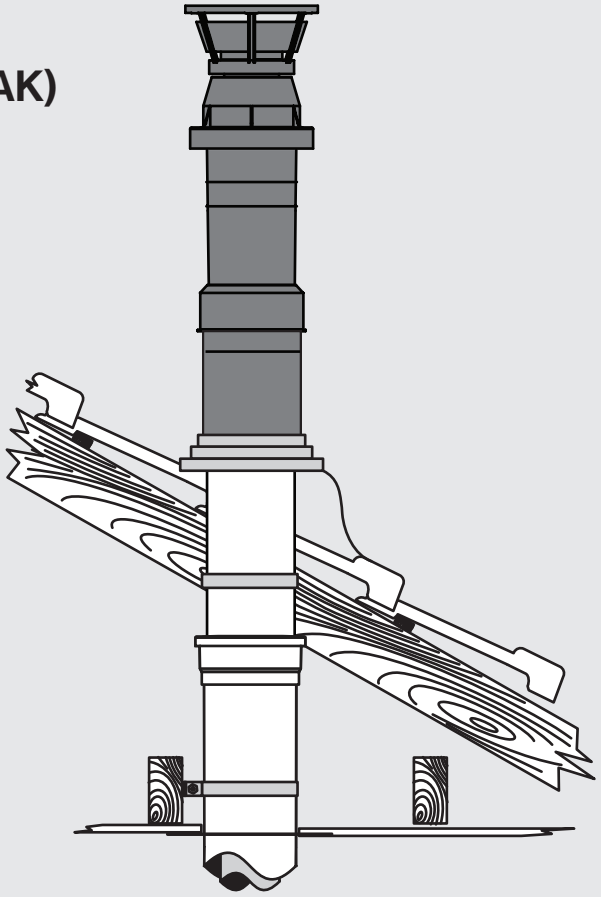
To Suit Water Heater Models

HDC211i (REU-KM3237FFUDC-AK)
HD210i (REU-N3237FFC-AK)



Rinnai FFSS (Stainless Steel) Flue Systems

Flue Installation Manual

Rinnai

IMPORTANT

Before proceeding with the installation of an FFSS coaxial flue system, read this manual thoroughly to gain a full understanding of the installation requirements.

This appliance must 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 including local OH&S requirements

This appliance must be installed, maintained and removed by an Authorised Person.

For continued safety of this appliance it must be installed and maintained in accordance with the manufacturer's instructions.

The Australian Gas Association

All Rinnai gas products are A.G.A. certified.

INSTALLATION TABLE OF CONTENTS

WARNINGS & IMPORTANT INFORMATION

WARNING

BEFORE USING INSTALLING FLUE COMPONENTS

Before proceeding with the installation of an FFSS coaxial flue system, read this manual thoroughly to gain a full understanding of the installation requirements.

Always comply with the following precautions to avoid dangerous situations and to ensure optimum performance.

Failure to carefully read and follow all instructions in this manual can result in equipment malfunction, property damage, personal injury and/or death.

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

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

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

WARNING

REGULATORY INFORMATION

Your Rinnai gas continuous flow water heater flue has been certified by the Australian Gas Association. The A.G.A. Certification Number is shown on the data plate.

These flueing components MUST be installed in accordance with:

- **Current AS/NZS 3500 and AS/NZS 5601**
- **The installation MUST comply with all relevant instructions supplied by Rinnai.**
- **Service and removal MUST be carried out by an authorised person.**
- **Local regulations and municipal building codes including local OH&S requirements**

Flue components MUST be installed correctly by an appropriately licensed tradesperson. The installation of gas, water, and electricity must conform to local regulations.

All dimensions referred to in these instructions are in millimetres, unless otherwise specified.

These instructions ONLY apply to the Rinnai FFSS water heater coaxial flueing system. This flue system utilises pipe components with a stainless steel 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 aluminium coaxial construction. If in doubt contact Rinnai.

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.

Appliances are certified to be installed side by side as shown on page 6. Refer to the operation and installation manual provided with the appliance for clearance details pertaining to single appliance installations.

A Rinnai internal continuous flow water heater fitted with an FFSS flue system is room sealed as defined in AS/NZS 5601. No ventilation in the space where the water heater is installed is required.

The outer plastic section of the coaxial flue complies with temperature hazard requirements and can be installed with zero clearance to combustible material.

Notice to Victorian Consumers

The appliance and flue components MUST be installed by a person licensed with the Victorian Building Authority. ONLY a licensed person will have insurance protecting their workmanship. So make sure you use a licensed person to install this appliance and ask for your Compliance Certificate.

For further information contact the Victorian Building Authority on 1300 815 127.

STAINLESS STEEL COMPONENTS

CAUTION

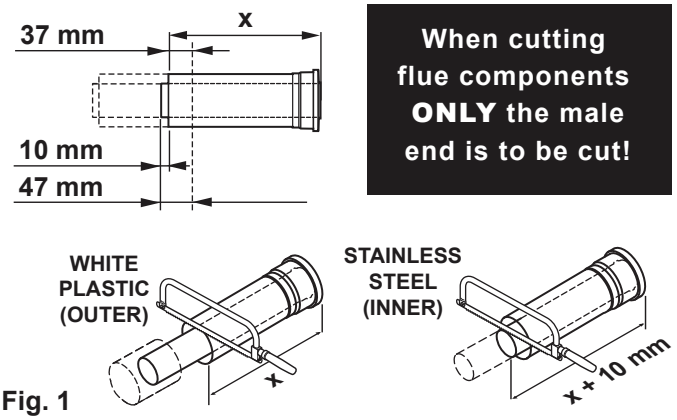
The stainless steel components of the flue components are sharp, CARE is to be taken when handling to avoid injury.

