

PSO Gas & Oil Cabinet Heater Range

Industrial & Commercial Heating Systems

THERMOBILE®



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Thermobile PSO

The PSO range of heaters from Thermobile provide efficient and cost effective heating solutions for a wide variety of industrial, commercial and retail buildings.

The range comprises of 13 models with outputs ranging from **30 to 586 kW** and heaters can be applied in free blowing format, discharging warmed air directly into the heated space, configured for connection to ductwork or for plant room or enclosure applications.

PSO heaters can also be specified for internal or external location and are available in upright or horizontal orientation. Energy efficiency is a key consideration and to comply with the stringent requirements of ErP legislation heaters as standard are arranged with high/low heat outputs with modulation an option.

GAS NATURAL GAS (G20) / PROPANE (G31)

OIL GAS OIL (35 SEC) / KEROSENE (28 SEC) / BIO FUEL



Efficiency and ErP Compliance

From 1st January 2018 all warm air heaters used to provide comfort for the occupants of a heated space are required to meet minimum standards of 'seasonal' efficiency as determined by the Ecodesign regulation (EU) 2015/1188, Directive 2009/125/EC - Lot 21 Tier 1. Compliance to the standard is mandatory.

The calculation for seasonal efficiency takes into account air flow, temperature rise across the heat exchanger, electrical power consumption as well as the usual thermal efficiencies.

PSO heaters placed on the market after 1st January 2018 comply with the requirements of the standard.

Installers and customers will note that in pursuit of increased efficiency when ErP legislation is implemented PSO heaters will no longer be available in on/off configuration other than for non-personnel heating applications. For most space heating applications high/low heat output will be standard with modulation as an option.

Models Available

- PSO UF - Upright Freeblowing
- PSO UD - Upright Ducted
- PSO HF - Horizontal Freeblowing
- PSO HD - Horizontal Ducted
- PSO EA - External

Installer Benefits

- Factory fitted and pre-wired controls
- Plain side panel option to provide siting flexibility
- Primary flue tee fitted as standard
- Stainless steel combustion chamber as standard
- Increased static pressure options (Model restrictions apply)

Peace Of Mind

- More than sixty years experience in warm air
- Two year parts and one year labour guarantee
- Ten-year time related heat exchanger warranty
- Full technical support

Working With The HVAC Trade

Thermobile philosophy is to work in partnership with our customers establishing a long-term commitment to a relationship based on understanding the expectations of customers and a dedicated common goal.

By working with our customers we can deliver solutions that enable them to meet technical and regulatory challenges they face, fulfil their clients needs effectively and economically, and gain a competitive edge.

TYPICAL APPLICATIONS

- Warehouses
- Factories
- Garage Workshops
- Distribution / Logistics Centres
- Aircraft Hangars
- Garden Centres
- Horticultural & Garden Centres

Construction

Of frame and panel construction complete with integral heat shields and finished with a hard wearing epoxy powder coat stove baked paint.

Combustion Chamber/ Heat Exchanger

Formed from a rolled and welded AISI430 stainless steel combustion chamber close coupled to a two-pass tubular heat exchanger. The heat exchanger benefits from unique split rear header box to allowing differential expansion of the two tube banks whilst the aluminised heat exchanger tubes are hydraulically swaged into position to further reduce stress. Stainless steel heat exchanger options available.

Burners

To ensure long-life, reliability and optimum fuel efficiency PSO heaters have been carefully matched to both Riello high/low and modulating burners as well as the Inverterjet range of pre-mix burners.

Air Movement

Via dynamically balanced centrifugal fan sets. Freeblowing heaters are equipped with heads providing rotational and lateral direction. Ducted heaters are provided with an outlet spigot for the onward connection of ductwork. A comprehensive range of return air spigots, dampers and filters accessories are available.

Controls

As standard PSO heaters are supplied with approved safety controls including high limit protection, flame monitoring and sequenced ignition.

For comfort, fuel efficiency and convenience PSO heaters are provided with MC200 digital controls. To save installation time the controls for upright internal heaters are factory fitted and pre-wired whilst controls for horizontal and external models are supplied in a remote format (Inter-connecting wiring by others).

Fuel Options

Gas fired units are certified for use on Natural Gas (G20) and LPG Propane (G31). Oil fired heaters can be specified at time of ordering for operation on either Class D light distillate fuel oil - 35 second gas oil, kerosene - 28 second oil (Model dependent) and bio fuel oil B10 (10% maximum).

Approvals

PSO heaters are type tested and CE approved. In addition heaters placed on the market subsequent to 1st January 2018 meet the seasonal efficiency requirements of ErP Lot 21 Tier 1.

CUSTOMER BENEFITS

- Energy efficient
- Range of sizes and configurations
- Colour (RAL) options
- Manufactured in the United Kingdom



