to be performed by qualified refrigeration personnel familiar with equipment operation, maintenance, correct servicing procedures, and the safety hazards inherent in this work. Causes for repeated tripping of equipment protection controls must be investigated and corrected. Disconnect all power before doing any service inside the unit. If refrigerant leaks from the unit, there is a potential danger of suffocation since refrigerant will displace the air in the immediate area. Servicing this equipment must comply with the requirements of all applicable industry related published standards and local, state and federal, statutes, regulations and codes in regards to refrigerant reclamation and venting. Avoid exposing refrigerant to an open flame or other ignition source.

Maintaining and servicing R-32 refrigerant should only be performed as recommended by this manual and by personnel licensed or certified in their jurisdiction to handle A2L refrigerants. Dismantling the unit and treatment of the refrigerant, oil, and additional parts must be done in accordance with the relevant local, state, and national regulations.

Only use tools meant for use on R-32 refrigerant, such as a gauge manifold, charge hose, gas leak detector, reverse flow check valve, refrigerant charge base, vacuum gauge, or refrigerant recovery equipment.

The following guidelines align with UL Standard 60335-2-40.

Maintenance and Repair

- Portable equipment shall be repaired outside or in a workshop specially equipped for servicing units with FLAMMABLE REFRIGERANTS.
- Ensure sufficient ventilation at the repair place.
- Be aware that malfunction of the equipment may be caused by refrigerant loss and a refrigerant leak is possible.
- Discharge capacitors in a way that won't cause any spark. The standard procedure to short circuit the capacitor terminals usually creates sparks.
- When brazing is required, the following procedures shall be carried out in the right order:
  - Remove the refrigerant. If the recovery is not required by national regulations, drain the refrigerant to the outside. Take care that the drained refrigerant will not cause any danger. In doubt, one person should guard the outlet. Take special care that drained refrigerant will not float back into the building.
  - Evacuate the refrigerant circuit.
  - Remove parts to be replaced by cutting, not by flame.
  - Purge the braze point with nitrogen during the brazing procedure.
  - Carry out a leak test before charging with refrigerant.
- Reassemble sealed enclosures accurately. If seals are worn, replace them.
- Check safety equipment before putting into service.

Checks to the refrigerating equipment

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall

be followed. If in doubt, consult the manufacturer's technical department for assistance.

The following checks shall be applied to installations using FLAMMABLE REFRIGERANTS:

- the actual REFRIGERANT CHARGE is in accordance with the room size within which the refrigerant containing parts are installed;
- the ventilation machinery and outlets are operating adequately and are not obstructed;
- if an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
- marking to the equipment continues to be visible and legible. Markings that are illegible shall be corrected; and
- refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

Checks to electrical devices

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.

Initial safety checks shall include:

- that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
- that no live electrical components and wiring are exposed while charging, recovering or purging the system; and
- that there is continuity of earth bonding.

Sealed electrical and intrinsically safe components

- All sealed electrical components shall be replaced.
- All intrinsically safe components must be replaced.

Cabling

- Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

Leak Detection

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. NEVER use the following when attempting to detect flammable refrigerant leaks:

- A halide torch (or any other detector using a naked flame);
  or
- Substances containing chlorine.

Detection of flammable refrigerants

The following leak detection methods are deemed acceptable for all refrigerant systems:

- Electronic leak detectors may be used to detect refrigerant leaks. For FLAMMABLE REFRIGERANTS, the sensitivity of electronic leak detectors may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed.
- Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work. Examples of leak detection fluids are:
  - — bubble method; or
  - — fluorescent method agents.
- If a leak is suspected, all open flames shall be removed/ extinguished.
- If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Removal of refrigerant shall be according to instructions in "Pressure Testing and Refrigerant Evacuation".

Pressure Testing and Refrigerant Evacuation

- Make sure that air or any matter other than R-32 refrigerant does not get into the refrigeration cycle.
- If refrigerant gas leaks occur, ventilate the room/area as soon as possible.
- R-32 should always be recovered and never released directly into the environment.
- Only use tools meant for use on R-32 refrigerant (such as a gauge manifold, charging hose, or vacuum pump adapter).

Removal and evacuation

When breaking into the refrigerant circuit to make repairs, or for any other purpose, conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration.

