



All Solo Variants

Technical Manual



Independently Tested by BSRIA



Independently Tested by
the Heat Transfer and Fluid Flow
Laboratory



Manufactured by
Aubren Limited



As Featured on Grand Designs



CE Certified

Technical Manual

Generic data for all variants

Solo only consumes 8-34W (the same as a reading lamp) and therefore may be either zone controlled by a timeclock, or by it's own on/off switch. Operation is controlled by a dedicated Microprocessor and associated software to ensure optimum operating efficiency.

Solo is mounted at skirting level, and accepts either rear or bottom 15mm Dia. Plastic or copper pipe.

Compensation

Solo software samples the air temperature at low level and predicts the temperature at occupant level. This feature greatly assists both economy and comfort. Low level temperatures are always colder than at occupant level, and will provide incorrect data for deciding on what level if heat is required.

Operation.

If enabled as defined above, then when the water temperature exceeds 26°C, the system starts silently and samples the air temperature over a 60 second period.

The user may set the temperature locally in the range 18-24°C via a keypad..

If the sampled air temperature is more than 1.5°C colder than selected temperature, the unit begins to increase it's output.

When the temperature is brought under control, the system reduces it's capacity.

When the temperature reaches setpoint, the system switches off and goes "to sleep" for 8 mins, after which it "wakes up" for 60 secs to sample the air temperature. If no action is needed, it goes back to sleep for another 8 mins etc, otherwise it repeats the startup sequence.

Boost

A boost button is incorporated in the user access pad, and this over rides temperature control for 20 minutes.

After the boost period elapses, the system reverts to normal temperature control,

Summer Cooling

Summer passive cooling is provided by simultaneously pressing both 'on' and 'boost' buttons for 1 second. This circulates

air at boost levels while ignoring water temperature.

Setback and Remote Shutdown

An optional facility exists for allowing the system to revert to Setback Control rather than on/of. In this mode, whatever temperature was set by the user is reduced by 5C when the system is activated by a timeclock or manual switch. This allows background warmth to be maintained, and facilitates rapid warm up when the zone is again activated.

Technical

All capacity changes are achieved with silent solid state switching, and no use is made of any noisy mechanical or interference inducing devices.

All controls and user interfaces are 100% isolated from mains voltage, and a double pole isolator is supplied fitted to each unit. Unlike conventional attempts to achieve Solo performance by others, conventional fans are not used, and each pressure generator (CE marked) is balanced for life, and guaranteed for at least 30,000 hours operation.

The typical operating sound level is 22dbA @ 0.25m in an anechoic environment, and this is considerably below background levels in virtually all locations.

Please ensure that adequate flow is available, and that reverse-return piping is used where necessary

Minimum 22mm flow and return pipes to be used for zones.

A 6-8m head pump is recommended for all circuits.

The importance of adequate flow cannot be over emphasised.

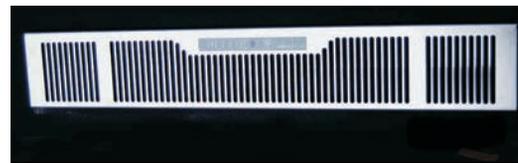
Solo Variants

Solo comes in several variants and in optional high style finishes.

The Solo Discreet range is a wall mounted series in two maximum capacity sizes (3kW and 6kW at 85C water flow rates). This series has all controls inbuilt, and unlike radiators, requires no mounting brackets.

