BENSON

TRADE DATA – VARIANTE² EQUILIBRIUM VRE

ROOM SEALED/FAN ASSISTED DOWNFLOW GAS UNIT HEATERS

- ✓ Unrivalled Comfort & Distribution
- ✓ Inbuilt De-Stratification Facility
- ✓ A Solution For Racked Warehouses
- ✓ Room Sealed or Fan Assisted Flue
- ✓ Electronic Ignition
- ✓ High Efficiency

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

RANGE & CONFIGURATION

Room Sealed or Fan Assisted Flue Automatic Ignition
Downflow Fan 12.0 kW to 144.0 kW

SPECIFICATION

WHAT DOES EQUILIBRIUM MEAN?

Providing uniformity of warmth in today's highly insulated buildings is a challenge faced by today's environmental engineers. Crossflow air heaters and radiant systems do not always harmonise heat input loading and building heat loss nor optimise heat distribution and stratification. Variante² Equilibrium does…

More and more heaters are be selected or specified on the profile of distribution patterns rather than output unnecessarily increasing both capital and operating costs.

Variante² Equilibrium can be centrally sited gently diffusing the air downwards allowing one heater to provide the distribution previously achieved with two, three or more heaters.

The attraction of these lower capital and installation costs are further enhanced by the ability to reduce running costs arising from matching steady state building heat loss with heat input directly reducing energy losses associated with high thermostatic switching frequency, the natural ability to combat stratification without independent fans and a burner and a heat exchanger assembly capable of delivery efficiencies in excess of 91%.

The Variante² downflow air distribution characteristic is also suited to providing warmth and frost protection in the isles of racked warehouses without the need or inconvenience of expensive ductwork or high air change rate systems.

CABINET: Low profile in design and robotically punched and formed from electro-zinc plated steel the heater cabinet presents a functional yet pleasing appearance.

Access to the burner and controls compartment is via a full width side hinged door. The cabinet is 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 Variante² heat exchanger has been designed so that manufacture can be accomplished without the use of any stress inducing welding processes.

BURNER: Variante² 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

ECA APPROVED: The Variante² range easily meets the Government's energy efficiency criteria for inclusion into the Enhanced Capital Allowance scheme. Please contact our sales office for further details.

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

SEALED COMBUSTION CIRCUIT: Variante² 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 through a pressure differential sensor.

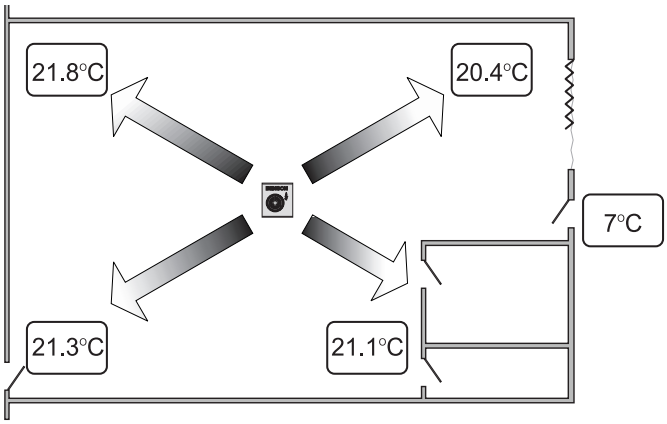
AIR DISTRIBUTION: Variante² Equilibrium gently discharges air in a downward pattern through an adjustable four-way diffuser proving a uniform level of heat throughout the working zone whilst at the same time minimising stratification.

CONTROLS: Variante² heaters are complete with necessary safety controls including overheat protection as well as external control connections. Automatic operation requires only the simple connection of time and temperature controls. Benson, as an option, can provide a number of alternative integrated control consoles with the choice ranging from simple analogue through to digital optimised systems Benson control systems are for remote mounting with inter-connecting wiring by others.

TESTING, APROVALS & 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: Variante² gas unit heaters are provided with a comprehensive guarantee package which covers both parts and labour for the first twelve months with a further twelve months parts only. The tubular heat exchanger has the benefit of a ten year time related warranty. Guarantees subject to terms and conditions.

