

# ***Solutions***

## Air Handling Units



**TECHNICAL<sup>TM</sup>**  
**S Y S T E M S**

DIVISION RAE CORPORATION

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## ***SOLUTIONS*** Air Handling Units

***SOLUTIONS*** – Competitively priced air handling units providing more choices and more solutions to your application requirements!

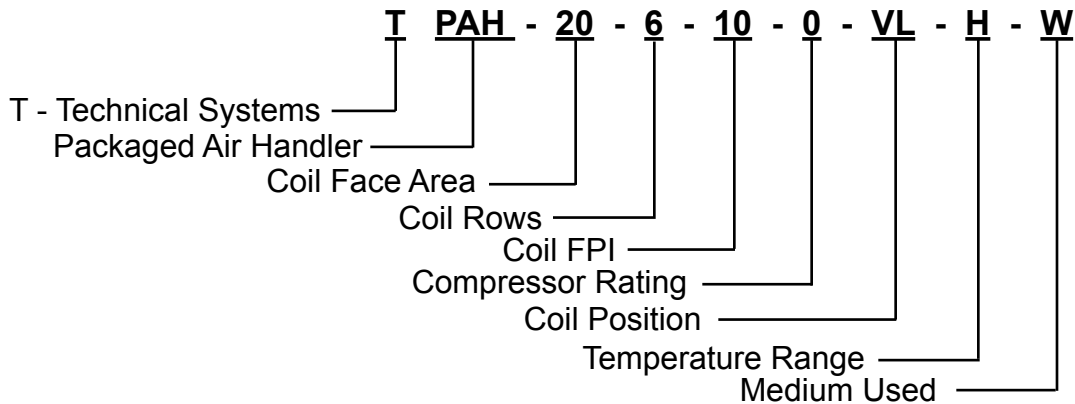
The new line of ***Solutions*** Air Handling units provides many features. The goal was to achieve many of the features currently unavailable in today's market and to do so in a cost effective manner. To do this Technical Systems merged its history in the custom air handling business with our current manufacturing design practices and the result is the new ***Solutions*** product line. Previously, Technical Systems manufactured a custom air handling unit that was comprised of many specialty parts and offered wide manufacturing flexibilities. We have combined many of these custom features with a strong pre-designed manufacturing approach to give the customer the best of both worlds. That is, the customer gets many options at a competitive price with an excellent delivery schedule. Technical Systems maintains inventory to offer lead times that stay consistent and do not significantly fluctuate.

The manufacturing capability provided by Technical Systems is one of the key factors in the resurgence into the air handling business. Technical Systems presently manufactures most of the components for the ***Solutions*** line in our many other product lines. This gives Technical Systems the opportunity to use current inventory to expand our growing product lines.

Each air handling unit is built to meet the needs of the end user. While the design has been optimized around 18 base units, the wide range of coils, fans, and special design options allows this product line to be fine tuned for the customer's design conditions. Whether it is plenum fans or forward curved fans, chilled water or DX cooling coils, hot water, steam or electric heating and various options for filters and sound attenuators; the ***Solutions*** air handling unit is the answer. To meet the demands of different operating environmental conditions, heavy galvanized construction is used to build these air handling units from the ground up. With the standard "heavy" construction features and the option for other specialty materials, the ***Solutions*** Air Handler is built to last for many years to come and is another quality product that you would expect from one of the leaders in the HVAC industry.

Just one call to your local Technical Systems representative and a high quality air handling unit can be designed to fit your needs. The ***Solutions*** Air Handler is one more reason Technical Systems is your Total Solutions supplier.

# PACKAGED AIR HANDLER NOMENCLATURE



## Packaged Air Handlers

Example: I PAH -22 6 10 -0 VL -H W  
I II III IV V VI VII VIII IX

### I – Basic Model

T = Technical Systems

A to ZZZ (other than R) = Customer code

### II – Unit Type

PAH = Packaged Air Handler

**III – Area of Coil Face** - Sizes 04, 05, 06, 07, 50, 58 are currently outside ETL listing.  
-08 to -45 = minimum 8 square feet to maximum 45 square feet

### IV – Number of Coil Rows

4 = 4 rows

6 = 6 rows

8 = 8 rows

### V – Density of Fins

4 to 14 = Minimum 4 fins/inch to maximum 14 fins/inch

### VI – Compressor Rating

-0 = No compressor

### VII – Coil Position

VL = Vertical, Left hand

VR = Vertical, Right hand

### VIII – Temperature Range

-H = High

### IX – Medium Used

2 = R-22

4 = R-404a

5 = R-502

7 = R-507

O = Other

W = Water

# UNIT CAPACITY CHART

**Table 1**

	MODEL NUMBER								
	TPAH-4	TPAH-5	TPAH-6	TPAH-7	TPAH-8	TPAH-10	TPAH-11	TPAH-12	TPAH-15
Max. Airflow (cfm)	2,000	2,670	3,000	4,000	4,333	5,333	6,000	6,667	8,000
Min. Airflow (cfm)	1,450	1,950	2,200	2,900	3,150	3,900	4,350	4,850	5,800
Min. Nom. Cap. (tons)	3.6	4.9	5.5	7.3	7.9	9.8	10.9	12.1	14.5
Max. Nom. Cap. (tons)	5.0	6.7	7.5	10.0	10.8	13.3	15.0	16.7	20.0
Cabinet Width (in.)	38	46	50	60	64	60	60	62	60
Cabinet Height (in.)	35	35	35	35.5	35.5	44.5	47.5	50.5	59.5
MB OA Dmp Area (ft. <sup>2</sup> )	2.50	3.50	3.75	5.00	5.50	6.67	7.92	8.75	10.00
MB OA Hood Area (ft. <sup>2</sup> )	2.50	3.50	3.75	5.00	5.50	6.67	7.92	8.75	10.00
MB RA Dmp Area (ft. <sup>2</sup> )	1.67	2.17	2.50	3.33	3.67	4.50	4.75	5.25	6.67
Flat Filter Area (ft. <sup>2</sup> )	4.00	5.34	6.00	8.00	8.70	10.70	12.00	13.30	16.00
Actual Coil Area (ft. <sup>2</sup> )	3.67	5.00	5.50	7.33	8.00	9.85	11.00	12.19	14.67
Coil Qty.	1	1	1	1	1	1	1	1	1
Coil Fin Height (in. ea.)	24	24	24	24	24	33	36	39	48
Fin Length (in.)	22	30	33	44	48	43	44	45	44
Actual Coil Area (ft. <sup>2</sup> )	3.67	5.00	5.50	7.33	8.00	9.85	11.00	12.20	14.70
Max. DWDI FC Fan Size (in.)	7	9	10	12	12	12	15	15	18
Max. DWDI FC Max Motor HP	5	5	5	7.5	7.5	7.5	7.5	10	10
Max. SWSI Plenum Fan Size	12	13	13	15	16	16	18	20	22
Max. SWSI Plenum Fan Max HP	5	5	5	7.5	7.5	10	10	15	15
Air Blender Area (ft. <sup>2</sup> )	1.50	1.90	2.30	3.80	3.80	3.80	4.60	4.60	4.60
Sound Atten. Area (ft. <sup>2</sup> )	4	6	6	8	8	12	12	12	16
Discharge Opening (ft. <sup>2</sup> )	1.8	2.4	2.6	3.3	3.6	5.3	5.3	5.6	6.7

