All Heaters
Part L2B Compliant

BENSON
HEATING



Technical Data –

PV Range Vertical Room Sealed/Fan Assisted Flue Gas Cabinet Heaters

Qualified for Energy Technology List
www.eca.gov.uk

For Models

PVN Vertical Nozzled

PVD Vertical Ducted

Range & Configuration

Room Sealed or Fan Assisted Flue Gas Fired
Vertical Cabinet Heater

Nozzled Discharge	29 kW to 144 kW
Ducted Discharge	29 kW to 144 kW

Specification

Cabinet: Machine punched and folded from electro-zinc coated steel to form a robust monocoque case construction. Access to the burner and controls compartment is via a front full width hinged door. The cabinet is stove hardened, epoxy powder coated with a durable Kestrel Grey paint finish.

Heat Exchanger: Formed from aluminised steel tube into a compact yet highly efficient four pass 'S' shaped assembly the PV heat exchanger has been designed so that manufacture can be accomplished without the use of any stress inducing welding processes. Stainless steel heat exchanger tubes available as an option.

Burner: PV family heaters are fitted with a quiet multi-flame low Nox burner which in turn is complete with automatic electronic spark ignition and ionisation flame proving. The burner, in conjunction with the heat exchanger is capable of delivering efficiencies in excess of 91% nett.

Efficiency: Each heater within the range has been designed and developed with fuel efficiency in mind and efficiencies exceed the mandatory requirements of CE legislation. Additionally for the United Kingdom market all heater efficiencies are compliant with the needs of Part L2B of the 2006 Building Regulations and have been rated to meet the criteria necessary for inclusion into the Enhanced Capital Allowance (ECA) scheme.

Fuel: Heaters can be specified to operate on either natural gas (G20) or Lpg (Propane G31).

Sealed Combustion Circuit: PV heaters are all factory fitted with a power flue venter that enables the heater to be operated in either room sealed or fan assisted flue mode. The flue fan is safety interlocked with the burner control system via a pressure differential sensor.

Air Distribution: Free blowing heaters are fitted with aerodynamic discharge nozzles each of which can be rotated through 360°. Each nozzle is fitted with adjustable horizontal louvre blades to provide lateral distribution. Models 250 and above include raised nozzles (one per three nozzled heater and two per four nozzled heaters) however for height sensitive applications lower standard nozzles can be specified. Heaters for ducted applications are supplied with a duct outlet spigot. Generally return air to the heaters is via louvred inlet panels permitting air entry directly into the fan compartment. However heaters can, as an option, be fitted with alternative return air arrangements including fresh air spigots and filters.

Controls: PV cabinet heaters are supplied ready for fully automatic operation and are complete with both safety and comfort controls. Each heater is fitted with a safety overheat thermostat as well as a time and temperature control system. Two alternative control options are available.

As standard, heaters are fitted with a digital time switch, mechanical day temperature and frost protection thermostats. Alternatively heaters may be specified with a fully optimised control which includes a secure entry code facility, temperature dependent start time, digital time switch with override facility, electronic day thermostat and frost protection thermostat.

Unless otherwise specified the controls are factory fitted. As an option controls can be supplied within a console for remote mounting. Inter-connecting wiring between heater and remote consoles is by others.

All heaters have the facility of 'fan only' operation for summer air movement.

Testing, Approvals & Certification: Benson Heating is accredited with ISO 9001 quality assurance certification – certificate number FM14923. All gas fired heaters have been type tested and approved to CE standards by an independent notified body. Each heater is function tested and fired prior to despatch.

Guarantee: Benson PV gas cabinet heaters are provided with a comprehensive package of guarantees covering both the appliance and the heat exchanger, which has the further benefit of an extended guarantee. For sales within the United Kingdom the guarantee includes a 'whole appliance' twelve months parts and labour guarantee supported by a further twelve months 'parts only' guarantee whilst the heat exchanger assembly has a ten year time related warranty. For PV heaters supplied to overseas markets please refer to the relevant country documentation. All guarantees are subject to terms and conditions.

