



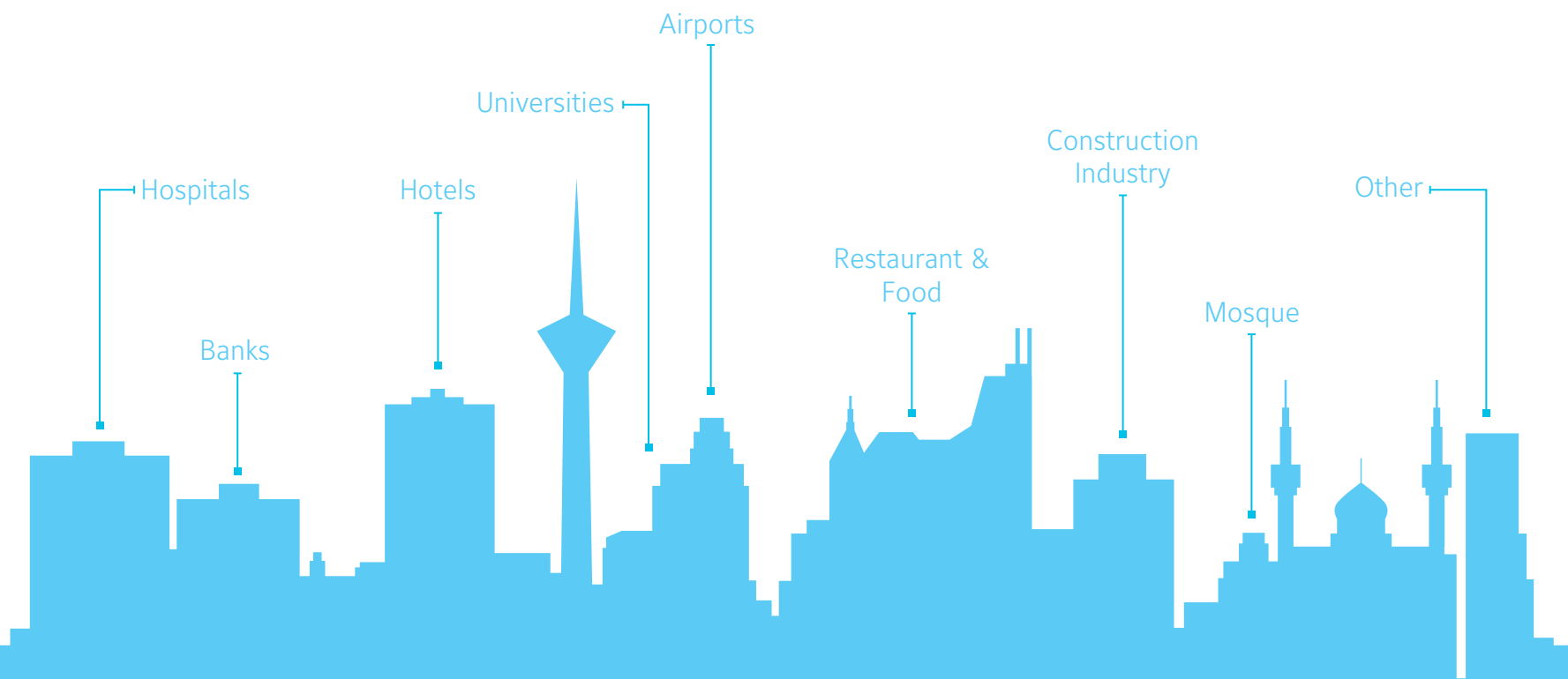
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DUCTED
FAN COIL UNIT