- The following procedure shall be adhered to:
  i. safely remove refrigerant following local and national regulations - see "Recovery" section;
  ii. purge the circuit with inert gas;
  iii. evacuate;
  iv. purge with inert gas;

v. open the circuit by cutting (if flammable refrigerant) or brazing.

- The refrigerant charge shall be recovered into the correct recovery cylinders according to local and national codes. For equipment containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the equipment safe for flammable refrigerants. This process might need to be repeated several times.
- Compressed air or oxygen shall not be used for purging refrigerant systems.
- For equipment containing flammable refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum.
- When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.
- Ensure that the outlet for the vacuum pump is not close to any potential ignition sources and that ventilation is available.

Handling and Storage

Conditions for safe storage

- Requirements to be met by storerooms and receptacles:
  - — Store only in unopened original receptacles
  - — Store in a cool and dry location
- Further information about storage conditions:
  - — Keep container tightly sealed
  - — Store in cool, dry conditions in well sealed receptacle
  - — Protect from heat and direct sunlight
- Maximum storage temperature: 40°C (104°F)

Fire and explosion protection information

Open and handle refrigerant receptacle with care. Keep ignition sources away. Do not smoke. Protect against electrostatic charges. Waste air is to be released into the atmosphere only via suitable separators.

Commissioning

- Ensure that the floor area is sufficient for the refrigerant charge or that the ventilation duct is assembled in a correct manner.
- Connect the pipes and carry out a leak test before charging with refrigerant.
- Check safety equipment before putting into service.

Charging procedures

In addition to conventional charging procedures and specific unit charging guidelines, the following requirements shall be followed:

- Ensure that contamination of different refrigerants does not occur when using charging equipment.
- Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the refrigeration system is electrically connected to ground to protect against electrical shock and to ensure safe discharge of static electricity during maintenance or prior to charging with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigerating system.
- Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

Decommissioning

- If the safety is affected when the equipment is put out of service, the refrigerant charge shall be removed before decommissioning.
- Ensure sufficient ventilation at the equipment location.
- Be aware that malfunction of the equipment may be caused by refrigerant loss and a refrigerant leak is possible.
- Discharge capacitors in a way that won't cause any spark.
- Remove the refrigerant according to details in "Recovery" section. If recovery is not required by national regulations, drain the refrigerant to the outside. Take care that the drained refrigerant will not cause any danger. In doubt, one person should guard the outlet. Take special care that drained refrigerant will not float back into the building.
- Ensure all isolation valves on the equipment are closed off.

Labeling

Equipment shall be labeled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. For equipment containing FLAMMABLE REFRIGERANTS, ensure that there are labels on the equipment stating the equipment contains FLAMMABLE REFRIGERANT.

Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely. When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i.e., special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants

including, when applicable, FLAMMABLE REFRIGERANTS. If in doubt, the manufacturer should be consulted. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that FLAMMABLE REFRIGERANT does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

Recovery procedure

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely.

Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant.

It is essential that electrical power is available before the task is commenced.

1. Become familiar with the equipment and its operation.
2. Isolate system electrically.
3. Before attempting the procedure, ensure that
   - mechanical handling equipment is available, if required, for handling refrigerant cylinders;
   - all personal protective equipment is available and being used correctly;
   - the recovery process is supervised at all times by a competent person;
   - recovery equipment and cylinders conform to the appropriate standards.
4. Pump down refrigerant system, if possible.
5. If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
6. Make sure that cylinder is situated on the scale before recovery takes place.
7. Start the recovery machine and operate in accordance with instructions.
8. Do not overfill cylinders (no more than 80% volume liquid charge).
9. Do not exceed the maximum working pressure of the cylinder, even temporarily.
10. When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.

Disposal

- Waste treatment method recommendation:
  - Must be specially treated adhering to official regulations
  - Incineration in an adequate incinerator is recommended
  - Uncleaned packaging disposal must be made according to official regulations
- Ensure sufficient ventilation at the working place
- The following procedure shall be adhered to:
  i. safely remove refrigerant following local and national regulations - see "Recovery" section;
  ii. evacuate the refrigerant circuit;
  iii. purge the refrigerant circuit with nitrogen gas for 5 minutes;
  iv. evacuate again; and
  v. If compressors are to be removed, cut out the compressor and drain the oil.

