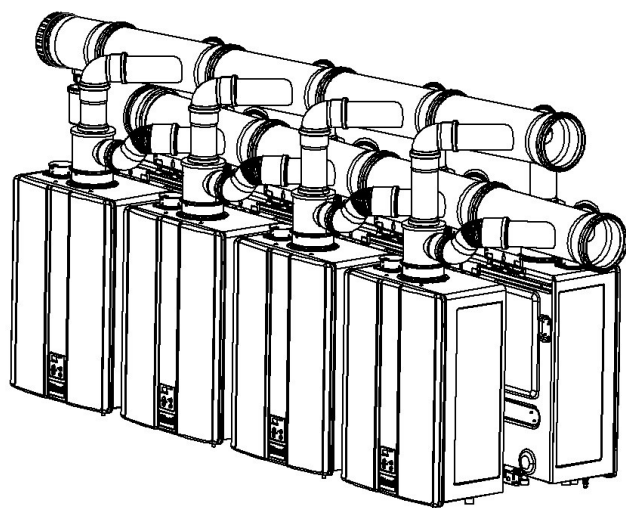




INSTALLATION INSTRUCTIONS

Polypropylene (PP) Common Venting

3 in., 4 in., 6 in. Diameters



TANKLESS WATER HEATER MODELS

CU199i (REU-N3237FFC-US)
CU160i (REU-N2530FFC-US)
RU199i (REU-N3237FF-US)
RU180i (REU-N2934FF-US)
RU160i (REU-N2530FF-US)
RU130i (REU-N2024FF-US)
RUR199i (REU-NP3237FF-US)
RUR160i (REU-NP2530FF-US)
Demand Duo (CHS199100CU)



Certified to ANSI Z21.10.3 - CSA 4.3
For U.S. and Canadian Installations

This manual is a supplement to the appliance manual. Additional information can be obtained from the Rinnai Water Heater Installation and Operation Manual.



DANGER

If these instructions are not followed exactly, a fire or explosion may result causing property damage, personal injury, or death.



WARNING

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- WHAT TO DO IF YOU SMELL GAS
 - Do not try to light any appliance.
 - Do not touch any electrical switch; do not use any phone in your building.
 - Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
 - If you cannot reach your gas supplier, call the fire department.
- Installation and service must be performed by a qualified installer, service agency or the gas supplier.

Welcome

This manual provides installation instructions for Ubbink Polypropylene (PP) common venting and is a supplement to the Installation and Operations Manual supplied with the Rinnai Tankless Water Heater.

Common venting must satisfy all the requirements of the Installation and Operations Manual, as well as the requirements in this manual.

For detailed information on the Rinnai Tankless Water Heater, including installation instructions, refer to the Tankless Water Heater Installation and Operation Manual or view an online version at rinnai.us.

To The Installer

- This manual is intended for the trained and qualified professional and is designed for licensed installers who should have skills such as:
 - Gas sizing
 - Connecting gas lines, water lines, valves, and electricity
 - Knowledge of applicable national, state, and local codes
 - Installing venting through a wall or roof
 - Training in installation of tankless water heaters. Training on Rinnai Tankless Water Heaters is accessible at www.trainingevents.rinnai.us
- A trained and qualified professional must test the Common Venting System for leaks before use.
- The installation must conform to the Rinnai Tankless Water Heater Installation and Operation Manual that is shipped with the unit, local codes, or in the absence of local codes, with the National Fuel Gas Code, ANSI Z223.1/NFPA 54.
- Read all instructions contained in this manual before installing the Common Venting System.
- Proper installation is the responsibility of the installer.
- When installation is complete, give all manuals related to the common venting installation (including this manual and the Rinnai Tankless Water Heater Installation and Operation Manual) directly to the consumer. The manuals should be stored in a readily accessible location for future reference.

To The Consumer

- Keep this manual for future reference.
- Be sure your Common Venting System is installed by a trained and qualified professional.

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If You Need Service

Contact your local dealer/distributor, or call Rinnai Customer Care at 1-800-621-9419 Monday to Friday between 8 AM to 8 PM EST.

Safety

WARNING

- If the information in these instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury, or death.
- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- WHAT TO DO IF YOU SMELL GAS:
 - Do not try to light any appliance.
 - Do not touch any electrical switch; do not use any phone in your building.
 - Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
 - If you cannot reach your gas supplier, call the fire department.
- Installation and service must be performed by a qualified installer, service agency or the gas supplier.
- The warning signs in this manual are here to prevent injury to you and others. Please follow them explicitly.
- Installations must comply with local requirements and with the National Fuel Gas Code, ANSI Z223.1/NFPA 54 for U.S. installations.
- Use only the materials listed in this manual for vent, air intake pipe, and fittings. Failure to comply with this warning could result in property damage.
- **DO NOT** slope the combustion air pipe toward unit. Failure to comply with this warning could result in property damage, personal injury, or death.
- **DO NOT** apply PVC/CPVC glues, solvents, or cleaners to the tankless water heater's intake or exhaust gasket connections. Failure to correctly assemble the components according to these instructions and the Rinnai Tankless Water Heater Installation and Operation Manual may result in property damage, personal injury, or death.

Safety Symbols

This manual contains the following important safety symbols. Always read and obey all safety messages.



Safety alert symbol. Alerts you to potential hazards that can kill or hurt you and others.

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in personal injury or death.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in personal injury or death.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It may also be used to alert against unsafe practices.

READ ALL INSTRUCTIONS BEFORE INSTALLATION

About the Common Venting System

The Common Vent System provides longer vent lengths and fewer wall or roof penetrations than conventional single-unit venting.

Features include:

- 3 in., 4 in. and 6 in. common vent PPTL common vent components are approved for use in the U.S. only and not available for installations in Canada.
- Canadian common vent installations must use 6 in. PPS (gray) common vent components.
- Certified to ANSI Z21.10.3 - CSA 4.3 for U.S. and Canadian installations.
- Venting material is comprised of Polypropylene (PP). For the exhaust flue, U.S. installations utilize PPTL — a CSA-certified and tested venting material. Canadian installations utilize PPS, a ULC-S636-certified and tested venting material from Ubbink.
- The various sections are self locking and sealing and can be pushed together without use of cement or glue.

Venting Guidelines

WARNING

Exhaust components must be propylene (PP/PPTL) for U.S. installations and PPS for Canadian installations. All venting components used in Canada must be ULC-S636 certified. Intake components to be in accordance with national and/or local codes having jurisdiction.

Do Not

- Do not exceed the maximum number of units indicated in the Rinnai Tankless Water Heater Installation and Operation Manual.
- Do not use cellular core PVC/CPVC, Radel, ABS or galvanized material for the exhaust vent.
- Do not combine vent components from different manufacturers.
- Do not connect the venting system with an existing vent or chimney.
- Do not cover vent components with thermal insulation.
- Do not common vent with the vent pipe of any other type of water heater or appliance.
- Do not reduce vent diameter to less than 2 in.
- Do not install the water heater in an area of negative pressure.
- Do not install the water heater, venting, and vent termination(s) in any areas where the air may contain corrosive compounds.

Must Do

- You must use vent components that are certified and listed with the water heater model.
- The vent system must vent directly to the outside of the building and use outside air or room air for combustion.
- Avoid dips or sags in horizontal vent runs by installing supports per the vent manufacturer's instructions.
- Support horizontal vent runs a minimum of every four feet and all vertical vent runs a minimum of every six feet.
- Venting should be as direct as possible with a minimum number of pipe fittings.
- Vent connections must be firmly pressed together so that the gaskets form an air tight seal.
- Vent components connected to the water heater must be secured with one self-tapping screw. Do not use any glues or solvents to connect vent components to the water heater.
- Set the temperature setting on all water heaters being common vented to the same temperature.

Information

- Unless recovering a tank, Rinnai recommends electronically connecting with common venting and where water heaters are in a manifold system. Refer to the Rinnai Tankless Water Heater Installation and Operation Manual for additional details on electronically connecting multiple water heaters.
- Refer to the appendix of this manual for Ubbink vent component assembly and installation instructions.

High Altitude Installations

- High altitude installations are certified up to 10,200 ft (3,109 m).
- Reference the respective Rinnai Tankless Water Heater Installation and Operation Manual to set the water heater for the altitude at which they will be operating.

High Altitude Derate

Tankless water heaters using common venting at altitudes over 2,000 ft will automatically derate according to the tables below. Use the tables below for calculating your total BTU for multiple tankless water heaters.

PROPANE (LP GAS)			
Number of Water Heaters	2,001 - 5,200 ft	5,201 - 7,700 ft	7,701 - 10,200 ft
1	168,000	151,000	120,000
2	332,640	298,980	237,600
3	493,920	443,940	352,800
4	651,840	585,880	465,600
5	806,400	724,800	576,000
6	957,600	860,700	684,000
7	1,105,440	993,580	789,600
8	1,249,920	1,123,440	892,800

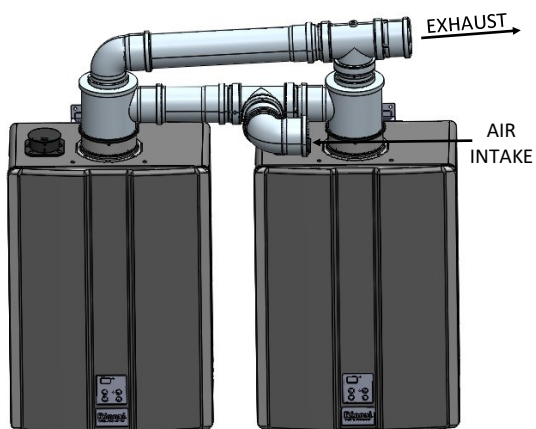
NATURAL GAS			
Number of Water Heaters	2,001 - 5,200 ft	5,201 - 7,700 ft	7,701 - 10,200 ft
1	170,000	153,000	139,000
2	336,600	302,940	275,220
3	499,800	449,820	408,660
4	659,600	593,640	539,320
5	816,000	734,400	667,200
6	969,000	872,100	792,300
7	1,118,600	1,006,740	914,620
8	1,264,800	1,138,320	1,034,160

3 in. Common Venting

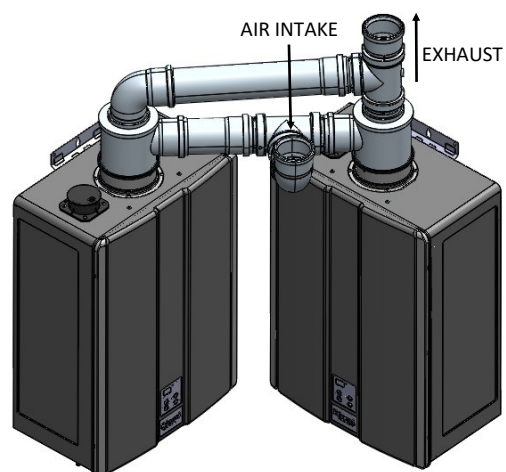
3 in. Direct Vent and Room Air

Direct Vent

Inline



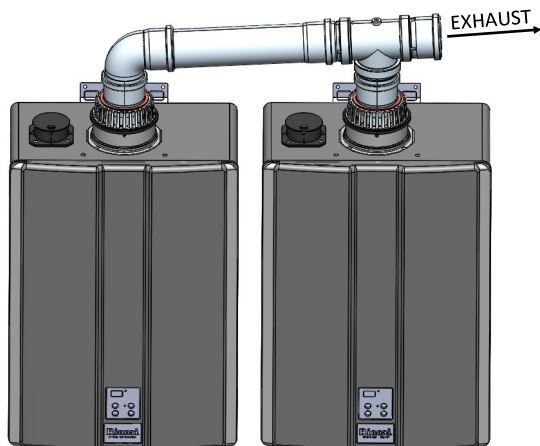
Corner



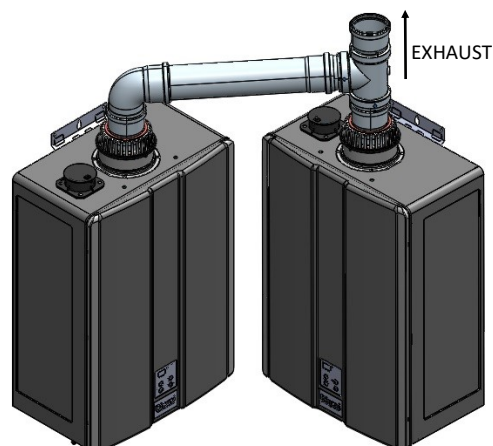
Room Air

- Refer to the "Combustion Air" section of this manual for room air requirements.

