

System Design for Fan Convectors

Fan convectors are intended to be connected to central heating systems in the same way as radiators, and offer advantages and benefits not available from traditional emitters. To ensure optimum fan convector performance, great care must be taken to ensure that the choice of unit and the heating system design are considered. The following factors must be taken into consideration:

- Fan convectors should only be used on closed circulation, two pipe, pump assisted central heating systems.
- Fan convectors should be correctly sized to match the heat loss requirement of the room with the unit operating at its lowest fan speed.
- The heating system must be capable of providing sufficient hot water through the heat exchanger. This means that:
 - The minimum pipe size should be 15mm.
 - Fan convectors are not suitable for use on microbore pipe-work.
 - Fan convectors are not suitable for one-pipe systems.
 - Where the unit is fitted onto a system with other emitters, a separate circuit for the fan convector should be considered to ensure an adequate water flow through it.
- The heating system water temperature must be greater than 43°C in heating mode for the unit to operate (lower temperatures possible for heat pump applications).
- Optimum performance of the fan convector will require effective balancing of the whole system.
- Fan convectors should not be used to replace radiators in existing systems unless pipe-work sizing, system design and system balancing can guarantee an adequate flow of water through the fan convector.
- The maximum working pressure through the heat exchanger is 10 bar (150 lb/in²). The maximum allowable water temperature through the heat exchanger is 90°C.
- The unit should be mounted on a flat wall, and stud or partition walls should be avoided to minimise the possibility of noise transmission.

HI-LINE RC Performance Data

The unit must be sized to match the calculated heat loss requirement of the room with the unit operating at normal fan speed. The higher fan speeds will be used automatically when the room temperature is significantly lower than the preset temperature.

When establishing the temperature difference, i.e. mean water to room temperature, allowance should be made for temperature drop in the system. It is the temperature at the convector which dictates the output.

Heating Performance Data

Model	Fan Speed	Heat Output (watts)						Heat Output (Btu/h)					
		Temperature Difference (°C)						Temperature Difference (°F)					
		40°	45°	50°	55°	60°	65°	72°	81°	90°	99°	108°	117°
20-14	Normal	2737	3101	3468	3836	4207	4579	9339	10581	11831	13089	14354	15625
	Medium	3457	3917	4380	4845	5314	5784	11796	13365	14944	16533	18130	19735
	Boost	3917	4436	4959	5485	6014	6545	13363	15136	16920	18715	20518	22331
15-10	Normal	1941	2199	2459	2721	2983	3248	6625	7504	8391	9282	10179	11081
	Medium	2197	2489	2783	3079	3376	3675	7495	8492	9495	10504	11519	12539
	Boost	2913	3300	3690	4082	4477	4873	9939	11260	12591	13929	15275	16628
10-6	Normal	1271	1440	1610	1781	1953	2126	4336	4912	5493	6076	6664	7254
	Medium	1546	1752	1959	2167	2376	2587	5276	5977	6684	7394	8109	8827
	Boost	1990	2255	2521	2789	3059	3330	6971	7694	8603	9517	10437	11361
7-4	Normal	734	831	930	1029	1128	1228	2504	2837	3172	3509	3848	4189
	Medium	1020	1156	1292	1430	1568	1707	3481	3944	4410	4879	5350	5824
	Boost	1344	1522	1702	1883	2065	2248	4584	5194	5807	6424	7045	7669

Heat outputs tested in accordance with BS 4856 Part 1.

Flow Rate: 340 ltr/h (75 gal/h).

Flow Rate Correction Factors:

- 455 ltr/h (100 gal/h) multiply output by 1.06.
- 227 ltr/h (50 gal/h) multiply output by 0.96.
- 113 ltr/h (25 gal/h) multiply output by 0.85.

