



UNITED TECHNOLOGIES CARRIER CORPORATION

39G Galaxy Air Handling Unit



MAXIMIZING PERFORMANCE, ENERGY SAVINGS & COMFORT

CISB 39G offers...

- Units are designed in accordance to
 - ARI Standard for Coils (ARI 410)
 - ASHRAE Standard for Drain Pan (ASHRAE 62-89)
- Double Wall with 1" & 2" 40kg/m³ CFC-Free PU Insulation (HCFC 141b). Isolates Insulation Exposure to the Air Stream.
- Wide range of Coils offering – 4, 5, 6, 7, 8 Rows and 8, 10, 12, 14 FPI for Chilled Water. Optimized coil circuiting. DX Coil and Hot Water Coil are also available.
- All Chilled Water and DX Coils are Factory Pressure Tested at 400 psig as standard.
- Coil tracks enable easy coil removal for complete cleaning and assurance of a dry unit interior.
- Powder painted sloped galvanized steel drain pan with bottom drainage.
- Forward Curved and Backward Curved (Airfoil Blade) Fan
 - Forward Curved - Sizes 160 ~ 1000mm Diameter
 - Backward Curved (Airfoil Blade) – Sizes 225 ~ 1000mm Diameter
- Low leak construction with hex socket compression, type latch assemble and ribseals on mating panel perimeter.
- Factory installed unit base of 100mm height, constructed of 14 Gauge Galvanized Steel.

50mm NTB Features :

- Composite Corner Piece (Trileg) - Nylon 6 + 30% Glass filled.
- Non Thermal Bridge Aluminium Frame Extrusion.
- Non Thermal Bridge Sandwiched Panels and Access Doors.
- Non Thermal Bridge Quality Panel to Frame Fitting.
- No condensation problems in humid environments at low internal temperatures.
- Hygienic : due to smooth internal and external surface.
- Rigid construction with aluminium framework and machine injected rigid polyurethane foam panels.
- Spring-mounted fans for low vibration transmission.
- Dry, Corrosion Free construction.



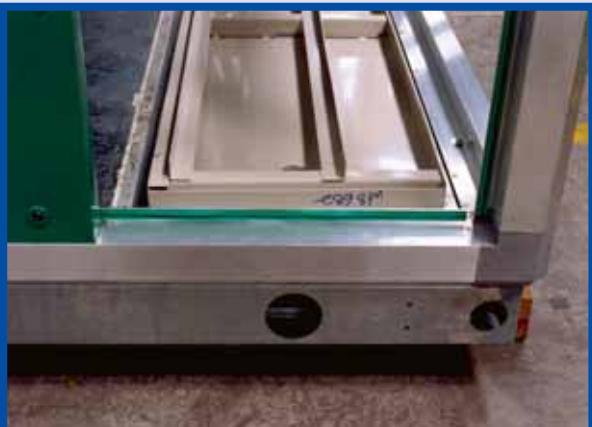
Compression Latch (Hex Socket)

Only requires the use of hexagon wrench to open / close the access door.



Chilled Water Coil With Steel Header (CU and Alu Fin)

Coils are of aluminium / copper plate fins with belled collars and bonded to 12.7mm OD copper tubes by mechanical expansion. The coils have galvanised steel casing and steel headers with male threaded connections.



Sloping Drain Pan and Drain Outlet

New drain pan assembly for better drainage, bottom access drain and sloping for rapid waterflow and better Internal Air Quantity (IAQ). Ready to couple with female connection.



Direct Expansion Coil (DX Coil)

Coils are of aluminium / copper with belled collars and bonded 12.7mm OD copper tubes by mechanical expansion. Coils are provided with brass distributors with sweat type connections.



Isolator Spring

As standard from the factory, the fan and motor assembly are mounted on a common base with colour-coded internally mounted spring isolators, which saves site installation cost.



Assembly Fan Housing Motor and Base

FMB are made of painted heavy gauge mild steel (for 39G1422 and above) or power strut type (for 39G0508 to 39G1319) to ensure proper and easy of installation fan housing and motor.



Bearing Arm

Self aligning double row ball bearings mounted within a cast iron housing supported on tubular bearing arm assembly.



Taper Lock Pulley

Ability to change diameter of pulley according to fan shaft. Pulleys with taper lock bush allows for convenient dismantling and maintenance of drive package, besides offering flexibility in interchanging for different shaft sizes.



Fan Discharge Collar

Flanged discharge collar to provide easy ducting connection.



Handle Grab

Large and Non-Conductive handles for easy panel removal.



Accessory High Velocity Filter (HVF) Frame

For "free air return" application, factory supplied 75mm HVF track is an option instead of one module casing resulting in shorter overall unit length.



Dampers

Mixing boxes are equipped with parallel blades interconnected outside with return air dampers.

Guide Specifications for 39GK 50mm Non-Thermal Bridge (NTB) AHU

Panel Design

- Panels shall be formed to produce solid 50mm double walled thermal break design of modular dimensions. There shall be a thermal break between the exterior and internal panels. Exterior panels shall be fabricated from 0.50mm thickness pre-painted steel, in accordance to JIS G3312 SG570 Z18 or equivalent. The coating shall meet or exceed ASTM B117 Standard for Salt Spray Resistance at 500 hours. Interior panels shall be fabricated from solid 1.00mm galvanized sheet steel, in accordance with JIS G3302 SGCC Z18 or equivalent [1.00mm SUS 304 Stainless Steel - optional]. Both exterior and interior panels shall be formed and reinforced to provide rigid construction.
- All panels to be insulated with machine-injected rigid polyurethane foam with a minimum density of 40kg/m³ and thermal conductivity K-factor of 0.019W/m.K in accordance with JIS A9514 (PU panel class 0).
- Panels shall be of one-piece design to facilitate removal. Panels shall be assembled with mechanical fasteners such that each panel is individually removable. The fasteners shall be zinc-chromate plated [SUS 304 stainless steel - optional].
- Panels shall have no exterior exposed raw edges that could lead to rust formation. The side perimeter of external panel shall include a built-in PVC gasket acting as air seal. Panels shall come with removable polyethylene protective sheet to protect external surfaces from scratches and allow for removal at job site.

