



BENSON

EnviroAir

Gas Fired Heating, Ventilation & Cooling Units



AMBIRAD
HEATING AND VENTILATION SOLUTIONS



EnviroAir



Gas Fired Heating, Ventilation & Cooling Units

The Benson EnviroAir is a new generation of gas fired air heaters to provide combined heating and ventilation with optional cooling.

The units are available with a wide range of heat outputs and cooling capacities. The units are available as non-condensing heaters with thermal efficiencies above 91% or fully condensing heaters with thermal efficiencies of 102% (ncv).

The design combines high thermal efficiency, quality components and ease of maintenance for enhanced life expectancy and reduced life cycle costs.

The new range provides higher thermal efficiencies and reduced emissions with the addition of optional cooling and improved air filtration.

Model Range

BSDH models are available with a short fan cabinet for applications requiring a simple return air or fresh air connections without filters.

Alternatively BSDH units can be supplied with an extended fan cabinet to allow filters and fresh air / recirculation air dampers to be added for full ventilation control.

BSHH condensing units are supplied as standard with extended fan cabinets. External static pressure up to 400 pascals, dependent on motor size selected and options fitted.

Features & Benefits

- > EnviroAir gas-fired units incorporate patented Tcore² 4-pass heat exchanger technology for optimum efficiency and enhanced life expectancy
- > BSHH models also incorporate a patented MacroChannel heat exchanger to provide 8-pass heat exchanger design with full load efficiency of 102%
- > Choice of titanium stabilised aluminised steel or stainless steel heat exchangers to suit application
- > Single burner with multi-try ignition provides enhanced reliability
- > Patented self-aligning burner eliminates possible flame impingement and premature heat exchanger failure



Airmix

The Airmix distribution ducts provide a viable alternative to traditional metal ductwork distribution for applications where ductwork is exposed.

Each duct is individually designed and manufactured to suit distribution, mounting height and application requirements.

Computer designed ducts are perforated precisely to suit each application and act as induction nozzles to promote very high volume turnovers, providing evenly diffused air distribution both horizontally and vertically.

- > Rapid installation reduces on site costs
- > Range of colours provides aesthetic appearance without the additional cost and ongoing maintenance of on site painting
- > Induction effect provides automatic high level air recirculation and eliminates requirement for additional installation of high level fans
- > Evenly diffused air distribution without draughts
- > Low noise

Air Distribution

The units are ideal for ducted installations with a choice of motor size and drives to provide external static pressures up to 400 pascals (dependent on options fitted). An adjustable pulley is fitted to the motor to simplify on site airflow adjustment for final balancing.

The units may also be used for free-blowing applications with a choice of optional outlet louvres, induction nozzles and 30 or 60 degree downflow heads.

Units may also be supplied with purpose designed air distribution systems.

Air Distribution Nozzles

For large open areas, air induction nozzles provide even air distribution with automatic high level air recirculation.

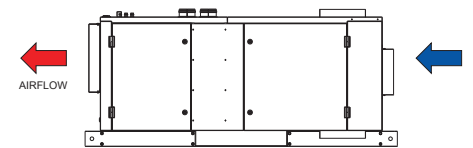
The nozzles are capable of an air throw of up to 60 metres and the high volume turnover induced eliminates the requirement to install additional high level recirculation fans.

Nozzles may be grouped on a distribution plenum to provide controlled terminal velocities on both heating and cooling modes or may be supplied complete with mounting plates for fitting to conventional grille shoes.

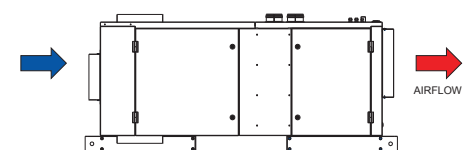
The rubber nozzles provide excellent acoustic reduction at high outlet velocities and may be adjusted through 60° for controlled air direction.

Service Access

All motor and burner controls are accessed from a single side. Units can be supplied with the controls access on either the right hand or left hand side, this must be clearly specified at order stage and cannot be changed once the units are manufactured.



Left Hand Access



Right Hand Access

BENSON

Gas fired heating, ventilation & cooling units

BSDH model Patented 4 pass vertical heat exchanger provides high thermal efficiency combined with extended life expectancy. Integral condensate drain between third and fourth pass removes the risk of condensate build up when units operate on fresh air during winter periods.

BSHH model consists of patented Tcore² heat exchanger with aluminium MacroChannel section to provide increased thermal efficiency up to 102%.

