

TURBOCELL

EVAPORATIVE COOLING

Catalog HECD-5



ALTON

Quality Engineered Products Since 1946

TURBOCELL

EVAPORATIVE COOLING

THE LATEST IN COOLING TECHNOLOGY

In many types of industries where efficient, low-cost cooling is essential, "Alton" has been the word for experience, reliability and innovation since 1946. Alton offers its service oriented expertise and reliability to ensure the high quality standards that architects, engineers, building owners, and plant managers have come to rely on from one of the industry leaders.

ALTON has the facilities, resources and people to assure Leadership and Quality in research and development, design and engineering, manufacturing and service.

To all this, add the professional planning assistance provided by ALTON. We work with architects, engineers, building owners and plant managers to help select the right equipment, analyze the best way to install it and back it with service.

BENEFITS OF EVAPORATIVE COOLING

Cooling without the cost of refrigeration . . . Cooling nature's way with water eliminates the cost of expensive refrigeration systems and reduces operating and maintenance costs. Installation is simple and inexpensive.

Big Space or Small.

You can cool a small area or a big plant. With capacities from 5,000 to 64,000 CFM you have the flexibility to put cool air right where you want it. Air changes can be planned for one every 30 seconds to one every five minutes (12 to 120 times an hour) – depending on climate conditions and operational requirements.

Comfort Anywhere.

On a humid day in New Orleans the Turbocell can reduce the 93°F air to a relatively cool 70°-80°F. In drier Tucson, 104° outside air can be brought down 30°F. The hotter and drier the air, the greater the reduction in temperature. That means maximum comfort when you need it most.

Ventilation.

Fresh air ventilation is available anytime by just turning off the water spray system. The Turbocell blower continues to operate pumping in plenty of fresh outside air.

HOW THE TURBOCELL EVAPORATIVE COOLER WORKS

Whenever water is evaporated, heat is absorbed. Wet the back of your hand, then blow on it. The skin surface is immediately cooler. This demonstrates the basic principle of evaporative cooling. The Turbocell works by drawing outside air through a uniquely designed cross-fluted media. Due to its internal geometry, a turbulent mix of air and water is created which optimizes heat transfer. An air washing effect is also created which removes most dust and dirt from the air stream before the air flows into the work area providing a clean, cool environment.

WHY EVAPORATIVE COOLING IS COMFORTABLE

Lowers Temperature.

The Turbocell pumps in cool air lowering room temperature.

Lowers the Temperature You Feel.

The rapid moving air produced by the Turbocell increases skin surface evaporation. This results in effective cooling meaning people feel 3 to 5 degrees cooler than the temperature read from a thermometer.

Carries Away Radiated Heat.

A constant flow of cool air removes heat from the work place leaving a more comfortable surrounding.

Fresh Air.

The Turbocell provides fresh, revitalizing air, forcing stale air out.

Cleans Air.

The Turbocell system cleans air by removing dust, dirt, pollen, and foreign matter creating a more refreshing environment.



COVER: HECD-340 with optional stainless steel blower section and pre-wired package.

TURBOCELL FEATURES

(A) Cooling Media.

The Turbodek media with its unique cross-fluted design not only offers a higher cooling efficiency, up to 90% in the 400 fpm range (slightly higher with Fiberdek), but is more durable and its self cleaning action extends the life span years beyond that of most conventional media. Optional Fiberdek is U.L. approved with a U.L.900, class 2 rating.

(B) Optional Maxaire Prefilter.

Keeps bugs out, reduces odor-producing algae by keeping out sunlight and helps minimize the accumulation of dust, dirt and other airborne particles from rapidly collecting in the water tank.

(C) Washer Cabinet and Water Pan.

Construction of 304 Stainless Steel.

(D) Float Operated Valve.

Maintains water level in tank, $\frac{3}{8}$ " parts are corrosion-resistant and replaceable.

(E) Bleed-off Valve.

Manually adjustable, brass construction, $\frac{1}{4}$ ", reduces mineral buildup, helps prevent media clogging thus extending media life.

(F) Water Distribution Manifold.

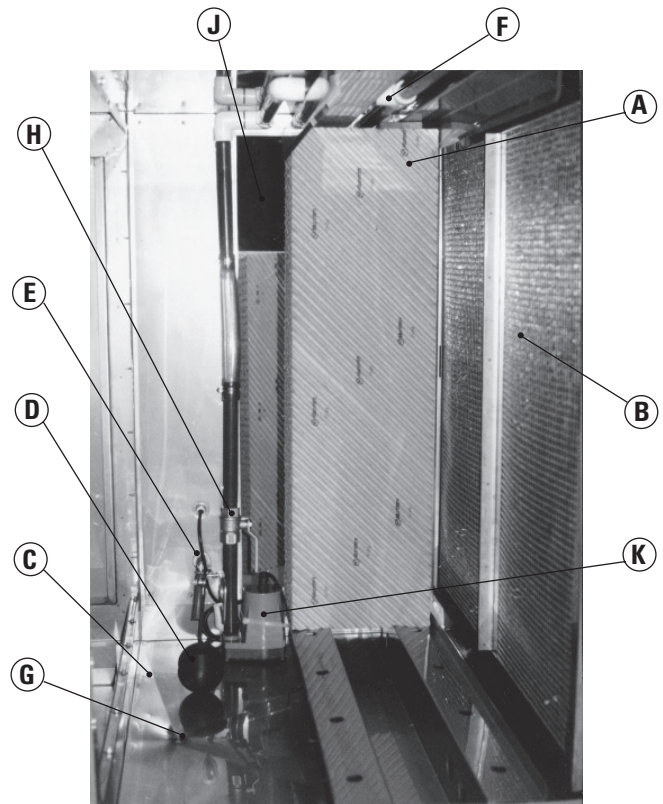
Heavy-duty schedule 40 PVC with metered orifices, and removable end caps for easy cleaning.

(G) Bottom Drain.

Drain pan is cross broke to center with stainless steel nipple welded in place, allows for complete drainage of water pan.

(H) Water Regulator Valve.

Brass construction, water flow can be field set.



(J) Access Panel.

Full size side panel provides easy access to pump, float valve, water regulator valve and cooling media that can be easily removed.

(K) Pump.

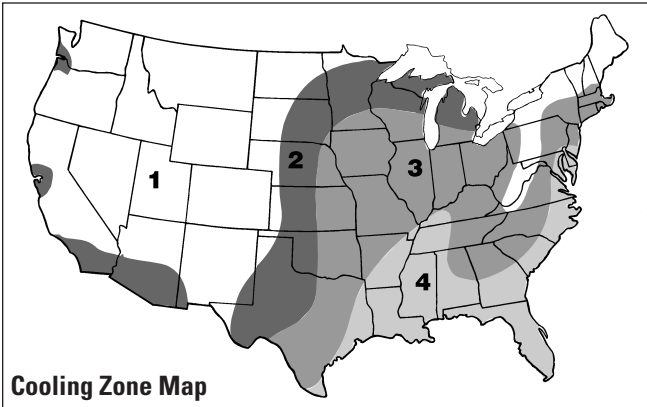
Submersible, centrifugal, U.L. listed, dielectric oil-filled motor, lubricated for life. Lightweight and compact with strainer to prevent clogging. Available for 115V or 230V, single-phase operation.

