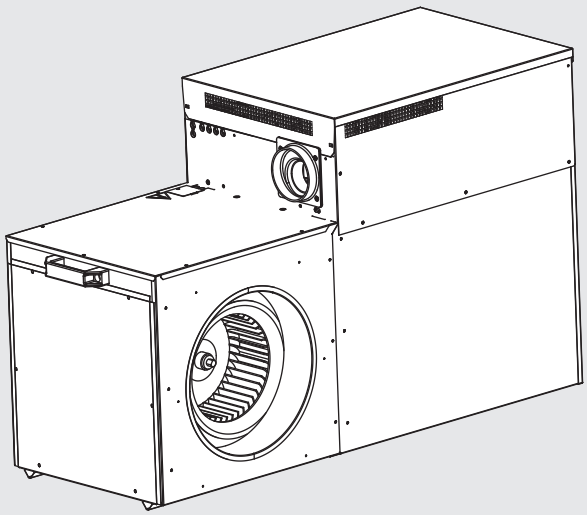
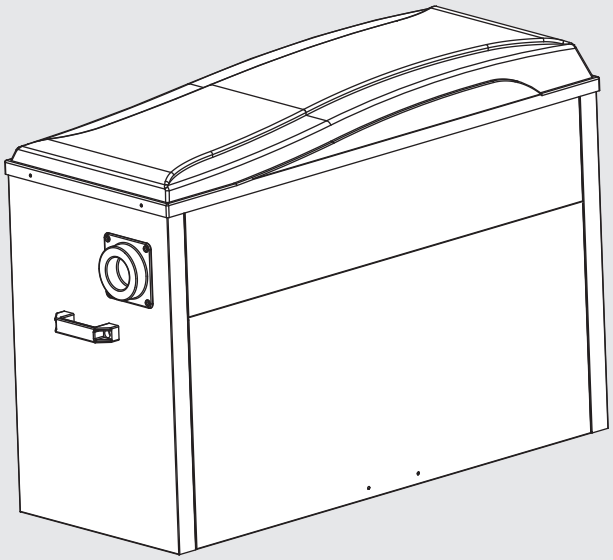
Brivis Models:

StarPro SP5 series
StarPro SP6 series





Ducted Gas Heater

Installation Manual

brivis
by Rinnai

This appliance must be installed in accordance with:

- Manufacturer's Installation Instructions
- Current AS/NZS 3000, AS/NZS 5601, AS/NZS 5141
- AS 4254, HB 276-2004
- Local Regulations and Municipal Building Codes including local OH&S requirements

This appliance must be installed, maintained and removed only 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

Proudly a member of the A.G.A. All of our gas products are A.G.A. certified.

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WARNINGS AND IMPORTANT INFORMATION

WARNING

READ ALL INSTRUCTIONS BEFORE USING THE APPLIANCE.

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 / INSTALLATION

This appliance shall be installed in accordance with:

- **Manufacturer's Installation Instructions.**
- **Current AS/NZS 5601, AS/NZS 5141 and AS/NZ 3000.**
- **AS 4254 - Ductwork for air-handling systems in buildings.**
- **HB 276-2004 – A Guide to Good Practice.**
- **Local Gas and Electricity Authorities.**
- **"SuperSizeGuide"**
- **Building Code of Australia (BCA) including local OH&S requirements**
- **Environment Authorities**

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 manufacturers instructions.

This appliance is heavy, use 2 people or mechanical lifting device. Improper lifting may result in serious injury.

Take care when opening or unpacking this appliance. Failure to do so may result in serious injury or product failure.

DO NOT modify the electrical wiring of this appliance. If the control power wiring is damaged or deteriorated then it must be replaced by an authorised person. Failure to do so may result in electric shock, fire, serious injury or product failure.

DO NOT install the heater on an unstable or non level surface or where there may be a danger of it falling. It may result in death, serious injury, or product failure.

DO NOT install the outdoor unit where noise may cause nuisance.

NOTE

A NOTE ON ILLUSTRATIONS

The illustrations used in this manual are for explanatory purposes only and the shape of your unit may vary slightly from that which is shown in this manual.

MANDATORY INSPECTION PRIOR TO INSTALLATION

WARNING

Immediately report any damage or discrepancies to the Supplier of the appliance. This appliance was inspected and tested at the time of manufacture and packaging, and released for transportation without known damage. Upon receipt, inspect the exterior for evidence of rough handling in shipment. Ensure that the appliance is labelled correctly for the gas and electrical supply, and/or other services it is intended to be connected to.

For safety and warranty purposes, appliances that may be damaged or incorrect must not be installed or operated under any circumstances. Installation of damaged or incorrect appliances may contravene local government regulations. Rinnai disclaims any liability or responsibility whatsoever in relation to the installation or operation of damaged or incorrect appliances.

NOTE

The manufacturer cannot guarantee compatibility and support for anyone using 3rd party accessory/devices (device) on any of their appliances.

The suitability, compatibility or functional performance of any 3rd party device is entirely the responsibility of the device's supplier or installer.

Any 3rd party device, technical, installation, operation, performance or other enquiries need to be referred to the device's supplier or installer.

Any adverse effects of 3rd party devices on the operation, performance or reliability of this appliance is not covered by the manufacturer's product warranty.

1. SCOPE

This installation manual is intended to be used as a guideline for the installation of Gas Fired Central Heaters. It covers only the installation and commissioning of the heater and the allowable flueing configurations. Although recommended return air grilles and allowable duct outlet quantities are specified, it does not cover the actual ducting design required to suit the installation.

This installation manual is based on Australian codes. For all other applications, please refer to local codes and regulations.

These heaters must be installed and serviced only by qualified personnel.

Models covered in this manual are as follows:

SP6 Series Heaters	
Internal	**External**
SP615IN	
SP623IN	SP623EN
SP623IN XA	SP623EN XA
SP630IN	SP630EN
SP630IN XA	SP630EN XA
SP635IN	

SP5 Series Heaters	
Internal	**External**
SP521IN	SP521EN
SP521IN-XA	SP521EN-XA
SP530IN	SP530EN
SP530IN-XA	SP530EN-XA
SP535IN	

SP6 models are condensing heaters.

SP5 models are non-condensing heaters.

For more details refer to Technical Specifications section.

Definitions

Shall

Indicates a mandatory requirement of this manual.

Should

Indicates a recommended requirement of this manual.

Any deviations from these instructions may, at the discretion of Brivis, void the warranty. As a result, the customer and/or installer may be charged a fee for non-product warranty related call outs. Also note that failure to comply with these instructions may preclude company service personnel from being able to service the unit.

Disclaimer

IMPORTANT: *This document is a guide only. Laws, regulations and industry standards can vary between States and Territories. Accordingly, this guide must be read in conjunction with, and subject to, all laws, regulations and industry standards applicable in the State or Territory in which the products are installed. You must ensure that the installation of the products will comply with those laws, regulations and standards, and that the products recommended to customers are fit for the purpose for which they are intended.*

2. GENERAL PRODUCT GUIDELINES

2.1 APPLICATION AND SIZING

These heaters are designed to provide a central source of heat for a ducted central heating system.

The heaters should not be installed downstream from an air washer, an evaporative cooler or refrigerative cooling system. Nor are they designed to be installed on a marine craft, houseboat, or any similar environment.

The heaters must be installed in accordance with these instructions and related regulations, codes, standards, and authorities. These include but may not be limited to:

- AS/NZS 3000 - Electrical Installations
- AS/NZS 5601 - Gas Installations
- AS 4254 - Ductwork for air-handling systems in buildings
- HB 276 - A Guide to Good Practice
- AS/NZS 5141 - Residential Climate Control Systems
- Local Gas and Electricity Authority Codes
- Product Sizing Guide
- Local Building Regulations
- Environment Authorities
- Building Code of Australia (BCA)

Note: *The manufacturer assumes no responsibility for equipment installed in violation of any code, regulations and these installation instructions.*

It is recommended the Product Sizing Guide is followed in estimating heating requirements and for system design that will result in efficient installation and provide a higher level of comfort and economical operation.

For the hourly input and the gas type to be used, refer to the appliance data label located inside the service compartment or the Technical Specifications at the rear of this manual.

Note: *All installations should only be carried out by a qualified tradesperson. Installations at altitudes above 1000m above sea level may require main burner injector upgrading. Please contact the Customer Service Centre for advice.*

2.2 INSPECTION

This appliance has been inspected and tested at the time of manufacture and packaging and released for transportation without known damage. Upon receipt, inspect the exterior for evidence of rough handling in shipment. Ensure that the appliance is labelled correctly for the gas to which it is intended to be connected. If a discrepancy or damage to the appliance is identified DO NOT install the appliance and report findings back to supplier.

2.3 UNPACKING THE HEATER

Some heaters are supplied on a pallet with a plastic sleeve. To unpack:

- Cut and remove the external plastic packaging and dispose of thoughtfully.
- Remove heater from pallet (if supplied).

2.4 UNLOADING OR LIFTING THE HEATER

When unloading or lifting the heater, ensure lifting equipment is in good operating condition and capable of lifting the total load. Be sure there is a clear area to place the heater down, which is within reach of the lifting equipment.

Note: *Do not use the lifting handles provided to lift the heater above head height. If fitting the heater to elevated heights such as a roof, use suitable lifting equipment.*

2.5 SERVICE CONNECTION GUIDELINES

2.5.1 Gas Inlet Connection

- All piping must be in accordance with AS/NZS 5601 and any local gas regulations.
- The connection point for external model heaters is a female G3/4 compression fitting to AS 3688. This is either located on the outer cabinet of the heater, or supplied loose within the heater.
- The connection point for internal model heaters is a male G3/4 compression fitting to AS 3688 located in the heater cabinet.
- A gas cock shall be fitted in the gas line adjacent to the heater and in a convenient location so it can be turned OFF quickly and easily.
- The gas supply shall in no way interfere with any servicing of the heater.

Note: *The gas supply must be installed by a licensed gas fitter. The gas pipe and gas meter should be sized so the heater can maintain its required incoming gas pressure at maximum consumption with all other gas appliances operating at their maximum capacity at the same time as the heater.*

2.5.2 Electrical Power Supply

The heater is pre-wired with a 3-pin plug and lead, and shall be plugged into a standard 10 Amp 220-240 volt fixed switched socket outlet adjacent to the heater, in a convenient location so it can be turned OFF quickly and easily.

Note: *A qualified electrician must install the 220 to 240 volt wiring according to local regulations.*

IMPORTANT: *Switch OFF the power and unplug the heater before touching any wiring. If any electrical wiring is damaged, it must be replaced by the manufacturer, its service agents or an electrically qualified technician, in order to avoid a hazard.*

The electricity supply must be 220-240V at 50Hz, and supplied by an authorised power supplier. Generators should never be used to supply this system as their output may be incompatible with, or prone to damage electronic components of the heater.

2.6 INSTALLATION OF DUCT CONNECTION POPS

On all SP heaters, the duct connection pops need to be fastened to the heater cabinet as follows:

- Insert pops into the hole in the pop plate, ensuring the pop flange is placed over the prescribed wall of the cabinet, refer to "Table 1. Pop Installation Matrix".
- Spread pop flange to fit tightly into the hole in the cabinet (the notch side overlapping the other).
- Secure pops with the rivets supplied.

Table 1. Pop Installation Matrix

		Return Air		Supply Air	
		No. of Walls	Install Pop	No. of Walls	Install Pop
Internal Model Cabinet	SP5	1	No Option	2	Inner Wall
	SP6	1	No Option	2	Inner Wall
External Model Cabinet	SP5	1	No Option	1	No Option
	SP6	1	No Option	1	No Option

3. HEATER POSITIONING

Install the heater in a position that allows adequate and safe access for service as per guidelines in this manual and applicable standards. The cost of any equipment and additional labour involved in accessing such heater installations will not be accepted by the manufacturer.

