

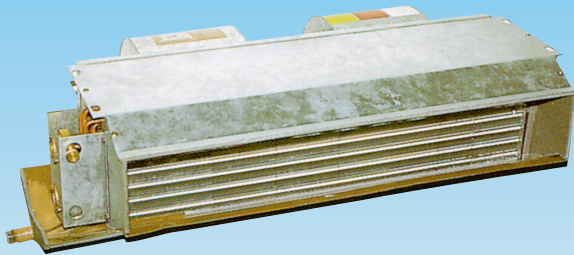


CHILLED

water

FAN COIL

UNITS



42ZM - Product Data Digest

QUALITY SYSTEM



MALAYSIA
MS ISO 9001
REG. NO: AR 0239

Any room, every room flexibility in a central air conditioning system.

FEATURES:

- Ultra-compact design - saves installation space.
- Low fan speed - super quiet operation.
- Low installation and maintenance cost - easy wiring, piping connections (with bleed valve & threaded connections).
- Installed with direct driven forward curved centrifugal fan and 3-speed high efficiency motor.
- Lanced sine wave fins - ensures high capacity performance.
- High static options are available.
- Return air plenum completed with air filter is optional.
- Minimum power requirement for significant money saving to the owners.
- Integral high pitched drain pan for excellent indoor air quality control and lower maintenance cost.
- Standard non-painted casing.
- Fully insulated cabinet to minimise energy loss.

SPECIFICATIONS

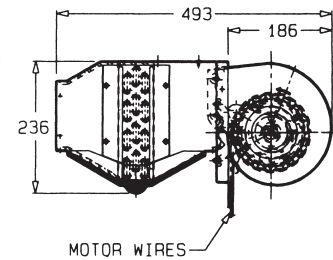
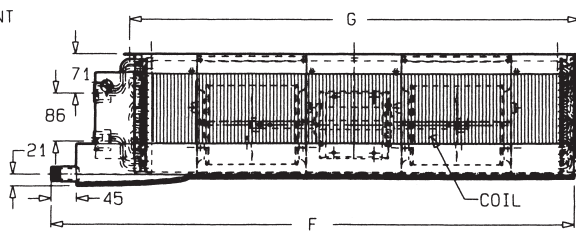
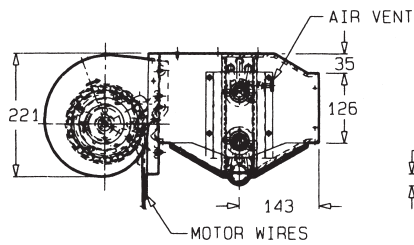
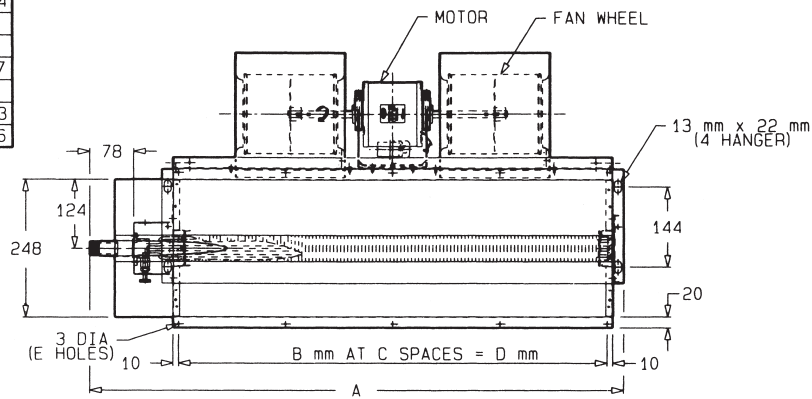
MODEL 42ZM		003	004	006	008	012
Power source (V-ph-hz) nominal		230 - 1 - 50				
Min. - max. voltage		207 - 253				
Operating weight	(kg)	14	17	21	26	29
Fans	Type	Centrifugal Forward Curve Blades				
	Number	1	1	2	2	3
	Blower dia. (mm)	143.2				
	Rated speed H (rpm)	1047	1175	1010	1165	1175
	M (rpm)	927	1091	878	1052	1091
L (rpm)	749	857	688	892	857	
Fan motor(s)	Drive	Direct Drive				
	Type	Permanent Split Capacitor				
	Number	1	1	1	1	2
	Input kW	0.042	0.051	0.072	0.100	0.146
Air flow @ 30Pa external static pressure	RLA*	0.23	0.29	0.42	0.56	0.85
	H (l/s)	166	191	298	390	560
	M (l/s)	142	167	268	348	541
Coil	L (l/s)	109	130	216	288	444
	Type	Copper Tubes, Aluminium Fins				
	Rows - Fins/m	3 - 472				
Connections	Face area (sq.m)	0.1	0.1	0.15	0.19	0.26
	Supply (mm)	25.4 FPT				
	Return (mm)	25.4 FPT				
	Drain (mm)	19.05 MPT				