APPROVED PRODUCT

Technical Specification

Model			30	45	60	90	120	150	175	200	250	300	360	440	590		
Output (nominal)	High Fire (Max)	kW	30	45	60	90	120	150	175	200	250	300	366	440	586		
	Low Fire (Min)	kW	21	32	42	63	84	105	123	140	175	210	252	308	410		
Thermal Efficiencies (Nett CV)		%	91.5%														
Airflow	Volume		m ³ /s	0.58	0.86	1.15	1.73	2.30	2.88	3.36	3.84	4.80	5.76	6.49	7.88	10.5	
	Heads	UF / HF	No.	2	2	3	3	4	4	4	4	4	4	4	8	8	
		Size	mm	203	254	254	305	305	305	356	406	457	457	457	457	457	
	Throw	UF / HF	m	14	20	18	23	23	28	28	28	40	47	48	30	40	
	Fan Static	Standard	Pa	188	322	185	100	140	175	190	100	60	150	300	300	300	
		Up-rated	Pa	n/a	n/a	n/a	200	200	240	250	200	150	N/A	600	600	600	
Electrics	Supply	Standard	V/ph/Hz	230/1/50					400/3/50								
		Optional	V/ph/Hz	400/3/50				230/1/50			N/A						
	Standard Fan	Start Current	amp	6.5	9.1	8.1	12.0	13.1	32.5	20.8	38.0	58.0	32	127.2	127.2	182.4	
		Run Current	amp	4.2	5.1	4.4	6.8	4.8	5.1	6.9	6.5	9.0	14.4	21.3	21.3	28.9	
	Up-rated Fan	Start Current	amp	N/A			17.5	25	25.0	35.0	35.0	35.0	N/A	182.4	182.4	221.2	
		Run Current	amp	N/A			6.1	4.9	5.75	11.0	8.83	11.65	N/A	28.9	28.0	35.0	
Fuel	Connection	Oil	BSP/Rc	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	½"	
		Gas	BSP/Rc	½"	½"	¾"	¾"	¾"	1¼"	1¼"	1¼"	1¼"	1¼"	1½"	1½"	1½"	
	Minimum Inlet Pressure	Nat Gas	mbar	17.5													
		LPG	mbar	37.0													
	Consumption Standard Outputs	Oil	l/h	3.16	4.83	6.38	9.70	12.95	15.90	18.89	21.17	26.73	31.36	38.82	47.45	63.62	
		Nat Gas	m ³ /h	3.45	5.17	6.89	10.34	13.79	17.23	20.11	22.99	28.73	33.33	41.41	50.61	67.86	
LPG		m ³ /h	1.34	1.98	2.64	4.01	5.31	6.64	7.72	8.84	11.00	12.84	16.00	19.56	26.23		
Overall Dimensions	UF Upright Freeblowing	Height	mm	2024	2072	2494	2585	2821	2821	3054	3174	3307	3307	3657	4107	4407	
		Width	mm	669	669	744	744	904	904	904	904	1104	1104	1260	1330	1330	
		Depth (Excludes burner)	mm	732	732	927	927	1200	1200	1399	1399	1599	1599	1915	2165	2715	
Installation Clearances	UF Upright Freeblowing	Front	mm	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	
		Side	mm	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	
		Blank Side	mm	150	150	150	150	150	150	150	150	150	150	n/a	n/a	n/a	
		Rear	mm	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	
Flue Diameter		mm ø	125	125	150	150	150	175	175	175	200	200	250	300	300		
Combustion Air Spigot		mm ø	150	150	150	150	150	150	150	150	150	150	150	175	175		
Max Combustion Duct Length * (See Note Below)		m	34	34	21	21	12	8	6	4	3	2	3	2	2		
Noise Level (See Note Below)		dB(A)	56	61	61	63	70	62	73	74	75	77	78	80	82		
Nett Weight (See Note Below)		kg	168	173	231	241	341	386	530	530	556	556	1012	1380	1720		

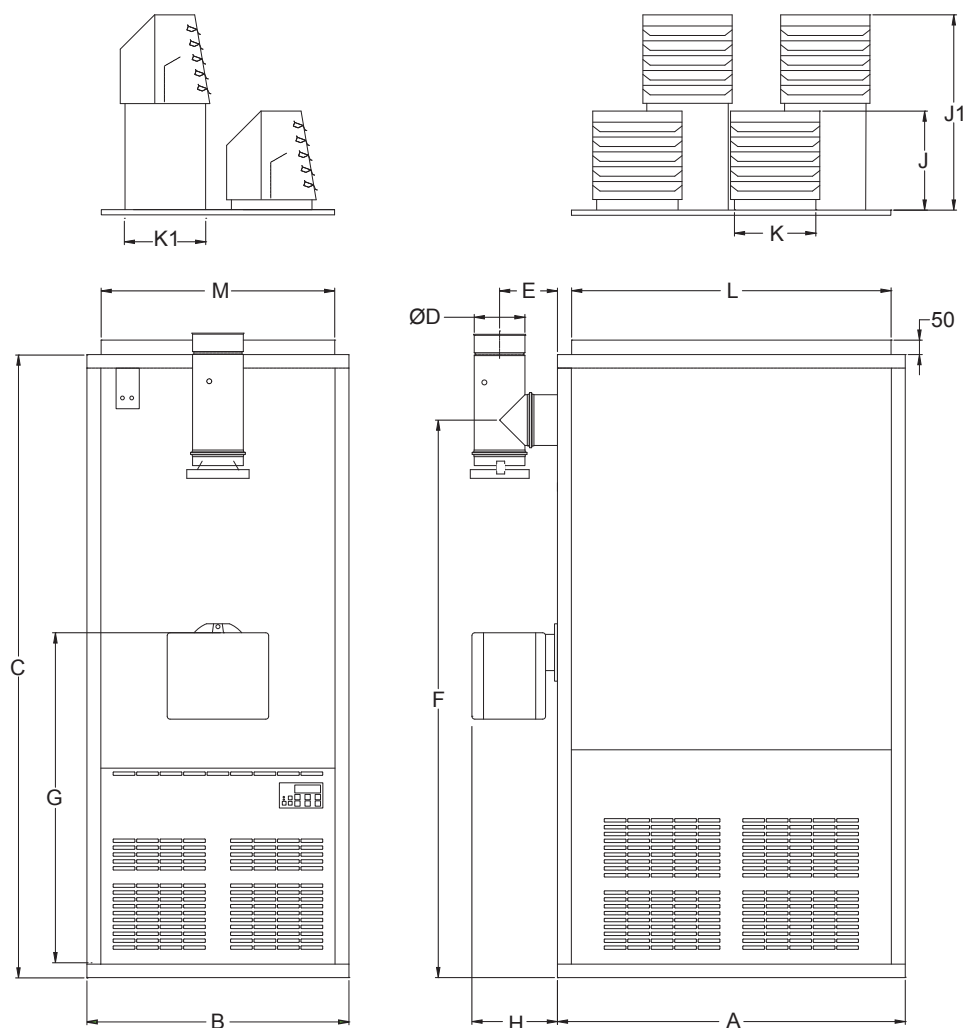
Notes:

- Fuel consumption and output figures based upon nett calorific values as follows
 - Class D light distillate fuel oil nett CV 36.28 MJ/l
 - Natural gas (G20) nett CV 34.02 MJ/m³
 - LPG Propane (G31) nett CV 88.00 MJ/m³
- PSO heaters have efficiency levels which comply with the requirements of United Kingdom Part L Building Regulations and comply the seasonal efficiency requirements of the Ecodesign regulation (EU) 2015/1188, Directive 2009/125/EC – Lot 21 Tier 1 (Known as ERP and mandatory as from 1st January 2018)
- Air handling data is assessed at room ambient conditions
- Throw figures provide the distance to the point where the terminal velocity degrades to 0.25 m/s
- Overall vertical heater height include heads or extended heads where appropriate.

