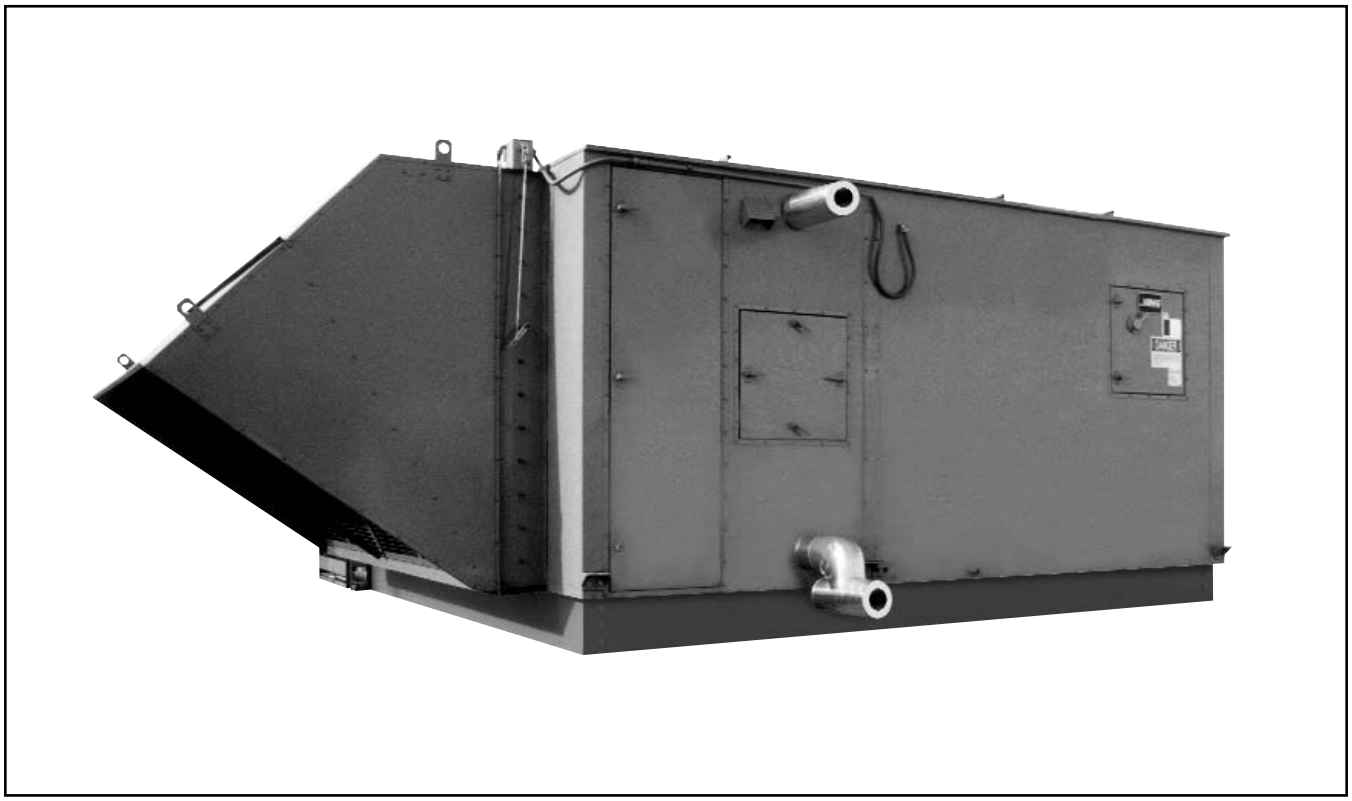
STEADYAIR®
TECHNICAL GUIDE



A COMPLETE AIR TEMPERING PACKAGE FOR COMMERCIAL, INSTITUTIONAL, AND INDUSTRIAL APPLICATIONS

LJ ING®

Since 1875, the L.J. Wing Company has been a leader in providing innovative solutions for difficult HVAC problems. The Steadyair® make-up air system (or SAS) combines the freeze-protection benefits of the Wing integral face and bypass coil with dependable air delivery in a single-source package.

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www.ljwing.com

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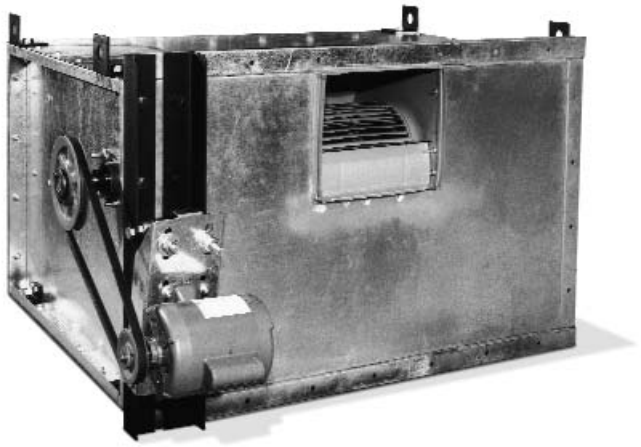
GENERAL INFORMATION

L.J. Wing's Steadyair® heating and ventilating modular package provides the user with new levels of operating reliability, system flexibility, maintenance convenience and overall savings.

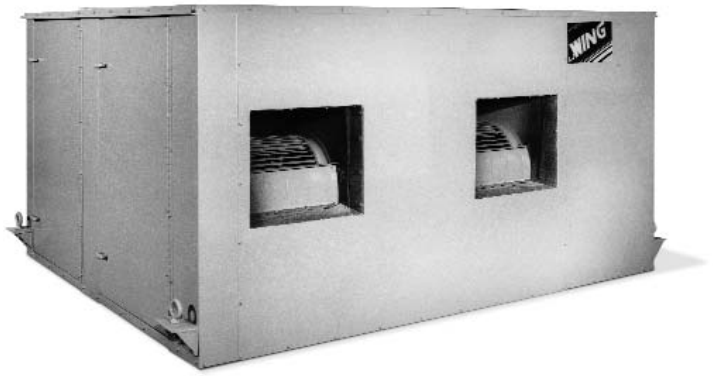
It features all the advantages of Wing's popular IFB Series of horizontal tube integral face and bypass coils – constant volume, positive freeze protection, accurate temperature control, elimination of stratification, and single source responsibility. The high quality standards of Wing are reflected in every component of the Steadyair® – integral face and bypass coils, centrifugal fan, intake hood, filter box, mixing box, and other accessories.

Maintaining Wing's high standard of design and desire to satisfy the customer's needs, the SAS is designed specifically for either indoor or outdoor applications.

The modular design provides the user with system flexibility. Wing's Steadyair® is readily adapted to existing ductwork, new construction, and rooftop or truss mounting. When fitted with one of Wing's unique optional vertical discharges, costly ductwork runs can be eliminated to significantly reduce installation costs. In total, the Steadyair® is an ideal air handling solution for today's industrial, commercial and institutional needs.



Indoor



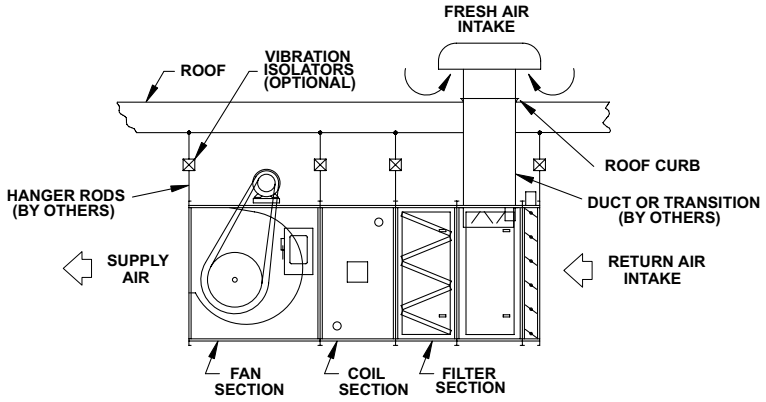
Outdoor

INSTALLATION

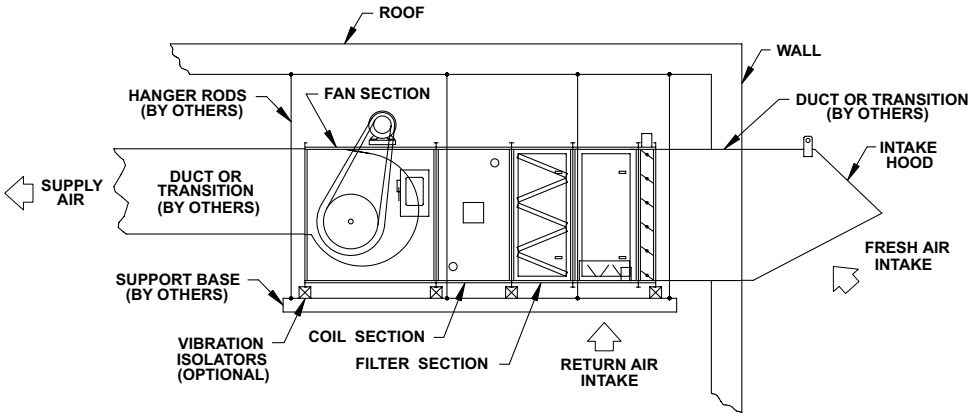
Typical Installation Arrangements

C000026

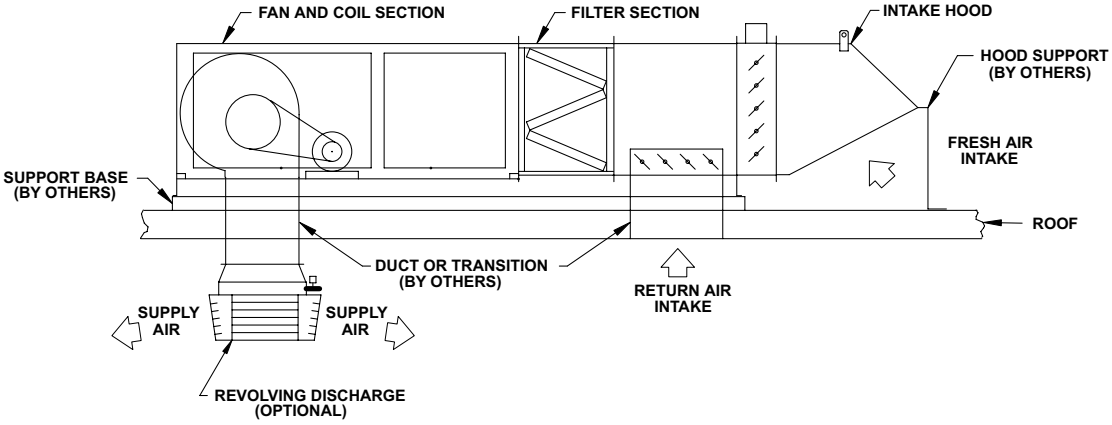
INDOOR CEILING SUSPENDED UNIT



INDOOR BASE SUPPORTED UNIT



OUTDOOR ROOF MOUNTED UNIT



NOTES

1. VIBRATION ISOLATORS ARE RECOMMENDED FOR ALL INSTALLATIONS.
2. FLEXIBLE DUCT AND PIPING CONNECTIONS ARE REQUIRED AS PART OF A COMPLETE VIBRATION ISOLATION SYSTEM.
3. SUPPORT BASE, HANGER RODS, FLEXIBLE PIPING AND DUCT CONNECTIONS TO BE PROVIDED BY OTHERS.

UNIT SELECTION

Selection Procedure and Example

Selection Procedure

Given:

- Indoor or outdoor application.
- Airflow rate at standard conditions of 70 degrees F at sea level.
- Entering Air Temperature, EAT, in degrees F.
- Desired Leaving Air Temperature, LAT desired, in degrees F.
- Steam pressure in psig or Hot Water Entering Temperature, EWT, in degrees F and Water Flow Rate, GPM.
- External Static pressure, ESP, in inches.
- Electrical Service characteristics in volts/phase/hertz.
- Desired optional accessories.
- Controls handing and discharge direction.

Procedure:

1. Select SAS model size from Unit Selection Table on page 7. In many instances, more than one model will be applicable.
2. Determine IFB coil performance using Coil Performance Calculation Procedure on page 12 for Steam coils or page 14 for Hot Water coils.
3. Determine system total static pressure requirement as the sum of the given External Static Pressure, the IFB coil air pressure drop, and the static pressure drop losses from the AIR Pressure Drop for Optional Accessories Table below for any optional accessories.
4. Using the given standard airflow rate, the SAS model number from Step 1, and the total static pressure, TSP, calculated in Step 3, look up the required motor horsepower from the Fan Performance tables on pages 8-11.
5. Look up the last three letters of the model number from the Model Number Description shown on page 7 based on the given coil handing and discharge direction.

Air Pressure Drop for Optional Accessories

Item	Static Pressure Loss (inches w.c.)
Intake hood with birdscreen	0.13
Motorized inlet damper	0.13
Mixing dampers	0.13
V-Bank filter section	0.25
Louvered Discharge	0.25
Louvered Discharge	See tables, pages on 26-27

Example:

Given:

- Outdoor application.
- Standard airflow = 5,800 scfm.
- EAT = -10 degrees F.
- Desired LAT = 69 degrees F.
- Steam pressure = 15 psig.
- ESP = 0.0 inches w.c.
- Electrical Service = 230volt/3 phase/60 Hz.
- Optional accessories: Intake hood, type 8R discharge.
- Right hand controls and bottom discharge.

Procedure:

1. From Unit Selection Table, it can be seen that either a model SAS(W)–115 or SAS(W)-118 will be applicable. Let us select the larger model, SAS(W)-118, to yield lower pressure drops and lower operating costs.
2. From Steam Coil Selection example on page 12:
   LAT = 70.0 degrees F.
   APD = 0.31 inches w.c.
   Q = 503,440 Btuh.
   CL = 532.7 lbm/hr
3. From Table 3 for intake hood: S.P. = 0.13 inches w.c.
   From the Optional Vertical Discharge Selection Coil Performance Table on page 12 for a SAS(W)–118 handling 5,800 scfm equipped with a type 8R discharge:
   S.P. = 0.14 inches w.c.
   Totalling the S.P. losses:
   T.S.P. = 0.0 + 0.13 + 0.14 + 0.31 = 0.58 inches w.c.
4. From the Fan Performance Table on page 10 for an SAS(W) – 118 with an airflow rate of 5,800 scfm and TSP = 0.58 inches w.c., a 1-1/2 HP motor is required.
5. From the Model Number Description it can be seen that the proper designation is HRB for right hand controls and bottom discharge. The complete model number for the unit selected is therefore SAS(W)-118-HRB.

UNIT SELECTION

Unit Selection Table

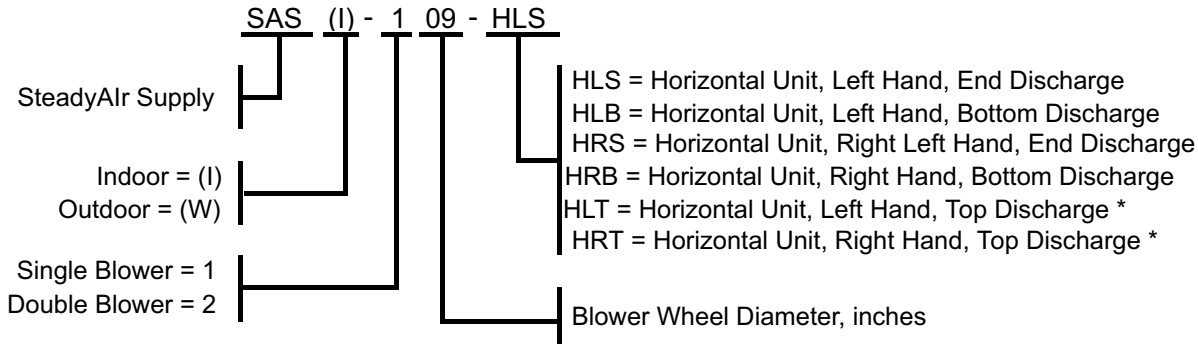
INDOOR UNITS - SAS(I)

	UNIT MODEL NO. (-)	MINIMUM AIRFLOW (CFM)	MAXIMUM AIRFLOW (CFM)	COIL MODEL NO. (-)	COIL OUTLET AREA (sq. ft.)
Single Blower	SAS(I)-109	1,000	3,000	B-36	6.21
	SAS(I)-112	2,000	4,250	B-36	6.21
	SAS(I)-115	3,000	6,000	C-42	9.67
	SAS(I)-118	4,000	8,000	C-42	9.67
	SAS(I)-120	6,000	11,000	E-54	18.70
	SAS(I)-122	11,000	16,000	E-54	18.70
	SAS(I)-125	14,000	20,000	F-66	26.70
Double Blower	SAS(I)-218	8,000	16,000	C-84	19.40
	SAS(I)-220	12,000	26,000	E-114	39.60
	SAS(I)-222	22,000	31,000	E-114	39.60
	SAS(I)-225	28,000	35,000	F-120	48.70

OUTDOOR UNITS - SAS(W)

