

# T- Vent SYSTEM INSTALLATION INSTRUCTION



Failure to follow the installation instructions could cause FIRE, CARBON MONOXIDE POISONING, or DEATH.

## **warning**

Sheet metal parts may be sharp. Always wear gloves and appropriate eye, foot, and other protections when handling these products.



Failure to follow the installation instructions could cause not only the lower performance of appliance but also property damage or personal injury.

## **caution**

This vent system is a special stainless steel vent system for gas fired appliances which is UL listed as Category II, III, and IV, and is for use only with specific appliances.

Different Manufacturers have Different Joint Systems and Adhesives. Do Not Mix Pipe, Fittings, or Joining Methods from Different Manufacturers.

- These installation instructions are for the vent system of gas burning appliances. Refer to the appliance manufacturer's instruction for its installation.
- It is recommended that experienced professionals familiar with the operation and maintenance of heating appliances and venting install this system. These instructions are a guide to assist a professional installer.
- Before commencing installation, please read the installation instructions carefully.
- The maximum flue gas temperature is 480 degrees F (249 degrees C), and the maximum positive pressure is 8inchW.C. for the vent system.
- Examine all components for possible shipping damage prior to installation.
- This venting system must be free to expand and contract.
- This venting system must be supported in accordance with these instructions.
- Check for unrestricted vent movement through walls, ceilings, and roof penetrations.
- Refer to the appliance manufacturer's instructions to determine requirements and limitations for venting system with respect to installation and use, such as maximum horizontal length from the appliance, maximum height, or the required installation clearances.
- Contact Local Building or Fire Officials About Restrictions and Installation Inspection in your area.

## 1 GENERAL INSTALLATION REQUIREMENTS

- Proper operation of the venting system and appliance is dependent on the use of all parts specified by the manufacturer for use in the particular installation, and that proper performance of the system may be affected if the proper assembly of all required parts is not accomplished.
- Except for installation in one and two family dwellings, a venting system that extends through any zone above that on which the connected appliance is located, shall be provided with an enclosure having a fire resistance rating equal to or greater than that of the floor or roof assemblies through which it passes.
- The venting system shall not be routed into, through, or within any other vent, such as an existing masonry or factory-built chimney, that is connected another appliance.
- Do not install insulation in any required clearance space around this venting system.
- Exterior mounted venting systems must be enclosed below the roof line to limit condensation and protect against mechanical damage.



- Any horizontally installed portion of a venting system shall have a slope (upwards for Category II, III, or IV appliances or downwards for Category III or IV appliances) not less than 1/4 inch (6.4 mm) every 12 inches (305 mm) to prevent collection of condensate at any location in the assembly.
- Means shall be provided for draining the condensate. Due to ice build up and blockage, it is required that the proper sloping be employed when the vent is installed in a horizontal installation. Refer to the appliance manufacturer's installation instructions for further details regarding the installation of the condensate drain fittings.
- The total horizontal/vertical vent length and the number of the elbows from the appliance flue collar to the outside termination shall not be greater than which specified in the appliance manufacturer's instructions.

( 1 ) SELECTING INSTALLING PLACE

- A venting system that exits the structure through a sidewall or the like shall terminate not less than 12 inches high above the ground.
- A termination of the venting system be located above the snow line in geographical areas where snow accumulates.
- The termination of the venting system shall not be located in traffic areas, such as walkways, unless the venting system is at least 7 feet (2.13 m) high above the ground.

( 2 ) CLEARANCE TO COMBUSTIBLES AND OPENINGS

① Maintain clearances to combustibles as follows.

TABLE 1 Minimum Clearance to combustibles

Max. Flue Gas Temp.	Enclosed		Unenclosed	
	Horizontal	Vertical	Horizontal	Vertical
480° F/249°C	Top:12"(305mm)	4"(102mm)	2"(51mm)	2"(51mm)
	Side:8"(203mm)			
	Bottom: 4"(102mm)			
330° F/166°C	-	-	1"(25mm)	-

② Maintain clearances to openings as follows

- Terminate the system at least 6' (1.8m) away from the combustion air intake of any appliance.
- Place the system at least 3' (.9m) away from any other building opening, gas utility meter, service regulator or the like, or other distance if specified in the appliance's instructions.