# UNIT CAPACITY CHART

**Table 1**

	MODEL NUMBER								
	TPAH-18	TPAH-22	TPAH-24	TPAH-28	TPAH-32	TPAH-38	TPAH-44	TPAH-50	TPAH-58
Max. Airflow (cfm)	10,000	12,000	12,500	15,000	17,500	21,000	24,000	28,000	32,000
Min. Airflow (cfm)	7,500	8,500	9,000	11,000	12,500	15,000	17,500	20,000	24,000
Min. Nom. Cap. (tons)	18.8	21.3	22.5	27.5	31.3	37.5	43.8	50.0	60.0
Max. Nom. Cap. (tons)	25.0	30.0	31.3	37.5	43.8	52.5	60.0	70.0	80.0
Cabinet Width (in.)	72	82	72	82	94	94	104	104	104
Cabinet Height (in.)	61.5	61.5	75.5	75.5	78	90	90	102	114
MB OA Dmp Area (ft. <sup>2</sup> )	13.0	15.0	16.0	20.0	24.0	27.0	31.5	38.5	42.0
MB OA Hood Area (ft. <sup>2</sup> )	13.0	15.0	16.0	20.0	24.0	27.0	31.5	38.5	42.0
MB RA Dmp Area (ft. <sup>2</sup> )	8.00	10.00	10.00	12.50	13.75	16.50	19.50	22.80	24.50
Flat Filter Area (ft. <sup>2</sup> )	20.0	24.0	25.0	30.0	35.0	42.0	48.0	56.0	64.0
Actual Coil Area (ft. <sup>2</sup> )	18.3	22.0	22.9	27.5	32.08	38.50	44.00	51.33	58.67
Coil Qty.	1	1	2	2	2	2	2	2	2
Each Coil Fin Height (in.)	48	48	60	60	60	72	72	87	96
Fin Length (in.)	55	66	55	66	77	77	88	88	88
Coil Area (ft. <sup>2</sup> )	18.33	22.00	22.92	27.50	32.08	38.5	44.00	51.33	58.67
Max. DWDI FC Fan Size (in.)	20	20	20	22	22	25	27	27	30
Max. DWDI FC Max Motor HP	15	15	20	20	25	30	30	40	40
Max. SWSI Plenum Fan Size (in.)	22	24	24	27	27	30	33	36	40
Max. SWSI Plenum Fan Max HP	20	25	25	25	30	40	40	40	50
Air Blender Area (ft. <sup>2</sup> )	7.80	9.00	9.00	11.8	15.0	16.6	20.3	20.3	22.2
Sound Atten. Area (ft. <sup>2</sup> )	20.0	24.0	25.0	30.0	30.0	42.0	42.0	49.0	64.0
Discharge Opening (ft. <sup>2</sup> )	8.3	9.7	10.0	11.7	13.7	17.1	19.2	23.0	25.6

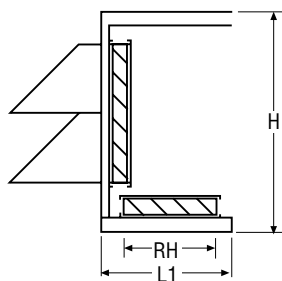
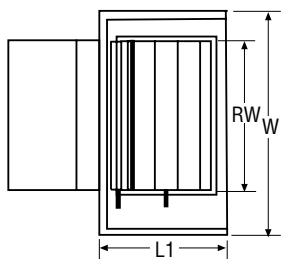
# SECTION DRAWINGS

**Table 2**

Each PAH consists of several sections that make up the air handling unit. The following is a description of the cataloged sections. For special section arrangements or components, please contact the factory. Note that in addition to the components listed below, each section also includes the cabinet, airseals, and accessories required for a working unit.

**MB1 (Mixing Box)\* -**

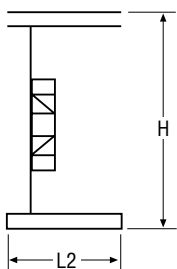
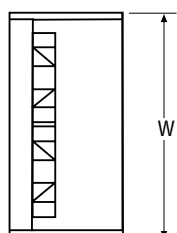
This section consists of either one or two dampers for a combination of outside air and return air. Outdoor units will also consist of a rainhood.



**MB1**

**BLD1 (Air Blender)\* -**

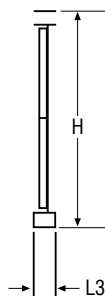
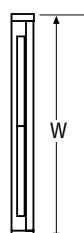
This section consists of an air mixing device to blend two airstreams at different temperatures into a non-stratified airstream.



**BLD1**

**FF1 (Filter) -**

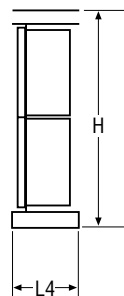
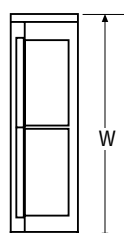
This section consists of universal filter holding frames to hold either 2" or 4" filters.



**FF1**

**FF2 (Filter) -**

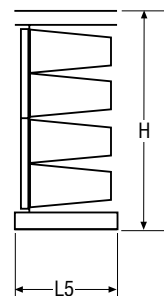
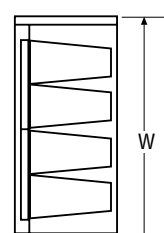
This section consists of universal filter holding frames to hold either 2' or 4" pre-filters and up to 22" bag filters



**FF2**

**FF3 (Filter) -**

This section consists of universal filter holding frames to hold either 2' or 4" filters and up to 22" bag filters