Inline

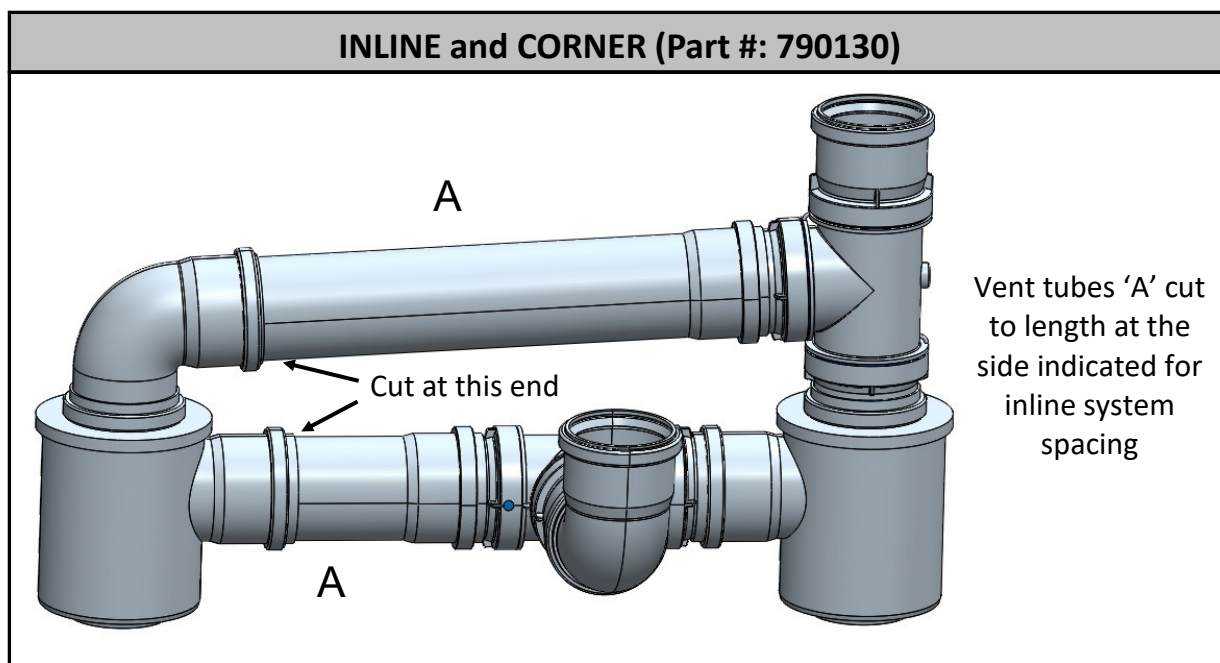


Corner

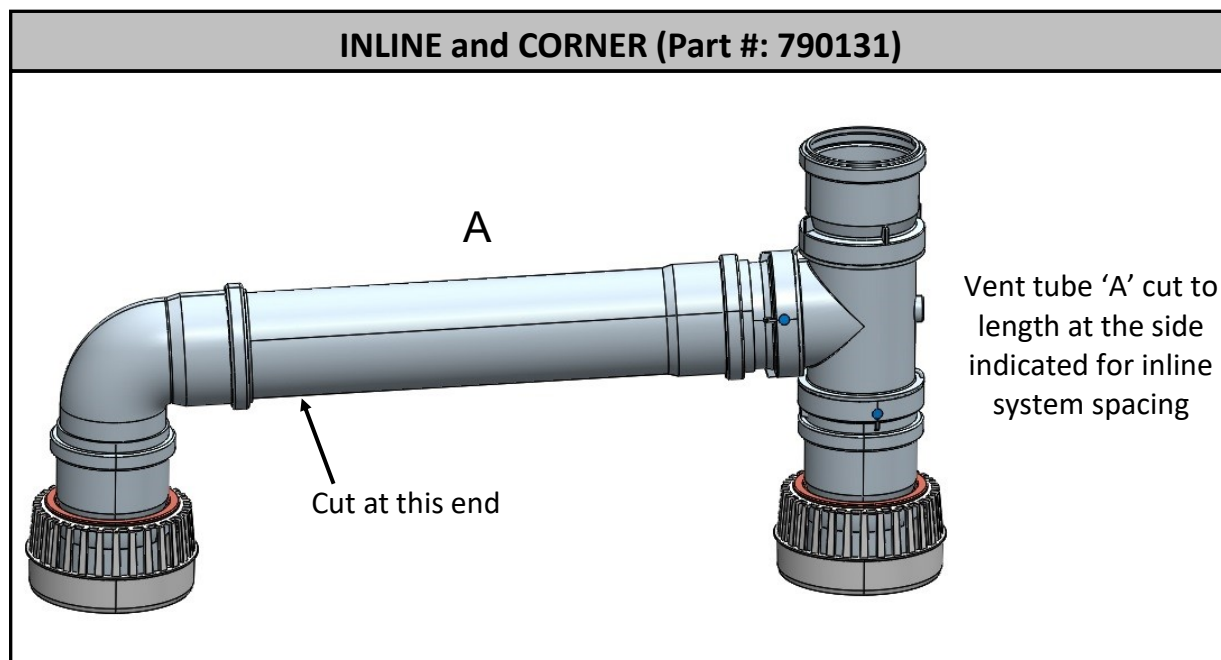


3 in. Inline and Corner Kits

Direct Vent



Room Air

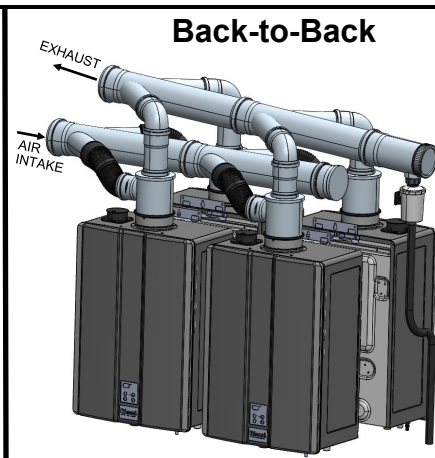
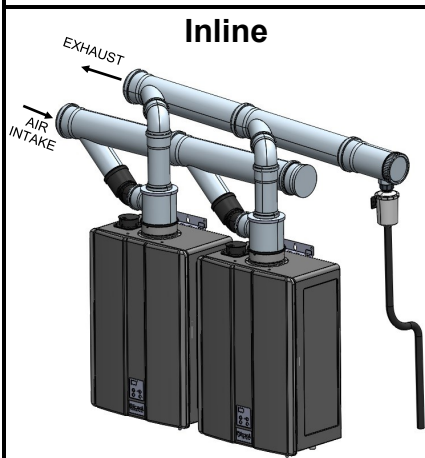


4 in. Common Venting

4 in. Direct Vent and Room Air

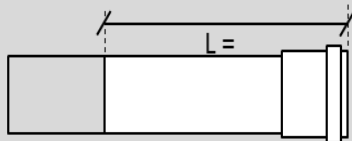
Direct Vent

- Maximum 4 Units



Cutting Line table applicable up to 4 units.

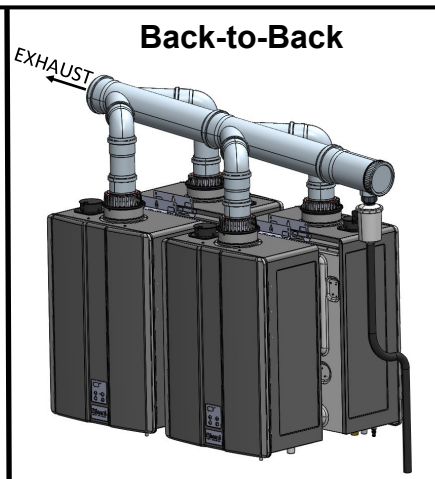
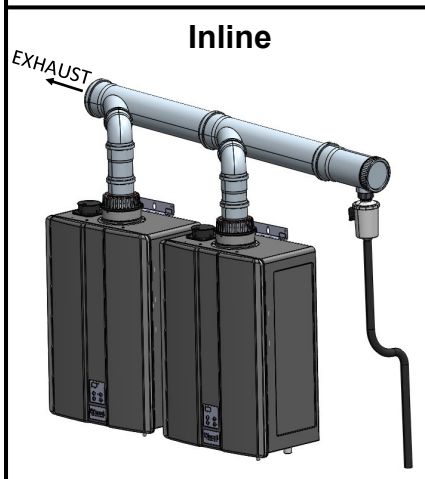
Inline # of Appl	L =	Back-to-Back # of Appl	L =
1	5.5 in.	1+1a	5.5 in.
2	6.5 in.	2+2a	6.5 in.
3	7.5 in.	3+3a	7.5 in.
4	8.5 in.	4+4a	8.5 in.



*Cutting line
Debur edges after cutting

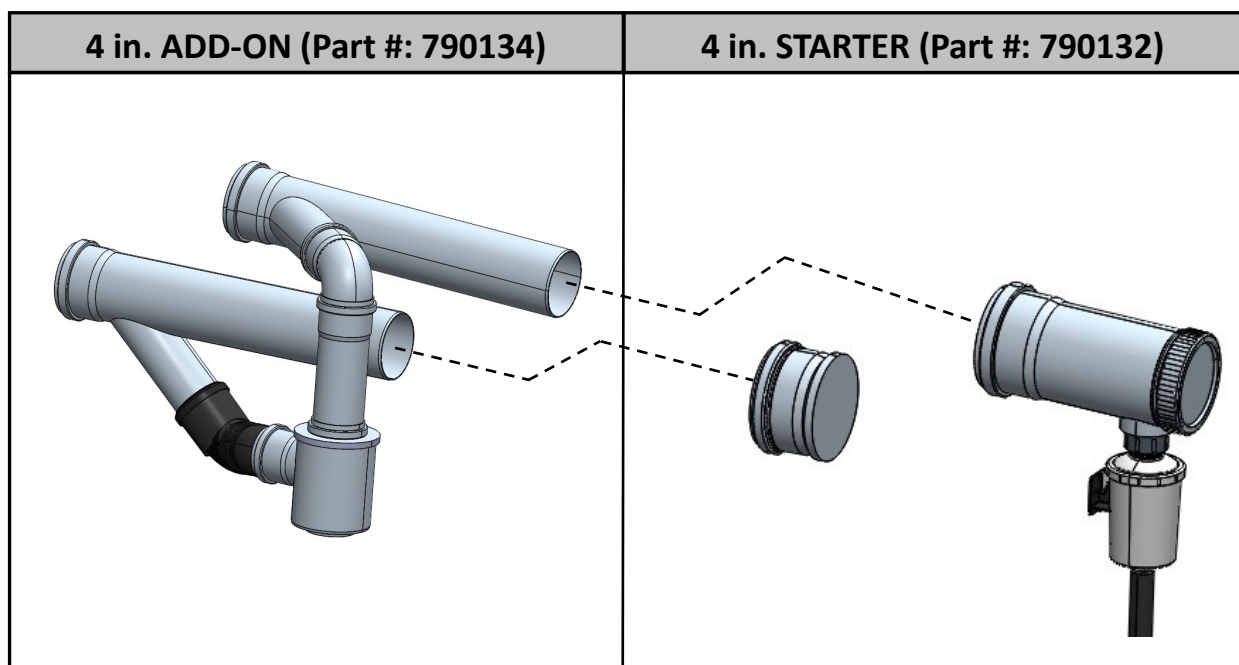
Room Air

- Maximum 4 Units
- Refer to the "Combustion Air" section of this manual for room air requirements

