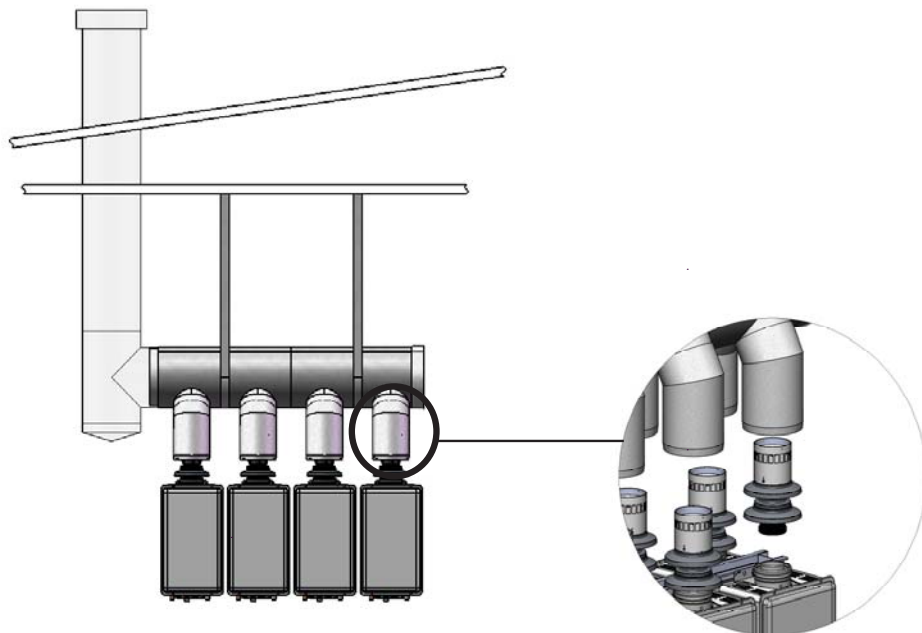


Rinnai

Commercial Common Flue System Operating & Installation Manual

The Rinnai Commercial Flue System is certified and suitable only for use with Rinnai Internal commercial continuous flow water heater models that contain the letters 'FFU' in the model code and have model name 'HD200i'.



WARNINGS

- The Rinnai commercial common flue system is designed for use in commercial or industrial plant room type installations. Not suitable for single water heater installations in domestic premises.
- Rinnai commercial common flue system components must not be used to replace flue systems associated with 'instantaneous' or other types of open flued water heaters in domestic installations.

This manual must be read and understood before installation, commissioning and operation of water heaters and flue systems are attempted. The information contained in other Operating / Installation instructions supplied with water heaters applies in full, unless otherwise dictated in this manual.

Installations must comply with:

- Manufacturer's Installation Instructions
- Current AS 5601 'Gas Installations'
- Local Regulations and Municipal Building Codes

Installation, commissioning and servicing must be performed by authorised persons



Quality
Endorsed
Company

ISO 9001 Lic 4983
SAI Global

Head Office Certified

Distributed and serviced in Australia under a Quality System certified as complying with ISO 9001 by SAI Global



The Australian
Gas Association
All Rinnai gas products
are A.G.A. certified.

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PART 1 - FOR YOUR SAFETY

The information contained in other Operating / Installation instructions supplied with Rinnai Continuous Flow water heaters, applies in full, unless otherwise dictated in this manual. These other manuals contain important information relating to:

- General Safety
- Warnings about hot water
- Inspection and maintenance

The Rinnai commercial flue system is certified and suitable only for use with Rinnai Internal Commercial continuous flow water heater models that contain the letters 'FFU' in the model code and have model name 'FFU' / 'HD200i'. The model code is found on the dataplate on the side panel of the water heater. Not certified or suitable for use with any other appliances.

Installations using Rinnai commercial flue systems components must comply with:

- Manufacturer's Installation Instructions
- Current AS 5601 'Gas Installations'
- Local regulations and municipal building codes
- Installation, commissioning and servicing must be performed by authorised persons.
- Improper installation, adjustment, alteration, service or maintenance can cause injury and/or property damage.



- **This manual must be read and understood in full before installation and commissioning of water heaters and flue system are attempted. The information contained in other Operating / Installation instructions supplied with Rinnai Continuous Flow water heaters applies in full, unless otherwise dictated in this manual.**

This manual is not to be regarded as a set of design specifications or instructions for persons unfamiliar with the installation, commissioning and servicing of gas appliances in commercial and industrial installations.



If you smell gas:

- **DO NOT operate or try to light any gas appliances**
- **DO NOT touch any electrical switches**
- **DO NOT light matches, cigarette lighters or smoke cigarettes**
- **TURN OFF the gas supply at the gas meter**
- **Immediately call your gas supplier or a licensed gas fitter (Use a neighbour's telephone).**

The Rinnai commercial common flue system is designed for use in commercial or industrial *plant room* type installations. Not suitable for single water heater installations in domestic premises.

Rinnai commercial common flue system components must not be used to replace flue systems associated with 'instantaneous' or other types of *open flued* water heaters in domestic installations.

It must be ensured that any permanent ventilation openings to the *plant room* remain unobstructed.

The flue system must be designed, installed and tested to ensure that *flue gases* are exhausted to the outside atmosphere and that there is no spillage of *combustion products* into the *plant room*. Spillage of *combustion products* into the *plant room* may be hazardous and may cause asphyxiation.

CERTIFICATION

Rinnai Commercial Common Flue system components are certified by the Australian Gas Association (AGA) as components of Rinnai Internal Commercial Continuous Flow water heater models that contain the letters 'FFU' in the model code and have model name HD200i. The AGA Approval Certificate Number is located on the side panel of the water heater.

PART 2 - GENERAL INFORMATION

In this manual, words in *italics* are defined in the 'Definitions' chapter for additional clarity.