**FF3**

## DIMENSIONAL DATA

**Table 2**

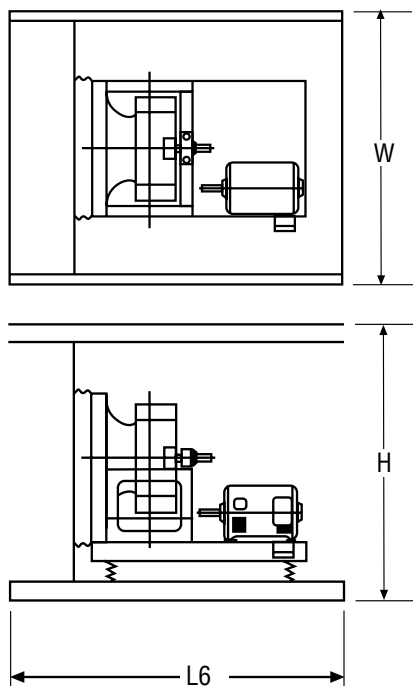
		SECTION DIMENSIONAL DATA								
		TPAH-4	TPAH-5	TPAH-6	TPAH-7	TPAH-8	TPAH-10	TPAH-11	TPAH-12	TPAH-15
	H	35"	35"	35"	35.5"	35.5	44.5"	47.5"	50.5"	59.5"
	W	38"	46"	50"	60"	64	60"	60"	62"	60"
MB1	L1	22"	22"	22"	22"	22	28"	28"	28"	34"
	RH	12"	12"	12"	12"	12"	18"	18"	18"	24"
	RW	20"	26"	30"	40"	44"	36"	38"	42"	40"
BLD1	L2	18"	22"	26"	21"	22	21"	23"	24"	30"
FF1	L3	6"	6"	6"	6"	6	6"	6"	6"	6"
FF2	L4	18"	18"	18"	18"	18	18"	18"	18"	18"
FF3	L5	28"	28"	28"	28"	28	28"	28"	28"	28"
PF1	L6	52"	54"	54"	56"	58	60"	62"	68"	72"
HF1	L7	50"	52"	54"	62"	62	62"	66"	66"	72"
HF2	L8	36"	38"	40"	46"	46"	46"	50"	50"	52"

# SECTION DRAWINGS

**Table 2**

**PF1 (Plenum Fan)\* -**

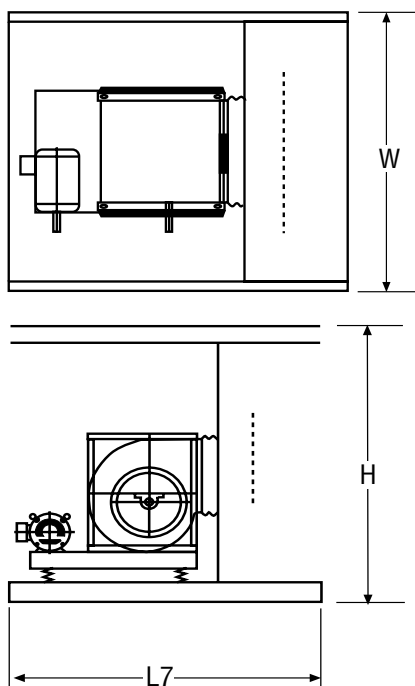
This section consists of the cabinet required to house an SWSI plenum fan.



**PF1**

**HF1 (Housed Fan)\* -**

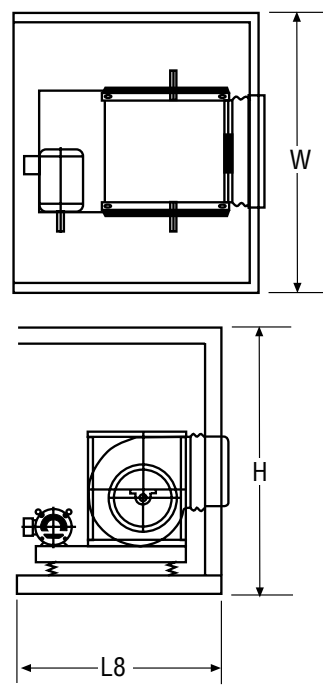
This section consists of the cabinet required to house a DWDI housed fan with discharge internal to the unit.



**HF1**

**HF2 (Housed Fan)\* -**

This section consists of the cabinet required to house a DWDI housed fan with discharge external to the unit.



**HF2**

# DIMENSIONAL DATA

**Table 2**

		SECTION DIMENSIONAL DATA								
		TPAH-18	TPAH-22	TPAH-24	TPAH-28	TPAH-32	TPAH-38	TPAH-44	TPAH-50	TPAH-58
	H	59.5"	60"	73.5"	74"	76"	88"	88.5"	100.5"	112.5"
	W	72"	82"	72"	82"	94"	94"	104"	104"	104"
MB1	L1	34"	34"	40"	40"	40"	46"	46"	52"	52"
	RH	24"	24"	30"	30"	30"	36"	36"	42"	42"
	RW	48"	60"	48"	60"	66"	66"	78"	78"	84"
BLD1	L2	31"	32"	37"	40"	42"	48"	50"	54"	60"
FF1	L3	6"	6"	6"	6"	6"	6"	6"	6"	6"
FF2	L4	18"	18"	18"	18"	18"	18"	18"	18"	18"
FF3	L5	28"	28"	28"	28"	28"	28"	28"	28"	28"
PF1	L6	72"	78"	78"	84"	86"	92"	98"	102"	110"
HF1	L7	84"	84"	84"	92"	96"	100"	110"	112"	114"
HF2	L8	64"	64"	64"	68"	72"	76"	80"	82"	84"



# SECTION DRAWINGS

**Table 2**

**C1 (Coil) -**

This section consists of the cabinet required to house a 1 or 2 row heating coil.

**C2 (Coil)\* -**

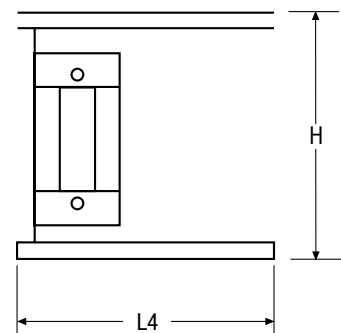
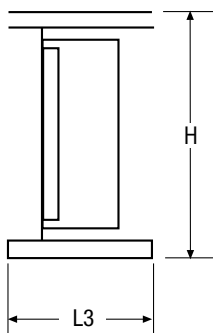
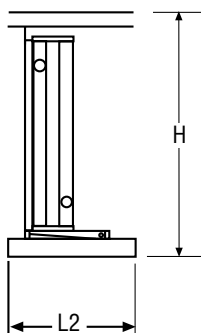
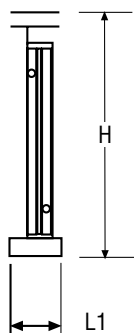
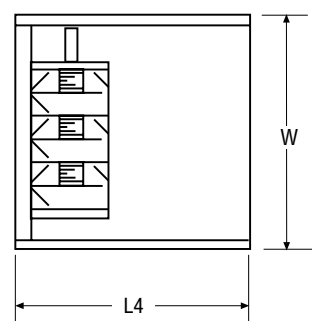
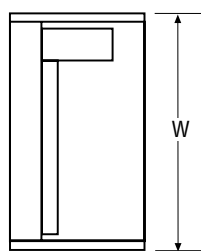
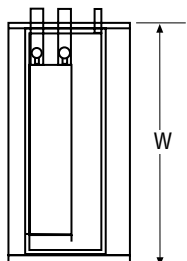
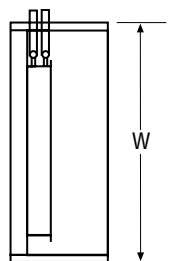
This section consists of the cabinet required to house a cooling coil and includes a drain pan.

