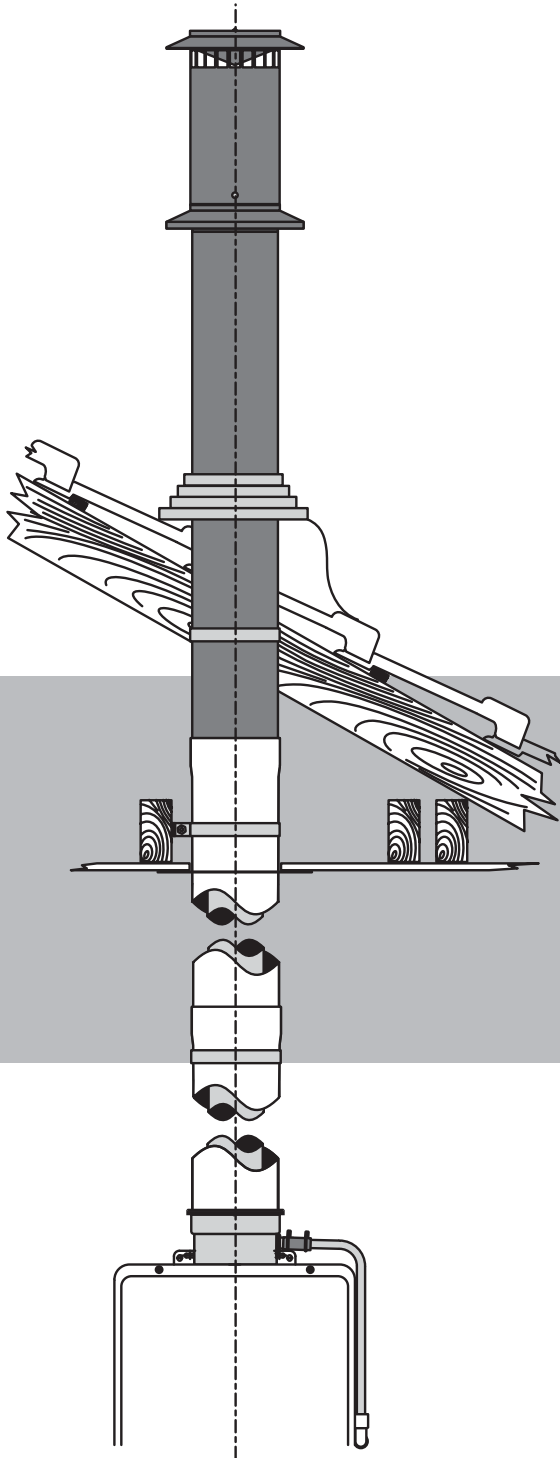


Rinnai

Flue Installation Manual



Rinnai FFU coaxial flue system, suitable for use with the following Rinnai internal continuous flow water heater models:

INFINITY 26i	–	REU-VR2632FFUG
HD 200i	–	REU-VRM2632FFUC

These components shall be installed in accordance with:

- Manufacturer's Installation Instructions
- Current AS/NZS 3000, AS/NZS 3500 & AS/NZS 5601
- Local Regulations and Municipal Building Codes

These components must be installed, serviced and removed by an Authorised Person.



BEFORE PROCEEDING WITH INSTALLING A FF COAXIAL FLUE SYSTEM, READ THIS MANUAL THOROUGHLY TO GAIN A FULL UNDERSTANDING OF THE INSTALLATION REQUIREMENTS.

INSTALLATION GENERAL



This flue must be installed by an authorised person. The Installation must conform to local regulations.

Installation must comply with the instructions supplied by Rinnai.

Service and removal must be carried out by an authorised person.

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CERTIFICATION

Certified by the Australian Gas Association (AGA) For use only with Rinnai internal continuous flow water heaters.

GENERAL

1. These instructions only apply to the Rinnai FF water heater coaxial flueing system. This flue system utilises pipe components with an aluminium inner pipe and a white plastic outer pipe.

These instructions **DO NOT** apply to older Rinnai water heater flueing that has either a stainless steel single skin or stainless steel coaxial construction. If in doubt contact Rinnai.

2. Before commencing installation, please read the 'Installation Instructions - General', located inside a pouch behind the front cover of all Rinnai water heater models. The Rinnai internal water heater range must only be installed with Rinnai water heater flueing as referred to in these instructions.
3. The requirements of the current AS/NZS 5601 and local authorities must be met, which is the installers responsibility.
4. The required clearances of Rinnai internal continuous flow water heater when installed as a single unit are shown in Fig.1. The appliances are certified to be installed side by side as shown on page 3, allowing a minimum distance between flues as follows:
 - 270mm between horizontal terminals.
 - 160mm between vertical cowls.
5. Rinnai internal continuous flow water heaters fitted with FF flue systems are room sealed as defined in AS/NZS 5601. No ventilation in the space where the water heater is installed is required.
6. The outer plastic section of the coaxial flue complies with temperature hazard requirements and can be installed with zero clearance to combustible material.