CUTTING THE FLUE COMPONENTS

Refering to "Flue Component Dimensions" on page 13, calculate the required number and type of flue components that are needed to reach from the water heater to the flue terminal.

When cutting components the outer flue pipe should be cut to the required length plus 37mm and the inner flue pipe should be cut to the required length plus 47mm, 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 10mm beyond the end of the outer pipe. See Fig. 1.



When cutting flue components ONLY the male end is to be cut!

Fig. 1

IMPORTANT

Cutting flue components can create sharp edges, care must be taken to avoid injury, use a file to remove debris, burrs and sharp edges from cut ends.

Ends that are left unfinished can damage the flue seals and result in the flue components no longer being air or weather tight.

Use a 32TPI (or equivalent) hacksaw blade when cutting stainless steel components.

The ONLY COMPONENTS that can be cut are as follows: FFSSKIT (pipe not bend), FFSSPIPE1000, FFSSROOFCOWL and UVROOF PROTECTORS.

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

LUBRICATING COMPONENTS

A container of "O" ring grease is provided. To ease assembly, lubricate the “O” rings of the inner pipes of each flue component prior to assembly.

IMPORTANT

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.

APPLIANCE SPIGOT DIMENSIONS & CENTRES

REU-KM Series

The wall mounting brackets are adjustable by 50mm, the minimum setting is 10mm. Adjusting the mounting bracket also adjusts the spigot centre relative to the wall mounting surface, the adjustment range is from 149mm to 199mm. See Fig. 2a for all spigot related dimensions.

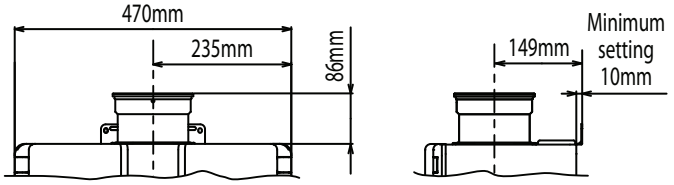


Fig. 2a - REU-KM Series spigot dimensions

REU-N Series

The wall mounting brackets are fixed.

The spigot centre is a fixed 155mm relative to the wall mounting surface. See Fig. 2b for all spigot related dimensions.

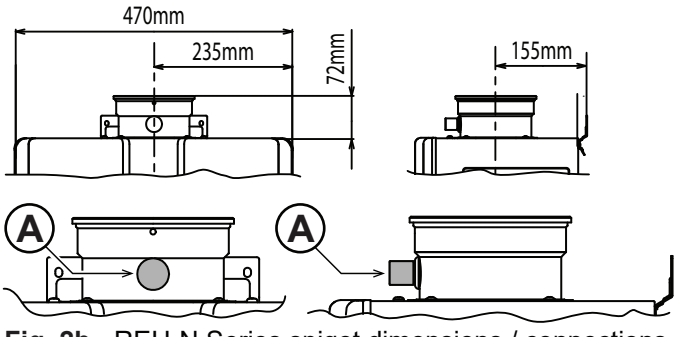


Fig. 2b - REU-N Series spigot dimensions / connections

WARNING

Item Ⓐ is NOT a condensate drain connection and MUST remained capped at all times.

FLUE LENGTH, BENDS & APPLIANCE SETTINGS

Flue installations can consist of both horizontal and vertical runs with the following limitations.

REU-KM Series

CAUTION

The maximum length of any flue run is NOT to exceed 9 metres and may ONLY have a maximum of three 90° bends.

If flue length exceeds 2.0m, dipswitch 1 of SW1 is to be switched to the 'OFF' position, see Fig. 3. This is to increase the combustion fan speed to overcome the additional friction losses incurred.

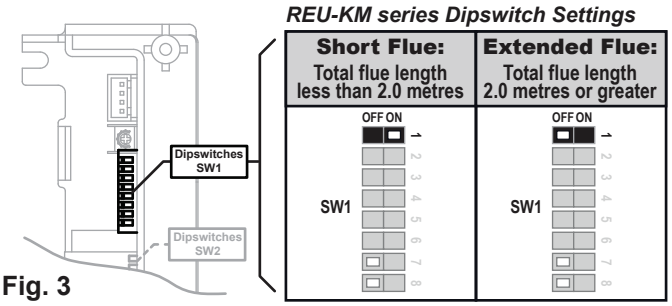


Fig. 3

REU-N Series

CAUTION

The maximum length of any flue run is NOT to exceed 42 metres. The number of 90° bends MUST NOT be more than fifteen. The ratio of metres of flue to the number of 90° bends MUST be in accordance with that described in Table 1.

Combustion is factory set and in normal circumstances adjustment is **NOT** required. Refer to the REU-N series commissioning instructions and or service manual for further information.

Table 1. REU N series, flue pipe lengths & changes of direction

Length Metres*	12	14	16	18	20	22	24	26
90° Bends	15	14	13	12	11	10	9	8
Length Metres*	28	30	32	34	36	38	40	42
90° Bends	7	6	5	4	3	2	1	0

** For flue runs of up to 12 metres in length a maximum of fifteen 90° bends is allowed.*

FLUE TERMINALS

WARNING

The flue gases can reach high temperatures. The flue terminal is to terminate in a location NOT to cause a nuisance, in accordance with AS/NZS 5601.

