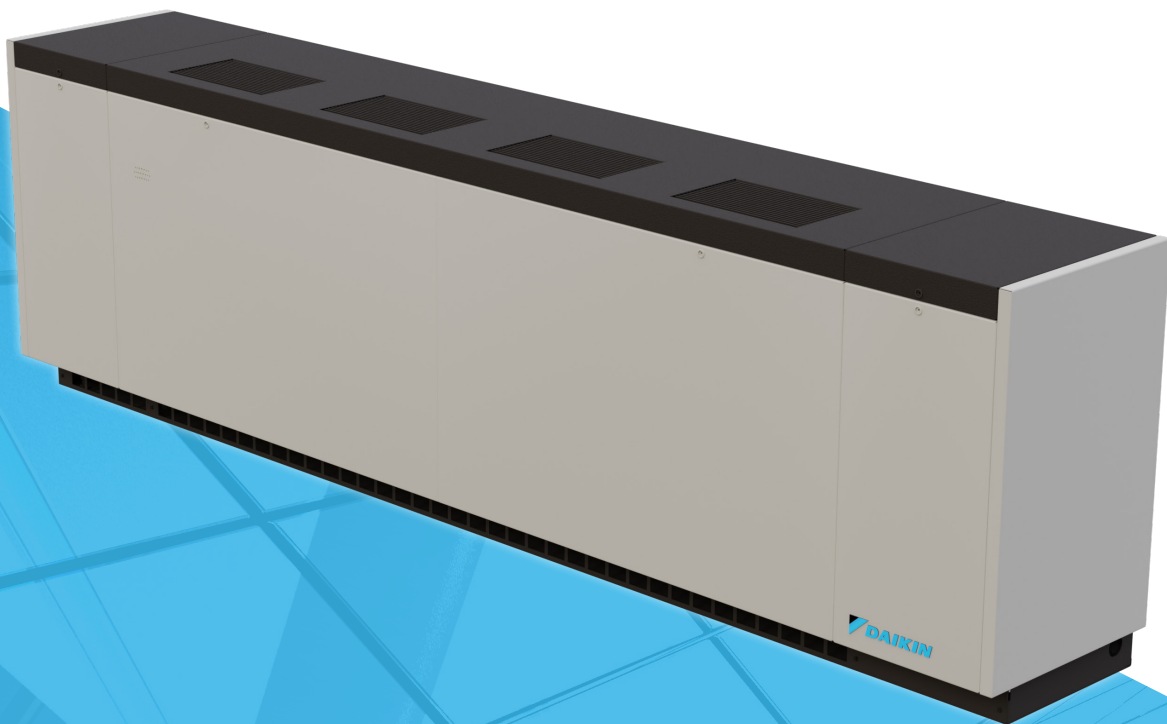


# CLASSROOM UNIT VENTILATOR

SELF-CONTAINED AIR-SOURCE HEAT PUMP



- MODEL AEQ
- SIZES 024-054 (2 TO 4.5 TONS)
- R-32 REFRIGERANT

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# Safety Information

## Hazard Identification

### DANGER

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

### WARNING

Warning indicates a potentially hazardous 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, depressurizing, 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 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.

For more information, consult "Refrigerant Information" on page 61.

### 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

Polyester 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.

- 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
 Refrigerant class per ISO 817	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

## 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.



# Introduction

## Model Nomenclature

<b>U</b>	<b>AEQ</b>	<b>K</b>	<b>024</b>	<b>H</b>	<b>G</b>	<b>12</b>	<b>Z</b>	<b>B1</b>	<b>AL</b>	<b>22</b>	<b>G</b>	<b>I</b>	<b>B</b>	<b>3</b>
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	AEQ	Air Source Heat Pump								
Design Series	3	5	K	Design K								
Nominal Capacity	4	6-8	024	24,000				044	44,000			
			036	36,000				054	54,000			
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								
			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 <sub>2</sub> 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								
Return Air/ Outside Air	11	18-19	22	Return Air Bottom Front/Outdoor Air Rear								
Power Connection	12	20	G	Box with Switch								
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 with 72" tines, or other lifting device is needed to move these products (Figure 1).

Move the louver, wall sleeve, or unit to the location at which it is to be installed before uncrating. Check tagging on carton to confirm that the item is correct for the location. The carton for the unit is imprinted with the Daikin Applied trademark which is the "front" or room side of the unit. The end of the unit carton marked

"Truck From This End" should be on the right-hand side when facing the front of the carton.

Forklift-type vehicles may be used to unload and move the cartons. When using a forklift, it is important that the products remain banded to its skid and be lifted only from the end designated on the carton. See Figure 5 on page 7. Move only one unit at a time. Do not drop unit.



### CAUTION

Use 72" length forklift tines. Short tines will damage the unit bottom. Improper handling can damage internal components.

Figure 1: Forklift Lifting Requirements



## 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. For extended storage times, rotate indoor fan motor and outdoor fan/motor assemblies periodically to prevent flattening of the bearing.

To help avoid concealed damage:

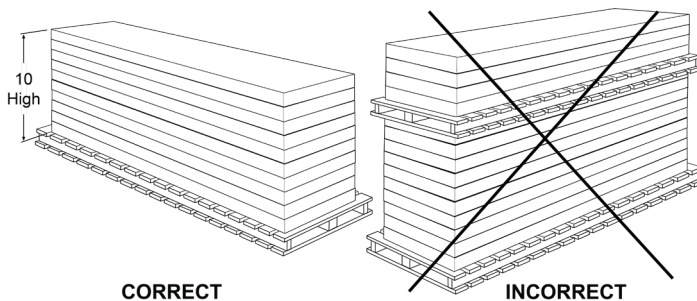
1. Lay the louvers on their side for shipping, handling and storage. Do not stack louver more than 10 high. See Figure 2 on page 7.
2. Do not stack wall sleeves more than 2 high. See Figure 3 on page 7.
3. Unit ventilators must be shipped, handled and stored right-side up. Do not stack units more than two (2) high. See Figure 4 on page 7.

Table 1: Physical Data

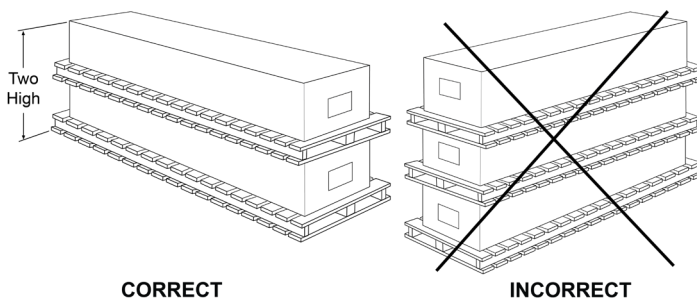
			024	036	044	054
Fan Data	Nominal CFM (L/s)	High Speed	1000 (472)	1250 (590)	1500 (708)	1500 (708)
		Medium Speed	750 (354)	1000 (472)	1050 (496)	1050 (496)
		Low Speed	650 (307)	800 (378)	850 (401)	800 (378)
	Number of Fans		3	4	4	4
	Size	Diameter - in (mm)	8.12 (206)	8.12 (206)	8.12 (206)	8.12 (206)
		Width - in (mm)	8.25 (210)	8.25 (210)	8.25 (210)	8.25 (210)
Fan Motors	Room Fan Motor Horsepower (Type)		1/4 (PSC)	1/4 (PSC)	1/4 (PSC)	1/3 (ECM)
	Outdoor Fan Horsepower (Type)		1/3 (PSC)	3/4 (ECM)	3/4 (ECM)	3/4 (ECM)
Filter Data	Nominal Size	in	10 × 48½ × 1	10 × 60½ × 1	10 × 36½ × 1	10 × 36½ × 1
		(mm)	254 × 1232 × 25	254 × 1537 × 25	254 × 927 × 25	254 × 927 × 25
	Area - ft² (m²)		3.37 (.31)	4.2 (.39)	5.08 (.47)	5.08 (.47)
	Quantity		1	1	2	2
Refrigerant Charge (R-32)		oz (lbs)	106 (6.63)	156 (9.75)	114 (7.13)	111 (6.94)

# Stacking

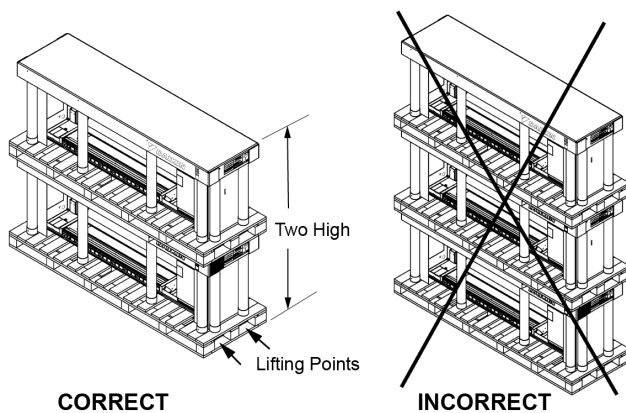
**Figure 2: Stack Louvers Maximum 10 High as Shown**



**Figure 3: Stack Wall Sleeve Maximum (2) Two High as Shown**



**Figure 4: Stack Units Maximum (2) Two High as Shown**

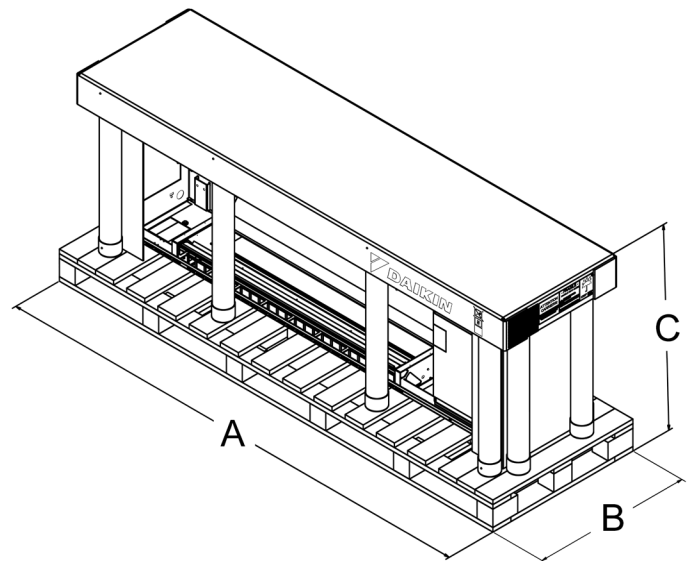


**Table 2: Shipping Carton Dimensions & Weights**

Unit Size	A	B	C	Shipping Weight
024	96"	37"	38"	850 lbs
036	108"	37"	38"	1060 lbs
044, 054	120"	37"	38"	1080 lbs

**NOTE:** All dimensions are approximate only and are subject to change without notice. Refer to approved submittal prints for rough-in details and construction purposes and for recommended wall opening size.

**Figure 5: Unit Package Dimensions**



## Properly Identify Unit Ventilator(s)

To be sure the correct unit ventilator(s) is/are 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 (refer to "Model Nomenclature" on page 5).



### WARNING

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

1. Move only one unit at a time.
2. DO NOT DROP UNIT!
3. Store in a clean dry environment.
4. Lift only from designated end.

Lower crated unit from dolly (if used), but DO NOT DROP. Remove unit from skid if unit will be installed immediately (See Figure 73 on page 40). If storing unit prior to installation, replace the carton over the unit until installation is begun. This will prevent the unit from being scratched or damaged by other workers preparing the area.

End panels are shipped separate from the unit and are installed after unit installation is complete.

- Unit comes encased in plastic bag. Be sure that the plastic bag is disposed of properly after removing permanently.
- Units are shipped in trucks. See Table 2 for loading, truckload quantities, weights and dimensions.
- Strap type sling of nylon or other material should be used rather than wire rope to prevent damage to the unit.

### NOTICE

These are general instructions. Refer to the Daikin Applied submittal drawings for specific dimensions, unit arrangement, stub-up locations, recommended wall opening size, etc.

# Pre-Installation Considerations

Carefully arrange the location and installation of each model AEQ unit to provide convenient service access for maintenance and, if necessary, removal of the unit. The installation consists of four basic elements in the following order:

1. Louver
2. Galvanized Wall Sleeve
3. Horizontal Air Splitters by others (if required)
4. AEQ Self-contained Unit Ventilator

The louver brings in outdoor air for the condenser fan section and ventilation air to the classroom while providing a path for heated condenser air to exit.

The wall sleeve secures the unit, provides a watertight and air tight seal to the building and brings in electrical and control wiring (if required). It contains the unit main power disconnect switch which is located in the wall sleeve junction box. All field electrical connections are made inside this box.

Horizontal air splitters provide proper air paths and minimize air recirculation.

The AEQ self-contained unit ventilator provides comfort cooling and heating for the space. The Model AEQ unit is designed to be installed into or up against an inside wall. The louver, air splitters

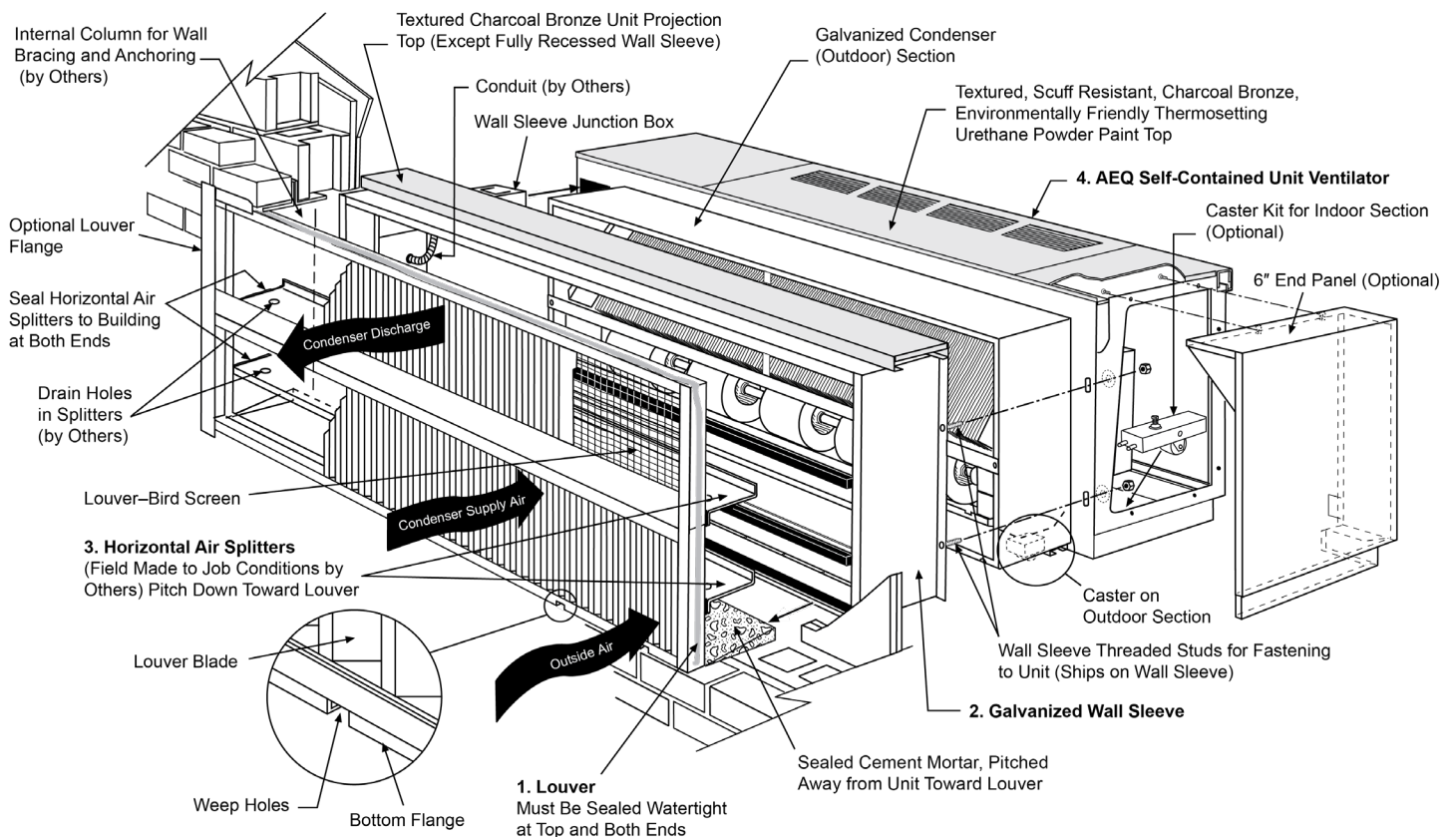
(if required) and wall sleeve are installed before the AEQ unit is installed.

On many jobs, the louver and wall sleeve are shipped ahead of the unit itself. Installation instructions for these components are shipped with the individual components included in this publication.

## Pre-Installation Checklist for Unit

- Lintel installed above wall louver to support masonry wall
- Bird screen on wall louver facing toward room interior
- Embossments of wall louver at bottom and free for drainage
- Wall sleeved to prevent moisture seepage into wall
- Free opening under wall louver clear for water run-out
- Wall louver anchored to building and sealed against air and water leaks
- Horizontal air splitters between wall sleeve and louver (if required), water and air tight
- Wall sleeve anchored to building and sealed against air or water leaks
- Sealant material applied to "D" seal cross channel flange to seal to drainage slope edge
- Unit inspection complete for damage, data plate information and correct location of unit

**Figure 6: Typical Frame and Brick Construction with Partial Recess**



# Unit Location

## Locating Wall Opening (Existing Building)

### CAUTION

Unit ventilators use fresh air to condition the interior space. Obstructions near the louver wall opening must be removed to allow free flow of entering and discharge air. Building and vehicle exhaust, etc., near the louver intake must be identified and eliminated.

### NOTICE

Wall and floor must be at 90° to one another. If not, the floor must be leveled (90°) to wall.

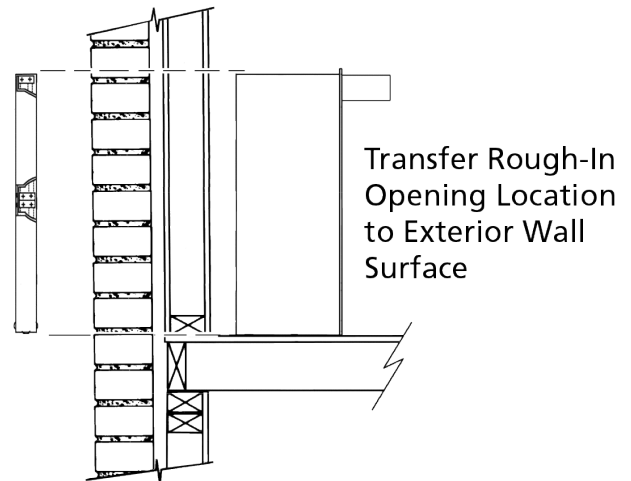
An opening in the outside wall is required to accommodate the wall sleeve and louver. The wall opening must be of sufficient size to allow proper fit of the louver and will depend on the type of wall. National and local codes for building construction must be followed and may supersede the suggested methods in this manual.

The first step in the installation is to carefully locate the area of interior and exterior wall to be removed. Determine the appropriate location on the interior wall where the unit ventilator is to be installed. Using the rear edge of the wall sleeve as a guide, mark the interior wall surface for the rough-in wall sleeve opening 1/4" larger at each end than the wall sleeve recess dimension, and 1/4" higher (see [Table 3 on page 10](#)). In all cases, the bottom of the outdoor louver opening must be at the same height as the floor line.

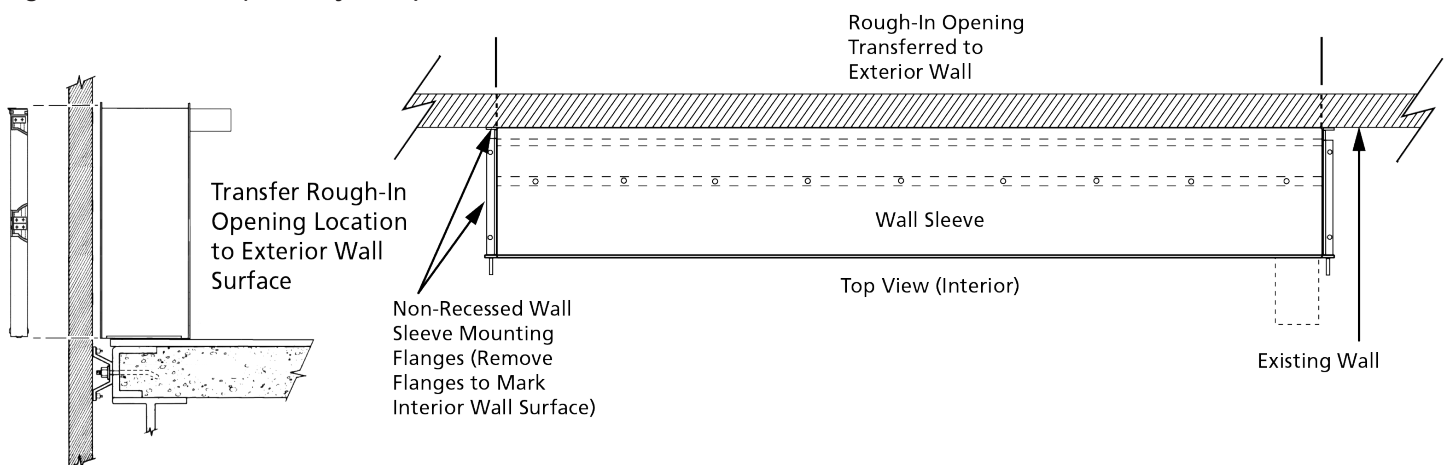
For non-recessed installations, (full projection), mark the position of the wall sleeve on the interior wall surface with the wall mount flanges removed to help determine the location of the outdoor wall surface rough opening.

Transfer the interior wall opening dimensions to the exterior wall surface, being certain the opening is 1/4" larger at each end than the wall sleeve recess dimension, and 1/4" higher.

**Figure 7: Partial recess, frame and brick construction**

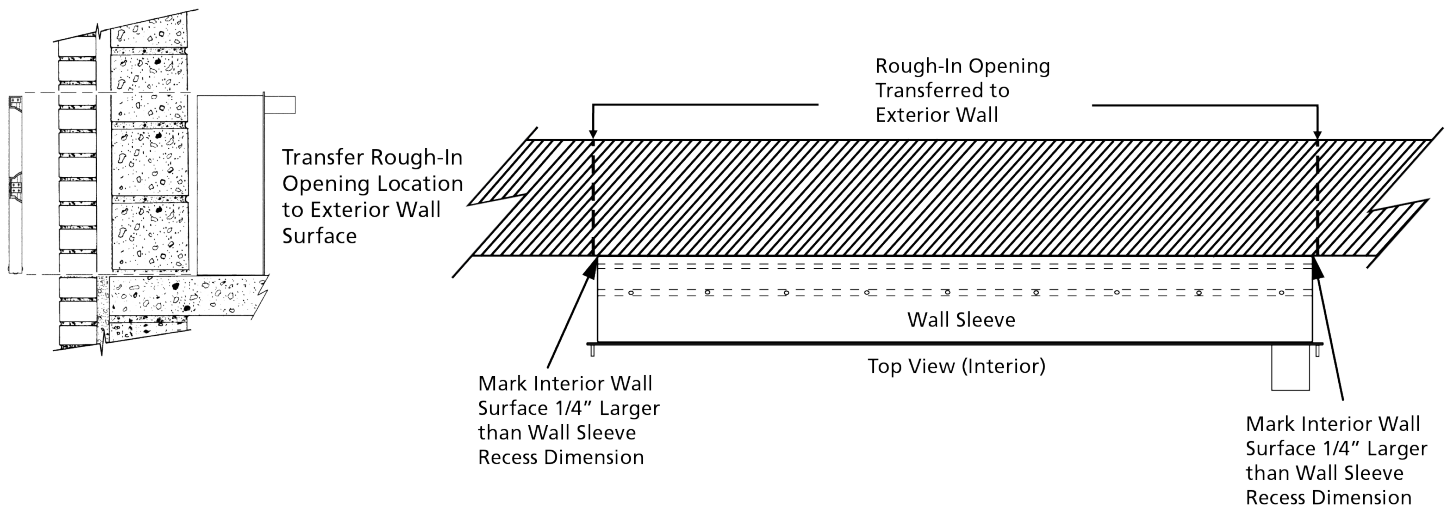


**Figure 8: No Recess (Full Projection), Thin Wall Construction**





**Figure 9: Full Recess, Thick Wall Construction**



## Cutting Exterior Wall Opening

The wall opening must be of sufficient size to allow proper, yet snug, fit of the louver and will depend on the type of wall. If the louver is to be installed in a masonry wall, install a lintel to support the wall above the wall sleeve and louver. Install a sleeve to prevent moisture from seeping into the wall interior. Refer to approved submittal prints for recommended rough wall opening size.



### CAUTION

Read louver and wall sleeve installation sections beginning on [page 13](#) before proceeding. Improper installation can result in property damage.

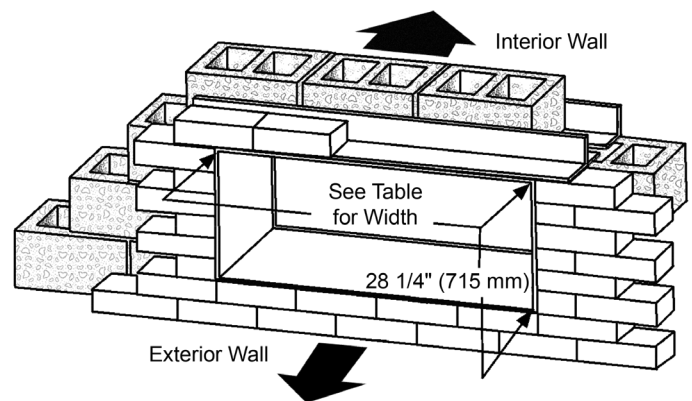
The following is a typical procedure for installing in existing masonry walls. Follow local codes and safety procedures.

If the Model AEQ unit is to be installed in an existing classroom, an opening must be cut in the outside wall to accommodate the wall sleeve and louver. This is accomplished as follows: First, the outside of the masonry wall is cut with a carborundum or other suitable blade as shown in [Figure 10](#). This opening should be 1/2" larger overall than the size of the louver supplied with the unit (see [Figure 11](#) & [Table 3](#)).

**Figure 10: Cutting the Outside Wall Rough Opening Slightly Larger Than the Size of the Louver**



**Figure 11: Rough-in Dimensions of Exterior Wall for Louvers**



**Table 3: Recommended Rough-in Dimensions for Louvers with or Without Flanges (Exterior Wall)**

Unit Size	Width		Height	
	in	mm	in	mm
024	84½	2140	28¼	715
036	96½	2444	28¼	715
044	108½	2747	28¼	715
054				

**NOTE:** See louver installation section [page 13](#). Dimensions are approximate and are dictated by job site conditions.



### CAUTION

Horizontal splitters (by others) must be installed whenever there is space between the wall sleeve and the louver.

Seal the ends of the wall opening. Pitch splitters toward the louver for water drainage, see sealing wall sleeve and horizontal splitters. Refer to [Figure 57](#) on [page 31](#) and [Figure 59](#) and [Figure 60](#) on [page 33](#).

## Cutting Interior Wall Opening

Next, the interior wall is cut as shown in [Figure 13](#). If any portion of the wall sleeve is to be recessed into the wall, the opening must be large enough to accommodate the wall sleeve (see [Table 4 on page 11](#)). In all cases, the bottom of the wall opening must be at the same height as the floor line. Seal the floor of the wall opening to permit water to drain under the louver and away from the building interior. If the building is a panel wall, the sleeve will be nonrecessed (full projection) and all of the unit will remain in the room.

