

FM30
(vertical discharge floor/wall mounted)

Technical Data

Induction Units

APPLICATION CONSIDERATIONS

Induction Systems were historically designed specifically for the perimeter zones of multi-room, multi-story buildings such as office buildings, patient wings of hospitals, apartments and hotels. By giving each room its own individual induction unit, it was possible to satisfy the individual cooling and heating loads in these perimeter zones.

The perimeter zone is the area running along the exterior walls of the building and extending 10 to 20 feet into the building (about 15 feet depth is most typically used in the design of the system). These perimeter zones are subjected to relatively constant heat gains from lights, people, and miscellaneous equipment. In addition these area are also subjected to the highly variable solar heat gains from the sun through the windows. Lastly, these areas are subjected to both heat gains and losses by transmission through the exterior walls/windows.

There will be times when some of the perimeter zones will need cooling while others need heating. As an example, the perimeter zones facing the east may need cooling in the morning while the perimeter zones facing west at the same time may need heating. In these instance the HVAC system must have the flexibility to alternatively provide either heating or cooling to every zone. When properly designed an induction system using a two-pipe water distribution network offers this flexibility.

Other air conditioning systems must use a more expensive 4 pipe water distribution network to offer this same flexibility. An Induction System makes use of two air streams and the water supplied to the induction unit to provide this flexibility. One air stream is delivered from the central air handlers and is referred to as the primary air. The other is referred to as secondary air and is the room air that is induced over the water coil in the induction unit. The water is called secondary water and serves the water coil in the induction units.

Primary air (which in most cases is 100% outside air) is filtered, cooled or heated, and dehumidified or humidified at the central air handlers in the building. The primary air is then supplied to all the induction units through the ductwork system. The primary air passes through the induction unit into the room where it adds or removes sensible heat and moisture. In passing through the induction unit it also draws or induces secondary room air through the water coil in the induction unit. The primary air provides the necessary ventilation, some heating or cooling and supplies the necessary motive power for inducing secondary airflow.

The secondary room air is induced and flows over the coil of the induction unit. Through the secondary water supplied to the induction unit's coil this secondary room air is heated or cooled, depending on the water temperature. The quantity of heat added to or re-moved from the secondary air is controlled by the room thermostat to satisfy the room demands.

The two air streams and water loop conditions can be controlled/manipulated to provide alternately either cooling or heating to every perimeter zone. The system can designed to deliver:

- Cold primary air and cold water in the coil.
- Warm primary air and cold water in the coil.
- Cold primary air and warm water in the coil.
- Warm primary air and warm water in the coil

In general a typical induction system design provides comfort as follows:

- Humidity is controlled by controlling the dew point temperature of the primary air.
- Cleanliness is controlled by filtering the primary air at the central air handlers. Lint screens are also used in the room induction unit to filter the secondary air.
- Air movement is controlled by the amount of primary air delivered and the amount of secondary air induced by the primary air.
- The room's dry bulb temperature is controlled by varying the temperature of the primary air, and varying the secondary water flow and temperature so that the sensible heat gains or losses to the space are balanced.

There will likely be times during the intermediate seasons when some amount of reheating/re-cooling will occur to simultaneously satisfy every zones heating or cooling loads. This possibility can be largely eliminated if separate air handlers are used to serve each exposure and the interior zones.

UNIT SELECTION

There are two methods for selecting DADANCO Induction Units – a manual method using the enclosed tables and an optimized design method using the DADANCO Specifier™ computerized product selection program. The following will demonstrate the manual selection method using the data from the Quick Selection Capacity and Sound tables. For optimized unit selections using the DADANCO Specifier™ computerized product selection program or for special selection assistance, contact Dadanco LLC via phone (413) 564 – 5657, fax (413) 568 – 2969 or e-mail at info@dadanco.com.

MANUAL SELECTION METHOD

The unit performance data in the Quick Selection Capacity tables is given for the FM30 floor-wall-mounted Induction Units in both 2-pipe and 4-pipe coil configurations. The capacity ratings are based on a “typical” nozzle selections. With the optimized design method using the DADANCO Specifier™ computerized selection program, both the size/number of nozzles will vary and will be optimized to provide the exact performance required.