EQUIPMENT OPTIONS

- The Turbocell cooling compartment may be purchased separately as our WCD series. On hot days it can turn an ordinary ventilating or make-up air system into a cooling system.
- Air distributors – 4 direction flow, available with manual damper.
- Air grilles – industrial duty, high velocity.
- Additional access door.
- Winter back cover.
- Motorized discharge damper (2 position or modulating).
- Maxaire prefilter.

- Fiberdek
- Duradek coating
- Stainless steel blower compartment.
- Factory wired starters/disconnects.
- Remote control panels.
- 2 speed, TEFC or high efficiency motors.
- OA/RA mixing plenum.
- Fill and drain kit.
- Spring isolated blower assembly.
- One foot cabinet section for coil mounting.

SELECTING A TURBOCELL



The Turbocell can be used to area cool or spot cool. Area cooling is used to cool an entire work area where workers constantly move about and cooling requirements do not vary greatly from one location to the next. Spot cooling is used when building volume is large and workers are located near machines that give off heat. Cool air from the Turbocell is distributed through ductwork and discharged directly on the workers.

AIR CHANGE TABLE

Interior Heat Load	Sun Protection	Minutes Per Air Change			
		Zone 1	Zone 2	Zone 3	Zone 4
Excessive	Poor	1½	1	¾	½
	Good	2	1½	1	¾
Normal	Poor	2	1½	1	¾
	Good	2	2	1½	1

AREA COOLING:

- Step 1.** Select the zone from the "Cooling Zone Map."
- Step 2.** Decide if the interior heat load is "Normal" or "Excessive." "Normal" means no heat producing equipment or large crowds. "Excessive" means an area with heat generating equipment or a large number of people. Examples of heat generating equipment are large motors, stoves, ovens, or industrial process equipment.
- Step 3.** Decide if the area to be cooled is protected from the heat of the sun. A "Good" sun protection is one where the building is insulated or the exterior walls are shaded. Windows do not face the sun during the heat of the day. A "Poor" sun protection is one where the building is uninsulated, sun beams down on the building and windows face the sun during the afternoon hours.
- Step 4.** Refer to the "Air Change Table" and determine the number of minutes required per air change.
- Step 5.** Calculate the building size. (Length in ft.) x (Width in ft.) x (Height in ft.) = ft³. **Note:** If the building has a very high ceiling, use a height of 15 to 18 feet. The Turbocell should be installed so it discharges into the lower part of the room while an exhaust fan draws air from the upper level.

- Step 6.** Reduce the building size by the room taken up with machinery, inventory, etc. (Building size in ft³) – (Machinery, etc. in ft³) = (Space to cool in ft³).
- Step 7.** Divide the (Space to cool in ft³) from step 6 by the (Number of minutes required per air change) from step 4. This gives the CFM rating of the Turbocell Unit.
- Step 8.** Refer to the "Air Delivery Table" to select the Turbocell Model No. If the required CFM rating falls between models select the larger of the two.

EXAMPLE:

- Step 1.** Small radiator factory located in Mobile, AL. See "Cooling Zone Map" to get Zone 4.
- Step 2.** Factory has solder dip tanks that give off heat. Interior heat load is "Excessive."
- Step 3.** Factory is exposed to sun throughout the day. Sun protection is "Poor."
- Step 4.** From "Air Change Table" get ½ minute per air change.
- Step 5.** Calculate the size of the factory. (50 ft. length) x (30 ft. width) x (10 ft. height) = 15,000 ft³.
- Step 6.** Room occupied by machinery and inventory is 2,200 ft³. (15,000 ft³) - (2,200 ft³) = 12,800 ft³.
- Step 7.** CFM rating = $\frac{12,800 \text{ ft}^3}{\frac{1}{2} \text{ min.}}$ = 25,600 CFM
- Step 8.** From the "Air Delivery Table" select Model HECD-260.

SPOT COOLING:

The volume of air per work station depends on the amount of activity, the degree of heat to overcome, and the distance between workers and air discharge. The volume of air usually varies from 500 to 5,000 CFM and the air velocity at the worker should range from 400-1000 FPM. The cool air discharge should be no more than 4-10 feet from the worker and be directed towards the upper body area. The air outlet should be adjustable so the direction of flow can be controlled. Due to the complexity of sizing units for specific spot cooling applications please contact the Alton Sales Department for assistance.