	UNIT MODEL NO. (-)	MINIMUM AIRFLOW (CFM)	MAXIMUM AIRFLOW (CFM)	COIL MODEL NO. (-)	COIL OUTLET AREA (sq. ft.)
Single Blower	SAS(W)-109	1,000	3,000	A-36	4.14
	SAS(W)-112	2,000	4,250	A-36	4.14
	SAS(W)-115	3,000	6,000	C-42	9.67
	SAS(W)-118	4,000	8,000	C-42	9.67
Double Blower	SAS(W)-215	6,000	12,000	C-60	13.90
	SAS(W)-220	12,000	26,000	E-96	33.40
	SAS(W)-222	22,000	31,000	E-108	37.50
	SAS(W)-225	28,000	35,000	E-120	41.70

Model Number Description



* Configuration available on indoor units only

FAN PERFORMANCE

Single Blower Indoor Units

SAS (I) Model No.	CFM Std. Air @ 70°	Fan Outlet Velocity "FPM"	Total Static Pressure									
			.250	.375	.500	.750	1.000	1.250	1.500	2.000	2.500	3.000
			Horse Power									
109	1000	1196	1/2	1/2	—	—	—	—	—	—	—	—
	1250	1495	1/2	1/2	1/2	1/2	1/2	—	—	—	—	—
	1500	1794	1/2	1/2	1/2	1/2	1/2	1/2	3/4	—	—	—
	1750	2093	1/2	1/2	1/2	1/2	3/4	3/4	1	1 1/2	—	—
	2000	2392	1/2	3/4	3/4	3/4	1	1	1	1 1/2	1 1/2	—
	2250	2691	3/4	3/4	1	1	1	1 1/2	1 1/2	1 1/2	2	3
	2500	2990	1	1	1	1 1/2	1 1/2	1 1/2	1 1/2	2	2	3
	2750	3289	1 1/2	1 1/2	1 1/2	1 1/2	2	2	2	3	3	3
	3000	3589	2	2	2	2	2	2	3	3	—	—
112	2000	1389	1/2	1/2	1/2	3/4	3/4	3/4	1	1 1/2	—	—
	2250	1563	1/2	1/2	1/2	3/4	3/4	3/4	1	1 1/2	—	—
	2500	1736	1/2	1/2	1/2	3/4	3/4	1	1 1/2	1 1/2	—	—
	2750	1910	1/2	3/4	3/4	1	1	1 1/2	1 1/2	2	—	—
	3000	2083	3/4	3/4	3/4	1	1	1 1/2	1 1/2	2	—	—
	3250	2257	3/4	3/4	1	1 1/2	1 1/2	1 1/2	1 1/2	2	3	—
	3500	2431	—	1	1	1 1/2	1 1/2	2	2	3	3	3
	3750	2604	—	—	—	1 1/2	2	2	2	3	3	5
	4000	2778	—	—	—	2	2	2	3	3	3	5
	4250	2951	—	—	—	—	2	3	3	3	5	5
115	3000	1493	1/2	1/2	1/2	3/4	1	—	—	—	—	—
	3250	1617	1/2	1/2	1/2	3/4	1	1 1/2	—	—	—	—
	3500	1741	1/2	3/4	3/4	1	1	1 1/2	1 1/2	—	—	—
	3750	1866	—	3/4	3/4	1	1 1/2	1 1/2	1 1/2	—	—	—
	4000	1990	—	1	1	1	1 1/2	1 1/2	2	3	—	—
	4250	2114	—	1	1	1 1/2	1 1/2	2	2	3	—	—
	4500	2239	—	—	1 1/2	1 1/2	1 1/2	2	2	3	3	—
	4750	2363	—	—	—	1 1/2	2	2	2	3	5	—
	5000	2488	—	—	—	2	2	2	3	3	5	5
	5250	2612	—	—	—	2	2	3	3	3	5	5
	5500	2736	—	—	—	—	3	3	3	5	5	5
	5750	2861	—	—	—	—	3	3	5	5	5	5
	6000	2985	—	—	—	—	3	3	5	5	5	5
118	4000	1394	1/2	1/2	3/4	1	1 1/2	—	—	—	—	—
	4500	1568	3/4	3/4	3/4	1	1 1/2	1 1/2	—	—	—	—
	5000	1742	—	1	1	1 1/2	1 1/2	2	2	—	—	—
	5500	1916	—	1	1 1/2	1 1/2	2	2	3	—	—	—
	6000	2090	—	1 1/2	1 1/2	2	2	3	3	5	—	—
	6500	2265	—	—	2	2	3	3	3	5	5	—
	7000	2439	—	—	—	3	3	3	5	5	5	—
	7500	2613	—	—	—	3	3	3	5	5	7 1/2	7 1/2
	8000	2787	—	—	—	3	5	5	5	5	7 1/2	7 1/2
120	6000	1429	1	1	1 1/2	1 1/2	2	—	—	—	—	—
	7000	1667	1 1/2	1 1/2	1 1/2	2	2	3	—	—	—	—
	8000	1905	—	2	2	3	3	5	5	—	—	—
	9000	2143	—	3	3	3	3	5	5	5	7 1/2	—
	10000	2381	—	—	3	5	5	5	5	7 1/2	7 1/2	—
	11000	2619	—	—	—	5	5	5	7 1/2	7 1/2	10	10
122	11000	2156	—	3	5	5	5	5	7 1/2	7 1/2	—	—
	12000	2353	—	5	5	5	5	7 1/2	7 1/2	7 1/2	10	—
	13000	2549	—	5	5	7 1/2	7 1/2	7 1/2	7 1/2	10	10	15
	14000	2745	—	—	7 1/2	7 1/2	7 1/2	7 1/2	10	10	15	15
	15000	2941	—	—	—	7 1/2	10	10	10	15	15	15
	16000	3137	—	—	—	—	10	10	15	15	15	20

FAN PERFORMANCE

Double Blower Indoor Units

SAS(1) Model No.	CFM Std. Air @ 70°	Fan Outlet Velocity "FPM"	Total Static Pressure									
			.250	.375	.500	.750	1.000	1.250	1.500	2.000	2.500	3.000
			Horse Power									
	14000	2086	—	3	5	5	5	7 1/2	7 1/2	7 1/2	—	—
	15000	2236	—	—	5	5	7 1/2	7 1/2	7 1/2	10	10	—
	16000	2385	—	—	—	7 1/2	7 1/2	7 1/2	10	10	15	—
125	17000	2554	—	—	—	7 1/2	7 1/2	10	10	10	15	15
	18000	2683	—	—	—	—	10	10	10	15	15	15
	19000	2838	—	—	—	—	10	10	15	15	15	20
	20000	2981	—	—	—	—	10	15	15	15	20	20
	8000	1394	1	1	1 1/2	2	—	—	—	—	—	—
	9000	1568	1	1 1/2	1 1/2	2	3	—	—	—	—	—
	10000	1742	1/2	2	2	3	3	5	5	—	—	—
	11000	1916	—	2	3	3	5	5	7 1/2	—	—	—
218	12000	2091	—	3	3	5	5	5	7 1/2	7 1/2	—	—
	13000	2265	—	—	5	5	5	7 1/2	7 1/2	7 1/2	10	—
	14000	2439	—	—	5	5	7 1/2	7 1/2	7 1/2	10	10	15
	15000	2613	—	—	—	7 1/2	7 1/2	7 1/2	7 1/2	10	15	15
	16000	2787	—	—	—	7 1/2	7 1/2	10	10	10	15	15
	12000	1429	2	2	3	3	5	—	—	—	—	—
	13000	1548	2	3	3	3	5	5	—	—	—	—
	14000	1667	3	3	3	5	5	5	7 1/2	—	—	—
	15000	1786	3	3	5	5	5	7 1/2	7 1/2	—	—	—
	16000	1905	3	5	5	5	5	7 1/2	7 1/2	—	—	—
	17000	2024	—	5	5	5	7 1/2	7 1/2	7 1/2	10	—	—
	18000	2143	—	5	5	7 1/2	7 1/2	7 1/2	10	10	—	—
220	19000	2262	—	7 1/2	7 1/2	7 1/2	7 1/2	7 1/2	10	15	15	—
	20000	2381	—	—	7 1/2	7 1/2	7 1/2	10	10	15	15	—
	21000	2500	—	—	—	7 1/2	10	10	15	15	20	20
	22000	2619	—	—	—	10	10	15	15	15	20	20
	23000	2738	—	—	—	10	15	15	15	15	20	20
	24000	2857	—	—	—	—	15	15	15	20	20	25
	25000	2976	—	—	—	—	15	15	15	20	20	25
	26000	3095	—	—	—	—	15	15	20	20	25	25
	22000	2156	5	7 1/2	7 1/2	7 1/2	10	10	15	15	—	—
	23000	2255	7 1/2	7 1/2	7 1/2	10	10	10	15	15	20	—
	24000	2353	—	—	7 1/2	10	10	15	15	15	20	—
	25000	2451	—	—	10	10	15	15	15	20	20	25
222	26000	2549	—	—	—	15	15	15	15	20	20	25
	27000	2647	—	—	—	15	15	15	20	20	25	25
	28000	2745	—	—	—	15	15	15	20	20	25	30
	29000	2843	—	—	—	15	15	20	20	25	25	30
	30000	2941	—	—	—	15	20	20	20	25	25	30
	31000	3039	—	—	—	20	20	20	25	25	30	30
	28000	2086	—	7 1/2	7 1/2	10	10	15	15	20	—	—
	29000	2161	—	7 1/2	7 1/2	10	15	15	15	20	—	—
	30000	2236	—	—	7 1/2	10	15	15	15	20	20	—
	31000	2310	—	—	10	10	15	15	15	20	25	—
	32000	2385	—	—	—	15	15	15	20	20	25	—
225	33000	2459	—	—	—	15	15	15	20	20	25	—
	34000	2554	—	—	—	15	15	20	20	25	25	30
	35000	2608	—	—	—	15	15	20	20	25	30	30
	36000	2604	—	—	—	15	20	20	20	25	30	30
	37000	2604	—	—	—	15	20	20	20	25	30	40
	38000	2604	—	—	—	—	20	20	20	25	30	40
	39000	2604	—	—	—	—	20	20	20	25	40	40
	40000	2604	—	—	—	—	20	20	20	25	40	40

FAN PERFORMANCE

Single Blower Outdoor Units

SAS(W) Model No.	CFM Std. Air @ 70°	Fan Outlet Velocity "FPM"	Total Static Pressure									
			.250	.375	.500	.750	1.000	1.250	1.500	2.000	2.500	3.000
			Horse Power									
109	1000	1196	1/2	1/2	—	—	—	—	—	—	—	—
	1250	1495	1/2	1/2	1/2	1/2	1/2	—	—	—	—	—
	1500	1794	1/2	1/2	1/2	1/2	1/2	1/2	3/4	—	—	—
	1750	2093	1/2	1/2	1/2	1/2	3/4	3/4	1	1 1/2	—	—
	2000	2392	1/2	3/4	3/4	3/4	1	1	1	1 1/2	1 1/2	—
	2250	2691	3/4	3/4	1	1	1	1 1/2	1 1/2	1 1/2	2	3
	2500	2990	1	1	1	1 1/2	1 1/2	1 1/2	1 1/2	2	2	3
	2750	3289	1 1/2	1 1/2	1 1/2	1 1/2	2	2	2	3	3	3
	3000	3589	2	2	2	2	2	2	3	3	—	—
112	2000	1389	1/2	1/2	1/2	3/4	3/4	3/4	1	1 1/2	—	—
	2250	1563	1/2	1/2	1/2	3/4	3/4	3/4	1	1 1/2	—	—
	2500	1736	1/2	1/2	1/2	3/4	3/4	1	1 1/2	1 1/2	—	—
	2750	1910	1/2	3/4	3/4	1	1	1 1/2	1 1/2	2	—	—
	3000	2083	3/4	3/4	3/4	1	1	1 1/2	1 1/2	2	—	—
	3250	2257	3/4	3/4	1	1 1/2	1 1/2	1 1/2	1 1/2	2	3	—
	3500	2431	—	1	1	1 1/2	1 1/2	2	2	3	3	3
	3750	2604	—	—	—	1 1/2	2	2	2	3	3	5
115	3000	1493	1/2	1/2	1/2	3/4	1	—	—	—	—	—
	3250	1617	1/2	1/2	1/2	3/4	1	1 1/2	—	—	—	—
	3500	1741	1/2	3/4	3/4	1	1	1 1/2	1 1/2	—	—	—
	3750	1866	—	3/4	3/4	1	1 1/2	1 1/2	1 1/2	—	—	—
	4000	1990	—	1	1	1	1 1/2	1 1/2	2	3	—	—
	4250	2114	—	1	1	1 1/2	1 1/2	2	2	3	—	—
	4500	2239	—	—	1 1/2	1 1/2	1 1/2	2	2	3	3	—
	4750	2363	—	—	—	1 1/2	2	2	2	3	5	—
	5000	2488	—	—	—	2	2	2	3	3	5	5
	5250	2612	—	—	—	2	2	3	3	3	5	5
	5500	2736	—	—	—	—	3	3	3	5	5	5
	5750	2861	—	—	—	—	3	3	3	5	5	5
	6000	2985	—	—	—	—	3	3	5	5	5	5
118	4000	1394	1/2	1/2	3/4	1	1 1/2	—	—	—	—	—
	4500	1568	3/4	3/4	3/4	1	1 1/2	1 1/2	—	—	—	—
	5000	1742	—	1	1	1 1/2	1 1/2	2	2	—	—	—
	5500	1916	—	1	1 1/2	1 1/2	2	2	3	—	—	—
	6000	2090	—	1 1/2	1 1/2	2	2	3	3	5	—	—
	6500	2265	—	—	2	2	3	3	3	5	5	—
	7000	2439	—	—	—	3	3	3	5	5	5	—
	7500	2613	—	—	—	3	3	3	5	5	7 1/2	7 1/2
	8000	2787	—	—	—	3	5	5	5	5	7 1/2	7 1/2

FAN PERFORMANCE

Double Blower Outdoor Units

SAS(W) Model No.	CFM Std. Air @ 70°	Fan Outlet Velocity "FPM"	Total Static Pressure									
			.250	.375	.500	.750	1.000	1.250	1.500	2.000	2.500	3.000
			Horse Power									
215	6000	1493	3/4	1	1	1 1/2	2	—	—	—	—	—
	6500	1617	1	1	1 1/2	1 1/2	2	3	—	—	—	—
	7000	1741	1	1 1/2	1 1/2	2	2	3	3	—	—	—
	7500	1866	—	1 1/2	2	2	3	3	3	—	—	—
	8000	1990	—	2	2	2	3	3	5	5	—	—
	8500	2114	—	2	2	3	3	5	5	5	—	—
	9000	2239	—	3	3	3	3	5	5	7 1/2	—	—
	9500	2363	—	—	3	3	5	5	5	7 1/2	7 1/2	—
	10000	2488	—	—	—	5	5	5	5	7 1/2	7 1/2	10
	10500	2612	—	—	—	5	5	5	7 1/2	7 1/2	7 1/2	10
	11000	2736	—	—	—	5	5	5	7 1/2	7 1/2	10	10
	11500	2861	—	—	—	—	5	7 1/2	7 1/2	7 1/2	10	10
	12000	2985	—	—	—	—	7 1/2	7 1/2	7 1/2	10	10	15
220	12000	1429	2	2	3	3	5	—	—	—	—	—
	13000	1548	2	3	3	3	5	5	—	—	—	—
	14000	1667	3	3	3	5	5	5	7 1/2	—	—	—
	15000	1786	3	3	5	5	5	7 1/2	7 1/2	—	—	—
	16000	1905	3	5	5	5	5	7 1/2	7 1/2	—	—	—
	17000	2024	—	5	5	5	7 1/2	7 1/2	7 1/2	10	—	—
	18000	2143	—	5	5	7 1/2	7 1/2	7 1/2	10	10	—	—
	19000	2262	—	7 1/2	7 1/2	7 1/2	7 1/2	7 1/2	10	15	15	—
	20000	2381	—	—	7 1/2	7 1/2	7 1/2	10	10	15	15	—
	21000	2500	—	—	—	7 1/2	10	10	15	15	20	20
	22000	2619	—	—	—	10	10	15	15	15	20	20
	23000	2738	—	—	—	10	15	15	15	15	20	20
	24000	2857	—	—	—	—	15	15	15	20	20	25
	25000	2976	—	—	—	—	15	15	15	20	20	25
	26000	3095	—	—	—	—	15	15	20	20	25	25
222	22000	2156	5	7 1/2	7 1/2	7 1/2	10	10	15	15	—	—
	23000	2255	7 1/2	7 1/2	7 1/2	10	10	10	15	15	20	—
	24000	2353	—	—	7 1/2	10	10	15	15	15	20	—
	25000	2451	—	—	10	10	15	15	15	20	20	25
	26000	2549	—	—	—	15	15	15	15	20	20	25
	27000	2647	—	—	—	15	15	15	20	20	25	25
	28000	2745	—	—	—	15	15	15	20	20	25	30
	29000	2843	—	—	—	15	15	20	20	25	25	30
	30000	2941	—	—	—	15	20	20	20	25	25	30
	31000	3039	—	—	—	20	20	20	25	25	30	30
225	28000	2086	—	7 1/2	7 1/2	10	10	15	15	20	—	—
	29000	1563	—	7 1/2	7 1/2	10	10	15	15	15	—	—
	30000	1736	—	—	7 1/2	10	15	15	15	20	20	—
	31000	1910	—	—	10	10	15	15	15	20	25	—
	32000	2083	—	—	—	15	15	15	20	20	25	—
	33000	2257	—	—	—	15	15	15	20	20	25	—
	34000	2431	—	—	—	15	15	20	20	25	25	30
	35000	2604	—	—	—	15	15	20	20	25	30	30

COIL PERFORMANCE

Steam Coil Selection

Selection Procedure

Given:

- Airflow Rate through the coil, SCFM
- Coil model number from Unit selection table.
- Coil Outlet Area, OA, from Unit selection Table.
- Entering Air Temperature, EAT, in degrees F.
- Desired Leaving Air Temperature, LAT desired, in degrees F.
- Steam pressure in psig.