## 2 INSTALLATION

Items shown below in TABLE 2 is used for this vent system. The diameters of pipes are 4"(100.8mm).

TABLE 2

Type	Description		Part Number
	Part Name	Effective Length(in)	
Straight ※	Straight 6	6	TK-KPS64
	Straight 12	12	TK-KPS124
	Straight 24	24	TK-KPS244
	Straight 36	36	TK-KPS364
	Straight 48	48	TK-KPS484
Adjustable ※	Adjustable 8	6.7-9.8	TK-KPA084
	Adjustable 11	8.7-13.8	TK-KPA114
	Adjustable 17	13.0-22.4	TK-KPA174
	Adjustable 46	31.9-60.2	TK-KPA464
Elbow ※	Elbow 45		TK-KPE454
	Elbow 90		TK-KPE904
Adapter ※	Appliance Adapter		TK-KPAA4
Termination ※	Louver Termination		TK-KPLT4
	Hood Termination		TK-KPHT4
	Rain Cap		TK-KPRT4
Condensation Drain ※	Drain Tee Horizontal		TK-KPDR4
	Drain Tee Vertical		TK-KPDRV4
Roof Piece	Flat Roof Flashing		TK-KPFR4
	Angled Roof Flashing		TK-KPAR4
	Roof Jack		TK-KPRJ4
	Storm Collar Pipe ※		TK-KPSP4
	Storm Collar		TK-KPSC4
Firestop	Firestop		TK-KPFS4
Wall Penetration	Wall Thimble-1		TK-KPW4-1
	Wall Thimble-2		TK-KPW4-2
	Wall Thimble-3		TK-KPW4-3
Wall Termination	Wall Thimble with Louver-1		TK-KPWL4-1
	Wall Thimble with Hood-1		TK-KPWH4-1
	Wall Thimble with Louver-2		TK-KPWL4-2
	Wall Thimble with Hood-2		TK-KPWH4-2
	Wall Thimble with Louver-3		TK-KPWL4-3
	Wall Thimble with Hood-3		TK-KPWH4-3
Support	Support Strap 1		TK-KPSS14
	Support Strap 2		TK-KPSS24
	Support Strap 4		TK-KPSS44
	Support Strap 8		TK-KPSS84
	Support Strap 12		TK-KPSS124
	Support Clamp		TK-KPCP4

(1)COMMON PROCEDURE FOR VERTICAL AND HORIZONTAL INSTALLATION

①KP-Joint :

[Joint Connection and Detachment Method]

Items marked (※) in TABLE 2 - Appliance Adapter, Straights, Elbows, Drain Tee, Terminations, Storm Collar Pipe- shall be connected and detached by the following method. Finally, the vent Straights must not be cut.

• Connection

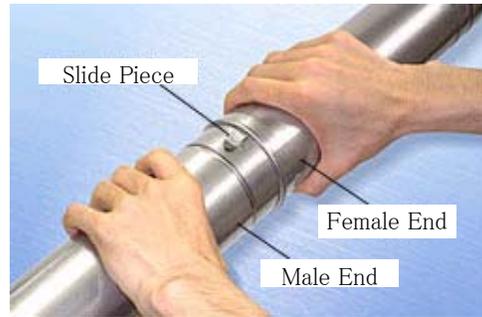
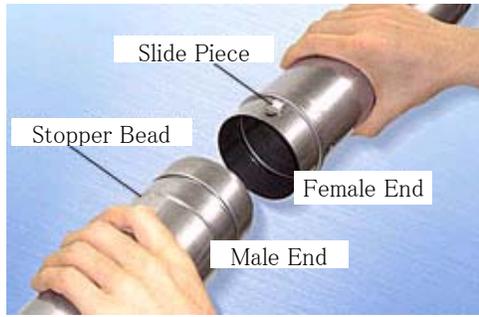


Fig 1-1 Connection

Confirm Female/Male Ends of the Straights.  
A Female End has Slide Piece.

Insert the Male End fully into the Female End till the Stopper Bead is seated against the stop end on the Female End.

• Disconnection



Fig 1-2 Disconnection

Insert the Male End fully into the Female end till the Stopper Bead is seated against the stop end on the Female End, then pull up the Female End with Slide Piece pressed in the Stopper Cover.\*

\* Caution:

When detach the pipe, if Slide Piece moves and the pipe is pulled out, joint system will be locked. Connect the pipe tightly and try the disconnection procedure again.