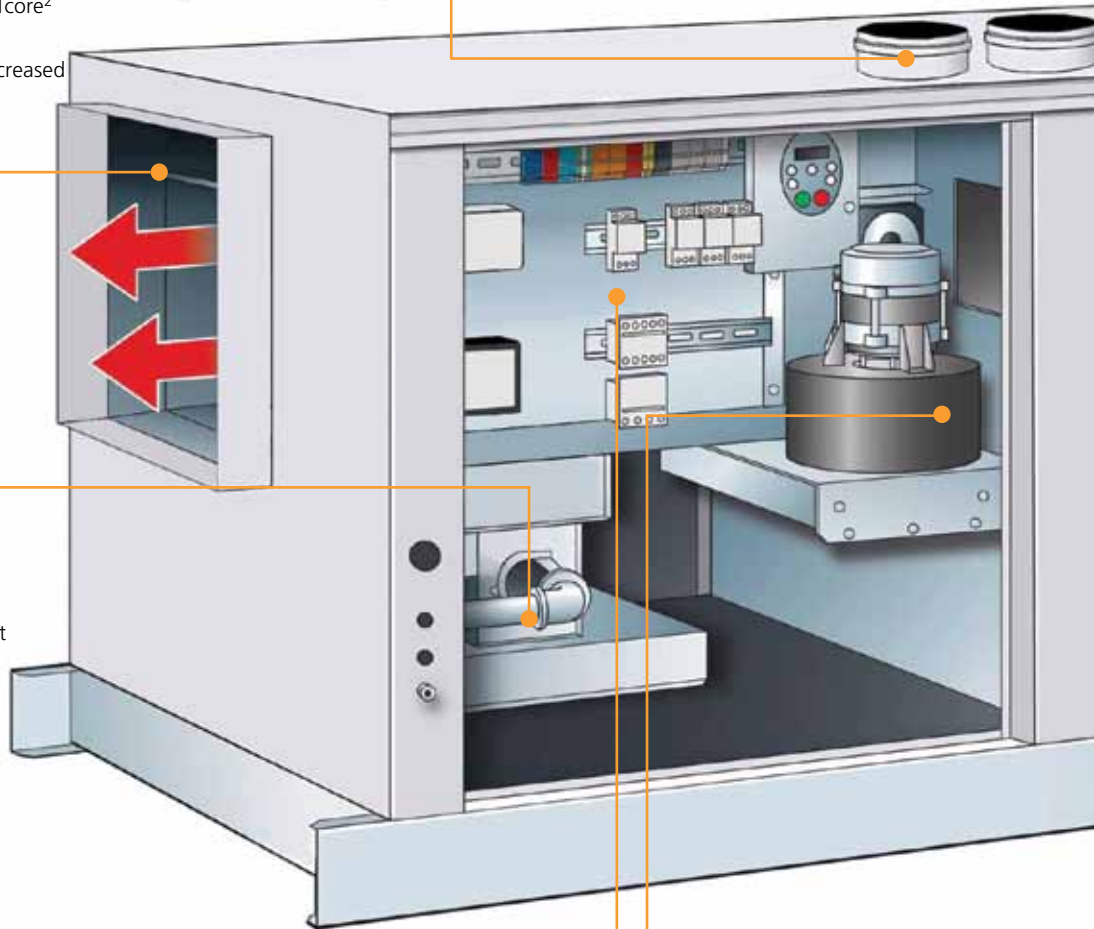


Balanced flue operation eliminates the requirement for additional plant room ventilation. The balanced flue terminal provides both the flue outlet and combustion air inlet and requires only a single building penetration. Optional balanced flue wall outlet or roof outlet terminals are available.



Single burner with multi-try ignition provides enhanced reliability. Patented self-aligning burner eliminates risk of flame impingement and premature heat exchanger failure. Burners may be specified for on/off, high/low or fully modulating control.

A microprocessor burner control provides full safety monitoring.