Procedure:

1. Calculate the coil Outlet velocity, OV, in ft/min. using:
   OV = SCFM/OA
2. Calculate the desired air temperature rise, ATR, in degrees F across the coil.
   Desired ATR = Desired LAT - EAT.
3. Enter the Steam Coil Performance Table on page 13 with the given EAT and OV from Step 1, then read the Air Temperature Rise, ATR, in degrees F and the Air Pressure Drop, APD, in inches w.c.
4. Calculate Heat transfer, Q, in Btuh:
   Q = 1.085 x SCFM x ATR
5. Calculate the air temperature leaving the coil:
   LAT = EAT + ATR.
6. Calculate condensate load, CL, in lbs./hr:
   CL = Q/LH,
   where LH = Latent heat from Steam Latent Heat Table below.

Example:

Given:

- Airflow rate = 5,800 SCFM.
- Model SAS (W) –118 has previously been selected.
- OA = 9.67 sq.ft. from Unit Selection Table.
- EAT = -10 degrees F.
- Desired LAT = 69 degrees F.
- Steam pressure = 15 psig.

Procedure:

1. OV = 5,800/9.67 = 600 sfpm.
2. Desired ATR = 69 – (-10) = 79 degrees F.
3. With EAT = -10 degrees F, Steam Pressure = 15 psig, and OV = 600 sfpm, a two row (single section) coil is found to give an ATR = 80 degrees F and an APD = 0.31 inches w.c.
4. Q = 1.085 x 5,800 x 80 = 503,440 Btuh.
5. LAT = -10 + 80 = 70 degrees F.
6. With LH = 945 Btu/lbm for 15 psig steam from Table 2:
   CL = 503,440/945 = 532.7 lbm/hr.

Note: Tabulated performance is for a coil with the standard fin spacing of 11 fins per inch. For performance at other fin spacings, use the Wing Specifier program. Consult your local Wing representative for a copy of the program or assistance.

STEAM LATENT HEAT

STEAM PRESSURE (PSIG)	LATENT HEAT (BTU)	STEAM PRESSURE (PSIG)	LATENT HEAT (BTU)
5	961	100	880
10	953	110	875
15	945	120	870
20	939	130	865
30	929	140	861
40	919	150	857
50	911	160	851
60	904	170	848
70	897	180	846
80	891	190	843
90	886	200	840

COIL PERFORMANCE

Steam Coil Selection

STP	Entering Air Temperature, EAT - Degrees F																																			
5	77	67	57	47	37	27	17	7	-3	-13	-23	-33	-43																							
10		79	69	59	49	39	29	19	9	-1	-11	-21	-31	-41																						
15			80	70	60	50	40	30	20	10	0	-10	-20	-30	-40																						
20					69	59	49	39	29	19	9	-1	-11	-21	-31	-41																						
30					84	74	64	54	44	34	24	14	4	-6	-16	-26	-36	-46																				
40							77	67	57	47	37	27	17	7	-3	-13	-23	-33	-43																			
60								87	77	67	57	47	37	27	17	7	-3	-13	-23	-33	-43																	
80										84	74	64	54	44	34	24	14	4	-6	-16	-26	-36	-46														
100												78	68	58	48	38	28	18	8	-2	-12	-22	-32	-42													
120													80	70	60	50	40	30	20	10	0	-10	-20	-30	-40												
140														81	71	61	51	41	31	21	11	1	-9	-19	-29	-39	-49										
160															82	72	62	52	42	32	22	12	2	-8	-18	-28	-38	-48									
200																88	78	68	58	48	38	28	18	8	-2	-12	-22	-32	-42								

Note: Performance ratings at the entering air temperatures to the right of the heavy line above are outside the range of ARI certification
Highlighted areas refer to example on page 12.

APD	OV	Air Temperature Rise, ATR - Degrees F --Two Row Coil																																		
0.67	**900**	37	39	42	44	47	49	52	54	57	59	62	64	67	69	72	74	77	79	81	84	86	89	91	94	96	99	101	104	106						
0.60	**850**	39	41	44	47	49	52	54	57	59	62	65	67	70	72	75	78	80	83	85	88	90	93	96	98	101	103	106	109	111						
0.54	**800**	40	43	46	48	51	54	56	59	62	65	67	70	73	75	78	81	83	86	89	91	94	97	99	102	105	108	110	113	116						
0.48	**750**	42	45	47	50	53	56	58	61	64	67	70	72	75	78	81	84	86	89	92	95	97	100	103	106	109	111	114	117	120						
0.42	**700**	43	46	49	52	55	58	60	63	66	69	72	75	78	81	83	86	89	92	95	98	101	104	106	109	112	115	118	121	124						
0.36	**650**	45	47	50	53	56	59	62	65	68	71	74	77	80	83	86	89	92	95	98	101	104	107	110	113	116	119	122	125	128						
0.31	**600**	46	49	52	55	58	61	64	67	71	74	77	80	83	86	89	92	95	98	101	104	107	110	114	117	120	123	126	129	132						
0.26	**550**	48	51	54	57	60	64	67	70	73	76	79	83	86	89	92	95	98	102	105	108	111	114	118	121	124	127	130	133	137						
0.22	**500**	50	53	56	59	63	66	69	73	76	79	83	86	89	92	96	99	102	106	109	112	116	119	122	125	129	132	135	139	142						
0.18	**450**	52	55	59	62	65	69	72	76	79	83	86	90	93	96	100	103	107	110	114	117	121	124	127	131	134	138	141	145	148						
0.14	**400**	54	58	61	65	69	72	76	79	83	87	90	94	98	101	105	108	112	116	119	123	126	130	134	137	141	144	148	152	155						
0.11	**350**	57	61	65	69	73	76	80	84	88	92	96	99	103	107	111	115	118	122	126	130	134	138	141	145	149	153	157	160	164						
0.08	**300**	61	65	69	73	77	81	85	89	93	97	101	105	109	113	117	121	125	129	133	137	141	145	149	154	158	162	166	170	174						
0.06	**250**	65	69	73	78	82	86	91	95	99	103	108	112	116	121	125	129	134	138	142	147	151	155	160	164	168	172	177	181	185						
0.04	**200**	69	74	79	83	88	92	97	102	106	111	116	120	125	129	134	139	143	148	153	157	162	166	171	176	180	185	190	194	199						

APDB	O.V.	Air Temperature Rise, ATR - Degrees F -- Four Row Coil																																		
1.36	**900**	65	69	73	78	82	86	91	95	99	104	108	112	117	121	125	130	134	138	143	147	151	156	160	164	168	173	177	181	186						
1.22	**850**	68	72	77	81	86	90	95	99	104	108	113	117	122	126	131	135	140	144	149	153	158	162	167	171	176	180	185	190	194						
1.09	**800**	70	75	80	84	89	94	98	103	108	112	117	122	126	131	136	140	145	150	154	159	164	168	173	178	183	187	192	197	201						
0.96	**750**	72	77	82	87	92	97	101	106	111	116	121	126	130	135	140	145	150	155	159	164	169	174	179	184	188	193	198	203	208						
0.84	**700**	75	80	85	89	94	99	104	109	114	119	124	129	134	139	144	149	154	159	164	169	174	179	184	189	194	199	204	209	214						
0.73	**650**	77	82	87	92	97	102	107	112	118	123	128	133	138	143	148	153	158	164	169	174	179	184	189	194	199	204	210	215	220						
0.63	**600**	79	84	89	95	100	105	110	116	121	126	131	137	142	147	152	158	163	168	173	179	184	189	194	200	205	210	215	221	226						
0.53	**550**	81	86	92	97	103	108	113	119	124	130	135	140	146	151	157	162	167	173	178	184	189	194	200	205	211	216	221	227	232						
0.44	**500**	83	89	95	100	106	111	117	122	128	134	139	145	150	156	161	167	172	178	184	189	195	200	206	211	217	223	228	234	239						
0.36	**450**	86	92	98	103	109	115	121	126	132	138	144	149	155	161	167	172	178	184	190	195	201	207	213	218	224	230	236	241	247						
0.29	**400**	89	95	101	107	113	119	125	131	137	143	149	155	161	167	173	179	185	191	197	203	209	215	221	226	232	238	244	250	256						
0.22	**350**	93	99	105	112	118	124	130	136	143	149	155	161	167	174	180	186	192	198	205	211	217	223	229	236	242	248	254	260	267						
0.17	**300**	97	104	110	117	123	130	136	143	149	156	162	168	175	181	188	194	201	207	214	220	227	233	240	246	253	259	266	272	279						
0.12	**250**	102	109	116	123	129	136	143	150	157	163	170	177	184	191	197	204	211	218	225	231	238	245	252	259	266	272	279	286	293						
0.08	**200**	108	115	122	129	136	144	151	158	165	172	180	187	194	201	208	215	223	230	237	244	251	258	266	273	280	287	294	302	309						

Note: Performance data in the shaded area at outlet velocities below 400 fpm is rated in accordance with ARI.

COIL PERFORMANCE

Water Coil Selection

Selection Procedure

Given:

- Airflow Rate through the coil, SCFM
- Coil model number from Unit selection table.
- Coil Outlet Area, OA, from Unit selection Table.
- Entering Air Temperature, EAT, in degrees F.
- Desired Leaving Air Temperature, LAT desired, in degrees F.
- Water Flow Rate, GPM
- Entering Water Temperature, EWT, in degrees F.

Procedure:

1. Calculate the coil Outlet velocity, OV, in ft/min. using: OV = SCFM/OA
2. Calculate the desired air temperature rise, ATR, in degrees F across the coil: Desired ATR = Desired LAT - EAT.
3. Enter the Water Coil Performance Table on page 15 with the given EAT, EWT, and OV from Step 1, then read Base Air Temperature Rise, BATR, and Air Pressure Drop, APD, in inches w.c.
4. Calculate the ratio of Water Flow Rate to Base Water Flow Rate from Base Water Flow Rates table below.
5. Look up Air Temperature Rise correction factor for water flow rate, ATRF, from Water Correction Factors table below.
6. Calculate the adjusted Air temperature rise: ATR = ATRB * ATRF
7. Calculate Heat transfer, Q, in Btuh: Q = 1.085 x SCFM x ATR
8. Calculate the air temperature leaving the coil: LAT = EAT + ATR.
9. Calculate the water temperature drop, WTD, in degrees F across the coil using: WTD = Q/(500 x GPM)
10. Calculate the Leaving Water Temperature, LWT, in degrees F using:LWT = EWT – WTD
11. Look up the Base Water Pressure Drop, WPDB, for the number of coil rows and the coil nominal face length from table below.
12. Look up the Water Pressure Drop Correction Factor, WPDF, in Water Correction Factors Table at the Water Flow rate ratio calculated in Step 4.
13. Calculate the Water Pressure Drop, WPD, in ft. H2O using WPDB of Step 11 and WPDF of step 12: WPD = WPDB x WPDF

Water Pressure drop for base flow rate, WPDB - ft. H2O

	Nominal Face length, inches									
	36	**42**	**54**	**60**	**66**	**84**	**96**	**108**	**114**	**120**
Two Row	0.52	0.61	0.78	0.86	0.48	0.61	0.69	0.78	0.82	0.86
Three Row	2.66	3.1	3.98	4.42	2.45	3.1	3.54	3.98	4.21	4.42
Four Row	0.52	0.61	0.78	0.86	0.48	0.61	0.69	0.78	0.82	0.86

Example:

Given:

- Airflow rate = 27,720 SCFM
- Assume a Model SAS(I)–222 has previously been selected.
- OA = 39.6 sq.ft. from Unit Selection Table.
- EAT = -20 degrees F.
- Desired LAT = 72 degrees F.
- Water flow rate = 176.0 gpm
- EWT = 180 degrees F.

Procedure:

1. OV = 27,720/39.6 = 700 sfpm.
2. Desired ATR = 72 – (-20) = 92 degrees F.
3. With EAT = -20 degrees F, a desired ATR = 92 degrees F, EWT = 180 degrees F, and OV = 700 sfpm, a four row (double section) coil is found to give an ATRB = 89 degrees F and APD = 0.84 inches w.c.
4. From table below, Base Water Flow Rate for a four row model size E coil = 140.8 gpm, so (Water Flow Rate/ Base Water Flow Rate) = (176.0/140.8) = 1.25.
5. From Water Correction Factors Table below at a ratio of 1.25, ATRF = 1.04.
6. ATR = 89 x 1.04 = 92.6 degrees F.
7. 1.085 x 27,720 x 92.6 = 2,785,060 Btuh.
8. LAT = -20 + 92.6 = 72.6 degrees F.
9. WTD = 2,785,060/(500 x176.0) = 31.6 degrees F
10. LWT = 180 – 31.6 = 148.4 degrees F.
11. From Water Pressure Drop Table for Base Flow Rate below for a four row coil with a nominal length of 114 inches: WPDB = 0.82 ft. H2O.
12. From Water Correction Factors Table below at a ratio of (Water Flow Rate/ Base Water Flow Rate) = 1.25: WPDF = 1.54.
13. WPD = 0.82 x 1.54 = 1.26 ft. H2O.

Base Water Flow Rates

MODEL SIZE	TWO ROW (GPM)	THREE ROW (GPM)	FOUR ROW (GPM)
A-36	11.8	14.0	23.6
B-36	17.6	21.0	35.2
C-42, C-60	23.5	28.0	47.0
C-84	47.0	56.0	94.0
E-54	35.2	42.0	70.4
E-96,E-108, E-114,E-120	70.4	84.0	140.8
F-66,F-120	82.0	98.0	164.0

Water Correction Factors

WATER FLOW RATE/BASE WATER FLOW RATE (----)	ATR CORRECTION FACTOR ATRF (----)	WPD CORRECTION FACTOR, WPDF (----)
2.00	1.08	3.80
1.75	1.07	3.01
1.50	1.06	2.19
1.25	1.04	1.54
1.00	1.00	1.00
0.75	0.95	0.54
0.50	0.86	0.26

COIL PERFORMANCE

Water Coil Performance Table

EWT	Entering Air Temperature, EAT (Degrees F)																						
150	80	70	60	50	40	30	20	10	0	-10	-20	-30	-40										
160		80	70	60	50	40	30	20	10	0	-10	-20	-30	-40									
170			80	70	60	50	40	30	20	10	0	-10	-20	-30	-40								
180				80	70	60	50	40	30	20	10	0	-10	-20	-30	-40							
190					80	70	60	50	40	30	20	10	0	-10	-20	-30	-40						
200						80	70	60	50	40	30	20	10	0	-10	-20	-30	-40					
210							80	70	60	50	40	30	20	10	0	-10	-20	-30	-40				
220								80	70	60	50	40	30	20	10	0	-10	-20	-30	-40			
230									80	70	60	50	40	30	20	10	0	-10	-20	-30	-40		
240										80	70	60	50	40	30	20	10	0	-10	-20	-30	-40	
250											80	70	60	50	40	30	20	10	0	-10	-20	-30	-40

Note:Performance ratings at the entering air temperatures to the right of the heavy line above are outside the range of ARI certification.
Highlighted areas refer to the example application from page 14.

