

Ducted Fan Coil



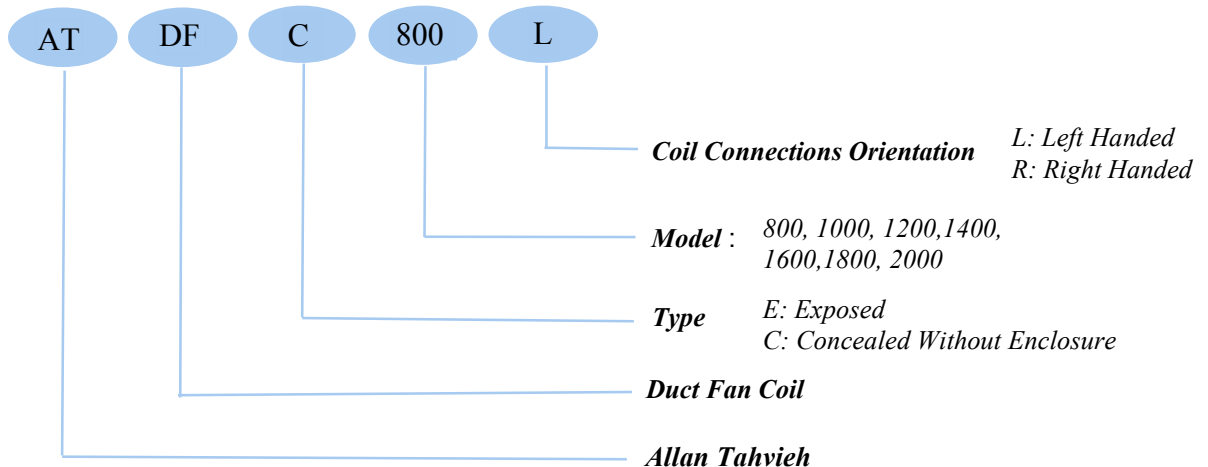
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Nomenclature



Features

All body made of hot galvanized steel sheet and covered with fine quality paint insulated panels to improve thermal efficiency. Efficient coils constructed from aluminum finned copper tubes. High performance forward curved double width double inlet centrifugal fans, statically and dynamically balanced. 220V/1Ø/50Hz three speeds controllable through three speeds type switches upon request. Easily accessible washable aluminum filters.

Selection Procedure

Chilled Water Cooling Selection Procedure Given:

Total Load: 18800Btu/hr
Sensible Load: 16200Btu/hr
Air Flow Requirement: 800 CFM
External Static Pressure Drop: 0.15In.WG
Ambient Altitude: 4000 ft.
Entering Air Temp.:80°F DB/67°F WB
Entering Water Temp.: 67°F

Select The Required Ducted Fan Coil Unit

Select model ATDFC/E-800 (Nominal CFM from Table 6)
Total Static Pressure Drop: Internal Static Pressure Drop (Table7) + External Static Pressure Drop
(0.37+0.15) = 0.52 In.WG
From Chart1: Air flow rate CFM = 770 CFM
Determine coil face velocity,
C.F.V. = Air Flow Rate (CFM) / Coil Face Area (ft²) (Table6) = 770 / 1.98 = 388 FPM
Enter Load Adjustment Factor (tables 1 and 2 by interpolation),
AF_T (Total Load Adjustment Factor) = 0.99
AF_S (Sensible Load Adjustment Factor) =0.99
Enter Altitude Adjustment Factor (Table3), AF_A= 0.91
Using nominal capacity values from Table4 and adjustment factors in previous steps, determine unit's actual total and sensible capacities.
Q_T = 21544 × 0.99 × 0.91=19409 Btu/hr
Q_S=17612 × 0.99 × 0.91= 15866 Btu/hr
Therefore, the chosen unit satisfies the load requirements.
To determine the leaving air wet bulb temperature, use the following procedure:
H_{LVG} = H_{ENT} - Qt / (4.5×CFM) = 34.1 - (19409 / (4.5×770)) = 28.5 Btu/lb
By referring to Enthalpy vs. Altitude (table9), the wet bulb temperature corresponding to the H_{LVG} is 60°F.