Casing Construction

- Casing construction shall be Non-Thermal-Bridge (NTB) with no direct metal-to-metal contact between the internal and external surfaces. The unit frame construction shall consist of nylon glass-fiber reinforced corner-joints that connect extruded aluminium thermal break profiles. The extruded aluminium thermal break profiles shall consist of a complete structure fabricated from high strength engineering thermoplastic bars that separates the aluminium outer and inner profiles. The aluminium frames shall be gasketed along the perimeter with closed cell heavy duty neoprene rubber gasket located in between panels and the aluminium frames. The frame shall be constructed to permit removal of the panels without affecting the structural integrity of the unit.
- Corner pieces (Tri-leg) molded of composite material forms the final integral part of the casing instruction. The non-metallic construction of the corner pieces enhances the Non-Thermal-Bridge feature of the AHU casing.
- Unit casing construction shall be tested to conform to the following standard:
BS EN 1886:1998 or DIN EN 1886:1998 Ventilation for buildings – Air Handling Units – Mechanical performance

The construction shall satisfy the minimum requirements according to the classification in BS EN 1886:1998 or DIN EN 1886:1998 as shown below:

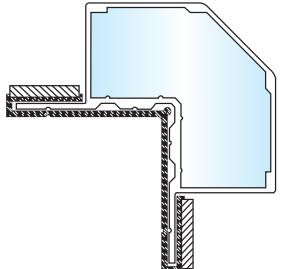
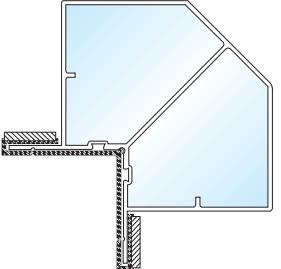
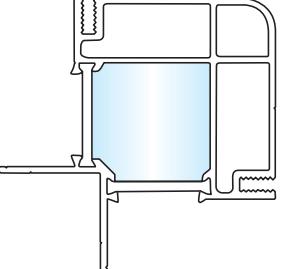
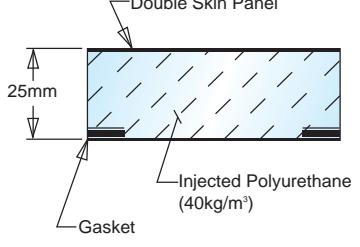
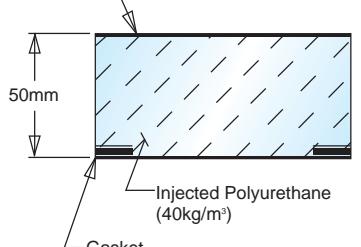
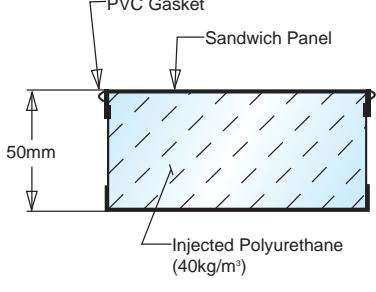
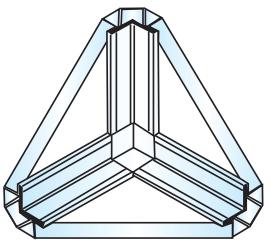
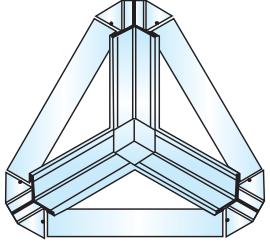
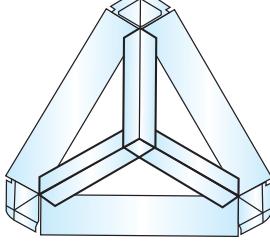
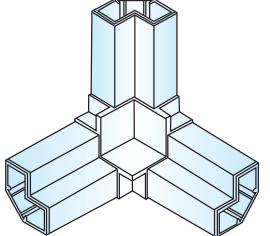
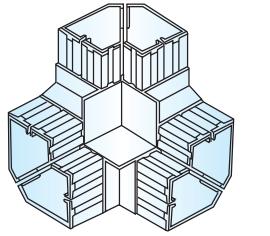
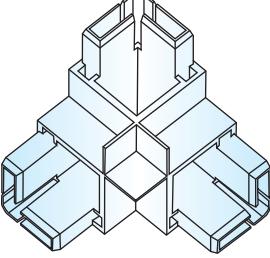
Mechanical Characteristics	Class
Casing strength	2
Casing air leakage under -400 Pa	B
Casing air leakage under +700 Pa	A/B *
Filter bypass leakage	F9
Thermal transmittance	T2
Thermal bridging factor	TB2

Note: Class B achievable upon request with special construction

Access Doors

- Access doors shall be constructed from double walled thermal break panels insulated with the same material as the casing panels. The four sides of the access door shall be covered permanently with extruded PVC to ensure non-metallic thermal break.
- Door frames shall be constructed of a single-piece fiberglass construction for Non-Thermal-Bridging (NTB). The internal flange of the door frame shall be sealed along the perimeter with replaceable closed cell neoprene gasket of minimum 5.0mm thickness for air tightness and thermal performance.
- The door latch shall consist of a single-piece construction consisting of a handle with opening and closing mechanism fabricated from nylon glass fiber reinforced thermoplastic with thermal break design. The locking of the access door shall be achieved via a single-piece graduated cam-lock with stopper for air-tightness.
- Door hinges shall be fabricated from nylon glass fiber reinforced thermoplastic and installed with no direct contact with the internal surface of the air handling unit. The hinges shall permit a complete 180° door swing

Basic Construction

39G 25mm Frame Construction	39G 50mm Frame Construction	39GK 50mm NTB Frame Construction
		
39G 25mm Panel (Double Skin)	39G 50mm Panel (Double Skin)	39GK 50mm NTB Panel (Sandwich)
		
39G 25mm Frame-Panel Construction	39G 50mm Frame-Panel Construction	39GK 50mm NTB Frame-Panel Construction
		
39G 25mm Trileg Construction	39G 50mm Trileg Construction	39GK 50mm NTB Trileg Construction
		

Quick Selection Chart

Carrier offers you 3 easy quick selection steps for 39G:

- 1.) Determine the unit size based on air flow or coil face area.
- a. 1.5m/s minimum velocity (cooling or heating).
- b. 2.5m/s maximum velocity for cooling coil without drift eliminator.
- c. 4.5m/s maximum velocity for heating coil only.

- 2.) Use roughing-in dimensions (Pg 8 & 9) to find approximate size of base unit and it's accessory sections.
- 3.) Compute weights of base casing unit (Pg 16).
- 4.) To compute total of unit weight and respective fan, coil and motor drive package weight (if applicable) to # 3.