TURBOCELL SERIES AIR DELIVERY TABLE

MODEL NO.	CFM	BLOWER HORSEPOWER AND SPEED REQ. @ ESP (W.C.)													
		0.125"		0.25"		0.50"		0.75"		1.00"		1.25"		1.50"	
		HP	RPM	HP	RPM	HP	RPM	HP	RPM	HP	RPM	HP	RPM	HP	RPM
HECD-70 WCD-70 FFA-13.3 sq. ft. 18" FC	5000	1	387	1	432	1.5	512	2	588	2	667	2	716	3	768
	6000	1.5	451	1.5	486	2	553	3	625	3	692	3	745	5	798
	7000	2	518	3	544	3	605	3	666	5	725	5	777	5	829
	8000	3	585	3	607	5	656	5	712	5	766	5	815	7.5	863
	9000	5	652	5	670	5	713	5	763	7.5	812	7.5	859	7.5	902
HECD-100 WCD-100 FFA-17.2 sq. ft. 20" FC	8000	3	462	3	490	3	545	5	593	5	642	5	688	5	740
	9000	5	514	5	539	5	588	5	635	5	675	7.5	715	7.5	760
	10,000	5	565	5	587	5	632	7.5	677	7.5	715	7.5	752	7.5	789
	11,000	7.5	617	7.5	640	7.5	680	7.5	720	7.5	756	10	791	10	826
	12,000	7.5	670	7.5	691	10	727	10	763	10	800	10	835	10	866
HECD-130 WCD-130 FFA-20.0 sq. ft. 25" FC	11,000	2	305	3	333	3	385	5	433	5	477	5	518	7.5	560
	12,000	3	329	3	354	5	402	5	447	5	490	7.5	530	7.5	566
	13,000	3	352	5	375	5	419	5	463	7.5	505	7.5	542	7.5	577
	14,000	5	375	5	396	5	439	7.5	481	7.5	520	7.5	555	10	590
	HECD-210 WCD-210 FFA-32.9 sq. ft. 27" FC	15,000	3	290	5	314	5	360	7.5	400	7.5	440	7.5	475	10
16,000		5	304	5	330	5	373	7.5	411	7.5	448	10	484	10	518
17,000		5	320	5	343	7.5	385	7.5	422	10	460	10	493	10	524
18,000		5	337	7.5	359	7.5	399	7.5	436	10	470	10	503	15	534
19,000		7.5	355	7.5	373	7.5	412	10	450	10	481	15	512	15	544
20,000		7.5	370	7.5	391	7.5	428	10	462	15	493	15	523	15	556
21,000		7.5	385	10	405	10	441	15	475	15	505	15	535	15	566
22,000		10	402	10	420	15	456	15	490	15	515	15	546	20	576
23,000		10	420	15	435	15	469	15	502	15	532	20	560	20	589
HECD-260 (2) WCD-130 FFA-40.0 sq. ft. 27" FC		21,000	7.5	325	7.5	343	10	375	10	409	15	441	15	468	15
	22,000	7.5	337	7.5	354	10	389	15	420	15	450	15	478	15	504
	23,000	10	350	10	369	15	400	15	431	15	460	15	487	15	513
	24,000	10	365	10	382	15	412	15	442	15	471	15	497	20	522
	25,000	10	375	15	395	15	424	15	455	15	481	20	507	20	532
	26,000	15	391	15	407	15	437	15	465	20	492	20	516	20	542
	27,000	15	403	15	421	15	449	20	476	20	503	20	528	25	551
	28,000	15	420	15	434	20	464	20	488	20	513	25	538	25	563
HECD-300 WCD-300 FFA-49.5 sq. ft. 33" FC	23,000	5	230	5	246	7.5	285	7.5	319	10	349	10	377	15	402
	24,000	7.5	239	7.5	252	7.5	291	10	325	10	354	15	382	15	406
	25,000	7.5	248	7.5	260	7.5	297	10	330	10	360	15	387	15	411
	26,000	7.5	258	7.5	267	10	303	10	335	15	365	15	393	15	416
	27,000	7.5	267	7.5	276	10	311	15	341	15	371	15	397	15	422
	28,000	10	276	10	284	10	318	15	347	15	376	15	402	20	427
	29,000	10	285	10	292	15	324	15	354	15	382	15	408	20	432
	30,000	10	295	10	303	15	331	15	360	15	388	20	414	20	436
	31,000	15	305	15	311	15	340	15	367	20	394	20	419	20	443
	32,000	15	313	15	320	15	346	15	373	20	400	20	424	20	449
HECD-340 (2) WCD-210 FFA-65.8 sq. ft. 33" FC	28,000	10	262	10	267	10	283	15	310	15	339	15	364	15	388
	29,000	10	270	10	276	10	290	15	315	15	343	15	368	20	392
	30,000	10	279	10	285	15	297	15	319	15	348	15	373	20	395
	31,000	15	288	15	293	15	305	15	325	15	353	20	377	20	400
	32,000	15	297	15	301	15	314	15	331	20	357	20	382	20	404
	33,000	15	307	15	311	15	322	15	337	20	361	20	387	20	408
	34,000	15	315	15	320	15	330	20	344	20	366	20	392	25	413
	35,000	15	325	20	329	20	338	20	351	20	370	25	396	25	417
	36,000	20	333	20	338	20	347	20	359	20	376	25	400	25	423
	37,000	20	342	20	347	20	355	20	365	25	382	25	404	25	428
38,000	20	352	20	355	25	364	25	374	25	388	25	408	30	433	
HECD-420 (2) WCD-210 FFA-66.8 sq. ft. 36" FC	36,000	15	259	15	274	15	299	20	325	20	350	25	370	25	390
	37,000	15	266	15	280	20	306	20	331	20	354	25	375	25	394
	38,000	15	273	20	287	20	311	20	336	25	359	25	380	25	398
	39,000	20	280	20	293	20	317	25	341	25	364	25	384	30	402
	40,000	20	287	20	298	20	322	25	345	25	368	30	389	30	407
	41,000	20	293	20	305	25	328	25	350	25	373	30	393	30	412
	42,000	20	299	20	312	25	334	25	356	30	377	30	398	40	417
	43,000	20	305	25	318	25	340	30	361	30	383	30	404	40	422
	44,000	25	311	25	324	25	346	30	366	30	388	40	408	40	427
	45,000	25	318	25	330	30	351	30	371	40	393	40	414	40	432
46,000	25	324	30	337	30	358	30	377	40	398	40	418	40	436	
HECD-600 (2) WCD-300 FFA-99.0 sq. ft. 42" FC	46,000	20	247	20	258	20	282	25	304	25	325	30	344	40	362
	48,000	20	258	20	267	25	290	25	313	30	332	40	351	40	368
	50,000	20	267	25	277	25	298	30	320	30	340	40	358	40	375
	52,000	25	277	25	287	30	307	30	328	40	347	40	366	40	382
	54,000	25	286	30	296	30	315	40	336	40	355	40	373	50	390
	56,000	30	296	30	306	40	324	40	344	40	362	50	380	50	396
	58,000	30	306	40	315	40	333	40	352	50	371	50	387	50	404
	60,000	40	316	40	325	40	342	50	360	50	378	50	395	60	411
	62,000	40	327	40	335	50	351	50	368	50	386	60	404	60	419
	64,000	50	337	50	345	50	359	50	377	60	394	60	411	60	426

EXAMPLE OF HOW TO USE AIR DELIVERY TABLE:

To select a blower that will provide 20,000 CFM with external static pressure of 0.50" at sea level and determine the RPM and horsepower required, begin by finding 20,000 in CFM column. Model HECD-210 meets this requirement. Then follow the line for 20,000 CFM horizontally to the column for 0.50" static pressure. (Make adjustments for the accessories listed below, if applicable.) This shows that the operating speed is 428 RPM and the horsepower is 7-1/2. Allowances for drive loss have already been factored into the table.

Static pressure drops for optional equipment accessories must be added to the external static pressures to determine the appropriate blower motor horsepower.

- Maxaire prefilter 0.30" WG
- Discharge damper 0.50" WG
- OA/RA mixing plenum 0.15" WG

Performance shown is for installation type B, Free inlet, Ducted outlet.

Performance ratings include the effects of evaporative media, bearings and blower sheaves in the airstream.

During certification testing, drive losses were not included as part of brake horsepower measurements. However, the selection table to the left reflects horsepower requirements based on stated air delivery and external static air pressure.

NOTE: Combination of some optional equipment may effect standard cabinet dimension. Please contact factory for more information.

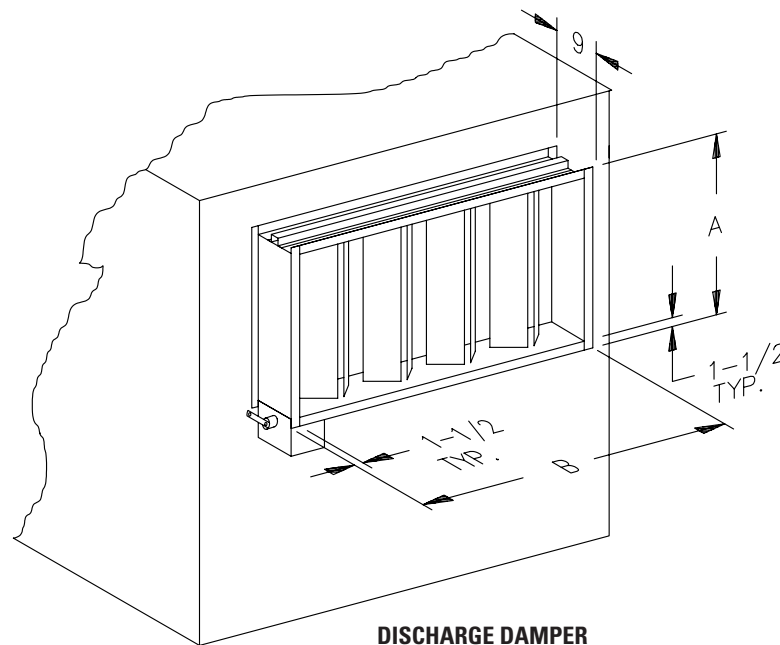
ALTON MOTORIZED VOLUME CONTROL DAMPERS

The Alton HECD Turbocell Series offers an optional motorized discharge damper which can be ordered with either a two-position or modulating actuator. This discharge damper is a simple, yet versatile option which will greatly enhance the flexibility of the Turbocell unit. The damper system attaches to the discharge of the blower and can be used as a shut-off damper or a variable air volume damper.