Performance data in this publication is only provided for the 6 and 8 tube high units in nominal coil lengths of 2, 3 and 4 feet. Contact DADANCO for performance data on other sizes not included in this publication.

Ventilation Air

To begin your unit selections determine the minimum ventilation air required for each zone (using as a minimum that prescribed by ASHRAE 62). This would be the minimum amount of primary air that could delivered to the Induction Units in each zone.

Quick Selection Cooling and Heating Capacity Tables

The performance data in the Quick Selection Capacity tables are based on assumed operating conditions of:

- 0.8 “w.c. inlet static pressure
- 75 °F db/62.5 °F wb room design temperature (50% relative humidity, 0.00925 Lb_{Water}/Lb_{Dry Air} humidity ratio)
- 54.0 °F db/ 52.4 °F wb primary air temperature (90% relative humidity, 0.00800 Lb_{Water}/Lb_{Dry Air} humidity ratio)
- 50.0 °F entering chilled water temperature for cooling
- 140.0 °F entering hot water temperature for heating
- 2.4 GPM water flow rate
- Sea level elevation

The correction factor tables can be used to adjust the cooling and heating capacities shown in the Quick Selection Capacity tables for operating conditions that differ from the above assumptions.

Cooling

The Quick Selection Cooling Capacity tables show the sensible and latent cooling capacity being provided by the primary air, the sensible cooling capacity being provided by the secondary water coil and the total unit sensible cooling capacity.

Example

Assume we want to select an FM30 2-pipe unit and that the total sensible cooling capacity required was 3,100 Btuh with a minimum primary airflow of 30 CFM. Using the correct Quick Selection Cooling Capacity table on page 6, a total sensible cooling capacity of 3,250 Btuh (910 Btuh from the primary air and 2,340 Btuh from the secondary water coil) could be provided by a 2 foot 6 tube high unit using 40 CFM of primary air.

Alternatively a longer/higher unit could be selected if there was a preference to reduce the primary airflow quantity down to the minimum primary airflow.

The performance data in the Quick Selection Cooling Capacity tables is based on $T_{RA} - T_{PA}$ of 21 °F (75 °F – 54 °F).

Use the correction factor for primary air temperature less room design temperature differences other than the 21 °F ΔT temperature difference used in the Quick Selection Cooling Capacity tables.

Primary Air Temperature Correction Factor – Cooling		
Primary Air Temperature T_{PA} (° F)	Δ Temperature Room Air – Primary Air $T_{RA} - T_{PA}$ (° F)	Correction Factor Applied to Primary Air Sensible Cooling Capacity K_{PA}
50	25	1.19
52	23	1.10
54	21	1.00
56	19	0.90
58	17	0.81
60	15	0.71
62	13	0.62
64	11	0.52
66	9	0.43
68	7	0.33

Example

Using the above base unit selection, the sensible cooling being provided by the primary air is 910 Btuh. If the primary air temperature was 52 °F (rather than the 54 °F assumed in the tables), the actual temperature difference is 23 °F (rather than the 21 °F used in the tables). The corrected sensible cooling capacity of the primary air at the 23 °F ΔT is 1,001 Btuh (910 Btuh x 1.10).

The performance data in the Quick Selection Cooling Capacity tables is based on a $T_{RA} - T_{CHW}$ of 25 °F ΔT (75 °F – 50 °F).

Use the correction factor for room design temperature less chilled water temperatures other than the 25 °F ΔT temperature difference used in the Quick Selection Cooling Capacity tables.

Water Temperature Correction Factor – Cooling		
Chilled Water Temperature T_{CHW} (° F)	Δ Temperature Room Air – Chilled Water $T_{RA} - T_{CHW}$ (° F)	Correction Factor Applied to Secondary Coil Sensible Cooling Capacity K_{CHW}
47	28	1.12
48	27	1.08
49	26	1.04
50	25	1.00
51	24	0.96
52	23	0.92
53	22	0.88
54	21	0.84

Example

Using the above base unit selection, the sensible cooling capacity being provided by the secondary water coil is 2,340 Btuh. If the chilled water temperature was 54 °F (rather than the 50 °F assumed in the tables), the actual temperature difference is 21 °F (rather than the 25 °F used in the tables). The corrected sensible cooling capacity of the secondary water coil at the 21 °F ΔT is 1,966 Btuh (2,340 Btuh x 0.84).