Unit Size Selection

39G Unit Size	Coil Face area (m ²)	Air volume (L/s) x 1000		
		1.5m/s	2.5m/s	4.5m/s
0608	0.170	0.25	0.42	0.76
0609	0.246	0.37	0.62	1.11
0610	0.340	0.51	0.85	1.53
0712	0.491	0.74	1.23	2.21
0813	0.699	1.05	1.75	3.15
0914	0.893	1.34	2.23	4.02
1015	1.045	1.57	2.61	4.70
1016	1.152	1.73	2.88	5.19
1117	1.437	2.16	3.59	6.47
1317	1.681	2.52	4.20	7.57
1518	2.078	3.12	5.20	9.35
1522	2.361	3.54	5.90	10.63
1622	2.550	3.82	6.37	11.47
1822	2.931	4.40	7.33	13.19
1824	3.301	4.95	8.25	14.86
1825	3.590	5.39	8.98	16.16
2025	3.964	5.95	9.91	17.84
2226	4.631	6.95	11.58	20.84
2330	5.492	8.24	13.73	24.71
2334	6.434	9.65	16.09	28.95
2434	6.987	10.48	17.47	31.44
2636	8.117	12.18	20.29	36.53

Note:

For application where face velocities exceed 2.5m/s drift eliminators are recommended to avoid moisture carry over.

Computer Selection

We have made available a computer program to finalize your selections. Please contact your Carrier representative for a computer selection based on your "Quick Selection" plus the design parameters of your application.



DIMENSION (cont)

Mixing Box Section				Filter Section				Coil Section				Heater Section		External Face & Bypass Damper		Fan Section		Plenum Access		Diffuser Section	
Mixing Box	Double MXB	Economized MXB		Bag Filter	LVF	HVF	Hepa Filter	Cooling Coil (Horiz)	Hot Water Coil (Horiz)	Dual Coil (Horiz)		Horiz.	Vert.	Horiz.	Vert.		Plenum Access	Diffuser Section			
MXB	DBL MXB	ECN MXB		BG	LVF	HVF	HEPA	CW	HW	CW-HW	HTR	FBP		FCF OR BCF	FCF OR BCF	FCF OR BCF	DISC	ACS	DIF		
39G	Galaxy Unit Size	Internal Size	Panel Size	External Size				50mm				Internal size section				Fan Section				Discharge Section with Damper	
		Height (mm)	Width (mm)	Height (mm)	Width (mm)	Height (mm)	Width (mm)	Length (mm)	Length (mm)	Length (mm)	Length (mm)	Length (mm)	Length (mm)	Length (mm)	Length (mm)	Length (mm)	Length (mm)	Length (mm)	Length (mm)	Length (mm)	Length (mm)
710	2000	2500	1950	2450	2050	2550	2100	2800	900	1800	600	300	900	600	300	600	300	1500	1500	900	900
800	2000	2500	2450	2050	2550	2300	250	2250	900	1800	600	300	900	600	300	600	300	1500	1700	-	900
710	2200	2600	2150	2550	2250	2650	2300	2700	1100	1800	600	300	900	600	300	600	300	1500	1500	-	1100
800	2200	2600	2150	2550	2250	2650	2300	2700	1100	1800	600	300	900	600	300	600	300	1500	1700	-	1100
900	2300	3000	2250	2950	2350	3050	2400	3100	1100	1800	600	300	900	600	300	600	300	1500	1700	-	1100
800	2300	3000	2250	2950	2350	3050	2400	3100	1100	1800	600	300	900	600	300	600	300	1500	1900	-	1100
900	2300	3400	2350	3350	2350	3450	2400	3500	1100	1800	600	300	900	600	300	600	300	1500	1700	-	1100
900	2400	3400	2350	3350	2450	3450	2500	3500	1100	1800	600	300	900	600	300	600	300	1500	1900	-	1100
1000	2400	3400	2350	3350	2450	3450	2500	3500	1100	1800	600	300	900	600	300	600	300	1500	2000	-	1100
900	2600	3600	2550	3650	2650	3650	2700	3700	1100	1800	600	300	900	600	300	600	300	1500	1900	-	1100
1000	2600	3600	2550	3650	2650	3650	2700	3700	1100	1800	600	300	900	600	300	600	300	1500	2000	-	1100

NOTE:

- A.) Vertical Fan + coil unit shipping option:
For vertical unit, factory pre-join the fan & coil section for model 0914 and below.
- B.) Plenum Access offered at 300, 600 and 1200mm (Length) as option.

For model 39G1015 and above, fan section and coil section will be delivered in separate packaging.

NOTES FOR DIMENSION CALCULATION

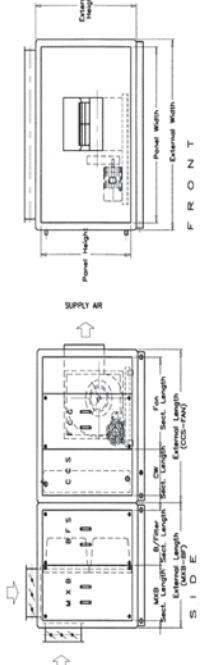
- I.) External AHU Length = $(\text{Section Length} + K) \text{ mm}$
Where, $K = 50\text{mm}$ (for 25mm casing thickness)
 $K = 100\text{mm}$ (for 50mm casing thickness)
- If the AHU module length is more than 2000mm, section will be split into several casing for shipping purposes.
Unit will be split into two sections:
1. MXB-BF-CCS-FS, Fan Size 500, Horizontal AHU with 50mm casing thickness
Module length is 800 + 600 + 1100mm, equals to 2100mm.
Total AHU Length = $\frac{2100}{K} = \frac{2100}{100} = 21\text{m}$
- II.) External AHU Height = $(\text{Module Width} + K) \text{ mm}$
Where, $K = 50\text{mm}$ (for 25mm casing thickness)
 $K = 100\text{mm}$ (for 50mm casing thickness)

- For Eg. A.)
- A.) Horizontal AHU
AHU Height = $(1500 + 100 + 100)\text{mm} = 1700\text{mm}$
Where, $K = 50\text{mm}$ (for 25mm casing thickness)
 - B.) Vertical AHU
AHU Height = $(\text{Section Vertical Height} - \text{Fan Section Vertical Height} + 2K + 100)\text{mm}$
Where, $K = 100\text{mm}$ (for 50mm casing thickness)

