



INSTALLATION AND MAINTENANCE INSTRUCTIONS

MGE9*-7-11-* Series

Electric Cooling / Gas Heating Packaged Unit

Save these instructions for future reference



This is a safety alert symbol and should never be ignored. When you see this symbol on labels or in manuals, be alert to the potential for personal injury or death.

Installation

WARNING

These units are not approved for mobile home applications. Such use could result in property damage, personal injury, or death.

General

These instructions explain the recommended method of installation of the MagicPak All-In-One™ HVAC system model MGE9 gas heating with electric cooling unit and associated electrical wiring. This unit is designed for use with R-454B refrigerant only.

These instructions, and any instructions packaged with mating components and/or accessories, should be carefully read prior to beginning installation. Note particularly any **CAUTIONS** or **WARNINGS** in these instructions and all labels on the units.



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WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a licensed professional installer (or equivalent), service agency or the gas supplier.

Manufactured By
Allied Air Enterprises LLC
215 Metropolitan Drive
West Columbia, SC 29170



(P) 508777-01

CAUTION

The installation of this appliance must conform to the requirements of the National Fire Protection Association; the National Electrical Code, ANSI/NFPA No. 70 (latest edition); and any state/provincial laws or local ordinances. Local authorities having jurisdiction should be consulted before installation is made. Such applicable regulations or requirements take precedence over the general instructions in this manual.

Check that equipment complies with all applicable building codes, laws, and regulations for its intended use prior to installation.

The MGE9 series are self-contained, condensing gas-fired heating with electric cooling models. The unit design has been certified by Intertek Testing Services for compliance with the latest edition of the American National Standard – ANSI Z21.47 for direct vent central furnaces and UL 60335-2-40 for HVAC equipment. The MGE* models are certified to be in compliance with the latest edition of AHRI Standard 210/240. All models are design certified for heating operation when fired with natural or propane gas (propane conversion kit required). Units must be equipped to use the fuel type provided in the field.

These instructions are intended as a general guide only, for use by qualified personnel and do not supersede any national or local codes in any way. Compliance with all local, state, provincial, or national codes pertaining to this type of equipment should be determined prior to installation.

Units certified for less than 2% cabinet leakage using ANSI/ASHRAE 193 (complies with IECC 2015) are identified on the rating plate.

WARNING

In the State of Massachusetts:

This product must be installed by a licensed Plumber or Gas Fitter. When flexible connectors are used, the maximum length shall not exceed 36". When lever-type gas shutoffs are used, they shall be T-handle type.

WARNING

Because the MGE unit is installed in a confined space, the return air must be ducted, sealed to the unit and terminated outside the space containing the unit. Even a small leak at the return air duct connection can cause a potentially dangerous negative pressure condition.

WARNING

For your safety, do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance. Such actions could result in property damage, personal injury, or death.

WARNING

Installation and servicing of air conditioning equipment can be hazardous due to internal refrigerant pressure and live electrical components. Only trained and qualified service personnel should install or service this equipment. Installation and service performed by unqualified persons can result in property damage, personal injury, or death.

WARNING

The unit must be installed with approved wall sleeve and louver accessories for safe operation. Improper installations could result in property damage, personal injury, or death.

Inspection

Upon receipt of equipment, carefully inspect it for possible shipping damage. If damage is found, it should be noted on the carrier's freight bill. Take special care to examine the unit inside the carton if the carton is damaged. File a claim with the transportation company. **If any damage is discovered and reported to the carrier, do not install the unit, as claim may be denied.**

Check the unit rating plate to confirm specifications are as ordered.

Limitations

The unit shall be installed in accordance with all national and local safety codes. Limitations of the unit and appropriate accessories must also be observed.

The outdoor fan is designed to operate against no more than .10" w.c. static pressure.

Minimum and maximum operation conditions must be observed to assure proper system performance. Refer to Table 1 for the ambient operating limitations of the unit.

Outdoor Ambient Air Temperature °F		
Minimum DB	Maximum DB	
Cool	Cool	Heat
65	115	75

Indoor Ambient Air Temperature °F			
Minimum		Maximum	
DB/WB	DB	DB/WB	DB
Cool	Heat	Cool	Heat
62/57	50	90/72	80

DB = Dry Bulb

WB = Wet Bulb

Table 1. Ambient Temperature Limitations

WARNING

Every working procedure that affects safety means shall only be carried out by competent persons. This appliance is 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 concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure they do not play with the appliance.

CAUTION

Leak Detection System factory installed. Unit must be powered except for service (on select models).

WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a licensed professional HVAC installer or equivalent, service agency, or the gas supplier.

CAUTION

Servicing shall be performed only as recommended by the manufacturer.

IMPORTANT

The Clean Air Act of 1990 bans the intentional venting of refrigerant (CFCs, HCFCs and HFCs) as of July 1, 1992. Approved methods of recovery, recycling or reclaiming must be followed. Fines and/or incarceration may be levied for noncompliance.

WARNING

Ducts connected to an appliance shall not contain a potential ignition source.

WARNING

- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance, or an operating electric heater).
- Do not pierce or burn.
- Be aware that refrigerants may not contain an odor.

WARNING

For appliances using A2L refrigerants connected via an air duct system to one or more rooms, only auxiliary devices approved by the appliance manufacturer or declared suitable with the refrigerant shall be installed in connecting ductwork.

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 and electric switching devices.

WARNING

This product is not intended to be installed inside of a false ceiling or drop ceiling.

CAUTION

Any service personnel installing, decommissioning, or performing maintenance on the unit must be properly trained with A2L refrigerants.

WARNING

If this appliance is conditioning a space with an area smaller than T_{Amin}, then that space must be without continuously operating open flames (e.g. an operating gas appliance) or other potential ignition sources (e.g. an operating electric heater or similar hot surface). A flame-producing device may be installed in the same space if the device is provided with an effective flame arrest system.

T_{Amin} Table

Charge (lb)	< 4	4	6	8	10
Charge (kg)	< 1.8	1.8	2.7	3.6	4.5
Minimum Conditioned Area (ft ²)	N/A*	60	90	120	150
Minimum Conditioned Area (m ²)	N/A*	5.6	8.4	11.2	14.0

IMPORTANT

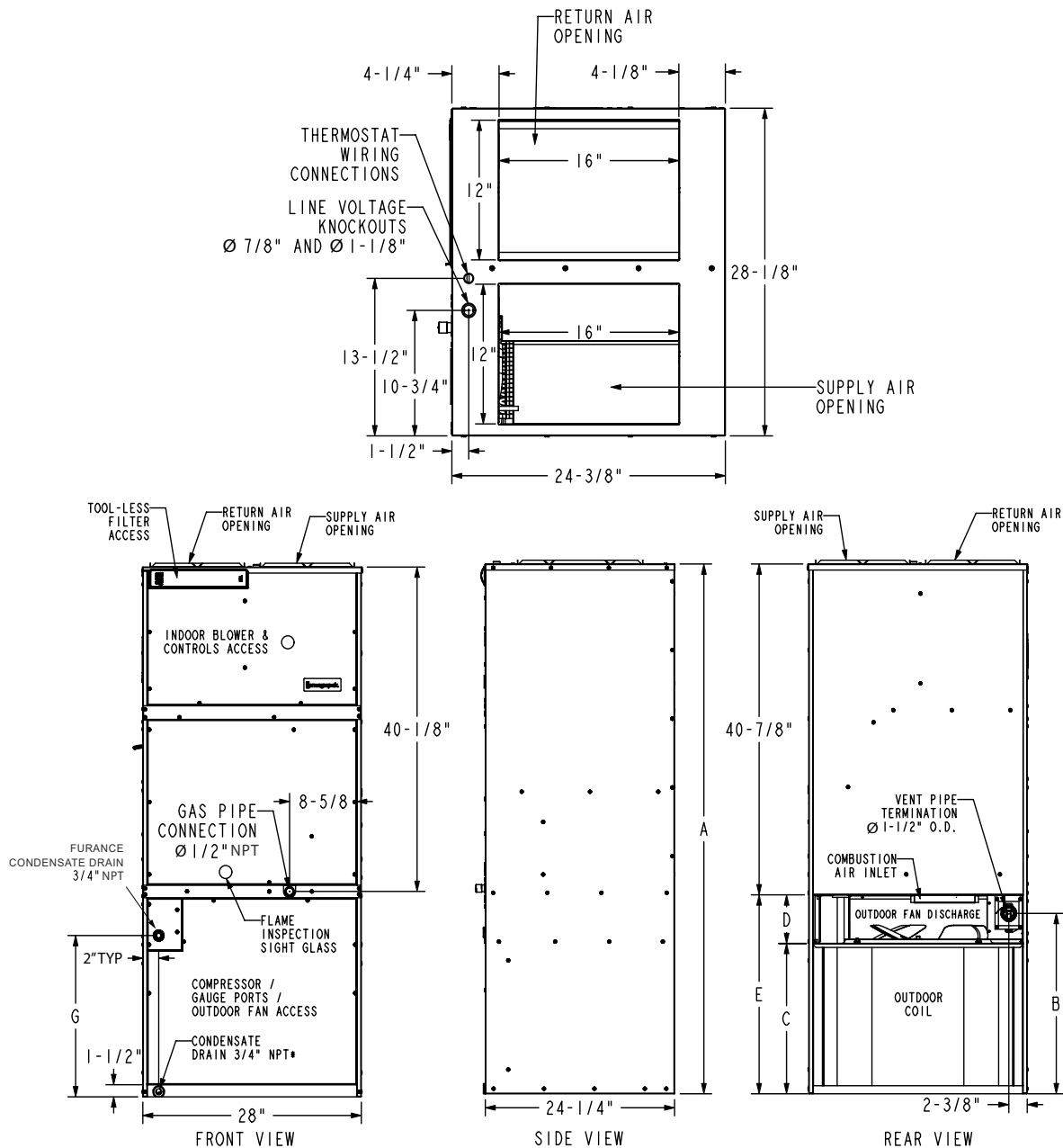
Verify cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

WARNING

These units are not approved for mobile home applications. Such use could result in property damage, personal injury, or death.

Unit Dimensions (in.)

MODEL	A	B	C	D	E	G
MGE920-7-11-12NP-01A	65-1/2"	22-5/16"	18-5/8"	6"	24-5/8"	20"
MGE930-7-11-12NP-01A						
MGE920-7-11-18NP-01A						
MGE930-7-11-18NP-01A						
MGE930-7-11-24NP-01A	67-1/2"	24-5/16"	20-5/8"		26-5/8"	22"
MGE940-7-11-24NP-01A						
MGE950-7-11-24NP-01A						
MGE930-7-13-30NP-01A						
MGE940-7-13-30NP-01A	71-1/2"	28-5/16"	24-5/8"		30-5/8"	26"
MGE950-7-13-30NP-01A						



*Provisions must be made to properly drain condensate from the drain pan and provisions must be made to properly drain furnace condensate from drain trap.

Figure 1.

Accessibility Clearances

The front of the unit must be accessible for service. A minimum clearance of 30" in front of unit is required for service.

If the unit is enclosed, a door or access panel aligned with the front of the unit is the preferred method of providing access. The door or access panel opening must be a minimum of 30" wide (centered on the unit) and be as tall as the unit.

IMPORTANT

The unit must be installed with approved wall sleeve and louver accessories for safe operation. Improper installations could result in property damage, personal injury, or death.

Supply Duct Clearances

Minimum Clearances to Combustible Materials¹

Front	Sides	Top
0"	0"	0"

¹ Accessibility clearances take precedence.

Unit Clearances

Minimum Clearances^[1]

Front ²	Sides ³
1"	1"

¹ Accessibility clearances take precedence.

² Clearance must accommodate field-installed condensate drain line / drain trap and gas line.

³ Additional clearance required if field-installed condensate drain line / drain trap is routing alongside unit.

NOTE: Consult local codes for other clearance requirements

CAUTION

Do not use tools to tighten fitting into drain. Drain lines must be hand tightened.

