

Installation Instructions


NOTE: Read the entire instruction manual before starting the installation.

SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause death, personal injury, or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing.

Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Have a fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions include in literature and attached to the unit. Consult local building codes, the current editions of the National Fuel Gas Code (NFGC) NFPA 54/ANSI Z223.1-2009 and the National Electrical Code (NEC) NFPA 70.

In Canada, refer to the current editions of the National Standards of Canada CAN/CGA-B149.1 and .2 Natural Gas and Propane Installation Codes, and Canadian Electrical Code CSA C22.1

Recognize safety information. This is the safety-alert symbol . When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words **DANGER**, **WARNING**, and **CAUTION**. These words are used with the safety-alert symbol. **DANGER** identifies the most serious hazards which **will** result in severe personal injury or death. **WARNING** signifies hazards which **could** result in personal injury or death. **CAUTION** is used to identify unsafe practices which **may** result in minor personal injury or product and property damage. **NOTE** is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

Special Venting Requirements for Installations in Canada

Installation in Canada must conform to the requirements of CSA B149 code. Vent systems **must** be composed of pipe, fittings, cements, and primers listed to ULC S636. The special vent fittings and accessory concentric vent termination kits and accessory external drain trap have been certified to ULC S636 for use with those IPEX PVC vent components which have been certified to this standard. In Canada, the primer and cement must be of the same manufacturer as the vent system - *IPEX System 636™, PVC/CPVC Primer, Purple Violet for Flue Gas Venting and IPEX System 636, PVC Cement for Flue Gas Venting, rated Class IIA, 65 deg C. must be used with this venting system - do not mix primers and cements from one manufacturer with a vent system from a different manufacturer. Follow the manufacturer's instructions in the use of primer and cement and never use primer or cement beyond its expiration date.

*IPEX System 636™ is a trademark of IPEX Inc.

The safe operation, as defined by ULC S636, of the vent system and this external vent trap kit is based on following these installation instructions, the vent system manufacturer's installation instructions, and proper use of primer and cement. All fire stop and roof flashing used with this system must be UL listed material. Acceptability under Canadian standard CSA B149 is dependent upon full compliance with all installation instructions. Under this standard, it is recommended that the vent system be checked once a year by qualified service personnel.

The authority having jurisdiction (gas inspection authority, municipal building department, fire department, etc) should be consulted before installation to determine the need to obtain a permit.

Consignes spéciales pour l'installation de ventilation au Canada

L'installation faite au Canada doit se conformer aux exigences du code CSA B149. Ce système de ventilation **doit** se composer de tuyaux, raccords, ciments et apprêts conformes au ULC S636. La tuyauterie de ventilation des gaz, ses accessoires, le terminal concentrique mural ainsi que l'ensemble du drain de condensat extérieur ont été certifiés ULCS 636 pour l'application des composantes IPEX PVC qui sont certifiées à ce standard. Au Canada l'apprêt et le ciment doivent être du même fabricant que le système de ventilation - IPEX Système 636, Apprêt PVC/CPVC. Mauve Violet pour conduit en évacuation des gaz et IPEX Système 636, ciment pour PVC pour conduit en évacuation des gaz, évalué CLASSE IIA, 65 deg. C. doit être utilisé avec ce système d'évacuation - ne pas mélanger l'apprêt et le ciment d'un fabricant avec le système de ventilation d'un autre fabricant. Bien suivre les indications du fabricant lors de l'utilisation de l'apprêt et du ciment et ne pas utiliser ceux-ci si la date d'expiration est atteinte.

L'opération sécuritaire, tel que défini par ULC S636, du système de ventilation et ceci ensemble purgeur pour conduite d'évacuation externe est basé sur les instructions d'installation suivantes, ainsi que l'usage approprié de l'apprêt et ciment. Tout arrêt feu et solin de toit utilisés avec ce système doivent être des matériaux listés UL. L'acceptation du standard Canadien CSA B419 est directement relié à l'installation conforme aux instructions ci-haut mentionnées. Le standard Canadien recommande l'inspection par un personnel qualifié et ce, une fois par année.

Les autorités ayant juridiction (inspecteurs de gaz, inspecteurs en bâtiments, département des incendies, etc) devraient être consultées avant l'installation afin de déterminer si un permis est requis.

