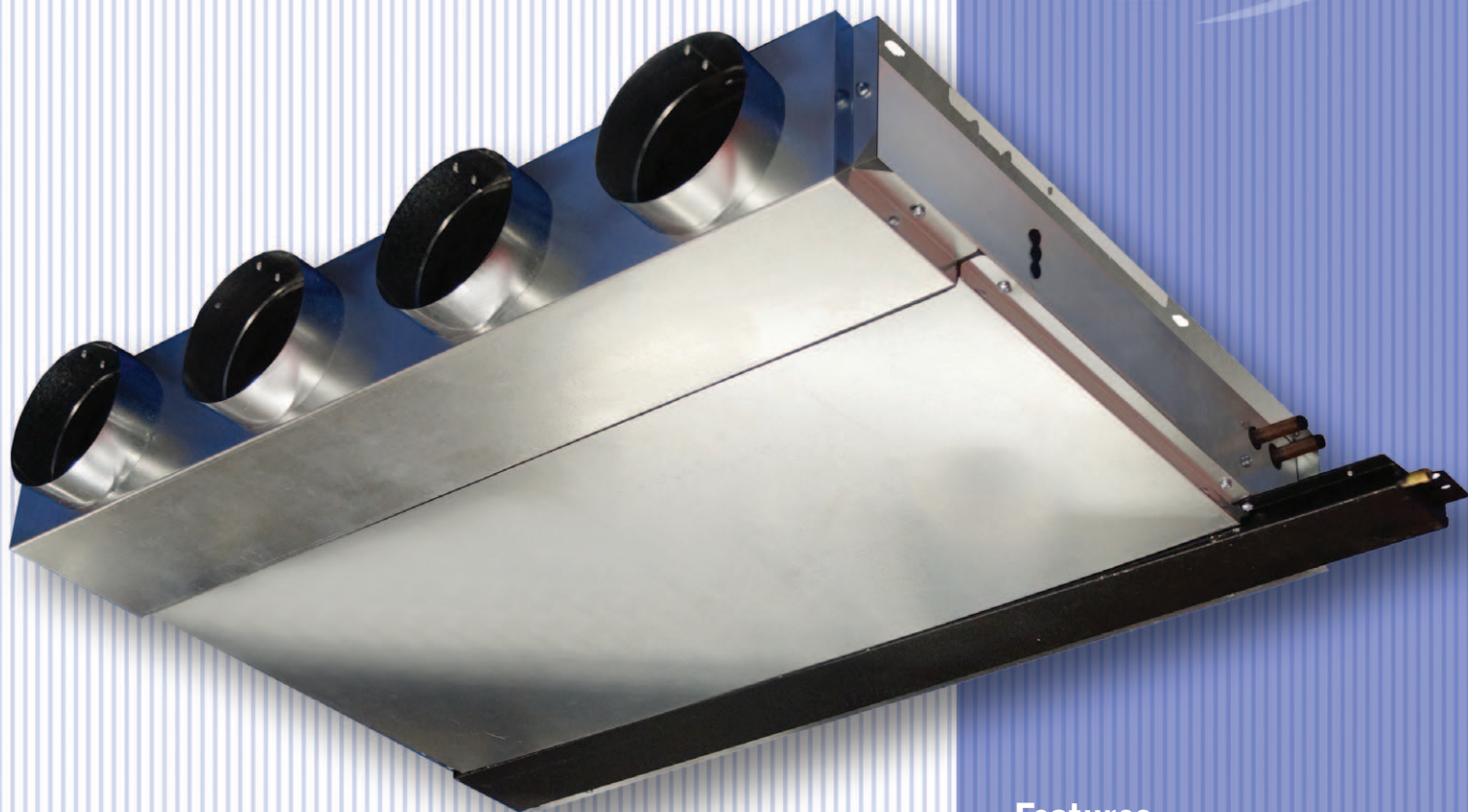


# Highline 170ec

## Waterside Control Fan Coil Units



# SLIMLINE

### Features:

- ▶ Incorporating Leading ec/dc Motor Technology
- ▶ ErP Directive 2015 Compliant
- ▶ Low Specific Fan Powers
- ▶ Infinite Fan Speed Control
- ▶ Performance at System Pressures Up To 50 pa
- ▶ Lifetime "eco" Filter

# Highline 170ec

## Waterside Control Fan Coil Units

### Description

The Diffusion Highline ranges of waterside control fan coils have been specifically designed with consideration to their intended installation; being either a concealed horizontal ceiling void application, or recessed under the floor.