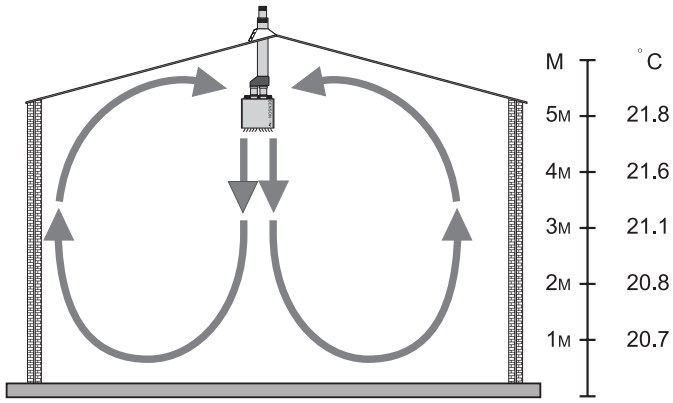
FEATURES



Wall to Wall Warmth .....

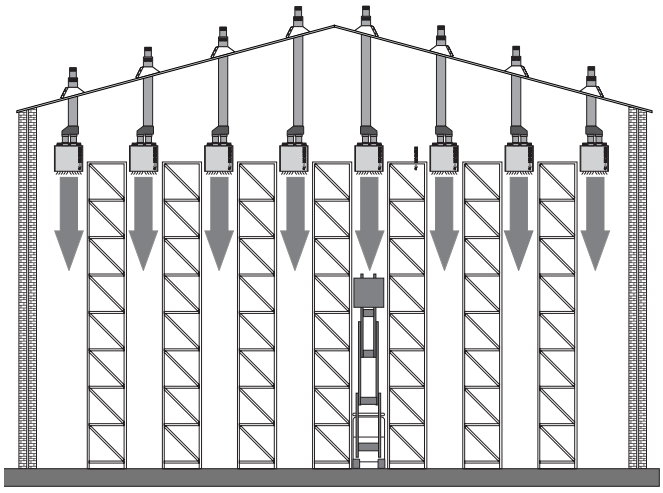
The gentle downward air discharge pattern of the Variante VR-E creates a series of vortexes within the building which enable a uniformity of heating not generally available with conventional cross flow systems and often reducing the number of heaters required.

Note: Temperatures indicate actual test results.



Floor to ceiling Too .....

by installing VR-E heaters within the roof space the recirculation air pattern significantly reduces the floor to ceiling heat gradient. VR-E is a heater and de-stratification fan all in one.



High Bay Racking - No Problem .....

Variante VR-E downward discharge is ideally suited for distributing heat into those often hard to get to aisles in highly racked areas.

The gentle downward air discharge pattern of the Variante VR-E creates a series of vortexes within the building which enable a uniformity of heating not generally available with conventional cross flow systems and often reducing the number of heaters required.

By installing VR-E heaters within the roof space the recirculation air pattern significantly reduces the floor to ceiling heat gradient. VR-E is a heater and de-stratification fan all in one.

Variante VR-E downward discharge is ideally suited for distributing heat into those often hard to get to aisles in highly racked areas.

QUICK REFERENCE DATA

Variante² Equilibrium VRE Room Sealed/Fan Assisted Flue Gas Unit Heaters

Natural Gas/Lpg (Propane) VRE

	Model		40	70	100	135	170	200	250	330	410	490
Output	All	kW	12.0	19.6	29.4	39.2	49.0	58.8	72.0	96.0	120.0	144.0
		Btu/h(K)	41	67	100	134	167	201	246	328	409	491
Efficiency	All	% Nett	92.8	92.7	92.0	92.1	92.0	92.0	91.4	91.2	91.5	91.5
Airflow	All	m^3/s	0.31	0.55	0.79	0.96	1.21	1.54	1.90	2.26	3.08	3.78
		ft^3/m	657	1165	1674	2034	2564	3263	4026	4789	6527	8010
Electrics	All	V/ph/hz	230/1/50									
O/A Height	All	mm	841	881	893	893	893	893	1023	1023	1023	1023
O/A Width		mm	1050	1050	1050	1050	1050	1050	1750	1750	1750	1750
O/A Depth		mm	440	440	545	650	780	910	650	800	980	1150
Flue	All	mm ø	80	80	100	100	100	100	130	130	130	130
Combustion Air		mm ø	80	80	100	100	100	100	130	130	130	130
Weight		kg	73	79	93	107	124	142	189	211	250	287