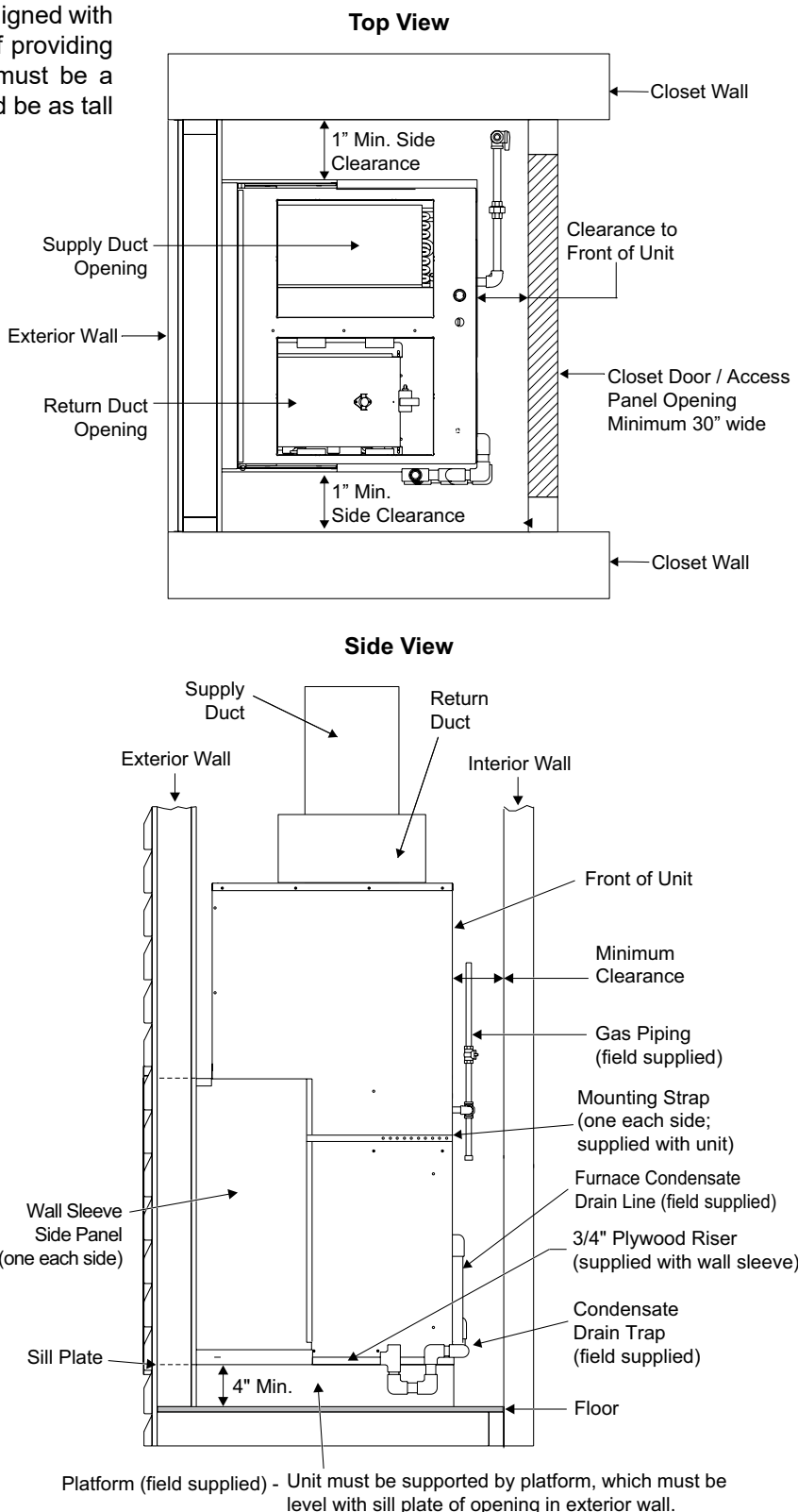


Figure 2. Minimum Clearances

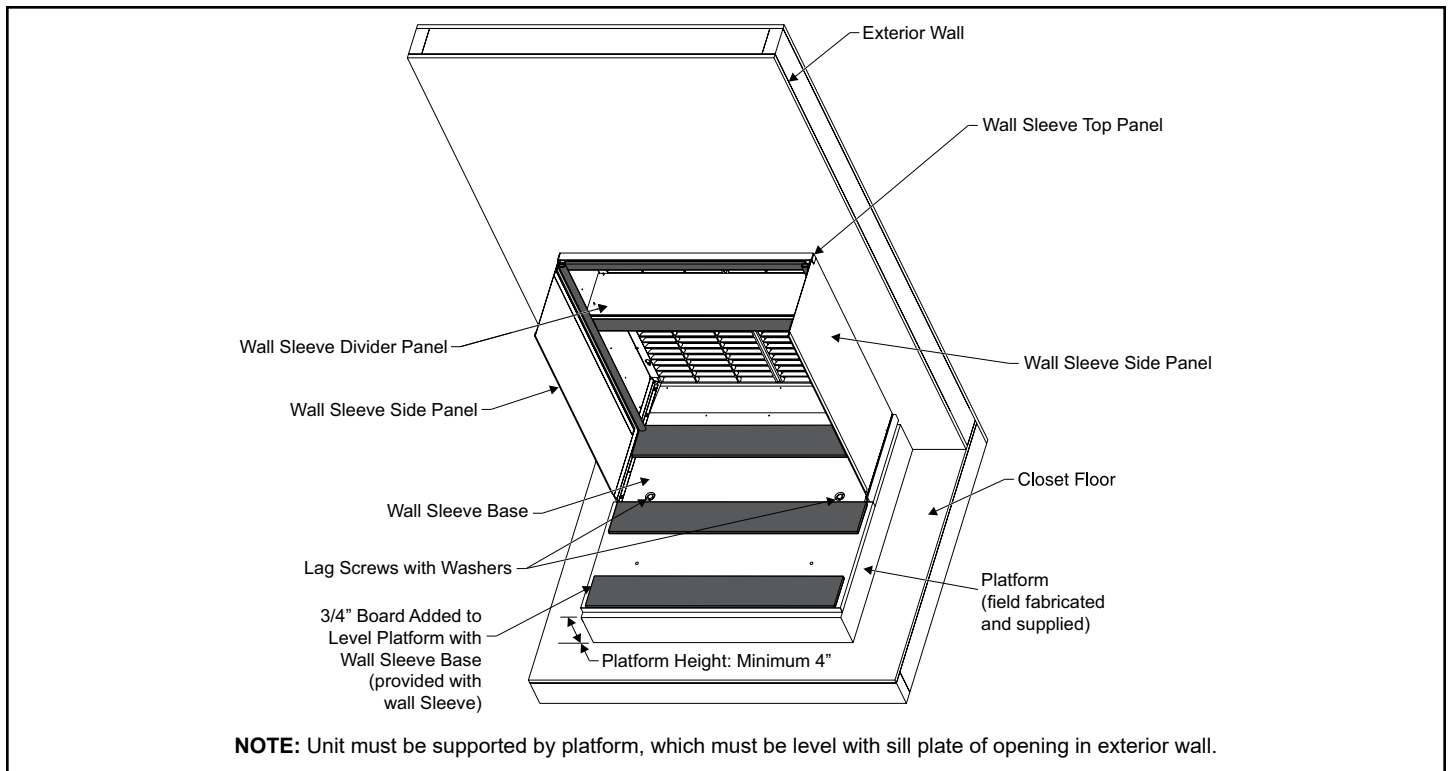


Figure 3. Wall Sleeve and Louver Kit Installation

Location

⚠ WARNING

The unit must be installed with approved wall sleeve and louver accessories for safe operation. Improper installations could result in property damage, personal injury, or death.

For information on wall sleeves and louver accessories, see the **Accessories** section.

This unit is designed to be installed up to the wall (exterior wall) only. Refer to Figure 2 for additional details. The furnace must meet the fire protection clearance requirements (clearance to combustibles as specified on the unit nameplate and in figure 2 of the installation instructions), but if the clearances needed for accessibility and servicing are greater, those larger clearances must be prioritized.

The outside of the unit should not be obstructed with trees, landscape materials, or building structure. Unit can be installed recessed with appropriate wall sleeve accessories.

There is no minimum clearance required on locating the unit to an interior corner of a building.

If the unit is installed in a residential garage, it must be located or protected to avoid physical damage by vehicles. The unit must be installed so that no electrical components are exposed to water.

⚠ CAUTION

This unit must be installed level to allow for proper drainage of the unit base pan and indoor drain pan.

Use of Unit During Construction

Use of this unit as a construction heater or air conditioner is not recommended during any phase of construction. Very low return air temperature, harmful vapors and operation of the unit with clogged or misplaced filters will damage the unit.

Units may be used for heating or cooling of buildings or structures under construction if the following conditions are met or the warranty will be void:

- The unit must be permanently installed per these installation instructions.
- A room thermostat must control the unit. The use of fixed jumpers that will provide continuous heating is not allowed.
- Supply and return air duct must be provided and sealed to the unit.
- Return air temperature range between 60°F (16°C) and 80°F (27°C) must be maintained.
- MERV 11 or greater air filters must be installed in the system and must be regularly inspected and maintained (e.g., regular static checks and replaced at end of life) during construction.

- Air filters must be replaced upon construction completion.
- The input rate and temperature rise must be set per the unit rating plate.
- One hundred percent (100%) outdoor air must be provided for combustion air requirements during construction.
- The heat exchanger, components, duct system, air filters and evaporator coils must be thoroughly cleaned following final construction cleanup.
- The unit operating conditions (including airflow, cooling operation, ignition, input rate, temperature rise and venting) must be verified according to these installation instructions.

Wall Sleeve and Louver Installation

For proper performance and operation, the unit must be installed with a factory approved wall sleeve and louver combination.

Refer to installation instructions included with the wall sleeve and the louver along with Figure 3 for guidance in assembling and installing the wall sleeve and louver.

CAUTION

The sleeve is not intended as the sole support for the unit. An additional support must be provided for adequate support (see Figure 3).

Installing and Securing Unit to Wall Sleeve

Before installing and securing the unit to the wall sleeve, make sure that the proper louver is installed. Due to the high temperatures of the combustion products released from the vent pipe, these units require the use of either an aluminum louver or polypropylene louver (see the **Accessories** section).

1. Make sure the gaskets attached to the sleeve are not damaged.
2. Verify divider panel is positioned properly. Refer to Table 2 for wall sleeves that allow for multiple divider panel locations.
3. Place the unit into the wall sleeve. Lift leading end of unit and walk unit onto the sleeve. Once in the wall sleeve, lower the unit into position. This prevents damage to the base pads. Assure that the unit is level and completely seated against the gaskets on the wall sleeve. The unit must be supported by a field-fabricated and supplied platform.

Model	ASLEEVE**-2	ASLEEVE**-5	Orientation of Flange
	Two Positions	Three Positions	
MGE9*-7-11-12	Lower	Lower	Down
MGE9*-7-11-18,24			Up
MGE9*-7-11-30	Upper	Middle	

Table 2. Wall Sleeve Divider Location

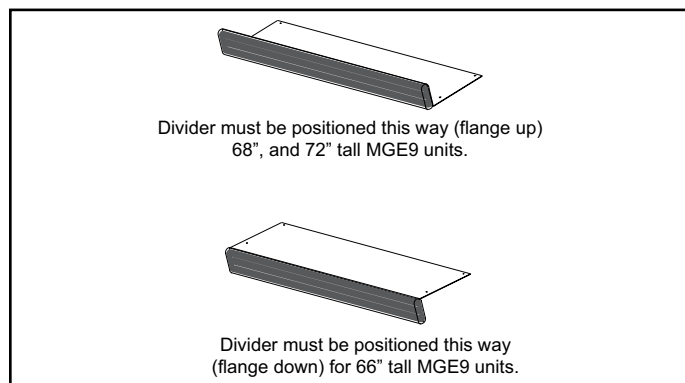


Figure 4. Positioning Divider Panel

4. Use the two installation brackets to secure the unit to the wall sleeve (see Figure 7). The units are shipped with the brackets placed loose on the unit top panel, beneath packaging. Hook each bracket into the front edge of the wall sleeve side panel. Position the bracket so it can be bent around the front corner of the unit. Remove one of the two screws in that position on the unit. Line up one of the holes in the installation bracket with the screw hole and attach the bracket to the unit with that screw. Make sure to fasten tight enough that the seal is maintained. Trim off excess bracket if applicable.
5. Inspect the fit up of the unit to the wall sleeve. Verify that the gaskets of the wall sleeve make a complete seal to the unit paying particular attention to top and bottom corners of unit to sleeve seal. Caulk if needed.