These instructions apply only to Rinnai Commercial Common Flueing components. They do not apply to the Rinnai INFINITY flueing system or Rinnai 'Co-Axial' flue systems.

Before commencing installation, ensure you are familiar with the content of the Operating / Installation manuals supplied with the Rinnai continuous flow water heaters. All information in these manuals applies except for any references made to:

1. Rinnai INFINITY flueing system
2. Flueing for Internal Models
3. Co-Axial flue system
4. External Models and External Water Heaters

DEFINITIONS



- The definitions in this chapter are reprinted from AS 5601:2004 'Gas Installations' with the kind permission of Standards Australia. AS 5601:2004 was current at the time of printing these instructions but may have been superseded by a later version of this Standard. It is the installers responsibility that the requirements of the current AS 5601 are met.

| | | | |
|-----------------|--|-----------------|---|
| 1.4.88 | Plant Room A Plant Room is a room designed to accommodate one or more appliances in which the appliances can be fully maintained and is not normally occupied or frequented for extended periods. | 1.4.35 | Draught diverter A device without moving parts, fitted in the flue of an appliance for isolating the combustion system from the effects of pressure changes in the flue. |
| 1.4.3.9 | Room-sealed / Room-sealed appliance An appliance designed such that air for combustion does not enter from, or combustion products enter into, the room in which the appliance is located. | 1.4.20 | Combustion products Constituents resulting from the combustion of a fuel with air, oxygen or mixture of the two, including the inert gases associated with the fuel and the air but excluding any other diluent or contaminant. |
| 1.4.7 | Atmospheric burner A system where all of the air for combustion is introduced by the inspirating effect of the gas or the natural draught in the combustion chamber or a combination of the two without mechanical assistance. | 1.4.49 | Flue gases Combustion products, plus all diluents and contaminants. These include, where applicable, excess air, dilution air, process air and waste products from the process. |
| 1.4.14.2 | Forced draught burner A system where all of the air, oxygen or a mixture of the two used for combustion is provided under pressure. | 1.4.46.3 | Open Flue A flue system containing a draught diverter or canopy. |
| 1.4.46.1 | Common Flue A flue conveying the flue gases from two or more appliances. | 1.4.46.4 | Power Flue A flue from which the flue gases are removed by a fan or other exhausting device installed in the flue. |
| 1.4.46.2 | Natural draft Flue A flue in which the draught is provided by the buoyancy effect of the hot gases in it. | | |

PART 3 - APPLICATIONS

Rinnai Internal Commercial applications for continuous flow water heaters can be fitted with two types of flue systems as follows:

RINNAI CO-AXIAL FLUE SYSTEM

Use of the Co-Axial flue system with a Rinnai internal continuous flow water heater results in a room sealed and power flued appliance as defined in AS 5601. The Co-Axial flue system is intended for domestic installations involving a single appliance or commercial and industrial installations involving multiple appliances, each fitted with individual Co-Axial flue systems and terminals.



- **This manual does not apply to Rinnai Co-Axial flue systems. The Operation / Installation Manual supplied with the Rinnai continuous flow water heater and the Co-Axial flue installation manual supplied with Co-Axial flue terminals contains technical information and installation instructions for this type of flue system.**

RINNAI COMMERCIAL COMMON FLUE SYSTEM

This manual applies only to Rinnai commercial common flue system components.

Use of the Rinnai Commercial Common Flue System with one or more Rinnai internal continuous flow water heaters results in open flue appliances and *natural draft flue* systems and are designed for *plant room* installations as defined in AS 5601.

Many applications for multiple Rinnai 'FFU' / HD200i type water heaters and Rinnai commercial flue system components are for the replacement of existing gas water heaters or boilers with *atmospheric burners* already installed in *plant rooms* which are already *common flued* as defined in AS 5601. Generally, most of the existing flue system infrastructure and provisions for appliance ventilation can remain when existing water heaters or boilers are replaced by Rinnai 'FFU' / HD200i type water heaters, provided the requirements of this manual and AS 5601 are met.

PART 4 - PRINCIPLE OF OPERATION

The *combustion products* are expelled from the Rinnai 'FFU' / HD200i water heater at '*forced draught*' and higher than atmospheric pressure through the inner Co-Axial flue pipe at the top of the Rinnai 'FFU' / HD200i water heater as a result of the combustion system design which includes an integral combustion fan.

The Common Flue Starter Kit (DDSKIT) contains the Common Flue Insert Terminal (Parts DDINSTERM) and adjustable sleeve/bend (DDADJSLV). DDSKIT connects to the inner Co-Axial flue pipe at the top of the Rinnai 'FFU' / HD200i water heater.

The design of DDSKIT is such that flow of *combustion products* from the water heater through it results in the continuous induction of air from the *plant room* which mixes with the *combustion products*. The resulting *flue gases* at the exit of DDSKIT are at negative pressure (below atmospheric). Part DDINSTERM also contains an integral *draught diverter* and combustion air diverter. The function of the combustion air diverter is to ensure the supply of air to the water heater for the purposes of combustion is not affected by operation of the flue system.