APDB	OV	Base Air Temperature Rise, ATRB (Degrees F) -- Two Row Coil																					
0.67	**900**	15	17	19	21	23	25	28	30	32	34	36	38	40	42	45	47	49	51	53	55	57	59	61
0.60	**850**	16	18	20	22	25	27	29	31	34	36	38	40	43	45	47	49	52	54	56	58	60	63	65
0.54	**800**	16	19	21	23	26	28	30	33	35	37	40	42	44	47	49	51	54	56	59	61	63	66	68
0.48	**750**	17	19	22	24	27	29	32	34	36	39	41	44	46	49	51	53	56	58	61	63	65	68	70
0.42	**700**	18	20	23	25	28	30	33	35	38	40	43	45	48	50	53	55	58	60	63	65	68	70	73
0.36	**650**	18	21	23	26	28	31	33	36	39	41	44	46	49	52	54	57	59	62	64	67	70	72	75
0.31	**600**	19	21	24	27	29	32	34	37	40	42	45	48	50	53	56	58	61	64	66	69	72	74	77
0.26	**550**	19	22	25	27	30	33	36	38	41	44	46	49	52	55	57	60	63	66	68	71	74	77	79
0.22	**500**	20	23	26	28	31	34	37	40	43	45	48	51	54	57	60	62	65	68	71	74	77	79	82
0.18	**450**	21	24	27	30	33	36	38	41	44	47	50	53	56	59	62	65	68	71	74	77	80	83	86
0.14	**400**	22	25	28	31	34	37	40	43	47	50	53	56	59	62	65	68	71	75	78	81	84	87	90
0.11	**350**	23	26	30	33	36	39	43	46	49	53	56	59	62	66	69	72	76	79	82	85	89	92	95
0.08	**300**	25	28	32	35	39	42	46	49	53	56	60	63	67	70	74	77	81	84	88	91	95	98	102
0.06	**250**	26	30	34	38	41	45	49	53	56	60	64	68	71	75	79	83	86	90	94	98	102	105	109
0.04	**200**	28	33	37	41	45	49	53	57	61	65	69	73	77	81	85	90	94	98	102	106	110	114	118

APDB	OV	Base Air Temperature Rise, ATRB (Degrees F) -- Three Row Coil																					
1.12	**900**	21	24	27	30	33	36	39	42	45	48	51	54	57	60	62	65	68	71	74	77	80	83	86
1.00	**850**	22	25	28	31	34	37	40	43	46	49	53	56	59	62	65	68	71	74	77	80	83	87	90
0.90	**800**	22	25	29	32	35	38	41	45	48	51	54	57	61	64	67	70	73	76	80	83	86	89	92
0.79	**750**	23	26	29	33	36	39	43	46	49	52	56	59	62	66	69	72	75	79	82	85	88	92	95
0.70	**700**	23	27	30	34	37	40	44	47	50	54	57	60	64	67	70	74	77	81	84	87	91	94	97
0.61	**650**	24	27	31	34	38	41	45	48	52	55	58	62	65	69	72	76	79	82	86	89	93	96	100
0.52	**600**	25	28	32	35	39	42	46	49	53	56	60	63	67	70	74	77	81	84	88	91	95	98	102
0.44	**550**	25	29	32	36	40	43	47	50	54	58	61	65	68	72	76	79	83	86	90	94	97	101	104
0.37	**500**	26	30	33	37	41	44	48	52	56	59	63	67	70	74	78	81	85	89	93	96	100	104	107
0.30	**450**	27	30	34	38	42	46	49	53	57	61	65	68	72	76	80	84	88	91	95	99	103	107	110
0.24	**400**	28	31	35	39	43	47	51	55	59	63	67	71	75	79	83	87	91	94	98	102	106	110	114
0.19	**350**	29	33	37	41	45	49	53	57	61	65	69	74	78	82	86	90	94	98	102	106	110	114	118
0.14	**300**	30	34	38	43	47	51	55	60	64	68	72	77	81	85	89	94	98	102	107	111	115	119	124
0.10	**250**	31	36	40	45	49	54	58	63	67	71	76	80	85	89	94	98	103	107	112	116	121	125	129
0.07	**200**	33	38	42	47	52	56	61	66	71	75	80	85	89	94	99	104	108	113	118	122	127	132	136

APDB	OV	Base Air Temperature Rise, ATRB (Degrees F) -- Four Row Coil																					
1.36	**900**	27	31	35	39	43	47	51	55	59	63	66	70	74	78	82	86	90	94	98	102	106	109	113
1.22	**850**	28	33	37	41	45	49	53	57	61	65	69	73	77	81	85	89	93	98	102	106	110	114	118
1.09	**800**	29	34	38	42	46	50	55	59	63	67	71	76	80	84	88	93	97	101	105	109	114	118	122
0.96	**750**	30	35	39	43	48	52	56	61	65	69	74	78	82	87	91	95	100	104	108	113	117	121	126
0.84	**700**	31	36	40	45	49	53	58	62	67	71	76	80	85	89	94	98	102	107	111	116	120	125	129
0.73	**650**	32	37	41	46	50	55	59	64	69	73	78	82	87	92	96	101	105	110	114	119	124	128	133
0.63	**600**	33	38	42	47	52	56	61	66	70	75	80	85	89	94	99	103	108	113	117	122	127	131	136
0.53	**550**	34	39	43	48	53	58	63	68	72	77	82	87	92	97	101	106	111	116	121	126	130	135	140
0.44	**500**	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	129	134	139	144
0.36	**450**	36	41	46	52	57	62	67	72	77	82	88	93	98	103	108	113	118	124	129	134	139	144	149
0.29	**400**	37	43	48	53	59	64	69	75	80	86	91	96	102	107	112	118	123	128	134	139	144	150	155
0.22	**350**	39	45	50	56	61	67	72	78	84	89	95	100	106	112	117	123	128	134	139	145	151	156	162
0.17	**300**	41	47	53	58	64	70	76	82	88	94	99	105	111	117	123	129	134	140	146	152	158	164	170
0.12	**250**	43	49	55	62	68	74	80	86	92	98	105	111	117	123	129	135	142	148	154	160	166	172	178
0.08	**200**	46	52	59	65	72	78	85	91	98	104	111	117	124	130	137	143	150	156	163	169	176	182	189

Note: Performance data in the shaded area at outlet velocities below 400 fpm is rated in accordance with ARI.

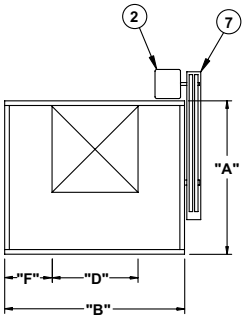
DIMENSIONS

Single Blower Indoor Units

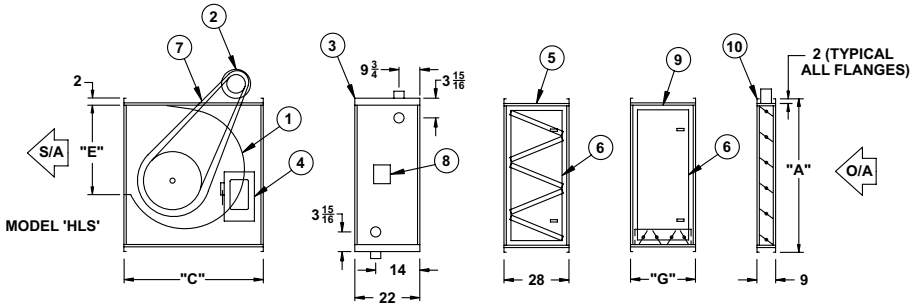
C000604

UNIT COMPONENTS

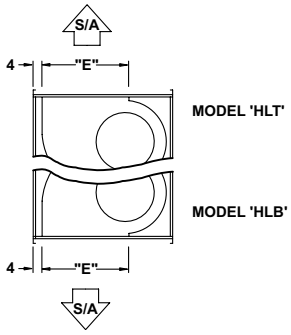
1. CENTRIFUGAL SUPPLY FAN
2. FAN MOTOR
3. HEATING COIL - STEAM OR HOT WATER
4. CONTROL LOCATION
5. V-BANK FILTER SECTION
6. HINGED ACCESS DOOR
7. BELT GUARD
8. FACE AND BYPASS DAMPER CONTROL LOCATION
9. RETURN AIR SECTION
10. OUTSIDE AIR DAMPER



END VIEW



FRONT VIEW



NOTES

1. ON UNITS PROVIDED WITH A DOUBLE SECTION COIL, THE STEAM OR HOT WATER HEATING COIL LENGTH INCREASES FROM 22" TO 38 1/2" AND THE SUPPLY AND RETURN CONNECTIONS DOUBLE.
2. LEFT HAND UNIT SHOWN. RIGHT HAND UNIT OPPOSITE FROM SHOWN UNIT.
3. MODELS 109, 112, 115, 118, 120 AND 122 HAVE SIDE HEATING COIL CONNECTIONS.
4. MODEL 125 HAS TOP AND BOTTOM HEATING COIL CONNECTIONS.
5. ALL DIMENSIONS ARE IN INCHES.

SAS(I) MODEL	IFB MODEL	DIMENSIONS						
		A	B	C	D	E	F	G
109	B-36	29	45	33	11 13/16	10 1/4	16 5/8	28
112	B-36	29	45	33	15 13/16	13 7/16	14 5/8	28
115	C-42	37 1/4	51	43	18 15/16	15 7/8	16 1/8	43
118	C-42	37 1/4	51	43	21 15/16	18 7/8	14 9/16	43
120	E-54	54	60	52	24 15/16	24 3/4	17 9/16	52
122	E-54	54	60	52	27 7/16	27 1/4	16 5/16	52
125	F-66	66	72	60	31 3/8	31 1/4	20 5/16	52

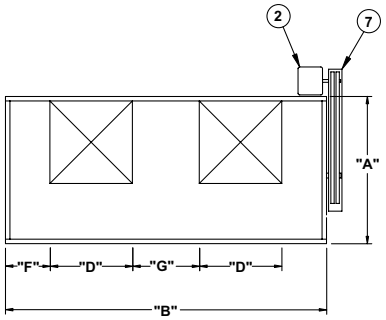
DIMENSIONS

Double Blower Indoor Units

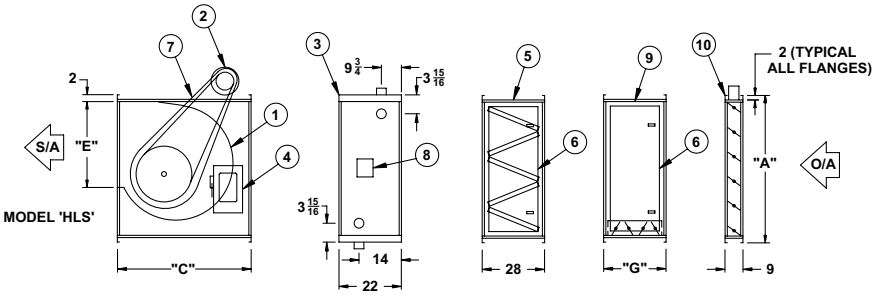
C000605

UNIT COMPONENTS

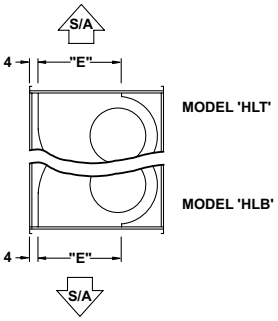
1. CENTRIFUGAL SUPPLY FAN
2. FAN MOTOR
3. HEATING COIL - STEAM OR HOT WATER
4. CONTROL LOCATION
5. V-BANK FILTER SECTION
6. HINGED ACCESS DOOR
7. BELT GUARD
8. FACE AND BYPASS DAMPER CONTROL LOCATION
9. RETURN AIR SECTION
10. OUTSIDE AIR DAMPER



END VIEW



FRONT VIEW



NOTES

1. ON UNITS PROVIDED WITH A DOUBLE SECTION COIL, THE STEAM OR HOT WATER HEATING COIL LENGTH INCREASES FROM 22" TO 38 1/2" AND THE SUPPLY AND RETURN CONNECTIONS DOUBLE.
2. LEFT HAND UNIT SHOWN. RIGHT HAND UNIT OPPOSITE FROM SHOWN UNIT.
3. MODELS 218, 220, 222 AND 225 HAVE TOP AND BOTTOM HEATING COIL CONNECTIONS.
4. ALL DIMENSIONS ARE IN INCHES.

SAS(I) MODEL	IFB MODEL	DIMENSIONS							
		A	B	C	D	E	F	G	H
218	E-84	37 1/4	93	43	21 15/16	18 7/8	13 5/16	43	22 1/2
220	E-114	54	120	52	24 15/16	24 3/4	20 1/4	52	29 5/8
222	E-114	54	120	52	27 7/16	27 1/4	17 3/4	52	29 5/8
225	F-120	66	144	60	31 3/8	31 1/4	21 13/16	52	37 5/8

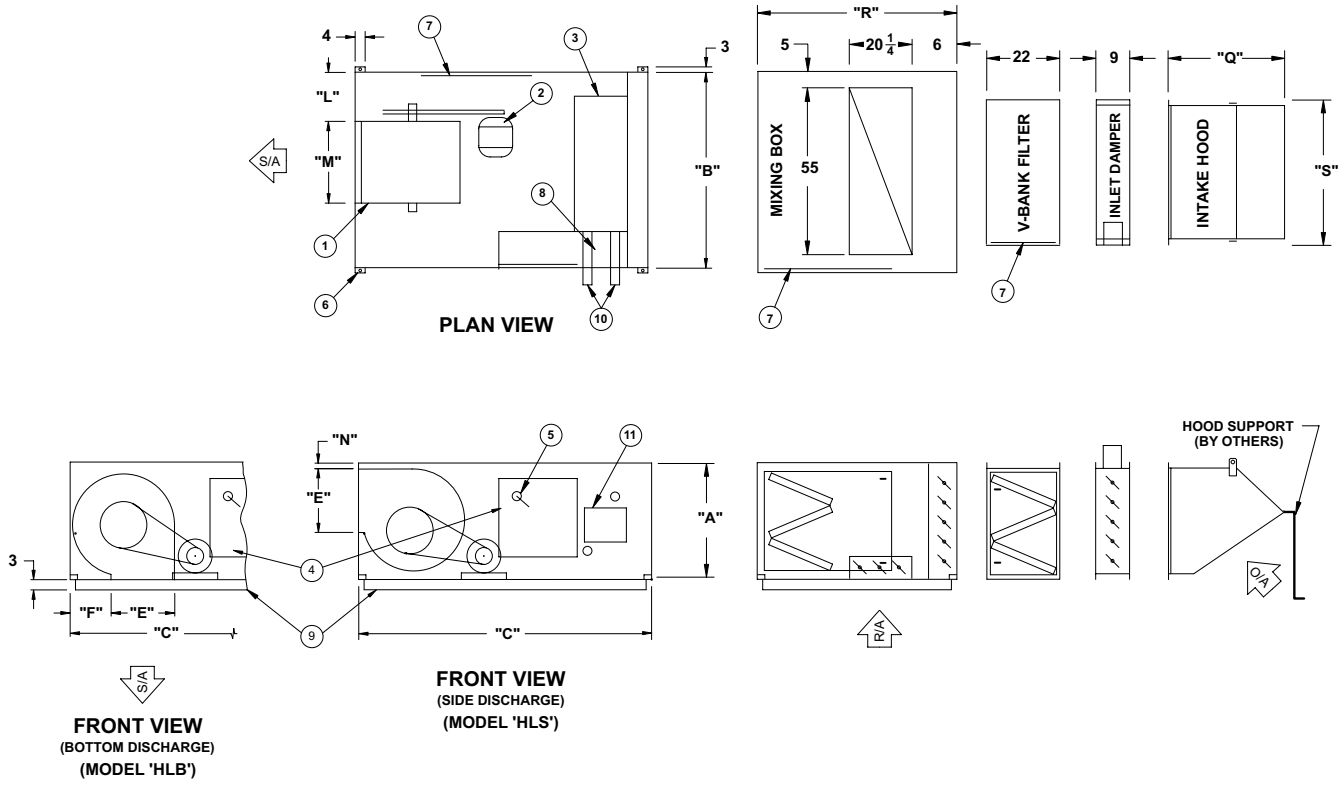
DIMENSIONS

Single Blower Outdoor Units

C000601

UNIT COMPONENTS

1. CENTRIFUGAL SUPPLY FAN
2. FAN MOTOR
3. HEATING COIL - STEAM OR HOT WATER
4. CONTROL CABINET
5. HINGED CONTROL CABINET ACCESS DOOR
6. REMOVABLE LIFTING LUG
7. HINGED ACCESS DOOR
8. FACE AND BYPASS DAMPER CONTROL LOCATION
9. UNIT BASE
10. SUPPLY AND RETURN CONNECTIONS
11. COIL ACTUATOR ACCESS PANEL



NOTES

1. ON UNITS PROVIDED WITH A DOUBLE SECTION COIL, ADD 16"" TO DIMENSION "C".
2. LEFT HAND UNIT SHOWN. RIGHT HAND UNIT OPPOSITE FROM SHOWN UNIT.
3. ALL DIMENSIONS ARE IN INCHES.

