

This catalogue consists of :

- A description of the various component parts available to be combined in the order best suited to your requirements.
- Technical data sheets, dimensions, specifications, quick selection table, etc ...

Research

The 39F line of Air Handling Units, together with numerous accessories, is the result of detailed research in the thermal, aerodynamic and acoustic fields, and allows Sarman Afarin to offer technically superior units at competitive prices.

Flexible Modular "Building Block" Construction

This adaptable unit design which is based upon a wide range of standard panel sizes, frequently enables Sarman Afarin to offer several configurations of unit height and width so that esthetic or practical dictates of confined plant room space or rooftop silhouettes can be easily met.

Major items of plant such as fans , coils , filters , etc, can be arranged in the sequence dictated by the job requirements , and separated by access sections where necessary giving complete flexibility of design. The units can be delivered in sections for indoor or outdoor installation, completely assembled , partially assembled or knocked-down for on site assembly.

Rigidity

The Sarman Afarin series 39F Air Handling Unit is fabricated from heavy gauge pre-galvanized sheet steel which is folded to form sturdy side, top and bottom panels and a rigid "Penta Post" supporting frame.

Panels and frame are secured using internally bolted fixings so that welding is minimized and the integrity of the galvanised finish is maintained. This bolted construction, and the use of standardised components facilitates the removal of panels for maximum access to fans, coils, filters, etc.

Wide Range of Sizes

26 models provide air quantities from 840-58170 cfm.

Flexibility in Panel Construction

Units are offered with double skin and perforated double skin panels in 25 mm thickness. (approximately 1 inch).

Vibration Isolation

Centrifugal fan/motor packages are mounted on common bases with rubber vibration isolators and flexible cuffs ensuring that all moving parts are independently isolated from the casing structure.

Aesthetics

The standard construction features galvanized panels finished in paint with natural galvanized frame.(see page 10).

Accessibility and Maintenance

The easily removable panels and quick release access doors offer complete accessibility to fans, coils, filters and dampers. Additional access sections can be provided between coils and filters if required. All component parts are standard and interchangeable filters are commercially available standard items conforming to international standards and sizes.

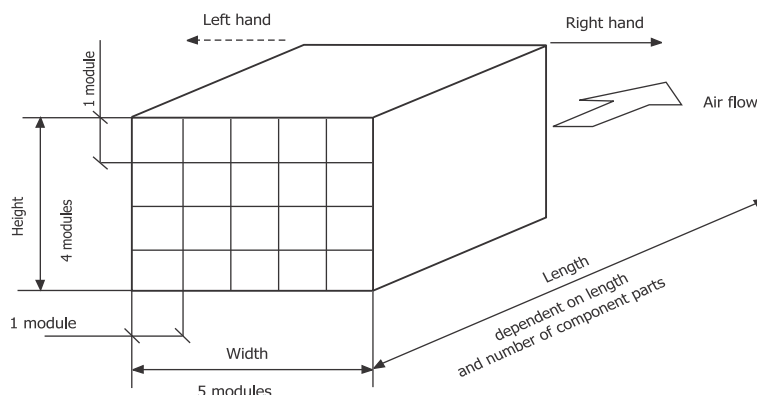
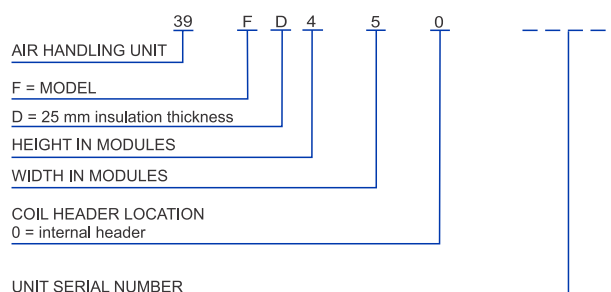
Features/Benefits

- **Double - wall casings, galvanized steel or perforated sheet metal 1-in Insulated.**
- **Shipping option available as a single assembly up to 10 ft long, or in sections.**
- **Efficient design means reduction in required space - units require 20% less space than competitive units.**
- **Unlimited design versatility - flexible, compact units; horizontal or vertical draw - thru; blow-thru; forward - curved fan wheels.**

The 39F line of Sarma Afarin air handling units is based on a **modular** system. The number of modules respectively in height and in width determines the cross-section available for air flow and encodes the unit size. Each module equals 315 millimeters. The

unit length is determined by the number and size of the component parts required. The side for services (connections and access) is defined as right hand or left hand in the direction of the air flow.

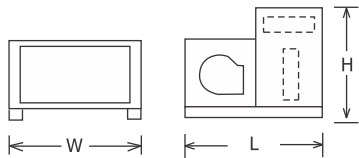
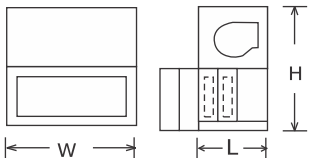
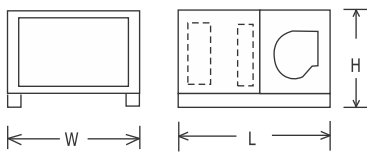
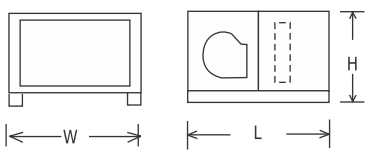
EXAMPLE



QUICK SELECTION

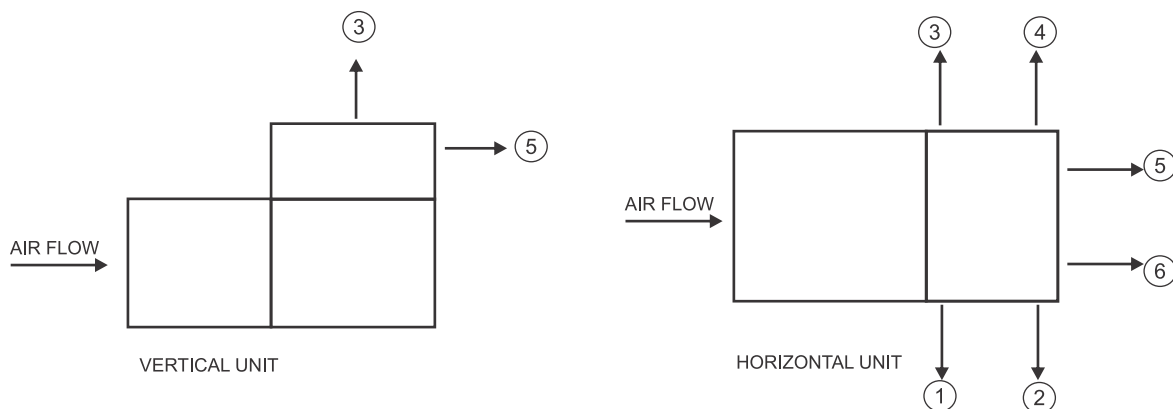
Table 1

Table 1								
UNIT 39F	COIL FACE VELOCITY (fpm)					CHILLED WATER & DX COOLING COIL	BLOW THRU HEATING COIL	DRAW THRU PREHEAT & REHEAT COIL
	400	500	550	600	700			
	AIR DELIVERY (cfm)					COIL FACE AREA (sqft)		
220	840	1050	1155	1260	1470	2.1	1.6	2.1
230	1560	1950	2145	2340	2730	3.9	2.9	3.9
240	2240	2800	3080	3360	3920	5.6	4.2	5.6
330	2320	2900	3190	3480	4060	5.8	3.9	5.8
340	3320	4150	4565	4980	5810	8.3	5.6	8.3
350	4320	5400	5940	6480	7560	10.8	7.2	10.8
360	5400	6750	7425	8100	9450	13.5	9	13.5
370	6400	8000	8800	9600	11200	16	10.7	16
440	4440	5550	6105	6660	7770	11.1	6.9	11.1
450	5760	7200	7920	8640	10080	14.4	9	14.4
460	7240	9050	9955	10860	12670	18.1	11.3	18.1
470	8560	10700	11770	12840	14980	21.4	13.4	21.4
480	10000	12500	13750	15000	17500	25	15.6	25
550	7240	9050	9955	10860	12670	18.1	10.8	18.1
560	9040	11300	12430	13560	15820	22.6	13.5	22.6
570	10680	13350	14685	16020	18690	26.7	16	26.7
580	12520	15650	17215	18780	21910	31.3	18.8	31.3
660	11720	14650	16115	17580	20510	29.3	18.1	29.3
670	13920	17400	19140	20880	24360	34.8	21.4	34.8
680	16240	20300	22330	24360	28240	40.6	25	40.6
770	16040	20050	22055	24060	28070	40.1	24.1	40.1
780	18760	23450	25795	28140	32830	46.9	28.1	46.9
7100	23760	29700	32670	35640	41580	59.4	35.6	59.4
8100	26920	33650	37015	40380	47110	67.3	39.6	67.3
9100	30080	37600	41360	45120	52640	75.2	43.5	75.2
10100	33240	41550	45705	49860	58170	83.1	47.5	83.1

BLOW-THRU (MULTIZONE)	VERTICAL DRAW-THRU
	
HORIZONTAL DRAW-THRU	BLOW-THRU (SINGLE ZONE)
	
FILTER SECTION : - LVF:LOW VELOCITY FILTER SECTION - HVF:HIGH VELOCITY FILTER SECTION - BFS1 : SOFT BAG FILTER SECTION - FMB1:COMBINATION RD & LVF - FMB2:COMBINATION RT & LVF - FMB3:COMBINATION RD & BFS1 - FMB4:COMBINATION RT & BFS1 - FMB5:COMBINATION RD & HVF FAN SECTION -VSH: SUPPLY FAN (HORIZONTAL DISCHARGE) -VSV: SUPPLY FAN (VERTICAL DISCHARGE) MIXING BOX -RD1:MIXING BOX (TOP & REAR INLET) -RD2:MIXING BOX (BOTTOM & REAR INLET) -RD3:MIXING BOX (TOP & BOTTOM INLET) -RT :MIXING BOX (3 DAMPERS) DAMPER SECTION -RI :INTERNAL DAMPER -RA:FULL FACE DAMPER -RM:HALF FACE DAMPER -FBP:FACE & BYPASS DAMPER -ZDS:ZONING DAMPER COIL SECTION -BC1:HOT WATER COIL (NONBYPASS) -BS1:STEAM COIL (NONBYPASS) -BF1:COOLING COIL (NONBYPASS) -BC2:HOT WATER COIL (BYPASS) -BS2:STEAM COIL (BYPASS) -BF2: COOLING COIL (BYPASS) HUMIDIFIER -HU1:AIR WASHER (1 SPRAY) -HU2:AIR WASHER (2 SPRAY)	SOUND ATTENUATOR -SL1: (3 MOUDULES LENGTH) -SL2: (4 MOUDULES LENGTH) -SL3: (5 MOUDULES LENGTH) -SL6: (6 MOUDULES LENGTH) BLOW THRU COIL SECTION -BCS1:MULTIZONE,HEATING & COOLING (HORIZONTAL DISCH.) -BCS2:MULTIZONE,HEATING & COOLING (VERTICAL DISCH.) -BCS3:SINGLEZONE,COOLING (HORIZONTAL DISCH.) STEAM GRID -SG1 :STEAM GRID (nonbypass) -SG2 :STEAM GRID (bypass) PLENUM SECTION -PLN1:PLENUM (bypass in to isolated plenum) -PLN2:nonbypass (2Way vertical used) -PLN3:bypass (3Way plenum vertical used) HEATING BOX - HB1: HEATING BOX (NON BYPASS) - HB2 :HEATING BOX (BY PASS) LEGEND L : LENGTH OF SECTION IN AIR FLOW DIRECTION H : HEIGHT OF SECTION W : WIDTH OF SECTION DX : DIRECT EXPANSION

Fan disch. Position:

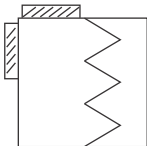
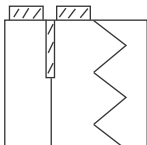
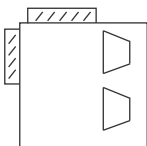
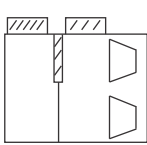
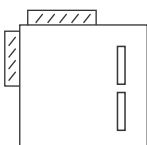
- 1 - DBR: Down Blast Rear
- 2 - DBF: Down Blast Front
- 3 - UBR: Upblast Rear
- 4 - UBF: Upblast Front
- 5 - THD: Top Horizontal Discharge.
- 6 - BHD: Bottom Horizontal Discharge.