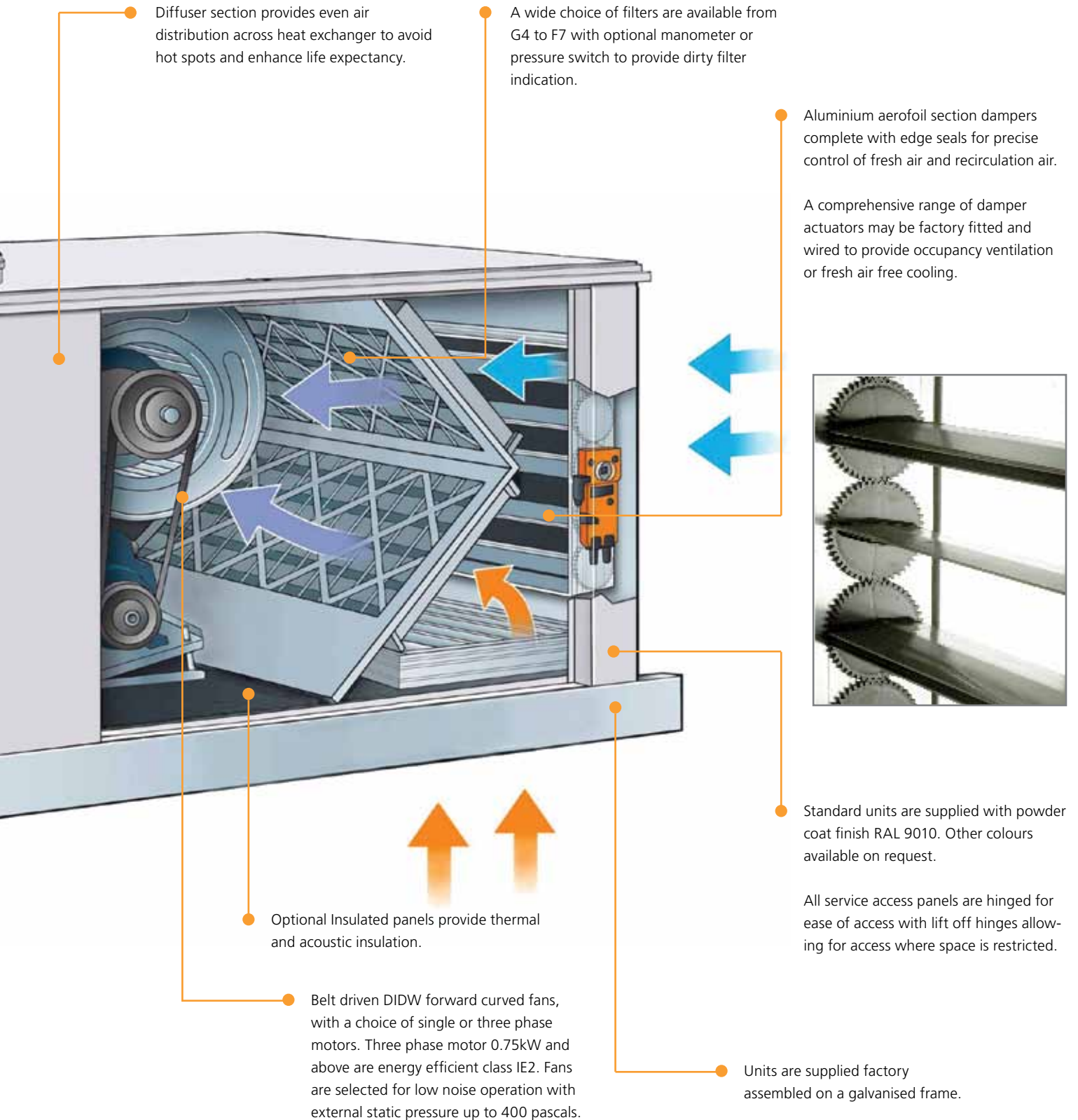
Units are supplied fully wired complete with all motor starters, an optional external isolator may also be fitted. Unit electrical protection IP20.

A wide variety of control options is available to provide fully integrated control.

Fan assisted flue with venter fan is mounted on top of stainless steel collection chamber to eliminate possibility of corrosion.

An aluminium epoxy coated venter fan is fitted on BSHH units.





Diffuser section provides even air distribution across heat exchanger to avoid hot spots and enhance life expectancy.

A wide choice of filters are available from G4 to F7 with optional manometer or pressure switch to provide dirty filter indication.

Aluminium aerofoil section dampers complete with edge seals for precise control of fresh air and recirculation air.

A comprehensive range of damper actuators may be factory fitted and wired to provide occupancy ventilation or fresh air free cooling.

Optional Insulated panels provide thermal and acoustic insulation.

Belt driven DIDW forward curved fans, with a choice of single or three phase motors. Three phase motor 0.75kW and above are energy efficient class IE2. Fans are selected for low noise operation with external static pressure up to 400 pascals.

Adjustable drive pulley allows for on-site system balancing.

Standard units are supplied with powder coat finish RAL 9010. Other colours available on request.

All service access panels are hinged for ease of access with lift off hinges allowing for access where space is restricted.

Units are supplied factory assembled on a galvanised frame.