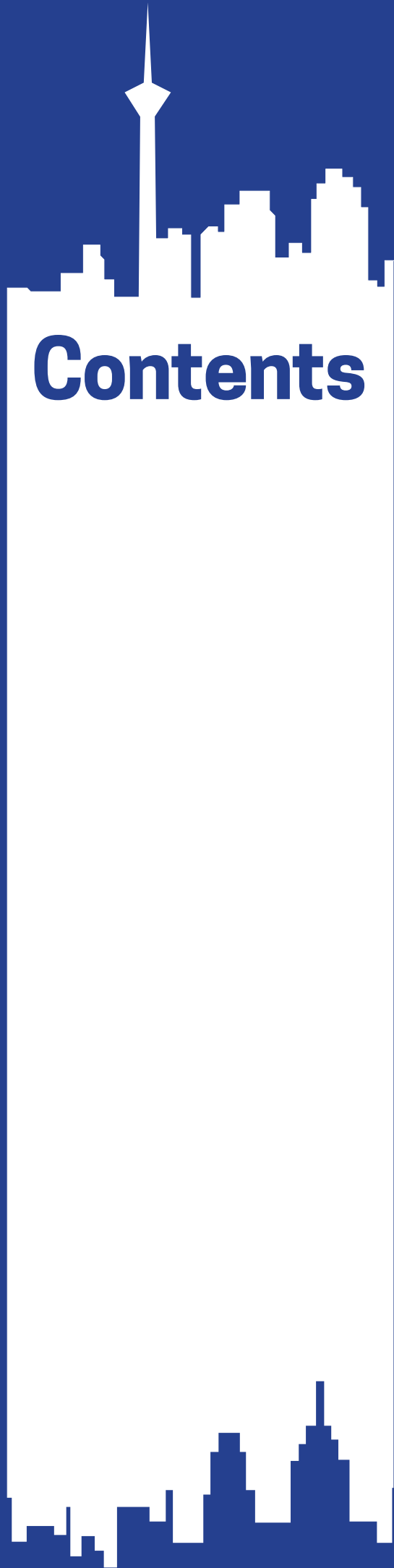
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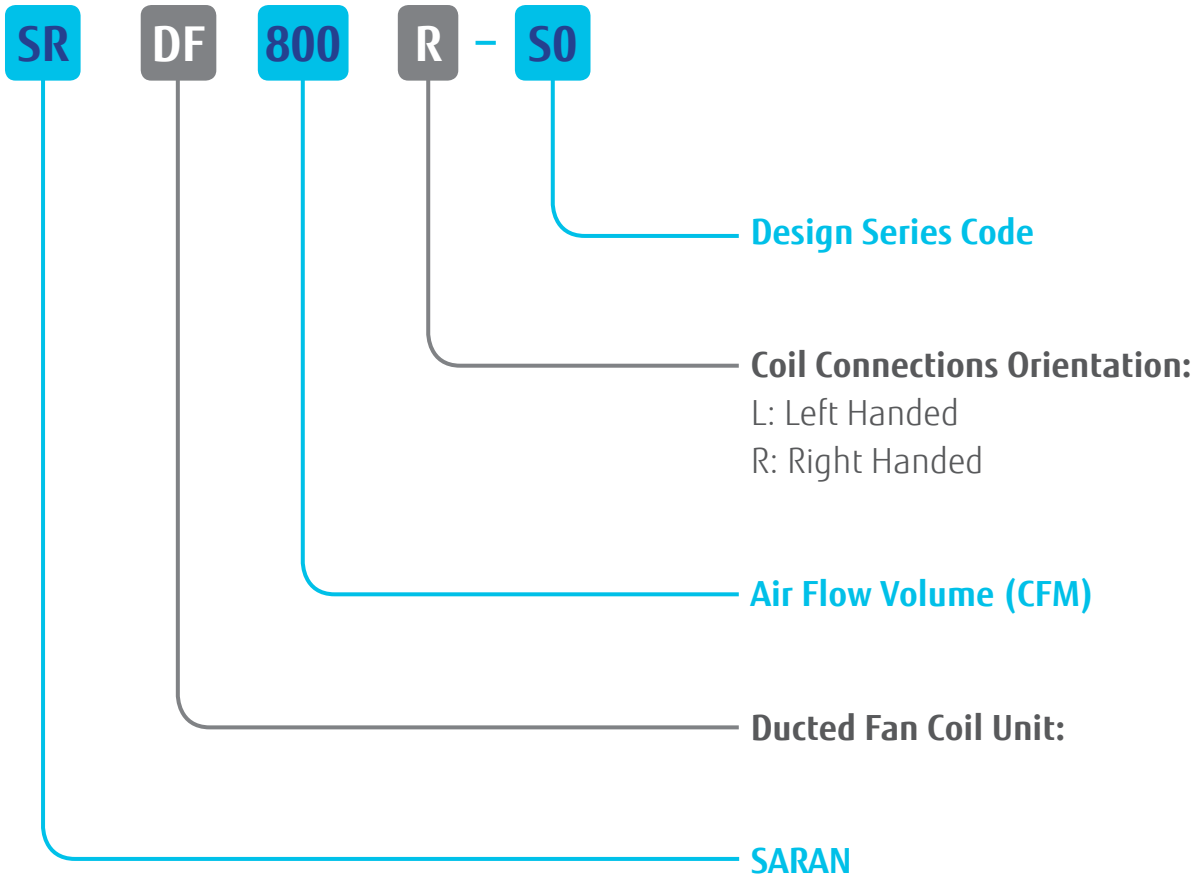


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NOMENCLATURE





Introduction

Saran ducted fan coil units are designed for applications where higher air volumes and static pressures than a traditional fan coil are required. High air volumes and static pressures capabilities of that units, allows them to be used for a variety of multi room applications such as apartments, office buildings, hotels, hospitals, etc. Additionally, high static pressure capability, allowing that units can accommodate longer discharge duct runs with multiple air outlets. This allows the ducted fan coil to be mounted farther from the occupied space and reducing acoustic concerns. Saran ducted fan coil units are available in seven sizes with airflow capacity ranging from 800 to 2000 CFM.

Main Features:

- Heavy gauge galvanized casing
- High efficiency forward curved fan for quiet operation
- Low power consumption
- High efficiency coil with wavy corrugated fins
- Insulated heavy gauge drain pan
- Quick electrical connections

Component Features

Cabinet:

All units are constructed from heavy gauge galvanized steel sheet, which are insulation to minimize heat loss and noises produced by the unit. The highly compact, super lightweight design of this units makes it ideal for inside ceiling installations where height is limited.

Extremely Quiet Operation:

Direct-drive centrifugal fans, are statically and dynamically balanced with large flow-path and low-noise.

High Performance Coils:

Cooling and Heating coils are manufactured from seamless 5/8" OD copper tubes mechanically bonded to high efficiency wavy corrugated aluminum fins.

Drain Pan:

Drain pans of all units insulated for a maximum protection against sweating and corrosion.

Filter:

All units are equipped with anti-bacterial and washable synthetic media filter as standard. Washable filter is provided with easy access through return grill.



Technical Data

Table 1

Model	SRDF-800	SRDF-1000	SRDF-1200	SRDF-1400	SRDF-1600	SRDF-1800	SRDF-2000	
Nominal Air Flow Rate (CFM)	800	1000	1200	1400	1600	1800	2000	
Total Heating Capacity (Btu/hr)	67257	79813	96546	112095	125336	141982	158528	
Total Cooling Capacity (Btu/hr)	21544	28112	35997	42557	44038	51746	59366	
Coil Data	Face Area (Sqft)	1.98	2.32	2.74	3.02	3.39	4.20	
	Fins Per Inch	8						
	No. of Rows	4						
No. of Motors	1							
Nominal Power (W)	215	300	300	430	790	850	900	
Rated Current (Amp)	1	1.4	1.4	2	3.7	4	4.2	
Drain Pipe	1/2"							
Noise (dBA)	56	62	63	63	63	63	62	
Weight (kg)	Net	74	77	88	88	111	115	122
	Operating	84	89	101	103	128	134	142

