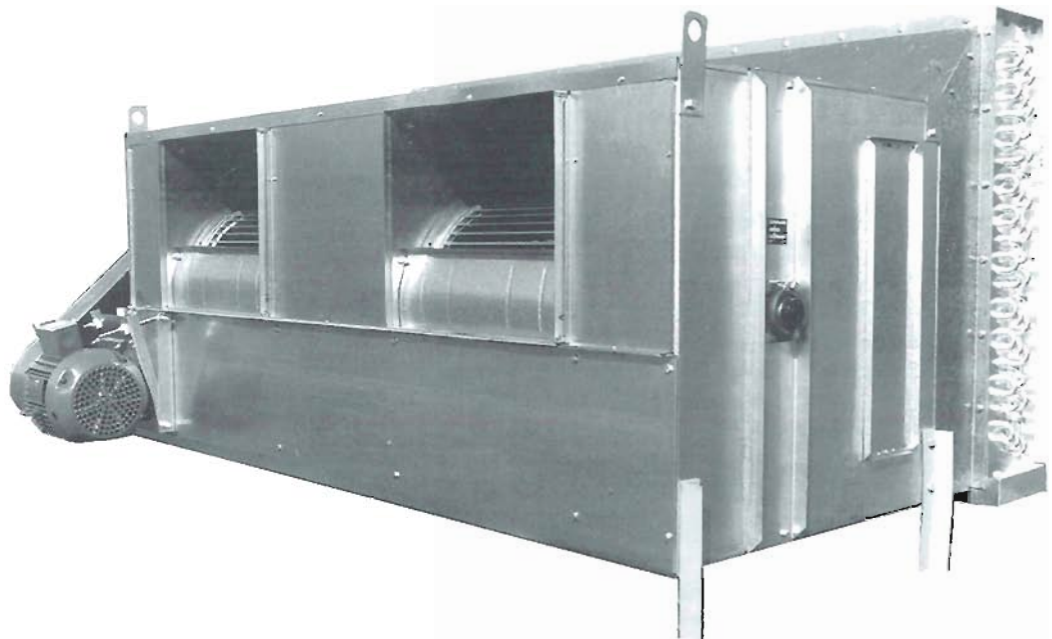


HPC/VPC Series

Centrifugal Fan Product Cooler



Applications:

- Product Storage (above 32°F)
- Processing Rooms
- Ripening Rooms
- Bulk/Palletized Storages

Sizes:

- Six Sizes
 - 1,710 - 20,630 BTU / °F TD
 - 3,200 - 31,290 CFM
- Direct Expansion & Glycol Coils
- Air Defrost
- Halocarbon Refrigerants

QUALITY
REFRIGERATION
SYSTEMS



Construction

HPC / VPC series product coolers with centrifugal fans cover a wide range of capacity in applications where the room design is above 32° F.

MODELS HPC / VPC - 80 and 120 are single fan design mounted on solid tempered steel shaft. Outboard bearings are flange type, with lubrication fittings. Fan shafts are coated with a rust resistant sealer after assembly.

MODELS HPC / VPC -160 thru 447 are dual fan design mounted on advance technology tubular shafts. Outboard bearing design eliminates alignment problems associated with multiple inboard bearings that requires center bearing structural members which hinder air flow patterns.

Cabinet Construction

Unit housing is fabricated entirely of G90 Mill Galvanized Sheet Steel. Panels are 16 and 18 GA., bolted to an integral support assembly of 12 and 14 GA. formed structural members. Panels are removable for components requiring inspection or maintenance.

Heat Transfer Coils

Copper tube heat transfer coils have die-formed tempered aluminum plate type fins with equilateral triangle design in a staggered pattern. Fins are corrugated type with waffle edge. Tube sheets are die formed and full collared for maximum tube support and integrity. Intermediate tube sheets (when applicable) are die-formed, full collared, and full coil depth.

Centrifugal Blower

HPC / VPC series product coolers are furnished with rugged double width, double inlet, forward curve centrifugal blower assemblies constructed of galvanized steel. These blowers are selected for their high performance and efficient operation. Housings are heavy-gauge galvanized steel with die-formed outlets.

After fabrication and assembly, the entire fan assembly with coil mounted is dynamically balanced at the rated CFM.

