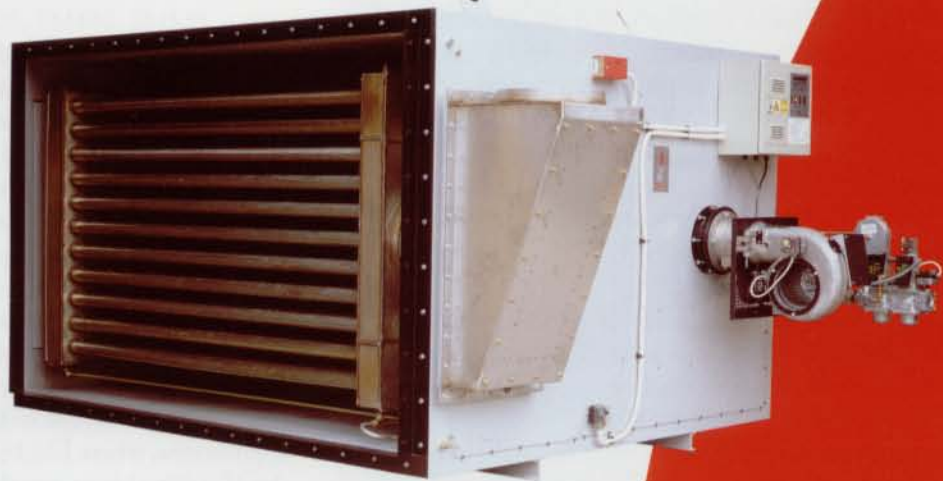


Heat Exchange Modules



Gas Fired and
Oil Fired
High Performance
Heat Exchange
Modules for
Industrial and
Commercial
Applications



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EM HEAT EXCHANGE MODULES

The range of Benson Heating indirect fired EM Heat Exchange Modules comprises of 12 basic units with heat outputs ranging from 60kW up to 700kW. The units can be specified so that their configuration is suitable for a variety of uses within warm air and process heating applications.