*RLA : Rated Load Amps

MPT : Male Pipe Thread

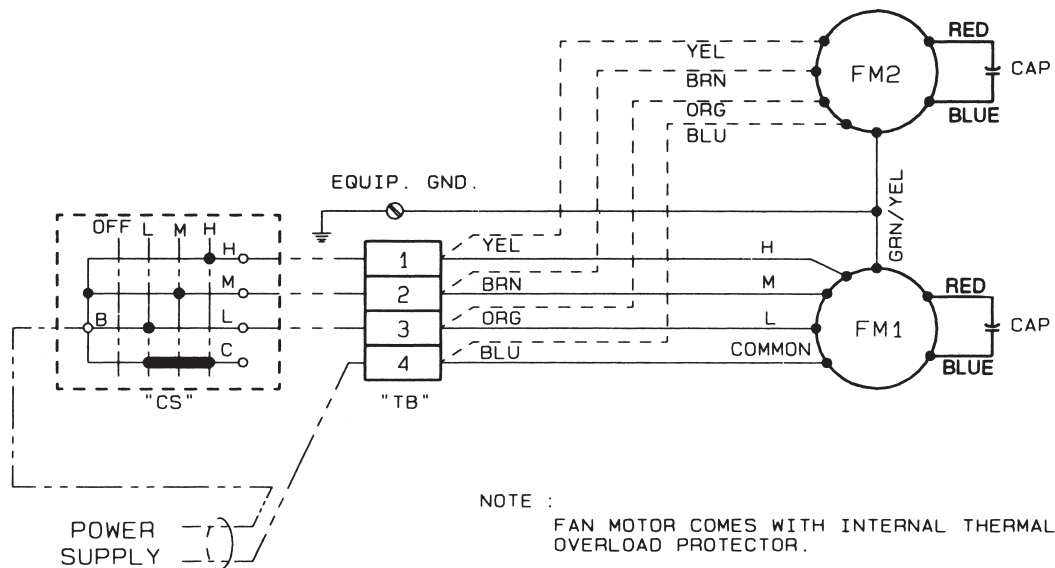
FPT : Female Pipe Thread

42ZM					
MODELS	003	004	006	008	012
A	714	714	964	1169	1514
B	259	259	192	243	220
C	2	2	4	4	6
D	518	518	767	972	1317
E	3	3	5	5	7
F	643	643	893	1098	1443
G	557	557	806	1011	1356



PHYSICAL DIMENSIONS

WIRING DIAGRAM



NOTE :
FAN MOTOR COMES WITH INTERNAL THERMAL OVERLOAD PROTECTOR.

230V-1PH-50Hz

ITEM	MODEL SIZE	MOTOR (S)
1	42ZM-003	FM1 (SSM)
2	42ZM-004	FM1 (SSM)
3	42ZM-006	FM1
4	42ZM-008	FM1
5	42ZM-012	FM1 (SSM) : FM2

FM	FAN MOTOR
CS	SWITCH
CAP	CAPACITOR
SSM	SINGLE SHAFT MOTOR
TB	TERMINAL BLOCK

42CM510-018

SELECTION PROCEDURE (WITH EXAMPLES)

Select a unit for cooling by matching design sensible heat cooling load to unit sensible heat cooling capacity. The coil, in most cases, will have sufficient latent capacity to meet design requirements, if outside air is used, adjust load and entering coil conditions accordingly.

FORMULAS:

$$\begin{aligned} & \text{Water temperature rise (}^{\circ}\text{C)} \\ & = \frac{\text{Total capacity (W)}}{4186 \times \text{Water flow rate (l/sec)}} \end{aligned}$$

$$\begin{aligned} & \text{Air temperature rise (}^{\circ}\text{C db)} \\ & = \frac{\text{Sensible heat capacity (W)}}{0.09375 \times \text{Air quantity (l/sec)}} \end{aligned}$$

EXAMPLES

Selection at high fan speed (cooling)

Units are usually selected for cooling at high fan speed to ensure use of the smallest size unit.

