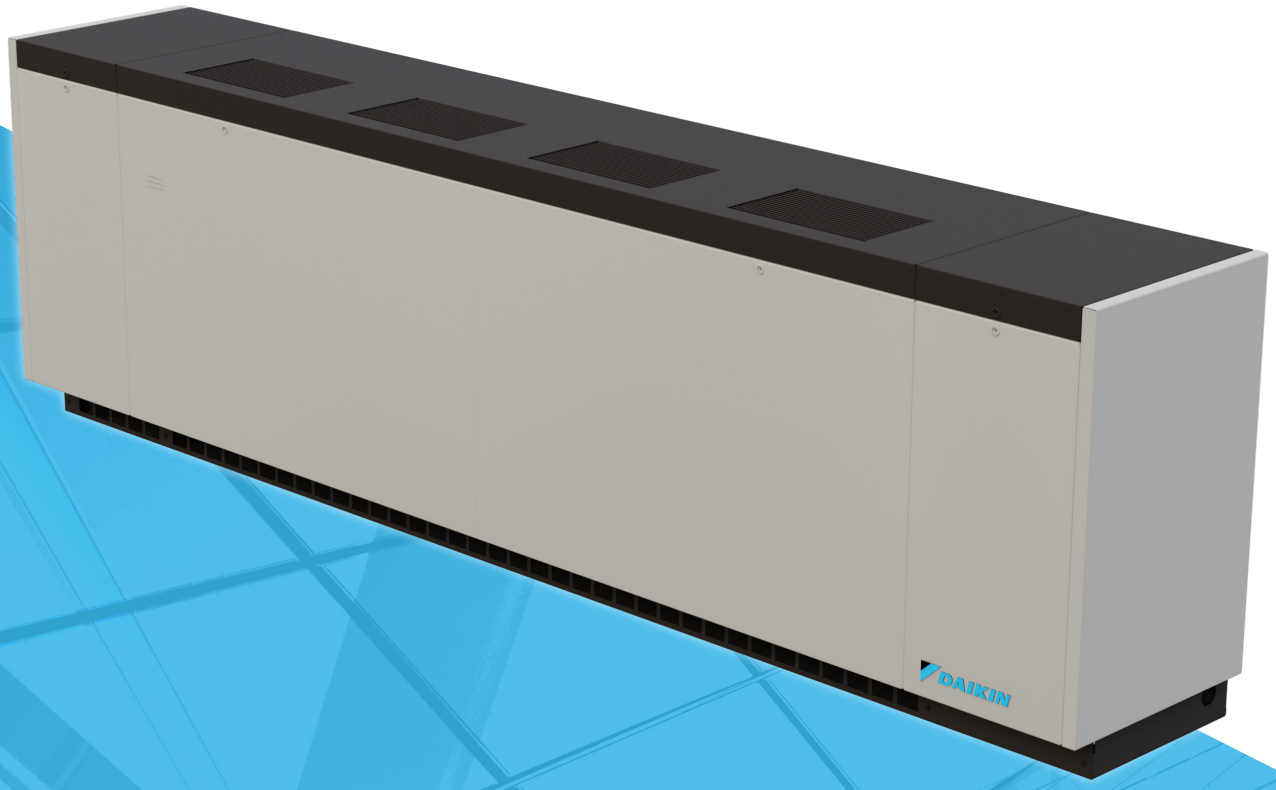
INSTALLATION & MAINTENANCE MANUAL

IM 1392

APRIL 2025

CLASSROOM UNIT VENTILATOR

SELF-CONTAINED



- MODELS ARQ, GRQ
- SIZES 024 - 048 (2 TO 4 TONS)
- R-32 REFRIGERANT

LEARN MORE AT **DAIKINAPPLIED.COM**

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 situations, which can result in property damage, personal injury, or death if not avoided.

⚠ CAUTION

Caution indicates a potentially hazardous situations, 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 CLASSROOM UNIT VENTILATOR with a MicroTech® controller.

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.

⚠ 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.

This unit is equipped with a Refrigerant Detection System, and the system components, such as supply fans, may begin operation unexpectedly and without warning.

⚠ 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

Hazardous Voltage! Use copper conductors only. Unit terminals are not designed to accept other types of conductors. Failure to do so may cause damage to the equipment.

⚠ 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 46.

⚠ WARNING

The appliance is designed to activate leak mitigation airflow in the event a refrigerant leak is detected. This is required to ensure dilution and prevent stagnation of any leaked refrigerant. Always ensure the supply fans are able to operate freely. Always maintain proper airflow and do not allow filters, air inlets, or air outlets to become blocked.

⚠ 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.

⚠ 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

Cleaning agents may cause serious damage to internal components, such as aluminum coils and electronic controls, etc. Do not operate unit ventilator while building maintenance cleaning agents are in use.

⚠ CAUTION

Personal injury hazard. Wear protective gloves to avoid possible cuts and abrasions from exposed edges. Avoid contact with sharp edges.

⚠ 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

This unit is not intended for use in laundry rooms.

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 refrigerating 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 technical manual for instructions
	WARNING - flammable refrigerant present

Introduction

Model Nomenclature

U	ARQ	K	024	H	G	12	Z	B1	AL	22	G	I	B	3
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Category	Code Item	Code Option	Code Designation & Description			
Product Category	1	1	U	Unit Ventilators		
Model Type	2	2-4	ARQ	WSHP Standard Range, Ultra Quiet	GRQ	WSHP Ground Source, Ultra Quiet
Design Series	3	5	K	Design K		
Nominal Capacity	4	6-8	024	24,000	048	48,000
			040	40,000		
Voltage	5	9	C	208/60/1	H	230/60/3
			G	230/60/1	K	460/60/3
			D	208/60/3		
Coil Options	6	10	G	Direct Expansion	9	Direct Expansion with Stainless Steel Drain Pan
Heating Options	7	11-12	12	3 Element Low Cap. Electric Heat	00	None
			13	6 Element Low Cap. Electric Heat		
Hand Orientation	8	13	Z	Not Available		
Controls	9	14-15	##	MicroTech Controls (see control code table below)		

Control Features		Feature Selections							
Open Protocol	BACnet / Stand-Alone	•		•		•	•		
	LonMark		•		•			•	•
DCV	CO_2 Sensor			•	•		•		•
Factory Installed Keypad	LUI					•	•	•	•
		Control Code							
Economizer Control	Basic	B1	B5	B9	BD	BH	BL	BP	BT
	Expanded	E1	E5	E9	ED	EH	EL	EP	ET
	Leading-Edge	L1	L5	L9	LD	LH	LL	LP	LT

		44	Electromechanical w/2-Position OA Damper for Remote Thermostat		
Discharge	10	16-17	AL	16-5/8" Top Bar Grille	AP	21-7/8" Top Bar Grille Full Adapter Back, Cold Pipe Tunnel, Top Duct In
			AK	21-7/8" Top Bar Grille Partial Adapter Back, Open Tunnel	AM	21-7/8" Top Bar Grille 2" Step, Full Adapter Back, Closed Tunnel
			AN	21-7/8" Top Bar Grille Full Adapter Back, Closed Tunnel	AB	21-7/8" Top Bar Grille Full Adapter Back, Closed Pipe Tunnel w/ Solid Back
Return Air/ Outside Air	11	18-19	22	Return Air Bottom Front/ Outdoor Air Rear	24	Recirculation Only / No OA or RA Dampers
Power Connection	12	20	G	Box with Switch		
			J	Box w/switch, w/USB		
			K	Box w/switch, w/SD		
			M	Box w/switch, w/USB, w/SD		
Color	13	21	I	Antique Ivory	G	Soft Gray
			W	Off White	C	Cupola White
			B	Putty Beige		
SKU Type	14	22	B	Standard Delivery		
Product Style	15	23	3	R-32 Refrigerant		

Installation

Receiving and Handling

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.

Lifting Unit

A forklift or other lifting device is needed to install this product.

⚠ WARNING

Make sure lifting equipment can handle the weight of the unit safely. Personal injury may result if improper lifting and moving methods are used. (See Table 1 for approximate shipping weights.)

⚠ CAUTION

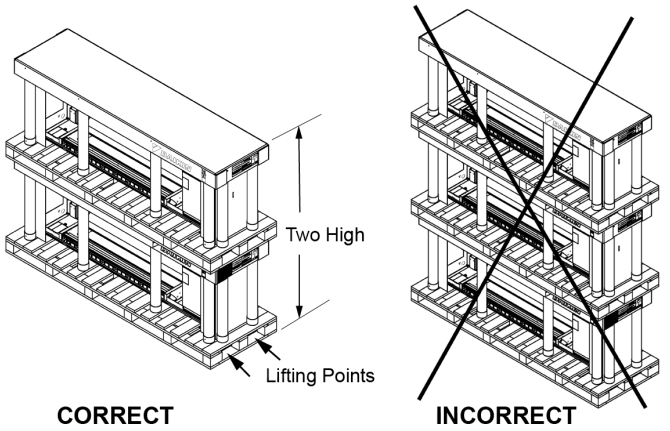
Use 72" length forklift tines, short tines will damage the unit bottom. Improper handling can damage internal components. Do not stand the unit on end or stack (see Figure 1 & Figure 2).

Figure 1: Forklift Lifting Requirements

Table 1: Physical Data

			024	040	048
Overall Unit Dimensions			96″w × 38″h × 32″d or (21⅞″d w/Adapter Back)	108″w × 38″h × 32″d or (21⅞″d w/Adapter Back)	120″w × 38″h × 32″d or (21⅞″d w/Adapter Back)
Fan Data	**Nominal CFM (L/s)**	**High Speed**	1000 (472)	1100 (519)	1400 (661)
		Medium speed	750 (354)	970 (458)	940 (444)
		Low Speed	650 (307)	800 (378)	750 (354)
	Number of Fans		3	4	4
	Size	**Diameter - in (mm)**	8.12 (206)	8.12 (206)	8.12 (206)
		Width - in (mm)	8.25 (210)	8.25 (210)	8.25 (210)
Room Fan Motor Horsepower			1/4	1/4	1/4
Filter Data	**Nominal Size - in (mm)**		10 x 48½ x 1 (254 x 1232 x 25)	10 x 60½ x 1 (254 x 1537 x 25)	10 x 36½ x 1 (254 x 927 x 25)
	Area - ft² (m²)		3.37 (.31)	4.2 (.39)	5.08 (.47)
	Quantity		1	1	2
Approximate Shipping Weight	**lb (kg)**		630 (286)	700 (318)	800 (363)
Refrigerant Charge (R-32)	**oz (lbs)**		72 (4.50)	74 (4.63)	100 (6.25)

Figure 2: Stack Units Maximum Two High As Shown



Before beginning installation, please read this publication in its entirety.

Directions given in this bulletin for right and left sides assume a position facing the indoor side of the unit ventilator.

Before beginning installation, if provided, remove the protective plastic film covering the unit painted panels.

⚠ WARNING

Plastic packaging is a suffocation hazard, dispose of properly. Keep away from children.

To be sure the correct unit ventilator(s) is/are installed in the correct location(s), the installer must check the packing list and unit identification/tagging number(s) against the plans. Further, the unit data plate, located on the lower right end of the unit ventilator, contains specific information of standard components as listed in the "Model Nomenclature" on page 5.

Install this product in accordance with good engineering practices and workmanship, following these general instructions, plus the job-specific Daikin Applied submittal drawings provided for specific dimensions, unit arrangements, controls and electrical details, pipe stub-up locations, etc. Applicable tools for lifting, hook-up of piping, electrical and insulation are required.

Storage

If equipment is stored for any length of time before installation, it should remain in its shipping packaging in a clean, dry, climate controlled area.

Operating Limits

This equipment is designed for indoor installation only. Sheltered locations such as attics, garages, etc., generally 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 25ºF (-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 2: 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)
Common Design Ambient Air	80°F (27°C)	70°F (21°C)	80°F (27°C)	70°F (21°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]	50°F (10°C)	50°F (10°C)	50°F (10°C)	40°F (4°C)
Common Design Entering Air	80°F/67°F (27°C/19°C)	70°F (21°C)	80°F/67°F (27°C/19°C)	70°F (21°C)
Maximum Entering Air[2]	100°F/83°F (38°C/28°C)	80°F (27°C)	100°F/83°F (38°C/28°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 3: 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)	20°F (-7°C)
Common Design Entering Fluid	85 (29°C)	70°F (21°C)	77°F (25°C)	40°F (4°C)
Maximum Entering Fluid	110°F (43°C)	90°F (32°C)	110°F (43°C)	90°F (32°C)
Minimum GPM/Ton	2.0			
Nominal GPM/Ton	3.0			
Maximum GPM/Ton	4.0			

Pre-Installation Considerations

Figure 3: Typical Unit Ventilator Installation and Louver Details

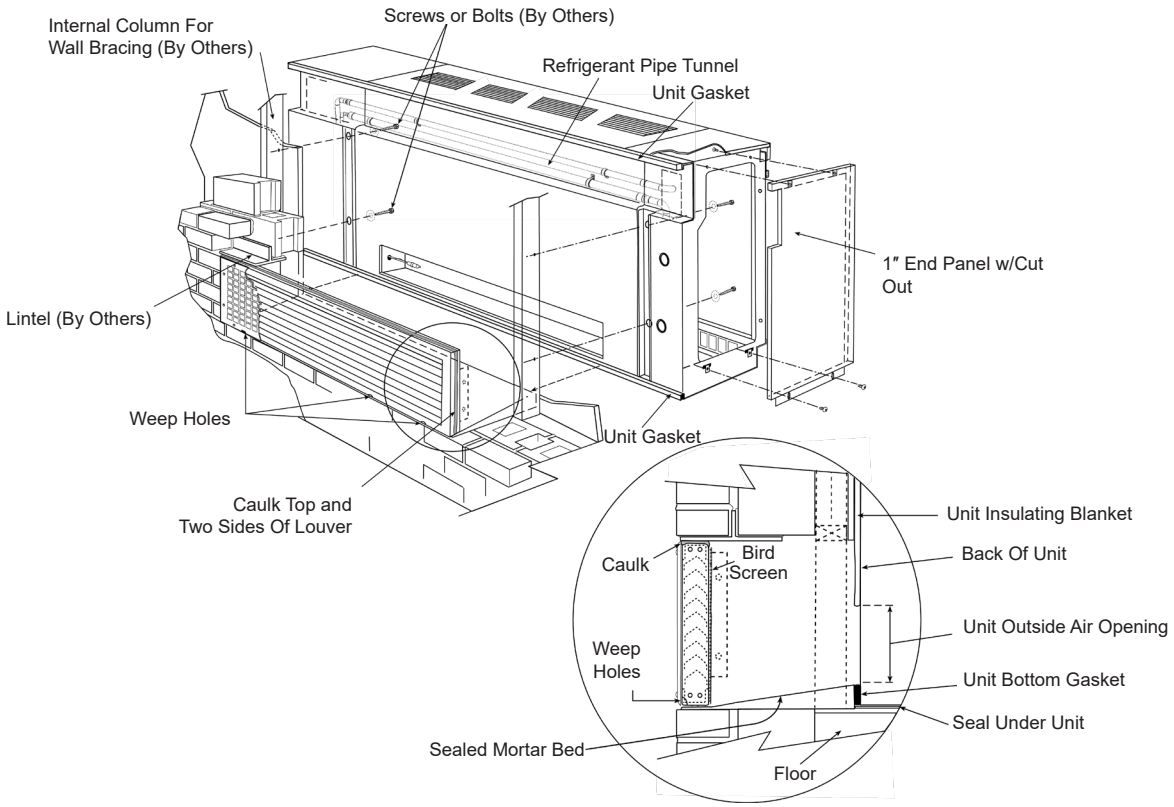
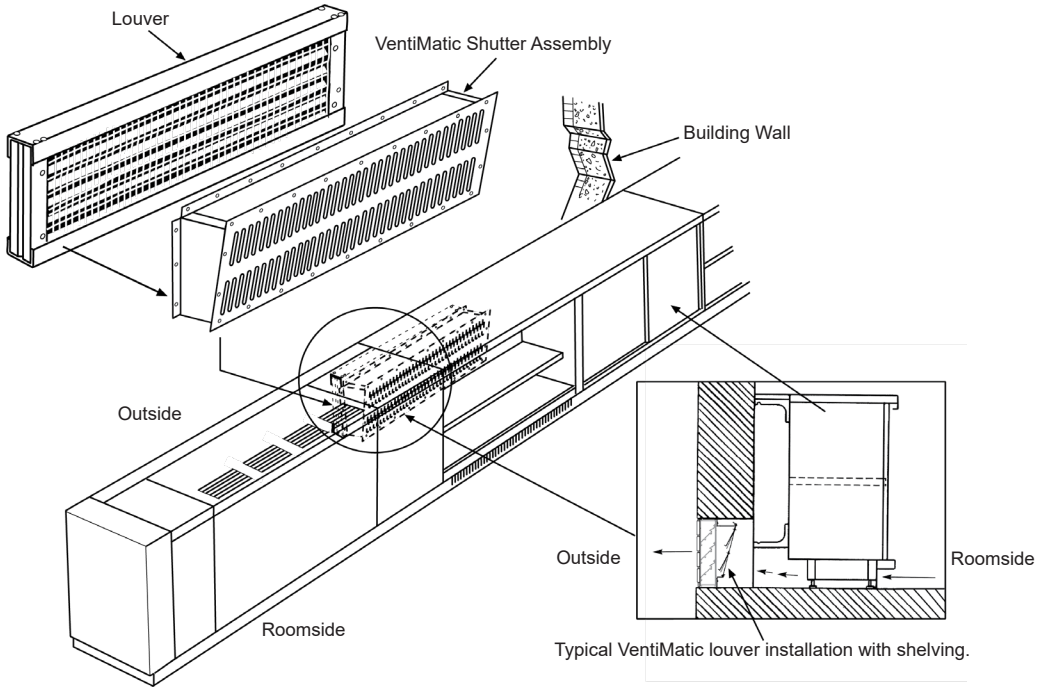


Figure 4: Typical VentiMatic™ Shutter Assembly Installation



Unit Location

Wall Openings, Louvers, and VentiMatic Shutter

⚠ CAUTION

Locate Drain Lip at bottom of vertical louver to allow proper drainage. For horizontal louvers, the louver blades should face down for proper drainage. Bird screen should always be on side toward unit.

Self-Contained Floor Models ARQ and GRQ are typically installed in front of a wall opening containing a properly sized louver that is designed to let in outside air while preventing water (such as rain) from getting past the louver and into the unit itself. A weather-tight seal keeps unwanted air and moisture from entering the occupied space. Refer to Figure 5 through Figure 22, for louver details.

VentiMatic™ Shutter Assembly

In many installations, a Daikin Applied VentiMatic Shutter Assembly is specified. See Figure 8. This one-way shutter is a continuously variable, gravity actuated, room exhaust vent that operates in direct response to positive static pressure. It opposes any airflow into the room and allows a slight positive pressure.

It is important that the VentiMatic shutter and unit ventilator louvers are mounted on the same wall. This neutralizes the effect of the wind. Forcing excess air into the room through the unit ventilator louver overcomes the same wind pressure that works to keep the VentiMatic shutter closed. This prevents room air exhausting from the room through the VentiMatic shutter.

Figure 5: Horizontal Blade Louver, Without Flange

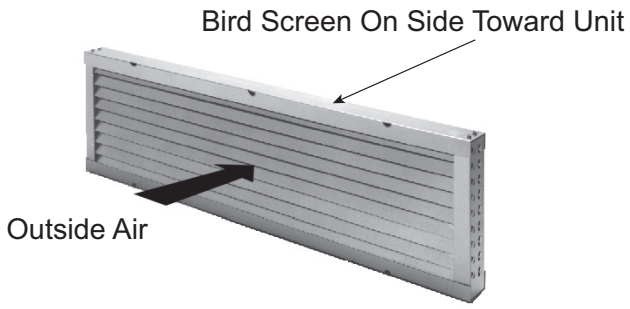


Figure 6: Vertical Blade Louver, Without Flange

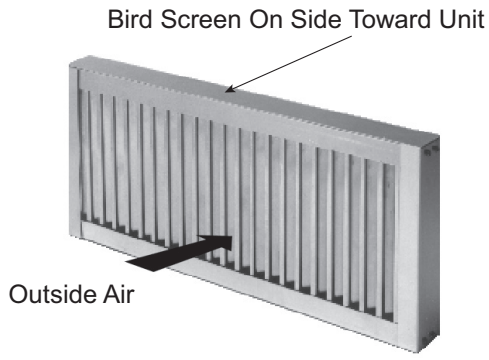


Figure 7: Horizontal and Vertical Blade Louvers, Without Flanges with Grille or with Flange Without Grille

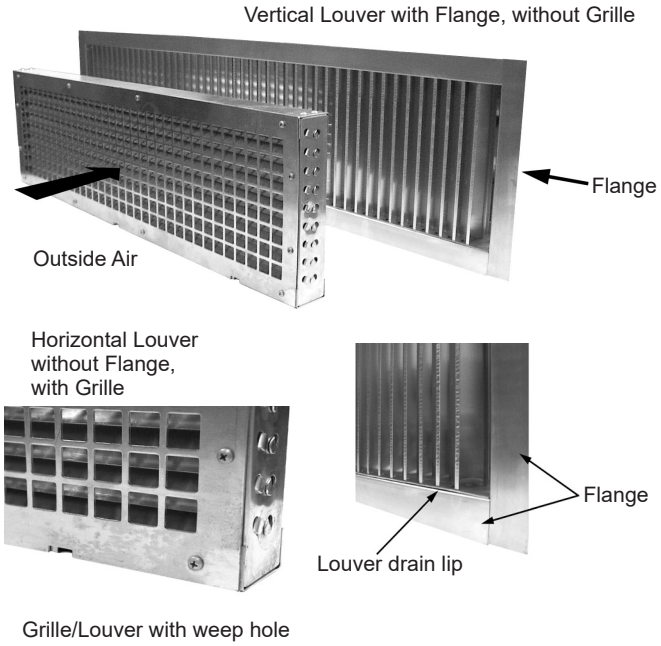
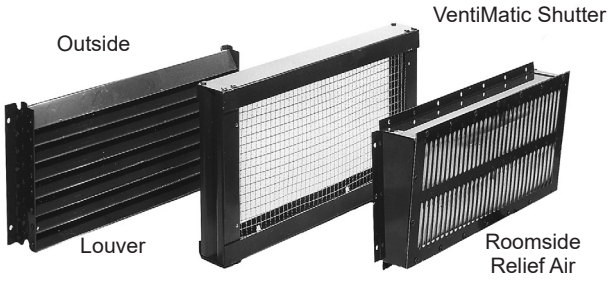


Figure 8: VentiMatic Shutter Assembly



NOTE: Bird screen and louver are shipped in one (1) piece.