- Blank and louvred lower side panels are interchangeable.
- Dimensions in table above refer to upright heaters only - for horizontal and counterflow heater dimensions refer to dimensions page.
- Noise levels are applicable to standard UF models and are measured 5m from appliance and in free field conditions.
- Motor, run and start amps apply to standard electrical supply as stated. For optional data contact sales office.
- Nett weight figures apply to standard upright PSO heaters only.
- Up-rated fan motor supplied as standard on external cabinet heaters
- For extended combustion duct lengths please contact Thermobile Technical Support
- For Installer guidance notes see page 13

Dimensions

PSO UD/UF Upright Free Blowing Upright Ducted (30-300)



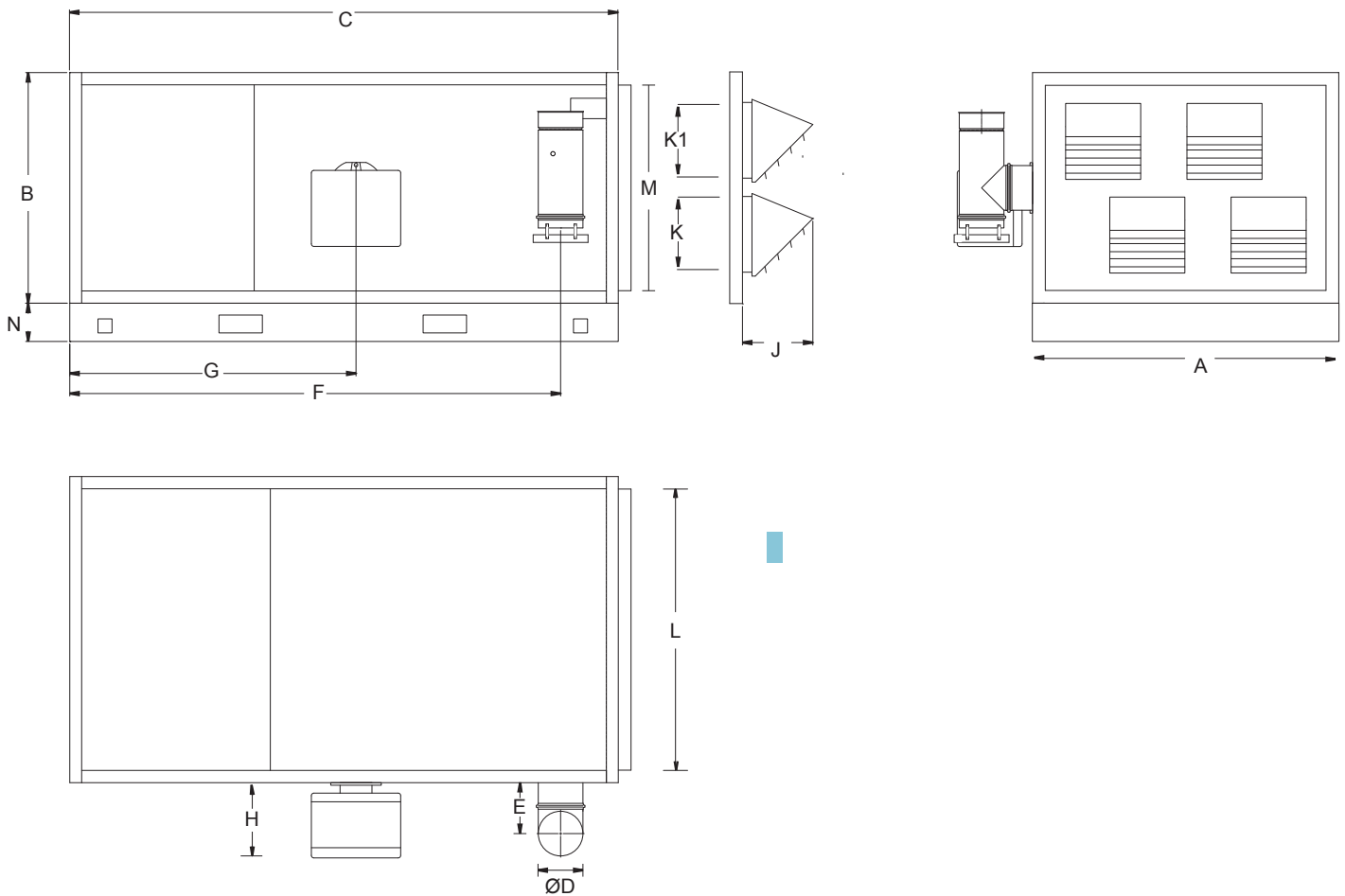
Model			30	45	60	90	120	150	175	200	250	300
A	All	mm	732	732	927	927	1200	1200	1399	1399	1599	1599
B	All	mm	669	669	744	744	904	904	904	904	1104	1104
C	All	mm	1767	1767	1895	1895	2149	2149	2265	2265	2265	2265
D	All	mm Ø	125	125	150	150	150	175	175	175	200	200
E	All	mm	150	150	150	150	150	200	200	200	240	240
F	All	mm	1535	1535	1661	1661	1923	1923	2021	2021	2021	2021
G	All	mm	864	864	944	944	1122	1122	1122	1122	1122	1122
H	Gas	mm	295	295	346	346	389	389	389	610	610	610
	Oil	mm	236	236	261	261	295	295	295	295	473	473
J	All	mm	238	286	286	340	340	340	400	442	558	558
J1	All	mm	N/A	N/A	581	672	672	672	788	875	1007	1007
K	All	mm	180	234	234	287	287	287	333	381	431	431
K1	All	mm	N/A	N/A	N/A	N/A	333	333	N/A	N/A	N/A	N/A
M	Duct Spigot	mm	632	632	824	824	1100	1100	1299	1299	1499	1499
		mm	569	569	644	644	804	804	804	804	1004	1004
Head Plan			1	1	2	2	3	3	3	3	2	2

Notes -

- Flue tee provided as standard.