Hot Water Heating Selection Procedure Given:

Total Heating Load: 56000Btu/hr
Air Flow Requirement: 800 CFM
External Static Pressure Drop: 0.15In.WG
Ambient Altitude: 3000 ft.
Entering Air Temp.: 60°F DB
Entering Hot Water Temp.: 160°F

Select The Required Ducted Fan Coil Unit

Select model ATDFC/E-800 (Nominal CFM from Table 6)
Total Static Pressure Drop: Internal Static Pressure Drop. (Table8) + External Static Pressure Drop
(0.24+0.15) = 0.39 In.WG
From Chart1: Air flow rate CFM = 815 CFM
Determine coil face velocity.
C.F.V. = Air Flow Rate (CFM) / Coil face area (ft²) (Table6) = 815 / 1.98 = 411FPM
AFs (Sensible Load Adjustment Factor) =1.015
Enter Altitude Adjustment Factor (Table3), AF_A = 0.94
Using nominal capacity values from Table5 and adjustment factors in previous steps, determine unit's actual heating capacities.
Q= 58696×1.015×0.94= 56001 Btu/hr
Therefore, the chosen unit satisfies the load requirements.

Adjustment Factors

Total Load Adjustment Factor (AF_T)

Table 1

Model	Coil Face Velocity (FPM)					
	350	400	450	500	550	600
ATDF-800	0.96	1.2	1.06	1.08	1.106	1.14
ATDF-1000	0.94	0.99	1.03	1.06	1.088	1.12
ATDF-1200	0.93	0.99	1.03	1.06	1.09	1.12
ATDF-1400	0.90	0.96	0.99	1.04	1.08	1.105
ATDF-1600	0.90	0.96	0.99	1.03	1.06	1.09
ATDF-1800	0.90	0.93	0.99	1.03	1.06	1.09
ATDF-2000	0.85	0.96	0.989	1.03	1.07	1.09

Sensible Load Adjustment Factor (AF_S)

Table 2

Model	Coil Face Velocity (FPM)					
	350	400	450	500	550	600
ATDF-800	0.96	1	1.08	1.15	1.22	1.29
ATDF-1000	0.89	0.97	1.04	1.15	1.17	1.22
ATDF-1200	0.89	0.96	1.03	1.09	1.16	1.22
ATDF-1400	0.89	0.93	0.85	1.06	1.13	1.19
ATDF-1600	0.85	0.92	0.99	1.05	1.15	1.17
ATDF-1800	0.85	0.92	0.98	1.05	1.15	1.17
ATDF-2000	0.84	0.92	0.98	1.04	1.15	1.16

Attitude Adjustment Factor (AF_A)

Table 3

Attitude(ft)	0	1000	2000	3000	4000	4500	5000	5500	6000	6500
AF_A	1	0.99	0.97	0.95	0.91	0.91	0.89	0.89	0.88	0.87

Capacity Ratings (Chilled Water)

Table 4

Model	E.W.T (°F)	Water Flow Rate (GPM)	W.P.D (ft.WG)	Entering Air Temperature (°F)							
				75 DB 63 WB		77 DB 65 WB		80 DB 67 WB		85 DB 71 WB	
				Sensible Cooling (Btu/hr)	Total Cooling (Btu/hr)	Sensible Cooling (Btu/hr)	Total Cooling (Btu/hr)	Sensible Cooling (Btu/hr)	Total Cooling (Btu/hr)	Sensible Cooling (Btu/hr)	Total Cooling (Btu/hr)
ATDF-800	42	5.6	0.86	16592	19176	17002	21043	18186	23021	19699	27159
	44	5.5	0.85	15992	17716	16386	19499	17613	21546	19131	25604
	46	5.5	0.85	15415	16288	15798	18006	17027	20019	18547	23994
ATDF-1000	42	7.2	1.12	21059	25049	21593	27462	23162	30215	25141	35728
	44	7.2	1.12	20249	23091	20796	25482	22337	28114	24354	33612
	46	7.2	1.09	19452	21134	19988	23445	21555	26093	23578	31489
ATDF-1200	42	9.3	1.69	26024	31909	26792	35159	28722	38639	31328	46001
	44	9.3	1.69	24967	29382	25687	32452	27669	35998	30263	43189
	46	9.3	1.67	23919	26837	24669	29916	26628	33342	29238	40436
ATDF-1400	42	10.9	1.99	30429	37625	31379	41553	33664	45724	36699	54346
	44	10.9	1.97	29160	34607	30062	38339	32396	42559	35467	51105
	46	10.9	1.96	27917	31593	28795	35194	31126	39333	34232	47805
ATDF-1600	42	11.3	1.59	33114	39134	33997	43027	36440	47271	39576	55972
	44	11.3	1.58	31825	36008	32720	39847	35175	44040	38319	52581
	46	11.3	1.57	30639	33093	31448	36632	33942	40841	37096	49225
ATDF-1800	42	13.3	1.99	38008	45867	39057	50431	41898	55486	45604	65885
	44	13.3	1.98	36453	42125	37563	46742	40418	51746	44108	61894
	46	13.3	1.97	35046	38688	36043	42929	38918	47892	42639	57912
ATDF-2000	42	15.2	1.88	42839	52446	44118	57823	47353	63687	51609	75716
	44	15.2	1.86	41087	48254	42353	53497	45631	59366	49888	71165
	46	15.2	1.85	39365	44065	40607	49144	43848	54814	48186	66588