Heating

The Quick Selection Heating Capacity tables show the sensible heating being provided by the primary air, the sensible heating being provided by the secondary water coil and the total unit sensible heating capacity. Remember that if the primary in the heating mode is being delivered at a temperature below the room design temperature, the heating required to bring the primary air up to the room design temperature must be added to the heating load that must be satisfied by the Induction Unit secondary water coil.

Example

Using the same base unit selection and the correct Quick Selection Capacity table on page 8, the unit would provide a total sensible heating capacity of 5,175 Btuh (-910 Btuh from the primary air and 6,085 Btuh from the secondary water coil) using 40 CFM of primary air (based on the operating condition assumptions used in the Quick Selection Heating Capacity tables).

The performance data in the Quick Selection Heating Capacity tables are based on a room design temperature less primary air temperature of 21 °F ΔT temperature difference (75 °F – 54 °F). For primary air temperatures other than the 54 °F adjust the amount of heating being provided by the primary air using the formula of:

$$Q_{PA} = 1.085 \times PA \times (T_{PA} - T_{RA})$$

Example

Using the above base unit selection, the sensible heating being provided by the primary air is –910 Btuh. If the primary air temperature was 65 °F (rather than the 54 °F assumed in the tables), the corrected sensible heating capacity of the primary air is –434 Btuh. The heating provided by the Induction Unit would increase to 5,651 Btuh (-434 Btuh from the primary air and 6,085 Btuh from the secondary water coil).

The performance data in the Quick Selection Heating Capacity tables is based on a $T_{HW}-T_{RA}$ OF 65 °F (140 °F – 75 °F).

Use the correction factor for hot water temperature less room design temperature other than the 55 °F ΔT temperature difference used in the Quick Selection Heating Capacity tables.

Water Temperature Correction Factor – Heating		
Hot Water Temperature T_{HW} (° F)	Δ Temperature Hot Water–Room Air $T_{HW} - T_{RA}$ (° F)	Correction Factor Applied to Secondary Coil Heating Capacity K_{HW}
120	45	0.69
130	55	0.85
140	65	1.00
150	75	1.15
160	85	1.31

Example

Using the above base unit selection, the sensible heating being provided by the secondary water coil is 6,085 Btuh. If the hot water temperature was 120 °F (rather than the 140 °F assumed in the tables), the actual temperature difference is 45 °F (rather than the 65 °F used in the tables). The corrected sensible heating capacity of the secondary water coil at the 45 °F ΔT is 4,199 Btuh (6,085 Btuh x 0.69) and the Induction Unit heating capacity would decrease to 3,289 Btuh (-910 Btuh from the primary air and 4,199 Btuh from the secondary water coil.).

WATER FLOW RATES

The cooling and heating capacities shown in the Quick Slection Capacity tables are based on water flows rates of 2.4 GPM. Use the correction factor for water flow rates other than 2.4 GPM.

Water Flow Capacity Correction Factor – Cooling & Heating													
Water Flow (GPM)	2.4	2.2	2.1	1.9	1.7	1.6	1.4	1.3	1.1	1.0	0.8	0.6	0.5
6 Tube 2' Length	1.00	1.00	1.00	0.99	0.99	0.99	0.98	0.98	0.97	0.95	0.95	0.93	0.89
6 Tube 3' Length	1.00	1.00	0.99	0.98	0.98	0.97	0.96	0.94	0.92	0.90	0.87	0.82	0.74
6 Tube 4' Length	1.00	1.00	0.99	0.98	0.98	0.97	0.96	0.94	0.93	0.90	0.87	0.82	0.75
8 Tube 2' Length	1.00	0.99	0.99	0.98	0.97	0.96	0.95	0.94	0.89	0.89	0.86	0.81	0.73
8 Tube 3' Length	1.00	1.00	0.99	0.99	0.98	0.97	0.96	0.95	0.93	0.91	0.88	0.83	0.76
8 Tube 4' Length	1.00	1.00	0.99	0.98	0.98	0.97	0.96	0.94	0.93	0.90	0.87	0.82	0.75

Elevation

The performance data in the Quick Selection Capacity tables is based air densities at sea level. Use the correction factor for elevations other than sea level.