Typical Refrigeration Cycles

Cooling Refrigeration Cycle

When the wall thermostat is calling for COOLING, the reversing valve is de-energized and directs the flow of the refrigerant (hot gas) leaving the compressor to the water-to-refrigerant heat exchanger. Here the heat is removed by the water and the hot gas condenses to become a liquid. The liquid then flows through a thermal expansion valve (TXV) and then to the air-to-refrigerant heat exchanger coil. The liquid then evaporates becoming a gas, at the same time absorbing heat and cooling the air passing over the surfaces of the coil. The refrigerant then flows as a low pressure gas through the reversing valve and back to the suction side of the compressor to complete the cycle.

Heating Refrigeration Cycle

When the wall thermostat is calling for HEATING, the reversing valve is energized and directs the flow of the refrigerant (hot gas) leaving the compressor to the air-to-refrigerant heat exchanger coil. Here the heat is removed by the air passing over the surfaces of the coil and the hot gas condenses to become a liquid. The liquid then flows through a TXV then to the water-to-refrigerant heat exchanger. The liquid then evaporates becoming a gas, at the same time absorbing heat and cooling the water. The refrigerant then flows as a low pressure gas through the reversing valve and back to the suction side of the compressor.

Figure 64: Cooling Mode

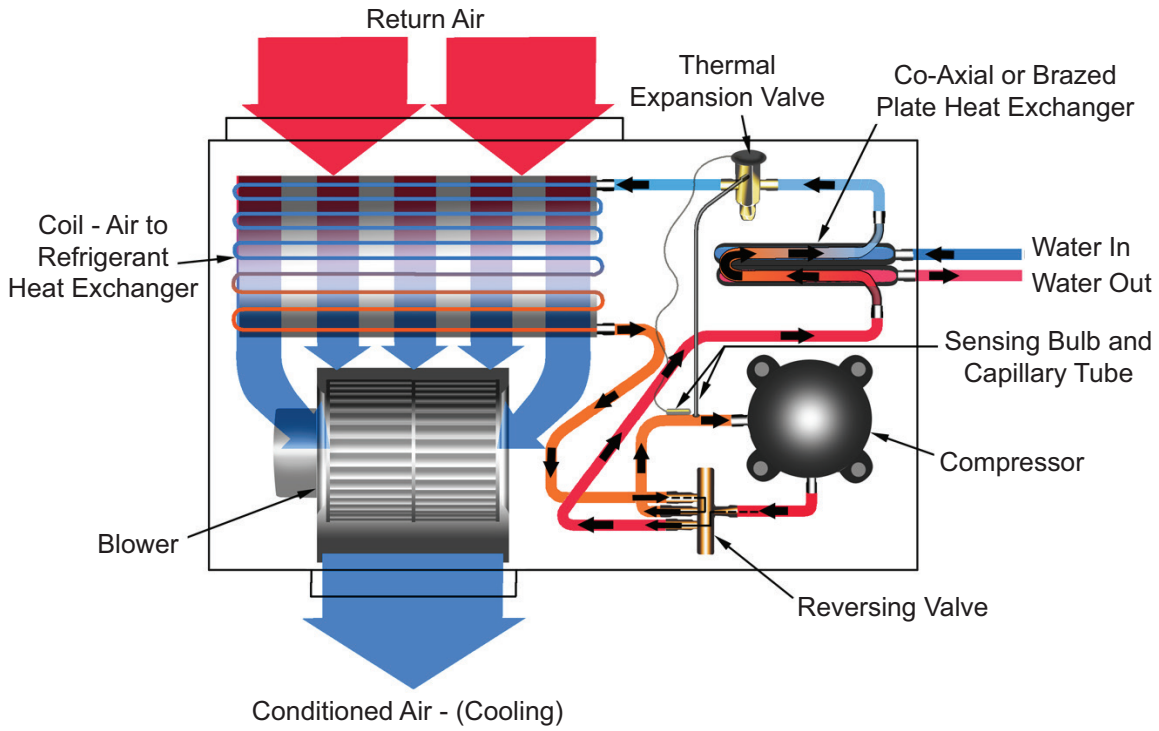
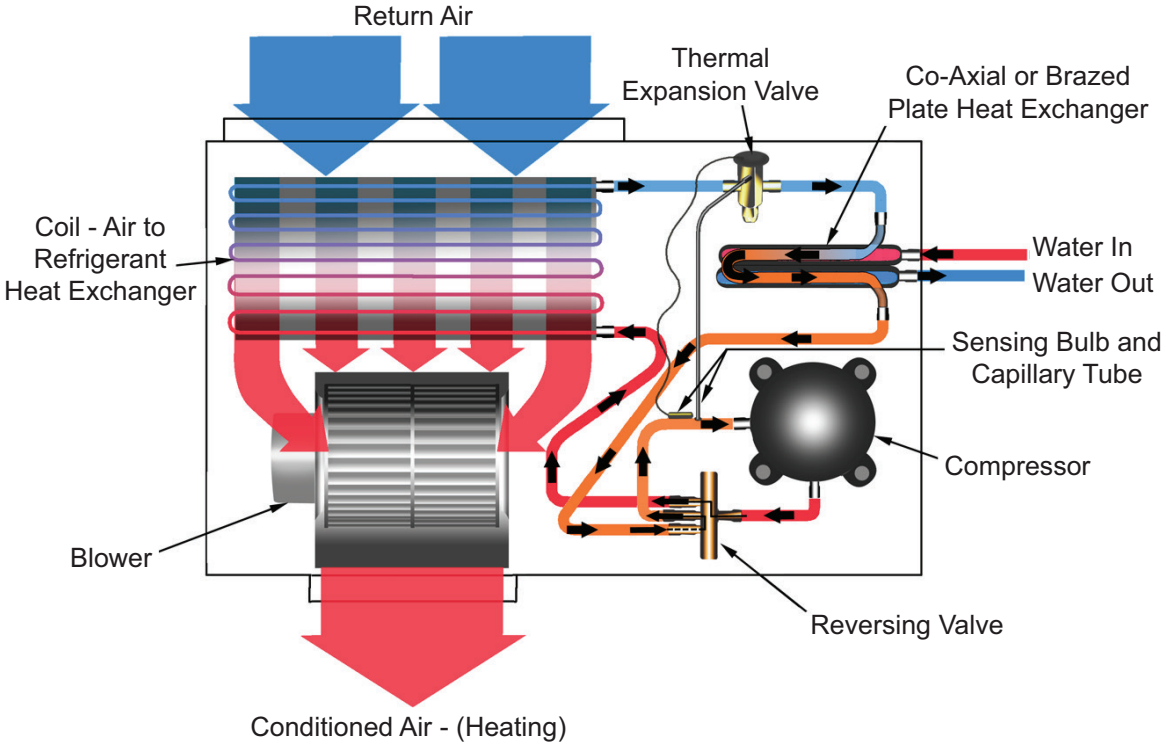