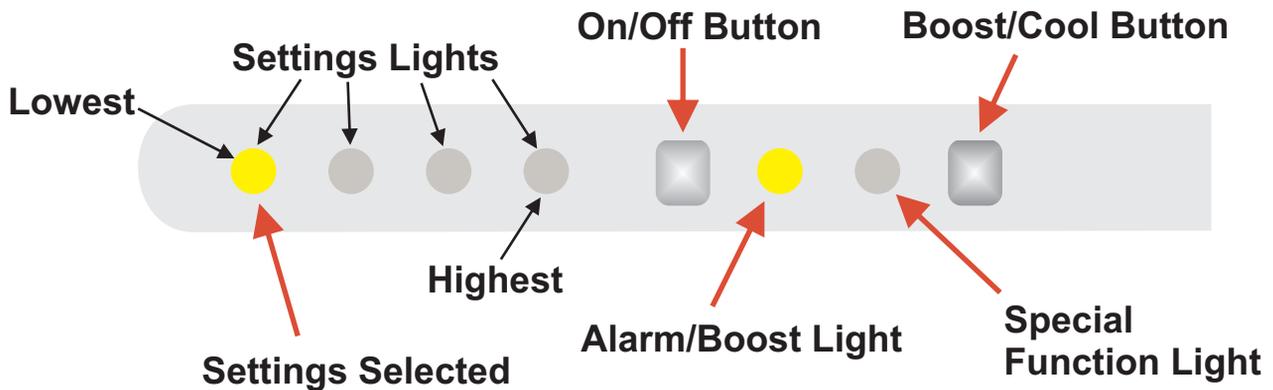
The discrete range also includes a hideaway model delivering up to 3kW under Kitchen units, or located under baths etc.

The Modular series is fully recessed into timberframe of ICF construction homes



The optional items are:
Remote Shutdown
Remote Setback
Optional Finishes (Silver etc)





Dear Customer,
Congratulations on purchasing this Solo heating unit. It will give you years of economic and controllable comfort while enhancing the decor and style of your home.
Please take a few minutes to read this as it will help you realize the full potential of this unique system of heating.

Please note

Do not allow Solo to be operated while building dust and dirt is present in your home, as operation of the Solo may be damaged

Mains on/off switch

This is located under the RHS edge of Solo and must be in the on position for Solo to operate.

Solo On/Off

When this is pressed for at least 1sec, if water temperature is greater than 26C, and if room temperature is low enough, Solo commences. If water is not warm enough, the alarm light flashes.

Comfort Setting

if this on/off button is depressed momentarily, the selected setting is incremented upwards. Repeated pressing will increment to the highest setting, and will scroll back to lowest again etc.

Boost

Momentary press will result in temperature control being abandoned for 20 minutes, and will enable a higher output setting not available in comfort settings. The Settings lights will extinguish at this point, and the Alarm Light will come on full to indicate Boost operation. Note, this also depends on water temperature being high enough to allow heating. System will revert to temperature control after 20 minutes when Alarm/Boost light will go off, and settings lights will revert to normal. Anytime during boost

period that the boost button is pressed again, boost is halted, and system reverts to normal operation. Pressing again will resume boost etc.

Summer Cooling

In summer, it may be desirable to initiate air movement in warm conditions.
If the On/Off AND the Boost buttons are depressed simultaneously for more than 1 second, then the water temperature will be ignored, and the airflow will ramp up to boost levels until the Solo is switched off. The Boost light will also come on in this mode.

Light Indicators

The setting Lights from left to right represent target temperatures.

The selected Light will flash slowly while the temperature is being raised.
When the temperature reaches setpoint, the Light will go on full.

Alarm Light

This will flash if heating is requested, but the water temperature is less than 26C.

Special Function Light

If remote setback (optional extra) is selected internally, this Light will light continuously.
If setback is selected internally, this Light will flash slowly.

Cleaning

Please only use a moist cloth with no cleaning fluids or abrasives for occasional cleaning of surfaces of Solo.

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Please ensure that Solo is protected from dirt and rubble, and it is suggested that Solo is final fixed when all other building and decorating is complete.

Solo comes complete with trailing three core cable to allow for quick connection without any access to Solo required.

Connection and possible subsequent disconnection are simple. Final pipe connections to Solo are 15mm, whereas flow and return piping from boiler or Heat Pump must be 22mm. The quick connect couplings(not supplied) are guaranteed watertight to 9 bar pressure between flow and return connections to Solo when the Solo is running.

Repeated tests have shown that assuming 22mm flow and return pipes are in place as well as a local electrical source, then installation of a Solo takes approximately 5 minutes.

To install a Solo refer to the dimensional drawings in this document, and drill three holes for the screws and dowels (not supplied). Mount the Solo so that the lower edge is approximately 75-100mm above skirting level.