When equipped with a two-position actuator, this damper system proves to be very effective at reducing air migration. The two-position actuator is designed to open the damper as the blower motor is energized, allowing maximum air flow as long as the blower motor is running. A spring return closes the damper on loss of power to prevent air migration in either direction.

When equipped with a modulating actuator, this damper system offers the benefits of a multi-speed unit without the expensive electrical controls a two-speed system requires. Controlled by a potentiometer which is remotely located inside the building, the damper can be adjusted from fully open, to partially opened, to fully closed when the blower is de-energized. During milder spring and fall days when full air capacity may not be required, the damper can be adjusted until the desired amount of air flow is established. As the damper is closed, the resistance on the blower results in a free wheeling action which, tests have proven, actually reduces the power consumption of the blower motor. The modulating damper system offers far greater flexibility than the typical high-low operation of a two-speed motor, while also providing greater savings for you.

Field results have proven that the motorized discharge damper option can be a valuable addition to your Alton HECD Turbocell unit.

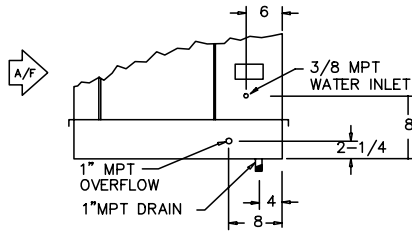


DIMENSIONS	MODEL								
	HECD-70	HECD-100	HECD-130	HECD-210	HECD-260	HECD-300	HECD-340	HECD-420	HECD-600
A	22-7/8	28-3/4	38-1/4	38-1/4	38-1/4	47	47	47	48
B	26-15/16	29-3/4	39-1/4	39-1/4	39-1/4	43-3/8	43-3/8	53	65-1/8

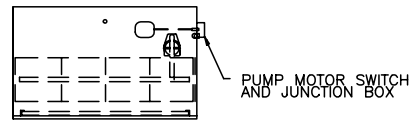


DIMENSIONS – BASIC UNIT

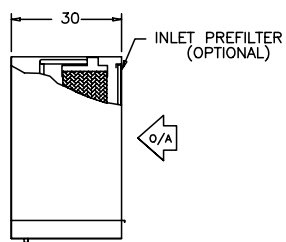
WCD-70, 100, 130, 210, 300



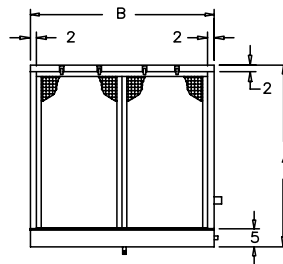
DETAIL "A"



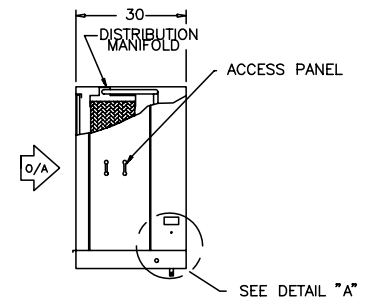
PLAN VIEW



LEFT SIDE VIEW



REAR VIEW

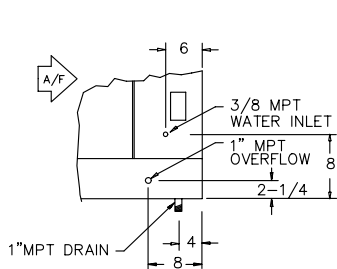


RIGHT SIDE VIEW

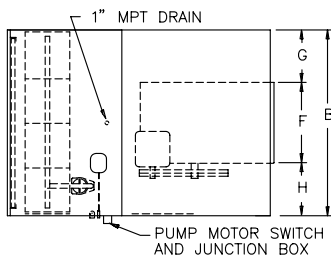
MODEL	EVAP. MEDIA	A	B	NET WT.	OPERATING WT.
WCD-70	(4) 12 x 12 x 42-1/2 (1) 2 x 12 x 42-1/2	50	50	155 lbs.	415 lbs.
WCD-100	(4) 12 x 12 x 48 (1) 8 x 12 x 48	56	56	205 lbs.	469 lbs.
WCD-130	(5) 12 x 12 x 54-1/2	62	60	224 lbs.	515 lbs.
WCD-210	(6) 12 x 12 x 67-1/2 (1) 3 x 12 x 67-1/2	75	75	344 lbs.	734 lbs.
WCD-300	(8) 12 x 12 x 78-1/2	86	96	430 lbs.	955 lbs.

DIMENSIONS – BASIC UNIT

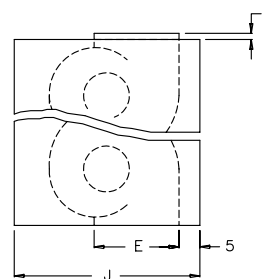
HECD-70, 100, 130, 210, 300



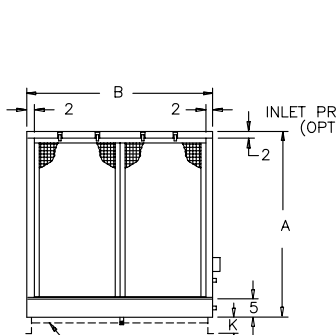
DETAIL "A"



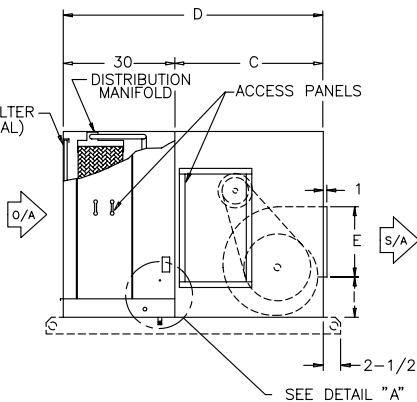
PLAN VIEW



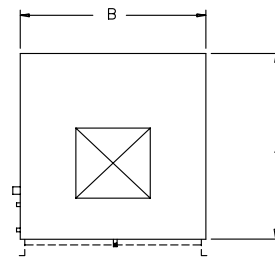
OPTIONAL FAN ARRANGEMENT



REAR VIEW



SIDE VIEW



FRONT VIEW

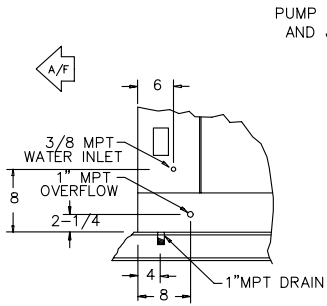
NOTE: When using optional fan arrangements or internally isolated fan "D" dimension will = "J" plus 30".