Figure 65: Heating Mode



Appendix

Warranty Registration Form

Warranty - Check, Test and Start | **Form: 5F-4239**

Group: **ATS**
Date: **February 2025**
Supercedes: **WS-CTS-00.01**

Water Source Heat Pump Equipment Check, Test and Start Form

This form must be completely filled out and the record retained by the sales representative or the owner in order to comply with the terms of the Daikin Applied warranty.

Installation Data

Job Name _____ Check, Test & Start Date _____

City or Town _____ State _____ Zip _____

Who is Performing CTS _____

General Contractor _____

Equipment Type (Check all that apply)
☐ Closed Loop ☐ Open Loop
☐ Geothermal ☐ Other (specify) _____

Essential Items Check of System – *Note:* *"No" answers below require notice to installer by memorandum (attached copy.)*

Essential Items Check

A. Voltage Check_____ Volts Loop Temp. _____ °F Heating Set For _____ °F Cooling System Water P.H. Levels _____

B. Yes	No	Condition	Comments
☐	☐	Loop Water Flushed Clean	
☐	☐	Closed Type Cooling Tower	
☐	☐	Water Flow Rate to Heat Pump Balanced	
☐	☐	Standby Pump Installed	
☐	☐	System Controls Functioning	
☐	☐	Outdoor Portion of Water System Freeze Protected	
☐	☐	Loop System Free of Air	
☐	☐	Filters Clean	
☐	☐	Condensate Traps Installed	

Note: *"No" answers below require notice to installer by memorandum (attached copy.)*

☐	☐	Outdoor Air to Heat Pumps:	
☐	☐	Other Conditions Found:	