Note flow and return connections, and push the flow pipe in as far as the end stop in the quick connect(not supplied). Repeat for return. Note that pipe should be cut with a ring cutter to avoid burrs damaging the valve seals. Open the in line valves. Connect the three core cable, and that's it.

To remove flow and return pipes, turn valves off, press downwards on the grey plastic ring on each quick connect(not supplied) in turn, and pull out pipes. Once system is filled, open highest bleed screw until air is purged.

Piping and Pumps
Ensure that 22mm flow and return piping is used for all normal installations, and each circuit should have 6-7 Solo's max **on a 22mm circuit.**

Always use a 6m head pump.

Electrical



As Solo has an on-board 2-pole isolator, no fused spur

is usually required, and simply connecting to a suitably backed up mains source is all that is needed. Solo only consumes less than 8-18 watts in normal operating mode.

Troubleshooting:

No Heat: Check if water temperature is high enough to allow operation, -alarm light should flash.

No Operation: Check if power is connected and on/off switch under RHS is switched on.

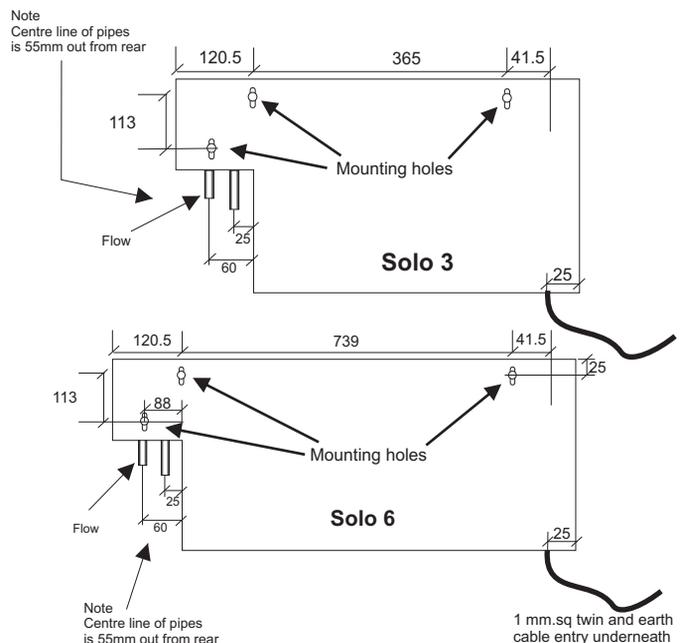
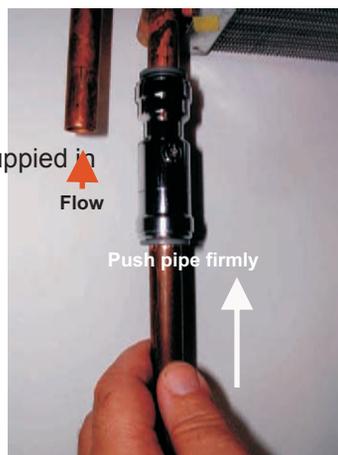
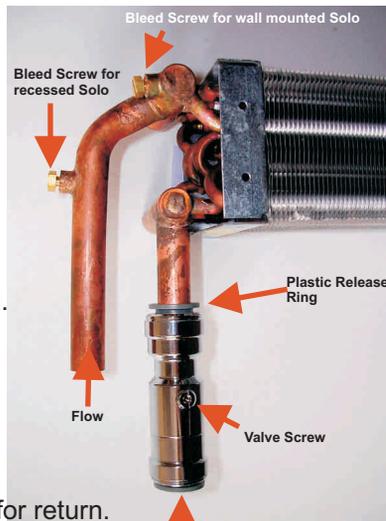
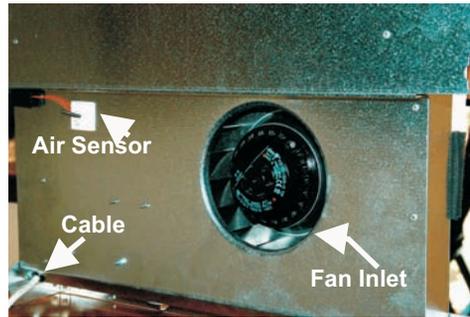
Inadequate heat: This is always a low flow issue, assuming the coil is correctly bled of all air. Please review piping and the pump selection.