FF FLUEING OPTIONS

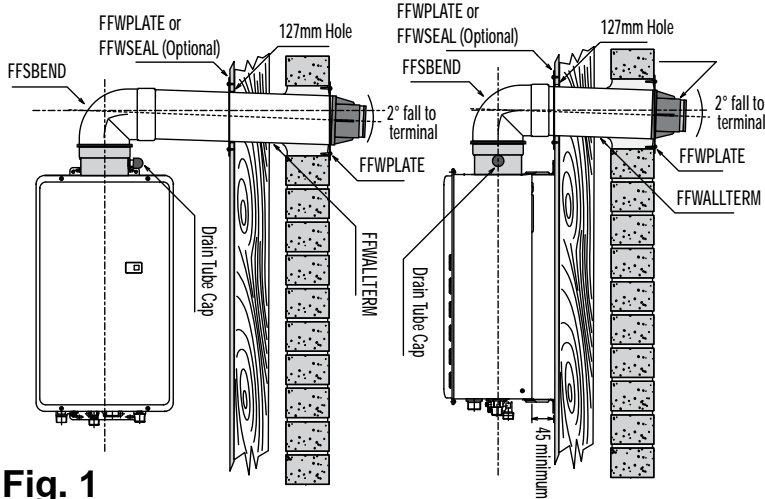


Fig. 1

DIRECT HORIZONTAL (FIG. 1)

A horizontal flue installation that consists of a starter bend (FFSBEND) and a wall terminal (FFWALLTERM) only. See page 4 for details.

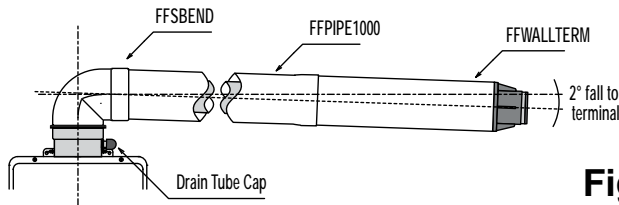


Fig. 2

HORIZONTAL EXTENDED (FIG. 2)

A horizontal flue installation that consists of a starter bend (FFSBEND), flue pipe(s) (FFPIPE1000) and a wall terminal (FFWALLTERM). See page 4 for details.

VERTICAL (FIG. 3)

A vertical installation that consists of flue pipe(s) (FFPIPE1000) and a roof terminal (FFROOFCOWL). See page 5 for details.

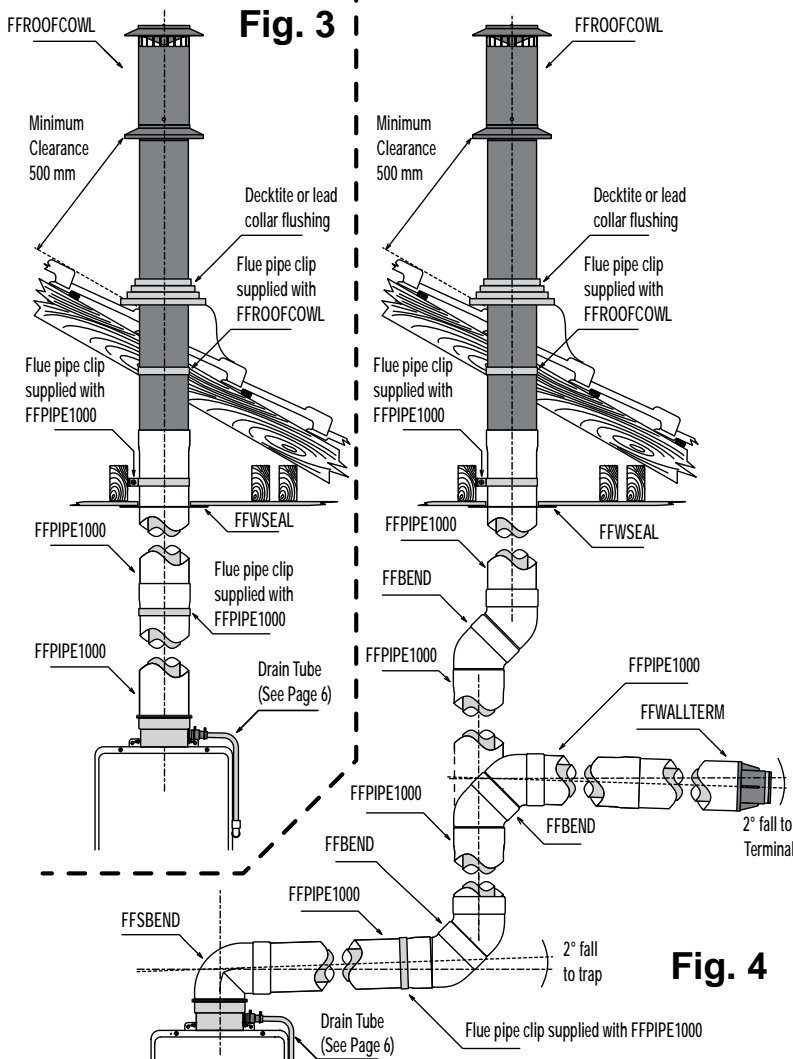


Fig. 3

VERTICAL / HORIZONTAL (FIG. 4)

A combination of pipe(s) (FFPIPE1000) and bends (FFSBEND/FFBEND) that terminate with either a wall (FFWALLTERM) or roof (FFROOFCOWL) terminal. See page 5 for details.

