



# BENSON

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## Cabinet Heaters

Gas & Oil Fired Heaters

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**AMBIRAD**  
HEATING AND VENTILATION SOLUTIONS





# Cabinet Heaters

Cabinet heaters combine innovative design with a proven four pass heat exchanger technology to provide a high efficiency cost effective and durable range.

The units may be specified for either free blowing applications or for use with ductwork.

## Model Range

- > Gas fired cabinet heaters are suitable for use with Natural Gas (G20), most units can also be specified for Propane (G31)
- > Oil fired cabinet heaters are suitable for use with Class D gas oil (35 sec), most units can also be specified for Kerosene (28 sec oil). Oil fired cabinets are supplied complete with factory fitted fire valve and oil filter

Vertical freestanding models are available from 29kW to 380kW.

Horizontal and Down flow models from 58kW to 380kW.

## Options

- > Two stage burner control for gas & oil on certain models
- > Modulating burner control for gas on certain models
- > Supply & recirculation air inlet spigots
- > Supply & recirculation dampers
- > Two stage or modulating damper actuators
- > Burner combustion air adaptors
- > Stainless steel tubular heat exchanger
- > Up-rated fan motor for increased static pressure

## Specification

### Cabinet

Cabinets are constructed from electro-zinc coated steel with an inner heat shield skin and an epoxy powder coat finish outer skin to form a rigid and durable casework.

### Electric Motors

All electric motors comply with EC motor directive 2005/32/EC.

### Heat Exchanger

Four pass combustion chamber/heat exchanger assembly provides improved thermal efficiency with extended life expectancy. A stainless steel chamber is combined with a high efficiency tubular heat exchanger to achieve thermal efficiency in excess of 91%.

The complete assembly is mounted to allow for thermal expansion thereby avoiding undue thermal stress and premature heat exchanger failure.

### Burner

Gas fired units are fitted with a fully automatic forced draught burner complete with full safety controls to EN676 and the heaters are CE certified. A high/low burner is fitted as standard on model 375.

Oil fired units are supplied complete with a fully automatic burner including safety controls and factory fitted fire valve and oil filter. An additional external fire valve may be required in accordance with BS 410:Part2:1978.

Technical Data		Model Ref													
		30	35	40	60	75	85	120	135	180	205	235	275	350	375
<b>Gas Fired</b>															
Nominal heat output	kW	29	36	40	58	73	83	117	133	177	206	237	278	350	381
Temperature rise	°C	39	42	50	46	43	50	45	45	45	49	44	48	40	45
Gas Consumption Nat gas G20	m³/h	3.4	4.1	4.7	6.7	8.5	9.7	13.6	15.3	20.4	23.9	27.2	32.2	40.7	45.8
Gas Consumption propane G31	m³/h	1.3	1.6	1.8	2.6	3.6	3.7	5.2	5.9	7.8	9.1	10.4	12.3	17.3	19.0
Minimum inlet pressure Nat gas G20	mbar	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
Minimum inlet pressure propane G31	mbar	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0
Gas Connection <sup>2</sup>	Rc	½"	½"	½"	½"	½"	½"	¾"	¾"	1"	1¼"	1¼"	1¼"	1 ½"	2"
<b>Oil Fired</b>															
Nominal heat output	kW	32	38	43	60	76	82	123	138	184	208	248	265	340	381
Temperature rise	K	39	42	51	46	43	50	45	45	48	49	44	48	40	45
Oil Consumption	l/h	3.4	4.1	4.7	6.5	8.1	9.1	13.3	15.0	19.4	22.4	26.7	28.8	40.4	45.6
Oil Connection <sup>2</sup>	Rc	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"
<b>Air Handling Data</b>															
Airflow	m³/s	2196	2556	2556	3708	5004	5004	7740	9540	11196	12240	15552	17496	24768	24768
Throw <sup>1</sup> (Nozzle outlet )	m	14	14	14	17	17	17	20	20	20	22	22	25	31	31
Static pressure (Ducted)	Pa	75	100	100	125	100	100	137	150	175	188	125	175	250	250
Std motor		-	-	-	-	-	-	200	200	200	200	200	200	std	std
200 ESP upgrade		-	-	-	400	400	400	400	400	400	400	400	400	400	400
400 ESP upgrade		-	-	-	-	-	-	600	600	600	600	600	600	600	600
600 ESP upgrade		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Standard main fan motor	kW	0.5	0.5	0.5	0.9	0.9	0.9	1.5	2.2	3.0	3.0	4.0	5.5	7.5	7.5
Up-rated fan motors	kW	tba	tba	tba	tba	tba	tba	tba	tba	tba	tba	tba	tba	tba	tba
<b>General Data</b>															
Nominal flue diameter	mmø	125	125	125	150	150	175	175	175	200	200	225	225	250	250
Nominal combustion air diameter	mmø	125	125	125	125	125	125	150	150	150	150	150	150	150	150
Noise level <sup>3</sup>	dB(A)	67	69	69	72	72	72	74	76	78	78	79	81	81	81
Net weight	kg	196	196	196	241	243	243	330	332	525	540	630	646	1090	1090