Please include any suggestions or comments for Daikin Applied: _____

Above System is in Proper Working Order

Note: *This form must be retained. If a warranty claim is submitted, this form will need to be sent to the warranty administrator before any service money can be released.*

_____
Date

_____
Signature for Sales Representative

_____
Signature for Customer

For Internal Use

Release:
SM _____
CTS _____
T _____

_____
Service Manager Approval

_____
Date

Form 5F-4239 (Rev. 02/2025) 1 © 2025 Daikin Applied

Warranty Registration Form

Unit Check / Equipment Data

Installation Data

Job Name _____ Check Test Date: _____

City _____ State _____ Zip _____

Daikin Model # _____

Daikin Serial # _____ Job site Unit ID # (HP #) _____

General Contractor: _____ Mechanical Contractor: _____

Technician Performing Start-Up: Name _____ Employer: _____

Complete equipment data from measurements taken at the locatons indicated on the drawing below.

Equipment Data

Flow Rate **EWP - LWP = ΔP**

① EWP - PSI In _____ minus ② LWP - PSI Out _____ equals ΔP _____

The first step in finding GPM is to subtract leaving water pressure from entering water pressure. The difference between the two is referred to as ΔP. ΔP can be converted to GPM by looking in the equipment specificaton catalog.
Caution ΔP ≠ GPM

Note: A conversion table must be used to find GPM from (Delta) ΔP measurements.

Loop Fluid Temperature Rise / Drop through Coaxial Heat Exchanger **EWT - LWT = ΔT**

③ EWT - °F Out _____ minus ④ LWT - °F Out _____ equals Fluid ΔT _____

ΔT is the rise or drop in the fluid temperature as it passes through the Coaxial.

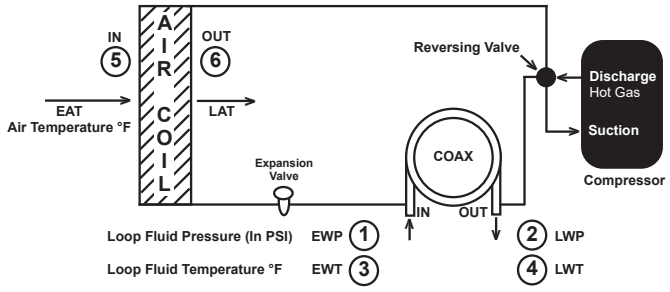
Air Temperature Rise / Drop through the air coil **ΔT x CFM x 1.08 = BTUH Sensible**

⑤ EAT - °F In _____ minus ⑥ LAT - °F Out _____ equals Air ΔT _____

Note 1: Perform Check, Test and Start-Up in the Cooling Mode Only.
Note 2: For units with multi-stage compressor operation, verify that the unit is in second stage before logging the requested information.

EWT - Entering Water Temperature
LWT - Leaving Water Temperature
EWP - Entering Water Pressure
LWP - Leaving Water Pressure
EAT - Entering Air Temperature
LAT - Leaving Air Temperature
Δ- Delta (Differential)
CFM - Cubic Feet/Minute
BTUH - British Thermal Units/Hour

Check, Test & Start



Warranty Registration Form

Commercial Check, Test and Start Worksheet

(Complete all equipment measurements indicated for each unit per installation on page 2)

	Model	Serial #	H.P. #	EWT (3)	LWT (4)	EWP (1)	LWP (2)	EAT (5)	LAT (6)	Volts	Amps Cooling	Check Air Filter and Coil	Comments (more comments on back)
1.													
2.													
3.													
4.													
5.													
6.													
7.													
8.													
9.													
10													
11.													
12.													
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39.													
40.													
41.													
42.													

Limited Product Warranty

DAIKIN APPLIED AMERICAS INC.
LIMITED PRODUCT WARRANTY
(**United States and Canada**)

WARRANTY

Daikin Applied Americas Inc. dba Daikin Applied ("Company") warrants to contractor, purchaser and any owner of the product (collectively "Owner") that, subject to the exclusions set forth below Company, at its option, will repair or replace defective parts in the event any product manufactured by Company, including products sold under the brand name Daikin and used in the United States or Canada, proves defective in material or workmanship within twelve (12) months from initial startup or eighteen (18) months from the date shipped by Company, whichever occurs first. Authorized replacement parts are warranted for the remainder of the original warranty. All shipments of such parts will be made FOB factory, freight prepaid and allowed. Company reserves the right to select carrier and method of shipment. In addition, Company provides labor to repair or replace warranty parts during Company normal working hours on products with rotary screw compressors or centrifugal compressors. Warranty labor is not provided for any other products.