For condensation drain fitting requirements see the section "CONDENSATE DRAIN" on page 6.

APPLIANCE SPIGOT CENTRES (FIG. 5)

The wall mounting brackets on internal water heaters are adjustable. See page 4 and page 5 for details on how this feature applies to vertical and horizontal installations.

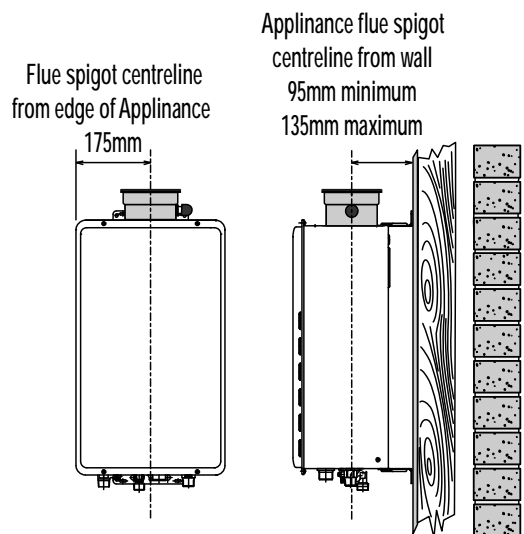


Fig. 5

GENERAL INSTALLATION METHODS

Lubricating Components

A container of "O ring" grease is provided with the flue terminal components (FFWALLTERM and FFROOFCOWL). To ease assembly, lubricate the "O" ring on the inner pipes of each flue component prior to assembly.



Use only a silicone based "O" ring seal lubricant. DO NOT use petroleum based lubricants such as petroleum jelly, as such products may cause deterioration.

Means of disconnection

The appliance connection shall include a means of disconnection in accordance with AS/NZS 5601.

Setting Flue Length Dipswitch

Installations can consist of both horizontal and vertical runs to a maximum length of 9 metres and with a maximum of three 90° bends.

If flue length exceeds 1.5m, dipswitch 1 of SW1 is to be switched to the 'OFF' position (Fig. 6).

This increases the combustion fan speed to overcome the additional friction losses.

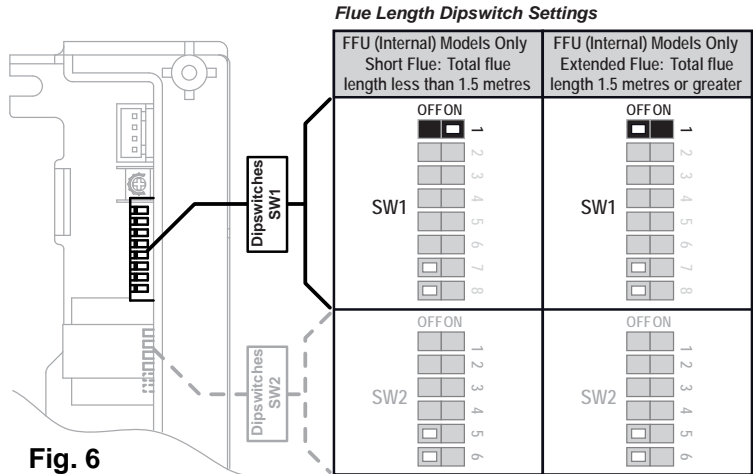


Fig. 6

Cutting The Flue Components

Using the dimensions shown on page 8, calculate the required number and type of flue components that are needed to reach from the water heater and the flue terminal.

When cutting components the outer flue pipe should be cut to the required length plus 35 mm and the inner flue pipe should be cut to the required length plus 50 mm, this will ensure that the correct penetration is provided for joining of components.

When inner and outer pipes are re-assembled after cutting the inner pipe should extend 15mm beyond the end outer pipe (Fig. 7).

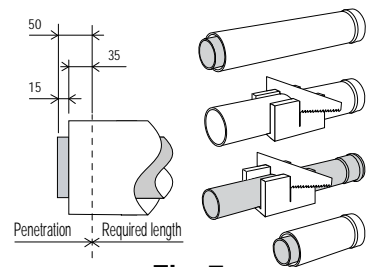


Fig. 7



The ONLY COMPONENTS that can be cut are as follows: FFPIPE1000, FFROOFCOWL and FFWALLTERM.

Ensure all ends are cut square (the use of a mitre box will ensure a clean square cut).

Ensure all cut ends are free from debris and burrs.