Twisting the pipe makes it easy to be detached.

[KP-Joint Structure]

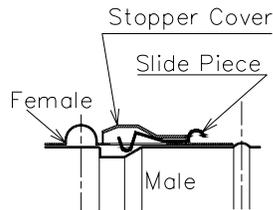


Fig 2-1 Structure

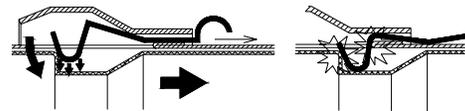


Fig 2-2 Unfasten Prevention Mechanism

[Unfasten Prevention Mechanism] (Fig.2-2)  
Pull the male without pushing Slide Piece to Stopper Cover, Slide Piece goes down into the gutter of male and two pipes are locked.

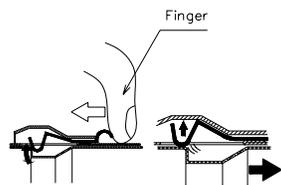


Fig 2-3 To detach the pipes

[To detach the pipes] (Fig.2-3)  
Pull the male pipe with pushing Slide Piece to Stopper Cover, Slide Piece goes up onto the male and two pipes are detached.

② Adjustable

Adjustables are available to allow for installation where fixed-length sections do not produce the desired dimensions. Also Adjustables may be used to compensate for linear thermal expansion/contract between two fixed points.

Four types of Adjustable Lengths are available according to the limits in which its effective length can expand and contract.

③ Elbows (See FIG.3)

45° and 90° Elbows are available for changing the direction of the vent system. The flexible section of them can be bended by hand for adjusting to delicate angle adjustment. Do not bend repeatedly or extremely, because it may cause vent gas leak.

④ Appliance Adapter

Install the appliance adapter between the appliance exhaust gas outlet(flue collar) and a vent pipe. Confirm the appliance exhaust gas outlet(flue collar) is designed to accept the vent system before installation.

⑤ Condensation Drain(See FIG.4)

If the appliance manufacturer's instructions or local regulations call for a condensate drain, locate the Drain Tee(Horizontal or Vertical) - shown in TABLE 2- as close as possible to the appliance exhaust gas outlet(flue collar) (like FIG 7). Locate the Drain Tee Horizontal at any transition from horizontal to vertical vent run. Confirm the direction of the Drain Tee Vertical, which has the direction label(UP,DOWN).

Connect a drain hose to the drain hose connector, which has 0.47"(12mm) diameter and 1.5"(39mm) length. The drain hose must be suitable for use with acidic effluent and the temperature anticipated by the appliance manufacturer. Follow appliance manufacturer's instruction, or all local and national codes for draining the condensate and acidic effluent.

⑥ Support(See FIG.5)

According to the required clearances to combustible materials(see TABLE 1), five types of supports for inner wall are available for both vertical and horizontal installation (see TABLE 2).

Support the vent system every 7feet(2,1m).

1. Secure the support to solid material using appropriate fasteners for various materials - wood screws for wood.
2. Loosen the nuts of the cylinder. After inserting pipes, fasten the loosened nuts. Use the pairs of nuts and bolts provided with the support.



Fig 3 Elbows

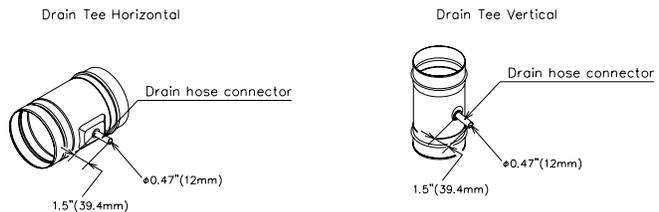


Fig 4 Condensation Drain

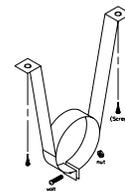


Fig 5 Supports

⑦ Wall Thimble(See FIG.6)

Use Wall Thimble to penetrate a combustible wall in a horizontal installation and pass the vent pipe through the Wall Thimble. Horizontal Termination is attached to the Wall Thimble. Wall Thimble consists of two parts (Part A(outside), Part B(inside)), separate them before installation.