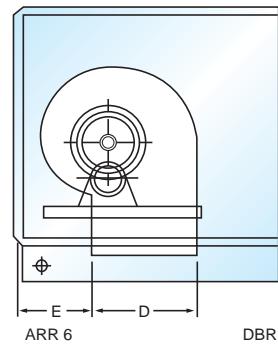
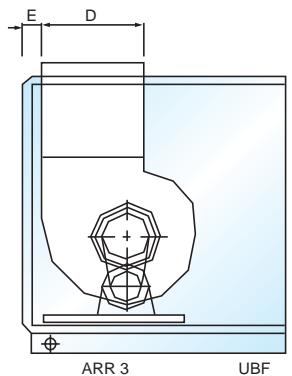
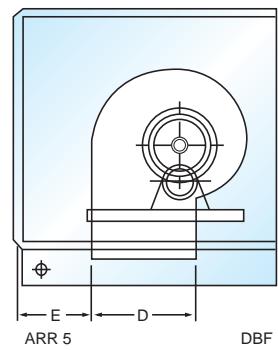
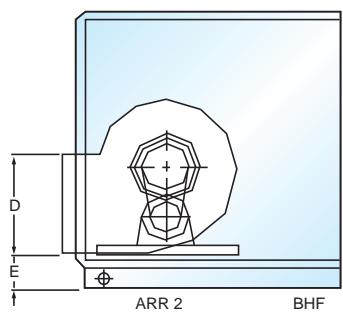
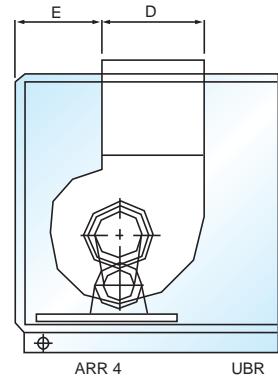
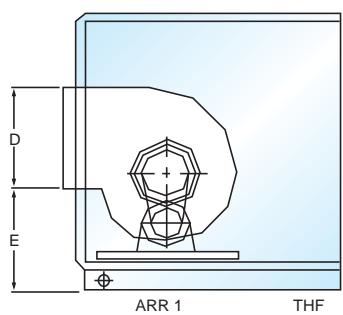
- For Eg. B.)
- A.) 39G1522, MXB-BF-CCS-FS, Fan Size 500, Vertical AHU with 50mm casing thickness
Unit will be split into two sections:
1. MXB-BF:
2. FS-
Module length is 900 + 600 + 1100mm, equals to 2600mm.
Total AHU Length = $\frac{2600}{K} = \frac{2600}{100} = 26\text{m}$
 - B.) 39G1522, MXB-BF-CCS-FS, Fan Size 500, Vertical AHU with 50mm casing thickness
Unit will be split into two sections:
1. MXB-BF:
2. FS-
Module length is 900 + 600 + 1100mm, equals to 2600mm.
Total AHU Length = $\frac{2600}{K} = \frac{2600}{100} = 26\text{m}$

Note: The fan is on top of the coil section, just apply the fan section length for calculation.

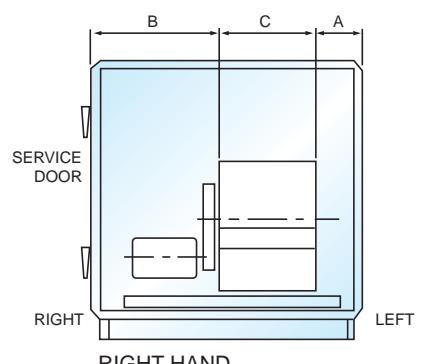
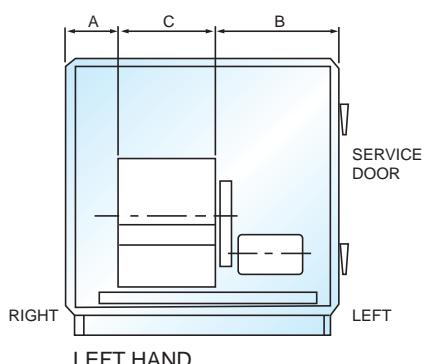
- III.) External AHU Width = $(\text{Module Width} + K) \text{ mm}$
Where, $K = 50\text{mm}$ (25mm casing thickness)
 $K = 100\text{mm}$ (50mm casing thickness)
- A.) AHU Width = $2200\text{mm} + K(100\text{mm}) = 2300\text{mm}$
- For Eg. A.)
- For Eg. B.)



Horizontal Fan Arrangements



Side Elevation



Front Elevation

Center to Center Distance for Fan & Motor Configuration (Cont.)

Unit Size	Fan Size	DBF/DBR (CTCD in mm)												
		1 hp	1.5 - 2 hp	3 - 4 hp	5 - 5.5 hp	7.5 - 10 hp	15 - 20 hp	25 - 30 hp	40 hp	50 - 60 hp	CTCD _{min}	CTCD _{max}	CTCD _{avg}	CTCD _{min}
0608	FCG 160	103	143	123	98	137	118	92	130	111	84	120	102	88
0609	FCG 180	121	161	141	114	154	134	106	145	125	95	133	114	94
0610	FCG 200	121	161	141	114	154	134	106	145	125	95	133	114	94
0712	FCGBBCG 25	191	231	211	183	222	203	172	212	192	157	197	177	147
0813	FCGBBCG 30	253	292	273	244	283	263	232	272	252	216	255	235	201
0914	FCGBBCG 35	295	334	315	286	324	305	273	313	293	256	296	276	241
1015	FCGBBCG 40	316	356	338	305	347	326	292	334	313	274	316	295	255
1016	FCGBBCG 45	339	379	352	322	380	350	316	360	338	299	343	321	282
1117	FCGBBCG 50	372	418	388	357	405	372	332	356	328	299	343	321	282
1317	FCGBBCG 60	316	348	337	305	347	326	292	334	313	274	316	295	255
1518	FCGBBCG 65	372	419	396	361	408	385	347	395	371	329	377	333	309
1622	FCGBBCG 70	-	407	463	435	396	453	424	383	440	411	364	422	393
1824	FCGBBCG 75	-	-	-	-	-	-	-	-	-	-	-	-	-
1825	FCG 710	-	-	-	-	-	-	-	-	-	-	-	-	-
2025	FCG 710	-	-	-	-	-	-	-	-	-	-	-	-	-
2226	FCG 710	-	-	-	-	-	-	-	-	-	-	-	-	-
2330	FCGBBCG 80	-	-	-	-	-	-	-	-	-	-	-	-	-
2334	FCGBBCG 85	-	-	-	-	-	-	-	-	-	-	-	-	-
2336	FCG 1000	-	-	-	-	-	-	-	-	-	-	-	-	-

Center to Center Distance for Fan & Motor Configuration (cont.)