Total Project Support

Benson offers a full range of services to ensure optimum customer satisfaction. The services available include investigative site visits and assistance with system design including:

- > Detailed schematic drawings
- > Running costs and payback calculations
- > Liaison with installation contractors
- > Commissioning
- > Warranty work
- > Tailored service packages

Additional Control At The Touch Of A Button

All models are compatible with Benson SmartCom control systems. SmartCom units incorporate a host of features such as self learning optimised start-up to ensure



SmartCom³
control panel



Radiant black
bulb sensor

(Please refer to separate leaflet 'SmartCom Energy Management Control' for full details)

SmartCom Features & Benefits

- > Alphanumeric backlit display with angled screen for easy viewing
- > Remote burner lock out facility
- > Easy-set overtime and holiday periods
- > Hours run metering and service data logging
- > Compact IP30 enclosure complete with top or bottom cable entry
- > Security – optional passwords prevent unauthorised access to unit
- > Dual temperature settings for sports/ nonsports comfort heating

Enhanced Capital Allowances

The Government's Enhanced Capital Allowance scheme actively encourages industry and commerce to reduce energy consumption by promoting the use of energy efficient equipment.



This symbol verifies that the product has been independently assessed and qualifies for the ECA scheme, an upfront tax relief enabling businesses that invest in energy-saving equipment to claim 100% first-year capital allowances against their taxable profits.



Flue Installation

For internal applications the balanced flue terminal provides both the combustion air inlet and flue outlet from a single building penetration. The terminals are ordered separately from the heaters to suit either a wall outlet or roof outlet. Additional flue and combustion air pipes may be added, up to a maximum of nine metres of flue pipe, plus nine metres* of combustion air pipe. (This reduces by 1.5 metres for every 90° bend fitted).

A differential pressure switch shuts down the unit in the event of inadequate combustion air, blocked flue or flue fan failure.

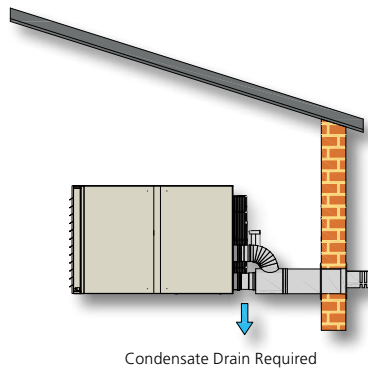
To comply with CE approvals, balanced flue appliances must be used with the manufacturer's balanced flue system.

The units are also certified for fan assisted flue installations, where the combustion air is to be drawn from inside the building; an alternative wall or roof terminal is required for this application. Maximum flue length 14 metres (12 metres on model 100).

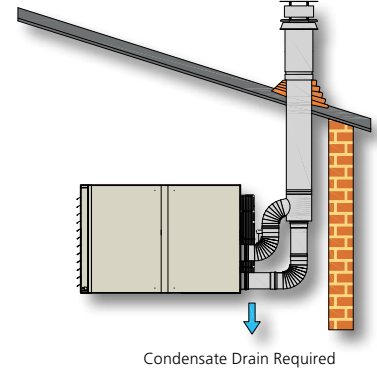
*up to 7.5 metres for model 100

Heater positions and flue arrangements are indicative.

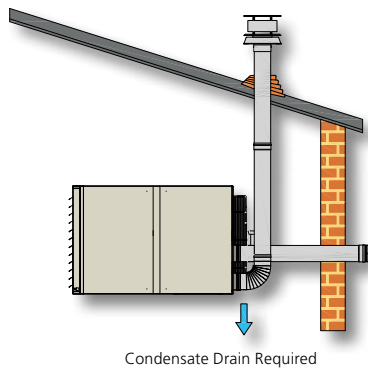
For heater and flue clearances please refer to our technical manual.



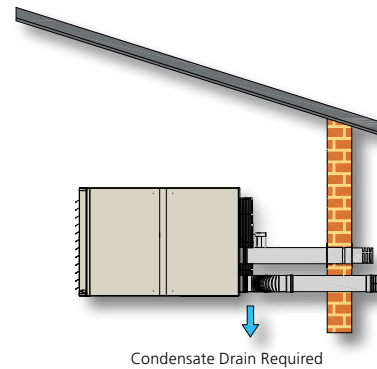
Balanced flue wall outlet (type C12) eliminates expensive roof opening and flashing



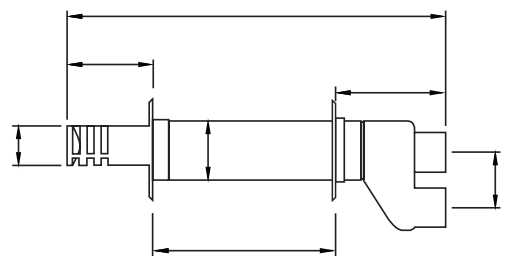
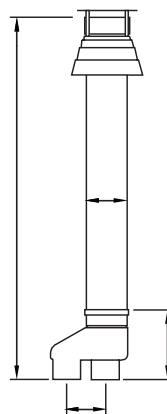
Balanced flue roof outlet (type C32)