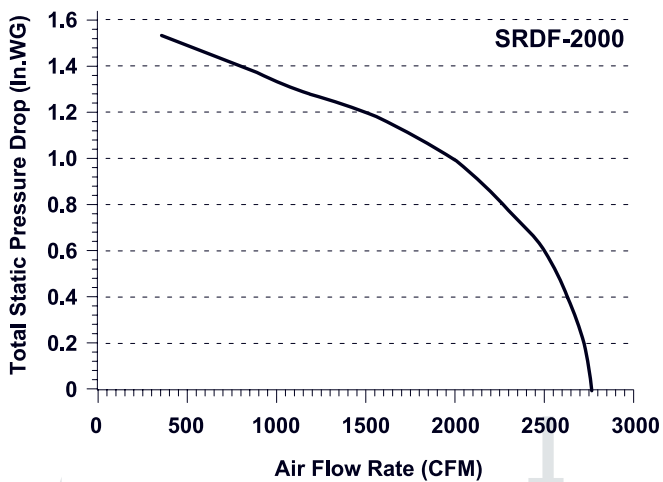
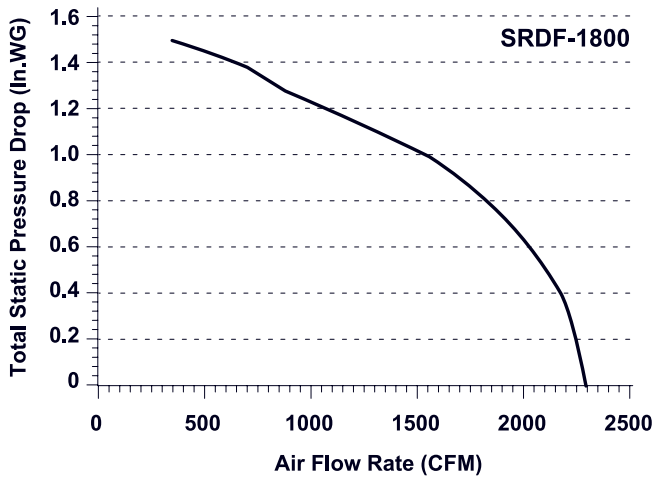
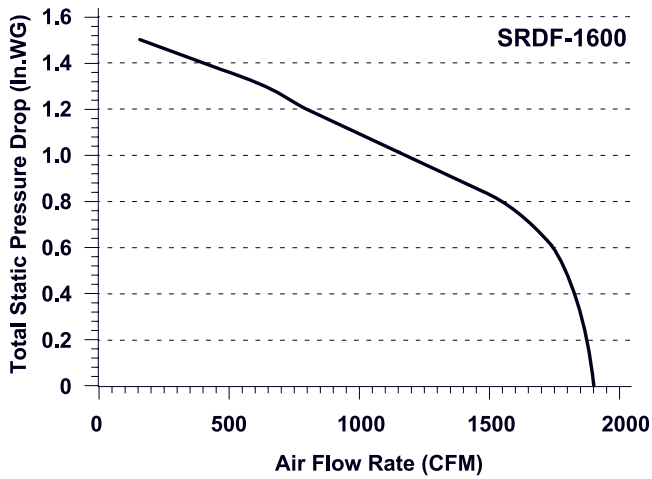
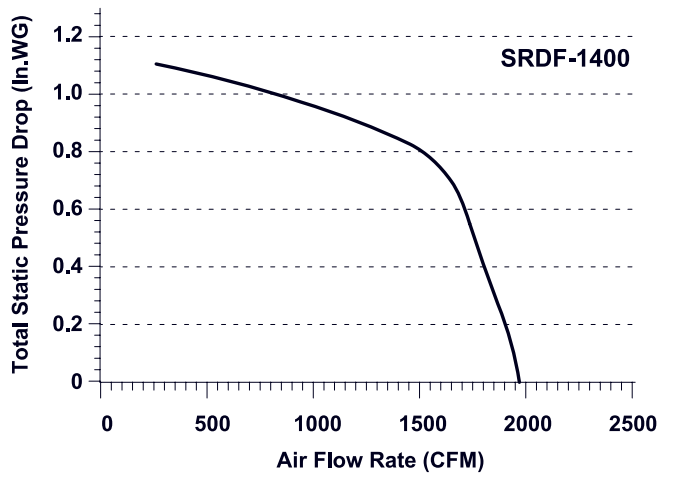
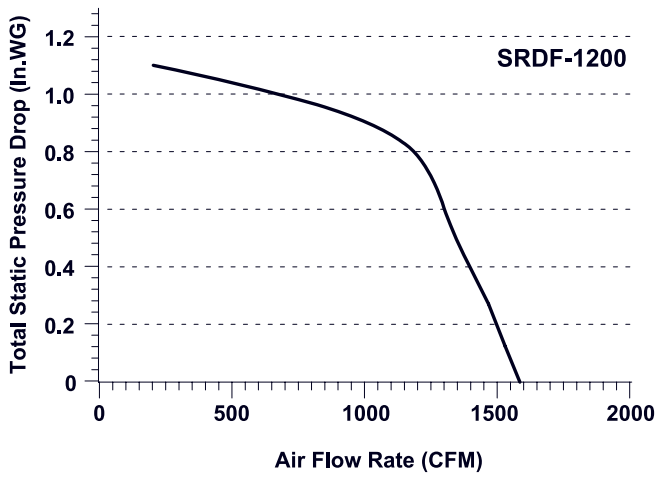
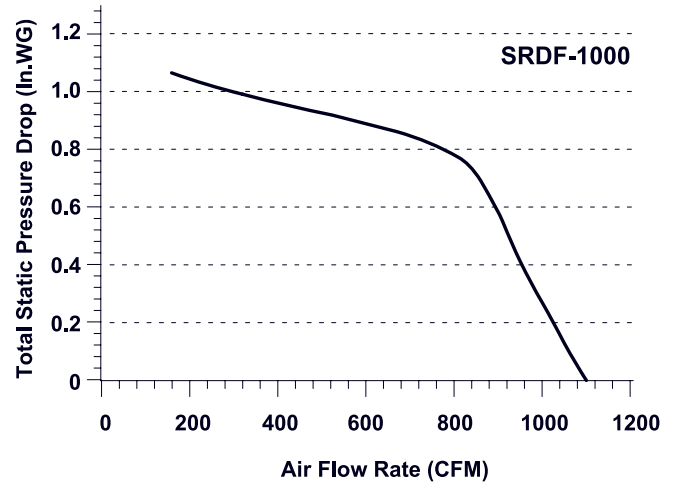
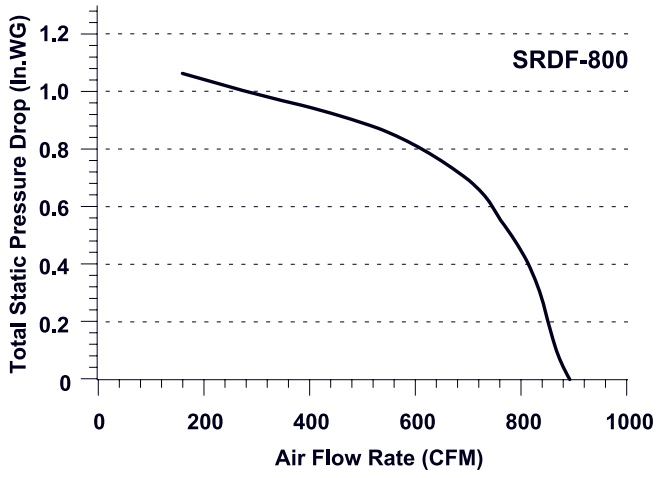
NOTE