Flue Terminals



The flue gases can reach temperatures up to 200°C. The flue terminal is to terminate in a location not to cause a nuisance, in accordance with AS/NZS 5601.

Multiple Terminal Installations

The terminal clearances in AS/NZS 5601 do not apply to the Rinnai internal continuous flow water heaters when installed side by side (Fig. 8).

AGA certification allows for a horizontal separation of 160 mm for roof terminals and 270 mm for wall terminals.

Each terminal is to be terminated at the same vertical height.

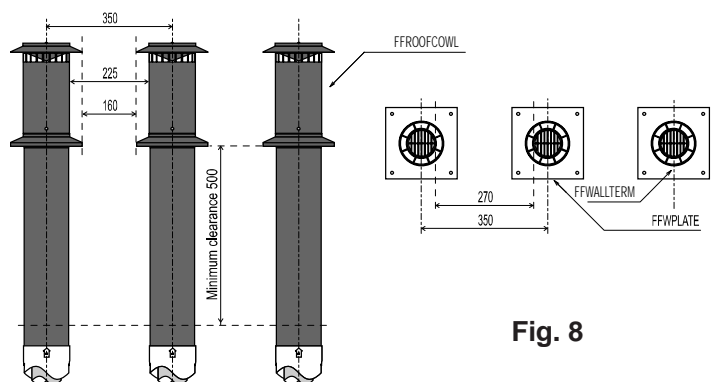


Fig. 8

DIRECT HORIZONTAL FLUE

The Rinnai water heater 'direct' flueing components (FFSBEND, FFWallTERM, FFWSEAL and FFWPLATE) must be used for this purpose.

Installation method

1. Mount the water heater in an appropriate location ensuring that there is enough space to install the flue assembly and pipe work. Also ensure that positioning of the flue terminal complies with the requirements of AS/NZS 5601 see (Fig.6.2 on page 9).
2. Using the dimensions provided in Fig. 9, mark a point along the appliance centring that is 160mm from the top of the water heater. This mark forms the centre point for the 127mm diameter wall penetration.
3. When installing the FFSBEND directly backwards from the appliance it is necessary to extend the adjustable mounting brackets of the water heater to a minimum of 45mm to allow for the flue component radius.
4. Make a 127mm wall penetration for the flue. Ensure that the flue spigot is covered to avoid debris entering the appliance flue connection.

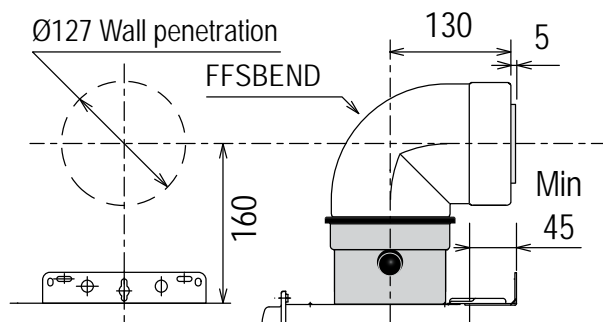


Fig. 9



If an accurate wall penetration is made then the FFSBEND will cover the hole and an internal wall plate will not be necessary.

Ensure the drain tube cap remains fitted in place (Fig. 10).

5. Measure the required length for the horizontal terminal to penetrate the wall and allow an extra 10mm protrusion from the wall outer surface as shown in Fig. 10. See the section "Cutting The Flue Components" on page 3 for correct cutting requirements.
6. Connect the FFWallTERM to FFSBEND (ensuring components are pushed 'fully home') and fit associated wall plates/seals as required.
7. To prevent rain water from entering the flue terminal ensure the required 2° fall to outside is achieved (Fig.2 page 2).
8. Seal the flue around the wall plate using silicon sealant.

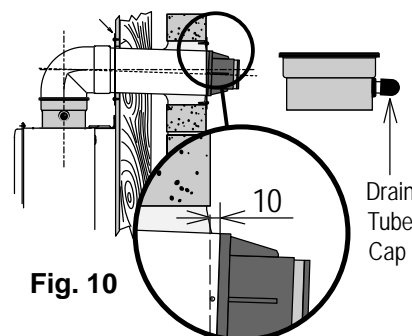


Fig. 10

EXTENDED HORIZONTAL FLUE

This option can be used when the water heater is mounted against an internal wall and flueing needs to extend horizontally to exit an external wall.

As with the DIRECT HORIZONTAL FLUE option the Rinnai water heater 'direct' flueing components (FFSBEND, FFWallTERM, FFWSEAL and FFWPLATE) must be used for this purpose, together with extension pieces (FFPIPE1000 and FFBEND) components as required.

Total flue length can be up to 9 metres long and a maximum of 3 bends can be used. Horizontal flue is to be installed with a 2° fall towards the wall terminal to prevent condensation running back into the water heater.



If this can not be achieved and the length of the flue system exceeds 1.5 metres the condensate drain pipe will require connection, refer to "CONNECTING CONDENSATE DRAIN" on page 6 for details.