Note: *All service clearance measurements must be adhered to, otherwise this will impede the serviceability of the heater.*

3.1 INSTALLATION OF INTERNAL HEATERS

All internal SP models are designed to be installed in the roof or beneath the floor. This shall be done in accordance with the following guidelines and AS/NZS 5601.

3.1.1 Installation in the Roof Space

- The area under the heater must be capable of supporting the additional load, without causing deformation of any part of the building structure.
- The appliance must be accessible by means of fixed access, a normal ladder or steps.
- A passage of 600mm wide must be provided between the roof access opening and the heater.
- This passage must have a suitable walkway of at least 19mm thick particle board or equivalent.
- A permanent level platform must be provided beneath the heater and this platform area must extend 750mm out from the controls access panel side and fan motor access panel side/s for the entire length of the heater.
- The air gap created between the base of the heater and the platform by the heater's legs must be maintained.
- Permanent artificial lighting must be provided at the heater, with the switch located at the roof access opening.
- If a lay-down kit is used the supporting platform must be covered with a fire resistant material.

3.1.2 Installation Beneath the Floor

- There must be a minimum clearance of 200mm between any part of the appliance and the lowest part of the floor structure. In addition to this, refer to Service Clearances 4.2 or 4.3 (internal) or (external).
- The heater must be located within 2m of the access opening, or with a minimum clearance of 1.2m between the lowest part of the floor structure and ground level, maintained from the access opening to the heater.
- All under floor installations must be on a level concrete base (50mm thick), and provision made to drain any condensate, seepage or ground water away from the heater.
- Permanent artificial lighting must be provided at the heater with the switch located at the access opening.
- Lateral (horizontal) flues may be installed in accordance with AS/NZS 5601, ensuring that the lateral flue section has a minimum rise of a 20mm per metre of lateral run.
- The flue must be terminated outside the building in accordance with AS/NZS 5601. For SP heaters, termination can be performed using a remote terminal. Refer to para 4.5.4. Refer to "4.5 Internal Model Flueing Instructions – SP Series" on page 14

3.2 VENTILATION CALCULATIONS

For installation of internal heaters in a room, enclosure, residential garage, or plant room with natural ventilation conditions, ensure adequate ventilation is available by utilising the following formulae:

Installation of a gas appliance in a room or enclosure for properties approved for construction prior to 31st March 2014

a. Determine if the unit(s) MJ/hr rating for each cubic metre of the room or enclosure, is greater than 3 MJ/hr per m^3.

Example:

Unit rating (Ur) = 120MJ/hr

Room volume (Rv) = 1m x 1m x 2.4m = $2.4m^3$

Ur/Rv = 120/2.4 = 50 MJ/hr per m^3

As the result if greater than 3 MJ/hr per cubic metre of the space, additional ventilation is required.

b. Two permanent openings are required, each equivalent in area to the determined value A. The lower vent shall be located close to the floor or at burner level for a Downflow unit. The upper vent shall be located at or above the top of the unit. The two openings may be combined as long as the above conditions are met.

Determine free ventilation area using A = T x F, where:

A = minimum free ventilation area, mm^2

T = total gas consumption of all gas appliances, MJ/hr. e.g. SP623 = 86MJ/hr

F = factor (detailed in the table below)

Table 2. Ventilation F Factors

Gas appliance location	Source of Ventilation	Factor F
Gas appliance in a room or enclosure	Directly to outside*	300
	Via an adjacent room	600
Gas appliance in a plant room	Directly to outside*	150
	Via an adjacent room	300
* **Directly to outside** means through an outside wall, into a cavity vented to outside, into an underfloor space or roof space vented to outside.		

Installation of a gas appliance in a room, enclosure, residential garage or plant room for properties approved for construction <u>after</u> 31st March 2014

c. Determine if the unit(s) MJ/hr rating for each cubic metre of the room, enclosure, residential garage or plant room is greater than 0.4 MJ/hr per m^3.

Example:

Unit rating (Ur) = 120MJ/hr

Room volume (Rv) = 1m x 1m x 2.4m = $2.4m^3$

Ur/Rv = 120/2.4 = 50 MJ/hr per m^3 > 0.4 MJ/hr per m^3

As the result if greater than 0.4 MJ/hr per cubic metre of the space, additional ventilation is required.

Refer to AS/NZS 5601 for natural ventilation requirements.

Note: *For all other applications, e.g. Mechanical Ventilation, refer AS/NZS 5601.*

3.3 INSTALLATION OF EXTERNAL HEATERS

SP5 & SP6 External models can be installed outside of the house. For an installation under a house floor, an SP5 or SP6 Internal model should be chosen.

All heaters that are installed externally on the ground should be installed on a level concrete base or pad, and there must be provision made to drain away any surface water from the heater and condensate for SP6 models. If the heater is to be installed in an elevated position or on a roof, the installation shall comply with AS/NZS 5601. It must be secured to prevent movement and it must have adequate provision for service access.

4. SP5/6 INTERNAL MODEL GUIDELINES

4.1 INTERNAL HEATER DIMENSIONS

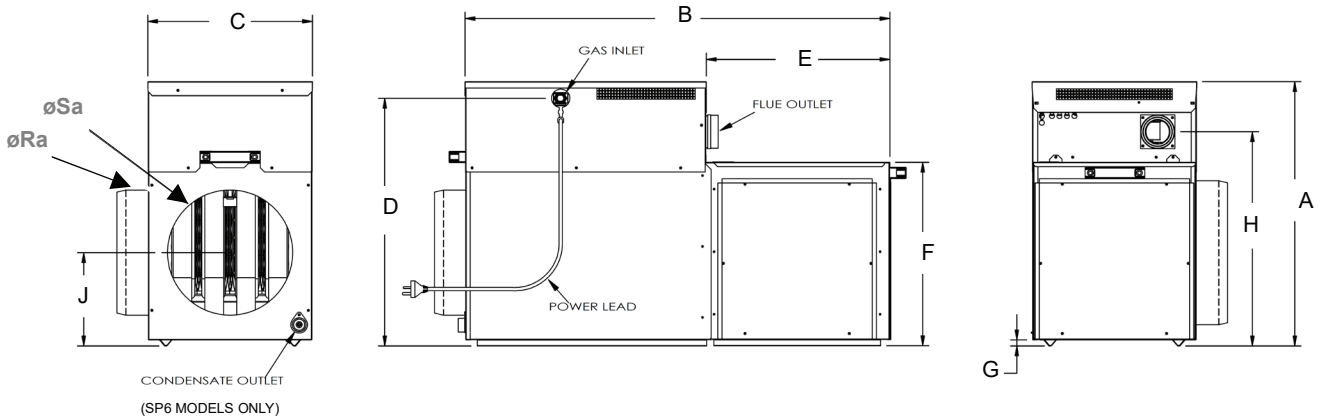


Table 3. SP5/6 Internal Heater Dimensions (mm)

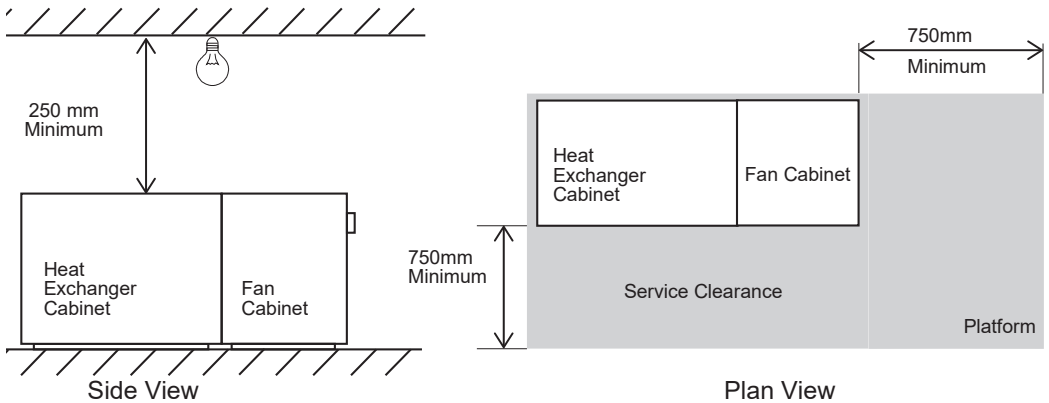
INTERNAL MODEL	A	B	C	D	E	F	G	H	J	øSa	øRa
SP521IN	634	1021	395	594	440	440	15	513	224	300	300
SP521IN-XA	634	1021	395	594	440	440	15	513	224	350	350
SP530IN	684	1070	547	643	491	490	15	563	253	350	350
SP530IN-XA	684	1070	547	643	491	490	15	563	253	400	400
SP535IN	684	1070	547	643	491	490	15	563	253	450	450
SP615IN	634	1021	395	594	440	440	15	513	224	300	300
SP623IN	634	1021	395	594	440	440	15	513	224	350	350
SP623IN-XA	684	1070	547	643	491	490	15	563	253	350	350
SP630IN	684	1070	547	643	491	490	15	563	253	400	400
SP630IN-XA	684	1070	547	643	491	490	15	563	253	450	450
SP635IN	684	1070	547	643	491	490	15	563	253	450	450

4.2 SERVICE CLEARANCES – INTERNAL

All SP5 models and SP6 models can be installed in accordance with 'Method 1', 'Method 2', 'Method 3' and 'Method 4' below.

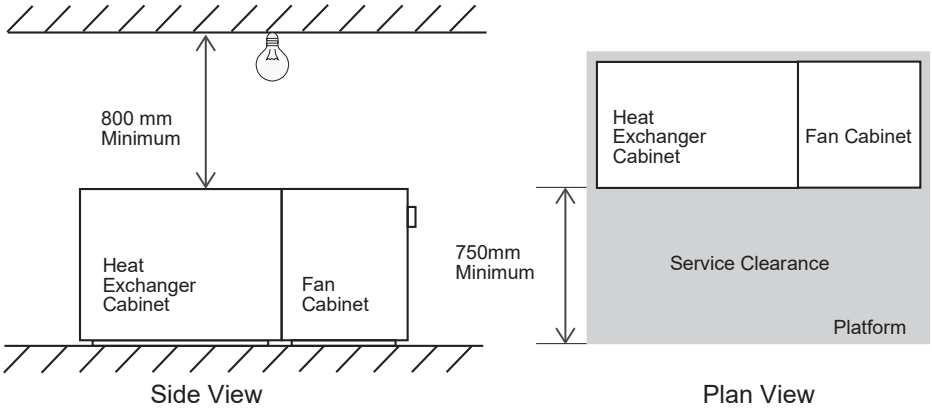
Method 1: In Ceiling and Under Floor

Diagram 1.



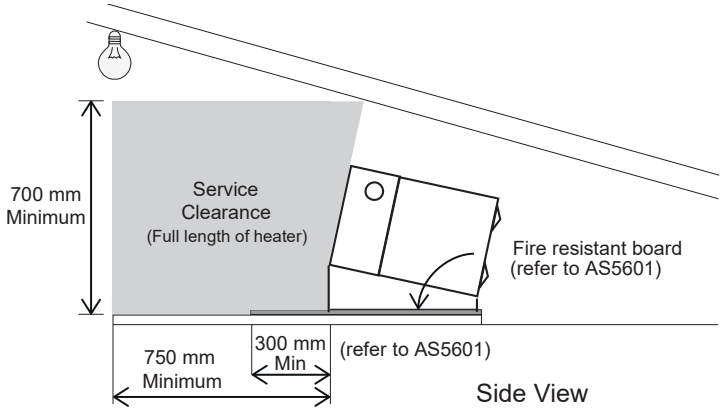
Method 2: In Ceiling and Under Floor

Diagram 2.