MODEL	BLOWER SIZE	EVAP. MEDIA	A	B	C	D	E	F	G	H	I	J	K	NET WT.	OPERATING WT.
HECD-70	18" FC	(4) 12 x 12 x 42-1/2 (1) 2 x 12 x 42-1/2	50	50	32	62	18-7/8	21-7/8	14-1/16	14-1/16	12-7/8	39	4	630 lbs.	890 lbs.
HECD-100	20" FC	(4) 12 x 12 x 48 (1) 8 x 12 x 48	56	56	35	65	24-3/4	24-7/8	15-9/16	15-9/16	13-1/2	44	4	805 lbs.	1069 lbs.
HECD-130	25" FC	(5) 12 x 12 x 54-1/2	62	60	42	72	31-1/4	31-3/8	14-5/16	14-5/16	15-7/8	53	4	949 lbs.	1240 lbs.
HECD-210	27" FC	(6) 12 x 12 x 67-1/2 (1) 3 x 12 x 67-1/2	75	75	50	80	34-1/4	34-3/8	20-5/16	20-5/16	17-9/16	60	4	1489 lbs.	1879 lbs.
HECD-300	33" FC	(8) 12 x 12 x 78-1/2	86	96	75	105	42-15/16	39-3/4	20	36-1/4	17-1/16	75	4	2008 lbs.	2529 lbs.

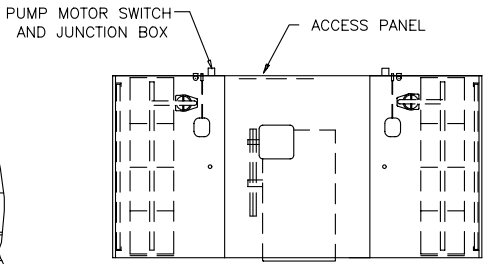


DIMENSIONS – BASIC UNIT

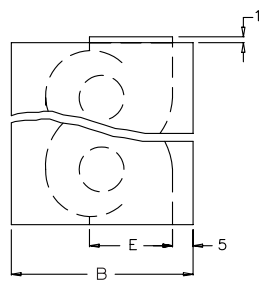
HECD-260, 340, 420, 600



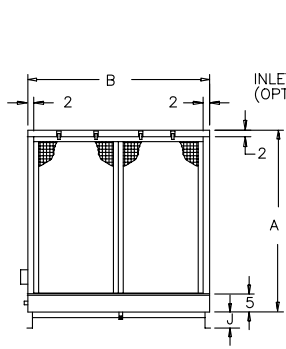
DETAIL "A"



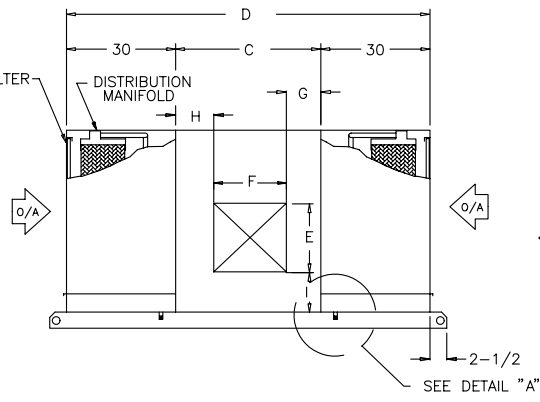
PLAN VIEW



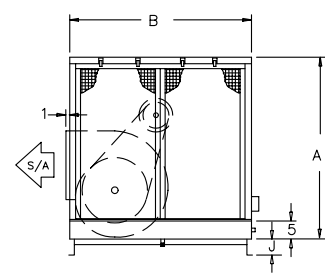
OPTIONAL FAN ARRANGEMENTS



REAR VIEW



SIDE VIEW



FRONT VIEW

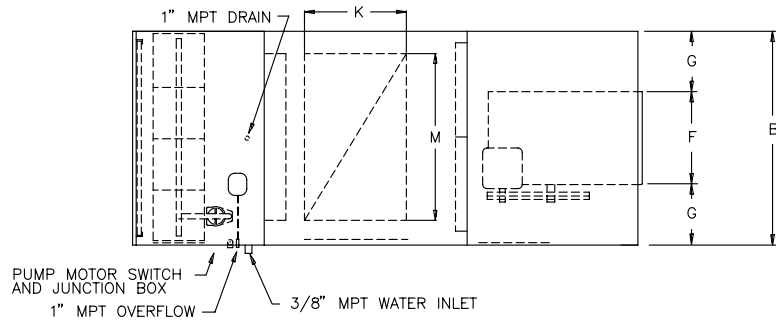
NOTE: Combination of some optional equipment may effect standard cabinet dimensions. Please contact factory for more information.

MODEL	BLOWER SIZE	EVAP. MEDIA	A	B	C*	D*	E	F	G	H	I	J	NET WT.	OPERATING WT.
HECD-260	27" FC	(10) 12 x 12 x 54-1/2	62	60	53	113	34-1/4	34-3/8	9-5/16	9-5/16	17-9/16	4	1553 lbs.	2135 lbs.
HECD-340	33" FC	(12) 12 x 12 x 67-1/2 (2) 3 x 12 x 67-1/2	75	75	96	156	42-15/16	39-7/8	20	36-1/8	17-1/16	4	2328 lbs.	3108 lbs.
HECD-420	36" FC	(12) 12 x 12 x 67-1/2 (2) 3 x 12 x 67-1/2	75	75	96	156	42-15/16	42-3/4	17	36-1/4	17-1/16	4	2453 lbs.	3233 lbs.
HECD-600	42" FC	(16) 12 x 12 x 78-1/2	86	96	129	189	44	60-1/4	30	38-3/4	36-1/2	6	3600 lbs.	4650 lbs.

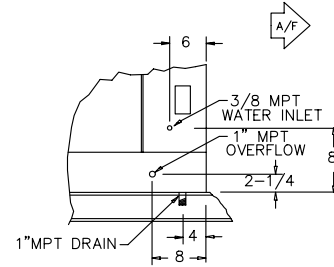
* Internally Isolated Model 260 - "C" = 75, "D" = 135

DIMENSIONS – BASIC UNIT WITH OA AND RA

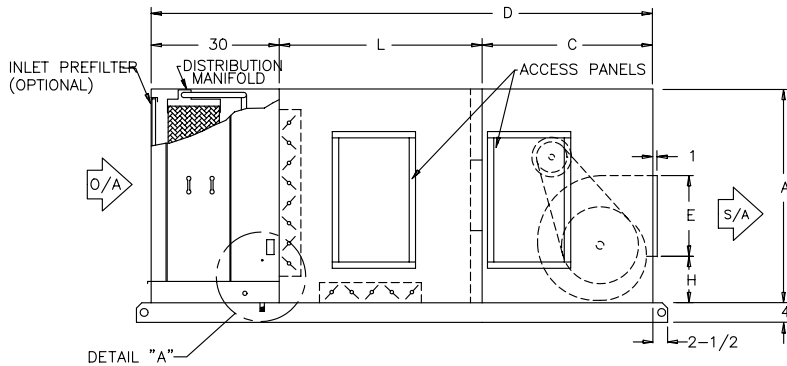
HECD-70, 100, 130, 210, 300



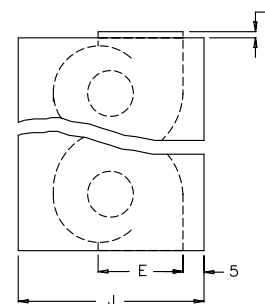
PLAN VIEW



DETAIL "A"



SIDE VIEW



OPTIONAL FAN ARRANGEMENTS

NOTE: When using internally isolated fan or optional fan arrangement use "J" dimension in place of "C" dimension.