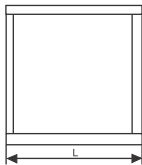
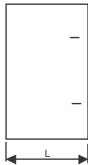
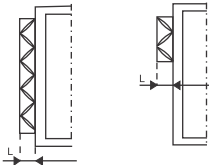
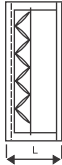
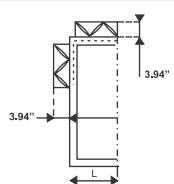
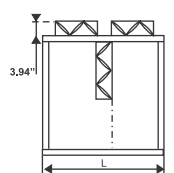
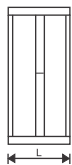
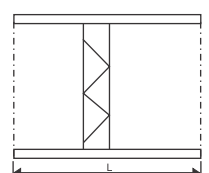
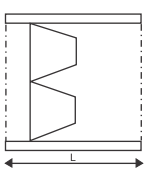
COMPONENTS

LIST OF COMPONENTS AND THEIR CASING LENGTH

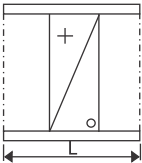
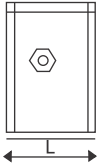
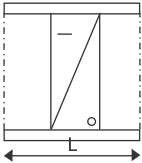
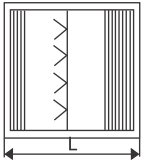
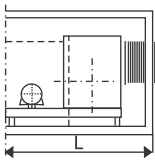
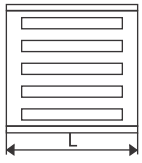
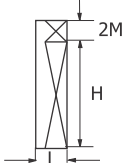
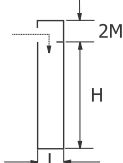
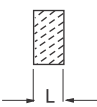
AIR FLOW FROM LEFT TO RIGHT

COMPONENT	LEGEND	SYMBOL	LENGTH IN MODULE M
COMBINATION RD&LVF	FMB1		220-480 L=5M 550-680 L=6M 770-8100 L=7M 9100-10100 L=8M
COMBINATION RT&LVF	FMB2		220-480 L=7M 550-680 L=9M 770-10100 N.A
COMBINATION RD&BFS	FMB3		220-480 L=4M 550-680 L=5M 770-8100 L=6M 9100-10100 L=7M
COMBINATION RT&BFS	FMB4		220-480 L=6M 550-680 L=8M 770-8100 L=10M 9100-10100 N.A
COMBINATION RD&HVF	FMB5		220-480 L=3M 550-680 L=4M 770-8100 L=5M 9100-10100 L=6M

AIR FLOW FROM LEFT TO RIGHT

COMPONENT	LEGEND	SYMBOL	LENGTH IN MODULE M										
EMPTY BOX	CV		L=n X M L max = 10 M										
DOOR	PO		L = 580 mm COMBINED IN 2 M										
DAMPER ON OUTSIDE OF CASE : FULL FACE HALF FACE	RA RM		L = 3.94" EXTERNAL PROTRUSION FROM CASE										
BOX WITH ONE DAMPER (INSIDE)	RI		L = 1 M										
MIXING BOX WITH TWO DAMPERS	RD		<table><tr><td>UNIT SIZE:</td><td>L</td></tr><tr><td>220 to 480</td><td>2 M</td></tr><tr><td>550 to 680</td><td>3 M</td></tr><tr><td>770 to 8100</td><td>4 M</td></tr><tr><td>9100 to 10100</td><td>5 M</td></tr></table>	UNIT SIZE:	L	220 to 480	2 M	550 to 680	3 M	770 to 8100	4 M	9100 to 10100	5 M
UNIT SIZE:	L												
220 to 480	2 M												
550 to 680	3 M												
770 to 8100	4 M												
9100 to 10100	5 M												
MIXING BOX WITH THREE DAMPERS	RT		<table><tr><td>UNIT SIZE:</td><td>L</td></tr><tr><td>220 to 480</td><td>4M</td></tr><tr><td>550 to 680</td><td>6M</td></tr><tr><td>770 to 8100</td><td>8M</td></tr><tr><td>9100 to 10100</td><td>10 M</td></tr></table>	UNIT SIZE:	L	220 to 480	4M	550 to 680	6M	770 to 8100	8M	9100 to 10100	10 M
UNIT SIZE:	L												
220 to 480	4M												
550 to 680	6M												
770 to 8100	8M												
9100 to 10100	10 M												
SIDE WITHDRAWAL FILTERS (METALLIC FLAT)	HVF		L = 1 M WITH SIDE PANEL FOR QUICK ACCESS										
LOW VELOCITY FILTER SECTION	LVF		L = 4 M WITH SIDE PANEL FOR QUICK ACCESS L = 3 M WITH MIXING BOX (Optionally)										
SOFT BAG FILTER SECTION	BFS1		L = 4 M WITH UPSTREAM ACCESS										

AIR FLOW FROM LEFT TO RIGHT

COMPONENT	LEGEND	SYMBOL	LENGTH IN MODULE M
HOT WATER COIL STEAM COIL	BC BS		1 TO 4 ROWS L = 1M
STEAM GRID	SG		L = 1M
COOLING COIL	BF		DIRECT EXPANSION: 4 - 6 ROWS CHILLED WATER: 4 TO 8 ROWS L = 2M
AIR WASHER 1 OR 2 SPRAY TREE(S)	HU		1 SPRAY TREE L = 4M 2 SPRAY TREES L = 6M
SUPPLY FAN	VSH AND VSV		L = SEE SECTION FOR FANS
SOUND ATTENUATOR	SL		L = 4-5-6-7 M SEE SECTION ON SOUND ATTENUATOR
FACE AND BY PASS DAMPER	FBP		H=(HEIGHT OF A.H.U) M L = 2M
PLENUM	PLN(1)		H=(HEIGHT OF A.H.U) M L = 2 M
ZONING DAMPER	ZDS		L = 3.94"

AIR FLOW FROM LEFT TO RIGHT

COMPONENT	LEGEND	SYMBOL	LENGTH IN MODULE M		
BLOW THRU COIL SECTION	BCS		UNIT SIZE	K	L
			220-370	2	4
			440-480	3	6
			550-580	4	7
			660-7100	4	8
			8100-10100	5	10
			H=(HEIGHT OF A.H.U) IN M		
			K=0 FOR BCS(3)		
			L = 2 FOR BCS(3)		
VERTICAL PLENUMS	PLN(2) AND PLN(3)		UNIT SIZE	VSH USE L	VSV USE L
			220-480	2	2
			550-580	2	3
			660-780	3	3
			7100-10100	3	4
			H=(HEIGHT OF A.H.U) IN M		
			PLN3 USED ONLY FOR BYPASS USAGE.		
VERTICAL UNITS	—		H=(HEIGHT OF A.H.U) M		
			PLN3 USED ONLY FOR BYPASS USAGE.		
			SEE VERTICAL COIL ARRANGEMENT SECTION		
			L = SEE SECTION FOR FANS		
			M = SEE PLN(3) LENGTH.		
HEATING BOX	HB		L = 1M		

GENERAL

Each module has a constant value of (12.4 in)(315 mm) and determines the internal dimensions of the unit. To determine external dimensions, apply the following formula.

For n = number of modules, the exterior dimension is $n \times 12.4 + 1.97$ (in) OR $n \times 315 + 50$ (mm)

The length of the unit is found from the sum of component parts (in modules) required. Use same formula for each section.

Table 2 shows the number of modules.

Example : 39FD 570

External height $H = (5 \times 12.4) + 1.97 = 63.97"$

External width $W = (7 \times 12.4) + 1.97 = 88.77"$

TABLE 2 - OVERALL DIMENSIONS				
UNIT SIZE 39F	NUMBER OF MODULES		39F BOX (mm)	
	HEIGHT (H)	WIDTH (W)	HEIGHT (H)	WIDTH (W)
220	2	2	681	681
230	2	3	681	996
240	2	4	681	1311
330	3	3	996	996
340	3	4	996	1311
350	3	5	996	1626
360	3	6	996	1941
370	3	7	996	2256
440	4	4	1311	1311
450	4	5	1311	1626
460	4	6	1311	1941
470	4	7	1311	2256
480	4	8	1311	2570
550	5	5	1626	1626
560	5	6	1626	1941
570	5	7	1626	2256
580	5	8	1626	2570
660	6	6	1941	1941
670	6	7	1941	2256
680	6	8	1941	2570
770	7	7	2256	2256
780	7	8	2256	2570
7100	7	10	2256	3200
8100	8	10	2570	3200
9100	9	10	2885	3200
10100	10	10	3200	3200

NO LIMITS TO THE TOTAL NUMBER OF SECTIONS USED.

GENERAL

The case of 39F units is formed by :

- penta post frame
- fixed and removable panels
- internal insulation

A- FRAME

The frame is made up of 3 components:

1 - Penta post frame

Forms the overall shape of the section and receives the panels. The penta post is manufactured from press formed, galvanized sheet steel or aluminum profile (optional) and insulated.

2 - Corner piece

Completes corner section by connecting pentapost in three planes. Manufactured from sheet steel press formed welded and galvanized. For aluminum penta post poly amid corner piece is used.

3 - Intermediate mullion

Recessed to accept panels and stiffens the case assembly. Made of galvanized sheet steel press formed or aluminum profile (optional) to a top hat shape and internally insulated.