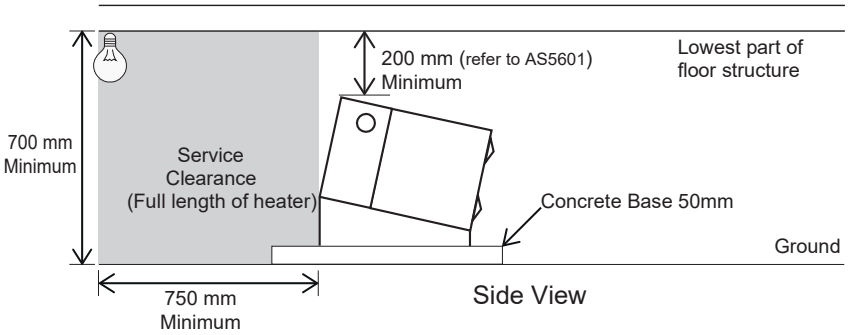
Method 3: Lay-down Option – In Ceiling

Diagram 3.



Method 4: Lay-down Option – Under Floor

Diagram 4.



4.3 SPLITTING INTERNAL MODEL HEATERS

The SP5 & SP6 Internal model heaters can be split for ease of installation. To split the heater, follow these simple instructions:

a. Remove the heater's roof after removing the 4 roof screws.

b. Disconnect the speed sensor loom from the control board and remove it from the heat exchanger cabinet.

c. Remove the main fan motor and speed sensor loom access plate located on top of the fan cabinet compartment by removing the single screw.

d. Unplug the main fan loom at the connection located inside the access hole which has just been uncovered.

e. Remove the 2 screws fastening the fan cabinet tabs to the heat exchanger cabinet. These are located at the top of the fan cabinet on the heater's split line.

f. Pivot the fan cabinet upwards high enough to dislodge the lower locking tabs fixed to the fan cabinet near the base.

g. The heater is now split in two.

h. Protect the exposed looms and tabs from damage while the heater is split in two parts.

i. Once ready, reassemble in reverse order.

Note: *Ensure when reassembling the heater that everything is put back and connected correctly.*

4.4 CHANGING THE RETURN AIR POP ORIENTATION

The return air pop orientation can be changed from side to side or to the rear of the heater if necessary.

Reversing the Side Entry

- Remove the screws securing the side pop blanking plate and remove the blanking plate.
- Swap to the other side and fasten with the same screws.

Changing to Rear Entry

Note: *If this is done, predominantly when a unit is laid down, then the total number of outlets normally permitted for that installation must be reduced by 2 (refer to the outlet register chart, Table 8 on page 26).*

- Remove the screws securing the end pop blanking plate and remove the blanking plate.
- Swap to the open side and fasten with the same screws.

IMPORTANT: ***RETURN AIR CONNECTION AT THE END OF THE UNIT (REAR ENTRY)***
On applicable models, connecting the Return Air duct to the end of the unit (rear entry) will result in reduced air flow – for example, when using a Lay Down Kit. In this situation:
– The total number of outlets normally permitted for a heating system shall be reduced by 2 (refer to the outlet register chart located on page 20).
– DO NOT USE this configuration in Add-On Cooling applications, unless you ensure Minimum Recommended Airflow required for the cooling is maintained.

4.5 INTERNAL MODEL FLUEING INSTRUCTIONS – SP SERIES

4.5.1 General

- All flues shall be installed in accordance with AS/NZS 5601.
- Horizontal flues shall have a minimum rise of 20mm per 1m run.
- Horizontal flues terminating on a wall shall be at least 300mm above ground level.
- An external flue terminal clearance to an opening in a building shall be no less than 1000mm in the vertical direction and 300mm in the horizontal direction.
- Systems with both vertical and horizontal flue runs should be treated as all horizontal.
- One 45º bend is equivalent to one half 90º bend (i.e. two 45º bends = one 90º bend).
- Provide adequate support to flue sections (e.g. saddles / strapping).

4.5.2 SP5 Internal Models – 100mm non-corrosive metal flue.

- Requires a 100mm round single or twin wall non-corrosive metal flue, suitably terminated.
- All flues shall have a bolted flue sleeve connection to allow for repairs and/or removal of the appliance.
- Twin Wall flue – maximum flue length of 6m.
- Single Wall flue – maximum flue length of 2m.
- Up to four 90º elbows are permitted with the same length requirements specified above.

4.5.3 SP6 Internal Models – 100mm Drainage Waste Vent (DWV) flue

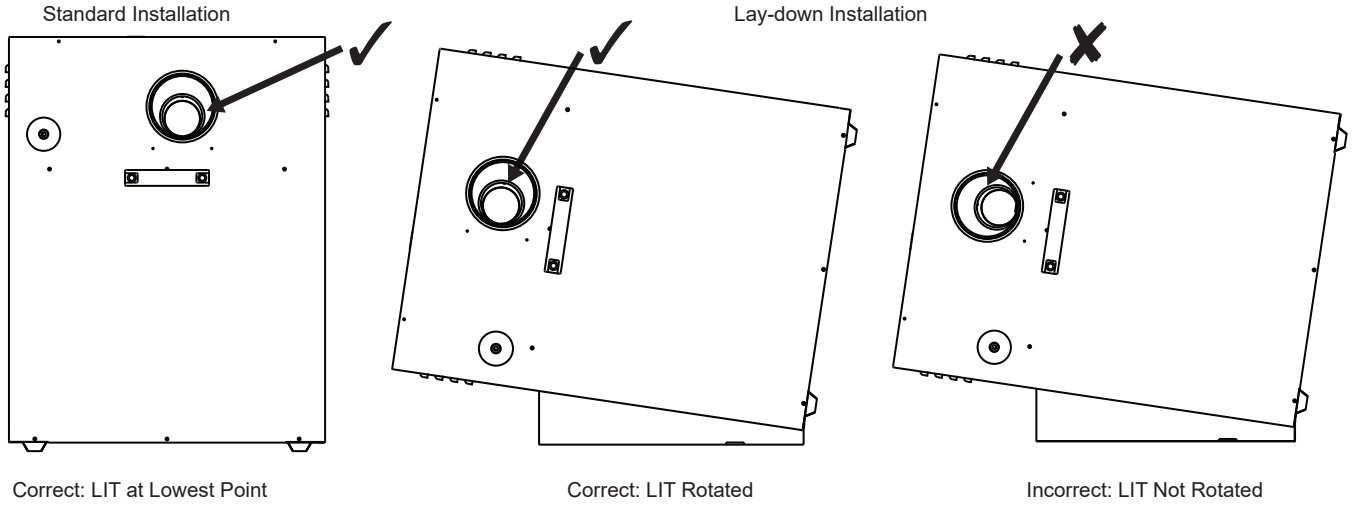
All SP6 internal model heaters are supplied with an Level Invert Taper (LIT) fitting and flue connection to unit is with 100mm Drain Waste Vent pipe (DWV to AS/NZS 1260).

Flue shall be installed in accordance with the following:

- Exit heater with a minimum 300mm straight run of 100mm DWV flue before the first elbow.
- All flue joints shall be adequately sealed to prevent condensate leakage.
- Ensure there is continual fall back to the flue outlet on the heater from flue termination point.
- Flue shall be removable from the heater to allow for repairs and/or removal of the appliance.
- Flat side of the LIT (not tapered side) must be positioned so it is always the lowest part of the fitting or the closest point to ground.

Note: *If a lay-down kit is used, the LIT must be rotated to ensure the flat side of LIT fitting is closest to ground (Diagram 5).*

Diagram 5. LIT Orientation for Lay-down Installations



A maximum length of 25m x 100mm DWV flue pipe is allowed in all situations with no more than four 90º bends. Refer to Table 4.

Table 4. Maximum Flue Bends and Terminals

All Internal SP6 Models		100mm DWV Flue	
Heater Orientation	**Flue Orientation**	**90º Bends (Up to 4)**	**Terminal Type**
Standard	Vertical	25m	100mm DWV Plain Vent Cowl
	Horizontal	25m	Remote Flue Terminal
Lay-down	Vertical	25m	100mm DWV Plain Vent Cowl
	Horizontal	25m	Remote Flue Terminal

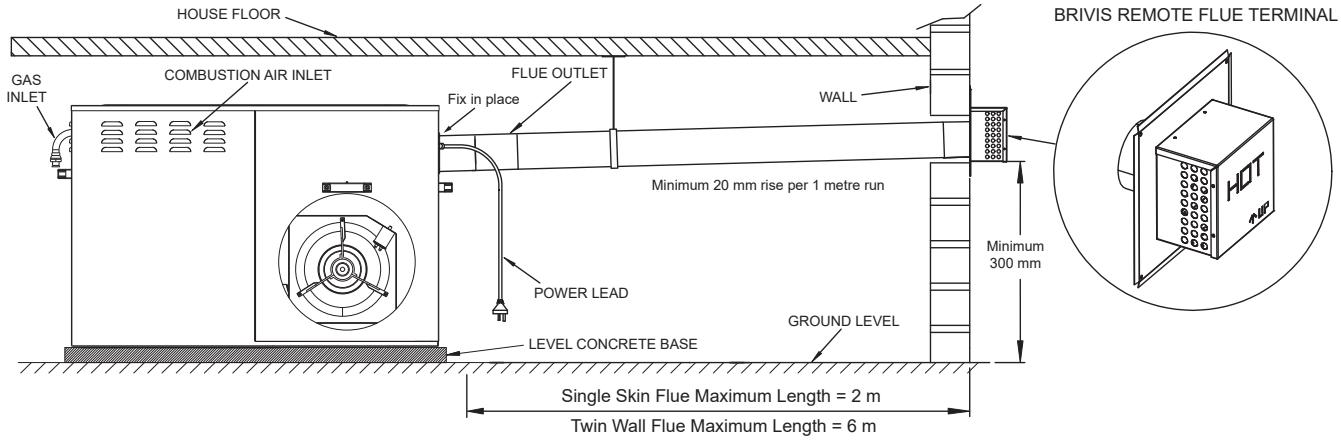
Note: *One 45º bend is equivalent to one half 90º bend and all vertical flue orientations will have at least one 90º bend.*

4.5.4 Remote Terminal (Part No. B018384) All Internal Model Applications

In specific installations, for example under the floor, it is recommended that a remote terminal be used to terminate the flue on the outside wall of the building. Please refer to the instructions supplied with a remote flue terminal.

Diagram 6 depicts a typical SP5 underfloor configuration.