I Determine job requirement

Given:

Room sensible heat cooling load 2600W
 Room total cooling load 3600W
 Entering air temperature 26°Cdb. 19.5°Cwb
 Entering water temperature 7°C
 Air Quantity 184 l/sec

II Determine unit size, water flow and pressure drop

Enter Cooling Capacities table at entering air and water temperature of 19.5°Cwb and 7°C. Find sensible heat cooling capacity equal to or greater than required. Read 2610W sensible heat cooling capacity; 3805W total heat cooling capacity. Read left to select a size 004 unit at 0.18 l/sec water flow rate with 17.6 kPa pressure drop.

Selection at medium fan speed (cooling)

A common practice is to operate fans most of the time at medium or low speed. Units, therefore, may be selected on the basis of an average cooling load condition and at medium speed operation at high fan speed allows for unusual or peak load requirements.

I Determine job requirements

Given:

Average design room sensible heat cooling load .. 1800W
 Average design room total cooling load 2600W
 Entering air temperature 26°Cdb. 19.5°Cwb
 Average design air quantity 139 l/sec

II Select trial unit size

Enter specifications table at "M" (medium) speed air quantity. Read 142 l/sec which is the closest air quantity to that required in this example. Read up to select a size 003 trial unit size.

III Determine medium fan speed capacity multipliers for trial unit size, using Cooling Capacity Multipliers table

For a size 003 unit, the sensible heat multiplier is 0.87 and the total cooling multiplier is 0.88 at 30Pa external static pressure.

IV Determine adjusted sensible and total heat cooling loads by dividing average design loads by the selected multiplier

$$\frac{1800}{0.87} = 2069 \text{ W (adjusted sensible load)}$$

$$\frac{2600}{0.88} = 2955 \text{ W (adjusted total cooling load)}$$

V Make final unit selection. Determine water flow rate and pressure drop

Substituting adjusted load for specified load, enter Cooling Capacities table at 26°Cdb, and 7°C entering water temperature. Find sensible and total cooling capacities equal to or greater than adjusted loads. Read 2121W sensible and 3091W total cooling capacities. Read left to select a size 003 unit at 0.13 l/sec water flow with 10.8 kPa pressure drop.

CAPACITY MULTIPLIER vs SPEED

MODEL	SPEED	MED	LOW
42ZM003		0.85	0.75
42ZM004		0.86	0.74
42ZM006		0.87	0.75
42ZM008		0.86	0.74
42ZM012		0.87	0.75

PERFORMANCE DATA COOLING CAPACITIES

ENTERING AIR CONDITION DB = 24°C WB = 17.8°C (RH = 55%)

COOLING CAPACITY IN (WATT)

Type	Water Flow l/Sec	W.P.D. kPa	Entering Water Temperature C									
			5		6		7		8		9	
			SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC
003	0.10	6.9	2035	2847	1961	2629	1888	2411	1797	2193	1661	1975
	0.13	10.8	2189	3205	2098	2950	1961	2705	1843	2462	1751	2219
	0.17	14.0	2262	3449	2189	3180	2071	2911	1961	2654	1824	2385
	0.20	20.3	2308	3616	2244	3346	2117	3065	2007	2782	1861	2514
004	0.13	10.8	2410	3205	2335	2958	2298	2700	2189	2461	2079	2213
	0.18	17.6	2712	3702	2554	3417	2403	3219	2315	2940	2226	2569
	0.23	26.1	2797	4048	2651	3735	2578	3422	2506	3119	2335	2807
	0.28	36.4	2944	4296	2773	3973	2675	3640	2530	3306	2396	2980
006	0.20	11.0	3831	5023	3667	4445	3502	3797	3320	3675	3247	3552
	0.25	15.4	3940	5363	3794	4925	3667	4484	3502	4285	3320	3798
	0.30	20.1	4094	5575	3886	5014	3739	4577	3594	4370	3411	3975
	0.35	26.6	4232	5955	3995	5493	3831	5043	3685	4582	3502	4119
008	0.27	21.1	5156	7194	4913	6642	4864	6282	4670	5671	4597	5351
	0.37	33.2	5643	8036	5156	7427	4937	6682	4816	6155	4670	5631
	0.47	54.7	5837	8588	5546	7931	5230	6996	4986	6299	4702	6013
	0.57	71.6	5959	8973	5740	8282	5302	7131	5181	6700	4864	6268
012	0.40	43.5	7734	10477	7552	9669	7187	8861	6603	8053	6238	7140
	0.50	77.8	8135	11257	7844	10371	7516	9503	6895	8440	6640	7977
	0.60	99.8	8354	11591	7953	10704	7588	9863	7005	8748	7041	8363
	0.70	123.0	8463	11925	8063	10999	7697	10084	7297	9170	7223	8628