SAS(W) MODEL	IFB MODEL	DIMENSIONS										
		A	B	C	E	F	L	M	N	Q	R	S
109	A-36	36	65	77	10 3/8	15 1/8	26 1/2	11 15/16	7 1/8	30	54	47 1/4
112	A-36	36	65	77	13 9/16	13 9/16	24 1/2	15 15/16	7 1/8	30	54	47 1/4
115	C-42	48	65	77	16	12 3/8	23	18 15/16	7 1/8	54 1/16	54	47 1/4
118	C-42	48	65	77	19	12 3/8	21 1/2	22 1/16	7 1/8	54 1/16	54	47 1/4

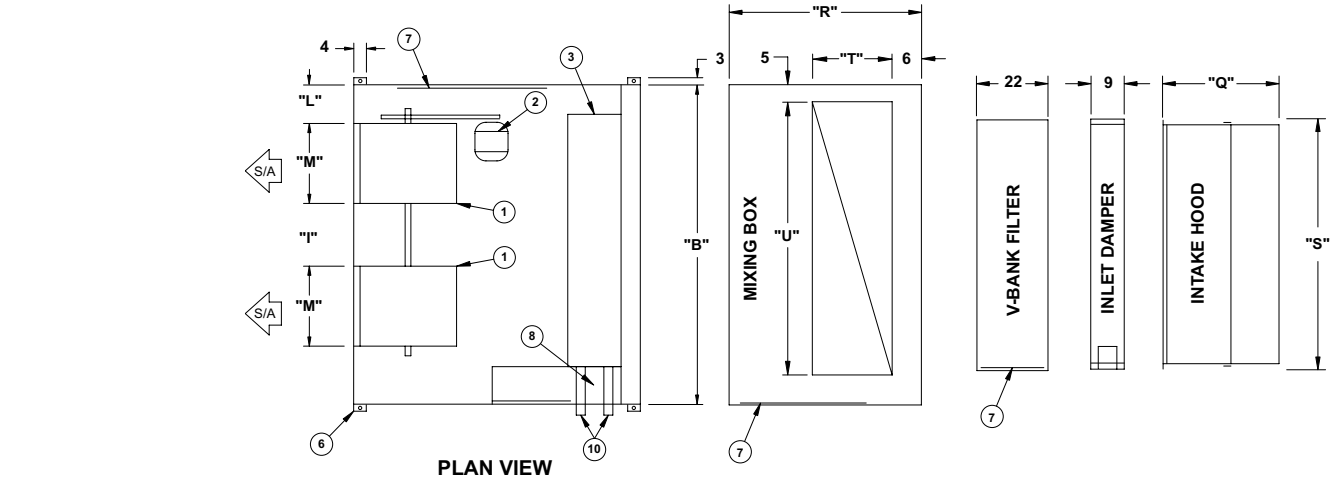
DIMENSIONS

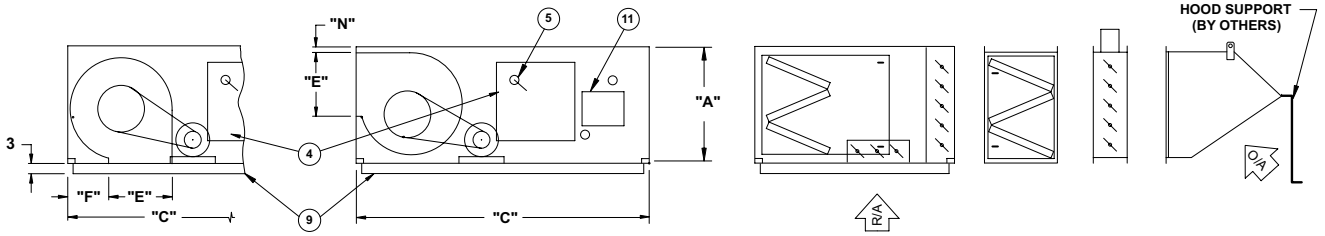
Double Blower Outdoor Units

C000602

UNIT COMPONENTS

1. CENTRIFUGAL SUPPLY FAN
2. FAN MOTOR
3. HEATING COIL - STEAM OR HOT WATER
4. CONTROL CABINET
5. HINGED CONTROL CABINET ACCESS DOOR
6. REMOVABLE LIFTING LUG
7. HINGED ACCESS DOOR
8. FACE AND BYPASS DAMPER CONTROL LOCATION
9. UNIT BASE
10. SUPPLY AND RETURN CONNECTIONS
11. COIL ACTUATOR ACCESS PANEL





FRONT VIEW
(BOTTOM DISCHARGE)
(MODEL 'HLB')

FRONT VIEW
(SIDE DISCHARGE)
(MODEL 'HLS')

NOTES

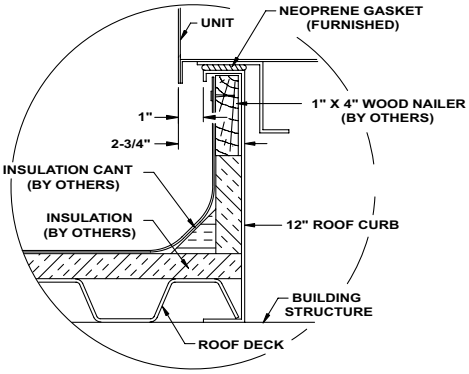
1. ON UNITS PROVIDED WITH A DOUBLE SECTION COIL, ADD 16"" TO DIMENSION "C".
2. LEFT HAND UNIT SHOWN. RIGHT HAND UNIT OPPOSITE FROM SHOWN UNIT.
3. MODELS 220, 222 AND 225 TO BE SHIPPED IN TWO SECTIONS.
4. ALL DIMENSIONS ARE IN INCHES.

SAS(W) MODEL	IFB MODEL	DIMENSIONS													
		A	B	C	E	F	I	L	M	N	Q	R	S	T	U
215	C-60	48	94	77	16	12 3/8	18 3/8	18 7/8	18 15/16	7 1/4	54 1/16	54	82	20 1/4	84
220	E-96	78	154	102	24 7/8	13 3/8	29 5/8	37 1/8	25 1/16	32 1/4	60	60	121 3/8	26 1/2	144
222	E-108	78	154	102	27 3/8	14 3/8	24 5/8	37 1/8	27 9/16	32 1/4	60	60	121 3/8	26 1/2	144
225	E-120	78	154	102	31 3/8	17 9/16	37 5/8	26 11/16	31 1/2	20 1/4	60	60	121 3/8	26 1/2	144

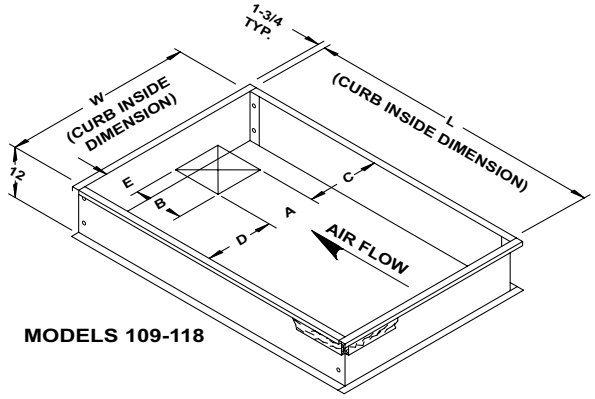
DIMENSIONS

Optional Roof Curb Dimensions

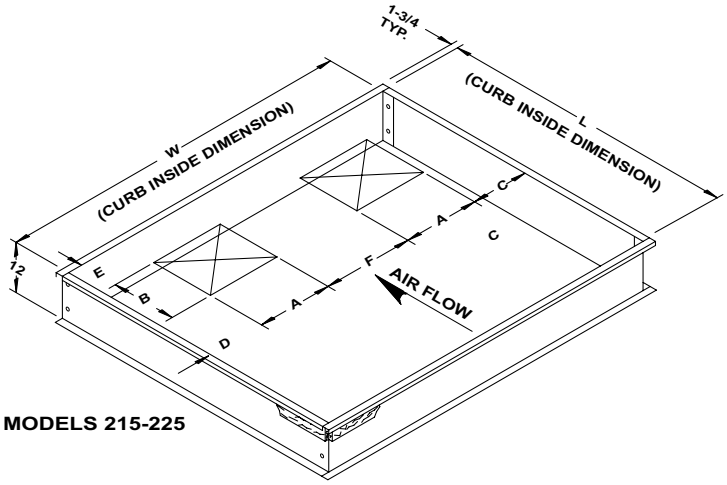
C000017



ROOF CURB DETAIL



MODELS 109-118



MODELS 215-225

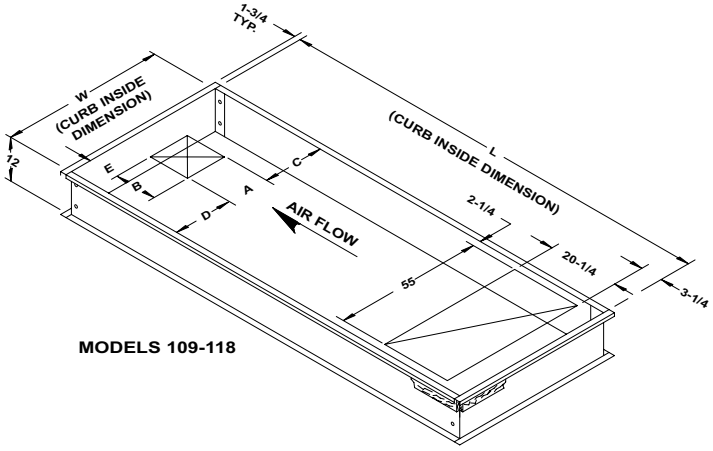
MODEL	DIMENSIONS						CURB	
	A	B	C	D	E	F	L	W
109	11-15/16	10-3/8	23-13/16	23-3/4	12-3/8	—	71-1/2 *	59-1/2
112	15-15/16	13-9/16	21-13/16	21-3/4	10-13/16	—	71-1/2 *	59-1/2
115	18-15/16	16	20-5/16	20-1/4	9-5/8	—	71-1/2 *	59-1/2
118	22-1/16	19	18-11/16	18-3/4	9-5/8	—	71-1/2 *	59-1/2
215	18-15/16	16	16-1/8	16-1/8	9-5/8	18-3/8	71-1/2 *	88-1/2
220	25-1/16	24-7/8	34-3/8	34-3/8	10-5/8	29-5/8	96-1/2 *	148-1/2
222	27-9/16	27-3/8	34-3/8	34-3/8	11-5/8	24-5/8	96-1/2 *	148-1/2
225	31-1/2	31-3/8	23-15/16	23-15/16	14-13/16	37-5/8	96-1/2 *	148-1/2

NOTES

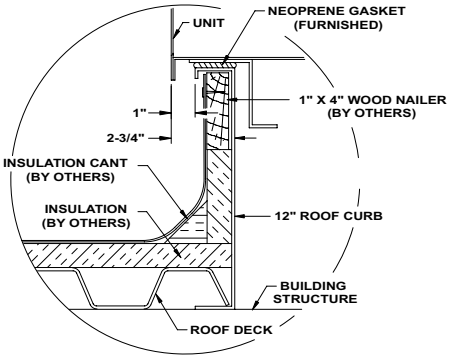
1. FOR DOUBLE COIL SECTION ADD 16" TO 'L' DIMENSION.
2. ALL DIMENSIONS ARE IN INCHES.

DIMENSIONS

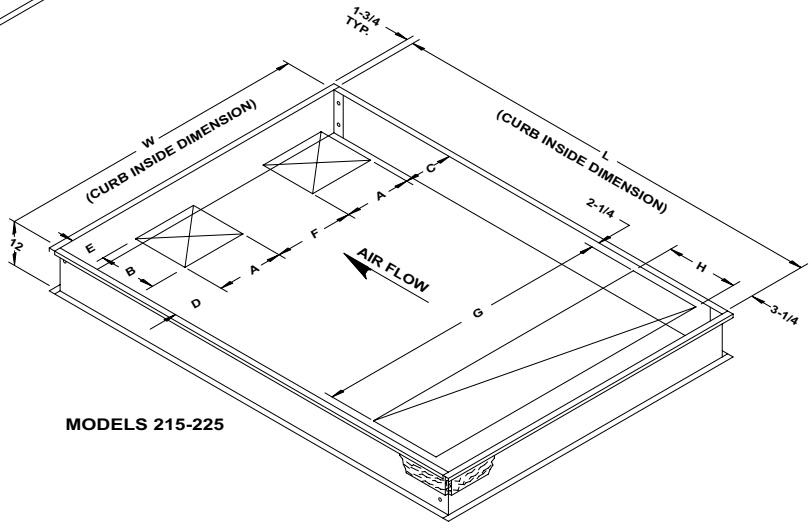
Optional Roof Curb Dimensions - Units With Return Air C000603



MODELS 109-118



ROOF CURB DETAIL



MODELS 215-225

CURB FOR UNITS WITH RETURN AIR

MODEL	DIMENSIONS								CURB	
	A	B	C	D	E	F	G	H	L	W
109	11-15/16	10-3/8	23-13/16	23-3/4	12-3/8	—	—	—	125-1/2 *	59-1/2
112	15-15/16	13-9/16	21-13/16	21-3/4	10-13/16	—	—	—	125-1/2 *	59-1/2
115	18-15/16	16	20-5/16	20-1/4	9-5/8	—	—	—	125-1/2 *	59-1/2
118	22-1/16	19	18-11/16	18-3/4	9-5/8	—	—	—	125-1/2 *	59-1/2
215	18-15/16	16	16-1/8	16-1/8	9-5/8	18-3/8	84	20-1/4	125-1/2 *	88-1/2
220	25-1/16	24-7/8	34-3/8	34-3/8	10-5/8	29-5/8	144	26-1/2	156-1/2 *	148-1/2
222	27-9/16	27-3/8	34-3/8	34-3/8	11-5/8	24-5/8	144	26-1/2	156-1/2 *	148-1/2
225	31-1/2	31-3/8	23-15/16	23-15/16	14-13/16	37-5/8	144	26-1/2	156-1/2 *	148-1/2

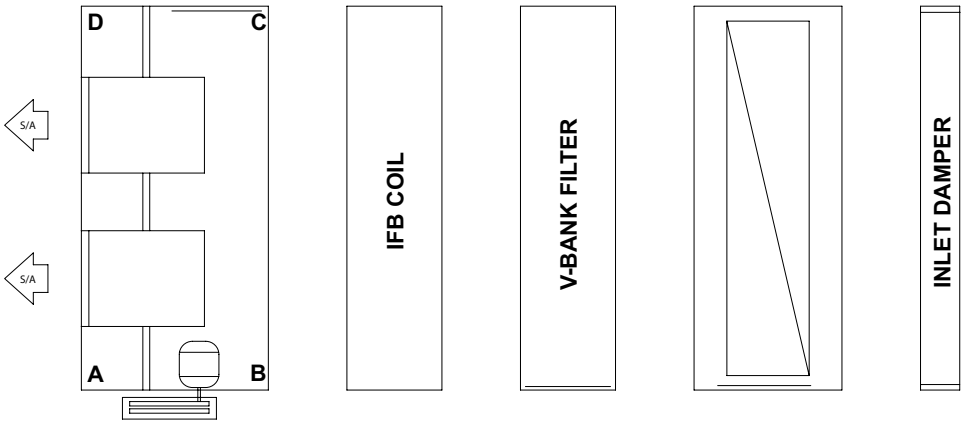
NOTES

1. FOR DOUBLE COIL SECTION ADD 16" TO 'L' DIMENSION.
2. ALL DIMENSIONS ARE IN INCHES.

WEIGHTS

Indoor Unit Weights

C000596



SAS(I) MODEL	IFB MODEL	BLOWER SECTION				INTAKE HOOD	INLET DAMPER	RETURN AIR	V-BANK FILTER	SINGLE SECTION COIL	DOUBLE SECTION COIL	V-BANK FILTERS SIZE & (QTY)
		A	B	C	D							
109-112	B-36	149	67	67	67	140	55	104	165	315	535	20x20x2(4)
115-118	C-42	253	94	94	94	150	70	116	185	415	705	16x20x2(9)
120-122	E-54	439	159	159	159	183	120	151	275	662	1125	20x25x2(10)
125	F-66	590	224	224	224	216	155	208	310	899	1528	16x20x2(24)
218	E-84	438	158	158	158	224	125	141	275	986	1676	15x20x2(18)
220-222	E-114	697	268	268	268	290	233	226	410	1299	2208	16x20x2(35)
225	F-120	953	388	388	388	350	340	302	500	1547	2630	20x20x2(42)

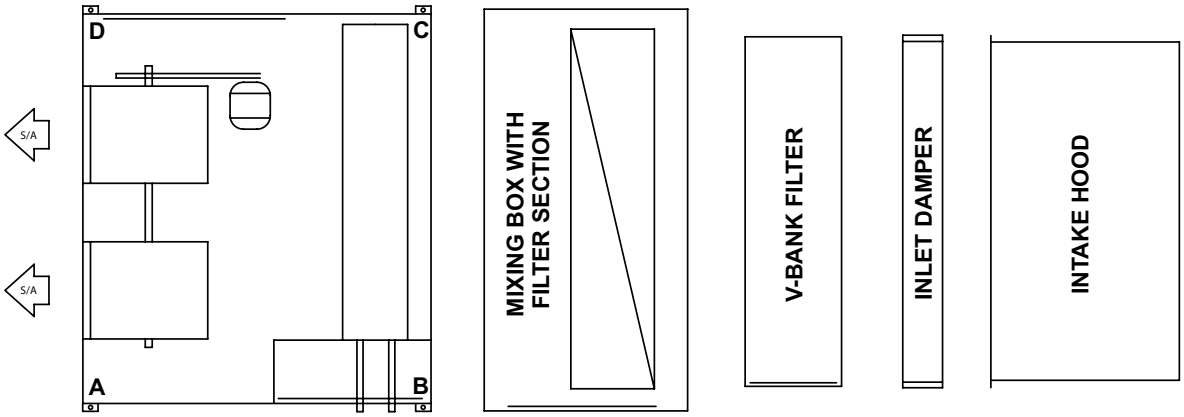
NOTES

1. ALL WEIGHTS ARE IN POUNDS.

WEIGHTS

Outdoor Unit Weights

C000016



BLOWER SECTION WITH HEATING COIL

SAS MODEL	IFB MODEL	BLOWER SECTION				INTAKE HOOD	INLET DAMPER	MIXING BOX	V-BANK FILTER	SINGLE SECTION COIL	DOUBLE SECTION COIL	V-BANK FILTERS SIZE & (QTY)
		A	B	C	D							
109-112	A-36	190	235	295	295	105	70	540	120	245	490	15x20x2(9)
115-118	C-42	205	240	310	310	185	90	570	145	415	790	15x20x2(12)
215	C-60	295	340	400	400	330	150	880	245	517	980	20x20x2(12)
220	E-96	615	655	745	745	425	320	1540	330	1111	2090	15x20x2(48)
222	E-108	665	705	795	795	425	320	1540	330	1236	2300	15x20x2(48)
225	E-120	710	750	840	840	425	320	1540	330	1361	2315	15x20x2(48)

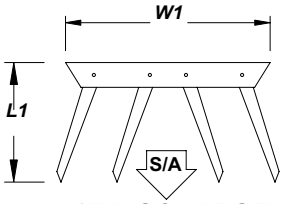
NOTES

1. BLOWER SECTION WEIGHTS DO NOT INCLUDE COILS.
2. ALL WEIGHTS ARE IN POUNDS.
3. DOUBLE SECTION COIL WEIGHT INCLUDES THE WEIGHT OF 16" EXTRA CABINET LENGTH.
4. DOUBLE WALL CONSTRUCTION WEIGHT MULTIPLIERS:
   BLOWER SECTION : 1.20
   DOUBLE SECTION COIL : 1.05
   COMBINATION FILTER AND MIXING BOX : 1.26

VERTICAL DISCHARGES

Dimensions - Sizes 1F, 4R, 4F, 5R, 5F

C000597

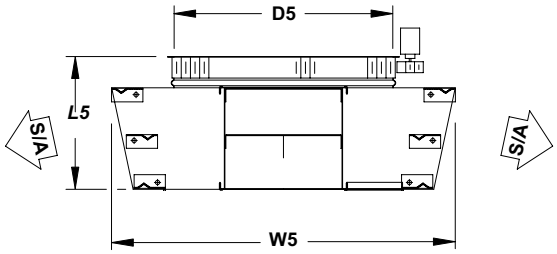


1F DISCHARGE

A VANE TYPE DISCHARGE.