Refer to Figures 1 and 2 as shown:

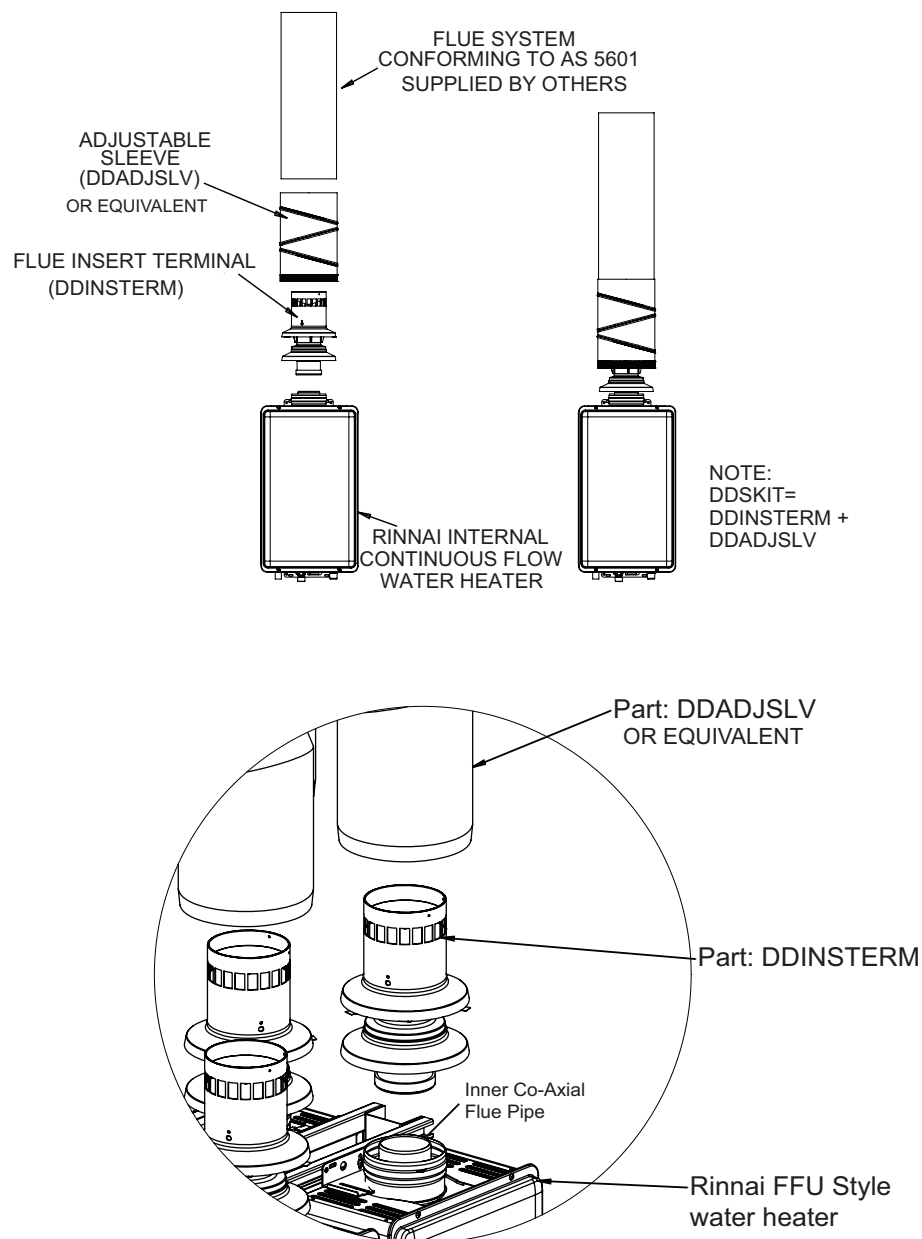


Figure 1 - Rinnai Commercial Common Flue System - Components

PART 4 - PRINCIPLE OF OPERATION

The combination of the Rinnai 'FFU' / HD200i continuous flow water heater and DDSKIT results in an *appliance with a natural draft flue and open flue and draft diverter with flue gases discharge characteristics the same as an appliance with an atmospheric burner and similar gas rate.*

As a result a Rinnai 'FFU' / HD200i water heater fitted with Rinnai Parts: DDINSTERM and DDADJSLV can be connected to any flue system designed for use with *atmospheric burner* in accordance with AS 5601, provided that the resulting installation complies with all relevant requirements of AS 5601.



NOTE

- Part DDADJSLV (common flue adjustable sleeve/bend) can be substituted with any non Rinnai component provided it is equivalent in terms of materials and dimensions.



IMPORTANT

- Rinnai Part DDINSTERM cannot be substituted with any other Rinnai or non Rinnai component. Rinnai Part DDINSTERM must always be used for Rinnai FFU water heaters installed with commercial common flue systems.