Combustion air through wall, flue outlet through the roof (C52)



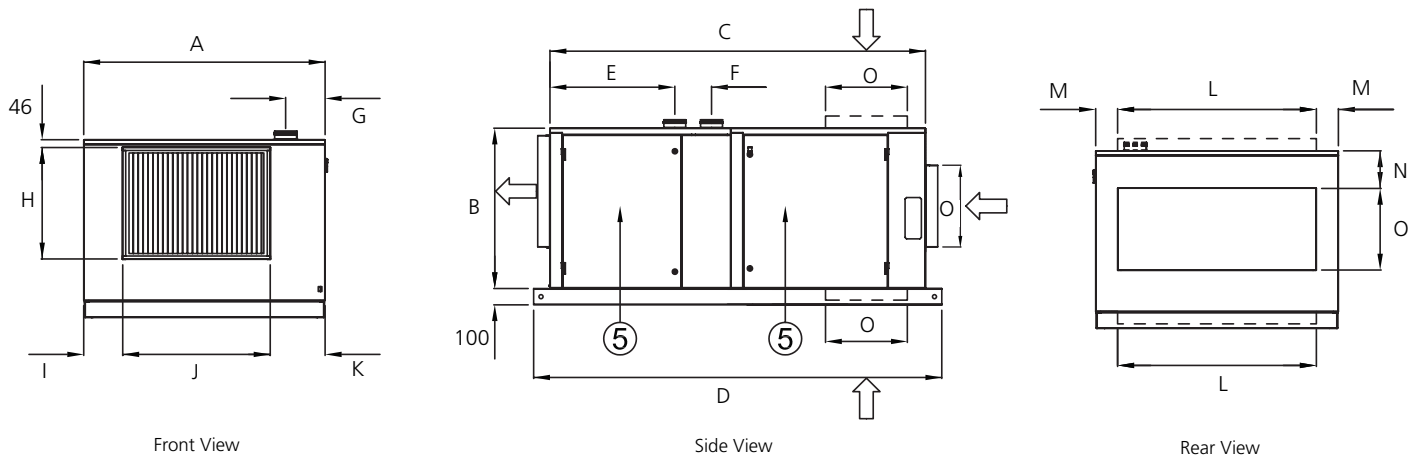
Separate combustion air and flue pipes (type C12) for applications where wall thickness exceeds maximum length shown in flue dimension table



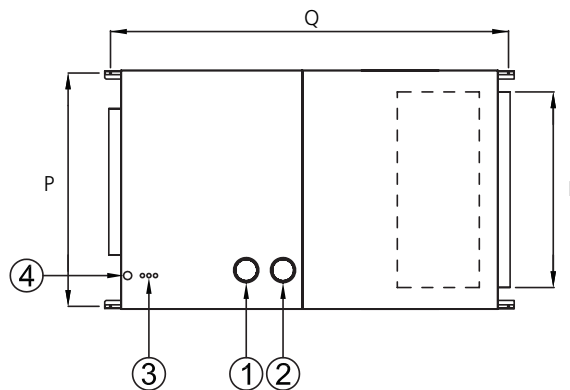
Flue Dimensions (mm)

Model	Vertical concentric flue terminal		Horizontal concentric flue terminal	
	Ø100mm	Ø130mm	Ø100mm	Ø130mm
A	1361	1973	775	940
B	140	225	140	225
C	n/a	n/a	100	130
D	150	200	150	200
E	n/a	n/a	170	180
F (maximum wall thickness)	n/a	n/a	370	370
G	253	355	225	355

SDH (short fan cabinet)