- Cooling capacities are based on entering chilled water temperature 44°F and entering air temperature of 80°F DB / 67°F WB at sea level and nominal flow rate.
- Heating capacities are based on entering hot water temperature 180°F and entering air temperature of 70°F DB at sea level and nominal flow rate.

Table 2: Internal Pressure Drop (In.WG)

Model	SRDF-800	SRDF-1000	SRDF-1200	SRDF-1400	SRDF-1600	SRDF-1800	SRDF-2000
Cooling Mode	0.37	0.38	0.38	0.39	0.45	0.45	0.46
Heating Mode	0.24	0.25	0.25	0.26	0.32	0.32	0.33

Fan Performance Curves



Selection Considerations

Following factors should be considered for selecting of Saran ducted fan coil units:

- Available space for the unit including floor to ceiling height
- Type of application (Standard / District cooling)
- Presence of high sensible or peripheral loads in space
- Functionality of intended space usage
- Availability of access for pipes, drains and power
- Compatibility with intended space finish
- Fresh air and ventilation requirements
- Noise level desired at peak or part load operations
- Control system desired especially if winter heating is required
- Economy of layout
- Pressure drop of duct system (ESP)

Saran ducted fan coil units rating data presented in the “Performance Data” tables indicate capacity of the fan coil units at a standard coil face velocity on sea level altitude; So for other condition, following performance adjustment factors shall be attend in unit selection:

Table 3: Altitude Correction Factors

Altitude (ft)	0	1000	2000	3000	4000	5000	6000
Total Cooling Capacity	1.00	0.99	0.98	0.97	0.96	0.94	0.93
Sensible Cooling Capacity	1.00	0.96	0.93	0.90	0.86	0.83	0.80
Total Heating Capacity	1.00	0.97	0.94	0.90	0.87	0.83	0.81

Table 4: Coil Face Velocity Correction Factors

Model	Correction Mode	Coil Face Velocity (FPM)					
		350	400	450	500	550	600
SRDF-800	Total	0.95	1.00	1.04	1.07	1.11	1.13
	Sensible	0.95	1.00	1.07	1.14	1.21	1.28
SRDF-1000	Total	0.93	0.98	1.01	1.05	1.09	1.11
	Sensible	0.89	0.96	1.03	1.10	1.16	1.21
SRDF-1200	Total	0.92	0.97	1.01	1.05	1.08	1.11
	Sensible	0.88	0.95	1.02	1.09	1.15	1.21
SRDF-1400	Total	0.89	0.94	0.99	1.03	1.07	1.10
	Sensible	0.89	0.92	0.94	1.05	1.12	1.18
SRDF-1600	Total	0.89	0.94	0.98	1.02	1.06	1.08
	Sensible	0.84	0.91	0.98	1.04	1.10	1.16
SRDF-1800	Total	0.89	0.94	0.98	1.02	1.05	1.08
	Sensible	0.84	0.91	0.97	1.04	1.10	1.16
SRDF-2000	Total	0.83	0.91	0.98	1.02	1.05	1.08
	Sensible	0.83	0.91	0.97	1.03	1.10	1.15

NOTE

- To determine actual heating capacity, please use sensible mode correction factor.

Selection Example

Given:

Required Air Flow Rate: 800 CFM

External Static Pressure Drop: 0.15 IN.WG

Ambient Altitude: 4000 ft

Summer Conditions

Total Cooling Load: 20000 Btu/hr

Sensible Cooling Load: 14900 Btu/hr

Entering Air Temperature: 80°F DB / 67°F WB

Entering Water Temperature: 44°F

Winter Conditions

Total Heating Load: 50000 Btu/hr

Entering Air Temperature: 60°F DB

Entering Water Temperature: 160°F

Step1: Appropriate Fan Coil Unit Selection

Because of we need 800 CFM air flow rate, in first step we select SRDF-800. By referring to performance table, we can see total and sensible cooling capacity of this unit in given summer conditions are 21544 Btu/hr and 17612 Btu/hr, respectively. In addition, heating capacity of this unit in given winter conditions are 58696 Btu/hr.

Step2: Performance Adjustment Factors Consideration

Because of fan coil units performance tables are based on standard coil face velocity, we need to calculate air flow rate of units base on calculated TSP in our conditions and then calculate the coil face velocity and corresponding performance adjustment factors. In addition, we shall be considered altitude performance adjustment factor to determine actual total and sensible cooling and heating capacity of selected unit.