A simple test for low flow is, if a noticeable temperature difference can be hand felt between flow and return connections to Solo when the Solo is running.

Operation with Radiators: Solo's are ultra low water volume devices, and should ideally not share circuits with radiators, as radiators will starve the Solos of water. If it is a requirement that Solos are added to a radiator circuit, firstly check to ensure that the flow and return pipework is 22mm. If it is 15mm or 1/2" poor or no performance will usually result.

When Solo is installed. initially turn off all radiators and check that Solo operates correctly. Next turn all radiators on, and adjust throttling valve on each radiator (opposite end to hand valve) and reduce flow until Solo operates.

Solo does not switch on: Check status of temperature selection lights. Select the highest setting, and if the light is on and not flashing, then some local heat source is artificially heating the temperature sensor.



All data applies only to Solo Discreet Range

Water Flow Data

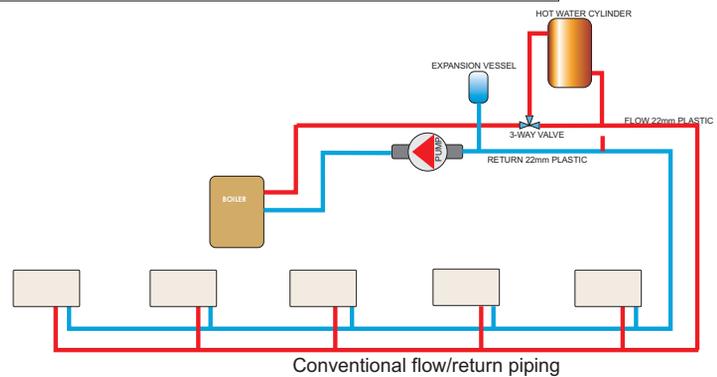
Water Flow Rate l/s	Model 6	Model 3	Capacity variation %	
	Pressure Drop kPa	Pressure Drop kPa	Model 6	Model 3
0.12	9.9	7.5	101	101
0.10	6.9	5.4	100	100
0.08	4.5	3.6	98	99
0.06	2.7	2.1	96	97
0.05	1.8	1.5	94	96

The pressure characteristics of Solo were designed to facilitate even flow sharing by ensuring that the pressure drop at various flow rates considerably exceeds the piping friction loss.

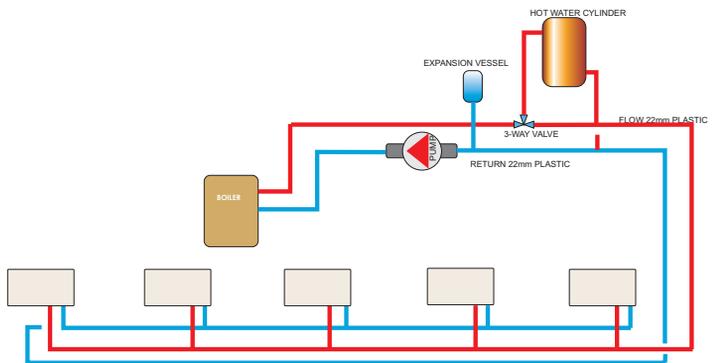
Care must therefore be taken to ensure that adequate pumping capacity exists to guarantee adequate flow. A 6m head pump is suggested, and approximately 6-8 Solo units max per 22mm flow and return circuit is recommended. It is suggested that reverse return pipework be used where possible.

The performance data must be derated as outlined above if lower flow rates are opted for.