All of the Highline models have been configured to perform efficiently against external system static pressures up to 50 Pa.

Flexibility of design allows the Highline range to be configured to suit a variety of installation requirements; including circular, rectangular and bulkhead ducted connections.

The numerous models within the Highline range enable performance selections ranging from NR25 to NR40, and air volumes up to 700l/s.

### Outline Engineering Specification

#### Chassis

The chassis shall be manufactured from heavy gauge galvanised mild steel sheet, with burr free edges and a natural finish, formed and strengthened to provide a rigid and distortion free construction.

Units shall have reinforced mounting points incorporated within the overall chassis width to facilitate drop rod installation.

Full width removable maintenance panels shall be fitted providing access to key internal components for maintenance purposes.

#### Fans

Fans shall be of the single inlet, single width, direct driven, centrifugal type.

Scrolls shall be manufactured from galvanised mild steel, complete with forward curved multi-bladed aluminum or galvanised steel impellers.

Impeller and motor assemblies shall be balanced in accordance with BS ISO 1940.

#### Motors

Motors shall be of the electronically commutated direct current type, rated for continuous operation with inbuilt overload protection devices, and shall be capable of performance control via a 0 to 10 Volt dc signal.

Construction shall be of the totally enclosed design protection rated to IP42, Insulation class 'B', with maintenance free sealed for life ball bearings, and compliant with BS 5000-11 and BS EN 60034

EMC: Interference emissions acc. to EN 61000-6-3  
Interference immunity acc. to EN 61000-6-2

Electrical supply requirements: 230V-1ph-50Hz in accordance with DIN IEC 38.

#### Heat Exchanger

Heat exchanger matrixes shall be manufactured from solid drawn copper tubes; mechanically expanded into accurately pre-formed collars in rippled plate type aluminium fins.

Multi circuit designs shall be incorporated ensuring maximum thermal performance efficiency, headers unifying the circuits shall terminate in plain tail connections on 40mm centres.

Heating and Cooling circuit headers shall incorporate manually operated key pattern air vents and drains.

Heat exchangers shall be suitable for operating at system pressures up to 12 bar, tested to 30 bar dry air / nitrogen at manufacture, and subsequently leak tested again when fitted with valve sets at our works.

#### Electric Elements

Electric heating elements shall be manufactured from 8mm fully sheathed stainless steel rods, with spiral fin on a 4mm pitch. A manual re-set high temperature cut-out shall be fitted in accordance with standard safety requirements. The element construction shall comply with BS7351 – 1990.

#### Filters

Fitted as standard the Diffusion "eco" filter shall be made of a fine woven mesh manufactured from galvanised steel wire, welded to a rigid galvanised steel support frame; retained on the unit via thumb screws.

The "eco" filter shall be capable of being vacuum cleaned whilst fitted to the fan coil and removable for cleaning elsewhere if required.

Optionally lofted continuous filament synthetic media replaceable pad in frame filters can be fitted; providing filtration grades G2 or G3 in accordance with BS EN 779.

## Condensate Drip Trays

Condensate drip trays shall be manufactured from hot dipped galvanised steel, designed with a dual axis fall to drain; welded at each corner.

SL units are fitted with a 15mm diameter brass end drain connection at the lowest point. (22mm diameter connection option available)

SS units are fitted with a 22mm diameter brass end drain connection at the lowest point. (15mm diameter connection option available)

The assembly is fully degreased and spray finished with an anti-condensation coating.

## Insulation

Units shall be insulated throughout with 90kg/m<sup>3</sup>, CFC & HFC free, impregnated open cell flexible PU foam; with fire performance rating to BS 476 Part 7:Class 1& Part 6: I<12, I(1) <6; Class '0' to building regulations.

Insulation adhesive shall be a light and age resisting modified acrylic resin with high temperature stability.

## Controls Enclosures

A ventilated control enclosure shall be built onto the unit providing an enclosed location for fitment of thermal and speed switching control equipment.

Enclosure wiring shall be in accordance with BS 7671:2008 / IEE wiring regulations 17th edition.