**Figure 12: The Interior Wall Opening is Cut**



**Table 4: Recommended Rough-in Wall Opening for Wall Sleeve**

Unit Size	Wall Sleeve w/Flange Length	Sleeve (Recessed) Length	Recommended Rough-in Wall Opening	
			Length	Height
024	86" (2184 mm)	84" (2145 mm)	84 1/2" (2146 mm)	28 1/2" (724 mm)
036	98" (2489 mm)	96" (2489 mm)	96 1/2" (2451 mm)	28 1/2" (724 mm)
044, 054	110" (2794 mm)	108" (2755 mm)	108 1/2" (2756 mm)	28 1/2" (724 mm)

The interior wall is then knocked out in the area cut for the wall sleeve as shown in [Figure 13](#).

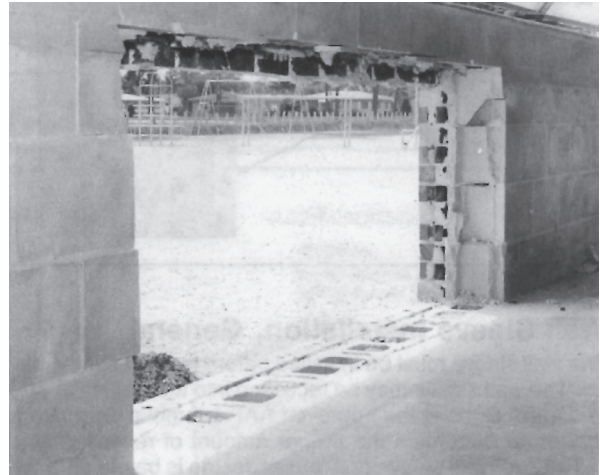
**Figure 13: The Interior Wall is Knocked out in the Area Cut for the Wall Sleeve**



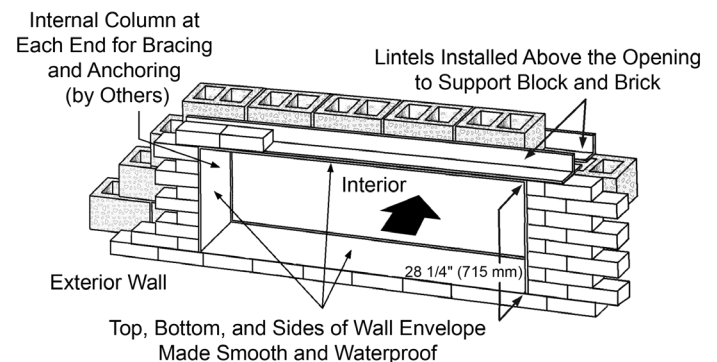
If the wall consists of concrete block with brick (or other) veneer and the louver opening is smaller than the opening of the wall sleeve (which is to be recessed), be careful to knock out only the veneer that is necessary.

After the opening is finished ([Figure 14](#)), a lintel must be installed above the opening in masonry walls to support the remaining block and brick ([Figure 15](#)). The wall must contain a solid surface or an internal column at each end for bracing and anchoring the wall sleeve and louver (by others).

**Figure 14: A Lintel Must be Installed Above the Opening to Support the Remaining Block and Brick**



**Figure 15: Lintels Installed**



### **CAUTION**

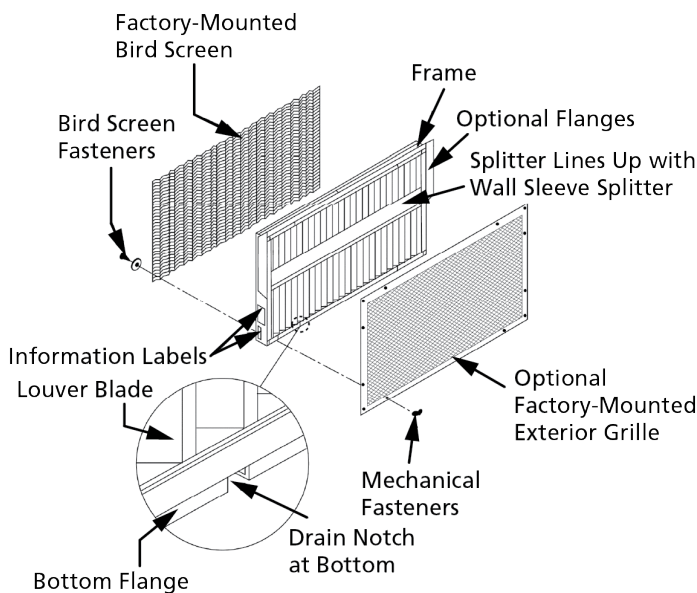
The wall opening must be sealed and made watertight. See the louver, splitter and wall sleeve installation sections.

## New Buildings

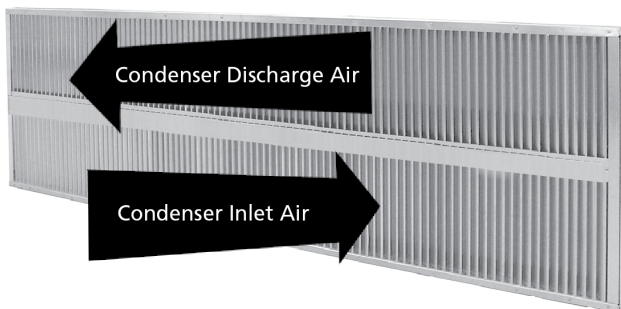
In new construction, if any portion of the wall sleeve is to be recessed into the wall, the opening must be large enough to accommodate the wall sleeve. Refer to [Table 4](#). For smaller wall thickness, the wall sleeve will be nonrecessed (full projection) and all of the unit will project into the room. In all cases, the bottom of the wall opening must be at the same height as the floor line. A lintel must be installed above the opening in masonry walls to support the block and brick. The wall must contain a solid surface or an internal column at each end for bracing and anchoring the wall sleeve and louver (by others).

## Installing Louver

**Figure 16: Typical Wall Louver and Grille**



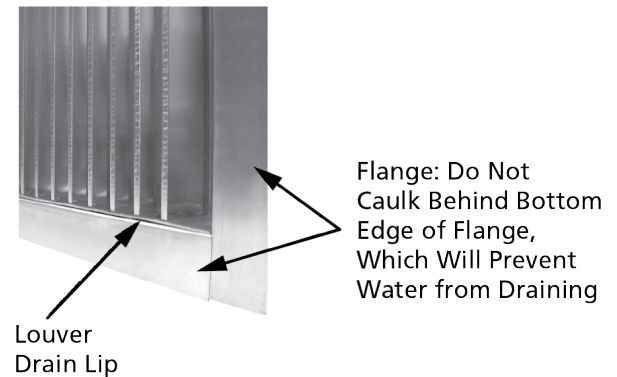
**Figure 17: Vertical Blade Louver, Without Flange**



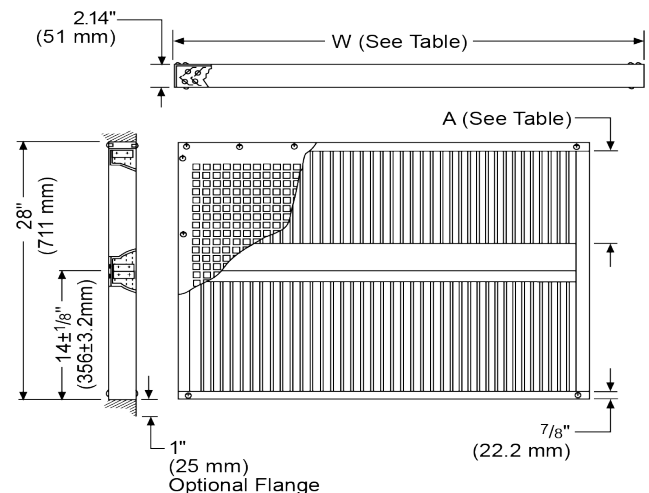
## CAUTION

Locate Drain Lip at bottom of vertical louver to allow proper drainage. Bird screen should always be on side toward unit.

**Figure 18: Vertical Louver with Flange**



**Figure 19: Grille Detail**

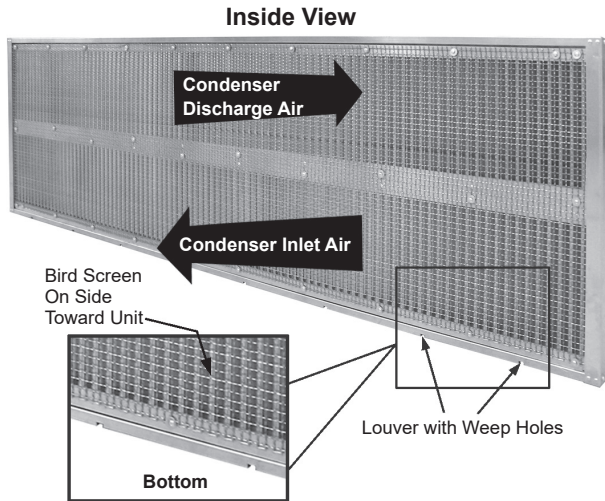
**Table 5: Wall Louver Dimensions**

Unit Size	Louver Size (Height x Width)	Discharge Air Opening (A)
024	28" x 84" (711 x 2134)	9" (229 mm)
036	28" x 96" (711 x 2438)	9" (229 mm)
044, 054	28" x 108" (711 x 2743)	7" (178 mm)

**NOTE:** All dimensions are approximate and subject to change without notice. Refer to approved submittal prints for rough-in details and construction purposes, and for recommended wall opening size.



**Figure 20: Vertical Blade Louver, Without Flange**



**CAUTION**

Locate Drain Lip at bottom of vertical louver to allow proper drainage. Bird screen should always be on side toward unit.

## Louver Installation Considerations

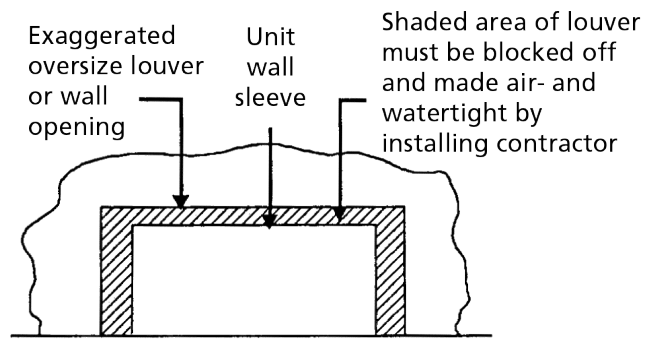
The standard louver is an aluminum, vertical, divided blade design complete with bird screen. This louver is also available with flanges and/or with a heavy-duty exterior lattice grille.

**CAUTION**

Louvers by Daikin Applied provide proper airflow. Proper unit performance has not been verified with louvers by others.

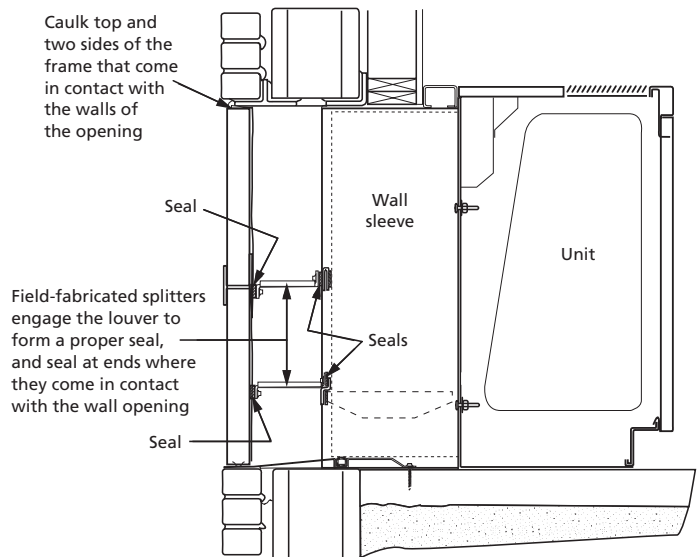
1. [Figure 17](#) & [Figure 20](#) on [page 13](#) show detail of a typical louver. Before installation, carefully examine the louver and note the location of the bird screen and the notches (drain holes). The louver must be installed with the small opening at the top, notches at the bottom and the bird screen toward the room. If the louver is to be installed in a masonry wall, there must also be a lintel to support the existing wall above the louver.
2. Measure the opening to be sure there is adequate clearance for the louver around the sides. Observe the opening in relation to the wall sleeve and unit. For proper unit operation, the louver must be centered left to right and top to bottom to the wall sleeve. If the louver is of such a dimension that it extends above, below, or beyond the wall sleeve, then these areas must be blocked off airtight ([Figure 21](#)).

**Figure 21: Oversize Wall Opening**



3. If the wall sleeve does not extend into the wall far enough to meet the louver, field fabricated splitter(s) must be provided. The splitter(s) need to extend far enough to engage the louver in order to form a proper seal. See [“Unit room projection & splitter length details”](#) on [page 28](#).

**Figure 22: Typical Field Fabricated Splitters**



**NOTE:** See [Figure 60](#) on [page 33](#) for detail of attaching splitters to wall sleeve.

**CAUTION**

See important information on bottom splitter seal, and drainage from condenser section drain pan ([Figure 5](#) & [Figure 55](#) on [page 30](#)).

4. Check to see if the horizontal divider on the louver is the same height as the top horizontal splitter rail of the wall sleeve. The louver frame must be permanently mounted in the wall.
5. Before installing the louver in the opening, place a heavy bead of caulk along the top and two sides of the frame that come in contact with the walls of the opening. Use a flexible, waterproof caulk such as silicone.

- Once the louver has been placed in the opening, further mechanical fastening may be desired or required. Fasten in a manner appropriate to the installation. See [“Louver Installation Methods” on page 19 through page 22](#). Care must be taken if fasteners are to be placed in the frame. If this is necessary, remove the louver by removing the screws that hold it in place. Drill holes in the desired locations and fasten with flat head screws. Be sure these screws do not interfere with the reinstallation. Shims must be placed between the louver and the wall so it won't be distorted. After the louver has been properly positioned, secure with fasteners.

In masonry wall applications, the louver may be permanently mounted by placing mortar around the top and sides in order to prevent it from being removed. Mortar keys may be attached to the louver, if necessary.

## Typical Installation Methods

If the outside opening has not yet been made refer to [page 9](#) through [page 11](#) for the recommended locations and the job-specific plans for the exact location. Follow national and local codes.

### Wall opening

Cut the wall opening so that it is slightly larger than the louver being installed. Refer to [Table 3 on page 10](#).

If the opening is already there refer to [Table 5 on page 12](#) for dimensions. Measure to be sure there is a minimum of 3/8" (9 mm) clearance around all sides. For masonry installations, follow national and local codes and install a lintel above all louvers.

### Outside air plenum

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) sealed cement 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 for a weather tight seal to help prevent moisture from seeping into the wall.



### CAUTION

Sealing is critical in preventing freeze-ups, cold drafts, air infiltration, and to prevent moisture from entering the wall or room. Be sure the wall is smooth, square, and provides a suitable mating surface.

### Sloping, sealed cement mortar base

Before setting the louver, construct a sloping, sealed cement mortar base to drain unwanted moisture to the outside, ([Figure 23](#)). Be sure the mortar base tapers toward the louver and away from the wall sleeve. The mortar at the wall sleeve also acts as a drain for excess moisture from the outside to drain back outside, thus it must extend so it meets the "D" seal flange of the wall sleeve. Temporarily slide the wall sleeve into place to mark this meeting point on the floor. Refer to [“Recessed Applications” on page 30](#). The mortar should be the same height as the "D" seal flange. Be sure the sealed cement mortar base is smooth

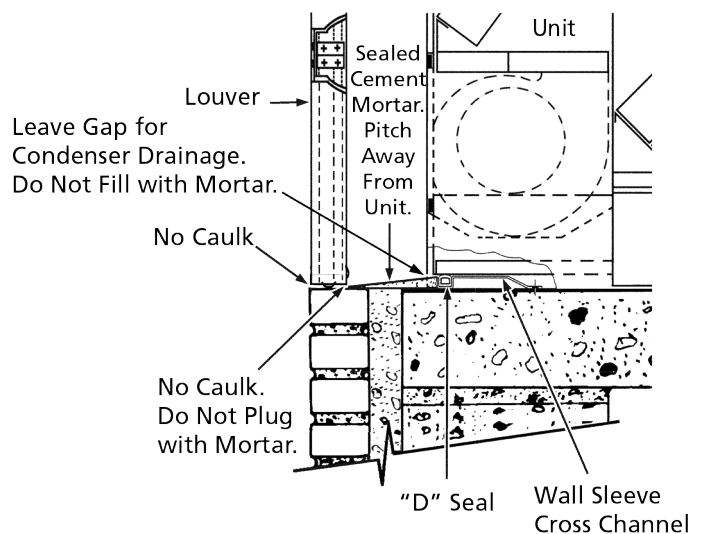
and flush along the wall sleeve "D" seal flange. This is critical in preventing water leaks and air leaks under the unit.



### CAUTION

A space must exist between the bottom back edge of the wall sleeve and the sloping sealed cement mortar base to allow moisture to drain away from the condenser section. Do not fill this space with mortar.

**Figure 23: Typical Louver Installation with Sloping Sealed Cement Mortar Base (Splitters not Shown)**



### Sloped flashing



### CAUTION

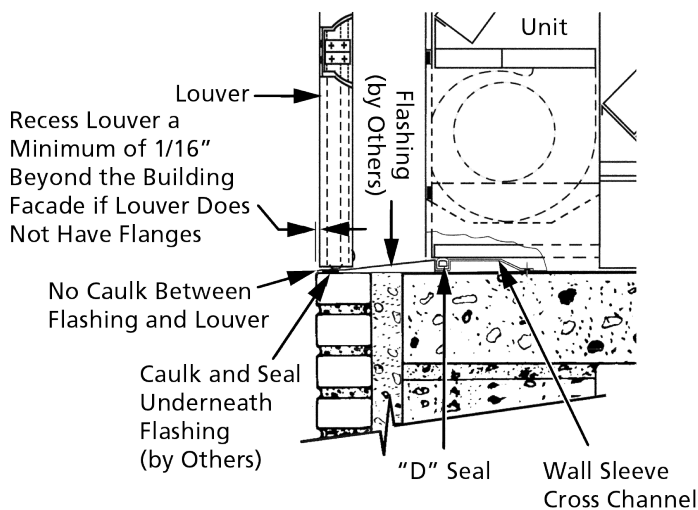
Personal injury hazard. Avoid contact with sharp edges.

If it is not possible to construct a sloping mortar base, then field-supplied flashing is required that is pitched for water drainage ([Figure 24](#)). The flashing should terminate flush with the exterior of the building. The flashing should extend so it is under the wall sleeve and meets the "D" seal flange of the wall sleeve. 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.

Before setting the louver, be sure the drain lip (vertical louver) is at the bottom, and the bird screen is toward the unit (refer to [Figure 16 through Figure 20 on page 13](#)). 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.



**Figure 24: Typical Louver Installation with Sloped Flashing**



### Louver with flanges

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 building. Fasten 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 will trap unwanted moisture behind the flange.

### Louver without flanges

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 (Figure 23). If specified in the plans, secure the louver in the wall using mechanical fasteners (supplied by others) appropriate to the installation. 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 bottom weep holes or the drip line of the louver. This will restrict the flow of unwanted moisture to the outside.

If flashing was used instead of the sloping mortar base, caulk the flashing where it contacts the "D" seal of the wall sleeve, the sides of the wall, etc. (Figure 24). This helps prevent moisture and outside air from getting under the flashing and into the room.

## Top Plan Views: No Recess (Full Projection)

### ⚠ CAUTION

The bottom of the louver must be installed flush with the bottom of the unit for proper air inlet/outlet orientation and to permit water to drain under the louver from the building exterior.

Louver dimensions are  $\pm 1/16"$  (1.6 mm) except as noted.

Intake and discharge must not be restricted. Trees, shrubs, etc, must be a minimum of 30" (762 mm) away from intake.

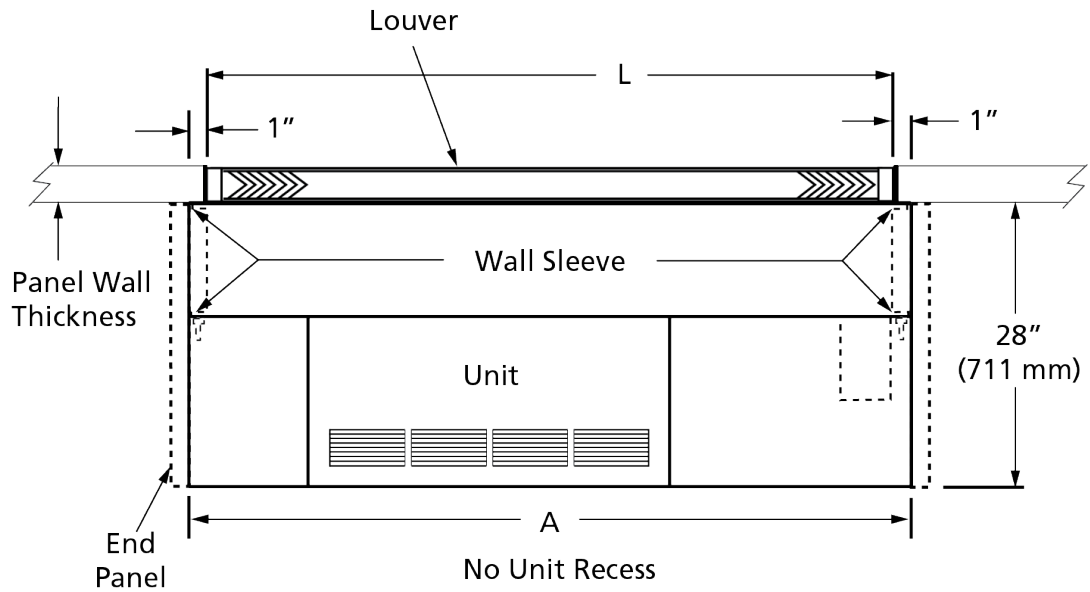
Louver must be blanked off airtight (by others) if it extends beyond the confines of the wall sleeve.

Horizontal splitters (by others) must be installed whenever there is any space between the wall sleeve and the louver. Seal the ends of the wall opening. Locate splitters between condenser discharge and condenser inlet and between condenser air inlet and outdoor air inlet. Pitch the splitters toward the louver for water drainage.

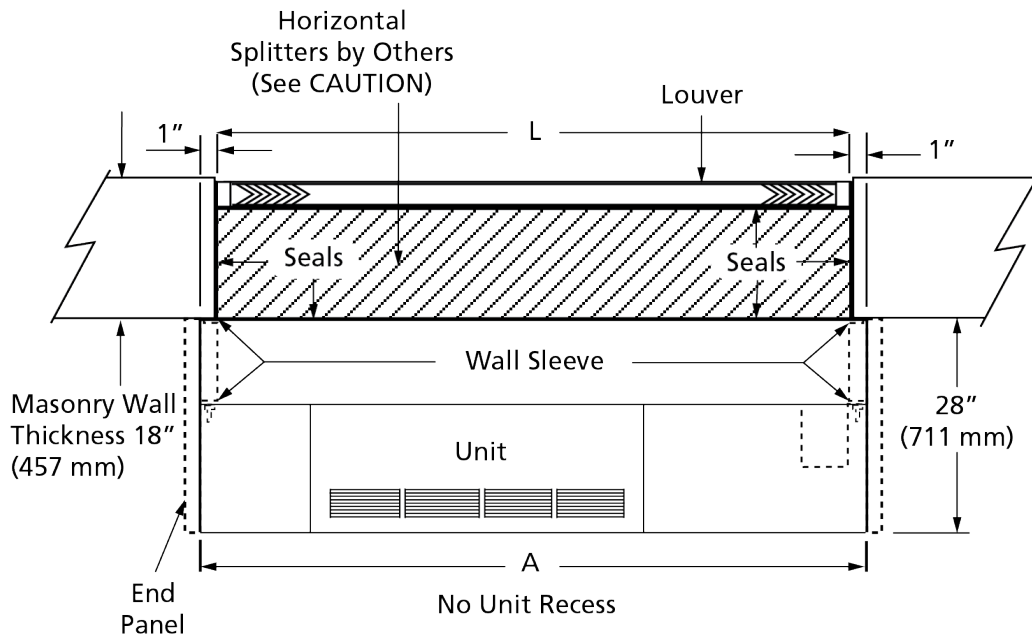
Louvers by Daikin Applied provide proper airflow. Proper unit performance has not been verified with louvers by others.

Grille must be flush with louver to provide proper airflow.

**Figure 25: Panel Wall Application with Flush Louver**



**Figure 26: Masonry Wall Application with Flush Louver**



**Table 6: Unit & Louver Dimensions with No Unit Recess**

Unit Size	Unit "A"		Louver "L"	
	in	mm	in	mm
024	86	2184	84	2134
036	98	2489	96	2438
044, 054	110	2794	108	2743

**NOTE:** "A" is unit length without end panels.

# Top Plan Views – Partial or Full Recess

## CAUTION

The bottom of the louver must be installed flush with the bottom of the unit for proper air inlet/outlet orientation and to permit water to drain under the louver from the building exterior.

Louver dimensions are  $\pm 1/16"$  (1.6 mm) except as noted.

Intake and discharge must not be restricted. Trees, shrubs, etc., must be a minimum of 30" (762 mm) away from intake.

Louver must be blanked off airtight (by others) if it extends beyond the confines of the wall sleeve.

Horizontal splitters (by others) must be installed whenever there is any space between the wall sleeve and the louver. Seal the ends of the wall opening. Locate splitters between condenser discharge and condenser inlet, and between condenser air inlet and outdoor air inlet. Pitch the splitters toward the louver for water drainage.

Daikin Applied supplied louvers provide proper airflow. Proper unit performance has not been verified with louvers supplied from others.

Grille must be flush with louver to provide proper airflow.

**Table 7: Unit & Louver Dimensions with Partial or Full Unit Recess**

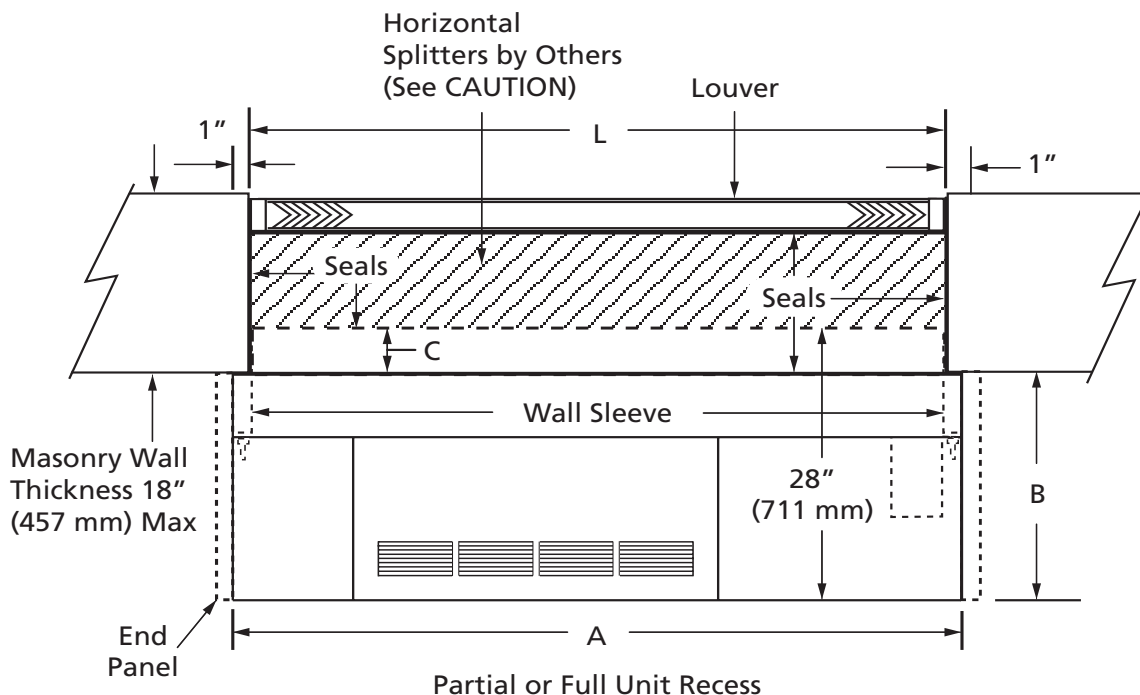
Unit Size	Unit "A"		Louver "L"	
	in	mm	in	mm
024	86	2184	84	2134
036	98	2489	96	2438
044, 054	110	2794	108	2743

NOTE: "A" is unit length without end panels.