Ensure the flue is fully supported independently of the appliance by use of suitable clips or brackets, in accordance with AS/NZS 5601.

Appropriate standoff brackets are supplied with each FFSSROOFCOWL and FFSSPIPE1000.

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. See Fig. 4.

AGA certification allows for a horizontal separation of 350mm centres for roof and wall terminals. Refer to Fig. 4 for other relevant spacing and clearance dimensions.

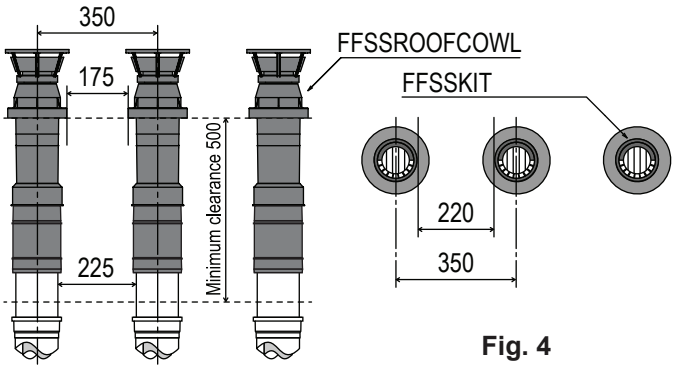


Fig. 4

UV Roof Protectors

The roof cowl comes with two black UV injection moulded pipe sections for covering and protecting the white flue pipe from UV damage.

To install, click together and cut to length if required. If for some reason there is any remaining white pipe exposed, this should be painted with a suitable UV resistant coating. See Fig. 5.

IMPORTANT

When installing the UV protectors it is CRITICAL that the protector sits outside the decktite and NOT inside as weather sealing will be an issue if the protector is installed inside the decktite.