## Quality Testing

When fully assembled each unit shall be subjected to thorough mechanical examination, be run tested and function tested where possible; and need to have passed a series of electrical compliance checks prior to being QC approved in accordance with our BS EN ISO 9001:2000 quality standards; ready for packing and dispatch.

## Options and Equipment

- ▶ Units are supplied as standard without performance modulation controls or waterside control valves; we can fit free-issued controls packages or supply controls packages specifically configured to your requirements
- ▶ Control valve fitting kits (Required when adaptors/connectors are not supplied with free issued valves)
- ▶ Pad and Frame G2 or G3 media filters
- ▶ Condensate pumps
- ▶ Fan fault monitoring boards. (Recommended when units are fitted with electric heating elements)
- ▶ Fan three speed interface board, allowing three pre-defined fan speeds to be selected for manual or control relay switching
- ▶ Rubber Isolation Mount Kits
- ▶ Pre-commissioning filters
- ▶ Inlet/Return air plenums, and Inlet attenuators
- ▶ Additional options and equipment are available – for details contact our sales office.

# Highline 170ec

## Waterside Control Fan Coil Units

### Airflow/NR/Speed Data

Model Reference	Air Volume Against A 30 Pa System Resistance	Individual Unit Acoustic Guide	Duty Fan Speed Setting
	l/s	NR	

#### HIGHLINE 17Aec WHCH-SL06/1

50	25	uLow
57	27	xLow
68	30	Low
72	31	Low+1
76	32	Low+2
81	33	Low+3
90	35	Med
95	36	Med+1
107	38	Med+3
124	40	High

#### HIGHLINE 17Aec WHCH-SL09/2

71	25	uLow
86	27	xLow
113	30	Low
123	31	Low+1
133	32	Low+2
143	33	Low+3
167	35	Med
182	36	Med+1
211	38	Med+3
236	40	High

#### HIGHLINE 17Aec WHCH-SL12/3

71	25	uLow
102	27	xLow
147	30	Low
162	31	Low+1
180	32	Low+2
199	33	Low+3
234	35	Med
251	36	Med+1
290	38	Med+3
326	40	High

#### HIGHLINE 17Aec WHCH-SL15/4

97	25	uLow
140	27	xLow
204	30	Low
224	31	Low+1
250	32	Low+2
276	33	Low+3
326	35	Med
349	36	Med+1
405	38	Med+3
454	40	High

### Cooling Phase Data

Sensible Cooling Performance	Total Cooling Performance	Chilled Water Flow Rate	Chilled Water Hydraulic Pres- sure Drop	Supply Air Temperature
Watts	Watts	l/s	kPa	db°C

674	836	0.034	7.15	11.8
755	931	0.037	8.72	11.9
868	1053	0.042	10.96	12.4
910	1100	0.044	11.88	12.5
944	1136	0.046	12.63	12.6
995	1192	0.048	13.81	12.8
1074	1273	0.052	15.66	13.1
1117	1318	0.054	16.73	13.2
1225	1434	0.059	19.67	13.5
1361	1580	0.065	23.82	13.9

1021	1305	0.052	3.97	11.0
1214	1538	0.062	5.34	11.2
1542	1924	0.077	8.03	11.6
1658	2059	0.083	9.08	11.8
1775	2194	0.088	10.20	11.9
1885	2318	0.093	11.28	12.0
2125	2572	0.104	13.67	12.4
2271	2732	0.110	15.28	12.6
2547	3029	0.123	18.53	12.9
2785	3285	0.133	21.60	13.2

1074	1405	0.056	1.97	10.4
1407	1762	0.071	2.96	11.5
1955	2411	0.097	5.24	11.9
2136	2623	0.105	6.11	12.0
2346	2866	0.115	7.18	12.1
2562	3113	0.125	8.36	12.3
2927	3522	0.142	10.49	12.6
3092	3700	0.149	11.50	12.7
3459	4091	0.165	13.87	13.1
3787	4439	0.180	16.19	13.3

1484	1952	0.078	2.24	10.3
2010	2564	0.103	3.68	11.0
2831	3554	0.143	6.66	11.4
3080	3853	0.155	7.72	11.5
3392	4220	0.169	9.12	11.7
3703	4585	0.184	10.61	11.8
4243	5185	0.209	13.31	12.1
4479	5440	0.219	14.55	12.3
5028	6039	0.244	17.68	12.6
5520	6585	0.267	20.81	12.9