Cooling Performance Data (Heater/Cooler Model Only)

Model	Fan Speed	Cooling Performance (watts)						Cooling Performance (Btu/h)					
		Air-Mean Water Temperature Difference (°C)						Air-Mean Water Temperature Difference (°F)					
		15°		20°		25°		27°		36°		45°	
		Tot.	Sens.	Tot.	Sens.	Tot.	Sens.	Tot.	Sens.	Tot.	Sens.	Tot.	Sens.
20-14	Normal	1256	1034	1922	1291	2676	1421	4284	3530	6557	4405	9131	4849
	Medium	1510	1241	2312	1597	3220	1759	5153	4234	7887	5449	10985	6002
	Boost	1601	1363	2449	1770	3408	1879	5462	4650	8354	6039	11628	6412
15-10	Normal	886	761	1355	1002	1886	1091	3022	2598	4624	3420	6435	3721
	Medium	958	815	1466	1058	2041	1123	3268	2781	5001	3609	6965	3833
	Boost	1276	1093	1953	1434	2719	1549	4354	3730	6664	4892	9276	5284
10-6	Normal	578	490	884	635	1230	668	1971	1671	3016	2166	4195	2279
	Medium	646	545	988	704	1375	736	2202	1861	3370	2404	4690	2512
	Boost	780	638	1194	867	1662	1098	2662	2178	4074	2957	5671	3748
7-4	Normal	318	274	487	362	678	396	1085	936	1663	1237	2313	1352
	Medium	473	405	725	531	1009	574	1614	1383	2473	1813	3443	1959
	Boost	574	459	878	623	1222	790	1957	1567	2995	2126	4170	2695

Cooling performance tested in accordance with BS 4856 Part 2.

Flow Rate: 340 ltr/h.

Relative Humidity: 50%.

Flow Rate Correction Factors:

- 455 ltr/h (100 gal/h) multiply output by 1.06.
- 227 ltr/h (50 gal/h) multiply output by 0.96.
- 113 ltr/h (25 gal/h) multiply output by 0.85.

HI-LINE RC Performance Data (continued)

Approximate Hydraulic Resistance

Litres/h	mm wg				kPa			
	7-4	10-6	15-10	20-14	7-4	10-6	15-10	20-14
455	1084	1240	1500	1774	9.4	12.12	14.7	17.42
340	798	657	905	1140	7.7	6.42	8.9	11.2
227	350	327	450	565	3.5	3.25	4.37	5.5
113	134	105	157	221	1.4	1.1	1.57	2.1

Weight, Water Content and Motor Power

Model	Motor Power (W)	Water Content (l)	Unpacked Weight (kg)
20-14	80	0.77	14.7
15-10	62	0.56	11.3
10-6	35	0.32	8.9
7-4	35	0.30	7.4

Noise Levels

Model	Sound Pressures at 2.5m (dBA)		
	Normal	Medium	Boost
20-14	33.3	38.7	45.4
15-10	28.8	35.4	45.6
10-6	23.5	30.8	37.2
7-4	23.4	32.5	43.3

Noise levels tested in accordance with EN 23741.

Air Flow

Model	Air Flow (m ³ /h)			Air Flow (ft ³ /h)		
	Normal	Medium	Boost	Normal	Medium	Boost
20-14	285	371	431	10061	13096	15214
15-10	207	276	333	7307	9743	11755
10-6	143	171	220	5048	6036	7766
7-4	81	105	133	2859	3707	4695

HI-LINE LV Performance Data

This model should only be selected if the normal fan speed output is capable of maintaining the calculated heat losses of the room at the chosen operating conditions. This will enable the boost fan speed and the higher temperature differences to be used to greater advantage for rapid warming of the room from cold in excessive conditions.

When establishing the temperature difference, i.e. mean water to room temperature, allowance should be made for temperature drop in the system. It is the temperature at the convector which dictates the output.