Coil Face Velocity in Cooling Mode

Total Static Pressure Drop= Internal Static Pressure Drop (Table2) + External Static Pressure Drop = 0.37 + 0.15 = 0.52 IN.WG

By referring to "fan performance curves", we can see air flow rate of SRDF-800 in 0.52 IN.WG is 770 CFM.

$$\text{Coil Face Velocity (Cooling Mode)} = \frac{\text{Air Flow Rate (CFM)}}{\text{Coil Face Area (ft}^2\text{)}(\text{Table-3})} = \frac{770 \text{ CFM}}{1.98 \text{ ft}^2} = 389 \text{ FPM}$$

Coil Face Velocity in Heating Mode

Total Static Pressure Drop= Internal Static Pressure Drop (Table2) + External Static Pressure Drop = 0.24 + 0.15 = 0.39 IN.WG

By referring to "fan performance curves", we can see air flow rate of SRDF-800 in 0.39 IN.WG is 815 CFM.

$$\text{Coil Face Velocity (Heating Mode)} = \frac{\text{Air Flow Rate (CFM)}}{\text{Coil Face Area (ft}^2\text{)}(\text{Table-3})} = \frac{815 \text{ CFM}}{1.98 \text{ ft}^2} = 412 \text{ FPM}$$

By referring to table4, Total and Sensible Load Adjustment Factor are 0.99 in 389 FPM coil face velocity and Heating Load Adjustment Factor is 1.02 in 412 FPM coil face velocity. In addition, by referring to table3, Altitude Adjustment Factor for total cooling, sensible cooling and heating capacity are 0.96, 0.86 and 0.87, respectively. So we have:

- Actual Total Cooling Capacity = 21544 × 0.99 × 0.96 = 20475 Btu/hr
- Actual Sensible Cooling Capacity = 17612 × 0.99 × 0.86 = 14995 Btu/h
- Actual Heating Capacity = 58696 × 1.02 × 0.87 = 52087 Btu/hr

Step3: Determine Leaving Air Temperature:

To determine leaving air wet bulb temperature in cooling mode, we shall be determine leaving air enthalpy by using following formula in first step and then by referring to table9 can find its corresponding wet bulb temperature.

$$\text{Leaving air enthalpy (Btu/lb)} = \text{Entering air enthalpy (Btu/lb)} - \frac{\text{Actual Total Cooling Capacity (Btu/hr)}}{4.5 \times \text{Air Flow Rate (CFM)}}$$

Base on above procedure by referring to table9, we can see corresponding enthalpy of entering air temperature (67°F WB) in 4000 feet altitude is 34.1 Btu/lb, so we have:

$$\text{Leaving air enthalpy} = 34.1 - \frac{20475}{4.5 \times 770} = 28.2 \text{ Btu/lb}$$

Finally, by referring to table9, we can see corresponding air temperature of determined enthalpy (28.2 Btu/lb) in 4000 feet altitude is 59.8°F, so leaving air wet bulb temperature in this problem will be 59.8°F.

In addition, to determine leaving air dry bulb temperature in cooling mode, we can use following formula:

$$\text{Leaving DB Temp. (°F)} = \text{Entering DB Temp. (°F)} - \frac{\text{Sensible Cooling Capacity (Btu/hr)}}{1.085 \times \text{Actual Air Flow Rate (CFM)}} = 80 - \frac{14995}{1.085 \times 770} = 62 \text{ °F}$$

Performance Data

Table 5: Chilled Water Ratings

Model	Entering Water Temperature (°F)	Water Flow Rate (GPM)	Water Pressure Drop (FT.W.G.)	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)
SRDF-800	42	5.4	0.85	16590	19174	17002	21041	18185	23019	19699	27158
	44	5.4	0.84	15990	17714	16386	19498	17612	21544	19128	25603
	46	5.4	0.84	15413	16287	15798	18005	17026	20017	18546	23993
SRDF-1000	42	7.1	1.11	21058	25048	21593	27461	23161	30213	25140	35727
	44	7.1	1.11	20248	23090	20796	25481	22336	28112	24353	33611
	46	7.1	1.09	19450	21132	19988	23444	21555	26091	23577	31488
SRDF-1200	42	9.2	1.69	26022	31907	26792	35159	28720	38638	31327	46000
	44	9.2	1.68	24965	29380	25687	32451	27668	35997	30262	43188
	46	9.2	1.66	23917	26835	24669	29915	26626	33340	29237	40435
SRDF-1400	42	10.9	1.98	30427	37623	31379	41552	33662	45722	36699	54345
	44	10.9	1.96	29159	34605	30062	38339	32394	42557	35466	51104
	46	10.9	1.95	27915	31591	28795	35193	31124	39331	34231	47804
SRDF-1600	42	11.2	1.58	33112	39132	33997	43026	36439	47269	39575	55971
	44	11.2	1.57	31823	36007	32720	39846	35173	44038	38319	52580
	46	11.2	1.56	30637	33091	31448	36631	33940	40841	37095	49224
SRDF-1800	42	13.2	1.98	38006	45866	39057	50430	41896	55486	45603	65884
	44	13.2	1.97	36451	42123	37563	46741	40416	51746	44107	61893
	46	13.2	1.96	35044	38686	36043	42928	38917	47892	42639	57911
SRDF-2000	42	15.1	1.87	42839	52444	44118	57822	47351	63687	51609	75715
	44	15.1	1.85	41086	48252	42353	53496	45629	59366	49887	71164
	46	15.1	1.84	39363	44063	40607	49143	43846	54814	48185	66587