BURNER & FUEL CONSUMPTION DATA

Variante² Equilibrium VRE Room Sealed/Fan Assisted Flue Gas Unit Heaters

Natural Gas/Lpg (Propane) VRE

	Model		40	70	100	135	170	200	250	330	410	490
Minimum Inlet Pressure	Natural Gas	mbar	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
		in wg	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	LPG Propane	mbar	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0
		in wg	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8
Fuel Consumption	Natural Gas	m^3/h	1.37	2.23	3.38	4.50	5.63	6.76	8.33	11.12	13.87	16.63
		ft^3/h	48	79	119	159	199	239	294	393	490	587
	LPG Propane	m^3/h	0.52	0.86	1.30	1.73	2.16	2.59	3.21	4.28	5.34	6.41
		kg/h	0.96	1.59	2.41	3.20	4.00	4.79	5.94	7.92	9.88	11.86
Connection	All	BSP/Rc	½	½	½	½	½	½	¾	¾	¾	¾

Note - All fuel consumption and output figures are based upon gross calorific values of fuel as -
Natural gas (G20) 39.3 MJ/m^3
Lpg (Propane) (G31) 95.0 MJ/m^3

AIR HANDLING DATA

Variante² Equilibrium VRE Room Sealed/Fan Assisted Flue Gas Unit Heaters

Natural Gas/Lpg (Propane) VRE

	Model		40	70	100	135	170	200	250	330	410	490
Output	All	kW	12.0	19.6	29.4	39.2	49.0	58.8	72.0	96.0	120.0	144.0
		Btu/h(K)	41	67	100	134	167	201	246	328	409	491
Airflow	All	m^3/s	0.31	0.55	0.79	0.96	1.21	1.54	1.90	2.26	3.08	3.78
		ft^3/m	657	1165	1674	2034	2564	3263	4026	4789	6527	8010
Mounting Height Min	All	m	3.5	4.0	4.0	4.0	5.0	5.0	5.0	6.0	6.0	6.0
		ft	12	13	13	13	17	17	17	20	20	20
Mounting Height Max		m	4.5	5.5	6.0	7.0	8.0	12.0	8.0	10.0	12.0	12.0
		ft	15	18	20	23	26	40	26	33	40	40
Output Grille	All	mm high	390	390	495	600	730	860	600	750	930	1100
		mm wide	729	729	729	729	729	729	1339	1339	1339	1339

INSTALLATION DATA

Variante² Equilibrium VRE Room Sealed/Fan Assisted Flue Gas Unit Heaters

Natural Gas/Lpg (Propane) VRE

	Model		40	70	100	135	170	200	250	330	410	490
Output	All	kW	12.0	19.6	29.4	39.2	49.0	58.8	72.0	96.0	120.0	144.0
		Btu/h(K)	41	67	100	134	167	201	246	328	409	491
Gas Connection	All	BSP/Rc	½	½	½	½	½	½	¾	¾	¾	¾
Electrics	All	V/ph/hz	230/1/50									
Fuse Rating		Amp	6	6	6	6	6	6	6	6	10	10
Flue	All	mm ø	80	80	100	100	100	100	130	130	130	130
Combustion Air		mm ø	80	80	100	100	100	100	130	130	130	130
Max Run Vertical		m	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Mounting Height Min	All	m	3.5	4.0	4.0	4.0	5.0	5.0	5.0	6.0	6.0	6.0
Mounting Height Max*		m	4.5	5.5	6.0	7.0	8.0	12.0	8.0	10.0	12.0	12.0
Clearance Lh side	All	mm	800	800	800	800	800	800	950	950	950	950
Others		mm	250	250	250	250	250	250	250	250	250	250
Above		m	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Below		m	4.0	4.0	4.0	4.0	5.0	5.0	6.0	6.0	6.0	6.0
Noise Level	All	dBA	53	55	57	58	61	65	61	63	66	66
Weight		kg	73	79	93	107	124	142	189	211	250	287

Note -

* lh side clearance = burner compartment side .