Heating Performance Data

Model	Fan Speed	Heat Output (watts)						Heat Output (Btu/h)					
		Temperature Difference (°C)						Temperature Difference (°F)					
		40°	45°	50°	55°	60°	65°	72°	81°	90°	99°	108°	117°
7-4	Normal	734	831	930	1029	1128	1228	2504	2837	3172	2509	3848	4189
	Boost	1344	1522	1702	1883	2065	2248	4584	5194	5807	6425	7045	7669

Heat outputs tested in accordance with BS 4856 Part 1.

Flow Rate: 340 ltr/h (75 gal/h).

Flow Rate Correction Factors:

455 ltr/h (100 gal/h) multiply by 1.06.

227 ltr/h (50 gal/h) multiply by 0.96.

113 ltr/h (25 gal/h) multiply by 0.85.

Approximate Hydraulic Resistance

Litres/h	mm wg	kPa
455	1084	9.4
340	798	7.7
227	350	3.5
113	134	1.4

Noise Levels

Fan Speed	Sound Pressures at 2.5m (dBA)
Normal	16.6
Boost	32.5

Noise levels tested in accordance with EN 23741.

HI-LINE LV Performance Data (continued)

Weight, Water Content and Motor Power

Motor Power (W)	Water Content (l)	Unpacked Weight (kg)
30	0.3	7.4

Air Flow

Fan Speed	Air Flow (m ³ /h)	Air Flow (ft ³ /h)
Normal	81	2859
Boost	133	4695

HI-LINE Super Performance Data

It is preferable to select the model with an output capable of maintaining the calculated heat losses of the room when operating at normal speed. This will enable the boost fan speed and the higher temperature differences to be used to greater advantage for rapid warming of the room from cold in excessive conditions.

When establishing the temperature difference, i.e. mean water to room temperature, allowance should be made for temperature drop in the system. It is temperature at the convector which dictates the output.

Heating Performance Data

Model	Fan Speed	Heat Output (watts) Temperature Difference (°C)						Heat Output (Btu/h) Temperature Difference (°F)					
		40°	45°	50°	55°	60°	65°	72°	81°	90°	99°	108°	117°
29-20	Normal	3906	4432	4962	5496	6033	6573	13327	15122	16930	18752	20585	22427
	Boost	5526	6281	7045	7815	8591	9373	18855	21431	24038	26665	29312	31981
25-18	Normal	3417	3843	4270	4697	5123	5550	11659	13112	14569	16026	17480	18937
	Boost	4800	5500	6200	6900	7600	8400	16378	18766	21154	23543	25931	28661

Heat outputs tested in accordance with BS 4856 Part 1.

Flow Rate Correction Factors:

- 455 ltr/h (100 gal/h) multiply output by 1.03.
- 227 ltr/h (50 gal/h) multiply output by 0.98.
- 113 ltr/h (25 gal/h) multiply output by 0.85.

Approximate Hydraulic Resistance

ltr/h	mm wg		kPa	
	25-18	29-20	25-18	29-20
455	2095	2551	20.5	24.6
340	1282	1530	12.6	15.0
227	620	850	6.1	8.3
113	234	245	2.3	2.4

Air Flow

Model	Air Flow (m ³ /h)		Air Flow (ft ³ /h)	
	Min	Max	Min	Max
29-20	390	540	13772	19069
25-18	350	500	12360	17657

Weight, Water Content and Motor Power

Model	Motor Power (W)	Water Content (l)	Unpacked Weight (kg)
29-20	80	0.85	21.0
25-18	80	0.63	18.0

HI-LINE RC E Performance Data

Heating Performance Data

Model	Heat Output (kW)	
	Low	High
RC E	1	2

HI-LINE Controls

HI-LINE RC

Units are supplied with an electronic infra-red remote control system with the following features:

- Automatic room temperature control.
- Fan only option for ambient air circulation.
- Three fan speeds.
- Unit mounted controls and display.
- Unit control panel electronic tamper proof lock.
- Low water temperature set point adjustment.
- Displayed temperature calibration system.

HI-LINE LV

Units are fitted with a switch offering high and low fan speed and off selection. A low limit thermostat is fitted to the unit to ensure that the fan stops after the heating system is switched off and the water flow stops.