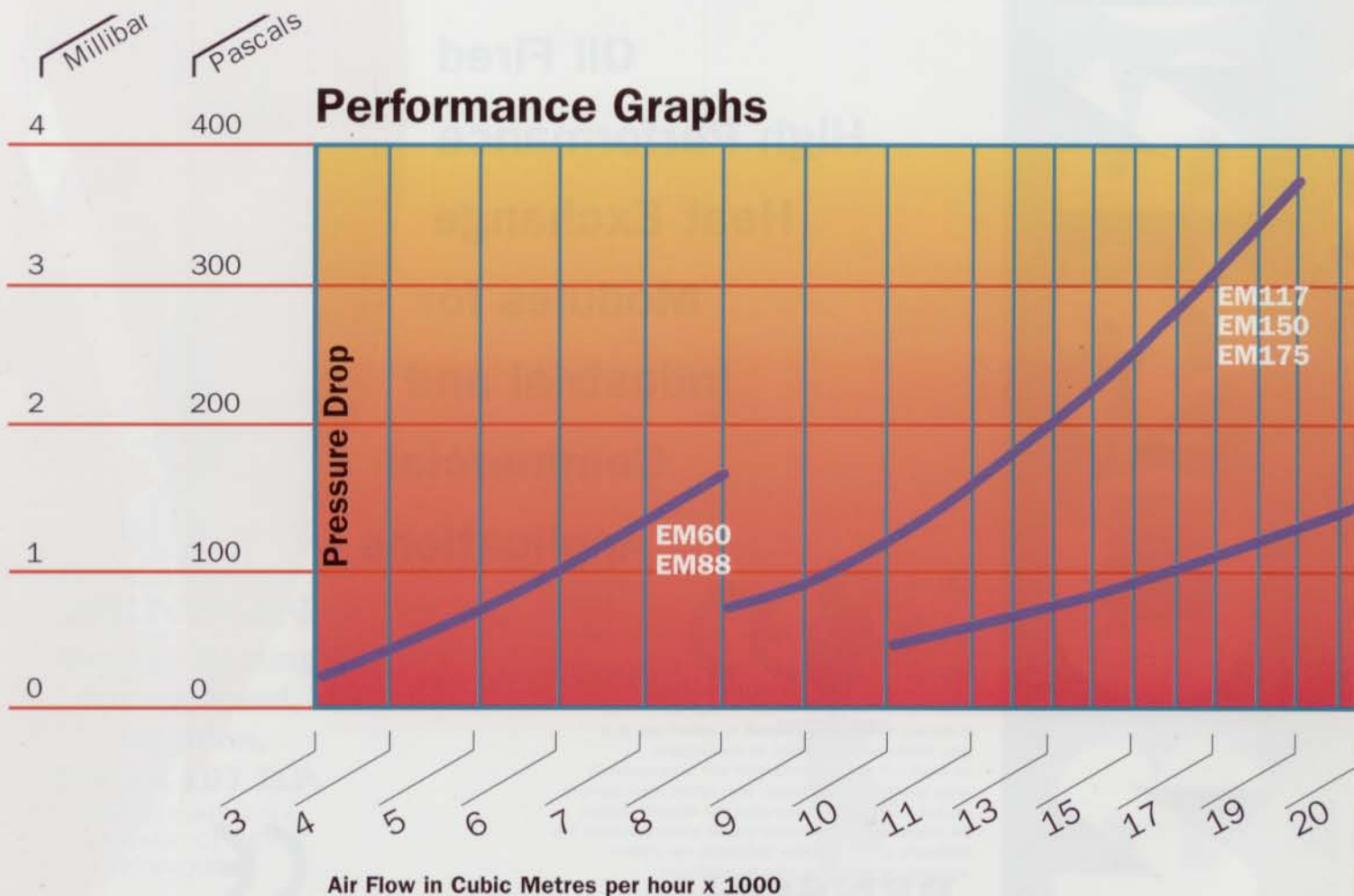
The units are all CE marked to comply with the latest British and European Standards, and are designed and manufactured using state of the art computer integrated systems. The range falls within the scope of the Benson Heating ISO 9001 quality management system, and the units offer the benefits of a proven high quality design, compliance with the latest legislation and product standards, and flexibility to meet the evolving needs of the warm air and process markets.

The gas fired units are all supplied with fully match tested forced draught burners, the controls specification for the burners allows for single stage, two stage, or fully modulating burner selection. The oil fired units are fitted with pressure jet burners offering single stage or two stage operation.

The units can be configured to suit various air flow characteristics with operational air volumes from 0.5m³/s through to 19.0m³/s. The maximum temperature rise through the EM units is 55°C and their operational ceiling is validated up to 125°C. The range can be specified with air flow directions to suit application requirements; either horizontal with air flow from left to right, or from right to left, or as vertical units.

The casing and heat shield sub-strates are manufactured from mild steel with a Zintec automotive specification corrosive protection, the units are supplied with outer panels primed and painted to provide a hammer effect finish to 90 microns thickness. The colour and finish can be specified to suit customer requirements as an option.

The units within the EM range are fully compatible for inclusion within Air Handling Units. EM Modules can also be used as stand alone units with the supply air being ducted to and from the units. For external applications, where EM Modules are not enclosed within Air Handling Units, weatherproof housings can be specified.