** Noise levels measured 3m from appliance

INSTALLATION REQUIREMENTS

INSTALLATION STANDARDS: All Benson unit heaters must be installed by a competent person and in accordance with the relevant standards, codes of practice, the requirements of the current Building Regulations (and in particular Parts J and L), Health and Safety regulations, IEE regulations and any requirements of the Local Authority, Fire Officer or insurers. Relevant standards may include BS6230, BS6891 and BS5588 parts 2 and 3.

SITING: The position chosen for the heater will need to take account of the following points -Benson Variante² EquilibriumVRE downflow heaters are specifically designed for downward discharge operation For optimum performance they should be sited centrally over the area they are to heat at a height consistent with the capability of the model selected and at least 1.5 to 2.0 metres from any roof or ceiling fabric. The heaters may be suspended by mean of the four M10 fixings with care taken to ensure that the fixing or other mounting points are structurally adequate.

Consideration should be given to the route and maximum permitted length of the flue, the provision and connection of gas and electrical supplies, access for maintenance, the minimum clearances from adjacent structures as well as protection from overhead cranes, fork lift trucks etc. So far as controls are concerned siting will often depend upon the type selected. Where controls have in-built or remote temperature sensors then consideration should be given to ensure that the sensor is located in a position which adequately reflects the working zone serviced by the heater. Sensors should not be located in an area which is subject to 'cold draughts'. In case of doubt relating to any aspect of heater or control siting please consult Benson Technical

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 must be provided adjacent to each heater It is recommended that the final connection to all Variante² gas unit heaters be made with an approved and adequately sized flexible gas connector.

CAUTION: When used in room sealed mode it may be possible to install Variante² heaters in areas containing flammable vapours, high levels of airborne dust, combustible dust, chlorinated or halogenated hydrocarbons, degreasing solvents, styrenes, other laminating materials or airborne silicones but before doing so please consult Benson Technical. Failure to do so may invalidate or reduce guarantee cover.

SPECIAL RISK AREAS: Where it is proposed to install a heater within a special risk area (ie an area 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, flue, wiring or controls may apply. It is strongly recommended that you consult Benson Technical before installation commences.

AIR SUPPLY: The provision of an air supply for combustion, for combustion product dilution if relevant, and for ventilation varies according to heater location. Where the heater is sited directly within the space to be heated and used in fan assisted flue mode (ie without the positive connection of the combustion air ductwork to atmosphere) then consideration of ventilation for combustion air and general ventilation is mandatory with the requirements dependent upon the air change rate of the building. Where the heater(s) is to be sited directly into the space to be heated and used room sealed mode the provision of a combustion air supply is not necessary however the need for general ventilation may remain. In all cases it is recommended that BS6230 be used as a consultative document.

FLUES: Variante² 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 Variante² flue/combustion air spigots are situated on the rear 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 Reference 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 are given in the Installation Data. The inclusion of 45° and 90° flue bends will reduce the total length on the basis that every 45° bend is equivalent to 0.5 metres of straight flue and every 90° bend is equivalent to 1.0 metres of straight flue