Table 6: Hot Water Ratings

Model	Entering Water Temperature (°F)	Water Flow Rate (GPM)	Water Pressure Drop (FT.W.G.)	Entering Air Temperature (°F)							
				55 DB		60 DB		65 DB		70 DB	
				Total Heating (Btu/hr)	Leaving Air Temp. DB (°F)	Total Heating (Btu/hr)	Leaving Air Temp. DB (°F)	Total Heating (Btu/hr)	Leaving Air Temp. DB (°F)	Total Heating (Btu/hr)	Leaving Air Temp. DB (°F)
SRDF-800	140	7.6	0.94	50191	114.9	47189	116.6	44193	118.5	41203	120.1
	160	7.6	0.91	61697	129.7	58696	131.5	55700	133.3	55457	138.6
	180	7.6	0.89	73003	144.6	70005	146.4	67012	148.3	67257	154.4
SRDF-1000	140	9.4	1.49	62662	126.4	58915	127.2	55174	118.4	51440	120.1
	160	9.4	1.44	76965	129.5	73220	144.1	69482	133.1	65752	140
	180	9.4	1.40	91005	144.3	87267	146.2	83536	148.6	79813	149.8
SRDF-1200	140	11.4	1.90	75958	115.5	71411	117.2	66872	118.9	62343	120.6
	160	11.4	1.84	93198	130.2	88658	132.1	84128	133.8	79607	135.5
	180	11.4	1.78	110100	145.1	105573	146.9	101055	148.7	96546	150.5
SRDF-1400	140	13.4	2.36	88259	115.2	82975	117	77702	118.7	72439	120.4
	160	13.4	2.28	108244	129.9	102972	131.7	97711	133.5	92461	135.2
	180	13.4	2.22	127830	144.6	122575	146.5	117330	148.3	112095	150.1
SRDF-1600	140	14.8	1.63	98336	113.7	92461	127.3	86596	117.3	80741	119.1
	160	14.8	1.57	120810	128	114940	129.9	109080	131.8	103231	133.6
	180	14.8	1.53	142882	142.5	137023	144.5	131174	146.4	125336	148.2
SRDF-1800	140	16.8	1.90	111563	114.2	104893	116	98235	117.8	91590	119.5
	160	16.8	1.83	136957	128.6	130298	130.5	123650	132.3	117015	134.1
	180	16.8	1.78	161876	143.2	155232	143.2	148601	147	141982	148.8
SRDF-2000	140	18.7	2.20	124708	114.6	117248	116.3	109803	118.1	102371	119.8
	160	18.7	2.13	153006	129	145562	130.9	138131	132.7	130715	134.5
	180	18.7	2.06	180755	143.6	173332	145.5	165923	147.4	158528	149.2

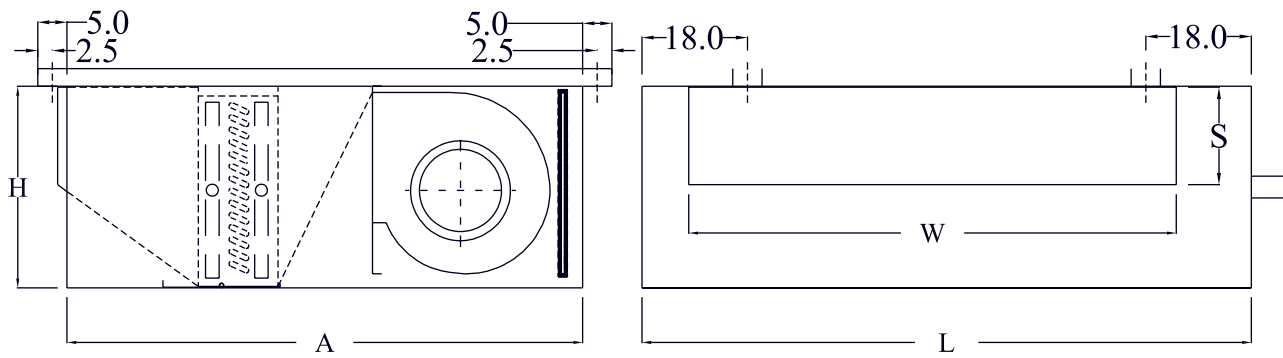
NOTE

- Capacities are based on standard coil face velocity and sea level altitude. For other condition, performance adjustment factors shall be attend in fan coil units selection (See Table 3&4).