Example

Using the previous example, the total sensible cooling being provided by the Induction Unit at sea level is 3,250 Btuh. If the installation was at 4,000 feet above sea level, the total unit sensible cooling capacity is 2,795 Btuh (3,250 Btuh x 0.86).

Elevation Correction Factor – Cooling & Heating	
Elevation Above Sea Level (Feet)	Correction Factor K_E
1000	0.96
2000	0.93
3000	0.90
4000	0.86
5000	0.83
6000	0.80

FM30 - 6 Tube High Coil 2-Pipe Quick Selection Cooling Capacity

Primary Air-flow (CFM)	Primary Air Cooling		Sensible Cooling (Btuh)					
	Sensible (Btuh)	Latent (Btuh)	Nominal 2 Foot Coil		Nominal 4 Foot Coil		Nominal 6 Foot Coil	
			Coil	Total	Coil	Total	Coil	Total
15	330	88	705	1035				
20	465	124	1010	1475				
25	570	151	1165	1735				
30	680	182	1380	2060	1475	2155		
35	795	212			1615	2410		
40	910	242			1835	2745	2065	2975
45	1025	272			2145	3170	2190	3215
50	1140	303			2525	3665	2310	3450
55	1255	333			2535	3790	2525	3780
60	1365	363			2745	4110	2760	4125
65	1480	393			2940	4420	3050	4530
70	1595	424					3385	4980
75	1710	454					3750	5460
80	1825	484					3630	5455
85	1935	514					3830	5765
90	2065	548					4020	6085
95	2180	578					4205	6385
100	2295	609					4385	6680

FM30 - 6 Tube High Coil 4-Pipe Quick Selection Cooling Capacity

Primary Air-flow (CFM)	Primary Air Cooling		Sensible Cooling (Btuh)					
	Sensible (Btuh)	Latent (Btuh)	Nominal 2 Foot Coil		Nominal 4 Foot Coil		Nominal 6 Foot Coil	
			Coil	Total	Coil	Total	Coil	Total
15	330	88	610	940				
20	465	124	860	1325				
25	570	151	985	1555				
30	680	182	1150	1830	1240	1920		
35	795	212			1345	2140		
40	910	242			1520	2430	1700	2610
45	1025	272			1755	2780	1795	2820
50	1140	303			2040	3180	1885	3025
55	1255	333			2050	3305	2045	3300
60	1365	363			2200	3565	2220	3585
65	1480	393			2345	3825	2435	3915
70	1595	424					2680	4275
75	1710	454					2940	4650
80	1825	484					2855	4680
85	1935	514					3000	4935
90	2065	548					3135	5200
95	2180	578					3265	5445
100	2295	609					3390	5685

Operating Conditions

Room Design Dry Bulb Temperature	75.0 °F
Room Design Wet Bulb Temperature	62.5 °F
Room Design Relative Humidity	50.0 %
Room Design Dew Point Temperature	55.0 °F
Room Design Humidity Ratio	0.00925Lb <small>Water</small> /Lb <small>Dry Air</small>
Chilled Water Supply Temperature	50.0 °F
Chilled Water Flow Rate	2.4 GPM
Primary Air Dry Bulb Supply Temperature	54.0 °F
Primary Air Wet Bulb Temperature	52.4 °F
Primary Air Relative Humidity	90.0 %
Primary Air Humidity Ratio	0.00800Lb <small>Water</small> /Lb <small>Dry Air</small>
Primary Air Static Pressure	0.80 In. w.c.