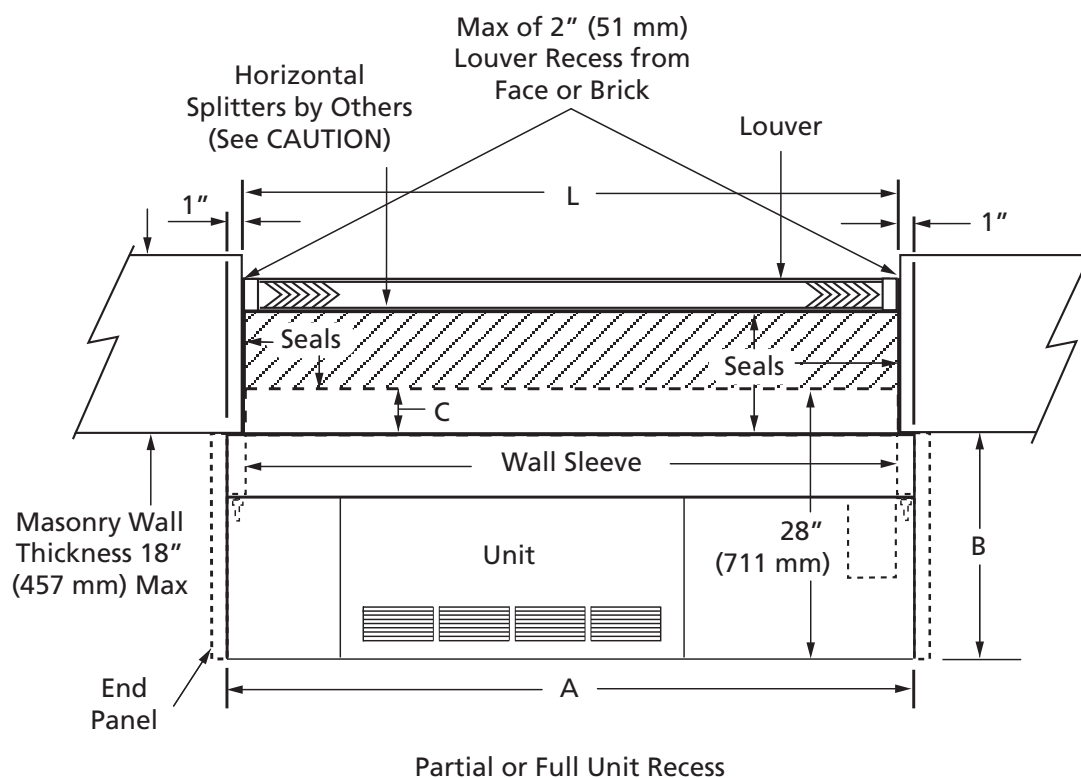
**Table 8: Room Projection/End Panel Depth**

Application	B Room projection of unit in (mm)	C Amount unit is recessed into wall in (mm)
Full Recess	16 $\frac{5}{8}"$ (422)	11 $\frac{3}{8}"$ (289)
Recess	19 $\frac{5}{8}"$ (498)	8 $\frac{3}{8}"$ (213)
	21 $\frac{5}{8}"$ (556)	6 $\frac{3}{8}"$ (156)
No Recess	28" (711)	0 (0)

**Figure 27: Masonry Wall Application with Flush Louver**



**Figure 28: Masonry Wall Application with Recessed Louver**



**CAUTION**

Maximum of 2" (51 mm) louver recess from face of brick.

## Louver Installation Methods

Figure 24 through Figure 36 show various methods of installation. Select the appropriate method.

The following is a brief description of several popular methods of installation. Many variations are possible, depending on wall thickness, opening size, method of fastening, etc.

### Louvers Without Flanges

#### Friction fit installation

This is a friction fit of the louver where the wall opening is made just large enough for the louver to be held in place by the friction between the wall and the louver. This will require each wall opening be “custom cut” to the intake size, which can be done only after the intake is on site for actual measurements. Recommended wall openings provided in this manual do not apply for this method of installation.



#### CAUTION

Appropriate fasteners must be used to prevent removal by unauthorized personnel.

#### Friction fit using shims installation

In cases where the opening is too large and the louver fits too loosely, friction fit may be obtained by the use of shims to help hold the louver in place.

#### Fastens to wall sleeve installation

It may be desired to mount the louver to the wall sleeve so as to allow demounting the louver from the building exterior.

The louver may be fastened to the wall sleeve using appropriate fasteners on each corner of the wall sleeve where it butts up against the louver. The louver must be at least as long as the wall sleeve to be secured to the sleeve in this fashion. No holes are provided in the louver or in the wall sleeve for this type of mounting; the holes must be drilled in the field. Mounting hardware must also be provided by the installer. The wall sleeve must be properly secured to the wall structure.



#### CAUTION

Install so that the embossments are at the bottom of the louver and the bird screen is on the unit (room) side.

If the wall intake louver extends above, below, or beyond the ends of the wall sleeve, it must be blanked off airtight in these areas only.

The wall opening should be of sufficient size to allow proper, yet snug, fit of the louver, and will depend on the type of installation

Refer to approved submittal prints for recommended wall opening size.

If the louver is to be installed in a masonry wall, there should also be a lintel to support the wall above the louver to prevent moisture from seeping into the wall. If it is to be installed in a panel wall, the louver should be placed so that it is as flush as possible with the inside wall.

Figure 29: Friction Fit Louver

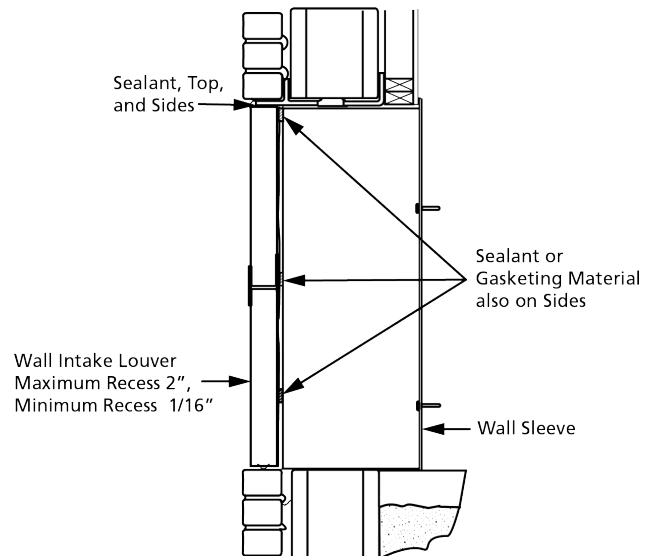


Figure 30: Friction Fit Using Shims

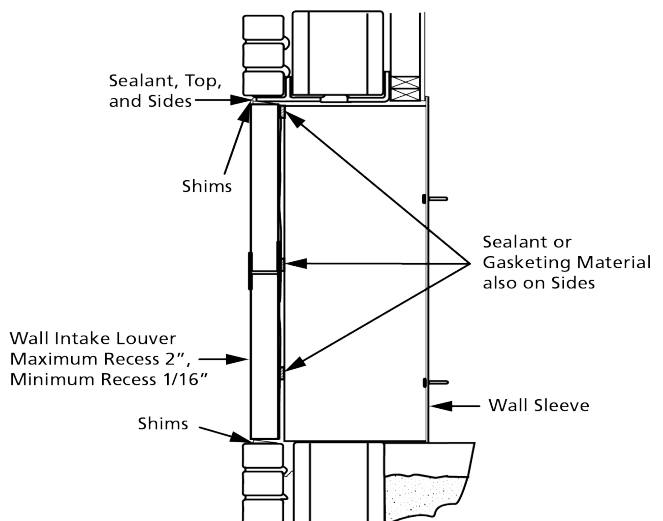
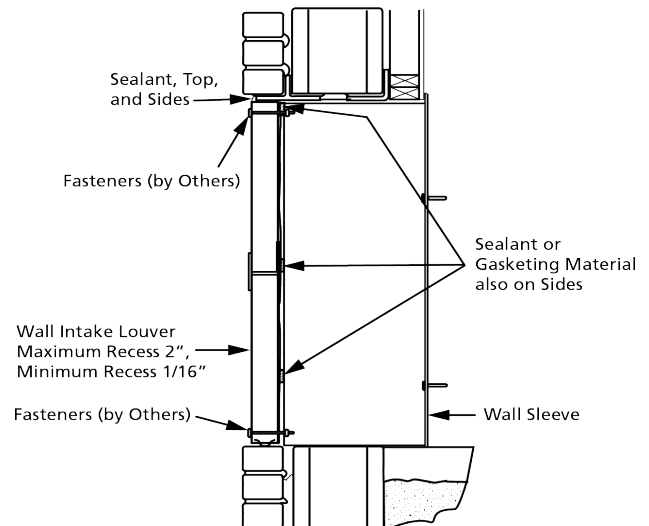


Figure 31: Louver Fastens to Wall Sleeve





### Angle bracket mounting to exterior surface

This shows a typical application where an angle bracket is affixed to the edges of the louver and then the entire assembly is mounted from the outside by fastening to the exterior surface using suitable hardware. This figure shows an application where the wall sleeve is fully recessed into the wall and butts up against the louver. However, the same method of installation may be used where only partial or no recess is required and a horizontal air splitter between louver and wall sleeve must be installed.



#### CAUTION

Do not use mounting angles or strips at the bottom of the intake louver that run across the louver's entire length and plug the weep hole locations. Property damage and poor indoor air quality will result if water cannot drain to the outside from the weep holes.

Appropriate fasteners must be used to prevent removal by unauthorized personnel.

### Angle bracket mounting to interior surface

This is a variation of the installation shown in Figure 32 where the angle brackets are mounted on the inside of the louver and fastened to the wall from the interior of the building. This also shows usage of a horizontal air splitter with a partially recessed wall sleeve. Once the louver has been installed, run a bead of caulk around the outside perimeter of the frame to seal it watertight.



#### CAUTION

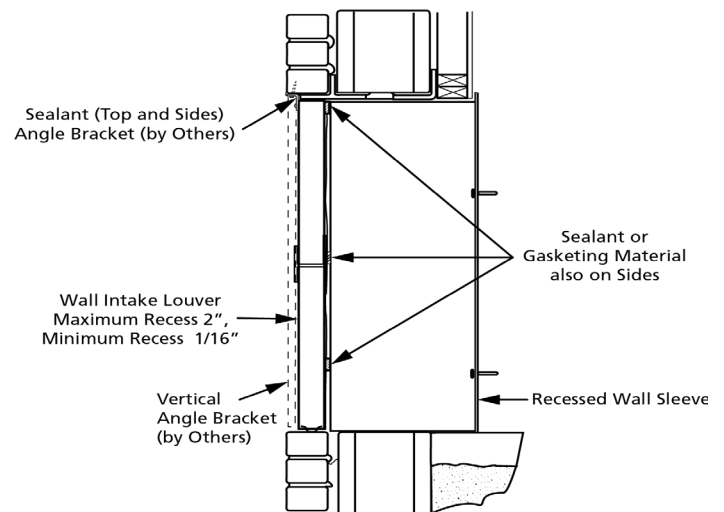
Do not plug the weep holes in the bottom of the louver. Property damage and poor indoor air quality will result if water cannot drain to the outside from the weep holes. Appropriate fasteners must be used to prevent removal by unauthorized personnel.

### Panel wall: angle bracket mounting on exterior surface

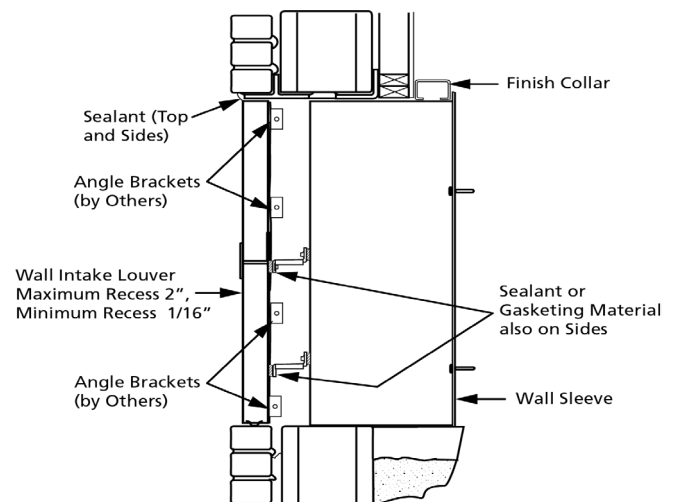
This shows a typical panel wall installation where the panel wall thickness is greater than that of the louver. In this case, it is possible to mount the louver without flange using angle brackets. The louver could be removable from the exterior of the building.

On many panel wall applications, the panel wall manufacturer may accomplish louver mounting by using various aluminum extrusions to "build-in" the louver as a permanent part of the panel wall. All panel wall applications will most likely utilize a full finish collar, meaning no wall sleeve recess into the wall itself. See CAUTIONS before.

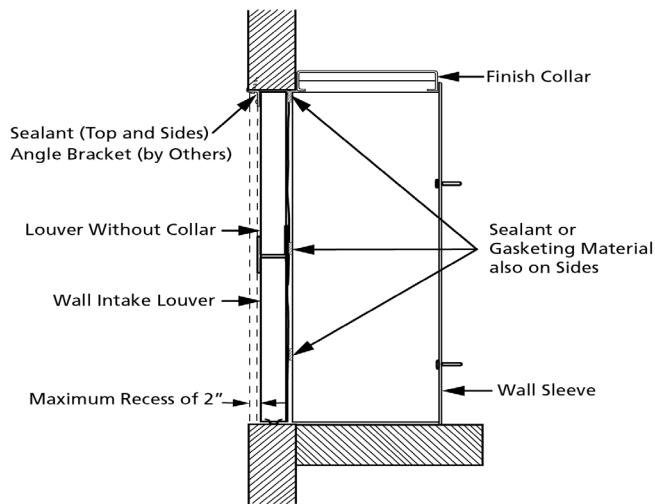
**Figure 32: Angle Bracket on Louver Mounts to Exterior Surface**



**Figure 33: Angle Brackets on Louver Mounts to Interior Surface**



**Figure 34: Panel Wall Using Angle Bracket on Exterior Surface**



### **Panel wall using moisture resistant material/ sheet metal framing**

If desired, the louver may be “framed” in moisture resistant material or a moisture resistant material/sheet metal combination and then inserted into the panel wall for final mounting. This installation is desirable when the wall opening is considerably larger than that required by the louver. Provide an air and watertight seal and avoid blocking drainage at the bottom of the louver. After installation, be sure that there are no obstructions (mortar, nails, etc.) on the inside of the Louver where it meets the wall sleeve.



#### **CAUTION**

Do not use mounting angles or strips at the bottom of the intake louver that run across the louver's entire length. This will plug the weep hole locations and property damage and poor indoor air quality will result if water cannot drain to the outside from the weep holes.

Appropriate fasteners must be used to prevent removal by unauthorized personnel.

## **Louvers with Flange**

### **Masonry installation**

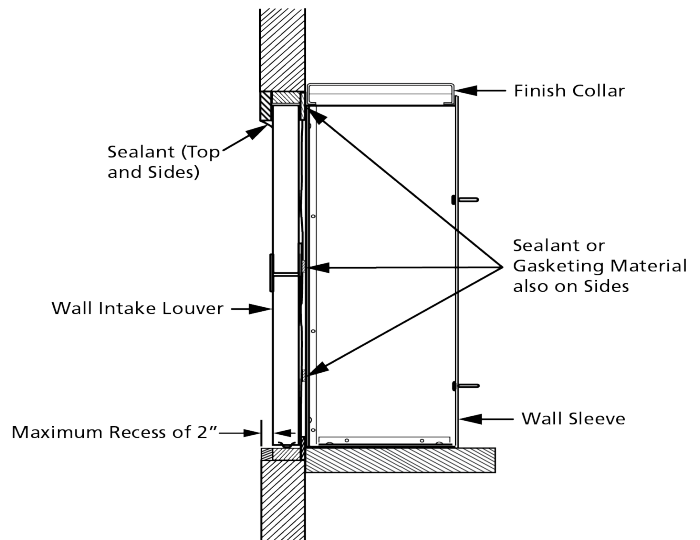
If the louver is supplied with a flange, follow these steps:

1. A bead of caulk is applied to the inside of the top and side flange that come in contact with the building facade.
2. The louver with flange is placed into the opening and pushed tight against the building.
3. Fasten it to the exterior of the building using appropriate fasteners for the installation.
4. Seal the top and two sides from the inside with waterproof caulk to make it weathertight. Do not seal the bottom flange. To do so may trap water behind the flange. See CAUTION before.

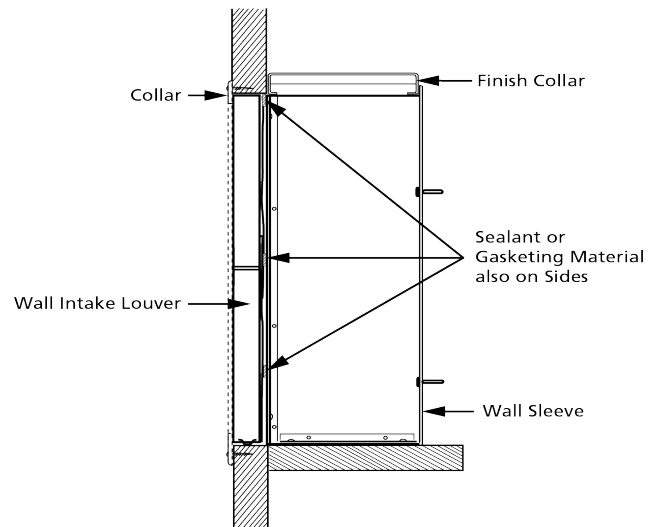
### **Panel wall installation**

This installation is typical when the thickness of the panel wall very closely approximates the thickness of the louver itself. Here only mounting straps may be required, running the entire top length and vertical width of the louver. This installation is perhaps the easiest. The louver could be removable from the exterior of the building. See CAUTION before.

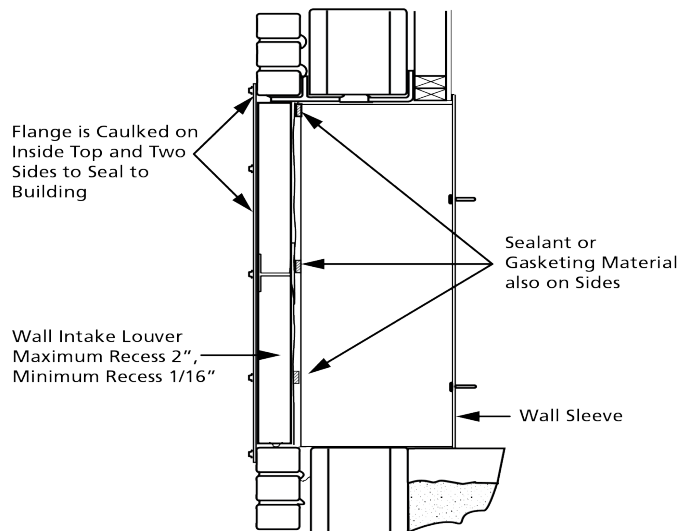
**Figure 35: Panel Wall Using Moisture Resistant Material/ Sheet Metal Framing**



**Figure 36: Panel Wall Using Collar on Exterior Surface**

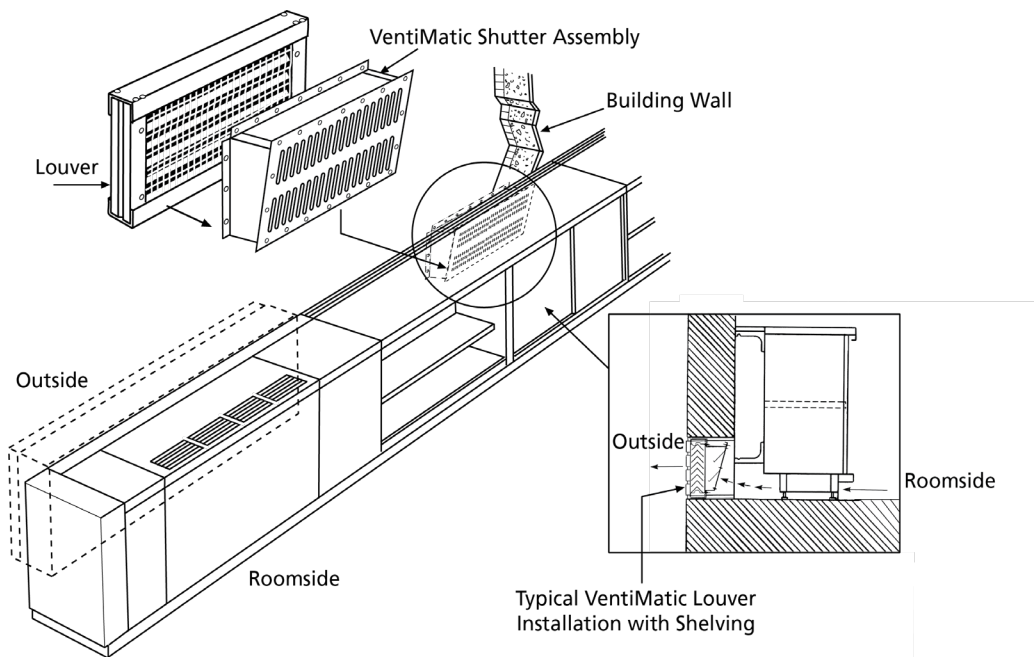


**Figure 37: Masonry Wall Using Collar on Exterior Surface**



## Installing VentiMatic™ Shutter

**Figure 38: Typical Ventimatic™ Shutter Assembly Installation**



### VentiMatic™ shutter assembly

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.



#### CAUTION

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

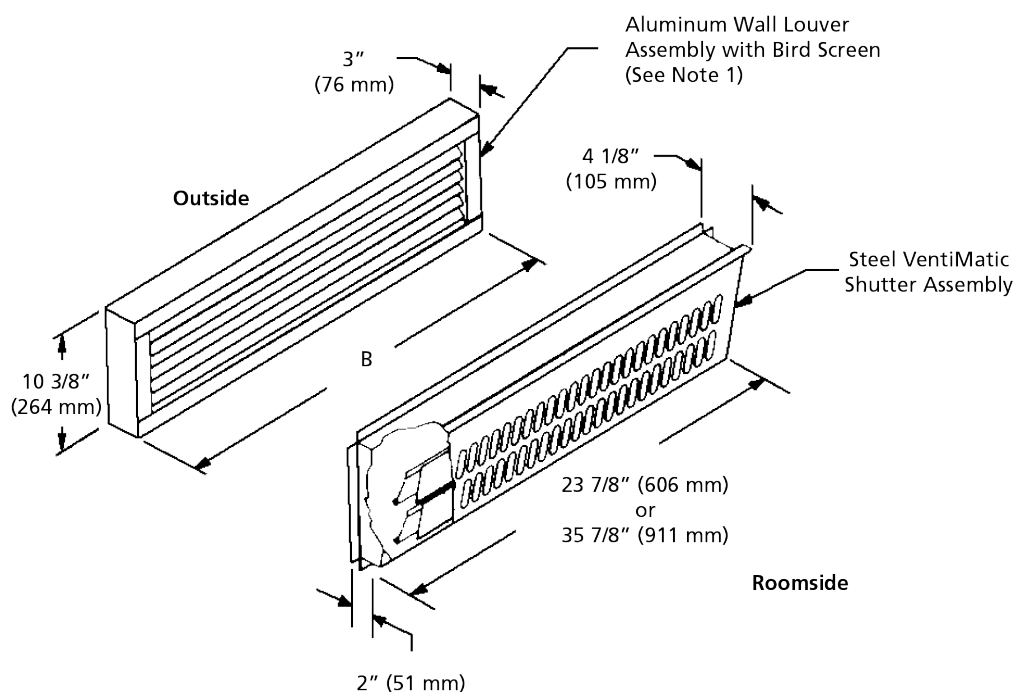
When mounting the VentiMatic Shutter(s) on the wall louver, make sure that all moving parts are unobstructed and placed level and plumb for proper operation. If an optional steel interior wall grille is furnished, install as shown in [Figure 83 on page 43](#).

For large units, two VentiMatic Shutters may be mounted side by side on the same louver ([Figure 40](#)).

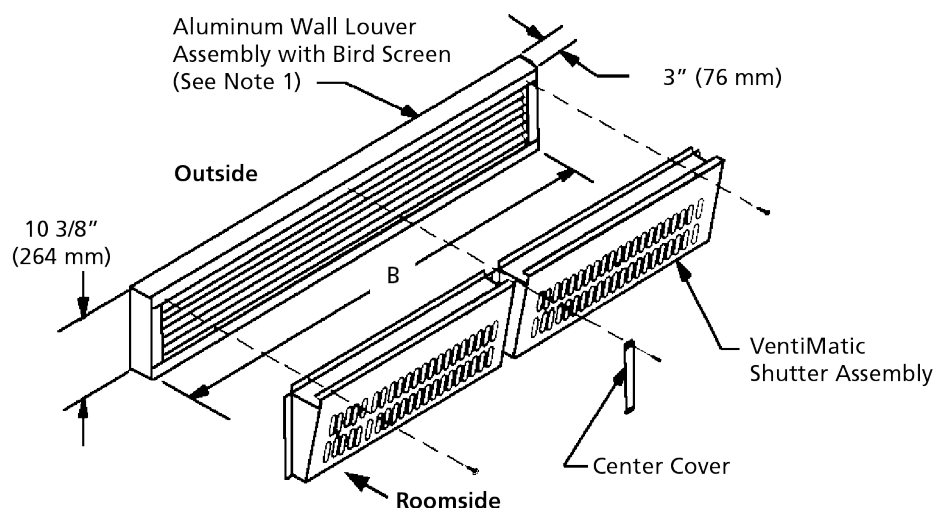
**Table 9: Recommended Wall Openings For Ventimatic Wall Louvers**

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 in (mm)	Height in (mm)	24"	36" Shutter	cfm	L/s
24 (610)	27 (659)	24½ (622)	10¾ (267)	1	0	500	236
36 (914)	39 (991)	36½ (927)	10¾ (267)	0	1	750	354
48 (1219)	51 (1295)	48½ (1232)	10¾ (267)	2	0	1000	472
60 (1524)	63 (1600)	60½ (1537)	10¾ (267)	1	1	1250	590
72 (1829)	75 (1905)	72½ (1842)	19¾ (495)	0	2	1500	708

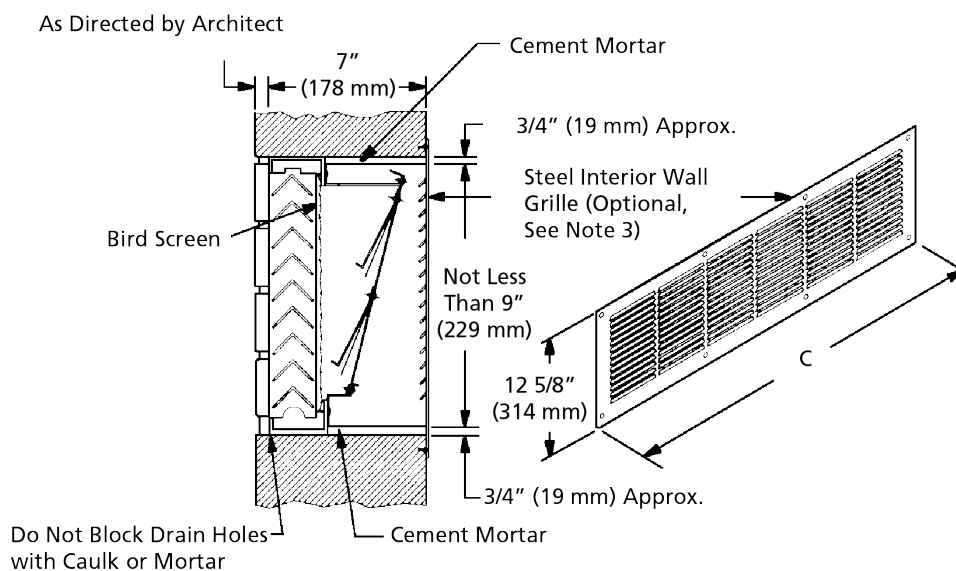
**Figure 39: Single VentiMatic Shutter & Wall Louver**



**Figure 40: Two VentiMatic Shutters & Wall Louver**



**Figure 41: Louver, VentiMatic Shutter, Interior Wall Grille Details, Dimensions**



**NOTE 1:** Horizontal blade wall louver shown. Vertical blade wall louver also available.

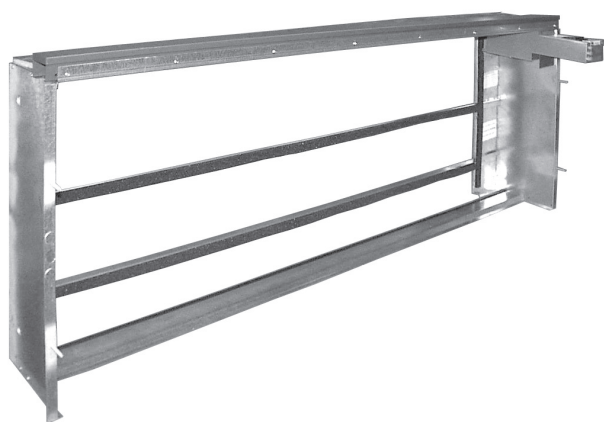
**NOTE 2:** The optional exterior grille shown mounted on the wall louver.