NOTES:

- E.W.T = Entering Water Temperature.
- W.P.D = Water Pressure Drop.
- Capacities are based on 4rows coil Configuration.

Capacity Ratings (Hot Water)

Table 5

Model	E.W.T (°F)	Water Flow Rate (GPM)	W.P.D (ft.WG)	Entering Air Temperature (°F)							
				55 DB		60 DB		65 DB		70 DB	
				Total Cooling (Btu/hr)	Leaving Air Temp. DB (°F)	Total Cooling (Btu/hr)	Leaving Air Temp. DB (°F)	Total Cooling (Btu/hr)	Leaving Air Temp. DB (°F)	Total Cooling (Btu/hr)	Leaving Air Temp. DB (°F)
ATDF-800	140	7.7	0.95	50192	114.9	47189	116.7	44194	118.6	41204	120.2
	160	7.7	0.92	61698	129.7	58696	131.6	55701	133.4	55458	138.7
	180	7.7	0.89	73004	144.6	70005	146.5	67013	148.4	67258	154.5
ATDF-1000	140	9.5	1.49	62663	126.4	58915	127.3	55175	118.5	51441	120.2
	160	9.5	1.45	76966	129.5	73220	144.2	69483	133.2	65753	140
	180	9.5	1.45	91006	144.3	87267	146.3	83537	148.7	79814	149.9
ATDF-1200	140	11.5	1.93	75959	115.5	71411	117.3	66873	118.9	62344	120.7
	160	11.5	1.86	93199	130.2	88658	132.2	84129	133.9	79608	135.6
	180	11.5	1.79	110101	145.1	105573	146.9	101055	148.8	96547	150.6
ATDF-1400	140	13.5	2.37	88259	115.2	82975	117.1	77703	118.8	72440	120.5
	160	13.5	2.29	108245	129.9	102972	131.7	97712	133.6	92462	135.3
	180	13.5	2.23	127831	144.6	122575	146.5	117331	148.4	112096	150.2
ATDF-1600	140	14.9	1.64	983367	113.7	92461	127.4	86597	117.4	80742	119.2
	160	14.9	1.58	120811	128	114940	129.9	109081	131.9	103232	133.7
	180	14.9	1.54	142883	142.5	137023	144.6	131175	146.5	125337	148.3
ATDF-1800	140	16.9	1.91	111564	114.2	104893	116.1	98236	117.9	91591	119.6
	160	16.9	1.84	136958	128.6	130298	130.6	123651	132.4	117016	134.2
	180	16.9	1.79	161877	143.2	155232	145.2	148602	147	141983	148.9
ATDF-2000	140	18.8	2.3	1247089	114.6	117248	116.4	109804	118.2	102372	119.9
	160	18.8	2.14	153007	129	145562	130.9	138132	132.8	130716	134.6
	180	18.8	2.07	180756	143.6	173332	145.6	165924	147.5	158529	149.3

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NOTES:

- E.W.T = Entering Water Temperature.
- W.P.D = Water Pressure Drop.
- Capacities are based on 4rows coil Configuration and water side temperature difference of 20°F.