Table 1 – Gas Furnaces

Single-Stage Furnaces			Two-Stage Furnaces		
58MCA 58MCB 58MSA 58MEB 58MXA 58MXB	340MAV 340AAV 345MAV 350MAV 350AAV 351DAS 353AAV	PG9MAA PG9MAB	58MTA 58MTB 58MEC	352MAV 352AAV 353BAV	PG9MXA

⚠ WARNING

FIRE, EXPLOSION, ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury, death and/or property damage.

Turn off gas and electrical supplies to unit and tag with appropriate lockout before beginning any installation or modification. Follow all operating instructions on label attached to furnace.

DESCRIPTION AND USAGE

Use this vent/exhaust pipe external trap kit to reduce gurgle noise concerns and/or to improve condensate draining in vent/exhaust pipe.

This vent/exhaust pipe external trap kit contains the following items:

Condensate trap	1
Tee vent fitting (2-in. (51 mm) PVC)	1
Bushing vent fitting (2 x 1-1/2-in. (51 x 38 mm) PVC)	1
Adapter fitting (1-1/2 (38 mm) male x 1-1/2 (38 mm) female)	1

INTRODUCTION

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD

Failure to follow this warning could result in personal injury or death.

Do not use this kit with variable-speed furnaces. Variable-speed inducer pressure could force water out of this trap and permit vent gas to leak into living space.

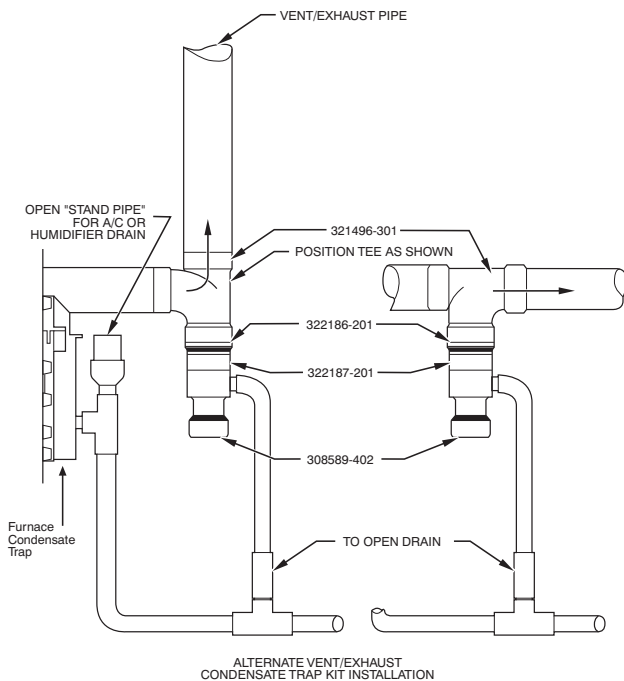
INSTALLATION

These instructions are written assuming kit is installed after furnace and vent system have been installed and is operational. Kit components and alternate methods of condensate plumbing are shown in Fig. 1. If installing kit during initial installation, install as shown in Fig. 2 through 9.

NOTE: This kit is designed for use with 2-in. (51 mm) PVC vent/exhaust pipe applications. Additional pipe diameters are usable when field-supplied PVC fittings are used with condensate trap and bushing supplied in kit.

Drain pipe and fittings must conform to ANSI standards and ASTM D1785 or D2846. CPVC or PVC cement and primer must conform to ASTM D2564 or F493. See section for Special Venting Requirements for installations in Canada for pipe, fittings, cement, and primer material requirements for Canadian installations.

This instruction covers installation of the vent/exhaust pipe external trap kit P/N KGAET101ETK in all fixed-capacity, multipoise condensing gas furnaces listed in Table 1.



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Fig. 1 - Condensate Trap Plumbing Options for Vent Above Floor

⚠ WARNING

FIRE HAZARD

Failure to follow this warning could result in personal injury, death or property damage.

Solvent cements are combustible. keep away from heat, sparks and open flame. Use only in well-ventilated areas. Avoid breathing in vapor or allowing contact with skin or eyes.

NOTE: Slope combustion-air and vent pipes a minimum of 1/4-in. (6 mm) per linear ft. with no sags between hangers.

⚠ CAUTION

UNIT OPERATIONAL HAZARD

Failure to follow this caution may result in intermittent unit operation.

This kit is intended to be located at the lowest point in the vent system and no more than 24 in. (610 mm) horizontally from where the vent exits the furnace to achieve proper drainage.