Venting

The venting system is an integral part of the appliance. The venting system must not be modified in any manner other than what is specified in these instructions.

This appliance should be installed in a location such that the vent outlet is located in the following manner:

1. Distances to windows that open, building openings, or public walkways should be consistent with the National Fuel Gas Code Z223.1.
2. For U.S. installations, the vent system shall terminate a minimum horizontal clearance of 4' from electric meters, regulators, and relief equipment.

3. Flue products from properly adjusted and maintained units, should not cause degradation to building materials.

The unit contains a combustion air inducer. The inducer draws the combustion products out of the heat exchanger together with dilution air and forces the mixture from the unit to the outside. No special provisions are required for supplying air for combustion, nor is a chimney required as this is a direct vent appliance.

The vent outlet must be extended (see Vent Pipe Installation).

The venting system is designed for proper operation under most weather conditions and for wind speeds up to 40 miles per hour. The venting system should be unobstructed for a minimum of 2 feet.

Existing Venting Systems

When an existing furnace is removed and replaced, the MGE* unit venting system may no longer be sized to properly vent the attached appliances. An improperly sized venting system can result in spillage of flue products into the living space, the formation of condensate, leakage, etc. Refer to the **CAUTION** box in the next column for proper test procedure.

Locating Vent Pipe & Extension

Determining the length of the vent pipe extension is dependent upon which wall sleeve accessory is installed at the job site for each particular installation.

CAUTION

For proper operation, the vent length must be correct for the installation. The unit may not operate correctly with inadequate vent length.

1. Access vent pipe at the side of the unit that will face the outdoors.
2. The vent pipe and vent pipe extension is located to the right of the outdoor fan (see Figure 5).

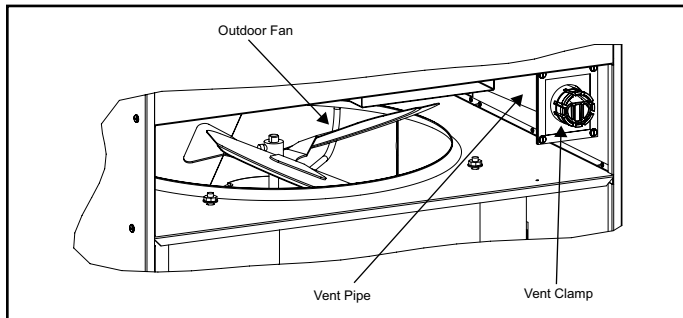


Figure 5. Locating Vent Pipe and Extension

3. Loosen the vent clamp used to clamp the inner vent pipe to the outer vent pipe for adjusting vent length based on wall thickness.

CAUTION

Carbon Monoxide Poisoning Hazard

Failure to follow the steps outlined below for each appliance connected to the venting system being placed into operation could result in carbon monoxide poisoning or death.

The following steps shall be followed for each appliance connected to the venting system being placed into operation, while all other appliances connected to the common venting system are not in operation:

1. Seal any unused openings in the common venting system.
2. Visually inspect the venting system for proper size and horizontal pitch, as required in the National Fuel Gas Code, ANSI Z223.1/NFPA 54 (latest edition) and these instructions. Determine that there is no blockage or restriction, leakage, corrosion, or other deficiencies which could cause an unsafe condition.
3. As far as practical, close all building doors and windows between the space in which the appliance(s) connected to the venting system are located and other spaces in the building.
4. Close fireplace dampers.
5. Turn on clothes dryers and any appliance not connected to the venting system. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they are operating at maximum speed. Do not operate a summer exhaust fan.
6. Follow the lighting instructions. Place the unit being inspected in operation. Adjust the thermostat so appliance is operating continuously.
7. Test for spillage from draft hood equipped appliances at the draft hood relief opening after 5 minutes of main burner operation. Use the flame of a match or candle.
8. If improper venting is observed during any of the above tests, the venting system must be corrected in accordance with the National Fuel Gas Code, ANSI Z223.1/NFPA 54 (latest edition).
9. After it has been determined that each appliance remaining connected to the venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers, and any other gas-fired burning appliance to their previous conditions of use.

- The inner vent pipe slides inside the outer vent pipe for adjusting vent length based on varying wall thickness. This feature allows the vent to be extended the necessary length required for the installation. The inner vent pipe has markings to indicate vent length of inner pipe extension (see Figure 5 and 6). This vent can be adjusted for a maximum of 18 inches.
- Tighten vent clamp after inner pipe has been adjusted for necessary length required for installation to secure inner vent pipe.

Wall Sleeve Used	Approximate Length the Vent Pipe Extends from the Cabinet
ASLEEVE6-1, 2, 5	6.0 in.
ASLEEVE8-1, 2, 5	8.0 in.
ASLEEVE10-1, 2, 5	10.0 in.
ASLEEVE12-1, 2, 5	12.0 in.

Table 3. Determining Hole Setting

- Position the vent pipe at the center of the metal wire grille when using polypropylene louvers. The vent pipe should have a slight slope to allow any moisture to drain back into the unit as well as being centered on the metal wire grille.

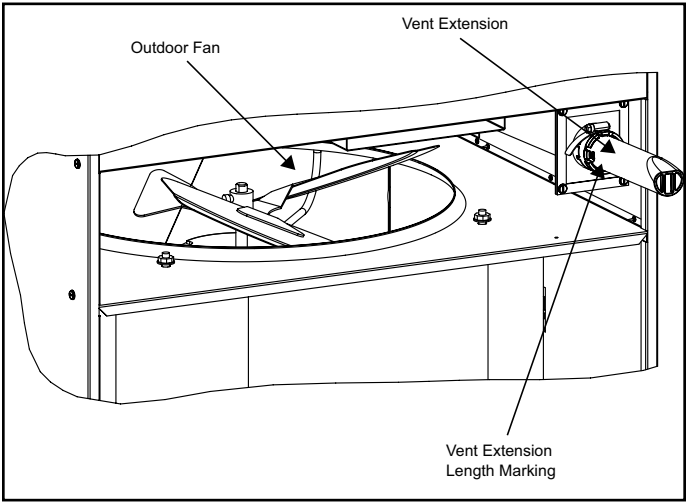


Figure 6. Positioning Vent Pipe Extension

Ductwork

Ductwork should be designed and sized according to the methods in Manual Q of the Air Conditioning Contractors of America (ACCA).

Check unit supply and return air openings for debris before making ductwork connections.

It is recommended that supply and return duct connections at the unit be made with flexible joints. If flexible ducts are used, a 6" sheet metal starter collar is required.

The supply and return air duct systems should be fabricated per the designed CFM and static requirements of the job (see Table 4). **Ductwork should not be sized to match the dimensions of the duct connections on the unit.** The return duct should be sealed to the unit casing and terminate outside the space containing the unit.

CAUTION

Do not screw into the side of the drain pan or the indoor coil, which is located above the installation bracket.

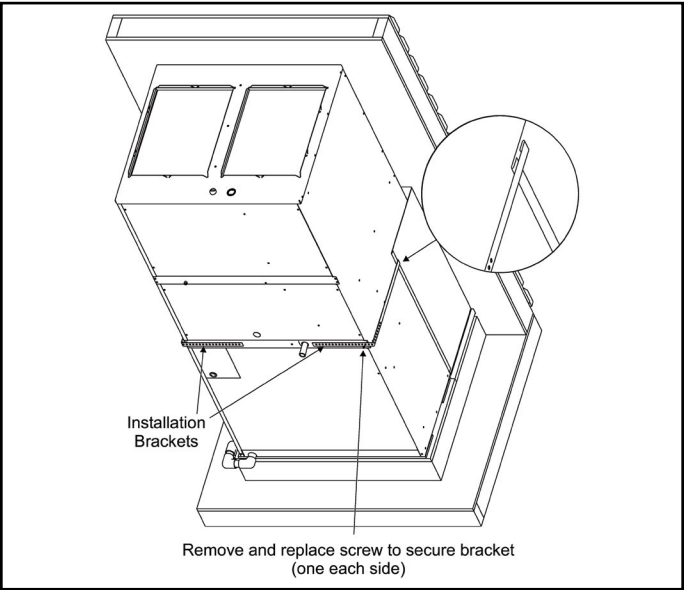


Figure 7. Securing Unit

BLOWER PERFORMANCE

- Performance based on factory-provided washable filter installed in the unit.
- If a higher resistance filter is field installed in the unit, the added resistance must be included in the external static pressure and must not exceed 0.5 in. w.c. including ductwork.
- Refer to Factory Filter Size and Pressure Drop table for additional details.

				SUPPLY AIRFLOW PERFORMANCE AS A FUNCTION OF EXTERNAL STATIC PRESSURE															
Tonnage	Model	Gas Heating		Indoor Blower Speed	0.1" w.c.			0.2" w.c.			0.3" w.c.			0.4" w.c.			0.5" w.c.		
		Rise Range (F°)	Mid Rise (F°)		SCFM	Watts	Temp Rise	SCFM	Watts	Temp Rise	SCFM	Watts	Temp Rise	SCFM	Watts	Temp Rise	SCFM	Watts	Temp Rise
1.0	MGE920-7-11-12NP	25 - 55 (15 - 45)	40 (30)	TAP 1 (FAN)	380	55	---	330	58	---	280	60	---	230	63	---	---	---	---
				TAP 2 (COOL)	490	80	---	450	84	---	410	87	---	365	89	---	320	92	---
				TAP 3 (COOL) [†]	520	91	---	480	94	---	440	97	---	405	100	---	365	103	---
				TAP 4 (HEAT) [*]	425	65	31	380	68	35	340	71	39	290	74	45	---	---	---
				TAP 5 (HEAT) [#]	425	65	41	380	68	46	340	71	52	290	74	61	---	---	---
	MGE930-7-11-12NP	25 - 55 (15 - 45)	40 (30)	TAP 1 (FAN)	380	55	---	330	58	---	280	60	---	230	63	---	---	---	---
				TAP 2 (COOL)	490	80	---	450	84	---	410	87	---	365	89	---	320	92	---
				TAP 3 (COOL) [†]	520	91	---	480	94	---	440	97	---	405	100	---	365	103	---
				TAP 4 (HEAT) [*]	660	151	30	630	156	31	590	159	34	560	162	35	530	162	37
				TAP 5 (HEAT) [#]	660	151	40	630	156	42	590	159	45	560	162	47	530	162	50
1.5	MGE920-7-11-18NP	25 - 55 (15 - 45)	40 (30)	TAP 1 (FAN)	490	80	---	450	84	---	410	87	---	365	89	---	320	92	---
				TAP 2 (COOL)	660	151	---	630	156	---	590	159	---	560	162	---	530	162	---
				TAP 3 (COOL) [†]	710	176	---	680	181	---	645	185	---	615	188	---	585	192	---
				TAP 4 (HEAT) [*]	425	65	31	380	68	35	340	71	39	290	74	45	---	---	---
				TAP 5 (HEAT) [#]	425	65	41	380	68	46	340	71	52	290	74	61	---	---	---
	MGE930-7-11-18NP	25 - 55 (15 - 45)	40 (30)	TAP 1 (FAN)	490	80	---	450	84	---	410	87	---	365	89	---	320	92	---
				TAP 2 (COOL)	660	151	---	630	156	---	590	159	---	560	162	---	530	162	---
				TAP 3 (COOL) [†]	710	176	---	680	181	---	645	185	---	615	188	---	585	192	---
				TAP 4 (HEAT) [*]	660	151	30	630	156	31	590	159	34	560	162	35	530	162	37
				TAP 5 (HEAT) [#]	660	151	40	630	156	42	590	159	45	560	162	47	530	162	50

N/A: Do not operate unit using this blower speed at this external static pressure.

[†] As shipped speed for Cooling operation. Blower speed must be field adjusted to speed Tap 2 for lower duct static applications.

^{*} As shipped speed for Low Stage heating operation.

[#] As shipped speed for High Stage heating operation.

SCFM = standard cubic feet per minute

Table 4. Blower Performance (208V or 230V)

BLOWER PERFORMANCE CONTINUED

- Performance based on factory-provided washable filter installed in the unit.
- If a higher resistance filter is field installed in the unit, the added resistance must be included in the external static pressure and must not exceed 0.5 in. w.c. including ductwork.
- Refer to Factory Filter Size and Pressure Drop table for additional details.