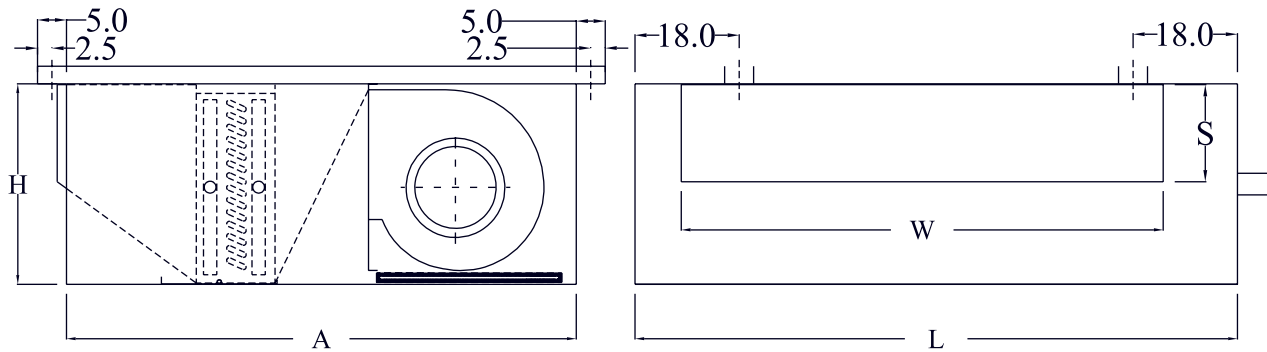


Dimensions

Horizontal Ceiling Mounted, Back Intake



Horizontal Ceiling Mounted, Bottom Intake



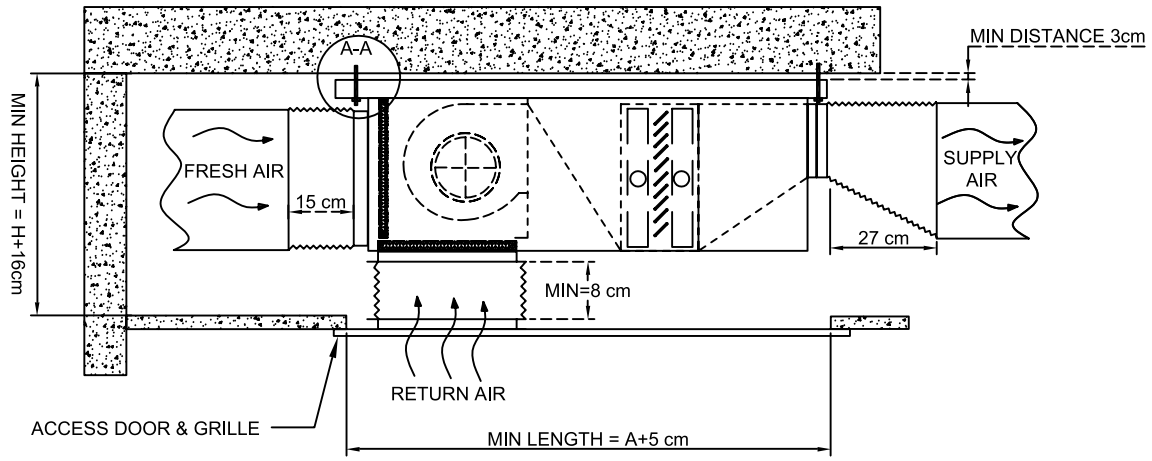
Model	A (cm)	H (cm)	L (cm)	W (cm)	S (cm)	MPT (Inch)	Drain Size (inch)
SRDF-800	95	30.5	100.5	70	18	1	1/2
SRDF-1000	95	30.5	100.5	82	18	1	1/2
SRDF-1200	95	30.5	115	97	18	1	1/2
SRDF-1400	95	30.5	125	107	18	1 1/4	1/2
SRDF-1600	110	43	115.5	84	26	1 1/4	1/2
SRDF-1800	110	43	115.5	94	26	1 1/4	1/2
SRDF-2000	110	43	125	104	26	1 1/4	1/2

NOTE

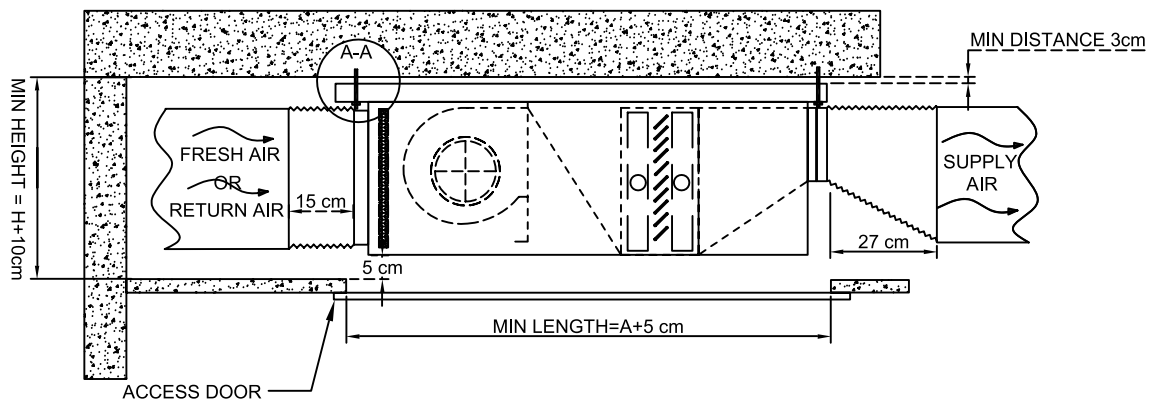
- All dimensions are in cm.

Installation Recommendation

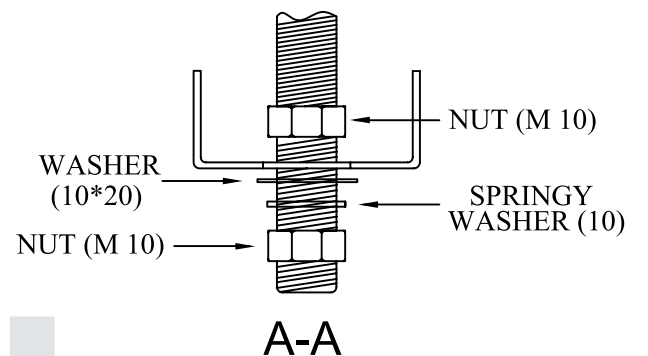
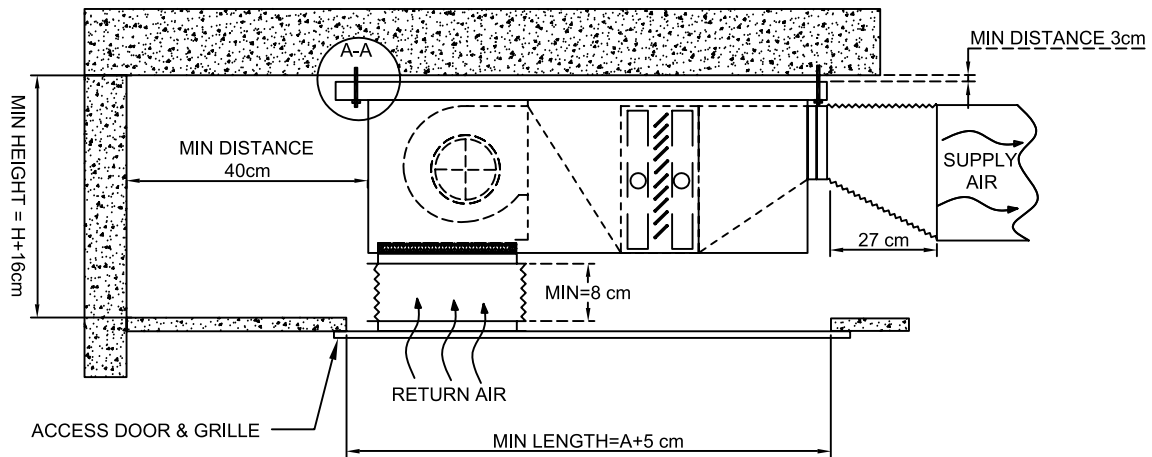
(SUGGESTED INSTALLATION DETAILED - MIXING INTAKE TYPE)