1 Throw is dependent on building height, room temperature and nozzle settings.

2 Gas/oil lines must be adequately sized and reduced at appliance as required

3 Noise levels measured at 5 metres from appliance.



### Air Distribution

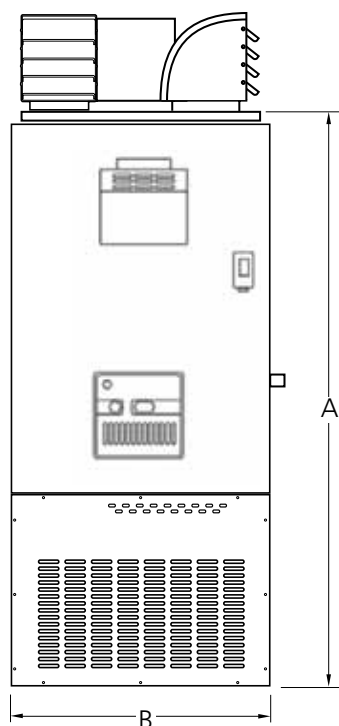
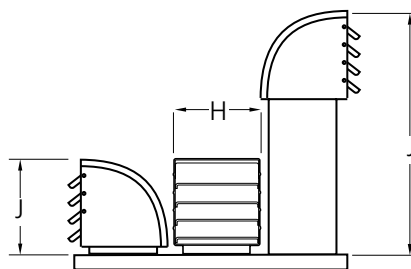
Centrifugal fan(s) circulate large air volumes evenly across the full heat exchanger surface for enhanced life expectancy. Fans on models 30 to 85 are direct drive with a single phase motor whilst larger models are fitted with a three phase motor and v-belt drive.

Free blowing heaters are fitted with long throw discharge nozzles complete with horizontal louvres and can be rotated through 360°. Models 75-375 are supplied with a raised rear nozzle (one per three nozzle heater and two per four nozzle heater).

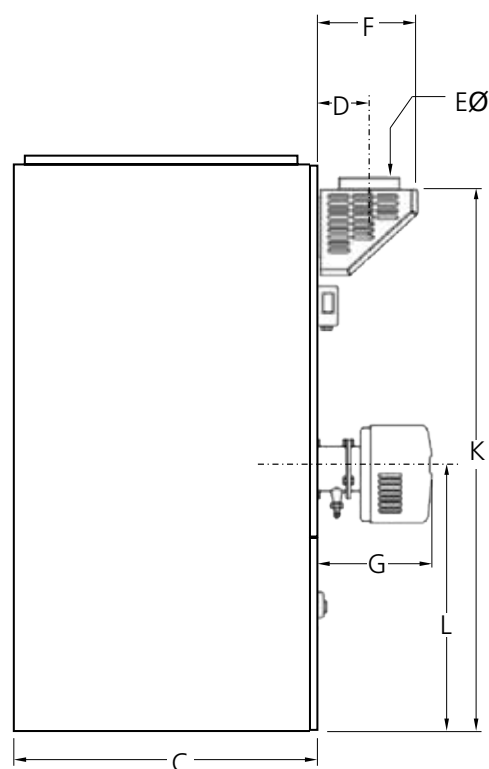
Heaters for use with ductwork are supplied with a duct outlet spigot.