Unit Size	Fan Size	TH/THR (CTCD in mm)											
		1 hp	3 - 4 hp	5 - 5.5 hp	7.5 - 10 hp	15 - 20 hp	25 - 30 hp	40 hp	50 - 60 hp	CTCD _{min}	CTCD _{ave}	CTCD _{max}	100 hp
0608	FCG 160	162	21	187	154	204	179	142	192	131	180	156	-
0609	FCG 180	146	186	171	137	187	162	124	174	112	162	137	-
0610	FCG 180	146	186	171	137	187	162	124	174	112	162	137	-
0712	FCGB/CG 225	223	272	247	213	282	238	199	249	185	235	210	-
0813	FCGB/CG 335	261	308	284	250	298	274	235	283	239	220	268	-
0914	FCGB/CG 335	304	350	327	293	340	316	278	324	301	282	309	-
1015	FCGB/CG 335	300	344	322	288	332	310	272	317	285	256	301	-
1016	FCGB/CG 335	300	344	322	288	332	310	272	317	285	256	301	-
1117	FCGB/CG 450	342	385	363	330	374	352	314	388	336	314	352	-
1317	FCGB/CG 450	312	363	322	288	332	310	272	317	285	256	301	-
1518	FCGB/CG 500	401	463	427	390	442	416	376	428	357	305	383	-
1522	FCG 560	-	-	-	-	-	-	-	-	305	359	322	-
1622	FCG 560	-	-	-	-	-	-	-	-	391	334	387	-
1824	FCG 710	-	-	-	-	-	-	-	-	430	455	428	-
1825	FCG 710	-	-	-	-	-	-	-	-	604	658	631	-
2025	BCG 710	-	-	-	-	-	-	-	-	629	684	656	-
2226	BCG 710	-	-	-	-	-	-	-	-	604	658	631	-
2330	FCGB/CG 800	-	-	-	-	-	-	-	-	753	810	781	-
2334	FCGB/CG 900	-	-	-	-	-	-	-	-	753	810	781	-
2434	FCG 1000	-	-	-	-	-	-	-	-	753	810	781	-
2636	FCG 1000	-	-	-	-	-	-	-	-	1041	1073	1057	-
	BCG 1000	-	-	-	-	-	-	-	-	1041	1073	1057	-

Center to Center Distance for Fan & Motor Configuration (cont.)

Unit Size	Fan Size	UBF/UBR (CTCD in mm)																	
		1hp		1.5 ~ 2 hp		3 ~ 4 hp		CTCD_max		CTCD_min		CTCD_max		CTCD_min		CTCD_max		CTCD_min	
0608	FCG 160	172	222	197	163	213	188	150	200	175	137	187	162	118	168	143	103	149	
0609	FCG 180	161	209	185	151	199	199	175	136	185	161	122	171	147	100	150	125	81	129
0610	FCG 180	161	209	185	151	199	199	175	136	185	161	122	171	147	100	150	125	81	129
0712	FCGB/CG 225	248	290	266	232	280	256	217	265	241	202	250	226	177	226	202	148	198	173
0813	FCGB/CG 280	290	335	312	279	324	301	263	309	286	247	292	270	220	267	243	187	255	211
0914	FCGB/CG 315	337	381	359	326	370	348	310	354	332	283	338	316	266	312	289	232	278	255
1015	FCGB/CG 355	341	382	362	329	371	350	313	355	334	296	338	317	288	311	289	232	275	254
1016	FCGB/CG 400	392	432	412	380	421	400	364	405	384	347	388	367	319	360	339	293	324	303
1117	FCGB/CG 400	392	432	412	380	421	400	364	405	384	347	388	367	319	360	339	293	324	303
1317	FCGB/CG 450	354	394	382	356	422	397	342	387	347	309	355	331	285	338	311	288	325	304
1518	FCGB/CG 450	354	399	377	342	422	397	342	387	347	309	354	331	285	331	308	252	299	276
1622	BCG 560	-	-	422	478	455	420	466	443	406	452	429	387	340	410	387	331	378	355
1822	FCG 560	-	-	422	478	455	420	466	443	406	452	429	373	340	412	387	331	378	355
1824	FCG 560	-	-	422	478	455	420	466	443	406	452	429	373	340	412	387	331	378	355
2025	FCG 710	-	-	520	569	544	487	537	512	485	545	515	490	437	462	407	458	422	397
2226	BCG 710	-	-	520	569	544	487	537	512	485	545	515	490	437	462	407	458	422	397
2330	FCGB/CG 800	-	-	618	666	642	585	633	609	599	648	623	576	618	557	598	568	533	598
2334	FCGB/CG 900	-	-	618	666	642	585	633	609	599	648	623	576	626	601	548	598	568	533
2434	FCG 1000	-	-	618	666	642	585	633	609	599	648	623	576	626	601	548	598	568	533
2636	FCG 1000	-	-	618	666	642	585	633	609	599	648	623	576	626	601	548	598	568	533

Base Unit Casing Weight

Table below shows the base unit casing weight (approximation) for 25mm, 50mm and 50mm NTB casing.

UNIT SIZE	MXB		FAN		COIL		HVF		BF		LVF		ACC	
	25	50	25	50	25	50	25	50	25	50	25	50	25	50
0608	31	38	34	42	34	42	25	31	34	42	34	42	34	42
0609	34	41	37	45	37	45	27	34	37	45	37	45	37	45
0610	36	44	43	52	40	48	30	36	40	48	40	48	40	48
0712	45	54	52	63	48	58	37	45	48	58	48	58	48	58
0813	51	61	64	76	55	66	42	52	55	66	55	66	55	66
0914	62	74	76	90	62	74	48	58	62	74	62	74	62	74
1015	70	83	84	100	70	83	55	66	70	83	70	83	70	83
1016	73	87	88	105	73	87	57	69	73	87	73	87	73	87
1117	81	96	109	128	81	96	64	77	81	96	81	96	81	96
1317	90	107	120	141	90	107	72	87	90	107	90	107	90	107
1518	117	137	136	159	104	122	84	100	104	122	104	122	104	122
1522	135	158	171	199	121	142	99	117	121	142	121	142	121	142
1622	141	165	185	215	126	148	104	123	126	148	126	148	126	148
1822	161	187	199	231	137	161	114	135	137	161	137	161	137	161
1824	171	200	212	246	147	172	122	144	147	172	147	172	147	172
1825	177	206	227	262	152	178	127	149	152	178	152	178	152	178
2025	190	221	242	280	164	192	138	162	164	192	164	192	164	192
2226	228	264	283	327	182	212	154	180	182	212	182	212	182	212
2330	262	302	343	394	211	245	180	211	211	245	211	245	211	245
2334	288	333	376	431	234	271	201	235	234	271	234	271	234	271
2434	297	343	397	455	242	280	208	243	242	280	242	280	242	280
2636	329	379	435	498	270	312	234	272	270	312	270	312	270	312

Note: Weight in kg.