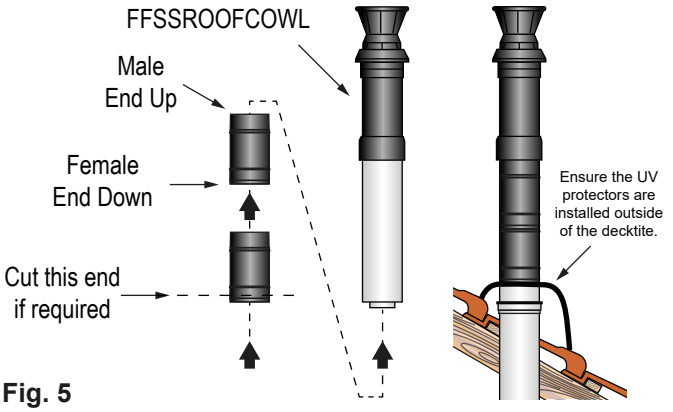


Fig. 5

FFSS FLUEING OPTIONS

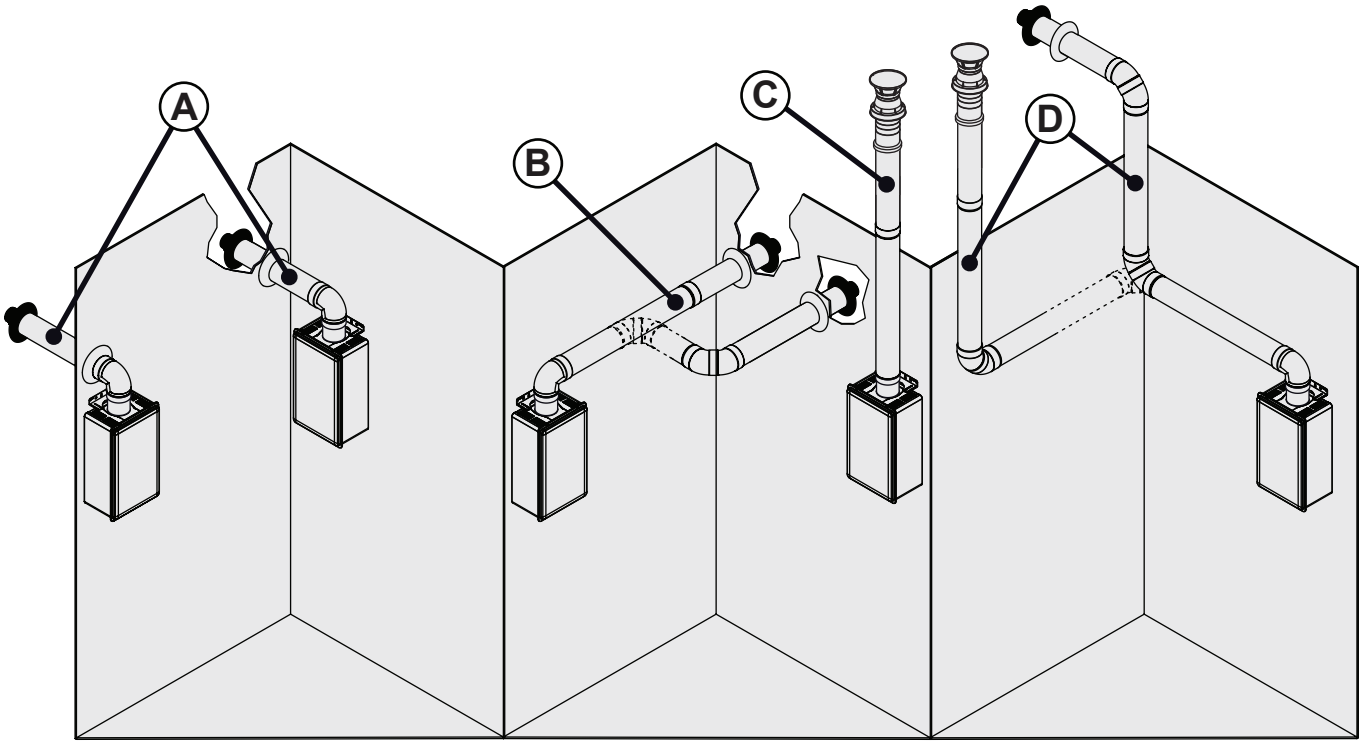


Fig. 6

Ⓐ **Direct Horizontal Flue**

For installations where the internal continuous flow unit is mounted directly on the inside of an external wall and the maximum thickness is:

REU-KM series = 468mm

REU-N series = 463mm.

Refer "Direct Horizontal Flue" on page 8 for details of this installation method.

Ⓑ **Extended Horizontal Flue**

The same as Direct Horizontal flueing with additional pipe required due to the longer horizontal distance.

Refer "Extended Horizontal Flue" on page 8 for details of this installation method.

Ⓒ **Vertical Flue**

Installations where the water heater is flued vertically through the roof.

Refer "Vertical Flue" on page 9 for details of this installation method.

Ⓓ **Combined Vertical And Horizontal Flue**

A combination of all the above.

Refer "Combined Vertical & Horizontal Flue" on page 10 for details of this installation method.

DIRECT HORIZONTAL FLUE

The Direct Horizontal Flue option (Fig. 7) is used for flueing directly through an external wall and FFSSKIT **MUST** be used for this purpose. Components included are: 90° starter bend, terminal pipe, white internal wall seal and black external wall seal.

Installation Method

IMPORTANT

All horizontal flue is to be installed with a 2° fall towards the water heater.

Ensure there is enough space to install the water heater, flue assembly and pipework. Also ensure that the positioning of the flue terminal complies with the requirements of AS/NZS 5601 (see page 12).

1. Mount the water heater in an appropriate location.
2. Using the dimensions provided in Fig. 8, mark a point 150mm (REU-KM series) / 136mm (REU-N series) along the appliance centreline from the top of the water heater. This mark forms the centre for the 140mm diameter wall penetration.
3. When installing the FFSSKIT directly backwards from the appliance, for REU-KM series set water heater mounting brackets to the minimum (10mm).
4. Make a 140mm wall penetration for the flue. Ensure that the flue spigot is covered to avoid debris entering the appliance flue connection.
5. Measure the required length for the horizontal terminal to penetrate the wall and allow an extra 67mm protrusion from the inside wall surface as shown in Fig. 9. See also the section “CUTTING THE FLUE COMPONENTS” on page 4.
6. Fit the external wall seal to the terminal pipe. Pass the male end of the terminal pipe through penetration point and weatherproof the penetration as required. Fit the internal wall seal to the terminal pipe.
7. Connect the terminal pipe to starter bend (ensuring components are pushed 'fully home'. Secure the PVC joints of bend to the terminal pipe with three (3) #8x1/2” or equivalent self tapping screws (not supplied) as shown in Fig. 10.
8. Connect condensate drain (go to "Condensate Drain" on page 10 for connection details).