				SUPPLY AIRFLOW PERFORMANCE AS A FUNCTION OF EXTERNAL STATIC PRESSURE															
Tonnage	Model	Gas Heating		Indoor Blower Speed	0.1" w.c.			0.2" w.c.			0.3" w.c.			0.4" w.c.			0.5" w.c.		
		Rise Range (F°)	Mid Rise (F°)		SCFM	Watts	Temp Rise	SCFM	Watts	Temp Rise	SCFM	Watts	Temp Rise	SCFM	Watts	Temp Rise	SCFM	Watts	Temp Rise
2.0	MGE930-7-11-24NP	25 - 55 (15 - 45)	40 (30)	TAP 1 (FAN)	480	81	---	440	84	---	400	87	---	365	89	---	320	92	---
				TAP 2 (COOL)	815	254	---	785	258	---	760	262	---	735	266	---	705	272	---
				TAP 3 (COOL) [†]	840	273	---	810	277	---	785	281	---	760	285	---	730	291	---
				TAP 4 (HEAT) [*]	660	151	30	630	156	31	590	159	34	560	162	35	530	162	37
				TAP 5 (HEAT) [#]	660	151	40	630	156	42	590	159	45	560	162	47	530	162	50
	MGE940-7-11-24NP	25 - 55 (15 - 45)	40 (30)	TAP 1 (FAN)	480	81	---	440	84	---	400	87	---	365	89	---	320	92	---
				TAP 2 (COOL)	815	254	---	785	258	---	760	262	---	735	266	---	705	272	---
				TAP 3 (COOL) [†]	840	273	---	810	277	---	785	281	---	760	285	---	730	291	---
				TAP 4 (HEAT) [*]	795	234	33	760	238	35	735	243	36	710	247	37	680	252	39
				TAP 5 (HEAT) [#]	795	234	44	760	238	46	735	243	48	710	247	50	680	252	52
	MGE950-7-11-24NP	25 - 55 (20 - 50)	40 (35)	TAP 1 (FAN)	480	81	---	440	84	---	400	87	---	365	89	---	320	92	---
				TAP 2 (COOL)	815	254	---	785	258	---	760	262	---	735	266	---	705	272	---
				TAP 3 (COOL) [†]	840	273	---	810	277	---	785	281	---	760	285	---	730	291	---
				TAP 4 (HEAT) [*]	970	387	34	940	386	35	910	385	36	880	384	37	845	383	39
				TAP 5 (HEAT) [#]	970	387	45	940	386	47	910	385	48	880	384	50	845	383	52

N/A: Do not operate unit using this blower speed at this external static pressure.

[†] As shipped speed for Cooling operation. Blower speed must be field adjusted to speed Tap 2 for lower duct static applications.

^{*} As shipped speed for Low Stage heating operation.

[#] As shipped speed for High Stage heating operation.

SCFM = standard cubic feet per minute

Table 4. Blower Performance (208V or 230V)

BLOWER PERFORMANCE CONTINUED

- Performance based on factory-provided washable filter installed in the unit.
- If a higher resistance filter is installed in the unit, the added resistance must be included in the external static pressure and must not exceed 0.5 in. w.c. including ductwork.
- Refer to Factory Filter Size and Pressure Drop table for additional details.

				SUPPLY AIRFLOW PERFORMANCE AS A FUNCTION OF EXTERNAL STATIC PRESSURE															
Tonnage	Model	Gas Heating		Indoor Blower Speed	0.1" w.c.			0.2" w.c.			0.3" w.c.			0.4" w.c.			0.5" w.c.		
		Rise Range (F°)	Mid Rise (F°)		SCFM	Watts	Temp Rise	SCFM	Watts	Temp Rise	SCFM	Watts	Temp Rise	SCFM	Watts	Temp Rise	SCFM	Watts	Temp Rise
2.5	MGE930-7-11-30NP	25 - 55 (15 - 45)	40 (30)	TAP 1 (FAN)	650	145	---	620	147	---	575	151	---	540	154	---	510	158	---
				TAP 2 (COOL)	935	350	---	910	352	---	875	351	---	840	350	---	805	349	---
				TAP 3 (COOL)†	950	366	---	915	365	---	890	364	---	855	363	---	820	362	---
				TAP 4 (HEAT)*	660	151	30	630	156	31	590	159	34	560	162	35	530	162	37
				TAP 5 (HEAT)#	660	151	40	630	156	42	590	159	45	560	162	47	530	162	50
	MGE940-7-11-30NP	25 - 55 (15 - 45)	40 (30)	TAP 1 (FAN)	650	145	---	620	147	---	575	151	---	540	154	---	510	158	---
				TAP 2 (COOL)	935	350	---	910	352	---	875	351	---	840	350	---	805	349	---
				TAP 3 (COOL)†	950	366	---	915	365	---	890	364	---	855	363	---	820	362	---
				TAP 4 (HEAT)*	795	234	33	760	238	35	735	243	36	710	247	37	680	252	39
				TAP 5 (HEAT)#	795	234	44	760	238	46	735	243	48	710	247	50	680	252	52
	MGE950-7-11-30NP	25 - 55 (20 - 50)	40 (35)	TAP 1 (FAN)	650	145	---	620	147	---	575	151	---	540	154	---	510	158	---
				TAP 2 (COOL)	935	350	---	910	352	---	875	351	---	840	350	---	805	349	---
				TAP 3 (COOL)†	950	366	---	915	365	---	890	364	---	855	363	---	820	362	---
				TAP 4 (HEAT)*	970	387	34	940	386	35	910	385	36	880	384	37	845	383	39
				TAP 5 (HEAT)#	970	387	45	940	386	47	910	385	48	880	384	50	845	383	52

N/A: Do not operate unit using this blower speed at this external static pressure.

[†] As shipped speed for Cooling operation. Blower speed must be field adjusted to speed Tap 2 for lower duct static applications.

^{*} As shipped speed for Low Stage heating operation.

[#] As shipped speed for High Stage heating operation.

SCFM = standard cubic feet per minute

Table 4. Blower Performance (208V or 230V)

Filter

All return air must be filtered. A washable filter is furnished with the unit, located in the return air opening.

If a filter is installed at a separate central return location, then the factory furnished filter must be removed from the unit.

If an installation is made in which it is more desirable to mount the filter exterior to the unit, in the return duct work or elsewhere, the washable filter can be used or replaced with a disposable filter. If a disposable filter is used in lieu of a washable filter, use the information provided in Table 5 when sizing the disposable filter.

Model Number	Filter Area (in ²)
MGE920*-7-11-12* MGE930*-7-11-12*	210
MGE920*-7-11-18* MGE930*-7-11-18*	325
MGE930*-7-11-24* MGE940*-7-11-24* MGE950*-7-11-24*	385
MGE930*-7-11-30* MGE940*-7-11-30* MGE950*-7-11-30*	435

Table 5. Minimum Required Surface Area for Disposable Filters

When proper duct design is applied, field-provided filters up to MERV 6 can typically be installed in the unit's factory filter location in lieu of a washable filter. If a higher resistance filter is field installed in the unit, the added resistance must be included in the external static pressure and must not exceed 0.5 in. w.c., including ductwork.

Evaporator Condensate Drain

Provisions must be made to properly drain condensate from the drain pan.

Condensate drain connection: 3/4" NPT to 3/4" PVC fitting (schedule 40 minimum). Drain must be trapped as shown in Figure 8. The drain line should pitch gradually downward at least 1" per 10' of horizontal run to open drain. Field fabricated platform should be 4" minimum to allow for proper trapping and drainage.

CAUTION

Use thread sealant on the threaded fittings. Install threaded fittings by hand only. **Do not over torque the fittings.**

If local codes require the use of metal condensate lines, do not thread metal fittings into the unit drain pans. Thread a PVC fitting into the unit drain pans and make the field connection to the PVC fitting.

NOTE: *These units are designed with a redundant drain system to handle condensate without the need for a secondary or emergency drain pan. Should the indoor coil condensate drain system fail, all water is contained within the unit and the flow is directed into the unit base pan. From there it will drain into the condensate riser.*

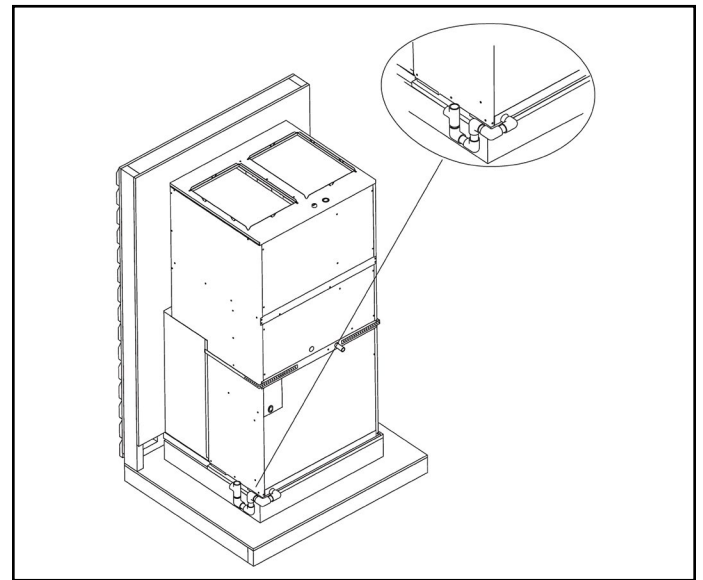


Figure 8. Evaporator Condensate Drain Installation

Furnace Condensate Drain

The MGE9 furnace is provided with an internal condensate trap and a condensate drain connection for disposing furnace condensate. All drain piping is field-supplied to suit the installation and local codes.

If the furnace is installed in an unconditioned space, the external field condensate piping must have heat tape suitable for PVC pipe installed. This heat tape and insulation are field-supplied from standard hardware items that are available locally and they must be installed in accordance with the instructions provided by their manufactures.

Units are designed with the furnace drain fitting exiting the front of the service door (inline with evaporator condensate drain – Figures 9 and 10).

If unit will be started immediately upon completion of installation, the drain must be primed as described in the procedure outlined in the “Start-up” section.

Field installed piping from the furnace must slope downward a Minimum of 1/2" per foot toward the floor drain.

If necessary, the condensate line from the furnace and evaporator coil can drain together.

Depending on applicable local codes and ordinances, the installer must provide and install a condensate neutralizer if required. Please refer to application guide for heating condensate treatment.

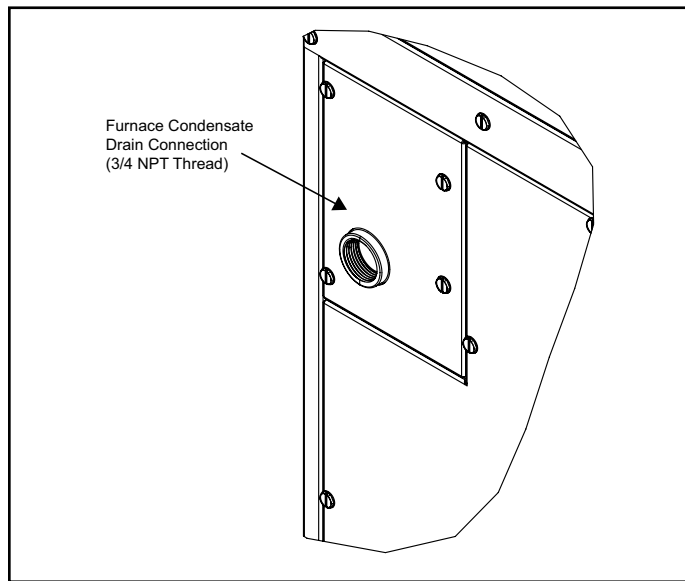


Figure 9. Furnace condensate connection

Electrical Connections

All wiring must be done in accordance with the National Electrical Code (NEC), ANSI/NFPA No. 70 (latest edition); or local codes, where they prevail. Any alteration of internal wiring will void certification and warranty.

Units are factory wired for a 230 volt power supply. If power supply is 208 volts, it will be necessary to change a wire connection on unit transformer from 240 volt terminal to 208 volt terminal as shown on the wiring diagram.

Use wiring with a temperature limitation of 75°C minimum. Run the 208 or 230 volt, single phase, 60 hertz electric power supply through a fused disconnect switch and connect to the unit as shown in the unit's wiring diagram.