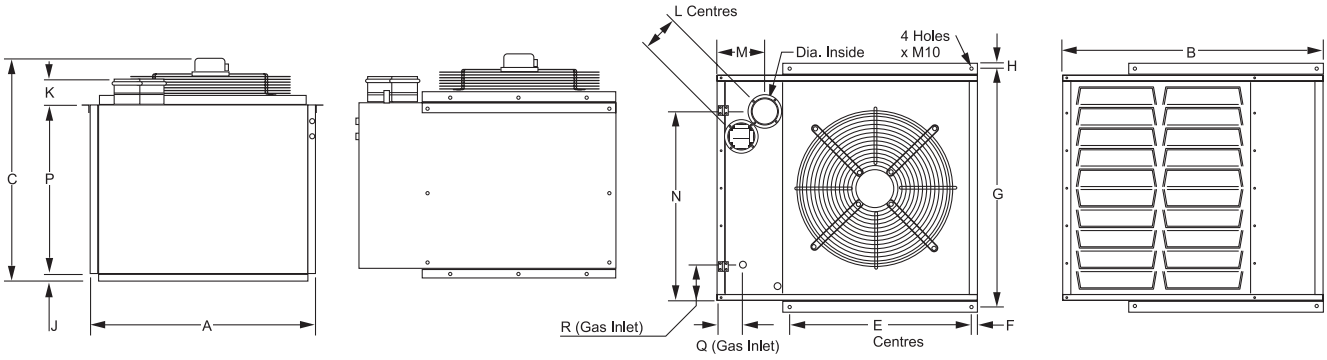
The flue route and exit point needs to be selected carefully and it is recommended that the installer consult the Variante² Installation, Operating and Maintenance manual before commencing installation. Additionally BS5854 and BS5440 should be used as consultative documents.

FURTHER INFORMATION: The foregoing is given for guidance purposes. More detailed information can be found within the relevant Installation, Operation and Maintenance manual or alternatively contact Benson Technical.

INSTALLATION DATA - HEATER SIZE

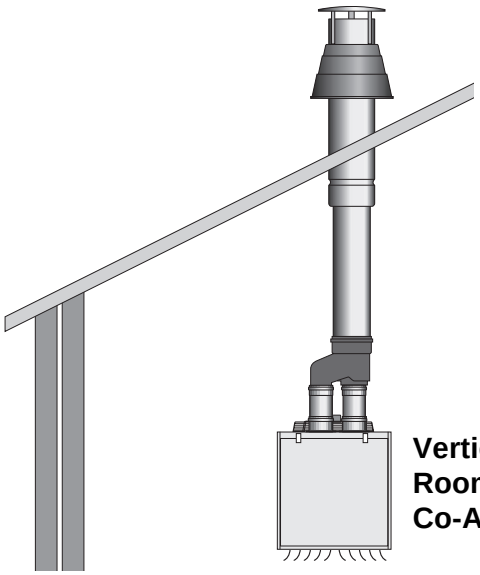
Variante² Equilibrium VRE Room Sealed/Fan Assisted Flue Gas Unit Heaters

Natural Gas/Lpg (Propane) VRE

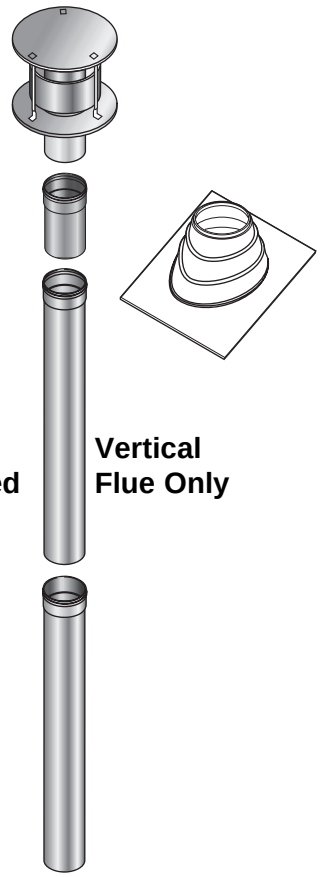


	Model		40	70	100	135	170	200	250	330	410	490
A	All	mm	440	440	545	650	780	910	650	800	980	1150
B	All	mm	1050	1050	1050	1050	1050	1050	1750	1750	1750	1750
C	All	mm	841	881	893	893	893	893	1023	1023	1023	1023
D	All	mm ø	80	80	100	100	100	100	130	130	130	130
E	All	mm	755	755	755	755	755	755	1365	1365	1365	1365
F	All	mm	17	17	17	17	17	17	17	17	17	17
G	All	mm	500	500	605	710	840	910	710	860	1040	1210
H	All	mm	20	20	20	20	20	20	20	20	20	20
J	All	mm	36	36	36	36	36	36	36	36	36	36
K	All	mm	60	60	100	100	100	100	100	100	100	100
L	All	mm	120	120	140	140	140	140	225	225	225	225
M	All	mm	192	192	192	190	190	190	308	308	293	293
N	All	mm	278	309	395	508	636	766	490	647	808	975
P	All	mm	680	680	680	680	680	680	810	810	810	810
Q	All	mm	103	103	103	103	103	103	227	227	227	227
R	All	mm	137	169	158	147	149	150	175	168	175	177