### Heating Phase Data

Sensible Heating Performance	Hot Water Flow Rate	Hot Water Hydraul- ic Pressure Drop	Supply Air Temperature
Watts	l/s	kPa	db°C

369	0.010	0.09	27.2
377	0.010	0.09	26.5
402	0.010	0.09	25.9
409	0.010	0.09	25.7
426	0.010	0.10	25.7
450	0.011	0.11	25.6
481	0.012	0.12	25.5
495	0.012	0.13	25.3
546	0.013	0.15	25.3
602	0.015	0.18	25.0

812	0.020	0.51	30.5
914	0.022	0.64	29.9
1077	0.026	0.86	28.9
1135	0.028	0.95	28.7
1193	0.029	1.04	28.5
1251	0.030	1.14	28.3
1354	0.033	1.32	27.8
1415	0.034	1.43	27.5
1542	0.037	1.67	27.1
1642	0.040	1.88	26.8

1362	0.033	1.83	37.0
1352	0.033	1.81	32.0
1598	0.039	2.45	30.1
1700	0.041	2.74	29.7
1812	0.044	3.08	29.4
1931	0.047	3.47	29.1
2118	0.051	4.11	28.5
2194	0.053	4.38	28.3
2378	0.058	5.08	27.8
2543	0.062	5.74	27.5

1898	0.046	4.26	37.3
1880	0.046	4.19	32.2
2265	0.055	5.89	30.3
2400	0.058	6.55	29.9
2567	0.062	7.40	29.6
2733	0.066	8.30	29.3
3003	0.073	9.85	28.7
3109	0.075	10.50	28.4
3379	0.082	12.23	28.0
3612	0.088	13.81	27.6

### Electrical Data

Motor Power	Maximum Start/ Run Current	Specific Fan Power
Watts	Amps	W/l/s

10	0.70	0.20
13	0.70	0.23
18	0.70	0.26
20	0.70	0.28
23	0.70	0.30
25	0.70	0.31
32	0.70	0.35
35	0.70	0.37
45	0.70	0.43
65	0.70	0.53

15	1.40	0.21
18	1.40	0.21
24	1.40	0.21
26	1.40	0.22
29	1.40	0.22
32	1.40	0.22
41	1.40	0.24
47	1.40	0.26
62	1.40	0.29
78	1.40	0.33

15	2.10	0.21
20	2.10	0.19
27	2.10	0.19
31	2.10	0.19
34	2.10	0.19
41	2.10	0.20
52	2.10	0.22
59	2.10	0.24
77	2.10	0.27
99	2.10	0.30

21	2.80	0.22
27	2.80	0.19
38	2.80	0.19
43	2.80	0.19
50	2.80	0.20
57	2.80	0.21
73	2.80	0.22
82	2.80	0.23
107	2.80	0.26
137	2.80	0.30

### Based on following Design Condition:

- ▶ Return Air Temperature(summer): 23°C db and 16.4°C wb
- ▶ Chilled Water Temperature: 6/12 °C
- ▶ Return Air Temperature(winter): 21°C
- ▶ LPHW Temperature: 60/50 °C
- ▶ External Static Pressure: 30Pa
- ▶ Electric heat is available on all units.
- ▶ For further information please contact us.
- ▶ For any alternative design conditions please contact the Cooling Department at Diffusion.