Table 2 – Approved Combustion Air and Vent Pipe, Fitting and Cement Materials

SPECIFICATION (MARKED ON MATERIAL)	MATERIAL	PIPE	FITTINGS	SOLVENT CEMENT AND PRIMERS	DESCRIPTION
D1527	ABS	Pipe	--	--	Schedule-40
D1785	PVC	Pipe	--	--	Schedule-40
D2235	For ABS	--	--	Solvent Cement	For ABS
D2241	PVC	Pipe	--	--	SDR-21 & SDR-26
D2466	PVC	--	Fittings	--	Schedule-40
D2468	ABS	--	Fittings	--	Schedule-40
D2564	For PVC	--	--	Solvent Cement	For PVC
D2661	ABS	Pipe	Fittings	--	DWV at Schedule-40 IPS sizes
D2665	PVC	Pipe	Fittings	--	DWV
F438	CPVC	--	Fittings	--	Schedule-40
F441	CPVC	Pipe	--	--	Schedule-40
F442	CPVC	Pipe	--	--	SDR
F493	For CPVC	--	--	Solvent Cement	For CPVC
F628	ABS	Pipe	--	--	Cellular Core DWV at Schedule-40 IPS sizes
F656	For PVC	--	--	Primer	For PVC
F891	PVC	Pipe	--	--	Cellular Core Schedule-40 & DWV

- Determine the best location for kit components. They should be installed as close to furnace as possible. See Fig. 2 - 9 for examples.
- Cut existing section of 2-in. (51 mm) PVC vent/exhaust pipe exiting furnace casing. (See Fig. 10.)
- Dry fit tee-vent fitting (supplied in kit) on vent/exhaust pipe exiting furnace.

NOTE: Position tee-vent fitting such that curved portion is as shown in Fig. 1 to ensure proper vent/exhaust pipe draining.

- Cut existing section of vent/exhaust pipe to attach to outlet connection on tee-vent fitting.
- Dry fit vertical section of vent/exhaust pipe to tee-vent fitting outlet connection.
- Cement tee-vent fitting in place.
- Cement bushing (supplied in kit) in bottom tee-vent fitting connection.
- Position condensate trap (supplied in kit) in bushing such that drain connection is positioned for suitable field drain attachment.
- Cement condensate trap in place.
- Attach drain tube to condensate drain connection using field--supplied components.

NOTE: Condensate trap drain connection is 5/8-in. (16 mm) OD, suitable for attachment of 1/2-in. (13 mm) CPVC or 5/8-in. (16 mm) ID plastic tubing.

- Terminate drain tube in an open drain.
- Prime vent/exhaust pipe condensate trap. This can be accomplished by one of the following methods:
 - Pour water into the vent/exhaust pipe termination.
 - Raise condensate trap drain tube above drain tube connection and pour water into drain tube.

- Prime condensate trap at furnace with water.

⚠ CAUTION

UNIT OPERATIONAL HAZARD

Failure to follow this caution may result in intermittent unit operation.

Condensate trap at furnace must be PRIMED or proper draining may not occur. The condensate trap has 2 internal chambers which can ONLY be primed by pouring water into the inducer drain side of condensate trap.

- When condensate pump is required, select a pump which is approved for condensing furnace applications. To avoid condensate spillage, select a pump with an overflow switch. Furnace condensate is mildly acidic, typically in the pH range of 3.2 to 4.5. Due to the corrosive nature of this condensate, a condensate pH neutralizing filter may be desired. Check with local authorities to determine if a pH neutralizer is required.