1. Combustion air inlet
2. Flue outlet
3. Electrical connections
4. Gas connections
5. Access door

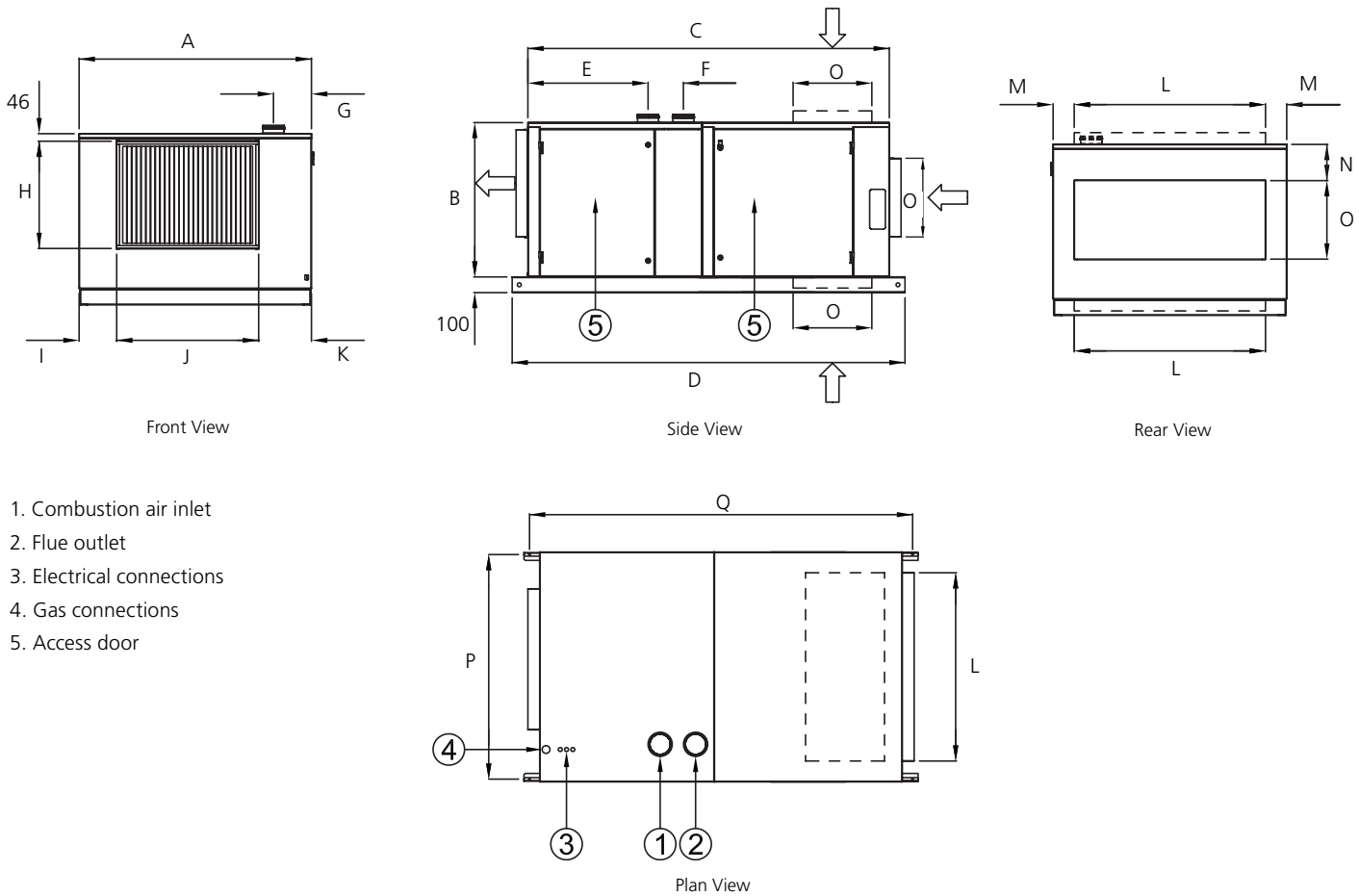


Dimensions

Model		BSDH25	BSDH30	BSDH35	BSDH43	BSDH55	BSDH73	BSDH100
A	mm	840	1094	1094	840	840	1268	1468
B	mm	753	753	753	988	988	988	988
C	mm	1454	1454	1454	1722	1722	1722	1722
D	mm	1654	1654	1654	1922	1922	1922	1922
E	mm	574	574	574	842	757	765	765
F	mm	140	140	140	140	225	225	225
G	mm	190	190	190	190	190	240	240
H	mm	451	451	451	686	686	686	686
I	mm	28	28	28	28	28	234	235
J	mm	583	837	837	583	583	710	901
K	mm	229	229	229	229	229	324	332
L	mm	600	700	700	600	600	1000	1200
M	mm	120	197	197	120	120	134	134
N	mm	212	212	212	229	229	229	229
O	mm	300	300	300	500	500	500	500
P	mm	806	1060	1060	806	806	1234	1434
Q	mm	1584	1584	1584	1852	1852	1852	1852
Flue and combustion collars (1,2)	mm	100	100	100	100	130	130	130

Typical configuration shown above for SDH complete with mixing box. For alternative configurations please consult AmbiRad. Unit shown with left hand access, units can also be supplied right hand access. Left hand access or right hand access must be specified on ordering as this cannot be changed once the units are manufactured.