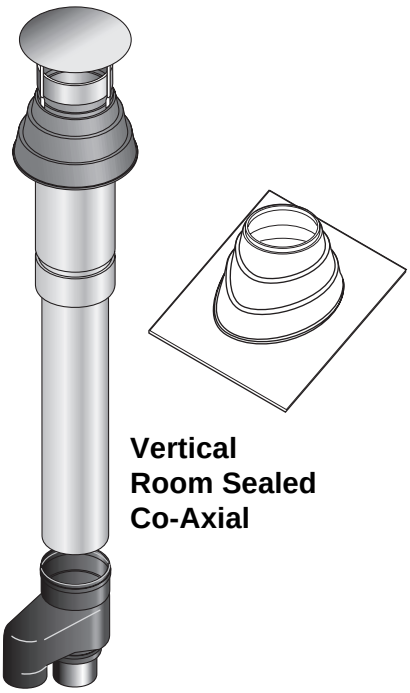
FLUEING SYSTEMS



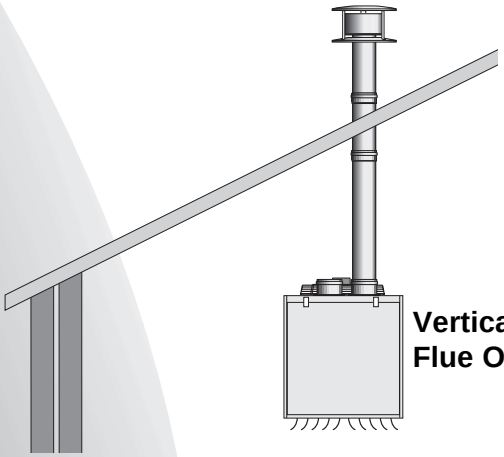
Vertical Room Sealed Co-Axial



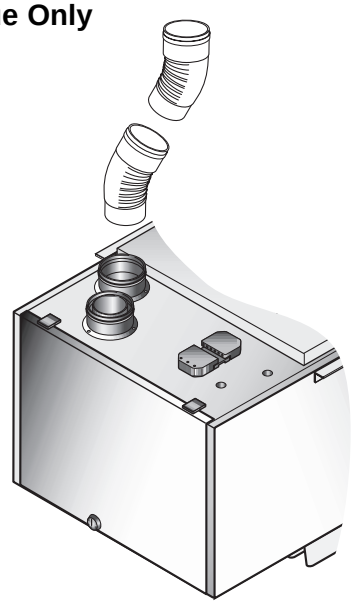
Vertical Flue Only

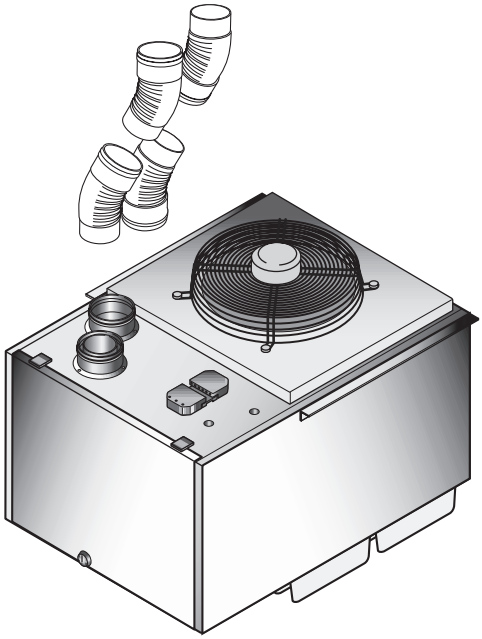


Vertical Room Sealed Co-Axial



Vertical Flue Only





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