Engineering Data

Table 6

Model	Nominal CFM	Coil Face Area (ft ²)	Water Flow Rate (GPM)	Water Pressure Drop (ft.WG)	Motor Electrical Specifications					Weight (Kg)	
					No.	Max. Ampere	Max. RPM	Power (W)	Capacitor (μF)	Net	Oper.
ATDF-800	800	1.99	5.5	0.86	1	1.2	1150	240	8	57	71
ATDF-1000	1000	2.33	7.2	1.12	1	2.1	820	450	8	60	76
ATDF-1200	1200	2.75	9.3	1.69	1	2.25	820	460	8	66	81
ATDF-1400	1400	3.03	10.9	1.99	2	2.4	1050	480	18	72	90
ATDF-1600	1600	3.40	11.3	1.59	2	2.6	1120	520	18	84	94
ATDF-1800	1800	3.80	13.3	1.99	2	2.85	1140	680	18	96	107
ATDF-2000	2000	4.20	15.2	1.88	2	4.5	820	900	18	109	115

Internal Pressure Drop for Nominal CFM (Cooling)

Table 7

Model	ATDF-800	ATDF-1000	ATDF-1200	ATDF-1400	ATDF-1600	ATDF-1800	ATDF-2000
Internal P.D. (In.WG)	0.38	0.39	0.39	0.39	0.46	0.46	0.47

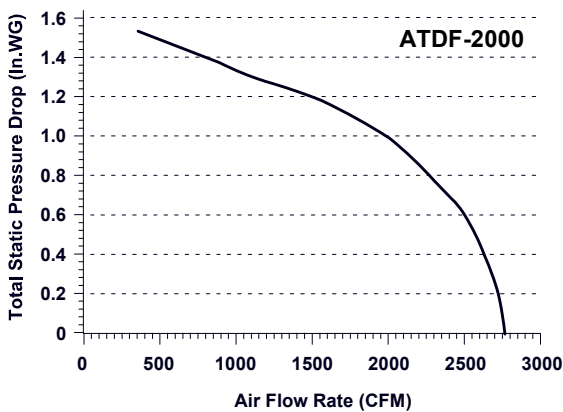
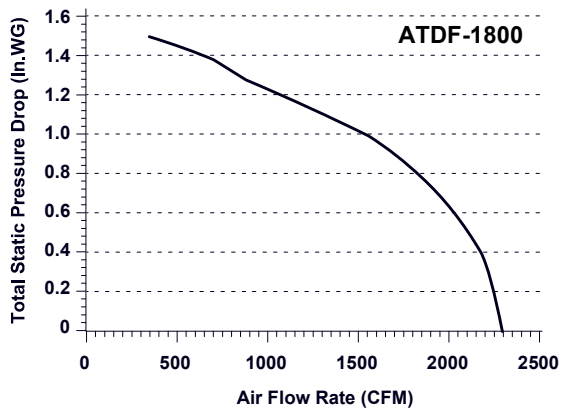
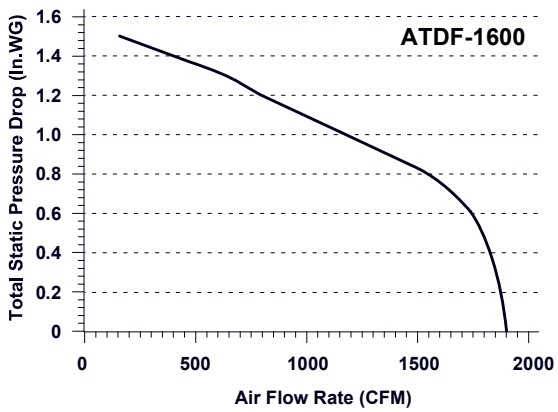
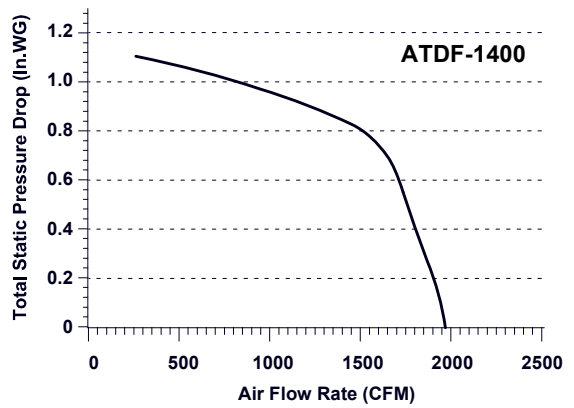
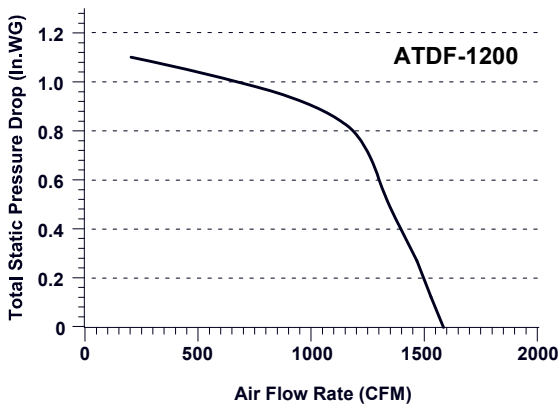
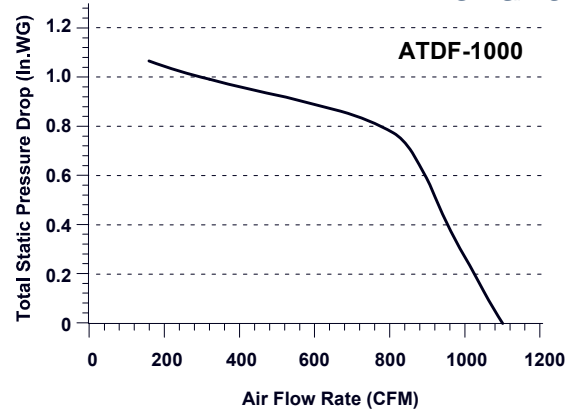
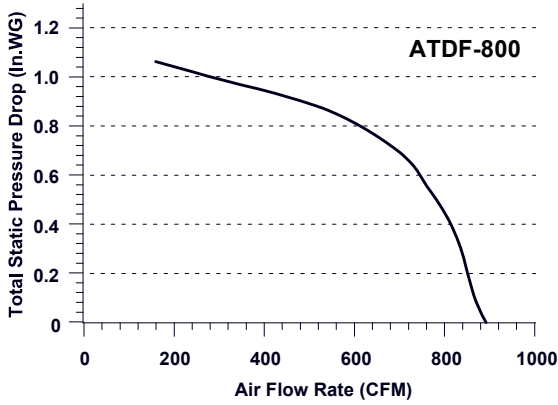
Internal Pressure Drop for Nominal CFM (Heating)