HI-LINE Super

Units are supplied with a wall mounted control, giving fully variable speed control and fan only option for ambient air circulation.

HI-LINE RC E

Units are supplied with an electronic infra-red remote control system with the following features:

- Automatic room temperature control.
- Fan only option for ambient air circulation.
- Timer for user setting of heating periods.
- Unit mounted controls and temperature display .
- Single fan speed.
- Optional oscillating outlet vanes for improved air circulation.

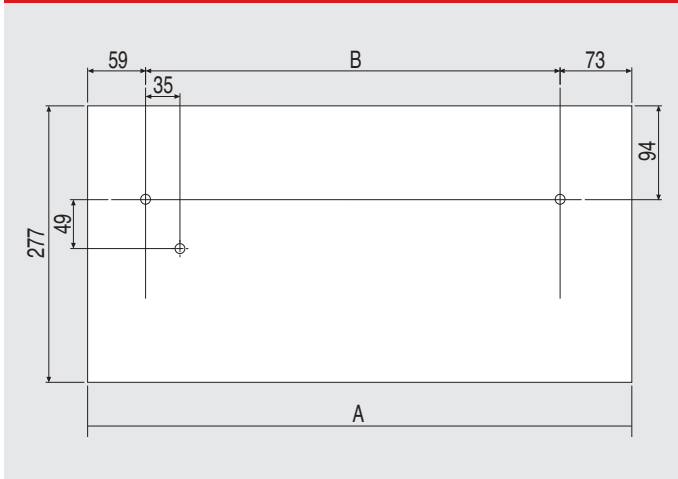
HI-LINE Water Connections

Water connections (15mm compression) are on the right-hand side and the system pipework may be brought in from above or the rear. Supplied with isolating valves.

HI-LINE Electrical Data

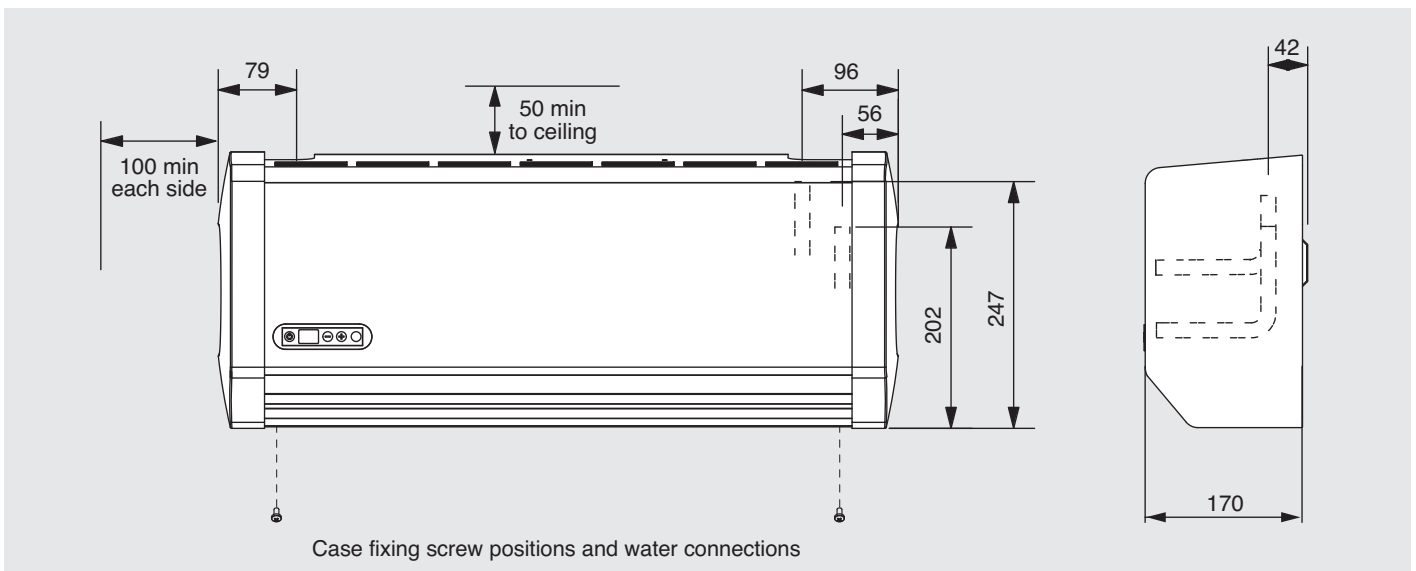
All HI-LINE models require an electrical supply of 220-240V - 50Hz fused at 3A (except HI-LINE RC E model which requires to be fused at 10A).