Diagram 6. Typical Remote Terminal Configuration - SP5 Models



5. SP5/6 EXTERNAL MODEL GUIDELINES

5.1 HEATER DIMENSIONS

Diagram 7. SP6 External

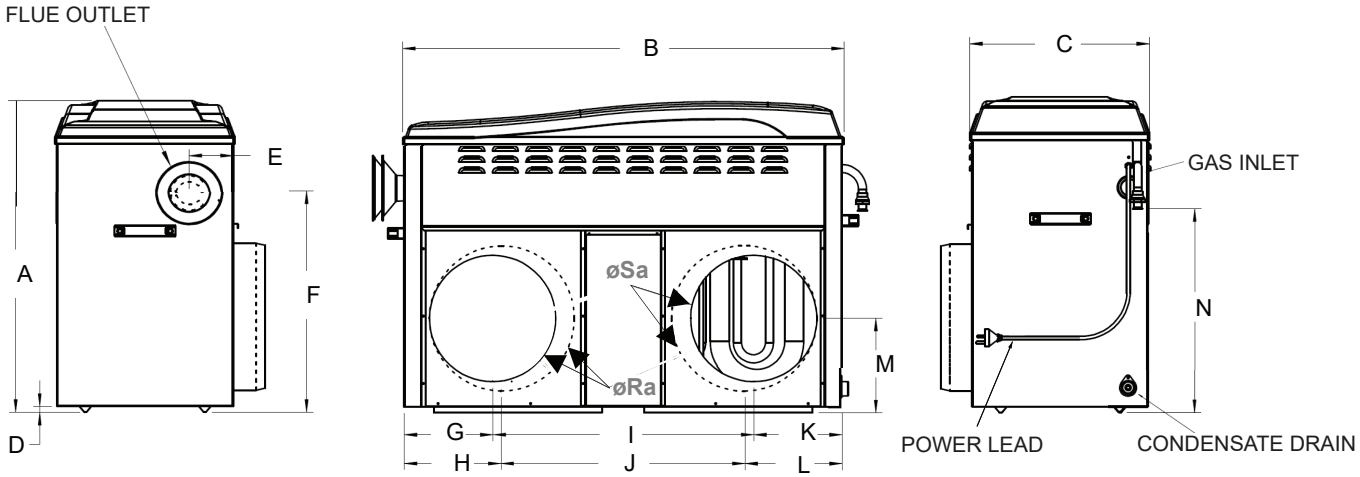


Table 5. SP6 External Heater Dimensions

Model (mm)	A	B	C	D	E	F	G	H	I	J	K	L	M	N	øSa	øRa
SP623EN	750	1046	416	15	104	520	211	n/a	620	n/a	210	-	224	480	300	300
SP623EN-XA	750	1046	416	15	104	520	-	230	-	580	-	231	224	480	350	350
SP630EN	790	1102	575	15	255	570	236	-	620	-	236	-	249	530	350	350
SP630EN-XA	790	1102	575	15	255	570	-	261	-	570	-	261	249	530	400	400

Diagram 8. SP5 External

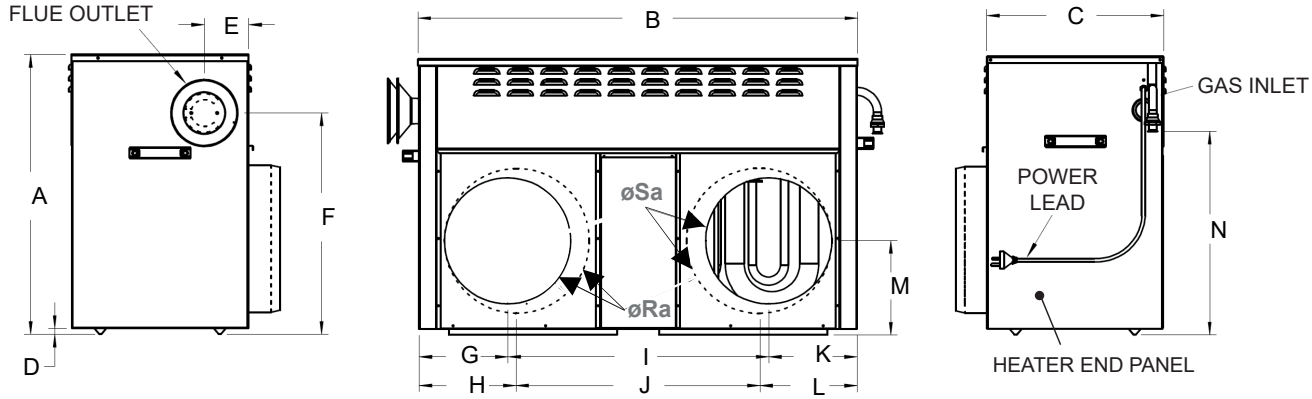


Table 6. SP5 External Heater Dimensions

Model (mm)	A	B	C	D	E	F	G	H	I	J	K	L	M	N	øSa	øRa
SP521EN	657	1046	416	15	104	520	211	-	620	-	210	-	224	480	300	300
SP521EN-XA	657	1046	416	15	104	520	-	230	-	580	-	231	224	480	350	350
SP530EN	707	1096	568	15	255	570	236	-	620	-	236	-	249	530	350	350
SP530EN-XA	707	1096	568	15	255	570	-	261	-	570	-	261	249	530	400	400

5.2 SERVICE CLEARANCES

Front/Back

A minimum clearance of 500mm must be provided at the side facing away from the house.

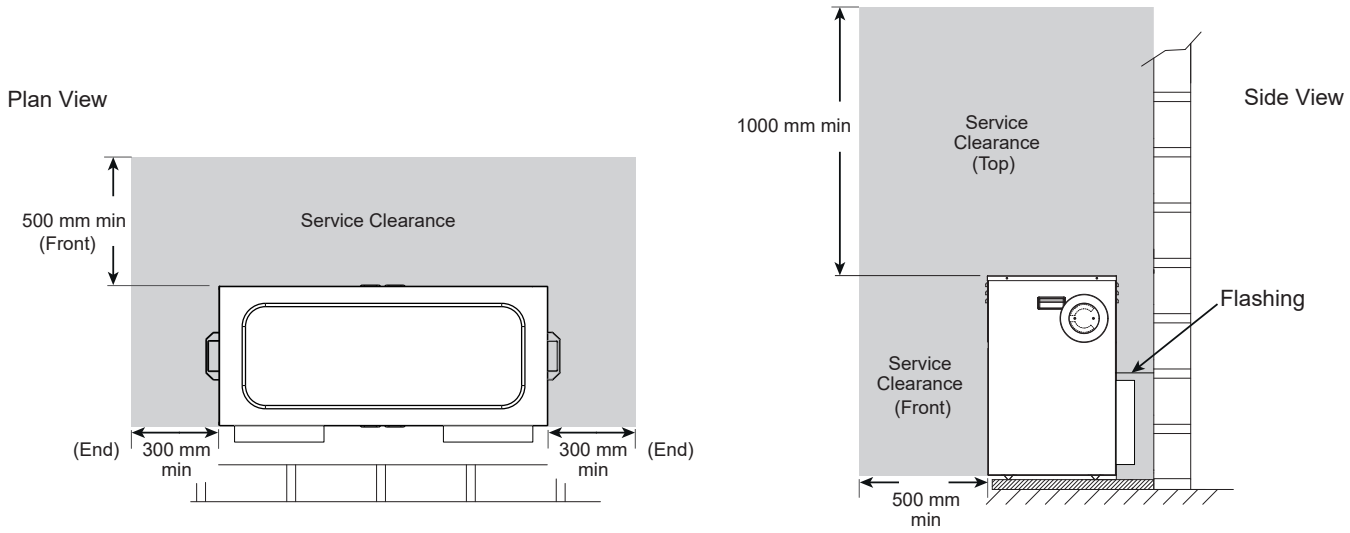
End

A minimum clearance of 300mm must be provided at each end of the heater.

Top

A minimum clearance of 1000mm must be provided above the heater roof. This clearance must be maintained for the entire surface area of the heater roof.

Diagram 9. Clearances



5.3 REVERSING THE HEATER

The duct orientation of SP5 & SP6 External heaters can be reversed if the installation requires it.

- Remove the screws at the bottom edge of the front panel of the heater, and carefully lift away the front panel, without scratching or marking it.
- There are two blanking plates behind the front panel, which cover the two pop holes. Remove the two blanking plates.
- Fit the two blanking plates to cover the original pop holes to prevent air leakage.
- Above the original pop holes there will be a flashing bracket secured by screws, which needs to be reversed. Remove the flashing bracket, and fit it to the new pop outlet side of the heater.
- Gently fit the front panel back in place on the reverse side from where it was removed, and fasten using the screws along the bottom edge.

5.4 INSTALLATION OF FLASHING

A minimum 75mm flashing must be fitted to ensure the ductwork is adequately weather protected.

- Clip flashing into position by placing the lugs of the flashing firmly into the slots on either side of the cabinet wrap flanges at the rear of appliance.
- Place a bead of silicone along the upstanding face of the top flashing then push the heater up against wall and secure sides of flashing to the wall.

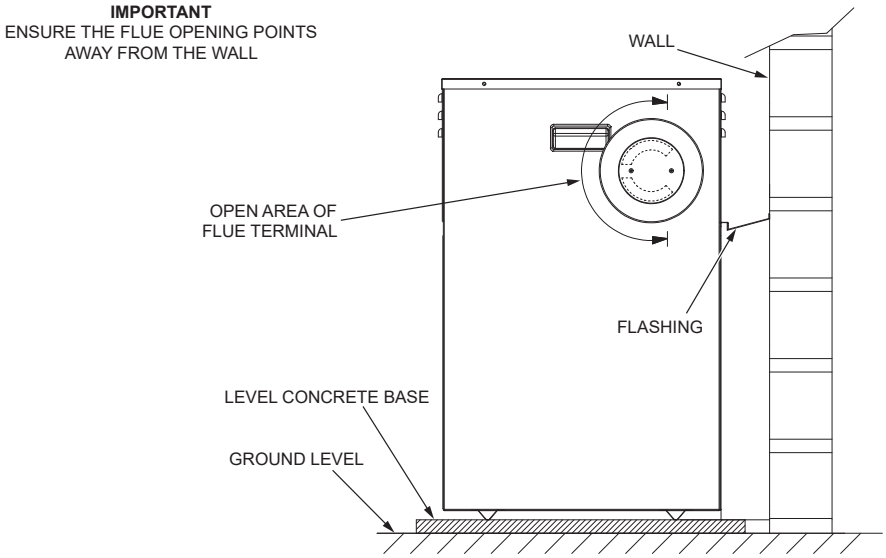
Note: *It is important to allow for sufficient slack in the ducting connected to the heater's pops, to allow the heater to be moved out from the wall if required for servicing.*

5.5 INSTALLATION OF FLUE TERMINAL

The flue terminal for External models is supplied inside the heater under the roof. On one end of heater you will find the flue outlet socket under an installer instruction label.

- Remove the label and insert the flue terminal firmly into the flue outlet socket in the correct orientation to ensure the flue gases are expelled away from the house (refer to Diagram 10).

Diagram 10. Flue Terminal Installation

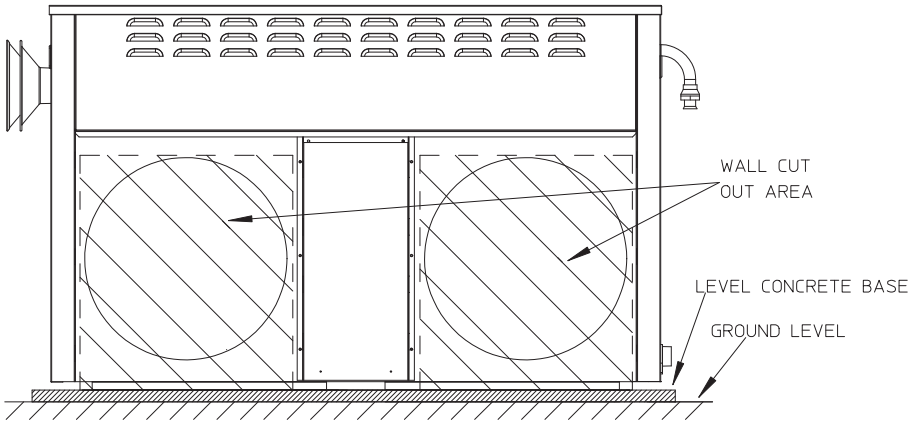


Note: *The flue terminal must always be installed before starting the heater.*

5.6 WALL CUT-OUT AREA

When installing the heater at ground level, create two holes to suit the pops all the way to ground level (see Diagram 11), or one rectangular hole to cover the distance of both pops ensuring there is no impediment to the structural integrity of the dwelling.