Louver Installation with Typical Unit Arrangements – 16⅝″ Unit Depth

Figure 9: The 16⅝″ (422 mm) Deep Unit with Open Refrigerant Pipe Chase and Floor Level Outdoor Intake Louver Location

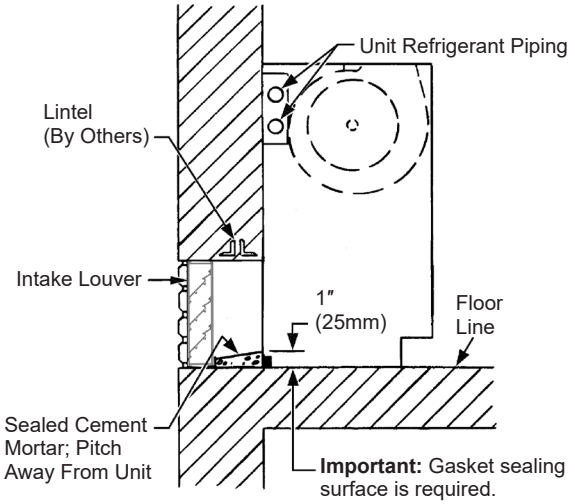
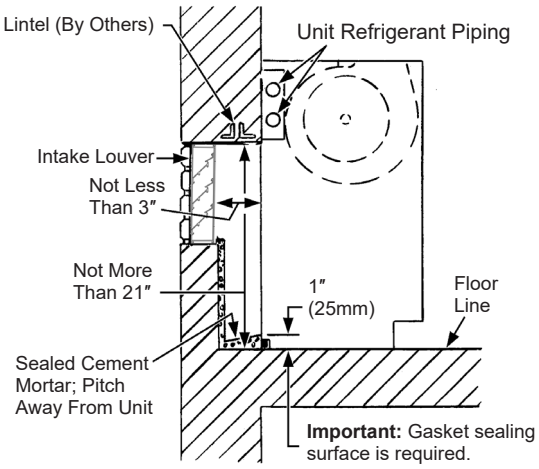


Figure 10: 16⅝" (422 mm) Deep Unit with Open Refrigerant Pipe Chase & Above-Floor-Level Outdoor Intake Louver Application with Chased Wall



⚠ CAUTION

Accumulated moisture can cause property damage if not properly drained. Installing contractor must provide such drainage.

Figure 11: Above Floor Level Outdoor Air Intake with Accessory Closed Refrigerant Pipe Chase

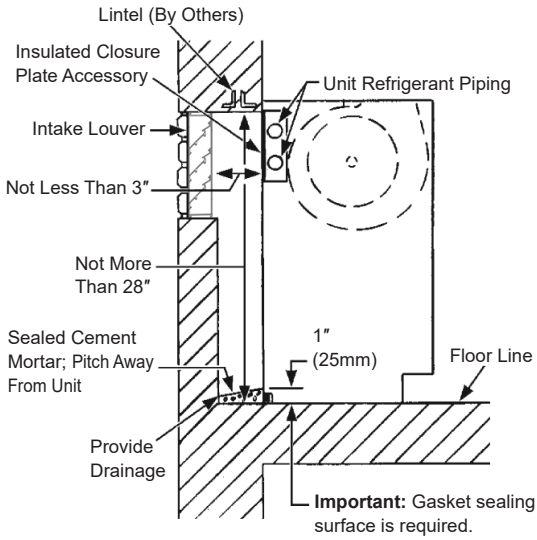
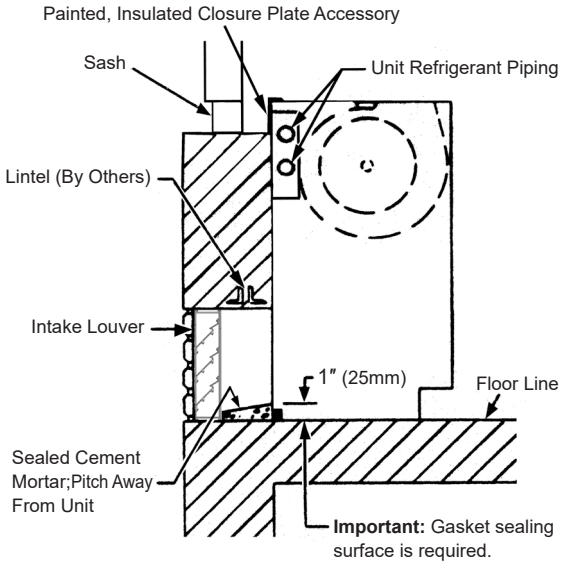


Figure 12: Floor Level Outdoor Air Intake with Window Below Unit Top and 9" "Finished" (Painted) Accessory (Insulated) Closed Refrigerant Pipe Chase



Louver Installation with Typical Unit Arrangements – 21⅞" Unit Depth

Figure 13: 21⅞" (556 mm) Deep Full Adapter Back Unit and Floor Level Outdoor Intake Louver Location

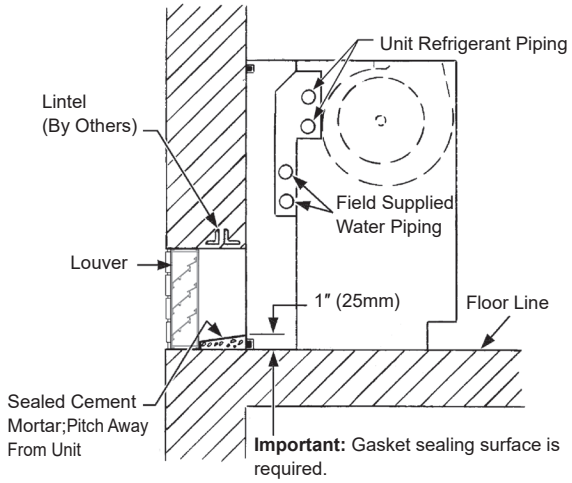


Figure 14: 21⅞" (556 mm) Deep Full Adapter Back Unit with High Louver Application

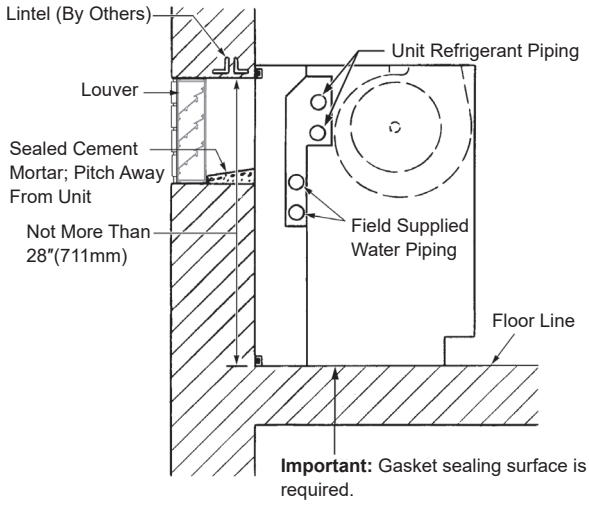


Figure 15: 21⅞" (556 mm) Partial Adapter Back Unit with Window Below Unit Top (2" Step-Down) and Floor Level Outdoor Intake Louver Location

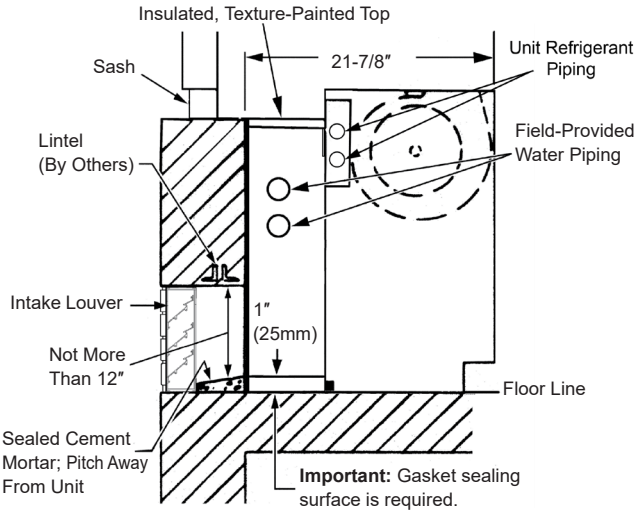


Figure 16: 21⅞" (556 mm) Deep Partial Adapter Back Unit with Open Refrigerant Pipe Chase and Floor Level Outdoor Intake Louver Location

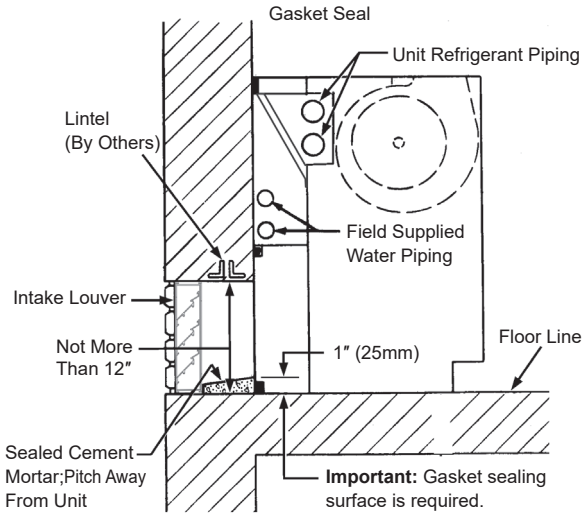
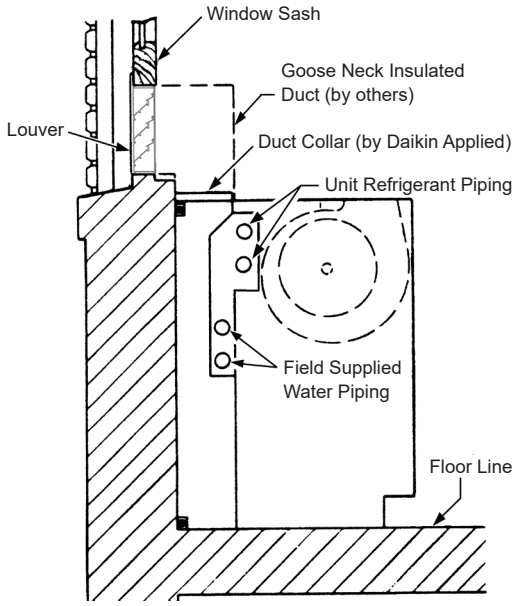


Figure 17: The 21⅞" (556 mm) Deep Full Adapter Back Unit with Closed Refrigerant Pipe Chase, Ducted with Top Intake



Installing Louvers

Typical Installation Methods

If the fresh air opening has not yet been made, see Figure 9 through Figure 17 for the recommended locations and the job-specific plans for the exact location. Follow local codes.

Cut the wall opening so that it is slightly larger than the louver being installed. For dimensions, see Table 4. If the opening is already there, measure to be sure there is a minimum of 3/8″ (9 mm) clearance around all sides. For masonry installations, a lintel must be installed above all louvers.

In thick wall applications, the portion of the wall between the louver and the unit is the outside air plenum. Line this plenum area with 3/8″ (9 mm) mortar or other suitable material. In some applications, the job specifications require a metal sleeve connection between the louver and the unit. If using such a sleeve, properly caulk it to ensure a weather-tight seal. This is critical in preventing freeze-ups, cold drafts, and air infiltration. Be sure the wall is smooth, square, and provides a suitable mating surface.

Before setting the louver, construct a sloping, sealed cement mortar base to drain unwanted moisture to the outside, (see Figure 18). Be sure the mortar base is 1″ (25 mm) thick at the unit and tapers toward the louver. The mortar at the unit also acts as a backing against which the open cell gasket of the unit itself can seal. This is critical in preventing water leaks and air leaks under the unit. Be sure the sealed cement mortar base is smooth and flush with the interior wall.

If it is not possible to construct a sloping mortar base, then field-supplied flashing is required. See Figure 19. The flashing should terminate flush with the exterior of the building. Place a bead of caulk under the flashing to prevent moisture from wicking back to the unit. Do not caulk the joint between the louver and the flashing. This joint is designed to let unwanted moisture escape.

Figure 18: Typical Louver Installation with Sloping Sealed Cement Mortar Base

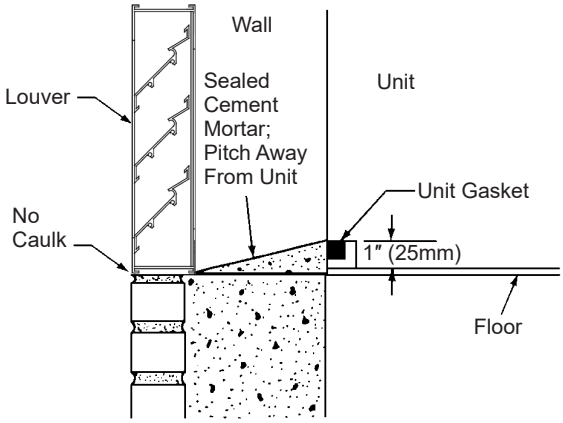
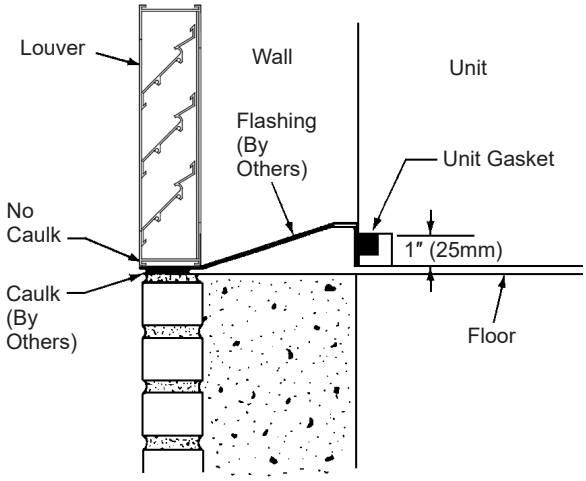


Figure 19: Typical Louver Installation with Flashing



⚠ CAUTION

Personal injury hazard. Wear protective gloves to avoid possible cuts and abrasions from exposed edges. Avoid contact with sharp edges.

See Figure 6 through Figure 22. Before setting the louver, be sure the drain lip (vertical louver) are at the bottom, horizontal louver blades face down and the bird screen is towards the unit as indicated in Figure 21 and Figure 22. Place a heavy bead of caulk along the top and the two vertical sides of the louver, leaving the bottom uncaulked so that if moisture gets into the area between the louver and the unit, it can drain to the outside, unrestricted.

If the louver is supplied with flanges, (see Figure 21) place an additional bead of caulk on the inside of the top and side flanges that come in contact with the building facade. Do not caulk the

bottom flange. Place the louver in the opening and push it tight against the supplied building, fastening it to the exterior of the building using fasteners (by others) appropriate to the installation. Seal the top and sides with a waterproof caulk to make it weather-tight. Do not caulk the bottom of the louver; doing so might trap unwanted moisture behind the flange.

If the louver is supplied with no flanges, (see Figure 22) place the louver in the opening so that it is recessed a minimum 1/16″ (2 mm) beyond the building facade or as directed in the architectural plans. If specified in the plans, secure the louver in the wall using mechanical fasteners (supplied by others) appropriate to the installation. (See Figure 20 for suggested fastening). With the louver solidly in place, run a bead of caulk around the perimeter of the louver to seal it weather-tight. Do not plug the weep holes (horizontal louver) or the drip line (vertical louver). This might restrict the flow of unwanted moisture to the outside (see Figure 22).

If flashing was used, as shown in Figure 19 instead of the sloping mortar base, caulk the flashing where it meets the inside of the opening between the louver and the unit. This helps prevent moisture from getting under the flashing and into the room.

Figure 20: Suggested Method For Fastening Louver (Without Flange) Inside Wall Opening

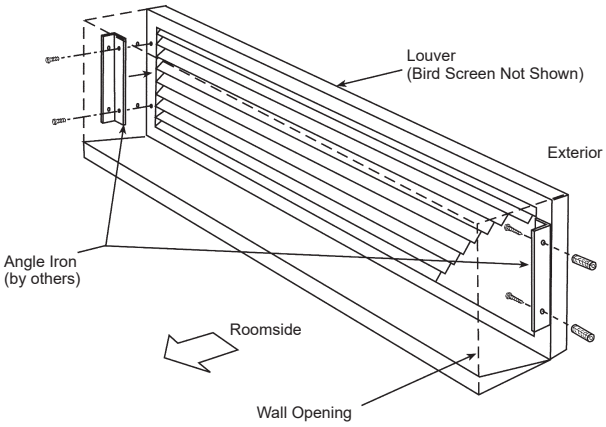


Figure 21: Vertical or Horizontal Blade Wall Intake Louver (Flanged) (Vertical Blade Shown)

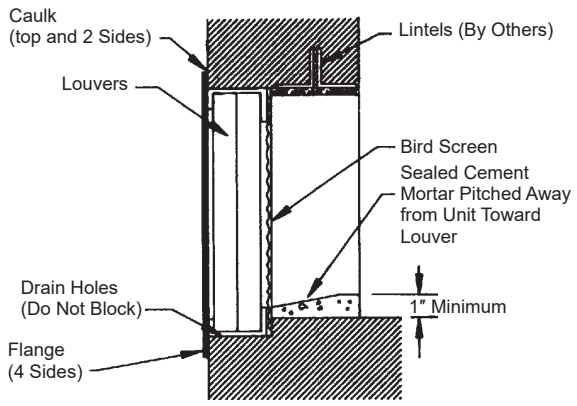
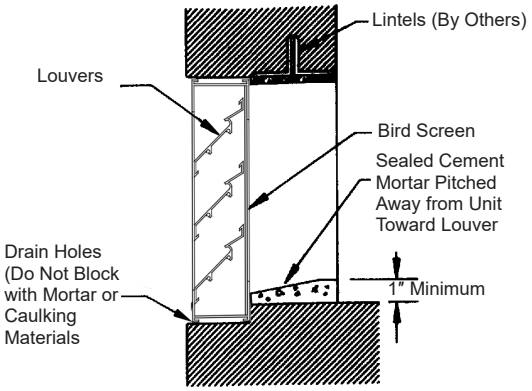


Figure 22: Vertical or Horizontal Blade Wall Intake Louver (Recessed Without Flange) (Horizontal Blade Shown)



Installing the VentiMatic Shutter Assembly

⚠ CAUTION

For proper operation, the VentiMatic shutter assembly must be mounted on the same wall as the unit ventilator louver(s) to neutralize wind effect.

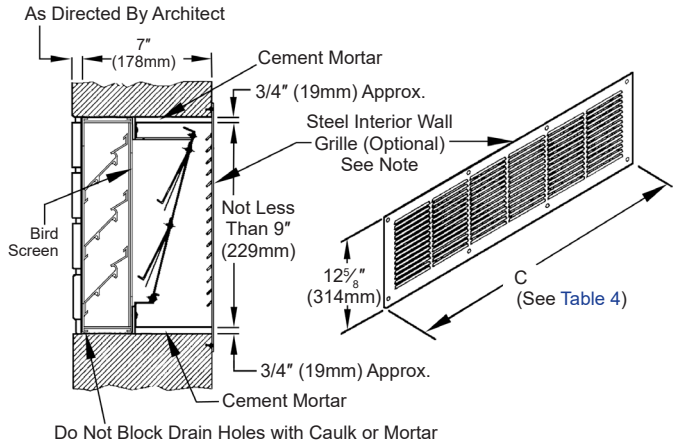
The Daikin Applied VentiMatic Shutter Assembly is a one-way shutter. It is a continuously variable, gravity-actuated, room exhaust vent that operates in direct response to positive static pressure, opposing any airflow into the room resulting in a slight positive pressure.

The VentiMatic Shutter Assembly is mounted on an installed wall louver. For larger units with 100% ventilation air dampers, two VentiMatic Shutters may be mounted side by side on the same louver, (Figure 25).

The size and appearance of the wall louvers with or without optional grilles used with the unit ventilator, and the VentiMatic Shutter, are identical.

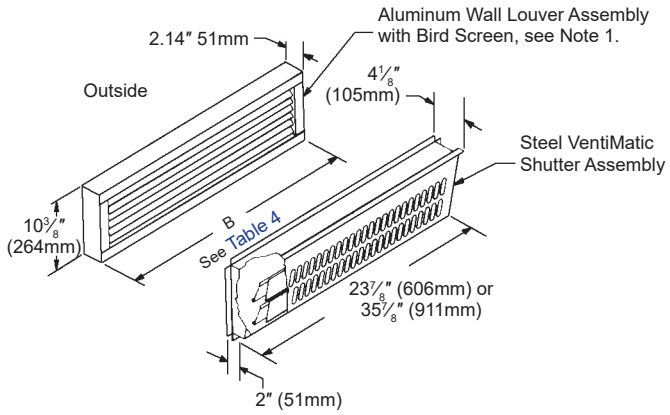
When installing VentiMatic Shutter(s) on the wall louver, make sure all moving parts are free to operate unobstructed and placed level and plumb for proper operation. If optional steel interior wall grille is furnished, install as shown in Figure 23.

Figure 23: Louver, VentiMatic Shutter, Interior Wall Grille Details, Dimensions



NOTE: Optional steel interior wall grille should be used to conceal the interior wall opening whenever the VentiMatic shutter is not located behind shelf cabinets. Hardware to mount the interior wall grille is not included.

Figure 24: Single VentiMatic Shutter & Wall Louver

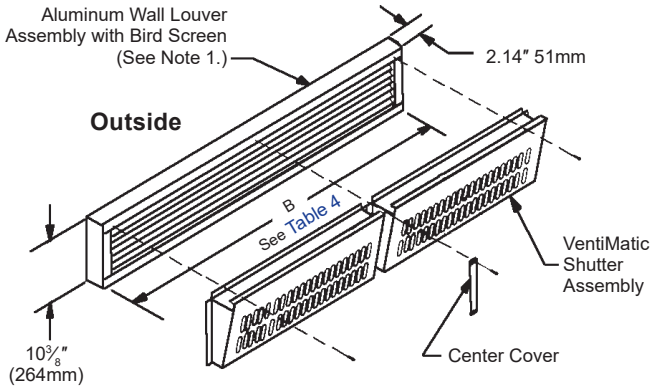


Decorative Exterior Grille Also Available, see Note 2. (Bird Screen not shown)

NOTE 1: Horizontal blade wall louver shown. Vertical blade wall louver also available with VentiMatic shutter.

NOTE 2: Optional exterior grille matches unit ventilator wall louver in material and design. Mounted on wall louvers.

Figure 25: Two VentiMatic Shutters & Wall Louver



Decorative Exterior Grille Also Available, see Note 2. (Bird Screen not shown)

NOTE 1: Horizontal blade wall louver shown. Vertical blade wall louver also available with VentiMatic shutter.