Dimensions

PSO HF/HD Horizontal Free Blowing Horizontal Ducted (30-300)

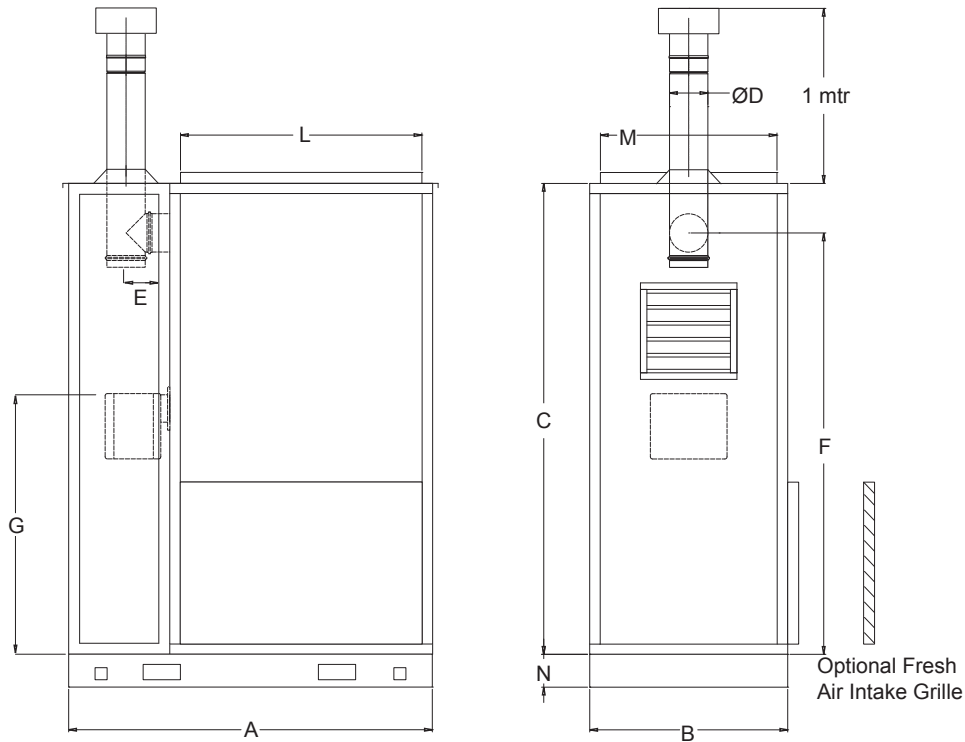


Model			30	45	60	90	120	150	175	200	250	300
A	All	mm	732	732	927	927	1200	1200	1399	1399	1599	1599
B	All	mm	669	669	744	744	904	904	904	904	1104	1104
C	All	mm	1767	1767	1895	1895	2151	2151	2265	2265	2265	2265
D	All	mm ø	125	125	150	150	150	175	175	175	200	200
E	All	mm	150	150	150	150	150	200	200	200	240	240
F	All	mm	1535	1535	1661	1923	1923	1661	2021	2021	2021	2021
G	All	mm	864	864	944	944	1122	1122	1122	1122	1122	1122
H	Gas	mm	295	295	346	346	389	389	389	610	610	610
	Oil	mm	236	236	261	261	295	295	295	295	473	473
J	All	mm	227	227	260	260	260	260	297	297	367	367
K	All	mm	180	234	234	287	287	287	333	381	431	431
K1	All	mm	N/A	N/A	N/A	N/A	333	333	N/A	N/A	N/A	N/A
L	Duct Spigot	mm	632	632	824	824	1100	1100	1299	1299	1499	1499
		mm	569	569	644	644	804	804	804	804	1004	1004
N	All	mm	125	125	125	125	150	150	150	150	150	150
Head Plan			1	1	2	2	3	3	3	3	4	4

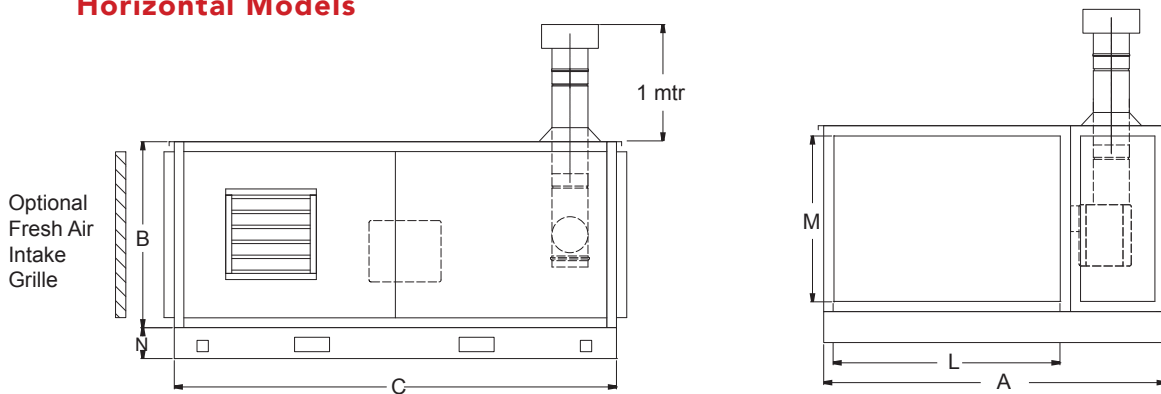
Notes:

- Flue tee provided as standard.
- Screened air intake (SAI) fitted as standard on HF models. Duct spigot option available.
- Direction of airflow to be specified at time of order. Left to Right (L-R when looking at the burner) airflow shown above.