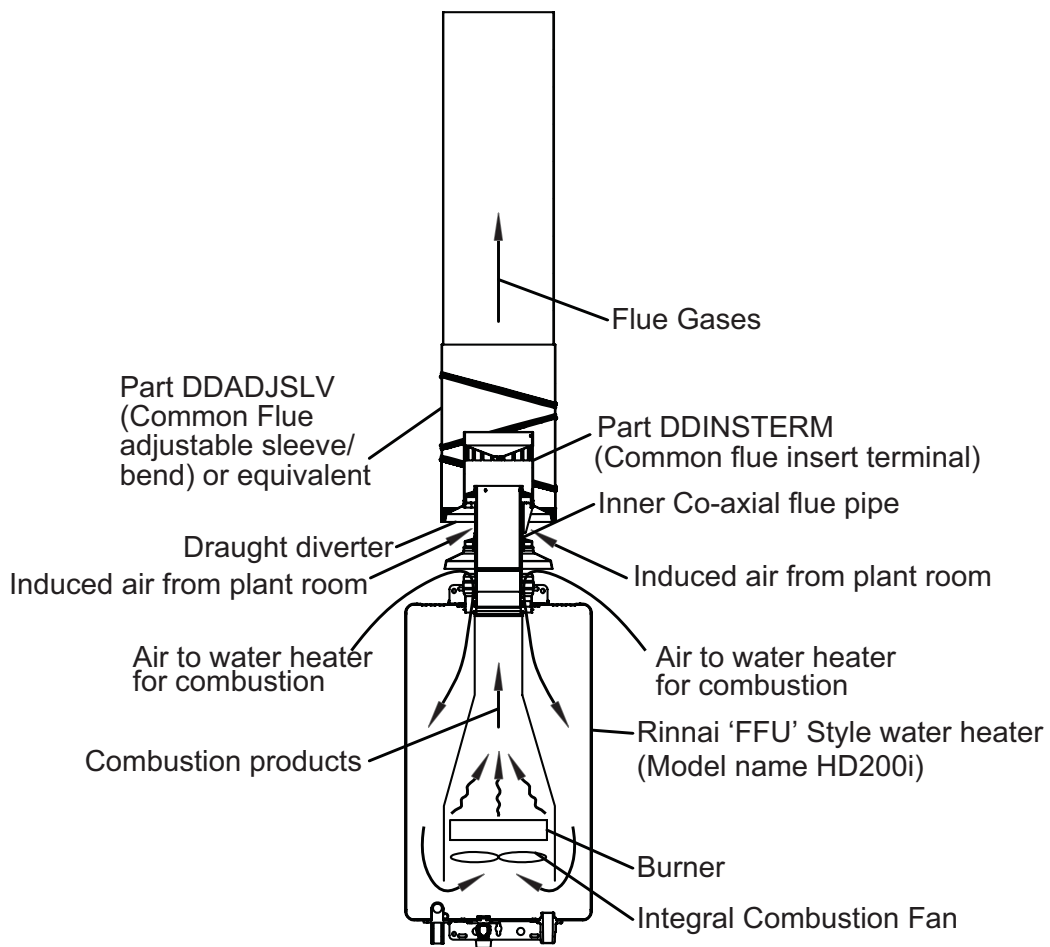


Figure 2 - Principle of Operation

PART 5 - INSTALLATION OPTIONS

The Rinnai Commercial Common Flue System is suitable for use with all flue design options outlined in the AS 5601 Appendix titled 'Flue Design'. The figures below show the more common application principles:

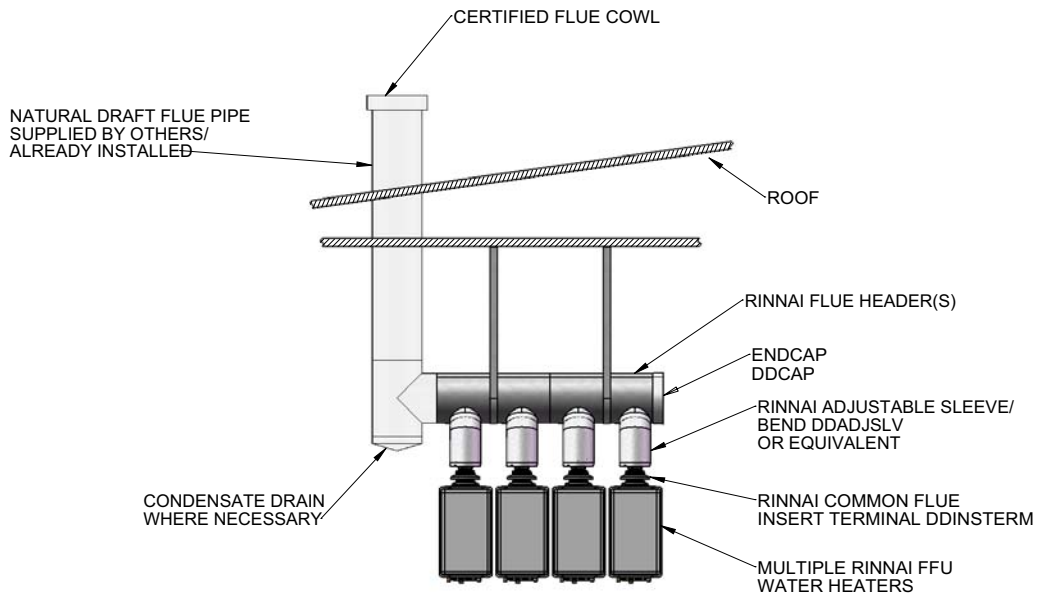


Figure 3 - 'Typical' Natural Draft Installation

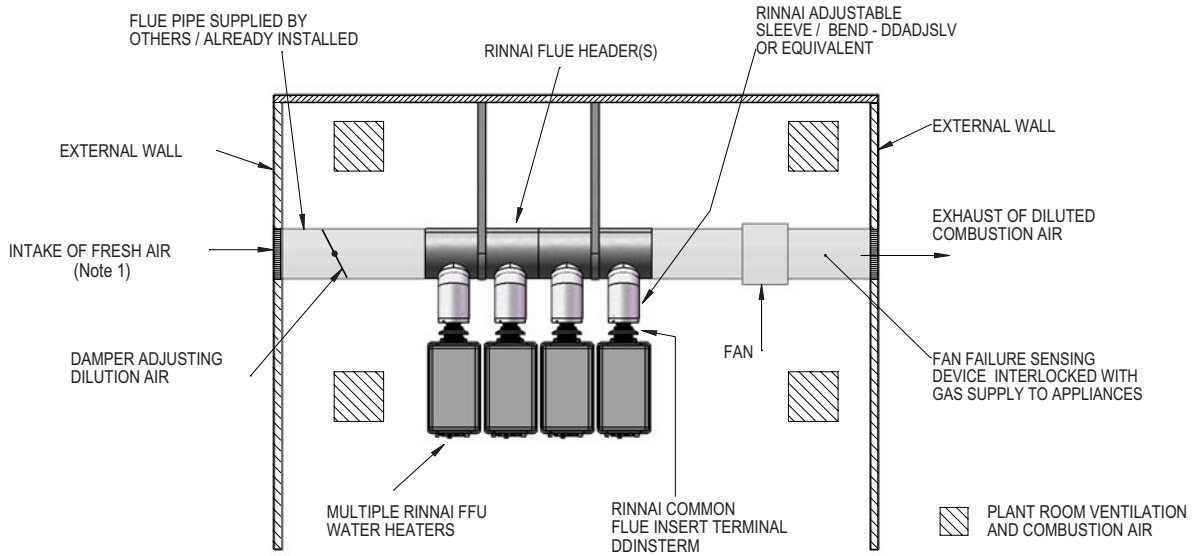


Figure 4 - 'Typical' Power Flue Installation



- **Note 1: Intake of fresh dilution air from outside the *plant room* is optional. The intake of fresh air into the flue pipe can be drawn directly from the *plant room*. *Plant room* ventilation must take into consideration combustion and dilution air requirements.**