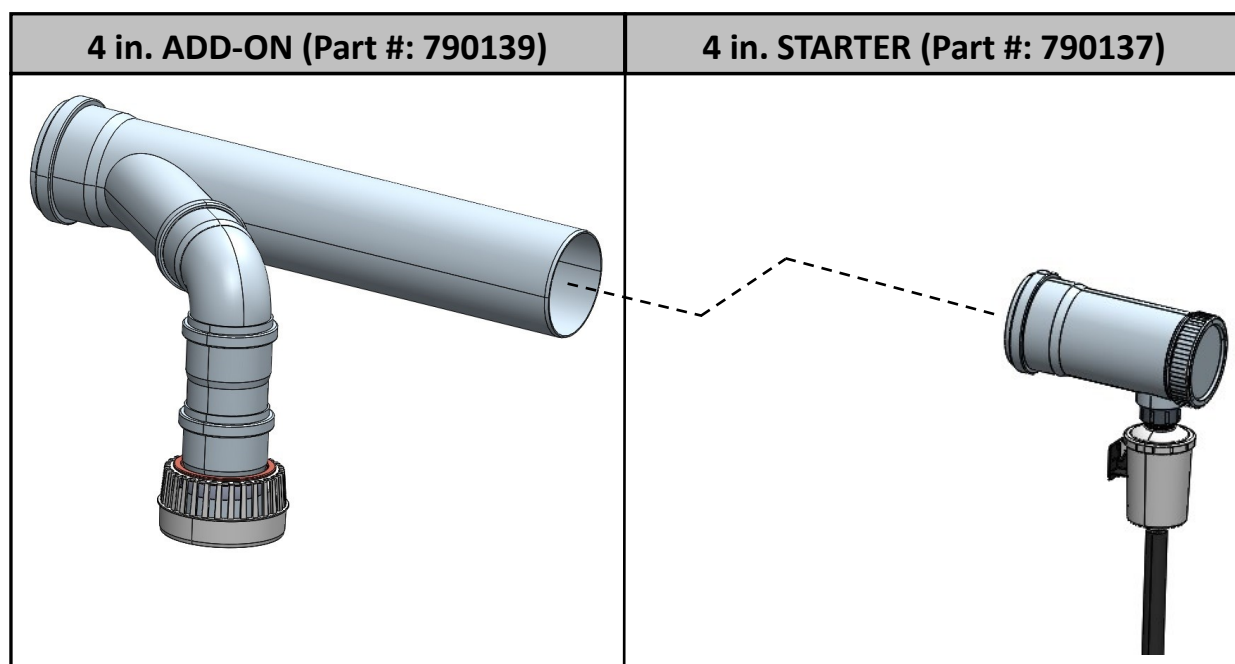


4 in. Inline Add-On and Starter Kits

Direct Vent

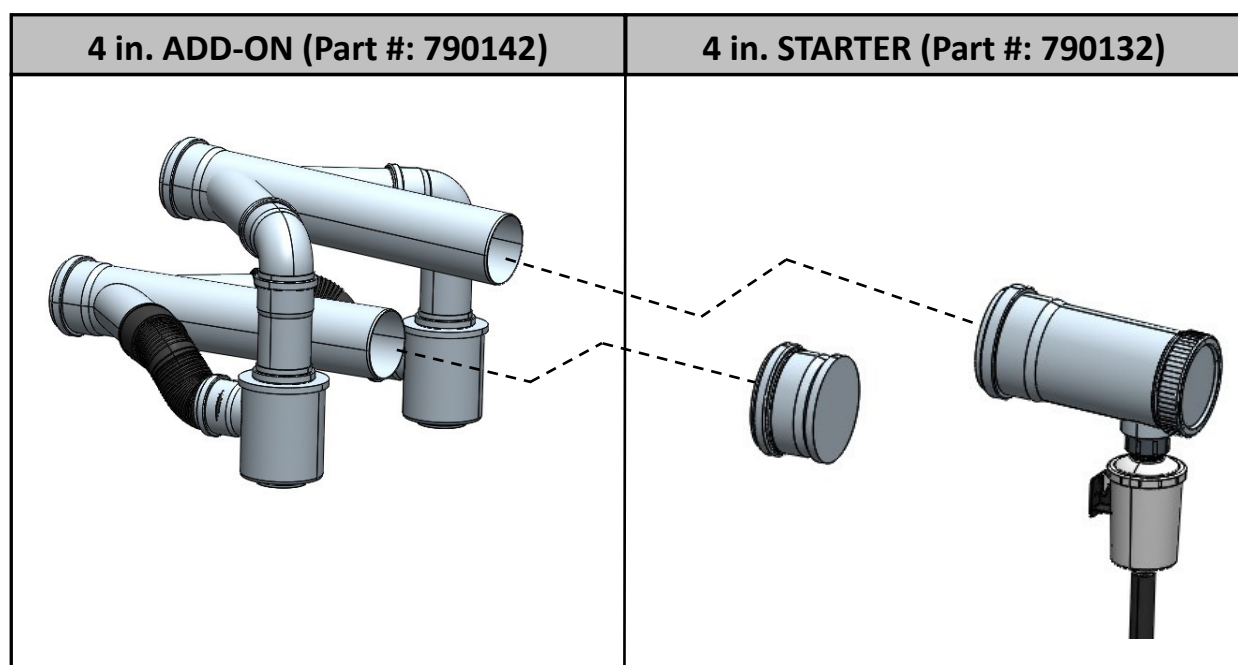


Room Air

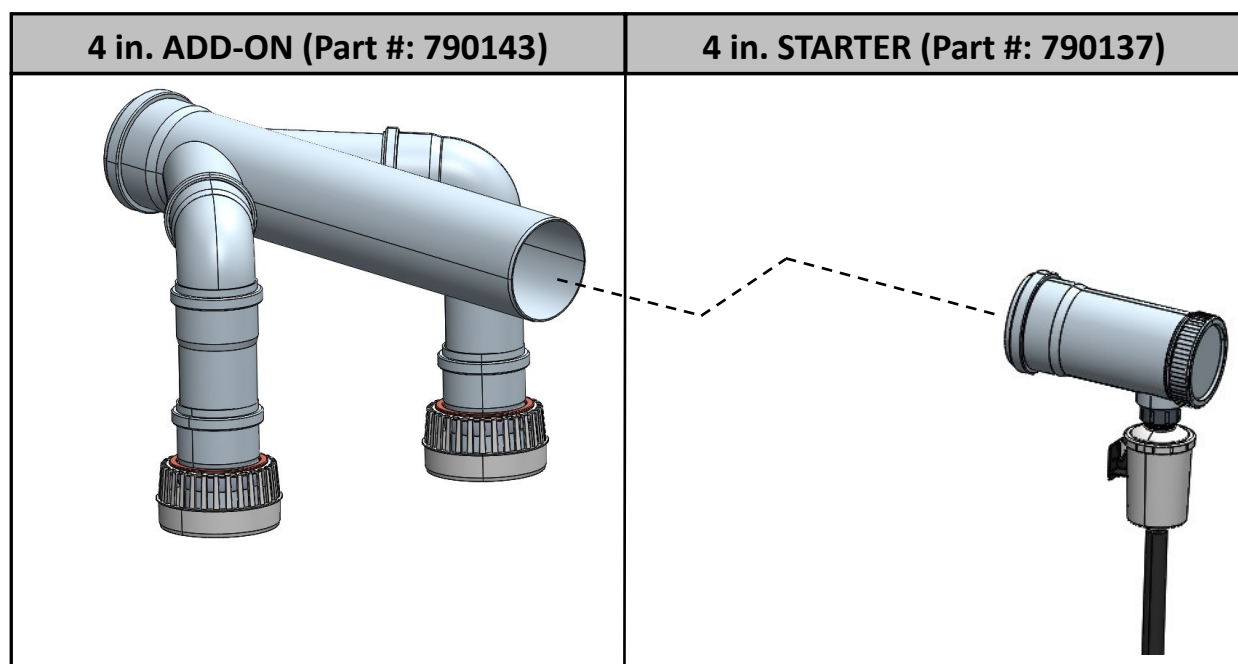


4 in. Back-to-Back Add-On and Starter Kits

Direct Vent



Room Air



6 in. Common Venting

6 in. Direct Vent and Room Air

Direct Vent

- Maximum 12 Units

Inline

Back-to-Back

Cutting Line table applicable up to 12 units.

Inline # of Appl	L =	Back-to-Back # of Appl	L =
1	5.5 in.	1+1a	5.5 in.
2	6.5 in.	2+2a	6.5 in.
3	7.5 in.	3+3a	7.5 in.
4	8.5 in.	4+4a	8.5 in.
5	9.5 in.	6+6a	9.5 in.
6	10.5 in.		
7	11.5 in.		
8	12.5 in.		
9	13.5 in.		
10	14.5 in.		
11	15.5 in.		
12	16.5 in.		

Room Air

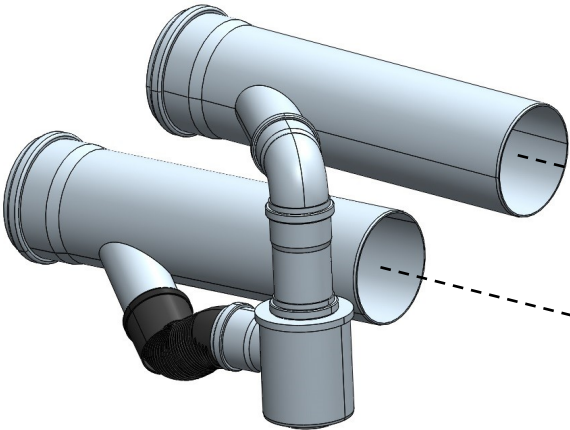
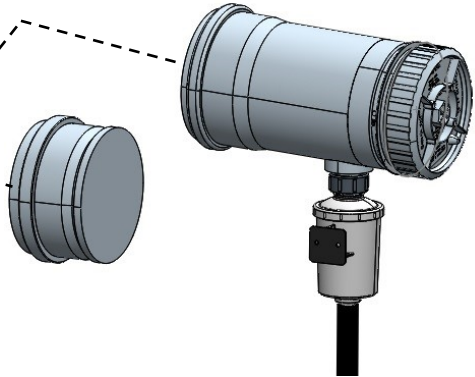
- Maximum 12 Units
- Refer to the “Combustion Air” section of this manual for room air requirements

Inline

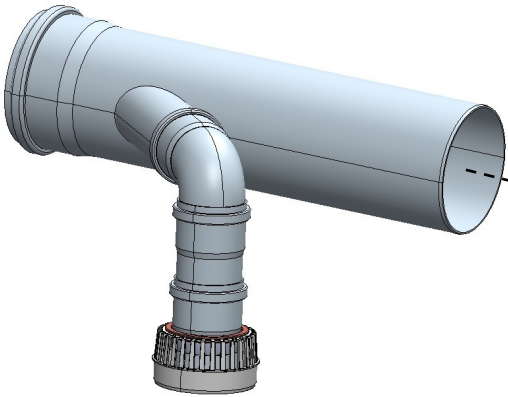
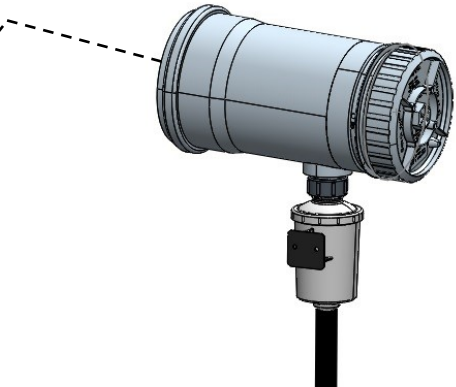
Back-to-Back

*Cutting line
Deburr edges after cutting

Direct Vent

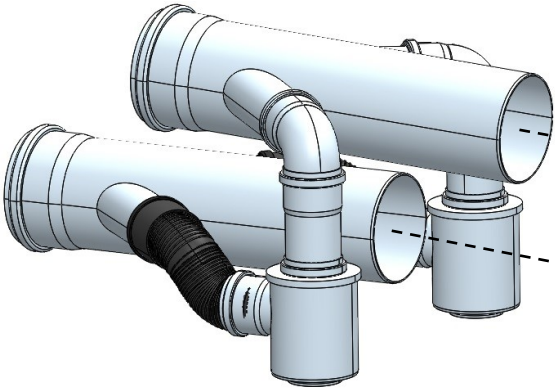
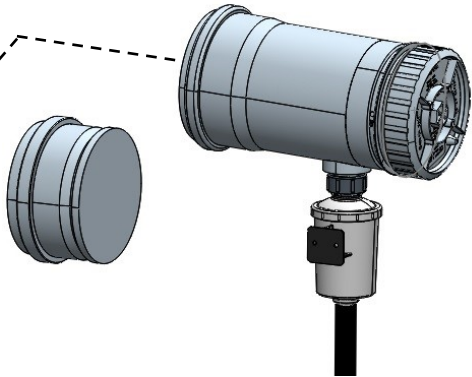
6 in. ADD-ON (Part #: 790135 / *791021PPS)	6 in. STARTER (Part #: 790133 / *791020PPS)
	

Room Air

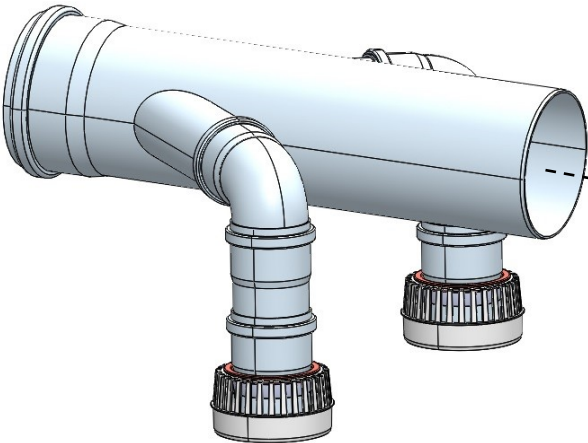
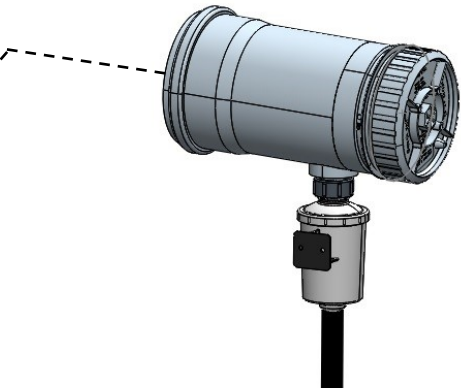
6 in. ADD-ON (Part #: 790140 / *791024PPS)	6 in. STARTER (Part #: 790138 / *791023PPS)
	

6 in. Back-to-Back Add-On and Starter Kits

Direct Vent

6 in. ADD-ON (Part #: 790136 / *791022PPS)	6 in. STARTER (Part #: 790133 / *791020PPS)
	

Room Air

6 in. ADD-ON (Part #: 790141 / *791025PPS)	6 in. STARTER (Part #: 790138 / *791023PPS)
	

Termination Kits



Roof Termination
6 inch: 790096
6 inch: *791030PPS
4 inch: 790095



Roof Termination
Shown with OPTIONAL
Exhaust Flue Rain Cap



Roof Termination
Shown with REQUIRED
Intake Air Rain Cap



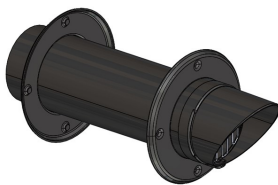
Roof Termination
3 inch: 790125



Roof Termination
(39 inch extension)
6 inch (stainless): 790103



Roof Termination
(39 inch extension)
4 inch (plastic): 790102



Wall Terminal Kit
6 inch (Plastic): 790094
6 inch (PPS): *791029PPS
4 inch (Plastic): 790093
3 inch (Plastic): 790124



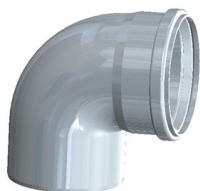
Intake Rain Cap
6 inch: 780061
4 inch: 780060



Exhaust Flue Rain Cap
6 inch: 790098
4 inch: 790097

Common Vent Components

Images below are representative shape of actual components.



90° Elbow
6 inch: 790087
6 inch: *791027PPS
4 inch: 790027
3 inch: 790121



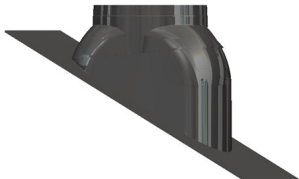
45° Elbow
6 inch: 790086
6 inch: *791026PPS
4 inch: 790026
3 inch: 790120
(All sizes sold in sets of 2)



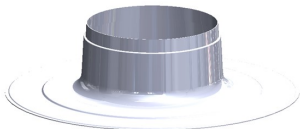
Bracket
6 inch: 790092
4 inch: 790091
3 inch: 790123



Centrocerin
Lubricant



Pitched roof moldable flashing
6 and 4 inch: 790099



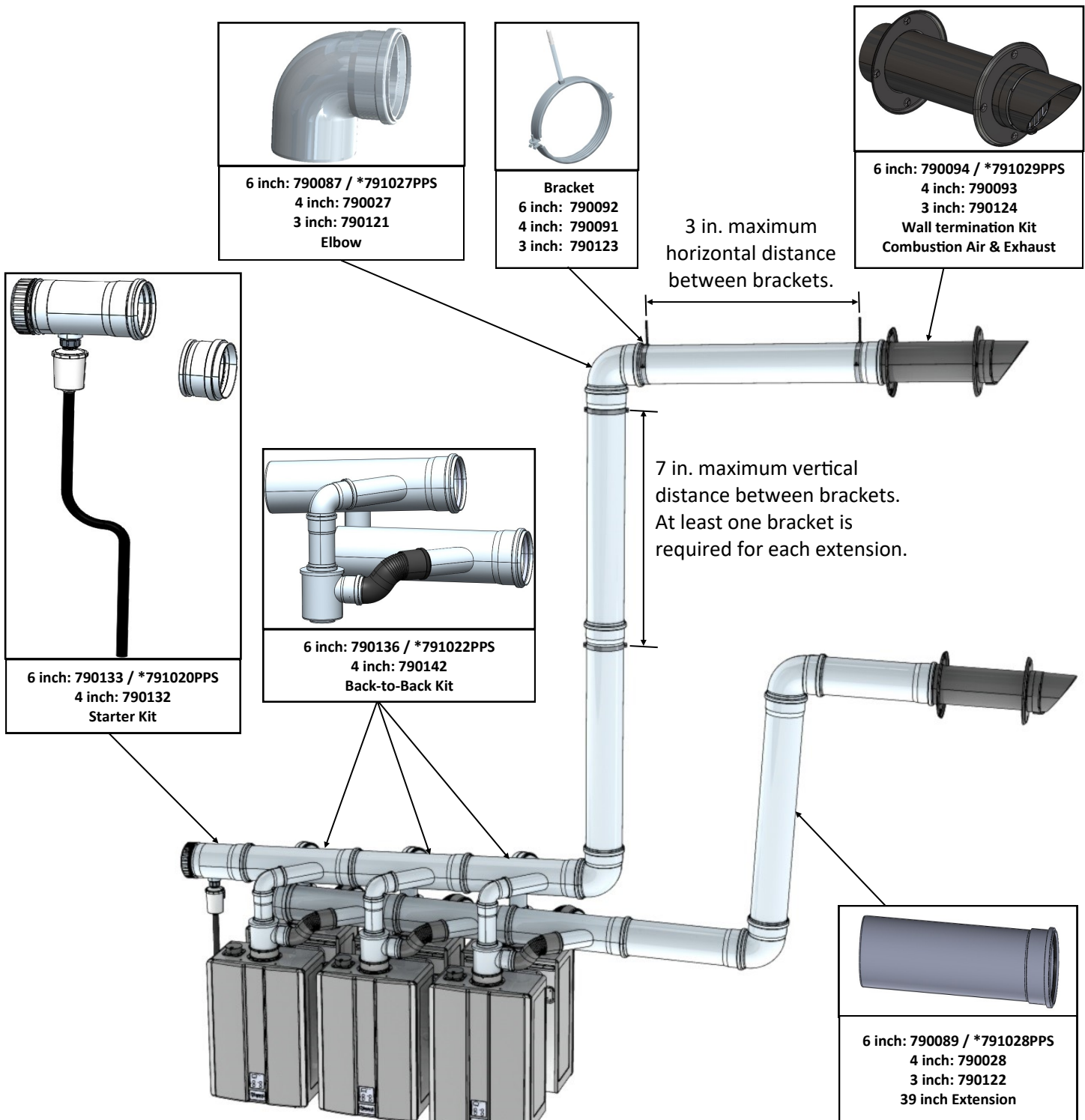
Flat Roof flashing
6 and 4 inch: 790101



Extension		
Diameter (inch)	Length (inch)	Part Number
3	39	790122
4	18	790035
4	39	790028
4	78	790088
6	39	790089 / 791028PPS
6	78	790090