THE INTEGRITY OF THE PROVEN DESIGN OF THE COMBUSTION CIRCUIT OFFERS THE FOLLOWING:-

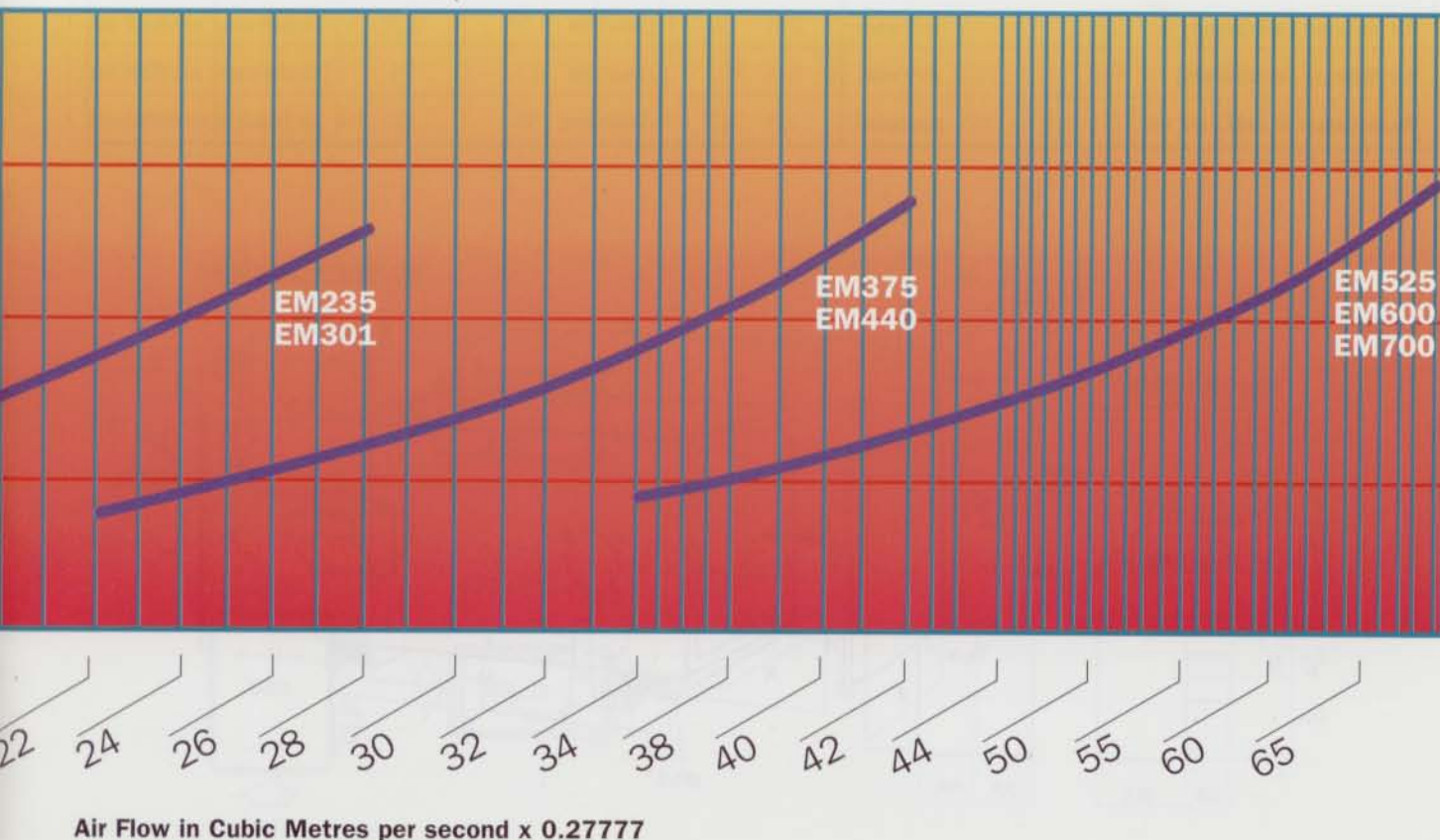
- Fully welded stainless steel combustion chamber featuring maximum volume and maximum surface area to provide high level efficiency, low temperature, and longevity
- Tubular mild steel or stainless steel three pass heat exchanger designed to offer maximum surface area and excellent heat transfer combined with low resistance to air flow
- The combustion circuit features integral expansion joints and is secured within the unit on flexible mountings designed to accommodate movement associated with thermal expansion
- Condensate drain facilities are fitted as standard on all stainless steel heat exchangers, and integral safety explosion relief facility is a common design feature on all units

Models EM60, EM88, EM117, EM150, and EM175 are designed so as to feature a bolt on panel method of construction. The panels are sealed using high performance rubber gaskets so as to offer minimum air leakage. An upgrade option is available for these units to offer improved high temperature performance and air worthiness.