PART 5 - INSTALLATION OPTIONS

COMPONENTS

| PRODUCT NAME | ORDER CODE | PRODUCT NAME | ORDER CODE |
|---|------------|--|------------|
| Common Flue Insert Terminals (placed on the HD200i 'FFU' water heater for natural draft flueing). (Note 2). | DDINSTERM | 350 mm flue header to suit DD/MP2, without starter kit | DD2FH350 |
| Common flue 300 mm x 200 mm dia adjustable sleeve / bend | DDADJSLV | 350 mm flue header to suit DD/MP1, without starter kit | DD1FH350 |
| Common flue starter kit (DDINSTERM and DDADJSLV) | DDSKIT | End cap to suit 350 mm flue header | DDCAP350 |
| Common flue 200 mm dia offset kit (2 x DDADJSLV + 900 mm flexi flue) | DDOSK | 400 mm flue header to suit DD/MP2, without starter kit | DD2FH400 |
| 200 mm flue header to suit DD/MP2, without starter kit | DD2FH200 | 400 mm flue header to suit DD/MP1, without starter kit | DD1FH400 |
| 200 mm flue header to suit DD/MP1, without starter kit | DD1FH200 | End cap to suit 400 mm flue header | DDCAP400 |
| End cap to suit 200 mm flue header | DDCAP200 | 450 mm flue header to suit DD/MP2, without starter kit | DD2FH450 |
| 250 mm flue header to suit DD/MP2, without starter kit | DD2FH250 | 450 mm flue header to suit DD/MP1, without starter kit | DD1FH450 |
| 250 mm flue header to suit DD/MP1, without starter kit | DD1FH250 | End cap to suit 450 mm flue header | DDCAP450 |
| End cap to suit 250 mm flue header | DDCAP250 | 500 mm flue header to suit DD/MP2, without starter kit | DD2FH500 |
| 300 mm flue header to suit DD/MP2, without starter kit | DD2FH300 | 500 mm flue header to suit DD/MP1, without starter kit | DD1FH500 |
| 300 mm flue header to suit DD/MP1, without starter kit | DD1FH300 | End cap to suit 500 mm flue header | DDCAP500 |
| End cap to suit 300 mm flue header | DDCAP300 | | |

Flue headers are supplied in modules of 1 and 2 Rinnai 'FFU' / HD200i water heaters. All headers have 375 mm centres between individual appliance flue spigot connections.

Flue headers are available in 'single row' or 'back to back' configurations and available in 200, 250, 300, 350, 400, 450 and 500 mm diameters and ordered separately. Larger diameter flue headers available on request.

Rinnai commercial common flue system components are designed for compatibility with flue components from other manufacturers. Additional components not supplied by Rinnai that are required to complete the flue installation are available from other flue component manufacturers.

Components are joined by self tapping, galvanised or stainless steel screws.

Note 2:

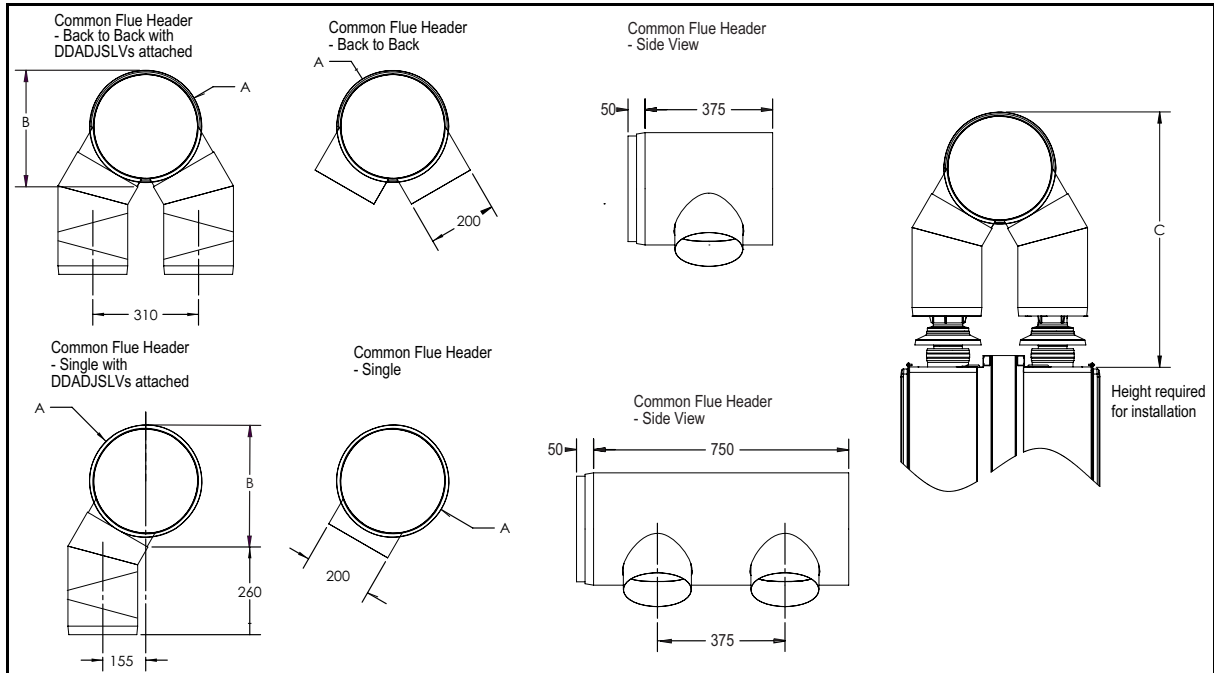


- Rinnai part DDINSTERM cannot be substituted with any other Rinnai or non Rinnai component. Rinnai part DDINSTERM must always be used for Rinnai FFU water heaters installed with commercial common flue systems.