### Vertical Heaters VN/VD



Front View



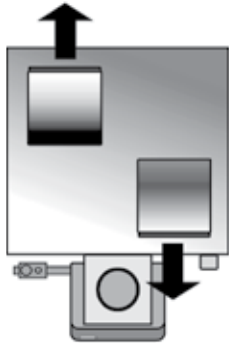
Side View

### Dimensions

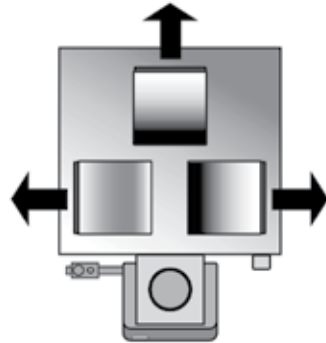
		Model Ref													
		30	35	40	60	75	85	120	135	180	205	235	275	350	375
A	Unit height	1650	1650	1650	1900	1900	1900	2025	2025	2120	2120	2110	2110	2667	2667
B	Unit width	660	660	660	660	660	660	790	790	1000	1000	1100	1100	1244	1244
C	Unit depth	662	662	662	925	925	925	1085	1085	1282	1282	1550	1550	1550	1550
D		95	95	95	170	170	170	170	170	213	213	195	195	203	203
E	mmø	125	125	125	150	150	175	175	175	200	200	225	225	250	250
F		250	250	250	320	320	320	327	327	394	394	380	380	355	355
G	Oil	229	229	229	267	267	267	298	298	298	476	476	476	476	476
	Gas	349	349	349	362	362	362	432	432	432	580	580	580	580	580
H		280	280	280	280	280	280	305	305	355	355	406	406	474	474
J <sup>1</sup>	Standard	240	330	300	300	330	330	360	360	410	410	460	460	613	613
	Extended	n/a	n/a	n/a	n/a	660	660	720	720	815	815	915	915	1115	1115
K		1500	1500	1500	1778	1778	1778	1865	1865	1980	1980	1965	1965	2610	2610
L		835	835	835	984	984	984	971	971	1068	1068	1054	1054	1372	1372

1. Heaters with 3 or 4 nozzles are supplied with extended head on the rear nozzle(s). For applications with restricted headroom, units may be specified with all nozzles at standard height.

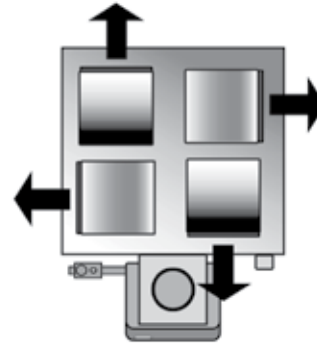
## Air Discharge and Inlet Details VN/VD