Ensure there is enough space to install the water heater, flue assembly and pipe work. Also ensure that positioning of the flue terminal complies with the requirements of AS/NZS 5601 (Fig.6.2 on page 9).

Installation method

1. Follow the installation method as described for the DIRECT HORIZONTAL FLUE option, using FFPIPE1000 and FFBEND components to extend the installation as required.
2. All external joints of the PVC pipe must be glued with approved PVC cement to prevent water entering the flue.

VERTICAL FLUE

This option can be used when the water heater is to be flued vertically through the roof.

The Rinnai water heater 'Vertical Flueing Components' (FFROOFCOWL and FFPIPE1000) with extension pieces (FFPIPE1000) and optional roof seal (FFSEAL) must be used for this purpose.



With vertical flue systems the condensate drain pipe will require connection if the total length of the flue system exceeds 2 metres. Refer to the section “CONDENSATE DRAIN” on page 6 for details. If the condensate drain tube is not required to be connected it is important to keep the drain tube cap in place on the appliance flue spigot. It is only to be removed if the condensate drain tube is connected. Appliances must not be operated with the drain tube cap removed and with no condensate drain tube connected.

Total flue length can be up to 9 metres long and have a maximum of 3 bends.

The distance of centreline of the appliance flue spigot from the wall is variable from a minimum 95mm to a maximum 135mm (see Fig. 5 on page 2). Take this into account when creating access holes through floors and ceilings for flue pipe components.

Installation method

1. Mount the water heater in an appropriate location ensuring that there is enough space to install the flue assembly and pipe work. Also ensure that positioning of the flue terminal complies with the requirements of AS/NZS 5601 (Fig.6.2 on page 9).
2. Set plumb bob from the centre of the heater flue outlet to ceiling marking position. Cut 127mm hole in plasterboard (or a suitable 'oval' for pitched roof applications). Repeat this step for underside of roofing.
3. Calculate the required number and combination of FFPIPE1000 lengths and cut to size as required, see the section “Cutting The Flue Components” on page 3.
4. Install roof seal. (Not supplied, if required Rinnai Part No. FFWSEAL).
5. Ensure the flue is fully supported independently of the appliance, by the use of suitable clips or brackets, in accordance with AS/NZS5601. Appropriate standoff brackets are supplied with each FFROOFCOWL and FFPIPE1000 component.
6. Ensure that the appliance can be removed without causing movement or displacement of the flue, in accordance with AS/NZS 5601.
7. Fit the condensate drain tube if required (see “CONDENSATE DRAIN” on page 6).
8. All external joints of the PVC pipe must be glued with approved PVC cement to prevent water entering the flue.

COMBINED VERTICAL & HORIZONTAL FLUE

This option allows the water heater to be installed virtually anywhere using a wall (FFWALLTERM) or roof (FFROOFCOWL) terminal. Extension pieces (FFPIPE1000 and FFBEND) can be mounted horizontally or vertically as required.



With combined horizontal and vertical flue systems the condensate drain pipe will require connection if the total length of the flue system exceeds 1.5 metres. Refer to the section refer to “CONNECTING CONDENSATE DRAIN” on page 6 for details. If the condensate drain tube is not required to be connected it is important to keep the drain tube cap in place on the appliance flue spigot. It is only to be removed if the condensate drain tube is connected. Appliances must not be operated with the drain tube cap removed and with no condensate drain tube connected.

Total flue length can be up to 9 metres long and have a maximum of 3 bends. Mount the water heater in an appropriate location ensuring that there is enough space to install the flue assembly and pipe work. Also ensure that positioning of the flue terminal complies with the requirements of AS/NZS 5601 (Fig.6.2 on page 9).

Installation method

1. Using a combination of the installation procedures covered in the “EXTENDED HORIZONTAL FLUE” on page 4 and “VERTICAL FLUE” on page 5 determine and install the required components.

CONDENSATE DRAIN

The condensate trap and associated drain connection are integral with the appliance flue spigot. The condensate trap collects any condensate from the flue system, thereby preventing condensate from entering the water heater and causing damage.

A condensate drain tube kit is supplied with the terminals (FFWALLTERM and FFROOFCOWL) and will require connection to the condensate drain connection in flue systems where the total length exceeds 1.5 metres AND condensate cannot be drained via the flue terminal. Usually, the condensate drain tube requires connection in 'vertical flue' and 'combined vertical & horizontal flue' systems and does not require connection in 'direct horizontal' and 'extended horizontal' flue systems.

If the condensate drain tube is not required to be connected it is important to keep the drain tube cap in place on the appliance flue spigot. It is only to be removed if the condensate drain tube is connected (Fig. 11).

Appliances must not be operated with the drain tube cap removed and with no condensate drain tube connected.