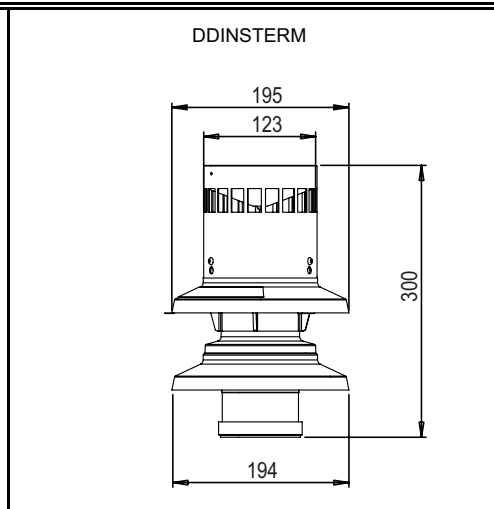
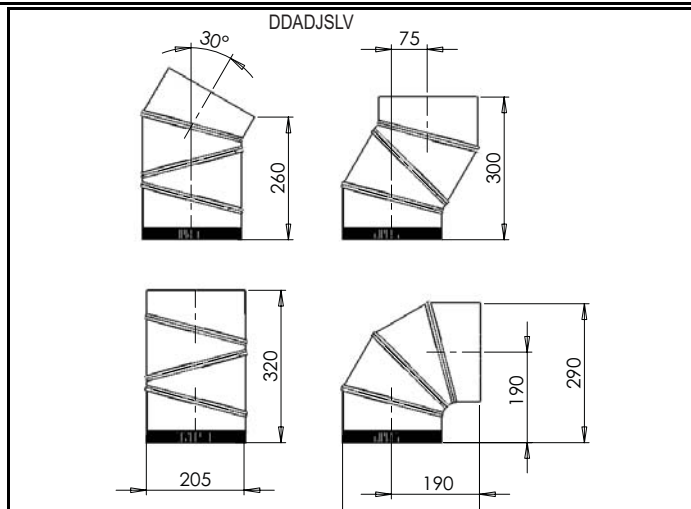
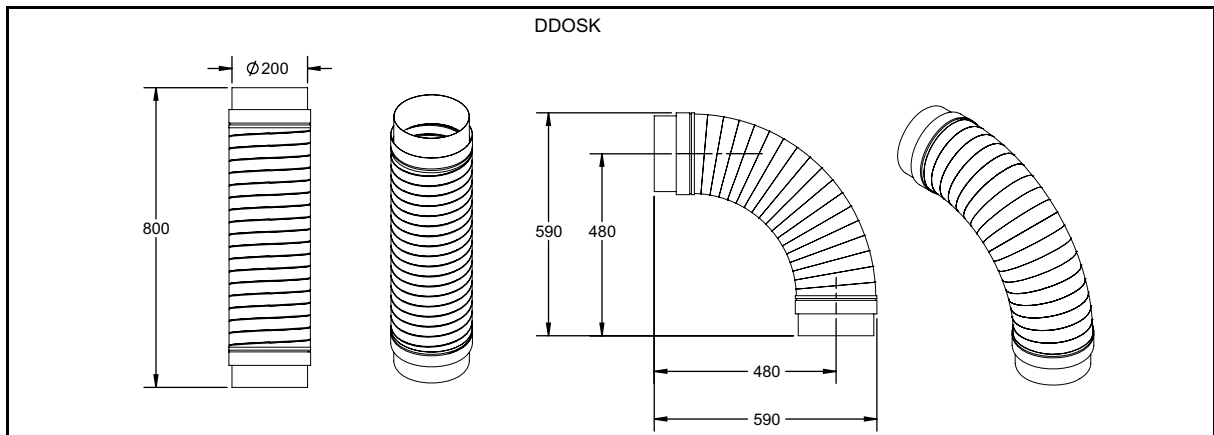
- Flue components cannot be cut to length.

PART 6 - INSTALLATION & COMMISSIONING INSTRUCTIONS



(all dimensions are in mm)

| Flue Header Inner Diameter | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
|----------------------------|-----|-----|-----|-----|-----|-----|-----|
| A | 220 | 275 | 325 | 375 | 425 | 475 | 525 |
| B | 230 | 285 | 340 | 390 | 445 | 500 | 555 |
| C | 640 | 695 | 750 | 800 | 855 | 910 | 965 |



PART 6 - INSTALLATION & COMMISSIONING INSTRUCTIONS

IMPORTANT INSTALLATION CONSIDERATIONS

Ensure you have read 'Part 1' of this manual for your safety.

AS 5601 contains important and specific requirements relating to air supply to appliances and flue system design. Below is a summary of these requirements which are a guide only. It is the installers responsibility to ensure the requirements of AS 5601 are met in full.

AIR SUPPLY / VENTILATION

The *plant room* in which the Rinnai 'FFU' / HD200i water heaters, associated commercial flue system and any other fuel burning appliances are installed requires ventilation.