Table 8

Model	ATDF-800	ATDF-1000	ATDF-1200	ATDF-1400	ATDF-1600	ATDF-1800	ATDF-2000
Internal P.D. (In.WG)	0.25	0.26	0.26	0.27	0.33	0.33	0.34

Fan Performance Curves

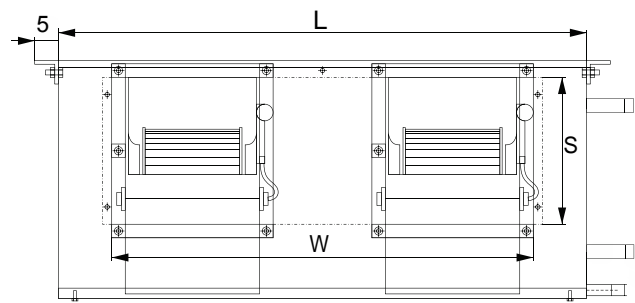
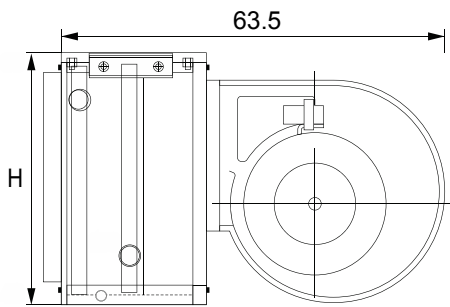
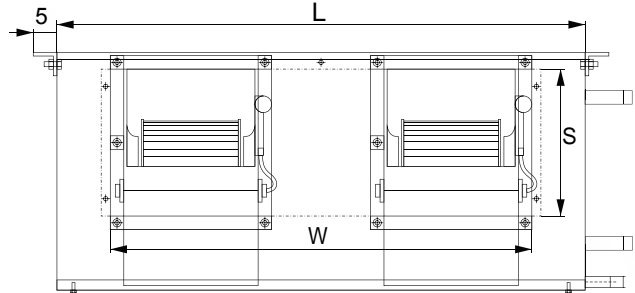
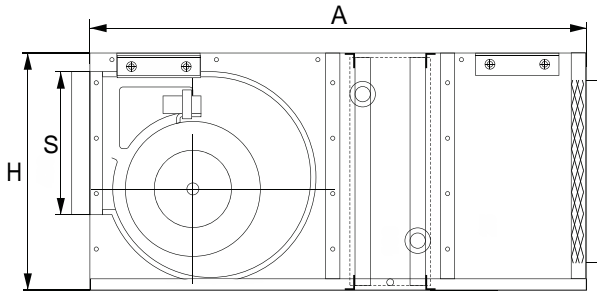
Chart 1