Diagram 11. Wall Cut-out Area



Note: *Refer to Table 3 or Table 5 to obtain the dimensions for the model of heater being installed.*

5.7 FLUE TERMINAL CLEARANCES

Heaters that are installed outside the house should be positioned so that, when measured from the edges of the flue, the following minimum clearances exist, which are in accordance with AS/NZS 5601:

75mm

- Out from the wall against which it is mounted.
- From a drain or soil pipe.

300mm

- From a flue terminal, cowl or combustion air intake.
- Below eaves, balconies or other projections.
- From the ground, above a balcony or other surface.
- To a return wall or external corner.
- Measured horizontally, from an opening window, door, non-mechanical air inlet or any other opening into the building (except sub floor ventilation) or 1500mm in direction of discharge.

500mm

- From an electricity meter or fuse box (prohibited area extends to ground level).

1000mm

- Measured vertically, from an opening window, door, non-mechanical air inlet or any other opening into the building (except sub floor ventilation).
- From a gas meter.
- From a mechanical air inlet, including a spa blower, measured both vertically and horizontally.
- A flue terminal of this type shall not be located under a roofed area, unless the roofed area is fully open on at least two sides, and a free flow of air at the appliance is achieved.

6. THERMISTOR INSTALLATION

6.1 SP5 & SP6 INSTALLATION OF THERMISTOR

All SP heaters are supplied with a remote thermistor assembly. The thermistor must be installed in the supply air duct, between 1m to 3m away from the heater, but never beyond the first Branch Take Off (BTO) fitting.

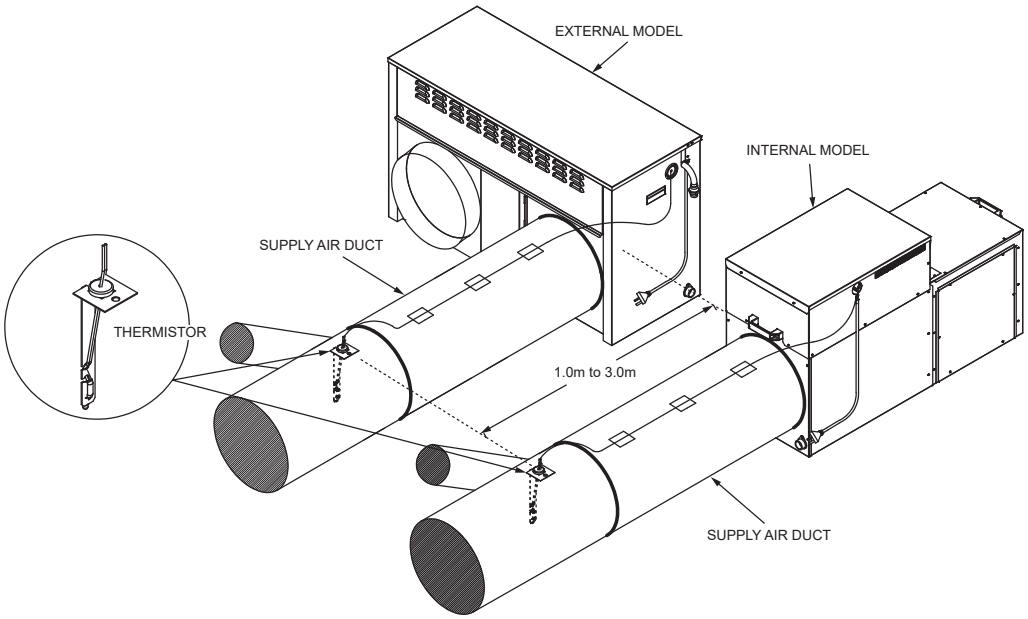
Note: *Where an Add-On air conditioning indoor evaporator coil is installed, the thermistor must be located in the discharge air pop of the indoor coil.*

These installation practices promote more accurate supply air temperature control and optimise heater performance.

- Ensure that there is at least 1 metre of appropriately sized ducting installed between the heater and the first BTO fitting (or evaporator coil).
- Drill a 20mm diameter hole through the top of the inlet end of the first BTO fitting (refer to Diagram 12) or through the top of the evaporator coil discharge pop.
- Carefully insert the thermistor assembly (probe end first) into this hole and secure using the self drilling screw provided. Seal any remaining openings with duct tape.
- Ensure that the thermistor lead is secured to timbers or duct outer casing to prevent damage.

If the first BTO fitting is installed more than 3m away from the heater, an additional duct joiner (installer supplied) will be required so that the thermistor assembly can be fitted correctly. Install the joiner between 1m and 3m away from the heater, ensuring the thermistor can reach this joint. After making this modification, follow the steps per normal practice.

Diagram 12. Duct Joiner Location



7. CONDENSATE REMOVAL

All SP6 models have a condensate drain outlet. A fitting and clamp are provided loosely beneath the heater lid for connection to the drain (refer to Diagram 13).

- For External models, the outlet is located in the bottom corner below the gas supply connection point.
- For Internal models, the outlet is located in the bottom corner of the supply air pop hole panel.
- The condensate is mildly acidic, and shall be run via a PVC pressure pipe (to AS 1477), with an outside diameter of approximately 27mm, away from the heater to a suitable area (i.e. to above a drain, sewer or pit)
- Use PVC cement on all joints to prevent any condensate leakage.
- Do not connect the condensate drain directly to the sewer or below ground level of a storm water drain. A blockage in the drain system would cause the heater condensate tank to flood with water and shut down. Check for any additional local drainage codes which may apply.
- Under no circumstances should it be allowed to run onto electrical connections, earth stakes, copper pipes or concrete paths. It should also not discharge onto metallic roofs or guttering, however the condensate drain may terminate into the vertical section of a downpipe above ground level.
- Tube length should be minimised and a continuous fall of 20mm per metre created. Maximum equivalent tube length of 12m is recommended (or increase diameter size).
- Under no circumstances should any part of the tube sag or run uphill.
- Special consideration is required for installation in areas experiencing sub-zero temperature as condensate could freeze in the drain. In these cases, larger diameter drainage piping is required.
- Approximately 2 to 3 litres per hour of condensate may be produced under continuous running conditions, depending on the size of the heater.

Note: *It is important that the above guidelines are adhered to as incorrect drainage may cause serious damage to the heater or its surroundings.*

7.1 CONDENSATE DRAIN

7.1.1 Fitting Condensate Drain to Internal Units

a. Fit the barbed connector to the flexible condensate hose (refer to Diagram 13 Internal Fitment).

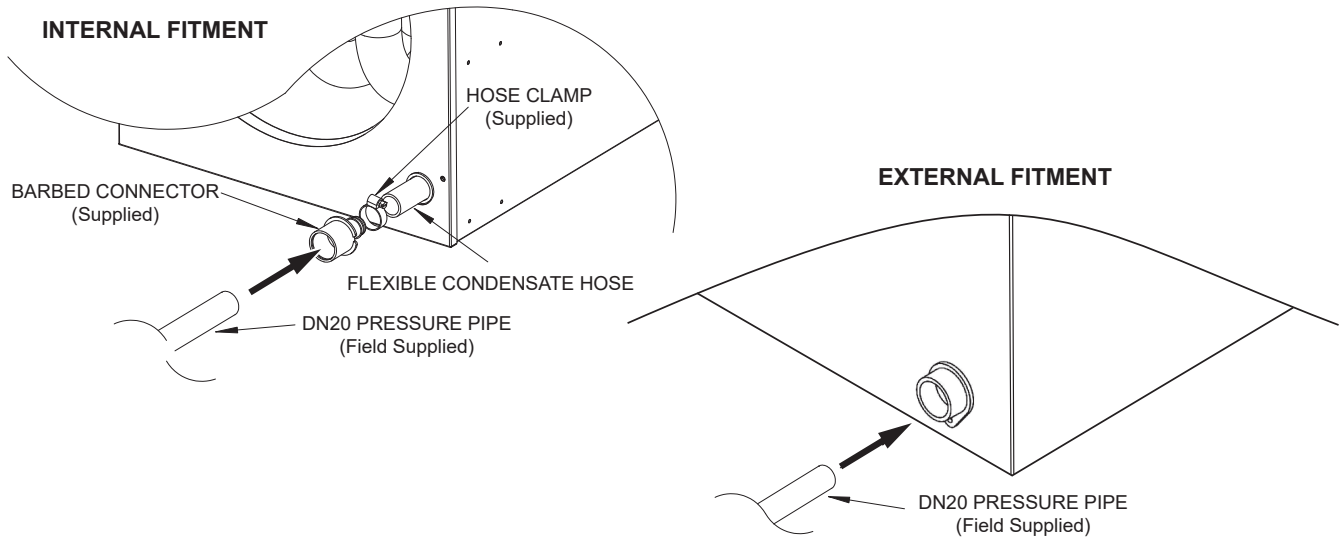
b. Fasten the hose to secure the barbed connector to the flexible hose.

c. Fit the DN20 pressure pipe drain to the barbed connector.

7.1.2 Fitting Condensate Drain to External Units

a. Fit the DN20 pressure pipe drain into the connector (refer to Diagram 13 External Fitment).

Diagram 13. Condensate Drain Installation



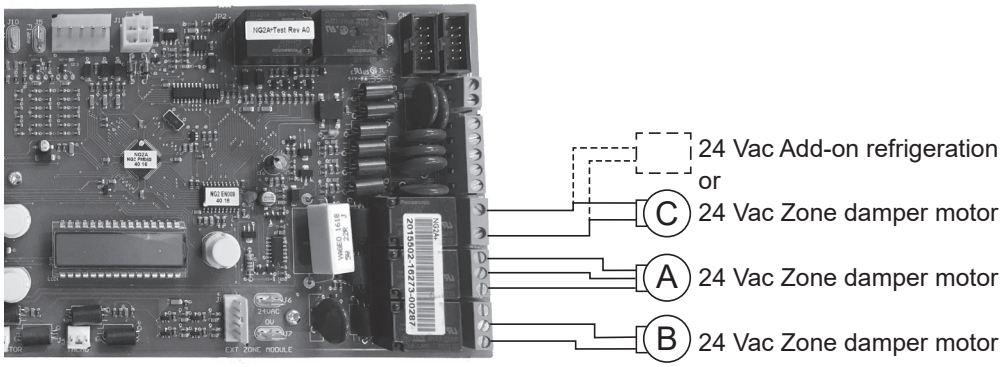
Note: *Always use the correct PVC cement to bond the field supplied PVC pressure pipe to the barbed connector, following the instructions as detailed for the PVC cement for proper bonding and curing.*

8. ZONING AND ADD-ON

8.1 SP5 & SP6 ADAPTIVE ZONING AND ADD-ON AIR CONDITIONING

SP5 and SP6 heaters can be configured for zoning and/or Add-On Refrigerative Air Conditioning. There are three 24 Vac relays on the heater's control module, which can be configured for either three zone motors, or two zone motors and Add-on refrigerative air-conditioning control as shown in Diagram 14 below. For additional zone requirements; or 'Network 516 module' (Part No. B023178) is required, which can then allow for control of up to four zone dampers and a refrigeration relay. ICE Add-on Cooling sizing information is provided on 11.2 on page 29.