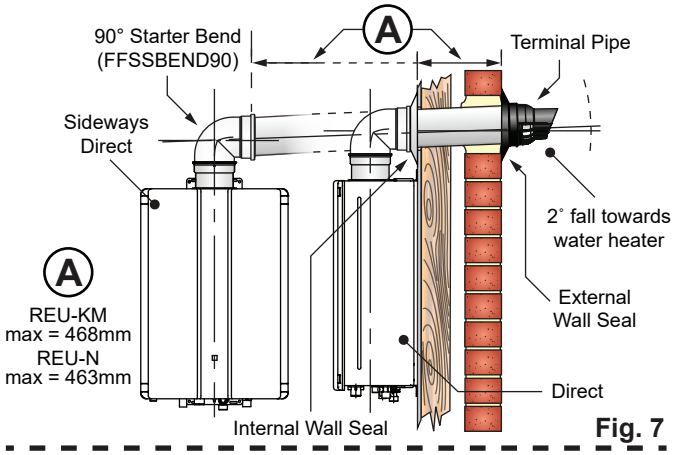


Fig. 7

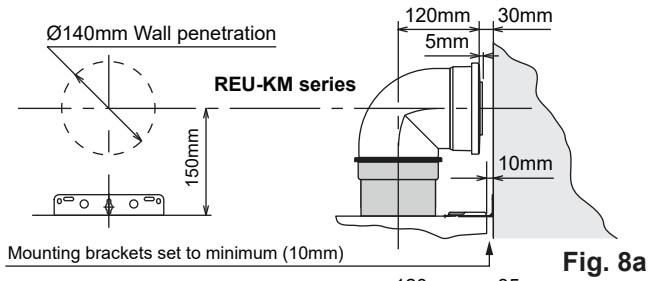


Fig. 8a

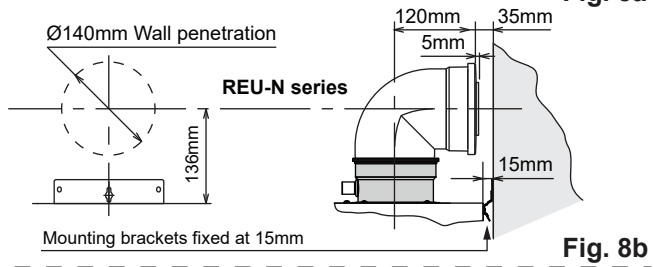


Fig. 8b

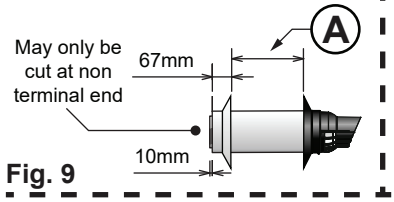


Fig. 9

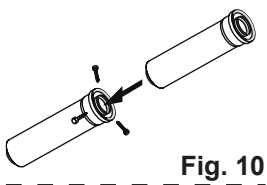


Fig. 10

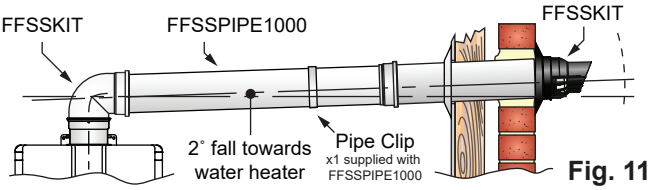


Fig. 11

EXTENDED HORIZONTAL FLUE

The Extended Horizontal Flue option (Fig. 11) is used when the water heater is mounted on an internal wall and flueing needs to extend horizontally to exit an external wall. Use **ONLY** FFSS components to extend installations.

IMPORTANT

Refer to "Flue Length, Bends & Appliance Settings" on page 6 for flue run length limitations.

All horizontal flue is to be installed with a 2° fall towards the water heater.

1. Follow the installation method as described for the DIRECT HORIZONTAL FLUE above. Use FFSSPIPE1000 and FFSSBEND90 / FFSSBEND45 components to extend the installation horizontally as required. Note that PVC joints **MUST** be secured with three (3) #8x1/2” or equivalent self tapping screws (not supplied) Fig. 10.

VERTICAL FLUE

The Vertical Flue option (Fig. 12) is used for flueing vertically through the roof and FFSSROOFCOWL and FFSSPIPE1000 **MUST** be used for this purpose. Components included with FFSSROOFCOWL are: terminal pipe, 2x UV protectors and 1x pipe clip. Components included with FFSSPIPE1000 are: flue pipe, 1x pipe clip.

Installation Method

IMPORTANT

Refer to "Flue Length, Bends & Appliance Settings" on page 6 for flue run length limitations.

Ensure there is enough space to install the water heater, flue assembly and pipe work. Also ensure that the positioning of the flue terminal complies with the requirements of AS/NZS 5601 AS/NZS 5601 (see page 12).

Refer to "Appliance Spigot Dimensions & Centres" on page 5 when creating access holes through floors and ceilings for flue pipe components.

1. Mount the water heater in an appropriate location.
2. Set plumb bob from the centre of the heater flue outlet to ceiling marking position. Cut 140mm hole in plasterboard (or a suitable 'oval' for pitched roof applications). Repeat this step for underside of roofing.
3. Install, UV protectors to the vertical terminal as required, refer "UV Roof Protectors" on page 6.
4. Calculate the required number and combination of FFSSPIPE1000 lengths and cut to size as required, see Fig.1, in section "Cutting The Flue Components" on page 5.
5. Install decktite roof seal (Not supplied).
6. Ensure the flue is fully supported independently of the appliance, by the use of suitable clips or brackets, in accordance with AS/NZS 5601. Appropriate standoff brackets are supplied with each FFSSROOFCOWL and FFSSPIPE1000 component.
7. Ensure that the appliance can be removed without causing movement or displacement of the flue, in accordance with AS/NZS 5601.
8. All PVC joints must be secured with 3x #8x1/2" or equivalent self tapping screws (not supplied) as shown in Fig. 13.
9. Connect condensate drain (go to "Condensate Drain" on page 10 for connection details).