Fan Motor Weight

Table below shows the approximate fan motor weight

Motor HP	Motor kW	Approx. Weight (kg)	Frame Number
1	0.75	15	D80
1.5	1.1	20	D90S
2	1.5	22	D90L
3 & 4	2.2/3.0	30	D100L
5 & 5 1/2	3.7/4.4	42	D112M
7.5	5.5	65	D132S
10	7.5	76	D132M
15	11	118	D160M
20	15	139	D160L
25	18.5	189	D180M
30	22	203	D180L
40	30	290	D200L
50	37	320	D225SC
60	45	355	D225MC
75	55	520	D2250SA

Notes :

- Motor weights based on 4 - pole 415/3Ø/50Hz induction type TEFC motor foot mounted.
- Motor shall be of Δ , Y or D.O.L. wiring.
- Standard motor shall be per IEE standard IP55 enclosure with Class F insulation and B Temperature rise complying with BS2757.
- Maximum ambient temperature 40°C.
- For derivation of motor kW from fan BkW use

$$\text{Motor kW} = \text{Fan BkW} \times A, \text{ where } A = 1.20 \text{ if } \text{BkW} < 10\text{kW}$$

$$A = 1.15 \text{ if } \text{BkW} > 10\text{kW}$$
- Please refer to your nearest Carrier representatives for special motor voltages or application.

Fan Blower Specifications

Gebhardt Fan

Fan Type	Fan Size	Maximum RPM	Maximum BkW	Fan Shaft Diameter (mm) end tolerance
Forward Curved	FCG 02-160	4250	3.5	20 k6
	FCG 02-180	4000	3.5	20 k6
	FCG 02-200	3800	4.0	20 k6
	FCG 02-225	3400	5.0	20 k6
	FCG 02-280	2730	6.3	25 k6
	FCG 02-315	2400	6.3	25 k6
	FCG 02-355	1900	9.0	25 k6
	FCG 02-400	1900	9.0	30 k6
	FCG 05-450	1700	16.0	30 k6
	FCG 05-500	1500	16.0	30 k6
Backward Curved	FCG 02-560	1200	13.5	40 k6
	FCG 02-630	1000	13.5	40 k6
	FCG 05-630	1000	26.0	40 k6
	FCG 02-710	850	13.5	50 k6
	FCG 05-710	850	38.0	50 k6
	FCG 05-800	750	38.0	50 k6
	FCG 05-800/G1	750	38.0	50 k6
	FCG 05-900	670	47.0	60 k6
	FCG 05-900/G1	670	47.0	60 k6
	FCG 05-1000	600	47.0	60 k6
Kruger Fan	BCG 12-225	6640	6.5	20 k6
	BCG 12-280	5235	6.5	25 k6
	BCG 12-315	4418	6.5	25 k6
	BCG 12-355	3200	6.5	25 k6
	BCG 15-400	3600	26.6	30 k6
	BCG 15-450	3360	26.6	30 k6
	BCG 15-500	2920	26.6	30 k6
	BCG 15-560	2400	32.8	40 k6
	BCG 15-630	1880	32.8	40 k6
	BCG 15-710	2000	49.9	50 k6
Forward Curved	BCG 15-800	1470	49.9	50 k6
	BCG 15-800/G1	1470	49.9	50 k6
	BCG 15-900	1430	68.0	60 k6
	BCG 15-900/G1	1430	68.0	60 k6
	BCG 15-1000	1140	68.0	60 k6

Remark:
A selection is valid provided if first reaches and not exceed either maximum limits (RPM of BkW).

Kruger Fan

Fan Type	Fan Size	Maximum RPM	Maximum BkW	Fan Shaft Diameter (mm) end tolerance
Forward Curved	FDA 180 CL	3700	2.0	20 g6
	FDA 200 CL	3300	2.5	20 g6
	FDA 225 CL	2900	3.0	20 g6
	FDA 250 CL	2700	3.0	20 g6
	FDA 280 CL	2400	4.0	25 g6
	FDA 315 CL	2100	5.5	25 g6
	FDA 355 CL	1800	5.5	30 g6
	FDA 400 TL	1800	15.0	35 g6
	FDA 450 TL	1600	18.5	40 g6
	FDA 500 TL	1300	18.5	45 g6
Backward Curved	FDA 560 TL	1200	22.0	50 g6
	FDA 630 TL	1000	22.0	50 g6
	FDA 710 TL	900	25.0	60 g6
	FDA 800 TM	750	25.0	60 g6
	FDA 900 TM	650	30.0	65 g6
	FDA 1000 TM	600	37.0	70 g6
	BDB 225 CL	4500	2.2	20 g6
	BDB 250 CL	4000	2.5	20 g6
	BDB 280 CL	3500	3.0	25 g6
	BDB 315 CL	3100	4.0	25 g6
Kruger Fan	BDB 355 CL	2700	5.0	30 g6
	BDB 400 TL	3200	14.0	35 g6
	BDB 450 TL	2900	18.0	40 g6
	BDB 500 TL	2500	20.0	40 g6
	BDB 560 TL	2200	25.0	45 g6
	BDB 630 TL	2000	30.0	50 g6
	BDB 710 TL	1800	40.0	50 g6
	BDB 800 XM	1600	50.0	65 g6
	BDB 900 XM	1400	60.0	70 g6
	BDB 1000 XM	1300	80.0	80 g6