**C3 (Coil)\* -**

This section consists of the cabinet required to house a typical electric heater. *Note that due to the number of voltages and capacities, this section's length may vary from the cataloged value.*

**C4 (Coil)\* -**

This section consists of the cabinet required to house an integral face and bypass coil.



C1

C2

C3

C4

## DIMENSIONAL DATA

**Table 2**

		SECTION DIMENSIONAL DATA								
		TPAH-4	TPAH-5	TPAH-6	TPAH-7	TPAH-8	TPAH-10	TPAH-11	TPAH-12	TPAH-15
	H	35"	35"	35"	35.5"	35.5"	44.5"	47.5"	50.5"	59.5"
	W	38"	46"	50"	60"	64"	60"	60"	62"	60"
C1	L1	12"	12"	12"	12"	12"	12"	12"	12"	12"
C2	L2	24"	24"	30"	30"	30"	30"	30"	30"	30"
C3*	L3	24"	24"	30"	30"	30"	30"	30"	36"	36"
C4	L4	60"	60"	60"	60"	60"	60"	60"	60"	60"
ATT	L5	L5 is dependent on ATT3 / ATT4 / ATT5 and is 36" / 48" / 60" respectively								
SS	L6	L6 is dependent on SS1 / SS2 / SS3 and is 12" / 24" / 36" respectively								
D1	L7	18"	18"	18"	18"	18"	24"	24"	24"	28"
D2	L8	6"	6"	6"	6"	6"	6"	6"	6"	6"
	DH	10"	10"	10"	10"	10"	16"	16"	16"	20"
	DW	26"	34"	38"	48"	52"	48"	48"	50"	48"
US1	L9	4"	4"	4"	4"	4"	4"	4"	4"	4"

\* Electric heater section length is dependent on capacity and voltage. The given value is an estimate based on 460V power and 50° temperature rise.



# SECTION DRAWINGS

**Table 2**

**ATT3 (Sound Attenuator)**

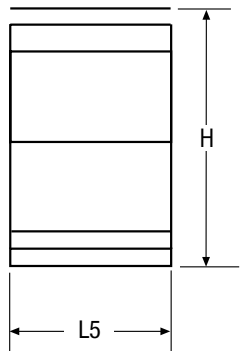
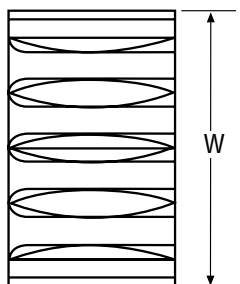
This section consists of 3' sound attenuators.

**ATT4 (Sound Attenuator)**

This section consists of 4' sound attenuators.

**ATT5 (Sound Attenuator)**

This section consists of 5' sound attenuators.



ATT3, ATT4, ATT5

**SS1 (Space Section)**

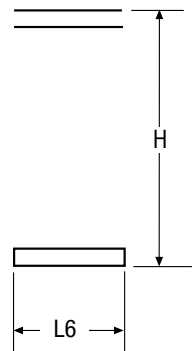
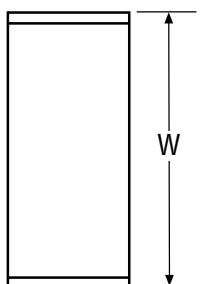
This section consists of a 1' space section.

**SS2 (Space Section)**

This section consists of a 2' space section.

**SS3 (Space Section)**

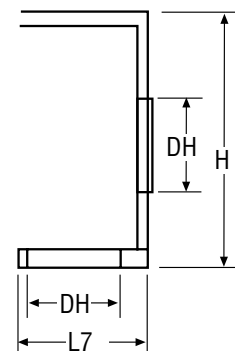
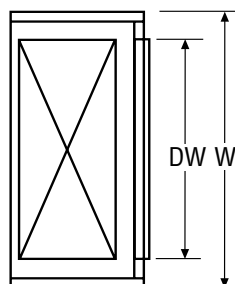
This section consists of a 3' space section.



SS1, SS2, SS3

**D1 (Discharge)**

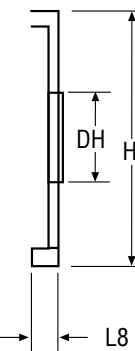
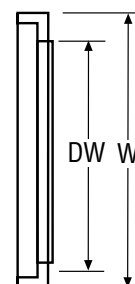
This section consists of a down or up discharge. An end discharge can be applied if the cabinet length is required for proper airflow.



D1

**D2 (Discharge)**

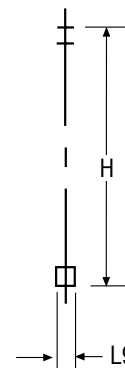
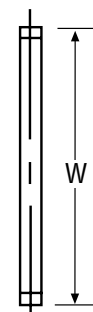
This section consists of an end discharge.



D2

**US1 (Unit Split)**

This section consists of the required space to split a unit into two pieces.



US1

## DIMENSIONAL DATA

**Table 2**

		SECTION DIMENSIONAL DATA								
		TPAH-18	TPAH-22	TPAH-24	TPAH-28	TPAH-32	TPAH-38	TPAH-44	TPAH-50	TPAH-58
	H	59.5"	60"	73.5"	74"	76"	88"	88.5"	100.5"	112.5"
	W	72"	82"	72"	82"	94"	94"	104"	104"	104"
C1	L1	12"	12"	12"	12"	12"	12"	12"	12"	12"
C2	L2	36"	36"	36"	36"	42"	42"	42"	42"	48"
C3	L3	36"	36"	36"	42"	42"	42"	42"	48"	48"
C4	L4	60"	60"	60"	60"	60"	60"	60"	60"	60"
ATT	L5	L5 is dependent on ATT3 / ATT4 / ATT5 and is 36" / 48" / 60" respectively								
SS	L6	L6 is dependent on SS1 / SS2 / SS3 and is 12" / 24" / 36" respectively								
D1	L7	28"	28"	32"	32"	32"	38"	38"	44"	48"
D2	L8	6"	6"	6"	6"	6"	6"	6"	6"	6"
	DH	20"	20"	24"	24"	24"	30"	30"	36"	40"
	DW	60"	70"	60"	70"	82"	82"	92"	92"	92"
US1	L9	4"	4"	4"	4"	4"	4"	4"	4"	4"

# SECTION WEIGHTS

**Table 3**

Weights in Table 3 are in pounds.