### Airflow/NR/Speed Data

### Cooling Phase Data

### Heating Phase Data

### Electrical Data

Model Reference	Air Volume Against A 30 Pa System Resistance			Individual Unit Acoustic Guide			Duty Fan Speed Setting			Sensible Cooling Performance			Total Cooling Performance			Chilled Water Flow Rate			Chilled Water Hydraulic Pressure Drop			Supply Air Temperature			Sensible Heating Performance			Hot Water Flow Rate			Hot Water Hydraulic Pressure Drop			Supply Air Temperature			Motor Power			Maximum Start/Run Current			Specific Fan Power		
	l/s	NR		Watts	Watts	l/s	kPa	db°C	Watts	l/s	kPa	db°C	Watts	l/s	kPa	db°C	Watts	Amps	W/l/s																										
HIGHLINE 17Aec WHCH-SS17/1	54	25	uLow	793	1023	0.041	0.92	10.8	1137	0.028	1.52	38.5	12	0.70	0.21																														
	62	27	xLow	876	1109	0.045	1.06	11.2	1241	0.030	1.79	37.7	14	0.70	0.22																														
	76	30	Low	1006	1240	0.050	1.31	12.0	1416	0.034	2.28	36.5	19	0.70	0.24																														
	81	31	Low+1	1053	1287	0.052	1.40	12.2	1480	0.036	2.47	36.2	20	0.70	0.25																														
	85	32	Low+2	1084	1314	0.053	1.46	12.4	1527	0.037	2.61	36.0	22	0.70	0.26																														
	90	33	Low+3	1129	1361	0.055	1.56	12.5	1581	0.038	2.79	35.6	24	0.70	0.27																														
	101	35	Med	1239	1483	0.060	1.83	12.8	1716	0.042	3.23	35.2	29	0.70	0.29																														
	106	36	Med+1	1314	1578	0.064	2.05	12.7	1769	0.043	3.42	34.9	32	0.70	0.30																														
	116	38	Med+3	1438	1729	0.070	2.42	12.7	1867	0.045	3.78	34.4	38	0.70	0.33																														
	128	40	High	1578	1896	0.077	2.88	12.7	1979	0.048	4.20	33.9	48	0.70	0.38																														
HIGHLINE 17Aec WHCH-SS17/2	68	25	uLow	1029	1346	0.054	1.86	10.4	1572	0.038	3.40	40.3	14	1.40	0.21																														
	91	27	xLow	1328	1706	0.068	2.86	10.9	1818	0.044	4.43	37.6	18	1.40	0.20																														
	132	30	Low	1909	2445	0.098	5.51	11.0	2326	0.056	6.95	35.7	28	1.40	0.21																														
	143	31	Low+1	2057	2628	0.106	6.29	11.0	2461	0.060	7.70	35.3	32	1.40	0.22																														
	155	32	Low+2	2203	2800	0.113	7.06	11.2	2582	0.063	8.40	34.9	36	1.40	0.23																														
	169	33	Low+3	2369	2991	0.120	7.97	11.3	2717	0.066	9.22	34.4	41	1.40	0.24																														
	195	35	Med	2670	3341	0.135	9.79	11.6	2964	0.072	10.81	33.7	54	1.40	0.28																														
	210	36	Med+1	2840	3538	0.143	10.89	11.7	3105	0.075	11.77	33.3	63	1.40	0.30																														
	236	38	Med+3	3119	3852	0.156	12.79	12.0	3332	0.081	13.38	32.8	82	1.40	0.35																														
	267	40	High	3438	4204	0.171	15.13	12.3	3602	0.087	15.43	32.2	111	1.40	0.42																														
HIGHLINE 17Aec WHCH-SS17/3	91	25	uLow	1358	1765	0.071	1.75	10.6	2278	0.055	8.69	41.9	20	2.10	0.21																														
	133	27	xLow	1880	2383	0.096	3.04	11.2	2703	0.066	11.87	37.9	30	2.10	0.23																														
	191	30	Low	2699	3418	0.137	5.83	11.2	3436	0.083	18.37	36.0	38	2.10	0.20																														
	210	31	Low+1	2951	3727	0.150	6.84	11.3	3665	0.089	20.66	35.5	43	2.10	0.21																														
	228	32	Low+2	3165	3976	0.160	7.70	11.4	3838	0.093	22.46	35.0	49	2.10	0.22																														
	246	33	Low+3	3372	4215	0.169	8.57	11.6	4020	0.098	24.44	34.6	56	2.10	0.23																														
	283	35	Med	3792	4699	0.189	10.49	11.8	4371	0.106	28.46	33.9	71	2.10	0.25																														
	302	36	Med+1	4006	4944	0.199	11.53	11.9	4560	0.111	30.74	33.6	81	2.10	0.27																														
	340	38	Med+3	4406	5388	0.218	13.56	12.2	4798	0.117	33.72	32.8	106	2.10	0.31																														
	378	40	High	4785	5801	0.236	15.65	12.5	4806	0.117	33.82	31.6	142	2.10	0.38																														
HIGHLINE 17Aec WHCH-SS17/4	120	25	uLow	1738	2229	0.090	1.84	11.0	2875	0.070	2.49	41.0	27	2.80	0.23																														
	170	27	xLow	2405	3048	0.122	3.25	11.2	3374	0.082	3.34	37.5	34	2.80	0.20																														
	244	30	Low	3470	4410	0.177	6.37	11.2	4276	0.104	5.16	35.6	52	2.80	0.21																														
	268	31	Low+1	3791	4806	0.193	7.46	11.2	4559	0.111	5.80	35.2	58	2.80	0.22																														
	294	32	Low+2	4105	5171	0.208	8.53	11.4	4816	0.117	6.41	34.6	67	2.80	0.23																														
	317	33	Low+3	4374	5486	0.221	9.52	11.5	5032	0.122	6.95	34.2	75	2.80	0.24																														
	355	35	Med	4815	5998	0.242	11.23	11.7	5390	0.131	7.88	33.7	91	2.80	0.26																														
	382	36	Med+1	5114	6338	0.256	12.45	11.8	5633	0.137	8.54	33.3	105	2.80	0.27																														
	430	38	Med+3	5629	6915	0.280	14.67	12.1	6059	0.147	9.77	32.7	134	2.80	0.31																														
	478	40	High	6116	7448	0.303	16.93	12.3	6474	0.157	11.03	32.3	177	2.80	0.37																														