(SUGGESTED INSTALLATION DETAILED - BACK INTAKE TYPE)



(SUGGESTED INSTALLATION DETAILED - BOTTOM INTAKE TYPE)





Service Are Recommendation

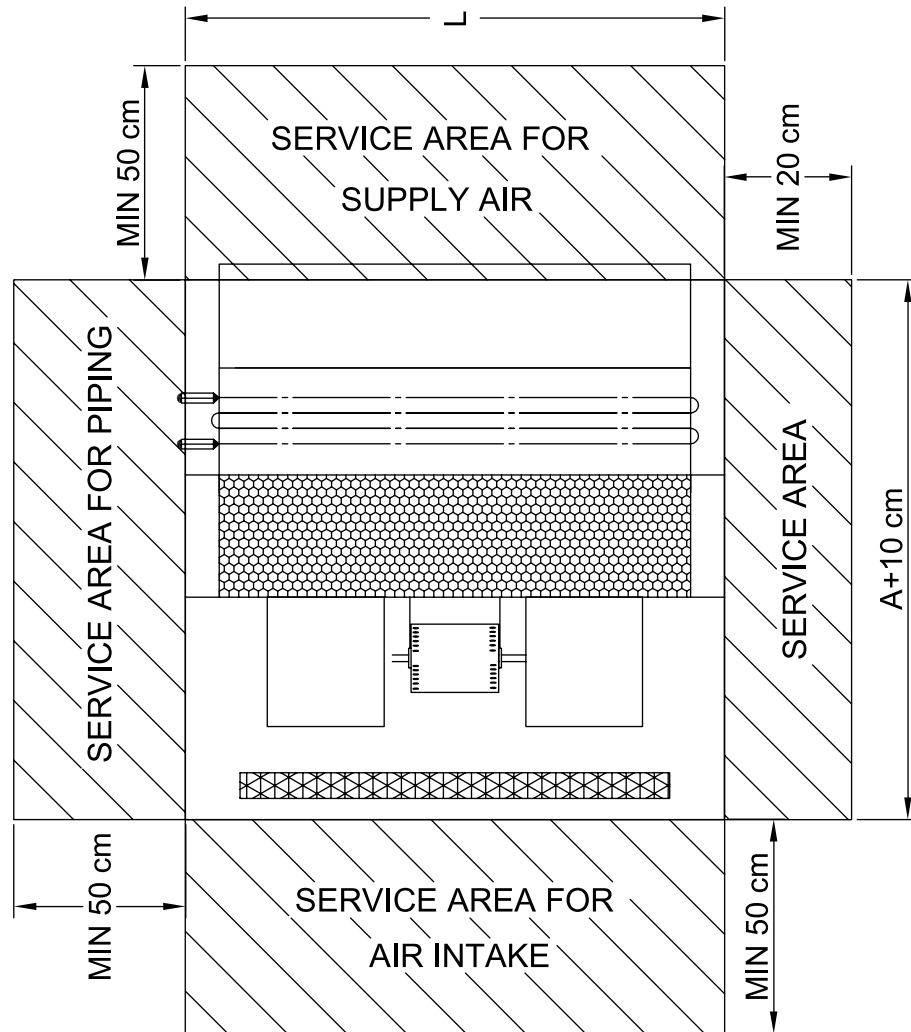


Table 8

Model	A	H
SRDFC-800	95	100.5
SRDFC-1000	95	100.5
SRDFC-1200	95	115
SRDFC-1400	95	125
SRDFC-1600	110	115.5
SRDFC-1800	110	115.5
SRDFC-2000	110	125

NOTE

- All dimensions are in cm.

Enthalpy Based on Altitude

Table 9: Enthalpy / Altitude

Air Wet Bulb Temperature (°F)	Attitude (Ft)					
	0	1000	2000	3000	4000	5000
	Enthalpy (BTU/Lb)					
35	13	13.2	13.3	13.5	13.7	13.9
36	13.4	13.5	13.8	14	14.2	14.5
37	13.9	14	14.3	14.4	14.7	14.8
38	14.2	14.5	14.7	15	15.1	15.3
39	14.8	15	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
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
46	18.2	18.4	18.7	19	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	20.4	20.8
49	19.7	20	20.4	20.6	21	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	22.4	22.7	23.1	23.5	24
54	22.6	23	23.4	23.8	24.1	24.6
55	23.2	23.6	24	24.4	24.8	25.3
56	23.8	24.2	24.6	25	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	29.6	30.2	30.7	31.4
64	29.3	29.8	30.3	31	31.6	32.2
65	30.1	30.6	31.2	31.7	32.3	33
66	30.8	31.4	32	32.6	33.3	33.9
67	31.6	32.2	32.8	33.5	34.1	34.8
68	32.4	33	33.7	34.3	35	35.8
69	33.2	33.9	34.5	35.3	35.9	36.7
70	34	34.7	35.4	36.1	36.9	37.6
71	34.9	35.6	36.3	37	37.9	38.6
72	35.8	36.5	37.3	38	38.8	39.7
73	36.7	37.5	38.2	39	39.9	40.7
74	37.6	38.4	39.2	40	40.9	41.8
75	38.6	39.4	40.2	41	42	42.9
76	39.6	40.3	41.2	42.1	43	44
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
82	45.9	46.9	48	49	50.3	51.4
83	47	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	54.2	55.6