	TPAH4	TPAH5	TPAH6	TPAH7	TPAH8	TPAH10	TPAH11	TPAH12	TPAH15	TPAH18	TPAH22	TPAH24	TPAH28	TPAH32	TPAH38	TPAH44	TPAH50	TPAH58
MB1	607	649	667	760	837	953	987	1,025	1,119	1,292	1,425	1,622	1,655	1,856	2,065	2,393	2,684	2,853
BLD1	362	519	578	569	645	651	694	733	783	927	986	1,179	1,112	1,229	1,342	1,639	1,970	2,123
FF1	301	335	349	382	453	460	465	477	484	599	640	645	480	569	588	618	670	688
FF2	360	416	431	468	564	588	593	605	612	772	818	874	684	895	915	1,017	1,149	1,175
FF3	525	576	592	634	739	768	777	795	815	980	1,029	1,080	901	1,079	1,116	1,292	1,418	1,467
PF1*	800	859	889	1,072	1,202	1,257	1,297	1,370	1,446	1,629	1,916	1,968	2,022	2,191	2,550	3,056	3,325	3,807
HF1*	792	850	889	1,102	1,224	1,268	1,319	1,360	1,446	1,875	1,956	2,006	2,267	2,470	2,634	3,449	3,651	3,853
HF2*	613	777	814	901	1,009	1,040	1,103	1,138	1,191	1,579	1,652	1,687	1,702	1,870	2,190	2,594	2,816	2,974
C1**	309	336	350	385	450	448	453	465	472	573	617	595	467	510	529	626	651	676
C2**	500	531	585	627	714	724	733	752	771	938	990	981	883	1,194	1,250	1,438	1,506	1,720
C3	700	766	855	932	1,054	1,099	1,143	1,229	1,283	1,453	1,540	1,566	1,729	1,849	1,940	2,163	2,405	2,515
C4**	890	932	953	1,108	1,119	1,152	1,171	1,201	1,245	1,407	1,468	1,494	1,448	1,555	1,630	1,900	1,993	2,087
ATT3	711	819	839	959	1,052	1,199	1,208	1,228	1,386	1,667	1,864	1,885	1,968	2,048	2,505	2,694	2,989	3,564
ATT4	914	1,046	1,068	1,213	1,313	1,511	1,526	1,551	1,762	2,094	2,336	2,384	2,553	2,651	3,247	3,511	3,900	4,650
ATT5	1,127	1,283	1,306	1,477	1,590	1,841	1,860	1,891	2,155	2,543	2,829	2,905	3,140	3,253	3,988	4,263	4,742	5,660
SS1	285	307	319	348	411	411	416	427	435	530	960	551	418	454	474	565	590	615
SS2	472	499	512	546	622	635	645	661	682	793	1,254	837	718	772	810	912	956	999
SS3	529	559	574	613	702	713	722	740	760	887	1,379	931	827	894	932	1,109	1,159	1,209
D1	439	464	476	546	612	803	819	842	919	1,039	1,132	1,136	1,077	1,205	1,534	1,713	1,888	2,116
D2	371	393	403	468	528	547	559	576	603	692	776	743	647	742	798	820	876	932
US1	254	274	285	311	369	371	375	386	394	482	517	503	345	373	392	412	431	449

\* Fan sections do not include fan/motor weight. See Tables 4 and 5 for additional weights.

\*\* Coil sections do not include coil weight. See the Total Package for coil weights.

# FAN WEIGHTS

**Table 4**

Fan Type	FAN SIZES							
	7"	9"	10"	12"	13"	15"	16"	18"
SWSI Plenum CL1 (lbs.)	–	–	–	83	90	105	119	132
SWSI Plenum CL2 (lbs.)	–	–	–	–	–	110	135	154
DWDI FC (lbs.)	37	44	57	76	–	96	–	132
DWDI BI (lbs.)	–	–	134	167	182	213	257	283

Fan Type	FAN SIZES							
	20"	22"	24"	25"	27"	30"	33"	36"
SWSI Plenum CL1 (lbs.)	147	204	248	–	274	310	372	437
SWSI Plenum CL2 (lbs.)	185	229	270	–	297	427	486	578
DWDI FC (lbs.)	242	270	–	327	424	517	649	704
DWDI BI (lbs.)	329	495	572	–	659	–	–	–

# MOTOR WEIGHTS

**Table 5**

	MOTOR HP							
	1	1.5	2	3	5	7.5	10	15
Motor (lbs.)	45	47	54	79	84	132	155	239

	MOTOR HP							
	20	25	30	40	50	60	75	100
Motor (lbs.)	261	363	409	521	531	768	889	1,284

**Notes:**

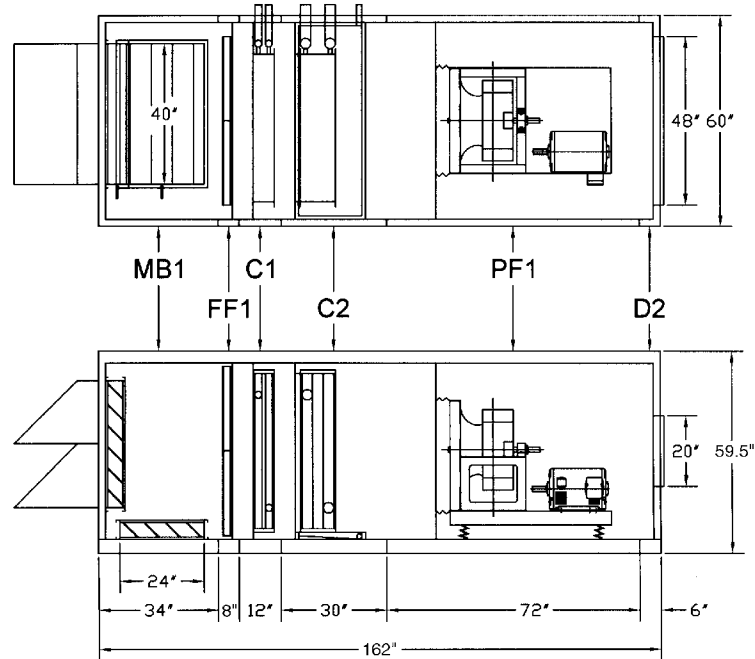
- All weights are for typical components. Specific manufacturer's weight may vary slightly.
- All motor weights are for 230/460 volt motors at 1750 rpm.
- See RAE Total Package for Coil Weights.