NOTE 2: Optional exterior grille matches unit ventilator wall louver in material and design. Mounted on wall louvers.

Table 4: Recommended Wall Openings for Wall Louvers

B	C	Recommended Wall Openings For Wall Louvers		Maximum Number of VentiMatic Shutters Which Can Be Mounted On Standard Louver		VentiMatic Shutter(s) Air Capacity Maximum	
		Length	Height	24" Shutter	36" Shutter	cfm	L/s
48″ (1219)	51″ (1295)	48 5/8″ (1222)	10 7/8″ (267)	2	0	1000	472
60″ (1524)	63″ (1600)	60 5/8″ (1527)	10 7/8″ (267)	1	1	1250	590
72″ (1829)	75″ (1905)	72 5/8″ (1832)	19 7/8″ (495)	0	2	1500	708

Preparing to Move the Unit

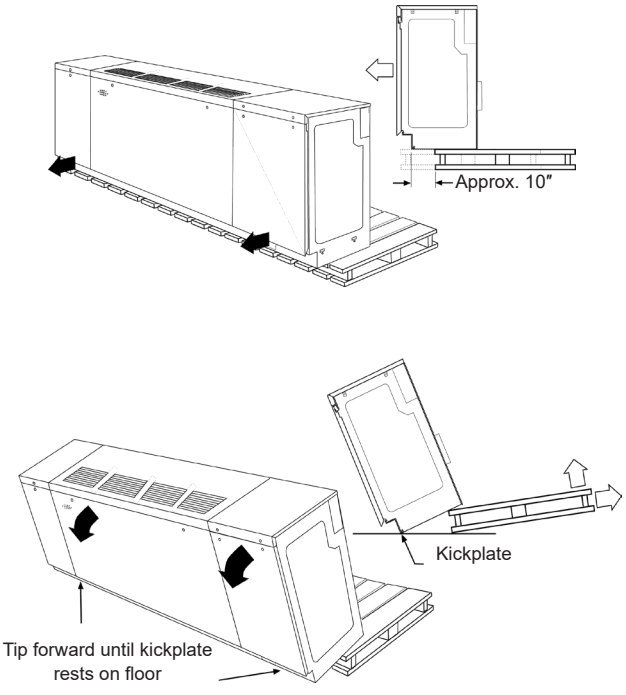
Move the unit ventilator to the correct location. See Table 1 on page 6 for approximate shipping weights.

Carefully remove unit ventilator from wood skid. Be sure to properly dispose of the skid in accordance with local recycling rules and guidelines.

Removing Unit from the Skid

1. Remove fasteners at each end which hold the unit to the skid and carefully slide the front of the unit off the front of the skid.
2. While supporting unit from the front, slowly tip unit forward until the bottom of the slotted front kickplate is resting on the floor.
3. Lift rear of unit off of the skid by tipping unit forward while supporting the unit from the front, until it is possible to slide skid out from under the unit. GENTLY LOWER the rear of the unit to the floor. DO NOT DROP. See Figure 26.

Figure 26: Removing Unit From Skid



Unit Ventilator Installation

Before setting the unit ventilator in position, be sure that field-supplied electrical connections are in place, de-energized and in accordance with the plans.

Before Sliding the Unit into Place

Sliding of this unit to the wall can be made easier with the assistance of Caster Kit P/N 105629001 (Figure 27). A piece of cardboard placed under the unit will make this job easier and reduce marring the floor. (Do not leave cardboard under unit after installation.)

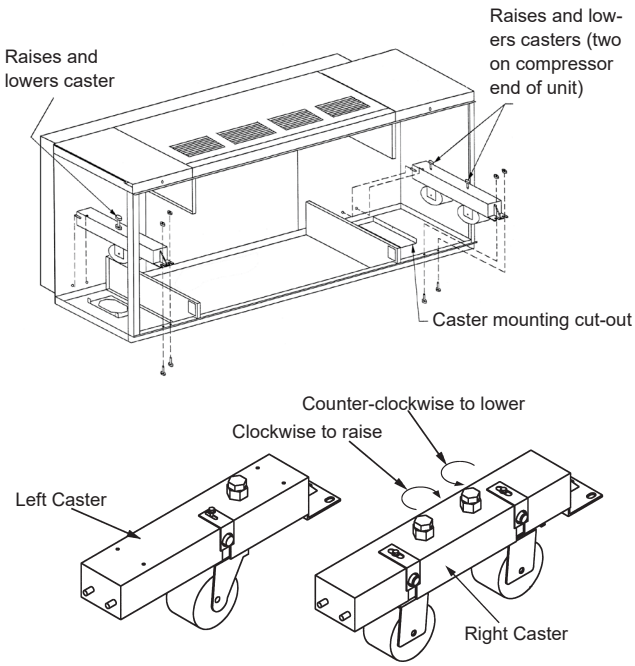
Be certain that the field-supplied electrical connections are in place, de-energized and in accordance with the plans.

Installing Casters

If the unit was ordered with the optional caster wheels, install them as follows:

1. Remove the left and right front access panels.
2. With the left side (one-wheeled) caster, ensure the caster is fully up (turn bolt clockwise to raise, counterclockwise to lower).
3. Locate the slots and bolt location in the left end compartment.
4. Insert the tines of the caster channel into the slots.
5. Securely bolt the front to the unit front rail.
6. Repeat for the right side (two-wheeled) caster.
7. Slowly engage the casters by lowering the bolt. Make all caster adjustments equally before raising the unit.
8. When fully engaged, the unit will roll forward up to the wall. When the unit is in position, reverse the procedure and remove the caster kit. Save the caster kit for future unit servicing or replacement.

Figure 27: (Optional) Indoor Section Caster Installation



Reversing Condensate Drain End

⚠ CAUTION

Personal injury hazard. Wear protective gloves to avoid possible cuts and abrasions from exposed edges. Avoid contact with sharp edges.

Models ARQ and GRQ condensate drain connection is on the left end (with static equalizer cover). If the job dictates that the drain connection be made at the right end, perform the following procedure to change the drain connection from left to right end:

1. Remove the two screws holding the static equalizer cover in place (Figure 28). It will be necessary to cut the seal between the static equalizer cover and the drain pan.
2. Remove the upper plate and lower bracket — which may be covered by insulation — from each end of the unit, as shown in Figure 29. This is done by removing the screws in each with a 1/4 inch nut driver.

Figure 28: Low End of Drain Pan (Drain End)

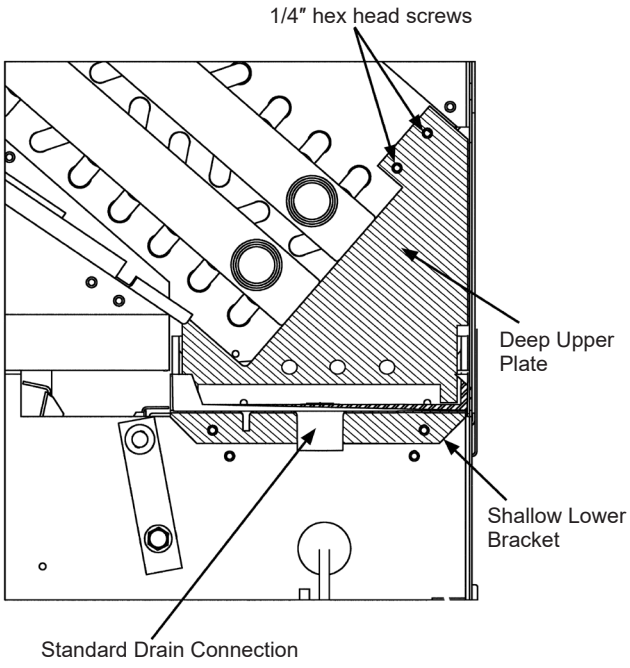
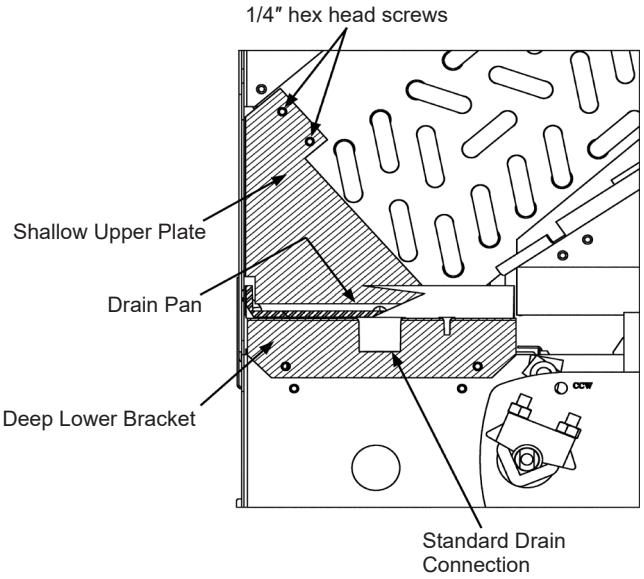


Figure 29: High End of Drain Pan



3. Reinstall the brackets on the opposite end of the unit.
4. Reinstall the static equalizer cover into the right end drain pan and secure to the upper plate. Use silicone sealer and seal all gaps between the equalizer cover where it meets the drain pan.
5. Verify the drain connection is open on the low (drain) right end only. The open drain connection stub-out at the high end of the drain pan (left end), must be sealed water tight with silicone sealer or similar.

To Clean the Drain Pan

1. Remove the shallow and deep upper plates from the unit (see Figure 28 and Figure 29).
2. Spray water into the drain pan on the high end to wash debris to the low end (drain end).
3. Remove any debris, making sure that the drain holes are not obstructed.
4. Wipe the drain pan with a cloth.
5. Reinstall the upper plates.

Mounting Hole Locations & Dimensions

⚠ CAUTION

Leakage of outdoor air wastes energy, causes drafts and erratic unit ventilator operation. Check the following details: At the correct unit ventilator location, examine the wall surface. Make sure that it is smooth, plumb, and perpendicular to the floor. The seals on the rear of the unit ventilator will take up the small irregularities found in normal masonry construction. If the wall is irregular or has mullions, install furring strips to provide a flush surface against which the unit ventilator can seal. If there are moldings on the floor/wall line, omit them behind the unit ventilator. (See Figure 30.) Provide a sealing surface at the floor line. Install a seal pad under the unit to prevent air leakage. Install the unit ventilator against a wall made of non-combustible material, and on a floor made of non-combustible material. Floor must be level, unbroken and structurally strong to support the unit.

⚠ CAUTION

Unit must be anchored to an internal wall column or other suitable support (see Figure 3 on page 8).

Move the unit ventilator into position against the wall surface. Check to see that the unit ventilator is level from end to end and back to front. Using a 4′ level is recommended.

Refer to Figure 31 and attach the unit ventilator to the wall through the four (4) mounting holes provided, using field-supplied fasteners appropriate to the wall construction and the washers provided in the brown envelope with these instructions. Envelope also contains Allen wrench to provide access to unit. Push the unit ventilator tight to the wall structure so that the outdoor air seals are compressed. Secure the wall fasteners to prevent the unit ventilator from moving and tipping over.

Figure 30: Setting the Unit Ventilator in Place

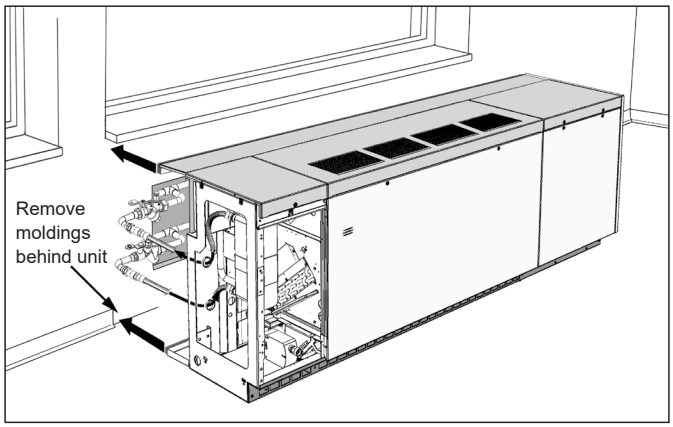
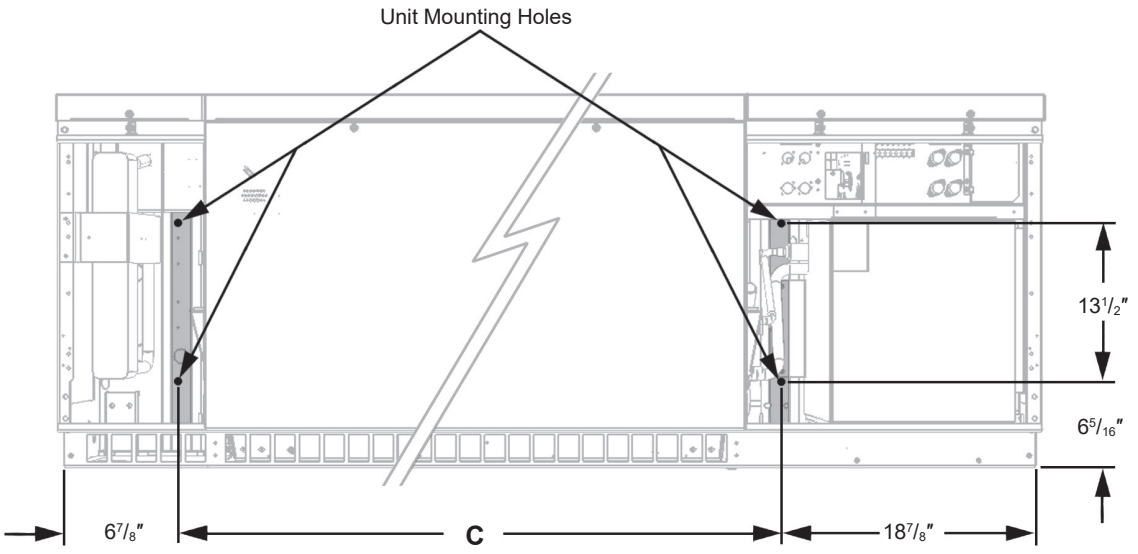


Table 5: Mounting Holes Dimension "C" for Figure 31

Unit Size	C
024	60″ (1524 mm)
040	72″ (1829 mm)
048	84″ (2134 mm)

Figure 31: Unit Mounting Holes Locations



Water Piping

Piping Considerations

1. All units should be connected to supply and return piping in a two-pipe reverse return configuration. 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. Check for proper water balance by measuring differential temperature reading across the water connections. To insure proper water flow, the differential flow should be 10°F to 14°F (5°C to 8°C) for units in cooling mode.

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

2. The condenser water or loop piping can be steel or copper.
3. Supply and return runouts usually join the unit via short lengths of high pressure flexible hose which are sound attenuators for both unit operating noise and hydraulic pumping noise. One end of the hose should have a swivel fitting to facilitate removal for service. Hard piping can also be brought directly to the unit. This option is not recommended since no vibration or noise attenuation can be accomplished. The hard piping must have unions to facilitate unit removal.
4. Some flexible hose threaded fittings are supplied with sealant compound. If not, apply Teflon tape to assure a tight seal.

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.

5. Supply and return shutoff valves are required at each conditioner. The return valve is used for balancing and should have a “memory stop” so that it can always be closed off but can only be reopened to the proper position for the flow required.
6. No unit should be connected to the supply and return piping until the water system has been cleaned and flushed completely. After the cleaning and flushing has taken place, the initial connection should have all valves wide open in preparation for water system flushing.
7. Condensate drain piping can be steel, copper or PVC or CPVC.
8. The condensate drain hose must be trapped. The hose must be pitched away from the unit not less than 1⁄4″ per foot. The unit drain pan has a 7/8 inch O.D. drain connection to accommodate the condensate drain hose.

Figure 32: Condensate Disposal Trapping Detail

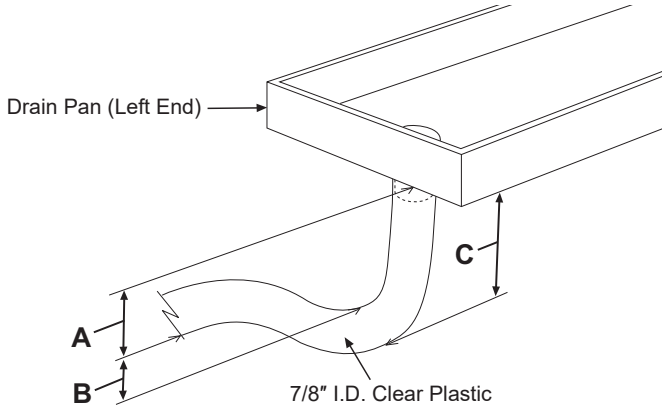


Table 6: Condensate Drain Trap & Static Pressure

	A	B	C
Standard Static Pressure	1¼″	5/8″	2¾″
High Static	1½″	3/4″	3⅛″

9. Do not locate any point in the drain system above the drain connection of any unit.
10. Automatic flow controlled devices must not be installed prior to system cleaning and flushing.
11. A high point of the piping system must be vented.
12. Check local code for the need for dielectric fittings.

Water System Cleaning

⚠ CAUTION

Prior to first operation of any unit, the water circulating system must be cleaned and flushed of all construction dirt and debris. If the unit is provided with water shutoff valves, either electric or pressure operated, the supply and return run outs must be connected together at each unit location. This will prevent the introduction of dirt into the water circulating system. Additionally, pressure operated valves only open when the compressor is operating.

⚠ 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.

⚠ CAUTION

Water/refrigerant heat exchanger fouling will interrupt water flow resulting in localized freezing. Install a 16-20 mesh strainer in the water line upstream of the exchanger.

NOTICE

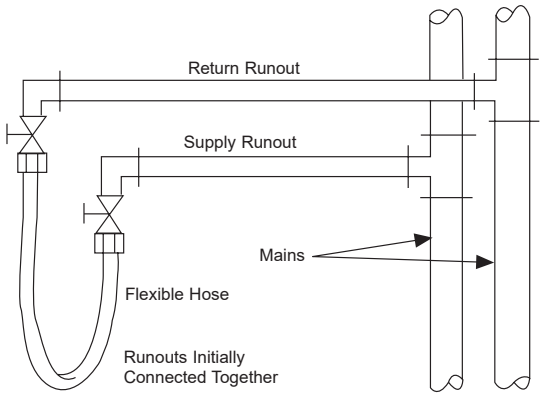
It is Daikin Applied’s policy not to make recommendations on water treatment. It is the responsibility of the user to check that the water supply to the units is free of contaminants or corrosive agents, chemicals or minerals. The general contractor or owner should contact a local water treatment company regarding water treatment. A fouled closed loop water system will lead to premature component failure.

The system water piping must be thoroughly cleaned and flushed in order to remove dirt, chips or other foreign matter before connecting to the heat pumps or starting the system. Since the initial condition of the system water may be such that dirt or other foreign matter may clog or otherwise damage balancing and shutoff valves, it is recommended that these valves be omitted during the cleaning of the water system as outlined in the following procedure.

The entire system should be filled with clean, fresh water and properly vented. Piping leaks should be repaired as early in this procedure as they are discovered. With valves positioned to bypass the heat pumps, heat rejector and the supplementary water heater, the pump should be started to circulate water through the system. Check strainers frequently and clean as often as needed. If the water is extremely dirty or murky, it is sometimes helpful to continuously flush, using the system pump, until the water being flushed out of the pipe loop has become clear. To flush in this manner requires care to be certain that make-up water is being added fast enough to replace what is being flushed out. This can be accomplished by opening the make-up water bypass valve around the automatic pressure reducer valve, adjusting the manual valve so that the pump suction pressure gauge continues to indicate the same positive pressure that existed before the manual drain and make-up valves were opened. Continue for at least two (2) hours.

To complete the cleaning, fill the system with fresh water, adding a cleaning agent such as trisodium phosphate (TSP).

Figure 33: Connections for Flushing System Piping



Bypass valves at the heat rejector and supplementary water heater should be adjusted for normal operation. Disconnect all power to the heat rejector and heat pump so that they will not operate while the system is being cleaned. The cleaning solution should then be circulated throughout the system, with water heater controls temporarily adjusted to raise the solution temperature to about 105°F to 110°F. DO NOT allow the temperature to rise above 110°F, especially in systems using plastic pipe. Alternate operation of the primary and standby pumps, and circulate the warm solution for several hours. Then turn off the water heater and pump, completely drain the system and refill with fresh water. Repeat the cleaning process only if there is indication of foreign matter still in the system, or if a test of the water indicates that it is even slightly acid.

The water should be slightly alkaline, with a pH no higher than 8.0 and no lower than 7.0, which is neutral. Traces of TSP or similar cleaning agent will tend to leave the water in a slightly alkaline condition provided all acid forming substances such as pipe coatings or flux have been properly cleaned out. A tight system requiring little or no make-up water, with neutral or slightly alkaline water, will remain in proper operating condition indefinitely. The addition of chromates or other corrosion inhibitors is NOT recommended, except when ethylene glycol is added for freeze protection. IN ALL CASES, A WATER QUALITY EXPERT SHOULD BE RETAINED TO MAKE A WATER ANALYSIS.

NOTICE

Contact a local water treatment company to confirm water clarity prior to unit operation.

Make Piping Connections

⚠ WARNING

While brazing, have an extinguisher readily available. Wear appropriate eye and hand protection. Ensure all areas with shared ventilation have ample fresh air ventilation.

⚠ CAUTION

Be sure the hot and chilled water supply and return system are thoroughly flushed and cleaned before connecting piping to the unit ventilator. Debris in the lines can damage the unit. See "Water System Cleaning."

⚠ CAUTION

Be certain that the control valves are installed with the proper port orientation to provide proper flow and fail safe operation. Incorrect installation can result in improper unit operation, and/or the possibility of coil freeze-up.

⚠ CAUTION

Failure to install water piping to coils properly can result in improper unit operation and coil freeze-ups.

NOTICE

Use piping shut off valves and connection unions for future servicing to the coil supply and return stubs, instead of hard piping. This permits easy removal of the coil or control valve if servicing is required.

For all systems

Be sure to install the control valve(s) on the correct unit ventilator. Indiscriminate mixing of valves in the field can result in valves improperly sized for the desired flow rate, which can result in poor operation and coil freezeups. Install control valve so there is at least 2″ (51 mm) minimum clearance to remove the actuator from the valve body.

Be certain that the control valve is installed correctly, with its orientation vertical. Valves should be installed at least 5° off center.

With future servicing considerations in mind, use standard, field-supplied shutoff valves and union connections; this permits easy removal of the coil or control valve if servicing is required.

Proper ventilation is required for brazing. When brazing, be sure to protect unit ventilator components from overheating damage

(melting insulation, also damage to valves, wiring, electronics, sensors, etc.).