Because the condensate is a by-product of gas combustion it is mildly acidic. For this reason copper tube and fittings **MUST NOT** be used as it will corrode. Instead, Rinnai recommend plastic pipes and fittings such as Unplasticised Polyvinyl Chloride (UPVC) or Polyethylene (PE) which is commonly used for irrigation piping.

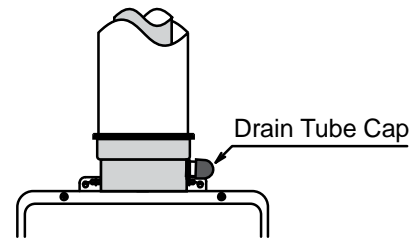


Fig. 11

Important Considerations For The Condensate Drain Tube



The content of AS/NZS 3500.4:2003 Section 5.12 'Temperature / Pressure Relief and Expansion Control Valve Drain Lines' has been used as a guide in preparing these considerations.

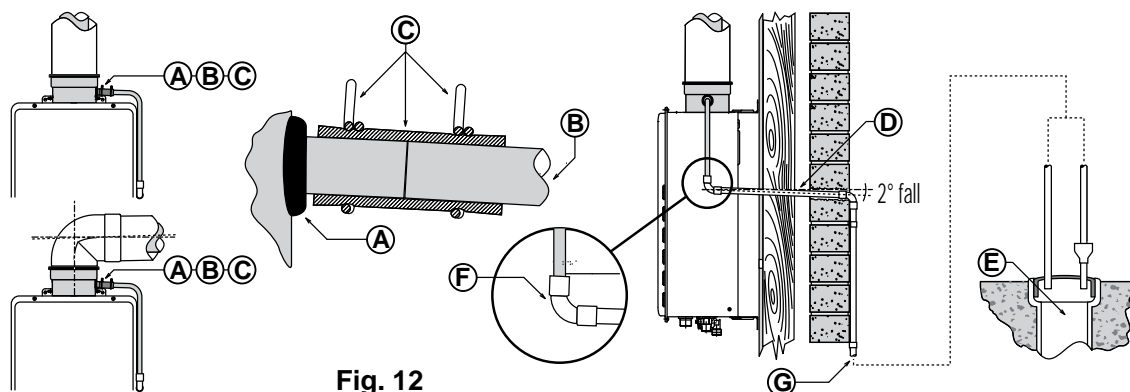


Fig. 12

- Ⓐ Flue spigot with integral condensate trap. Water heater drain outlet connection is 16mm.
- Ⓑ Aluminium condensate drain tube. (Supplied with flue terminals FFWALLTERM or FFROOFCOWL).
- Ⓒ Silicone connection tube and retaining clips. (Supplied with flue terminals FFWALLTERM or FFROOFCOWL).
- Ⓓ Continuous fall (of at least 2°) from water heater to discharge point. Lengths and bends in accordance with 'length And Changes Of Direction' table below.
- Ⓔ 16 mm UPVC conduit to terminate in accordance with Ⓔ.
- Ⓕ Drainage tube to be sealed to conduit with approved silicone.
- Ⓖ Suitable points of discharge are deemed to be drains, sewers or pits. DO NOT discharge onto electrical connections, earth stakes, copper pipes, concrete paths or into a pond.

Lengths and changes of direction					
Maximum length and changes of direction greater than 45 ° should be as follows:	Max length (Metres)	9	8	7	6
	Max changes of direction >45°	3	4	5	6

CONDENSATE DRAIN

Installation Method

- (a) The drain line **MUST NOT** discharge onto electrical connections, earth stakes, copper pipes, concrete paths or into a pond.
- (b) The point of discharge from each drain line shall be located so that the release of condensate does not cause a nuisance, is readily discernible and incurs no risk of damage to the building.
In view of (a) and (b), suitable points of discharge are deemed to be drains, sewers or pits.
- (c) There shall be no tap, valve or other restrictions in any line.
- (d) Each line shall fall continuously from the valve to the approved point of discharge.
- (e) Drain lines shall not discharge into a storage water heater safe tray.
- (f) The end of the condensate drain line shall be:
 - (i) not lower than 200 mm or higher than 300 mm above an un-paved surface; or
 - (ii) not lower than 75 mm or higher than 300 mm above a gravel pit not less than 100 mm in diameter in a paved surface.
- (g) Where discharging over a tundish or gully trap, drain lines shall have an air gap of a size at least twice the diameter of the drain line.

Interconnection Of Condensate Drain Lines

Condensate drain lines from multiple water heaters may be joined together provided they conform with the 'INSTALLATION' requirements on page 6.

Common Stack Discharge

Where individual water heaters are installed in a multistorey building, the condensate drain lines may discharge into a common stack, subject to the following:

- (a) The discharge from the common stack is to a tundish, having a discharge line, that is not less than the size of the common stack, directly connected to a fixture trap, and installed in connection with any adjacent soil or waste stack.
- (b) The discharge point of the common stack is such that any discharge is readily visible and not cause any nuisance.
- (c) The common stack is vented by extending the pipe upwards, above the roof level.