### NR Guide Qualification

Calculations detailed in the CIBSE Guide for Sound Control are used to model the combined Inlet and Case Radiated sound power levels and Discharge sound power levels for each unit and speed setting; providing a Guide NR rating for the units when installed in a typical manner.

- ▶ Room size based on a cooling load of: 90Watts per square metre.
- ▶ Ceiling allowance / loss; from: 125Hz to 4kHz -4,-7,-9,-11,-14, and-16 dB.
- ▶ Discharge system allowance / loss; from: 125Hz to 4kHz -3,-5,-9,-10,-10 and -11 dB.
- ▶ Room acoustic characteristics: Medium Live.
- ▶ Distance to listener: 1.5 metres.

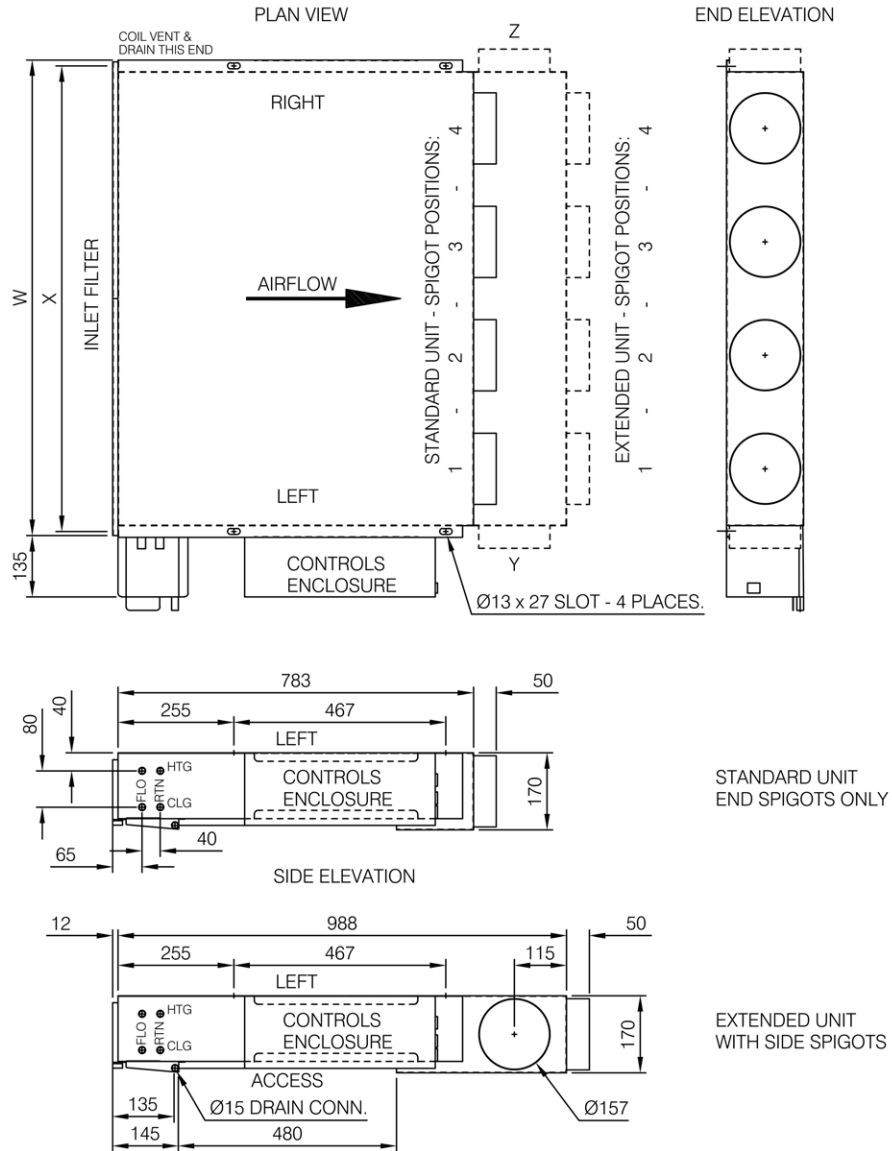
\*Please note that our NR figure should be considered as a guide only.