Ensure proper insulation of supply and return piping. Proper insulation prevents loss of unit ventilator capacity, overheating of end compartment, and / or moisture dripping.

The piping to and from the unit must be protected from outside air and freeze conditions. The piping must be suitably insulated for condensation or heat lose or gain. Penetrations entering the unit end compartments must be fitted/sealed for unit integrity.

Water Coil Connections

Hook up water piping in accordance with Figure 34.

Figure 34: Water Supply and Return Connections (Unit Size 040 & 048 Shown)

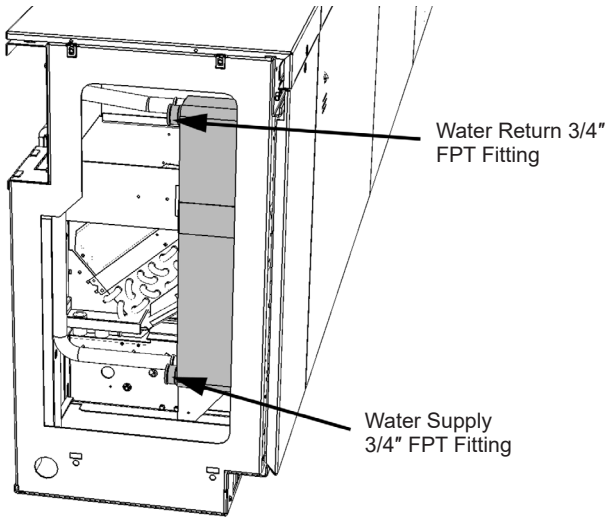


Figure 35: Typical Piping Through The Floor, Inside Cabinet (Unit Size 024 Shown)

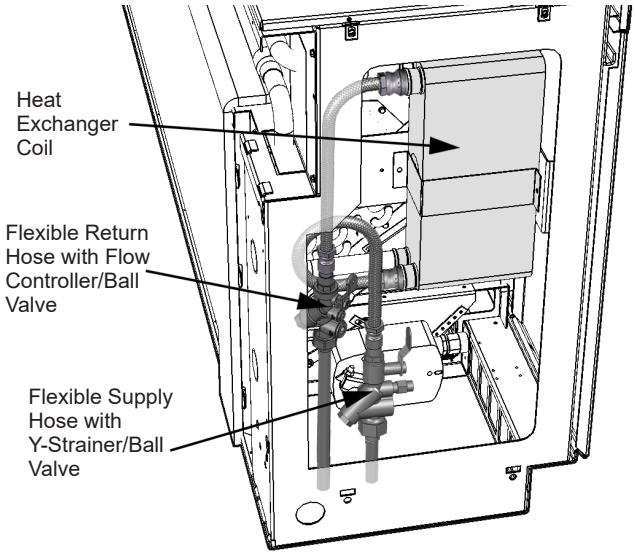
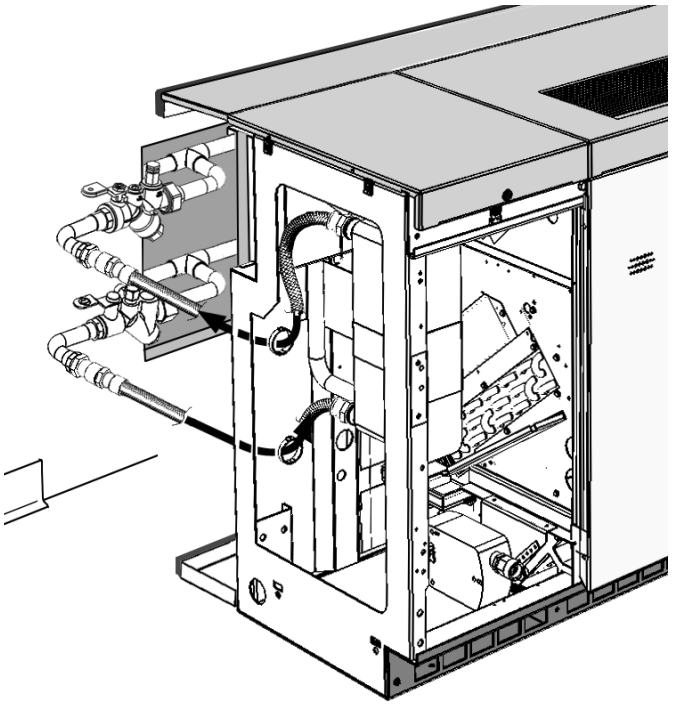


Figure 36: Typical Piping Through Grommets in Back of Unit



System Balancing

The recommended method for balancing a system is called “proportionate balancing.” Figure 37 shows a water system consisting of reverse return mains feeding three branch mains. Branch A and Branch C are designed as reverse returns, while Branch B is designed as a direct return upfeed riser. Each of the branch circuits has a balancing valve in the line going back to the system return main. In addition, each unit has a balancing valve in its return line.

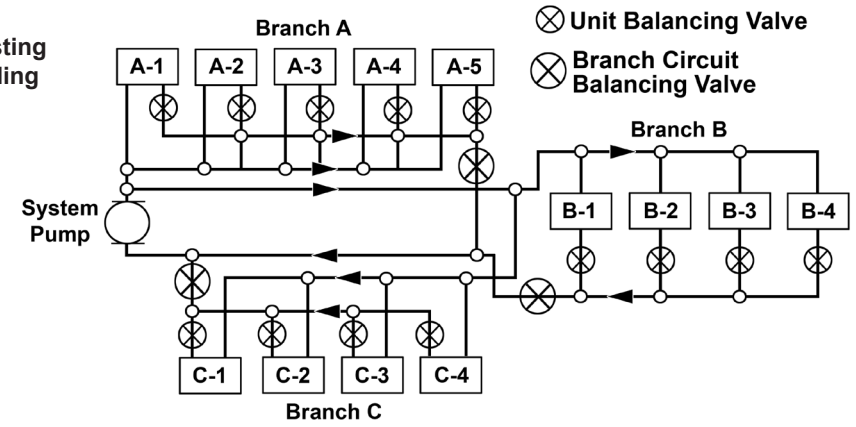
The prescribed method of proportionate balancing is as follows:

1. Open all valves fully.
2. Beginning with Branch A, take readings to determine the GPM flowing to each unit in the branch.
3. Determine the ratio of the actual/design flow for each of the coils in Branch A. This is called the proportionate flow rate. For instance, if Coil A-1 had a design flow rate of 10 GPM and the measured flow rate was 15 GPM, then its proportionate flow rate would be 1.5.
4. Assume Coil A-1 has the lowest proportionate flow rate, A-2 the next lowest, and so on. Leaving the balancing valve to Coil A-1 wide open, begin to throttle the balancing valve on A-2 until the two coils have the same proportionate flow within an allowed tolerance. (This usually is set by the balancing contract at around 5 percent.) Proportionate balance now has been achieved between these two coils.
5. Proceed to Coil A-3 and establish proportionate balance between it and Coil A-2 by the same procedure. Coil A-2 need not be read. It will change in direct proportion to the change in A-2 and will remain in balance with it.

6. Adjust the balancing valve in Coil A-4 until it is in proportionate balance with Coil A-3. Likewise, bring Coil A-5 into proportionate balance with Coil A-4. This is the end of Branch A. All coils on this branch will be proportionately balanced and any increase or decrease in the total system GPM, or the branch, will increase or decrease the GPM at each coil proportionately. They will remain in balance with one another.
7. By the same process, achieve a proportionate balance of all coils on Branches B and C.
8. The next step is to balance the branches. To do this, select at random one coil on each of the three branches. Use the same procedure as for coil balancing and proportionately balance the branches against one another, using the selected coils. Note the balancing valve on the lowest proportionately flowing branch will be left wide open.
9. The final step in the procedure is to adjust the flow from the pump to the system to bring all coils to their design flow rate. As was previously discussed, this can be done by imposing additional resistance at the pump by means of a balancing valve and throttling the system back until the flow rates are equal to those called for by the design, or decreasing the output of the pump.

Figure 37: Typical System Balancing Circuit

Typical water system consisting of reverse return mains feeding branch circuits



Field Installed Accessories

Installing Optional End Panel

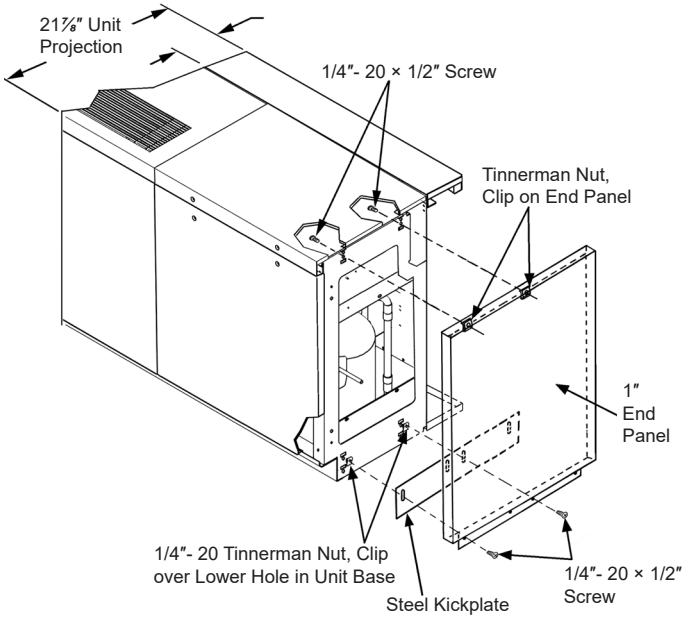
End Panel Assembly

Accessory end panels are shipped separately with hardware and kickplate.

The final step of unit installation is attaching the end panels. End panels are required unless the unit has adjoining matching cabinets.

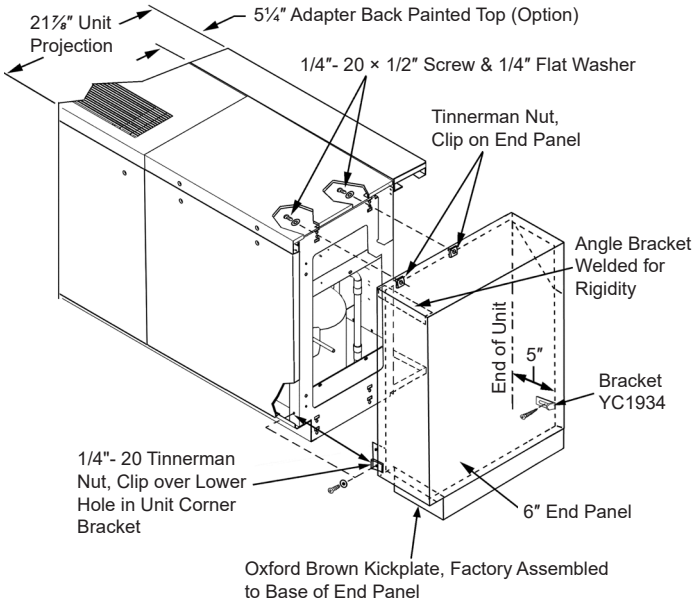
1. Refer to Figure 38 for a 1″ thick end panel. Attach two (2) Tinnerman nuts to the top edge of the end panel and two (2) to the bottom end of the unit. Align the end panel with the front and top edges of the unit. Insert through upper mounting holes inside unit end compartment and thread into Tinnerman clips on the end panel. Attach the end panel to the unit using four (4) 5/32″ hex socket head fasteners provided.

Figure 38: 1" End Panel with Provided Hardware



2. Refer to Figure 39 for 6″ thick end panel.
   a. Position bracket (YC1934) on wall so angle is 5″ from end of unit and near bottom.
   b. Mark and drill required hole for device to fasten bracket to wall (not included).
   c. Attach the bracket to wall.
   d. Attach two (2) Tinnerman nuts to the top edge of the end panel and one (1) to the bottom front of the end frame.
   e. Align the end panel with the front and top edges of the unit. Attach end panel to the unit using three (3) 5/32″ hex socket head fasteners provided. Bracket should prevent movement of panel toward the unit when pressure is applied to the end panel.

Figure 39: 6" End Panel with Provided Hardware



End Panel Dimensions

Figure 40: 1" End Panel Dimensions

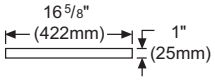
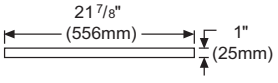
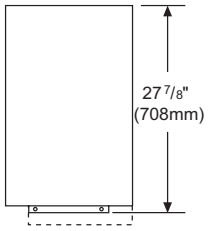
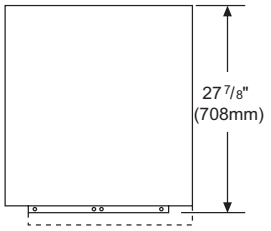
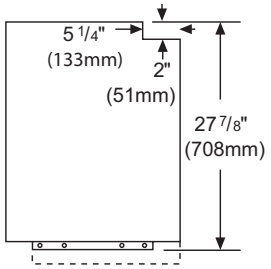
All Dim. in inches	16⅝" (422 mm) Deep End Panels	21⅞" (556 mm) Deep End Panels
Top View		
End View with No Cut-Out		
End View with 2" x 5-1/4" (51 mm x 133 mm) Step Down (Dashed lines indicate kickplate)		

Figure 41: 6" End Panel Dimensions

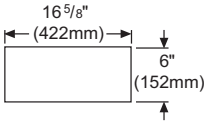
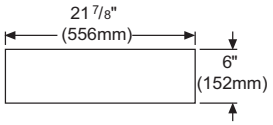
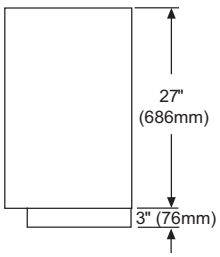
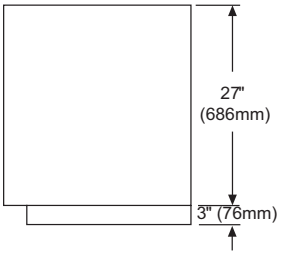
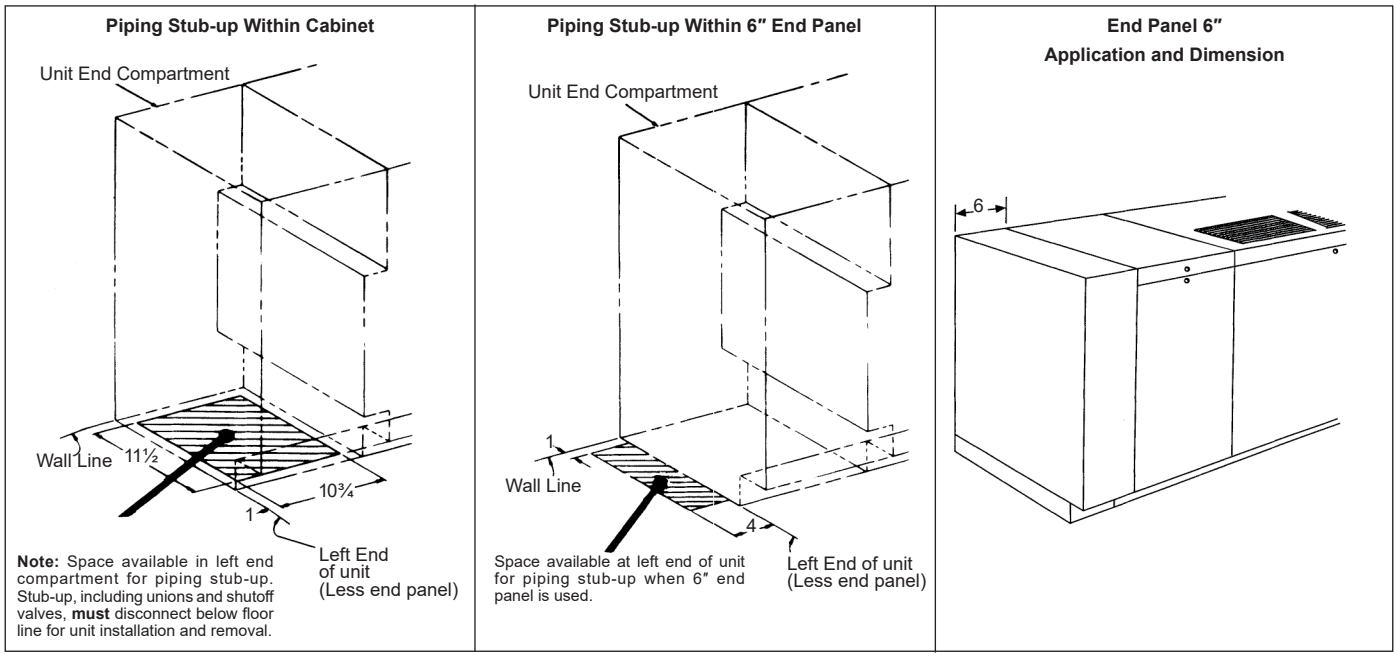
All Dim. in inches	16⅝" (422 mm) Deep End Panels	21⅞" (556 mm) Deep End Panels
Top View		
End View with No Cut-Out		

Figure 42: Piping Stub-Up Details, 6" End Panel



NOTE: All dimensions in inches.

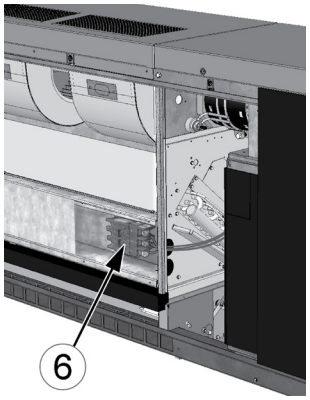
Electrical and Controls

Unit Electrical and Control Connections

MicroTech Unit Mounted DDC Control Components

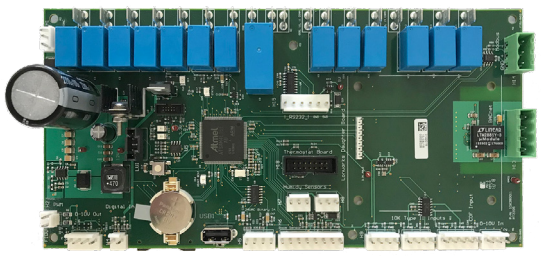
1. **MicroTech Unit Ventilator Controller (UVC):** Factory mounted and run tested, microprocessor-based DDC control device capable of complete Standalone unit control, Client-Server control or incorporated into a building-wide network using an optional plug-in communication module. The UVC contains a microprocessor that is preprogrammed with the application code required to operate the unit. The UVC supports up to 16 analog inputs, 8 binary inputs, 4 analog outputs, 2 PWM outputs, and 14 binary outputs. The controller is field configured. Optional network communication is provided via plug-in communication modules that connect directly to the UVC. (Located Beneath the Local User Interface Panel).
2. **On-Board Building Automation:** BACnet (MS/TP) protocol with a conformance level of 3, allows the UVC to inter-operate with BACnet Building Automation Systems (BAS). Meets the requirements of ANSI/ASHRAE 135-2012 standard for BACnet systems.
   - **Communication Module (optional):** Plug-in LonWorks® communication module that attaches to the UVC via an 8-pin header and 4 locking standoffs.
3. **Local User Interface (LUI) (optional):** The LUI provides a unit mounted interface which indicates the current unit operating state and can be used to adjust the unit ventilator operating parameters (operating mode, temperature set points, fan speed and occupancy mode). The LUI has a 4 x 20 OLED display, built in menu structure (password protected), with 4 keys and 2 individual LED indicators, to adjust the unit ventilator operating parameters. See “Local User Interface” for further details.
4. **External Signal Connection Plugs:** (Located beneath the Local User Interface Panel), three (3) multi-pin plugs are factory provided and pre-wired with short wire whips that are capped (they must remain capped if not used). Provided for field wiring of:
   - **Remote Wall-Mounted Temperature Sensor:** (optional accessory)
   - **External Input Signals (by others):** unoccupied, remote shutdown, ventilation lockout, dew point/humidity (night time operation), or exhaust interlock signals
   - **External Output Options (by others):** lights on/off, fault indication signal, exhaust fan on/off or auxiliary heat signal.
5. **Motor Speed Transformer:** (Located beneath the Local User Interface Panel). Multi-tap auto-transformer provides multiple fan motor speed control through the LUI. Used with an indoor PSC fan motor only.
6. **Unit Main Power “On-Off” Switch (SW1):** Disconnects the main power to the unit for servicing or when the unit is to be shut down for an extended period of time.

Figure 43: Unit Main Power “On-Off” Switch (SW1)



7. **Fuse(s):** Fan motor and controls have the hot line(s) protected by factory installed cartridge type fuse(s).
8. **Control Transformer:** 75 VA 24-volt NEC Class 2 transformer for 24 volt power supply. (Located behind the motor transformer).
9. **Outdoor Air/Return Air Damper Actuator (A1):** Proportional, direct coupled actuator that spring returns the outdoor air damper to the closed position upon a loss of power.
10. **Low Refrigerant Temperature Sensor (ICT):** This sensor is provided on all units with a direct expansion (DX) cooling coil. It is located on the right hand side of the air coil “u-bend”.
11. **Room Temperature Sensor (RAT):** The RAT is a field-installed, optional accessory. The unit mounted sensor can be installed in the sampling chamber (front, center section) where room air is continuously drawn through for prompt response to temperature changes in the room. A Remote Wall Mounted Temperature Sensor is also available for remote room temperature sensing.
12. **Discharge Air Temperature Sensor (DAT):** The sensor is located on the second fan from the right to sense discharge air temperatures.

Figure 44: MicroTech Unit Ventilator Controller (UVC)



13. **Outdoor Air Temperature Sensor (OAT):** The sensor is located in the outdoor air section of the unit before the outdoor air damper. With network applications, the unit mounted sensor can be overridden by a remote sensor through the network.
14. **Outdoor Air Humidity Sensor (OH) (optional feature):** Unit mounted humidity sensor for units using Expanded outdoor enthalpy economizer or Leading Edge indoor/outdoor, true enthalpy comparison economizer. The sensor is located in the outdoor air section of the unit before the outdoor air damper. With network applications, the unit mounted sensor can be overridden by a remote sensor through the network.
15. **Room Humidity Sensor (IH) (optional feature):** Unit mounted humidity sensor for units capable of active dehumidification or with units using Leading Edge indoor/outdoor, true enthalpy comparison economizer. The sensor is located in the sampling chamber (front, center panel) where room air is continuously drawn through for fast response to humidity changes in the room. With network applications, the unit mounted sensor can be overridden by a remote sensor through the network.
16. **CO_2 Sensor (CO_2) (optional feature):** Unit mounted, single beam absorption infrared gas sensor with a sensing range of 0 – 2000 ppm and voltage output of 0 to 10 VDC (100 ohm output impedance). The Pitot Tube sensing device is located in the unit ventilator's return air stream. The optional CO_2 sensor is used with the UVC's Demand Control Ventilation feature to vary the amount of outside air based on actual room occupancy. With network applications, the unit mounted sensor can be overridden by a remote sensor through the network.
17. **Water Out Temperature Sensor (LWT):** The water out temperature sensor is factory wired. The sensor must be field-installed and insulated (by others) and located on the return connection of the plate heat exchanger.
18. **Water Coil DX Temperature Sensor (OCT):** This sensor is factory wired, installed and insulated. It is located on the lower left refrigerant line of the plate heat exchanger leading to the expansion valve.
19. **A2L Sensor (A2L1-2):** Up to two unit mounted R-32 refrigerant sensors are installed in the base of each end pocket. They are used to detect a refrigerant leak for initiating leak mitigation control.
20. **MT6210 A2L Mitigation Controller:** Factory mounted controller monitors the A2L sensors and indicates a refrigerant leak or refrigerant sensor failure should one occur.