HI-LINE RC Dimensions and Fixings

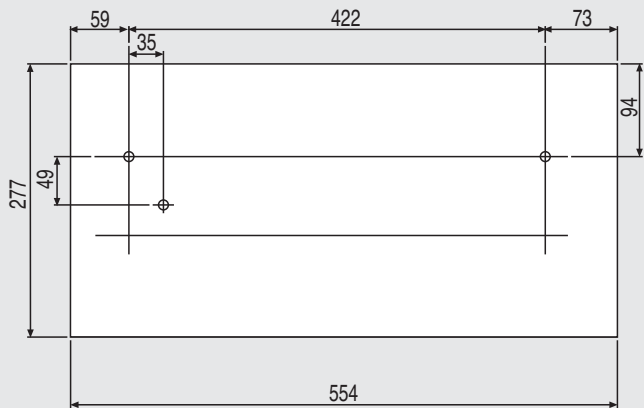
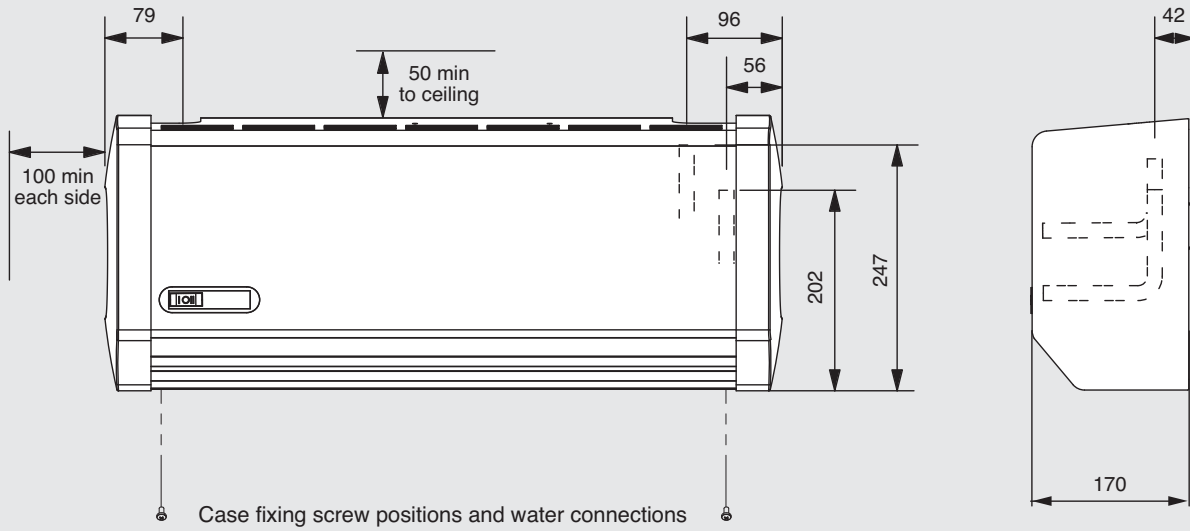


Model	Dimensions (mm)	
	A	B
20-14	1171	1039
15-10	886	754
10-6	682	550
7-4	554	422

- Maximum installation height is 2.13m to the underside of the unit.
- Minimum installation height is 1.8m to the underside of the unit.
- Maximum ceiling height is 3m.
- Minimum clearance each side is 100mm.
- Minimum top clearance is 50mm.