# STATIC PRESSURE LOSS CHARTS

**Table 6**

Component	Component Losses (in. w.c.)									
	300	400	450	500	550	600	700	800	900	1000
Rainhood	0.02	0.04	0.05	0.06	0.07	0.08	0.11	0.14	0.18	0.22
Damper	0.03	0.05	0.07	0.08	0.10	0.12	0.16	0.21	0.27	0.33
2" - 30% Pleated Filter (clean)	0.10	0.18	0.23	0.28	0.34	-	-	-	-	-
4" - 30% Pleated Filter (clean)	0.10	0.17	0.22	0.27	0.33	-	-	-	-	-
12" - 65% Rigid Filter (clean)	0.15	0.22	0.26	0.30	0.35	-	-	-	-	-
12" - 85% Rigid Filter (clean)	0.28	0.40	0.46	0.53	0.60	-	-	-	-	-
12" - 95% Rigid Filter (clean)	0.34	0.51	0.60	0.68	0.78	-	-	-	-	-
22" - 65% Bag Filter (clean)	0.12	0.21	0.25	0.30	0.36	-	-	-	-	-
22" - 85% Bag Filter (clean)	0.32	0.41	0.40	0.45	0.51	-	-	-	-	-
22" - 95% Bag Filter (clean)	0.52	0.61	0.65	0.70	0.76	-	-	-	-	-
12" - 95% HEPA Filter (clean)	0.75	1.02	1.22	1.35	-	-	-	-	-	-
3' Sound Attenuator	0.04	0.06	0.07	0.08	0.09	0.10	0.13	0.15	0.18	0.20
4' Sound Attenuator	0.05	0.07	0.09	0.10	0.11	0.13	0.16	0.19	0.22	0.25
5' Sound Attenuator	0.06	0.09	0.10	0.12	0.14	0.15	0.19	0.23	0.26	0.30
Electric Heater	0.04	0.07	0.08	0.10	0.12	0.13	0.18	0.22	0.27	0.33
Cabinet Losses (typical)	0.05	0.09	0.11	0.14	0.17	-	-	-	-	-
Coils	Conveniently Select Your Coils On The RAE Total Package									
Component	Component Losses (in. w.c.)									
	900	1000	1100	1200	1300	1400	1500	1600	1700	1800
Duct Connection	0.02	0.02	0.03	0.04	0.04	0.05	0.06	0.06	0.07	0.08
Duct Connection w/ Grating	0.03	0.04	0.04	0.05	0.06	0.07	0.08	0.09	0.11	0.12
Air Blender	0.08	0.10	0.12	0.14	0.17	0.19	0.22	0.25	0.29	0.32
Component	DWDI FC Fan Static Pressure Loss Charts									
	Fan Losses (in. w.c.)									
	1500	1700	1900	2100	2300	2500	2700	2900	3100	3300
Diffuser	0.3	0.39	0.48	0.59	0.71	0.83	0.97	1.12	1.28	1.45
Unducted Velocity Pressure Correction	0.25	0.32	0.40	0.49	0.59	0.69	0.81	0.93	1.07	1.21
Inlet Screen	0.05	0.06	0.08	0.10	0.12	0.14	0.16	0.19	0.21	0.24
Component	DWDI BI Fan Static Pressure Loss Charts									
	Fan Losses (in. w.c.)									
	1500	1700	1900	2100	2300	2500	2700	2900	3100	3300
Diffuser	0.08	0.10	0.13	0.16	0.19	0.22	0.26	0.30	0.34	0.39
Unducted Velocity Pressure Correction	0.07	0.09	0.11	0.14	0.16	0.19	0.23	0.26	0.30	0.34
Inlet Screen	0.05	0.06	0.08	0.10	0.12	0.14	0.16	0.19	0.21	0.24
Component	SWSI Plenum Fan Static Pressure									
	Fan Losses (in. w.c.)									
	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200
Inlet Correction	0.05	0.07	0.09	0.09	0.14	0.17	0.20	0.23	0.27	0.31
Inlet Screen	0.05	0.07	0.09	0.11	0.14	0.17	0.20	0.23	0.27	0.31

# SAMPLE SELECTION



## Sample TPAH Selection

Job Name:	Sample Job - Pryor, Oklahoma
Tag:	AHU-1
Description:	7,500 cfm Air Handler - 340 MBH CW - 280 MBH PHW w/ Mixing Box (MB1), Flat Pre-Filter (FF1), Pre-Heat Coil (C1), Chilled Water Coil (C2), Plenum Fan (PF1), and End Discharge (D2).

Known Information  
 Airflow: 7,500 cfm  
 ESP: 2.4 in w.c.

From Table 1	
Cabinet Size:	15
H (in.)	59.5
W (in.)	60

From Table 1	
Coil H (in.)	48
Coil W (in.)	44

Based on coil dimensions given, select actual coil in the Total Package.

### Section Data

	MB1	FF1	C1*	C2*	PF1	D2
Section Length (in.) <i>per Table 2</i>	34	6	12	30	72	6
Section Weight (lb.) <i>per Table 3</i>	1,119	484	472	771	1,446	603
Component Weight (lb.) <i>per Table 4/5</i>	—	—	132**	353**	359	—
Component Face Area (ft. <sup>2</sup> ) <i>per Table 1</i>	10	16	14.67	14.67	—	6.7
Component FV (fpm)	750	469	511	511	1,963***	1,119
Component ΔP (in. w.c.) <i>per Table 6</i>	0.31	0.25	0.08	0.79	0.09	0.03

\* Coil pressure drop taken from the RAE Total Package.

\*\* See Total Package for Coil Weights.

\*\*\* Fan Velocity taken from supplemental fan guide.