NOTICE
Not all external signal options can be used simultaneously and may not be available on all software models.

Figure 45: Top View - Local User Interface (LUI) Compartment

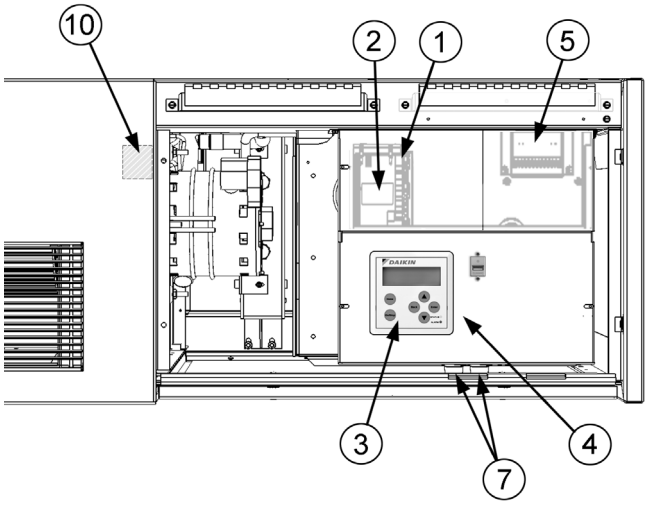


Figure 46: LWT and OCT Locations

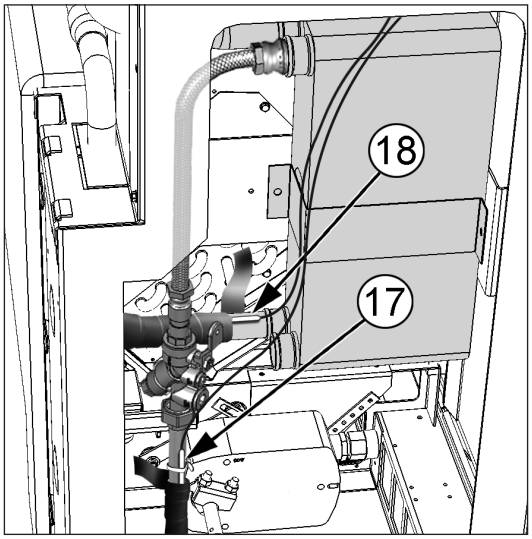
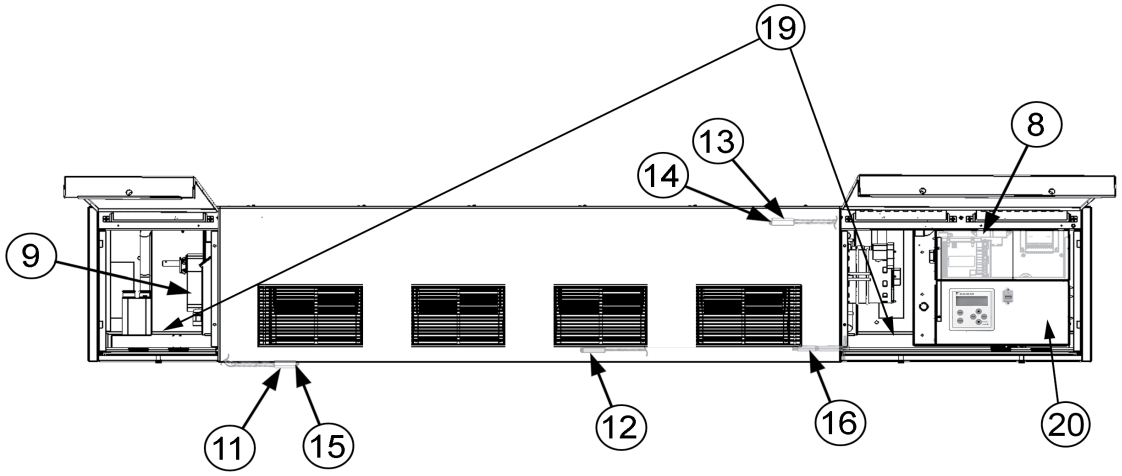


Figure 47: MicroTech Sensor and Component Locations (Top View)



Economizer Control Capabilities

- **Basic:** Compares the inside and outside air temperatures using item 11 (Room Temperature Sensor) and item 13 (Outdoor Air Temperature Sensor) to determine if outdoor air can be used for “free”, economizer cooling operation.
- **Expanded:** Compares the inside and outside air temperatures using item 11 (Room Temperature Sensor) and item 13 (Outdoor Air Temperature Sensor) and calculates the enthalpy of the outside air relative humidity using item 14 (Outdoor Air Humidity Sensor) to determine if outdoor air can be used for “free”, economizer cooling operation.
- **Leading Edge:** True enthalpy comparison economizer that compares the inside and outside air temperatures using item 11 (Room Temperature Sensor) and item 13 (Outdoor Air Temperature Sensor) and compares the enthalpy of the inside and outside air relative humidity using item 14 (Outdoor Air Humidity Sensor) and item 15 (Room Humidity Sensor) to determine if outdoor air can be used for “free”, economizer cooling operation.

Local User Interface (LUI)

Figure 48: Local User Interface (LUI)

The optional built-in LUI touch pad with digital OLED display is located in the right hand compartment below the top right access door. The 4 x 20 OLED display will provide a variety of information including:

- Operating mode states
- Fan functions
- Room set point temperature
- Current room temperature
- Fault codes for quick diagnostics at the unit

The LUI has a built in menu structure (password protected) with 4 keys and 2 individual LED indicators to adjust the unit ventilator operating parameters shown in the following.

Operating mode states

- **Heat:** Heating and economizer operation only
- **Cool:** Cooling and economizer operation only
- **Fan Only:** Fan operation only
- **Auto:** Unit automatically switches between heating, cooling and economizer operation to satisfy the room load conditions. The current unit state is also displayed.

Fan states

- **High (constant speed):** compressor on high stage
- **Medium (constant speed):** compressor on low stage
- **Low (constant speed):** compressor on low stage
- **Auto (part load, variable air):** Varies the fan speed automatically to meet the room load conditions whether the unit is in heating, cooling or economizer mode. The current fan speed is also displayed. During low load or normal operation (about 60% of the time) the fans will operate at low speed. When the load increases to an intermediate demand the fans automatically shift to medium speed. At near design or design load conditions, the fans will operate on high speed. A 10-minute delay between speed changes is incorporated to minimize the awareness of these changes. The outdoor air damper will index based on the fan speed to maintain the required minimum cfm (cubic feet per minute) of ventilation air.

Occupancy modes

- **Occupied:** Normal, daytime operation where the unit maintains the room set point.
- **Unoccupied:** Night set back operating mode in which the unit responds to a new room set point and cycles to maintain the condition. The fan comes on when heating or cooling is needed and runs until the load is satisfied. The outside air damper is closed during this mode. With direct expansion (DX) cooling units, when a cooling load is satisfied by the refrigerant system, the compressor is de-energized and the Unit Ventilator indoor fan continues to run for a fixed period of time to remove possible frost buildup on the evaporator coil.
- **Stand By Mode:** The unit ventilator maintains the stand by mode set point temperature with the outside air damper closed. The fan runs continuously unless it is configured to cycle in response to the room load.
- **Bypass Mode:** By depressing the Tenant Override Switch on a remote sensor or using the LUI keypad the unit is placed back into the Occupied Mode for a predetermined time (default of 120 minutes). This time can be set in 1-minute increments from 1 minute to 240 minutes through the Unit Ventilator Service Tool, the LUI keypad or a BMS network.

Electrical Data

Table 7: ARQ & GRQ – Size 024

Volt/Hz/Phase	Voltage Range		Indoor Fan FLA	Compressor		Heating Option				Power Supply	
	Min.	Max.		RLA	LRA	Heat Type		Heater Kw	Rated Heater Amps	MCA	Maximum Fuse
208/60/1	197	228	3.2	11.1	67.5	None		–	–	18.18	25
			3.2	11.1	67.5	Elec. Heat[1]	Low (3 elem.)	8.0	38.5	66.30	70
			3.2	11.1	67.5		High (6 elem.)	16.0	76.9	114.30	125
230/60/1	207	253	3.2	11.1	67.5	None		–	–	18.18	25
			3.2	11.1	67.5	Elec. Heat[1]	Low (3 elem.)	7.3	33.3	59.80	60
			3.2	11.1	67.5		High (6 elem.)	14.7	66.7	101.55	110
208/60/3	197	228	3.2	7.8	28.0	None		–	–	14.05	20
			3.2	7.8	28.0	Elec. Heat[1]	Low (3 elem.)	8.0	22.2	41.80	45
			3.2	7.8	28.0		High (6 elem.)	16.0	44.4	69.55	70
230/60/3	207	257	3.2	7.8	28.0	None		–	–	14.05	20
			3.2	7.8	28.0	Elec. Heat[1]	Low (3 elem.)	7.3	19.2	38.05	40
			3.2	7.8	28.0		High (6 elem.)	14.7	38.5	62.18	70
460/60/3	414	506	3.2	4.3	29.0	None		–	–	10.21	15
			3.2	4.3	29.0	Elec. Heat[1]	Low (3 elem.)	7.3	9.6	22.21	25
			3.2	4.3	29.0		High (6 elem.)	14.7	19.2	34.21	35

[1] Electric Heat Options are without Compressor and Outdoor Fan.

Legend			
FLA	Full Load Amps	**LRA**	Locked Rotor Amps
RLA	Rated Load Amps	**MCA**	Minimum Circuit Amps

Table 8: ARQ & GRQ – Size 040

Volt/Hz/Phase	Voltage Range		Indoor Fan FLA	Compressor		Heating Option				Power Supply	
	Min.	Max.		RLA	LRA	Heat Type		Heater Kw	Rated Heater Amps	MCA	Maximum Fuse
208/60/1	197	228	3.2	20.5	126.0	None		–	–	29.93	50
			3.2	20.5	126.0	Elec. Heat[1]	Low (3 elem.)	10.0	48.1	90.05	100
			3.2	20.5	126.0		High (6 elem.)	20.0	96.2	150.18	175
230/60/1	207	253	3.2	20.5	126.0	None		–	–	29.93	50
			3.2	20.5	126.0	Elec. Heat[1]	Low (3 elem.)	9.2	41.7	82.05	90
			3.2	20.5	126.0		High (6 elem.)	18.4	83.3	134.05	150
208/60/3	197	228	3.2	10.2	82.0	None		–	–	17.05	25
			3.2	10.2	82.0	Elec. Heat[1]	Low (3 elem.)	10.0	27.8	51.80	60
			3.2	10.2	82.0		High (6 elem.)	20.0	55.5	86.43	90
230/60/3	207	257	3.2	10.2	82.0	None		–	–	17.05	25
			3.2	10.2	82.0	Elec. Heat[1]	Low (3 elem.)	9.2	24.1	47.18	50
			3.2	10.2	82.0		High (6 elem.)	18.4	48.1	77.18	80
460/60/3	414	506	3.2	4.6	56.0	None		–	–	10.58	15
			3.2	4.6	56.0	Elec. Heat[1]	Low (3 elem.)	9.2	12.0	25.58	30
			3.2	4.6	56.0		High (6 elem.)	18.4	24.1	40.71	45

[1] Electric Heat Options are without Compressor and Outdoor Fan.

Legend			
FLA	Full Load Amps	**LRA**	Locked Rotor Amps
RLA	Rated Load Amps	**MCA**	Minimum Circuit Amps

Table 9: ARQ & GRQ – Size 048

Volt/Hz/Phase	Voltage Range		Indoor Fan FLA	Compressor		Heating Option				Power Supply	
	Min.	Max.		RLA	LRA	Heat Type		Heater Kw	Rated Heater Amps	MCA	Maximum Fuse
208/60/1	197	228	3.2	25.9	128.4	None		–	–	36.68	60
			3.2	25.9	128.4	Elec. Heat[1]	Low (3 elem.)	12.0	57.7	108.80	110
			3.2	25.9	128.4		High (6 elem.)	24.0	115.4	180.93	200
230/60/1	207	253	3.2	25.9	128.4	None		–	–	36.68	60
			3.2	25.9	128.4	Elec. Heat[1]	Low (3 elem.)	11.0	50.0	99.18	110
			3.2	25.9	128.4		High (6 elem.)	22.0	100.0	161.68	175
208/60/3	197	228	3.2	13.4	105.3	None		–	–	21.05	30
			3.2	13.4	105.3	Elec. Heat[1]	Low (3 elem.)	12.0	33.3	62.68	70
			3.2	13.4	105.3		High (6 elem.)	24.0	66.6	104.30	110
230/60/3	207	257	3.2	13.4	105.3	None		–	–	21.05	30
			3.2	13.4	105.3	Elec. Heat[1]	Low (3 elem.)	11.0	28.9	57.18	60
			3.2	13.4	105.3		High (6 elem.)	22.0	57.7	93.18	100
460/60/3	414	506	3.2	6.9	61.8	None		–	–	13.46	20
			3.2	6.9	61.8	Elec. Heat[1]	Low (3 elem.)	11.0	14.4	31.46	35
			3.2	6.9	61.8		High (6 elem.)	22.0	28.9	49.58	50

[1] Electric Heat Options are without Compressor and Outdoor Fan.

Legend			
FLA	Full Load Amps	**LRA**	Locked Rotor Amps
RLA	Rated Load Amps	**MCA**	Minimum Circuit Amps

MicroTech Unit Electrical Connections

⚠ DANGER

To avoid electrical shock, personal injury, or death, be sure that field wiring complies with local and national fire, safety, and electrical codes, and voltage to the system is within the limits shown in the job-specific drawings and unit electrical data plate(s).

⚠ WARNING

Power supply to unit must be disconnected before making field connections. To avoid electrical shock, personal injury, or death, be sure to rigorously adhere to field wiring procedures regarding proper lockout and tagout of components.

See "Electrical Data" on page 28 & page 29, and Figure 66 on page 41 and Figure 67 on page 42 or the job-specific electrical drawings before proceeding with field power and control wiring. See also the wiring diagram provided on the unit ventilator inside-right front access panel.

Unit ventilators equipped with an optional electric heating coil have electric heating coil power connections at right end only.

Field Power and Control Wiring Procedure

1. Provide power supply to right end compartment to match unit nameplate.

⚠ CAUTION

Use copper conductors only. Use of aluminum conductors may result in equipment failure and overheating hazards. All wiring in right hand compartment must be class 1.

2. Confirm that power is de-energized and locked and tagged-out.
3. Plug in the unit control wiring male plug(s) into the appropriate female plug(s).
   - 4-pin (for MicroTech and electromechanical, see Figure 52 on page 31).
   - 10-pin (MicroTech only, see Figure 53 on page 32).
   - 12-pin (MicroTech only, see Figure 54 on page 32).
4. Insert the main power wires into the main power On/Off switch terminal lugs (A, B, and C).

NOTICE

Terminal lug B is not used on single phase units.

6. Connect the ground wire to the ground lug as shown in Figure 51. Tighten the terminal lugs securely.
7. Reinstall the cover plate on the main power wire trough.

NOTICE

For electromechanical wiring, see Figure 62 on page 37. Control connections for electromechanical are made to the terminal block in the left end compartment.

Figure 49: Electrical Power On/Off Switch Located Behind Front-Middle Access Panel in Wire Trough, with Power Entry Accessed Behind Right-Front Access Panel

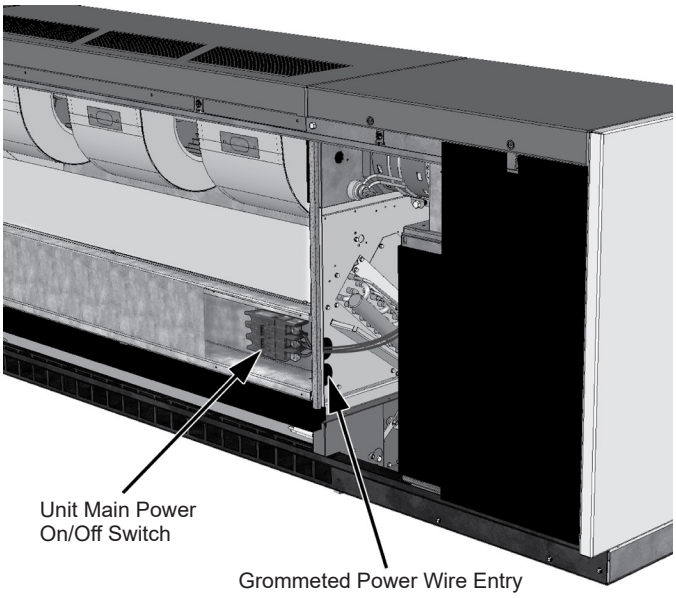


Figure 50: Control Wiring Plug Connections in Right End Compartment.

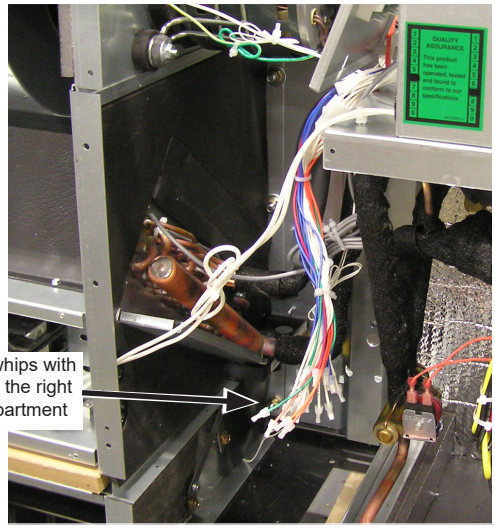
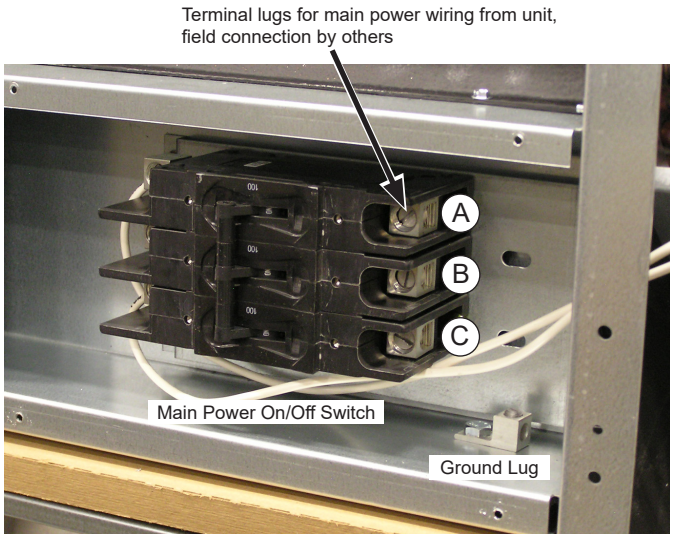
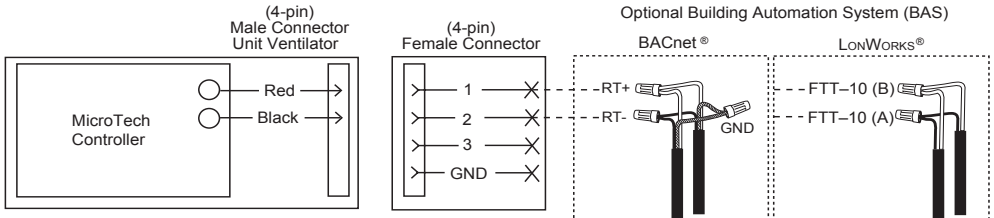


Figure 51: Electrical Power On/Off Switch for Power Wiring Connections



NOTE: (B) not used on single phase.

Figure 52: 4-Pin Plug MicroTech Control Wiring Diagram

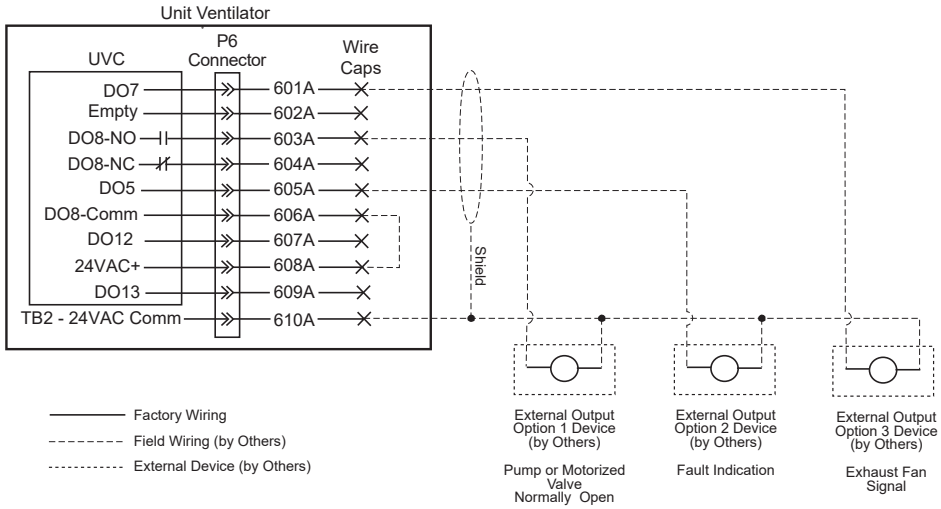


Wiring:
Use twisted shielded pair (Connect Air W221P-2544 or equivalent).
Daisy-chain and tie shield to earth ground at **one** point only.The polarity of the signal must always be maintained throughout the network. Always connect + to + and - to -. The shield connection must be continuous throughout the entire network and must be connected to earth ground at **one** (and only one) point.

The BACnet MS/TP bus can use either solid or stranded wires of the following types:
3-wire twisted cable, 2 twisted-pair telephone cable, or two twisted pair with shield.
The wiring is polarity sensitive. The polarity of the signal must always be maintained throughout the network. Always connect + to + and - to -. The shield connection must be continuous throughout the entire network and must be connected to earth ground at **one** (and only one) point.