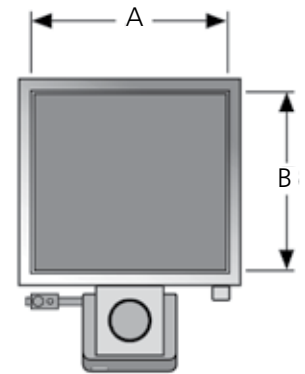
Nozzle outlet 30-60



Nozzle outlet 75-120

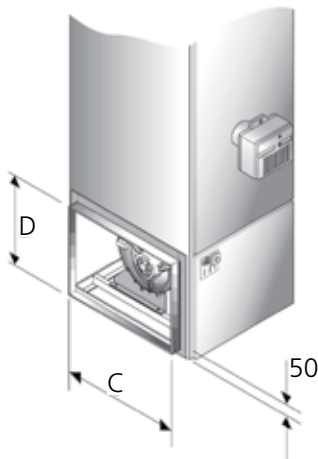


Nozzle outlet 135-375

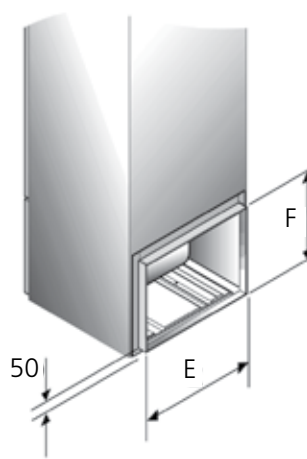


Duct outlet spigot

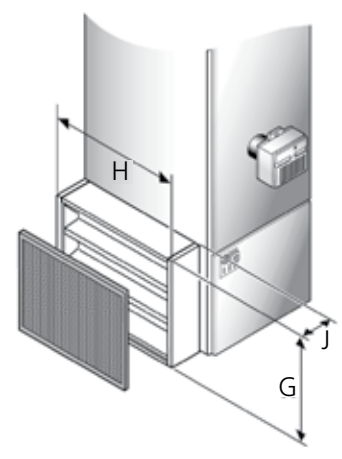
## Return Air Spigots and Filters VN/VD



Side inlet spigot  
left (as shown) or right -  
please specify at time of order



Rear inlet spigot



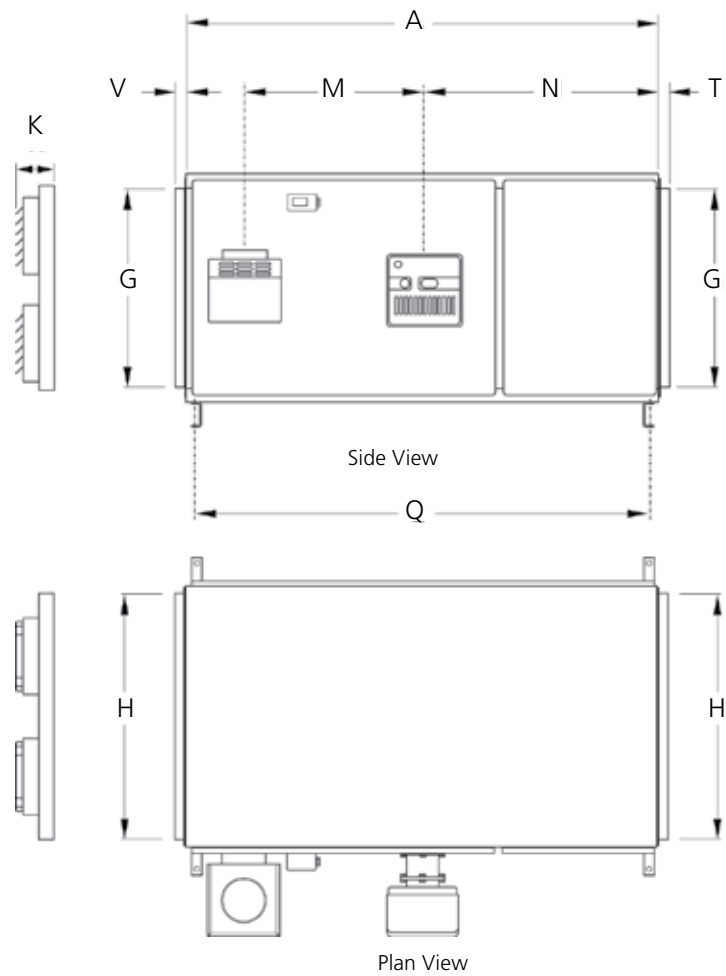
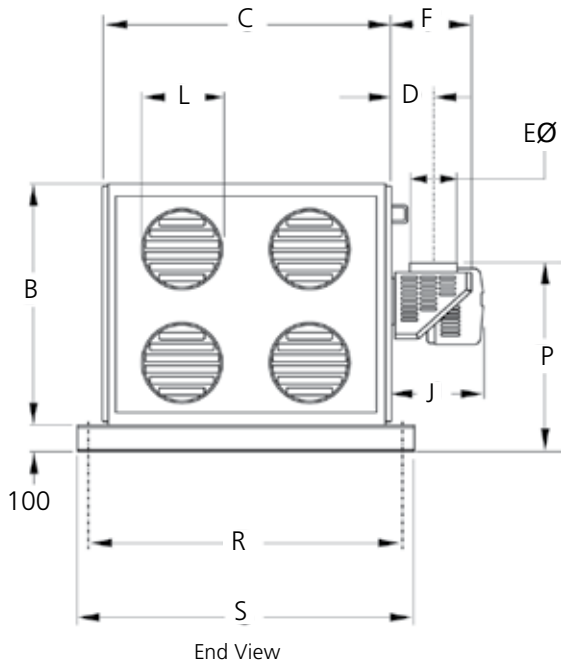
Side inlet filter  
Left (as shown) or right - please specify at time of order.  
Additional side inlet spigot is required to connect filter box to inlet ductwork