DISCHARGE VANES ARE ADJUSTABLE.

DISCHARGE DESIGNED FOR CONCENTRATED VERTICAL AIR FLOW.

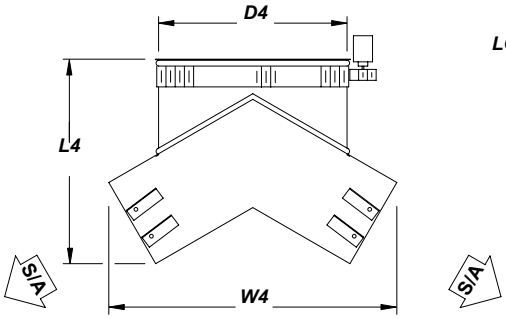


5F AND 5R DISCHARGE

A FOUR OUTLET DISCHARGE DESIGNED FOR FULL AIR DISTRIBUTION.

DISCHARGE VANES ARE ADJUSTABLE.

DISCHARGE DESIGNED FOR LOW CEILING HEIGHT APPLICATIONS.



4F AND 4R DISCHARGE

A TWO OUTLET DISCHARGE.

DISCHARGE VANES ARE ADJUSTABLE.

DISCHARGE DESIGNED FOR MEDIUM CEILING HEIGHT APPLICATIONS.

DISCHARGE DIMENSIONS AND WEIGHT													
	IF DISCHARGE			4F AND 4R DISCHARGE					5F AND 5R DISCHARGE				
DISCHARGE SIZE	W1	L1	WEIGHT	D4	L4	W4	WEIGHT 4F	WEIGHT 4R	D5	L5	W5	WEIGHT 5F	WEIGHT 5R
17	20	7 1/8	50	17 11/16	17 1/2	25 3/4	50	100	17 11/16	9 1/4	25 1/4	45	100
19	—	—	—	20 11/16	17 1/2	25	60	105	—	—	—	—	—
22	—	—	—	—	—	—	—	—	25 11/16	11	34 1/2	60	110
25	—	—	—	31 1/8	23	39	75	125	31 1/8	14	40	65	120
28	35 1/4	10 1/4	70	36 1/2	27 1/2	42	100	155	36 1/2	16 1/2	50	90	160
36	41 1/4	10 1/4	80	42 1/2	32	47 1/4	110	180	42 1/2	18 1/4	55 3/4	110	185
40	47 3/4	10 1/4	90	49 1/2	36	54	130	200	49 1/2	20	66 3/4	120	200
44	—	—	—	49 1/2	38	54	240	310	49 1/2	22	66 3/4	160	245

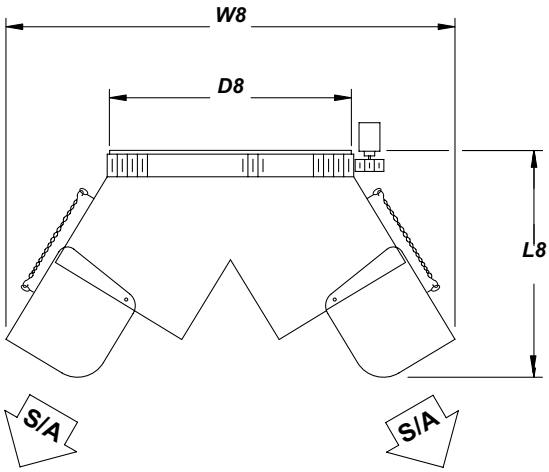
NOTES

1. ALL DIMENSIONS ARE IN INCHES.
2. ALL WEIGHTS ARE IN POUNDS.

VERTICAL DISCHARGES

Dimensions - Sizes 8R, 8F, 10R

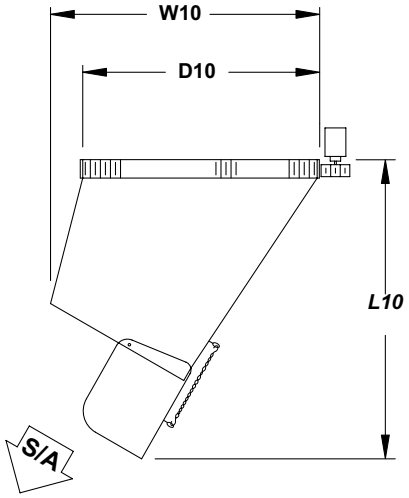
C000598



8F AND 8R DISCHARGE

A TWO OUTLET DISCHARGE SIMILAR TO THE 4F AND 4R DISCHARGE.

DISCHARGE DESIGNED FOR HIGH MOUNTING APPLICATIONS.



10R DISCHARGE

A SINGLE OUTLET DISCHARGE.

DISCHARGE DESIGNED FOR EXTREMELY HIGH MOUNTING APPLICATIONS.

DISCHARGE DIMENSIONS AND WEIGHT									
	8F AND 8R DISCHARGE					10R DISCHARGE			
DISCHARGE SIZE	D8	L8	W8	WEIGHT 8F	WEIGHT 8R	D10	L10	W10	WEIGHT 10R
17	—	—	—	—	—	—	—	—	—
19	—	—	—	—	—	—	—	—	—
22	25 11/16	26	47 1/2	80	100	—	—	—	—
25	—	—	—	—	—	—	—	—	—
28	36 1/2	33	64	100	125	36 1/2	38	41 1/2	140
36	42 1/2	39 3/4	77	120	145	42 1/2	42 1/4	44 3/4	150
40	49 1/2	45 3/4	89 1/2	140	165	49 1/2	56	53 1/2	170
44	49 1/2	44	86	160	195	49 1/2	56	56	180

NOTES

1. *ALL DIMENSIONS ARE IN INCHES.*
2. *ALL WEIGHTS ARE IN POUNDS.*

VERTICAL DISCHARGES

Selection Table - Sizes 1F, 4R, 4F, 5R, 5F

		DESIGN NO. 1F				DESIGN NO. 4R & 4F					DESIGN NO. 5R & 5F			
MODEL	CFM	SIZE	AIR PRESSURE DROP	MOUNT HEIGHT	FIXED COVERAGE	SIZE	AIR PRESSURE DROP	MOUNT HEIGHT	FIXED COVERAGE	REVOLVING COVERAGE	SIZE	AIR PRESSURE DROP	MOUNT HEIGHT	FIXED AND REVOLVING COVERAGE
SAS (I) 109	1,000	17	0.03	11	24 x 50	17	0.04	10	25 x 50	50 x 50	17	0.02	8	53 x 53
	2,000		0.11	14	30 x 59		0.17	12	32 x 63	63 X 63		0.07	10	63 x 63
	3,000		0.25	15	35 x 70		0.39	13	33 X 66	66 X 66		0.16	11	69 x 69
SAS (I) 112	2,000	17	0.11	14	30 x 59	19	0.12	12	32 x 63	63 x 63	22	0.03	12	70 x 70
	3,250		0.29	15	35 x 70		0.33	12	36 x 72	72 x 72		0.07	13	75 x 75
	4,250		0.50	16	37 x 74		0.56	12	40 x 80	80 x 80		0.11	14	78 x 78
SAS (I) 115	3,000	17	0.25	15	35 x 70	25	0.07	15	35 x 70	70 x 70	25	0.02	12	83 x 83
	4,500		0.56	17	40 x 79		0.16	16	42 x 83	83 x 83		0.05	13	86 x 86
	6,000		1.00	18	44 x 86		0.29	17	45 x 89	89 x 89		0.10	14	90 x 90
SAS (I) 118	4,000	28	0.02	19	39 x 78	28	0.06	17	41 x 82	82 x 82	28	0.02	12	83 x 83
	6,000		0.04	21	42 x 84		0.12	18	48 x 96	96 x 96		0.05	14	92 x 92
	8,000		0.08	23	49 x 99		0.22	19	55 x 110	110 x 110		0.10	16	109 x 109
SAS (I) 120	6,000	36	0.02	20	52 x 100	36	0.06	18	48 x 96	96 x 96	36	0.03	14	92 x 92
	8,500		0.05	22	53 x 106		0.13	20	57 x 115	115 x 115		0.08	16	109 x 109
	11,000		0.08	25	54 x 110		0.21	22	64 x 128	128 x 128		0.09	17	122 x 122
SAS (I) 122	11,000	40	0.04	24	50 x 99	40	0.11	22	64 x 128	128 x 128	40	0.05	17	122 x 122
	13,500		0.06	33	65 x 129		0.17	24	72 x 145	145 x 145		0.08	18	127 x 127
	16,000		0.09	37	80 x 160		0.24	25	76 x 153	153 x 153		0.11	19	132 x 132
SAS (I) 125	14,000	40	0.07	34	67 x 134	44	0.11	24	73 x 146	146 x 146	44	0.05	18	129 x 129
	18,000		0.11	40	93 x 186		0.18	28	83 x 166	166 x 166		0.09	21	139 x 139
	20,000		0.14	42	106 x 212		0.23	31	90 x 180	180 x 180		0.11	23	145 x 145
SAS (I) 218	8,000	40	0.02	23	53 x 106	40	0.06	20	57 x 115	115 x 115	40	0.03	16	109 x 109
	12,000		0.05	28	57 x 114		0.14	23	67 x 136	136 x 136		0.06	18	123 x 123
	16,000		0.09	37	80 x 160		0.24	25	76 x 152	152 x 152		0.11	19	132 x 132
SAS (I) 220	12,000	40	0.05	28	57 x 114	44	0.08	23	68 x 136	136 x 136	44	0.04	17	120 x 120
	19,000		0.12	41	96 x 192		0.21	28	85 x 170	170 x 170		0.10	22	142 x 142
	26,000		0.23	50	145 x 290		0.39	34	97 x 195	195 x 195		0.19	27	164 x 164
SAS (I) 222	22,000	40	0.17	44	119 x 238	44	0.28	31	90 x 180	180 x 180	44	0.14	25	151 x 151
	26,500		0.24	50	145 x 290		0.40	34	97 x 195	195 x 195		0.20	27	164 x 164
	31,000		0.33	56	171 x 342		0.55	37	108 x 216	216 x 216		0.27	29	177 x 177
SAS (I) 225	28,000	40	0.27	53	158 x 316	44	0.45	35	102 x 204	204 x 204	44	0.22	28	170 x 170
	33,500		0.38	58	184 x 368		0.64	39	115 x 230	230 x 230		0.31	30	183 x 183
	39,000		0.52	63	210 x 420		0.87	43	128 x 256	256 x 256		0.43	32	196 x 196
SAS (W) 109	1,000	17	0.03	11	24 x 50	17	0.04	10	25 x 50	50 x 50	17	0.02	8	53 x 53
	2,000		0.11	14	30 x 59		0.17	12	32 x 63	63 x 63		0.07	10	63 x 63
	3,000		0.25	15	35 x 70		0.39	13	33 x 66	66 x 66		0.16	11	69 x 69
SAS (W) 112	2,000	17	0.11	14	30 x 59	19	0.12	12	32 x 63	63 x 63	22	0.03	12	70 x 70
	2,875		0.23	14	33 x 67		0.26	12	35 x 70	70 x 70		0.05	13	73 x 73
	3,750		0.39	16	36 x 72		0.44	12	39 x 78	78 x 78		0.09	14	76 x 76
SAS (W) 115	3,000	17	0.25	15	35 x 70	25	0.07	15	35 x 70	70 x 70	25	0.02	12	83 x 83
	4,500		0.56	17	40 x 79		0.16	16	42 x 83	83 x 83		0.05	13	86 x 86
	6,000		1.00	18	44 x 86		0.29	17	45 x 89	89 x 89		0.10	14	90 x 90
SAS (W) 118	4,000	28	0.02	19	39 x 78	28	0.06	17	41 x 82	82 x 82	28	0.02	12	83 x 83
	6,000		0.04	21	42 x 84		0.12	18	48 x 96	96 x 96		0.05	14	92 x 92
	8,000		0.08	23	49 x 99		0.22	19	55 x 110	110 x 110		0.10	16	109 x 109
SAS (W) 215	6,000	36	0.02	20	52 x 100	36	0.06	18	48 x 96	96 x 96	36	0.03	14	92 x 92
	8,000		0.04	23	53 x 106		0.10	20	57 x 115	115 x 115		0.05	16	109 x 109
	12,000		0.09	25	55 x 110		0.25	23	68 x 136	136 x 136		0.11	18	123 x 123
SAS (W) 220	12,000	40	0.05	28	57 x 114	44	0.08	23	68 x 136	136 x 136	44	0.04	17	120 x 120
	19,000		0.12	41	96 x 192		0.21	28	85 x 170	170 x 170		0.10	22	142 x 142
	26,000		0.23	50	145 x 290		0.39	34	97 x 195	195 x 195		0.19	27	164 x 164
SAS (W) 222	22,000	40	0.17	44	119 x 238	44	0.28	31	90 x 180	180 x 180	44	0.14	25	151 x 151
	26,500		0.24	50	145 x 290		0.40	34	97 x 195	195 x 195		0.20	27	164 x 164
	31,000		0.33	56	171 x 342		0.55	37	108 x 216	216 x 216		0.27	29	177 x 177
SAS (W) 225	28,000	40	0.27	53	156 x 318	44	0.45	35	102 x 204	204 x 204	44	0.22	28	170 x 170
	33,500		0.38	58	184 x 368		0.64	39	115 x 230	230 x 230		0.31	30	183 x 183
	39,000		0.52	63	210 x 420		0.87	43	128 x 256	256 x 256		0.43	32	196 x 196