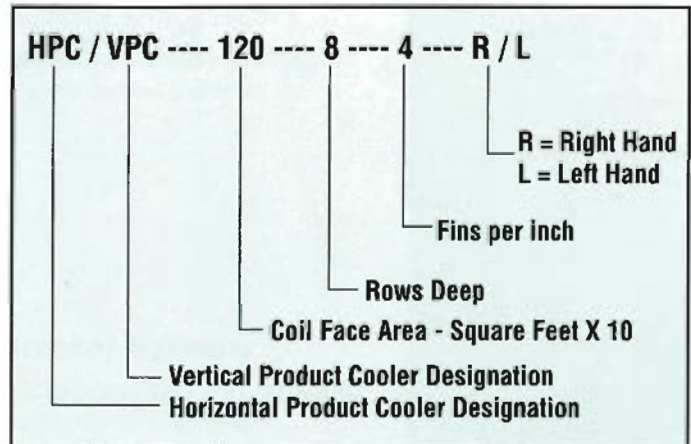
Motors and Drives

Motors are standard NEMA Design B, open drip proof, 1750 RPM for operation on 230 / 460-3-60 electrical systems. Drive assemblies are selected for 150% of rated HP, using adjustable motor sheave. Hubs are split taper-lock type. V-belts are A or B section selected in matched sets. Removable belt guards are provided with access to measure the blower RPM while guard is in place.

Bearings

Sealed ball bearings are flange type with 4 bolt mount and are self aligning. Outboard mounted bearings eliminate exposure of bearing to the air stream. Lubrication fittings are conveniently located on the exterior of the unit. Bearings are selected for an average life of 200,000 hours.

UNIT NOMENCLATURE



INSTALLATION

- HPC / VPC units are designed for floor and/or suspended platform mounting, and should be located within the conditioned space. Units should be installed level and located so that inlet and outlet air flow is unobstructed. Position units away from walls a distance equal to the height of the blower section for proper air flow and service.
- Drain lines in the refrigerated space should be as short as possible and pitched 1/4 inch per foot for proper flow. Drain lines must be trapped outside the refrigerated space.
- Insulated drain pans should be used when condensate formation on the exterior of the drain pan is undesirable. Units should not be located directly above doorways or exterior wall openings.

Performance

PERFORMANCE SCHEDULE
TABLE A

MODEL	CFR	CAPACITY - BTUH / °F TD (1) WET SURFACE			CAPACITY - BTUH / °F TD (2) DRY SURFACE		
		4 ROW	6 ROW	8 ROW	4 ROW	6 ROW	8 ROW
HPC/VPC 80	4400	2373	3134	3668	2431	3213	3737
HPC/VPC 120	6600	3564	4716	5502	3658	4832	5605
HPC/VPC 160	8800	4755	6288	7325	4874	6438	7474
HPC/VPC 218	11990	6469	8556	9986	6632	8771	10187
HPC/VPC 375	20625	11130	14718	17172	11423	15090	17517
HPC/VPC 447	24585	13261	17545	20458	13606	17981	20873

Fan motor heat is not included in published rating, and must be included in the load estimate. See Table A-2 below. Coils are based on 6 fins per inch.

Notes: (1) Based on 550 FPM coil face velocity.
(2) Based on 700 FPM coil face velocity.

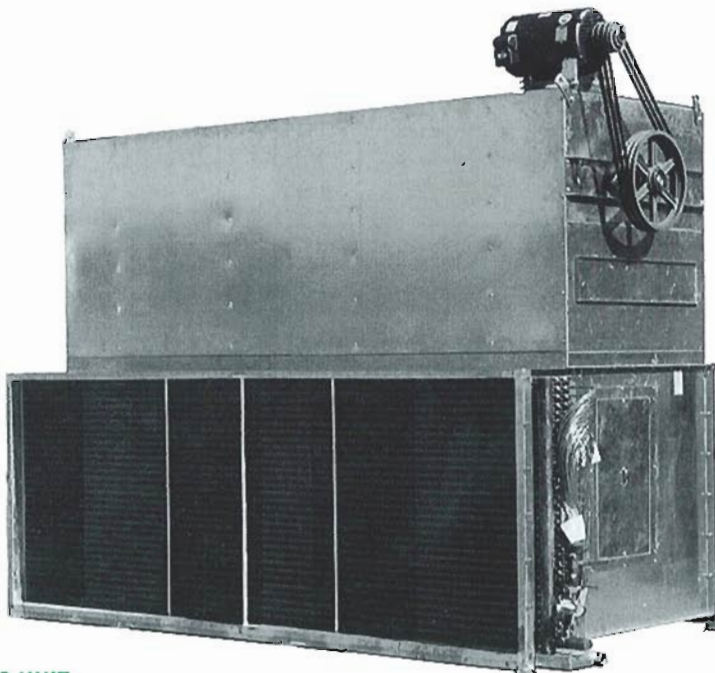
Input Data

Data required to calculate expanded ratings:

1. Total Required Capacity (BTUH)
2. Design Room Temperature (°F DB / °F WB)
3. Design Room Humidity (% RH)
4. Operating Temperature Difference (Temperature difference between room design and saturated suction temperature.)
5. Maximum Fins Per Inch
6. Maximum Face Velocity (For wet applications, limit coil face velocity to 550 FPM.)
7. External Static Pressure (Inch / WG)

TABLE A-2

	BTUH per HP @ Room Temperature			
Motor Size	70°	45°	35°	20°
3 HP or Smaller	3700	3900	4000	4100
5 HP or Larger	2950	3100	3200	3300



VPC UNIT

EXPANDED CAPACITY SELECTION PROCEDURE

Example:

- Total Required Capacity – 240,000 BTUH
 - Room Temperature – + 35° F
 - Evaporator Temperature – + 28° F
 - Refrigerant – R-22
 - Fins per inch – 6 max.
 - External Static – .25 Inch / WG
- Two horizontal product coolers required for proper air distribution.

Selection Procedure:

- If entering air dewpoint temperature is greater than evaporator temperature, coil will operate wet.
- For this application, the coil will operate wet.
- Determine required capacity per unit @ 1° F TD

$$TD = \text{Room Temperature} - \text{Evaporator Temperature} = 35 - 28 = 7^{\circ}\text{F}$$

$$\text{Unit Capacity} = \frac{\text{Total Capacity}}{\text{No. of Units X Calculated TD}} = \frac{240,000}{2 \text{ Units X } 7^{\circ}\text{ F TD}}$$

$$\text{Unit Capacity} = 17,143 \text{ BTU per degree TD}$$

- Assume a coil face velocity of 550 FPM to prevent water carry over.
- Select product cooler from Table C:

Select unit size 375 with 8 rows 6 fins per inch coil at 16,200 BTUH per degree TD.

Capacity Calculation:

Table Capacity (Table C) X Face Velocity Correction

Factor (Table E) X No. Units X TD = Total Capacity

$$\text{Total Capacity} = 16,200 \times 1.06 \times 2 \times 7 = 240,408 \text{ BTUH}$$

- Determine Unit CFM:

CFM = Coil Face Area (Table F) X Face Velocity

$$= 37.5 \times 550 = 20,625 \text{ CFM per unit}$$

PERFORMANCE DATA- DRY SURFACE

TABLE B

UNIT SIZE		80	120	160	218	375	447
BASE CFM		4,000	6,000	8,000	10,900	18,750	22,350
ROWS DEEP	FINS PER INCH	CAPACITIES - BTUH PER DEGREE T.D. @ 500 FPM COIL FACE VELOCITY					
		4	4	1710	2570	3420	4670
6	4	2300	3460	4610	6280	10800	12870
8	4	2740	4110	5480	7470	12840	15310
4	6	2060	3100	4130	5620	9680	11530
6	6	2700	4060	5410	7370	12680	15110
8	6	3140	4710	6280	8560	14720	17540
4	8	2280	3420	4560	6210	10690	12740
6	8	2930	4390	5860	7980	13730	16360
8	8	3360	5030	6710	9150	15730	18750

PERFORMANCE DATA - WET SURFACE

TABLE C

UNIT SIZE		80	120	160	218	375	447
BASE CFM		4,000	6,000	8,000	10,900	18,750	22,350
ROWS DEEP	FINS PER INCH	CAPACITIES - BTUH PER DEGREE T.D. @ 500 FPM COIL FACE VELOCITY					
		4	4	1890	2830	3770	5137
6	4	2530	3810	5080	6910	11880	14160
8	4	3020	4530	6030	8220	14130	16850
4	6	2270	3410	4550	6190	10650	12690
6	6	2970	4470	5960	8110	13950	16630
8	6	3460	5190	6910	9420	16200	19300
4	8	2510	3770	5020	6840	11760	14020
6	8	3230	4830	6450	8780	15110	18000
8	8	3700	5540	7390	10070	17310	20630