Diagram 14. Zoning/Add-on Connections - NG-2A+ PCB



SP Series – NG-2A+ PCB

Note: *Refer to the Network 516 module installation instructions for further information. Refer to the Networker Advanced Programming manual for zone setup on the Networker Thermostat. Refer to the Add-On Cooling brochure for further information. For ZonePlus configuration, please refer to the ZonePlus Installation manual.*

Note: *Network 516 modules can only be used on heaters manufactured after 1 Mar 2010.*

8.2 CONNECT A DAMPER MOTOR TO THE HEATER'S CONTROL MODULE

Diagram 15. 24VAC Power Open/Power Close Damper Motor

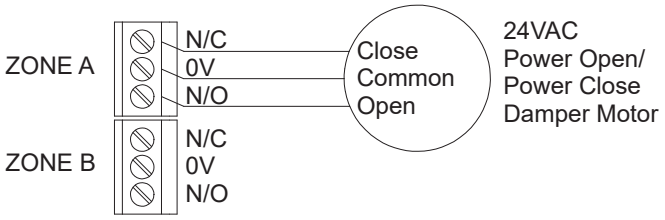


Diagram 16. 24VAC Power Open/Spring Return Damper Motor

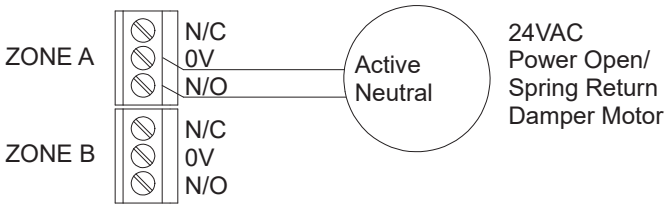
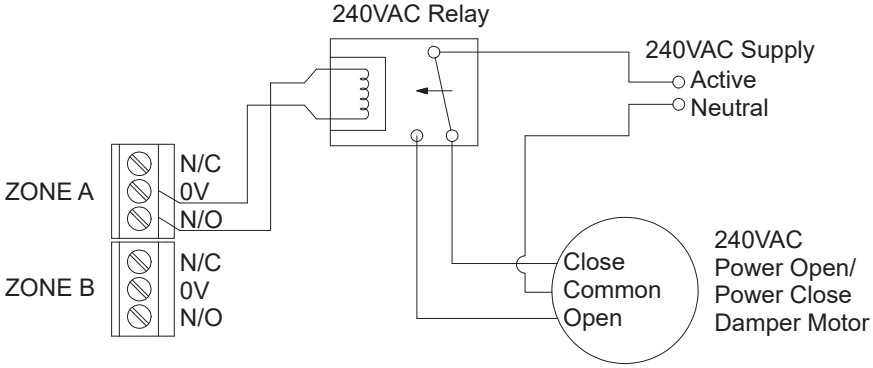


Diagram 17. 24VAC Power Open/Power Close Damper Motor



9. DUCTING

Good duct design and sizing are essential to every Central Heating system. Use the Product Sizing Guide and technical data within this manual for the best results and follow these guidelines:

- Ductwork should be well insulated and airtight and have a minimum insulation rating of R1.0 (R1.5 in some areas). Ensure that ducting complies with the Building Code of Australia.
- The ducting should be well fastened to pops, BTOs, outlet boots and neck adapters adequately with duct tape, in accordance with AS 4254, HB 276 and AS5141.
- It should also be properly sized, and curves and bends should be smooth enough to ensure that the air flows through efficiently, quietly and with minimal resistance.
- The registers and diffusers should be large enough and of good design. They should minimise noise, while providing the correct distribution pattern.
- The positive return air system should be fitted with a grille large enough to accept the full air capacity of the system at low noise levels.
- If the system uses high level outlets (e.g. ceiling diffusers), then the return air inlet should be at a low level. Ceiling systems with a high level return air may result in reduced performance.
- For SP5 and SP6 heaters, access to the ductwork must be provided for general maintenance and service to the supply air thermistor sensor.

Note: *It is important that the ducting should be well insulated. It is mandatory under building codes to install insulated, fire rated duct.*

If a filter is fitted to the return air grille, make sure it is easily accessible for regular cleaning.

Table 7 gives the minimum recommended return air grille sizes for each model heater.

Table 7. Minimum Recommended Return Air Grille Selection

	Without Filter		With Filter	
Model	**Grille Size (m^2)**	**Example Size (mm)**	**Grille Size (m^2)**	**Example Size (mm)**
SP521, SP615, SP623	0.26	(400x650)	0.39	(400x1000)
SP521 XA, SP623 XA	0.28	(400x700)	0.42	(400x1050)
SP530, SP630	0.36	(400x900)	0.54	(400x1350)
SP530 XA, SP630 XA	0.38	(400x1000)	0.57	(400x1450)
SP535, SP635	0.39	(400x1000)	0.58	(400x1450)

Note: *Sizes are based on maximum airflow for typical 'egg-crate' grilles. For all other types, refer to the manufacturer's specifications.*

Example:

If a grille has a free ventilation opening of 500mm x 800mm, the grille size is 0.5m x 0.8m = 0.4m^2

Without a filter, this grille suits the SP530 XA heater, which requires at least 0.38m^2.

With a filter, this grille suits the SP623 heater, which requires at least 0.39m^2.

10. OUTLET GUIDE

The outlet chart (Table 8 on page 26) provides recommendations based on using the Product Sizing Guide or a system designed using accepted design principles. These figures also relate to typical size registers and diffusers used on domestic heating systems i.e. 300mm x 100mm floor registers and 150mm round ceiling diffusers, with 150mm ductwork connection. For all systems, a minimum number of outlets must remain fully open (this includes both the outlet grille and the damper in the duct) if the heater is to operate properly without overheating. Similarly, ceiling outlet systems have a maximum number of outlets that can remain fully open, to ensure that the velocity through each outlet is sufficient. These maximum ceiling outlet figures relate to fully open outlets, however, the system will operate efficiently with more outlets open, if it has been properly balanced. There is no maximum number for floor outlets, so the following chart below lists the typical number of floor outlets for each heater model.

The outlet chart is divided into four columns as follows:

A. The maximum number of outlets that should remain fully open for a ceiling outlet system.

B. The typical number of outlets for a floor outlet system.

C. The minimum number of outlets that should remain fully open for floor/ceiling systems where the system does not have zone dampers installed or, where there are zone dampers but these zones are not operated from a networker thermostat (e.g. wall switches).

D. The minimum number of outlets that should be fully open for floor/ceiling systems where the system has zone dampers installed, and these zones are being operated from a Networker Thermostat using the heater's on-board zone relays or a Network 516 module. Systems fitting this description are deemed to have Adaptive Zoning active, hence minimum outlet numbers are reduced. Where it shows half figures such as 1.5, it is possible to operate with 1 outlet fully open, and another outlet half closed (such as a bathroom). Refer to Section 12 for balancing guidelines.

Note: *Column D should not be used unless the Networker has been configured for Adaptive Zoning only. If not refer to column C instead. For a ZonePlus configuration please refer to the ZonePlus Installation Manual.*

Note: *For SP5 & SP6 Internal models, the normal return air pop configuration is side entry, but can be changed to the end of the fan cabinet if necessary. If this is done, a total of two outlets must be removed from the allowable maximum number of outlets.*

10.1 RETURN AIR POP CONFIGURATION CHANGES

Some heater models offer an alternative for the return air pop from the side position to the end of the cabinet (for example, to accommodate a lay-down kit). Connecting the return air pop to the end of the unit reduces the rated air flow by up to 30%.

IMPORTANT: **RETURN AIR CONNECTION AT THE END OF THE UNIT (REAR ENTRY)**

On applicable models, connecting the Return Air duct to the end of the unit (rear entry) will result in reduced air flow by up to 30% – for example, when using a Lay Down Kit. In this situation:

Connecting the return air duct to the end of the unit reduces the rated airflow by up to 30%.

The total number of outlets normally permitted for a heating system shall be reduced by 2 (refer to the outlet register chart located on Table 8 on page 26).

- *DO NOT USE this configuration in Add-On Cooling applications, unless you ensure Minimum Recommended Airflow required for the cooling is maintained.*

Table 8. Outlet Register Chart

System Model	Airflow Rate (L/s)	A Maximum No. Ceiling Outlets	B Typical No. Floor Outlets	C Minimum No. Floor/Ceiling Outlets	D (Adaptive Zoning) Minimum No. Floor/Ceiling Outlets
SP6 Heaters – External					
SP623EN	715	12	12	5	2
SP623EN XA	755	13	12	5	2
SP630EN	850	15	23	7	3
SP630EN XA	985	17	23	7	3
SP6 Heaters – Internal					
SP615IN	695	12	13	5	2
SP623IN	765	12	13	5	2
SP623IN-XA	795	14	13	5	2
SP630IN	1065	16	22	7	3
SP630IN-XA	1095	17	22	7	3
SP635IN	1130	17	24	7	2.5
SP5 Heaters – External					
SP521EN	700	12	12	5	1.5
SP521EN XA	740	13	12	5	1.5
SP530EN	960	16	23	7	2
SP530EN XA	965	17	23	7	2
SP5 Heaters – Internal					
SP521IN	785	12	13	5	1.5
SP521IN-XA	830	14	13	5	1.5
SP530IN	1080	17	24	7	2
SP530IN-XA	1140	17	24	7	2
SP535IN	1160	17	24	7	2.5

Note: *Airflow figures are based on a total static pressure of 125 Pa for 30 & 35 models and 50 Pa for other models.*

Note: *Network 516 modules can only be used on heaters manufactured after 1 March 2010.*

11. THERMOSTAT INSTALLATION

All SP heating systems can be controlled by various Thermostats, the Networker is detailed below. A Thermostat inside the house is wired to the control module in the heater. The Thermostat monitors the temperature in the house, and switches the system ON and OFF in order to maintain a set temperature. So it must be positioned correctly.

Install in the living area

It is important that the Thermostat is placed in a position that will provide the most accurate reading of the temperature, i.e. in the area most often used for family living.

Attach on an internal wall

The temperature difference on an external wall can also affect it, so always mount it on an internal wall. Keep the hole in the wall for the wiring as small as possible to prevent draught from within the wall cavity affecting the temperature setting.

Get the height right

The thermostat should be positioned approximately 1500mm above floor level.

Avoid Hot Spots

Keep the thermostat as far away as possible from warm air outlets, radiation from the sun, fireplaces, radio and television sets or warm pipes and duct running in the wall behind it.

Avoid Cold Spots

Keep the thermostat as far away as possible from draughts caused by doorways, stairwells, windows or return air inlets.

Avoid Dead Spots

Keep the thermostat away from areas of less than normal air circulation, such as behind doors, in alcoves or in corners.

Interference From Other Electrical Connections

Ensure the thermostat and control wiring are kept away from other electrical components, including electrical wiring, data and antenna cables. This includes keeping the thermostat's wiring away from the spark igniter loom within the heater's cabinet.

Use the right cable

Ensure the cable is 0.75mm^2 in cross-section and less than 100m in length.

Note:

- *Do not install the wiring with the power turned on, as the fuse may blow, which would not be covered under warranty.*
- *Use only thermostats of the same brand as the heater unit, as any failure relating to a non-matching thermostat will not be covered under warranty.*

11.1 NETWORKER INSTALLATION



Networkers can be wired directly to SP series heaters.

Refer to Networker Advanced Programming Manual for additional programming information not provided in this manual.

Wiring Connection at Networker

The Networker backing plate has four terminal points for the connection of control wires. When making the connections, use only the two top terminals marked TW1 and TW2 or the two bottom terminals also marked TW1 and TW2. Never use a combination of terminals when connecting to a single appliance. For example, a Networker operating a cooler and a heater would have the two bottom terminals connected to the heater and the two top terminals connected to the cooler.

Note: *When there is more than appliance connected to a Networker or multiple Networkers on a system, always ensure that the TW1 and TW2 polarity is correct at both ends of the wire cable.*

Wiring a Networker to a StarPro Heater

a. Run a twin wire cable from the heater to the networker (for example, figure-eight cable, 0.75mm^2).

b. Remove the backing plate from the Networker by unclipping it at the sides.