Explanations :

- 1 - Penta post
- 2 - Mullion
- 3 - External face of panel
- 4 - Internal face of panel
- 5 - Gasket
- 6 - Teck screw
- 7 - Mullion closing sheet
- 8 - Insulation

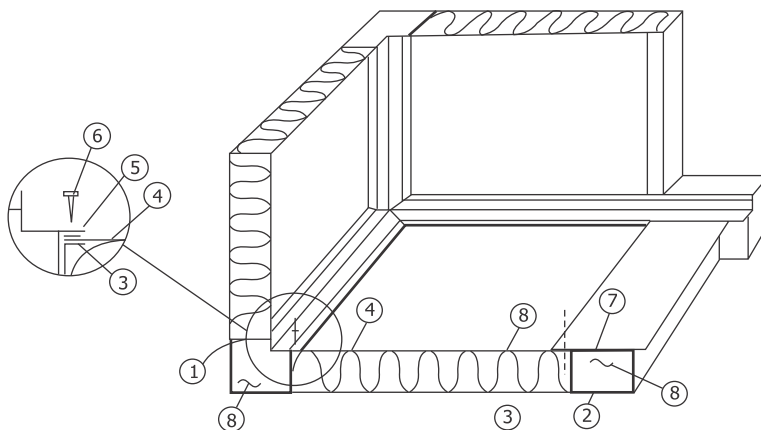
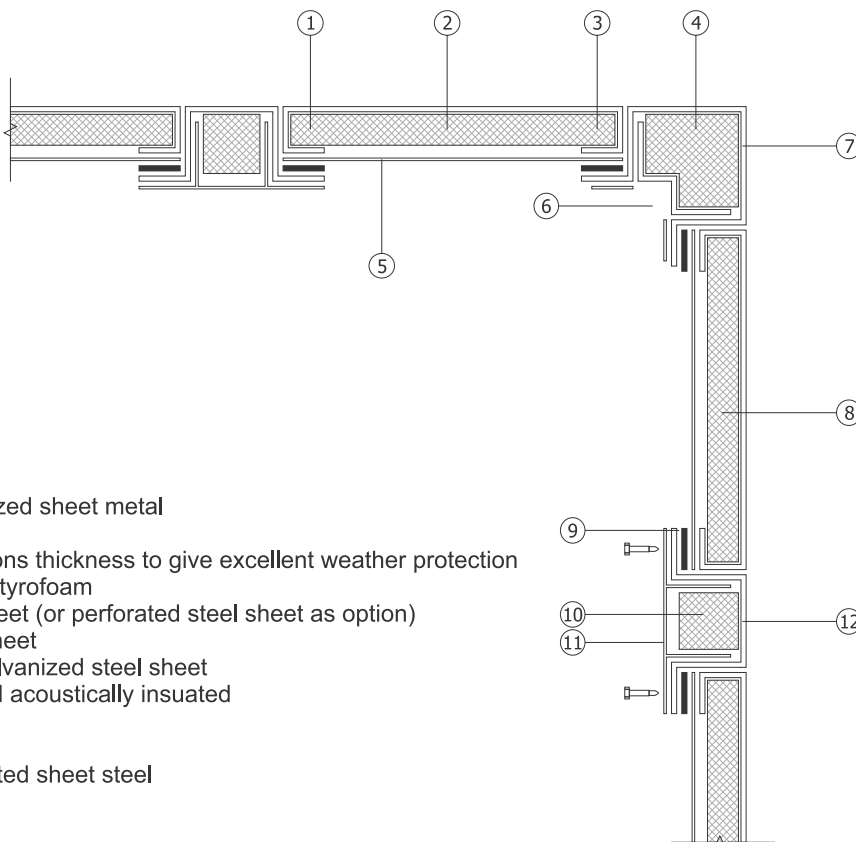


Figure 2 : Panel assembly



Explanations :

- 1 - Panel - External Skin: Painted galvanized sheet metal
- 2 - Panel - Insulation
- 3 - Powder Paint: Oven baked at 50 microns thickness to give excellent weather protection
- 4 - Frame - Insulation: 10 kg/m3 density styrofoam
- 5 - Panel - Inner Skin: Unpainted steel sheet (or perforated steel sheet as option)
- 6 - Frame - Inner Skin: Unpainted steel sheet
- 7 - Penta - Post Frame: Press formed, galvanized steel sheet
- 8 - Insulation: All panels are thermally and acoustically insulated
- 9 - Adhesive Foam Rubber
- 10 - Intermediate Post Insulation
- 11 - Intermediate Post Inner Skin: Unpainted sheet steel
- 12 - Mullion closing sheet

B-PANELS

1 -Fixed panels

Form the insulated enclosure of the case and give it rigidity and air-tightness, they consist of:

- external sheet metal
- insulation
- internal protective cover

The external galvanized sheet metal in 1 or 1.5 mm thickness (depending on unit size), is painted. The internal protective cover over the insulation depends on the unit application and is either :

"Single skin"

A plain fiber glass scrim preventing erosion of insulation by the airstream.

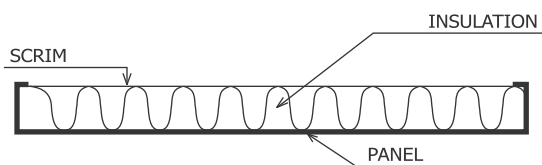


Figure3

"Double skin"

Sheet metal with insulation between the inner and the outer panel.

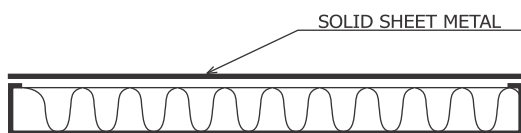


Figure4

"Double skin with perforated inner skin"

Sandwiched insulation for sound absorption. Inner perforated sheet made of aluminium.

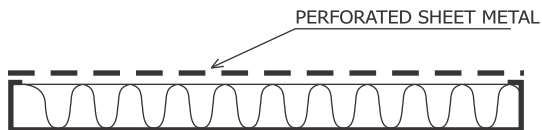


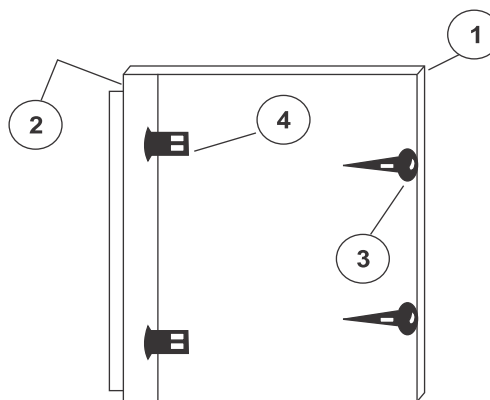
Figure 5

2 -Access panels

Are constructed of the same materials as the fixed panels and similar in dimension.

Three types are available:

- Removable panels, double skin, externally fixed to allow access to coil headers / return bends.
- Quick release access panels for access to side withdrawal filters.
- Hinged doors to facilitate the maintenance and service of bag filters, fans, drives, etc. The door widths match panel widths. Hinged doors have internal handles.



Explanations :

- 1 -Door
- 2 -Intermediate mullion
- 3 -Door handle(Internal)
- 4 -Hinges

Figure 6: Door

3. Paint

Oven- baked white powder, 50 microns thick provides an excellent weather protection.

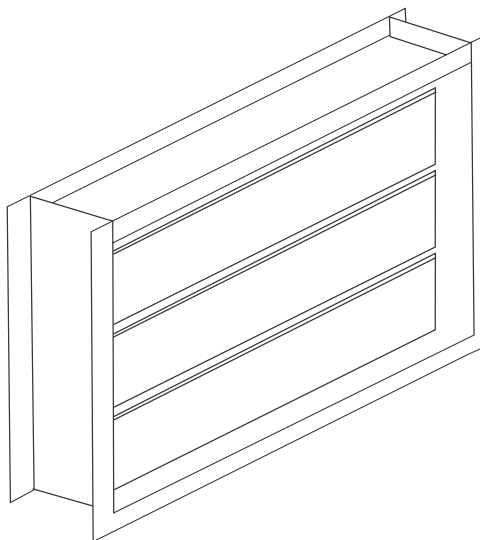
A- GENERAL

Application

- two way or three way mixing.
- by-pass.
- Multi zone.

Features

- No maintenance.
- low resistance to air flow - aerodynamical-shape.
- positive seal.
- blades interlocked in closed position.
- low sound level.
- low torque requirement.
- precise control.
- non-welded construction (corrosion resistant).



B-DESCRIPTION

1 - Characteristics

- Opposed blades assure positive control.
- Aerodynamic blade design reduces noise and pressure loss to a minimum.
- The lip formed seal between damper blades, aswell as the back-seat seals between top and bottom blades and frame, minimize leakage independent of damper length.

2 - construction

- Aluminium blade Damper profile.
- Glass fiber (Black colour) kit for each blade.
- Brass shaft.
- PVC or TPE (talc - termoplastic rubber) Gasket.

Accessory damper actuators act on two or three extended shafts and are selected to match damper torque.

- Damper spindle factory located either left or right hand upon request.

C-RECOMMENDATIONS

Limits of application :

Temperature (-20F to 176F)

Maximum pressure differential (8 inwg)

Maximum velocity : (1180 fpm)

D-INSTALLATION

The dampers are located on the outside of mixing boxes except on external installations where dampers are internally mounted.

U-formed damper frame serves as a flange for ductwork connection.

The size of the damper is defined by the number of modules (n) in height (H) and in width (W).

E-DAMPER DATA

The internal damper dimensions (duct size) in relation to the number of modules (n) are defined as follows:

$$W \text{ or } H = (n \times 12.4) - 5.04 \text{ in}$$

Example: damper 2 modules high X 4 modules wide

$$H = 2 \times 12.4 - 5.04 = 19.76 \text{ in}$$

$$W = 4 \times 12.4 - 5.04 = 44.57 \text{ in}$$

A-GENERAL

Particle size is one of the most important factors in determining the type of filters required. The type and size of the particles must be known for selection of the correct type of filter.

Filter characteristics :

- 1 - efficiency
- 2 - pressure drop
- 3 - saturation time

1 - Efficiency

Efficiency is defined by the capacity of the filter to retain a certain type of dust

$$\text{Efficiency in \%} = \frac{\text{quantity of retained dust}}{\text{Total emitted quantity of dust}} \times 100$$

The efficiency of the filter is given in relation to the method of test applied. Without such an indication, the definition of filter efficiency is meaningless.

Filter	Method of measure	Type of measure
Average efficiency	Relation to weight	Gravimetric
High efficiency	Relation to transparency	Opacimetric

2-Pressure drop

The loss of pressure through filters is a function of the air velocity and the state of filter saturation. Diagrams show pressure loss for clean filters. In selecting fans for air handling units, it is recommended that pressure loss through filters is taken as 150% of the pressure loss of clean filters.

3-Saturation time

Saturation time is an indication of the capacity of the filter to hold a certain amount of dust during a given time and at a given air velocity. The saturation time depends on the degree of site pollution. This data is essential for establishing life expectancy and preservation of filter efficiency.

B-RECOMMENDATIONS

Filters should always be installed inside the AHUs. They are not to be exposed to fog, frost, snow, or rain. The amount of dust accumulated should regularly be checked by measuring the pressure drop across the filter. This should not exceed (1.2 in. wg). The pressure drop on very high efficiency filters should not exceed twice the clean pressure loss.

These recommendations refer to normal air contamination in average urban areas. Special solutions must be sought for air contamination created in industrial locations.

C-INSTALLATION

Depending on the type of filter, the following recommendations are made:

a) **In slide rails** for side withdrawal and filters of average efficiency, such as flat metallic or synthetic filters, Synthetic V shape filters.

B) **In frames** for front or rear withdrawal for filters of high and very high efficiency soft bag Filters.

The use of prefilters (of average efficiency) is recommended to extend the life of high efficiency filters.

These are mounted in frames for front withdrawal.

Example:

Unit 39FD570, with 18000 cfm, and soft bag filters of 85% OPA efficiency.

- Using the values given in following table. Filter face areas are 120 sqft Therefore

$$\text{The face velocity is } \frac{18000}{120} = 150 \text{ fpm}$$

-the pressure loss through the clean filter is 0.1 in.wg from figure 5.

-The pressure loss to be used for selection is 150% clean loss: $0.1 \times 1.5 = 0.15 \text{ in.wg}$

A-GENERAL

Heating and cooling coils are of copper tubes aluminium or copper (optional) fins, in galvanized steel frame. Heating or cooling coils: Constructed with 1/2" copper tubes and aluminium or copper (optional) 8 or 14 fins per inch.