FM30 - 8 Tube High Coil 2-Pipe Quick Selection Cooling Capacity

Primary Air-flow (CFM)	Primary Air Cooling		Sensible Cooling (Btuh)					
	Sensible (Btuh)	Latent (Btuh)	Nominal 2 Foot Coil		Nominal 3 Foot Coil		Nominal 4 Foot Coil	
			Coil	Total	Coil	Total	Coil	Total
25	570	151	2370	2940				
30	680	182	2505	3185				
35	795	212	2755	3550	3480	4275		
40	910	242	2995	3905	3820	4730	4010	4920
45	1025	272			4150	5175	4355	5380
50	1140	303			4065	5205	4690	5830
55	1255	333			4420	5675	5120	6375
60	1365	363			4650	6015	4950	6315
65	1480	393			4870	6350	5185	6665
70	1595	424					5530	7125
75	1710	454					5750	7460
80	1825	484					5965	7790
85	1935	514					6305	8240

FM30 - 8 Tube High Coil 4-Pipe Quick Selection Cooling Capacity

Primary Air-flow (CFM)	Primary Air Cooling		Sensible Cooling (Btuh)					
	Sensible (Btuh)	Latent (Btuh)	Nominal 2 Foot Coil		Nominal 3 Foot Coil		Nominal 4 Foot Coil	
			Coil	Total	Coil	Total	Coil	Total
25	570	151	2100	2670				
30	680	182	2210	2890				
35	795	212	2410	3205	2995	3790		
40	910	242	2595	3505	3265	4175	3420	4330
45	1025	272			3380	4405	3685	4710
50	1140	303			3450	4590	3945	5085
55	1255	333			3725	4980	4120	5375
60	1365	363			3905	5270	4280	5645
65	1480	393			4075	5555	4330	5810
70	1595	424					4600	6195
75	1710	454					4770	6480
80	1825	484					4940	6765
85	1935	514					5200	7135

Operating Conditions

Room Design Dry Bulb Temperature	75.0 °F
Room Design Wet Bulb Temperature	62.5 °F
Room Design Relative Humidity	50.0 %
Room Design Dew Point Temperature	55.0 °F
Room Design Humidity Ratio	0.00925Lb Water/Lb Dry Air
Chilled Water Supply Temperature	50.0 °F
Chilled Water Flow Rate	2.4 GPM
Primary Air Dry Bulb Supply Temperature	54.0 °F
Primary Air Wet Bulb Temperature	52.4 °F
Primary Air Relative Humidity	90.0 %
Primary Air Humidity Ratio	0.00800Lb Water/Lb Dry Air
Primary Air Static Pressure	0.80 in. w.c.

FM30 - 6 Tube High Coil 2-Pipe Quick Selection Heating Capacity							
Primary Airflow (CFM)	Primary Air Heating (Btuh)	Sensible Heating (Btuh)					
		Nominal 2 Foot Coil		Nominal 3 Foot Coil		Nominal 4 Foot Coil	
		Coil	Total	Coil	Total	Coil	Total
25	-570	4110	3540				
30	-680	4915	4235				
35	-795	5510	4715	5935	5140		
40	-910	6085	5175	6665	5755	6745	5835
45	-1025			7375	6350	7475	6450
50	-1140			8035	6895	8195	7055
55	-1255			8905	7650	9135	7880
60	-1365			9465	8100	9785	8420
65	-1480			10010	8530	10365	8885
70	-1595					11205	9610
75	-1710					11750	10040
80	-1825					12280	10455
85	-1935					12805	10850

FM30 - 6 Tube High Coil 4-Pipe Quick Selection Heating Capacity							
Primary Airflow (CFM)	Primary Air Heating (Btuh)	Sensible Heating (Btuh)					
		Nominal 2 Foot Coil		Nominal 3 Foot Coil		Nominal 4 Foot Coil	
		Coil	Total	Coil	Total	Coil	Total
25	-570	2065	1495				
30	-680	2385	1705				
35	-795	2615	1820	2975	2180		
40	-910	2845	1935	3280	2370	3415	2505
45	-1025			3585	2560	3735	2710
50	-1140			3865	2725	4050	2910
55	-1255			4235	2980	4460	3205
60	-1365			4470	3105	4745	3380
65	-1480			4700	3220	4995	3515
70	-1595					5365	3770
75	-1710					5600	3890
80	-1825					5830	4005
85	-1935					6150	4195