ENTERING AIR CONDITION DB = 26°C WB = 19.5°C (RH = 55%)

COOLING CAPACITY IN (WATT)

Type	Water Flow l/Sec	W.P.D. kPa	Entering Water Temperature C									
			5		6		7		8		9	
			SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC
003	0.10	6.9	2139	3222	2093	2944	2003	2841	1958	2647	1813	2438
	0.13	10.8	2265	3473	2184	3245	2121	3091	2030	2808	1939	2676
	0.17	14.0	2411	3801	2320	3501	2220	3321	2066	3064	1958	2793
	0.20	20.3	2437	3932	2411	3700	2265	3415	2184	3316	1976	2956
004	0.13	10.8	2537	3310	2561	3425	2513	3194	2465	3062	2368	2933
	0.18	17.6	2731	3942	2755	3833	2610	3805	2538	3485	2417	3066
	0.23	26.1	2973	4530	2912	4226	2707	3912	2586	3491	2525	3284
	0.28	36.4	3069	4811	2973	4351	2803	4146	2610	3916	2549	3400
006	0.20	11.0	4132	5741	3987	5044	3824	4870	3697	4452	3588	4343
	0.25	15.4	4241	6109	4096	5659	3951	5386	3783	4925	3697	4586
	0.30	20.1	4331	6431	4241	5899	4042	5590	3932	4957	3806	4790
	0.35	26.6	4531	6875	4367	6398	4132	5921	4042	5455	3843	4977
008	0.27	21.1	5509	7951	5340	7388	5292	7009	5074	6613	4761	5805
	0.37	33.2	5751	8892	5606	8277	5509	7764	5196	6905	4929	6382
	0.47	54.7	6137	9496	5895	8834	5654	8061	5267	7139	5171	6727
	0.57	71.6	6306	9914	5993	9228	5751	8544	5509	7871	5292	7185
012	0.40	43.5	8445	12127	8119	11288	7829	10462	7430	9622	7176	8783
	0.50	77.8	8663	12977	8408	12121	8119	11187	7829	10340	7394	9325
	0.60	99.8	8916	13416	8517	12382	8228	11501	7973	10737	7467	9465
	0.70	123.0	9025	13803	8735	12854	8372	11904	8119	10954	7720	10005

NOTE: SHC - Sensible Heat Capacity (W)
 TC - Total Capacity (W)
 W.P.D. - Water Pressure Drop (kPa)

PERFORMANCE DATA COOLING CAPACITIES

ENTERING AIR CONDITION DB = 28°C WB = 21°C (RH = 55%)

COOLING CAPACITY IN (WATT)

Type	Water Flow l/Sec	W.P.D. kPa	Entering Water Temperature C									
			5		6		7		8		9	
			SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC
003	0.10	6.9	2243	3493	2147	3275	2051	3058	1994	2840	1860	2627
	0.13	10.8	2415	3928	2300	3685	2214	3441	2128	3198	2032	2943
	0.17	14.0	2530	4235	2444	3966	2291	3697	2185	3441	2080	3173
	0.20	20.3	2617	4452	2492	4171	2369	3889	2252	3608	2147	3339
004	0.13	10.8	2671	3931	2645	3683	2517	3446	2428	3189	2339	2957
	0.18	17.6	2914	4545	2863	4265	2709	3984	2607	3694	2492	3414
	0.23	26.1	3093	4975	2990	4664	2888	4351	2760	4039	2594	3726
	0.28	36.4	3297	5318	3118	4954	2965	4621	2837	4286	2671	3964
006	0.20	11.0	4159	6355	4121	6151	3929	5656	3833	5188	3738	4803
	0.25	15.4	4447	6841	4332	6524	4140	5935	3929	5587	3833	5186
	0.30	20.1	4562	7148	4447	6800	4198	6203	4159	5991	3929	5434
	0.35	26.6	4715	7607	4524	7128	4332	6661	4236	6181	4064	5702
008	0.27	21.1	5929	9108	5725	8542	5418	7926	5265	7594	4983	6836
	0.37	33.2	6287	10181	5929	9122	5674	8535	5465	8169	5213	7803
	0.47	54.7	6619	10880	6281	10126	5904	9629	5776	9132	5418	8482
	0.57	71.6	6798	11361	6440	10650	6159	9940	5929	9229	5648	8519
012	0.40	43.5	8893	13615	8395	12761	7935	11909	7782	11068	7513	10214
	0.50	77.8	9277	14471	8932	13803	8242	12574	7935	11675	7628	10582
	0.60	99.8	9545	15221	9277	14396	8663	13037	8230	12331	7858	11157
	0.70	123.0	9660	15497	9353	14531	9047	13565	8510	12598	7973	11620