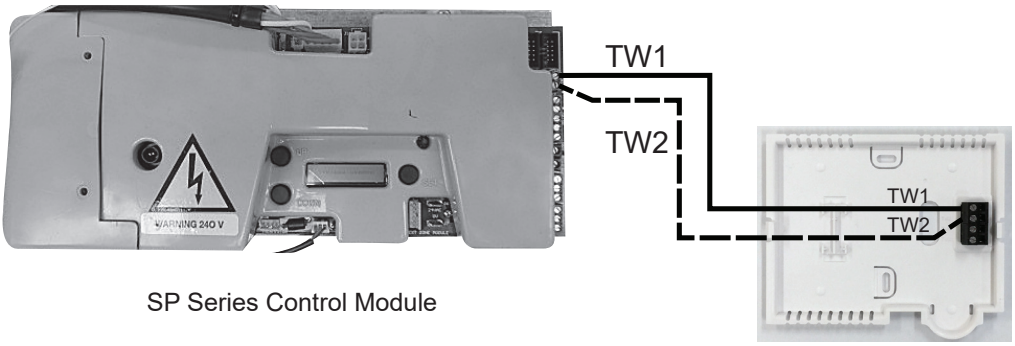
c. Draw the wires from the wall cavity and feed them through the opening in the backing plate.

d. Connect the cable to the terminal connections on the backing plate before mounting it on the wall and reassembling the Networker.

e. Connect the other end of the cable to the terminals marked TW1 and TW2 in the heater's electronic control module, refer to Diagram 18.

Note: *To connect multiple heaters, refer to Section "Connect Multiple Heaters to a Networker".*

Diagram 18. SP Series Networker Connections



SP Series Control Module

Networker Backing Plate

11.1.1 Connect Multiple Heaters to a Networker

To ensure each heater is configured correctly to the Networker, each heater must be wired to the network in parallel (refer to Diagram 19).

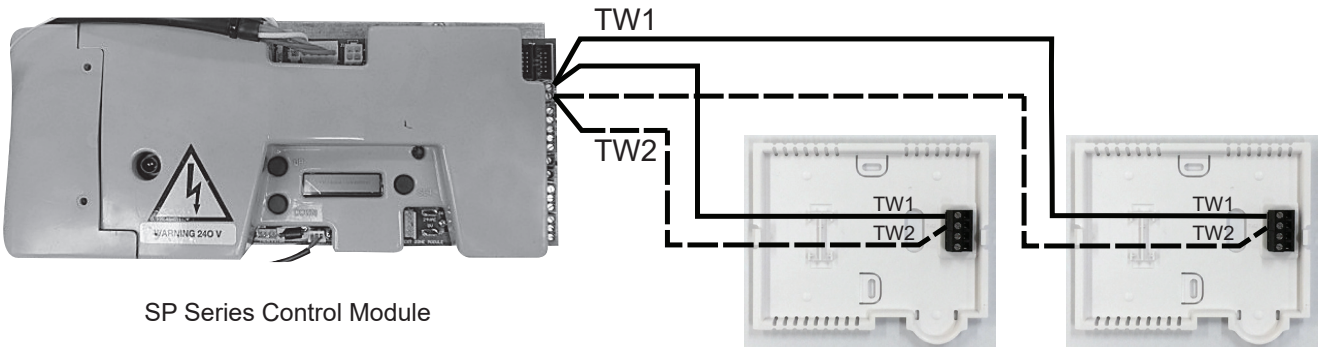
Each heater must be given a different identification number (address), starting at Number 1. To change the identification number, (refer to Section "12.1 SP5 and SP6 Heater Control Settings" on page 30).

Each heater must then be assigned to a zone. Refer to the Networker Advanced Programming Manual for further details.

11.1.2 Connect Dual Networkers

It is possible to install two Networkers on a single SP heater to allow for dual control. This is particularly useful where Adaptive Zoning is present, to allow for independent zone control from each Networker. For example, one Networker can control one zone, while the other Networker can control another zone. To connect two Networkers to a system they must be wired in parallel, not in series. Adjustments to the heaters settings can be made from either Networker, but settings are common to both Networkers. If an adjustment is made on one Networker it is immediately reflected on the other Networker.

Diagram 19. Dual Networker Connections



SP Series Control Module

Master Networker Backing Plate

Slave Networker Backing Plate

Note: *A **master** networker can be identified by the word 'Clock' beside Key 5 (while the networker is switched off).*

a. Mount the Networkers in their ideal locations and connect the wiring as shown in Diagram 19.

b. Determine which networker will be the Master and which will be the slave. There must be a Master and Slave Networker for a dual Networker system to operate correctly. All Networkers come set as Masters by default, which means only the Slave Networker needs to be configured.

c. Press key 5 on the proposed Slave Networker, and the screen will display the message “Clock setting mode”. Ensure that the clock is flashing on the display before proceeding.

d. Press and hold Key 2 and Key 4 until the message 'Installer parameter access' displays.

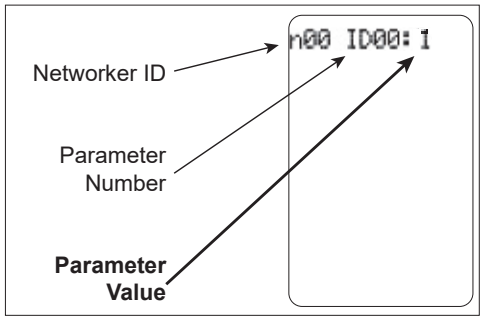
e. After the message clears, press the mode key Mode key until 'n01 ID00:1' displays (refer to Diagram 20).

f. Turn the rotary dial to change the parameter value displayed at the top right of the screen to the number required for the Slave (Master = 1, 2 = Slave = 2).

g. Once this parameter value has been set, push the ON/OFF button to exit this installer set-up program.

Note: *All Networkers come configured as Masters by default. Two Masters cannot be connected to one system otherwise the system will not function properly. Also if both Networkers are set as Slaves, the Networkers will lock out and will not be accessible.*

Diagram 20. Networker Identification



11.1.3 Change a Networker from Slave to Master

Use this method if altering a current installation or if both Networkers have been set to Slave by mistake.

a. Detach the networker from the backing plate. The controller powers down.

b. While continually pressing Key 3 and Key 5:

- mount the Networker onto the backing plate, and
- wait until *Set this Networker’s address!* displays.

If the message does not display, repeat from Step a.

c. Now the parameter value can be set to “1” by rotating the dial, which will make this Networker a Master.

d. Press the on/off button to save and exit.

11.1.4 Network 516 Manual

Refer to the Network 516 manual for further information about the following:

- Networker installation parameters
- Adaptive zoning
- Controlling multiple appliances with one networker
- Grouping multiple appliances into zones using one networker.

11.1.5 ZonePlus

Refer to the ZonePlus Installation Manual if installing a ZonePlus control system.

11.2 PROGRAMMABLE AND MANUAL THERMOSTAT INSTALLATION

Programmable and Manual thermostats can be connected directly to SP series heaters.

For connection details, refer to the installation manual supplied with the Thermostat.

Note: *Only use alkaline batteries in a manual Thermostat. Other types of batteries can cause unwanted operation of the heater when they reach the end of their life*

12. COMMISSIONING AND CONTROL SETTINGS

All of these heaters have been factory tested, but should be commissioned and adjusted in accordance with the following instructions to ensure efficient and optimal heating performance.

Remember:

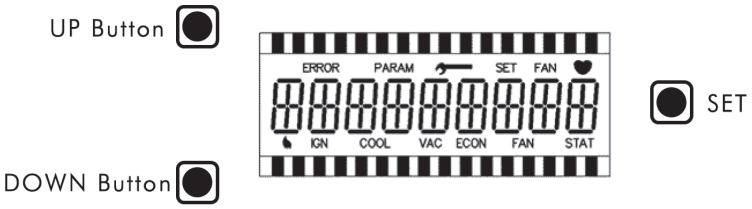
- Mains power must be switched OFF before any wiring is touched.
- Commissioning must be carried out by a qualified trades person.
- If the heater cannot be adjusted to operate in accordance with these instructions, contact the Customer Service Centre (refer to the back cover).

12.1 SP5 AND SP6 HEATER CONTROL SETTINGS

The heater module has 3 push buttons. On the right is a SET button and on the left are the UP and DOWN buttons.

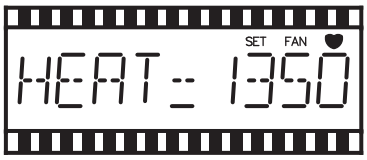
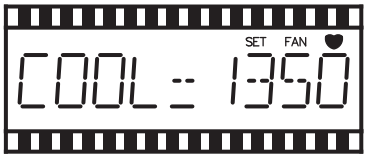
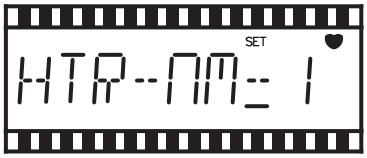
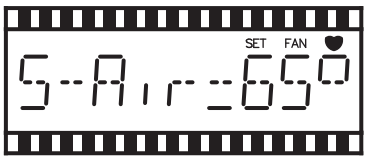
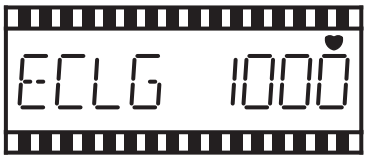
- To change an installer set-up parameter, press and quickly release the SET button, the word “SET” should now appear on the top line of the screen.
- The UP and DOWN buttons may now be used to increase or decrease the value on any setting displayed on the screen.
- By pressing the SET button the display will cycle through the installer set-up parameters in the order on the following page.

Diagram 21.



12.2 INSTALLER PARAMETERS – CONTROL LCD DISPLAY SETTINGS

Table 9. Heater Installer Parameters – SP5 and SP6

<table>
<tr><th>No.</th><th>DISPLAY</th><th>DESCRIPTION</th></tr>
<tr><td>1</td><td>
</td><td>HEATING: MAXIMUM FAN SPEED SETTING
The number displayed is the default fan speed setting. That is, the fan RPM setting for normal heating operation. This setting can be adjusted from 500 to 1350 and should be set to meet the installation airflow requirements. It is recommended that a fan speed of at least 1000 be selected as lower speeds are more likely to result in overheating if the system has not been balanced correctly.</td></tr>
<tr><td>2</td><td>
</td><td>COOLING: MAXIMUM FAN SPEED SETTING
The fan RPM setting for normal cooling operation. This setting can be adjusted from 500 to 1350.</td></tr>
<tr><td>3</td><td>
</td><td>HEATING: ZONING MINIMUM FAN SPEED SETTING
The minimum RPM to which the fan will operate with the maximum number of outlets closed, with the networker zoning in heating mode. This setting can be adjusted from 500 to 1350 (default is 950).</td></tr>
<tr><td>4</td><td>
</td><td>HEATER IDENTIFICATION NUMBER
(Do not alter unless multiple heaters are installed)
This parameter is used to identify each heater in priority order when more than one heater is connected on the system</td></tr>
<tr><td>5</td><td>
</td><td>CIRCULATION FAN OPERATION
The fan RPM setting in circulation mode. That is, fan operation between heating or cooling cycles when the set room temperature has been achieved.</td></tr>
<tr><td>6</td><td>
</td><td>SUPPLY AIR THERMISTOR SET POINT TEMPERATURE
The temperature that the heater gas valve modulates to maintain. This setting can be adjusted from 45°C to 70°C (default setting varies between different models) and should be set to provide a comfortable outlet temperature.</td></tr>
<tr><td>7</td><td>
</td><td>ZONE/REFRIGERATION MODE (Network 516 module mode and on-board relays). This is the selection mode for incorporation adaptive zoning and refrigeration onto the system.
<table>
<tr><th>Parameter Value</th><th>Description</th></tr>
<tr><td>0</td><td>No zone or add-on refrigeration</td></tr>
<tr><td>1</td><td>On-board or 516 Module relays can be used for Heating only zone control (up to 3 with on-board or 4 with Module).</td></tr>
<tr><td>2</td><td>On-board or 516 Module relays can be used for zone control (up to 2 on-board or 3 with Module) for Heating and Add-on refrigeration.</td></tr>
<tr><td>3</td><td>Network 516 zone control (up to 3), for Heating only.</td></tr>
<tr><td>4</td><td>Network 516 zone control (up to 2), for Heating and Add-On refrigeration.</td></tr>
<tr><td>5</td><td>Network 516 zone control (up to 4), for Heating, Add-On refrigeration control on-board.</td></tr>
</table></td></tr>
<tr><td>8</td><td>
</td><td>COOLING: ZONING MINIMUM FAN SPEED SETTING
The minimum RPM to which the fan will operate with the maximum number of outlets closed, with the networker zoning in heating mode.
DO NOT SET BELOW 1000</td></tr>
</table>