Wall Thimble has two sleeves in Part A. Part C is incorporated in the inner sleeve of Part A. Pull Part C out of Part A and adjust the whole length of cylindrical part of Part A and Part C to fit the wall thickness. In accordance with the wall thickness, select the Wall Thimble from 1 to 3(See (3)Table 5). Some of them are pre-assembled at factory from Wall Thimble and Termination(Louver or Hood) with adjustable mechanism as a set of Wall Termination(See Table 3).

Table 3

Wall Termination	Set Parts
Wall Thimble with Louver	Wall Thimble, Louver Termination with adjustable mechanism
Wall Thimble with Hood	Wall Thimble, Hood Termination with adjustable mechanism

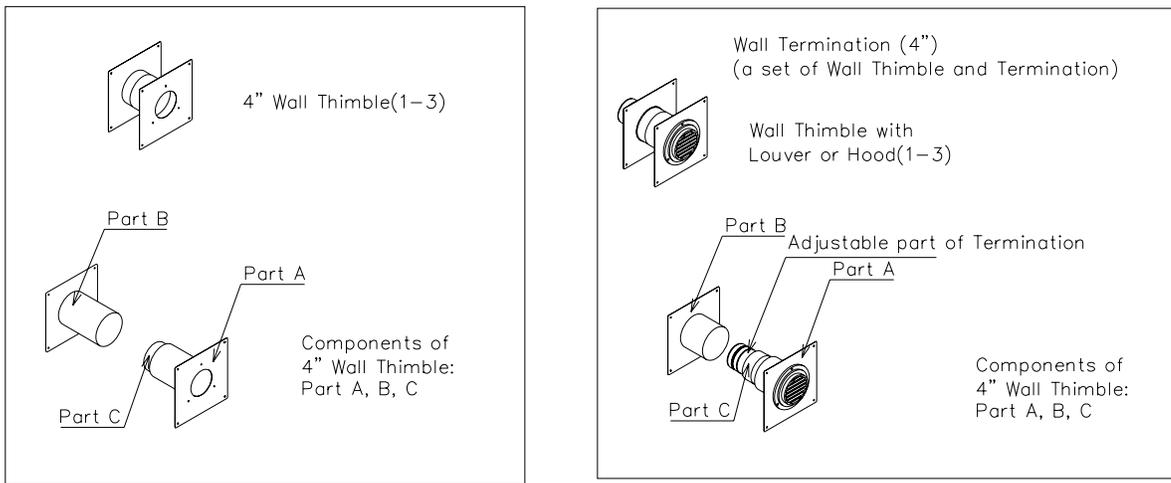


Fig 6 Wall Thimble

(2)VERTICAL INSTALLATION(See FIG.7)

1. Determine the path for the vent system, so that a continuous slope not less than 1/4 inch every 12 inches - upwards with Drain Tee - is maintained in the horizontal portion of the vent system.
2. Cut square openings in every floors, ceilings, and roof where the vent system pass through. Select opening size from TABLE 4 so that the spacer tab which protrude from Firestop sit within the opening. This keeps the required clearances between the vent pipes and combustibles.

TABLE 4 Square opening size in floors, ceiling, roof

	When Enclosed	When Unenclosed
for 4" diameter pipe	12"(305mm)	8"(203mm)

3. Fasten Firestop to the opening on floors, ceilings, with appropriate fasteners for various materials - wood screws for wood. Locate Firestop with the four spacer tab set within the opening. When installing a Firestop in the attic, the Firestop is located on top of the joist to prevent insulation from falling into the joist.
4. Fasten Roof Flashing to roof with appropriate fasteners for various building materials. Flat Roof Flashing and Angled Roof Flashing are available. When installing on a pitched roof, use Angled Roof Flashing.
5. Insert the Roof Jack into the Roof Flashing until the four stopping tabs of Roof Jack set on the top of Roof Flashing.
6. When using the Storm Collar Pipe, insert the Storm Collar Pipe into the Roof Jack. Slide the Storm Collar Pipe down to rest on the Flashing.