There are many factors which influence the actual resultant NR level within a given space; thus we would recommend that for a more accurate prediction of the resultant NR level an independent acoustic specialist be employed.

# Highline 170ec

## Waterside Control Fan Coil Units

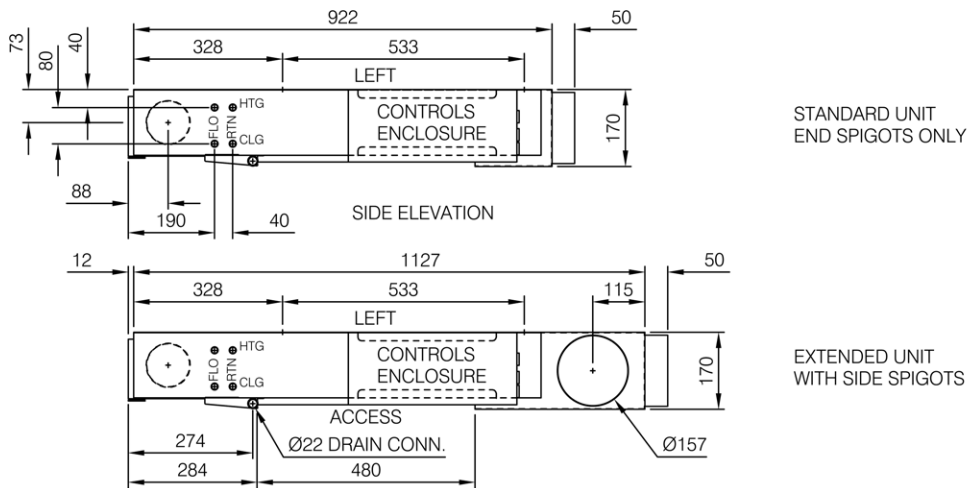
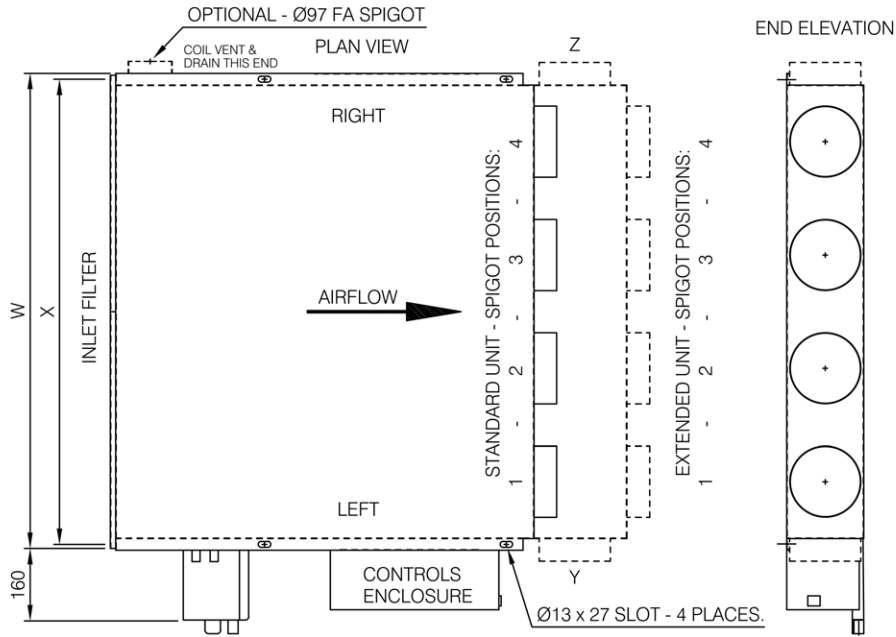
### HIGHLINE 17-WH\*\*-SL GENERAL ARRANGEMENT DETAILS