8

Dimensions

Horizontal Ceiling Mounted , Exposed



9

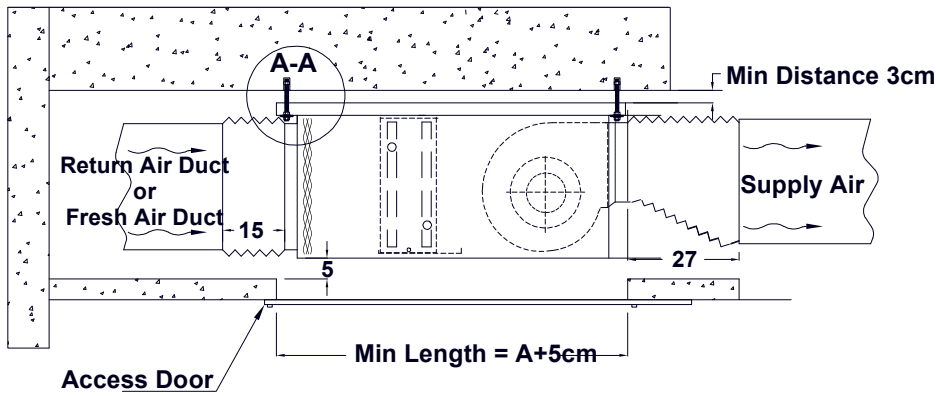
Model	A (cm)	H (cm)	L (cm)	W (cm)	S (cm)	MPT (Inch)	Drain Size (inch)
ATDF-800	90	45	65	28.5	27	1	3/8
ATDF-1000	90	45	75	34.5	27	1	3/8
ATDF-1200	90	45	85	75	27	1	3/8
ATDF-1400	90	45	95	75	27	1	3/8
ATDF-1600	90	45	105	80.5	27	1	3/8
ATDF-1800	90	45	120	87	27	1	3/8
ATDF-2000	90	45	135	96	27	1	3/8

NOTES:

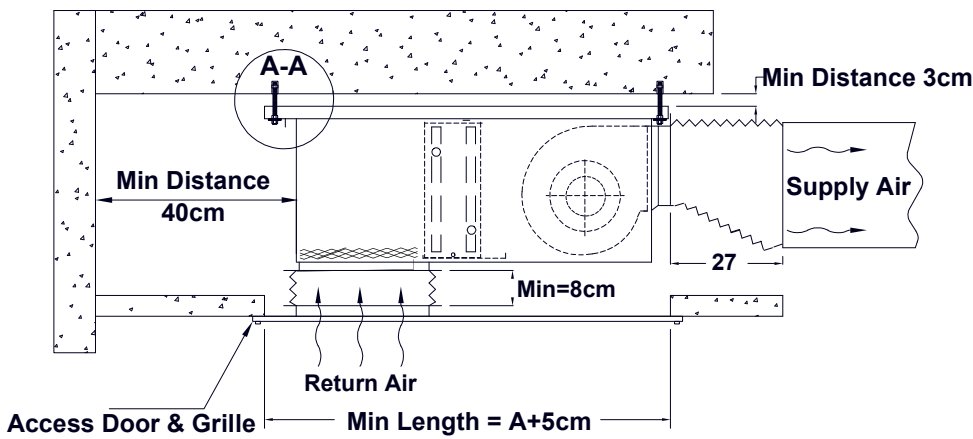
All dimensions are in cm.