When using the Storm Collar, slide the Storm Collar onto the straight pipe and fasten the Storm Collar at the appropriate point. When inserting Storm Collar onto the pipe and fastening it, be careful not to loosen and tighten too strongly in case the band of Storm Collar is broken. When fastening Storm Collar, put the pipe vertically and fasten Storm Collar horizontally. Insert the straight pipe with Storm Collar into the Roof Jack. Slide the straight pipe with the Storm Collar down to rest on the Flashing. Use high temperature sealant to seal the storm collar to the vent so that rain will not penetrate the roof opening.

7. Attach the Rain Cap to keep rain out of the vent. The vent system must terminate at least 3'(0.91m) high above the roofline and at least 2'(0.61m) higher than any portion of a building within 10'. Add the additional Straights between Rain Cap and the Storm Collar Pipe as needed. When the vent extends more than 32in high above the roofline it must be supported by support bracing.
8. Install the vent system from the Storm Collar Pipe to the appliance according to "(1) COMMON PROCEDURE FOR VERTICAL AND HORIZONTAL INSTALLATION" in this installation instruction. When enclosing vertical vent system, the clearance to combustibles inside a chase shall be not more than 4"(0.1m)
9. Once the vent system reaches the floor or ceiling, pass the pipe through the Firestop. Support vent pipe at every floor and ceiling. Tighten the Support Clamp to vent pipe using the pairs of volts and nuts provided.

### (3)HORIZONTAL INSTALLATION(See FIG.8)

1. Determine the path for the vent system so that the continuous slope requirement - downwards, or upwards if Drain Tee is used - is maintained in the horizontal portion of the vent system. Penetrating a combustible wall in a horizontal installation requires the use of a Wall Thimble, and pass the vent pipe through the Wall Thimble. The minimum horizontal vent length between the inside wall and appliance must be more than 3 feet.
2. The wall Thimble consists of two parts(Part A(outside) and Part B(inside)). Separate them before installation.
3. Cut the opening for the Wall Thimble with the square of 7"(178mm) or round of 8"(203mm) for 4" diameter pipe. The wall thickness shall be from 4.2"(107mm) to 14.0"(356mm) for 4" pipe. In accordance with the wall thickness, select the Wall Thimble from 1 to 3 for 4" diameter pipe(See Table5).
4. Insert Part A(outside) from outside wall.  
For 4" diameter pipe, measure the wall thickness. If necessary, pull Part C out of inner sleeve of Part A and adjust the whole length of cylindrical part of Part A and Part C to become the thickness of the wall plus +0.0" ~ 0.5". Fix inner sleeve of Part A with Part C by aluminum tape provided with Wall Thimble at two spots.
5. Insert Part B(inside) from inside wall. Slide the sleeve of Part B(inside) into outer sleeve of Part A(outside) until outer and inner plates of the Wall Thimble are fixed on the wall.
6. Fasten respectively Part A(outside) and Part B(inside) to wall with appropriate fasteners for various materials - wood screws for wood.
7. Pass pipe through Wall Thimble and connect the pipe with Termination. Fasten Vent Termination to Part A(outside) with the three bolts provided or three pieces of No.8 UNC bolts of about 3/4" long. Louver Termination, and Hood Termination are available. The distance between top of termination and outer wall varies from 1" to 4" according to the type of termination.
8. Seal between Wall Thimble and wall, or Wall Thimble and Vent Termination as required.
9. Install the vent system from the Wall Thimble toward the appliance. Refer to "(1)General" in these installation instructions for proper procedure.
10. For Wall Termination set which is assembled with Wall Thimble and Termination with adjustable mechanism, install in the same procedure basically. Termination is already connected and sealed with Part A of Wall Thimble. After separating Wall Thimble into two parts, extend the adjustable part of Termination first. Adjust the length of adjustable part of Termination in accordance with the vent path or the position of the appliance when appliance is installed near the wall.