Pipe connections to Solo are 15mm dia. and space exists internally in the units to allow for flow isolators if required



Conventional flow/return piping

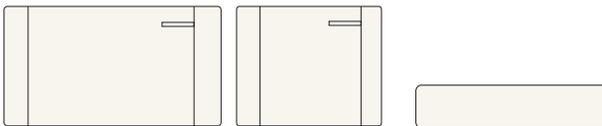


Reverse return piping schematic

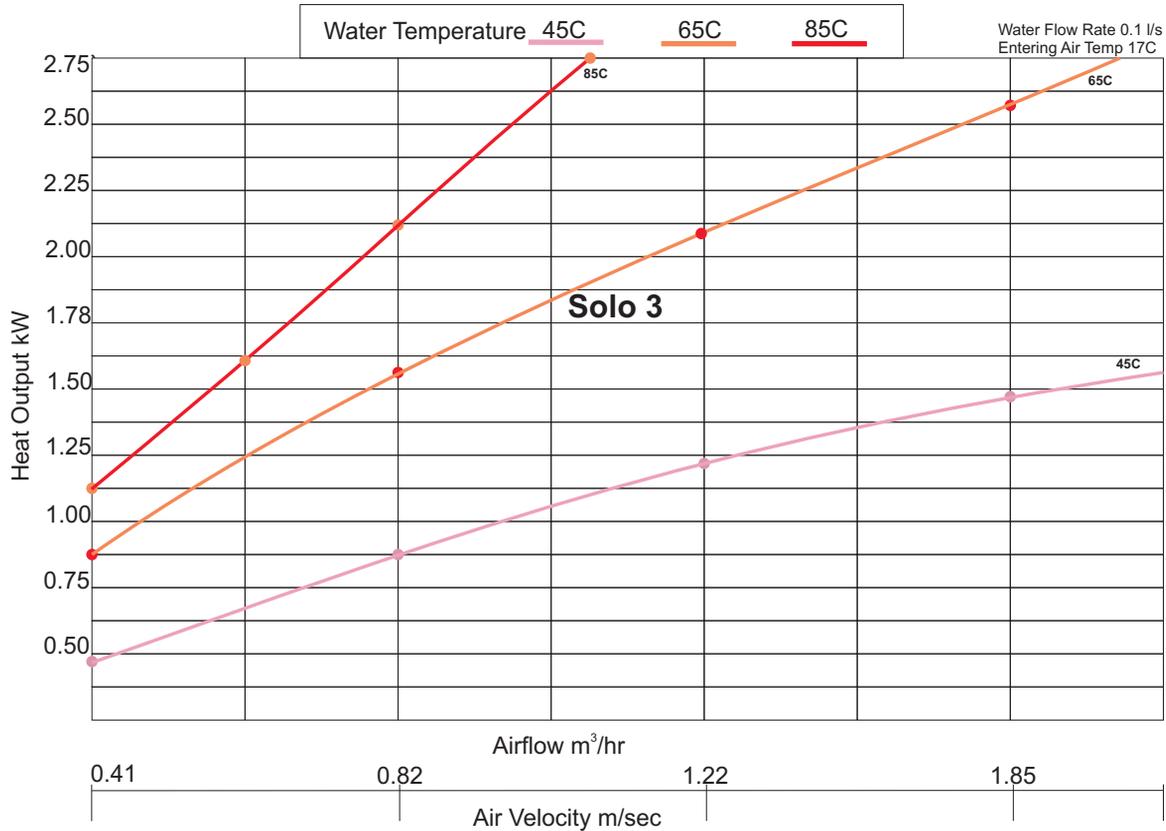
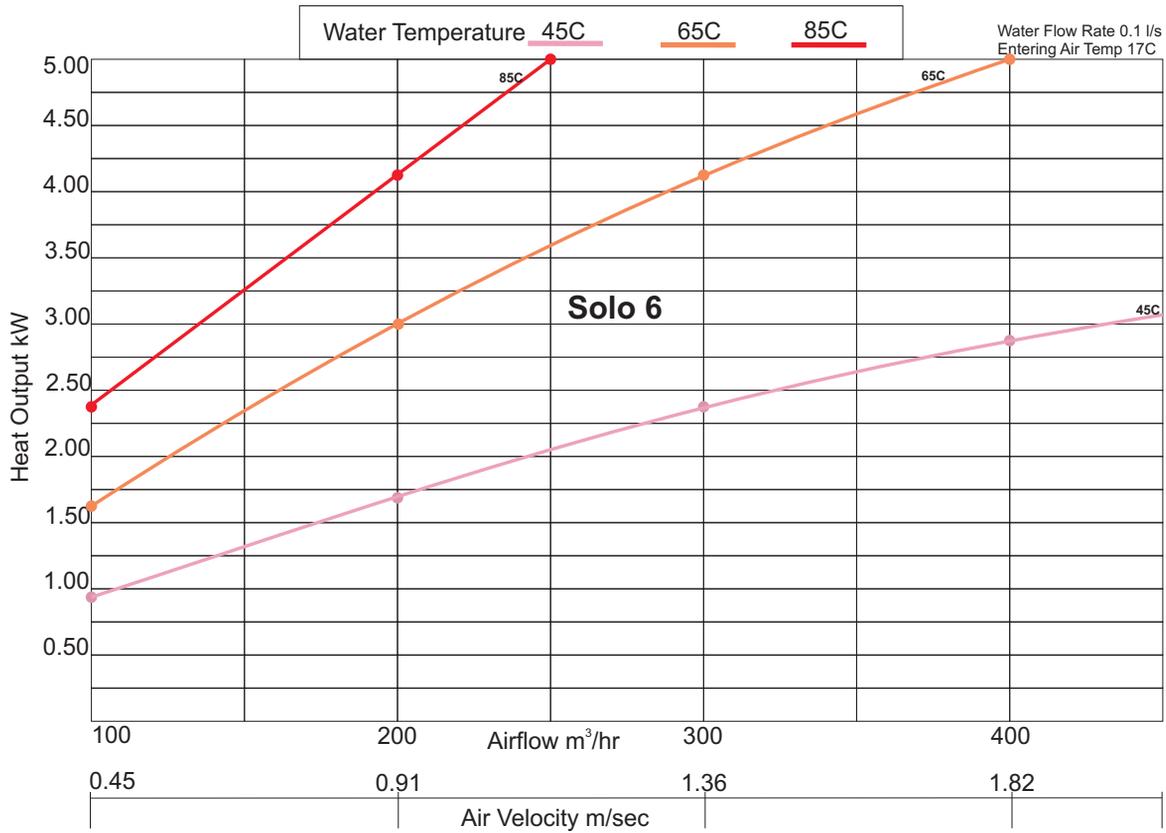
The standard configuration features:
 On board air temperature sensing
 External temperature selection via keypad