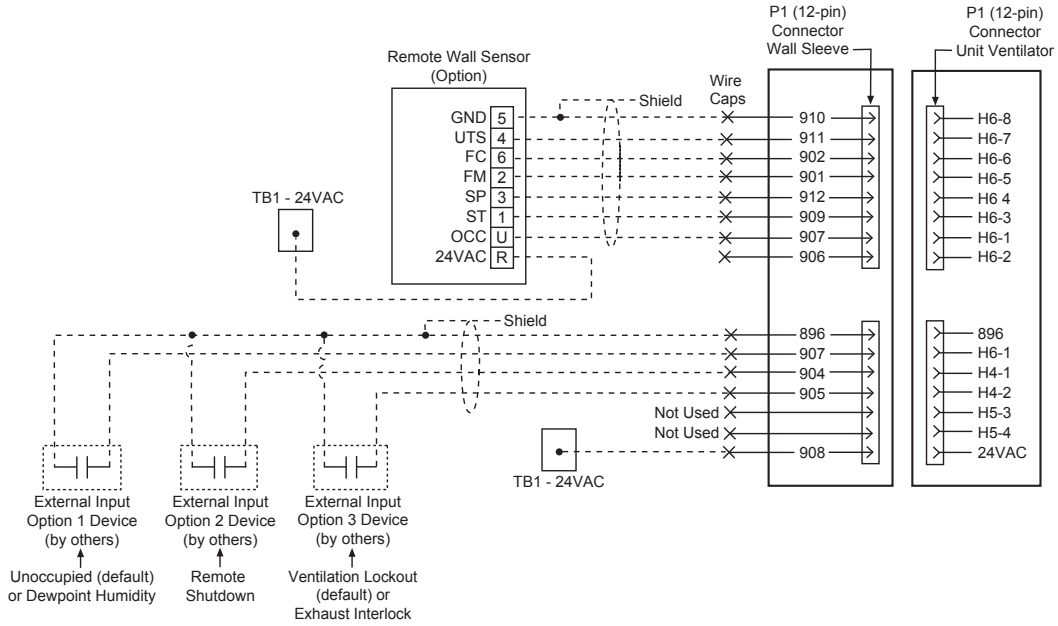
Use Belden 8471, NEMA Level 4, or Echelon-approved equivalent wire.
Since the LonWorks communication wiring is polarity insensitive, no polarity must be observed when making connections via the unshielded twisted-pair wiring.

Figure 53: 10-Pin Plug MicroTech Wiring Diagram



NOTE: Not all external input options are available for all models.

Figure 54: 12-Pin Plug MicroTech Control Wiring Diagram



NOTE: Not all external input options are available for all models.

MicroTech Wall Mounted Sensors

⚠ WARNING

Rigorously adhere to field wiring procedures regarding proper lockout and tagout of components.

⚠ WARNING

To avoid electrical shock, personal injury, or death:

1. Installer must be a qualified, experienced technician.
2. Disconnect power supply before installation to prevent electrical shock and damage to equipment.
3. Make all connections in accordance with electrical wiring diagrams, and in compliance with national and local codes. Use copper conductors only.
4. Do not exceed ratings of the device. This is a low voltage device: Never apply more than 12VAC/VDC to any lead or damage will result.
5. Avoid locations where excessive moisture, corrosive fumes, or vibrations are present.

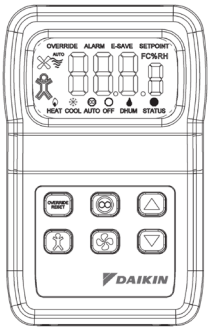
⚠ CAUTION

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 main control panel before performing any service work. Never unplug any cables, circuit board terminal blocks, relay modules, or power plugs while power is applied to the panel.

NOTICE

Avoid placing wall sensor near drafty areas such as doors or windows. Avoid external walls, or dead spots near exposed columns. Avoid direct sunlight on wall sensor.

Figure 55: Wall Mounted Temperature Sensor



When Using A Remote Temperature Sensor

If a decision is made to use a Wall Mounted Temperature Sensor instead of the unit mounted room air sensor then placement of the Remote Wall Mounted Temperature Sensor is critical for proper room temperature sensing (see Figure 56 and Figure 57). The UVC is capable of using one of four remote wall mounted temperature sensors. It is recommended that additional wires be pulled to compensate for potential wire breakage or future options.

- 6-Button Digital Adjustable Sensor (PN 910247458) 8-wires
- 4-Button Digital Adjustable Sensor (PN 910247448) 6-wires
- The Basic Sensor with setpoint adjustment (PN 910247453) 4-wires
- The Basic Sensor (PN 910247450) 3-wires

NOTICE

For sensor terminal wiring details see the installation manual specific to the sensor being used.

NOTICE

All MicroTech equipped unit ventilators are provided as standard with a unit mounted space temperature sensor. The unit mounted temperature sensor is provided with a quick disconnect plug (white) located outside of box with numbered wires 101 and 102.

Table 10: Max Sensor Wire Length and Gauge

Maximum Sensor Wire Length for Less Than 1°F Error	
Gauge	**Length**
14 AWG	800 ft. (244 m)
16 AWG	500 ft. (152 m)
18 AWG	310 ft. (94 m)
20 AWG	200 ft. (61 m)
22 AWG	125 ft. (38 m)

Figure 56: Correct Wall Sensor Locations

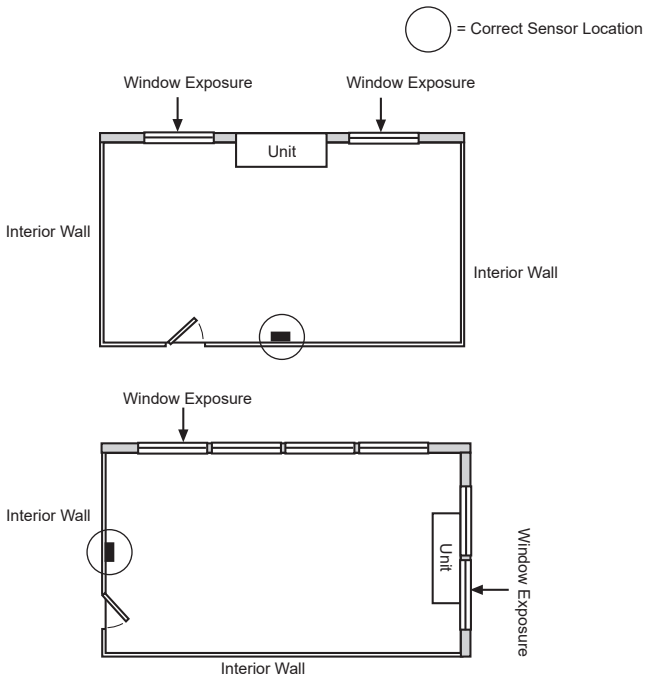
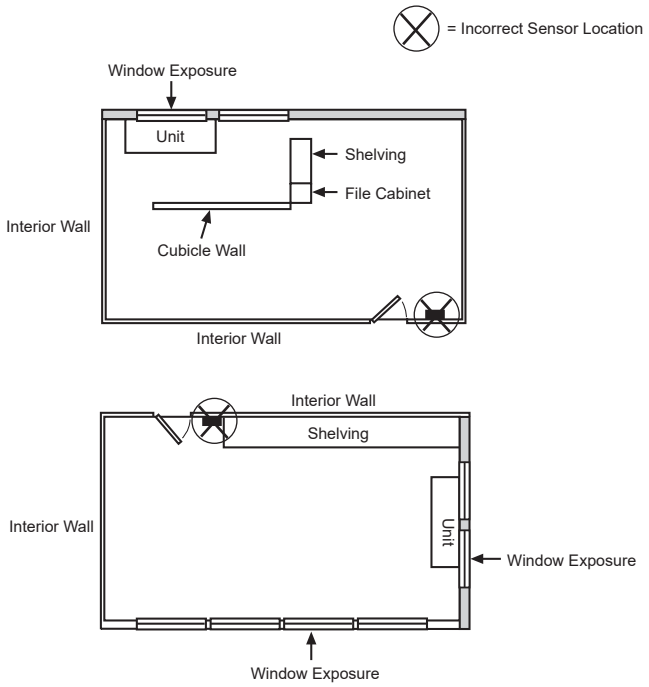


Figure 57: Incorrect Unit and Wall Sensor Locations



Field Wiring Remote Mounted Temperature Sensor

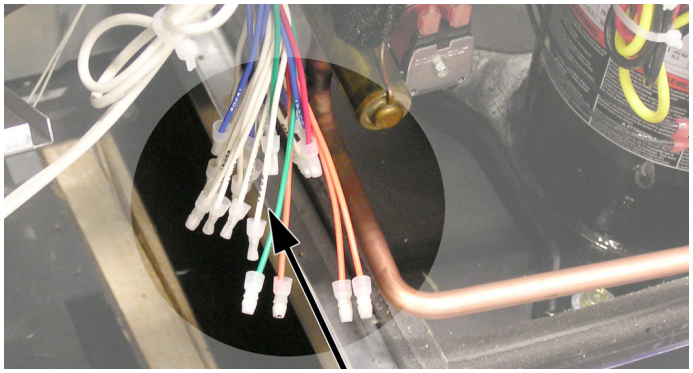
NOTICE

All low voltage field wiring connections must be run in shielded cable with the shield drain wires connected as shown in the field wiring diagrams.

The low voltage field wiring connections have all been centrally located within the unit ventilator and are easily accessible.

To simplify field connections, multi-pin plugs are factory provided and pre-wired with short wire whips (see Figure 58). Each of the wires in these wire whips is capped and should remain capped if not used. See Table 11 on page 36 for wiring the remote mounted temperature sensor to the unit control wiring.

Figure 58: Wire Whips with Caps for Field Wiring Remote-Mounted Temperature Sensor



NOTE: Refer to the wiring diagram provided on the unit inside-right front access panel.

Typical Connections For Temperature Sensor Applications

The low voltage field wiring connections have all been centrally located within the unit ventilator and are easily accessible.

To simplify field connections, multi-pin plugs are factory provided and pre-wired with short wire whips (Figure 58). Each of the wires in these wire whips is capped and should remain capped if not used. See Table 11 on page 36 for wiring the remote mounted temperature sensor to the unit control wiring.

All low voltage field wiring connections must be run in shielded cable with the shield drain wires connected as shown in the field wiring diagrams.

For sensor terminal wiring details see the installation manual specific to the sensor being used. Sensor functions include:

- Display sensor to show room temperature, fan speed (AUTO/HIGH/MEDIUM/LOW), system mode (HEAT/COOL AUTO/OFF), ALARM, override and occupancy.

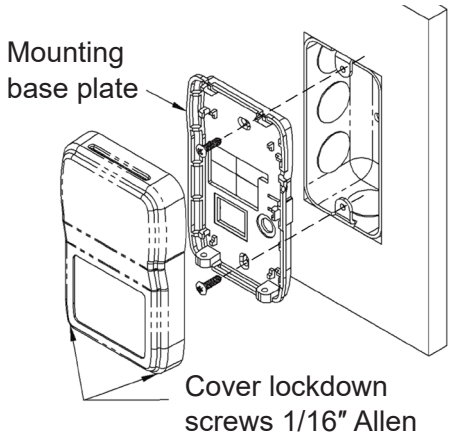
Mounting Location

Avoid mounting on outside walls or in direct sunlight.

Junction Box, (J-Box)

1. Pull the wire through the wall and out of the junction box, leaving about six inches free.
2. Pull the wire through the hole in the base plate.
3. Secure the back plate to the box using the #6-32 × 1/2 inch mounting screws provided.
4. Screw the plate firmly to the wall so the foam plate backing is compressed about 50%.
5. Terminate the unit according to the guidelines in the "Terminations" section.
6. Attach cover by latching it to the top of the base, rotating it down and snapping into place.
7. Secure the cover by backing out the lock-down screws using a 1/16″ Allen wrench until it is flush with the bottom of the cover.

Figure 59: Junction Box Mounting (Hardware is Provided for Both Junction Box and Drywall Installation.)



Drywall Mounting

1. Place the base plate against the wall where you want to mount the sensor.
2. Mark out the two mounting holes where the unit will be attached to the wall. Drill a 3/16″ hole in the center of each mounting hole and insert a drywall anchor into the holes.
3. Drill one 1/2″ hole in the middle of the marked wiring through hole area.
4. Pull the wire through the wall and out the 1/2″ hole, leaving about six inches free.
5. Pull the wire through the hole in the base plate.
6. Secure the base to the drywall anchors using the #6 × 1″ mounting screws provided.
7. Screw the plate firmly to the wall so the foam plate backing is compressed about 50%.
8. Terminate the unit according to the guidelines in the Termination section.
9. Attach cover by latching it to the top of the base, rotating it down and snapping it into place.
10. Secure the cover by backing out the lock-down screws using a 1/16″ Allen wrench until it is flush with the sides of the cover.

NOTICE

In any wall-mount application, the wall temperature and the temperature of the air within the wall cavity can cause erroneous readings.

The mixing of room air and air from within the wall cavity can lead to condensation, erroneous readings and sensor failure. To prevent these conditions, Daikin Applied recommends sealing the conduit leading to the junction box with fiberglass.

Maintenance

Wipe the display as needed with a damp water only cotton cloth. Do not use any type of cleaner as it may damage the buttons or scratch the display. Do not paint.

Terminations

Daikin Applied recommends using shielded 22AWG for all connections and a separate twisted pair for the power wire connections. The shield should be earth grounded only at the power source. Larger gauge wire may be required for runs greater than 250 feet.

⚠ CAUTION

The AC power wiring at terminals [R] & [5] should be run in a separate twisted shielded pair to avoid fluctuating and inaccurate signal levels induced into the other sensor signal wires. This sensor AC power can be run in the same conduit with the sensor signal wire as long as it's run in twisted, shielded pair and terminated properly.

All wiring must comply with the National Electric Code (NEC) and local codes. Do NOT run any of this device's wiring in the same conduit as other AC power wiring. Tests show that fluctuating and inaccurate signal levels are possible when AC power wiring is present in the same conduit as the signal lines. If you are experiencing any of these difficulties, please contact your Daikin Applied representative.

Figure 60: Sensor Circuit Board

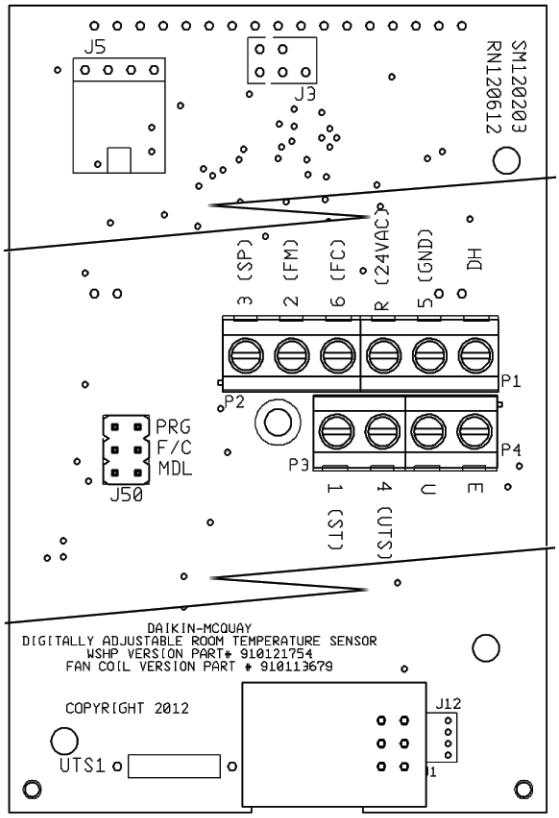


Table 11: Unit Ventilator MicroTech Board to Room Temperature Sensor Wiring

MicroTech Base Board									
Terminal Block Label	**TB1**	**H6-1**	**H6-2**	**H6-3**	**H6-4**	**H6-5**	**H6-6**	**H6-7**	**H6-8**
Sensor 910247458	●	●	○	●	●	●	●	●	●
Sensor 910247448	●	●	○	●	●	○	○	●	●
Sensor 910247453	○	○	○	●	●	○	○	●	●
Sensor 910247450	○	○	○	●	○	○	○	●	●
Description	24VAC	Occupancy	Shutdown (Not Used)	Status LED	Setpoint	Unit Mode	Fan Speed	10K RTD	Ground
Wire	**908**	**907**	**906**	**909**	**912**	**901**	**902**	**911**	**910**

Typical Wiring

Terminal Label	**R**	**U**	**1 (ST)**	**3 (SP)**	**2 (FM)**	**6 (FC)**	**4 (UTS)**	**5 (GND)**
Description	24VAC	Unoccupied	Unit Status Output	Setpoint Adjust	Unit Mode	Fan Speed	Room Temp Sensor & Tenant Override	Ground
Room Temperature Sensor								

Terminal Designations

● = Active Terminal ○ = Not Used

Electromechanical Unit Wiring Connections

⚠ DANGER

Disconnect all electrical power before servicing unit to prevent injury or death due to electrical shock.

⚠ CAUTION

Refer to unit wiring diagram located on inside-right front panel, for actual wiring. Improper wiring can cause equipment and property damage.

⚠ CAUTION

Use copper conductors only. Unit terminals are not designed to accept other types of conductors. Failure to do so may damage the equipment.

Electromechanical control connections are made to the terminals located behind the left-front access panel as shown in Figure 61. Refer to Figure 62 on page 37 for wiring details and the wiring diagram provided with the unit.

Terminal A2LCUST is intended to be used to provide notification of a refrigerant leak. For electromechanical units, the A2LCUST terminal is connected to Thermostat Control Terminal X. See Figure 61. This normally de-energized output will energize providing 24 VAC when the MT6210 Mitigation Controller detects a refrigerant leak as indicated by one of the A2L sensors. In the event of an A2L leak, the compressor and any electric heat outputs will be de-energized and the fan will be forced to run at high speed for at least 5 minutes after refrigerant centrifugation is no longer detected. See Figure 64.

Upon indication of a refrigerant leak by the MT6210 Mitigation Controller, the field installed controller should disable compressor and electric heat signals immediately and also command the fan speed so that sufficient airflow is delivered within 10 seconds of leak indication. The MT6210 Mitigation Controller will continue to deliver the airflow until the leak indication signal is re-energized.

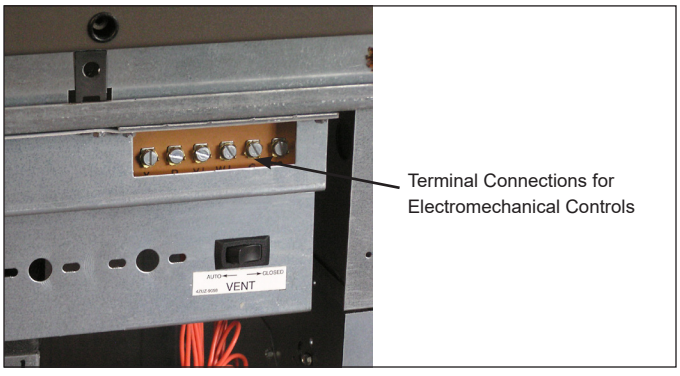
The Adjustable Analog Relay (AAR) board is intended to provide notification of a refrigerant sensor failure. Relay 1 on the AAR will be energized under normal operating conditions (closed circuit between C1 and N.O., open circuit between C1 and N.C.) and energized when the MT6210 Mitigation Controller detects that any of the sensors are reporting a failure, or if they are not communicating with the MT6210 Mitigation Controller or when a refrigerant leak is detected.

Upon indication of a sensor failure by the MT6210 Mitigation Controller, the field installed controller should command the fan speed so that sufficient airflow is delivered within 10 seconds of sensor failure indication. The MT6210 Mitigation Controller will continue to deliver the airflow until the sensor failure indication signal is re-energized.

⚠ CAUTION

The Adjustable Analog Relay (AAR) is factory calibrated to provide an indication of a R-32 sensor failure or communication problem. Consult the factory before making any adjustments to the settings on the AAR.