SDH (extended fan cabinet complete with integrated filter cabinet)



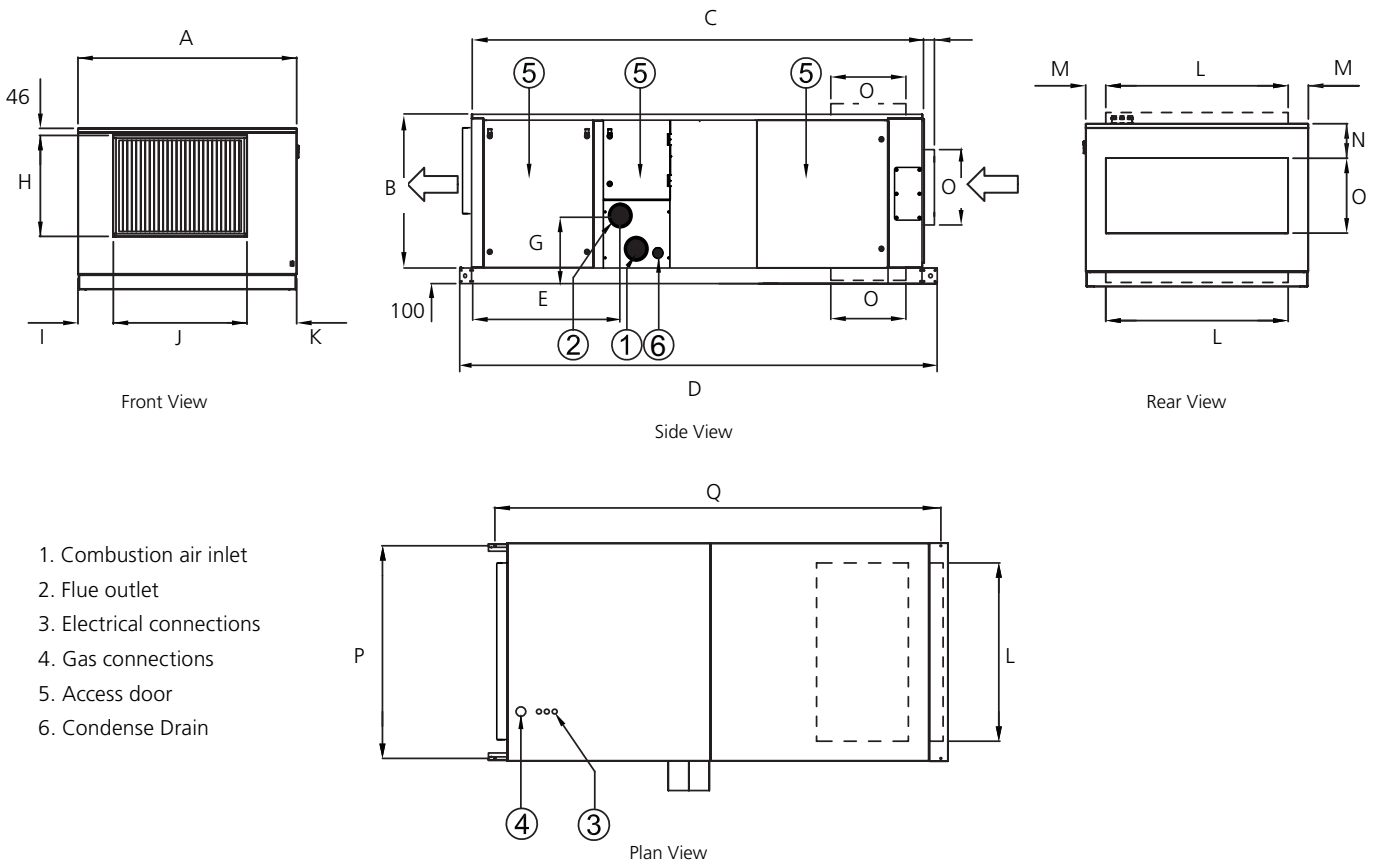
1. Combustion air inlet
2. Flue outlet
3. Electrical connections
4. Gas connections
5. Access door

Dimensions

Model		BSDH25	BSDH30	BSDH35	BSDH43	BSDH55	BSDH73	BSDH100
A	mm	840	1094	1094	840	840	1268	1468
B	mm	753	753	753	988	988	988	988
C	mm	1860	1860	1860	2300	2300	2300	2300
D	mm	2060	2060	2060	2500	2500	2500	2500
E	mm	574	574	574	842	757	765	765
F	mm	140	140	140	140	225	225	225
G	mm	190	190	190	190	190	240	240
H	mm	451	451	451	686	686	686	686
I	mm	28	28	28	28	28	234	235
J	mm	583	837	837	583	583	710	901
K	mm	229	229	229	229	229	324	332
L	mm	600	700	700	600	600	1000	1200
M	mm	120	197	197	120	120	134	134
N	mm	212	212	212	229	229	229	229
O	mm	300	300	300	500	500	500	500
P	mm	806	1060	1060	806	806	1234	1434
Q	mm	1990	1990	1990	2430	2430	2430	2430
Flue and combustion collars (1,2)	mm	100	100	100	100	130	130	130