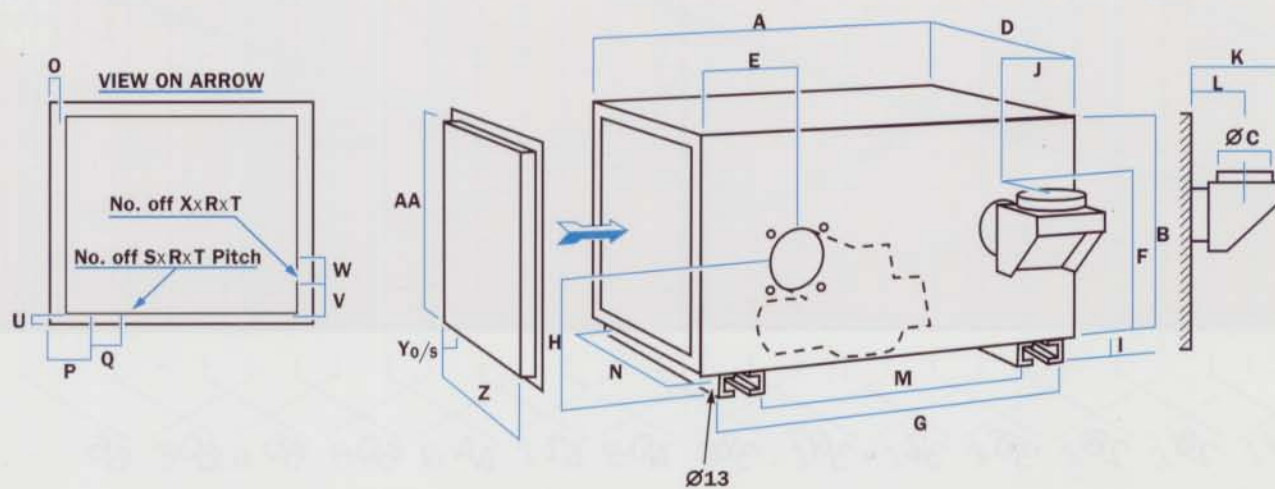
Models EM235, EM301, EM375, EM440, EM525, EM600, and EM700 are designed with a fully welded casing offering superior resistance to air leakage, and are validated for use in high pressure applications up to 2500 pascals.

The safety features on all units includes both an air proving device and a high temperature limit thermostat. The burner controls package for both gas and oil firing includes all necessary features so as to be compliant with the current requirements, and the controls interface make the units readily compatible with virtually all building and process management systems.

Each unit is fully inspected at various stages throughout manufacturing, in addition to this every unit is subject to a rigorous diagnostic hot test prior to despatch.