Figure 61: Thermostat Control Terminal Connections Located in Left Front Compartment



Typical Electromechanical Wiring Diagrams

Figure 62: Typical Electromechanical Wiring Diagram - Thermostat Control with Normally Open Heat, 460V/60Hz/3Ph

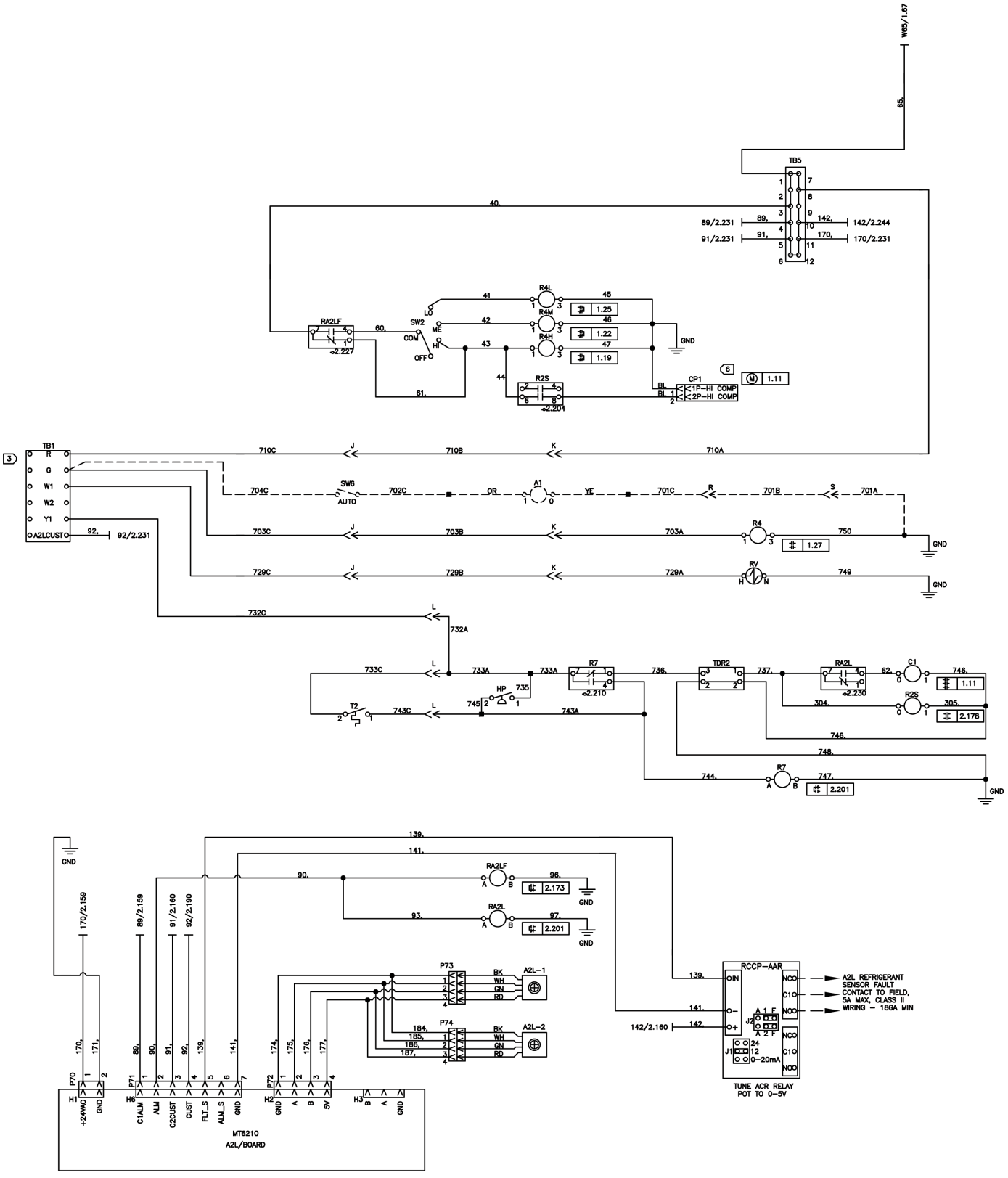
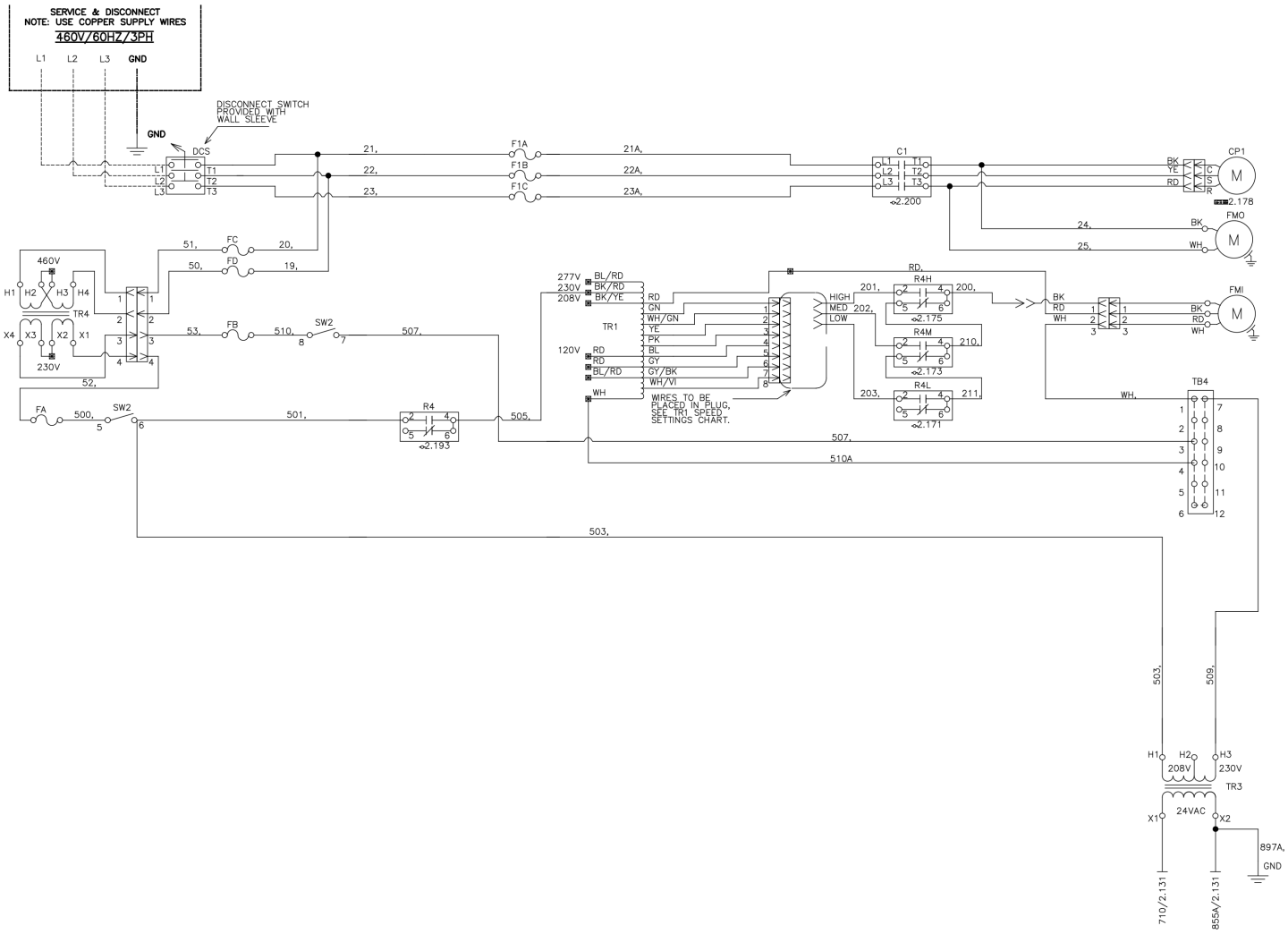


Figure 63: Typical Electromechanical Wiring Diagram - Thermostat Control with Normally Open Heat, 460V/60Hz/3Ph



Wiring Schematics Legend for "Typical Electromechanical Wiring Diagrams"

Legend					
A1	Actuator (Optional)	**OHM**	E.H. Man Reset - Overheat Stat	**SW1**	Switch - Disconnect
A2L-1	A2L Sensor	**R1-R3**	Relay Electric Heat (Backup)	**SW2**	Switch - On-Off & Fan Speed
A2LB	A2L Mitigation Board	**R4**	Relay - Fan Coil (24 VAC)	**SW5**	Switch - Emergency Heat
C1	Compressor Contactor	**R7**	Relay - Compressor Lockout	**SW6**	Switch - Rocker SPDT
CAP1	Capacitor Run	**R8-9**	Relay - Emergency Heat	**T2**	Thermostat EH Relay - 0A Temp>20°
CEH1-3	Electric Heat Contactor	**R10-R12**	Relay – Electric Heat	**T4**	Thermostat Low Temp 28°
CP1	Motor Compressor 2-Stage	**R2S**	Relay - High (2nd) Stage Compr	**T5**	Thermostat Defrost
CO2	Sensor - Indoor Air CO2	**R3B**	Relay - Defrost/EH Coil (24 VAC)	**T6**	Thermostat - Freeze Stat
CS	Current Sensor (Hawkeye 800)	**R4L**	Relay– Fan Low Speed	**T7**	Thermostat Changeover 60°
DCS	Switch - Unit Power	**R4M**	Relay– Fan Medium Speed	**T8**	Thermostat - Cooling Lockout 59° F
DF	Dead Front Switch	**R4H**	Relay – Fan High Speed	**TB1**	Terminal Block - 24VAC+
EH1-6	Heater - Electric	**R11A**	Relay - Defrost	**TB4**	Terminal Board
EH10	Heater - Outdoor Drain Pan	**RA1**	Relay - Actuator/Valve	**TB-DE**	Terminal Board for DE Contactor
F1A/F1B	Fuse - Compressor	**RA2L**	Relay A2L	**TBE**	Terminal Block - Electric Heat
F2A/F3C	Fuse - Electric Heat	**RAT**	Sensor - Room Air Temperature	**TR1**	Transformer - Motor Speed
FA/FB	Fuse– Control, Load	**RCCP**	Transducer AAR	**TR3**	Transformer - 208 / 230 V-24 V, 75 VA
FC/FD	Fuse– Control, Transformer	**REH**	Relay - H1 Fan 3rd Stg EH	**TR4**	Transformer - 460 V–230 V
FMI	Motor - Room Fan	**RT4**	Relay 24 VAC	**TR5**	Transformer - 208 / 230 V-24 V
FMO	Motor Outdoor Air	**RT6**	Relay - Freeze Stat	**TS**	Terminal Strip for EH
OH1	Thermostat - Overheat	**RV**	Reversing Valve	**V1**	Valve - Heat EOC (Accessory)
OH2	Thermostat - Overheat	**S2**	Sensor - DA (TAC 01-2085-001)	**V2**	Valve - Cool EOC (Accessory)

Legend - Symbols	
– – –	Accessory or field mounted component
⏚	Ground
⊠	Wire nut / splice
●	Overlap point - common potential wires
L1/1.20	Wire link (wire link ID / page # . line #)

Motor Size	SW2 Term	TR1 Speed Settings			
		750	1000	1250	1500
1/4 HP .00-0.20 ESP	High	PK	YE	WH/GN	GN
	Med	GY	GY	PK	YE
	Low	GY/BK	GY/BK	GY	PK

Electric Heat Sequence:

NOTE 1: Backup relays R1, R2, and R3 are energized when power is applied.

NOTE 2: Main relays R10, R11, and R12 are energized when a 24 VAC source is connected to STG1, STG2, and STG3 on terminal strip.

NOTE 3: Electric heat can be staged by applying the 24 VAC to the stages (1, 2, and 3) at different time intervals.

Control Wiring Notes:

NOTE 1: All electrical installation must be in accordance with national and local electrical codes and job wiring schematic.

NOTE 2: Automatic temperature control supplier is responsible to ensure controls operate correctly and protect the unit.

NOTE 3: Numbers along the right of schematic designate the location of contacts by number.

NOTE 4: SW2 contacts 5, 6, and 7, 8 open only when SW2 is in off position.

NOTE 5: SW20 shown with face & bypass damper in full face position.

NOTE 6: 1K thermistor is positive temperature coefficient. 10K thermistor is negative temperature coefficient.

NOTE 7: Actuator 24 VAC for 2 to 10 VDC Control input. For 4 to 10 mA input control signal, add a 500 ohm resistor across WHT and BLK. Output signal of 2 to 10 VDC for position feedback.

NOTE 8: OH2 furnished on ceiling units only. Wire 514 connects to OH1 when OH2 is not furnished.

NOTE 9: Air flow switch (AF) used only on size 8000 units. Wire 583 connects to SW20 when AF is not furnished.

NOTE 10: Devices in legend may or may not be on unit.

Figure 64: Electromechanical Controls – A2L Leak Mitigation

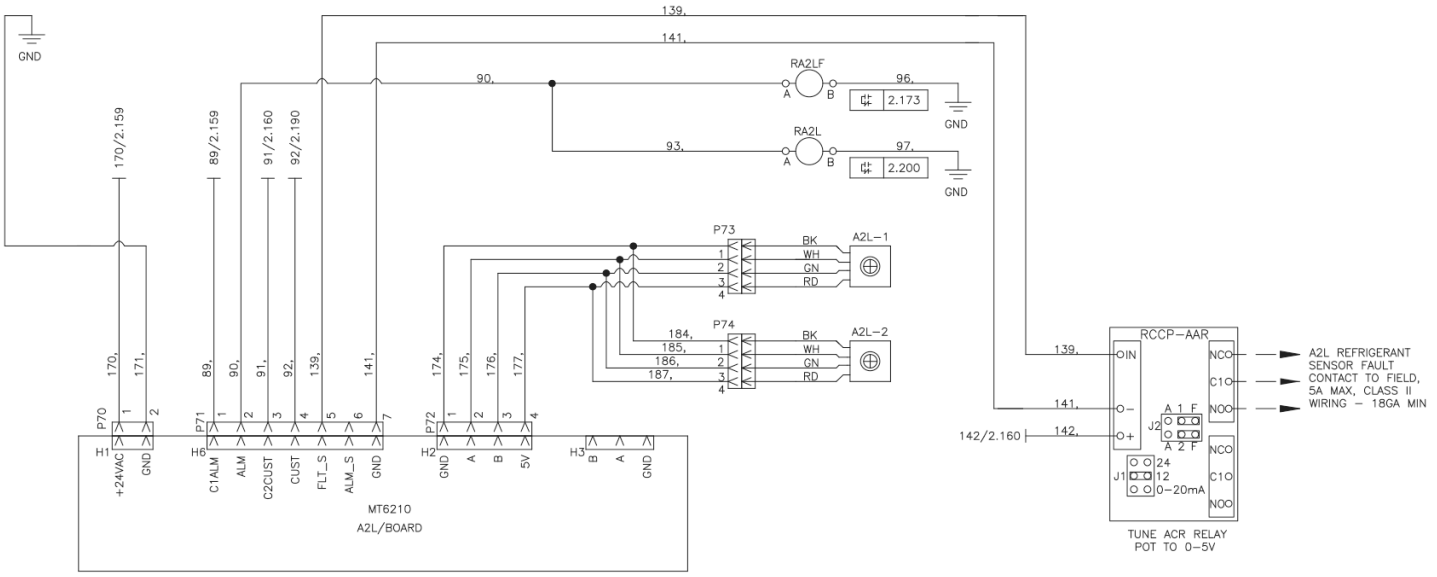
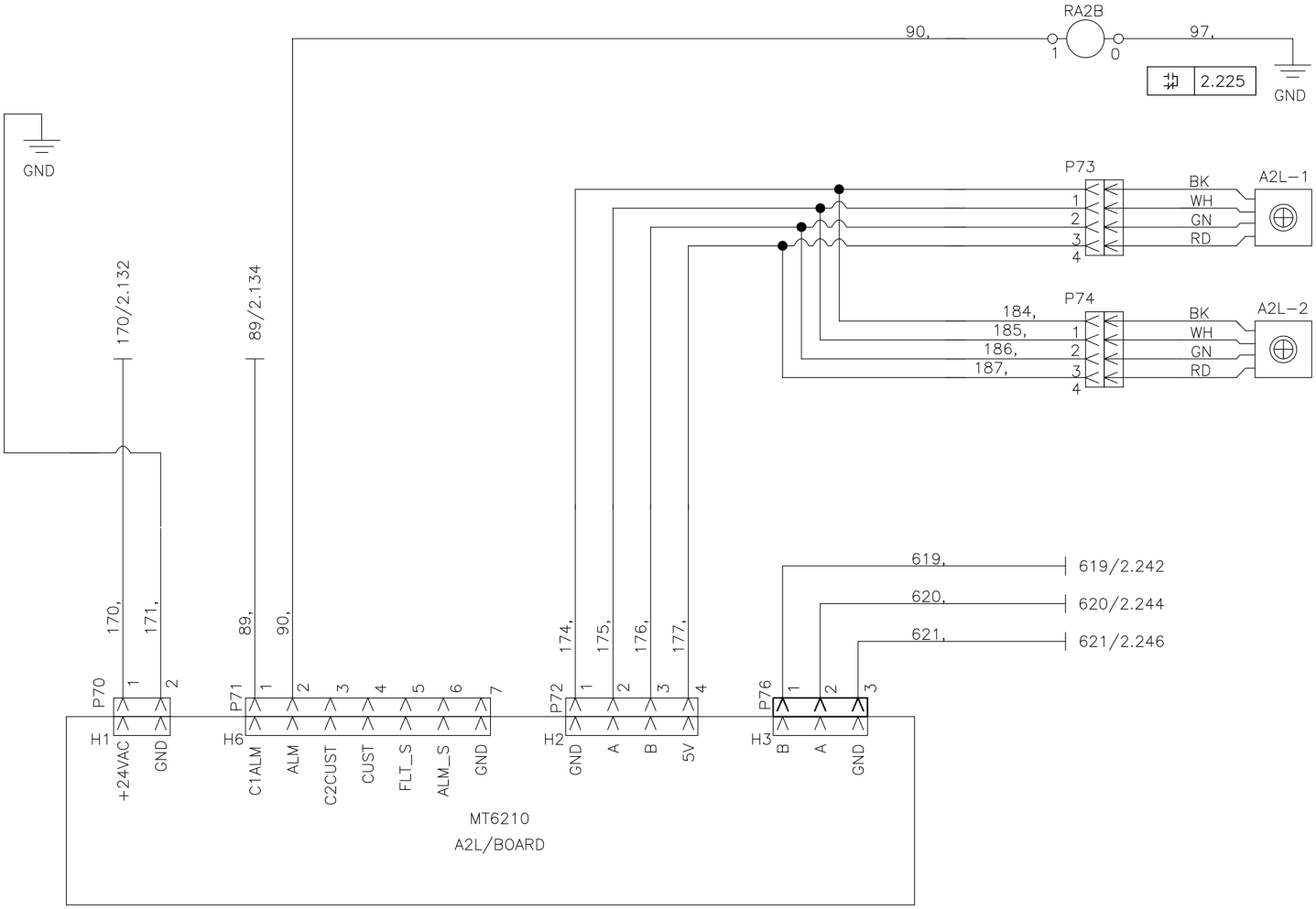


Figure 65: MicroTech Controls – A2L Leak Mitigation



Typical MicroTech Wiring Diagrams

Figure 66: Typical MicroTech Wiring Diagram - 460V/60Hz/3Ph

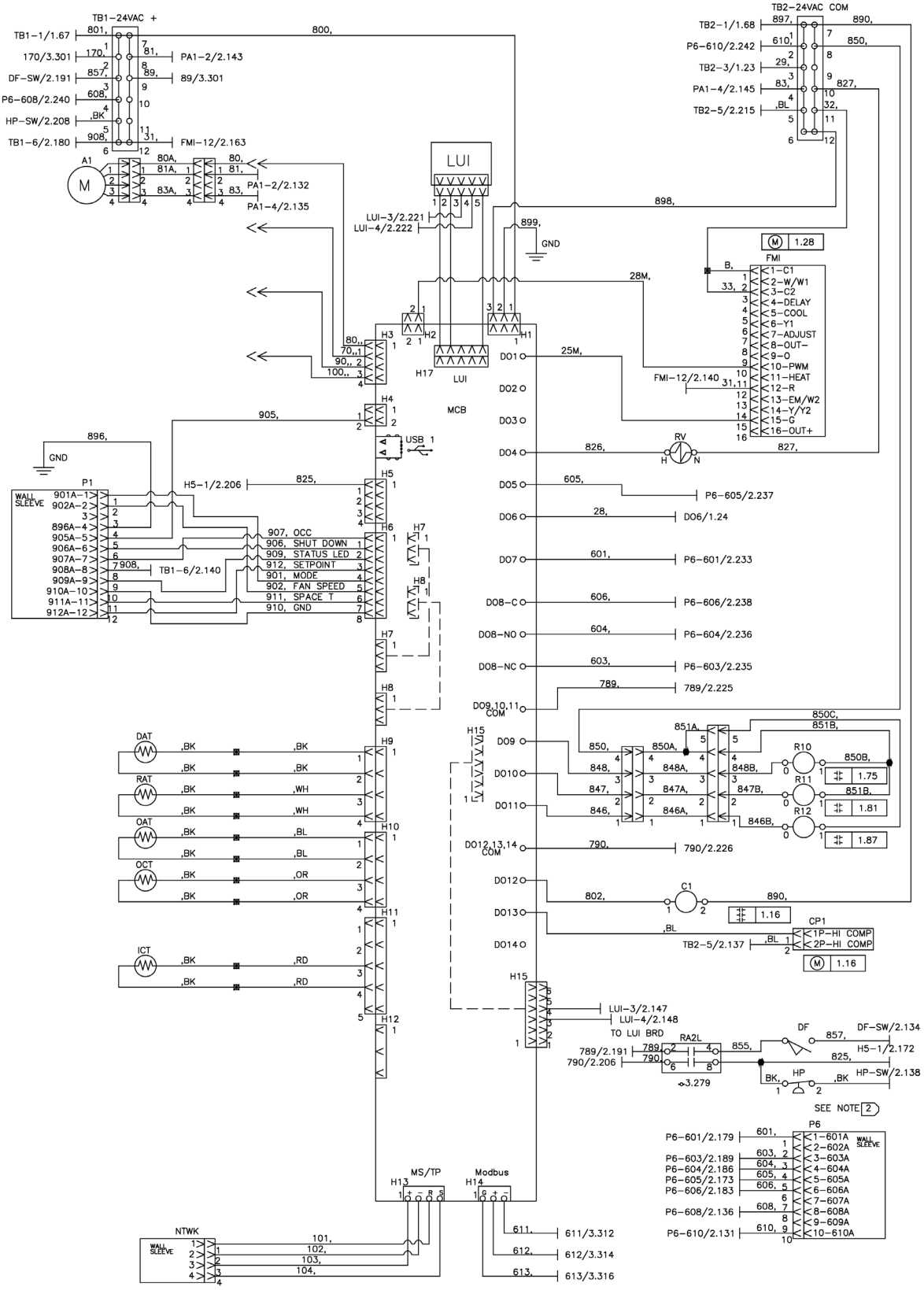
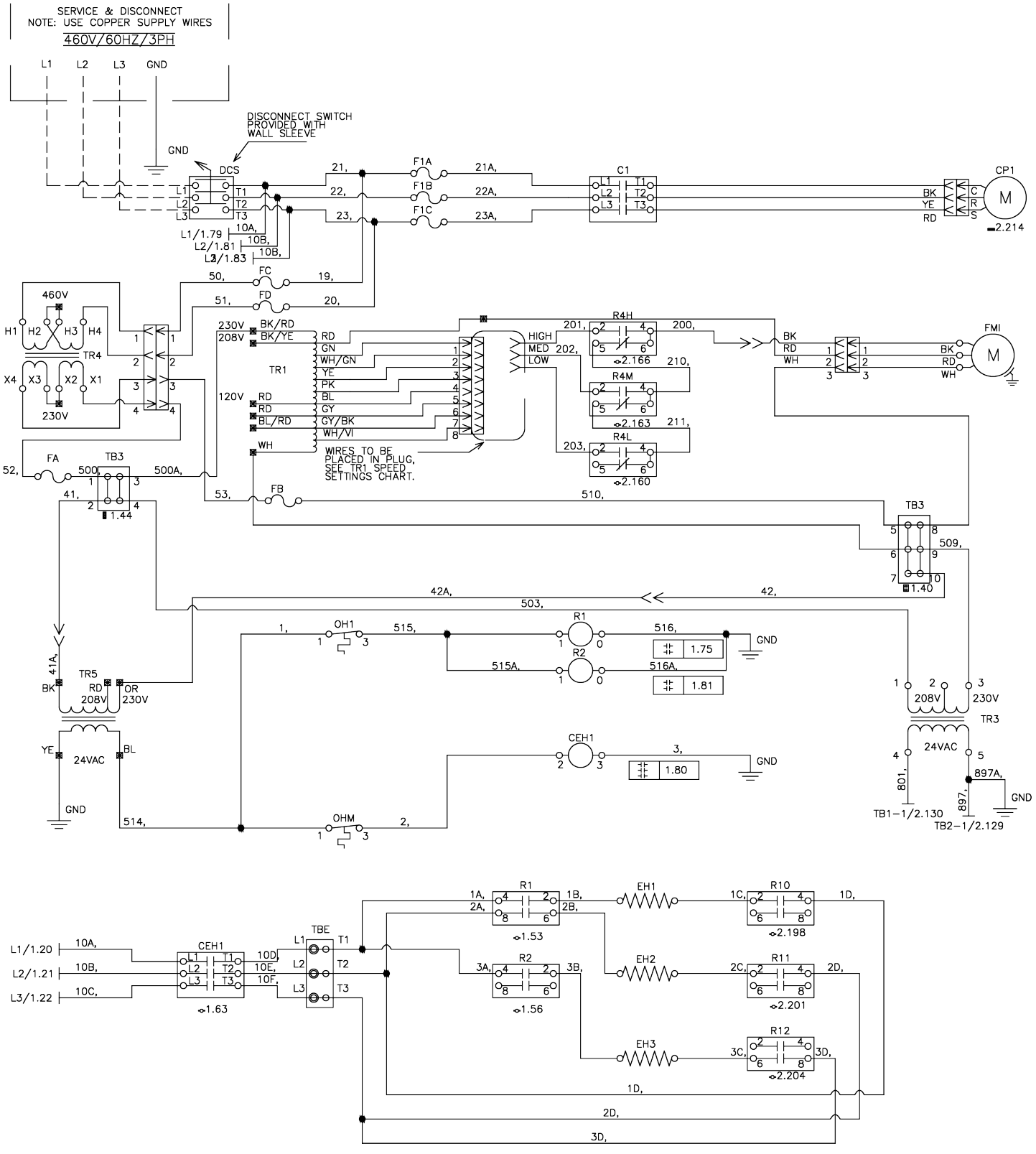