Specification

Room Sealed/Fan Assisted Flue Vertical Cabinet Heater PVN/PVD

Model				100	170	250	330	410	490
Output			kW	29	49	72	96	120	144
ECA Approved				✓	✓	✓	✓	✓	✓
Airside Data	Airflow		m^3/s	0.80	1.05	1.50	2.30	3.05	3.66
	Nozzles	PVN	no.	2	2	3	3	3	4
	Throw	PVN	m	18	19	19	26	29	26
	Fan Static	Standard	Pa	80	110	100	130	150	150
Electrics	Standard		V/ph/hz	230/1/50			415/3/50		
	Optional		V/ph/hz	n/a			230/1/50		n/a
Overall Dimensions	PVN	Height	mm	1908	1974	2507	2507	2775	2775
	PVD	Height	mm	1725	1725	1890	1890	2020	2020
	All	Width	mm	700	700	840	840	840	840
		Depth	mm	1080	1080	1395	1395	1625	1625
Flue Diameter			mm ø	100	100	130	130	130	130
Combustion Air Spigot			mm ø	100	100	130	130	130	130
Noise Level			dBA	63	64	71	74	74	76
Nett Weight	PVN		kg	192	202	330	380	440	460



Note

Where heaters are selected for the UK Enhanced Capital Allowance (ECA) scheme then they must be specified with CP4 controllers

All models have efficiency levels which meet with the minimum efficiency requirements of UK PartL2B Building Regulations

Air handling data is assessed at room ambient conditions

Throw figures provide the distance to the point where the average air velocity is 0.25 m/s

Overall height dimension includes flue/combustion air spigots, heads or extended heads where appropriate

Standard height heads can be ordered where site height is restricted

Combustion air connection not required when heater is used in 'flue only' configuration

Noise levels measured 3m from appliance.

Installation

Installation Standards: PV cabinet heaters must be installed and commissioned by a competent person and in accordance with Benson's installation and commissioning instructions, relevant local and national standards, Codes of Practice, and any requirements of Local Authorities, Fire Officer or insurers

Siting: The position chosen for the heater will need to take account of the following points -

All heaters should be mounted on a flat non-combustible base capable of supporting the weight.

Care should also be taken to ensure that the recommended clearances for maintenance, air discharge, return and re-circulation are observed.

Consideration should be given to the route and length of the flue, the provision and connection of gas and electrical supplies, potential public access issues and protection from overhead cranes, fork lift trucks etc.

For effective warm air distribution free blowing heaters should be both selected and positioned to take account of the throw characteristics and sited such that the discharge avoids any immediate obstructions, partitions or other significant obstacles. In areas where it is proposed to install more than one heater then a general scheme of uniform air circulation should be employed to provide optimum distribution.

Generally, heaters will be operated with in-built controls and temperature sensors which carefully monitors the room air temperature. In applications where heaters are installed with fresh air intakes then consideration should be given to ensure that the control and/or temperature sensors are located in a position which adequately reflects the working zone serviced by the heater. Sensors should not be located in areas subject to cold draughts.

In case of doubt relating to any aspect of heater or control siting please consult with Benson.

Gas Pipework: The gas supply pipework must be sized and installed with due regard for all current standards and legislation, flow rates and the maximum/minimum inlet pressure requirements of the heater. Isolating gas cocks and service unions must be provided adjacent to each heater.

Special Risk Areas: Where it is proposed to install a heater within a special risk area (including but not limited to areas containing flammable vapours, where petrol engined vehicles are stored, parked or serviced, where paint spraying occurs or where wood working or other flammable dust creating process are employed) then restrictions, additional regulations and requirements concerning the heater installation may apply. Additionally areas containing chlorinated or halogenated hydrocarbons, degreasing solvents, styrene's, other laminating materials or airborne silicones can cause corrosion to heat exchange surfaces and It is strongly recommended that you consult Benson before installation commences. Failure to do so may invalidate or reduce guarantee cover.

Caution: When specified in certain configurations it may be possible to install heaters in areas containing flammable vapours, high levels of airborne dust, combustible dust, chlorinated or halogenated hydrocarbons, degreasing solvents, styrene's, other laminating materials or airborne silicones however before doing so consult Benson.

Plant Room/Enclosure Siting: Provided certain criteria are met it is possible to install a PVD (Ducted) cabinet heaters within a plant room or enclosure. Where it is proposed to install a heater within such a location then the return air and discharge air arrangements must be such that they do not interfere with the operation of the flue or burner. Ideally both the warm air discharge and return air should be positively ducted to and from the heater.

Air Supply: Consideration for the provision of an air supply for combustion and appliance ventilation may be a mandatory requirement. For United Kingdom installations ventilation requirements vary according to heater location.