Operating Conditions	
Room Design Dry Bulb Temperature	75.0 °F
Room Design Wet Bulb Temperature	62.5 °F
Room Design Relative Humidity	50.0 %
Room Design Dew Point Temperature	55.0 °F
Room Design Humidity Ratio	0.00925Lb Water/Lb Dry Air
Hot Water Supply Temperature	140.0 °F
Hot Water Flow Rate	2.4 GPM
Primary Air Dry Bulb Supply Temperature	54.0 °F
Primary Air Wet Bulb Temperature	52.4 °F
Primary Air Relative Humidity	90.0 %
Primary Air Humidity Ratio	0.00800Lb Water/Lb Dry Air
Primary Air Static Pressure	0.80 In. w.c.

FM30 - 8 Tube High Coil 2-Pipe Quick Selection Heating Capacity

Primary Airflow (CFM)	Primary Air Heating (Btuh)	Sensible Heating (Btuh)					
		Nominal 2 Foot Coil		Nominal 3 Foot Coil		Nominal 4 Foot Coil	
		Coil	Total	Coil	Total	Coil	Total
25	-570	6165	5595				
30	-680	6520	5840				
35	-795	7165	6370	9045	8250		
40	-910	7785	6875	9935	9025	10425	9515
45	-1025			10790	9765	11325	10300
50	-1140			10880	9740	12195	11055
55	-1255			11490	10235	13310	12055
60	-1365			12085	10720	12865	11500
65	-1480			12660	11180	13485	12005
70	-1595					14375	12780
75	-1710					14950	13240
80	-1825					15505	13680
85	-1935					16050	14115

FM30 - 8 Tube High Coil 4-Pipe Quick Selection Heating Capacity

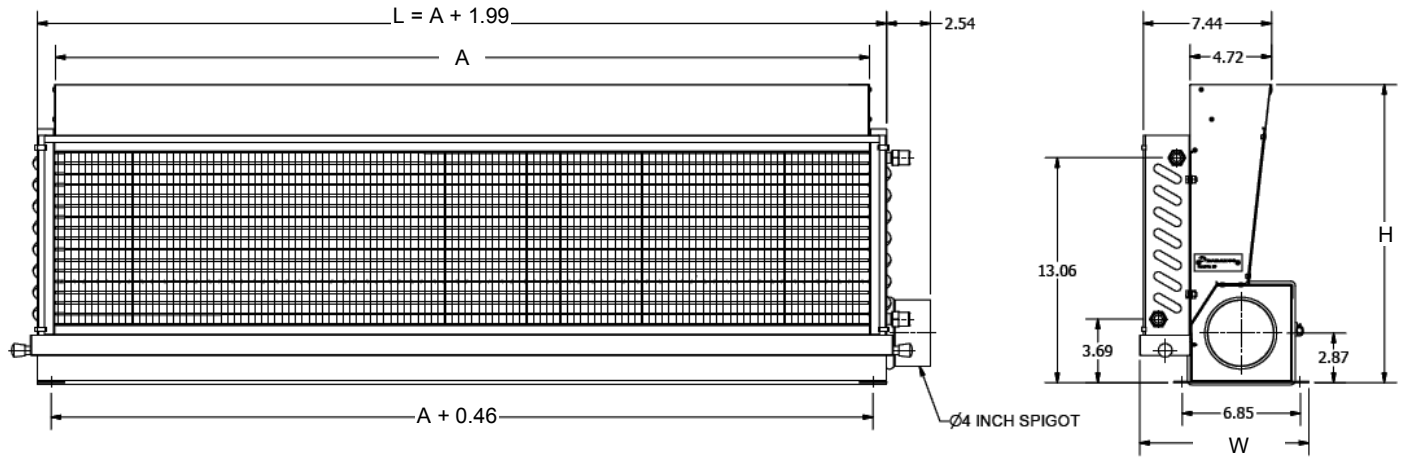
Primary Airflow (CFM)	Primary Air Heating (Btuh)	Sensible Heating (Btuh)					
		Nominal 2 Foot Coil		Nominal 3 Foot Coil		Nominal 4 Foot Coil	
		Coil	Total	Coil	Total	Coil	Total
25	-570	2995	2425				
30	-680	3135	2455				
35	-795	3395	2600	4490	3695		
40	-910	3635	2725	4865	3955	5270	4360
45	-1025			5190	4165	5660	4635
50	-1140			5300	4160	6030	4890
55	-1255			5515	4260	6240	4985
60	-1365			5760	4395	6380	5015
65	-1480			5995	4515	6575	5095
70	-1595					6950	5355
75	-1710					7185	5475
80	-1825					7415	5590
85	-1935					7850	5915