The unit must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code ANSI/NFPA No. 70 (latest edition).

The power supply to the unit must be NEC Class 1 and must comply with all applicable codes. A fused disconnect switch should be field provided for the unit, and must be separate from all other circuits. If any of the wire supplied with the unit must be replaced, replacement wire must be of the type shown on the wiring diagram.

Electrical wiring must be sized to minimum circuit ampacity (MCA) marked on the unit. **Use copper conductors only.** Each unit must be wired with a separate branch circuit and be properly fused.

Gas Supply and Piping

Refer to unit rating plate to make sure the furnace is equipped to utilize the type of fuel that is being provided (natural or propane).

WARNING

Any conversion of a natural gas unit to propane gas must be done by qualified personnel using a conversion kit available from the manufacturer, following the instructions in the conversion kit. If done improperly, over-firing of the burners and improper burner operation can result. This can create carbon monoxide which could cause asphyxiation.

Gas supply piping should be installed in accordance with local codes and the regulations of the utility. Piping must be of adequate size to prevent undue pressure drop. Consult the local utility or gas supplier for complete details on special requirements for sizing gas piping.

If local codes allow the use of a flexible gas appliance connector, always use a new approved connector. Do not use a connector which has previously serviced another gas appliance.

Pipe connections must be tight, and a non-hardening pipe compound resistant to liquefied petroleum gases must be used.

Connect the gas pipe to the gas pipe connection providing a ground joint union as close to the gas pipe connection as is possible to facilitate removal of controls and manifold. Provide a drip leg on the outside of the furnace. A manual shutoff valve shall be installed in the gas line, outside the unit, 5' above the floor, or in accordance with any local codes.

The furnace must be isolated from the gas supply piping system by closing the individual manual shutoff valve during any pressure testing of the gas supply piping system at test pressure equal to or less than 1/2 psig (3.5 kPa) or 14" W.C. If the piping system is to be tested at pressures in excess of 1/2 psig (3.5 kPa), the furnace and its appliance main gas valve must be disconnected from the gas supply piping system.

After gas piping is complete, carefully check all piping connections (factory and field) for gas leaks. Use a leak detecting solution or other preferred means. Some soaps used for leak detection are corrosive to certain metals. Carefully rinse piping thoroughly after leak detection has been completed.

⚠ WARNING

The gas valve supplied with this furnace is rated at 1/2 psig maximum. Any higher pressure may rupture the pressure regulator diaphragm and may cause over-firing of the burners and improper burner operation. The over-firing may result in the creation of carbon monoxide which could cause asphyxiation.

⚠ WARNING

Fire or Explosion Hazard

Failure to follow the safety warnings exactly could result in serious injury, death, or property damage.

Never test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks to check all connections. A fire or explosion may result causing property damage, personal injury, or loss of life.

Thermostat

The room thermostat should be located on an inside wall where it will not be subject to drafts, sun exposure, or heat from electrical fixtures or appliances. Follow manufacturer's instructions enclosed with the thermostat for general installation procedures. Color-coded insulated wires (#18 AWG) should be used to connect the thermostat to the unit.

Start-Up

For Your Safety, Read Before Lighting

⚠ WARNING

If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury, or loss of life.

⚠ CAUTION

This furnace is equipped with a direct ignition control. Do not attempt to manually light the burners.

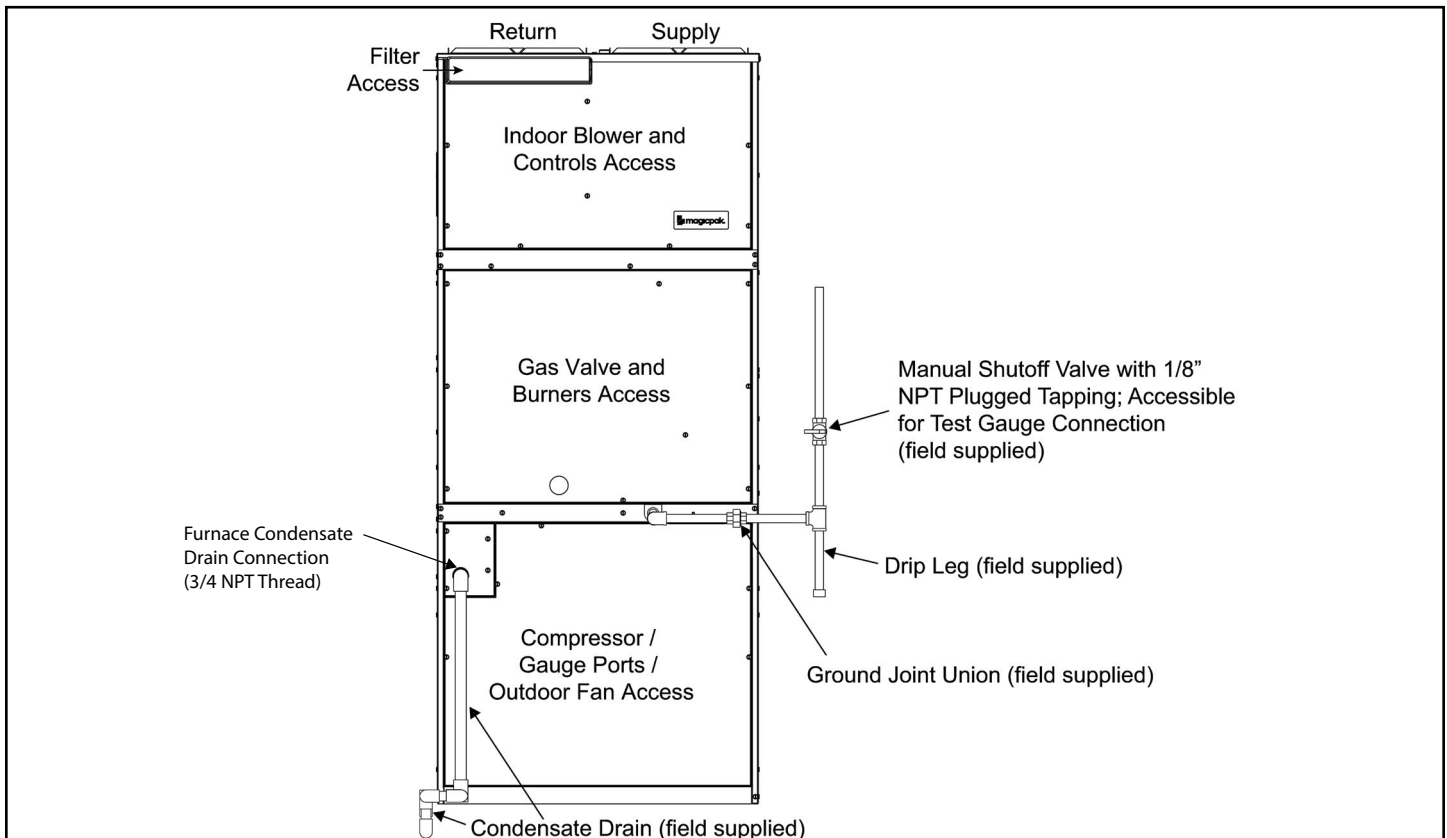


Figure 10. Gas Supply Piping

Priming Condensate Trap

The condensate trap must be primed with water prior to start-up to ensure proper condensate drainage. See Figure 11 to identify the upper drain hose. Follow these steps to prime the trap:

1. Disconnect the upper drain hose at the collector box.
2. Flex the hose so that water can be poured into it. Pour 5 fl. oz. (147 ml) of water into the trap.
3. Reconnect the upper drain hose.
4. Follow the lighting instructions to place the unit into operation.
5. Set the thermostat to initiate a heating demand.

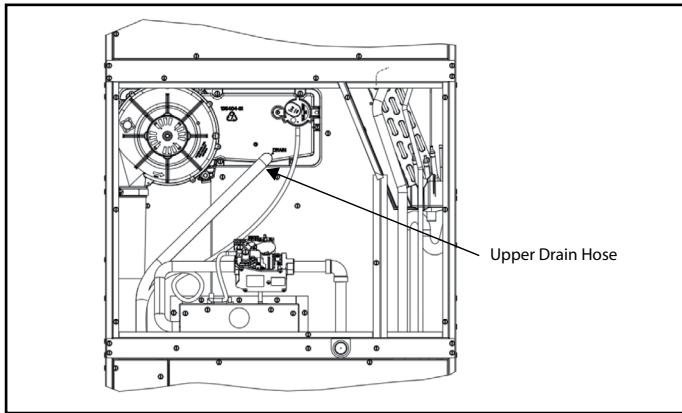


Figure 11. Condensate Hose

To Light Burners

1. Turn off electrical power to unit.
2. Turn the thermostat to lowest setting.
3. Move the gas valve switch to the “ON” position (see Figure 12).
4. Turn on electrical power to the unit.
5. Set the room thermostat to the desired temperature. If the thermostat “set” temperature is above room temperature after the pre-purge time expires, burners will light.

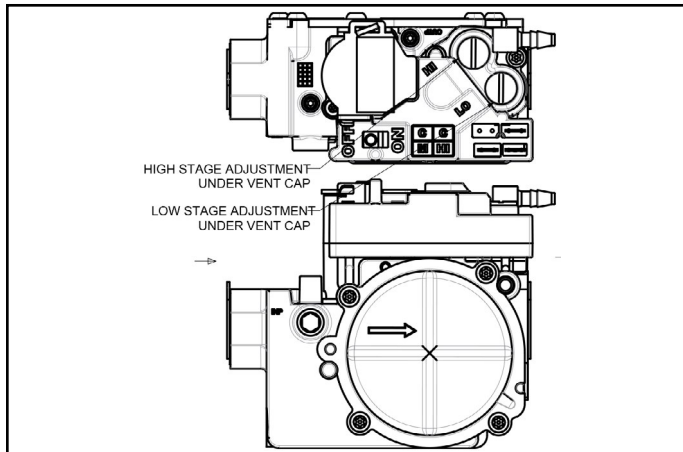


Figure 12. Gas Valve

To Shut Down Unit

1. Turn off electrical power to unit.
2. Move the gas valve switch to the “OFF” position (see Figure 12).

Operation

Operation of the unit is automatic and will provide heating and cooling depending on the setting of the thermostat. W1 activates low stage heat and W2 activates high stage heat. If using a single stage thermostat, W1 and W2 must be jumped together at thermostat.

Heating

1. Turn on main power supply.
2. Open manual gas shutoff valve.
3. Set thermostat system to “HEAT”.
4. Set thermostat to temperature desired.

Sequence of Operation

1. Thermostat calls for heat.
2. Combustion air inducer starts and proper air flow is proven by the pressure switch closing.
3. Blower continues to operate for 30 seconds prior to the burners lighting.
4. Ignition control begins spark and opens gas valve. The burners are lit. Ignition is proved through flame sensor.
5. Supply air blower starts 30 seconds after the burners light.
6. When the thermostat is satisfied, the burners and combustion air inducer shut off.
7. Supply air blower will shut off 120 seconds later.

If the burners should fail to ignite, the ignition control will try to ignite the burners a total of three times. Should the burners fail to ignite within the three trials for ignition, the ignition control will lock out for 1 hour before beginning another ignition cycle. To reset the control, turn the thermostat down or off for 10 seconds and then set to desired setting. At this time, the ignition sequence will try again.

Cooling

1. Set thermostat system switch to "COOL."
2. Set thermostat to temperature desired.

NOTE: When Y is energized, the combustion air inducer will operate for 10 seconds. The purpose of this action is to deter insect nesting in the flue pipe.

To Shut Down Unit

For temporary or short periods of shutdown, set the thermostat system switch to "OFF". For a prolonged period of shutdown, set the thermostat system switch to "OFF" and turn off the electrical power supply and the gas supply to the unit.

Adjustments – Heating Section

Temperature Rise

At time of installation, the temperature rise must be adjusted to be within the range specified on the unit rating plate.

Checking and Adjusting Gas Input

The gas input must not exceed the figures shown on the rating plate. The unit is equipped for rated inputs with manifold pressures of: 3.5" w.c. for natural gas and 10.0" w.c. for propane. The furnace requires conversion for use with propane; the MagicPak propane conversion kit must be used.

The manifold pressure can be measured by removing the pipe plug in the downstream side of the gas valve and connecting a water manometer or gauge.