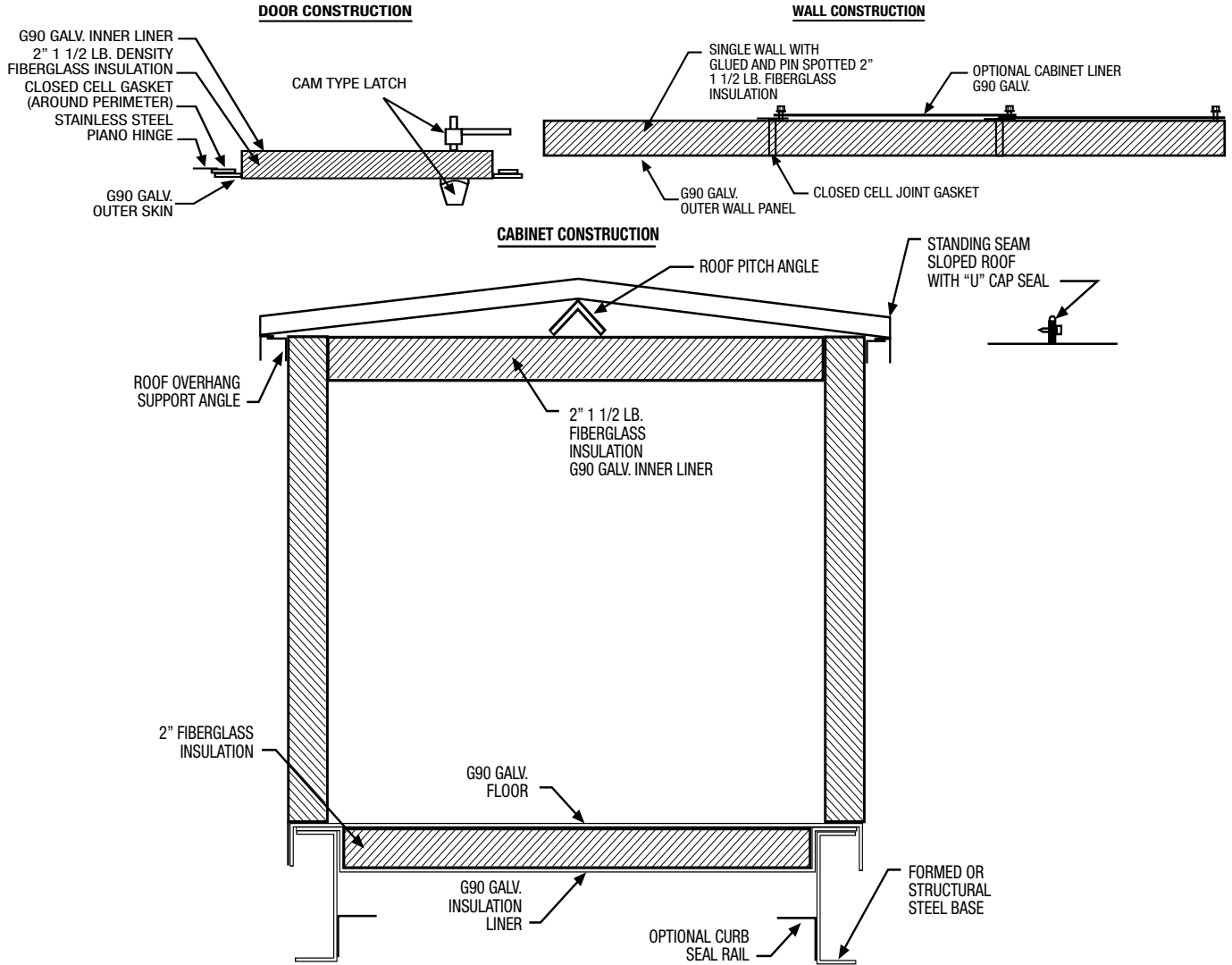
Total Static Pressure: 4" w.c. This includes .05 w.c. for cabinet loss.

### Fan Selection Per Fan Guide

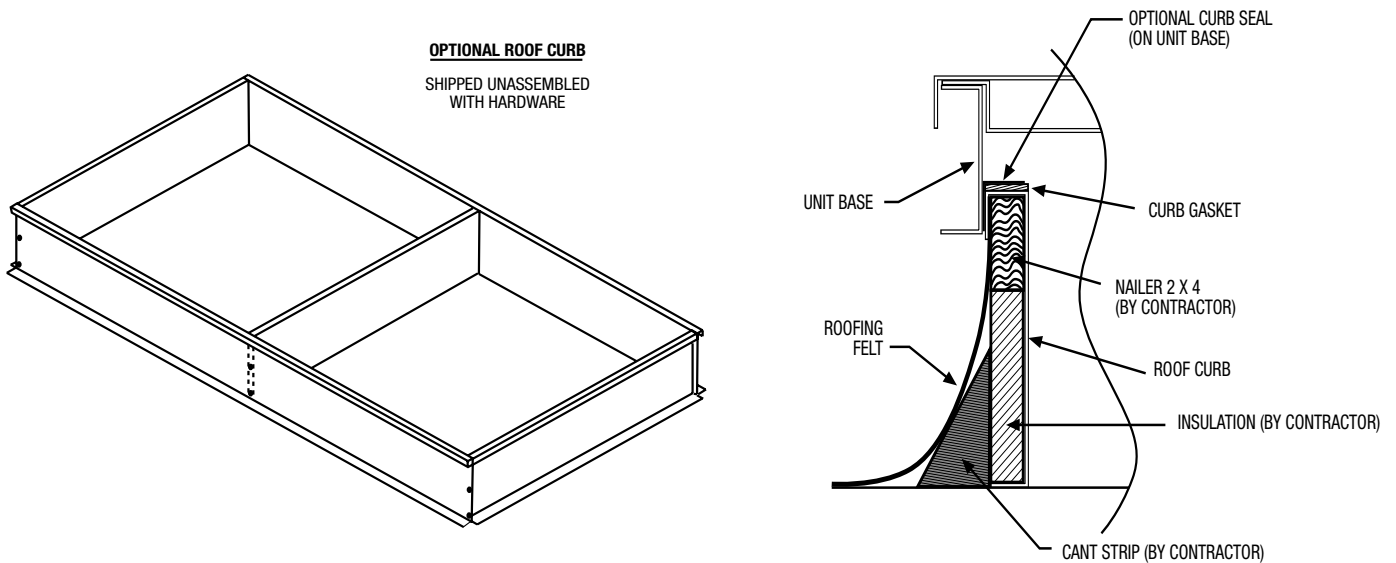
22" SWSI Plenum Fan		
Airflow (cfm)	4" tsp	
	rpm	bhp
7,500	2,006	8.82

Total Dimensions			
H (in.)	W (in.)	L (in.)	Weight (lbs.)
59.5	60	160	5,381

# CONSTRUCTION DETAILS



# CURB DRAWING





# GENERAL AIR HANDLING UNIT SPECIFICATIONS

## **General Information**

The air handling unit is built by Technical Systems for indoor or outdoor installation depending on job requirements. Outdoor units have a minimum 0.25" roof pitch with standing seam to facilitate water removal. Each air handler is built as a single piece with an option to break the unit into smaller sections for shipping or rigging requirements. Multiple piece units are shipped as one piece where possible. All equipment is designed to be base mounted and supported around the full perimeter of each section. Each section has rigging lugs attached to the base for lifting the equipment. The unit casing is able to withstand pressures up to 1.5 times its maximum operating pressure. The maximum total static pressure allowable is 5" w.c. across the fan. The unit is ETL listed as defined in the model nomenclature.

## **Unit Construction**

### **Base Construction**

The unit is constructed of a heavy gauge, formed galvanized steel perimeter base on units up to 8 feet wide. Units over 8 feet wide have a welded structural steel perimeter base. The span between cross member supports does not exceed 30". The base is insulated to meet the R-value of the walls.

### **Wall Panel Construction**

All walls and the roof are made of a paneled construction. The panel consists of a formed outer panel that is a minimum 20-gauge galvanized steel. The inner liner is a minimum 22-gauge galvanized steel. Options for alternate materials or perforated material are available. Fiberglass insulation is provided to the thickness required. Insulation conforms to NFPA 90 requirements. A standard 2" insulation is provided with a panel R-value of 8.4. All panels have a thermal break between the inner liner and outer panel to help eliminate sweating.

### **Paint**

When painting is required, the units galvanized exterior surface is cleaned, etched, and primed with a zinc-rich primer. A 2-mil gray enamel or epoxy top coat is applied over the primer. Optional special colors are available.