NOTE: SHC - Sensible Heat Capacity (W)
 TC - Total Capacity (W)
 W.P.D. - Water Pressure Drop (kPa)

CORRECTION FACTOR

FAN SPEED : HIGH

Model 42ZM	TC SHC	External Static Pressure (Pa) - Low Static Unit							
		10		20		30		40	
		CF	l/s	CF	l/s	CF	l/s	CF	l/s
003	TC	1.18	190	1.12	180	1.00	166	0.90	145
	SHC	1.18		1.11		1.00		0.89	
004	TC	1.04	199	1.02	194	1.00	191	0.98	186
	SHC	1.03		1.01		1.00		0.97	
006	TC	1.07	315	1.05	310	1.00	298	0.89	263
	SHC	1.06		1.04		1.00		0.88	
008	TC	1.06	413	1.03	401	1.00	390	0.98	380
	SHC	1.05		1.02		1.00		0.97	
012	TC	1.05	591	1.03	576	1.00	560	0.98	548
	SHC	1.05		1.02		1.00		0.97	

FAN SPEED : MEDIUM

Model 42ZM	TC SHC	External Static Pressure (Pa) - Low Static Unit							
		10		20		30		40	
		CF	l/s	CF	l/s	CF	l/s	CF	l/s
003	TC	1.05	168	0.99	159	0.88	142	0.80	128
	SHC	1.03		0.97		0.87		0.79	
004	TC	0.85	175	0.84	172	0.82	167	0.81	165
	SHC	0.84		0.83		0.82		0.81	
006	TC	0.96	283	0.94	279	0.90	268	0.80	236
	SHC	0.94		0.93		0.89		0.78	
008	TC	0.93	371	0.90	359	0.88	348	0.86	341
	SHC	0.92		0.89		0.86		0.85	
012	TC	0.93	548	0.91	544	0.89	541	0.86	529
	SHC	0.91		0.89		0.86		0.83	

NOTE: TC - Total Capacity
 SHC - Sensible Heat Capacity
 CF - Correction Factor

CORRECTION FACTOR

FAN SPEED : HIGH

Model 42ZM	TC SHC	External Static Pressure (Pa) - High Static Unit							
		40		60		80		100	
		CF	l/s	CF	l/s	CF	l/s	CF	l/s
003	TC	1.20	199	1.12	186	1.03	171	0.94	157
	SHC	1.20		1.12		1.03		0.94	
004	TC	1.19	227	1.13	216	1.05	201	0.98	184
	SHC	1.19		1.13		1.05		0.96	
006	TC	1.13	337	1.09	325	1.03	308	0.91	272
	SHC	1.13		1.09		1.03		0.91	
008	TC	1.15	450	1.13	443	1.08	422	0.95	374
	SHC	1.15		1.13		1.08		0.95	
012	TC	1.14	643	1.12	633	1.06	596	0.96	543
	SHC	1.14		1.12		1.06		0.96	

FAN SPEED : MEDIUM

Model 42ZM	TC SHC	External Static Pressure (Pa) - High Static Unit							
		40		60		80		100	
		CF	l/s	CF	l/s	CF	l/s	CF	l/s
003	TC	0.97	162	0.90	150	0.85	142	0.83	137
	SHC	0.97		0.90		0.85		0.83	
004	TC	0.99	190	0.94	180	0.87	167	0.83	159
	SHC	0.99		0.94		0.87		0.83	
006	TC	0.97	287	0.92	276	0.85	254	0.77	232
	SHC	0.97		0.92		0.85		0.77	
008	TC	0.97	378	0.93	365	0.85	334	0.80	312
	SHC	0.97		0.93		0.85		0.80	
012	TC	0.99	558	0.95	533	0.87	491	0.82	461
	SHC	0.99		0.95		0.87		0.82	

NOTE: TC - Total Capacity
SHC - Sensible Heat Capacity
CF - Correction Factor

SOUND PRESSURE LEVEL - (HIGH STATIC UNIT)