Only small variations in gas input may be made by adjusting the regulator. **In no case should the final manifold pressure vary more than 0.3" w.c. for natural gas or 0.7" w.c. for propane.**

WARNING

The furnace rate must be within +/- 2% of the appliance rating input.

To adjust the regulator, turn the adjusting screw on the regulator clockwise to increase pressure and input or counterclockwise to decrease pressure and input.

$$\text{BTU/HR Input} = \frac{\text{Cubic Feet per Revolution}}{\text{\# Seconds per Revolution}} \times 3600 \times \text{Heating Value}$$

For Natural Gas: Check the furnace rate by observing the gas meter, when available, making sure all other gas appliances are turned off. The test hand on the meter should be timed for at least one revolution. Note the number of seconds for one revolution.

The heating value of the gas can be obtained from the local utility company.

For Propane Gas: The only check for the furnace rate is to verify proper orifice spud size is installed and properly adjust the manifold pressure using a manometer. Typical manifold set point for installations is 10.0" W.C.

Adjustments – Cooling Section

No adjustments are required or should be attempted regarding any of the components of the cooling system. The system should be checked for loose or missing wiring.

Blower

The unit contains a constant torque ECM blower motor with dedicated blower speed taps for continuous fan, cooling and heating operation. The proper speeds have been preset at the factory for typical heating and cooling operation. Refer to the wiring diagram and Blower Performance table for recommended heating/cooling speeds for specific models. Speeds may require adjustment due to duct design and application.

Blower Operation

Continuous operation of the air handling blower will be obtained if the thermostat fan switch is set to "ON". With the thermostat fan switch set to "AUTO", the air handling blower will cycle corresponding with the thermostat cycling.

The blower will start approximately 30 seconds after the burners ignite and will stop approximately 120 seconds after the thermostat is satisfied. The time delay is preset at the factory and timing cannot be adjusted.

When the thermostat system switch is set for "COOL", the blower will start 5 seconds after the thermostat calls for cooling and will stop 90 seconds after the thermostat is satisfied.

A fan switch is provided on the thermostat which will bring the blower on for continuous operation when the switch is set for "ON".

Limit Control

A fixed temperature limit control is provided which will shut off the gas to the burners if the unit is overheated for any reason. The control must not be adjusted or relocated.

Rollout Switch

If for any reason the heat exchanger were to become blocked, there is a temperature sensitive switch located above the burners that will turn off the burners. After correcting the problem, this switch must be manually reset by pressing the button on top of it.

Installation and Operation in Extremely Cold Weather Areas

In areas where extremely cold outdoor temperatures (below –20°F) can be expected, some additional installation and operating precautions should be taken. The following precautions are designed to prevent possible vent system ice blockage that could result in safety shutdown of the burners:

1. Adjust to the highest achievable temperature rise within the rise and static pressure ranges specified on the rating plate. Depending on specific model, it may be possible to change to a lower heating blower speed tap to get a higher temperature rise. This also increases comfort.
2. Make sure there are no leaks of outside air into the return air system.
3. Keep the louver free from ice that may form and obstruct the flue outlet.

High Altitude

This unit is approved for operation at altitudes from 0 to 5,500 feet above sea level without any required modifications. For installations above 5,500 feet, refer to Table 6.

Altitude	Natural Gas		LP Gas	
	Burner Orifices	Manifold Pressure	Burner Orifices LP Kit	Manifold Pressure
0 - 5,500 ft.	As shipped	3.5" w.c.	ALPKT615	10.0" w.c.
5,500 - 8,500 ft.		3.0" w.c.		8.0" w.c.
Above 8,500 ft.	Per National Fuel Gas Code	3.5" w.c.	Per National Fuel Gas Code	10.0" w.c.

Table 6.

Maintenance

WARNING

Disconnect all electrical power to the unit before conducting any maintenance procedures. Failure to disconnect the power could result in personal injury or death.

Every working procedure that affects safety means shall only be carried out by competent persons. This appliance is 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 concerning use of the appliance by a person responsible for their safety.

- 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, the appropriate fire extinguishing equipment shall be available to 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 or ignition risks. "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.

- Pipe-work including piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards.
- All field joints shall be accessible for inspection prior to being covered or enclosed.
- 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 as applicable:
 1. The actual refrigerant charge is in accordance with the room size within which the refrigerant containing parts are installed.
 2. The ventilation machinery and outlets are operating adequately and are not obstructed.
 3. If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant.
 4. Markings on the equipment should be visible and legible. Markings and signs that are illegible shall be corrected.
 5. 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.
- For systems containing refrigerant, all repair and maintenance to electrical components shall include initial safety checks and component inspection procedures such as that capacitors are discharged 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. 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 that is reported to the owner of the equipment, so all parties are advised.

NOTE – Sealed electrical components shall be replaced, not repaired.

NOTE – Intrinsically safe components must be replaced, not repaired.

NOTE – All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out with work in confined spaces being avoided.

- Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used. The following leak detection methods are deemed acceptable for all refrigerant systems. Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity 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 that 12.5 % refrigerant 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. If a leak is suspected, all naked 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 of valves) in a part of the system remote from the leak.
- 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 and, since flammability is a consideration, procedures such as safely remove refrigerant following local and national regulations, purging the circuit with inert gas, evacuating (optional for A2L), purging with inert gas (optional for A2L), or opening the circuit by cutting or brazing be adhered to. The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance 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 appliances 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 (optional for A2L). This process shall be repeated until no refrigerant is within the system (optional for A2L). When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to be able to perform the required work.

Ensure that the outlet for the vacuum pump is no close to any potential ignition sources and working area is well ventilated.

Periodic inspection and maintenance normally consists of changing or cleaning filters and (under some conditions) cleaning the coils.

Cooling System

The refrigeration system normally requires no maintenance since it is a closed, self-contained system. Periodic maintenance is limited to:

- Cleaning the air filter. Follow directions noted on the filter and label attached to the access panel.
- Cleaning the indoor and outdoor coil if covered with any foreign material, lint, leaves, or other obstructions.

The condensing coil should be cleaned at a minimum once per year. In areas subject to high traffic or environmental conditions which may contain chloride, sulfites, dust, ammonia, etc., more frequent cleaning is required.

Heating System

Burners

The burners can be removed for cleaning or to change orifices. To remove the burners:

1. Disconnect electrical service and turn off gas to the appliance.
2. Remove access panel to burners and gas valve compartment.
3. Remove burner box assembly from unit. Remove front cover of burner box to gain access to burners/orifices. Burners can be individually removed from burner assembly by removing the two screws that hold each burner in the burner rack.
 - Burners can be cleaned using a bottle brush.
 - Orifices are threaded into the gas manifold and can be removed by unscrewing.
4. Reinstall orifices and burners in the reverse order in which they were removed. Ensure burners are properly seated over orifices and properly aligned.
5. Reinstall burner box assembly to unit.
6. Reinstall access panel and turn on gas and electrical service.

Heat Exchanger

The heat exchanger should be inspected periodically and cleaned if necessary. If cleaning is necessary, use a stiff brush with a wire handle to remove scale. While cleaning the heat exchanger, the vent extension tube should also be cleaned. Remove the four screws on the combustion air inducer mounting plate and take out the blower. Use a brush to clean the vent extension tube.

Filters

Inspect the filter once a month. Replace disposable filter or clean the washable filter as necessary (a minimum of three times each heating or cooling season is recommended).

To clean the washable filter, shake filter to remove excess dirt and/or use a vacuum cleaner. Wash filter in soap or detergent water and replace after filter is dry.

Outdoor Coil

Foreign material should not be allowed to accumulate on the outdoor coil surface or other parts in the air circuit.

Cleaning should be as often as necessary to keep the coil clean. To clean the coil, remove the lower access panel and blow out debris by using compressed air or water. Be sure power to unit is shut off before using water to clean the coil.

Care should be used when cleaning the coils so that the coil fins are not damaged.

Motors

The indoor and outdoor fan motors are permanently lubricated and require no maintenance.

Condensate Drain Pan

Foreign material should not be allowed to clog the drain hole. Inspect and clear drain opening prior to cooling season.

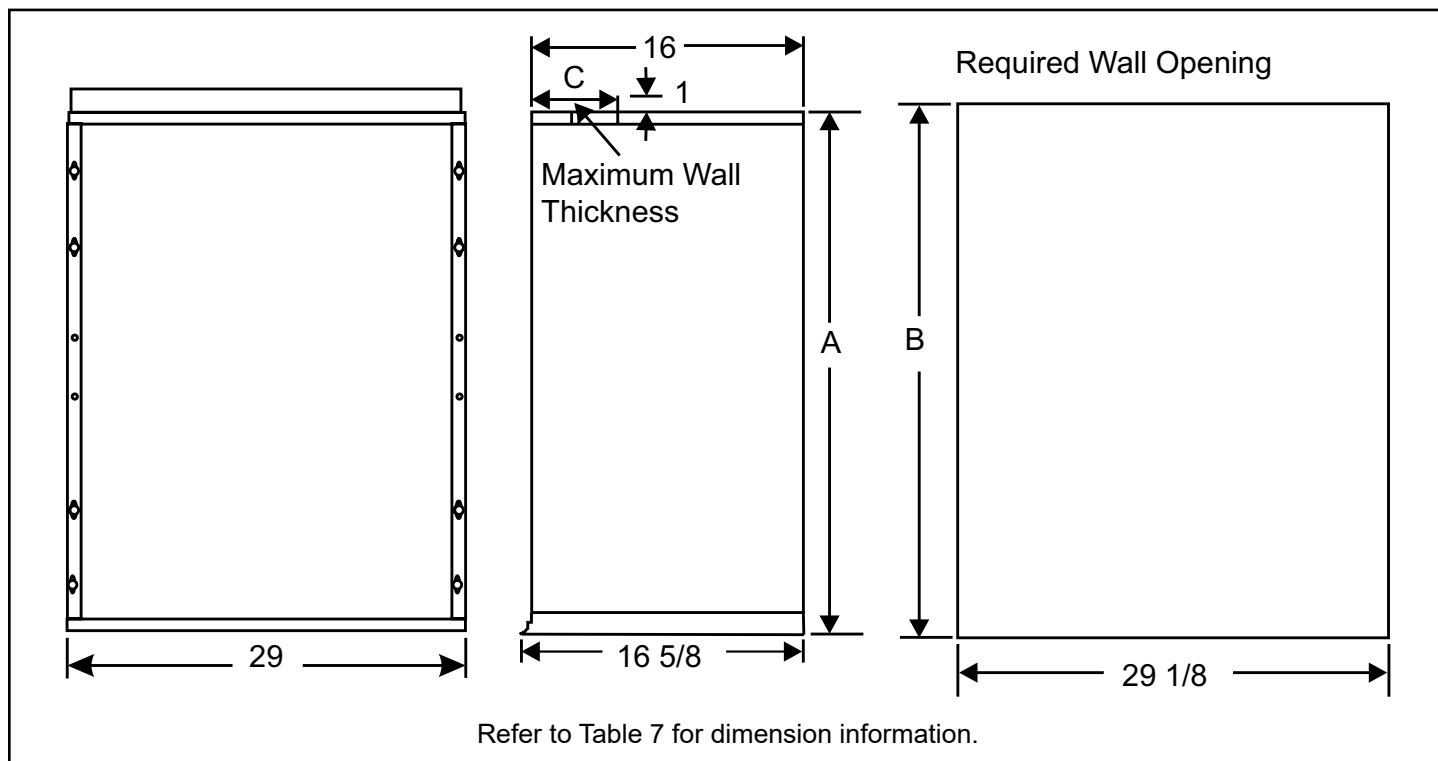


Figure 13.

⚠ WARNING

The unit must be installed with approved wall sleeve and louver accessories for safe operation. Improper installations could result in property damage, personal injury, or death.