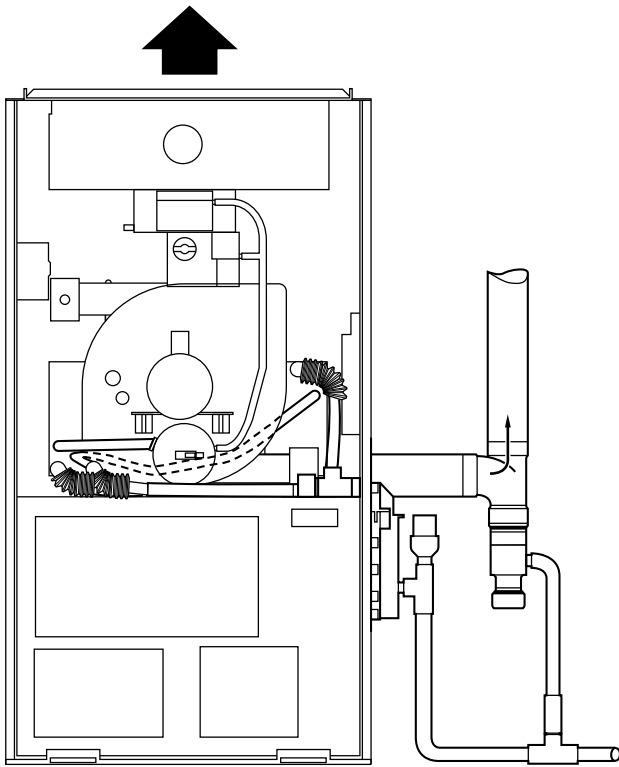
FOR VENT LOCATED IN UNHEATED SPACE

Step 1 — Condensate Drain Protection

Freezing condensate in condensate trap and drain line may cause cracks, and possible water damage may occur (See Table 3). If freeze protection is required, use condensate freeze protection accessory or equivalent 3 to 6 watt per ft. at 120v and 40°F (4°C) self-regulating, shielded, and waterproof heat tape. See Installation Instructions supplied with accessory or heat tape manufacturer's recommendations.

1. Fold heat tape in half and wrap on itself three times.
2. Locate heat tape between sides of condensate trap back.
3. Use wire ties to secure heat tape in place. Wire can be positioned in notches of condensate trap sides.
4. Wrap field drain pipe with remaining heat tape, approximately one wrap per ft.
5. When using field-supplied heat tape, follow heat tape manufacturer's instructions for all other installation guidelines.

Caution should be taken to prevent condensate trap and drain line from freezing. Ambient temperatures below 32°F (0°C) may freeze drain pipe and prohibit draining.



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Fig. 2 - Upflow Furnace Right-Side Outlet with External Condensate Trap and Trap Kit for Vent Above Floor

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD AND UNIT DAMAGE HAZARD

Failure to follow this warning could result in personal injury, death and unit damage.

After completing installation, vent pipe must be installed and fully seated against inducer housing internal stop. Coupling clamp screw(s) must be tightened to 30 in.-lb of torque to prevent disassembly of vent from furnace, and to prevent vent gas and condensate leakage.

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD

Failure to follow this warning could result in personal injury or death.

Failure to use a properly constructed trap or NOT priming trap before operating furnace may allow positive pressure flue gases to enter the structure through drain tube. Flue gases contain carbon monoxide which is tasteless and odorless.

⚠ CAUTION

UNIT OPERATIONAL HAZARD

Failure to follow this caution may result in intermittent unit operation.

Unit must not be installed, operated, and then turned off and left in an unoccupied structure during cold weather when temperature drops to 32°F (0°C) and below unless drain trap and drain line have adequate freeze protection. See Service and Maintenance Instructions for winterizing procedure.

Step 2 — Application

The furnace, A/C, and humidifier drains may be combined and drained together. The A/C drain must have an external, field-supplied trap prior to the furnace drain connection. All drain connections (furnace, A/C, or humidifier) must be terminated into an open or vented drain as close to the respective equipment as possible to prevent siphoning of the equipment's drain.

Outdoor draining of the furnace is permissible if allowed by local codes.

⚠ CAUTION

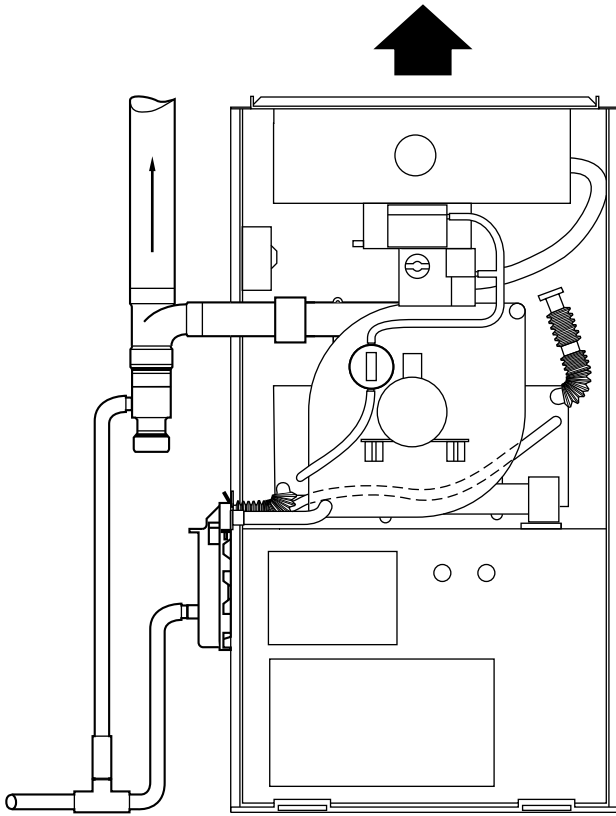
PERSONAL INJURY HAZARD

Failure to follow this caution may result in personal injury.