SUGGESTED INSTALLATION DETAILS

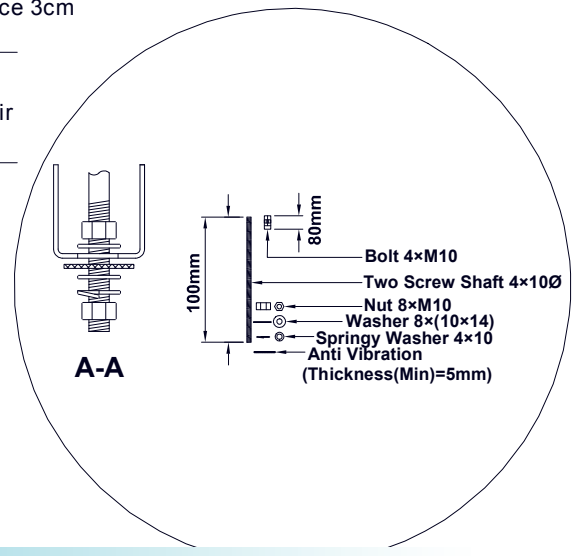
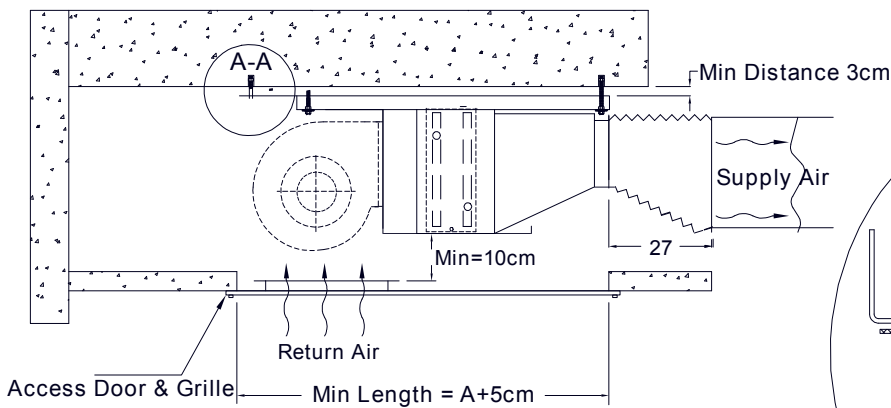
HORIZONTAL CEILING MOUNTED, EXPOSED, BACK INTAKE