B - CHARACTERISTICS OF HEATING AND COOLING COILS

UNIT SIZE 39F	COPPER TUBING O.D (in)	HEATING		COOLING	
		ROWS	FINS/in	ROWS	FINS/in
220 to 10100	1/2"	1, 2 & 4	8 OR 14	4, 6 & 8	8 OR 14

TABLE 3 : Tubing and fin spacings

C-RECOMMENDATIONS

For standard or customized coils, the maximum allowable face velocity is :

V=880 FPM HEATING COILS

V=620 FPM DEHUMIDIFYING COOLING COILS
WITH DROPLET ELEMINATOR

V=550 FPM DEHUMIDIFYING COOLING COILS
WITHOUT DROPLET ELIMINATOR

Chilled water coils are provided with a condensate drain pan with condensate drain connection. A U-trap of height equal to twice the fan static pressure must be provided on site by others. All water coils are supplied with a vent and a drain connection.

D-INSTALLATION

Heating coils are mounted on slide rails for side withdrawal. Cooling coils are mounted in the condensate pan (with or without droplet eliminator) and the whole assembly is mounted on slide rails. Supply and return coil connections are always located on the same end defined as right or left hand, in the direction of air flow . Closing panels of double skin construction with external fixings are provided at both ends of the coil so as to provide for possible coil withdrawal on either end.

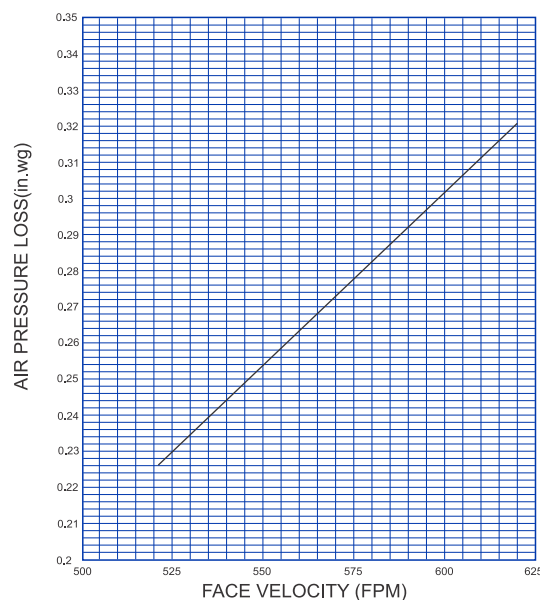


Figure 3: Air pressure loss through droplet eliminator

COOLING COIL AIR SIDE PERFORMANCE CHART

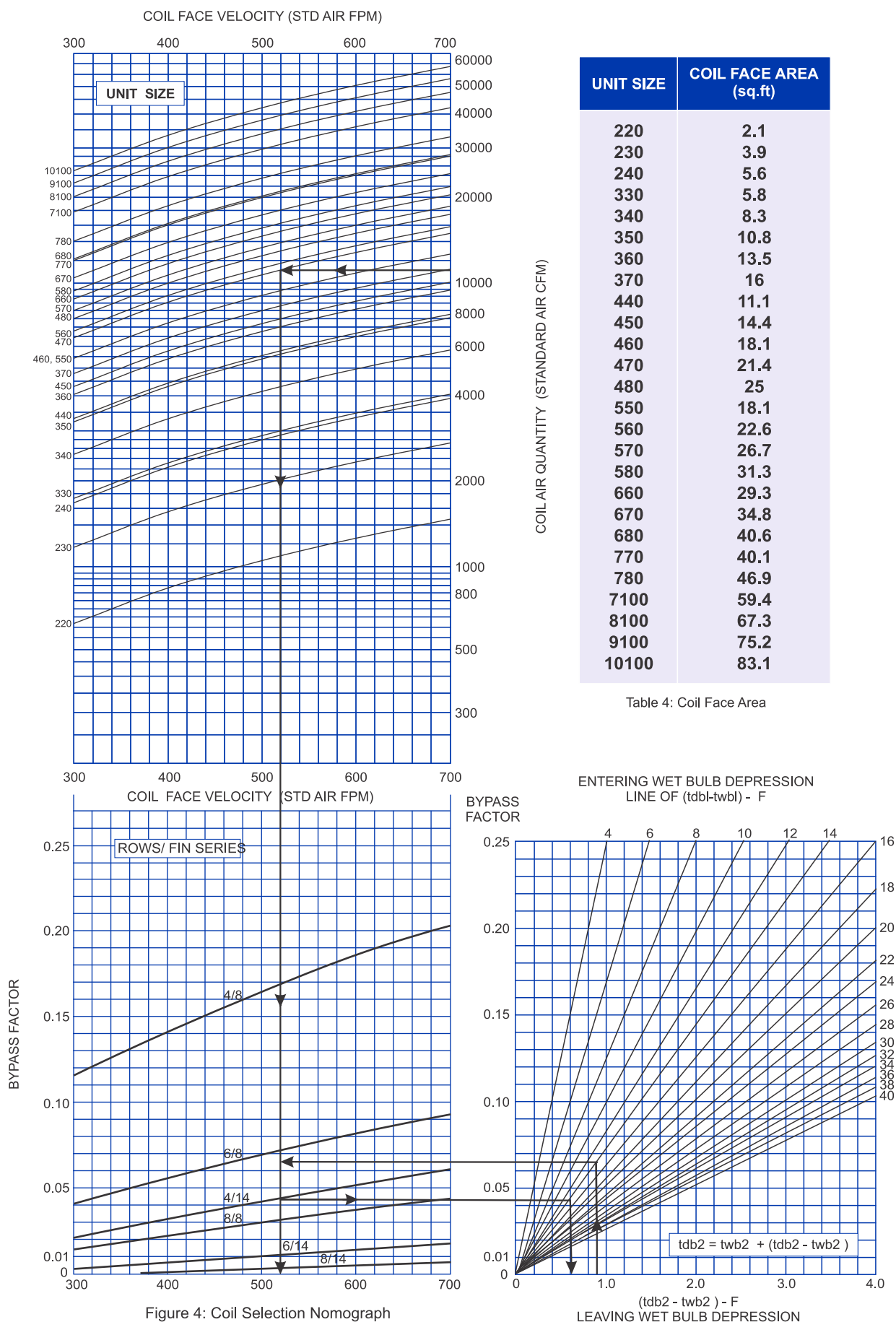


Figure 4: Coil Selection Nomograph

TABLE 5 - COOLING COILS

ROWS	FINS	Air Friction (In. wg)					
		Face Velocity (fpm)					
		300	400	500	550	600	700
4	8	0.13	0.21	0.32	0.39	0.45	0.58
		0.20	0.31	0.43	0.50	0.57	0.72
4	14	0.20	0.33	0.49	0.57	0.67	0.87
		0.27	0.43	0.60	0.70	0.80	1.02
6	8	0.19	0.32	0.48	0.58	0.68	0.87
		0.30	0.46	0.65	0.75	0.86	1.08
6	14	0.30	0.50	0.73	0.86	1.00	1.31
		0.40	0.64	0.91	1.05	1.21	1.53
8	8	0.25	0.43	0.64	0.77	0.90	1.16
		0.40	0.62	0.87	1.00	1.14	1.44
8	14	0.40	0.66	0.97	1.15	1.33	1.74
		0.54	0.85	1.21	1.40	1.61	2.04

TABLE 6 - HEATING COILS

ROWS	FINS	U-Bend Coils										
		Air Friction (In. wg)										
		Face Velocity (fpm)										
		300	400	500	600	700	800	900	1000	1100	1200	
1 and 2	8	.06	.10	.16	.22	.29	.37	.46	.55	.66	.77	
	14	.11	.17	.25	.34	.44	.55	.68	.80	.96	1.09	
4	8	.13	.22	.33	.45	.60	.76	.95	1.14	1.36	1.58	
	14	.22	.35	.50	.68	.87	1.09	1.34	1.57	1.86	2.12	

Dry Wet

FILTER PRESSURE LOSS (Clean filters)

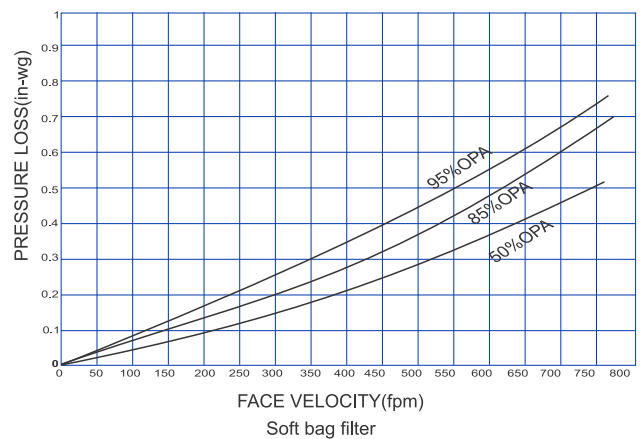
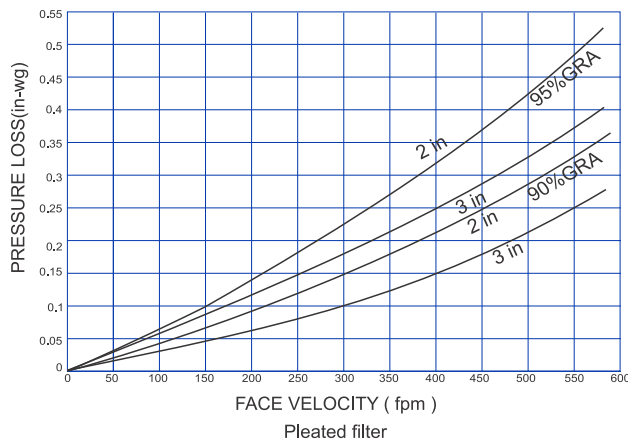
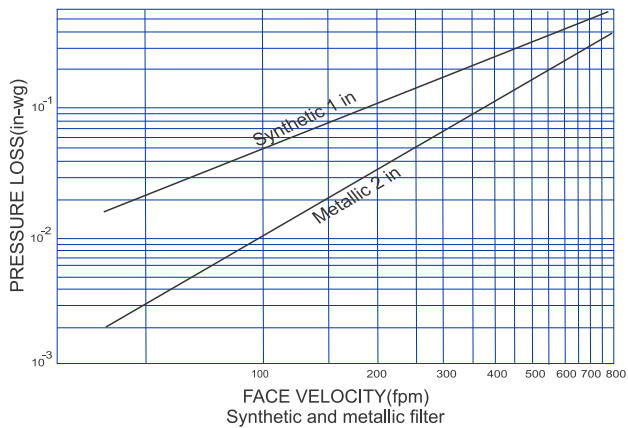


Figure 5

DIRECT-EXPANSION COOLING COILS												
Single-Coil Units												
UNIT SIZE	240			330			340		350		360	
CFM Range	2240 - 3920			2320 - 4060			3320 - 5810		4320 - 7560		5400 - 9450	
Circuiting Type	Qtr	Half	Full	Qtr	Half	Full	Half	Full	Half	Full	Half	Full
Total Number of Circuits	4	8	16	6	12	24	12	24	12	24	12	24
Total Number of TXV's	2	2	2	2	2	2	2	2	2	2	2	2
Coil Section Face Area (sq ft)	5.6	5.6	5.6	5.8	5.8	5.8	8.3	8.3	10.8	10.8	13.5	13.5
Number of Circuits in Section	4	8	16	6	12	24	12	24	12	24	12	24
Number of TXV's in Section	2	2	2	2	2	2	2	2	2	2	2	2
Number of Circuits per TXV	2	4	8	3	6	12	6	12	6	12	6	12
Suction Connections Diam (in. OD)	1	1 1/8	1 3/8	1	1 3/8	1 5/8	1 3/8	1 5/8	1 3/8	1 5/8	1 3/8	1 5/8
Liquid Refrigerant Diam (in. OD)*	1/2	1/2	5/8	1/2	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8
4 Row Circuit Equivalent Length (ft)	67	33	17	47	23	12	33	17	43	22	54	27
6 Row Circuit Equivalent Length (ft)	100	50	25	70	35	18	50	25	65	33	81	41