Sample Horizontal Termination Assembly

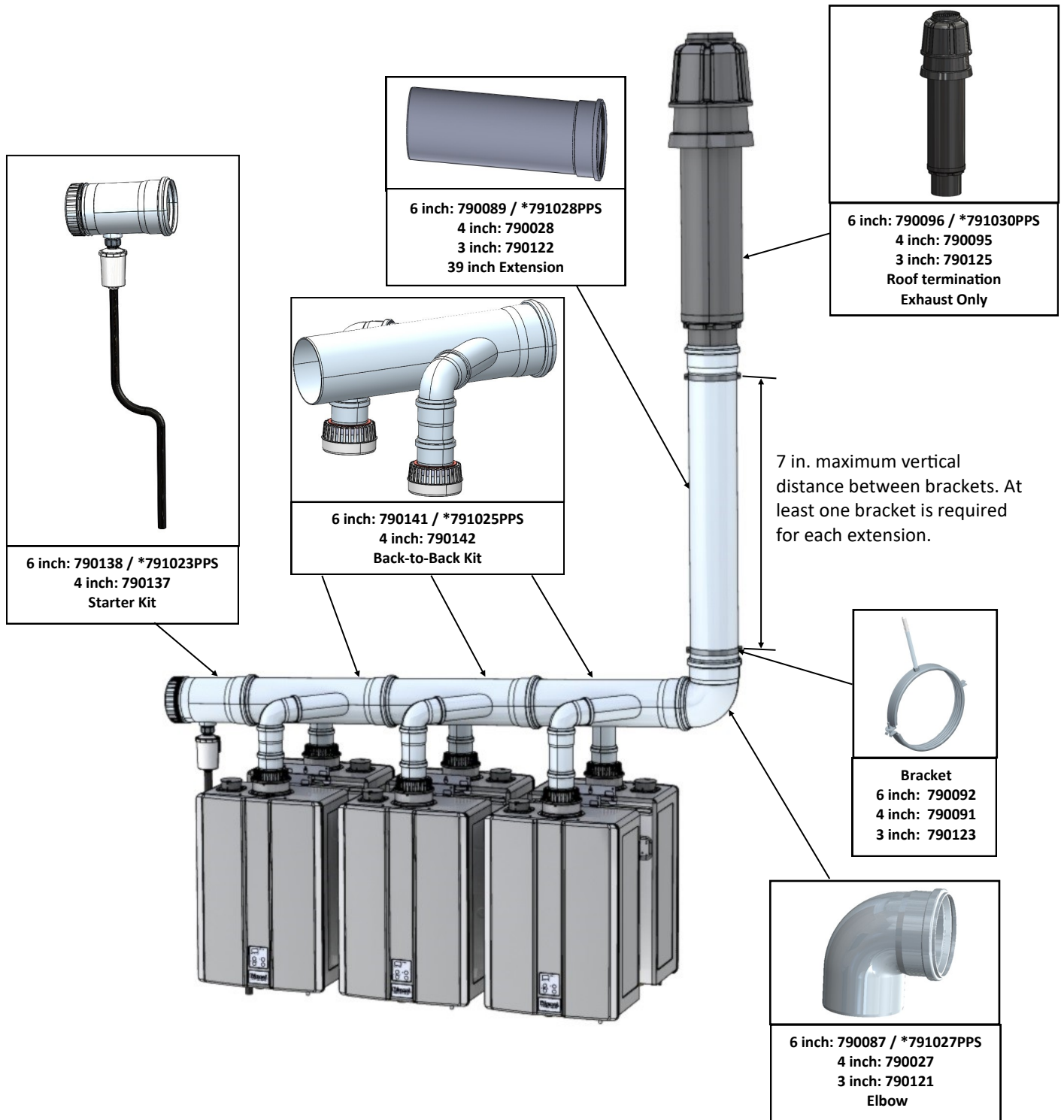
Support Brackets Required



Vent termination per ANSI Z223.1/NFPA 54. For clearances not specified in ANSI Z223.1/NFPA 54, clearances are in accordance with local installation codes and the requirements of the gas supplier.

Sample Vertical Termination Assembly - Room Air

Support Brackets Required



Vent termination per ANSI Z223.1/NFPA 54. For clearances not specified in ANSI Z223.1/NFPA 54, clearances are in accordance with local installation codes and the requirements of the gas supplier.

Maintenance Clearances

If the vent system is to be enclosed, it is suggested that the design of the enclosure shall permit inspection of the vent system. The design of such enclosure shall be deemed acceptable by the installer or the local inspector.

Water Heater Clearances

Refer to the Tankless Water Heater Installation and Operation Manual for minimum clearance requirements around the water heater.

Vertical Termination Clearances (All System Sizes)

There should be a minimum of 12 in. (30 cm) between exhaust and intake terminations.

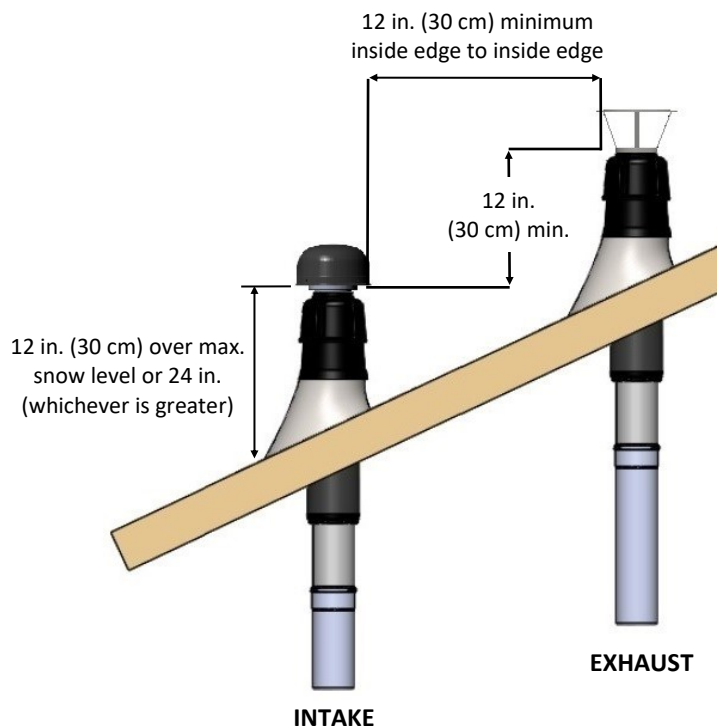
Clearances of Brackets:

All supports such as wall brackets or spacer blocks must be installed with a maximum distance of 78 in. (2 m) between each support. Additional supports can be installed before and after an elbow if needed.

Freestanding Components:

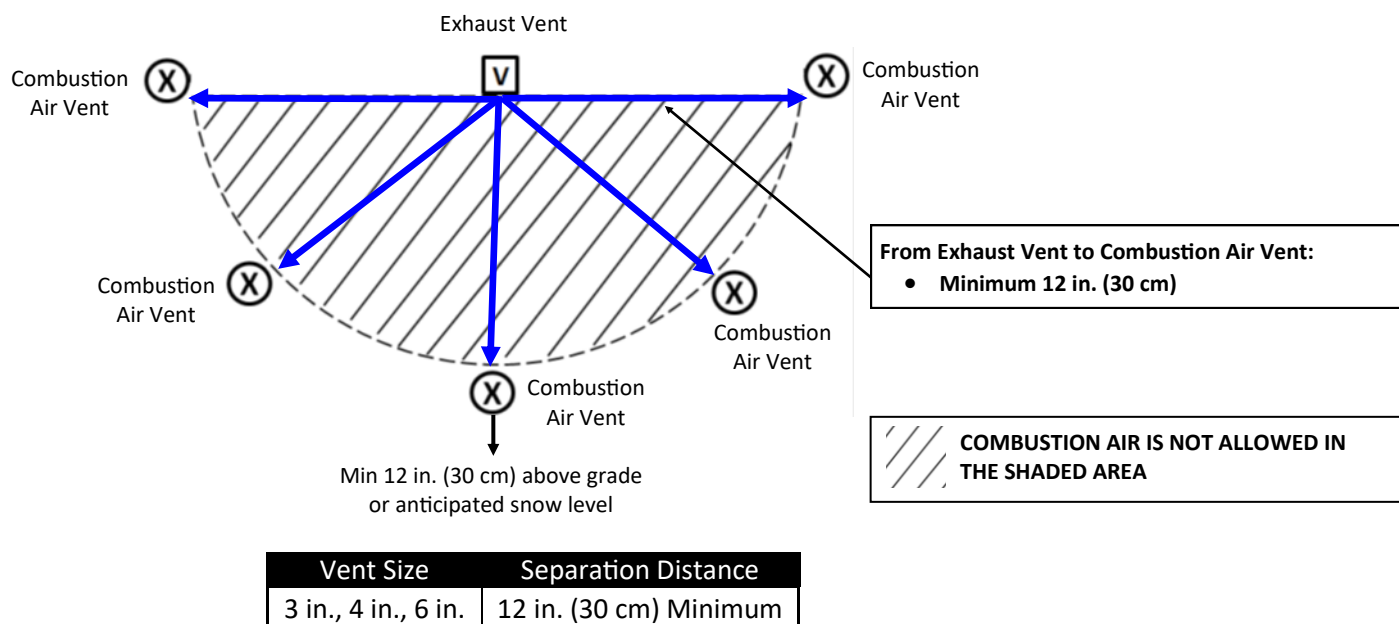
Components which are installed freestanding for vertical termination with a length of over 59 in. (1.5 m), must be additionally secured to the building with guys or braces.

Vent termination per ANSI Z223.1/NFPA 54. For clearances not specified in ANSI Z223.1/NFPA 54, clearances are in accordance with local installation codes and the requirements of the gas supplier.



Horizontal Termination Clearances

This appliance and the Common Vent System is certified with the 3 in., 4 in., and 6 in. wall termination mounted in the orientation shown below.

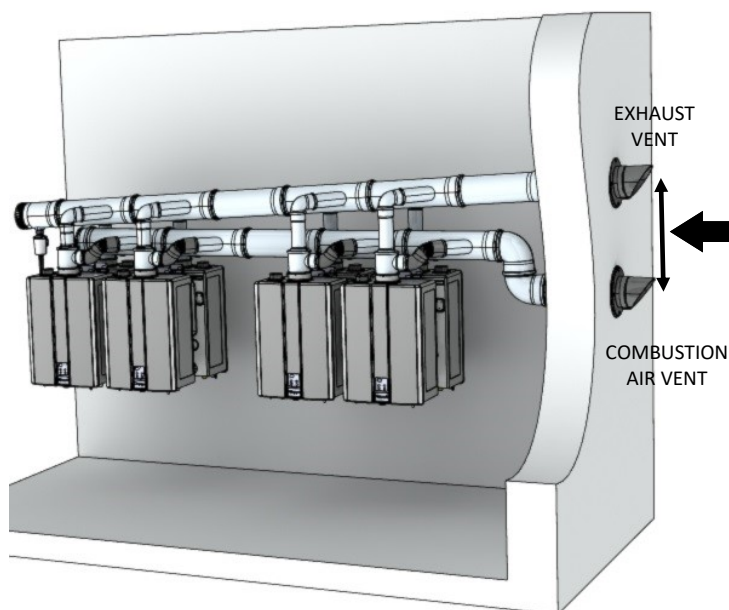


The exhaust and combustion air terminations must follow the clearances below:

- 12 in. (30 cm) minimum vertically from bottom of combustion air termination to ground or anticipated snow line.
- 12 in. (30 cm) minimum from edge of exhaust termination to edge of combustion air termination.

There should be a minimum of 12 in. (30 cm) between exhaust terminations in multiple common vent installations.

Refer to the Rinnai Tankless Water Heater Installation and Operation Manual for maximum vent lengths based on the vent diameter installed.

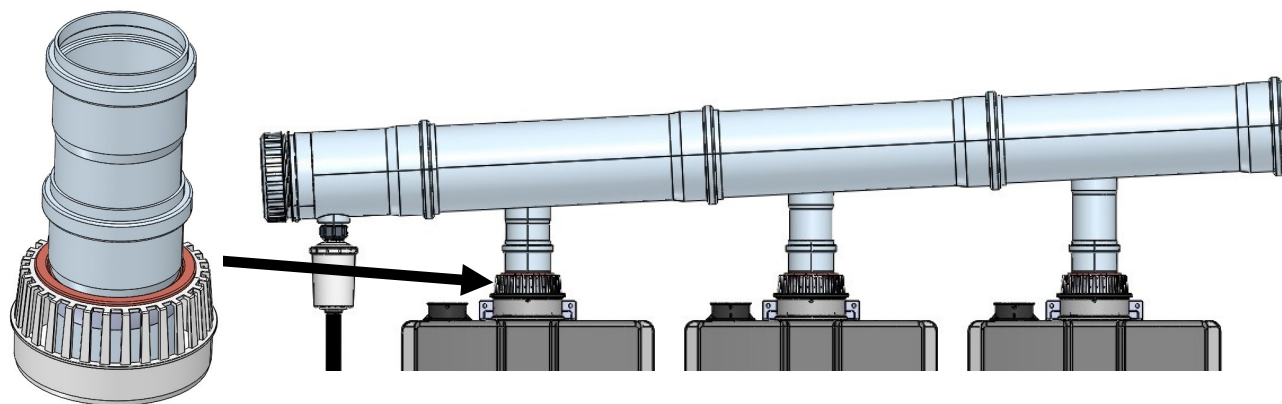


NOTE: During colder weather when the exhaust temperature is much hotter than the outside air, the exhaust fumes will condense, producing water vapor. As a result a plume of water vapor may be seen exiting the exhaust.