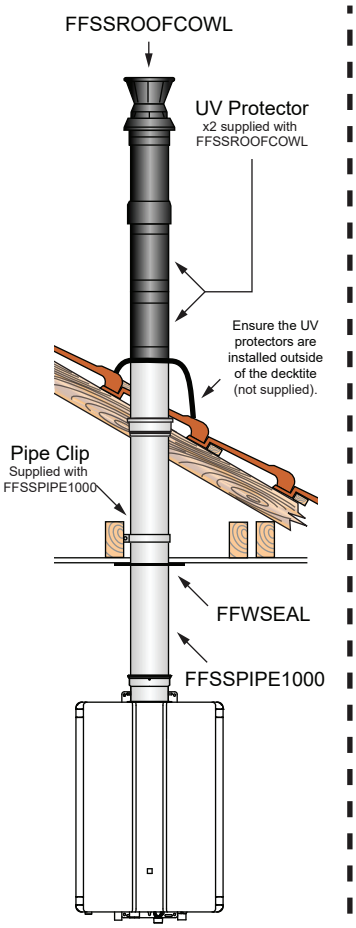


Fig. 12

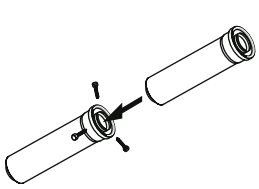


Fig. 13

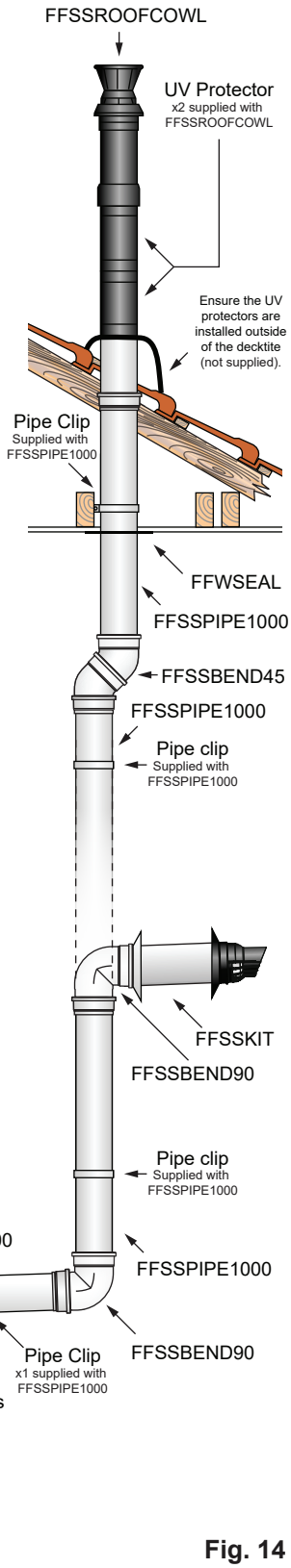


Fig. 14

COMBINED VERTICAL & HORIZONTAL FLUE

The Combined Vertical & Horizontal Flue option (Fig. 14, page 7) allows the water heater to be installed virtually anywhere using a wall (FFSSKIT) or roof (FFSSROOFCOWL) terminal. Extension pieces (FFSSPIPE1000, FFSSBEND90 and FFSSBEND45) can be mounted horizontally or vertically as required.

Installation Method

IMPORTANT

Refer to "Flue Length, Bends & Appliance Settings" on page 6 for flue run length limitations.

All horizontal flue is to be installed with a 2° fall towards the water heater.

1. Using a combination of the installation procedures covered in the “EXTENDED HORIZONTAL FLUE” on page 6 and "Vertical Flue" on page 9, determine and install the required components. Note that PVC joints **MUST** be secured with three (3) #8x1/2” or equivalent self tapping screws (not supplied) Fig. 13 on page 9.

CONDENSATE DRAIN

The Rinnai range of condensing water heaters generate condensate continuously at a rate of up to 5 litres per hour as a by-product of highly efficient gas burner system. This condensate must be drained via a pipe to a suitable point of discharge (Fig. 15). 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.

Important Considerations For Condensate Drain Pipe

NOTE

The content of AS/NZS 3500 ‘Temperature / Pressure Relief and Expansion Control Valve Drain Lines’ has been used as a guide in preparing these considerations.

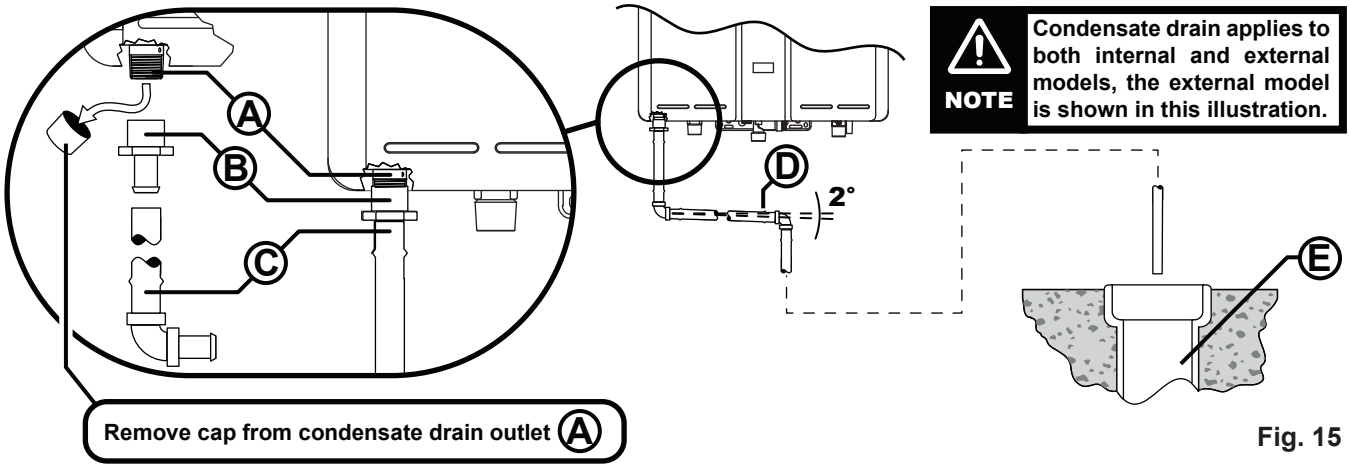


Fig. 15

Ⓐ Water heater drain outlet connection, R½” (15 mm) BSP male. Condensate drain outlet connection, 1/2” (15mm) BSP male nylon (Note: the black plastic shipping cap **MUST** be removed from the condensate drain outlet prior to water heater operation).

Ⓑ PE R½” BSP (15 mm) female to barbed irrigation system connector (13 – 19mm) or equivalent plastic fitting.

Ⓒ Drain pipe and fittings to match item Ⓑ.

Ⓓ Continuous fall (of at least 2°) from water heater to discharge point. Lengths and bends in accordance with ‘Length & Changes Of Direction’ table below.