VERTICAL DISCHARGES

Selection Table - Sizes 8R, 8F, 10R

		DESIGN NO. 8R & 8F					DESIGN NO. 10R			
MODEL	CFM	SIZE	AIR PRESSURE DROP	MOUNT HEIGHT	FIXED COVERAGE	REVOLVING COVERAGE	SIZE	AIR PRESSURE DROP	MOUNT HEIGHT	REVOLVING COVERAGE
SAS (I) 109	1,000	22	0.01	12	20 x 39	39 x 39	28	0.01	14	60 x 60
	2,000		0.05	16	28 x 57	57 x 57		0.02	20	71 x 71
	3,000		0.12	18	33 x 66	66 x 66		0.04	25	81 x 81
SAS (I) 112	2,000	22	0.05	16	28 x 57	57 x 57	28	0.02	20	71 x 71
	3,250		0.14	18	33 x 66	66 x 66		0.04	25	81 x 81
	4,250		0.25	20	38 x 75	75 x 75		0.08	27	85 x 85
SAS (I) 115	3,000	22	0.12	18	33 x 66	66 x 66	28	0.04	25	81 x 81
	4,500		0.28	20	39 x 78	78 x 78		0.09	27	85 x 85
	6,000		0.49	23	41 x 81	81 x 81		0.15	29	89 x 89
SAS (I) 118	4,000	28	0.06	20	38 x 75	75 x 75	28	0.07	26	83 x 83
	6,000		0.14	26	42 x 84	84 x 84		0.15	29	89 x 89
	8,000		0.26	29	48 x 95	95 x 95		0.27	32	95 x 95
SAS (I) 120	6,000	36	0.08	26	42 x 84	84 x 84	36	0.08	31	107 x 107
	8,500		0.16	30	49 x 97	97 x 97		0.16	36	114 x 114
	11,000		0.27	35	55 x 110	110 x 110		0.27	41	121 x 121
SAS (I) 122	11,000	40	0.14	35	55 x 110	110 x 110	40	0.14	41	121 x 121
	13,500		0.21	40	57 x 114	114 x 114		0.21	46	127 x 127
	16,000		0.29	43	60 x 120	120 x 120		0.29	51	132 x 132
SAS (I) 125	14,000	44	0.14	40	57 x 114	114 x 114	44	0.14	46	127 x 127
	18,000		0.22	50	63 x 125	125 x 125		0.23	57	138 x 138
	20,000		0.27	58	65 x 130	130 x 130		0.28	68	150 x 150
SAS (I) 218	8,000	40	0.07	30	49 x 97	97 x 97	40	0.07	36	114 x 114
	12,000		0.17	37	56 x 112	112 x 112		0.17	44	124 x 124
	16,000		0.29	43	60 x 120	120 x 120		0.29	51	132 x 132
SAS (I) 220	12,000	44	0.10	37	56 x 112	112 x 112	44	0.10	44	124 x 124
	19,000		0.25	54	64 x 126	126 x 126		0.26	62	144 x 144
	26,000		0.47	76	73 x 146	146 x 146		0.48	90	173 x 173
SAS (I) 222	22,000	44	0.33	66	67 x 135	135 x 135	44	0.34	77	162 x 162
	26,500		0.49	76	73 x 146	146 x 146		0.50	90	173 x 173
	31,000		0.66	86	79 x 158	158 x 158		0.68	103	184 x 184
SAS (I) 225	28,000	44	0.54	81	75 x 151	151 x 151	44	0.55	96	179 x 179
	33,500		0.78	91	81 x 163	163 x 163		0.79	105	195 x 195
	39,000		1.05	101	90 x 180	180 x 180		1.08	114	211 x 211
SAS (W) 109	1,000	22	0.01	12	20 x 39	39 x 39	28	0.01	14	60 x 60
	2,000		0.05	16	28 x 57	57 x 57		0.02	20	71 x 71
	3,000		0.12	18	33 x 66	66 x 66		0.04	25	81 x 81
SAS (W) 112	2,000	22	0.05	16	25 x 57	57 x 57	28	0.02	20	71 x 71
	2,875		0.11	17	31 x 62	62 x 62		0.04	24	77 x 77
	3,750		0.19	19	36 x 72	72 x 72		0.06	26	83 x 83
SAS (W) 115	3,000	22	0.12	18	33 x 66	66 x 66	28	0.04	25	81 x 81
	4,500		0.28	20	39 x 78	78 x 78		0.09	27	85 x 85
	6,000		0.49	23	41 x 81	81 x 81		0.15	29	89 x 89
SAS (W) 118	4,000	28	0.06	20	38 x 75	75 x 75	28	0.07	26	83 x 83
	6,000		0.14	26	42 x 84	84 x 84		0.15	29	89 x 89
	8,000		0.26	29	48 x 95	96 x 95		0.27	32	95 x 95
SAS (W) 215	6,000	36	0.08	26	42 x 84	84 x 84	36	0.08	31	107 x 107
	8,000		0.14	30	49 x 97	97 x 97		0.15	36	114 x 114
	12,000		0.32	37	56 x 112	112 x 112		0.33	44	124 x 124
SAS (W) 220	12,000	44	0.10	37	56 x 112	112 x 112	44	0.10	44	124 x 124
	19,000		0.25	54	64 x 128	128 x 128		0.26	62	144 x 144
	26,000		0.47	76	73 x 146	146 x 146		0.48	90	173 x 173
SAS (W) 222	22,000	44	0.33	66	67 x 138	138 x 138	44	0.34	77	162 x 162
	26,500		0.49	76	73 x 146	146 x 146		0.50	90	173 x 173
	31,000		0.66	86	79 x 158	158 x 158		0.68	103	184 x 184
SAS (W) 225	28,000	44	0.54	81	75 x 151	151 x 151	44	0.55	96	179 x 179
	33,500		0.78	91	81 x 163	163 x 163		0.79	105	195 x 195
	39,000		1.05	101	90 x 180	180 x 180		1.08	114	211 x 211

DISCHARGE LOUVERS

Dimensions and Weights

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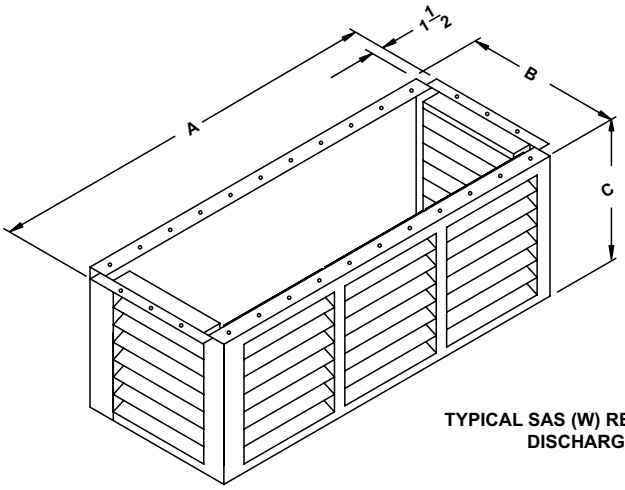
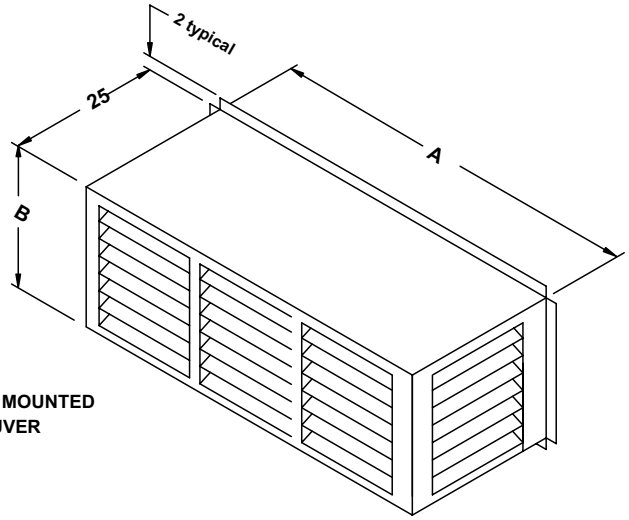


TYPICAL SAS (W) REMOTE MOUNTED
DISCHARGE LOUVER

MODEL	DIMENSIONS			WEIGHT
	A	B	C	
109-112	20-13/16	23	21	44
115-118	26-15/16	26	24	64
215	64-7/8	26	24	112
220-222	84-1/2	31-1/4	45	218
225	105-3/8	40-3/4	45	310



TYPICAL SAS (I) UNIT MOUNTED
DISCHARGE LOUVER

MODEL	DIMENSIONS		WEIGHT
	A	B	
109-112	19-1/8	14-3/8	70
115-118	23	20-3/8	80
120-122	28-1/2	39-1/4	110
125-130	40-1/8	39-1/4	125
218	67-3/4	20-3/8	150
220-222	85-3/4	39-1/4	215
225	108-1/8	39-1/4	230

NOTES
1. ALL DIMENSIONS ARE IN INCHES.
2. ALL WEIGHTS ARE IN POUNDS.

Piping Instructions

The integrity of the system depends in part on proper piping. The following recommendations should be diligently observed.

Steam Systems

1. All piping in contact with airflow should be insulated.
2. Install the Steadyair® unit level to ensure the coil tubes will drain properly.
3. Steam traps, return mains and traps should be anchored and supported independently of the IFB coil.
4. A drip trap should be installed in the steam supply line and drip into the return main. This will prevent steam line condensate from entering the unit with the steam. Avoid dripping steam mains into the line between the IFB coil and traps.
5. Use only bucket or float and thermostatic traps for condensate removal. Use thermostatic traps for venting only.
6. Steam traps should be sized for three times the calculated condensate loading at the coil design conditions, based on the pressure differential across the trap rather than the boiler pressure. Each trap should be selected for the actual pressure differential across the trap, not the boiler pressure. Pressure differential is herein defined as the gauge pressure at the trap minus the pressure in the return main.
7. The return connection should be full size of the coil header and reduced at the trap. Use of a reducing bushing on the coil return connection is not recommended. (If shutoff valve, strainer and trap are piped together with pipe nipples, then the pipe can be reduced to the trap inlet size at the shutoff valve.)
8. Strainers should be installed ahead of traps to prevent dirt and sludge from affecting trap operation.
9. In the case of double section coils, each of the coil sections should be individually trapped and vented.
10. Risers should not be installed in condensate return lines.
11. When the “closed circuit gravity return system” leads directly to the boiler, the coil traps should be located at least 2 feet above the water line of the boiler.
12. The steam trap should have provisions for air venting. If the trap is non-venting, proper air vents should be provided for each coil section to eliminate condensable gases. All air vent lines should be minimum 1-inch diameter and properly pitched to assure free venting of air. The venting device should be located at least 12 inches above the bottom of the coil casing. In low-pressure steam systems (15 psig and below) in which a non-venting trap is used for condensate removal, a thermostatic air trap should be installed in a 1 inch diameter air line bypassing the condensate trap to the atmospheric return main. An automatic air vent should be installed in a 1-inch diameter air line before the condensate trap on systems with a vacuum return system. In high-pressure steam systems (above 15 psig) in which a non-venting trap is used for condensate removal, an automatic air vent should be installed in a 1 inch diameter air line before the condensate trap. Do not return vented air to the condensate return main.
13. It is recommended that a bypass line with valve be installed around the trap to allow for operation of the coil during trap maintenance. This feature will also provide better coil start-up conditions when temperatures are below freezing.
14. If condensate must be lifted above the coil return level into overhead mains or if return mains are pressurized, then a pump and receiver should be installed between the condensate traps and return mains.
15. Proper vacuum breakers should be furnished as shown on the piping diagrams.
16. Swing check valves of 15-degree type should be used to prevent condensate backup in the case of steam system failure. Vertical lift check valves or 45-degree swing check valves should not be used as they require a higher head pressure of water to open them.

Hot Water Systems

1. Install the Steadyair® unit level to ensure the coil tubes will drain properly.
2. Water mains, inlet and outlet mains should be anchored and supported independently of the IFB coil.

Piping Diagrams – Steam Coils

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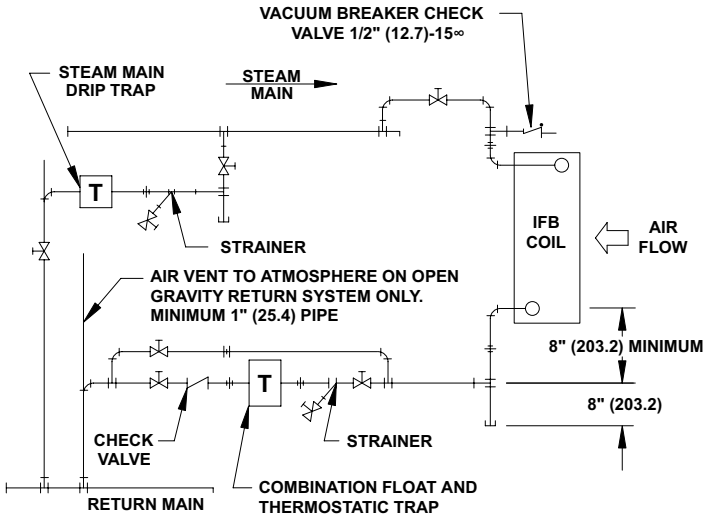
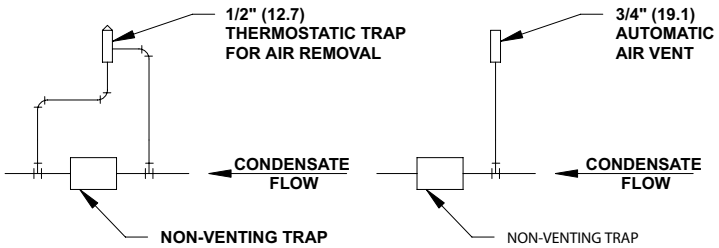
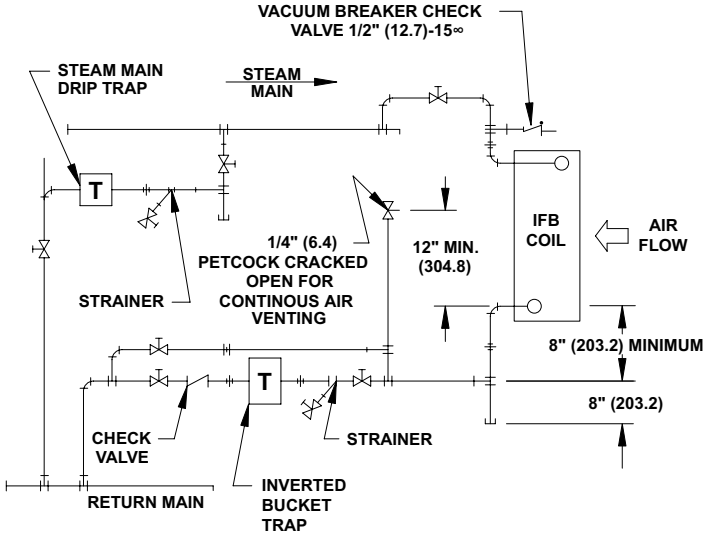
PIPING DIAGRAM - STEAM PRESSURE BELOW 15 PSIG OR 103.4 KPA



Non-venting Traps
(Steam Pressure Below 15 PSIG Or 103.4 KPa)



PIPING DIAGRAM - STEAM PRESSURE ABOVE 15 PSIG OR 103.4 KPA

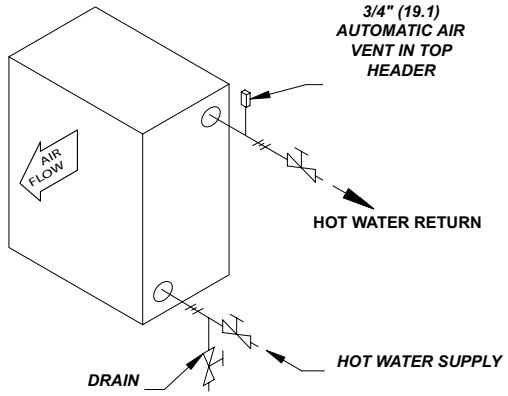


NOTE : DIMENSIONS ARE IN INCHES.
DIMENSIONS IN PARENTHESIS ARE IN MILLIMETERS.

Piping Instructions

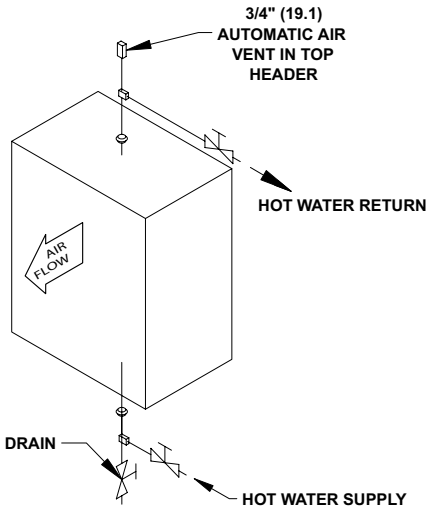
C000594

HOT WATER PIPING DIAGRAM - IFB SINGLE SECTION COIL



SIDE HEADER COIL

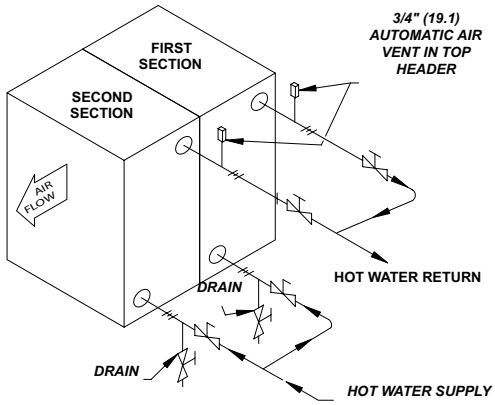
APPLIES TO COIL MODEL NUMBERS
A-36, B-36, C-42, C-60 AND E-54



CENTER HEADER COIL

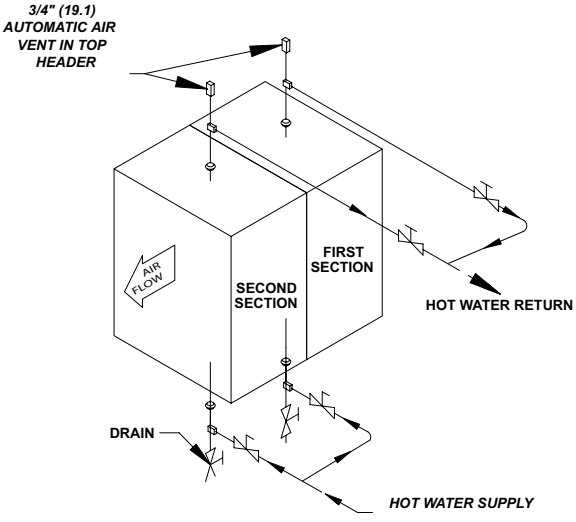
APPLIES TO COIL MODEL NUMBERS
E-84, E-96, E-108, E-114,
E-120, F-66 AND F-120

HOT WATER PIPING DIAGRAM - IFB DOUBLE SECTION COIL



SIDE HEADER COIL

APPLIES TO COIL MODEL NUMBERS
A-36-DS, B-36-DS, C-42-DS,
C-60-DS AND E-54-DS



CENTER HEADER COIL

APPLIES TO COIL MODEL NUMBERS
E-84-DS, E-96-DS, E-108-DS, E-114-DS,
E-120-DS, F-66-DS AND F-120-DS

NOTES :

1. ***DIMENSIONS ARE IN INCHES.***
2. ***DIMENSIONS IN PARENTHESIS ARE IN MILLIMETERS.***
3. ***THE SUPPLY AND RETURN CONNECTIONS ON EACH COIL PROVIDED IN AN OUTDOOR UNIT ARE PLUMBED TO THE EXTERIOR OF THE HOUSING OF THE UNIT.***

Controls Systems

Methods of Control

Steadyair® is available with either of two methods of control: Airstream or Room with Low Limit. Both methods control the discharge temperature of the unit by modulating the coil face and bypass dampers. With Airstream control, the controller is mounted in the unit and has a single sensing element located in the discharge airstream. Room with Low Limit control uses the Airstream controller as its low limit and adds a room thermostat as the primary control.