- MINIMUM 12 in. (30 cm)

Combustion Air Requirements

Common Vent Applications Utilizing Room Air



Common Vent Room Air
Appliance Adapter

Combustion Air Requirements

This rack system requires adequate combustion air for ventilation and dilution of flue gases. Failure to provide adequate combustion air can result in unit failure, fire, explosion, serious bodily injury or death. Use the following methods to ensure adequate combustion air is available for correct and safe operation of this rack system.

Important: Combustion air must be free of corrosive chemicals. Do not provide combustion air from corrosive environments. System failure due to corrosive air is not covered by warranty.

Combustion air must be free of acid forming chemicals such as sulfur, fluorine and chlorine. These chemicals have been found to cause rapid damage and decay and can become toxic when used as combustion air in gas appliances. Such chemicals can be found in, but not limited to bleach, ammonia, cat litter, aerosol sprays, cleaning solvents, varnish, paint and air fresheners. Do not store these products or similar products in the vicinity of the water heater system.

Unconfined Space:

An unconfined space is defined in *National Fuel Gas Code, ANSI Z223.1/NFPA 54* as "a space whose volume is not less than 50 cubic feet per 1000 Btu/hr (4.8 m³ per kW per hour) of the aggregate input rating of all appliances installed in that space. Rooms communicating directly with the space in which the appliances are installed, through openings not furnished with doors, are considered a part of the unconfined space." If the "unconfined space" containing the system is in a building with tight construction, additional outside air may be required for proper operation. Outside air openings should be sized the same as for a confined space.

Confined Space:

(Small Room, Closet, Alcove, Utility Room, Etc.)

A confined space is defined in the *National Fuel Gas Code, ANSI Z223.1/NFPA 54* as "a space whose volume is less than 50 cubic feet per 1000 Btu/hr (4.8 m³ per kW per hour) of the aggregate input rating of the combined appliances installed in that space." A confined space must have two combustion air openings. Size the combustion air openings based on the BTU input for all gas utilization equipment in the space and the method by which combustion air is supplied.

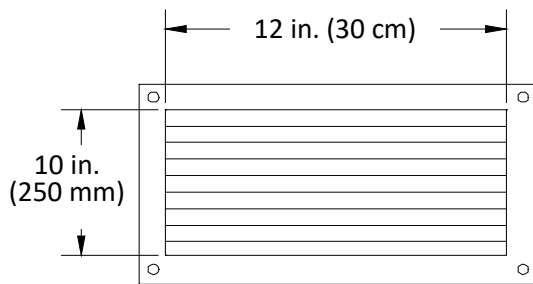
Louvers and Grills

When sizing the permanent opening, consideration must be taken for the design of the louvers or grills to maintain the required free area required for all gas utilizing equipment in the space. If the free area of the louver or grill design is not available, assume wood louvers will have 25% free area and metal louvers or grills will have 75% free area. Under no circumstance should the louver, grill or screen have openings smaller than 1/4 in.

Example:

Wood: 10 in. x 12 in. x 0.25 = 30 in²

Metal: 10 in. x 12 in. x 0.75 = 90 in²

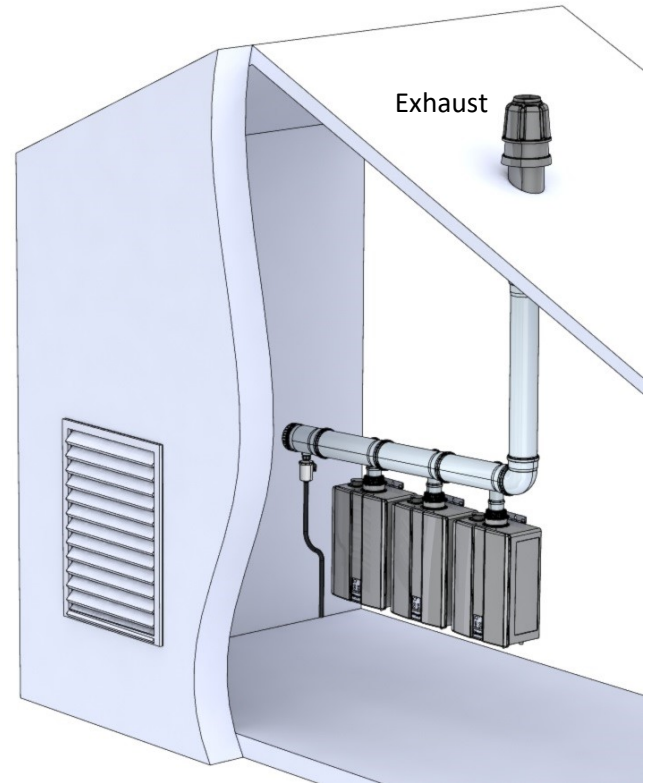


Location

To maintain proper circulation of combustion air, two permanent openings (one upper, one lower) must be positioned in confined spaces. The upper shall be within 12 in. (30 cm) of the top of the confined space and the lower opening shall be within 12 in. (30 cm) of the bottom of the confined space. Openings must be positioned as to never be obstructed.

Using Outdoor Air For Combustion

Outdoor air can be provided to a confined space through two permanent openings, one commencing within 12 in. (30 cm) of the top and one commencing within 12 in. (30 cm) of the bottom, of the confined space. The openings shall communicate to the outside by one of two ways.



Be sure to also maintain 12 in. (30 cm) above grade or anticipated snow level.

Vent termination per ANSI Z223.1/NFPA 54. For clearances not specified in ANSI Z223.1/NFPA 54, clearances are in accordance with local installation codes and the requirements of the gas supplier.

NOTICE

Combustion air provided to the system should not be taken from any area of the structure that may produce a negative pressure (i.e. exhaust fans, powered ventilation fans).

Using Indoor Air For Combustion

When using air from other room(s) in the building, the total volume of the room(s) must be of adequate volume (Greater than 50 cubic feet per 1000 Btu/hr). Each Combustion air opening must have at least one square inch of free area for each 1000 Btu/hr, but not less than 100 square inches each.

When communicating directly with the outdoors through horizontal ducts, each opening shall have a minimum free area of $1 \text{ in}^2/2000 \text{ Btu/hr}$ ($1100 \text{ mm}^2/\text{kW}$) of total input rating of all appliances in the confined space.

Note: If ducts are used, the cross sectional area of the duct must be greater than or equal to the required free area of the openings to which they are connected.

When communicating indirectly with the outdoors through vertical ducts, each opening shall have a minimum free area of $1 \text{ in}^2/4000 \text{ Btu/hr}$ ($550 \text{ mm}^2/\text{kW}$) of total input rating of all appliances in the confined space. Combustion air to the appliance can be provided from a well ventilated attic or crawl space.

WARNING

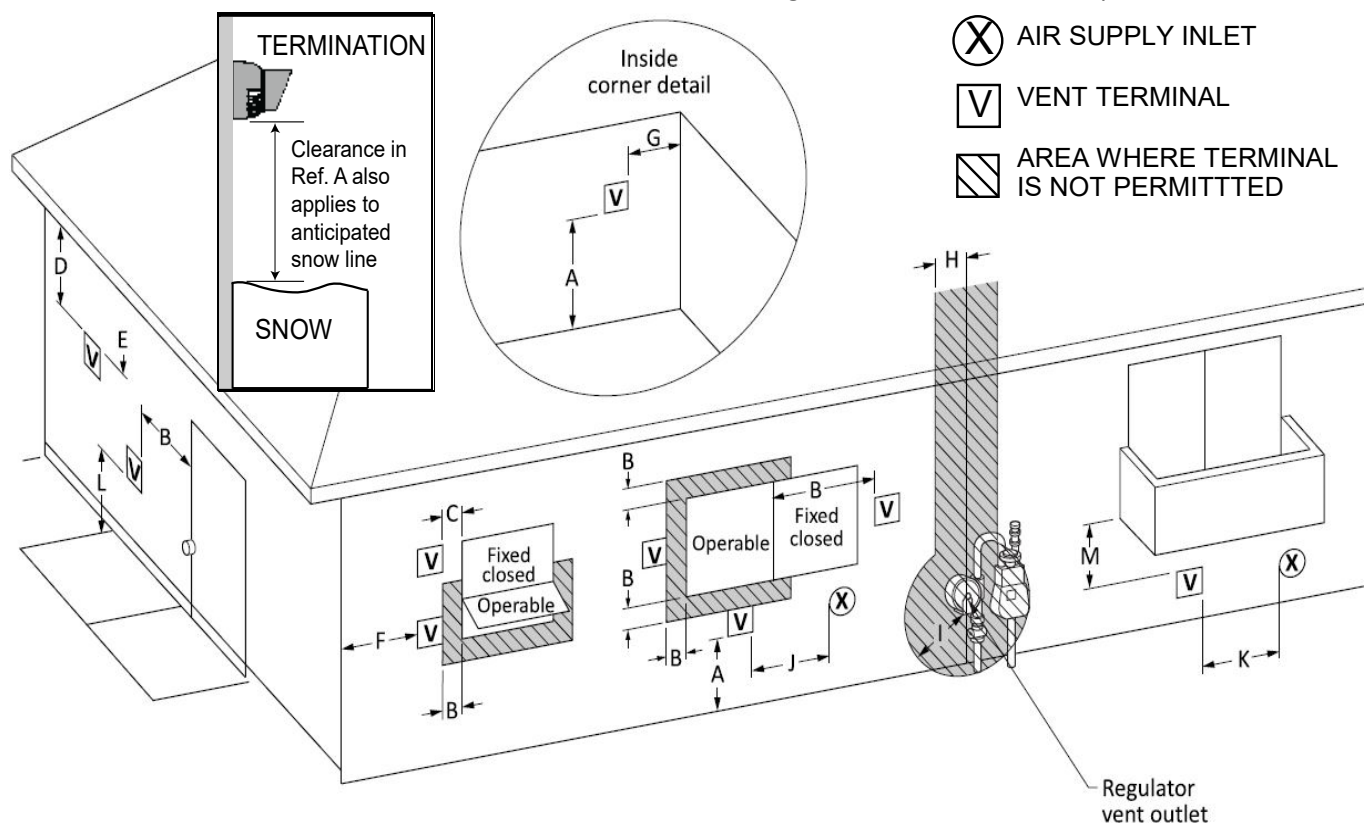
TO PREVENT POSSIBLE PERSONAL INJURY OR DEATH DUE TO ASPHYXIATION, COMMON VENTING WITH OTHER MANUFACTURER'S INDUCED DRAFT APPLIANCES IS NOT ALLOWED.

Checklist for Combustion Air and Venting Requirements

<input type="checkbox"/>	Verify proper clearances around the vents.
<input type="checkbox"/>	Ensure that the Combustion Air Requirements are followed that will provide sufficient combustion air for the appliance.
<input type="checkbox"/>	Ensure approved venting components have been used.
<input type="checkbox"/>	All horizontal vent runs must be sloped up away from the water heater a minimum of 1/4 in. (6 mm) per foot.
<input type="checkbox"/>	Verify that there is adequate combustion air.
<input type="checkbox"/>	Installation complies with National Fuel Gas Code, ANSI Z223.1/NFPA 54 as well as local and state regulations therein.

Exhaust Vent Termination Clearances

Direct Vent for indoor models: You must install terminations to bring in combustion air and expel exhaust



		Canadian Installations (CSA B149.1)	U.S. Installations (ANSI Z223.1 /NFPA 54)
Ref	Description	Direct Vent (Indoor Unit)	Direct Vent (Indoor Unit)
A	Clearance above grade, veranda, porch, deck, or balcony	12 in. (30 cm)	12 in. (30 cm)
B	Clearance to window or door that may be opened	36 in. (91 cm)	12 in. (30 cm)
C	Clearance to permanently closed window	*	*
D	Vertical clearance to ventilated soffit, located above the terminal within a horizontal distance of 2 ft (61 cm) from the center line of the terminal	*	*
E	Clearance to unventilated soffit	*	*
F	Clearance to outside corner	*	*
G	Clearance to inside corner	*	*
H	Clearance to each side of center line extended above meter/regulator assembly	*	*
I	Clearance to service regulator vent outlet	Above a regulator within 3 ft (91 cm) horizontally of the vertical center line of the regulator vent outlet to a maximum vertical distance of 15 ft (4 m)	*
J	Clearance to non-mechanical air supply inlet to building or the combustion air inlet to any other appliance	36 in. (91 cm)	12 in. (30 cm)
K	Clearance to a mechanical air supply inlet	6 ft (1.83 m)	3 ft (91 cm) above if within 10 ft (3 m) horizontally
L	Clearance above paved sidewalk or paved driveway located on public property	7 ft (2.13 m) [1]	*
M	Clearance under veranda, porch, deck, or balcony	12 in. (30 cm) [2]	*