Upright Models



Horizontal Models



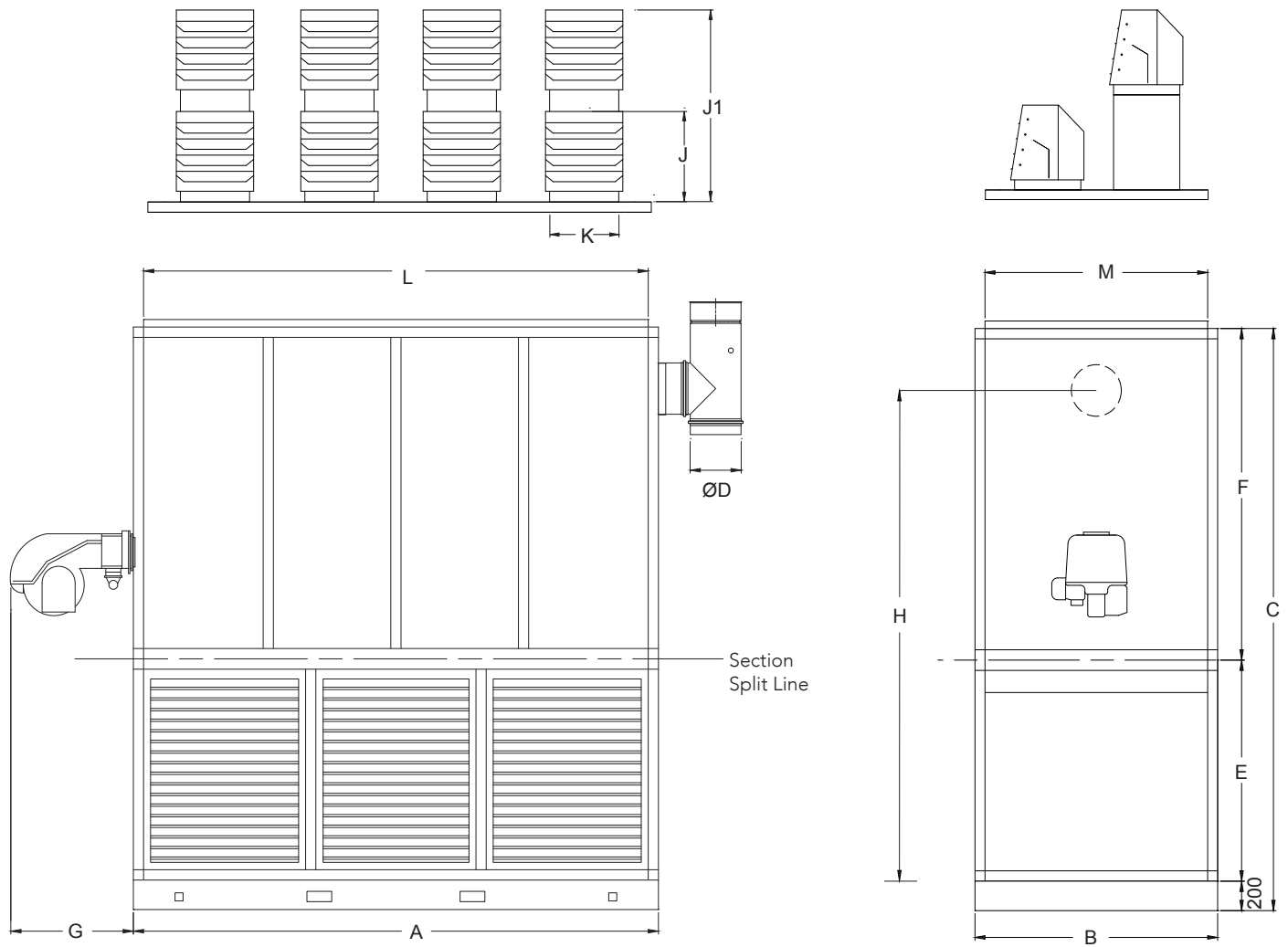
Model		30	45	60	90	120	150	175	200	250	300	
A	All	mm	1184	1184	1379	1379	1692	1692	1891	1891	2280	2280
B	All	mm	669	669	744	744	904	904	904	904	1104	1104
C	All	mm	1767	1767	1895	1895	2149	2149	2265	2265	2265	2265
D	All	mm ø	125	125	150	150	150	175	175	175	200	200
E	All	mm	150	150	150	150	150	200	200	200	240	240
F	All	mm	1535	1535	1661	1661	1923	1923	2021	2021	2021	2021
G	All	mm	864	864	944	944	1122	1122	1122	1122	1122	1122
H	Gas	mm	295	295	295	347	389	389	389	610	610	610
	Oil	mm	236	236	270	270	295	295	295	473	473	473
L	Duct Spigot	mm	632	632	824	824	1100	1100	1299	1299	1499	1499
M		mm	569	569	644	644	804	804	804	804	1004	1004
N	All	mm	125	125	125	125	150	150	150	150	150	150

Notes:

- Direction of airflow for horizontal heaters to be specified at time of order. Left to right (when looking at burner) airflow shown above.
- Inlet and Outlet duct spigots have the same dimensions (Horizontal units only).
- Primary flue length, cowl and flashing provided as standard.

Dimensions

PSO UD/UF Upright Free Blowing and Ducted (360-590)



Model			360	440	590
A	All	mm	1915	2165	2715
B	All	mm	1260	1330	1330
C	All	mm	2615	3065	3365
D	All	mm ø	250	300	300
E	All	mm	865	965	1265
F	All	mm	1550	1900	1900
G	Gas	mm	580	580	840
	Oil	mm	468	468	680
H	All	mm	2152	2537	2837
J	All	mm	558	558	558
J1	All	mm	1007	1007	1007
K	All	mm	431	431	431
L	Duct Spigot	mm	1815	2065	2615
M		mm	1160	1230	1230
Head Plan			3	5	5

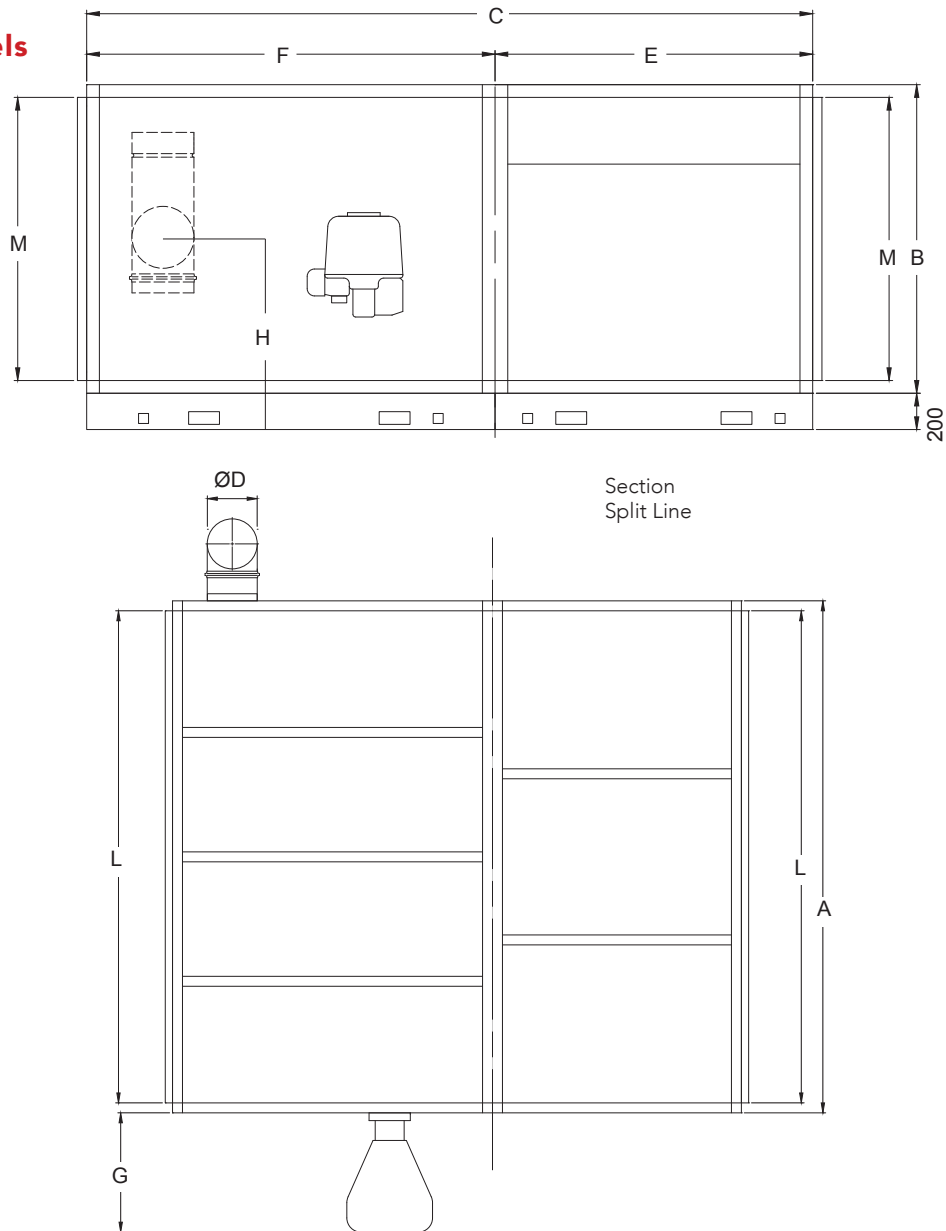
Notes:

- The Heat Exchanger and Fan Section can be split on the 'Section Split Line'.
- Flue tee provided as standard.

Dimensions

PSO HF/HD Horizontal Free Blowing and Ducted (360-590)

Horizontal Models

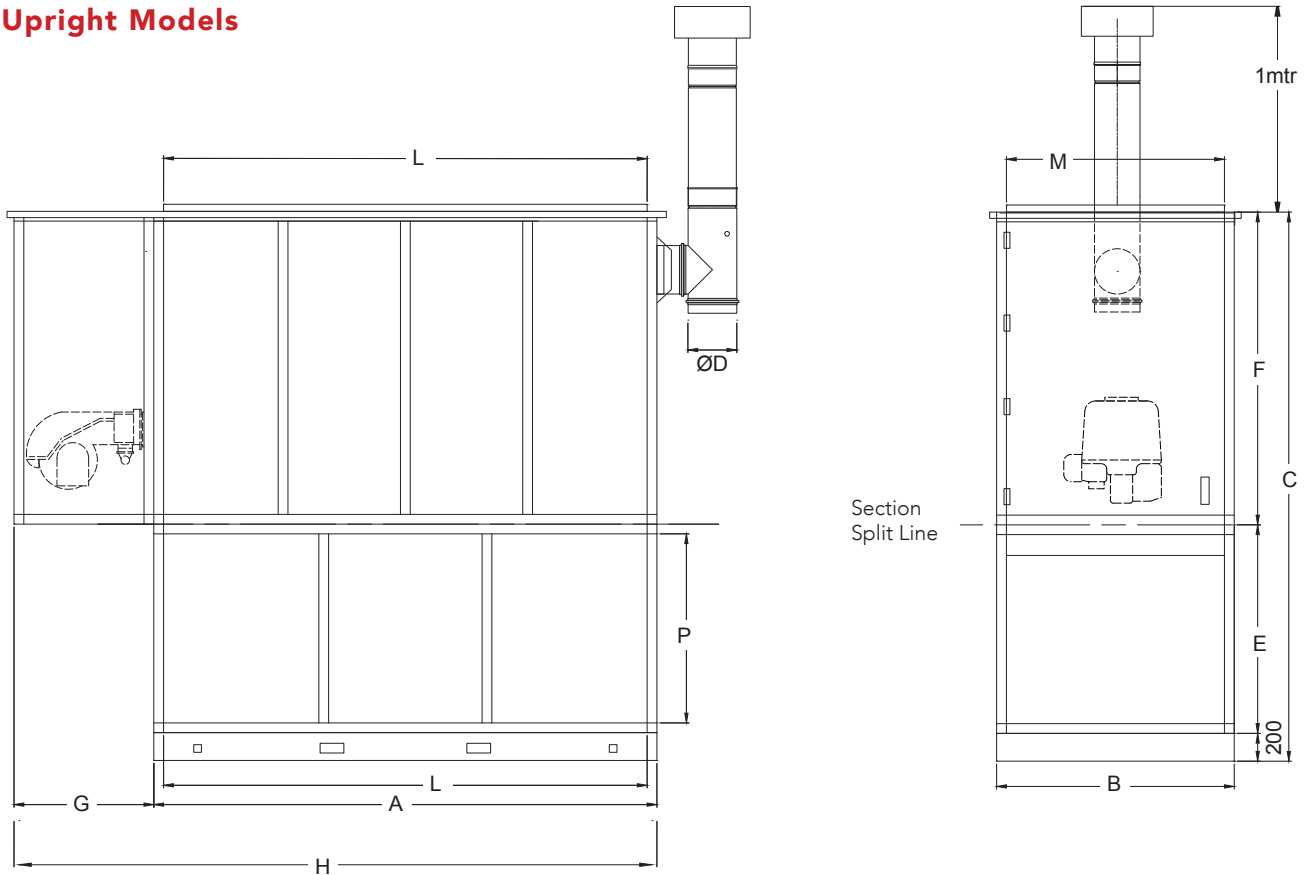


Model			360	440	590
A	All	mm	1915	2165	2715
B	All	mm	1260	1330	1330
C	All	mm	2800	3250	3600
D	All	mm ø	250	300	300
E	All	mm	1250	1350	1700
F	All	mm	1550	1900	1900
G	Gas	mm	580	580	840
	Oil	mm	468	468	680
H	All	mm	830	865	865
L	Duct Spigot	mm	1815	2065	2615
M		mm	1160	1230	1230
Head Plan			3	5	5

Notes:

- Flue tee provided as standard.
- Direction of airflow to be specified at time of order. Left to Right (L-R when looking at the burner) airflow shown above.