DIRECT-EXPANSION COOLING COILS												
Single-Coil Units												
UNIT SIZE	370			440			450		460		470	
CFM Range	6400-11200			4440 - 7770			5760 - 10080		7240 - 12670		8560 - 14980	
Circuiting Type	Half	Full	Full	Half	Full	Full	Half	Full	Half	Full	Half	Full
Total Number of Circuits	12	24	16	32	16	32	16	32	16	32	16	32
Total Number of TXV's	2	2	2	2	2	2	2	2	2	2	2	2
Coil Section Face Area (sq ft)	16	16	11.1	11.1	14.4	14.4	18.1	18.1	21.4	21.4	25	25
Number of Circuits in Section	12	24	16	32	16	32	16	32	16	32	16	32
Number of TXV's in Section	2	2	2	2	2	2	2	2	2	2	2	2
Number of Circuits per TXV	6	12	8	16	8	16	8	16	8	16	8	16
Suction Connections Diam (in. OD)	1 3/8	1 5/8	1 3/8	1 5/8	1 3/8	1 5/8	1 3/8	1 5/8	1 3/8	1 5/8	1 3/8	1 5/8
Liquid Refrigerant Diam (in. OD)*	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	7/8	5/8	5/8
4 Row Circuit Equivalent Length (ft)	64	32	33	17	43	22	54	27	64	32	75	38
6 Row Circuit Equivalent Length (ft)	96	48	50	25	65	33	81	41	96	48	113	56

DIRECT-EXPANSION COOLING COILS												
Two-Coil Units												
UNIT SIZE	550				560				570			
CFM Range	7240-12670				9040-15820				10680 - 18690			
Circuiting Type	Half	Full	Full	Full	Half	Full	Full	Full	Half	Full	Full	Full
Total Number of Circuits	20	40	40	40	20	40	40	40	20	40	40	40
Total Number of TXV's	4	4	4	4	4	4	4	4	4	4	4	4
Coil Section Face Area (sq ft)	U	L	U	L	U	L	U	L	U	L	U	L
Face Area (sq ft)	9.05	9.05	9.05	9.05	11.3	11.3	11.3	11.3	13.35	13.35	13.35	13.35
Number of Circuits in Section	10	10	20	20	10	10	20	20	10	10	20	20
Number of TXV's in Section	2	2	2	2	2	2	2	2	2	2	2	2
Number of Circuits per TXV	5	5	10	10	5	5	10	10	5	5	10	10
Suction Connections Diam (in. OD)	1 1/8	1 1/8	1 3/8	1 3/8	1 1/8	1 1/8	1 3/8	1 3/8	1 1/8	1 1/8	1 3/8	1 3/8
Liquid Refrigerant Diam (in. OD)*	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8
4 Row Circuit Equivalent Length (ft)	43	22	54	27	64	32	75	38	75	38	81	41
6 Row Circuit Equivalent Length (ft)	65	33	81	41	96	48	113	56	113	56	120	61

DIRECT-EXPANSION COOLING COILS												
Two-Coil Units												
UNIT SIZE	670				680				770			
CFM Range	13920 - 24360				16240-28420				16040 - 28070			
Circuiting Type	Half	Full	Full	Full	Half	Full	Full	Full	Half	Full	Full	Full
Total Number of Circuits	26	52	52	52	26	52	52	52	30	60	60	60
Total Number of TXV's	4	4	4	4	4	4	4	4	4	4	4	4
Coil Section Face Area (sq ft)	U	L	U	L	U	L	U	L	U	L	U	L
Face Area (sq ft)	10.8	24	10.8	24	12.5	28.1	12.5	28.1	18.7	21.4	18.7	21.4
Number of Circuits in Section	8	16	16	32	8	16	16	32	14	16	28	32
Number of TXV's in Section	2	2	2	2	2	2	2	2	2	2	2	2
Number of Circuits per TXV	4	9	8	16	4	9	8	16	7	8	14	16
Suction Connections Diam (in. OD)	1 1/8	1 3/8	1 3/8	1 5/8	1 1/8	1 3/8	1 3/8	1 5/8	1 3/8	1 3/8	1 5/8	1 5/8
Liquid Refrigerant Diam (in. OD)*	5/8	5/8	7/8	7/8	5/8	5/8	7/8	7/8	5/8	5/8	7/8	7/8
4 Row Circuit Equivalent Length (ft)	64	32	75	38	75	38	96	48	64	32	75	38
6 Row Circuit Equivalent Length (ft)	96	48	113	56	113	56	143	71	96	48	113	56

DIRECT-EXPANSION COOLING COILS												
Two-Coil Units												
UNIT SIZE	770				780				7100			
CFM Range	16040 - 28070				18760 - 32830				23760 - 41580			
Circuiting Type	Half	Full	Full	Full	Half	Full	Full	Full	Half	Full	Full	Full
Total Number of Circuits	30	60	60	60	30	60	60	60	30	60	60	60
Total Number of TXV's	4	4	4	4	4	4	4	4	4	4	4	4
Coil Section Face Area (sq ft)	U	L	U	L	U	L	U	L	U	L	U	L
Face Area (sq ft)	18.7	21.4	18.7	21.4	21.9	25	21.9	25	27.7	31.7	27.7	31.7
Number of Circuits in Section	14	16	28	32	14	16	28	32	14	16	28	32
Number of TXV's in Section	2	2	2	2	2	2	2	2	2	2	2	2
Number of Circuits per TXV	7	8	14	16	7	8	14	16	7	8	14	16
Suction Connections Diam (in. OD)	3/8	3/8	5/8	5/8	3/8	3/8	5/8	5/8	3/8	3/8	5/8	5/8
Liquid Refrigerant Diam (in. OD)*	5/8	5/8	7/8	7/8	5/8	5/8	7/8	7/8	5/8	5/8	7/8	7/8
4 Row Circuit Equivalent Length (ft)	64	32	75	38	75	38	96	48	64	32	75	38
6 Row Circuit Equivalent Length (ft)	96	48	113	56	113	56	143	71	96	48	113	56

DIRECT-EXPANSION COOLING COILS												
Three-Coil Units												
UNIT SIZE	9100				10100				10100			
CFM Range	30080-52640				33240-58170				33240-58170			
Circuiting Type	Half	Full	Full	Full	Half	Full	Full	Full	Half	Full	Full	Full
Total Number of Circuits	38	76	76	76	42	84	84	84	42	84	84	84
Total Number of TXV's	6	6	6	6	6	6	6	6	6	6	6	6
Coil Section Face Area (sq ft)	U	U	L	U	U	L	U	L	U	U	L	U
Face Area (sq ft)	23.75	23.75	27.7	23.75	27.7	27.7	27.7	27.7	27.7	27.7	27.7	27.7
Number of Circuits in Section	12	12	14	24	12	14	24	28	12	14	24	28
Number of TXV's in Section	2	2	2	2	2	2	2	2	2	2	2	2
Number of Circuits per TXV	6	6	7	12	6	7	12	14	6	7	12	14
Suction Connections Diam (in. OD)	3/8	3/8	1 3/8	5/8	3/8	3/8	1 3/8	5/8	3/8	3/8	1 3/8	5/8
Liquid Refrigerant Diam (in. OD)*	5/8	5/8	5/8	7/8	5/8	5/8	7/8	7/8	5/8	5/8	7/8	7/8
4 Row Circuit Equivalent Length (ft)	95	48	71	24	95	48	71	24	95	48	71	24
6 Row Circuit Equivalent Length (ft)	143	71	113	56	143	71	113	56	143	71	113	56

Table 7: D.X. Coils Physical Data

CHILLED WATER COOLING COILS DRAW-THRU & BLOW-THRU UNITS																										
UNIT SIZE	220	230	240	330	340	350	360	370	440	450	460	470	480	550	560	570	580	660	670	680	770	780	7100	8100	9100	10100
Nom.cfm.At 550 FPM	1155	2145	3080	3190	4565	5940	7425	8800	6105	7920	9955	11770	13750	9955	12430	14685	17215	16115	19140	22330	22055	25795	32670	37015	41360	45705
FACE AREA (sq.ft)	2.1	3.9	5.6	5.8	8.3	10.8	13.5	16	11.1	14.4	18.1	21.4	25	18.1	22.6	26.7	31.3	19.3	34.8	40.6	40.1	46.9	59.4	67.3	75.2	83.1
TUBE FACE	16	16	16	24	24	24	24	24	32	32	32	32	32	20/20	20/20	20/20	20/20	16/36	16/36	16/36	28/32	28/32	28/32	32/36	24/24 /28	28/28 /28
CONNECTION SIZE (in)	3-in MPT SUPPLY & RETURN																									

U-BEND HEATING COILS																											
UNIT SIZE		220	230	240	330	340	350	360	370	440	450	460	470	480	550	560	570	580	660	670	680	770	780	7100	8100	9100	10100
PRE/REHEAT DRAW-THRU & PREHEAT BLOW-THRU	FACE AREA (sq-ft)	2.1	3.9	5.6	5.8	8.3	10.8	13.5	16	11.1	14.4	18.1	21.4	25	18.1	22.6	26.7	31.3	19.3	34.8	40.6	40.1	46.9	59.4	67.3	75.2	83.1
	TUBE FACE	16	16	16	24	24	24	24	24	32	32	32	32	32	20/20	20/20	20/20	20/20	16/36	16/36	16/36	28/32	28/32	28/32	32/36	24/24 /28	28/28 /28
BLOW-THRU ONLY	FACE AREA (sq-ft)	1.6	2.9	4.2	3.9	5.6	7.2	9	10.7	6.9	9	11.3	13.4	15.6	10.8	13.5	16	18.8	18.1	21.4	25	24.1	28.1	35.6	39.6	43.5	47.5
	TUBE FACE	12	12	12	16	16	16	16	16	20	20	20	20	20	24	24	24	24	32	32	32	36	36	36	20/20	20/24	24/24
CONNECTION SIZE (in)		2-in MPT SUPPLY & RETURN																									