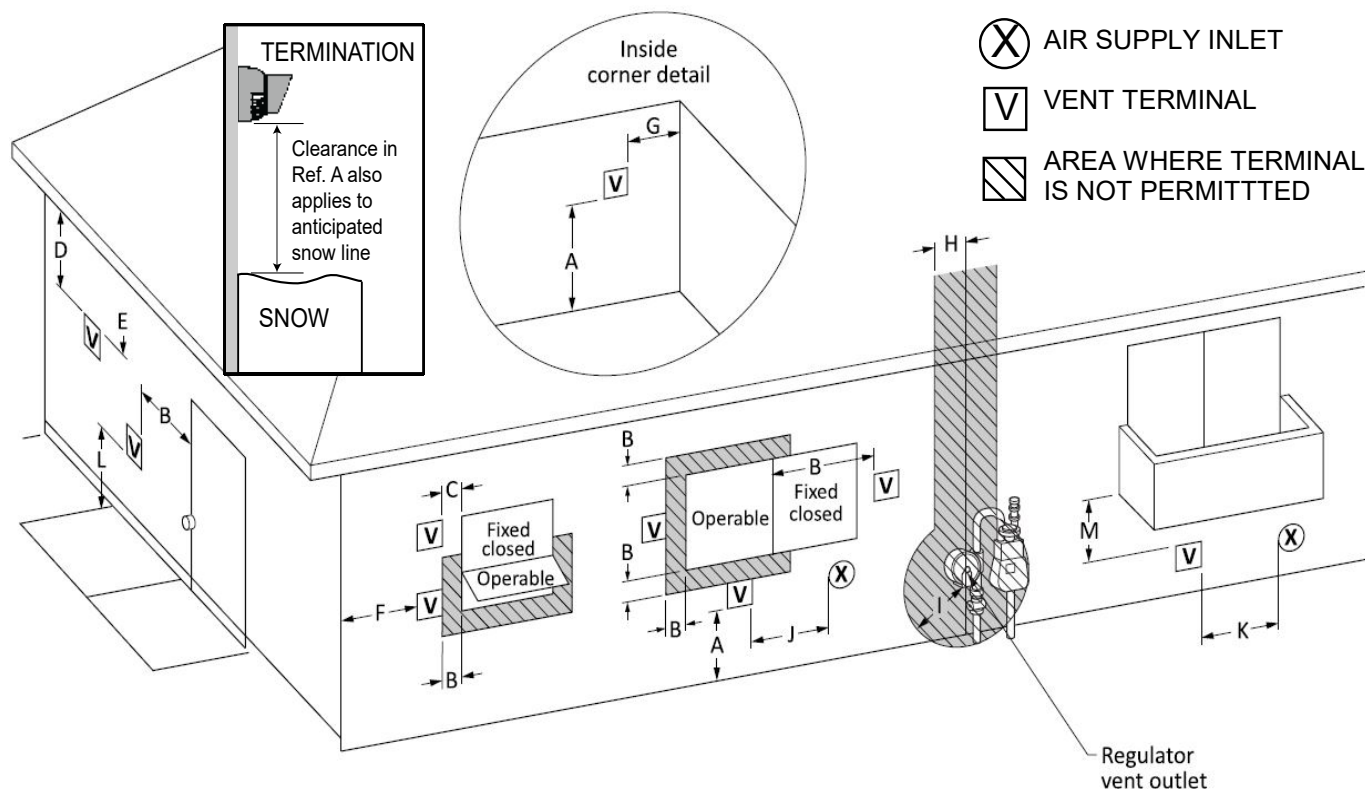
Clearance to opposite wall is 24 in. (60 cm).

- [1] A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings.
- [2] Permitted only if veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor.

* Clearances are in accordance with local installation codes and the requirements of the gas supplier. (*Dégagement conforme aux codes d'installation locaux et aux exigences du fournisseur de gaz.*)

Exhaust Vent Termination Clearances

Other than direct vent: When using room air for combustion, you must install terminations to expel exhaust.



Ref	Description	Canadian Installations (CSA B149.1)	U.S. Installations (ANSI Z223.1 /NFPA 54)
		Other than direct vent (Outdoor unit and/or Room Air)	Other than direct vent (Outdoor unit and/or Room Air)
A	Clearance above grade, veranda, porch, deck, or balcony	12 in. (30 cm)	12 in. (30 cm)
B	Clearance to window or door that may be opened	36 in. (91 cm)	4 ft (1.2 m) below or to side of opening; 1 ft (300 mm) above opening
C	Clearance to permanently closed window	*	*
D	Vertical clearance to ventilated soffit, located above the terminal within a horizontal distance of 2 ft (61 cm) from the center line of the terminal	*	*
E	Clearance to unventilated soffit	*	*
F	Clearance to outside corner	*	*
G	Clearance to inside corner	*	*
H	Clearance to each side of center line extended above meter/regulator assembly	*	*
I	Clearance to service regulator vent outlet	Above a regulator within 3 ft (91 cm) horizontally of the vertical center line of the regulator vent outlet to a maximum vertical distance of 15 ft (4 m)	*
J	Clearance to non-mechanical air supply inlet to building or the combustion air inlet to any other appliance	36 in. (91 cm)	4 ft (1.2 m) below or to side of opening; 1 ft (300 mm) above opening
K	Clearance to a mechanical air supply inlet	6 ft (1.83 m)	3 ft (91 cm) above if within 10 ft (3 m) horizontally
L	Clearance above paved sidewalk or paved driveway located on public property	7 ft (2.13 m) [1]	*
M	Clearance under veranda, porch, deck, or balcony	12 in. (30 cm) [2]	*

Clearance to opposite wall is 24 in. (60 cm).

- [1] A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings.
- [2] Permitted only if veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor.

* Clearances are in accordance with local installation codes and the requirements of the gas supplier. (*Dégagement conforme aux codes d'installation locaux et aux exigences du fournisseur de gaz.*)

Additional Clearances

Check whether local codes supersede these clearances:

- Avoid termination locations near a dryer vent.
- Avoid termination locations near commercial cooking exhaust.
- You must install a vent termination at least 12 in. (30 cm) above grade or snow line.

The vent for this appliance shall not terminate:

- Over public walkways.
- Near soffit vents, crawl space vents or other areas where condensate or vapor could create a nuisance, hazard or cause property damage.
- Where condensate or vapor could cause damage or could be detrimental to the operation of regulators, relief valves, or other equipment.

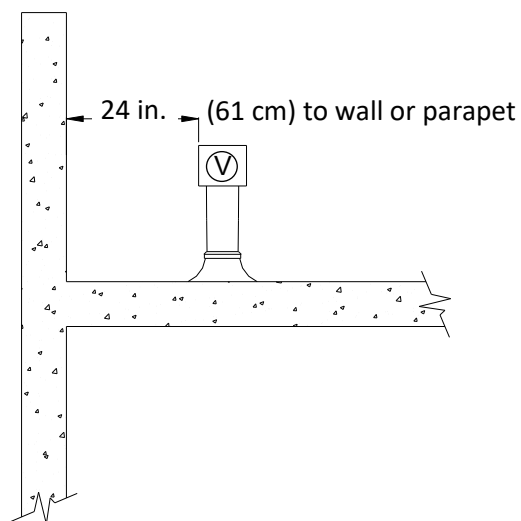
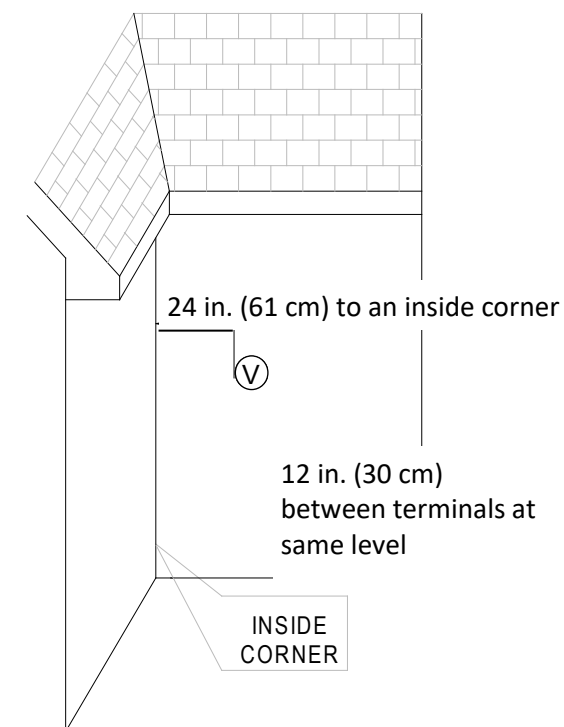
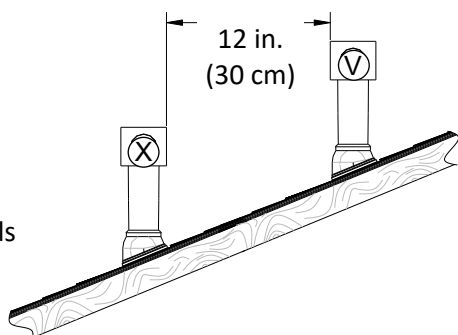
Important considerations for locating vent terminations under a soffit (ventilated, unventilated or eave vent; or to a deck or porch)

- Do not install vent terminations under a soffit vent such that exhaust can enter the soffit vent
- Install vent termination such that exhaust and rising moisture will not collect under eaves. Discoloration to the exterior of the building could occur if installed too close.
- Do not install the vent termination too close under the soffit where it could present recirculation of exhaust gases back into the combustion air intake part of the termination.

(V) Represents the exhaust vent of the common venting system.

(X) Represents the combustion air vent of the common venting system.

12 in. (30 cm)
between
terminals at
different levels



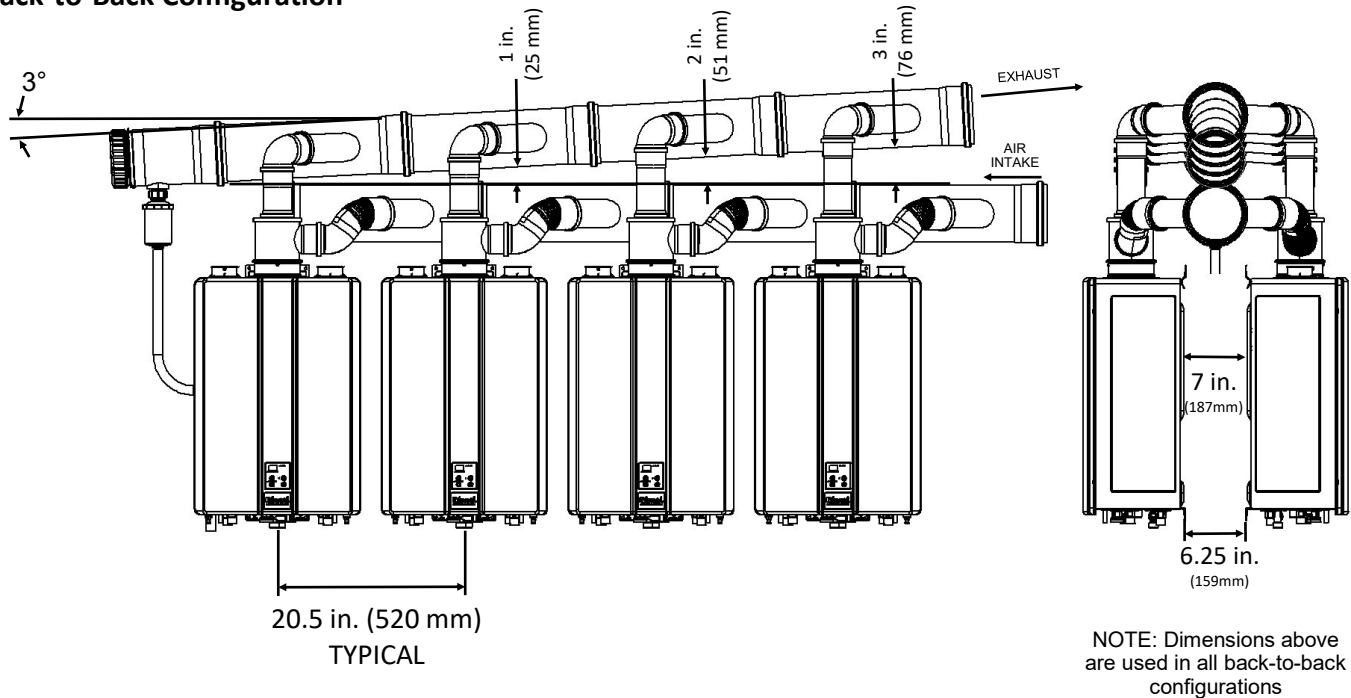
Installation Instructions

Follow these Rinnai instructions, the Rinnai Installation and operation Manual and the Ubbink Vent System Assembly instructions located in the appendix of this manual.

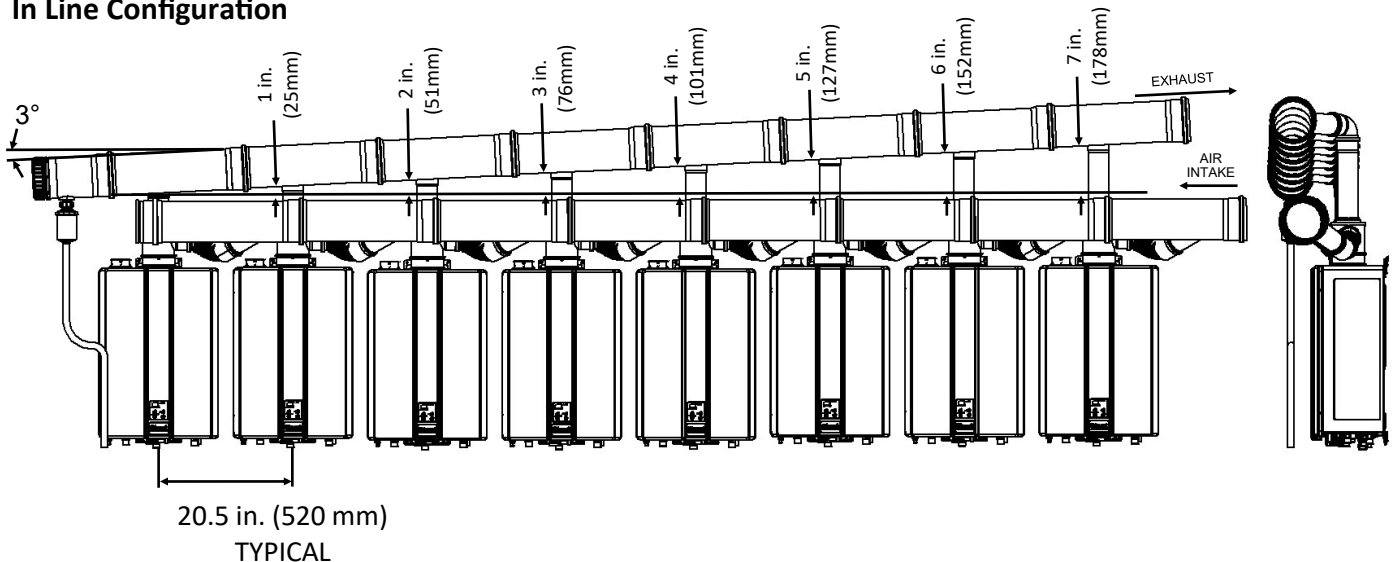
Install the venting according to one of the two configurations below. Do not locate the common vent header remotely from the water heaters. (Room air configurations follow the same instructions excluding information regarding air intake.)