## Installation Dimensions

		Model Ref													
		30	35	40	60	75	85	120	135	180	205	235	275	350	375
Head plan (VN)		1	1	1	1	2	2	2	3	3	3	3	3	3	3
Nozzle detail (VN)	no.	2	2	2	2	3	3	3	4	4	4	4	4	4	4
	Spigot ø	240	240	240	240	240	240	280	280	320	320	370	370	370	370
Outlet Spigot (VD)	A	570	570	570	634	634	634	711	711	890	890	1000	1000	1086	1086
	B	570	570	570	770	770	770	944	944	1120	1120	1450	1450	1365	1365
Side Inlet Spigot (VN/VD)	C	522	522	522	702	702	702	904	904	1077	1077	1145	1145	1150	1150
	D	348	348	348	427	427	427	642	642	691	691	654	654	796	796
Rear Inlet Spigot (VN/VD)	E	620	620	620	520	520	520	687	687	691	691	935	935	n/a	n/a
	F	445	445	445	550	550	550	642	642	896	896	654	654	n/a	n/a
Inlet Filter Assembly (VN/VD)	G	420	420	420	600	600	600	702	702	765	765	720	720	860	860
	H	660	660	660	800	800	800	990	990	1165	1165	1245	1245	1530	1530
	J	300	300	300	300	300	300	300	300	300	300	450	450	450	450
Installation Clearances	Front	500	500	500	500	500	500	600	600	600	900	900	900	900	900
	Side	300	300	300	300	300	300	300	300	300	300	400	400	500	500
	Rear	700	700	700	1000	1000	1000	1200	1200	1500	1500	2000	2000	2000	2000

Filter cassettes can be withdrawn from either side, ensure adequate clearance for withdrawal i.e. full width of filter box.

## Horizontal Heaters HN/HD



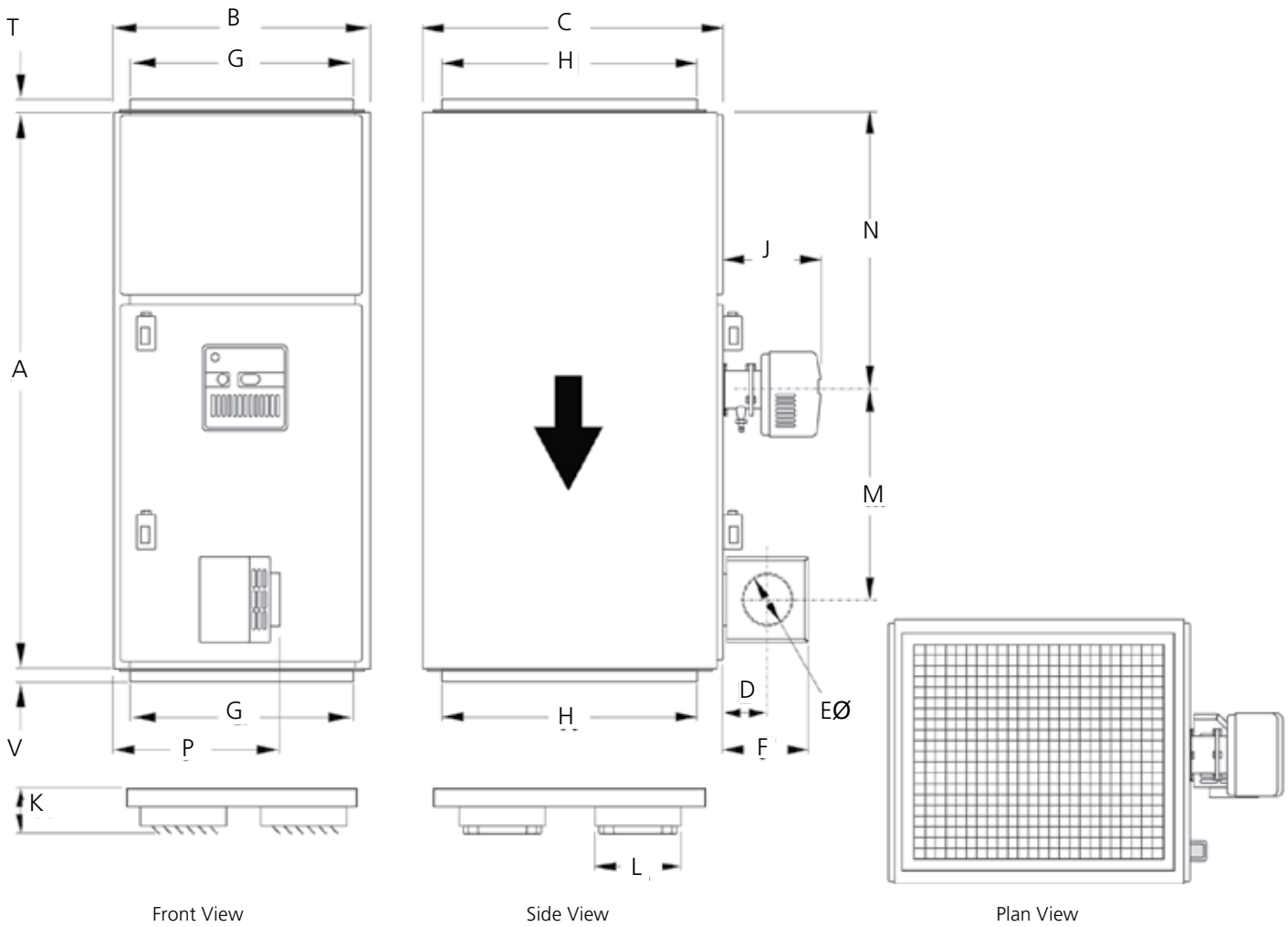
Note: Units may be specified for airflow right to left which is the standard configuration as shown. Alternatively units can be specified for airflow left to right.