### **Drain Pan**

IAQ-type drain pans are two-way sloping to allow for proper drainage. The pan is completely insulated and is made of galvanized steel. Optional stainless steel drain pan construction is available.

### **Access Doors**

Access doors are constructed to the same specifications as the wall panels. The door frame has a bulb-type perimeter gasket to minimize air leakage. The door has a minimum of three galvanized piano hinges and a compression-type door latch. Optional tempered glass viewing windows are available.

## **Fans**

All fans include vibration isolation. This consists of a flexible fabric duct and rubber isolators. Optional spring isolation and seismic restraints are available. All fans are dynamically balanced at the operating condition prior to shipment. Each

fan wheel is keyed to a solid fan shaft. The fan shaft is made of steel and coated to prevent corrosion. Each door that has access to a fan has a lock that requires a tool to open for safety.

### **Forward Curved Blowers (FC)**

Centrifugal FC blowers are DWDI. They have galvanized wheels and either a painted or galvanized housing. FC blowers are constructed such that installation can result in any right angled outlet position. The self-aligning bearings have an L50 life of 150,000 hours minimum. All FC fans are belt driven. All FC blowers that discharge inside the air handler and are not ducted have a diffuser.

### **Plenum Fans**

Centrifugal plenum fans are SWSI with backward inclined, non-overloading airfoil blades. They have either steel or aluminum wheels depending on the size and application. The frame is painted steel construction for corrosion resistance. The self-aligning bearings have an L50 life of 200,000 hours minimum. Plenum fans can be either belt driven or direct drive.

### **Motors**

The motor is an integral part of the fan isolation system. Either slide or pivot motor bases are provided on belt drive application for belt tensioning. High efficiency, ODP, T-frame motors are provided as standard. All motors are in accordance with the energy policy act. Optional TEFC motors available.

### **Sheaves**

All fans operating over 2,000 rpm or with motors greater than 5 hp have fixed pitch sheaves as standard. All other fans receive variable pitched sheaves. All sheaves are selected at 120% above rated motor horsepower.

### **Variable Frequency Drives (VFD)**

Fan modulation can be provided by use of a VFD. Optional bypass of VFD is available. Optional motor disconnect available on VFD.

## **Coils**

All coils are manufactured by the air handler manufacturer. All coils are pressure tested with dry air underwater to 350 psi and promptly sealed. Coils are installed such that no air bypass around the coil can occur. Coil connection penetrations through the air handler casing are sealed with a rubber grommet that fits snug around the connection. Any coil that can produce condensation on the finned surface has a drain pan as specified above. All coils have seamless copper tubes expanded into plate fins. The tubes are arranged in a staggered pattern. All headers are constructed of heavy wall seamless copper tube. Sweat-type connections are provided on all coils. Optional coil construction and materials are available.

### **Water Coils**

Water coils where applicable are certified and rated in accordance with ARI 410. The coil has 16-gauge galvanized steel casings with 5/8" OD, 0.020" thick seamless copper tubes, and 0.006" thick aluminum fin. Water coils shall be provided with a 1/4" flare vent and drain connection.



# GENERAL AIR HANDLING UNIT SPECIFICATIONS *cont.*

## **Direct Expansion Coils**

DX coils where applicable are certified and rated in accordance with ARI 410. The coil has 16-gauge galvanized steel casings with 5/8" OD, 0.020" thick seamless copper tubes, and 0.006" thick aluminum fin. DX coils are provided with a 1/4" flare equalizer connection in the suction nozzle. The DX coil is complete with a properly sized brass refrigerant distributor and nozzle.

## **Standard Steam Coils**

Standard steam coils where applicable are certified and rated in accordance with ARI 410. The coil has 16-gauge galvanized steel casings with 5/8" OD, 0.020" thick seamless copper tubes, and 0.006" thick aluminum fin.

## **Steam Distributing Coils**

Steam distributing coils where applicable are certified and rated in accordance with ARI 410. The coil has 16-gauge galvanized steel casings with 1" OD and 0.035" thick seamless copper outer tubes with 5/8" OD seamless copper inner tubes. The fin material is 0.010" thick aluminum.

## **Electric Coils**

Electric air handling coils are constructed of heavy gauge galvanized steel with galvanized steel brackets, stiffening ribs, and gussets spot welded to the frame. Three-phase heaters have balanced phases. Electric heater is UL listed for zero clearance and meets all NEC requirements. Terminals are sealed with silicone rubber to protect against moisture.

## **Open Element Coil**

Open coil heating elements are 80% nickel and 20% chromium. Element terminals are stainless steel; insulators and bracket bushings are nonporous ceramic and securely positioned. Terminals are machine crimped to elements.

## **Finned Tubular Coil**

Elements for finned tubular heaters have steel fins brazed to copper plated sheath. Element wire is 80% nickel and 20% chromium. Elements are protected against corrosion by a high-temperature aluminum coating.

## **Filters**

Filter section includes universal upstream accessible filter holding frames. The filter frames are 16-gauge galvanized steel with filter sealing flange, centering dimples, sealing gasket, and lances for appropriate air filter fasteners. Fasteners are provided when filters are provided. Filter type and efficiency are given on the mechanical schedule.

Optional spare filters are available. Optional factory-mounted differential pressure gauge is provided across entire filter bank.

## **Air Blending**

An aluminum or galvanized air blending device is used to evenly mix two adjacent or opposed airflows with different temperatures to prevent stratification. The blender is properly sized for the unit's airflow, and the upstream and downstream distances comply with the manufacturer's recommendations.

## **Openings**

### **Duct Connections**

All duct connections through the wall are rectangular with a square edge and have a 1" duct flange. All open floor penetrations are covered with a protective screening to prevent personnel injury. Floor connections have a minimum 1" lip on the unit's interior.

### **Dampers**

Low leakage galvanized steel control dampers are provided where required on outside air, return air, and exhaust air openings. An optional discharge control damper is available. Optional aluminum control dampers are available. Where mixing is required, parallel blades are used. In all other applications, opposed blades are used.

### **Rainhoods**

All outside air and exhaust air openings have rainhoods sized for the maximum operating airflow of the opening. The hoods include a mesh birdscreen.

## **Electrical**

- optional wiring of motors to a junction box on the unit's exterior
- optional wiring of motors to a non-fused disconnect on the unit's exterior
- optional wiring of fan motors to a variable frequency drive (see VFD spec above)
- optional factory provided fusing and starter for fan motor
- optional marine-type 100W incandescent light in required sections
- optional GFI outlet in required sections
- optional lighting transformer and optional lighting disconnect
- optional factory mounted electric or pneumatic damper actuators
- optional factory mounted smoke detector in RA section

**TECHNICAL**<sup>TM</sup>  
**S Y S T E M S**

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