The installation area should be measured to make sure that adequate space is available to install the water heaters and venting system.

Back-to-Back Configuration



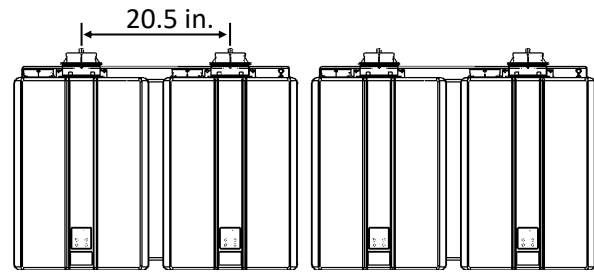
In Line Configuration



Note: If water heaters are mounted directly on a wall, air intake piping will need to be in front of the appliance adapters. Installer is responsible for installing appropriate support for the vent system.

Recommended Spacing of Water Heaters

Spacing of the water heaters is critical for the common vent system to mounting easily and securely. The common vent headers are made for 20.5 in. spacing (center line to center line) between water heaters. If a different spacing is needed, please contact Rinnai concerning your application. Rinnai recommends using the Tankless Rack System (TRS) which is designed for 20.5 in. spacing. The engineered system is designed to make installation simple and greatly reduces installation time.



Custom Water Heater Spacing

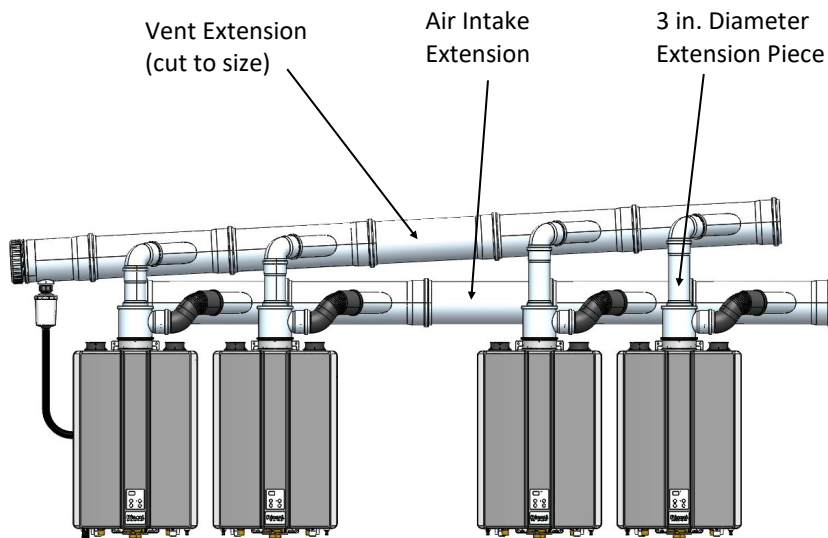
If common venting with **LESS** than 20.5 in. between water heaters:

- The installer assumes all responsibility of following local codes. Inspectors can reject the installation if the rating plate cannot be seen for all water heaters.
- The exhaust header and 3 in. diameter extension pieces must be cut appropriately to maintain the required 3° slope.

If common venting with **GREATER** than 20.5 in. between water heaters:

- The vent extension and 3 in. diameter extension pieces must be cut to the appropriate length between to maintain a 3° slope.
- The length of each additional vent extension must be considered in the maximum allowable vent length.

Exhaust Vent Installation Procedures:



To maintain a 3° slope, use the following formula to calculate 3 in. diameter extension piece length (L):

$$(L) = (\text{water heater spacing}) \times 0.05$$

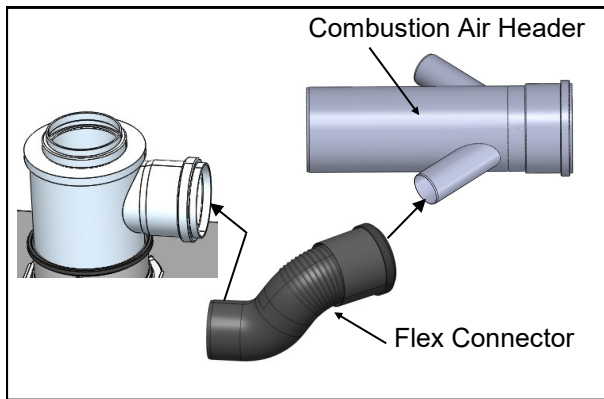
Example: if the adjacent water heater is 20.5 in. away

$$\text{Length } (L) = 20.5'' \times 0.05 = \underline{1.02 \text{ in.}}$$

Example: if the adjacent water heater is 26 in. away

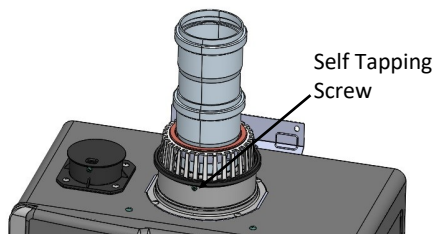
$$\text{Length } (L) = 26.0'' \times 0.05 = \underline{1.30 \text{ in.}}$$

- After ensuring the water heaters are mounted securely and spaced 20.5 in. apart, install the appliance adapter on top of the water heaters.
- Exhaust venting is designed for a 3° rise. When the water heaters are mounted at 20.5 in. spacing, the height increase is 1 in. per water heater. A 3 in. diameter extension pipe is included with the kit that must be cut to length to account for the rise from unit to unit. After cutting, always deburr and bevel the end of the vent piece so the sealing gaskets are not damaged and operation of the vent system is not compromised.
- Install the elbows to the 3 in. diameter extension pipe. Do not cut or modify the elbow.
- After direct vent or room air components are appropriately positioned, securely fasten the appliance adapter to the top of the water heater with a self tapping screw.
- For direct vent applications, connect the combustion air opening of the appliance adapter to one end of the flex connector and the other end of the flex connector to the combustion air header.

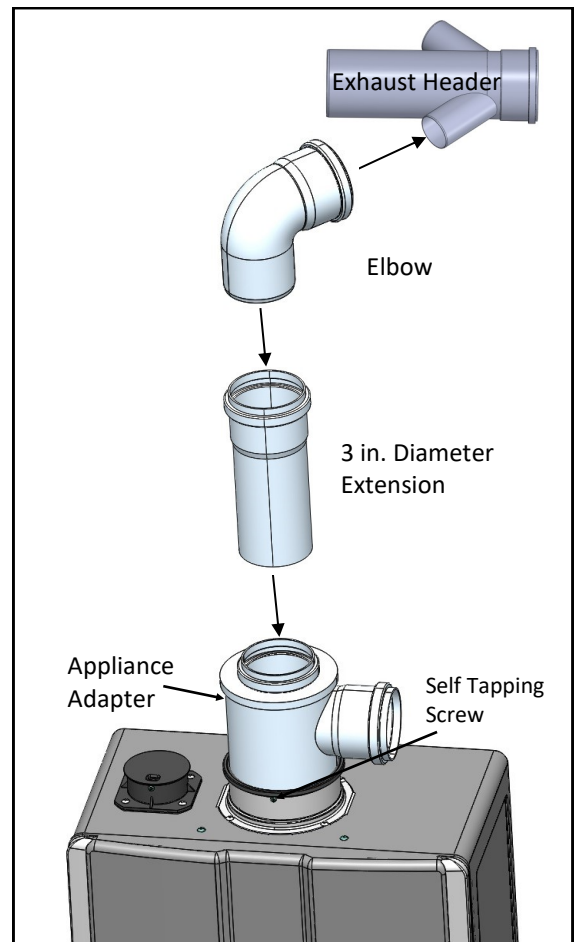
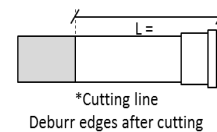


- Connect the open end of the elbow to the header.

The same procedure may be used when substituting the room air adapter with the only exception being no flex connector or combustion air header to connect when installing.



Inline # of Appl	L =	Back-to-Back # of Appl	L =
1	5.5 in.	1+1a	5.5 in.
2	6.5 in.	2+2a	6.5 in.
3	7.5 in.	3+3a	7.5 in.
4	8.5 in.	4+4a	8.5 in.
5	9.5 in.	6+6a	9.5 in.
6	10.5 in.		
7	11.5 in.		
8	12.5 in.		
9	13.5 in.		
10	14.5 in.		
11	15.5 in.		
12	16.5 in.		



Installation Instructions (Condensate Trap and Drain Pipe)

Install the Condensate Trap and Drain Pipe

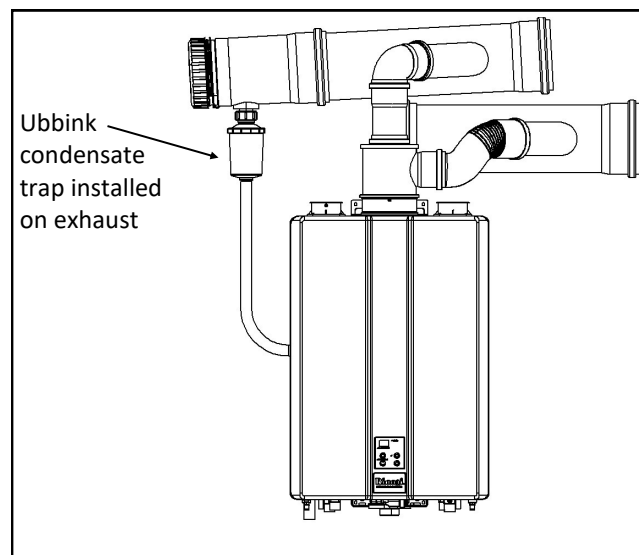
The exhaust header collects condensate. A collector and self-priming trap is included with each starter kit.

Condensate must be drained to prevent the malfunction, diagnostic code failures, or property damage. Condensate should be disposed according to local codes. Refer to the National Fuel Gas Code, ANSI Z223.1/NFPA 54, or the Natural Gas and Propane Installation Code, CSA B149.1 condensate disposal.

A condensate pump must be used if the condensate outlet is lower than the public sewage system.

Rinnai recommends installing a condensate neutralizer which allows condensate to flow through neutralizing media to raise the pH of the condensate to a level that will help prevent corrosion of the drain and public sewer system.

Ensure that the condensate drain does not freeze.



Final Checklist

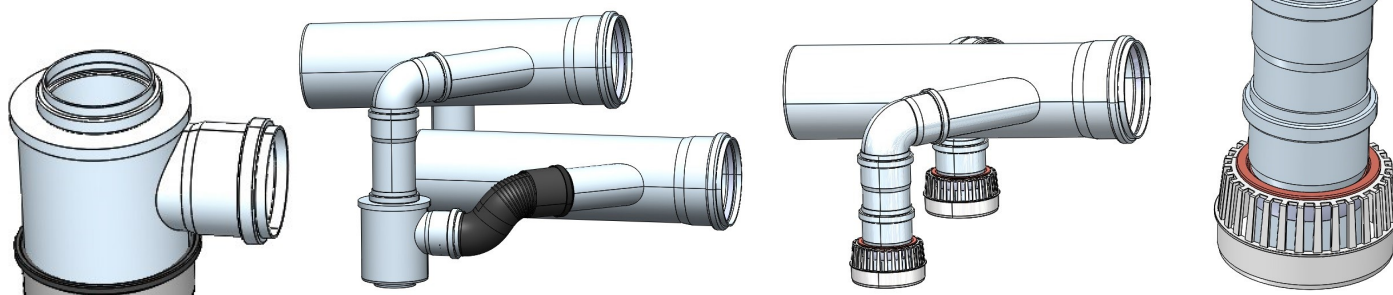
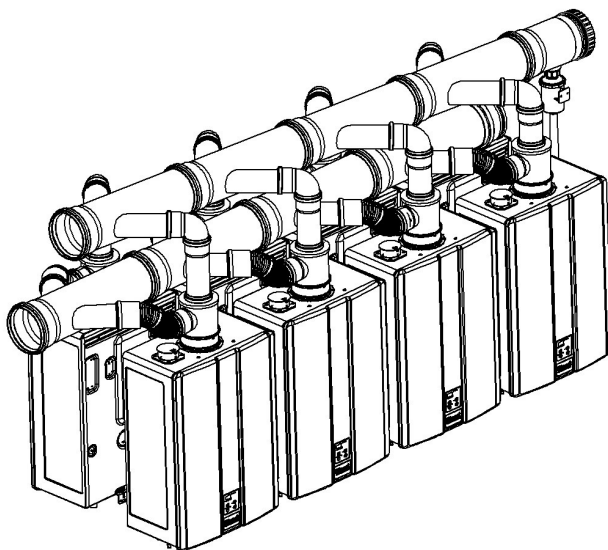
<input type="checkbox"/>	Reference the Rinnai Tankless Water Heater Installation and Operation Manual for proper installation of the Rinnai Tankless Water Heaters.
<input type="checkbox"/>	Clearances from the water heater unit are met.
<input type="checkbox"/>	Clearances from the exhaust termination(s) and the combustion air termination(s) are met.
<input type="checkbox"/>	Ensure you have used the correct venting products and that you have completely followed the venting manufacturer's installation instructions and the installation instructions in this document.
<input type="checkbox"/>	Verify that the vent system does not exceed the maximum equivalent length allowed.
<input type="checkbox"/>	Explain to the customer the importance of not blocking the vent termination or air intake.
<input type="checkbox"/>	Explain to the customer the operation of the water heater, safety guidelines, maintenance, and warranty.

<input type="checkbox"/>	The installation must conform with local codes or, in the absence of local codes, with the National Fuel Gas Code, ANSI Z223.1/NFPA 54, or the Natural Gas and Propane Installation Code, CSA B149.1.
<input type="checkbox"/>	Inform the customer if the isolation valves are not installed or if a water softening system is not installed.
<input type="checkbox"/>	Verify that the water heaters installed match the model numbers described in the manual.
<input type="checkbox"/>	Verify that the appropriate amount of combustion air has been provided.
<input type="checkbox"/>	Verify the parameter setting has been adjusted for the altitude/elevation of the installation location.
<input type="checkbox"/>	Leave this manual taped to one of the water heaters or give the entire manual directly to the customer.