INTERNAL UNIT STATIC PRESSURE*

TABLE D

COIL ROWS DEEP	FINS PER INCH	COIL FACE VELOCITY (FPM)			
		400	500	600*	700*
4	4	0.20	0.27	0.34	0.53
6	4	0.27	0.36	0.49	0.76
8	4	0.34	0.49	0.63	1.06
4	6	0.29	0.39	0.51	0.65
6	6	0.39	0.54	0.74	0.93
8	6	0.51	0.74	0.96	1.25
4	8	0.39	0.53	0.71	0.77
6	8	0.53	0.77	1.05	1.11
8	8	0.71	1.05	1.36	1.48

*Wet surface. For dry surface, multiply static X .85. Pressure in Inches of WG.

FACE VELOCITY CORRECTION FACTORS

TABLE E

ROWS DEEP	COIL FACE VELOCITY (FPM)			
	400	500	600*	700*
4	0.89	1.0	1.09	1.18
6	0.87	1.0	1.11	1.19
8	0.88	1.0	1.12	1.19

*Water carry over possible at these face velocities with high latent loads.

PHYSICAL DATA

TABLE F

MODEL	BLOWER		COIL			SHIPPING WEIGHT LBS.	
	QTY/SIZE	OUTLET AREA FT. ²	FACE AREA FT. ²	ROWS DEEP	INTERNAL VOLUME FT. ³	HPC	VPC
HPC/VPC 80	1 @ 15"	2.01	8.0	4	0.55	470	605
				6	0.81	511	646
				8	1.14	552	686
HPC/VPC 120	1 @ 18"	2.87	12.0	4	0.79	631	833
				6	1.19	689	891
				8	1.56	747	949
HPC/VPC 160	2 @ 15"	4.02	16.0	4	1.03	766	990
				6	1.55	842	1066
				8	2.14	917	1141
HPC/VPC 218	2 @ 18"	5.74	21.8	4	1.40	1026	1326
				6	2.11	1126	1426
				8	2.82	1225	1525
HPC/VPC 375	2 @ 22"	10.2	37.5	4	2.40	1626	2089
				6	3.60	1791	2254
				8	4.81	1955	2418
HPC/VPC 447	2 @ 25"	13.42	44.7	4	2.85	1878	2426
				6	4.29	2071	2619
				8	5.72	2265	2813

* Shipping weight does not include motor weight. See Table "H"

7. Determine Motor Horsepower:

a. Determine Internal Unit Static Pressure. An 8 row 6 fins per inch coil has a static pressure loss (from Table D) of .85 Inches / WG (by interpolation).

b. To determine Total Static Pressure, add External Static Pressure to Coil Static Pressure Loss. Total Static Pressure Loss = .85 + .25 = 1.10 TSP

c. Select 10 H.P. from Table G by interpolation.

Equipment Selected:

2 - Each model HPC - 375 product coolers with 8 row 6 FP coils, 10 H.P. motor.