Operating Conditions

Room Design Dry Bulb Temperature	75.0 °F
Room Design Wet Bulb Temperature	62.5 °F
Room Design Relative Humidity	50.0 %
Room Design Dew Point Temperature	55.0 °F
Room Design Humidity Ratio	0.00925Lb Water/Lb Dry Air
Hot Water Supply Temperature	140.0 °F
Hot Water Flow Rate	2.4 GPM
Primary Air Dry Bulb Supply Temperature	54.0 °F
Primary Air Wet Bulb Temperature	52.4 °F
Primary Air Relative Humidity	90.0 %
Primary Air Humidity Ratio	0.00800Lb Water/Lb Dry Air
Primary Air Static Pressure	0.80 In. w.c.

FM30 - 4 Foot Unit Sound Data						
Primary Airflow	0.4" wc Inlet Static Pressure		0.6" wc Inlet Static Pressure		0.8" wc Inlet Static Pressure	
	NC	dB (A)	NC	dB (A)	NC	dB (A)
High Nozzle Pitch						
30	-	14				
35			-	19		
40					16	24
Medium Nozzle Pitch						
40	-	16				
50			15	22		
60					20	26
Low Nozzle Pitch						
55	16	23				
70			22	27		
80					26	31

Note: Room attenuation effect of 10 dB has been applied to calculate NC levels.



Unit Model	Nominal Coil Length	Actual Coil Finned Length A (inches)	Overall Length (inches)	H = Unit Height (inches)			W = Unit Width (inches)		
				6 Tube	8 Tube	10 Tube	6 Tube	8 Tube	10 Tube
FM30 – 1650--		65.00	70.91	14.96	17.32	19.88	9.80	9.80	9.80
FM30 – 1500--		59.05	64.96						
FM30 – 1400--		55.12	61.03						
FM30 – 1300--		51.18	57.09						
FM30 – 1200--		47.24	53.15						
FM30 – 1100--		43.31	49.22						
FM30 – 1050--	4 Feet	41.34	47.25						
FM30 – 1000--		39.37	45.28						
FM30 – 900--		35.43	41.34						
FM30 – 800--	3 Feet	31.50	37.41						
FM30 – 700--		27.56	33.47						
FM30 – 600		23.62	29.53						
FM30 – 500		19.69	25.60						
FM30 – 450	2 Feet	17.72	23.63						

Note: Unit dimensions for all sizes shown. Performance data in this publication is only provided for the 6 and 8 tube high units in nominal coil lengths of 2, 3 and 4 feet. Contact DADANCO for performance data on other sizes not included in this publication.

Note: While every effort is made to ensure the details contained in this publication are current and up-to-date, in the interest of ongoing product development DADANCO reserves the right to alter the same without notice.



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DADANCO LLC is jointly owned by Dadanco Pty Ltd headquartered in Adelaide, Australia and Mestek, Inc. headquartered in Westfield, MA. Mestek is a diversified manufacturer of HVAC products with sales of over \$400m. Mestek's HVAC companies include Smith Cast Iron Boilers, Hydrotherm, RBI Boilers & Water Heaters, Sterling, Vulcan, Airtherm, Applied Air, Anemostat, Air Balance, Arrow United, L. J. Wing, Lockformer and many others.



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