UNITS ARE HANDED LOOKING AGAINST THE DIRECTION OF AIRFLOW.  
 ie: LOOKING AT THE DISCHARGE OF THE UNIT; e.g. ABOVE UNIT DETAILED AS LEFT HAND COIL CONNECTIONS.  
 SPIGOT POSITIONS ARE IDENTIFIED FROM LEFT TO RIGHT WHEN LOOKING AT THE DISCHARGE OF THE UNIT;  
 FOR EITHER LEFT OR RIGHT HANDED UNITS.

MODEL SIZE	DIMENSIONS		WEIGHT kg	SPIGOT Qty. Ø 157mm		COIL CONNECTION Ø		COIL VOLUME ltr.	
	W	X		Standard Unit.	Extended Unit.	Clg. 'A'	Htg.	Clg.	Htg.
SL06/1	550	526	32	1-2	Y-1-2-Z	15	15	0.45	0.11
SL09/2	1050	1026	48	1-2-3-4	Y-1-2-3-4-Z	15	15	0.85	0.16
SL12/3	1550	1526	71	1-2-3-4-5-6	Y-1-2-3-4-5-6-Z	15	15	1.26	0.21
SL15/4	2050	2026	94	1-2-3-4-5-6-7	Y-1-2-3-4-5-6-7-Z	15	15	1.66	0.26

# HIGHLINE 17-WH\*\* -SS GENERAL ARRANGEMENT DETAILS



UNITS ARE HANDED LOOKING AGAINST THE DIRECTION OF AIRFLOW.  
 ie: LOOKING AT THE DISCHARGE OF THE UNIT; e.g. ABOVE UNIT DETAILED AS LEFT HAND COIL CONNECTIONS.  
 SPIGOT POSITIONS ARE IDENTIFIED FROM LEFT TO RIGHT WHEN LOOKING AT THE DISCHARGE OF THE UNIT;  
 FOR EITHER LEFT OR RIGHT HANDED UNITS.

MODEL SIZE	DIMENSIONS		WEIGHT kg	SPIGOT Qty. Ø 157mm		COIL CONNECTION Ø			COIL VOLUME ltr.	
	W	X		Standard Unit.	Extended Unit.	Clg. 'A'	Htg.	Clg.	Htg.	
SS17/1	800	776	40	1-2-3	Y-1-2-3-Z	15	15	0.84	0.21	
SS17/2	1050	1026	50	1-2-3-4	Y-1-2-3-4-Z	15	15	1.09	0.26	
SS17/3	1450	1426	75	1-2-3-4-5-6	Y-1-2-3-4-5-6-Z	15	15	1.49	0.34	
SS17/4	1850	1826	95	1-2-3-4-5-6-7	Y-1-2-3-4-5-6-7-Z	15	15	1.89	0.42	

## DIFFUSION Fan Coil Coding System

UNIT MODEL	COIL DESIGN	FAN TYPE	CONTROL	APPLICATION	OPTIONS	UNIT SIZE
<b>H17</b> –Highline 170	<b>A</b> –Circuit Type	<b>ec</b> –ec/dc motor	<b>W</b> –Waterside	<b>H</b> –Horizontal	<b>CH</b> –COOLING & HEATING	SL06/1
				<b>U</b> –Under-floor	<b>CO</b> –COOLING ONLY	SL09/2
					<b>CE</b> –COOLING & ELEC HTG	SL12/3
					<b>OH</b> –HEATING ONLY	SL15/4
						SS17/1
						SS17/2
						SS17/3
						SS17/4

e.g.

▶ **H17Aec-WHCH-SL12/3**

HIGHLINE 170 – A circuit coil with ec/dc fans - Waterside Horizontal – Cooling and Heating 4 pipe - Size SL12/3.

▶ **H17Aec-WHCE-SS17/4**

HIGHLINE 170 – A circuit coil with ec/dc fans - Waterside Horizontal – Cooling and Electric Heating 2 pipe - Size SS17/4.

Established in 1960,  
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experience in producing  
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