Typical configuration shown above for SDH complete with mixing box. For alternative configurations please consult AmbiRad. Unit shown with left hand access, units can also be supplied right hand access. Left hand access or right hand access must be specified on ordering as this cannot be changed once the units are manufactured.

SHH (Condensing heaters with optional filters and mixing dampers)



Dimensions

Model	BSHH55	BSHH83	BSHH102
A	840	1468	1468
B	988	988	988
C	2737	2737	2737
D	2937	2937	2937
E	940	940	940
G	458	458	458
H	686	686	686
I	28	235	235
J	583	901	901
K	229	332	332
L	600	1200	1200
M	120	134	134
N	231	231	231
O	500	500	500
P	806	1434	1434
Q	2867	2867	2867
Flue and combustion collars (1,2)	100	130	130

Typical configuration shown above for SHH complete with mixing box. For alternative configurations please consult Reznor. Unit shown with left hand access, units can also be supplied right hand access.

Left hand access or right hand access must be specified on ordering as this cannot be changed once the units are manufactured.

All dimensions have a tolerance of +/- 3mm

SDH Technical Data								
Model		BSDH25	BSDH30	BSDH35	BSDH43	BSDH55	BSDH73	BSDH100
Nominal heat output	kW	24	29	35	42	55	73	97
Minimum thermal efficiency (H ₁)	kW	91	91	91	91	91	91	91
Gas Consumption¹								
Natural gas G20	m ³ /h	2.77	3.35	4.02	4.85	6.30	8.39	11.19
Propane G31	kg/h	2.04	2.47	2.96	4.00	6.64	6.18	8.24
Gas connection ²	Rc	¾"	¾"	¾"	¾"	¾"	¾"	¾"
Airflow								
Minimum @ 15°C	m ³ /h	1700	2100	2500	3000	3900	5300	7000
Maximum @ 15°C	m ³ /h	3500	4200	5100	6100	8000	10600	14100
Maximum @nom. cooling capacity	m ³ /h	3500	4200	5100	5750	5750	9800	11800
Output cooling capacity								
Maximum with DX Coil	kW	17.6	20.9	29.0	36.0	36.0	50.7	65.4
Maximum with cooling water coil	kW	20.9	24.3	27.6	31.2	31.2	52.5	63.7
Motor power								
Minimum	m	0.25	0.25	0.25	0.25	0.37	0.55	0.56
Maximum	m	1.10	1.50	2.20	3.00	4.00	5.50	5.50
Maximum external static pressure	Pa	400						
Electrical supply		0.25 - 0.75 kW : 230/240V 1N - 50Hz 0.55 - 5.5 kW : 380/400V 3N - 50Hz						
Net weight	kg	212	244	246	287	289	360	430

1 Natural gas G20 Calorific value 10.48 kW/m³ GCV, inlet gas pressure maximum 50 mbar, minimum 17.5 mbar. Propane G31 Calorific value 14.0kW/kg GCV, inlet gas pressure maximum 50 mbar, minimum 37 mbar.

2 Not supply line size.

SHH Technical Data				
Model		BSHH55	BSHH83	BSHH102
Nominal heat output	kW	54	80	99
Gas Consumption¹				
Natural gas G20	m ³ /h	5.59	8.36	10.26
Propane G31	kg/h	4.12	6.16	7.57
Gas connection ²	Rc	¾"	¾"	¾"
Airflow				
Minimum @ 15°C	m ³ /h	5500	8500	10000
Maximum @ 15°C	m ³ /h	8500	10000	14000
Motor power				
Minimum	m	0.37	0.55	0.56
Maximum	m	4.00	5.50	5.50
Maximum external static pressure	Pa	400		
Electrical supply		0.25 - 0.75 kW : 230/240V 1N - 50Hz 0.55 - 5.5 kW : 380/400V 3N - 50Hz		
Net weight	kg	280	445	457

1 Natural gas G20 Calorific value 10.48 kW/m³ GCV, inlet gas pressure maximum 50 mbar, minimum 17.5 mbar. Propane G31 Calorific value 14.0kW/kg GCV, inlet gas pressure maximum 50 mbar, minimum 37 mbar.

2 Not supply line size.

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