Upright Models



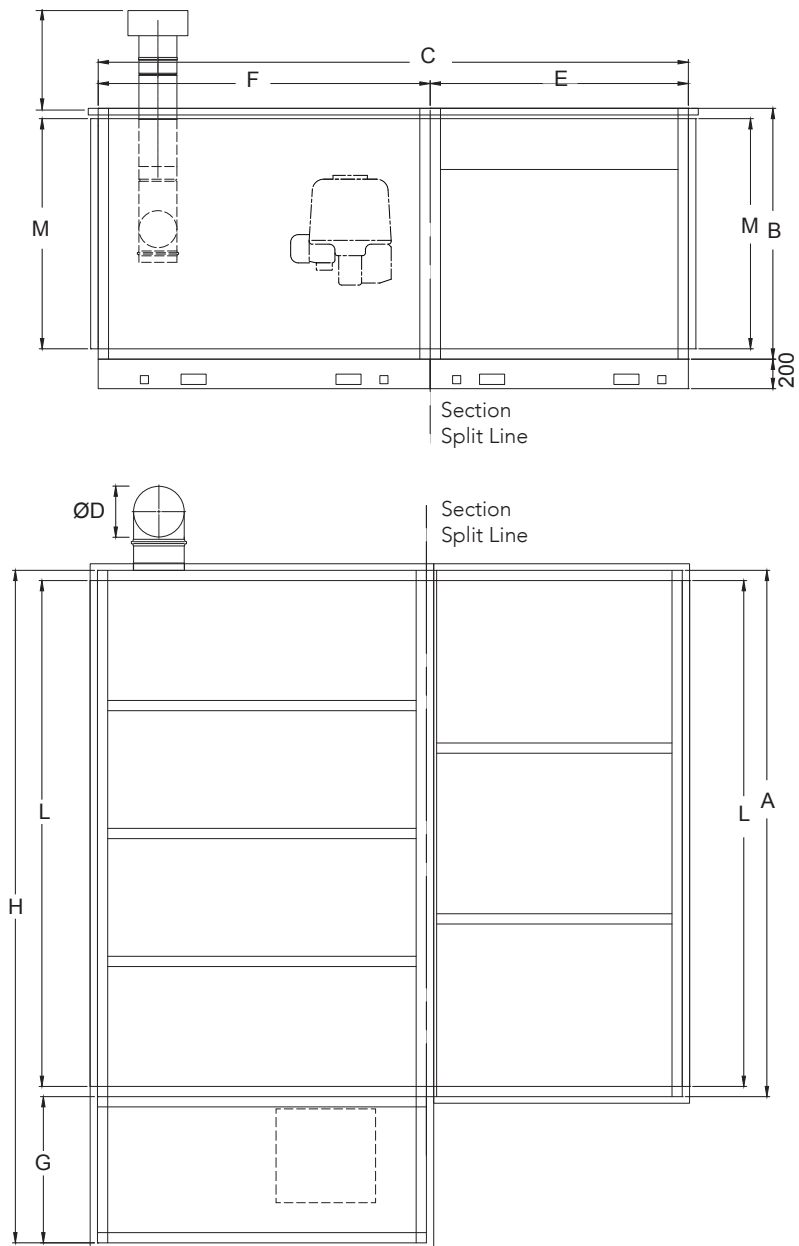
	Model		360	440	590
A	All	mm	1915	2165	2715
B	All	mm	1260	1330	1330
C	All	mm	2615	3065	3365
D	All	mm ø	250	300	300
E	All	mm	865	965	1265
F	All	mm	1550	1900	1900
G	All	mm	650	650	950
H	All	mm	2565	2815	3665
L	Duct Spigot	mm	1815	2065	2615
M		mm	1160	1230	1230
P	All	mm	760	860	1160

Notes:

- The Heat Exchanger and Fan Section can be split on the 'Section Split Line'.
- Return air via inlet duct spigot is standard. Optional fresh air grille is available.
- Primary flue and cowl provided as standard.

Dimensions

PSO-EA External Cabinet Heaters (360-590)



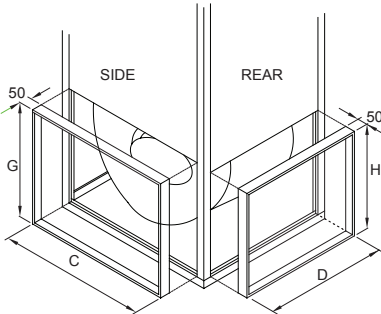
	Model		360	440	590
A	All	mm	1915	2165	2715
B	All	mm	1260	1330	1330
C	All	mm	2800	3250	3600
D	All	mm \varnothing	250	300	300
E	All	mm	1250	1350	1700
F	All	mm	1550	1900	1900
G	All	mm	650	650	950
H	All	mm	2565	2815	3665
L	Duct Spigot	mm	1815	2065	2615
M		mm	1160	1230	1230

Notes:

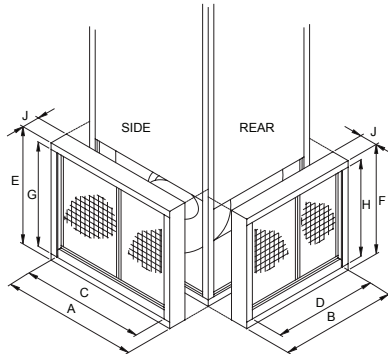
- The Heat Exchanger and Fan Section can be split on the 'Section Split Line'
- Direction of airflow for horizontal heaters to be specified at time of order. Left to right (when looking at burner) airflow shown above
- Primary flue section, cowl and flashing provided as standard

Accessories

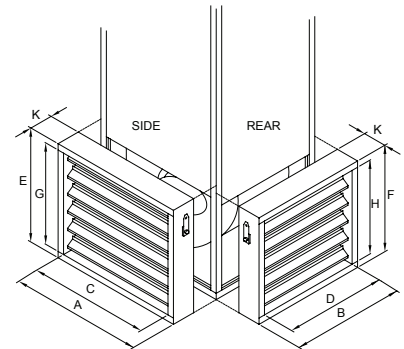
Side/Rear Inlet Spigots



Filters



Dampers



	Model		30	45	60	90	120	150	175	200	250	300	360	440	590
A	All	mm	732	732	927	927	1200	1200	1399	1399	1599	1599	1915	2165	2715
B	All	mm	669	669	744	744	904	904	904	904	1105	1105	n/a	n/a	n/a
C	All	mm	630	630	825	825	1098	1098	1300	1300	1500	1500	1815	2065	2615
D	All	mm	567	567	642	642	802	802	802	802	1003	1003	n/a	n/a	n/a
E	All	mm	685	685	738	738	868	838	838	838	838	838	865	965	1265
F	All	mm	627	627	677	677	775	775	775	775	775	775	n/a	n/a	n/a
G	All	mm	585	585	640	640	738	738	738	738	738	738	765	865	1165
H	All	mm	527	527	577	577	675	675	675	675	675	675	n/a	n/a	n/a
J	All	mm	136	136	136	136	136	136	136	136	136	136	250	250	250