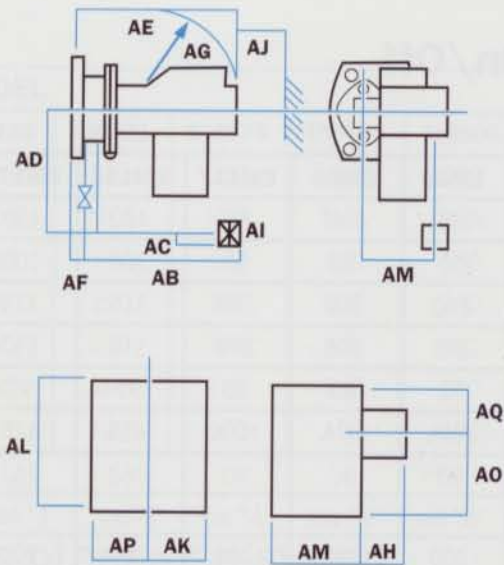
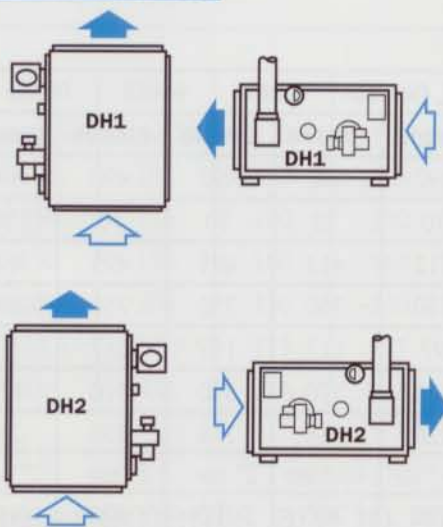


		EM60	EM88	EM117	EM150	EM175	EM235
Heat Output (nominal)	kW	60	88	117	150	175	235
Heat Input	kW	75	110	146	186	219	294
Nominal Efficiency	%	80	80	80	80	80	80
Gas Consumption	m ³ /hr	7.03	10.32	13.69	17.44	20.54	27.57
Inlet Pressure	mbar	17.5	17.5	17.5	17.5	17.5	17.5
Gas Connection Size (on/off)	BSP	0.75	0.75	0.75	1	1	1
Gas Connection Size (high/low)	BSP	0.75	0.75	0.75	1	1	1
Gas Connection Size (modulating)	BSP	0.75	1	1	1	1.5	1.5
Oil Consumption	l/hr	6.96	10.22	13.56	17.28	20.35	27.31
Oil Connection Size	BSP	0.25	0.25	0.25	0.25	0.25	0.25
Maximum Feed Pressure	psi	6	6	6	6	6	6
Flue Spigot Size	mm	128	128	182	182	182	232
Flue Diameter	mm	125	125	175	175	175	225
Electrical Supply (on/off high/low)	V-Hz-Ph	230-1-50	230-1-50	230-1-50	230-1-50	230-1-50	230-1-50
Electrical Supply (modulating)	V-Hz-Ph	230-1-50	230-1-50	230-1-50	230-1-50	230-1-50	230-1-50
Fuse Rating (unit)	A	5	5	5	5	5	10
Max. Running Current (nominal)	A	3	3	3	3	3	6
Open area for combustion @ low/high levels	cm ²	625/313	787/394	963/481	1175/587	1341/670	1656/828
Weight (gas fired units)	kg	191	191	305	305	305	435
Weight (oil fired units)	kg	182	182	295	295	295	410
Maximum Temperature Rise	Celsius	55	55	55	55	55	55
Air Volume (minimum)	m ³ /sec	0.91	1.33	1.77	2.27	2.65	3.55
Air Volume (maximum)	m ³ /sec	2.25	2.25	3.5	5.1	5.1	6.75
Resistance @ max. air vol.	pascals	165	165	190	350	350	200