Appendix A

Ubbink Condensing Common Vent System

Installation and Assembly Instructions



Warranty and Liability

Claims for personal and material damages are excluded, if they are due to any or several of the following reasons:

- Use of the system not in accordance with the regulations.
- Improper assembly and incorrect operation.
- Faulty maintenance.
- Non-compliance with the assembly and operating instructions.
- Non-approved structural changes to the unit or to the individual components.
- Installation of components which are not part of the system.
- Subsequent damage, which occurred through further use of the system despite known defects.
- Intentional damage.

These installation instructions should be kept with the appliances for maintenance

List of Contents

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WARNING

Improper installation of vent system and components, or failure to follow all installation instructions, can result in property damage or serious injury.

A1 Preface

These installation instructions were compiled in accordance with the current state of technology and with the greatest care. They serve as a general guideline for the construction and operation of the Common Vent System as supplied by Rinnai US, manufactured by Ubbink.

If you have any further questions please contact our experts .

Rinnai America Corporation

103 International Drive
Peachtree City, GA 30269
United States of America
Phone 800-621-9419
www.rinnai.us

A2 General and Local standards information

When installing and operating the Common Vent System, the following valid standards and regulations must be complied with and adhered to:

- Local codes or, in the absence of local codes, with the *National Fuel Gas Code, ANSI Z223.1/NFPA 54*, or the *Natural Gas and Propane Installation Code, CSA B149.1*.
- Appliance Manufacturers Installation Instructions
- Regulations on supervision of construction
- Statutory provisions
- Work must only be carried out by a licensed professional.

Fill out spec table at the back of this manual and keep this manual with the system after completion of the installation.

A3 Risk guidelines

- All components of the Common Vent System are produced and built in accordance with valid standards, regulations and safety engineering rules.
- Risks to life and limb of the user or of the third party or impairments or damages to property can arise in the case of improper assembly or handling.
- To avoid such risks, the Common Vent System must be installed and used only for the designated intent as described in this manual.
- Deficiencies or damage of the Common Vent System must be addressed and repaired immediately.
- For roof or chimneys modifications, we refer you to the valid industrial safety regulations.
- These must especially be complied with, unconditionally and at any time, when working on roofs and facades.

A4 Transport and storage

When transporting Common Vent System components the following points must be complied with:

- Transport Common Vent System components in a clean dry environment and only in its original packaging.
- If stored or transported at temperatures below 32 F (0°C), the Common Vent System components must be warmed up to 60F (15°C), before the start of assembly.
- Components must be protected from solar emission. The Common Vent System components must be stored in a non UV-charged environment.(i.e. do not store outdoors!)
- The Common Vent System components must be stored in original packaging.

A5 Tools and workmanship

Standard trade tools are sufficient for cutting and assembly of the Common Vent System components.

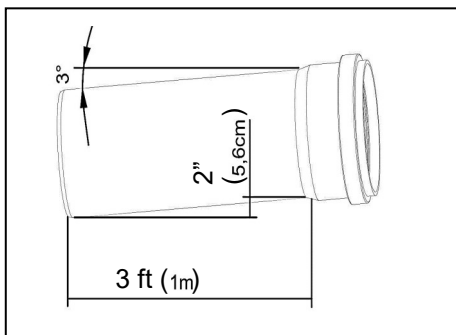
Following is a list of tools or equipment that may be necessary:

- | | |
|---------------------|-------------------------|
| • Safety Glasses | • Gloves |
| • Screw Driver | • Fine Tooth Saw |
| • File or Sandpaper | • Weather Proof Sealant |

Workmanship shall include the following:

- When cutting vent components, the cut must be straight. Cut edge shall be chamfered and all burrs removed before installation.
- All vent joints shall fully engage the male / female socket assembly
- Installed vent system shall be clean and free of any foreign debris before operation.
- Vent system shall be rigidly supported as instructed in this manual and include the appropriate 3° slope.

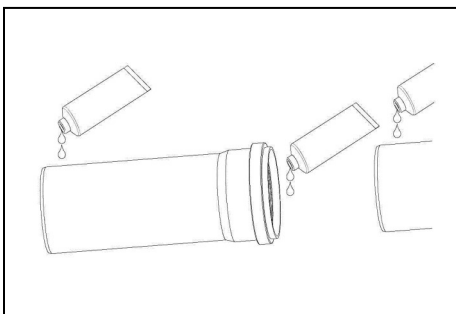
A6 General Assembly Instructions



Correct Pitch

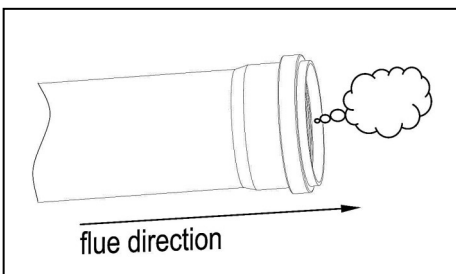
The pipes and formed parts must be installed at an angle of 3° incline towards the heating appliance, to allow the condensate to dispose in accordance with regulations.

Note: 3° Pitch equals a height difference of 2" per 3 ft (5.6 cm/meter)



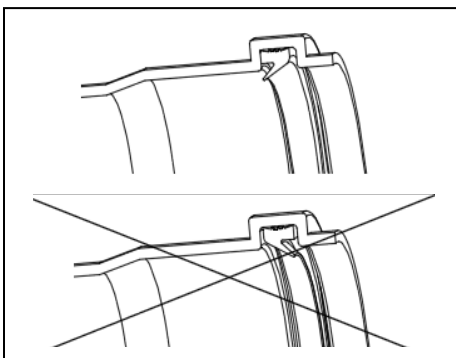
Lubricant

- The seals and male ends of all common vent components must be lubricated before assembly. Use **ONLY** CENTROCERIN® lubricant or water to aid in the assembly of these vent components.
- Apply a thin layer of CENTROCERIN® lubricant to each seal before assembly.
- A tube CENTROCERIN® lubricant is packed with every kit assembly and available for separate purchase.
- 1 tube of CENTROCERIN® lubricant is sufficient for a 100 ft common header installation



Flue Direction

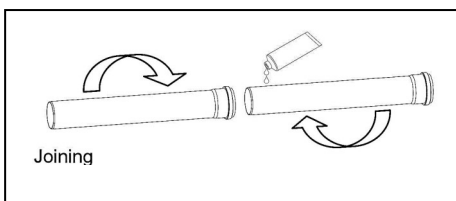
- The female end of the components in contact with the flue gasses must always point in the direction of the termination.
- It is imperative to maintain this flow direction for proper condensate flow and integrity of the seal/gasket.



Seal Direction and Assembly of Seals

Seals are pre-assembled in the vent components. If a seal is missing or damaged, this component should not be used or an appropriate seal must be installed.

- Use **ONLY** original seals. NEVER use fabricated or non common vent seals.
- Use only the appropriate nominal width and diameter seals.
- Confirm seal is installed in the appropriate direct (see figure)
- Seal and Seal Chamfer must remain clean and free of foreign debris before assembly.

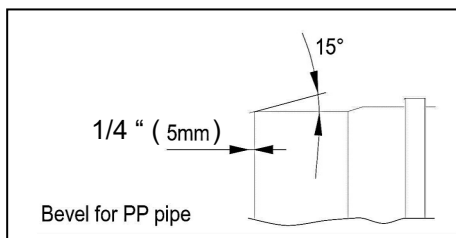


Joining, Disconnecting, Shortening and Chamfering

For measuring purposes the seals can be removed from their chamber.

Note: Always reassemble the seals in the right direction, as indicated in the illustration.

- Lubricate the seals and/or male ends of the components with CENTROCERIN® lubricant or water and assemble the components using light rotational movements. Entirely insert the male end into the female end.
- Inspect immediately the correct position of the seal as the system is produced out of translucent material
- Pipes are always shortened on the male end. Never cut or modify formed vent components such as elbows or collectors.
- Cut straight, perpendicular to the tube and chamfer the edges approximately 15° at 1/4".



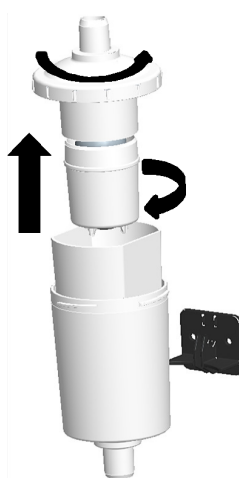
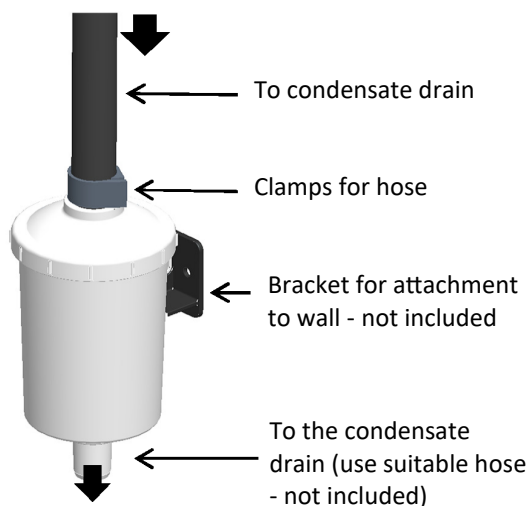
A7 Condensate and Condensate Drain

- Condensate is produced in the Common Vent System when appliances are operating.
- Condensate must be drained to prevent the malfunction, equipment failure, or property damage. Condensate should be disposed according to local codes. Refer to the *National Fuel Gas Code, ANSI Z223.1/NFPA 54*, or the *Natural Gas and Propane Installation Code, CSA B149.1* condensate disposal.
- The disposal for the condensate can be accommodated via the appliances and / or separate condensate outlets in the Common Vent System.
- A condensate trap must be installed at any drain point to prevent flue gasses from exiting.
- The condensate trap provided with the header (illustrated below) has an integrated valve that temporarily blocks condensate flow if high (wind) pressures cause a pressure rise in the vent system.
- The condensate trap integrated valve will also prevent trap from drying out if the system is off for a long period of time.
- The Ubbink condensate trap illustrated below does NOT require priming.
- 3rd party condensate valves (or a hose loop) DO need priming to be effective. Do not fire the appliances before the condensate traps are inspected and/or primed, otherwise flue gasses can escape from the common vent system.
- All subsequent drains must have a minimum diameter of 1/2" (12mm) and must be protected (if applicable) from freezing.

A8 Instructions to be Complied With

When assembling the Common Vent System, the following points must be complied with:

- Correct fit of the seals
- Complete use of the insertion depth of the pipes and formed parts
- Assembly must be carried out with an incline of at least 3° (3/4inch per foot or 5.6 cm/m), so that the condensate produced can flow away from the appliances in accordance with the regulations.
- Conversions or change to the system components are not permissible without approval by Rinnai.
- After assembly of the Common Vent System a visual inspection of all seals must be completed.
- Fill in the last page of this manual with the required data, and leave this manual for review with the end user and store it with the common header installation.



Annual inspection and cleaning

- 1- Remove top cap (twist left)
- 2- Remove debris container from top cap (gently twist and pull) Carefully take out the valve (ball) **Note: If any component is damaged the entire trap has to be replaced!**
- 3- Remove debris and clean components with water **only** do **not** use detergents or solvents.
- 4- Re-assemble components in reverse order. Assure that the valve (ball) is placed in position



WARNING

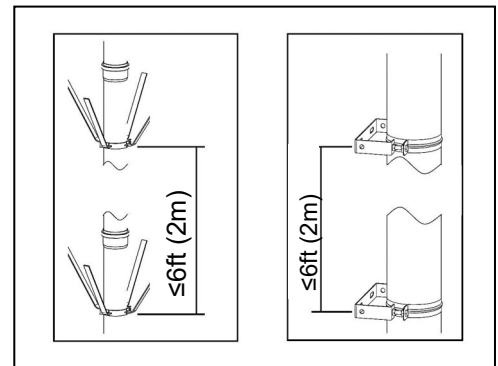
Improper installation of vent system and components, or failure to follow all installation instructions, can result in property damage or serious injury.

A9 Final Installation Check List

<input type="checkbox"/>	All vent components are secure and fully engaged.
<input type="checkbox"/>	All seals are correctly positioned and included at every joint.
<input type="checkbox"/>	All exhaust vent runs include a minimum of a 3° incline (3/4" per ft or 5.6 cm/m)
<input type="checkbox"/>	All condensate drains tubes are connected to a drain and comply with local code.
<input type="checkbox"/>	All condensate traps have been primed.
<input type="checkbox"/>	There are no obstructions in the combustion air or exhaust vent runs.
<input type="checkbox"/>	Both intake and exhaust terminations are appropriately positioned and comply with the manufacturers installation instructions and local codes.
<input type="checkbox"/>	The Common Vent System Installation Instructions and the Appliance Installation Instructions have been secure to the system or provided to the end user.

A10 Clearances of brackets

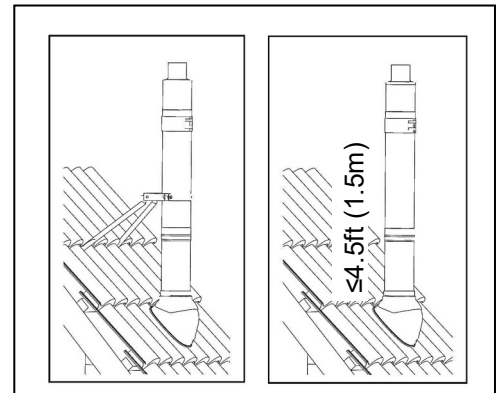
All supports such as e.g. wall brackets on the external façade or spacer blocks in a shaft must be assembled in a maximum distance of 6 ft (2 m). Where there is a bend, additional spacer blocks or wall brackets can be planned before and after the bend, depending on the local situation.



A11 Inspection after assembly

After assembly of a system chimney the following points must be noted inspected

- Carry out a visual seal inspection of the whole flue gas tract.
- The chimney is put into operation together with the heating appliance.
- Regular cleaning and maintenance in accordance with valid country-specific regulations.



A12 Application Manufacturer's Information

The manufacturer's identification information as displayed below must be filled out and kept with the system chimney.

The following points must be filled out below by the installer after release of the system:

Installation date of the system chimney	
Number of entries (appliances)	
Nominal diameter of the selected system chimney	
Constructor of the chimney with full name ((Stamp) legible and with signature)	
Include Name, Street Address and Signature	

OEM Manufacturer identification

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