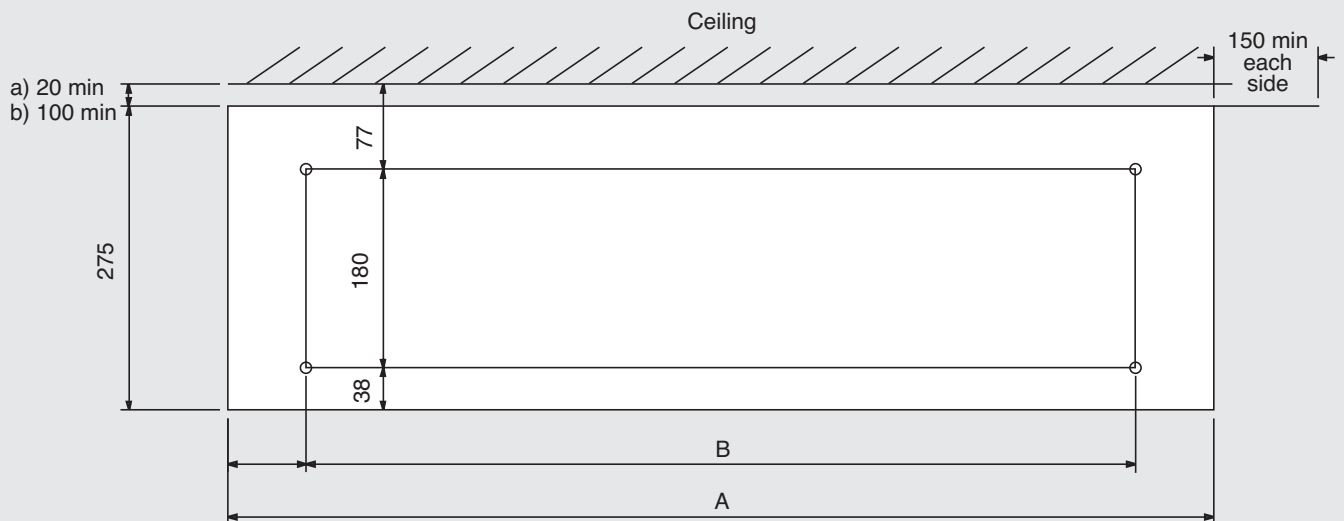
HI-LINE LV Dimensions and Fixings



Dimensions (mm)		
Height	Width	Depth
277	554	170

- Maximum installation height is 2.13m to the underside of the unit.
- Minimum installation height is 1.8m to the underside of the unit.
- Maximum ceiling height is 3m.
- Minimum clearance each side is 100mm.
- Minimum top clearance is 50mm.