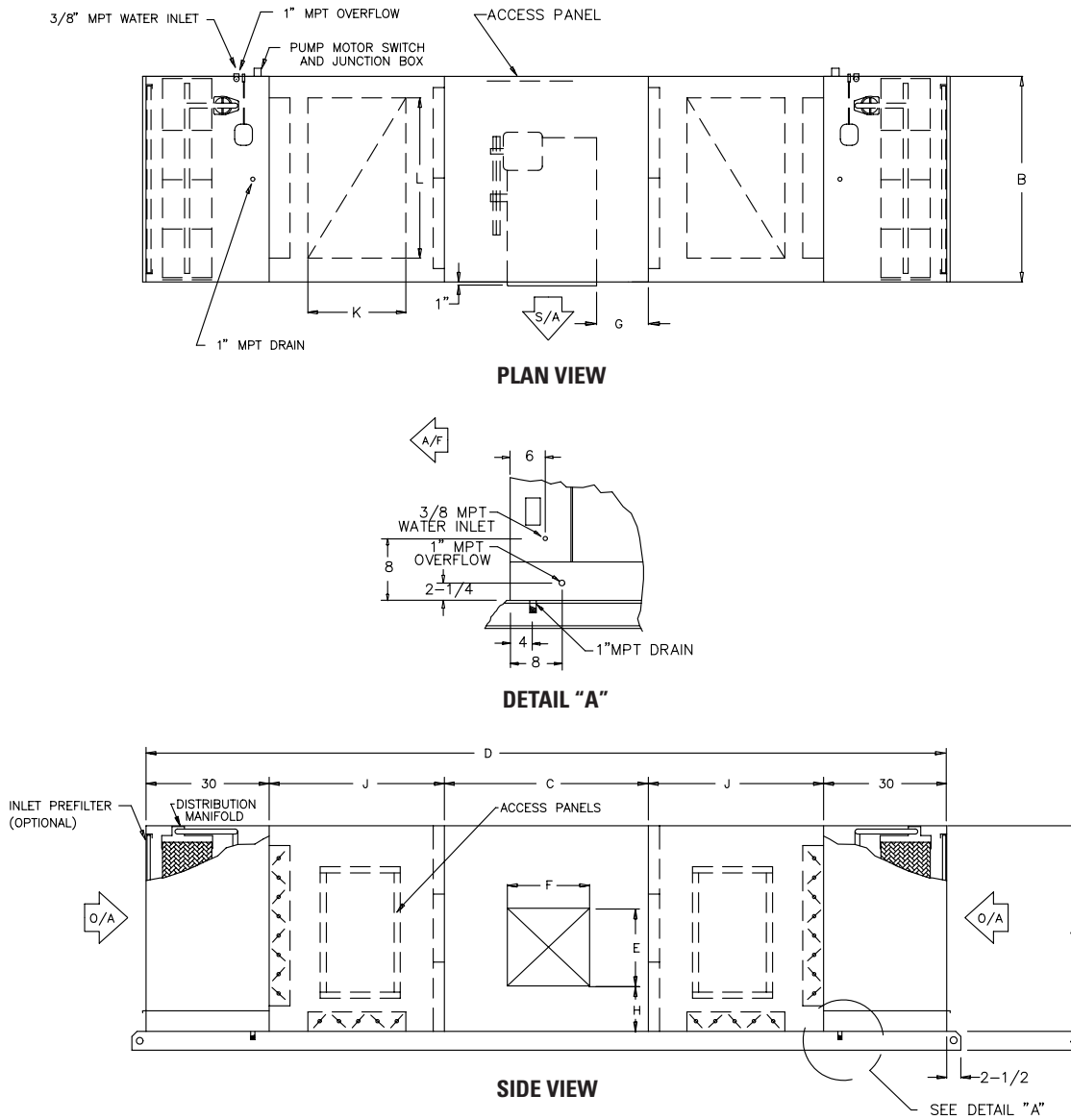
MODEL	A	B	C	D	E	F	G	H	J	K	L	M
HECD-70	50	50	32	110	18-7/8	21-7/8	14-1/16	12-7/8	39	24	48	32
HECD-100	56	56	35	113	24-3/4	24-7/8	15-9/16	13-1/2	44	24	48	40
HECD-130	62	60	42	120	31-1/4	31-3/8	14-5/16	15-7/8	53	28	48	44
HECD-210	75	75	50	128	34-1/4	34-3/8	20-5/16	17-9/16	60	30	48	65
HECD-300	86	96	75	153	42-15/16	39-3/4	20	17-1/16	75	32	48	75

MODEL	BLOWER SIZE	EVAP. MEDIA	FILTER QTY. & SIZE	NET WT.	OPERATING WT.
HECD-70	18" FC	(4) 12 x 12 x 42-1/2 (1) 2 x 12 x 42-1/2	(6) 16 x 25 x 2	995 lbs.	1253 lbs.
HECD-100	20" FC	(4) 12 x 12 x 48 (1) 8 x 12 x 48	(6) 16 x 25 x 2	1250 lbs.	1514 lbs.
HECD-130	25" FC	(5) 12 x 12 x 54-1/2	(9) 20 x 20 x 2	1488 lbs.	1780 lbs.
HECD-210	27" FC	(6) 12 x 12 x 67-1/2 (1) 3 x 12 x 67-1/2	(6) 16 x 25 x 2 (6) 20 x 25 x 2	2269 lbs.	2659 lbs.
HECD-300	33" FC	(8) 12 x 12 x 78-1/2	(16) 20 x 24 x 2	3275 lbs.	3785 lbs.