Table 5

	4" Wall Thimble
Wall thickness / Wall Thimble-1	4.2in(107mm)-6.0in(152mm)
Wall thickness / Wall Thimble-2	5.6in(142mm)-9.0in(229mm)
Wall thickness / Wall Thimble-3	8.2in(208mm)-14.0in(356mm)
Opening	7"(178mm) square or 8"(203mm) round

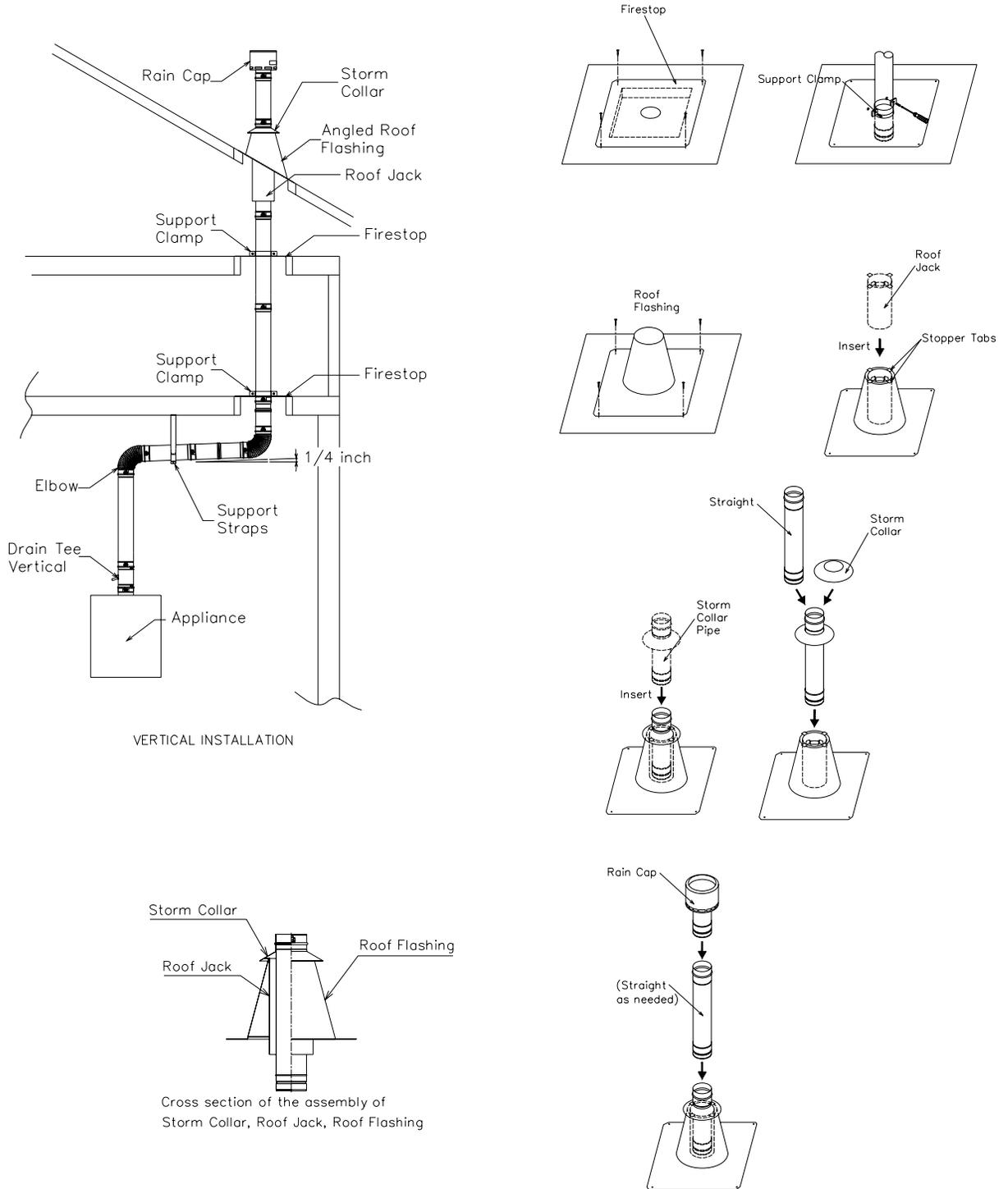


Fig 7 Detail of Vertical Installation