COIL VOLUME (gal. water)																												
UNIT SIZE			220	230	240	330	340	350	360	370	440	450	460	470	480	550	560	570	580	660	670	680	770	780	7100	8100	9100	10100
CHILLED WATER COILS	ROWS	4	2.38	3.04	3.64	4.38	5.29	6.18	7.16	8.06	6.93	8.14	9.45	10.66	11.90	10.38	12.00	13.59	15.22	15.60	17.45	19.67	20.03	22.48	27.01	30.58	34.38	38.15
		6	2.76	3.74	3.65	5.44	6.8	8.16	9.63	10.98	8.95	10.76	12.72	14.53	16.40	13.78	16.25	18.43	20.89	20.97	23.05	27.09	27.29	30.98	37.77	42.60	36.46	53.20
		8	3.14	4.45	5.65	6.51	8.31	10.13	12.10	13.91	10.96	13.38	16	18.41	20.90	17.00	20.28	23.28	26.55	26.17	30.05	34.29	34.56	39.47	48.53	54.80	46.24	68.24
HOT WATER COILS	ROWS BLOW-THRU	1	0.73	0.86	0.97	1.07	1.24	1.24	1.4	1.76	1.51	1.7	1.91	2.1	2.96	3.26	3.59	2.48	2.73	3.89	3.26	4.20	3.65	4.01	4.69	4.62	5.51	7.11
		2	0.88	1.12	1.35	1.25	1.75	1.58	1.88	2.56	2.14	2.52	2.93	3.31	3.96	4.56	5.21	3.94	4.43	4.00	5.2	6.61	5.83	6.56	7.92	7.43	8.60	10.50
		4	1.16	1.65	2.1	1.63	2.75	2.28	2.88	4.05	3.4	4.16	4.98	5.73	5.96	7.16	8.46	6.85	7.83	9.66	9.07	11.40	10.19	11.66	14.38	13.03	14.94	17.74
	ROWS DRAW-THRU	1	0.93	1.1	1.25	1.56	1.79	2.02	2.27	2.49	2.33	2.63	2.96	3.26	3.57	3.42	3.84	4.19	4.6	4.92	5.35	5.94	6.13	6.75	7.88	8.90	10.07	11.03
		2	1.12	1.45	1.75	2.10	2.54	2.98	3.47	3.91	3.34	3.94	4.59	5.2	5.84	5.04	5.85	6.62	7.43	7.57	8.51	9.59	9.77	10.99	13.26	14.98	16.77	18.63
		4	1.5	2.15	2.76	3.14	4.05	4.96	5.94	6.84	5.35	6.56	7.87	9.07	10.32	8.29	9.93	11.46	13.1	12.86	14.81	16.93	17.03	19.48	24.02	27.11	30.49	33.65

TABLE 8: Water Coils Physical Data

A-GENERAL

Air humidification can be obtained by:

- adiabatic process (constant heat)
- isothermal process (constant temperature)

1-Adiabatic humidification (with waterspray)

At constant enthalpy part of the sensible heat content of the air is converted into latent heat of evaporation. The efficiency of that process is defined by:

$$E\% = \frac{Xl - Xe}{Xs - Xe} \times 100$$

Xl = quantity of water vapor in the air leaving the humidifier(g/lb).

Xe = quantity of water vapor in the air entering the humidifier(g/lb).

Xs = quantity of water vapor at saturation in the air entering the humidifier(g/lb).

2-Isothermal humidification (steam injection)

At constant temperature the amount of water in the air is increased and with it the enthalpy of the air.

B-DESCRIPTION

The adiabatic or spray humidifier used with the 39F units consists of:

painted and bolted galvanized sheet metal Panels (welding eliminated) and internally coated for water tightness. water sump with level control and furnished with the following openings:

- drain
- overflow
- water supply with float valve
- suction connection with screen
- one or two rows of galvanised stand pipes with atomising brass spray nozzles providing a fine water mist for maximum efficiency (spray nozzles easily removed for maintenance):
- vertical galvanised steel eliminator plates specially formed, and installed upstream and downstream to provide droplet elimination:
- porthole for easy inspections (not furnished on sizes 220, 230 and 240);
- inspection-maintenance door;
- Recirculating centrifugal pump, field mounted by others.

Note: units are supplied single skin, un-lagged. Two models of humidifiers are available.

1- Short humidifier (medium efficiency)

With one row of spray nozzles directed against air flow. Maximum efficiency : 79% at 430 fpm coil face velocity. Overall length: 4 modules = 51.6 in

2 - Long humidifier (high efficiency)

Two rows of spray nozzles directed against air flow. Maximum efficiency: 84% at 430 fpm coil face velocity. Overall length: 6 modules = 76.4(in).

C-RECOMMENDATIONS

The following conditions must be met:

- electrical interlock between pump and fan motor;
- supply of filtered and treated water (pH = 7.0).
- continuous bleed-off to prevent salt accumulation in sump .
- a drain U-trap twice the height of the fan static - pressure; adequate protection against freezing.

D-INSTALLATION

The humidifier forms an independent section to be connected to the other unit sections by using the accessories fixings supplied with the unit for this purpose. Since the sump is located at the bottom of the humidifier and below the air flow, support legs for the other sections of the air handling units have to be provided to maintain uniform level. These support legs are factory supplied as optional accessories. The recirculating pump must be field-connected and located at the same height as the sump. a free space of 23.6 in for this installation is required.

E-SELECTION

Example:

Unit 39FD 570, entering air 14150 cfm at 530 fpm entering air at 77F and Xe = 1.36 g/lb water vapor.

-Required : leaving air Xl = 3.4 g/lb

-From the psychrometric chart read: saturation of entering air Xs = 3.85 g/lb

$$\text{-Efficiency } E \% = \frac{3.4 - 1.36}{3.85 - 1.36} \times 100 = 82\%$$

-From figure 6 at 530/fpm

For one spray tree : E = 74 %

For two spray trees : E = 80%

Two spray trees humidifier satisfies the requirements.

The actual leaving air conditions are

$$Xl = 0.8(3.85 - 1.36) + 1.36 = 3.35 \text{ gr/lb}$$

Leaving air temperature : 58F with 75% r.h.

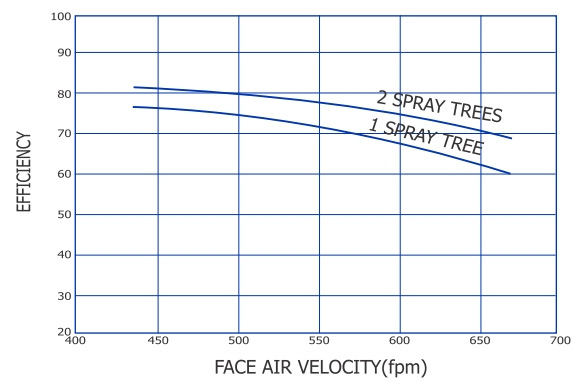
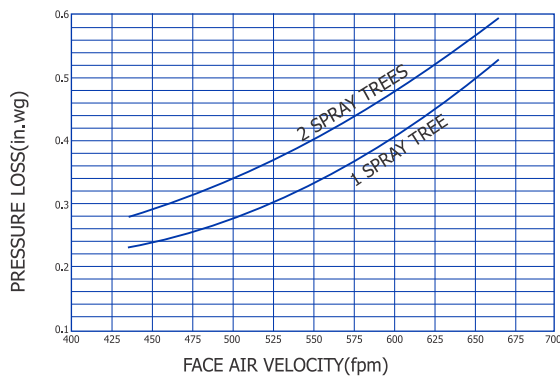


Figure 6 : Efficiencies and air side pressure losses through humidifiers. Face velocity is at coil.

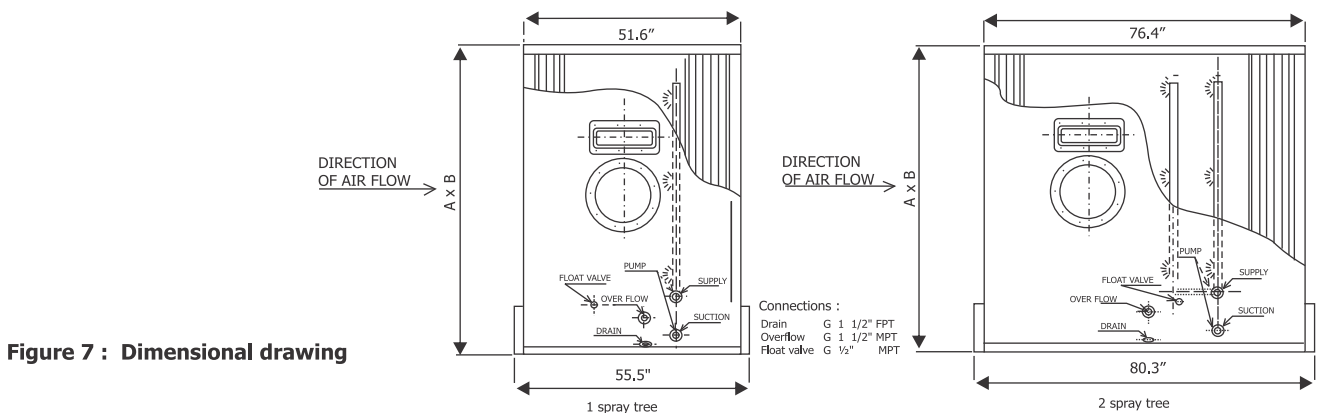


Figure 7 : Dimensional drawing

TABLE 9 : PHYSICAL DATA

* Velocity of 490 fpm through humidifier

UNIT SIZE 39F	A(in)	B(in)	Max. AIR VOLUME (CFM)	1 TREE COUNTER FLOW			2 TREE COUNTER FLOW		
				WATER FLOW (GPM)	SUCTION DIA. (in)	HEADER DIA. (in)	WATER FLOW (GPM)	SUCTION DIA. (in)	HEADER DIA. (in)
220	39.2	26.8	1380	3.5	1 1/4"	1 1/4"	6.9	1 1/4"	1 1/4"
230		39.2	2440	6.1	1 1/4"	1 1/4"	12.2	1 1/4"	1 1/4"
240		51.6	3500	8.8	1 1/4"	1 1/4"	17.5	1 1/4"	1 1/4"
330	51.6	39.2	4030	10.1	1 1/4"	1 1/4"	20.2	1 1/4"	1 1/4"
340		51.6	5620	14.1	1 1/4"	1 1/4"	28.1	1 1/4"	1 1/4"
350		64	7520	18.8	2"	2"	37.6	2"	2"
360	64	76.4	9220	23.1	2"	2"	46.1	2"	2"
370		88.8	10920	27.3	2"	2"	54.6	2"	2"
440		51.6	7840	19.6	2"	2"	39.2	2"	2"
450	64	64	10498	26.2	2"	2"	52.5	2"	2"
460		76.4	12710	31.8	2"	2"	63.6	2"	2"
470		88.8	15150	37.9	2"	2"	75.8	2"	2"
480	76.4	101.2	17590	44	2"	2"	88	2"	2"
550		64	13990	35	2 1/2"	2 1/2"	70	2 1/2"	2 1/2"
560		76.4	16950	42.4	2 1/2"	2 1/2"	84.8	2 1/2"	2 1/2"
570	88.8	88.8	20240	50.6	2 1/2"	2 1/2"	101.2	2 1/2"	2 1/2"
580		101.2	23480	58.7	2 1/2"	2 1/2"	117.4	2 1/2"	2 1/2"
660		76.4	20440	51.1	2 1/2"	2 1/2"	102.2	2 1/2"	2 1/2"
670	101.2	88.8	24470	61.2	2 1/2"	2 1/2"	122.4	2 1/2"	2 1/2"
680		101.2	28390	71	2 1/2"	2 1/2"	142	2 1/2"	2 1/2"
770		88.8	28710	71.8	2 1/2"	2 1/2"	143.6	2 1/2"	2 1/2"
780	113.6	101.2	33270	83.2	2 1/2"	2 1/2"	166.4	2 1/2"	2 1/2"
7100		126	42590	106.5	2 1/2"	2 1/2"	213	2 1/2"	2 1/2"
8100		126	48110	120.3	3"	3"	240.6	3"	3"
9100	126	126	53750	134.4	3"	3"	268.8	3"	3"
10100		126	59400	154.4	3"	3"	297	3"	3"

CONSTRUCTION

- a) Fan casings are constructed of galvanized steel, with a series of punched holes or welded nuts allow the fixing of accessories such as frames or support legs thus providing a variety of discharge positions.
- b) The impeller is rust proof and securely fixed to the shaft. All fan impellers are statically and dynamically balanced according to E90600 and VDI 2060.
- c) Fan shafts are of steel machined to close tolerances and protected by anticorrosive paint.
- d) High precision ballbearings are permanently lubricated. Single row ballbearings are supplied on sizes 180 to 710, double row bearings in cast-iron housings are supplied on sizes 800 to 1000.
- e) 39FD air handling units are supplied with forward curved, backward curved or air foil blades. For backward and air foil; curved fan blades contact SSI sales office.