**NOTE 3:** The optional steel interior wall grille is 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.

## Installing Wall Sleeve

### Wall Sleeve Details

**Figure 42: Wall Sleeve**



## Mount The Junction Box To Wall Sleeve

### NOTICE

Electric junction box is strapped to the wall sleeve during shipping and is field mounted.

Mount the junction box to the wall sleeve as shown in [Figure 43](#) with five (5) provided screws. Three (3) screws on the front and two (2) screws secure the underside back edge of the junction box to the wall sleeve.

### CAUTION

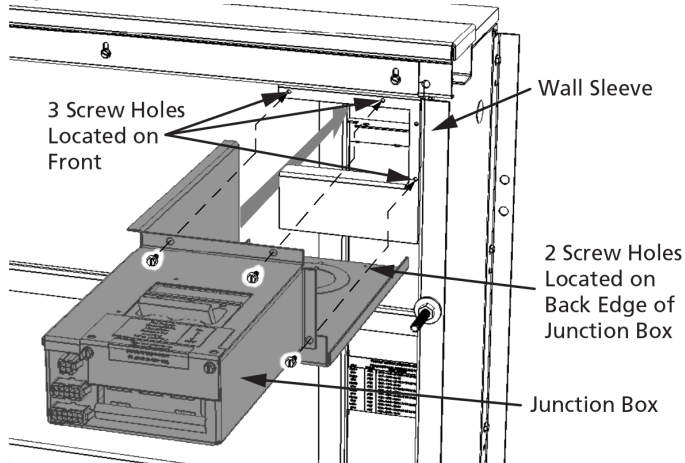
The opening between the wall sleeve and the louver must be completely enclosed by the installer to prevent air and water leaks into the building.

**Table 10: Wall Sleeve Dimensions**

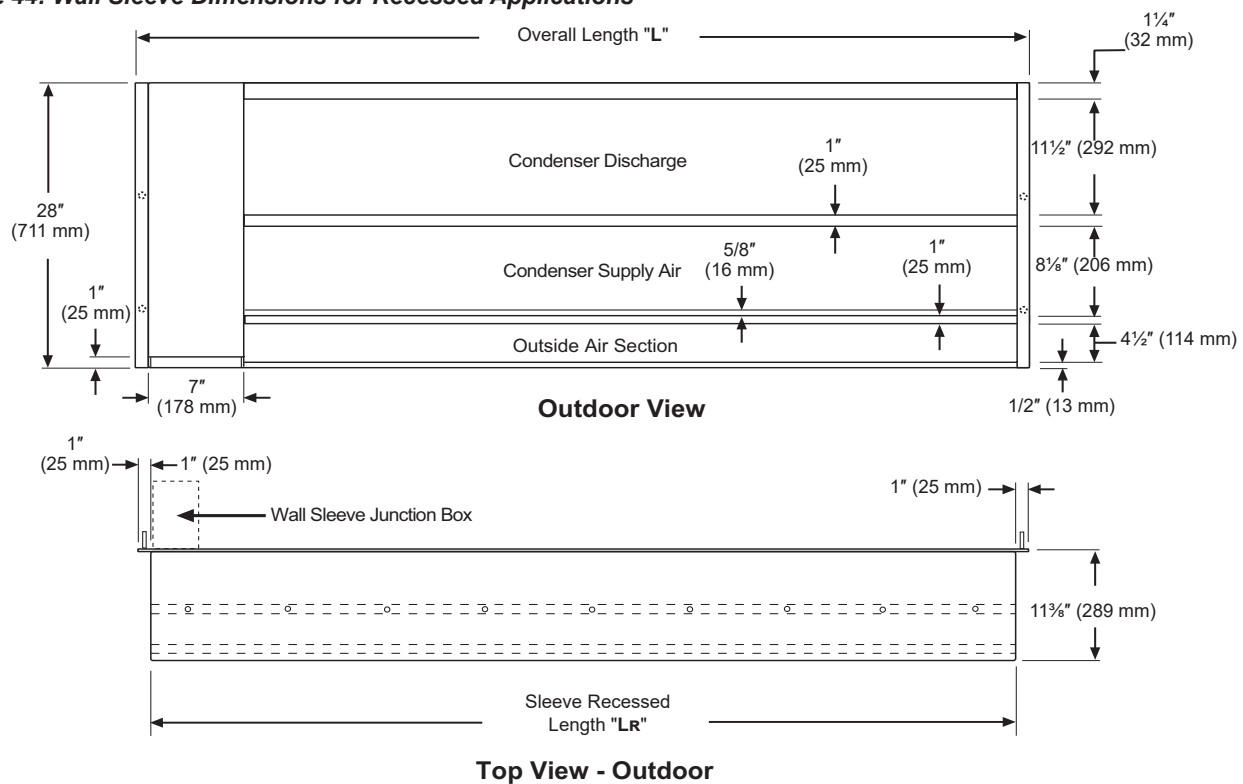
Unit Size	Overall Length "L" in (mm)	Sleeve Recess Length "Lr" in (mm)
024	86 (2184)	84 (2145)
036	98 (2489)	96 (2450)
044, 054	110 (2794)	108 (2755)



**Figure 43: Attach Electric Junction Box to Wall Sleeve**



**Figure 44: Wall Sleeve Dimensions for Recessed Applications**



# Pre-Wall Sleeve Installation Checklist

- Wall sleeve section of manual read in its entirety with understanding of the installation procedures
- Louver installed and sealed with bird screen toward wall sleeve with 9" exhaust opening at top
- Structural columns exist to attach wall sleeve
- Sides of rough opening smooth and sealed
- Electrical and control wiring stubbed up
- Top, and bottom of wall envelope smooth and sealed and 90° to interior mounting wall
- Splitters installed and sealed for mate-up to wall sleeve
- Metal flashing in place or sealed sloped mortar bed for drainage from wall sleeve "D" seal channel to bottom of louver
- Correct wall sleeve confirmed
- Wall sleeve assembled



## CAUTION

Unit wall sleeve must be anchored to an internal wall column or other suitable support.

The Daikin Applied wall sleeve and louver design is based on a "wet sleeve" concept. In brief, this means the design accommodates the penetration of some moisture into the rear outdoor section of the AE unit with provisions for containment and

disposal of this moisture to the outdoors (see details in [Figure 6 on page 8](#)). Therefore, proper louver, splitter and wall sleeve installation is critical.

The wall sleeve must be installed before the AE self-contained unit ventilator can be placed. The recessed portion of the wall sleeve measures approximately 84", 96" or 108" wide by 28" high and may be recessed into the wall up to 11 3/8" in depth. Consult approved Daikin Applied submittal drawings for the job to determine the proper amount of recess, if any, and recommended wall opening size.

The AE unit chassis attaches to the wall sleeve threaded studs using 4-nuts and washers ([Figure 4](#)).

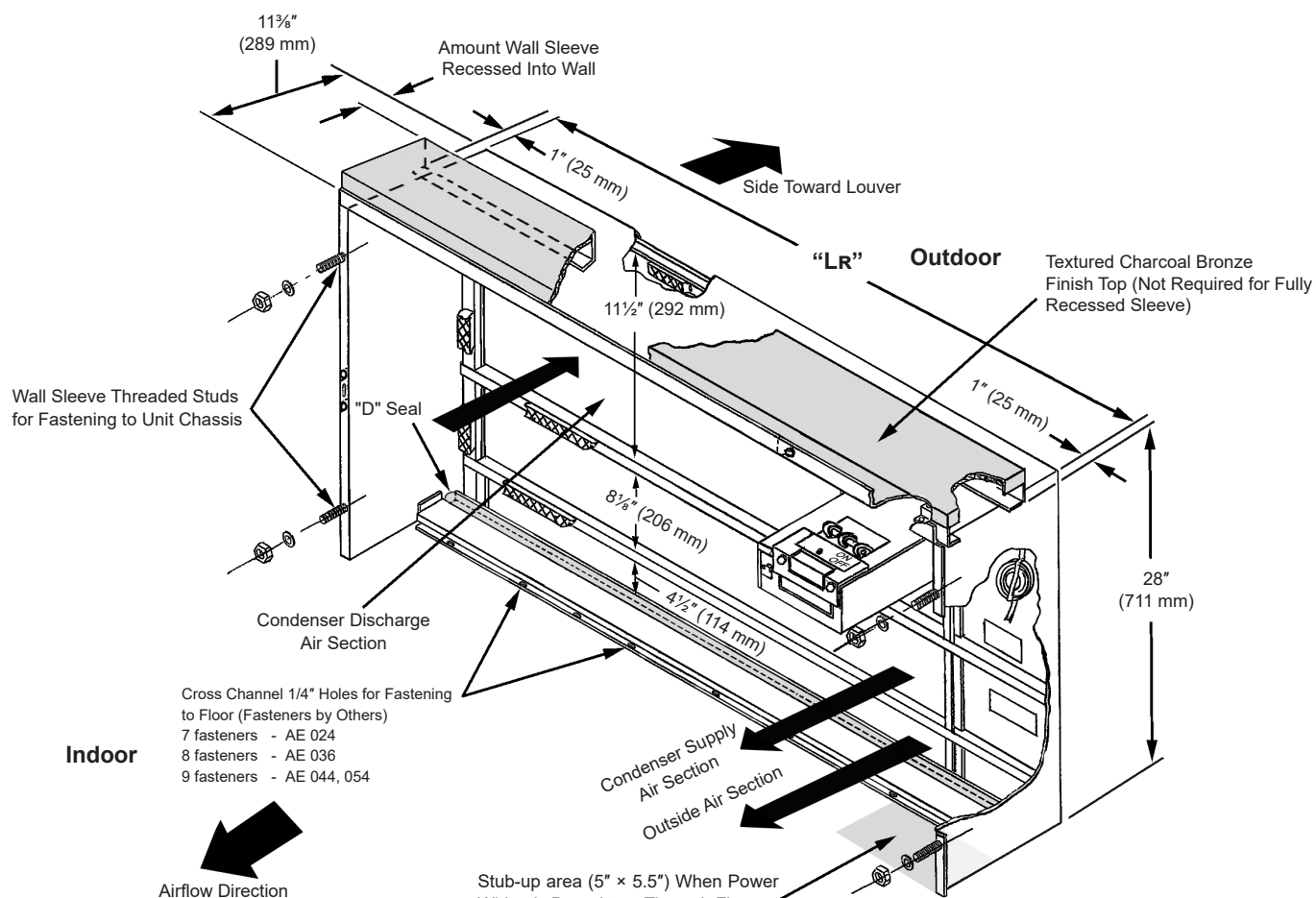
## NOTICE

Wall and floor must be at 90° to one another. If not, the floor must be leveled (90°) to wall.

**Table 11: Recommended Rough-In Wall Opening**

Unit Size	Recommended Rough-in Wall Opening		Sleeve Recess Length "LR" in (mm)
	Length in (mm)	Height in (mm)	
024	84 1/2 (2146)	28 1/2 (724)	84 (2184)
036	96 1/2 (2451)		96 (2489)
044, 054	108 1/2 (2756)		108 (2794)

**Figure 45: Wall Sleeve Details (Recessed Type)**



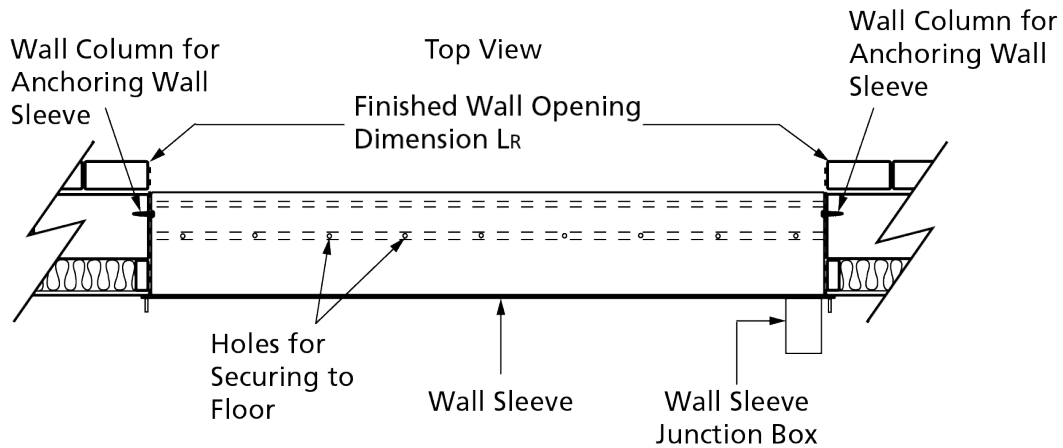
## Typical Wall Sleeve Applications

The following is a brief description of three typical methods of installation. Many variations are possible, depending on wall thickness.

### **Thick masonry wall with full recess**

This example shows the wall sleeve fully recessed into a masonry (thick) wall.

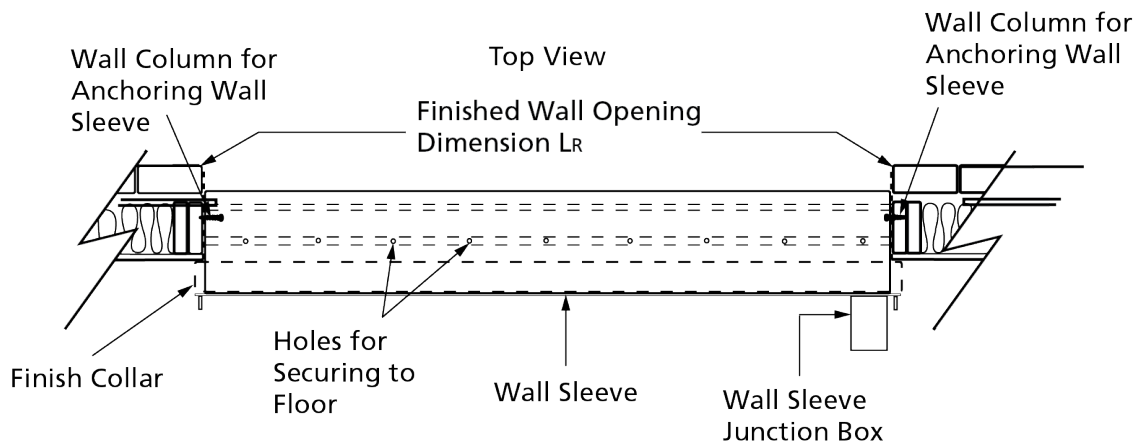
**Figure 46: Thick Masonry Wall with Full Recess Wall Sleeve**



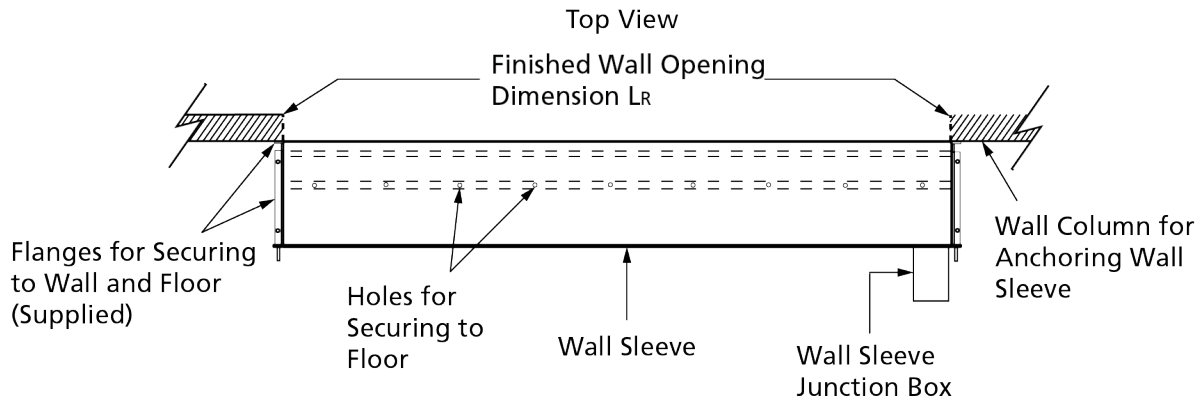
### **Masonry wall with partial recess**

This example shows the wall sleeve partially recessed into a masonry (thick) wall.

**Figure 47: Masonry Wall with Partial Recess Wall Sleeve**



**Figure 48: Panel (Thin) Wall with No Recess (Full Projection) Wall Sleeve**



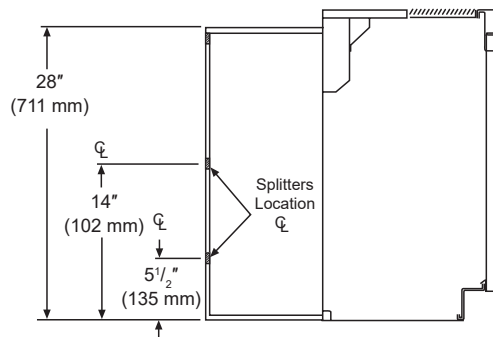
### Unit room projection & splitter length details



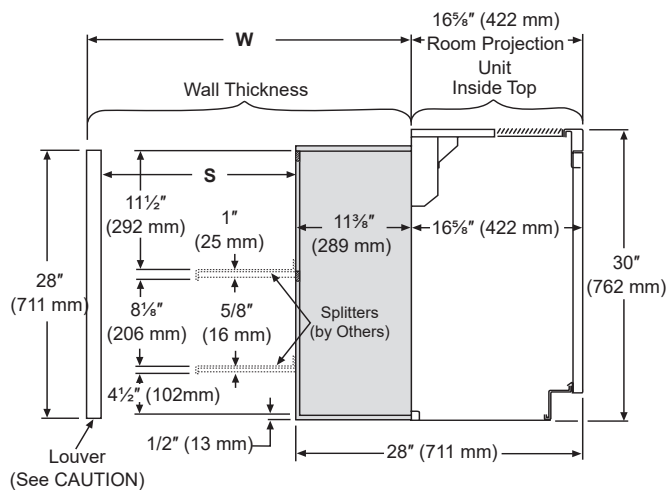
#### CAUTION

Horizontal splitter (by others) must be installed whenever there is space between the wall sleeve and the louver. Seal the ends of the wall opening to prevent water penetration and air leakage. Pitch the splitters toward the louver for water drainage.

**Figure 49: Splitter Locations**

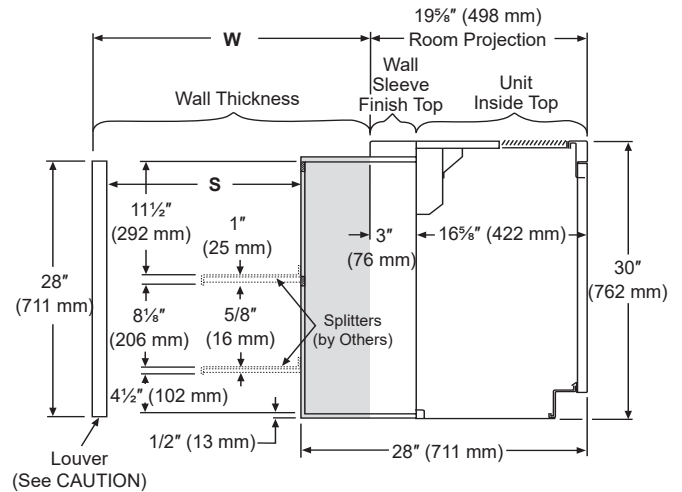


**Figure 50: 6 5/8" Room Projection or Full Wall Sleeve Recess**

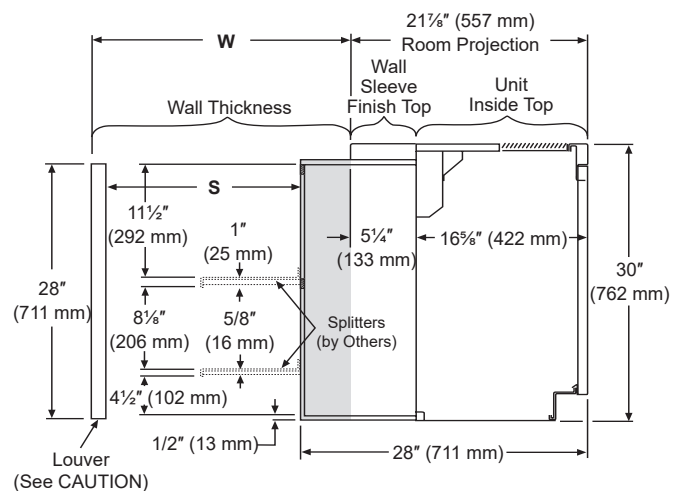


**NOTE:** Shading indicates portion of unit wall sleeve recessed into wall opening

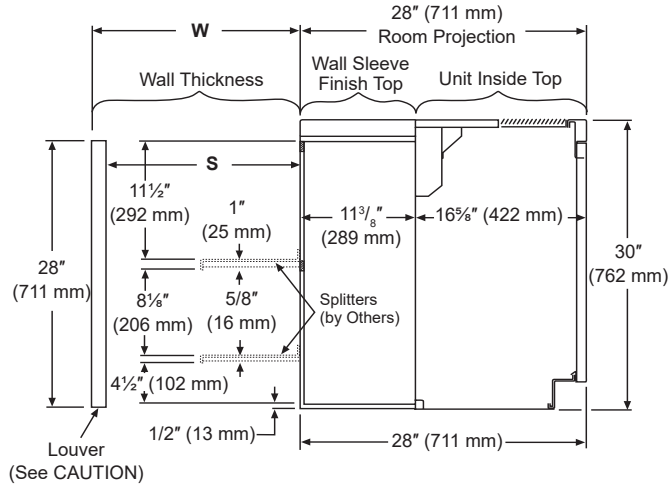
**Figure 51: 19 5/8" Room Projection**



**Figure 52: 21 7/8" Room Projection**



**Figure 53: 28" Room Projection**



**Table 12: Wall Thickness, Unit Projection Into Room**

Wall Thickness “W”	Louver	Unit Projection into Room and Wall Sleeve Type			
		28”	21 <sup>7</sup> / <sub>8</sub> ”	19 <sup>5</sup> / <sub>8</sub> ”	16 <sup>5</sup> / <sub>8</sub> ”
		Figure 53	Figure 52	Figure 51	Figure 50
		Splitter Length from Wall Sleeve to Louver “S”			
2½”	2½”	0			
4”	2½”	1½”			
6”	2½”	3½”			
8”	2½”	5½”			
8 <sup>5</sup> / <sub>8</sub> ”	2½”	6 <sup>1</sup> / <sub>8</sub> ”	0”		
10”	2½”	7½”	1 <sup>3</sup> / <sub>8</sub> ”		
10 <sup>7</sup> / <sub>8</sub> ”	2½”	8 <sup>3</sup> / <sub>8</sub> ”	2¼”	0”	
12”	2½”	9½”	3 <sup>3</sup> / <sub>8</sub> ”	1 <sup>1</sup> / <sub>8</sub> ”	
13 <sup>7</sup> / <sub>8</sub> ”	2½”			3”	0”
14”	2½”			3 <sup>1</sup> / <sub>8</sub> ”	1/8”
16”	2½”				2 <sup>1</sup> / <sub>8</sub> ”
18”	2½”				4 <sup>1</sup> / <sub>8</sub> ”
24”	2½”				10 <sup>1</sup> / <sub>8</sub> ”

**NOTE:** All dimensions are approximate and subject to change without notice. Actual building dimensions may vary.

## General Considerations

The installing contractor shall do the following:

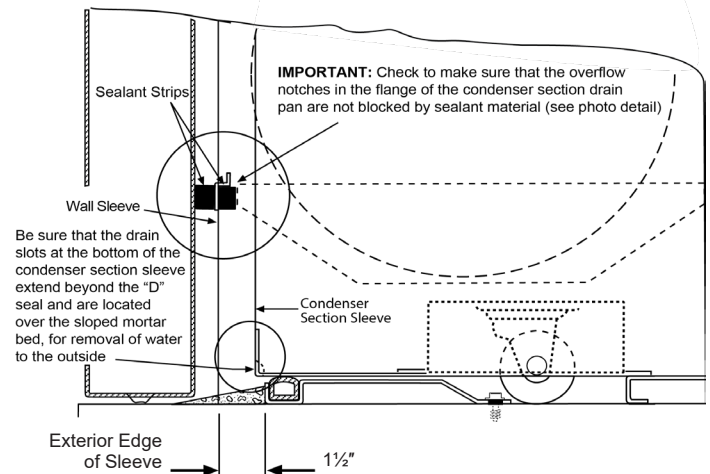
1. Make sure there is a masonry lintel supporting the wall above any masonry opening and vertical wall column on the ends.
2. Frame and seal airtight and watertight all openings between the louver and wall sleeve not enclosed by the wall sleeve.



### CAUTION

Installation and maintenance are to be performed only by qualified personnel who are familiar with and in compliance with state, local and national codes and regulations, and experienced with this type of equipment. Sharp edges and coil surfaces are potential injury hazards. Avoid contact with them.

**Figure 54: Wall Sleeve Sealant Material Where It Contacts the Condenser Section Drain Flange**



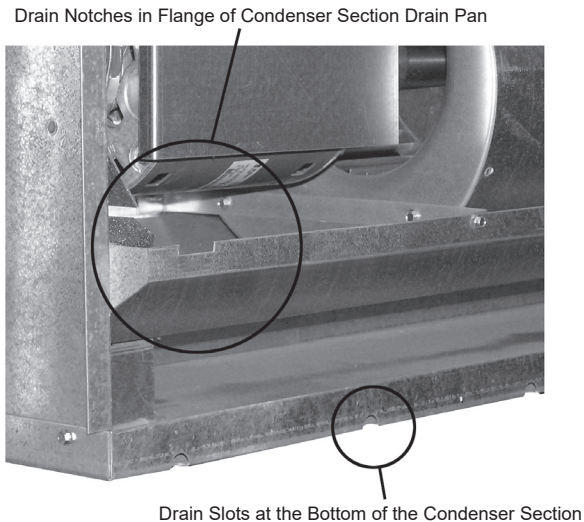
3. For details of required sealing, refer to [Figure 57](#) and [Figure 57 on page 31](#) for recessed wall sleeve applications and [Figure 60 on page 33](#) for nonrecessed wall sleeve applications.
4. Seal watertight both ends and top of wall sleeve to building at rear flange of wall sleeve.
5. Seal watertight the bottom of wall sleeve at rear "D" seal to building and pitch toward louver bottom channel. Also fasten the wall sleeve cross channel to the floor through 1/4" holes with fasteners (by others) (7 fasteners - AE 024), (8 fasteners - AE 036), (9 fasteners - AE 044, 054) (refer to [Figure 45 on page 26](#)).
6. The louver must be installed with the drain notches located at the bottom and the bird screen located on the unit side. Openings between louver drain notches must be free of mortar or other foreign material for water removal.