Company must receive the Registration and Startup Forms for products containing motor compressors and/or furnaces within ten (10) days of original product startup, or the ship date and the startup date will be deemed the same for determining the commencement of the warranty period and this warranty shall expire twelve (12) months from that date. For additional consideration, Company will provide an extended warranty(ies) on certain products or components thereof. The terms of the extended warranty(ies) are shown on a separate extended warranty statement.

No person (including any agent, sales representative, dealer or distributor) has the authority to expand the Company's obligation beyond the terms of this express warranty or to state that the performance of the product is other than that published by Company.

EXCLUSIONS

1. If free warranty labor is available as set forth above, such free labor does not include diagnostic visits, inspections, travel time and related expenses, or unusual access time or costs required by product location.
2. Refrigerants, fluids, oils and expendable items such as filters are not covered by this warranty.
3. This warranty shall not apply to products or parts : (a) that have been opened, disassembled, repaired, or altered, in each case by anyone other than Company or its authorized service representative; (b) that have been subjected to misuse, abuse, negligence, accidents, damage, or abnormal use or service; (c) that have not been properly maintained; (d) that have been operated or installed, or have had startup performed, in each case in a manner contrary to Company's printed instructions; (e) that have been exposed, directly or indirectly, to a corrosive atmosphere or material such as, but not limited to, chlorine, fluorine, fertilizers, waste water, urine, rust, salt, sulfur, ozone, or other chemicals, contaminants, minerals, or corrosive agents; (f) that were manufactured or furnished by others and/or are not an integral part of a product manufactured by Company; or (g) for which Company has not been paid in full.
4. This warranty shall not apply to products with rotary screw compressors or centrifugal compressors if such products have not been started, or if such startup has not been performed, by a Daikin Applied or Company authorized service representative.

SOLE REMEDY AND LIMITATION OF LIABILITY

THIS WARRANTY CONSTITUTES THE SOLE WARRANTY MADE BY COMPANY. COMPANY'S LIABILITY TO OWNER AND OWNER'S SOLE REMEDY UNDER THIS WARRANTY SHALL NOT EXCEED THE LESSER OF: (i) THE COST OF REPAIRING OR REPLACING DEFECTIVE PRODUCTS; AND (ii) THE ORIGINAL PURCHASE PRICE ACTUALLY PAID FOR THE PRODUCTS. COMPANY MAKES NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, REGARDING PREVENTION OF MOLD/MOULD, FUNGUS, BACTERIA, MICROBIAL GROWTH, OR ANY OTHER CONTAMINATES. THIS WARRANTY IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMENT, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT AND UNDER NO CIRCUMSTANCE SHALL COMPANY BE LIABLE TO OWNER OR ANY THIRD PARTY FOR INCIDENTAL, INDIRECT, SPECIAL, CONTINGENT, CONSEQUENTIAL, DELAY OR LIQUIDATED DAMAGES FOR ANY REASON, ARISING FROM ANY CAUSE WHATSOEVER, WHETHER THE THEORY FOR RECOVERY IS BASED IN LAW OR IN EQUITY, OR IS UNDER A THEORY OF BREACH CONTRACT OR WARRANTY, NEGLIGENCE, STRICT LIABILITY, OR OTHERWISE. THE TERM "CONSEQUENTIAL DAMAGE" INCLUDES, WITHOUT LIMITATION, THOSE DAMAGES ARISING FROM BUSINESS INTERRUPTION OR ECONOMIC LOSS, SUCH AS LOSS OF ANTICIPATED PROFITS, REVENUE, PRODUCTION, USE, REPUTATION, DATA OR CROPS.

ASSISTANCE

To obtain assistance or information regarding this warranty, please contact your local sales representative or a Daikin Applied office.

Form No. 933-430285Y-01-A (11/2023)
Part No. 043028500 Rev.0F

Notes / Comments

Notes / Comments

COMPLETE HVAC SYSTEM SOLUTIONS

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