FAN SPEED	SIZE	OCTAVE BAND CENTRE FREQUENCY HERTZ								dB(A)
	42ZM	63	125	250	500	1000	2000	4000	8000	
H	003	24.4	33.0	42.3	43.3	48.0	45.7	41.5	34.8	52.1
	004	22.6	33.4	43.8	45.0	47.5	45.8	41.6	34.9	52.4
	006	24.3	36.0	44.5	46.1	50.1	47.2	43.0	35.3	54.0
	008	23.0	38.0	47.2	47.8	32.4	50.6	47.0	39.2	56.6
	012	26.0	40.0	48.0	49.1	52.6	51.1	47.0	39.6	58.0
M	003	22.9	30.0	37.5	38.8	42.5	40.4	34.6	27.7	46.6
	004	21.0	32.0	41.0	40.1	43.0	41.6	35.3	27.8	48.0
	006	23.0	34.0	42.0	43.0	47.5	44.1	39.6	31.0	51.4
	008	23.3	36.5	45.6	46.4	50.3	48.7	44.5	36.7	55.0
	012	24.0	37.5	46.0	47.3	50.6	48.6	44.1	35.5	55.1
L	003	21.6	24.5	25.0	27.4	28.0	23.0	16.0	10.1	35.0
	004	20.0	26.4	31.6	30.0	30.7	26.4	18.5	11.0	36.7
	006	22.5	30.0	37.2	38.0	40.2	37.0	30.8	20.5	45.0
	008	22.6	31.6	35.4	40.0	43.0	41.7	34.4	27.4	48.0
	012	22.0	32.0	40.0	41.5	42.6	40.0	33.1	22.3	48.0

SOUND PRESSURE LEVEL - (LOW STATIC UNIT)

FAN SPEED	SIZE	OCTAVE BAND CENTRE FREQUENCY HERTZ								dB(A)
	42ZM	63	125	250	500	1000	2000	4000	8000	
H	003	22.5	26.6	34.2	38.3	39.4	39.2	34.2	30.8	45.8
	004	24.0	29.0	38.8	43.8	45.8	43.7	40.2	36.1	50.2
	006	26.3	29.8	36.6	40.2	43.0	40.6	35.8	32.0	47.2
	008	26.4	30.8	41.4	44.2	46.8	45.3	41.2	37.1	52.7
	012	27.9	34.4	42.4	45.8	47.9	46.8	42.9	38.5	53.5
M	003	22.4	27.4	30.5	35.4	35.6	33.3	28.1	22.4	40.8
	004	23.7	25.8	33.9	38.6	39.8	37.4	32.5	29.4	44.9
	006	25.9	28.2	32.2	35.7	37.4	34.3	29.6	24.2	41.8
	008	26.2	28.6	38.4	42.4	43.8	42.2	37.7	35.2	48.3
	012	27.4	34.2	38.4	42.6	44.2	42.4	37.9	34.5	49.3
L	003	21.4	25.4	29.2	27.3	26.2	22.5	22.0	21.8	34.2
	004	22.5	25.2	28.9	27.9	28.1	22.3	21.6	20.8	34.6
	006	25.5	25.8	26.0	26.4	26.5	23.3	22.6	20.3	33.3
	008	24.1	25.4	34.4	35.4	37.4	34.4	29.5	23.0	40.8
	012	27.1	31.4	32.6	35.4	36.2	32.8	27.9	23.6	41.8

NOTE: SOUND DATA AT 1.5m AWAY FROM AIR DISCHARGE OPENING.

GUIDE SPECIFICATIONS

Furnish and install fan coil units as indicated in installation manual.

Units shall be complete with chilled water coil, one or more centrifugal fans, intergral high pitched condensate drain pan and galvanized steel panels fully insulated on discharge side of fans. Base unit height shall not exceed 236mm. Horizontal units shall have holes in top sheet for ease installation.

Coil shall be 3 row with staggered tubes, lanced sine wave fins pattern with 25.4mm threaded connections. Coil's copper tubing, return bends and joints shall be enclosed within insulated end sections of drain pan for protection against sweating. Coils shall have manual air bleed valve.

Fan(s) shall be centrifugal forward curve, direct-driven by a permanent split capacitor type motor. Motors shall have single phase power supply and 3-speed windings for super quiet operation.

Intergral high pitched drain pan shall be galvanized steel, powder painted in baked oven, insulated and pitched for positive drainage with unit level. Pan shall project under the entire length and width of the coil including header's connections.

Filters must be removable without removing or loosening front panel. Filters will only be supplied when unit is equipped with return air plenum.



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