Where heaters are installed directly within the heated space (ie not in a plant room or enclosure) then combustion air or heater related ventilation air will generally not be required if the heater is installed in room sealed mode (ie with the positive connection of both flue and combustion air ductwork) or if the air change rate of the heated space is 0.5 air changes per hour or greater. If it is proposed to install a heater in flue only mode (ie without the positive connection of combustion air ductwork) and if the heated space has an air change rate of less than 0.5 air changes per hour then it will be necessary to provide either natural ventilation openings or mechanical ventilation.

Where heaters are installed within a plant room or enclosure then provision for both combustion air and air for general ventilation will be required by means of high and low level ventilation openings. Alternatively, the plant rooms or enclosures may be mechanically ventilated.

Flues: PV cabinet heaters are approved for use in both room sealed and fan assisted flue format. The in-built flue fan permits the heater to be sited several metres away from the point of flue/combustion air ductwork exit.

The PV cabinet heater flue/combustion air spigots are situated on the top of the heater and from which flues/combustion air ductwork may be run either horizontally or vertically. The diameters of flue and combustion air ductwork must not be less than stated in the data sections of this brochure. Benson offer a full range of compatible flue and it is strongly recommended that this flue be used.

The maximum permitted lengths given in the Installation data table on the next page are for guidance purposes and installers should be mindful that the inclusion of 45° and 90° flue bends will reduce the total available length on the basis that every 45° bend is equivalent to 0.5 metres of straight flue and every 90° bend if equivalent to 1.0 metres of straight flue.

The flue route and exit point needs to be selected carefully and it is recommended that the installer consult the installation and commissioning instructions before commencing installation.

Further Information: The foregoing is given for guidance purposes. More detailed information can be found within the relevant installation, commissioning and servicing instructions or alternatively contact Benson.

Installation Data

Room Sealed/Fan Assisted Flue Vertical Cabinet Heater PVN/PVD

Model				100	170	250	330	410	490
Fuel Connection			BSP/Rc	½	½	¾	¾	¾	¾
Minimum Gas Inlet Pressure		Nat Gas	mbar	17.5	17.5	17.5	17.5	17.5	17.5
		Lpg	mbar	37.0	37.0	37.0	37.0	37.0	37.0
Fuel Consumption		Nat Gas	m^3/h	3.38	5.63	8.33	11.12	13.87	16.63
		Lpg	m^3/h	1.30	2.16	3.21	4.28	5.34	6.41
Electrics		Supply	V/ph/hz	230/1/50			415/3/50		
		FLC	amp	3.2	3.2	7.2	3.6	5.2	6.5
Flue & Combustion Air Details	Flue Diameter		mm ø	100	100	130	130	130	130
	Combustion Air Diameter		mm ø	100	100	130	130	130	130
	Maximum Run	Horiz	m	6.0	6.0	8.0	8.0	8.0	8.0
		Vert	m	10.0	10.0	10.0	10.0	10.0	10.0
Installation Clearances		Front	mm	700	700	840	840	840	840
		Side	mm	150	150	150	150	150	150
		Rear	mm	400	400	400	400	400	400
Nett Weight	PVN		kg	192	202	330	380	440	460