### Dimensions

		Model Ref										
		60	75	85	120	135	180	205	235	275	350	375
A	Unit length	1865	1865	1865	1960	1960	2057	2057	2076	2076	2667	2667
B	Unit height	660	660	660	790	790	1000	1000	1100	1100	1244	1244
C	Unit width	925	925	925	1085	1085	1282	1282	1550	1550	1550	1550
D		170	170	170	170	170	213	213	225	225	203	203
E	mmø	150	150	175	175	175	200	200	225	225	250	250
F		320	320	320	327	327	394	394	380	380	355	355
G		560	560	560	711	711	890	890	1000	1000	1086	1086
H		790	790	790	944	944	1120	1120	1450	1450	1365	1365
J	Oil	267	267	267	298	298	298	476	476	476	476	476
	Gas	362	362	362	432	432	432	580	580	580	580	580
K		160	160	160	280	280	366	366	320	320	320	320
L	mmø	209	209	209	290	290	425	425	425	425	480	480
M		676	676	676	790	790	790	790	769	769	1054	1054
N		984	984	984	936	936	1033	1033	1054	1054	1372	1372
P		568	568	568	641	641	770	770	840	840	1396	1396
Q		1806	1806	1806	1895	1895	1992	1992	2020	2020	2612	2612
R		1081	1081	1081	1289	1289	1489	1489	1750	1750	1750	1750
S		1157	1157	1157	1365	1365	1565	1565	1826	1826	1826	1826
T					50	50	50	50				
V					30	30	30	30				