		EM301	EM375	EM440	EM525	EM600	EM700
Heat Output (nominal)	kW	301	375	440	525	600	700
Heat Input	kW	376	469	550	656	750	875
Nominal Efficiency	%	80	80	80	80	80	80
Gas Consumption	m3/hr	35.26	43.99	51.58	61.53	70.34	82.07
Inlet Pressure	mbar	17.5	17.5	17.5	17.5	17.5	17.5
Gas Connection Size (on/off)	BSP	1.25	1.5	2	2	2	2
Gas Connection Size (high/low)	BSP	1.25	1.5	2	2	2	2
Gas Connection Size (modulating)	BSP	1.5	1.5	1.5	1.5	2	2
Oil Consumption	l/hr	34.93	43.57	51.09	60.94	69.67	81.29
Oil Connection Size	BSP	0.25	0.25	0.25	0.25	0.25	0.25
Maximum Feed Pressure	psi	6	6	6	6	6	6
Flue Spigot Size	mm	232	258	258	360	360	360
Flue Diameter	mm	225	250	250	350	350	350
Electrical Supply (on/off high/low)	V-Hz-Ph	415-3-50	415-3-50	415-3-50	415-3-50	415-3-50	415-3-50
Electrical Supply (modulating)	V-Hz-Ph	230-1-50	230-1-50	230-1-50	230-1-50	415-3-50	415-3-50
Fuse Rating (unit)	A	10	10	10	10	10	10
Max. Running Current (nominal)	A	6	6	6	6	6	6
Open area for combustion @ low/high levels	cm²	1971/985	2475/1237	2835/1417	3299/1649	4000/2000	4578/2289
Weight (gas fired units)	kg	435	800	800	1765	1765	1765
Weight (oil fired units)	kg	410	765	765	1700	1765	1765
Maximum Temperature Rise	Celsius	55	55	55	55	55	55
Air Volume (minimum)	m³/sec	4.5	5.5	6.65	8.1	9.1	10.6
Air Volume (maximum)	m³/sec	7.75	11.25	12.1	16.9	17.9	18.9
Resistance @ max. air vol.	pascals	240	250	275	225	250	275

DIRECTION OF AIRFLOW



Dimensional Data

Dimension	MODEL											
	EM60	EM88	EM117	EM150	EM175	EM235	EM301	EM375	EM440	EM525	EM600	EM700
A	1291	1291	1300	1300	1300	1400	1400	1835	1835	2138	2138	2138
B	610	610	750	750	750	1024	1024	1256	1256	1568	1568	1568
C	128	128	182	182	182	232	232	258	258	360	360	360
D	818	818	1015	1015	1015	1486	1486	1557	1557	2450	2450	2450
E	410	410	280	280	280	292	292	505	505	494	494	494
F	540	540	600	600	600	1025	1025	1070	1070	1383	1383	1383
G	1233	1233	1242	1242	1242	N/A	N/A	N/A	N/A	1000	1000	1000
H	390	390	450	450	450	595	595	704	704	860	860	860
I	80	80	80	80	80	76	76	76	76	76	76	76
J	207	207	235	235	235	345	345	278	278	271	271	271
K	295	295	290	290	290	475	475	525	525	490	490	490
L	182	182	171	171	171	300	300	315	315	270	270	270
M	N/A	N/A	N/A	N/A	N/A	585	585	790	790	N/A	N/A	N/A
N	724	724	912	912	912	N/A	N/A	N/A	N/A	2300	2300	2300
O	20	20	21.5	21.5	21.5	23	23	23.5	23.5	36	36	36
P	20	20	21.5	21.5	21.5	23	23	23.5	23.5	100	100	100
Q	370	370	309	309	309	144	144	151	151	150	150	150
R	M6	M6	M6	M6	M6	M10	M10	M10	M10	M10	M10	M10
S	3	3	4	4	4	11	11	11	11	16	16	16
T	1	1	1	1	1	1.5	1.5	1.5	1.5	1.5	1.5	1.5
U	22.5	22.5	26	26	26	22	22	24	24	36	36	36
V	0	0	0	0	0	0	0	0	0	73	73	73
W	282.5	282.5	349	349	349	140	140	151	151	150	150	150
X	3	3	3	3	3	8	8	9	9	10	10	10
Y	25	25	45	45	45	50	50	50	50	74	74	74
Z	708	708	870	870	870	1400	1400	1470	1470	2306	2306	2306
AA	536	536	640	640	640	938	938	1170	1170	1424	1424	1424