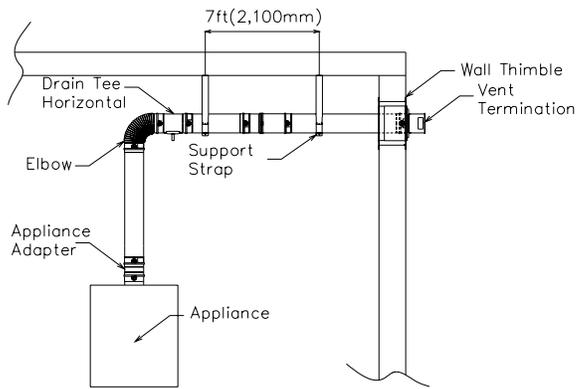


Fig 8 - 1 General Horizontal Installation

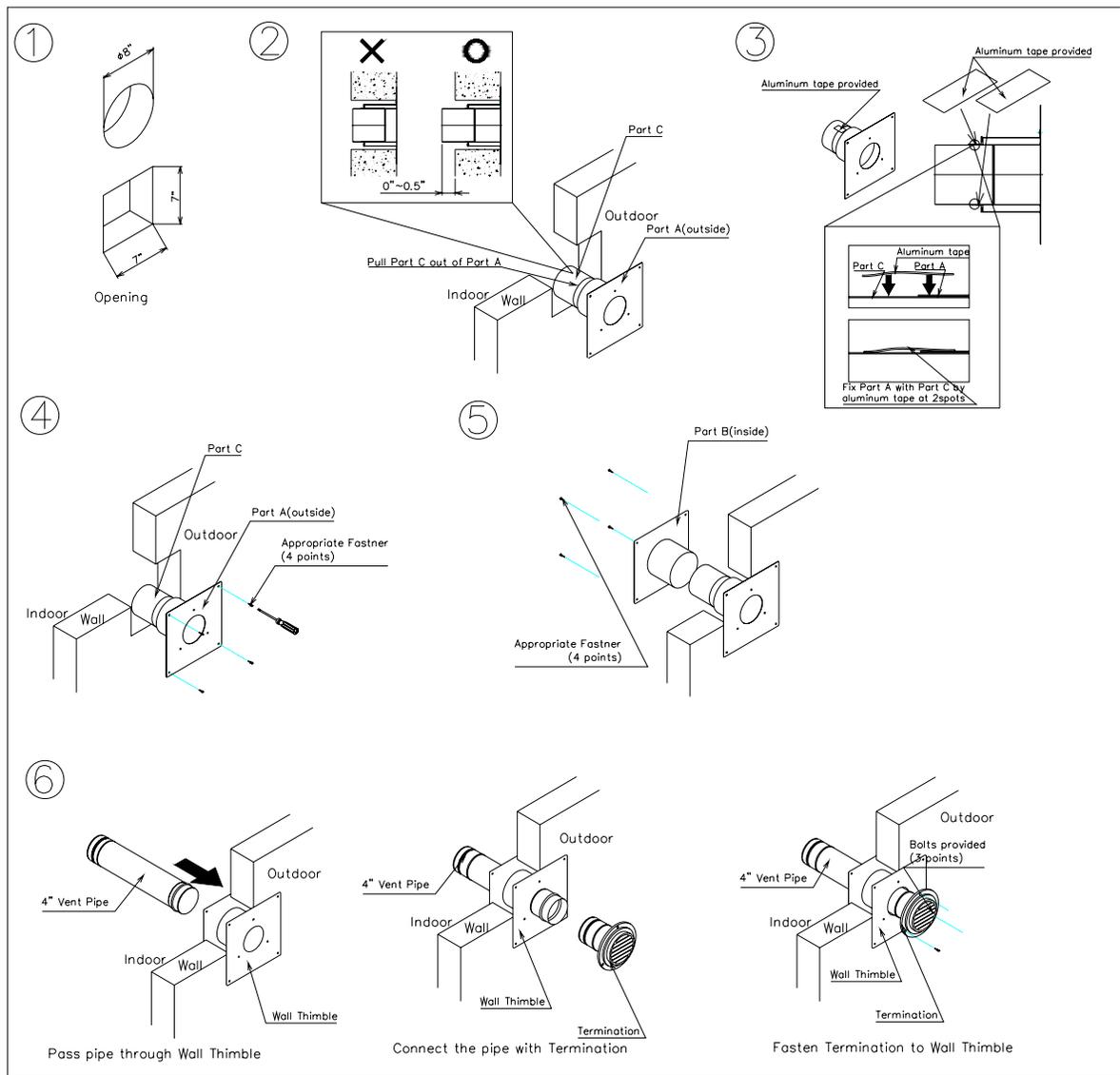


Fig 8 - 2 Wall Thimble

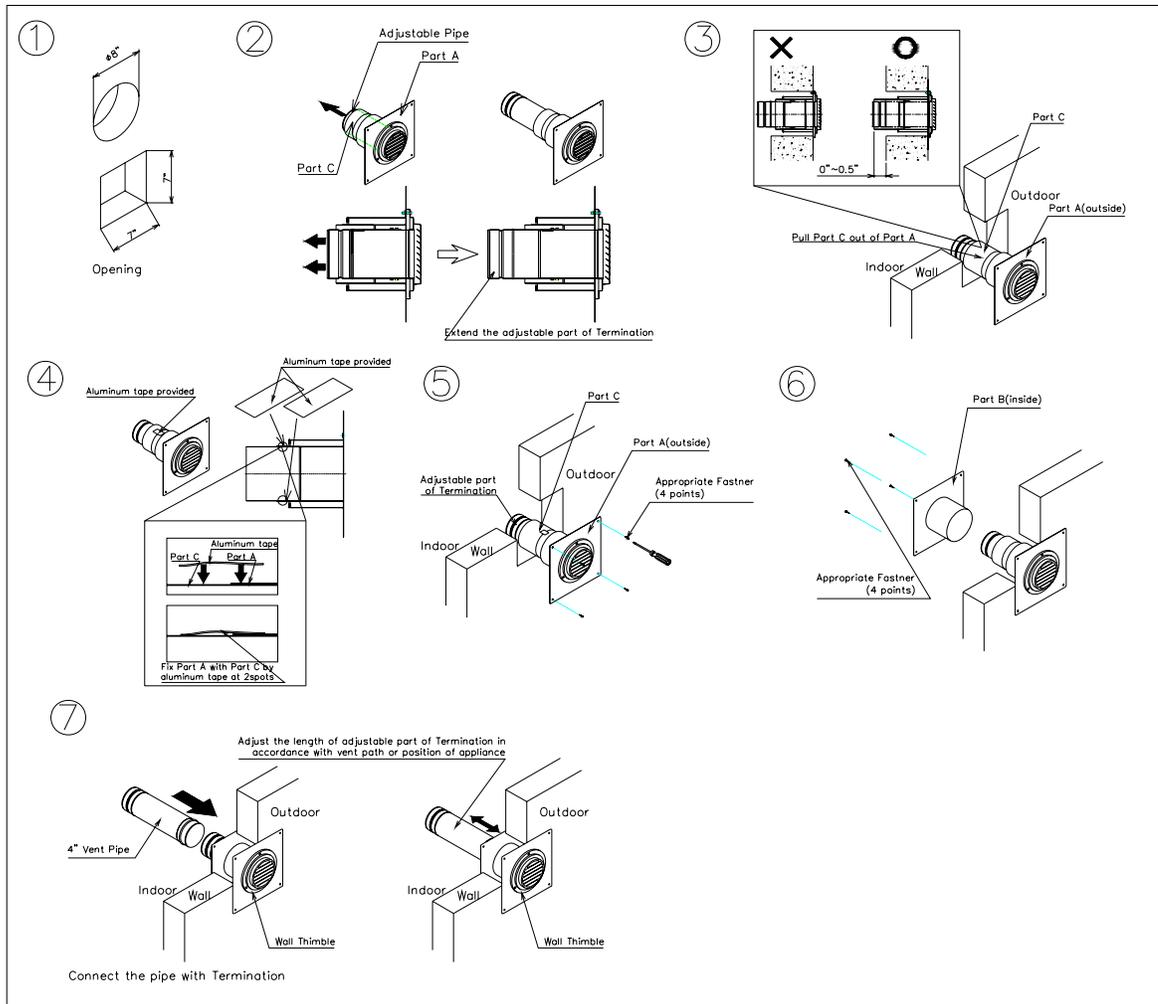


Fig 8 - 3 Wall Termination  
(a set of Wall Thimble and Termination)

Fig 8 Detail of Horizontal Installation

All warranties, stated or implied, are void if this product and the appliances to which it is connected are not installed in accordance with their respective instructions and local code requirements. After the installation, check the entire system to make sure all joints are secure and sealed correctly.

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