MOTOR SELECTION DATA

TABLE G

MIDDLES	CFM	TOTAL STATIC PRESSURE INCHES OF WATER GAUGE										
		.25	.50	.75	1.0	1.25	1.50	1.75	2.0	2.25	2.5	2.75
HPC/VPC 80	3200	1/2	3/4	3/4	1	1 1/2	1 1/2	1 1/2	2	2	3	3
	4000	3/4	1	1 1/2	1 1/2	1 1/2	2	2	3	3	3	3
	4800	1 1/2	1 1/2	2	2	2	3	3	3	3	5	5
	5600	2	2	3	3	3	3	5	5	5	5	5
HPC/VPC 120	4800	1	1 1/2	2	2	3	3	3	5	5	5	5
	6000	1 1/2	1 1/2	2	3	3	3	5	5	5	5	5
	7200	2	3	3	3	5	5	5	5	5	7 1/2	7 1/2
	8400	3	3	5	5	5	5	7 1/2	7 1/2	7 1/2	7 1/2	7 1/2
HPC/VPC 160	6400	1	1 1/2	1 1/2	2	2	3	3	5	5	7 1/2	7 1/2
	8000	1 1/2	2	3	3	3	5	5	7 1/2	7 1/2	7 1/2	7 1/2
	9600	3	3	5	5	5	7 1/2	7 1/2	7 1/2	7 1/2	10	10
	11200	5	5	7 1/2	7 1/2	7 1/2	7 1/2	10	10	10	10	10
HPC/VPC 218	8720	1 1/2	2	3	3	5	5	5	7 1/2	7 1/2	7 1/2	7 1/2
	10900	2	3	5	5	5	5	7 1/2	7 1/2	7 1/2	7 1/2	7 1/2
	13080	3	5	5	5	7 1/2	7 1/2	7 1/2	7 1/2	7 1/2	10	10
	15260	5	5	7 1/2	7 1/2	7 1/2	10	10	10	15	15	15
HPC/VPC 375	15000	3	3	5	5	7 1/2	7 1/2	7 1/2	7 1/2	10	15	15
	18750	5	5	7 1/2	7 1/2	7 1/2	7 1/2	10	15	15	15	15
	22500	7 1/2	7 1/2	7 1/2	10	10	15	15	15	15	20	20
	26250	7 1/2	10	15	15	15	15	20	20	20	20	25
HPC/VPC 447	17880	3	3	5	7 1/2	7 1/2	7 1/2	7 1/2	10	15	15	15
	22350	5	5	7 1/2	7 1/2	7 1/2	10	15	15	15	20	20
	26820	7 1/2	7 1/2	7 1/2	10	15	15	15	15	20	20	20
	31290	7 1/2	10	15	15	15	15	20	20	20	25	25

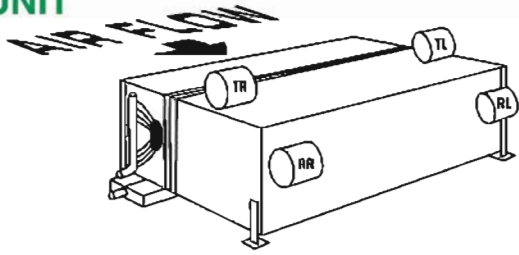
Motor Horsepower can be optimized by adjusting coil face velocity and capacity

TABLE H

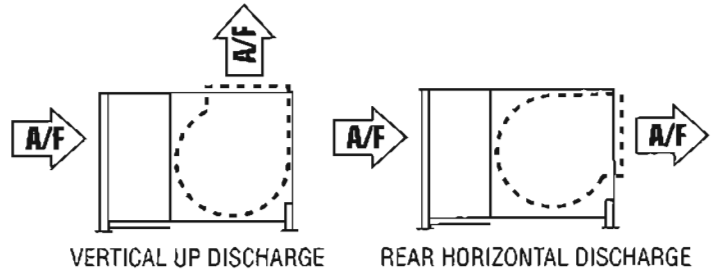
HORSEPOWER	WEIGHT LBS.
1/2	24
3/4	29
1	41
1 1/2	44
2	44
3	71
5	76
7 1/2	106
10	119
15	180
20	193
25	266
30	299