Ⓔ 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.

Length & Changes Of Direction

Maximum length and changes of direction greater than 45° for the drainage pipe to be in accordance with that described in the Table 2.

Table 2. Drainage lengths & changes of direction

Max length (Metres)	9	8	7	6
Max changes of direction >45°	3	4	5	6

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 unpaved 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 requirements of the "Installation Method" on page 11.

Common Stack Discharge

Where individual water heaters are installed in a multi-storey 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

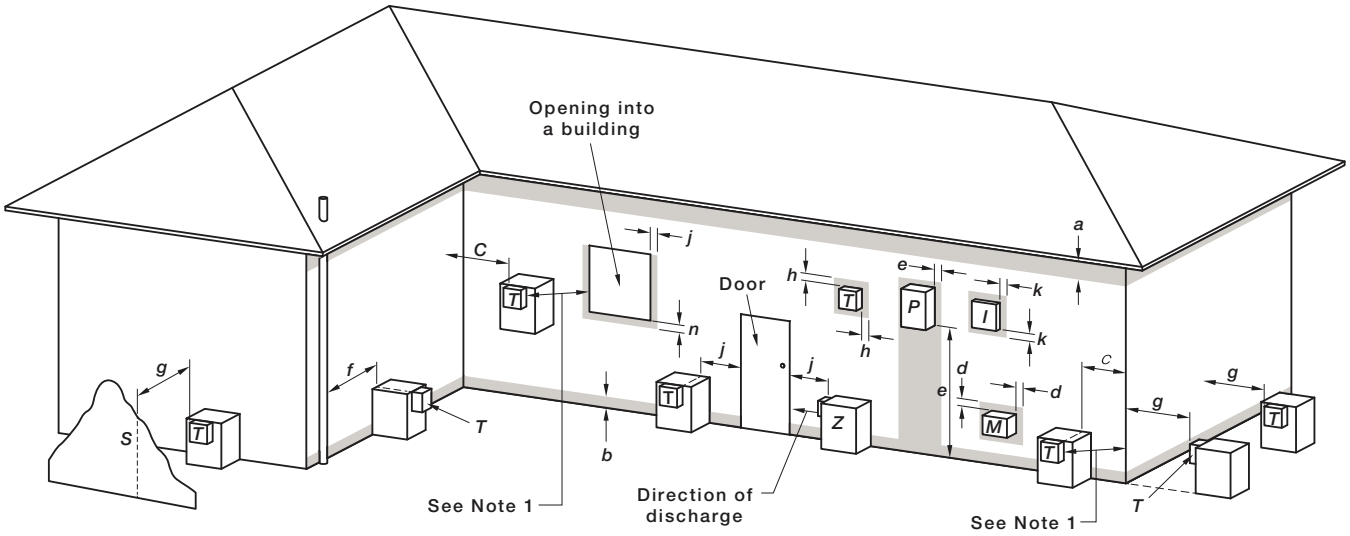
The drain line from any tundish shall be not less than DN 20 or less than one size larger than that of the largest drain line discharging into the tundish. Tundish drain lines shall comply with the requirements of the "Installation Method" on page 11.

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.

FLUE TERMINAL CLEARANCES

Horizontal Terminal Clearances (Extract from AS/NZS 5601)



Ref.	Item	Min. Clearances (mm) Fan assisted
a	Below eaves, balconies and other projections:	
	For *appliances* up to 50 MJ/h input	200
	For *appliances* over 50 MJ/h input	300
b	From the ground, above a balcony or other surface *	300
c	Front a return wall or external corner *	300
d	From a *gas meter* (M) (see Note 5) (see Clause 5.11.5.9 for vent terminal location of regulator) (see Table 6.7 for New Zealand requirements)	1000
e	From an electricity *meter* or fuse box (P) † (see Note 5)	500
f	From a drain pipe or soil pipe	75
g	Horizontally from any building structure* = or obstruction facing a terminal	500
h	From any other *flue terminal* , cowl, or combustion air intake *	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 *	300
	Appliances over 150 MJ/h input up to 200 MJ/h input *	300
	Appliances over 200 MJ/h input up to 250 MJ/h input *	500
	Appliances over 250 MJ/h input *	1500
	All fan-assisted *flue appliances*, in the direction of discharge	1500
k	From a mechanical air inlet, including a spa blower	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
	Other *appliances* up to 50 MJ/hr input	500
	Appliances over 50 MJ/h input and up to 150 MJ/h input	1000
	Appliances over 150 MJ/h input	1500

* Unless *appliance* is *certified* for closer installation.

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

NOTES:

1 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.

2 See Clause 6.9.4 for restrictions on a *flue terminal* under a covered area.

3 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.

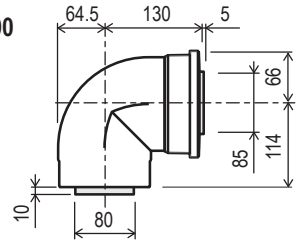
4 For *minimum clearances* not addressed above acceptance should be obtained from the *Technical Regulator*.