Note: *All settings are saved automatically when the on/off button is pressed to exit networker set-up mode. To leave the set up mode and return to normal operation, either leave the control untouched for 20 seconds, or keep pressing he SET button until the normal operation screen resumes, or press and hold the SET button for 3 seconds.*

12.3 SP5 & SP6 COMMISSIONING INSTRUCTIONS

With a correctly designed and installed ducted system, generally, the balancing damper in an outlet should be initially set as follows:

- Living areas: 100% open
- Bedrooms: 50% open
- Bathrooms, ensuite and laundry: 25% open.

12.3.1 Initial Ignition and Gas Inlet Pressure Check

- Attach a manometer to the inlet gas pressure test point on the gas valve (refer to label on gas valve for location) after unscrewing the captive screw 3 full turns anti-clockwise (DO NOT remove the screw completely).
- Ensure that all air has been purged from the gas piping, and then turn on the gas supply at the supply tap.
- Turn on the 240 V power supply at the power point.
- Go to the Thermostat and turn it on and temporarily set the temperature setting to maximum for commissioning purposes (see the Owner's Manual for operating instructions). Ensure that all zones (if any) are open.
- Go back to the heater and wait for the heating module screen to display "Heat = ##-#", which is a measure of the supply air temperature to one decimal place (for example the diagram below shows 23.0° C).
- You should also be able to see the burners operating; a small flame symbol will be visible on the LCD bottom line along with the words STAT (Thermostat is calling for heat), VAC (vacuum pressure is sufficient for combustion), and FAN (once the fan begins to operate). Note that the heater may not ignite on first attempt due to the presence of air in the gas line. Ignition re-attempts will be repeated automatically.
- Initially the fan will only be running at a low speed (approx 500 RPM) and then begin to ramp up to the "HEAT" set fan speed.
- Measure the gas inlet pressure after the heater has been operating for at least 1 minute. Ensure the gas pressure does not fall below 1.1 kPa for NG models at all times (2.7 kPa for LPG models) **while all other gas appliances are operating at their full capacity.** If the reading is below minimum figures stated above, then the incoming gas supply is inadequate (check supply pipe for blockage, and check pipe sizing and gas meter sizing).
- Remove the manometer after the heater has been set up and switched off, and re-tighten the inlet gas pressure test point screw.

Note: *DO NOT adjust the gas valve under any circumstances.*

If everything seems to be functioning correctly up to this point, please continue on with the commissioning procedure. SP5 & SP6 heaters will automatically reattempt ignition a few times should the ignition process be unsuccessful (IGN_RTRY will be displayed on the LCD), so give the heater time to rectify itself. It may simply be purging any remaining air through the gas components. In any event, the heater will cease ignition re-attempts and lock out with an error code if there is any problem that it can't rectify itself. If the heater does lock out with an error code, please make a note of the code then reset the heater (see the Operation manual).

12.3.2 Heater Fan Speed and Temperature Settings

The next part of the procedure requires you to set the heating settings to suit the installation. The settings are critical to provide adequate and efficient heating for the installation.

- Ensure that the Thermostat is still set much higher than the actual room temperature.
- Set the fan speed to suit the installation, adjusting it to provide sufficient but not excessive airflow. Remember, typically the fan speed is less for floor outlet systems than for ceiling outlet systems. With down-vent type ceiling diffusers, airflow in main living areas should be able to be felt down near floor level.
- You should not need to adjust the thermistor set temperature. This setting should only be adjusted if the system is NOT achieving the following temperature rise; ceiling outlets: 25º to 30º C and floor outlets: 35º to 40º C. This temperature rise is measured from the closest outlet to the heater, minus the return air intake temperature.(i.e. with a return air intake temperature of 20º C the temperature at the closest floor outlet to the heater should not register more than 60º C). This temperature rise should never exceed 45º C.

Adjustments

If the desired temperature rise is too low or too high the following adjustments may be required.

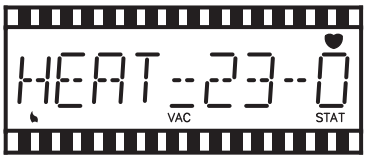
Increase the room set temperature to maximum to turn the heater on and watch the thermistor temperature until it stabilises.

Ideally, the fan speed setting should be sufficient for the heater to operate at full capacity, when all of the outlets are open and balanced as described previously. The gas rate will then be maintained at the maximum rate during the initial heating cycle, and will only decrease (modulate) the gas rate once the supply air temperature has been reached on subsequent heating cycles. This will initially allow the heater to increase the house temperature at a faster rate to maintain the customer's desired temperature level.

So, with a floor outlet system, which usually requires a low fan speed, you may have to increase the thermistor set temperature to achieve a 35º to 40º C rise and avoid modulation. If the heater still reaches the thermistor set temperature or the rise is greater than 40º C, increase the fan speed.

With a ceiling outlet system, which usually requires a higher fan speed, it is unlikely the heater will reach the thermistor set temperature and modulate. However, if it does, increase the thermistor set temperature and/or increase the fan speed to achieve a 25º to 30º C rise and avoid modulation. If the temperature rise is above 40º C investigate the reason:

- Small number of outlets on the system.
- Restrictive or poorly balanced ductwork.
- Oversized heater for the installation.
- Inadequate fan speed or thermistor set point.



Adaptive Zoning

Systems that have zone damper motors that are being operated from the Networker (Adaptive Zoning) will require the zone minimum fan speed to be set to suit the duct system. This ensures optimum performance from the Adaptive Zoning functions within the heater. To do this:

- Go to the Networker and close all but one zone. If the system does not have a common zone, leave only the zone key that operates the least number of outlets turned ON (ensure this zone does not have less than the minimum number of outlets required for the heater size). If the system has a common zone then all zone keys can be turned OFF.
- Adjust the EHTG fan speed setting to provide the required amount of air from the remaining open outlets. Ensure that the temperature rise does not exceed 45º C. Do not adjust the thermistor set temperature while setting up the EHTG fan speed.

12.4 FINAL CHECKS (SP5 AND SP6 HEATERS)

- Check the temperature rise through the heater. The temperature of the warm air at any outlet should not be more than 45º C above the return air temperature. If it is, the heater will be approaching an overheat situation.
- Check that the fan continues to run while the gas burner is operating.
- Check that the fan operates in fan only mode, by operating the Networker in fan only mode (see Operation Manual).
- Ensure the required gas inlet pressure is supplied at all times during the heater's operation (this should be with all other gas appliances operating at the same time and at their full capacity).
- Go back to the Thermostat and press the ON/OFF button to turn the heater off.
- Ensure that the burners and fan turn off, then turn off the gas supply at the supply tap and remove the manometer hose from the inlet test point on the gas valve.
- Tighten the inlet test point screw, turn on the gas supply at the supply tap and test for leaks using a soapy water solution or leak detector spray.
- Replace the heater's roof, and then proceed to instruct the customer on the correct operation of the system and assist the customer with filling in the Warranty Card details enclosed in the Operation Manual.
- Issue any required documentation to the relevant people/authorities in regard to the installation of the heater, the gas connection and power supply. For example, a Certificate of Compliance and Certificate of Electrical Safety.

Note: *Assist the customer with filling in the Warranty Details on the company website:*

http://www.rinnai.com.au or www.brivis.com.au and follow the links.

13. TECHNICAL SPECIFICATIONS

Table 10.

Models	Gas Input MJ/hr		Heat Output kW		Duct Connection Pop Sizes (mm)	Minimum Recommended Return Opening		Airflow @ Total Static Pressure (L/s)				Weight (kg)	Fan Motor		Total Maximum Current (A)	Maximum Recommended Add-On Cooling Capacity (kW)
	Max Input NG	Max Input ULPG	Max Output NG	Max Output ULPG		No Filter (m^2)	With Filter (m^2)	50 Pa	75 Pa	100 Pa	125 Pa		Power (W)	Current (A)		
External																
SP615IN	58	N/A	14	N/A	300	0.26	0.39	695	665	630	595	57	315	4.2	6	10
SP623EN	86	86	23	23	300	0.26	0.39	715	690	660	630	67	315	4.2	6	13
SP623EN-XA	86	86	23	23	350	0.28	0.42	755	730	705	675	67	315	4.2	6	13
SP623IN	86	86	23	23	300	0.26	0.39	765	745	720	695	59	315	4.2	6	13
SP623IN-XA	86	86	23	23	350	0.28	0.42	795	775	755	730	59	315	4.2	6	13
SP630EN	110	110	29	29	350	0.36	0.54	960	930	890	850	89	650	4.3	6	18
SP630EN-XA	110	110	29	29	400	0.38	0.57	1075	1050	1020	985	89	650	4.3	6	18
SP630IN	110	110	29	29	350	0.36	0.54	1125	1110	1085	1065	72	650	4.3	6	18
SP630IN-XA	110	110	29	29	400	0.38	0.57	1165	1145	1120	1095	72	650	4.3	6	18
SP635IN	129	129	35	35	450	0.39	0.58	1205	1180	1155	1130	76	650	4.3	6	22
SP521EN	90	N/A	21	N/A	300	0.26	0.39	700	675	645	615	66	315	4.2	6	13
SP521EN-XA	90	N/A	21	N/A	350	0.28	0.42	740	710	685	655	66	315	4.2	6	13
SP521IN	90	N/A	21	N/A	300	0.26	0.39	785	765	740	715	53	315	4.2	6	13
SP521IN-XA	90	N/A	21	N/A	350	0.28	0.42	830	800	770	735	53	315	4.2	6	15
SP530EN	130	N/A	30	N/A	350	0.36	0.54	1055	1030	995	960	85	650	4.3	6	18
SP530EN-XA	130	N/A	30	N/A	400	0.38	0.57	1055	1030	1000	965	85	650	4.3	6	18
SP530IN	130	N/A	30	N/A	350	0.36	0.54	1170	1140	1110	1080	71	650	4.3	6	18
SP530IN-XA	130	N/A	30	N/A	400	0.38	0.57	1220	1195	1170	1140	71	650	4.3	6	18
SP535IN	150	N/A	35	N/A	450	0.39	0.58	1245	1215	1190	1160	72	650	4.3	6	22

ULPG capacities are based on propane. All ULPG units are compatible with butane/propane blends.

Note:

- *The manufacturer reserves the right to change specifications without notice.*
- *Internal units in 'lay down' position reduces rated airflow by up to 30%*

NOTES

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facebook.com/rinnainz
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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 National Help Line. Rinnai recommends that this appliance be serviced every 2 years.

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