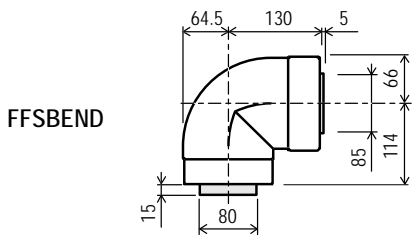
Tundish Drain Lines

The drain line from any tundish shall be not less than DN 20 or less than one size larger than that of the largest drain line discharging into the tundish. Tundish drain lines shall comply with the 'INSTALLATION' requirements on page 6.

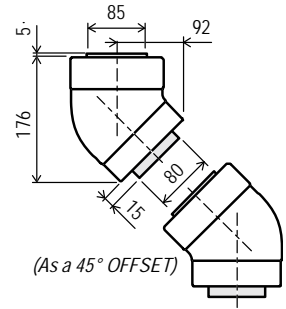
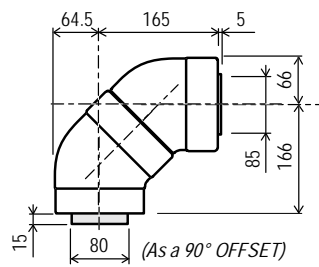
Areas Subject To Freezing

In areas where water pipes are prone to freezing, the drain pipe from any valve shall be insulated and not exceed 300 mm in length. It shall discharge into a tundish through an air gap of not less than 75 mm and not more than 150 mm measured from the outlet of the drain pipe to the rim of the tundish.

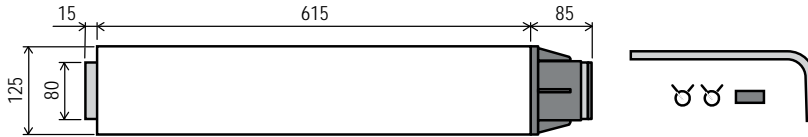
DIMENSIONS



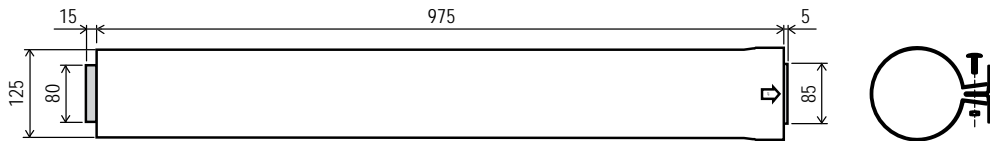
FFBEND
(2x 45° Bends)



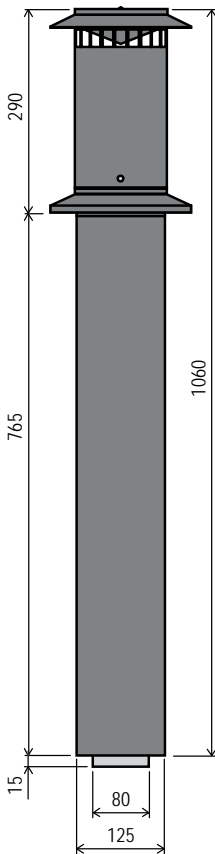
FFWALLTERM
Includes:
Drain tube
Silicone lubricant



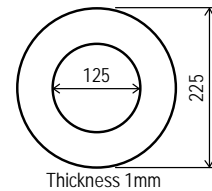
FFPIPE1000
Includes:
Wall bracket



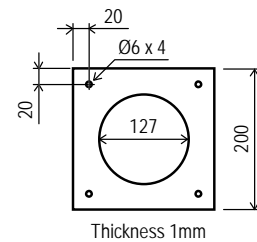
FFROOFCOWL
Includes:
Drain tube
Silicone lubricant
Wall bracket