HORIZONTAL CEILING MOUNTED, EXPOSED, BOTTOM INTAKE

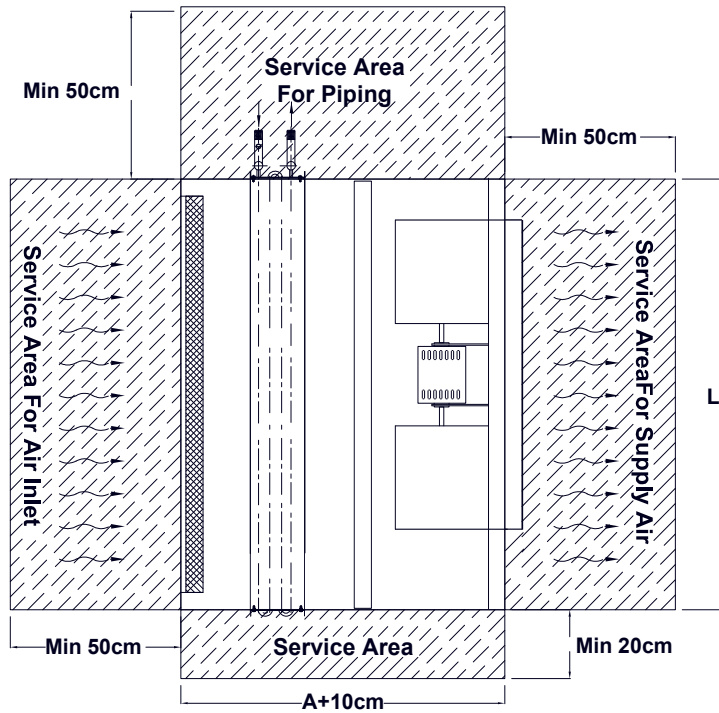


HORIZONTAL CEILING MOUNTED, CONCEALED



SERVICE AREA

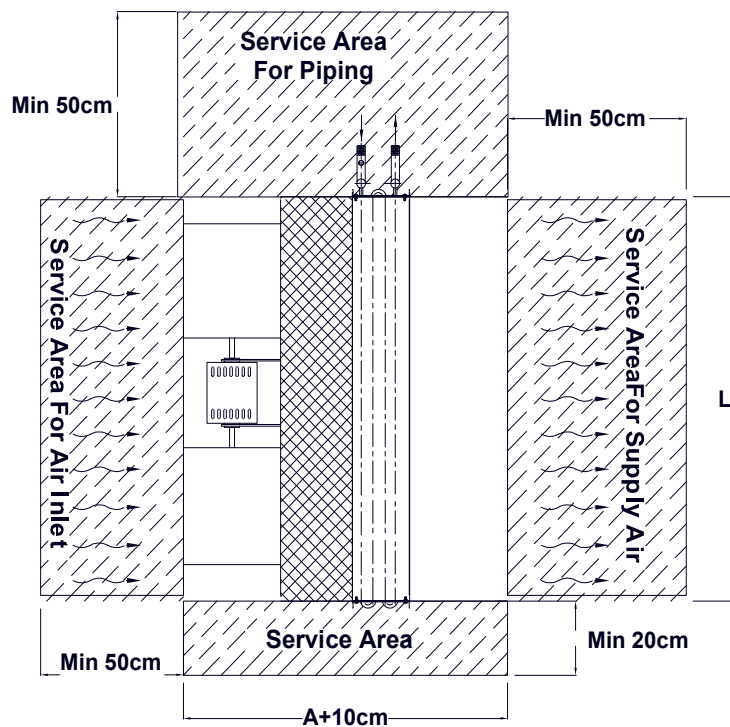
HORIZONTAL CEILING MOUNTED, EXPOSED, BACK INTAKE , BOTTOM INTAKE



11

SERVICE AREA (CONT.)

HORIZONTAL CEILING MOUNTED, CONCEALED



NOTE:

Please refer to "Dimensions" section for knowing "A" and "L"

Enthalpy / Altitude

Table 9

Air Wet Bulb Temperature (°F)	Attitude (Ft)					
	0	1000	2000	3000	4000	5000
	Enthalpy (BTU/Lb)					
35	13.0	13.2	13.3	13.5	13.7	13.9
36	13.4	13.5	13.8	14.0	14.2	14.5
37	13.9	14.0	14.3	14.4	14.7	14.8
38	14.2	14.5	14.7	15.0	15.1	15.3
39	14.8	15.0	15.2	15.4	15.6	15.9
40	15.2	15.4	15.7	15.9	16.2	16.4
41	15.7	15.9	16.1	16.4	16.6	16.8
42	16.2	16.4	16.6	16.9	17.2	17.4
43	16.6	16.9	17.1	17.4	17.6	18.0
44	17.2	17.4	17.6	17.9	18.2	18.5
45	17.7	17.9	18.2	18.4	18.7	19.0
46	18.2	18.4	18.7	19.0	19.3	19.6
47	18.7	18.9	19.3	19.5	19.8	20.2
48	19.2	19.5	19.8	20.0	20.4	20.8
49	19.7	20.0	20.4	20.6	21.0	21.3
50	20.3	20.6	20.9	21.2	21.6	22.3
51	20.9	21.2	21.5	21.8	22.2	22.6
52	21.4	21.7	22.1	22.5	22.8	23.2
53	22.0	22.4	22.7	23.1	23.5	24.0
54	22.6	23.0	23.4	23.8	24.1	24.6
55	23.2	23.6	24.0	24.4	24.8	25.3
56	23.8	24.2	24.6	25.0	25.5	25.9
57	24.4	24.8	25.3	25.8	26.2	26.7
58	25.2	25.5	25.9	26.4	26.9	27.4
59	25.8	26.2	26.7	27.2	27.6	28.2
60	26.5	26.9	27.4	27.8	28.4	28.9
61	27.2	27.6	28.1	28.6	29.2	29.7
62	27.9	28.3	28.9	29.4	29.9	30.5
63	28.5	29.0	29.6	30.2	30.7	31.4
64	29.3	29.8	30.3	31.0	31.6	32.2
65	30.1	30.6	31.2	31.7	32.3	33.0
66	30.8	31.4	32.0	32.6	33.3	33.9
67	31.6	32.2	32.8	33.5	34.1	34.8
68	32.4	33.0	33.7	34.3	35.0	35.8
69	33.2	33.9	34.5	35.3	35.9	36.7
70	34.0	34.7	35.4	36.1	36.9	37.6
71	34.9	35.6	36.3	37.0	37.9	38.6
72	35.8	36.5	37.3	38.0	38.8	39.7
73	36.7	37.5	38.2	39.0	39.9	40.7
74	37.6	38.4	39.2	40.0	40.9	41.8
75	38.6	39.4	40.2	41.0	42.0	42.9
76	39.6	40.3	41.2	42.1	43.0	44.0
77	40.6	41.4	42.3	43.2	42.2	45.2
78	41.5	42.5	43.4	44.3	45.3	46.4
79	42.6	43.5	44.5	45.5	46.5	47.5
80	43.7	44.6	45.6	46.6	47.6	48.8
81	44.8	45.8	46.7	47.8	48.8	50.0
82	45.9	46.9	48.0	49.0	50.3	51.4
83	47.0	48.1	49.2	50.3	51.5	52.8
84	48.2	49.3	50.4	51.6	52.9	54.2
85	49.4	50.3	51.7	53.0	54.2	55.6