### CAUTION

The two (2) overflow drain notches in the flange of the condenser drain pan must not be blocked. Remove any sealant material from wall sleeve bottom splitter rail that may cover these notches.

**Figure 55: Check That Condenser Section Drain Pan Notches Are Not Blocked**



**NOTE:** The condenser section drain pan notches are located approximately 1" from the left end and right end of the condenser drain pan flange.

7. Apply rubber stripping or sealant material (by others) across full length of wall sleeve splitters.
8. If the louver does not butt up against the wall sleeve:
  - a. Fabricate a horizontal air splitter from galvanized steel, or some other suitable weather resistant material. Pitch the splitters toward the louver for water drainage. The width of the air splitters is determined by the width of the wall opening. The depth of the air splitters is determined by the distance between the louver horizontal splitter and the wall sleeve splitter rails.
  - b. Position a 1" diameter drain hole in the horizontal splitter, approximately 6" from each end, next to the louver.

**CAUTION**

Use appropriate screws to attach to the wall sleeve splitters. Ensure the screws do not restrict proper mate-up or sealing of the unit to the wall sleeve.

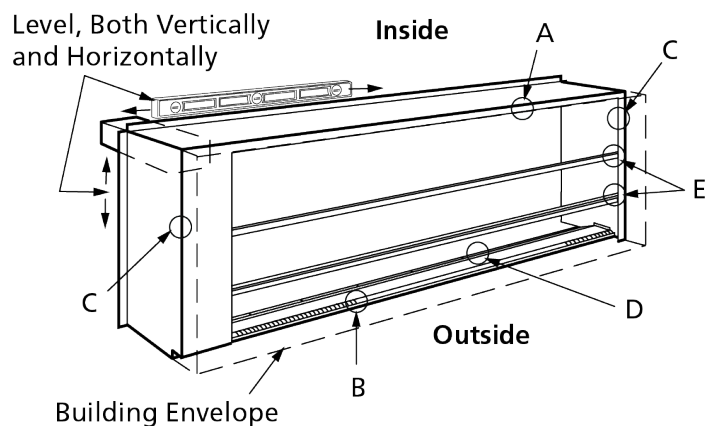
- c. Install the horizontal air splitters by fastening to the wall sleeve splitter rails.
- d. Apply rubber stripping or sealant material (by others) across full length of horizontal air splitters to seal against louver.
9. Permanently seal any remaining air leaks so that, when finished:
  - a. There is an airtight separation between the condenser inlet air, condenser discharge air and the outdoor air inlet.
  - b. There are no air leaks around the perimeter of the wall sleeve where it adjoins the wall.

## Recessed Applications

The installing contractor must do the following:

1. Place the wall sleeve into the wall opening and recess it the amount shown on the approved Daikin Applied submittal drawings.
2. Level the wall sleeve horizontally and plumb the wall sleeve vertically.
3. (See Figure 56). Mark top (A), bottom (at "D" seal flange) (B), and sides where wall sleeve extends into the wall opening (C). Mark the wall sleeve cross channel holes (D). Also mark points where wall sleeve splitters meet the building envelope (E).

**Figure 56: Mark Edges and Points of Wall Sleeve On Building Envelope**



4. Drill with the appropriate masonry bit, holes to receive fasteners (by others), for securing the wall sleeve to the building envelope.
5. Make a galvanized metal flashing or use sealed cement mortar from marked edge of "D" seal on wall sleeve, and pitch toward louver. The mortar or flashing should be the same height as the "D" seal flange.

**CAUTION**

Sloped mortar bed or metal flashing must not restrict water drainage under louver.

6. Fabricate splitter enclosure and /or splitters to fit space between louver and wall sleeve, at marked reference points.
7. Apply gasketing (sealant material) to splitters and seal each end where splitters contact building envelope. A thin layer of caulk is suggested along the edge of the flashing or sloped mortar bed, where it contacts the "D" seal flange.
8. Position the wall sleeve into the opening, making sure all critical sealing points make contact. Fasten the wall sleeve securely in place using the previously drilled holes, and through the two knockouts provided on each end.
9. Secure the splitters to the wall sleeve and seal each splitter to each wall sleeve splitter rail (Figure 57 below and Figure 60 on page 33).
10. Caulk or seal any space between the wall sleeve and the wall on both the indoor side and the outdoor side.

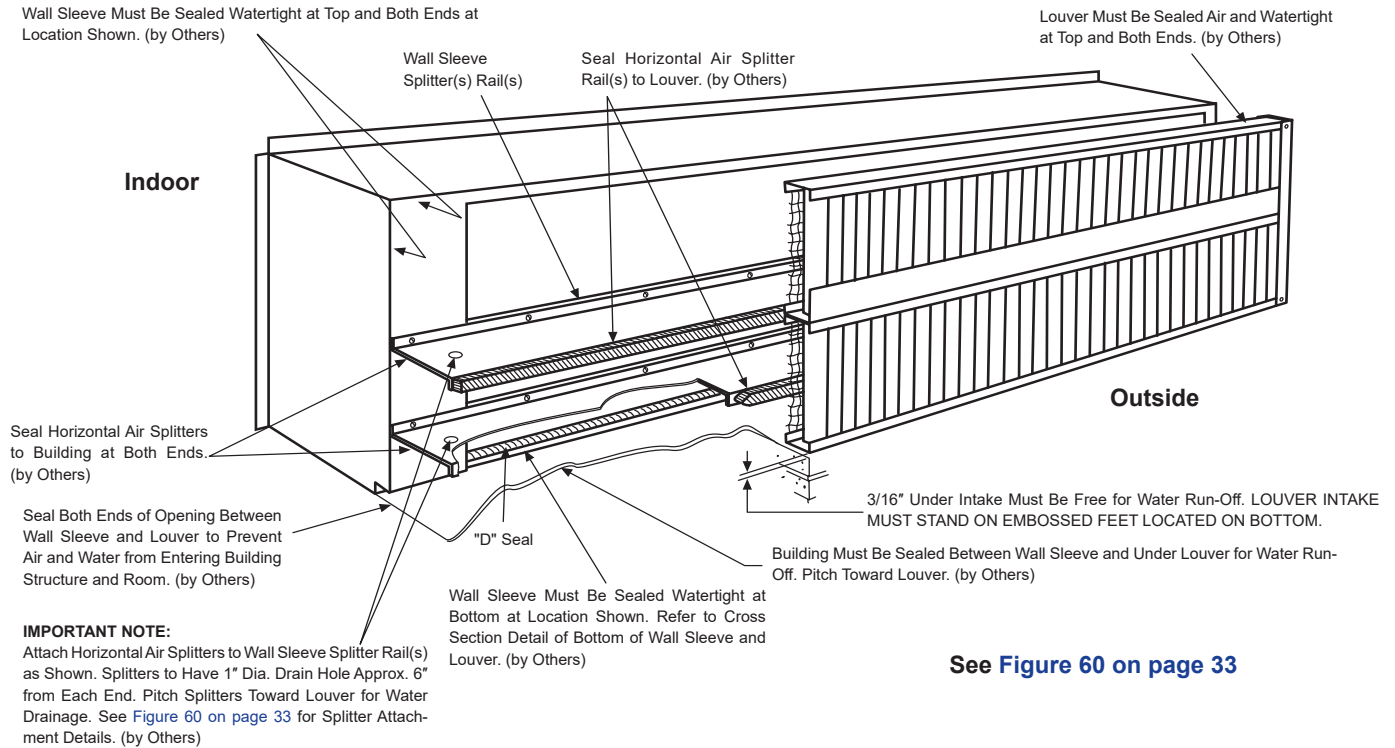


**CAUTION**

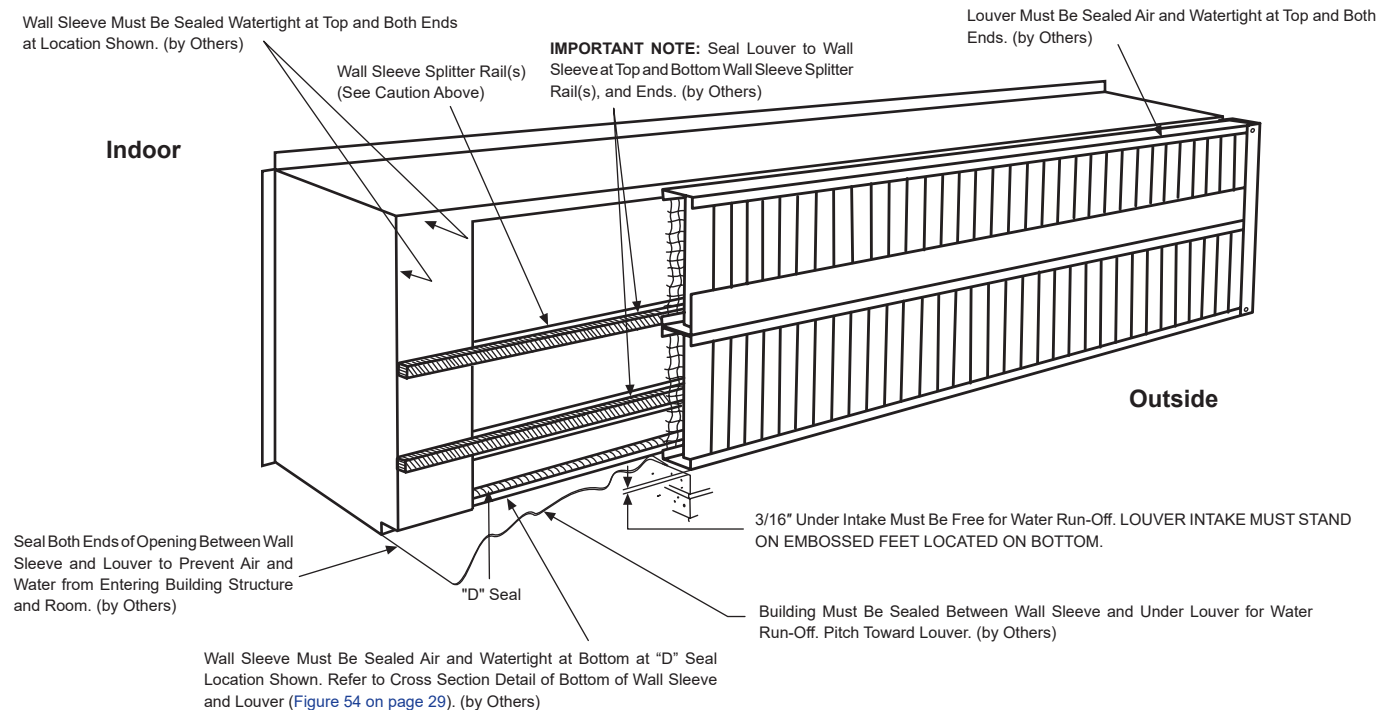
Locate drain lip at bottom of vertical louver to allow proper drainage. Bird screen must always be on side toward unit.

Wall sleeve must be anchored to an internal wall column or other suitable support.

**Figure 57: Recessed Wall Sleeve: Mounting and Sealing Splitters to Wall Sleeve and Louver**



**Figure 58: Recessed Wall Sleeve: Direct Sealing Wall Sleeve to Louver**



## Full Projection Applications

The installing contractor must check the following before proceeding:

1. A structural wall column exists in the wall for anchoring the wall sleeve to the building.
2. The louver is installed correctly and sealed, with the wall cavity air and water tight.
3. Electrical and wall sleeve control wiring is roughed in.
4. The wall behind the unit is smooth and plumb.
5. The seals on the rear of the wall sleeve take up the small irregularities of normal masonry construction.
6. Moisture resistant material strips are installed on irregular walls or walls with mullions in order to provide a flush surface for the wall sleeve to seal against.
7. Moldings at the floor/wall line are omitted behind the unit.

The installing contractor must do the following:

1. Apply sealant (by others) to bottom edge at rear of unit top and both end flanges on rear of wall sleeve to provide air and water tight seal to interior wall of building.
2. Level the wall sleeve horizontally, and plumb the wall sleeve vertically.
3. Mark top, bottom (at "D" seal flange), and sides where wall sleeve extends into the wall opening. Mark the wall sleeve cross channel holes and the vertical frame holes (4). Also mark points where wall sleeve splitters rail(s) meet the building envelope.
4. Drill with the appropriate masonry bit, holes to receive fasteners (by others), for securing the wall sleeve to the building envelope.

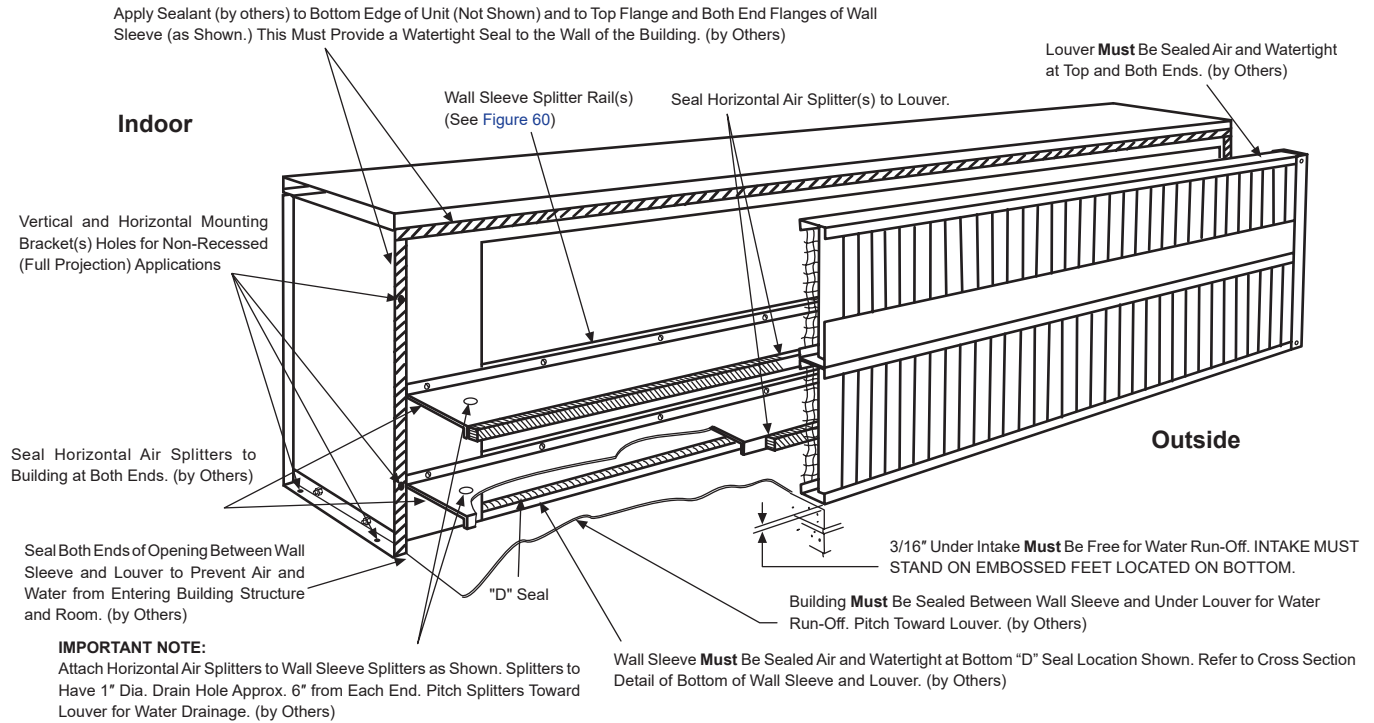
5. Make a galvanized metal flashing or use sealed cement mortar from marked edge of "D" seal on wall sleeve, and pitch toward louver.
6. Fabricate splitter enclosure and /or splitters to fit space between louver and wall sleeve, at marked reference points (see splitter details).
7. Apply gasketing (sealant material) to splitters and seal each end where splitters contact building envelope. A thin layer of caulk is required along the edge of the flashing or sloped mortar bed, where it contacts the "D" seal flange to provide an air and water tight seal.
8. Fasten the wall sleeve securely in place by:
  - a. Securing it to the floor through the two (2) 3/8" diameter holes in the turned out bottom flanges of the wall sleeve at each end, and/or;
  - b. Securing it to the wall through the two (2) 3/8" diameter holes in the turned out vertical flanges of the wall sleeve at each end to a wall structural column on each side.
9. Panel wall applications must have:
  - a. The wall opening sleeved to prevent moisture from seeping into the wall interior.
  - b. If the panel wall is less than 2 1/4" thick, the wall louver must be installed flush to the interior wall and be allowed to extend to the outside as required, and must be air and water tight.
10. Seals on wall sleeve must be compressed to provide a watertight seal after installation is complete.
11. Secure the splitters to the wall sleeve and seal each splitter to each wall sleeve splitter rail (see [Figure 59](#) and [Figure 60 on page 33](#)).



### CAUTION

Leakage of outdoor air wastes energy, causes drafts and erratic unit ventilator operation. These passages are also a potential pathway for water. Provide a sealing surface at the floor line. Install the wall sleeve in a wall made of noncombustible material, and on a floor made of noncombustible material. Floor must be level, unbroken and structurally strong to support the unit.

**Figure 59: Sealing Full Projection Wall Sleeve and Horizontal Air Splitters**

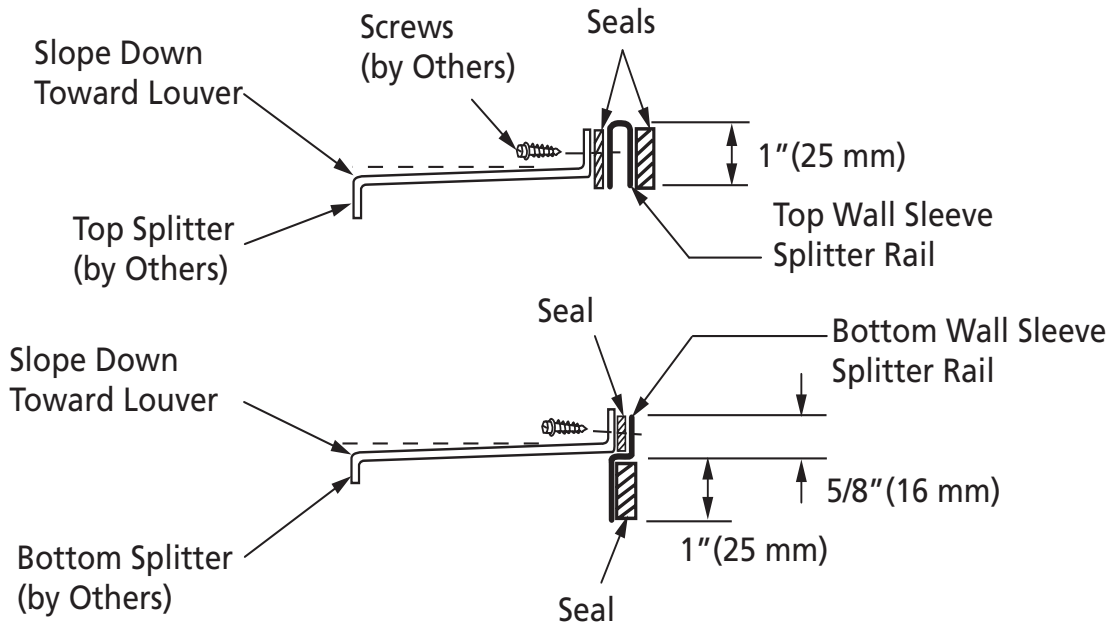


**CAUTION**

Locate drain lip at bottom of vertical louver to allow proper drainage. Bird screen must always be on side toward unit.

Wall sleeve must be anchored to an internal wall column or other suitable support.

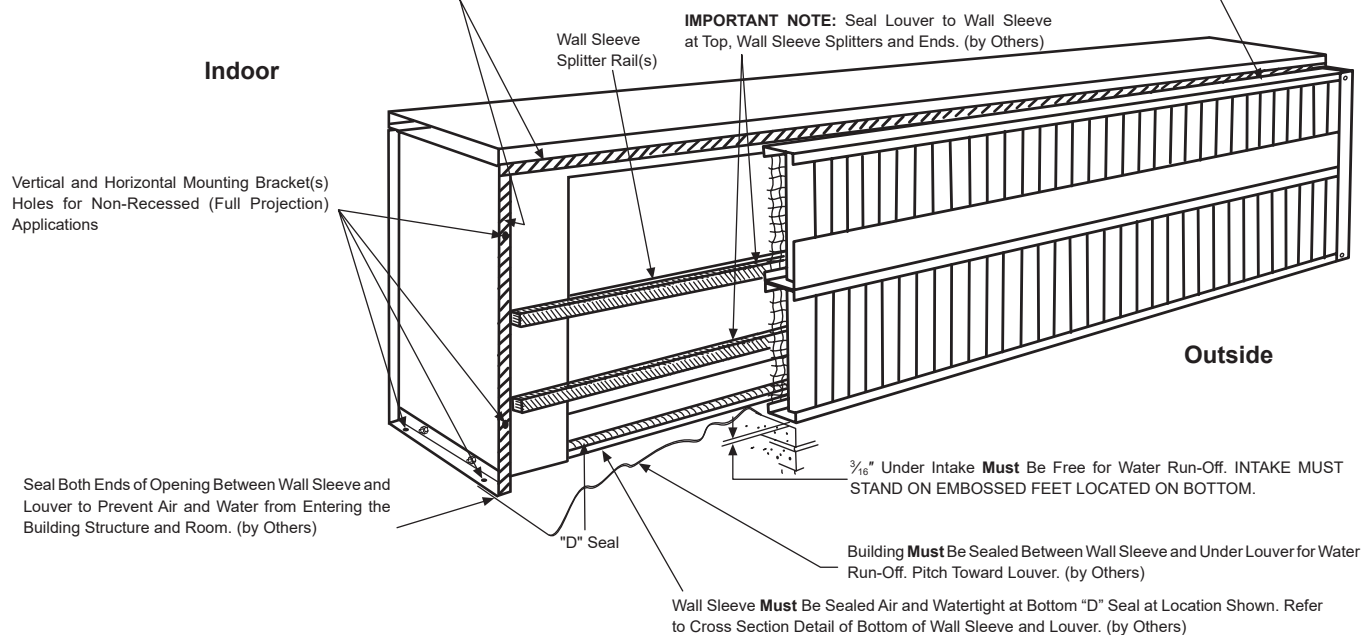
**Figure 60: Attaching Splitters to Wall Sleeve Splitter Rails and Seals**



**Figure 61: Sealing Full Projection Wall Sleeve to Louver Intake Without Horizontal Air Splitters**

Apply Sealant (by Others) to Bottom Edge of Unit (Not Shown) and to Top Flange and Both End Flanges of Wall Sleeve (as Shown.) This Must Provide a Watertight Seal to the Wall of the Building. (by Others)

Louver **Must** be Sealed Watertight at Top and Both Ends. (by Others)



**CAUTION**

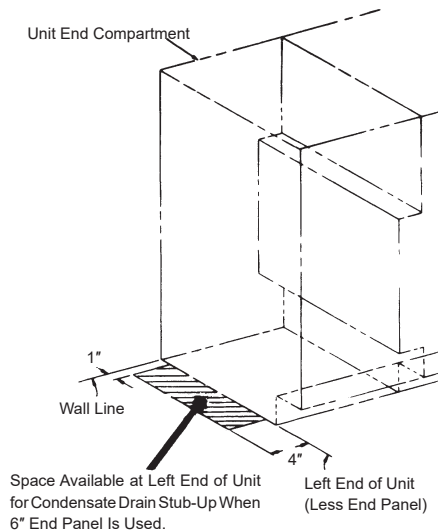
Wall sleeve must be anchored to an internal wall column or other suitable support.

## Drain System: Heat Pump Condensate Disposal into Building

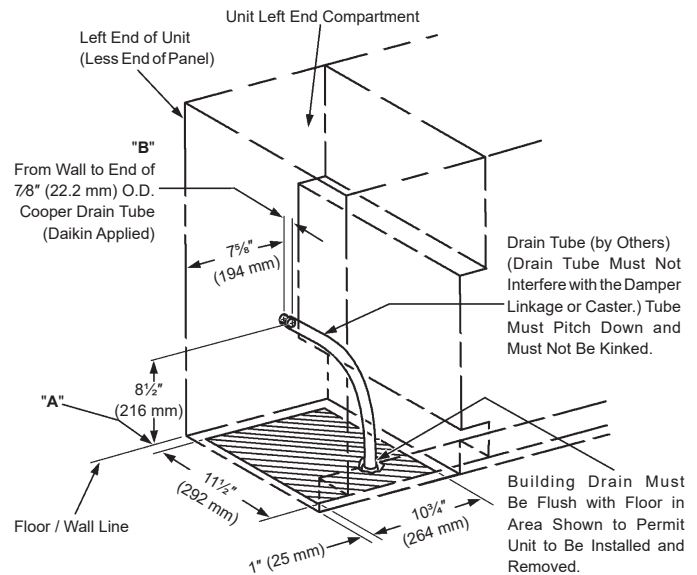
Daikin Applied cooling unit ventilators are designed for condensate removal into a condensate disposal system. Do not connect the unit drain connection so that condensate exits to the outside and/or is exposed to freezing temperatures. Installer is responsible for any damage that might be caused from freezing condensate.

During the heat mode, frost can build up on the cold, outdoor section coil. When the frost build up on the coil is too great, the unit will go into defrost mode and remove this frost by warming up the outdoor coil. The condensate from the defrost mode is collected in the upper drain pan located below the outdoor section coil. It is then directed into the indoor section through a plastic tube. This tube must be connected to the buildings condensate disposal system. Do not connect the unit drain connection so that condensate exits to the outside and/or is exposed to freezing temperatures. Installer is responsible for any damage that might be caused from freezing condensate. Refer to Figure 63 and Figure 63 for the recommended method for draining the heating condensate from the unit.

**Figure 63: Condensate Drain Stub-Up Within 6" End Panel**



**Figure 64: Condensate Drain Stub-Up Inside Left End Compartment**



**Table 13: Condensate Drain Location Dimensions**

Room Projection		Dimension "A"		Dimension "B"	
in	mm	in	mm	in	mm
16 5/8	422	1	25.4	2	50.8
19 5/8	498	4	102	5	127
21 7/8	556	6 1/4	159	7 1/4	184
28	711	12 3/8	314	13 3/8	340



### WARNING

Condensate drain stub-up, including unions and shutoff valves, must disconnect below floor line to permit unit to be installed and removed.



# Wall Sleeve Electrical Connections

Refer to the wiring diagram furnished with the unit to determine electrical connections required.

## CAUTION

Use copper conductors only. Aluminum conductors can cause equipment failure and overheating hazards. All wiring in right hand compartment must be class 1.

## CAUTION

All field wiring must be in accordance with the National Electric Code and applicable local codes.

Refer to [Figure 67](#) & [Figure 68](#) on [page 37](#) for stub-up locations. Refer to [page 38](#) and [page 39](#) for main power connections and field wired communication module, and [page 50](#) through [page 54](#) for remote wall mounted sensor controls, if any.

Check wall sleeve nameplate to verify it is the correct voltage and amperage for the AEQ model to be installed.

Whenever the electric stub-up is brought in through the floor within the confines of the wall sleeve and any portion of the wall sleeve is recessed into the wall, the watertight conduit must be flush with the floor to permit installation of the wall sleeve. Sufficient space must be left around the conduit to permit the attachment of continuing watertight conduit after the wall sleeve is installed. For concrete slabs, it is recommended that this be accomplished either by sleeving the conduit or by recessing a watertight junction box into the slab.