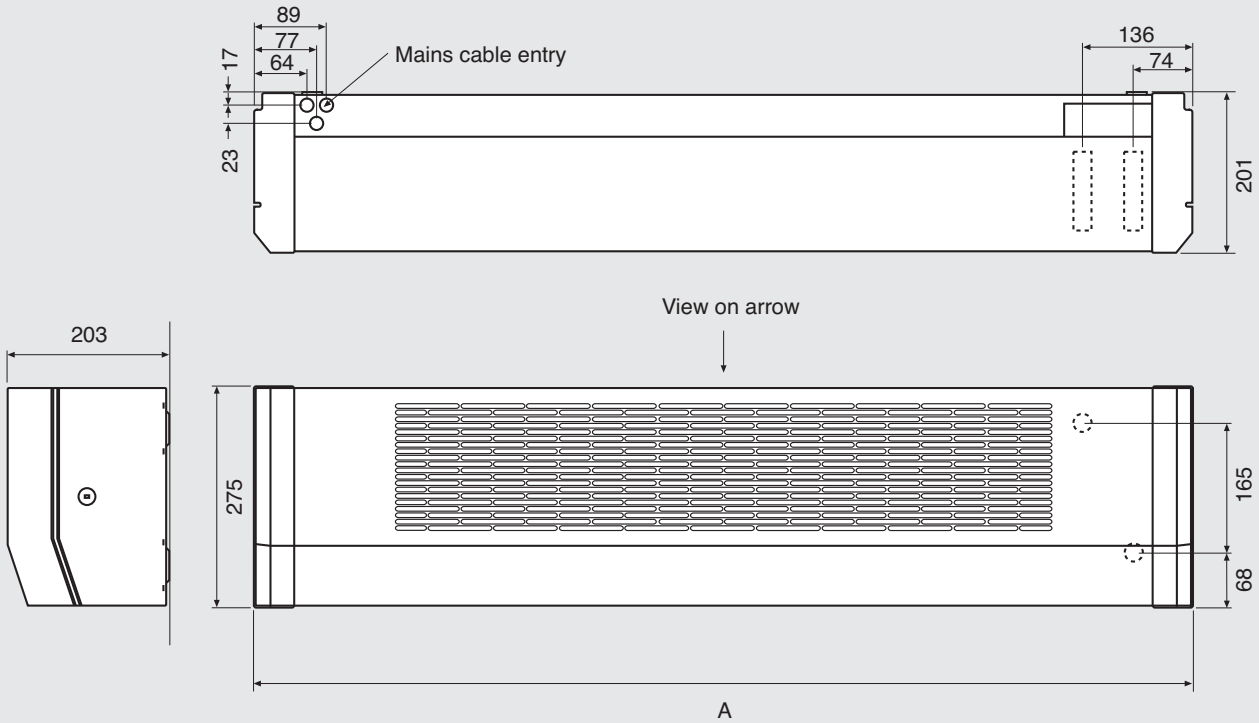
HI-LINE Super Dimensions and Fixings



Model	Dimensions (mm)	
	A	B
29-20	1378	1237
25-18	1168	1027

- a) 20mm clearance required if pipework is from the rear.
- b) 100mm clearance required if pipework is from the top to allow for valve.

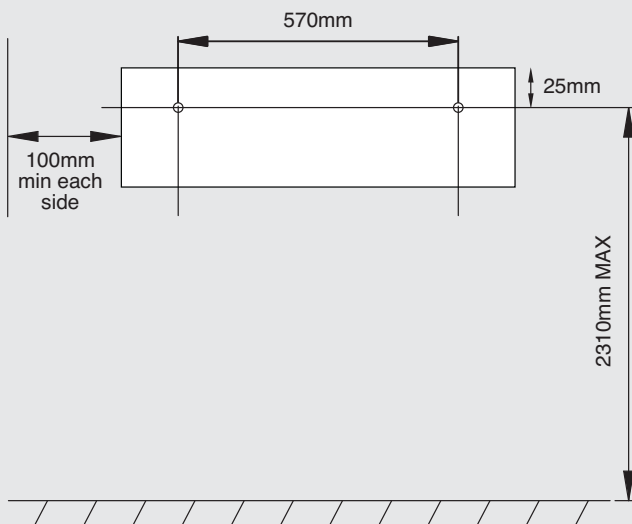
HI-LINE Super Dimensions and Fixings (continued)



Model	Dimensions (mm)	
	A	
29-20	1378	
25-18	1168	

- Maximum installation height is 3m to the underside of the unit.
- Minimum installation height is 1.8m to the underside of the unit.
- Maximum ceiling height is 3.5m.
- Minimum side clearance is 150mm.

HI-LINE RC E Dimensions and Fixings



- Maximum installation height is 2.13m to the underside of the unit.
- Minimum installation height is 1.8m to the underside of the unit.
- Maximum ceiling height is 3m.
- Minimum side clearance is 100mm.

Dimensions (mm)		
Height	Width	Depth
205	615	130