Note

Fuel consumption and output figures based upon gross calorific values as -

Natural gas (G20) @ 37.78 MJ/m3

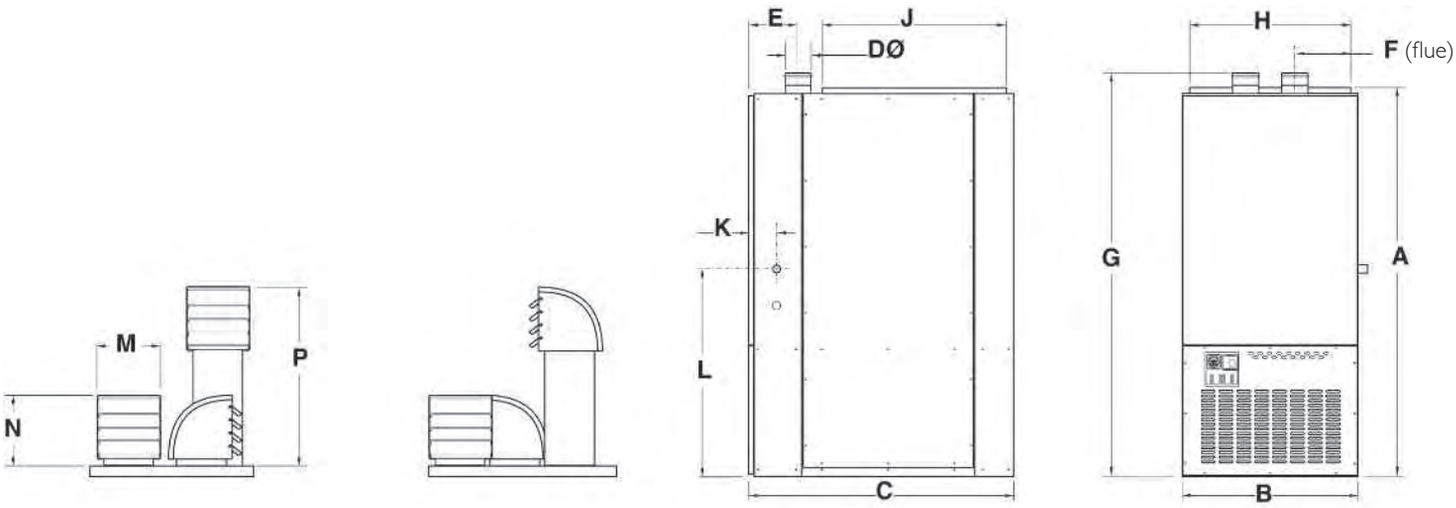
Lpg Propane (G31) @ 95.65 MJ/m3

Flue and combustion air maximum runs for guidance purposes only. Please refer to installation instructions for detailed information

Front clearance = burner compartment side

Dimensions

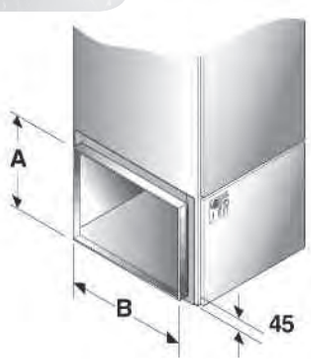
Room Sealed/Fan Assisted Flue Vertical Cabinet Heater PVN/PVD



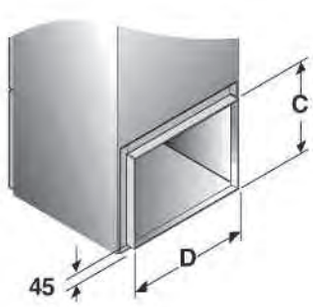
Model			100	170	250	330	410	490
A	All	mm	1650	1650	1830	1830	1960	1960
B	All	mm	700	700	840	840	840	840
C	All	mm	1080	1080	1395	1395	1625	1625
D	All	mm ø	100	100	130	130	130	130
E	All	mm	189	189	255	255	255	260
F	All	mm	263	263	311	311	283	287
G	All	mm	1725	1725	1890	1890	2020	2020
H	PVD	mm	570	570	769	769	769	769
J	PVD	mm	570	570	984	984	1214	1214
K	All	mm	103	103	169	169	95	95
L	All	mm	967	840	963	849	934	894
M	PVN	mm	280	280	314	314	355	355
N	PVN	mm	258	324	352	352	410	410
P	PVN	mm	n/a	n/a	677	677	815	815

Return Air Detail

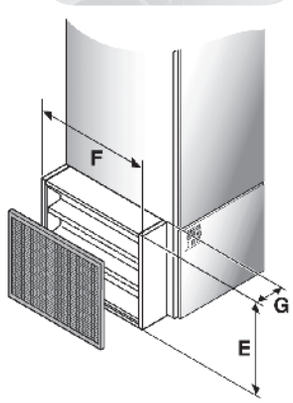
Side Return Air Inlet



Rear Return Air Inlet



Side Filter



Model				100	170	250	330	410	490
Side Inlet Spigot	All	A	mm	348	348	560	560	560	560
		B	mm	522	522	850	850	1030	1030
Rear Inlet Spigot	All	C	mm	468	468	560	560	560	560
		D	mm	650	650	677	677	677	677
Inlet Filter Assembly	All	E	mm	420	420	645	645	640	640
		F	mm	660	660	990	990	1110	1110
		G	mm	300	300	300	300	450	450

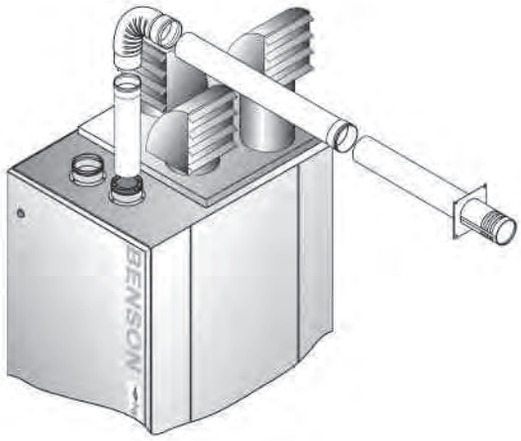
Notes

Side inlet spigots and filter assemblies require to be specified either left hand or right hand side