Centrifugal Product Coolers

HPC UNIT

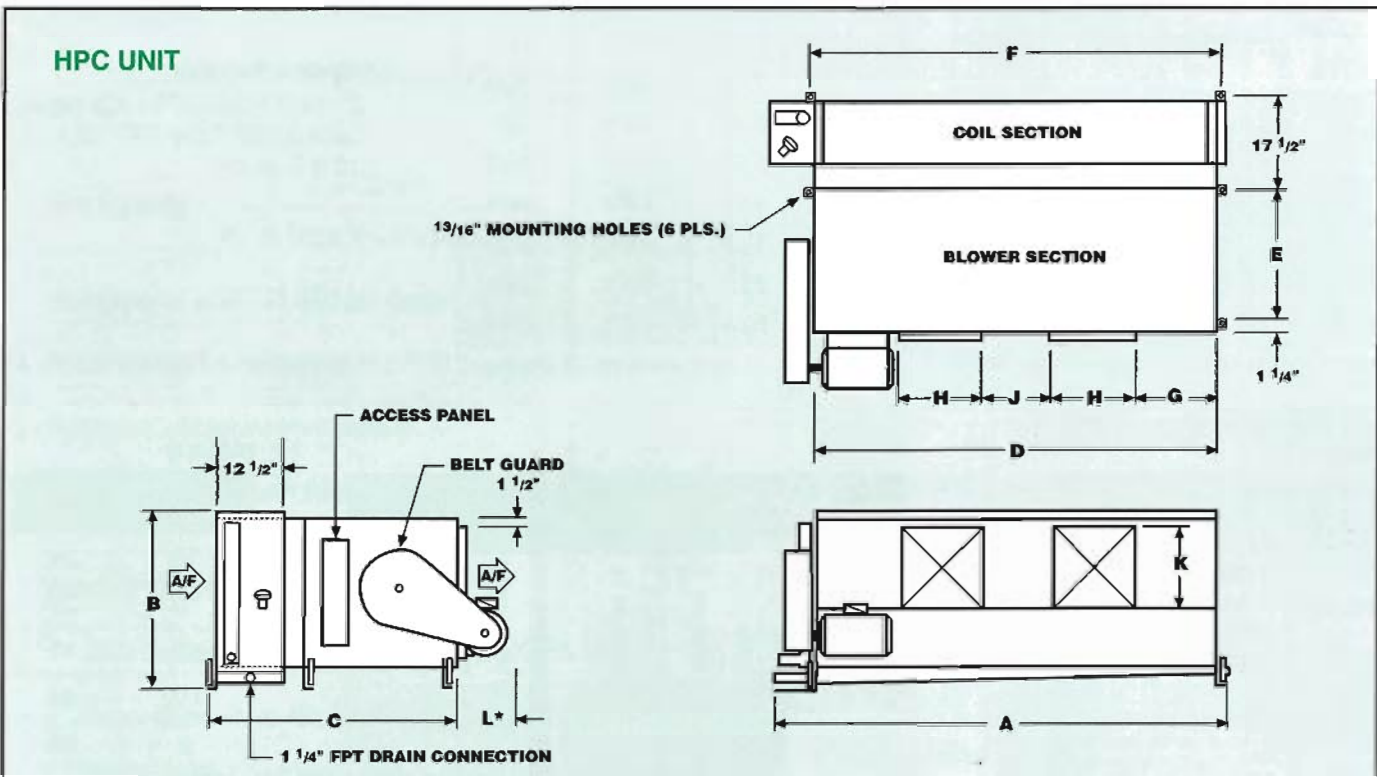


HPC BLOWER DISCHARGE POSITIONS



MOTOR LOCATIONS

TR = TOP RIGHT TL = TOP LEFT RR = REAR RIGHT RL = REAR LEFT



HPC DIMENSIONS

MODEL	A	B	C	D	E	F	G	H	J	K	No. Blowers
HPC-80	51 1/2	34 3/4	47 1/8	38 5/8	27 3/4	40 3/4	10	18 5/8		15 7/8	1 @ 15
HPC-120	61	40 3/4	53 1/8	48 1/8	33 1/2	50 1/4	13 1/8	21 7/8		18 7/8	1 @ 18
HPC-160	90	34 3/4	47 1/8	77 1/8	27 3/4	79 1/4	10	18 5/8	19 7/8	15 7/8	2 @ 15
HPC-218	100	40 3/4	53 1/8	87 1/8	33 1/2	89 1/4	10 7/8	21 7/8	21 5/8	18 7/8	2 @ 18
HPC-375	133	49 3/4	60 1/8	120 1/8	40 1/2	122 1/4	16 7/16	27 1/4	32 3/4	27 1/4	2 @ 22
HPC-447	147	52 3/4	64 5/8	134	45	136 1/4	17 7/8	31 1/4	35 3/4	31 1/4	2 @ 25

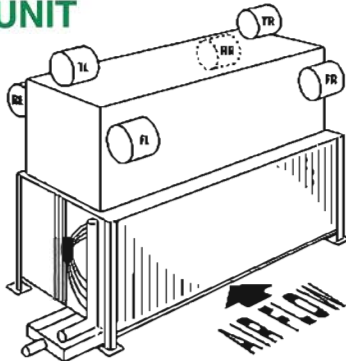
NOTE: • Coil connection, or drain pan connection may be right or left hand, determined by looking with direction of air flow.
• The front of all HPC and VPC units is determined by the air inlet.

* "L" dimension is based on motor horsepower. See Table L for the corresponding dimension for each motor horsepower.