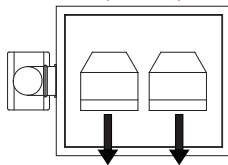
Notes:

- All spigot dimensions are outside dimensions
- Vertical units shown - for horizontal units please contact our sales office
- EU1 Standard filter specification is 10ppi (parts per inch)
- Higher specification filters available on request - contact our Technical Support team for more information
- Standard dampers are manual operation - motorised options available
- Installer guidance notes on rear page

Head Plan Options

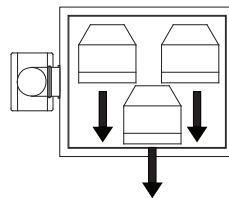
Head Plan 1

(30 & 45)



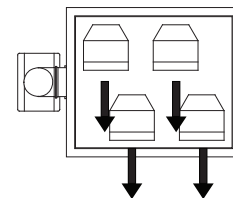
Head Plan 2

(60 & 90)



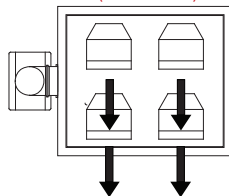
Head Plan 3

(120, 150, 175 & 200)



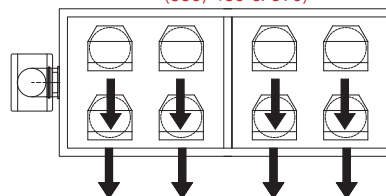
Head Plan 4

(250 & 300)



Head Plan 5

(360, 460 & 590)



General

The following notes are provided as a guide, however installers and users should fully acquaint themselves with the more detailed guidance provided in the relevant Installation, Operation and Maintenance Manual. For copies of manuals please consult our technical department or visit our website - www.Thermobile.co.uk

Standards

PSO and PSO EA heaters must be installed, commissioned and operated with due regard to appropriate regulations including but not limited to BS 6230 2005, BS5410 1998, relevant Codes of Practice, the possible requirements of Local Authorities, Fire Officers and insurers as well as the Installation, Operation and Maintenance Manuals.

Position & Location

PSO Heaters should be installed on a level non-combustible base. Horizontal heaters can be suspended. It is important that all supporting structures or methods of suspension have due regard to the relevant weight Loadings.

External heaters are specifically designed for outside locations and should not be installed within partially enclosed areas or under canopies which may restrict the operation of the heater or evacuation of flue gases. If an external heater is to be located in any area which is partially or fully enclosed then it is recommended that you consult our technical department.

Consideration should also be given to flue routes and points of exit, gas, oil, electrical and where applicable control connections, the throw characteristics of the heater, issues of public access and in the instance of remote temperature sensors the position necessary to be representative of the zone temperature to which they refer.

Heaters should not be installed in hazardous areas or areas where there is a foreseeable risk of flammable or corrosion inducing particles, gases or vapours being drawn into the combustion air or main fan circuits.

Areas where special consideration or advice may be required could include but is not limited to -

- Where de-greasing solvents are present, even in minute concentrations
- Where paint spraying is carried out
- Where styrenes or other laminating products are used
- Where foam products are moulded, cut or fabricated
- Where airborne silicone is present
- Where petrol engined vehicles are stored or maintained
- Where dust is present (ie wood working or joinery shops)
- Where high levels of extract persist

Installation in such areas may be possible under specific conditions. Please consult our technical department or your local sales manager for further information.

Plant Room or Enclosure Locations

Specific requirements exist where heaters are to be installed in a plant room or enclosure. Such requirements include the provision of positive ductwork connections as well as ventilation for combustion air and general ventilation. It is recommended that you consult with our technical department or your local area sales manager for further guidance.

Combustion Air & General Ventilation

Within the United Kingdom mandatory regulations apply concerning the provision of combustion air and general heater ventilation. Where a heater is installed within the heated space and where that heated space has a natural ventilation rate greater than 0.5 air changes per hour then combustion air and general heater ventilation is probably not required.

If the heated space has a natural ventilation rate of less than 0.5 air changes per hour then either natural ventilator openings or mechanical ventilation will be required. Please consult the Installation, Operation and Maintenance Manual for further details.

External heaters located in unrestricted outside areas will generally source combustion air from the surroundings and as such no additional requirements should be necessary.

Installation Clearances

Particular clearances may be necessary for the correct and safe function of the heater as well as for maintenance purposes. Such clearances are confirmed in the relevant Installation, Operation and Maintenance Manual

Flue

PSO heaters are supplied with a 90° flue tee that has a flue gas analysis sample point. For internally located heaters each heater requires a separate flue system of the appropriate size. The flue should essentially be installed in the vertical plane and the number of bends kept to a minimum.

The flue must be adequately supported and terminated with a suitable cowl, with due regard to the point of exit and it's proximity to any windows, doors or ventilation intakes.

External heaters are supplied complete with a primary flue section and cowl which provides the direct discharge of flue gases directly to atmosphere. Care should be taken to ensure that the flue discharge is not in anyway restricted or the exit point such that flue gases can enter a building.

If the application requires it may be possible to extend the flue of external heaters to enable the point of discharge to be repositioned. However should this be necessary then the diameter of flue must not be less than stated in the data sections of this brochure.

Pipework

Care should be taken when sizing pipework to ensure that minimum gas and maximum oil inlet pressures are not compromised under dynamic load conditions. Isolating valves and service unions should be provided for each heater and pipework installed with due regard for relevant standards and Codes of Practice.

Ductwork

PSO heaters can be fitted with distribution ductwork and/or inlet or return air duct connections. Installers must ensure that the combined duct resistances, including grilles, filters, dampers or other ductwork components are balanced to closely match the static pressure as shown on page 4 of this brochure. Insufficient or excessive duct resistance will compromise the performance of the heater. Please consult our technical department or your local area sales manager for further guidance.

Guarantee

Thermobile PSO heaters are provided with a comprehensive guarantee covering both the heater and the heat exchanger. For United Kingdom sales the heater has the benefit of a two year parts and one year labour guarantee whilst the heat exchanger assembly has a ten year time related warranty. All guarantees are subject to terms and conditions.



2 YEAR PARTS WARRANTY

1 YEAR LABOUR WARRANTY

10 YEAR TIME RELATED HEAT EXCHANGER WARRANTY

THERMOBILE®

Thermobile UK Ltd was established in 1993 as a daughter company of Thermobile Industries BV, a major European manufacturer of warm air heating products based in the Netherlands and which has been established for nearly 50 years.

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All the heat you need!