Caution should be taken to prevent draining where slippery conditions may cause personal injuries.

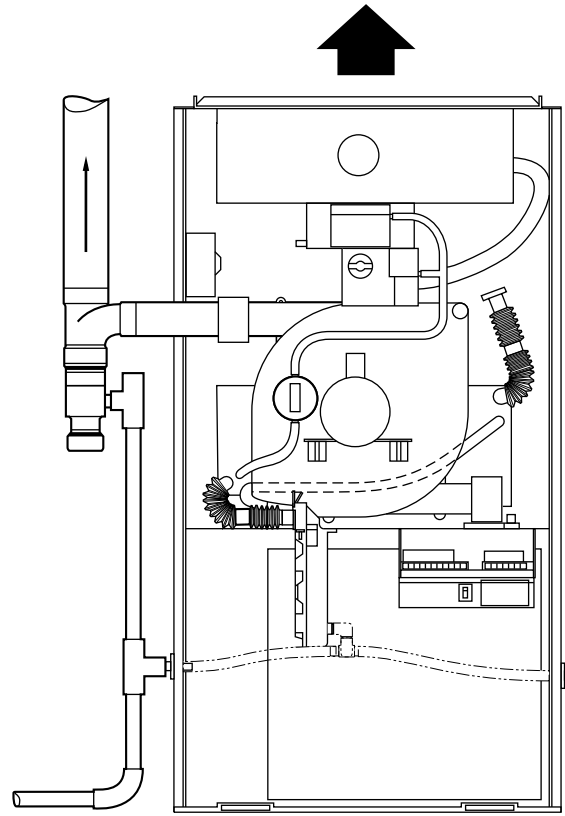
Excessive condensate draining may cause saturated soil conditions which may result in damage to plants.

Condensate is not to be drained onto crawlspace floor from furnace or external trap. Installations must comply with regulations of local building, heating, plumbing, or other codes in effect in area where installation is made.



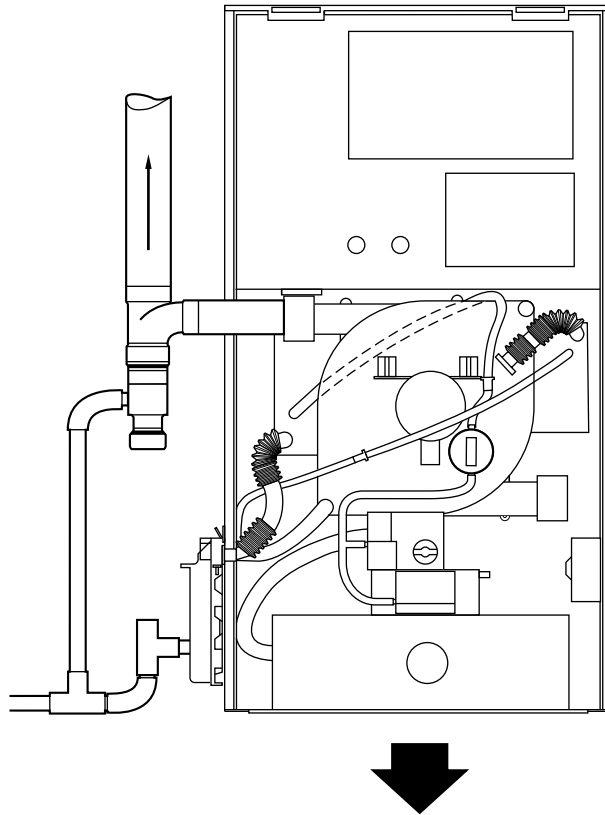
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Fig. 3 - Upflow Furnace Left-Side Outlet with External Condensate Trap and Trap Kit for Vent Above Floor



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Fig. 4 - Upflow Furnace Left-Side Outlet with Blower Compartment Condensate Trap Location and Trap Kit for Vent Above Floor



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Fig. 5 - Downflow Furnace Left-Side Outlet with External Condensate Trap and Trap Kit for Vent Above Floor