- **Air supply to the *plant room* must not be affected by any mechanical ventilation located in other parts of the building not associated with the gas appliance installation in the *plant room*. Such mechanical ventilation may create a negative pressure in the *plant room* which is hazardous and may cause asphyxiation, explosion or fire. AS 5601 allows for the air supply to appliances installed in the *plant room* to be direct from outside, via an adjacent room or via mechanical ventilation.**

VENTILATION DIRECT FROM OUTSIDE (See Figure 5)

If ventilation is provided direct from outside, two permanent openings shall be provided direct to outside. Openings shall be located to ensure the distance between the top of the upper opening and the ceiling of the *plant room*, and the distance between the bottom of the lower opening and the floor of the *plant room* does not exceed 5% of the height of the *plant room*. It is preferred that more than one wall be used to provide ventilation. Alternatively, the two openings may be combined provided that the top and bottom of the opening reaches the limits set by this clause. The minimum vertical dimension of any free ventilation opening shall be 6 mm. Minimum free ventilation areas provided by the opening(s) shall be calculated using the following formulas:

Two openings direct to outside

$A = N \times 300 \text{ cm}^2$ where A is the free ventilation area per opening and N is the number of Rinnai HD200i appliances

One opening direct to outside

$A = N \times 600 \text{ cm}^2$ where A is the free ventilation area for the one opening and N is the number of Rinnai HD200i appliances

Note: The above formulas assume no appliances other than Rinnai HD200i water heaters are installed in the *plant room*.

The minimum vertical dimension of any free ventilation opening shall be 6 mm.

VENTILATION OF *PLANT ROOM* VIA AN ADJACENT ROOM

If ventilation of the plantroom is provided via an adjacent room, this room shall be a non habitable room. The adjacent room shall be ventilated direct to outside in accordance with the requirements in the previous clause. Two permanent openings shall be provided in the *plant room* to the adjacent room. Openings shall be located to ensure the distance between the top of the upper opening and the ceiling of the plant room, and the distance between the bottom of the lower opening and the floor of the *plant room* does not exceed 5% of the height of the *plant room*. It is preferred that more than one wall be used to provide the ventilation. Alternatively, the two openings may be combined provided that the top and bottom of the opening reaches the limits set by this clause. The minimum vertical dimension of any free ventilation opening shall be 6 mm. Minimum free ventilation areas provided by the opening(s) in the *plant room* shall be calculated using the following formulas:

Two openings to an adjacent room

$A = N \times 600 \text{ cm}^2$ where A is the free ventilation area per opening and N is the number of Rinnai HD200i appliances

One opening to an adjacent room

$A = N \times 1200 \text{ cm}^2$ where A is the free ventilation area for the one opening and N is the number of Rinnai HD200i appliances

Note: The above formula assume no appliances other than Rinnai HD200i water heaters are installed in the *plant room*

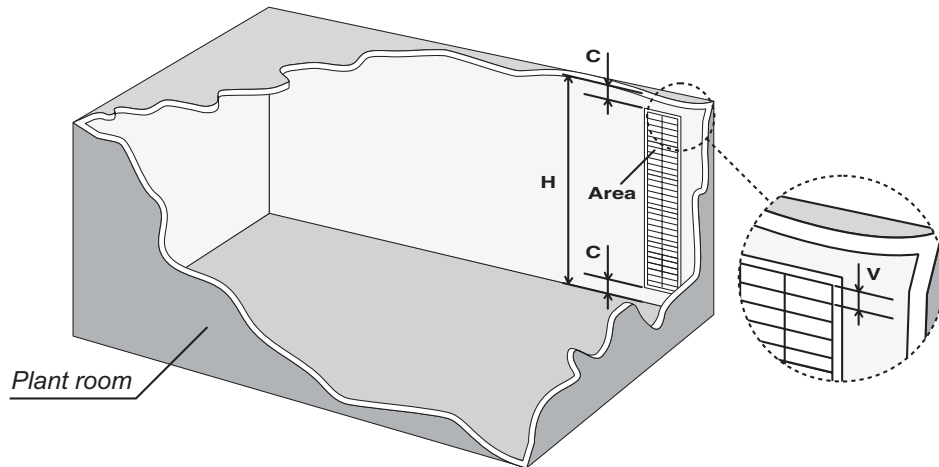
The minimum vertical dimension of any free ventilation opening shall be 6 mm.

PART 6 - INSTALLATION & COMMISSIONING INSTRUCTIONS

MECHANICAL VENTILATION

Where the combustion air supply to the appliances in the *plant room* is to be provided by mechanical means this shall be directly from outside and the system shall comply with the requirements of AS 5601.

Option 1. A Single Permanent Opening Direct To Outside



H = Height of *Plant room*

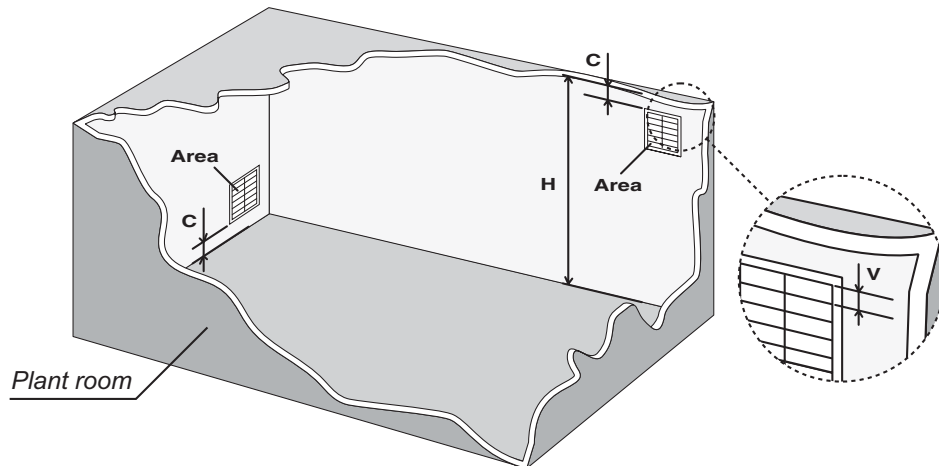
C = Distance from floor to ceiling - **NOT** to exceed 5% of H (it can be less)