Figure 67: Typical MicroTech Wiring Diagram - Service and Disconnect - 460V/60Hz/3Ph



Wiring Schematics Legend for "Typical MicroTech Wiring Diagrams"

Legend			
A1	Actuator- Outdoor Air	**OH**	Sensor - Outdoor Humidity
A2	Actuator- Face & Bypass	**OH1**	Thermostat - Overheat
A2L1-2	A2L Refrigerant Sensor	**OH2**	Thermostat - Overheat
BPT	Sensor - Braze Plate DX Coil Refrigerant Temperature	**OHM**	E.H. Man Reset - Overheat Stat
C1	Compressor Contactor	**PL1**	LED Occupancy / Fault Status
CAP1	Capacitor Run	**R1-R3**	Relay Electric Heat (Backup)
CEH1-3	Electric Heat Contactor	**R10-R12**	Relay – Electric Heat
CP1	Motor Compressor 2-Stage	**R28**	Relay - Outdoor Motor Air
CO2	Sensor - Indoor Air CO2	**R32**	Relay - Drain Pan Heater
DAT	Sensor - Discharge Air Temperature	**R4H**	Relay – Fan High Speed
DCS	Switch - Unit Power	**R4L**	Relay– Fan Low Speed
DF	Dead Front Switch	**R4M**	Relay– Fan Medium Speed
EH1-6	Heater - Electric	**RA2L**	Relay A2L
EH10	Heater - Outdoor Drain Pan	**RAT**	Sensor - Room Air Temperature
EWT	Sensor - Entering Water Temperature	**RCCP**	Transducer AAR
F1A/F1B	Fuse - Compressor	**RV**	Reversing Valve
F2A/F3C	Fuse - Electric Heat	**SRT**	Sensor - Suction Line
FA/FB	Fuse– Control, Load	**T6**	Thermostat - Freeze Stat
FC/FD	Fuse– Control, Transformer	**TB1**	Terminal Block - 24VAC+
FMI	Motor - Room Fan	**TB2**	Terminal Block – 24VAC Gnd
FMO	Motor Outdoor Air	**TB3**	(A, B) Terminal Block – Main Power
HP	High Pressure Switch	**TBE**	Terminal Block - Electric Heat
ICT	Sensor - Indoor DX Coil Temperature	**TR1**	Transformer - Motor Speed
IH	Sensor - Indoor Humidity	**TR3**	Transformer - 208 / 230V-24V, 75VA
LWT	Sensor - Leaving Water Temperature	**TR4**	Transformer - 460V–230V
MCB	Main Control Board	**TR5**	Transformer - 208 / 230V-24V
MT6210	A2L Control Board	**V1**	Valve - Heat EOC (Accessory)
NTWK	Network Connection	**V2**	Valve - Cool EOC (Accessory)
OAT	Sensor - Outdoor Air Temperature	**VC**	Valve - Cool (Accessory)
OCT	Sensor - Outdoor DX Coil Temperature	**VH**	Valve - Heat (Accessory)

Legend - Symbols	
– – –	Accessory or field mounted component
⏚	Ground
⊠	Wire nut / splice
●	Overlap point - common potential wires
L1/1.20	Wire link (wire link ID / page # . line #)

NOTE 1: All electrical installation must be in accordance with national and local electrical codes and job wiring schematic.

NOTE 2: External wiring options - see IM for the different configured options, wiring to be minimum 18 gauge, 90°C.

NOTE 3: EC motors are factory programmed for specified airflow. Contact Daikin Applied for replacement.

NOTE 4: Cap extra wire. Switch wire 42A to red wire for 208V operation.

NOTE 5: Devices in legend may or may not be on unit.

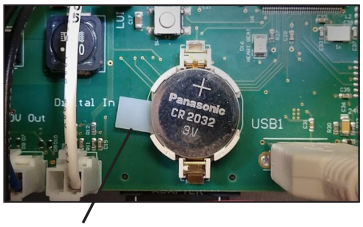
Operation

Start-Up

Remove Battery Shipping Tab

Check that board backup battery shipping tab is removed. To remove, grasp tab and gently pull. Battery should be replaced every 3 years of unit service.

Figure 68: Battery Shipping Tab



Remove Battery Shipping Tab

Complete Check, Test and Start Procedure

Provide completed Check, Test and Start form to your local Daikin Applied representative and specifying engineer for verification that proper start-up was completed. See page 52.

⚠ CAUTION

Remove debris, dust, dirt, and any obstruction from the area in front of the return air intake grille at the floor.

1. Before proceeding, inspect the fan system, to verify that all parts are aligned properly and move freely. Inspect fans and fan discharge area for obstructions. Verify that power has been disconnected. Rotate the fan assembly manually. Check that a clean filter is installed and the area in front of unit ventilator is free of debris. All panels should be in place and properly fastened. Check for outdoor air leaks and condensation. Verify that the coil section is properly sealed using the insulating foam donuts supplied.
2. After the unit ventilator has been properly installed, activate unit electrical power and applicable refrigerant systems.
3. Using the applicable control, activate the unit ventilator. Depending on the operating mode selected, the dampers, fans, and other components should operate as needed.
4. Run the unit ventilator for ten minutes, listening and observing. Fans should be operating correctly and rotating in the proper direction, without unusual noise. Likewise, the unit should be free of sheet metal rattles and / or unusual noises. All panels should be in place and properly fastened. Check for air leaks and condensation. Compressor should run without noise. If noisy, check electrical phases to verify that the compressor is rotating correctly. Phase reversal can damage the compressor and void the warranty.
5. Test Refrigerant Detection System (RDS). See “A2L Leak Detection Sensor and Board Troubleshooting and Diagnostics” on page 48. For full details on the mitigation modes and sequence of operation please refer to the literature for the unit controller and A2L mitigation control board.

Post Installation Checklist

- □ Unit is securely fastened to wall.
- □ Electrical hook-up is complete; power, control, wall thermostat (if applicable) in accordance with unit wiring diagram(s).
- □ Air filter is clean and in place.
- □ All access and end panels are in place and protective covering has been removed.
- □ No debris, dust, dirt, or obstructions exist in front of the return air intake grille at the floor.
- □ All installation work has been completed in accordance with applicable local, state and national codes.
- □ Unit is square and level and is running smoothly and quietly.
- □ Refrigerant Detection System for refrigerant leak mitigation has been tested.
- □ No air infiltration has been detected.
- □ Paint nicks and scratches have been touched up (as required).
- □ Access space is provided for maintenance, service and unit removal.
- □ Shipping carton replaced over unit for protection (as required).
- □ Owner or maintenance personnel provided with a copy of this manual and other manuals/documents shipped with the unit.
- □ Owner or maintenance personnel instructed on proper unit operation and maintenance.

Maintenance

General Maintenance

1. Normal maintenance on all units is generally limited to filter changes. Units are provided with a permanently lubricated motor 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. 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 almost always are 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.

Oiling (Not Required)

No oiling required. The indoor motor and fan shaft bearings are permanently lubricated.

NOTICE
Motor manufacturer recommends not oiling the room fan motor.

Filter(s)

⚠ CAUTION
Units must have a filter installed when operating. Operation without a filter can compromise unit performance due to build up of dust and dirt on components.

Daikin Applied single-use filters are standard on all self-contained units, including the ARQ and GRQ. Permanent wire mesh and renewable media filters are available in lieu of single-use filters.

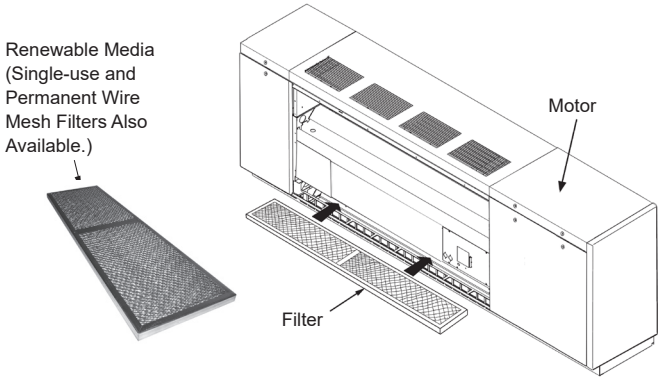
- Single-use filters feature Amerglas media. They are designed to be used once and discarded.
- Permanent filters are metal filters that may be removed for cleaning and reused numerous times.
- Renewable media filters (Figure 69) consist of a heavy painted metal structural frame and renewable Amerglas media.

Turn off the unit (fan speed switch or unit on/off switch is located behind the right front end compartment panel). Remove the center front panel, pull out the filter and replace with a clean filter. Replace the center panel and restart the unit.

Filters should be replaced during the first week of placing into service to prevent dirt carry-over into the internals of the unit and back into the classroom (see Figure 69). A periodic filter changeout program should be established. Filters should be checked monthly or more often if conditions indicate. Filters are included in all units.

⚠ CAUTION
Dirty or clogged filters can impact unit performance, resulting in damage to the unit.

Figure 69: Filter installation



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.

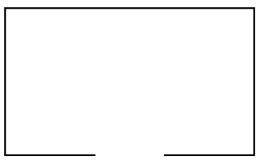
Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

⚠ WARNING

The appliance is designed to activate leak mitigation airflow in the event a refrigerant leak is detected. This is required to ensure dilution and prevent stagnation of any leaked refrigerant. Always ensure the supply fans are able to operate freely. Always maintain proper airflow and do not allow filters, air inlets, or air outlets to become blocked. Refer to Table 12.

⚠ WARNING

The appliance shall be installed, operated, and stored in a room with a floor area not less than the minimum room area.



≥ 261 ft² (24.25 m²)
Minimum Room Area*

*See the required minimum room area for your specific unit size in Table 12.

NOTICE

Refer to Table 13 for the altitude adjusted room area calculation referenced later in this manual.

The indoor equipment mitigation requirements are calculated at sea level. For higher altitudes, adjust the minimum room area specified on or near the serial plate by the corresponding altitude adjustment factor shown in Table 13. This table is provided as a reference. Adjusted room area (Amin adj) is the product of the minimum room area specified in the serial plate and the minimum room area multiplier, as shown in formula below.

Amin adj = Amin (serial plate) * (minimum room area multiplier)

The minimum room area can also be found in Table 12.

Table 12: Minimum Airflow and Room Area Requirements

Unit Size	R-32 Refrigerant Charge oz (kg)	Minimum Room Area Amin ft² (m²)	Minimum Airflow Qmin ft³/min (m³/min)
024	72 (2.04)	188 (17.47)	118 (3.34)
040	74 (2.10)	193 (17.93)	121 (3.43)
048	100 (2.83)	261 (24.25)	164 (4.64)

Table 13: Minimum Room Area Multipliers by Altitude

Altitude (Meters)	Minimum Room Area Multiplier
0	1.000
305	1.047
500	1.078
750	1.117
1000	1.156
1250	1.195
1500	1.234
1750	1.273
2000	1.312
2250	1.351
2500	1.390
2750	1.429
3000	1.468
3250	1.507
3500	1.546

Refrigerant Detection System (RDS) Operation

The Refrigerant Detection System (RDS) is controlled by refrigerant sensors, which are secured to designated locations for active monitoring. If the sensors detect the presence of R-32 refrigerant above 15% LFL mitigation actions are initiated. Compressor and electric heat operation is disabled and the supply fan is activated, providing airflow at or above the minimum required airflow to evacuate excess concentration. Once refrigerant concentration reaches below a safe threshold, the unit will resume normal operation. If the sensors detect another refrigerant concentration excess, the unit will go back into mitigation mode and will repeat the same process.

High speed airflow must be maintained above minimum airflow levels for proper operation of the RDS. See Table 12 for specific airflow requirements.

Refrigerant Detection System and Sensors

For additional instructions on how to operate the RDS including how to activate a manual test of the RDS, refer to the unit controller manual.

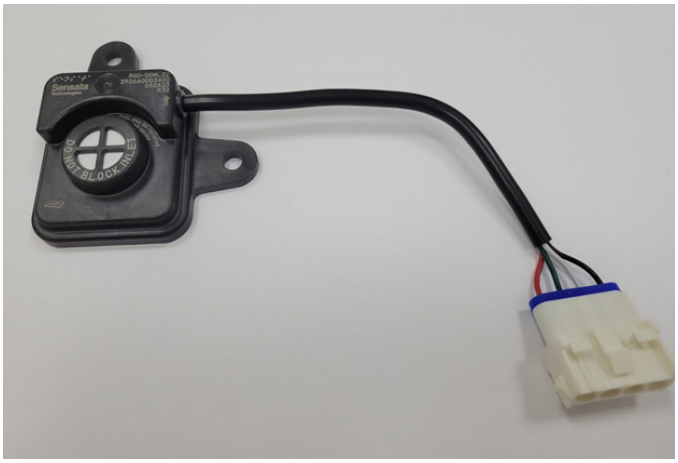
⚠ WARNING

This unit is equipped with a Refrigerant Detection System (RDS). Only components and refrigerant detection sensors specified by Daikin Applied may be used for replacement and maintenance.

⚠ WARNING

Always ensure the refrigerant detection sensors installed in the equipment are free of debris and the inlet is not blocked. If replacing a refrigerant detection sensor, always install in the identical orientation as the original sensor.

Figure 70: Sample Refrigerant Detection Sensor



NOTE: Identify the sensor inlet marked “Do Not Block Inlet,” and ensure it is free of debris.

⚠ WARNING

Auxiliary devices which may be a Potential Ignition Source shall not be installed in the duct work. Examples of such Potential Ignition Sources are hot surfaces with a temperature exceeding 700°C (1292°F) and electric switching devices.

⚠ WARNING

The unit must be stored and/or located to prevent mechanical damage of the refrigeration system. Do not store the unit near sources of open flame, electrical switching devices, or hot surfaces above 700°C (1292°F). If the unit is stored indoors, the storage area should be larger than the Minimum Room Area specified in this manual. The storage space should be well ventilated and not allow for the stagnation of leaked refrigerant. Failure to do so may result in a fire or explosion hazard.

⚠ WARNING

Only auxiliary devices approved by Daikin Applied or declared suitable for installation with R-32 shall be installed in the connecting ductwork.

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.

A2L Leak Detection Sensor and Board Troubleshooting and Diagnostics

At power up, the Refrigerant Detection System RDS control board display shows what sensors are detected and what sensors are not detected.

- Where X is the sensor number (1 to 8):
  - SX = 1 , sensor X is active and communicating
  - SX = 0, sensor X is not communicating or inactive

By pressing and holding the push button for:

- Less than 2 seconds:

  The RDS control board display shows the last 10 sensor faults (can be loss of communication or faulted state reported by a specific sensor). General configuration fault (Flt CFG) is also shown when the expected number of sensors does not match the number of sensors detected online.
- More than 2 seconds and less than 5 seconds:

  The display shows sensor(s) status info:
  - The current LFL level.
  - Loss of communication or faulted state reported by a specific sensor.
- More than 5 seconds and less than 10 seconds:

  The RDS control board starts a mitigation test. The board will go into alarm mode and the MT6210 controller will begin the mitigation sequence. The mitigation test will last approximately 5 minutes.

  As part of the test, the following will occur:
  - Compressor outputs will be de-energized.
  - Electric heat outputs will be de-energized.
  - Supply fan circulation will be energized to provide airflow above minimum required levels.
- More than 10 seconds:

  The display shows all the GID values supported by the sensor board.

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)
- 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 refrigerating system is earthed prior to charging the system 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.

Appendix

Warranty Registration Form

Warranty - Check, Test and Start	Form: 5F-4240
	Group: **ATS**
	Date: **June 2024**
	Supercedes: **573882Y**

Unit Ventilator Warranty Registration Form

Check, test & start procedure for Daikin Applied Unit Ventilators

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.

Sales Office: _____ S.O.#: _____ Date Started: _____

Job Name: _____ G.O. # _____

Job Location: _____

Unit Location: _____ Unit Tagging: _____

Model No: _____ Serial No.: _____

Supply Voltage: L1/L2 _____ L2/L3 _____ L3/L1 _____ Rated: _____

Room Fan Motor Amps: T1: _____ RPM _____ Nameplate Rating: _____

I. Initial check

A. Does electrical service correspond to unit nameplate? ..... Yes ☐ No ☐
B. Are all electrical power connections tight? ..... Yes ☐ No ☐
C. Does all field wiring conform to unit electrical schematic? ..... Yes ☐ No ☐
D. Is unit installed per IM bulletin? ..... Yes ☐ No ☐
E. Cabinet paint O.K.? ..... Yes ☐ No ☐
F. Cabinet bent? ..... Yes ☐ No ☐
G. Do outdoor (AEQ, AZU, AZQ & AZR) and indoor fans turn freely? ..... Yes ☐ No ☐
H. Are all setscrews on outdoor and indoor fan couplings tight? ..... Yes ☐ No ☐
I. Is the fan coupler aligned between the shaft and motor? ..... Yes ☐ No ☐
J. Are end bearing bolts on outdoor and indoor fan shaft tight? ..... Yes ☐ No ☐
K. Have the fan shaft end bearing and room fan motor been oiled (if applicable)? ..... Yes ☐ No ☐
L. Are outdoor air and return air dampers operating properly? ..... Yes ☐ No ☐
M. Is the filter clean? ..... Yes ☐ No ☐
N. Is there excessive noise or vibration? ..... Yes ☐ No ☐

If Yes, corrective action (if any) _____

II. Controls check

A. Does the unit have Daikin Applied controls (MicroTech)? ..... Yes ☐ No ☐

If No, control company _____
If controls are not by Daikin Applied, skip to Section III.

B. Condensate disposal system operating O.K.? ..... Yes ☐ No ☐
C. Does unit start and perform per sequence of operation as stated in OM? ..... Yes ☐ No ☐
D. If the unit has a unit mounted sensor, has the insulation been removed from the sampling chamber inlet? ..... Yes ☐ No ☐
E. Are all sensors installed and insulated properly? ..... Yes ☐ No ☐
F. If the unit has MicroTech controls, room setpoint: _____°F Deadband 6° or _____°F

III. Refrigeration system

A. Has all field piping been leak tested to 100 psig (AVS, AVV, AVR, AHF, AHV, & AHR)? ..... Yes ☐ No ☐
B. Is expansion valve bulb properly installed and insulated? ..... Yes ☐ No ☐
C. High pressure control cutout (if applicable) _____ psig
D. Crankcase heater operating O.K.? ..... Yes ☐ No ☐
E. Reversing valve operating O.K.? ..... Yes ☐ No ☐
F. Emergency heat operating O.K.? ..... Yes ☐ No ☐
G. Piping correct (AVS, AVV, AVR, AHF, AHV, & AHR to remote condensing unit)? ..... Yes ☐ No ☐
H. Checked for refrigerant leaks? ..... Yes ☐ No ☐

IV. Hydronic piping check

A. Is unit piping correct (the remainder of this section applies only to units with Daikin Applied controls)? ..... Yes ☐ No ☐
B. Is the modulating control valve(s) piped correctly (valve controlled units)? ..... Yes ☐ No ☐
C. Is the modulating control valve(s) placed in the upright position (valve controlled units)? ..... Yes ☐ No ☐
D. Is 2 - position control valve(s) piped correctly (face and bypass)? ..... Yes ☐ No ☐

Warranty Registration Form

V. Start-up (Readings must be taken at full load conditions)

A. Outdoor Fan Motor Amps: T1 _____ Nameplate Rating: _____

B. Compressor Amps (Cig): T1 _____ T2 _____ T3 _____ Nameplate Rating: _____

C. Compressor Amps (Htg): T1_____ T2 _____ T3 _____ Nameplate Rating: _____

D. Refrigerant Pressures Htg./Clg.: Suction:_____ /_____ Discharge:_____ / _____

E. Refrigerant Temperature Htg./Clg.: Suction_____°F/_____°F Discharge:_____°F/_____°F

F. O.A.Temp.: _____°F Super Heat: _____°F Subcooling:_____°F

G. R.A. Temp. Htg./Clg.: _____°F/_____°F Discharge Air Temp.:_____°F/_____°F

H. Electric Htg. Amp: L1 _____ L2 _____ L3 _____ Total Amp: _____

I. Water Temperature Htg./Clg.: In _____°F/_____°F Out _____°F/_____°F

VI. Performed by:

Company: _____

Name: _____

Title: _____

Signature: _____ Date: _____

Comments: _____

_____

_____

_____

_____

_____

Service Technician: _____

Contractor Representative: _____

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

COMPLETE HVAC SYSTEM SOLUTIONS

SELF-CONTAINED | ROOFTOPS | COILS | CONDENSING UNITS
AIR HANDLERS | WATER-COOLED CHILLERS | AIR-COOLED CHILLERS
MODULAR CENTRAL PLANTS | SITELINE BUILDING CONTROLS
UNIT HEATERS | FAN COILS | AIR PURIFIERS | WATER SOURCE HEAT PUMPS
VARIABLE AIR VOLUME UNITS | UNIT VENTILATORS

13600 INDUSTRIAL PARK BLVD. | MINNEAPOLIS, MN 55441
1-800-432-1342 | 763-553-5330

LEARN MORE AT
DAIKINAPPLIED.COM

PART NUMBER: IM1392