Wall Sleeves		Louvers			Model				Dimensions (in.)			
									Wall Sleeve	Maximum Wall Thickness		
Wall Sleeve	Wall Sleeve Extension	Polypropylene Louvers	Aluminum Louvers	Impact Louvers	MGE9**7-11-12*P	MGE9**7-11-18*P	MGE9**7-11-24*P	MGE9**7-11-30*P	Height (A)	Height (B)	Depth (C)	
											Sleeve Only	Sleeve Plus Extension
ASLEEVE6-1	---	ALVRP***MGE-1	ALVRAL-1^	ALVRALC-1^	•	•	•		29	29-1/8	6	---
ASLEEVE8-1	---	ALVRP***MGE-1	ALVRAL-1^	ALVRALC-1^	•	•	•		29	29-1/8	8	---
ASLEEVE10-1	ASLEEVEEXT4-1	ALVRP***MGE-1	ALVRAL-1^	ALVRALC-1^	•	•	•		29	29-1/8	10	14
ASLEEVE12-1	ASLEEVEEXT4-1	ALVRP***MGE-1	ALVRAL-1^	ALVRALC-1^	•	•	•		29	29-1/8	12	16
ASLEEVE6-2	---	ALVRP***MGE-2	ALVRAL-2^	ALVRALC-2^				•	32-3/4	32-7/8	6	---
ASLEEVE8-2	---	ALVRP***MGE-2	ALVRAL-2^	ALVRALC-2^				•	32-3/4	32-7/8	8	---
ASLEEVE10-2	ASLEEVEEXT4-2	ALVRP***MGE-2	ALVRAL-2^	ALVRALC-2^				•	32-3/4	32-7/8	10	14
ASLEEVE12-2	ASLEEVEEXT4-2	ALVRP***MGE-2	ALVRAL-2^	ALVRALC-2^				•	32-3/4	32-7/8	12	16
ASLEEVE6-2	---	---	ALVRAL-7^	ALVRALC-7^	○	○	○		32-3/4	32-7/8	6	---
ASLEEVE8-2	---	---	ALVRAL-7^	ALVRALC-7^	○	○	○		32-3/4	32-7/8	8	---
ASLEEVE10-2	ASLEEVEEXT4-2	---	ALVRAL-7^	ALVRALC-7^	○	○	○		32-3/4	32-7/8	10	14
ASLEEVE12-2	ASLEEVEEXT4-2	---	ALVRAL-7^	ALVRALC-7^	○	○	○		32-3/4	32-7/8	12	16
ASLEEVE6-5	---	---	ALVRAL-3^	ALVRALC-3^	○	○	○		45	45-1/8	6	---
ASLEEVE8-5	---	---	ALVRAL-3^	ALVRALC-3^	○	○	○		45	45-1/8	8	---
ASLEEVE10-5	ASLEEVEEXT4-3	---	ALVRAL-3^	ALVRALC-3^	○	○	○		45	45-1/8	10	14
ASLEEVE12-5	ASLEEVEEXT4-3	---	ALVRAL-3^	ALVRALC-3^	○	○	○		45	45-1/8	12	16
ASLEEVE6-5	---	---	ALVRAL-4^	ALVRALC-4^				○	45	45-1/8	6	---
ASLEEVE8-5	---	---	ALVRAL-4^	ALVRALC-4^				○	45	45-1/8	8	---
ASLEEVE10-5	ASLEEVEEXT4-3	---	ALVRAL-4^	ALVRALC-4^				○	45	45-1/8	10	14
ASLEEVE12-5	ASLEEVEEXT4-3	---	ALVRAL-4^	ALVRALC-4^				○	45	45-1/8	12	16

*** Louver colors: WHT = white, SAN = sandstone, BGE = beige, TPST = taupestone

^ -P: Option to paint standard, aluminum, and impact-resistant louver

○ Optional: Wall sleeves and louvers can be oversized to maintain a uniform appearance

NOTE: ALVRPMGE louvers may not be oversized due to vent pipe and metal grate insert location**

Table 7. Accessories

Model	Kit
MGE920-7-11-***P	ALPKT615
MGE930-7-11-***P	
MGE940-7-11-***P	
MGE950-7-11-***P	

Table 8. LP Conversion Kits

Refrigerant Detection System



FIGURE 14. Example of Clear, Unobstructed Sensor Inlet

Model	RDS Factory Installed	RDS KIT Compatible
MGE9*-7-11-12*P		×
MGE9*-7-11-18*P		×
MGE9*-7-11-24*P		×
MGE9*-7-11-30*P	×	

Table 9. MGE RDS Table

Sensor Maintenance

It is recommended to check the state of the sensor every 6 months, at the beginning of each cooling and heating season.

- Ensure that the sensor opening is clear and free of debris.
- Check that the sensor cable is in good condition.
- DO NOT use abrasive cleaning solutions or detergents to clean sensor opening.
- DO NOT use flammable compressed air solutions to clean the sensor opening.
- DO NOT vacuum sensor inlet opening, as this could cause damage to the sensor internal components.
- Replace sensor if the opening is not clean or free of debris.
- When cleaning the evaporator coil, remove sensor from the coil. Follow recommended coil cleaning guidelines as described in installation instructions.

Modes of Operation

The modes of operation for the RDS Non-Communicating Blower Control Board are Initializing, Normal, Leak Detected, and Fault.

Initializing

The RDS Non-Communicating Blower Control Board is establishing connection with the refrigerant detection sensor and is completing an initial five (5) minute purge sequence.

Normal

The HVAC system is functioning normally. The RDS Non-Communicating Blower Control Board has not detected a refrigerant leak.

Leak Detected

When the RDS Non-Communicating Blower Control Board detects a refrigerant leak:

- 1 - The RDS Non-Communicating Blower Control Board shuts off the (R) input (24VAC power) to the thermostat, which de-energizes the unit compressor and heat sources, such as gas and/or electric strip heat. No heating or cooling demands will be met.
- 2 - The RDS Non-Communicating Blower Control Board activates the blower (high speed). The blower purges refrigerant from the cabinet, plenum, and ductwork.
- 3 - After the RDS Non-Communicating Blower Control Board determines the refrigerant levels are below the safety threshold, the blower will continue to function for an additional seven (7) minutes.
- 4 - After the blower sequence is complete, the HVAC system resumes normal operation.

NOTE – The HVAC system may not maintain a cooling or heating setpoint if a significant leak exists. Any refrigerant leaks that remain unaddressed for an extended time may cause the HVAC system to shut down on a low refrigerant pressure limit condition.

Table 10. Minimum Circulation Airflow

Model	Charge	Qmin		Fan CFM	Minimum Velocity	
	OZ	m3/hr	ft3/min	Tap 1@ 0.1	ft/min	m/s
MGE9*-7-11-30*P	72	207	122	490	368	1.87

Fault

When a fault is detected within the RDS Non-Communicating Blower Control Board, the indoor unit blower engages and remains engaged at a constant output until the fault is cleared.

Diagnostic Codes and Troubleshooting

The RDS Non-Communicating Blower Control Board is equipped with a multi color LED within its enclosure. The LED signals the state of the RDS Non-Communicating Blower Control Board.

See Table 11 to review the diagnostic codes.

TABLE 11. LED Diagnostic Codes

State	LED Diagnostic Code	Action
Initializing	Flashing green ¹	Not Applicable
Monitoring	Solid green with blue flash ²	Not Applicable
Mitigating (Leak Detected)	Flashing blue	Check coil tubes for leak. Repair the issue and restart the equipment.
Fault/Service	Solid blue, interrupted by issue flash code	Refer to Table 12 for troubleshooting steps.

1. A rapid flash indicates the RDSC is in the process of sensor enumeration

2. A blue flash indicates the mitigation process has previously occurred.

Red LED Diagnostic Codes

Red diagnostic codes indicate a specific RDS Non-Communicating Blower Control Board issue. Yellow diagnostic codes indicate the sensor's position (if applicable).

TABLE 12. Red LED Diagnostic Codes / Troubleshooting

Red Flash	Applies to Individual Sensor(s)	Issue	Action
1	Yes	Sensor indicates fault	Replace the sensor
2	No	Float Switch Jumper Connection	Ensure float switch jumper on RDS board is present and making proper connection
3	Yes	Incompatible sensor type	Replace with a compatible sensor.
4	Yes	Sensor communications issue	Check sensor connection. Ensure connection is clean and tight.
5	No	R-input not available	Check for 24VAC power connection to the R terminal inputs on the RDSC. R-inputs must be energized for the RDSC to function.

Test Button Functionality

The RDS Non-Communicating Blower Control Board is equipped with a Test/Reset button. The Test button can be used to complete several functions, depending on the mode of operation of the RDS Non-Communicating Blower Control Board.

Table 13 lists the functions of the Test button during each mode of operation.

TABLE 13. Test Button Function

Mode of Operation	Press the Test Button to...
Normal	Trigger a leak detection response. Verify all equipment is wired correctly into the RDSC (after installation).
Leak Detected	Reset the RDSC to a normal mode of operation after a previous leak has been detected and purged from the HVAC system.
Fault	Reset the RDSC after troubleshooting and resolving a fault condition. If the fault is not resolved, the RDSC will enter the Fault mode again.

Test Button - Additional Functions

Table 14 lists the additional functions of the Test Button while the RDS Non-Communicating Blower Control Board is functioning within the states of Initializing, Monitoring, Leak Detection, Servicing and Fault. Refer to "Table 11. LED Diagnostic Codes".

TABLE 14. Additional Button Functions

State	Press	Action
Initializing	Short	Skips remaining pre-purge after sensors are recognized by the RDSC
Initializing	Long	Reset control
Monitoring	Short	Clear purge-counter if prior mitigation has occurred; Test mitigation
Monitoring	Long	Reset control
Mitigating	Short	If testing mitigation, end test
Servicing	Short	Reevaluate fault condition - if cleared return to monitoring, otherwise update indicator
Servicing	Long	Reset control
Fault	Short	Reevaluate fault condition - if cleared return to monitoring, otherwise update indicator
Fault	Long	Reset control

Thermostat Compatibility

Thermostats that preserve memory settings are compatible with the RDS Non-Communicating Blower Control Board. Examples include:

- Battery-powered thermostats
- Analog thermostats
- Smart thermostats
- Late-model programmable thermostats
- *Early-generation digital and programmable thermostats may not retain the operation mode and temperature setpoints after a power outage.*

The following scenarios are likely to occur when home occupants are not available to adjust the thermostat setpoints as the system is recovering from leak detection and resuming normal operation:

- Heating could be lost during a cold night
- Cooling could be lost during a hot day
- The thermostat could reset to an incorrect temperature setpoint

Compatibility Verification

Complete the following process to determine whether the thermostat is compatible with the RDS Non-Communicating Blower Control Board.

- 1 - Change the thermostat's current setpoint and operating mode.
- 2 - Power cycle the breaker to the furnace.

NOTE – Wait five (5) minutes before supplying power to the furnace breaker.

- 3 - Note whether the thermostat maintained its setpoints and operating mode.
 - a. If the thermostat maintained the settings, the thermostat is compatible with the RDS Non-Communicating Blower Control Board.
 - b. If the thermostat did not maintain its setpoint and/or operating mode, the thermostat is not compatible with the RDS Non-Communicating Blower Control Board. Recommend replacing with a compatible thermostat.

Additional Applications

In zoned applications, all dampers will remain open when the RDS Non-Communicating Blower Control Board is in Fault or Leak Detected mode. Normal heating and cooling demands are permissible, but the blower will remain engaged until the fault condition is addressed.

Zone HVAC System

If the RDS Non-Communicating Blower Control Board is installed in a zone HVAC system, the RDS Non-Communicating Blower Control Board will open all zone dampers if a leak is detected.

NOTE – Proper wiring of the zone panel to the RDS Non-Communicating Blower Control Board is required for all zone dampers to open.

After the purge sequence is complete, the zone system will resume normal operation.

External Alarm

(For applications with external alarms wired directly to the RDS Non-Communicating Blower Control Board.)

The RDS Non-Communicating Blower Control Board triggers the external alarm system when it enters Leak Detected mode. For alarm notifications, the RDS Non-Communicating Blower Control Board provides a dry relay contact that is rated 3A at 30 VAC/DC.

Start Up Test Procedure

The RDS Non-Communicating Blower Control Board is equipped with a Test/Reset button, see "Test Button Functionality" on page 24. After the RDS Non-Communicating Blower Control Board has been mounted and wired, restore power to the HVAC system. The system will then run through a purge sequence for five (5) minutes. After the purge sequence is complete, proceed to testing cooling demand and heating demand.

Cooling Demand

- 1 - Prompt a cooling demand at the thermostat.
- 2 - Press the Test button on the RDS Non-Communicating Blower Control Board.