## DANGER

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

## Procedure: Main Power Connections

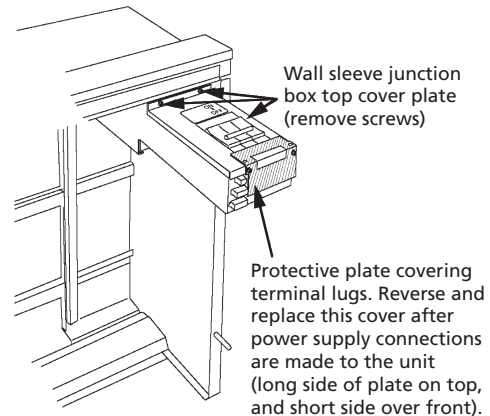
The main steps to wiring the wall sleeve are as follows:

1. Confirm that the main power to the wall sleeve wires are de-energized and tagged-out.
2. Remove top cover plate and protective plate covering the terminal lugs on the wall sleeve junction box ([Figure 64](#)).
3. Bring the main power through the waterproof conduit to the junction box on the wall sleeve, to the terminal lugs on the upstream side of SW1-Main Power non-fused "ON-OFF" switch. See [Figure 65](#) for terminal lug locations and phase connections. Insert main power wires into the terminal lugs (A, B, C) and tighten securely. Power wiring must be hooked up with proper phasing. Electrical (3) phasing must be A, B, and C for electrical phase 1, 2, and 3 (A = L1, B = L2, C = L3). Single phase power wiring must be A and C. Check supply power with a phase meter to match the unit phase wiring.

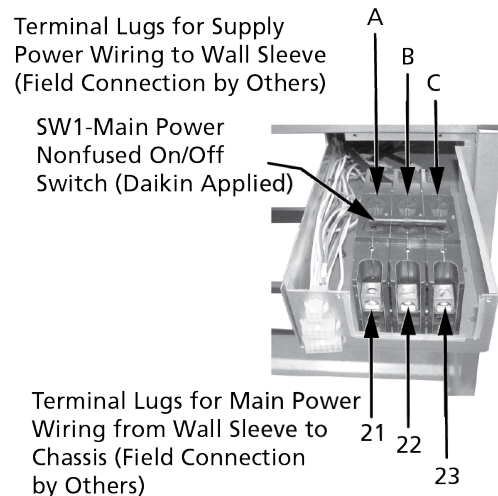
## CAUTION

AE unit compressors are single-direction rotation compressors and can be damaged if rotated in the wrong direction. For this reason, proper phasing of electrical power is important. Running the compressor backward will damage the compressor and void the warranty.

**Figure 65: Wall Sleeve Junction Box Cover Plates**



**Figure 66: Detail of SW1-Main Power Connections**



**NOTE:** B and 22 not used on single phase

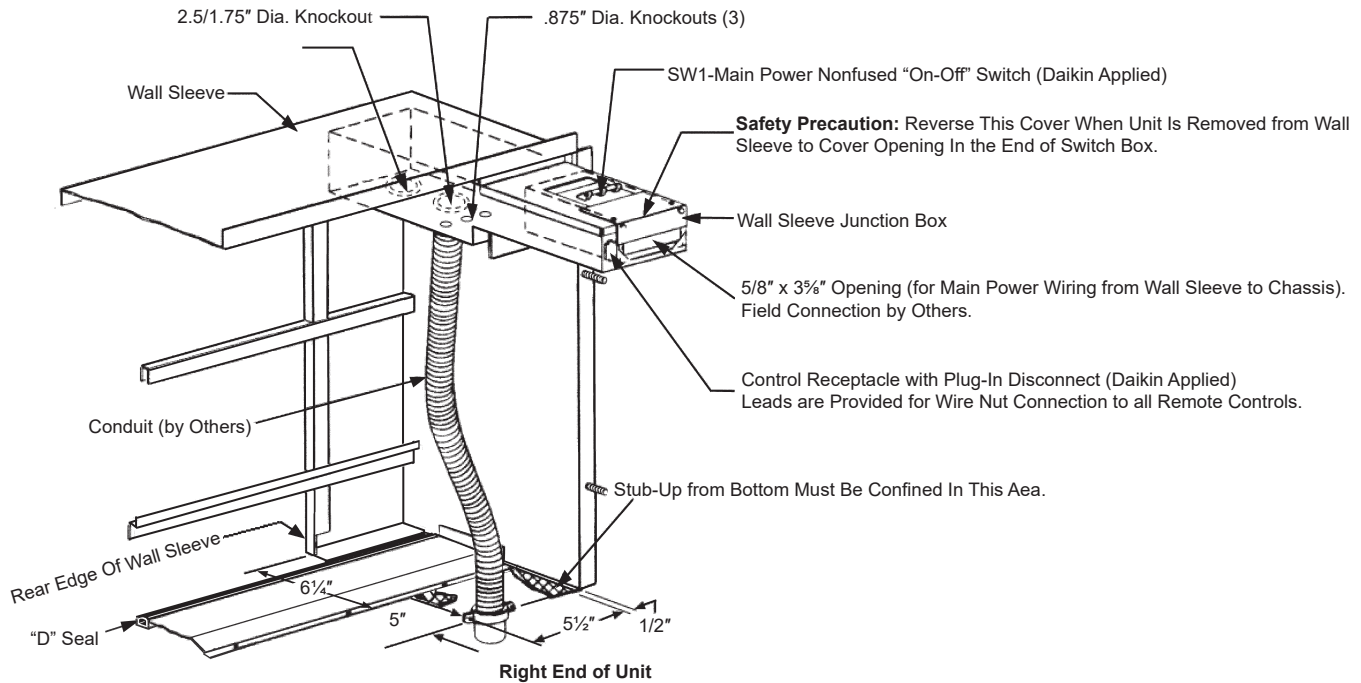
## CAUTION

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

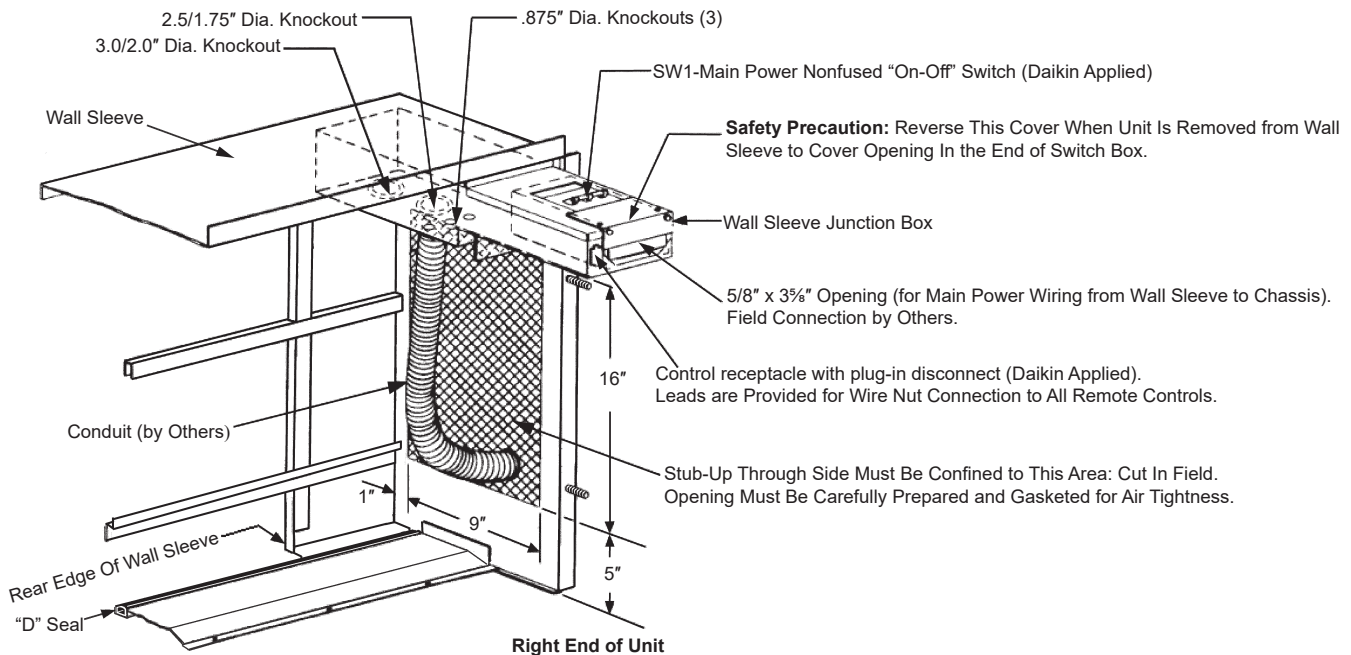
4. Bring the control wiring (optional remote wall sensor, optional building automation control wiring to the optional communication module, optional communications for other external inputs/outputs) through the waterproof conduit to the junction box on the wall sleeve, to the appropriate capped wires within the wall sleeve junction box.
5. Connect remote wall sensors and external input/output devices to the appropriate wires using the existing wire caps. Verify that the wires are securely fastened within the wire caps. Wiring diagrams for doing so are provided in [Figure 71](#) on [page 39](#) through [Figure 71](#).
6. Reinstall the top cover plate and protective plate covering the terminal lugs of the wall sleeve junction box.

## Wall Sleeve Electrical Stub-Up Details

**Figure 67: Wall Sleeve with Electric Stub-Up From Bottom**



**Figure 68: Wall Sleeve with Electric Stub-Up From Side**



# **DANGER**

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

# **CAUTION**

AE unit compressors are single-direction rotation compressors and can be damaged if rotated in the wrong direction. For this reason, proper phasing of electrical power is important.

## Unit Connection Procedure to Wall Sleeve

Before installing the unit ventilator into the wall sleeve confirm that power to the wall sleeve is de-energized and tagged out.

After the unit ventilator has been installed into the wall sleeve, do the following:

1. Confirm that power to the wall sleeve is de-energized and locked and tagged-out.
2. Plug in the unit control wiring male plug(s) into the appropriate wall sleeve female plug(s) (Figure 69).
  - a. 4-pin (for MicroTech and Electromechanical).
  - b. 10-pin (MicroTech only).
  - c. 12-pin (MicroTech only).
3. Remove the wall sleeve junction box terminal lugs cover plate.
4. Insert the unit chassis main power wires (21, 22, and 23) into the wall sleeve disconnect switch terminal lugs. Tighten the terminal lugs securely.
5. Reinstall the wall sleeve terminal lugs cover plate over the main power wires with the label reading correctly, (long edge of plate on top and short edge over front).
6. Proceed to page 45 to complete electrical procedure.

## NOTICE

For electromechanical, use 4-pin plug only. The 10-pin and 12-pin plugs are not used for electromechanical. Control connections for electromechanical are made to the terminal block in the left end compartment.

Figure 69: Wall Sleeve Junction Box Details for MicroTech

Terminal Lugs for Supply Power Wiring (by Others) to Wall Sleeve (Field Connection by Others)

SW1-Main Power Nonfused "On/Off" Switch (Daikin Applied)

4-Pin Plug

10-Pin Plug

12-Pin Plug

Terminal Lugs for Main Power Wiring from Unit to Wall Sleeve (Field Connection by Others)

A B C

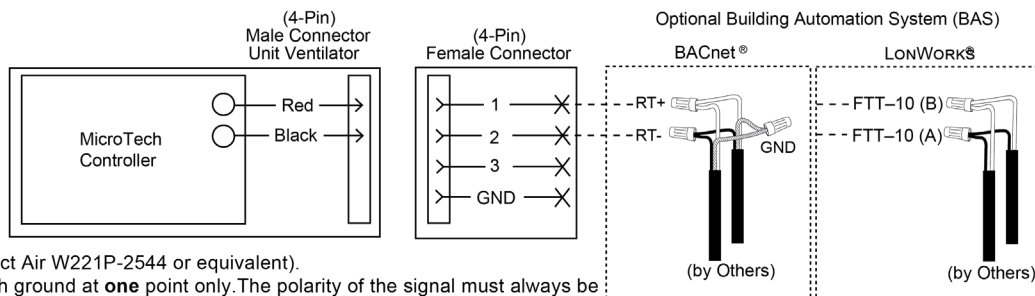
21 22 23

**NOTE:** B and 22 not used on single phase.

Table 14: Wall Sleeve Junction Box Wiring Legend

Legend			
	Plug In		Comp Tie Point
	Splice		Optional Wiring
	Tap Conn.		Wired by Others
	Term Conn.		Factory Wired
	Capped Wire		Ground
			External Device by Others

Figure 70: 4-Pin Plug MicroTech Control Wiring Diagram



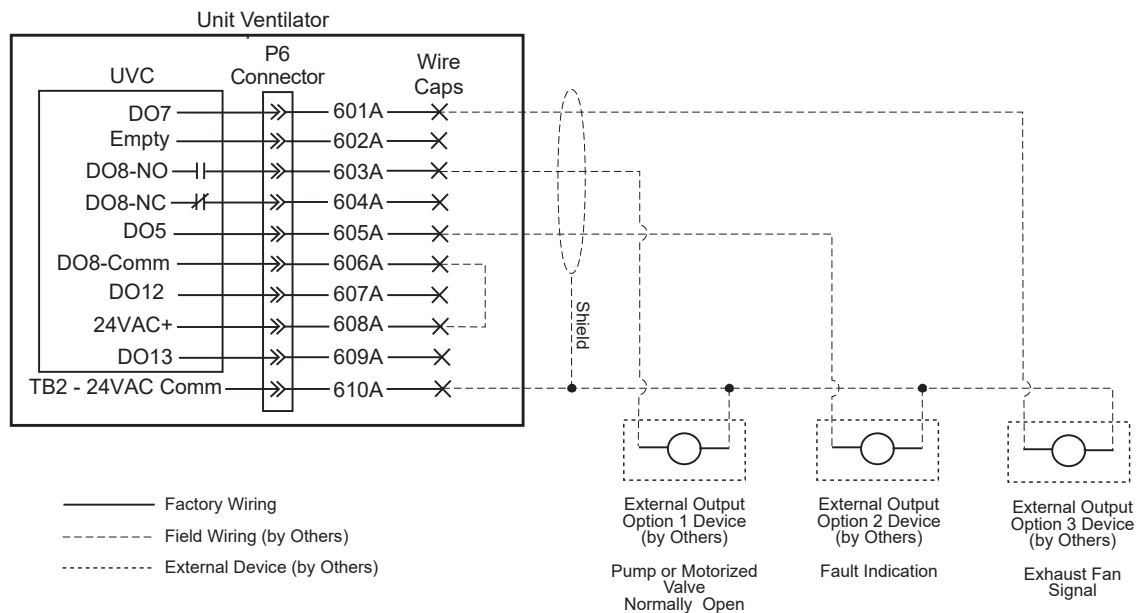
### Wiring:

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.

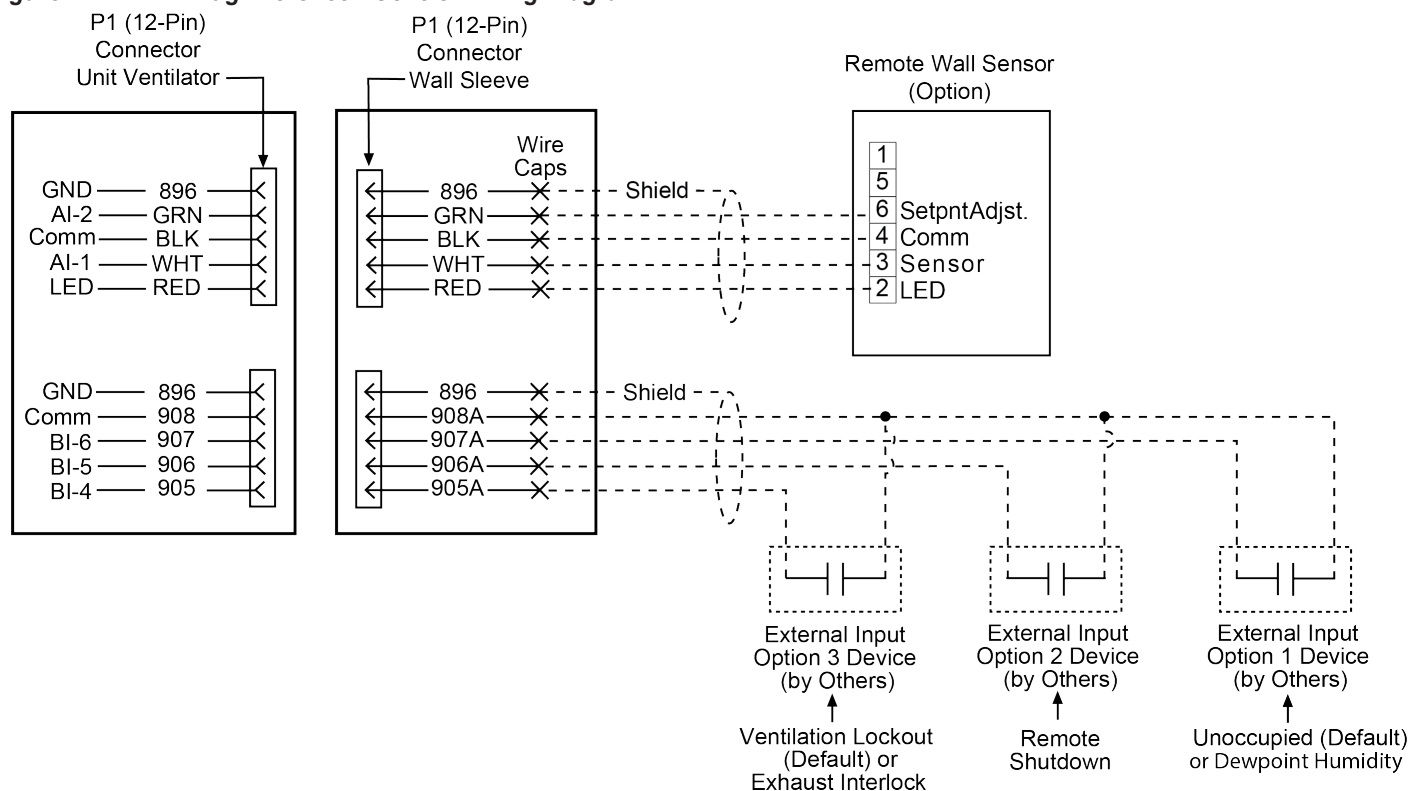
Use Belden 8471, NEMA Level 4, or Echelon-approved equivalent wire. Since the LONWORKS communication wiring is polarity insensitive, no polarity must be observed when making connections via the unshielded twisted-pair wiring.

**Figure 71: 10-Pin Plug MicroTech Wiring Diagram**



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

**Figure 72: 12-Pin Plug MicroTech Control Wiring Diagram**



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

## Before Moving Unit Up to Wall Opening Checklist

- Unit is correct for the location
- Unit installation section of manual was read in its entirety with understanding of the installation procedures of the wall sleeve and air intake louver in accordance with the instructions
- For full projection applications, the field applied pressure adhesive gasketing has been inspected and forms an unbroken and tight seal to prevent air and water leaks
- Room air and condenser fan bearings are secure and oiled
- Room air and outdoor condenser fan shaft coupling set screws are tightened securely to both motor shaft and fan shaft
- Room air and condenser fans rotate freely and quietly
- Fan wheel set screws are tight
- Construction debris inside unit, in the area of the wall sleeve, the entire surface of the sealed, sloped mortar bed, and the drainage space at the bottom of the outdoor air louver has been cleaned up
- Adequate access space for maintenance, service and unit removal has been provided
- Wall sleeve is properly sealed air and watertight
- Power to wall sleeve is correctly hooked up and control wiring if any is hooked up
- Wall and floor are 90° to one another. If not, floor needs to be leveled (90°) to wall
- Unit power supply is correct and verified by unit data plate

### NOTICE

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

## Position the Unit Ventilator

Move the unit ventilator to the correct location. Refer to [Table 2 on page 7](#) for approximate shipping weights.

If the unit packaging has already been removed, carefully remove unit ventilator from wood skid ([Figure 72](#) through [Figure 73](#)). Be sure to properly dispose of the skid in accordance with local recycling rules and guidelines.

Lower crated unit from dolly (if used), but **DO NOT DROP**. Remove external carton by lifting off, and **SAVE THIS CARTON**.



### DANGER

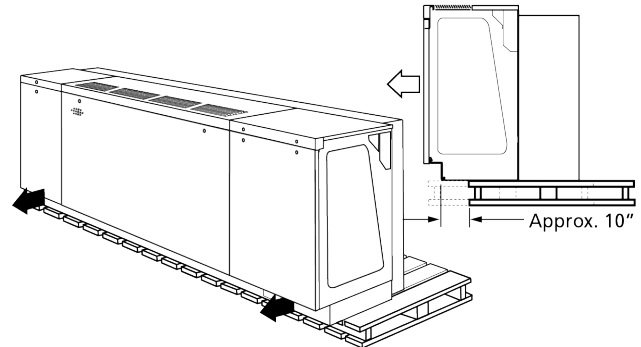
Hold down clamps must be on unit when moved. If unit shifts or slides off skid, it can be damaged or cause personal injury.

## Removing Unit from the Skid

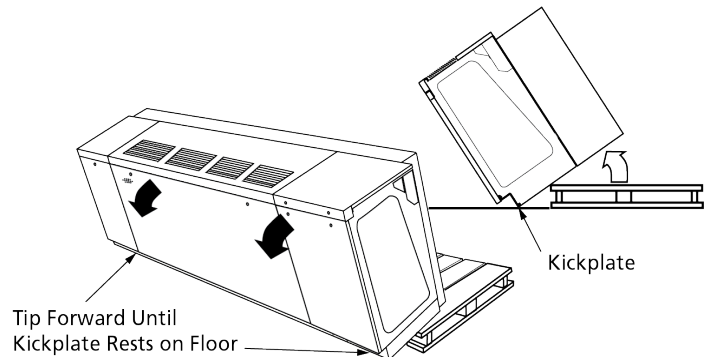
1. Remove fasteners at each end which hold the unit to the skid and carefully slide the front of the unit off the front of the skid.
2. While supporting unit from the front, slowly tip unit forward until the bottom of the slotted front kickplate is resting on the floor.

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**).

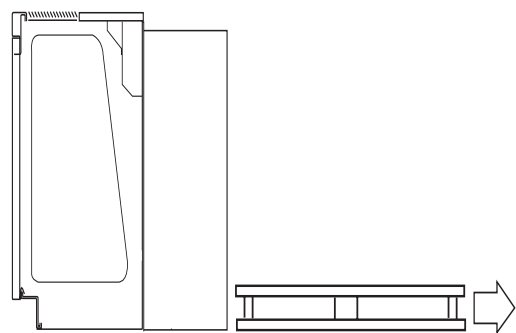
**Figure 73: Removing Unit From Skid**



**Figure 74: Tip Unit Forward Slowly**



**Figure 75: Remove Skid and Gently Lower Unit**



## 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 74](#) and [Figure 75](#)). 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.



**DANGER**

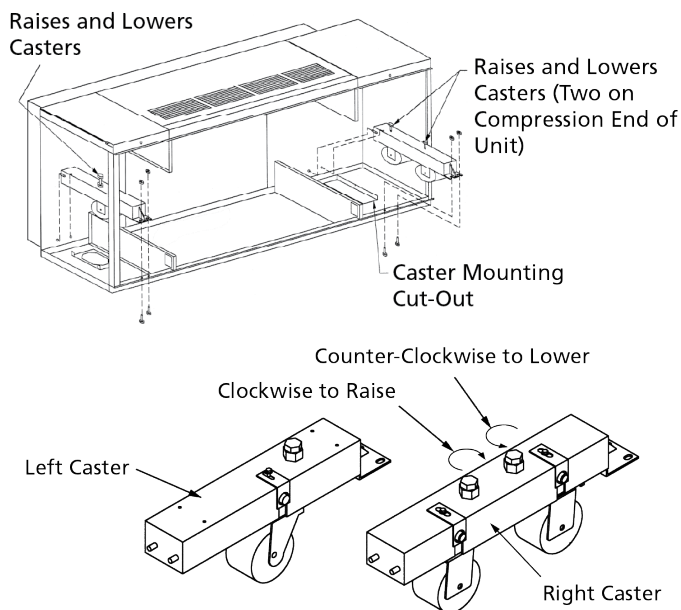
Disconnect all electrical power before installing the unit to prevent injury or death due to electrical shock. Ensure the wall sleeve junction box protective cover plate is installed.

### Installing casters

If the unit was ordered with the optional caster wheels, utilize these casters to help move the unit into position. The outdoor section comes with two swivel casters. Casters are installed 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 full engaged, the unit will roll forward into the wall sleeve. When installed, reverse the procedure and remove the caster kit. Save the caster kit for future unit servicing or replacement.

**Figure 76: Optional Indoor Section Caster Installation**



**Figure 77: Optional Indoor Section Caster Shown in Right End Compressor Compartment**



### Procedure

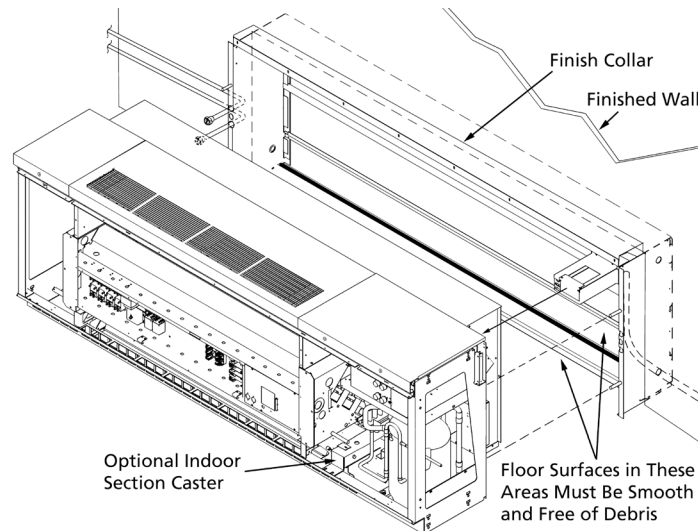
Wall and floor must be at 90° to one another. If not, the floor needs to be leveled (90°) to wall. Be sure that the condenser section drain pan notches are not blocked (see [Figure 55 on page 30](#) and [Figure 78 on page 41](#)).

Slide the unit up to the wall sleeve aligning the four threaded studs ([Figure 75 on page 34](#)) on the wall sleeve with the holes on each end of the unit. If the optional indoor caster kit is not used, a piece of cardboard placed under the unit will make the job easier and prevent marking the floor (Do not leave the cardboard under the unit after installation). The wall sleeve mounting studs should slide through the holes in the unit.

If a finish collar is used, make sure that the unit, finish collar and wall sleeve all line up properly.

Confirm that the bottom splitter rail seal in area of unit condenser drain pan notches is removed (see [Figure 79 on page 42](#)).

**Figure 78: Slide the Unit Up to the Wall Sleeve**



**Figure 79: Slide the Unit Up to the Wall Sleeve Threaded Studs**

Wall Sleeve Threaded Studs for Mounting to Unit



Check to see that the unit ventilator is level from end to end and back to front. Using a 4' level is recommended.

Place the washers over the threaded studs and tighten the mounting nuts (see cautions).



**CAUTION**

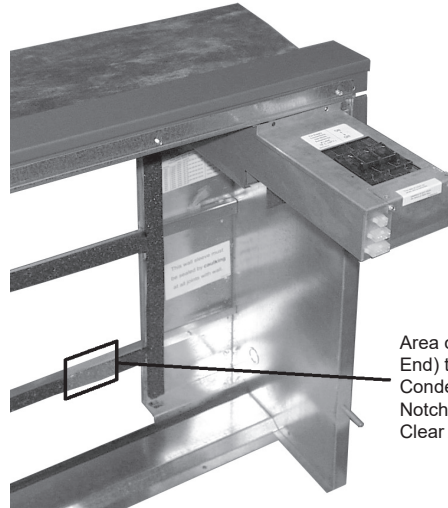
Do not draw the nuts up as tight as possible as they may distort the unit and loosen the caulking and wall sleeve from their position.