Gas On/Off

Dimension	MODEL											
	EM60	EM88	EM117	EM150	EM175	EM235	EM301	EM375	EM440	EM525	EM600	EM700
AB	299	299	299	450	450	490	490	490	490	490	490	490
AC	50	50	50	200	200	70	70	70	70	70	70	70
AD	260	260	260	315	315	412	412	412	495	495	495	495
AE	298	298	298	550	550	550	550	750	750	750	890	890
AF	70	70	70	97	97	97	97	117	117	117	107	107
AG	N/A	N/A	N/A	425	425	425	425	570	570	570	650	650
AH	90	90	90	262	262	226	226	238	238	238	263	263
AI	3/4" BSP	3/4" BSP	3/4" BSP	1" BSP	1" BSP	1" BSP	1 1/4" BSP	1 1/2" BSP	2" BSP	2" BSP	2" BSP	2" BSP
AJ	200	200	200	200	200	290	290	200	200	200	400	400

Gas High/Low

Dimension	MODEL											
	EM60	EM88	EM117	EM150	EM175	EM235	EM301	EM375	EM440	EM525	EM600	EM700
AB	440	440	440	440	560	520	520	560	560	560	640	640
AC	60	60	60	60	160	110	110	70	70	70	110	110
AD	-270	-270	-270	-270	-350	-350	-380	-540	-540	-540	-670	-670
AE	440	440	440	440	440	580	690	690	690	690	720	720
AF	50	50	50	50	50	150	150	170	170	170	150	150
AG	350	350	350	350	350	460	555	555	555	555	555	555
AH	130	130	130	130	130	270	270	250	250	250	420	420
AI	3/4" BSP	3/4" BSP	3/4" BSP	1" BSP	1" BSP	1" BSP	1 1/4" BSP	1 1/2" BSP	1 1/2" BSP	1 1/2" BSP	1 1/2" BSP	2" BSP
AJ	200	200	200	200	200	390	390	340	340	340	520	520

Gas Modulating

Dimension	MODEL											
	EM60	EM88	EM117	EM150	EM175	EM235	EM301	EM375	EM440	EM525	EM600	EM700
AB	410	410	410	508	508	552	552	560	560	560	560	560
AC	50	50	50	65	65	65	65	70	70	70	70	70
AD	242	242	242	350	350	350	350	462	545	545	545	545
AE	298	298	298	550	550	550	550	750	750	750	890	890
AF	70	70	70	97	97	97	97	117	117	117	107	107
AG	N/A	N/A	N/A	425	425	425	425	570	570	570	650	650
AH	90	90	90	222	222	222	222	238	238	238	263	263
AI	3/4" BSP	1" BSP	1" BSP	1" BSP	1 1/2" BSP	1 1/2" BSP	1 1/2" BSP	1 1/2" BSP	1 1/2" BSP	1 1/2" BSP	2" BSP	2" BSP
AJ	200	200	200	200	200	290	290	200	200	200	400	400

Oil Burner

Dimension	MODEL											
	EM60	EM88	EM117	EM150	EM175	EM235	EM301	EM375	EM440	EM600	EM700	
AK	152.5	152.5	175	175	175	225	225	280	280	280	280	
AL	262	262	298	298	298	N/A	N/A	N/A	N/A	N/A	N/A	
AM	256	256	290	290	290	390	390	580	580	580	580	
AN	150	150	160	160	160	290	290	200	200	200	200	
AO	204	204	230	230	230	250	250	300	300	300	300	
AP	152.5	152.5	175	175	175	260	260	280	280	280	280	
AQ	N/A	N/A	N/A	N/A	N/A	120	120	100	100	100	100	

All measurements are in mm unless otherwise stated

ASSOCIATED PRODUCTS

- Gas & Oil Fired Cabinet Heaters.
- Gas Fired Unit Heaters.
- Portable Heaters.
- Flue Systems.
- Recoupak Destratification Fans.

Customer Hotline

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