

Common Flue

Specification Guide



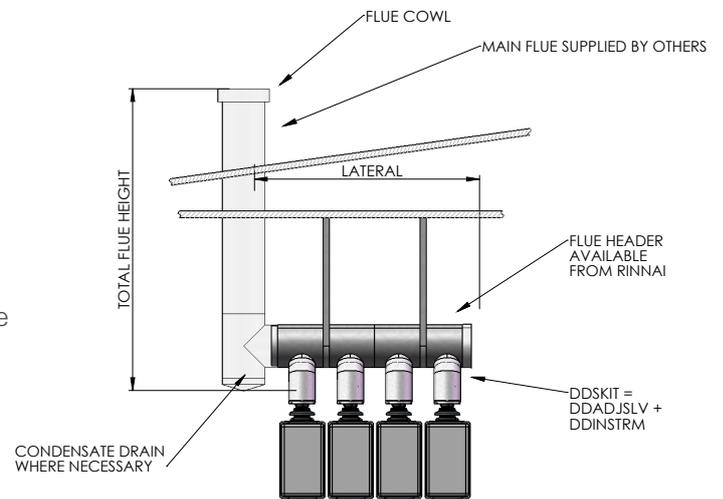
Rinnai

Common Flue System

Upgrading an old internal hot water system or installing a new internal gas continuous flow system in apartments, office blocks, hotels or other buildings has many benefits. Plant rooms are often cluttered and small with space being a premium creating difficulty and occasionally preventing the installation of an internal system due to the need to manage flue gases. Historically a Rinnai proprietary co-axial flue installed per water heater has been the only way to do this. This is not the case anymore with Rinnai common flue systems. One common header can be used to manage the flue gases and one penetration of the roof or wall is only required. This reduces cost and installation time while maintaining the aesthetics of the building.

Rinnai Common Flue System

The Rinnai Common Flue System has been designed with flexibility in mind for both new and existing installations. Rinnai HD200i units can now be flued in a single, common, natural draft flue. Natural draft flues rely on the principle that hot air from the products of combustion are less dense, and so lighter, than the surrounding air. This heated air will rise up through the flue and discharge at an approved gas flue cowl. To accommodate this change, the air for combustion must now be drawn from within the room and adequate ventilation must be provided in accordance with AS5601. This only applies to common flue installations.



Installation Flexibility

This concept is not only suitable for new buildings, but also in existing buildings where there is a previously installed correctly sized flue that is in sound condition and meets the sizing criteria detailed later. To simplify the changeover and minimise costs, Rinnai have introduced a number of standard components manufactured in either Stainless steel or galvanised mild steel.

Insert Terminal

Using a patented design one is required for each HD200i to convert the water heater from fan assisted forced draft to natural draft.

Adjustable 200mm Sleeve

Each Insert Terminal must be inserted into a $\varnothing 200\text{mm} \times 300\text{mm}$ (minimum length) starter. The Adjustable Sleeve achieves this and allows for adjustments including offset and angles up to 90° .

Flue Starter Kit

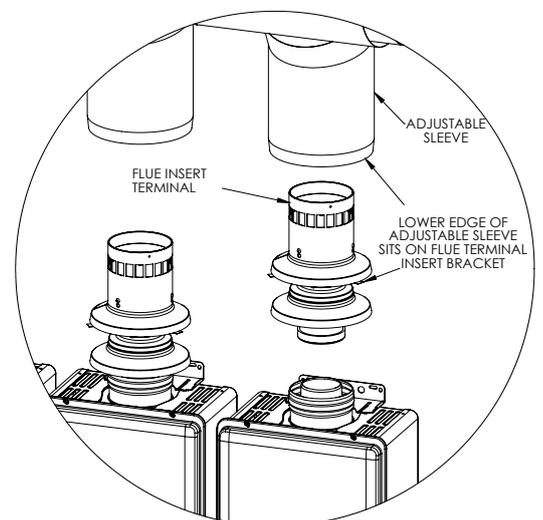
Contains one of each of the above for simplicity.

Common Flue Headers

These are supplied in easy joinable modules of 1 and 2 branches to make up the required heater numbers, to match Demand Duo and Manifold Pack installations.