UNIT SIZE 39F	FAN SIZE	LENGTH		A(inch)
		Horizontal discharge	Vertical discharge	
220	180	3	3	9
230	225	3	3	11.33
240	250	3	3	12.67
330	250	4	4	17.83
340	355	4	5	17.83
350	355	4	5	17.83
360	355	4	5	17.83
370	355	4	5	17.83
440	450	5	5	22.4
450	500	5	6	25.11
460	560	5	6	28.15
470	560	5	6	28.15
480	560	5	6	28.15
550	560	6	6	35.35
560	560	6	7	35.35
570	710	6	7	35.35
580	710	6	7	35.35
660	710	7	7	35.35
670	710	7	7	35.35
680	710	7	7	35.35
770	800	7	8	39.64
780	900	7	8	44.49
7100	1000	7	8	49.88
8100	1000	7	8	49.88
9100	1000	7	8	49.88
10100	1000	7	8	49.88

Table 9: Fan Section Dimensions

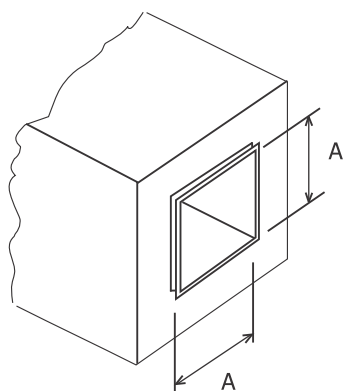


Figure 8: V.S.H

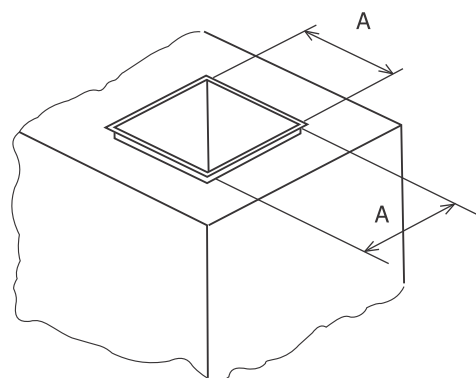


Figure 9: V.S.V

A-MOTORS

Description

The specifications for motors used with centrifugal fans is:

- thermal overload protection (normally closed)
- three phase (star / delta)
- insulation class F, max. ambient temperature: 140°F

Installation

The motor is mounted on an adjustable base so that belt tension can be easily adjusted. Dependent upon motor power and fan size the motor can be installed :

- On the base frame at the back of the fan.
- On the fan casing (max motor power 5.5 Kw).

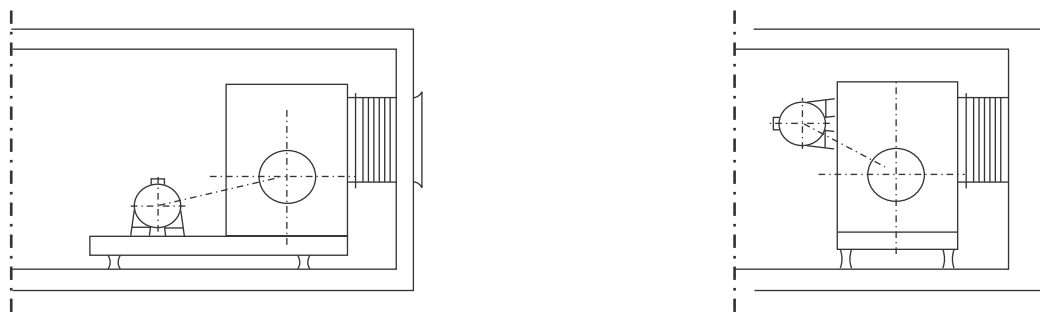


Figure 10 : Fan motor arrangement

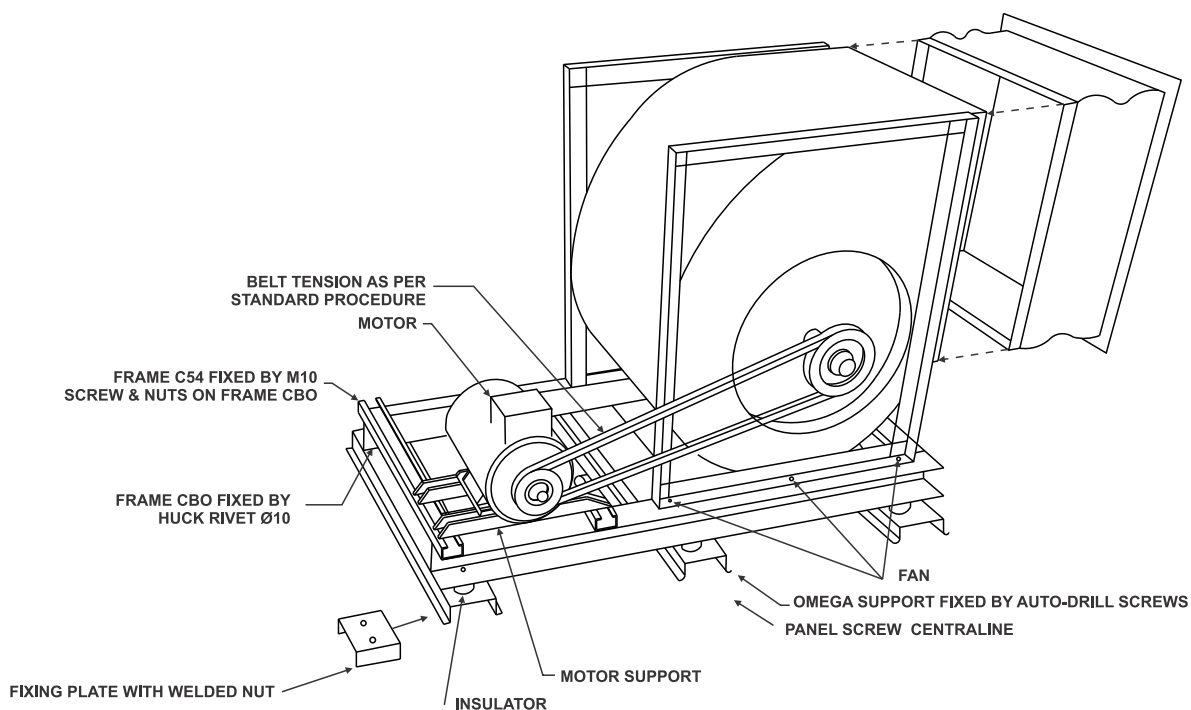
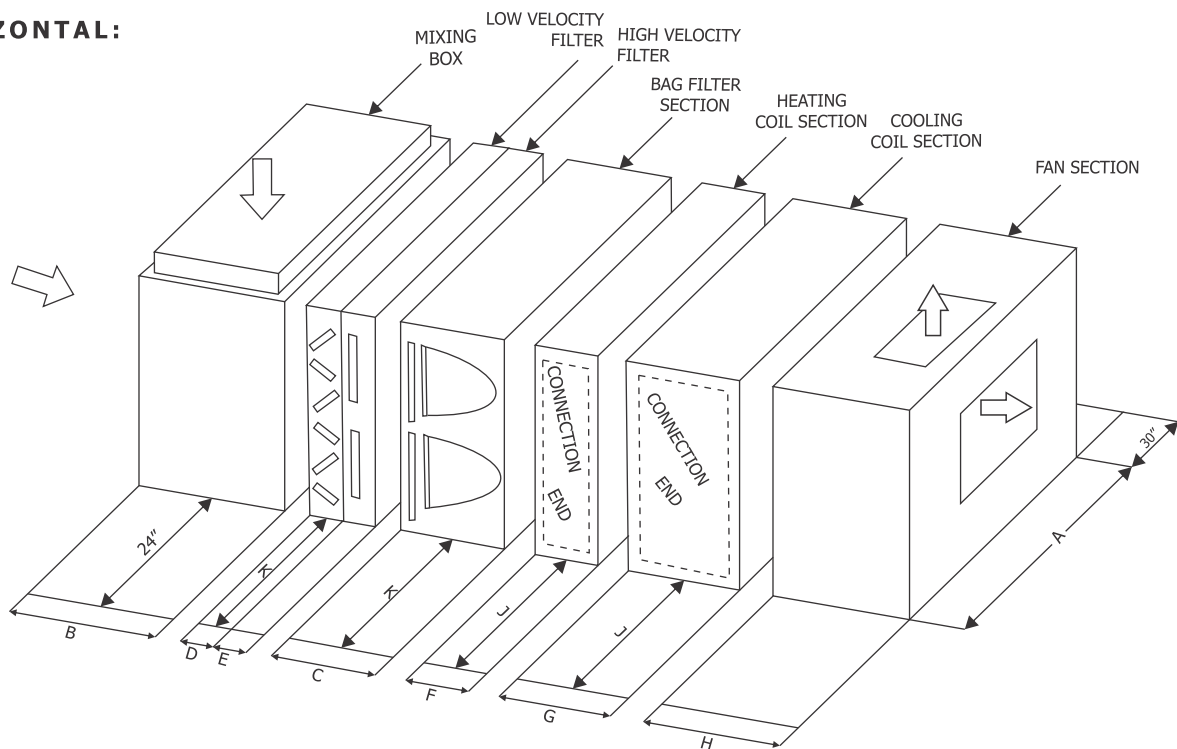


Figure 11: Fan and Motor Assembly on the Fan and Motor Base

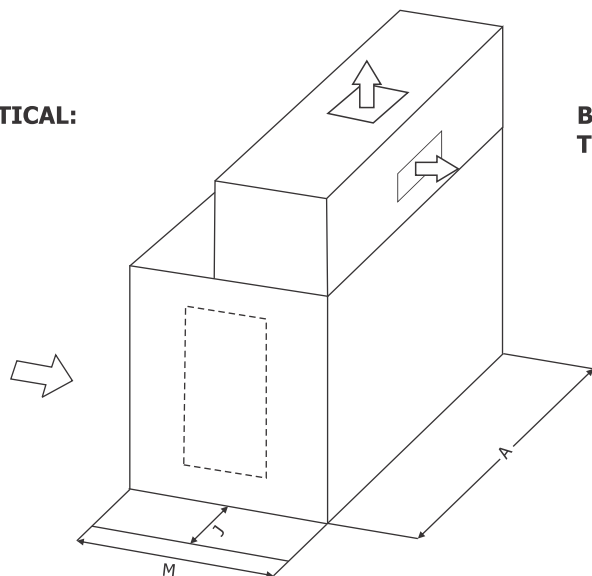
SERVICE AREA REQUIREMENTS



HORIZONTAL:



VERTICAL:



BLOW THRU :