DIMENSIONS – BASIC UNIT WITH OA AND RA

HECD-260, 340, 420, 600

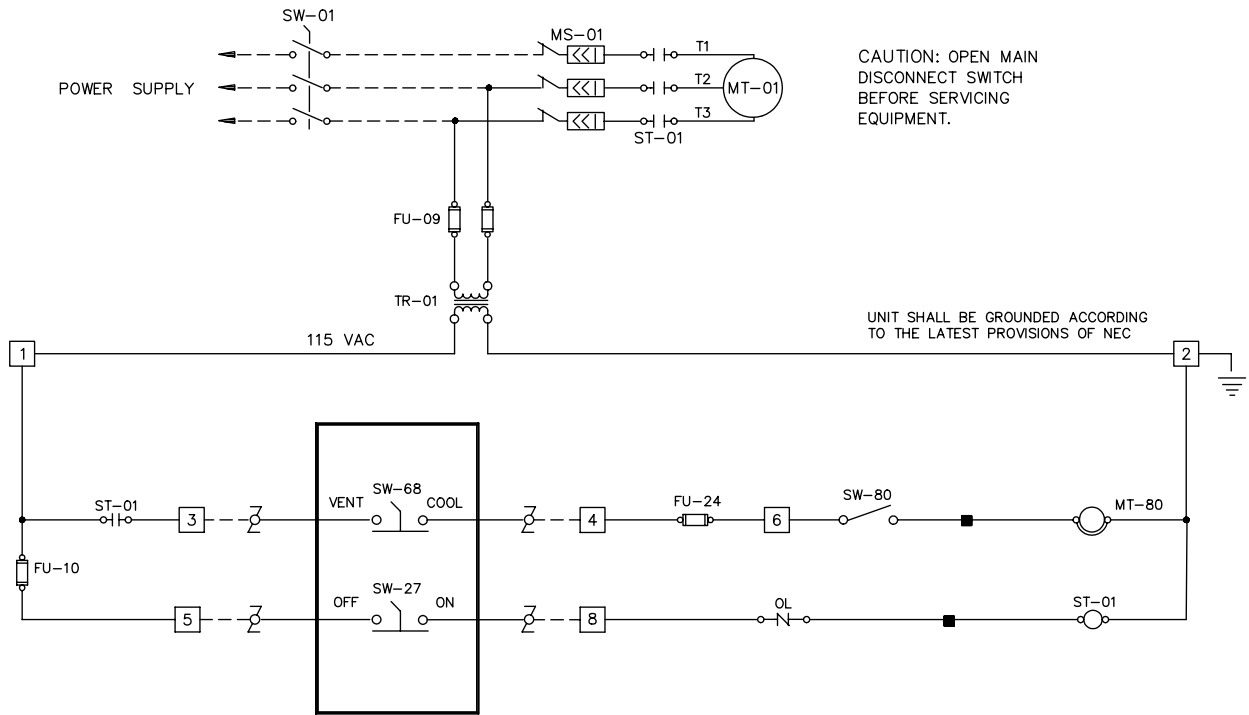


NOTE: When using internally isolated fan on 260 size only "C" dimension = 75" & "D" dimension = 219".

MODEL	A	B	C	D	E	F	G	H	J	K	L
HECD-260	62	60	53	209	34-1/4	34-3/8	9-5/16	17-9/16	48	28	44
HECD-340	75	75	96	252	42-15/16	39-7/8	20	17-1/16	48	30	65
HECD-420	75	75	96	252	42-15/16	42-3/4	17	17-1/16	48	30	65
HECD-600	86	96	129	285	44	60-1/4	30	36-1/2	48	32	75

MODEL	BLOWER SIZE	EVAP. MEDIA	FILTER QTY. & SIZE	NET WT.	OPERATING WT.
HECD-260	27" FC	(10) 12 x 12 x 54-1/2	(18) 20 x 20 x 2	2650 lbs.	3245 lbs.
HECD-340	33" FC	(12) 12 x 12 x 67-1/2 (2) 3 x 12 x 67-1/2	(12) 16 x 25 x 2 (12) 20 x 25 x 2	4040 lbs.	4840 lbs.
HECD-420	36" FC	(12) 12 x 12 x 67-1/2 (2) 3 x 12 x 67-1/2	(12) 16 x 25 x 2 (12) 20 x 25 x 2	4215 lbs.	5015 lbs.
HECD-600	42" FC	(16) 12 x 12 x 78-1/2	(32) 20 x 25 x 2	6100 lbs.	7175 lbs.

TYPICAL WIRING DIAGRAM










CAUTION: OPEN MAIN DISCONNECT SWITCH BEFORE SERVICING EQUIPMENT.

UNIT SHALL BE GROUNDED ACCORDING TO THE LATEST PROVISIONS OF NEC

NOTES

Note: Because of shipping restrictions field connections and/or wiring between components or sections may be required.

-  DENOTES COMPONENT TERMINAL NUMBER AND WIRING
-  DENOTES JUMPER WIRE
-  DENOTES WIRE CONNECTION
-  DENOTES CONTROL CABINET TERMINAL BLOCK AND WIRE NUMBER
-  DENOTES COMPONENTS SUPPLIED AND WIRED BY OTHERS
-  DENOTES WIRING BY OTHERS
-  DENOTES WIRE NUMBER LEADS

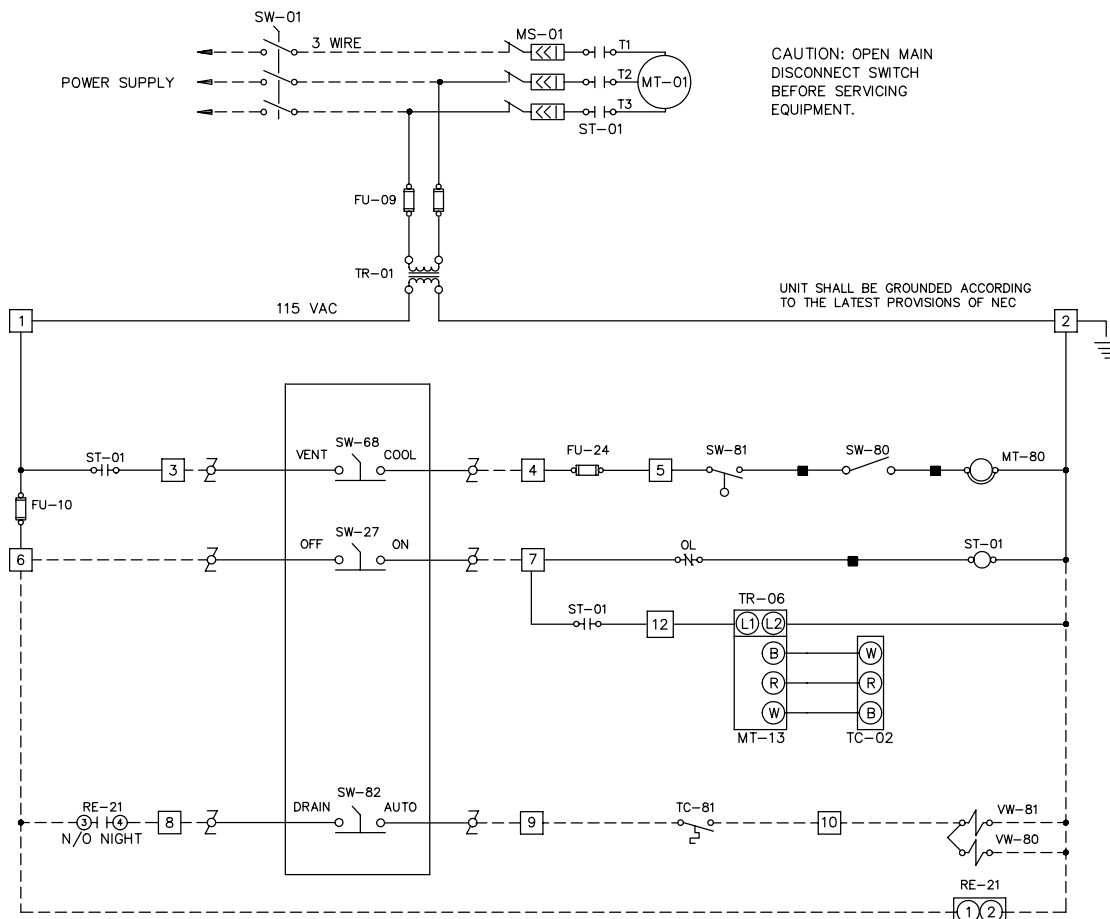
1 TO 99 TERMINAL BLOCKS - 115 VOLT
101 TO 199 TERMINAL BLOCKS - 24 VOLT

COMPONENT IDENTIFICATION

- FU-09 Transformer Fuse
- FU-10 Control Circuit Fuse
- FU-24 Evaporative Cooling Motor Fuse
- MS-01 Manual Motor Protector
- MT-01 Main Supply Fan Motor
- MT-80 Water Pump
- ST-01 Main Supply Fan Motor Starter
- SW-01 Main Disconnect Switch
- SW-27 Fan On-Off Switch
- SW-68 Cool-Vent Switch
- SW-80 Pump Switch
- TR-01 Control Circuit Transformer



TYPICAL WIRING DIAGRAM



NOTES

Note: Because of shipping restrictions field connections and/or wiring between components or sections may be required.