**CAUTION**

Leakage of outdoor air wastes energy, causes drafts and erratic unit ventilator operation. These passages are also a potential pathway for water. Provide a sealing surface at the floor line. Install the wall sleeve in a wall made of noncombustible material, and on a floor made of noncombustible material. Floor must be level, 90° to wall, unbroken and structurally strong to support the unit.

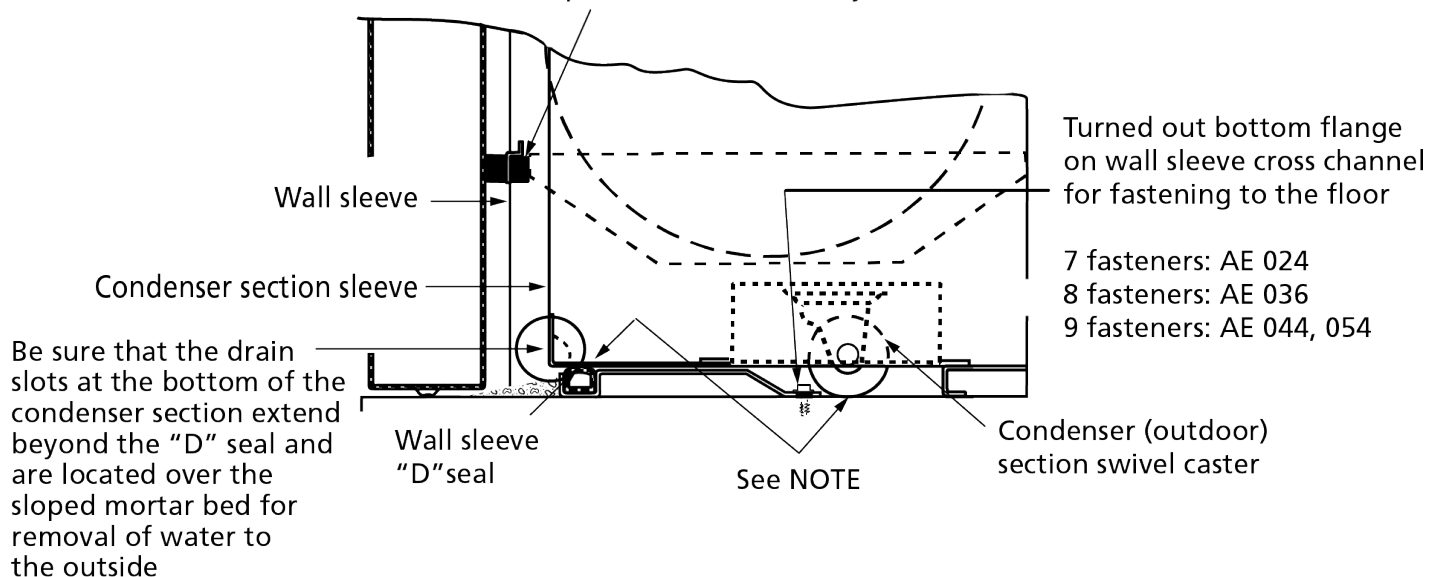
**Figure 80: Bottom Splitter Rail Seal Removal**



Area of Seal to Remove (Right End) to Allow Drainage from Condenser Section Drain Pan Notches. (See Figure 81). Also, Clear Area for Left End Notch.

**Figure 81: Wall Sleeve Drainage Considerations**

Check to make sure that the overflow notches in the flange of the condenser section drain pan are not blocked by sealant material



**NOTE:** The floor, at the location of the outside condenser section caster wheels must be smooth and level, and free of any debris. The condenser section must make contact and seal to the "D" seal on the cross channel of the wall sleeve to help prevent air and water leaks into the building.

# Field-Installed Accessories

## Installing Optional End Panel

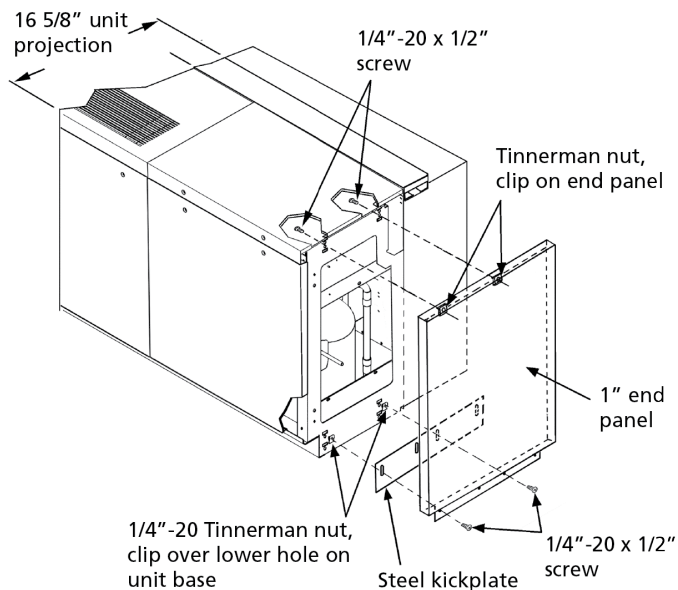
### End Panel Assembly

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.

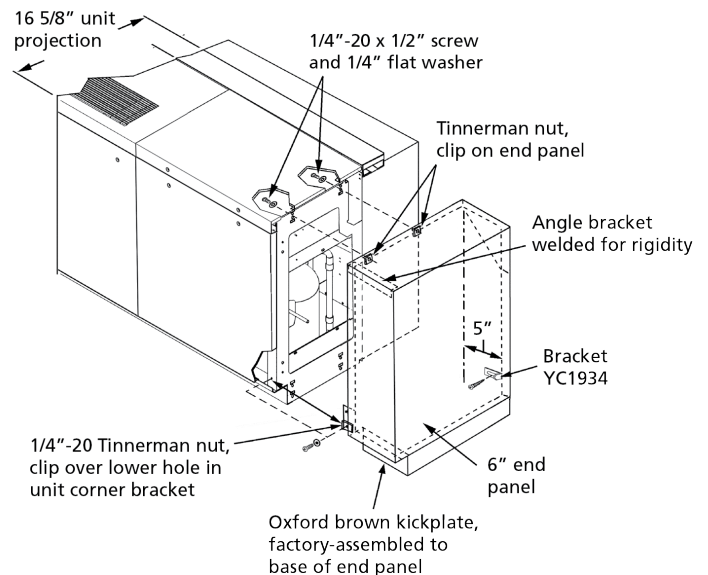
1. Refer to [Figure 82](#) for a 1" thick end panel. Attach two (2) Tinnerman nuts to the top edge of the end panel and two (2) to the bottom end of the unit. Align the end panel with the front and top edges of the unit. Insert through upper mounting holes inside unit end compartment and thread into Tinnerman clips on the end panel. Attach the end panel to the unit using four (4) 5/32" hex socket head fasteners provided.

**Figure 82: 1" End Panel with Provided Hardware**



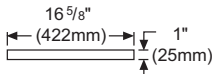
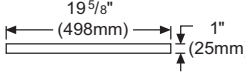
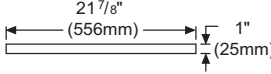
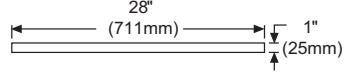
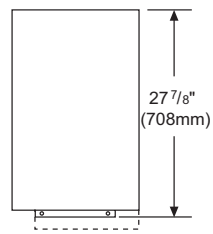
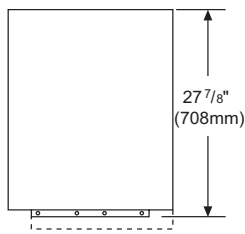
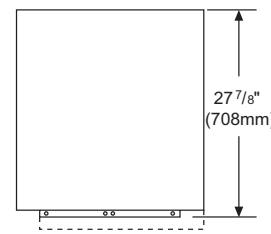
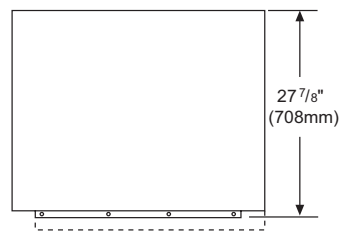
2. Refer to [Figure 83](#) for 6" thick end panel.
  - a. Position bracket (YC1934) on wall so angle is 5" from end of unit and near bottom.
  - b. Mark and drill required hole for device to fasten bracket to wall (not included).
  - c. Attach the bracket to wall.
  - d. Attach two (2) Tinnerman nuts 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 (YC1934) is intended to prevent movement of the panel toward the unit when pressure is applied to the end panel.

**Figure 83: 6" End Panel with Provided Hardware**

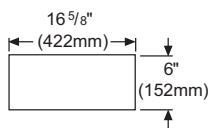
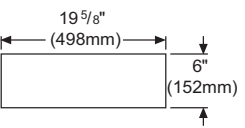
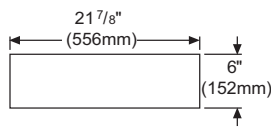
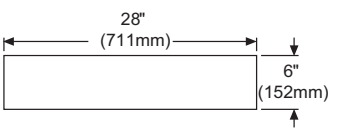
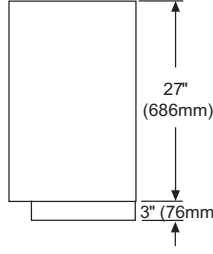
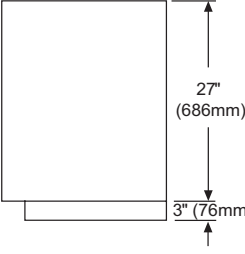
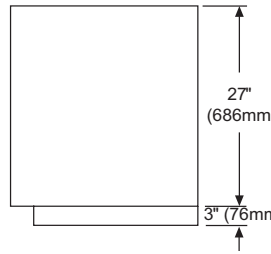
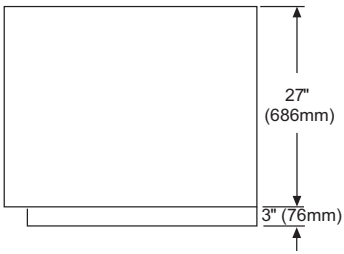


## End Panel Dimensions

**Figure 84: 1" (25 mm) End Panel Dimensions: Self-Contained Floor Unit Ventilator**

All Dim. in inches	16 <sup>5</sup> / <sub>8</sub> " (422 mm) Deep End Panels	19 <sup>5</sup> / <sub>8</sub> " (498 mm) Deep End Panels	21 <sup>7</sup> / <sub>8</sub> " (556 mm) Deep End Panels	28" (711 mm) Deep End Panels
<b>Top View</b>				
<b>End View with No Cut-Out</b>				

**Figure 85: 6" (152 mm) End Panel Dimensions – Self-Contained Floor Unit Ventilator**

All Dim. in inches	16 <sup>5</sup> / <sub>8</sub> " (422 mm) Deep End Panels	19 <sup>5</sup> / <sub>8</sub> " (498 mm) Deep End Panels	21 <sup>7</sup> / <sub>8</sub> " (556 mm) Deep End Panels	28" (711 mm) Deep End Panels
<b>Top View</b>				
<b>End View with No Cut-Out</b>				

# Electrical and Controls

## Unit Electrical and Control Connections



### WARNING

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.

Refer to [Table 15](#) through [Table 18](#), and [Figure 98](#) on [page 56](#) and [Figure 99](#) on [page 57](#) or the job-specific electrical drawings before proceeding with field power and control wiring. See also the wiring diagram provided on the unit ventilator right front access panel.

## Electrical Data

**Table 15: Electrical Data Size 024**

Volt/Hz/ Phase	Voltage Range		Indoor Fan FLA	Outdoor 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	2.8	11.1	67.5	Elec. Heat <sup>†</sup>	Low (3 elem.)	8.0	38.5	69.10	70
			3.2	2.8	11.1	67.5		High (6 elem.)	16.0	76.9	117.10	125
230/60/1	207	253	3.2	2.8	11.1	67.5	Elec. Heat <sup>†</sup>	Low (3 elem.)	7.3	33.3	62.60	70
			3.2	2.8	11.1	67.5		High (6 elem.)	14.7	66.7	104.35	110
208/60/3	197	228	3.2	2.8	7.8	28.0	Elec. Heat <sup>†</sup>	Low (3 elem.)	8.0	22.2	44.60	45
			3.2	2.8	7.8	28.0		High (6 elem.)	16.0	44.4	72.35	80
230/60/3	207	253	3.2	2.8	7.8	28.0	Elec. Heat <sup>†</sup>	Low (3 elem.)	7.3	19.2	40.85	45
			3.2	2.8	7.8	28.0		High (6 elem.)	14.7	38.5	64.98	70
460/60/3	414	506	3.2	1.5	4.3	29.0	Elec. Heat <sup>†</sup>	Low (3 elem.)	7.3	9.6	23.71	25
			3.2	1.5	4.3	29.0		High (6 elem.)	14.7	19.2	35.71	40

<sup>†</sup> Electric Heat Options are with Compressor and Outdoor Fan.

Legend			
<b>FLA</b>	Full Load Amps	<b>LRA</b>	Locked Rotor Amps
<b>RLA</b>	Rated Load Amps	<b>MCA</b>	Minimum Circuit Amps



### CAUTION

Confirm the wiring and phase is correct. Running the compressor backward will damage the compressor and void the warranty.

## Procedure

1. Confirm that the power to the wall sleeve is de-energized and tagged-out.
2. Verify that all wiring has been hooked up per the instructions in the ["Wall Sleeve Electrical Connections"](#) section. Details for MicroTech controls and electromechanical control can be found on [page 48](#) through [page 58](#).
3. Confirm that the unit SW1-Main Power non-fused "On-Off" switch is "Off."
4. Provide power to the wall sleeve.
5. Verify that the main power is correctly phased to the wall sleeve and unit without closing SW1.



**Table 16: Electrical Data Size 036**

Volt/Hz/ Phase	Voltage Range		Indoor Fan FLA	Outdoor 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	6.3	20.5	126.0	Elec. Heat <sup>1</sup>	Low (3 elem.)	10.0	48.1	96.35	100
			3.2	6.3	20.5	126.0		High (6 elem.)	20.0	96.2	156.48	175
230/60/1	207	253	3.2	5.7	20.5	126.0	Elec. Heat <sup>1</sup>	Low (3 elem.)	9.2	41.7	87.75	90
			3.2	5.7	20.5	126.0		High (6 elem.)	18.4	83.3	139.75	150
208/60/3	197	228	3.2	6.3	10.2	82.0	Elec. Heat <sup>1</sup>	Low (3 elem.)	10.0	27.8	58.10	60
			3.2	6.3	10.2	82.0		High (6 elem.)	20.0	55.5	92.73	100
230/60/3	207	253	3.2	5.7	10.2	82.0	Elec. Heat <sup>1</sup>	Low (3 elem.)	9.2	24.1	52.88	60
			3.2	5.7	10.2	82.0		High (6 elem.)	18.4	48.1	82.88	90
460/60/3	414	506	3.2	3.1	4.6	56.0	Elec. Heat <sup>1</sup>	Low (3 elem.)	9.2	12.0	28.68	30
			3.2	3.1	4.6	56.0		High (6 elem.)	18.4	24.1	43.81	45

<sup>1</sup> Electric Heat Options are with Compressor and Outdoor Fan.

Legend			
<b>FLA</b>	Full Load Amps	<b>LRA</b>	Locked Rotor Amps
<b>RLA</b>	Rated Load Amps	<b>MCA</b>	Minimum Circuit Amps

**Table 17: Electrical Data Size 044**

Volt/Hz/ Phase	Voltage Range		Indoor Fan FLA	Outdoor 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	6.3	25.9	128.4	Elec. Heat <sup>1</sup>	Low (3 elem.)	12.0	57.7	115.14	125
			3.2	6.3	25.9	128.4		High (6 elem.)	24.0	115.4	187.26	200
230/60/1	207	253	3.2	5.7	25.9	128.4	Elec. Heat <sup>1</sup>	Low (3 elem.)	11.0	50.0	104.88	110
			3.2	5.7	25.9	128.4		High (6 elem.)	22.0	100.0	167.38	175
208/60/3	197	228	3.2	6.3	13.4	105.3	Elec. Heat <sup>1</sup>	Low (3 elem.)	12.0	33.3	68.93	70
			3.2	6.3	13.4	105.3		High (6 elem.)	24.0	66.6	110.55	125
230/60/3	207	253	3.2	5.7	13.4	105.3	Elec. Heat <sup>1</sup>	Low (3 elem.)	11.0	28.9	62.88	70
			3.2	5.7	13.4	105.3		High (6 elem.)	22.0	57.7	98.88	100
460/60/3	414	506	3.2	3.1	6.9	61.8	Elec. Heat <sup>1</sup>	Low (3 elem.)	11.0	14.4	34.59	35
			3.2	3.1	6.9	61.8		High (6 elem.)	22.0	28.9	52.72	60

<sup>1</sup> Electric Heat Options are with Compressor and Outdoor Fan.

Legend			
<b>FLA</b>	Full Load Amps	<b>LRA</b>	Locked Rotor Amps
<b>RLA</b>	Rated Load Amps	<b>MCA</b>	Minimum Circuit Amps

**Table 18: Electrical Data Size 054**

Volt/Hz/ Phase	Voltage Range		Indoor Fan FLA	Outdoor 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	3.0	6.3	30.2	178.0	Elec. Heat <sup>1</sup>	Low (3 elem.)	12.0	57.7	120.28	125
			3.0	6.3	30.2	178.0		High (6 elem.)	24.0	115.4	192.41	200
230/60/1	207	253	2.8	5.7	30.2	178.0	Elec. Heat <sup>1</sup>	Low (3 elem.)	11.0	50.0	109.85	125
			2.8	5.7	30.2	178.0		High (6 elem.)	22.0	100.0	172.35	175
208/60/3	197	228	3.0	6.3	16.9	140.0	Elec. Heat <sup>1</sup>	Low (3 elem.)	12.0	33.6	73.56	80
			3.0	6.3	16.9	140.0		High (6 elem.)	24.0	66.6	114.81	125
230/60/3	207	253	2.8	5.7	16.9	140.0	Elec. Heat <sup>1</sup>	Low (3 elem.)	11.0	28.9	66.85	70
			2.8	5.7	16.9	140.0		High (6 elem.)	22.0	57.7	102.85	110
460/60/3	414	506	2.8	3.1	8.2	54.7	Elec. Heat <sup>1</sup>	Low (3 elem.)	11.0	14.4	35.79	40
			2.8	3.1	8.2	54.7		High (6 elem.)	22.0	28.9	53.92	60

<sup>1</sup> Electric Heat Options are with Compressor and Outdoor Fan.

Legend			
<b>FLA</b>	Full Load Amps	<b>LRA</b>	Locked Rotor Amps
<b>RLA</b>	Rated Load Amps	<b>MCA</b>	Minimum Circuit Amps

## MicroTech Unit Mounted DDC Control Components

### NOTICE

Figure 87 and Figure 86 provide a top view of the unit and its components. A description of each component follows, by callout number.

1. MicroTech Unit Ventilator Controller (UVC, located beneath the local user interface panel): Factory mounted and run tested, microprocessor-based DDC control device capable of complete, Stand-alone unit control or incorporated into a building-wide network using the optional BACnet plug-in communication module. The UVC contains a microprocessor that is pre-programmed 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. Client-server unit controllers are field configured for local peer-to-peer network between units, with the wiring field-installed.
2. Communication Module (optional, located beneath the local user interface panel): Plug-in network communication module that is attached to the UVC via a 12-pin header and 4 locking standoffs. Available communication module:
  - a. Building Automation and Control Network: (BACnet™) Server-Client/Token Passing (MS/TP) - Allows the UVC to inter-operate with systems that use the BACnet (MS/TP) protocol with a conformance level of 3. Meets the requirements of ANSI/ASHRAE 135-2008 standard for BACnet systems.
3. Local User Interface (LUI): 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 built in menu structure (password protected) with 4 keys and 2 individual LED indicators to adjust the unit ventilator operating parameters.
4. External Signal Connection Plugs (located beneath the local user interface panel): Three (3) multi-pin plugs are factory provided and pre-wired with amp plug connections that plug into the wall sleeve. Provided for field wiring of:
  - a. Remote Wall Mounted Temperature Sensor (optional accessory).
  - b. External Input Signals (by others): unoccupied, remote shutdown, ventilation lockout, dew point/humidity (night time operation) or exhaust interlock signals.
  - c. External Output Options (by others): 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.
6. Unit Main Power "On-Off" Switch: Shipped with the wall sleeve accessory, the "On-Off" switch disconnects the main power to the unit for servicing or when the unit is to be shut down for an extended period of time.
7. Fuse(s): Fan motor and controls have the hot line(s) protected by factory installed cartridge type fuse(s).
8. Control Transformer (located beneath the local user interface panel): 75 VA 24-volt NEC Class 2 transformer for 24 volt power supply.
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. Indoor, Direct Expansion (DX) Coil Refrigerant Temperature Sensor (UCT): The sensor is installed on the unit ventilator's indoor refrigerant coil on the right hand side of the coil "u-bend". It is used to sense low refrigerant temperatures on the indoor coil.
11. Outdoor, Direct Expansion (DX) Coil Refrigerant Temperature Sensor (OCT): – The sensor is installed on the unit ventilator's outdoor refrigerant coil on the right hand side of the coil "u-bend." It is used to sense the refrigerant temperature on the outdoor coil.
12. 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 available for remote room temperature sensing.
13. Discharge Air Temperature Sensor (DAT): The sensor is located on the second fan from the right to sense discharge air temperatures. 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 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.
15. Outdoor Air Humidity Sensor (OH, optional/standard with expanded and leading edge controls): 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.
16. Room Humidity Sensor (IH, optional/standard with expanded and leading edge controls): Unit-mounted humidity sensor for units capable of passive or active dehumidification (Reheat) or with units using Leading Edge

### NOTICE

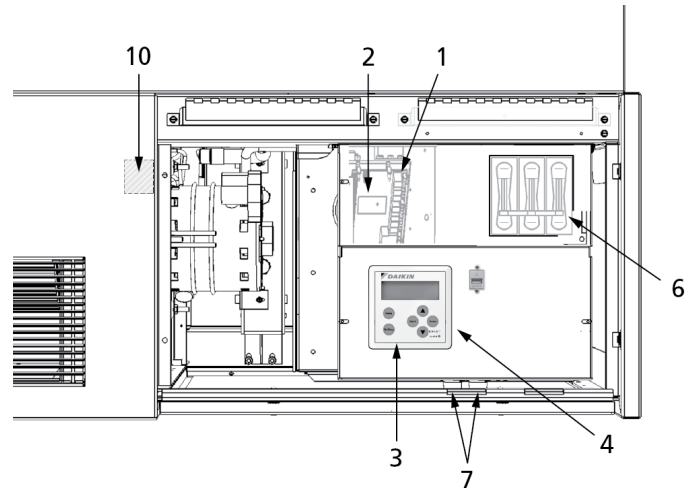
Not all external signal options can be used simultaneously and may not be available on all software models.

5. Motor speed transformer (located beneath the local user interface panel): Multi-tap auto-transformer provides

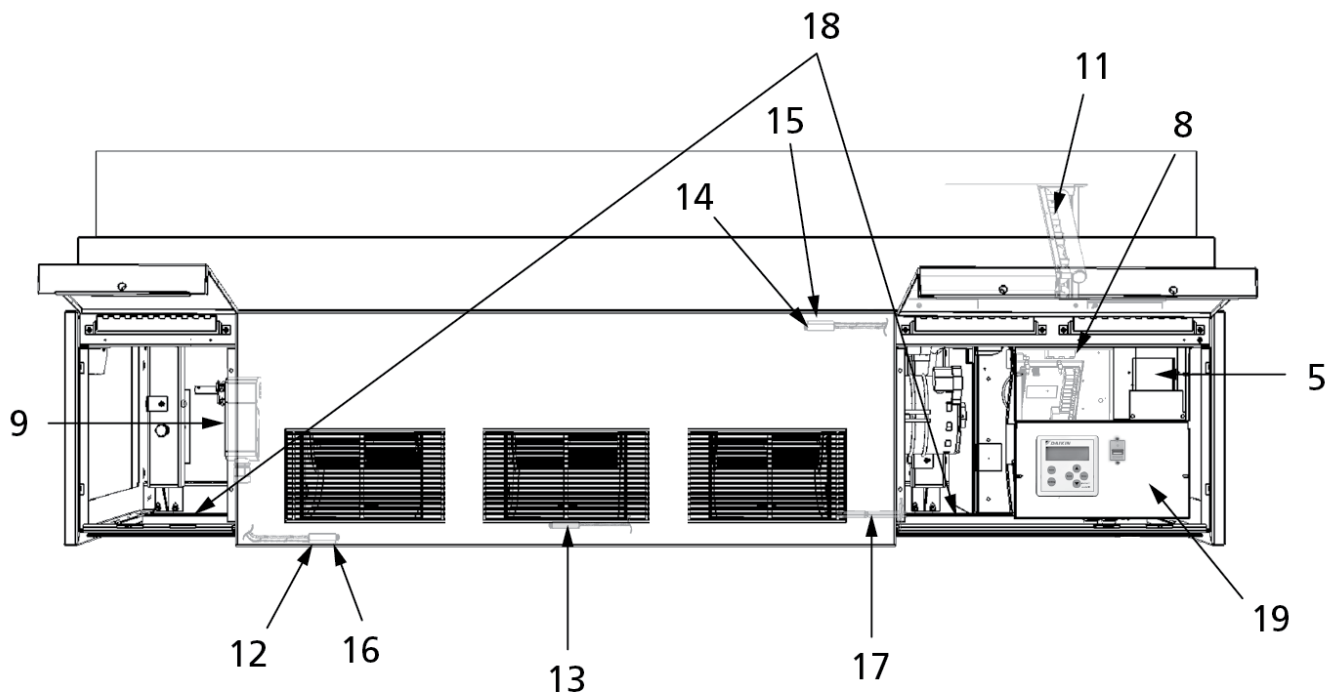
indoor/outdoor, true enthalpy comparison economizer. The sensor is located in the sampling chamber (front, center panel) where room air is continuously drawn through for fast response to humidity changes in the room. With network applications, the unit mounted sensor can be overridden by a remote sensor through the network.

17. CO<sub>2</sub> Sensor (available option): 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  $\Omega$  output impedance). The Pitot Tube sensing device is located in the unit ventilator's return air stream. The optional CO<sub>2</sub> 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.
18. 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.
19. MT6210 A2L Mitigation Controller: Factory mounted controller monitors the A2L sensors and indicates a refrigerant leak or refrigerant sensor failure should one occur.

**Figure 86: Top Right Access View**



**Figure 87: MicroTech Sensor and Component Locations (Top View)**



## Economizer Control Capabilities

- Basic: Compares the inside and outside air temperatures using item 12 (Room Temperature Sensor) and item 14 (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 12 (Room Temperature Sensor) and item 14 (Outdoor Air Temperature Sensor) and calculates the enthalpy of the outside air relative humidity using item 15 (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 12 (Room Temperature Sensor) and item 14 (Outdoor Air Temperature Sensor) and compares the enthalpy of the inside and outside air relative humidity using item 15 (Outdoor Air Humidity Sensor) and item 16 (Room Humidity Sensor) to determine if outdoor air can be used for “free,” economizer cooling operation.

## Economizer for Reheat

- Basic: Uses Room Temperature sensor, Outdoor Air Temperature Sensor and Room Humidity Sensor for active dehumidification (reheat) or to determine if outdoor air can be used for “free,” economizer cooling operation.
- Leading Edge: Uses Room Temperature Sensor, Outdoor Air Temperature Sensor, Outdoor Air Humidity Sensor and Room Humidity Sensor for active dehumidification (reheat) or to determine if outdoor air can be used for “free,” economizer cooling operation.

## Local User Interface (LUI)

**Figure 88: 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
- Medium: constant speed
- Low: constant speed
- 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 shifts 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. 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.