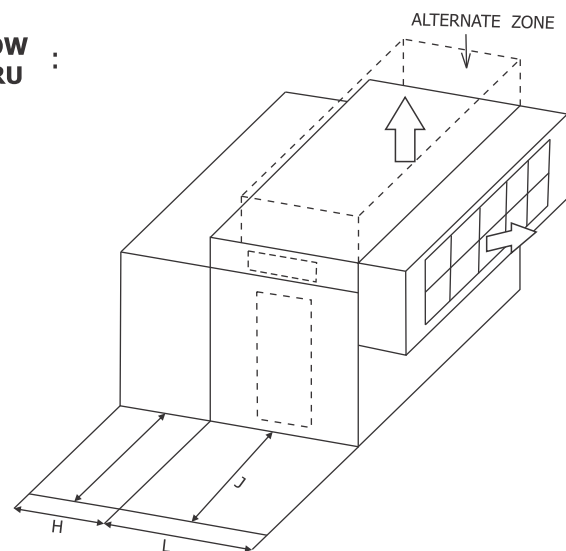


Figure 12

* K is required area for access door

* J is required area for coil connection and motor

SIZE	220	230	240	330	340	350	360	370	440	450	460	470	480	550	560	570	580	660	670	680	770	780	7100	8100	9100	10100	Dim.in inches
A	26.8	39.2	51.6	39.2	51.6	64	76.4	88.8	51.6	64	76.4	88.8	101.2	64	76.4	88.8	101.2	76.4	88.8	101.2	88.8	101.2	126	126	126	126	
B	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	39.2	39.2	39.2	39.2	39.2	39.2	39.2	51.6	51.6	51.6	51.6	51.6	51.6	
C	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	
D	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	
E	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	
F	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	
G	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	
H	39.2	39.2	39.2	51.6	51.6	51.6	51.6	51.6	64	64	64	64	64	76.4	76.4	76.4	76.4	88.8	88.8	88.8	88.8	88.8	88.8	88.8	88.8	88.8	
H	39.2	39.2	39.2	51.6	64	64	64	64	64	76.4	76.4	76.4	76.4	88.8	88.8	88.8	88.8	88.8	88.8	88.8	101.2	101.2	101.2	101.2	101.2	101.2	
K	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
J	43	56	68	56	68	80	93	105	68	80	93	105	118	80	93	105	118	93	105	118	105	118	142	142	142	142	
L	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	76.4	76.4	76.4	76.4	88.8	88.8	88.8	88.8	88.8	101.2	101.2	101.2	101.2	101.2	101.2	101.2	101.2	101.2	
M	DEPENDENT ON REQUESTED SECTIONS																										

DEPENDENT ON REQUESTED SECTIONS

Table 10

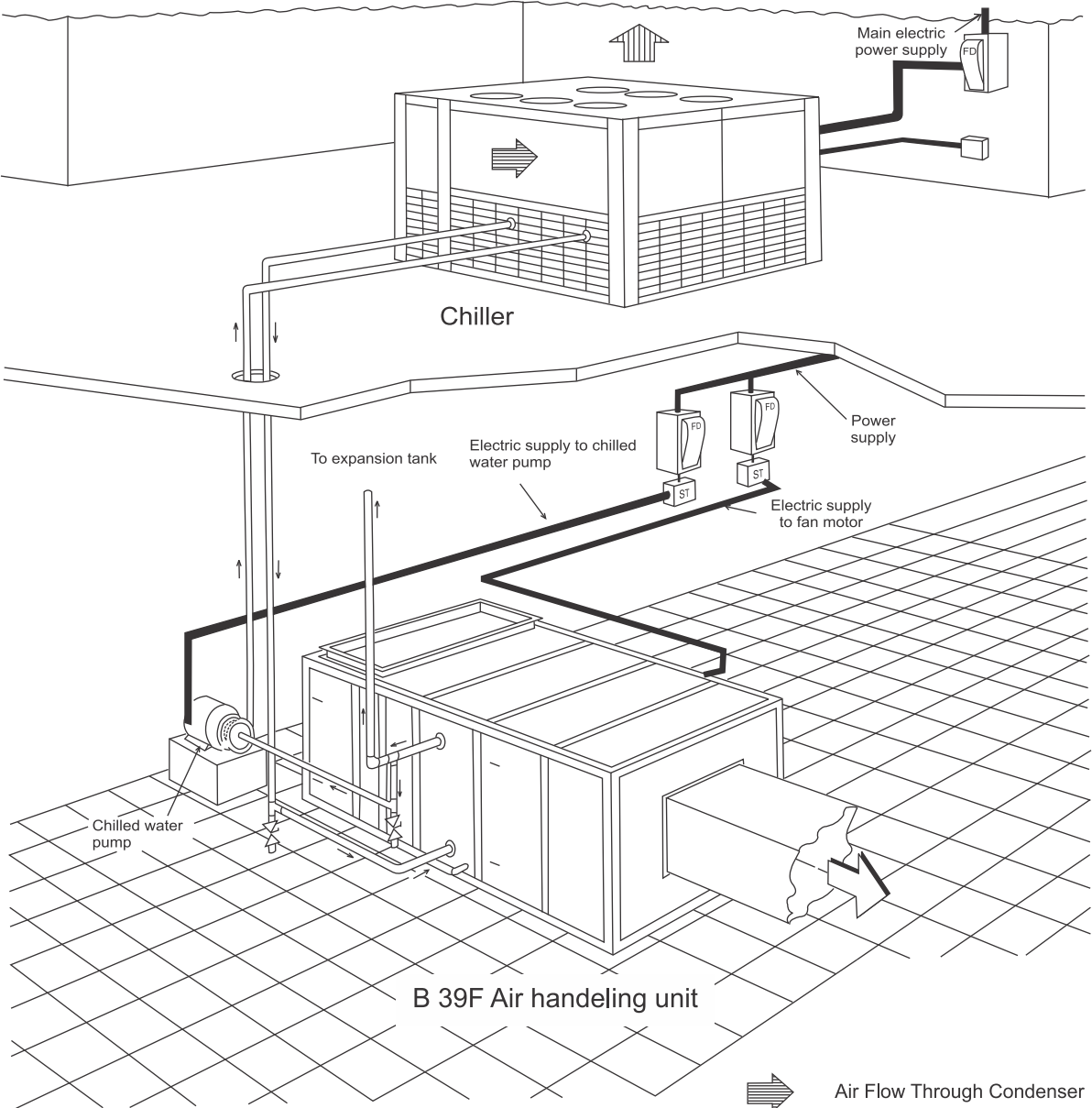


Figure 13

- ➡ Air Flow Through Condenser
- ➡ Air Flow Through Air Handling Unit
- Power Lines
- Control Lines
- ↔ Water Piping
- ST - Starter
- FD - Fused Disconnect Switch

ITEM	AHU Model	Weight(kg)												
		Empty Section										Damper each	Filter	
		1M	2M	3M	4M	5M	6M	7M	8M	9M	10M		Metalic	Soft Bag
1	39FD220	33	52	68	84	100	116	133	147	165	180	5	5	3
2	39FD230	45	67	88	108	129	147	169	188	210	229	7	6	5
3	39FD240	54	79	103	125	150	172	196	218	243	265	9	9	5
4	39FD330	56	80	107	129	154	176	201	223	249	271	10	10	6
5	39FD340	66	95	122	147	176	201	230	254	283	308	12	11	9
6	39FD350	79	111	144	173	206	234	267	296	330	359	16	15	10
7	39FD360	89	125	161	193	229	260	296	328	364	396	19	17	12
8	39FD370	103	143	182	219	259	295	334	370	410	447	22	20	14
9	39FD440	79	110	142	171	204	231	264	292	325	352	16	17	9
10	39FD450	95	129	166	198	235	266	304	336	373	405	21	20	12
11	39FD460	106	144	184	219	259	294	333	369	408	443	25	25	13
12	39FD470	121	164	208	246	292	330	374	413	458	497	28	29	17
13	39FD480	133	179	226	267	315	356	404	447	495	538	31	33	18
14	39FD550	108	146	187	223	264	299	340	375	417	452	23	26	17
15	39FD560	122	163	207	245	289	328	372	409	454	493	28	30	19
16	39FD570	140	185	233	275	325	366	415	457	505	548	31	35	23
17	39FD580	153	201	252	298	350	394	446	491	544	591	35	40	37
18	39FD660	138	182	230	271	319	360	408	449	498	539	34	38	21
19	39FD670	157	206	257	303	356	400	453	498	551	596	37	42	26
20	39FD680	173	224	278	327	383	430	486	535	592	642	42	46	27
21	39FD770	176	227	283	331	388	436	493	540	597	646	44	50	32
22	39FD780	191	246	306	356	417	468	527	579	640	692	50	56	35
23	39FD7100	230	292	358	416	484	541	608	668	738	800	65	71	43
24	39FD8100	250	319	389	450	522	584	654	720	795	862	71	78	52
25	39FD9100	272	348	423	490	567	632	704	777	858	930	77	86	63
26	39FD10100	296	380	460	533	617	684	763	840	927	1005	85	95	76

Table 11

ITEM	AHU Model	Weight(kg)					ITEM	AHU Model	Weight(kg)										
		Humidifier				Fan Section			Standard Coil					Droplet Eliminator	Coil Water Charge				
		1spray	Water Charge	2spray	Water Charge				1	2	4	6	8		1	2	4	6	8
1	39FD220	187	154	264	231	50	1	39FD220	6	8	20	25	31	12	1	2	4	6	8
2	39FD230	226	237	325	352	50	2	39FD230	7	11	30	37	46	20	1	3	6	9	11
3	39FD240	242	319	341	473	50	3	39FD240	9	15	40	51	62	28	2	4	8	12	15
4	39FD330	253	237	363	352	116	4	39FD330	11	20	50	66	80	32	2	6	12	18	23
5	39FD340	286	319	413	473	127	5	39FD340	14	25	59	81	98	40	4	9	17	25	32
6	39FD350	347	407	506	605	127	6	39FD350	15	27	63	87	105	43	4	9	18	26	34
7	39FD360	402	473	589	792	127	7	39FD360	16	29	67	93	113	46	5	10	20	30	39
8	39FD370	451	572	666	847	127	8	39FD370	17	30	70	98	119	49	5	10	20	30	39
9	39FD440	369	319	534	473	176	9	39FD440	18	32	74	103	125	53	6	11	23	34	44
10	39FD450	413	407	605	605	292	10	39FD450	21	40	90	127	154	69	7	13	29	42	55
11	39FD460	473	473	699	792	292	11	39FD460	29	52	116	163	197	84	9	17	33	51	66
12	39FD470	539	572	792	847	292	12	39FD470	32	59	132	186	224	99	10	20	39	58	75
13	39FD480	600	660	891	974	292	13	39FD480	40	69	142	197	238	105	11	21	40	60	78
14	39FD550	468	407	704	605	319	14	39FD550	48	79	152	208	251	111	11	22	44	66	86
15	39FD560	539	473	803	792	429	15	39FD560	56	89	162	219	264	117	12	23	46	68	88
16	39FD570	616	572	891	847	429	16	39FD570	66	98	171	231	278	123	12	23	47	70	91
17	39FD580	682	660	1023	974	429	17	39FD580	70	104	182	247	298	130	13	25	50	75	97
18	39FD660	616	473	919	792	468	18	39FD660	72	109	193	264	318	138	14	27	54	82	107
19	39FD670	699	572	1045	847	468	19	39FD670	75	114	206	281	338	146	14	29	57	87	113
20	39FD680	759	660	1172	974	468	20	39FD680	82	125	216	303	365	149	16	32	64	96	125
21	39FD770	776	572	1172	847	715	21	39FD770	90	136	234	325	391	171	18	34	68	103	134
22	39FD780	869	660	1320	974	715	22	39FD780	98	147	248	347	417	183	20	40	80	120	150
23	39FD7100	1051	825	1595	1221	770	23	39FD7100	106	158	262	369	444	195	21	42	84	126	158
24	39FD8100	1170	825	1775	1221	847	24	39FD8100	114	169	276	391	470	207	23	46	92	138	174
25	39FD9100	1300	825	1965	1221	932	25	39FD9100	122	180	290	413	497	219	24	48	96	144	180
26	39FD10100	1440	825	2175	1221	1025	26	39FD10100	130	191	304	435	523	231	26	52	104	156	196

Note: Fan section weight includes fan, frame and motor.