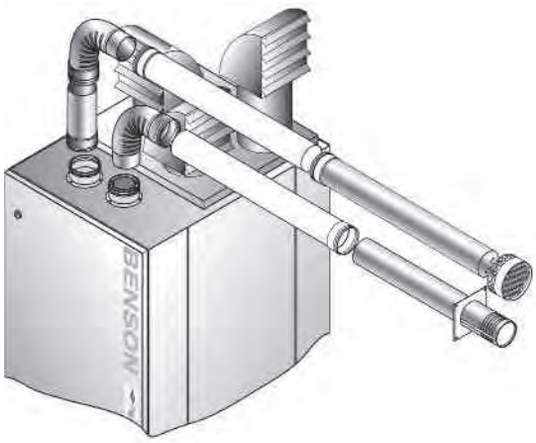
Filter assemblies can be side mounted only

Flueing Systems

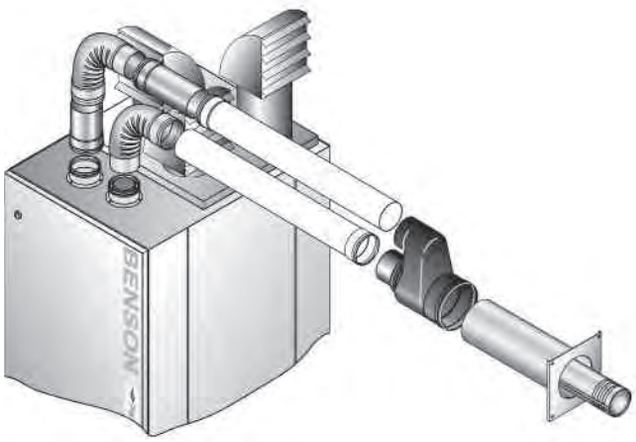
Horizontal flue only



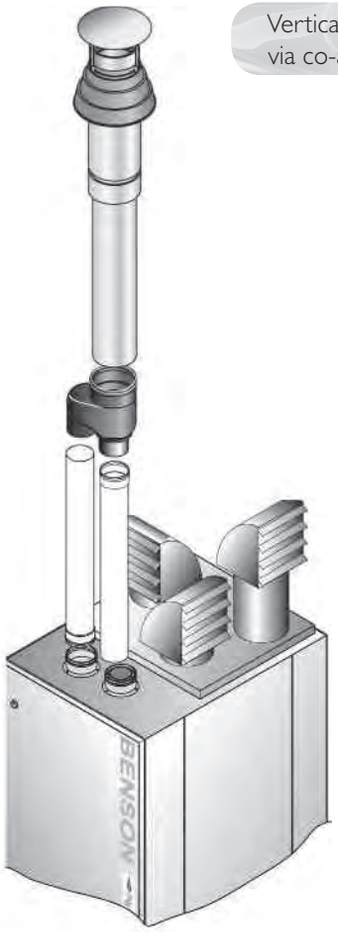
Horizontal room sealed via separate pipes



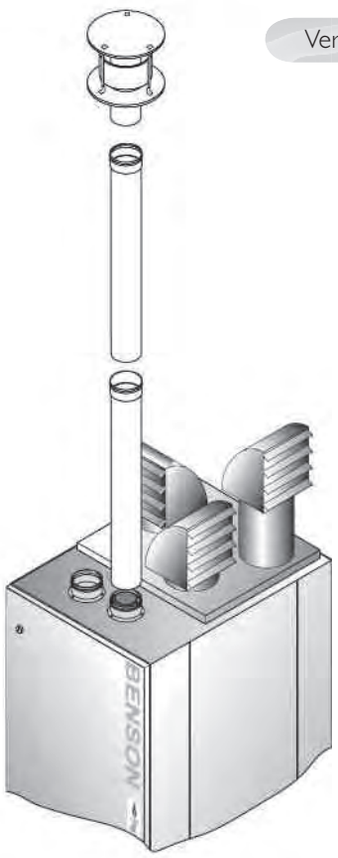
Horizontal room sealed via co-axial assembly



Vertical room sealed via co-axial assembly



Vertical flue only



Notes

Flue components shown shaded form the horizontal and vertical flue/combustion air kits. The drawings above are indicative of typical arrangements. For actual installation details please refer to the Installation and Operating manual.

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