## MicroTech Wall-Mounted Sensors

### **WARNING**

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

### **WARNING**

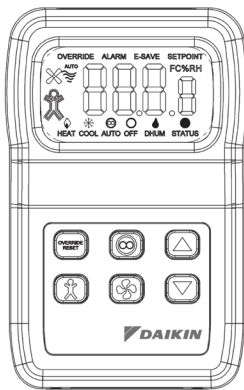
To avoid electrical shock, personal injury, or death:

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.

### **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 89: 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 87](#) and [Figure 88](#)). 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.

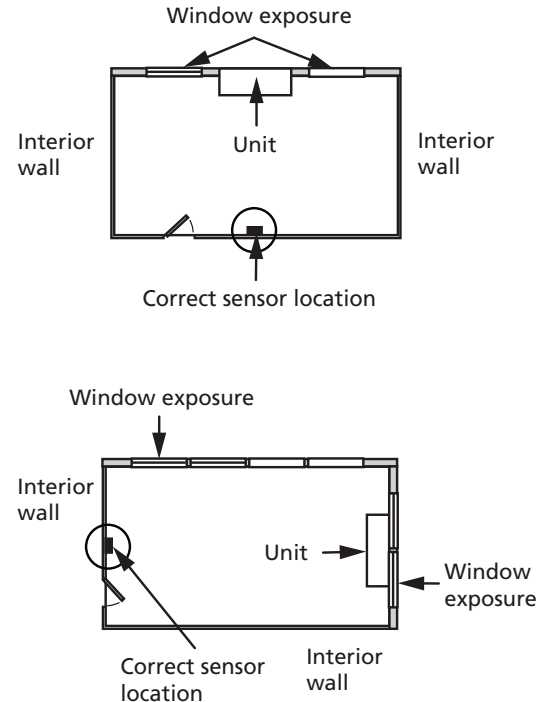
- 6-Button Digital Adjustable Sensor (PN 910247458) 8-wires
- 4-Button Digital Adjustable Sensor (PN 910247448) 6-wires
- The Basic Sensor with setpoint adjustment (PN 910247453) 4-wires

- The Basic Sensor (PN 910247450) 3-wires

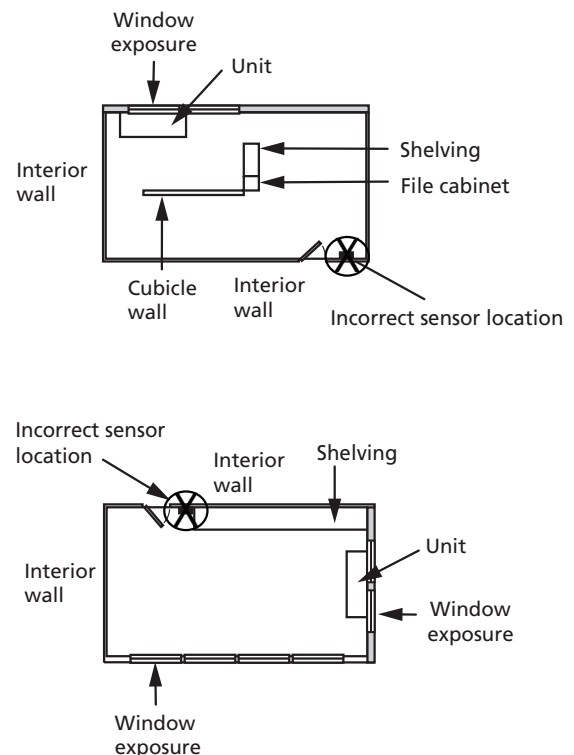
### **NOTICE**

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

**Figure 90: Correct Wall Sensor Locations**



**Figure 91: Incorrect Unit and Wall Sensor Locations**





**Table 19: 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)

**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.

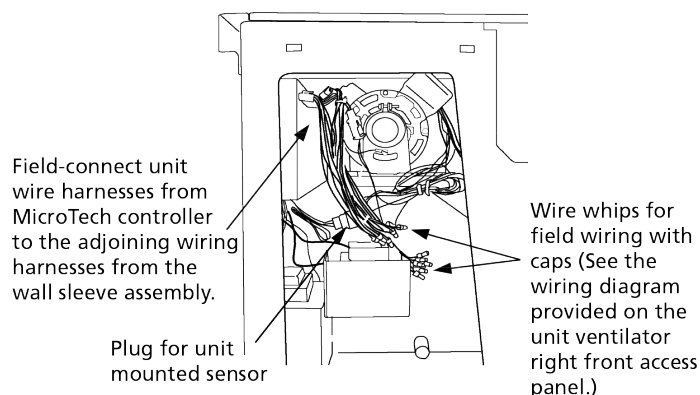
## Typical Connections For Temperature Sensor Applications

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 89). Each of the wires in these wire whips is capped and should remain capped if not used. See Table 20 on page 54 for wiring the remote mounted temperature sensor to the unit control wiring.

**NOTICE**

The capped wire whips are built into the wall sleeve. The mating-connections from the MicroTech control board plug into the wall sleeve wire whip harnesses when the unit ventilator is installed and connected to the wall sleeve.

**Figure 92: Field Wiring Whips with Caps Viewed From Right End Compartment**

**NOTE:** The capped wire whips are built into the wall sleeve. The mating-connections from the MicroTech control board plug into the wall sleeve wire whip harnesses when the unit ventilator is installed and connected to the wall sleeve.

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

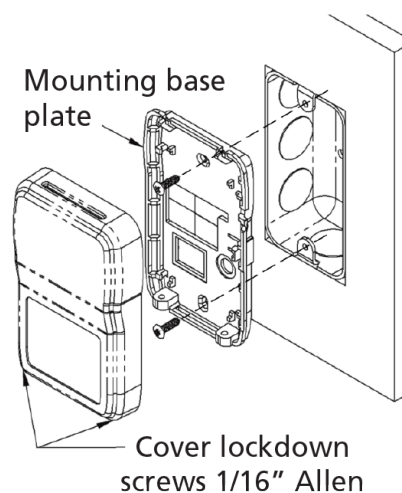
Display sensor to show room Temperature, fan speed (AUTO/HIGH/MEDIUM/LOW), system mode (HEAT/COOL AUTO/OFF), ALARM, Override and occupancy.

## 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 Termination 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 93: 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.

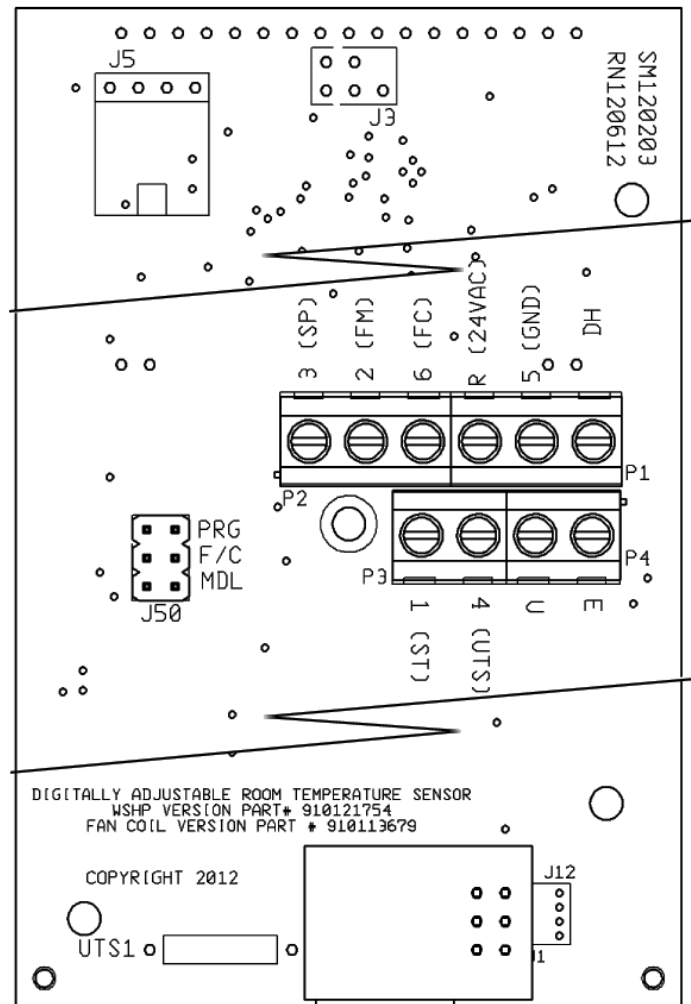
## Maintenance

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'.

Figure 94: Sensor Circuit Board



### 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.

**Table 20: 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 96](#). Refer to [Figure 97 on page 55](#) 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 96](#) 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 97](#).

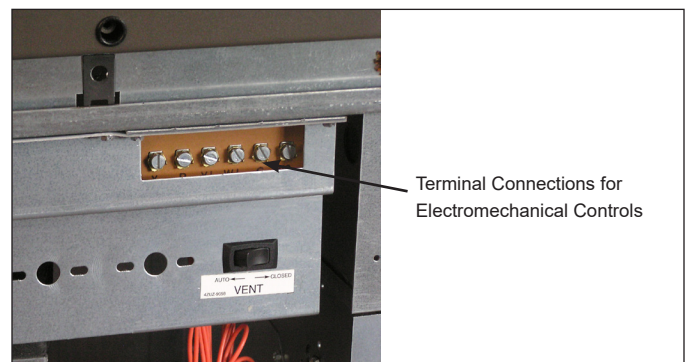
Upon indication of a refrigerant leak by the MT6210 Mitigation Controller, the field installed controller should disable compressor and electric heat signals immediately and also command the fan speed so that sufficient airflow is delivered within 10 seconds of leak indication. The MT6210 Mitigation 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 96: Thermostat Control Terminal Connections Located in Left Front Compartment**

# MicroTech Wiring Diagram – Typical

**Figure 97: MicroTech Controls – A2L Leak Mitigation**

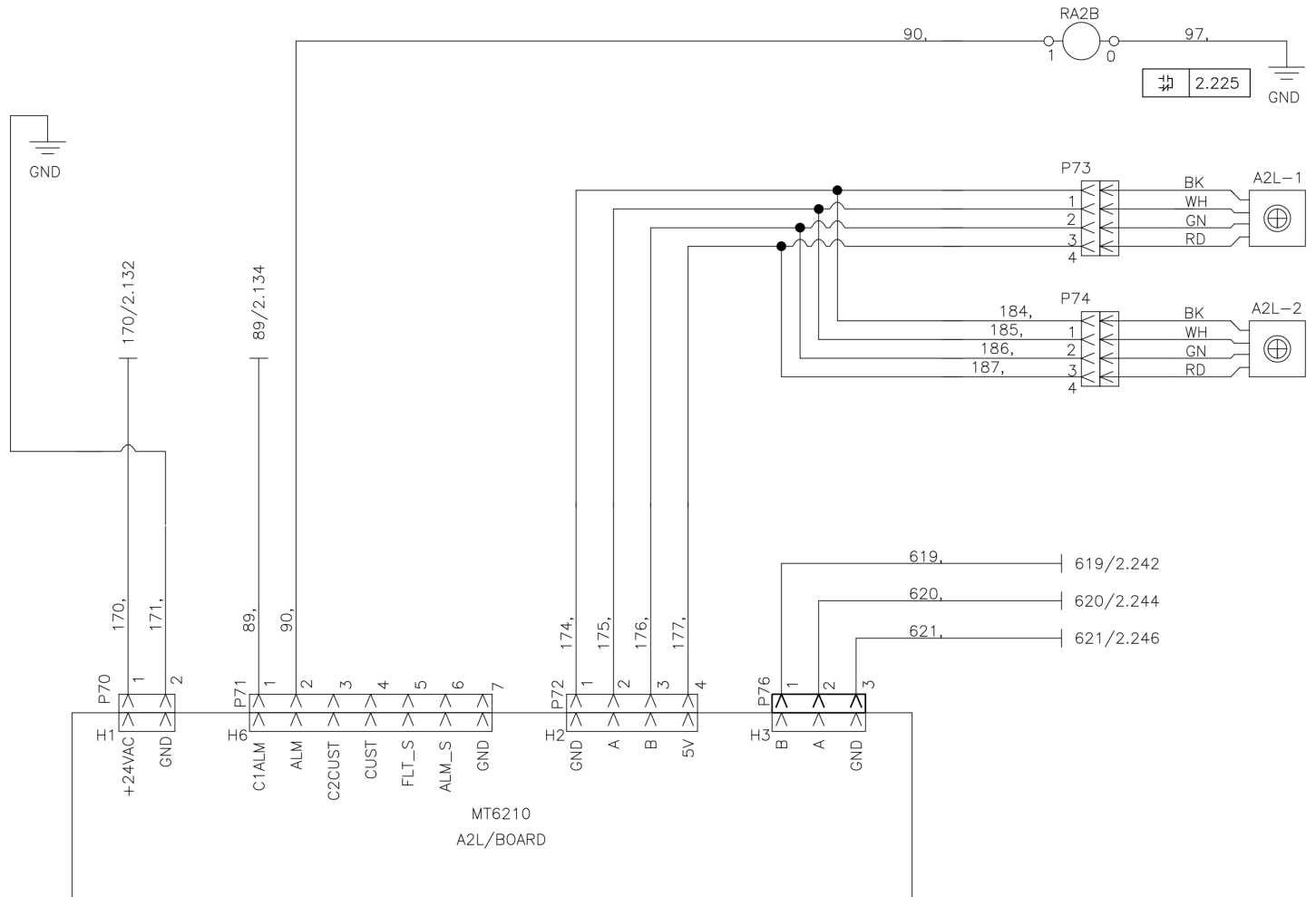
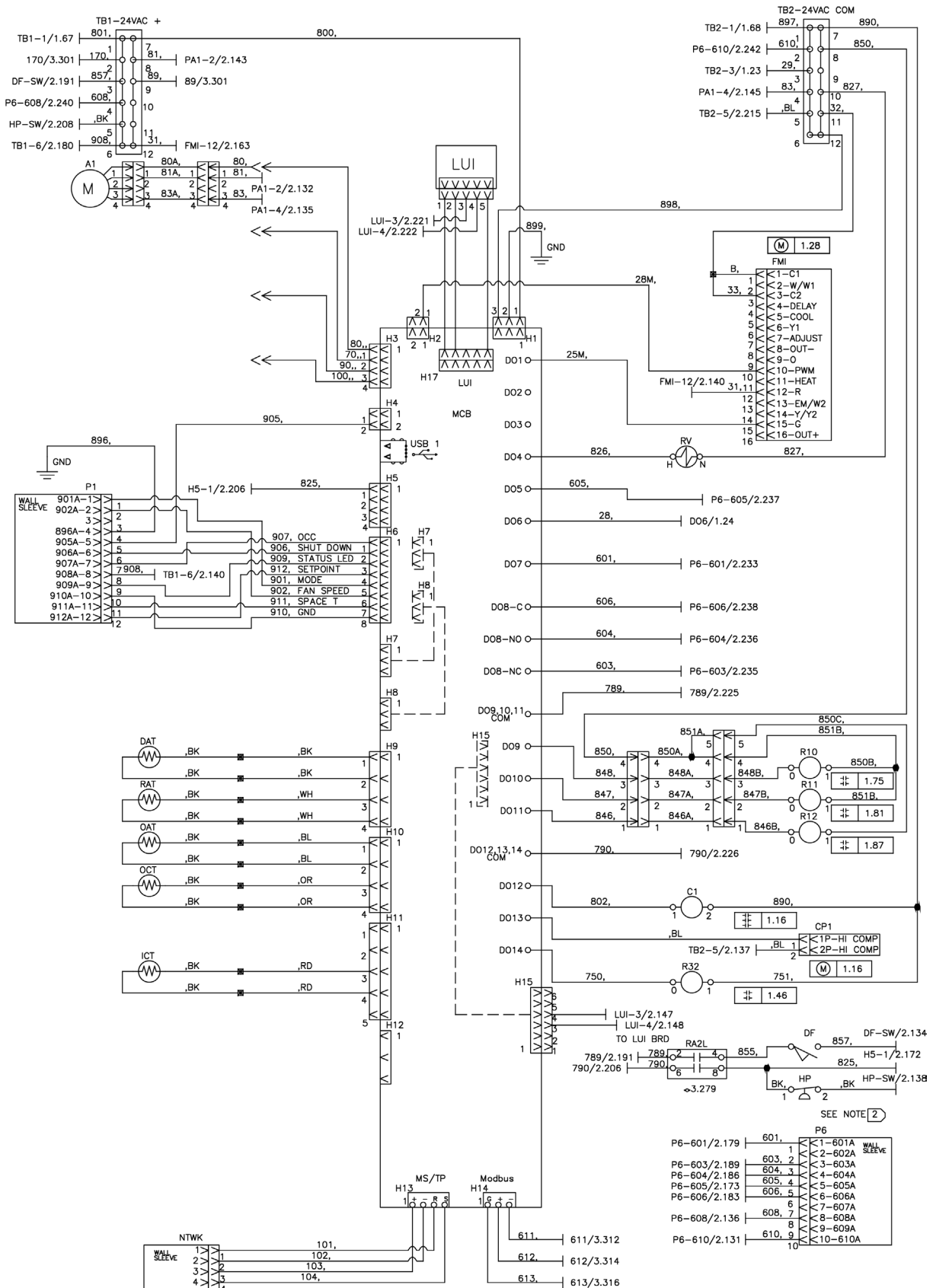
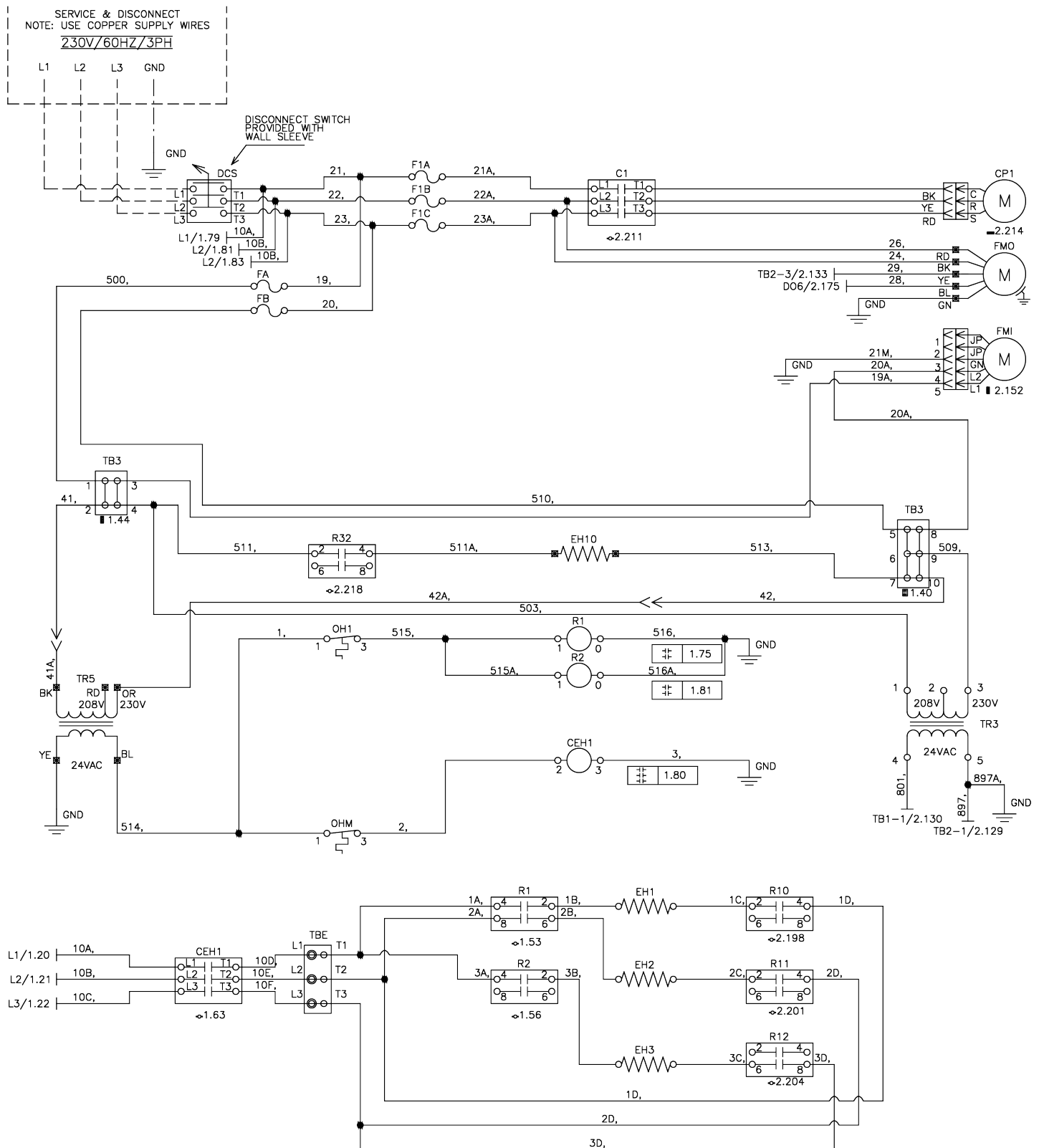


Figure 98: Typical MicroTech Controls Wiring Diagram - 230V/60Hz/3Ph



**Figure 99: Typical MicroTech Wiring Diagram - Service and Disconnect - 230V/60Hz/3Ph**



## Wiring Schematics Legend for “MicroTech Wiring Diagram – Typical”

Legend			
<b>A1</b>	Actuator- Outdoor Air	<b>OH</b>	Sensor - Outdoor Humidity
<b>A2</b>	Actuator- Face & Bypass	<b>OH1</b>	Thermostat - Overheat
<b>A2L1-2</b>	A2L Refrigerant Sensor	<b>OH2</b>	Thermostat - Overheat
<b>BPT</b>	Sensor - Braze Plate DX Coil Refrigerant Temperature	<b>OHM</b>	E.H. Man Reset - Overheat Stat
<b>C1</b>	Compressor Contactor	<b>PL1</b>	LED Occupancy / Fault Status
<b>CAP1</b>	Capacitor Run	<b>R1-R3</b>	Relay Electric Heat (Backup)
<b>CEH1-3</b>	Electric Heat Contactor	<b>R10-R12</b>	Relay – Electric Heat
<b>CP1</b>	Motor Compressor 2-Stage	<b>R28</b>	Relay - Outdoor Motor Air
<b>CO2</b>	Sensor - Indoor Air CO2	<b>R32</b>	Relay - Drain Pan Heater
<b>DAT</b>	Sensor - Discharge Air Temperature	<b>R4H</b>	Relay – Fan High Speed
<b>DCS</b>	Switch - Unit Power	<b>R4L</b>	Relay– Fan Low Speed
<b>DF</b>	Dead Front Switch	<b>R4M</b>	Relay– Fan Medium Speed
<b>EH1-6</b>	Heater - Electric	<b>RA2L</b>	Relay A2L
<b>EH10</b>	Heater - Outdoor Drain Pan	<b>RAT</b>	Sensor - Room Air Temperature
<b>EWT</b>	Sensor - Entering Water Temperature	<b>RCCP</b>	Transducer AAR
<b>F1A/F1B</b>	Fuse - Compressor	<b>RV</b>	Reversing Valve
<b>F2A/F3C</b>	Fuse - Electric Heat	<b>SRT</b>	Sensor - Suction Line
<b>FA/FB</b>	Fuse– Control, Load	<b>T6</b>	Thermostat - Freeze Stat
<b>FC/FD</b>	Fuse– Control, Transformer	<b>TB1</b>	Terminal Block - 24VAC+
<b>FMI</b>	Motor - Room Fan	<b>TB2</b>	Terminal Block – 24VAC Gnd
<b>FMO</b>	Motor Outdoor Air	<b>TB3</b>	(A, B) Terminal Block – Main Power
<b>HP</b>	High Pressure Switch	<b>TBE</b>	Terminal Block - Electric Heat
<b>ICT</b>	Sensor - Indoor DX Coil Temperature	<b>TR1</b>	Transformer - Motor Speed
<b>IH</b>	Sensor - Indoor Humidity	<b>TR3</b>	Transformer - 208 / 230V-24V, 75VA
<b>LWT</b>	Sensor - Leaving Water Temperature	<b>TR4</b>	Transformer - 460V–230V
<b>MCB</b>	Main Control Board	<b>TR5</b>	Transformer - 208 / 230V-24V
<b>MT6210</b>	A2L Control Board	<b>V1</b>	Valve - Heat EOC (Accessory)
<b>NTWK</b>	Network Connection	<b>V2</b>	Valve - Cool EOC (Accessory)
<b>OAT</b>	Sensor - Outdoor Air Temperature	<b>VC</b>	Valve - Cool (Accessory)
<b>OCT</b>	Sensor - Outdoor DX Coil Temperature	<b>VH</b>	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 100: 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 67](#).



#### 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 hot water/steam/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 63](#). 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 securely fastened to wall sleeve
- ☐ Electrical hook-up complete; power, control, wall thermostat (if applicable) in accordance with unit wiring diagram(s)
- ☐ Air filter clean and in place
- ☐ All access and end panels in place and protective covering 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 square and level and running smoothly and quietly
- ☐ Refrigerant Detection System for refrigerant leak mitigation has been tested
- ☐ No air infiltration
- ☐ Paint nicks and scratches touched up (as required)
- ☐ Access space 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 operation and maintenance

# Maintenance

## General Maintenance

1. Normal maintenance on all units is generally limited to filter changes. Units are provided with permanently lubricated motors and require no oiling even though oil caps may be provided.
2. Filter changes are required at regular intervals. The time period between changes will depend upon the project requirements. 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 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. Both the indoor and the outdoor condenser 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 unit ventilators. 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 39 on page 23) 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.

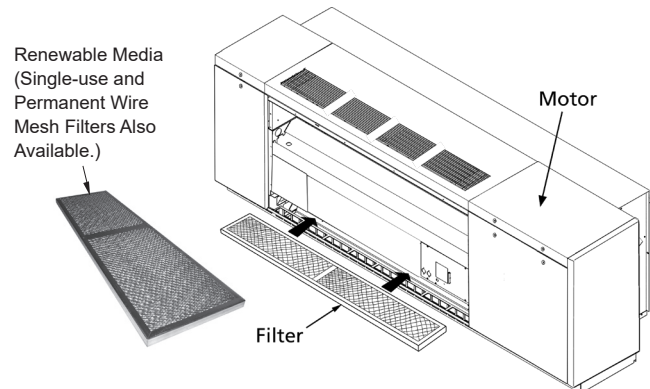
Filters should be replaced during the first week of placing into service to prevent dirt carry-over into the internals of the unit and back into the classroom (see Figure 39). A periodic filter changeout program should be established. Filters should be checked monthly or more often if conditions indicate. Filters are included in all units.



### CAUTION

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


Figure 101: 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 21](#).

**⚠ WARNING**

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



≥ 298 ft<sup>2</sup> (27.69 m<sup>2</sup>)  
Minimum Room Area\*

\*See the required minimum room area for your specific unit size in [Table 21](#).

### NOTICE

Refer to [Table 22](#) 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 22](#). This table is provided as a reference. Adjusted room area (A<sub>min adj</sub>) is the product of the minimum room area specified in the serial plate and the minimum room area multiplier, as shown in formula below.

A<sub>min adj</sub> = A<sub>min</sub> (serial plate) \* (minimum room area multiplier)

The minimum room area can also be found in [Table 21](#).

**Table 21: Minimum Airflow and Room Area Requirements**

Unit Size	R-32 Refrigerant Charge oz (kg)	Minimum Room Area A <sub>min</sub> ft <sup>2</sup> (m <sup>2</sup> )	Minimum Airflow Q <sub>min</sub> ft <sup>3</sup> /min (m <sup>3</sup> /min)
024	106 (3.01)	277 (25.73)	174 (4.93)
036	156 (4.42)	407 (37.81)	256 (7.25)
044	114 (3.23)	298 (27.69)	187 (5.30)
054	111 (3.15)	290 (26.94)	182 (5.15)

**Table 22: 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 21](#) 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 102: 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 decommissioned 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**Supersedes: **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: \_\_\_\_\_

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\_\_\_\_\_

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\_\_\_\_\_

\_\_\_\_\_

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



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