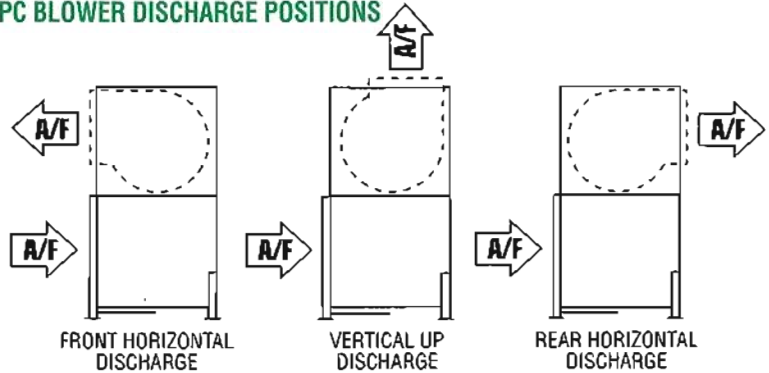
TABLE L

Motor HP	1/2	3/4	1	1 1/2	2	3	5	7 1/2	10	15	20	25	30
"L"	13"	13"	13"	13"	13"	15"	15"	16 1/2"	16 1/2"	18 1/2"	18 1/2"	20"	20"

VPC UNIT

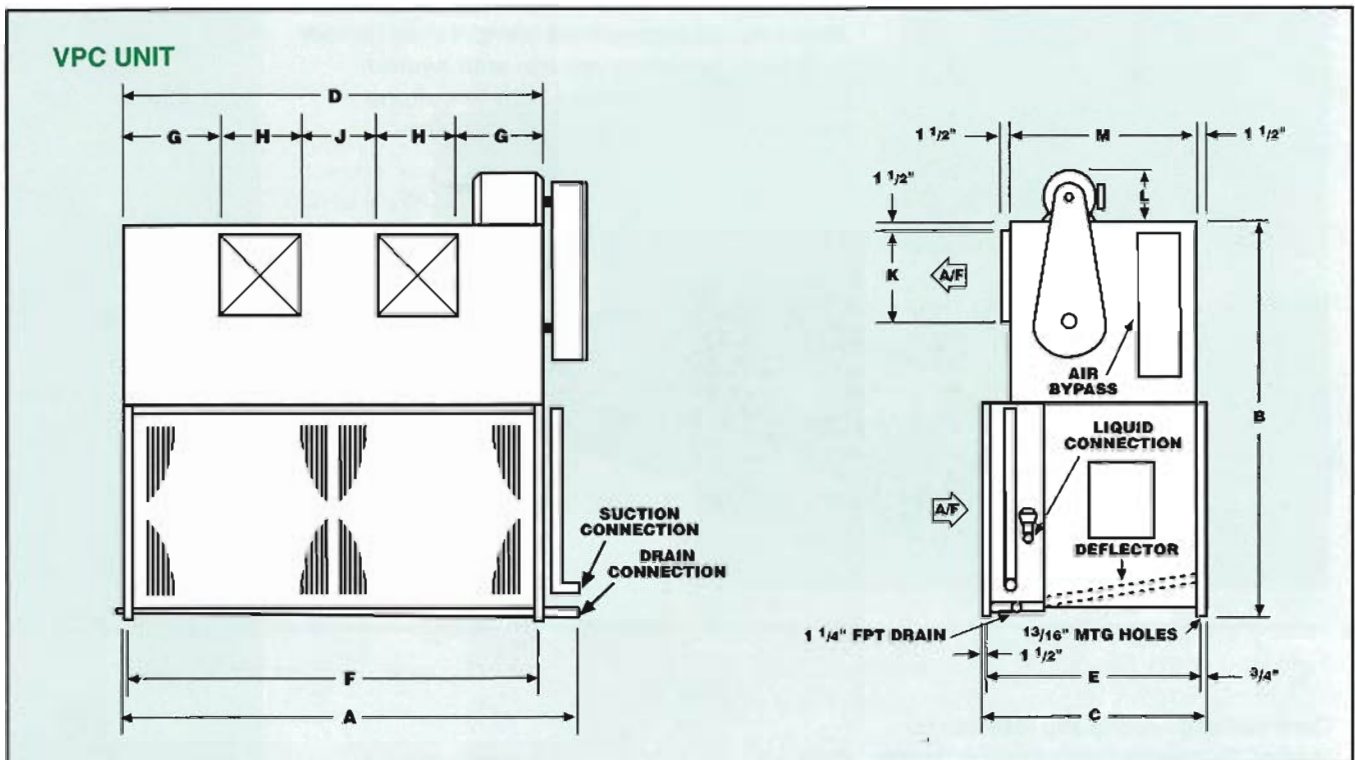


VPC BLOWER DISCHARGE POSITIONS



MOTOR LOCATIONS

FR = FRONT RIGHT FL = FRONT LEFT TR = TOP RIGHT TL = TOP LEFT RR = REAR RIGHT R = REAR LEFT



VPC DIMENSIONS

MODEL	A	B	C	D	E	F	G	H	J	K	M	No. Blowers
VPC-80	51 1/2	68 1/2	41 3/4	38 5/8	39 1/2	37	10	18 5/8		15 7/8	30 1/4	1 @ 15
VPC-120	61	80 1/2	47 3/4	48 1/8	45 1/2	49 1/2	13 1/8	21 7/8		18 7/8	36 1/4	1 @ 18
VPC-160	90	68 1/2	41 3/4	77 1/8	39 1/2	78 1/2	10	18 5/8	19 7/8	15 7/8	30 1/4	2 @ 15
VPC-218	100	80 1/2	47 3/4	87 1/8	45 1/2	88 1/2	10 7/8	21 7/8	21 5/8	18 7/8	36 1/4	2 @ 18
VPC-375	133	96 1/2	54 3/4	120 1/8	52 1/2	121 1/2	16 7/16	27 1/4	32 3/4	27 1/4	43 1/4	2 @ 22
VPC-447	147	104	59 1/4	134	57	135 1/2	17 7/8	31 1/4	35 3/4	31 1/4	47 3/4	2 @ 25

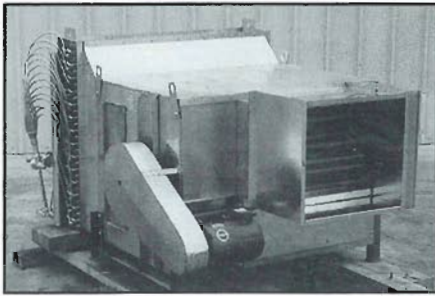
NOTE: • Coil connection, or drain pan connection may be right or left hand, determined by looking with direction of air flow.