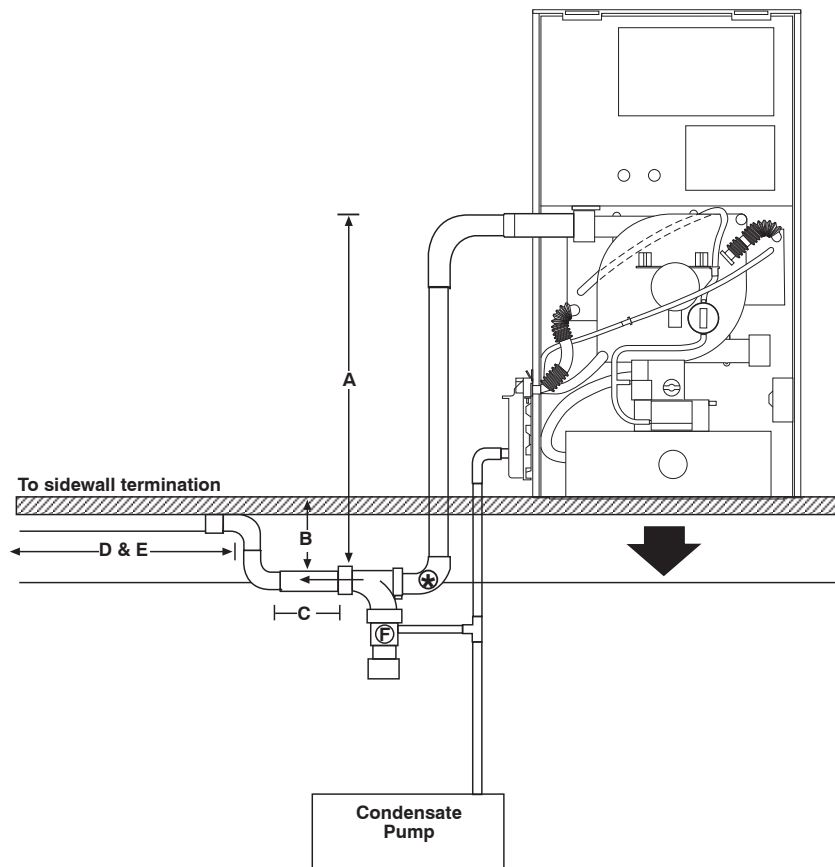


Fig. 6 - Vent Located Below Floor in Which Furnace is Located with Vent Between Floor Joists

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- A. Restricted to maximum of 60"
- B. Restricted to maximum of 24" below flooring
- D. Pipe must slope back to external drain trap
- F. Pipe must be insulated when exposed to freezing temperatures
- F. Drain trap must use heat tape for freeze protection
- G. Elbow must connect directly into external drain trap tee-vent fitting