The system then executes a leak detection response.
- 3 - Observe the following sequence:
 - a. The LED indicator flashes the sequence for leak detection (flashing blue).
 - b. The blower powers up.
 - c. The compressor powers down.
- 4 - Press the Test button to terminate the simulated Leak Detected mode upon test completion.

Heating Demand

- 1 - Prompt a heating demand at the thermostat.
- 2 - Press the Test button on the RDS Non-Communicating Blower Control Board.

The system then executes a leak detection response.
- 3 - Observe the following sequence:
 - a. The LED indicator flashes the sequence for leak detection (flashing blue).
 - b. The blower powers up.
 - c. The gas burners power down.
 - d. The compressor powers down.
- 4 - Press the Test button to terminate the simulated Leak Detected mode upon test completion.

The installation of the RDS Non-Communicating Blower Control Board is complete after both sequences are successfully completed.

NOTE – REFRIGERANT SENSORS for REFRIGERANT DETECTION SYSTEMS shall only be replaced with sensors specified by the appliance manufacturer.

Diagnostic Codes and Troubleshooting

TABLE 15. LED Diagnostic Codes

State	LED Diagnostic Code	Action Required
Initializing	Flashing green	None
Monitoring	Solid green. If a prior mitigation occurred, a blue flash interrupts the solid green LED.	None
Mitigating (Leak Detected)	Flashing blue	Check coil tubes for leak. Repair the issue and restart the equipment.
Fault/Service	Solid blue, interrupted by issue diagnostic code	Refer to Table 16 for troubleshooting steps.

TABLE 16. Red LED Diagnostic Codes / Troubleshooting

Red Flash	Applies to Individual Sensor(s)	Issue	Action Required
1	Yes	Sensor indicates fault	Replace the sensor
2	No	Float Switch Jumper Connection	Ensure float switch jumper on RDS board is present and making proper connection.
3	Yes	Incompatible sensor type	Replace the sensor
4	Yes	Sensor communications issue	Check sensor connection. Ensure connection is clean and tight.
5	No	R-input not available	Check sensor connections. Ensure connection is clean and tight.

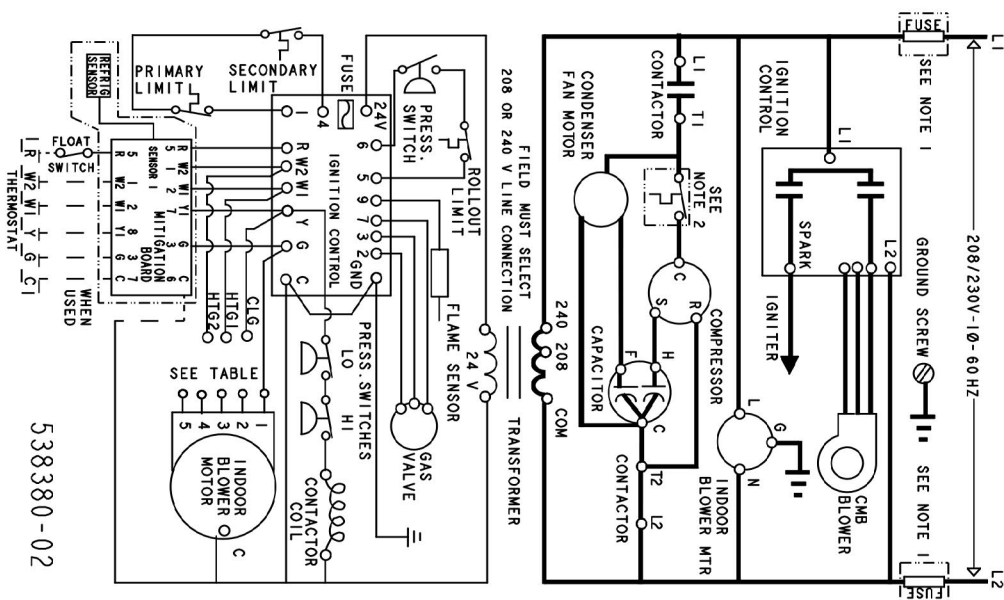
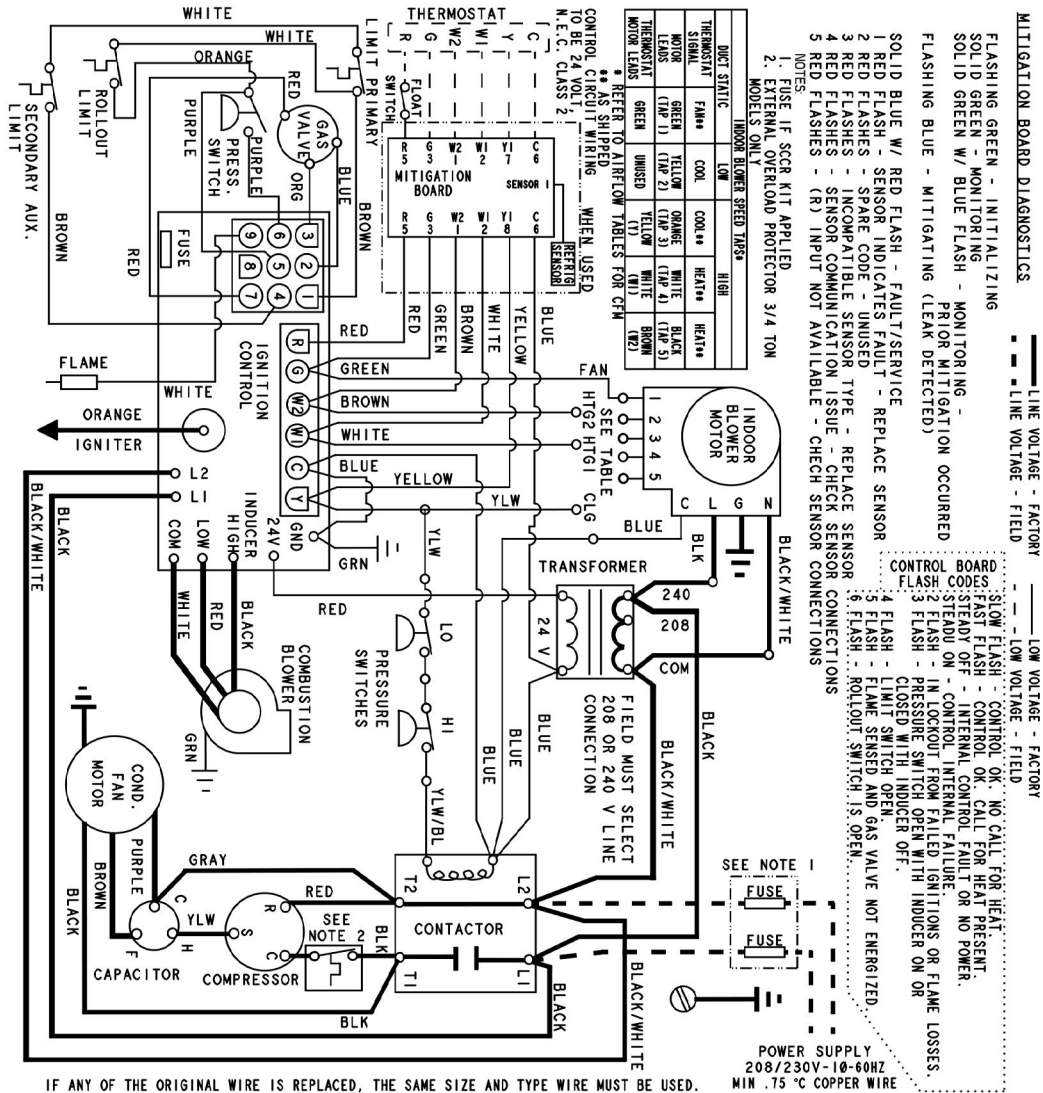


Figure 15. Wiring Diagram - MGE 1 Ton through 2 Ton

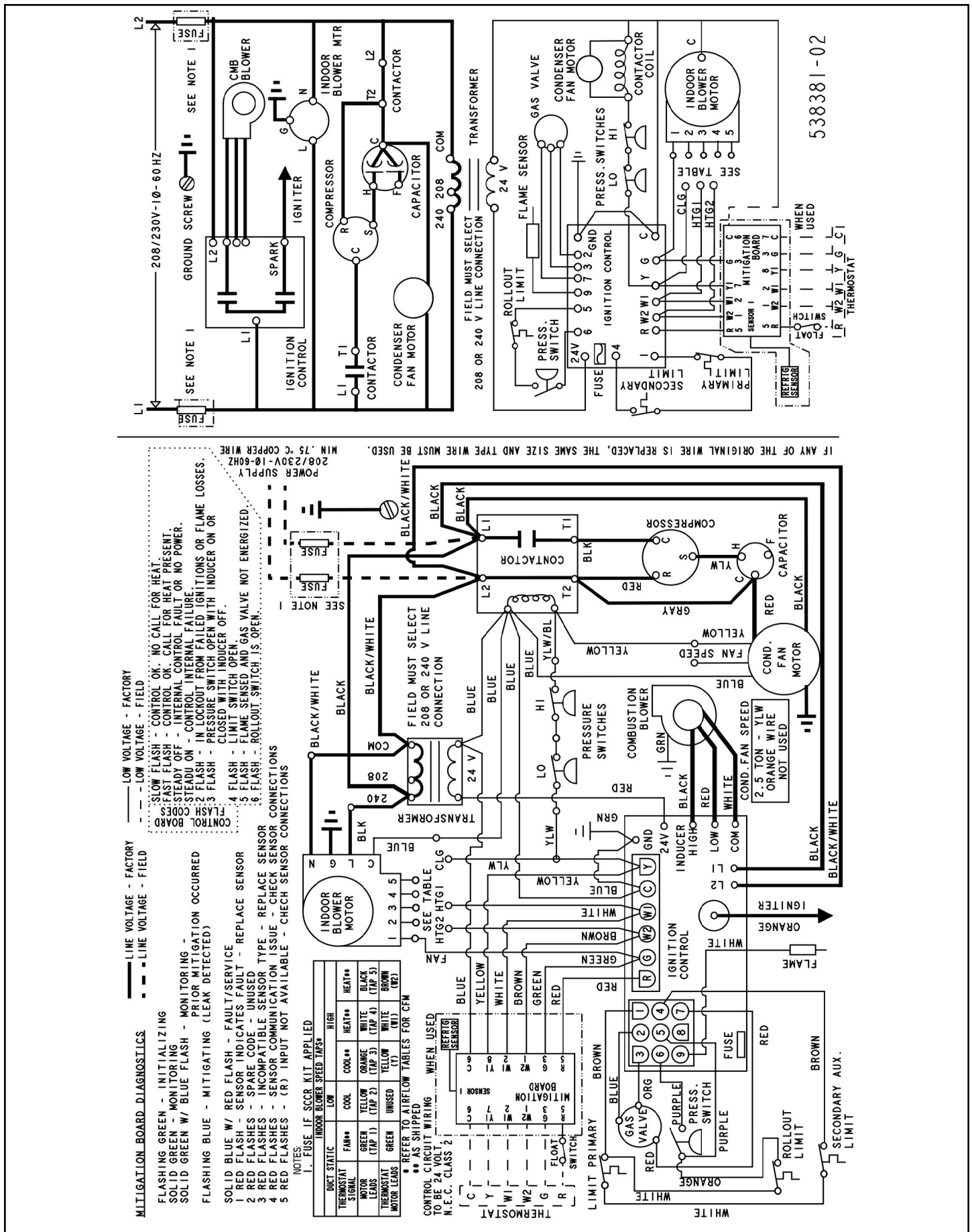


Figure 16. Wiring Diagram - MGE 2.5 Ton

Decommissioning

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 starting decommissioning.

- a) Become familiar with the equipment and its operation.
- b) Isolate system electrically.
- c) 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.
- d) Pump down refrigerant system, if possible.
- e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- f) Make sure that cylinder is situated on the scales before recovery takes place.
- g) Start the recovery machine and operate in accordance with instructions.
- h) Do not overfill cylinders (no more than 80% volume liquid charge).
- i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
- j) 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.
- k) Recovered refrigerant shall not be charged into another REFRIGERATING SYSTEM unless it has been cleaned and checked.

NOTE – Equipment shall be labelled stating that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed. For appliances 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 labelled 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 the flammable refrigerant.
- 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.
- The recovered refrigerant shall be processed according to local legislation 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 compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it shall be carried out safely.