5 Minimum clearances *d* and *e* also apply to any combustion air intake openings of appliances.

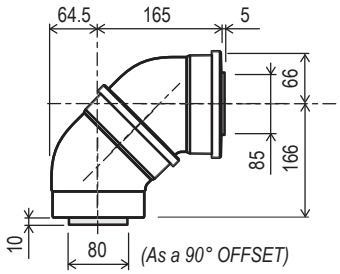
FIGURE 6.2 (in-part) LOCATION OF FLUE TERMINALS OF BALANCED FLUE, ROOM-SEALED, FAN-ASSISTED OR OUTDOOR APPLIANCES

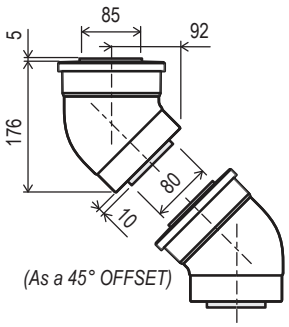
FLUE COMPONENT DIMENSIONS

FFSSBEND90
Includes:
90° Bend

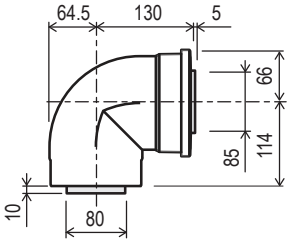


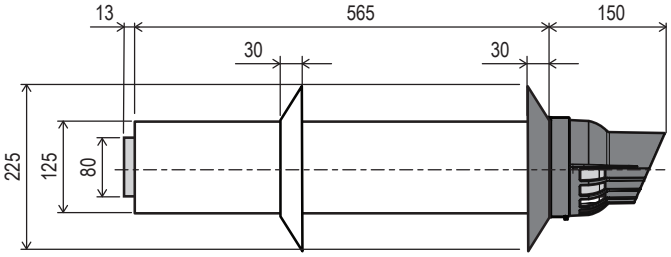
FFSSBEND45
Includes:
45° Bend (x2)



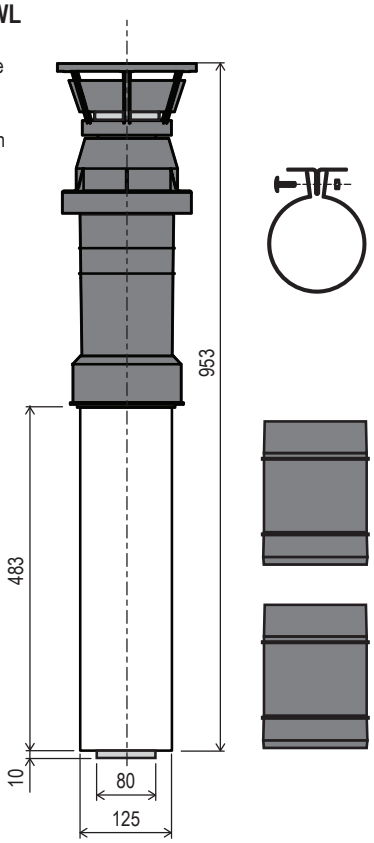


FFSSKIT
Includes:
Starter Bend (FFSSBEND90)
Horizontal Terminal Pipe
Internal Wall Seal (White)
External Wall Seal (Black)
Installation Instruction

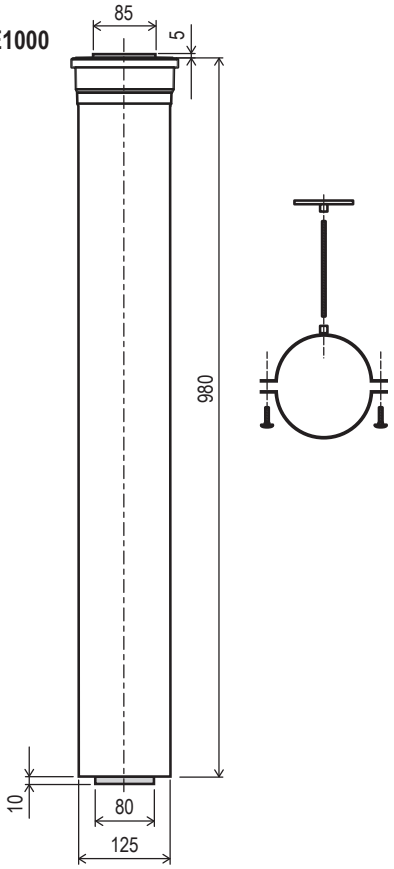




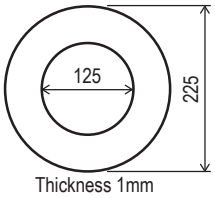
FFSSROOFCOWL
Includes:
Vertical Terminal Pipe
UV Protector (x2)
Wall bracket
Installation Instruction



FFSSPIPE1000
Includes:
Flue Pipe
Wall bracket



FFWSEAL
Includes:
Ceiling Ring



DESCRIPTION	CODE NUMBER	BAR CODE NUMBER
90 Degree Bend	FFSSBEND90	940100401006
45 Degree Bend	FFSSBEND45	940100401007
Horizontal Flue Terminal	FFSSKIT	940100401003
Flue Pipe 1000mm length	FFSSPIPE1000	940100401005
Vertical Flue Terminal	FFSSROOFCOWL	940100401004
Ceiling Ring	FFWSEAL	9314109107722

NOTES

NOTES

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National Help Line
Tel: 1300 555 545* Fax: 1300 555 655
Monday to Friday, 8.00 am to 5.00 pm EST.

After Hours Hot Water Service Line
Tel: 1800 000 340*

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

For further information visit **www.rinnai.com.au**
or email **enquiry@rinnai.com.au**

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 National Help Line. Rinnai recommends that this appliance be serviced every 3 years.

With our policy of continuous improvement, we reserve the right to change, or discontinue at any time, specifications or designs without notice.