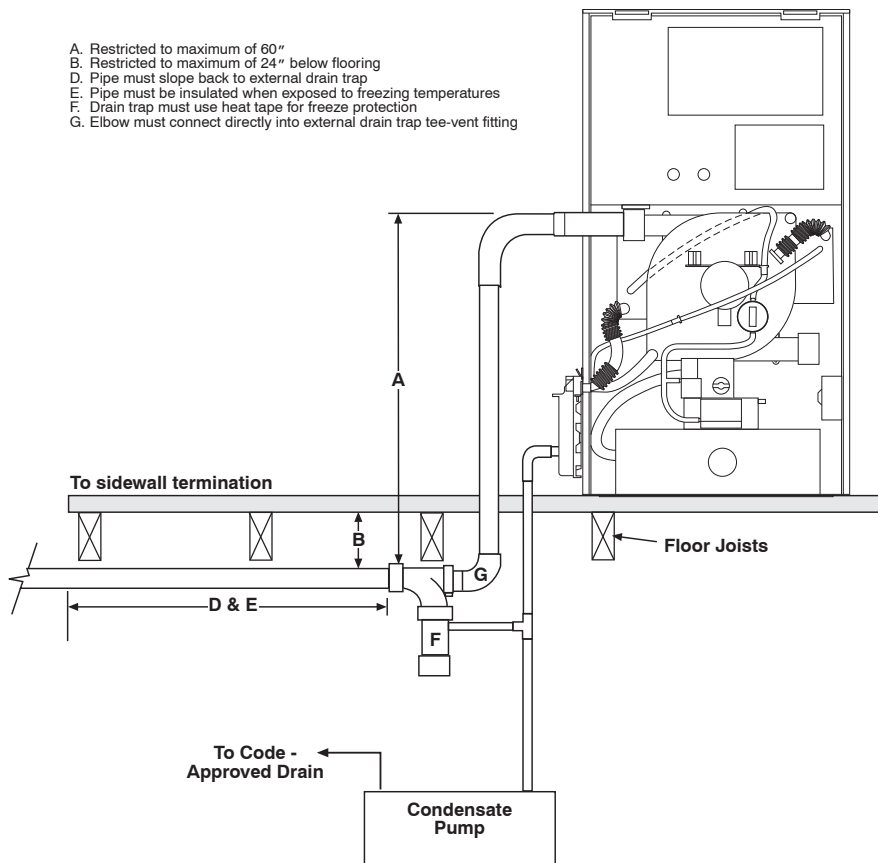


Fig. 7 - Vent Located Below Floor on which Furnace is Located with Vent Below Floor Joists

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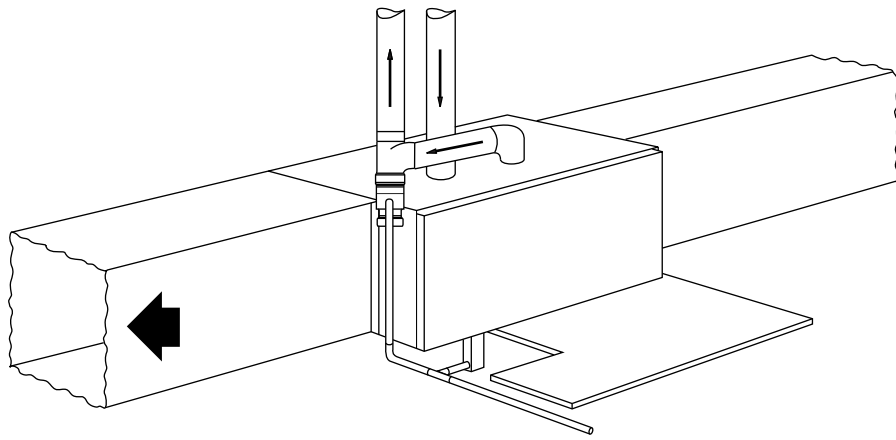


Fig. 8 - Horizontal Furnace External Trap with Condensate Trap Kit for Vent Above Floor

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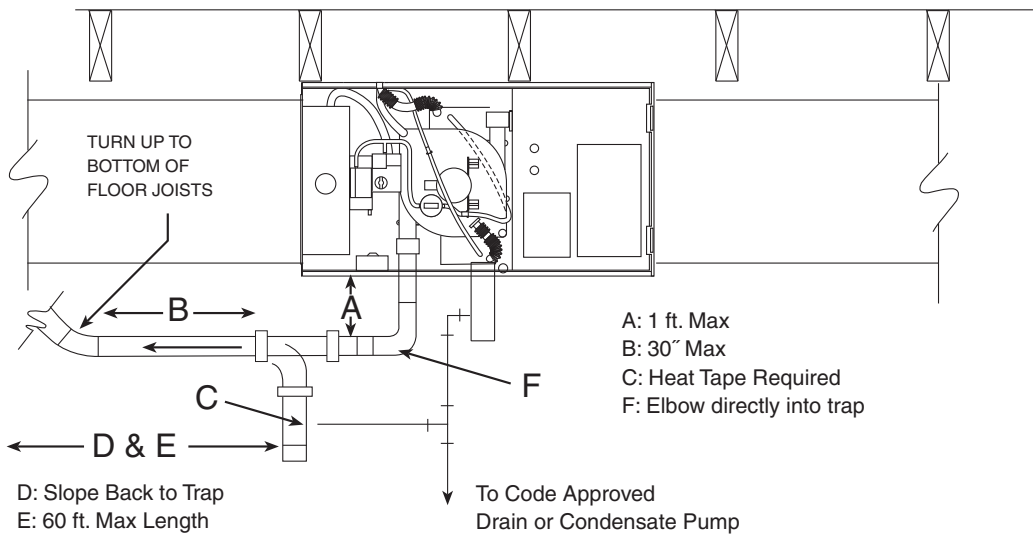