Pneumatic or Electric Actuators

Both methods of control are available in either electric or pneumatic versions.

The standard electric version uses foot-mounted 24 volt Honeywell damper actuators with Honeywell controllers. In the event of a control failure, the dampers will remain at the last controlling position.

The standard pneumatic version uses Siemens actuators. These actuators close the bypass dampers on the spring return stroke to protect the system in the event of control air pressure failure. Pilot positioners are required.

Controller Setpoints

Steadyair® is a make-up air unit and, as such, the delivered air temperature should be at or near that of the room ambient temperature. Using Room with Low Limit control insures that if the Room thermostat is satisfied, the Low Limit controller will not allow the unit discharge to fall below the controller setpoint. Without this, or if the Low Limit temperature was set well below the Room Temperature, unheated air could be introduced into the room, driving the ambient temperature down and requiring the unit to bring it back up. The Room with Low limit Control prevents this unwanted temperature cycling.

Sequence of Operation

When maximum temperature rise is required, the IFB coil face dampers are fully open to the heating sections while the bypass dampers are fully closed. As the discharge temperature approaches the controller setpoint, the bypass dampers will begin to open while the face dampers will begin to close. Once the discharge temperature reaches the controller setpoint, the bypass dampers remain fully open while the face dampers are fully closed.

Note that the IFB coil is designed to operate with full steam pressure or constant water flow. This results in some temperature override when the set point is reached. In the event that this is undesirable, then a slow-acting, two-position (fully open/fully closed) valve should be installed. The use of modulating valves on steam systems when the outdoor air temperatures are below freezing is strongly discouraged as this can lead to coil freeze-ups.

Additional Control Options

Included among the additional control options are:

- Freezestat – Uses an averaging sensing element mounted to one heating element to shut down the unit upon sensing a temperature that could potentially lead to a frozen tube or coil.
- Fan Cut-Off Thermostat - Uses a single sensing bulb to shut down the unit upon sensing a discharge temperature that is below the setpoint.

Control Diagrams

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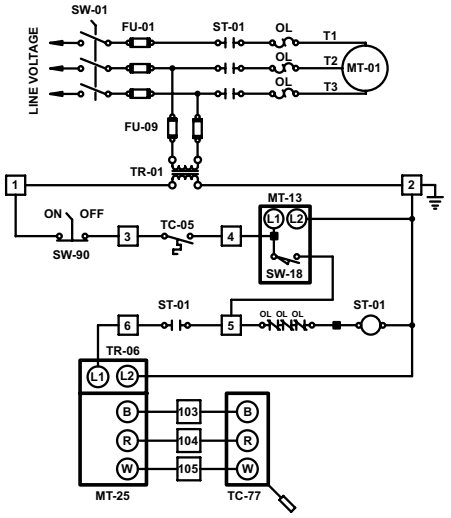
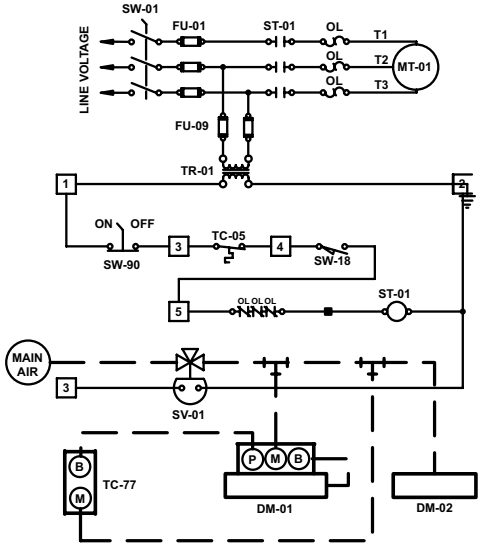
ELECTRIC AIRSTREAM CONTROL



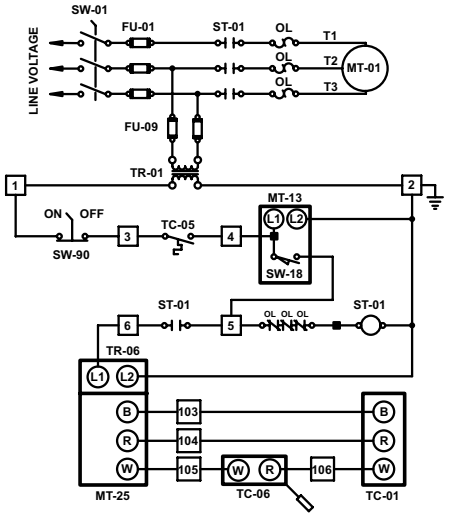
UNIT SHALL BE GROUNDED ACCORDING TO THE LATEST PROVISIONS OF NEC.
CAUTION: OPEN MAIN DISCONNECT SWITCH BEFORE SERVICING EQUIPMENT.

PNEUMATIC AIRSTREAM CONTROL



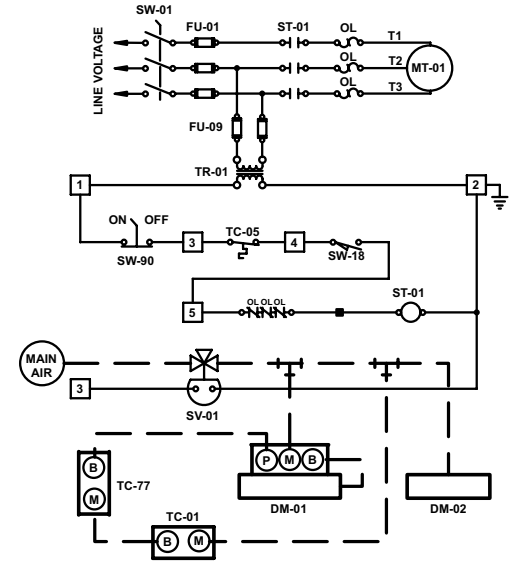
UNIT SHALL BE GROUNDED ACCORDING TO THE LATEST PROVISIONS OF NEC.
CAUTION: OPEN MAIN DISCONNECT SWITCH BEFORE SERVICING EQUIPMENT.

ELECTRIC ROOM AND LOW LIMIT CONTROL



UNIT SHALL BE GROUNDED ACCORDING TO THE LATEST PROVISIONS OF NEC.
CAUTION: OPEN MAIN DISCONNECT SWITCH BEFORE SERVICING EQUIPMENT.

PNEUMATIC ROOM AND LOW LIMIT CONTROL



UNIT SHALL BE GROUNDED ACCORDING TO THE LATEST PROVISIONS OF NEC.
CAUTION: OPEN MAIN DISCONNECT SWITCH BEFORE SERVICING EQUIPMENT.

COMPONENT IDENTIFICATION

DM-01	PNEUMATIC COIL FACE AND BY-PASS DAMPER MOTOR
DM-02	PNEUMATIC OUTSIDE AIR DAMPER MOTOR
FU-01	MAIN DISCONNECT FUSE
FU-09	CONTROL TRANSFORMER FUSE
MT-01	SUPPLY FAN MOTOR
MT-13	ELECTRIC OUTSIDE AIR DAMPER MOTOR
MT-25	ELECTRIC COIL FACE AND BY-PASS DAMPER MOTOR
ST-01	SUPPLY FAN MOTOR STARTER
SV-01	AIR SOLENOID VALVE

COMPONENT IDENTIFICATION

SW-01	MAIN DISCONNECT SWITCH
SW-18	OUTSIDE AIR DAMPER ACTUATOR END SWITCH
SW-90	UNIT ON-OFF SWITCH
TC-01	ROOM THERMOSTAT
TC-05	MANUAL RESET FAN CUT-OFF THERMOSTAT
TC-06	LOW LIMIT DISCHARGE AIR DUCTSTAT
TC-77	AIRSTREAM THERMOSTAT
TR-01	CONTROL TRANSFORMER
TR-06	DAMPER TRANSFORMER

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ELECTRICAL DATA

Amp Draw Table

ITEM	SOURCE	AMPS	MOTOR HORSEPOWER							
			1	**1 1/2**	**2**	**3**	**5**	**7 1/2**	**10**	**15**
A	Blower Motor	AMPS for 208V 3 Ph	4.6	6.6	7.5	10.6	16.7	24.2	30.8	46.2
		AMPS for 230V 3 Ph	4.2	6.0	6.8	9.6	15.2	22.0	28.0	42.0
		AMPS for 460V 3 Ph	2.1	3.0	3.4	4.8	7.6	11.0	14.0	21.0
		AMPS for 575V 3 Ph	1.7	2.4	2.7	3.9	6.1	9.0	11.0	17.0
		AMPS	**MOTOR HORSEPOWER**							
			20	**25**	**30**	**40**	**50**	**60**	**75**	**100**
		AMPS for 208V 3 Ph	59.4	74.8	88.0	114.0	143.0	169.0	211.0	273.0
		AMPS for 230V 3 Ph	54.0	68.0	80.0	104.0	130.0	154.0	192.0	248.0
		AMPS for 460V 3 Ph	27.0	34.0	40.0	52.0	65.0	77.0	96.0	124.0
		AMPS for 575V 3 Ph	22.0	27.0	32.0	41.0	52.0	62.0	77.0	99.0

ITEM	SOURCE	AMPS	CONTROL CIRCUIT AMPS
B	Control Transformer	AMPS for 208V 3 Ph	2.4
		AMPS for 230V 3 Ph	2.2
		AMPS for 460V 3 Ph	1.1
		AMPS for 575V 3 Ph	0.9

NOTES:
1. Above motor amps are based on 2002 edition of NEC.
2. Control circuit amps are based on standard controls.

Steps to size optional disconnect switch:
1. Find the blower motor HP required from tables on pages 8 to 11.
2. Find amp draw for required motor HP from chart in **Item A** above.
3. Find amps for control circuit from chart in **Item B** above.
4. Add amps from step 2 and step 3, then multiply by 1.25.

Specifications

Furnish L.J. Wing Steadyair® air handling unit(s) with airflow and heating capacities as shown on the schedule.

Unit Casing

Unit casing and accessories shall be fabricated from heavy gauge steel suitably reinforced to insure rigidity. All panels will be galvanized steel. All casings shall be airtight. (Outdoor units only: Casing shall also be weatherproof the base of the unit shall be adaptable for curb mounting). Complete access shall be provided to all internal components through gasketed access doors.

Blower Section

Each unit shall be supplied with centrifugal forward curved, DWDI fan(s) rated in accordance with AMCA standards. The fan or fans shall be mounted on a solid shaft for single blowers and a hollow shaft for double blowers. Shaft shall be designed for a maximum operating speed not to exceed 75% of its first critical speed. Bearings are to be heavy-duty industrial pre-lubricated type. (**Indoor units only:** Bearings are to be external type.) (**Outdoor units only:** Bearings to have extended grease lines to the control side of the cabinet.) Blowers are to be driven by a V-belt package sized with a capacity that is 25% greater than the motor horsepower. Multiple belt applications must be matched sets. Drives are to be adjustable for motor sizes through 7 1/2 HP, and fixed for 10 HP and larger. Motor shall be single-speed (or two-speed) open drip-proof (or totally enclosed fan-cooled) type. Motor to be mounted on an adjustable slide base. (**Indoor unit only:** Motor is to be mounted external to the cabinet. A belt guard shall be provided for protection.) (**Outdoor unit only:** Motor, bearings, and drives shall be mounted inside the cabinet for maximum weather protection).

Controls

Unit shall be furnished with controls on left hand side (Optional: right hand side) when facing in the direction of airflow.

Heating Coil

The heating coil shall be a horizontal tube integral face and bypass coil consisting of built-in series of finned heating elements and bypasses with interlocked dampers controlled by an electric (or pneumatic) damper motor and an airstream thermostat. Damper blades shall be fabricated of 16 gauge galvanized steel. Coil shall be capable of maintaining a constant discharge air temperature regardless of variations in the entering air temperature. Full steam pressure (or full hot water flow) shall be provided to the coil at all times.

Proportion of the air shall be such that the air temperature at any point in a plane parallel to the face of the coil three feet downstream from the coil's leaving side will not vary more than 5 degrees F from the average discharge temperature.

Finned heating elements shall be fabricated of seamless copper tubes with rectangular aluminum fins spaced not closer than 11 fins per inch. Each tube shall be brazed to the inlet and return headers. Finned elements shall be factory tested at 200 psig steam pressure and 500 psig hydrostatic pressure.

Air pressure drop through the coil shall not vary more than plus or minus 5 percent regardless of the internal damper position.

Performance of the coil shall be ARI-certified. Coil shall be ETL listed to UL standard 1995.

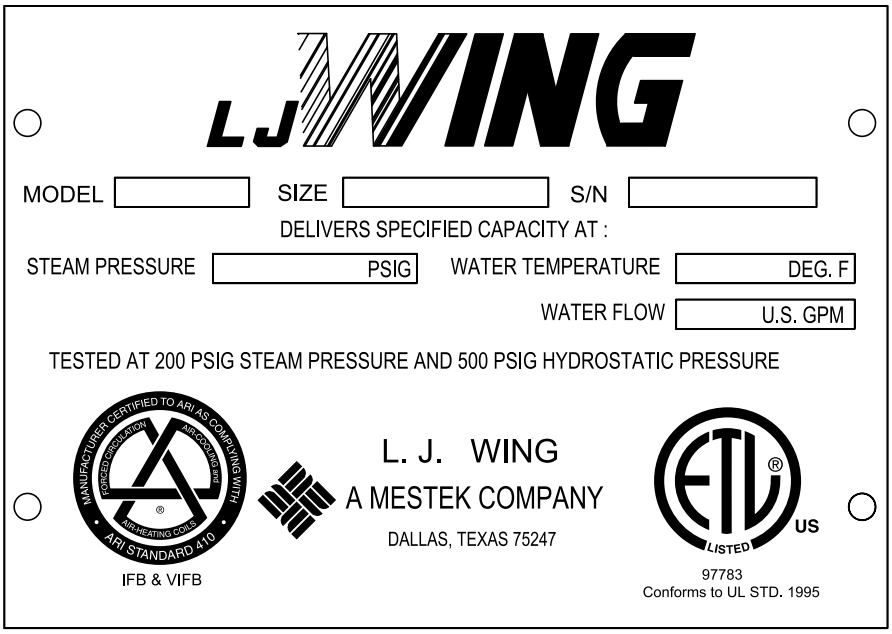
Options:

1. Fixed or revolving discharge
2. Discharge louver box
3. Inlet filter box
4. Roof curb (Outdoor units only)
5. Electric or pneumatic air stream controls
6. Inlet hood with bird screen
7. V-bank filter section
8. Combination V-bank filter with mixing box
9. Electric or pneumatic two-position damper motor
10. Pressure control system
11. Insulated fan box
12. Inlet air damper
13. Vibration feet
14. Blower/motor isolation (rooftop units only)
15. Painted Cabinet

Typical Schedule

From example on page 6:

Model no.	Airflow Rate (scfm)	Ent. Air Temp. (degrees F)	Leav. Air Temp. (degrees F)	Heat Transfer (MBtuh)	Steam Pressure (psig)	Condensate load (lbm/hr)	Total S.P. (inches w.c.)	Electrical Service (volt/ph./Hz)	Motor Horesepower (HP)
SAS(W)-118-HRB	5,800	-10	70	503.4	15	532.7	0.58	230/3/60	1-1/2



SERIAL NUMBER IS REGISTERED AT FACTORY
FOR SERVICE REFERENCE

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