Filter Type, Dimension And Quantity For Each AHU Size

PART NAME	PART NO.	Unit Size																						
		0608	0609	0610	0712	0813	0914	1015	1016	1117	1317	1518	1522	1622	1822	1824	1825	2025	2226	2330	2334	2434	2636	
a) HEPA filter EU13 Particle Board Frame (media Thickness 292mm) (H289 X W595)mm (H595 X W289)mm (H442 X W595)mm (H595 X W595)mm	3GA509-903 3GA509-904 3GA509-905 3GA509-902	-	-	-	-	-	-	2	2	-	-	3	-	-	-	-	4	-	5	-	-	-	-	
b) HEPA filter EU13 Aluminium Frame (media Thickness 292mm) (H289 X W595)mm (H595 X W289)mm (H442 X W595)mm (H595 X W595)mm	3GA509-920 3GA509-919 3GA509-921 3GA509-918	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	4	
c) 1" Bag Filter 529mm L (EU5) (H289 X W595)mm (H595 X W595)mm (H391 X W495)mm (H391 X W595)mm	39GA509-373 39GA509-378 39GA509-375 39GA509-376	-	-	-	-	3	-	2	2	3	-	2	2	5	5	2	4	-	4	7	8	8	4	
d) 1" Bag Filter 529mm L (EU6) (H289 X W595)mm (H595 X W595)mm (H391 X W495)mm (H391 X W595)mm	39GA509-230 39GA509-235 39GA509-232 39GA509-233	-	-	3	-	2	-	2	3	-	2	-	2	5	5	2	4	-	4	7	8	8	4	
e) 1" Bag Filter 529mm L (EU7) (H289 X W595)mm (H595 X W595)mm (H391 X W495)mm (H391 X W595)mm	39GA509-208 39GA509-213 39GA509-210 39GA509-211	-	-	3	-	2	-	2	3	-	2	-	2	5	5	2	4	-	4	7	8	8	4	
f) 1" Bag Filter 529mm L (EU8) (H289 X W595)mm (H595 X W595)mm (H391 X W495)mm (H391 X W595)mm	39GA509-240 39GA509-245 39GA509-242 39GA509-243	-	-	3	-	2	-	2	3	-	2	-	2	5	5	2	4	-	4	7	8	8	4	
g) 2" HVF Filter Washable (G3) (H289 X W595)mm (H595 X W595)mm (H391 X W495)mm (H391 X W595)mm	39GA509-038 39GA509-043 39GA509-040 39GA509-041	-	-	3	-	2	-	2	3	-	2	-	2	5	5	2	4	-	4	7	8	8	4	
h) 2" HVF Filter Disposable (G4) (H289 X W595)mm (H595 X W595)mm (H391 X W495)mm (H391 X W595)mm	39GA509-026 39GA509-031 39GA509-028 39GA509-029	-	-	3	-	2	-	2	3	-	2	-	2	5	5	2	4	-	4	7	8	8	4	

Fan Housing Dimension And Weight

Table below shows full details of 39G fan housing dimension and weight.

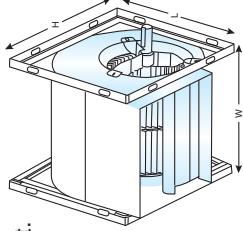
Gebhardt Fan

Fan Type	Fan Size	Length (mm)	Width (mm)	Height (mm)	Weight (kg)
Forward Curved	FCG 02-160	269	257	315	7
	FCG 02-180	299	282	352	9
	FCG 02-200	328	309	388	10
	FCG 02-225	366	350	433	12
	FCG 02-280	449	423	532	20
	FCG 02-315	502	465	596	23
	FCG 02-355	562	515	669	30
	FCG 02-400	632	578	750	45
	FCG 05-450	708	644	826	65
	FCG 05-500	827	713	952	80
Forward Curved	FCG 02-560	875	787	1046	97
	FCG 02-630	979	874	1173	115
	FCG 05-630	1028	876	1198	137
	FCG 02-710	1104	971	1324	175
	FCG 05-710	1152	973	1342	183
	FCG 05-800	1290	1092	1509	233
	FCG 05-800/G1	1290	1092	1509	233
	FCG 05-900	1448	1225	1697	316
	FCG 05-900/G1	1448	1225	1699	316
	FCG 05-1000	1573	1362	1889	376
Backward Curved	BCG 12-225	366	350	432	15
	BCG 12-280	449	423	532	23
	BCG 12-315	502	465	596	27
	BCG 12-355	562	515	699	36
	BCG 15-400	625	580	731	61
	BCG 15-450	708	644	826	73
	BCG 15-500	827	713	952	94
	BCG 15-560	921	789	1074	125
	BCG 15-630	1028	876	1198	149
	BCG 15-710	1152	973	1342	201
Backward Curved	BCG 15-800	1290	1092	1509	250
	BCG 15-800/G1	1290	1092	1509	250
	BCG 15-900	1448	1225	1697	358
	BCG 15-900/G1	1448	1225	1697	358
	BCG 15-1000	1573	1362	1889	416

Kruger Fan

Fan Type	Fan Size	Length (mm)	Width (mm)	Height (mm)	Weight (kg)
Forward Curved	FDA 180 CL	294	268	336	9.5
	FDA 200 CL	306	306	370	10.5
	FDA 225 CL	348	338	415	12
	FDA 250 CL	383	372	460	15
	FDA 280 CL	432	420	518	20
	FDA 315 CL	480	464	578	24
	FDA 355 CL	548	532	654	32
	FDA 400 TL	612	586	736	55
	FDA 450 TL	681	648	827	61
	FDA 500 TL	750	718	918	81
Backward Curved	FDA 560 TL	844	814	1030	110
	FDA 630 TL	945	900	1157	140
	FDA 710 TL	1057	998	1302	192
	FDA 800 TM	1180	1106	1468	281
	FDA 900 TM	1319	1230	1648	326
	FDA 1000 TM	1450	1366	1810	384
	BDB 225 CL	348	338	415	13
	BDB 250 CL	383	372	460	16
	BDB 280 CL	432	420	518	22
	BDB 315 CL	480	464	578	27
Backward Curved	BDB 355 CL	548	532	654	41
	BDB 400 TL	612	586	736	67
	BDB 450 TL	681	648	827	89
	BDB 500 TL	750	718	918	118
	BDB 560 TL	844	814	1030	158
	BDB 630 TL	945	900	1157	197
	BDB 710 TL	1057	998	1302	251
	BDB 800 XM	1180	1106	1468	323
	BDB 900 XM	1319	1230	1648	397
	BDB 1000 XM	1450	1366	1810	512

Note: Width does not include both end of shaft.



General

- 1.1 Furnish and install central station air handling units of the type, size and capacity shown on the equipment schedule.
- 1.2 Equipment schedules and specifications are based on Carrier 39G 'Galaxy' series. The design of the air-handling unit is based on the use of modular panels and extruded aluminium perimeter frames with composite material for corner piece. Other manufacturers of equal quality may be submitted to the consulting engineers for approval. When substitution of equipment is made, the contractor shall be responsible for the cost of any item and engineering revision necessary to satisfy plans and specifications.
- 1.3 Units shall be horizontal or vertical draw-through type as shown on the drawings and shall consists (in the direction of air flow) a mixing box section, a filter section, a coil section and a fan section generally in accordance with the attached equipment schedules.
- 1.4 Unit shall be supplied with welded unitbase with holes for rigging located to suit optimum hoisting stability. The use of slings and spreader bars are recommended for large section.