Fig. 9 - Horizontal Furnace with ETK Under Furnace

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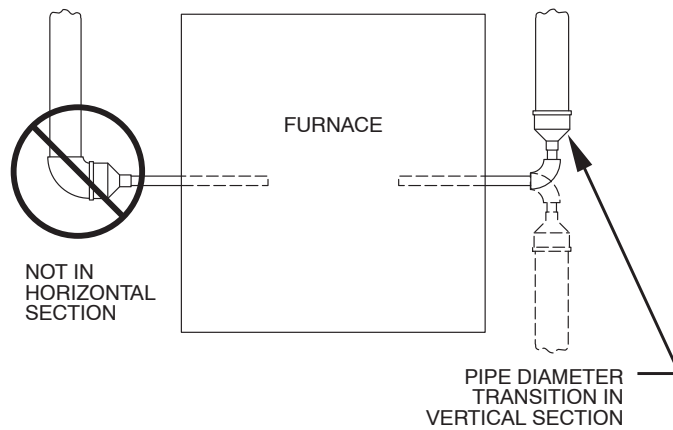


Fig. 10 - Combustion-Air and Vent Pipe Diameter Transition Location and Elbow Configuration

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**Table 3 – Maximum Allowable Exposed Vent Pipe Length - Ft. (M) With and Without Insulation
in Winter Design Temperature Ambient***

FURNACE SIZE	WINTER DESIGN TEMPERATURE °F (°C)	MAX PIPE DIAMETER IN (mm)	WITHOUT INSULATION FT (M)		WITH 3/8-IN. (10 mm) OR THICKER INSULATION† FT (M)	
			Fixed Capacity	2–Stage	Fixed Capacity	2–Stage
040	20 (-7)	1.5 (38)	51 (16)	–	70 (21)	–
	0 (-18)	1.5 (38)	28 (9)	–	70 (21)	–
	-20 (-29)	1.5 (38)	16 (5)	–	70 (21)	–
	20 (-7)	2 (51)	45 (14)	–	70 (21)	–
	0 (-18)	2 (51)	22 (7)	–	70 (21)	–
	-20 (-29)	2 (51)	10 (3)	–	58 (18)	–
060	20 (-7)	2 (51)	65 (20)	44 (13)	70 (21)	70 (21)
	0 (-18)	2 (51)	35 (11)	21 (6)	70 (21)	70 (21)
	-20 (-29)	2 (51)	20 (6)	20 (6)	70 (21)	57 (17)
080	20 (-7)	2 (51)	55 (17)	55 (17)	55 (17)	55 (17)
	0 (-18)	2 (51)	48 (15)	30 (9)	55 (17)	55 (17)
	-20 (-29)	2 (51)	30 (9)	16 (5)	55 (17)	55 (17)
	20 (-7)	2.5 (64)	70 (21)	58 (18)	70 (21)	70 (21)
	0 (-18)	2.5 (64)	47 (14)	29 (9)	70 (21)	70 (21)
	-20 (-29)	2.5 (64)	28 (9)	14 (5)	70 (21)	67 (20)
100	20 (-7)	2.5 (64)	40 (12)	40 (12)	40 (12)	40 (12)
	0 (-18)	2.5 (64)	40 (12)	38 (12)	40 (12)	40 (12)
	-20 (-29)	2.5 (64)	38 (12)	21 (6)	40 (12)	40 (12)
	20 (-7)	3 (76)	70 (21)	63 (19)	70 (21)	70 (21)
	0 (-18)	3 (76)	50 (15)	30 (9)	70 (21)	70 (21)
	-20 (-29)	3 (76)	28 (9)	12 (4)	70 (21)	70 (21)
120	20 (-7)	3 (76)	70 (21)	70 (21)	70 (21)	70 (21)
	0 (-18)	3 (76)	61 (19)	38 (12)	70 (21)	70 (21)
	-20 (-29)	3 (76)	37 (11)	19 (6)	70 (21)	70 (21)
	20 (-7)	4 (102)	70 (21)	65 (20)	70 (21)	70 (21)
	0 (-18)	4 (102)	48 (15)	26 (8)	70 (21)	70 (21)
	-20 (-29)	4 (102)	23 (7)	5 (2)	70 (21)	65 (20)
140	20 (-7)	3 (76)	60 (18)	–	60 (18)	–
	0 (-18)	3 (76)	60 (18)	–	60 (18)	–
	-20 (-29)	3 (76)	44 (13)	–	60 (18)	–
	20 (-7)	4 (102)	70 (21)	–	70 (21)	–
	0 (-18)	4 (102)	57 (17)	–	70 (21)	–
	-20 (-29)	4 (102)	30 (9)	–	70 (21)	–

* Pipe Length (ft.) specified for maximum pipe lengths located in conditioned spaces. Pipes located in unconditioned space cannot exceed total allowable pipe length as specified in the furnace Installation Instructions. Insulation thickness based on R values of 3.5 (Ft.² ° hr.)/(Btu in.).