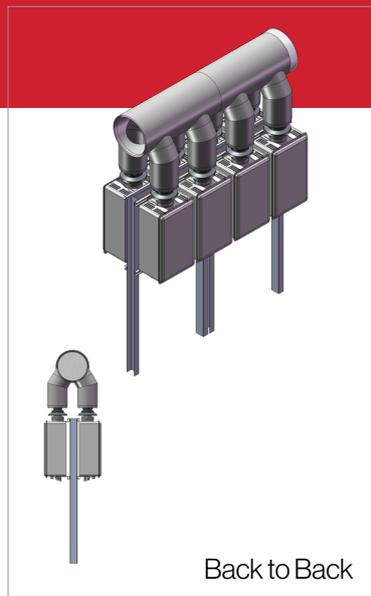
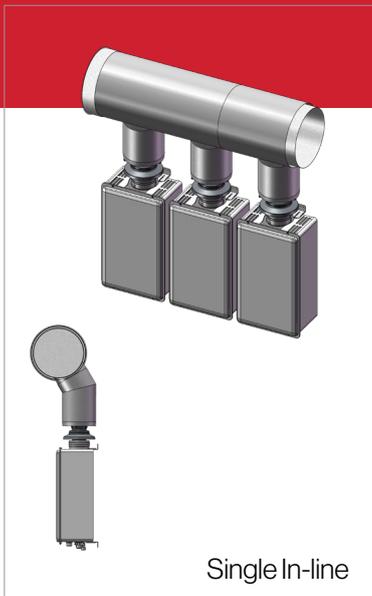
Eg. A Demand Duo 5 would require:

2 x 2 modules and 1 x 1 module = 5 Common Flue Headers



Design Flexibility

Often space is a consideration when designing a hot water system. Whether using a Demand Duo or Manifold Pack system, the Rinnai Common Flue System can be used in both single in-line applications usually mounted on a wall, or back to back configuration mounted on freestanding frames. The Common Flue Headers are sized accordingly and are available in 200, 250, 300, 350, 400, 450 & 500mm diameters (ordered separately). Additional flue components to complete the installation are not supplied by Rinnai as they are standard off-the-shelf items available through plumbing outlets.



Design Considerations

The entire installation must comply with AS5601 - Gas Installations. Some of the main points that need to be considered (not excluding others) include:

Ventilation

When using a Rinnai Common Flue System, the air for combustion for the gas water heaters is drawn from the plant room. The plant room must have sufficient allowance for make up air from outside (or through an adjacent room). Refer to AS5601.

Note: This does not apply when using a Rinnai coaxial flue system. This only applies when using a Rinnai Common Flue System

Heat Loss

All flueing must be designed and installed to ensure the maximum natural draft within the flue. Rinnai recommend that certified twin skin materials be utilised where ever possible, however other materials of low thermal conductivity are also suitable. AS5601 has separate tables for both low and high heat loss flues.

Flue Height

For a natural draft flue, the lateral shall not exceed 50% of the natural draft flue. In applications where this is not possible, a fan can be utilised in accordance with AS5601 - Power Flue Design.

Number of Bends

Flue tables in AS5601 allow for 2 x 90° changes in direction. If more than 2 x 90° bends are required, then there is a 10% reduction in flue capacity per bend. To compensate for this, increase the flue one size larger, however if there are many additional bends, this principle (i.e. 1 size up for 1 bend) does not apply. Refer to AS5601 for further information.

Sizing

There are many variables when it comes to the correct sizing of a Rinnai Common Flue System. The most critical is the total MJ input of all the gas water heaters and the total height of the flue. These variations are all covered in AS5601 along with other variables. The table below relates to 'typical installations'. It assumes a single lateral header at one level and a vertical riser with up to 2 offsets (bends). It also assumes a low heat loss installation and relates to the available Rinnai Common Flue Header sizes. The full table for flue sizing is listed in AS5601. Refer to the lateral (L) references which relate to Rinnai common flues.

When selecting a flue for a single HD200i or DD1, it is quite feasible that the flue diameter selected is smaller than 200mm. In these cases, then it is allowable to fit a reducer and use a smaller diameter flue after the first 300mm starter section.

Single HD200i:

Measure the total height of flue from bottom of the Adjustable Sleeve to the base of the flue cowl/terminal. Simply look up the MJ's capacity based on the height within the table.

Multiple HD200i's:

Assumes a Rinnai Common Flue and Header, and is measured the same as a single unit (above). Add the total MJ's of all the water heaters together.

Eg. Demand Duo 2 with a flue height of 3 metres. 2 x 195MJ = 390 MJ.

Flue Sizing Table (MJ/h)

Least Total Height	200mm	250mm	300mm	350mm	400mm	450mm	500mm
1.5m	206	327	480	665	876	1118	1403
1.8m	222	343	494	747	976	1234	1524
2.4m	243	385	549	837	1092	1382	1709
3m	264	417	599	913	1192	1509	1862
4.5m	306	485	692	1063	1387	1757	2173
6m	343	538	768	1188	1551	1962	2427
9m	396	622	890	1400	1830	2310	2859
12m	443	696	997	1574	2057	2606	3218
18m	485	760	1161	1846	2405	3049	3766
24m	515	807	1300	2057	2690	3408	4199
30m	528	823	1408	2258	2943	3724	4600

Need Assistance?

For applications outside the standard sizing of natural draft flues, often a solution can be engineered using fans. Rinnai offers a service whereby we can assist with the design of your Commercial Hot Water system. This includes advice on the full range of Rinnai Commercial products including Heavy Duty Continuous Flow, Manifold Packs, Demand Duo, Quick Recovery Electric, Solar Pre-heating, Warm Water and Common Flues. Please contact Rinnai Commercial on 1300 555 545.

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