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* "L" dimension is based on motor horsepower. See Table L for the corresponding dimension for each motor horsepower.

TABLE L

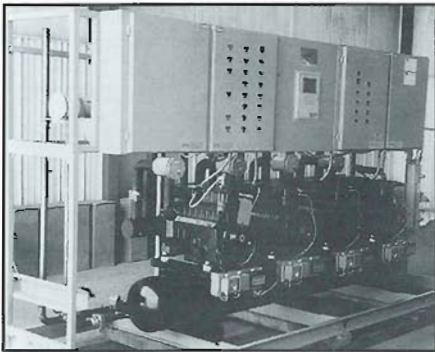
Motor HP	1/2	3/4	1	1 1/2	2	3	5	7 1/2	10	15	20	25	30
"L"	13"	13"	13"	13"	13"	15"	15"	16 1/2"	16 1/2"	18 1/2"	18 1/2"	20"	20"

CUSTOM DESIGN SYSTEMS



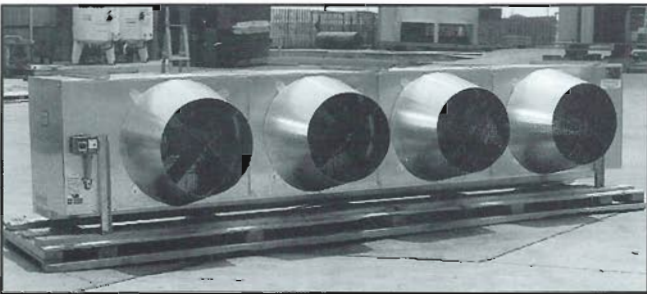
Product Cooler - Ripening Room

Shown with optional finned tube electrical heater, adjustable air bypass and multi-speed motor.



Parallel Compressor Systems

Even or uneven compressors, with demand cooling for low temperature systems. On board microprocessor for compressor, defrost and head pressure control with system annunciation. Available with telephone modem for remote access and alarm.



Commercial / Industrial Unit Coolers

A Series shown with extended throw nozzles.

Continual engineering and research for product improvement may result in design and specification changes. Consult factory for certified equipment drawings.



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