FFWSEAL

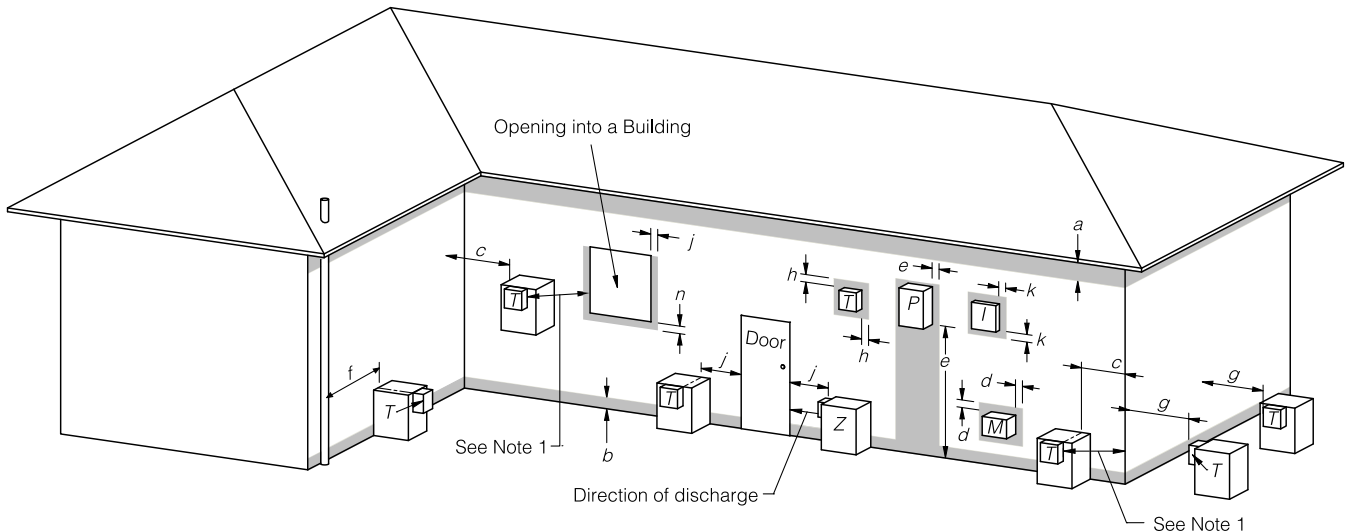


FFWPLATE



DESCRIPTION	CODE NUMBER	BAR CODE NUMBER
Starter Bend	FFSBEND	9314109158311
Universal 45/90 Degree Bend	FFBEND	9314109143058
Horizontal Flue Terminal	FFWALLTERM	9314109107685
Flue Pipe 1000mm length	FFPIPE1000	9314109107061
Vertical Flue Terminal	FFROOFCOWL	9314109107678
Ceiling Ring	FFWSEAL	9314109107722
Wall Plate	FFWPLATE	9314109107715

CLEARANCES



T = Flue terminal Z = Fan assisted flue appliance only M = Gas meter P = Electricity meter or fuse box I = Mechanical air inlet

Shading indicates prohibited areas for flue terminals

Ref.	Item	Min. clearances (mm)	
		Natural draft	Fan assisted
a	Below eaves, balconies and other projections:		
	• Appliances up to 50 MJ/h input	300	200
	• Appliances over 50 MJ/h input	500	300
b	From the ground, above a balcony or other surface *	300	300
c	Front a return wall or external corner *	500	300
d	From a gas meter (M) (see 5.11.5.9 for vent terminal location of regulator) (see Table 6.6 for New Zealand requirements)	1000	1000
e	From an electricity meter or fuse box (P) †	500	500
f	From a drain pipe or soil pipe	150	75
g	Horizontally from any building structure* = or obstruction facing a terminal	500	500
h	From any other flue terminal, cowl, or combustion air intake †	500	300
j	Horizontally from an openable window, door, non-mechanical air inlet, or any other opening into a building with the exception of sub-floor ventilation:		
	• Appliances up to 150 MJ/h input *	500	300
	• Appliances over 150 MJ/h input up to 200 MJ/h input *	1500	300
	• Appliances over 200 MJ/h input up to 250 MJ/h input *	1500	500
	• Appliances over 250 MJ/h input *	1500	1500
	• All fan-assisted flue appliances, in the direction of discharge	-	1500
k	From a mechanical air inlet, including a spa blower	1500	1000
n	Vertically below an openable window, non-mechanical air inlet, or any other opening into a building with the exception of sub-floor ventilation:		
	• Space heaters up to 50 MJ/hr input	150	150
	• Other appliances up to 50 MJ/hr input	500	500
	• Appliances over 50 MJ/h input and up to 150 MJ/h input	1000	1000
	• Appliances over 150 MJ/h input	1500	1500

* - unless appliance is certified for closer installation

† - Prohibited area below electricity meter or fuse box extends to ground level.

NOTES:

- Where dimensions c, j or k cannot be achieved an equivalent horizontal distance measured diagonally from the nearest discharge point of the terminal to the opening may be deemed by the Technical Regulator to comply.
- See Clause 6.9.4 for restrictions on a flue terminal under a covered area.
- See Figure J3 for clearances required from a flue terminal to an LP Gas cylinder. A flue terminal is considered to be a source of ignition.
- For appliances not addressed above acceptance should be obtained from the Technical Regulator.

FIGURE 6.2 (in-part) MINIMUM CLEARANCES REQUIRED FOR BALANCED FLUE TERMINALS, FAN-ASSISTED FLUE TERMINALS, ROOM-SEALED APPLIANCE TERMINALS AND OPENINGS OF OUTDOOR APPLIANCES

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Rinnai has a Service and Spare Parts network with personnel who are fully trained and equipped to give the best service on your Rinnai appliance. If your appliance requires service, please call our Hot Water Service Line. Rinnai recommends that this appliance be serviced every 3 years.

Internet: www.rinnai.com.au E-mail: enquiry@rinnai.com.au

National Help Lines

Sales & Service

Tel: 1300 555 545* Fax: 1300 555 655*

**Cost of a local call Higher from mobile or public phones.*

Hot Water Service Line

Tel: 1800 000 340