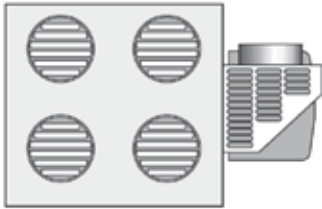
## Downflow Heaters RN/RD



### Dimensions

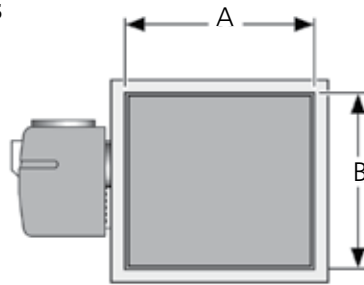
		Model Ref										
		60	75	85	120	135	180	205	235	275	350	375
A	Unit height	1865	1865	1865	1960	1960	2057	2057	2076	2076	2667	2667
B	Unit width	660	660	660	790	790	1000	1000	1100	1100	1244	1244
C	Unit depth	925	925	925	1085	1085	1282	1282	1550	1550	1550	1550
D		170	170	170	170	170	213	213	225	225	203	203
E	mmø	150	150	175	175	175	200	200	225	225	250	250
F		320	320	320	327	327	394	394	380	380	355	355
G		560	560	560	711	711	890	890	1000	1000	1086	1086
H		790	790	790	944	944	1120	1120	1450	1450	1365	1365
J	Oil	267	267	267	298	298	298	476	476	476	476	476
	Gas	362	362	362	432	432	432	580	580	580	580	580
K		160	160	160	280	280	366	366	320	320	320	320
L		209	209	209	290	290	425	425	425	425	480	480
M		676	676	676	790	790	790	790	769	769	1054	1054
N		984	984	984	436	436	1033	1033	1054	1054	1372	1372
P		476	476	476	541	541	670	670	748	748	1304	1304
T					50	50	50	50				
V					30	30	30	30				

## Air Discharge and Inlet Details



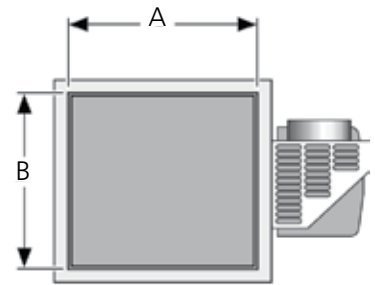
Discharge outlets (HN/RN)

(All HN/RN models are supplied with 4 louvred outlets)



End inlet spigot (HN/RN HD/RD)

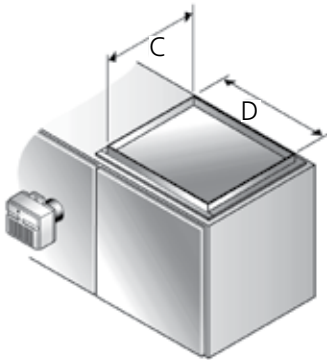
(Burner location shown for standard R-L horizontal airflow)



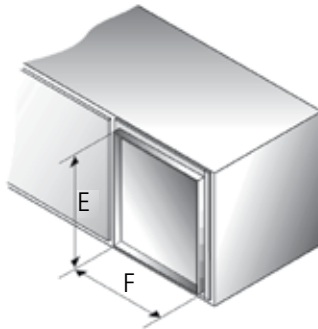
Outlet spigot (HD/RD)

(Flue location shown for standard R-L horizontal airflow)

## Alternative Return Air Spigots



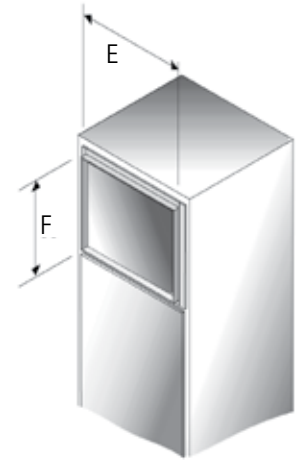
Top or bottom inlet spigot  
HN/HD



Rear inlet spigot  
HN/HD



Side inlet spigot  
RN/RD



Rear inlet spigot  
RN/RD

## Installation Dimensions

	Model Ref											
	60	75	85	120	135	180	205	235	275	350	375	
Nozzle ø (HN/RN)	203	203	203	284	284	419	419	419	419	470	470	
Duct Outlet Spigot (All)	A	790	790	790	944	944	1120	1120	1450	1450	1365	1365
	B	560	560	560	711	711	890	890	1000	1000	1086	1086
Top & Side Inlet (HN/HD & RN/RD)	C	702	702	702	904	904	1077	1077	1145	1145	1150	1150
	D	427	427	427	642	642	691	691	654	654	796	796
Rear Inlet (HN/HD)	E	520	520	520	687	687	896	896	935	935	n/a	n/a
	F	520	520	520	642	642	691	691	654	654	n/a	n/a
<b>Installation Clearances</b>												
Front	500	500	500	600	600	600	900	900	900	900	900	
Top (RN/RD)	150	150	150	150	150	150	150	150	150	150	150	
Top <sup>1</sup> (HN/HD)	150	150	150	150	150	150	150	400	400	500	500	
Rear	1000	1000	1000	1200	1200	1500	1500	2000	2000	2000	2000	

1 Top clearance applies to units with side air inlet. For units with top air inlet allow 1000mm

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