Solo configurations

Model 06



All data applies only to Solo Discreet Range



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Sound and Application Data

All data applies only to Solo Discreet Range

As manufactured, **Solo 6** is set such that the various capacities are as follows:

	Airflow m3/hr	Velocity	Capacity @85C	Capacity @65C	Capacity@45C
Low	100	0.45m/sec	2.4kW	1.6kW	0.9kW
High	155	0.68m/sec	3.4kW	2.5kW	1.4kW
Boost	200	0.81m/sec	4.2kW	3.0kW	1.7kW

Based on entering air temperature 17C

As manufactured, **Solo 3** is set such that the various capacities are as follows:

	Airflow m3/hr	Velocity	Capacity @85C	Capacity @65C	Capacity@45C
Low	50	0.40m/sec	1.13kW	0.87kW	0.40kW
High	62	0.53m/sec	1.35kW	1.10kW	0.60kW
Boost	82	0.70m/sec	1.90kW	1.36kW	0.77kW

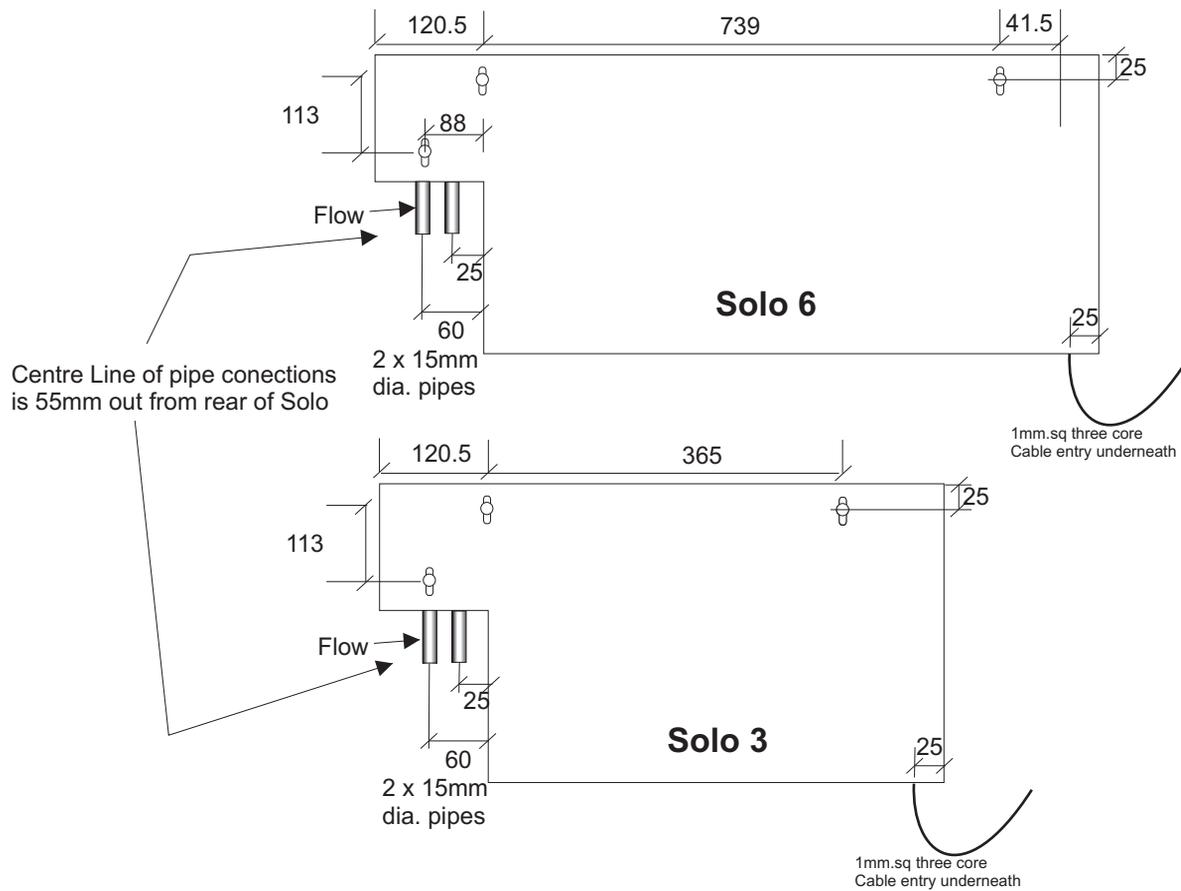
Based on entering air temperature 17C

Sound Data	Model 6	Model 3
Capacity Setting	dBA	dBA
Low	22.2	22.4
High	33.9	33.2
Boost	49.6	49.3

Note: All sound test were performed in an anechoic environment at 0.25m from the Solo in question.

Significant improvement can be expected in a normal residential or commercial environment with absorbent materials and surfaces

All data applies only to Solo Discreet Range



Pipe connections are as shown, and are either 15mm dia. Plastic or copper. Please note flow connection on LHS.

Electrical connection is via 3-core 1mm.sq or 1.5mm.sq
Trailing cable supplied with the Solo.
This is connected to a junction box or similar, and Solo is equipped with a double pole isolator located underneath lower edge on RHS.

Cutout Dimensions and installation for Discrete Hideaway



Install flexible hose connections (not supplied) as shown, and also connect electrical supply. Use bleed screws to purge air from the Solo until clear water is emitted.

Insert the Solo through the prepared slot and fasten the chassis to the wooden surround by inserting screws on each side via the holes provided as shown. Be careful not to displace the two filters.



Hang the front stainless steel panel on the lip provided over the keypad, and press home the two locking brass stud ball fasteners. Connect ribbon cable (supplied) to cable socket on the unit. Hang panel from top lip and press bottom to lock.