V = Minimum vertical dimension of any free ventilation opening shall be 6 mm

Area (The Minimum free ventilation area) = $N \times 600 \text{ cm}^2$ direct to outside, of the single permanent ventilation opening, where

N = Number of Rinnai 'FFU' / HD200i Continuous Flow water heaters

Option 2. Two Permanent Openings Direct To Outside



H = Height of *Plant room*

C = Distance from floor to ceiling - **NOT** to exceed 5% of H (it can be less)

V = Minimum vertical dimension of any free ventilation opening shall be 6 mm

Area (The Minimum free ventilation area) = $N \times 300 \text{ cm}^2$ direct to outside, permanent for each ventilation openings, where

N = Number of Rinnai 'FFU' / HD200i Continuous Flow water heaters

Figure 5 - Ventilation Direct To Outside - *Plant Room*

PART 6 - INSTALLATION & COMMISSIONING INSTRUCTIONS

IMPORTANT INFORMATION - FLUE SYSTEM

- The flue system must be designed, installed and tested to ensure that *flue gases* are exhausted to the outside atmosphere and that there is no spillage of *combustion products* into the *plant room*. Spillage of combustion product into the *plant room* may be hazardous and may cause asphyxiation. To confirm correct operation, the Flue System must be checked in accordance with the commissioning instructions in this manual.
- The flue system shall be supported independent of the appliance flue connection.
- The flue system shall be securely fixed and adequately supported by bracket(s) fastened to the building structure at suitable points to ensure the stability of the flue system.
- The flue system must vent to the outside and use only appropriately certified fittings.
- The design strength or fire resistance of a building shall not be reduced by the installation of a flue.
- The flue system must be designed and installed in accordance with the requirements of AS 5601.
- The installation and commissioning steps below must be followed in their numerical order.

INSTALLATION AND COMMISSIONING

1. Before commencing installation, ensure you are familiar with the content of all other Operation / Installation manuals supplied with the water heaters. All information in these manuals applies except for any references made to:
 - Rinnai INFINITY flueing system
 - Flueing for Internal Models
 - Co-Axial flue system
 - External Models and External Water Heaters
2. Locate and install the water heaters in accordance with the Operation / Installation manuals supplied with the water heaters.
3. Design, locate, install and connect the flue system in accordance with these instructions and the requirements of AS 5601.
4. If the water heaters have been located and installed in accordance with the 'Operation / Installation Manual for continuous flow water heaters', carry out commissioning in accordance with that manual.
5. If the water heaters have been located and installed in accordance with the 'Rinnai Demand Duo Installation Manual' carry out the 'filling instructions' and 'starting instructions' in accordance with that manual.
6. **IMPORTANT:** It must now be confirmed that all *flue gases* are exhausted to the outside atmosphere and that there is no continual spillage of *combustion products* into the room under the normal operating conditions of the water heaters. To achieve this, perform the following procedure:
 - a) Turn 'ON' the 240V power supply to the water heaters and any associated pumps and thermostat controls.
 - b) Open all available hot water taps fully (**CAUTION: Ensure building occupants do not have access to hot water outlets during this procedure. Hot water is a scalding hazard.**)



- The combination of steps a) and b) above is intended to result in the water heaters firing on full gas rate continuously.

PART 6 - INSTALLATION & COMMISSIONING INSTRUCTIONS

c) After 10 minutes of operation, place a smoke match or suitable smoke generating device under the *draught diverter* of the common flue insert terminal as shown in Figure 6. The smoke should get drawn into the common flue insert terminal at this point confirming there is no spillage of *combustion products* into the room from the flue system.

If the smoke is blown away from the common flue insert terminal at this point after 10 minutes of operation there is continual spillage of *combustion products* into the *plant room*. The cause must be found and rectified.

Perform this procedure for all 'FFU' water heaters and common flue insert terminals installed.

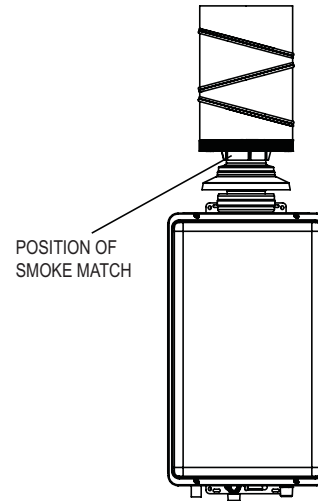


Figure 6 - Position of smoke match



- **Continual spillage of combustion product into the *plant room* is hazardous and may cause asphyxiation. The cause(s) of continual spillage must be found and rectified during the commissioning process.**

d) Close the hot water taps previously opened.

7. After commissioning is completed, explain to the customer the functions and operation of the water heaters and ensure he or she is supplied with all Operation / Installation manuals including this manual. Highlight the importance for the customer to familiarise themselves with the safety messages in this manual.

SERVICING

Rinnai has a service and spare part network with personnel who are fully trained and equipped to provide the best service on Rinnai appliances. If your appliance requires servicing, please call our National Help Line.

Rinnai recommend servicing of appliances installed in plant rooms at least once per year. Depending on operating conditions, servicing may be required more frequently. Service work must be performed by authorised persons.

Rinnai

Rinnai Australia Pty. Ltd. ABN 74 005 138 769

Head Office

10-11 Walker Street,
Braeside, Victoria 3195
P.O. Box 460
Tel: (03) 9271 6625
Fax: (03) 9271 6622

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

National Help Line

Spare Parts & Technical Info
Tel: 1300 555 545*
Fax: 1300 300 141*

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

Hot Water Service Line
Tel: 1800 000 340