Casing Construction (25mm and 50mm)

- 2.1 The unit casing construction shall have double skin construction to allow access without damaging the insulation and isolating it from the air stream.
- 2.2 The casing shall have extruded aluminium perimeter frame, with modular panels and composite material corner piece. The panels shall be constructed such that they shall comprise of two layers of steel sheet with injected insitu CFC-Free Polyurethane insulation with thermal conductivity factor of 0.019 w/mk and density of 40kg/m³ in between. The assembly of fix panels to the perimeter frame shall be from inside the unit. The removable panels should be provided on the both sides of the units with hex socket compression type latch assembly and large & non-conductive handles. All external panels surface shall be pre-painted zinc allume. Internal panels shall be galvanised steel sheet.

Fan Section

- 3.1 The fan shall be of the forward curved or backward curved DIDW centrifugal type. The blade of forward curved wheels shall be galvanised steel. The blade of backward curved wheel shall be heavy gauge steel, treated and painted after manufacture. The fan assembly shall be statically and dynamically balanced to the 80% of maximum fan speed as shown in the schedule.
- 3.2 Factory/field furnished and installed fan motors shall be mounted inside the fan section on the mounting base. The motors shall be of the totally enclosed fan cooled (TEFC) type (or open drip proof type) suitable for use with...Volts...Phase....Hz electrical supply. Motor speed shall be as per schedule.

- 3.3 The fan drive package shall consist of fixed pitch fan and motor pulleys and V-belts, adequately sized to accommodate the application service factor.
- 3.4 The fan and motor assembly shall be mounted on an adjustable mounting base with factory supplied spring anti-vibration mountings or rubber isolator. The fan discharge shall be square (for forward curved or backward curved fans) in area and flanged and isolated from the casing by a fire retardant grade flexible connection. Only on fan discharge shall be provided.

Coil

- 4.1 The coils shall be of the cartridge type, mounted over the condensate drain pan (for cooling coil). Coils shall be tested at 2760kPag air pressure while submerged in water. Coils performance shall be rated in accordance to ARI standard 410.
- 4.2 Chilled Water coils shall have aluminium/copper fins with belled collars and bonded to 12.7mm OD copper tubes by mechanical expansion. Fins shall be of the "Dual Sinewave" form. Coil shall have galvanised steel casing and steel headers with male threaded connections. Working pressure shall be 2060kPag at 93°C. Coils shall be drainable and have non-air-trapping circuits. No turbulence promoting devices will be permitted inside the tubes. Headers shall have drain and vent connections. Note : copper header shall be sweat type connection (brazed).
- 4.3 Direct expansion coil shall have aluminium/copper fins with belled collars and bonded to 12.7mm OD copper tubes by mechanical expansion. Fins shall be of the "Dual Sinewave" form. Coils shall be provided with brass distributors with sweat type connections. Coils shall have full-face active area with intertwined circuits for equal loading on each circuit. Suction and metering valve connection shall be on the same end. After leak testing, coil shall be charged with dry air. Coils shall be designed and tested in accordance to ARI standard.
- 4.4 Hot Water coils shall be constructed similar to the chilled water coil as per Section 4.3 except that the maximum working pressure shall be 1200kPag at 205°C.
- 4.5 All coils shall have counter flow arrangement.
- 4.6 The condensate drain pan shall be constructed by 16-gauge powder painted Galvanised Steel with 40mm depth and 600mm in length. Slider shall be welded at drain pan for easier coil installation and removal. The condensate drain pan shall be constructed in slope with one female threaded pipe connection of 43mm OD routed through bottom for drainage in accordance to ASHRAE 62-89 Standard.

Guide Specification

Filter Section

- 5.1 The filter section shall be supplied by the air handling unit manufacturer with the same casing construction as specified for the other unit sections. The type of filters to be housed within the filter section shall be the type and efficiency indicated on the equipment schedule.
- 5.2 High velocity filter section shall be capable of receiving 25mm or 50mm thick filters of standard size. Low velocity filter section shall be capable of receiving 50mm deep filters mounted in 50mm width holding frames.
- 5.3 Bag filter section shall be capable of accepting bag filters with length up to 529mm and 22mm-filter header thickness.

Mixing Box

- 6.1 Mixing boxes shall be parallel bladed, interconnected outside air and return air dampers. Damper blades shall be brake formed for stiffness and shall be mechanically secured to 13mm OD steel rods rotating in nylon bushings and mounted in rigid powder painted steel damper frames. Dampers shall be sectionalised to limit blade length to not more than 1480mm in order to prevent excessive blade warping and ensure tight closure.

Access Section

- 7.1 Access section shall be supplied by the air handling unit manufacturer with the same casing construction as specified for the other sections. The access panels shall be ultra low leak construction with hex socket compression type latch assembly and large & non-conductive handles for easy removal of the access panel. The access panel shall be double skinned construction and internally insulated with injected insitu CFC-Free polyurethane insulation. The access panel perimeter shall be lined with ribseals.

ViewPorts

- 8.1 ViewPorts shall be available as factory installed option on access doors. The viewports shall be fabricated from round, double plane, clear and rigid polycarbonate with a minimum diameter of 200.0mm and installed with screws that do not come into direct contact with the internal surface of the air handling unit. The viewport shall be gasketed on the internal and external surfaces with thermoplastic elastomer (TPE) gaskets to ensure air-tightness. The viewport shall be capable of withstanding unit operating pressures.

Marine Lamp (for inspection purpose)

- 9.1 Marine lamps shall be available as factory-installed option on the fan and access sections of the air handling unit. The construction shall be vapour and weather tight rated to IP44. The marine lamp shall consist of a structural light fitting base with aluminium reflector and receptacle, and a structural glass globe protected by wire mesh. The marine lamp shall come fitted with a light bulb complete with factory installed wiring and conduits and terminated with an on/off switch located external to the unit and near to the access door.

Drain Pan

- 10.1 The drain pan shall be available fabricated in galvanized steel and powder painted to withstand ASTM B-117 Salt Spray Test at 500 hours. The drain pan shall have option of being fabricated in Stainless Steel SUS 304.
- 10.2 The drain pan shall be constructed to have full width, single sloped drain pan to ensure positive condensate drainage and shall extend downstream of the coil to provide sufficient amount of space to contain moisture carry-over. The coil shall not sit in the drain pan and shall be removable via coil tracks. The drain pan shall have an integral FPT elbow for side discharge and trapping.
- 10.3 The drain pan must be accessible for inspection and cleaning.



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*Manufacturer reserves the right to discontinue, or
change at any time, specifications or designs
without notice and without incurring obligations.*