- DENOTES COMPONENT TERMINAL NUMBER AND WIRING
- DENOTES JUMPER WIRE
- DENOTES WIRE CONNECTION
- DENOTES CONTROL CABINET TERMINAL BLOCK AND WIRE NUMBER
- DENOTES COMPONENTS SUPPLIED AND WIRED BY OTHERS
- DENOTES WIRING BY OTHERS
- DENOTES WIRE NUMBER LEADS

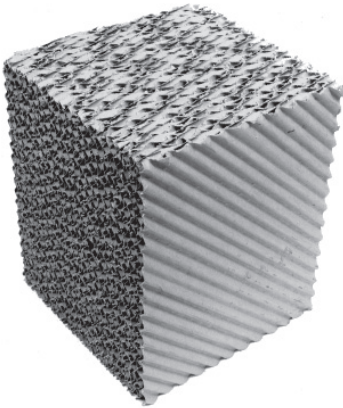
1 TO 99 TERMINAL BLOCKS - 115 VOLT
101 TO 199 TERMINAL BLOCKS - 24 VOLT

COMPONENT IDENTIFICATION

- FU-09 Transformer Fuse
- FU-10 Control Circuit Fuse
- FU-24 Evaporative Cooling Motor Fuse
- MS-01 Manual Motor Protector
- MT-01 Main Supply Fan Motor
- MT-13 Damper Motor
- MT-80 Water Pump
- RE-21 7 Day Time Clock
- TC-02 Mixed Air Controller
- ST-01 Main Supply Fan Motor Starter
- SW-01 Main Disconnect Switch
- SW-27 Fan On-Off Switch
- SW-68 Cool-Vent Switch
- SW-80 Pump Switch
- SW-81 Water Level Cut-Off Switch
- SW-82 Reservoir Drain Switch
- TC-81 Freeze Protection Thermostat
- TR-01 Control Circuit Transformer
- TR-06 Damper Motor Transformer
- VW-80 Water Drain Valve (N.O.)
- VW-81 3-Way Water Supply Valve (N.C.)

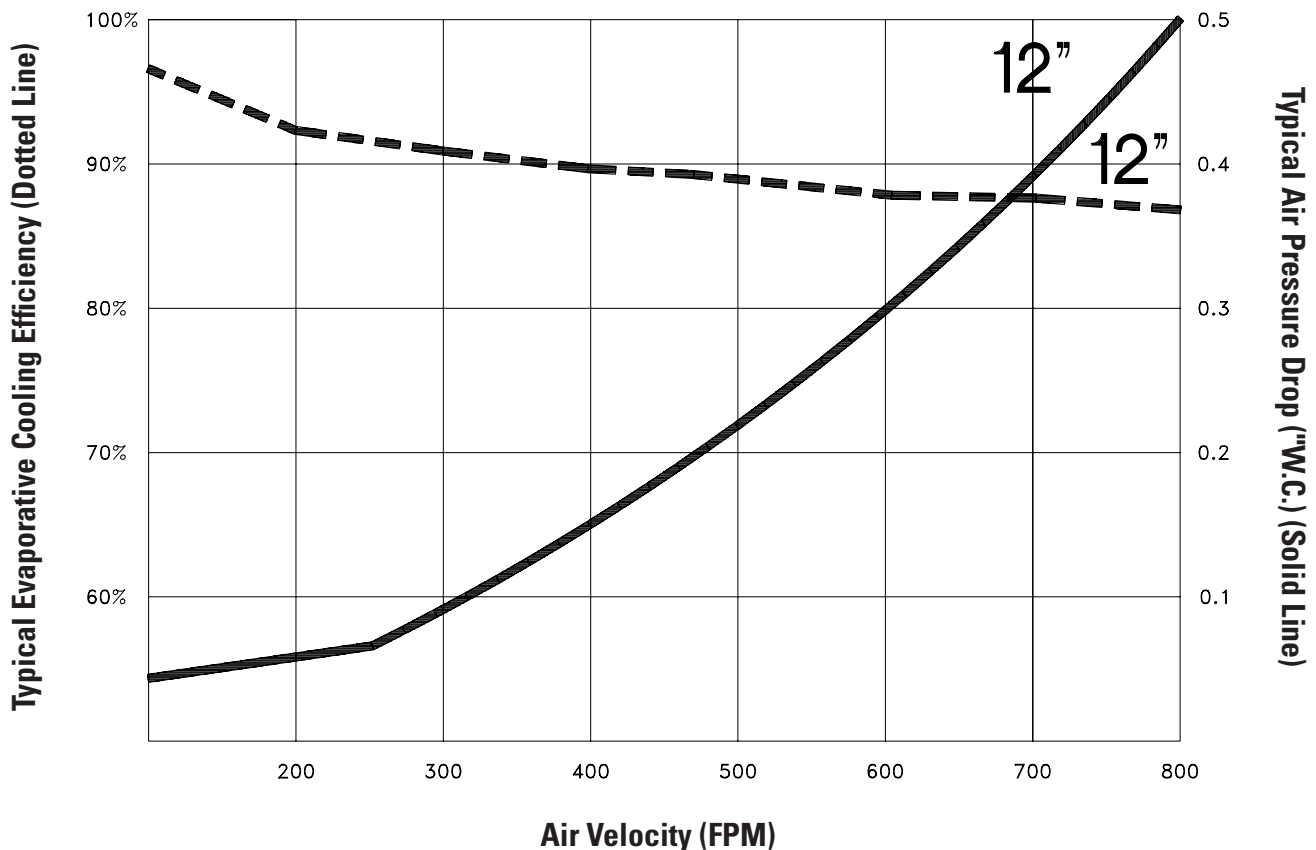
ALTON TURBO DEK

... is a broad name used to describe our Turbodek and Fiberdek evaporative pads. Turbodek is made from a special cellulose paper, impregnated with insoluble anti-rot salts and rigidifying saturants. Fiberdek is made from large glass fibers bound together by inorganic, noncrystalline fillers and is UL approved with a UL 900 Class 2 rating up to 12" depth.

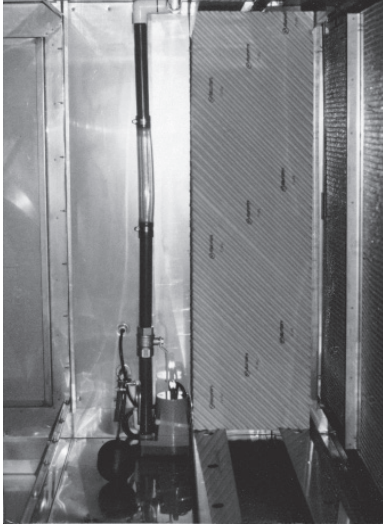


This unique crossfluted design of the pads induces highly turbulent mixing of air and water for optimum heat and moisture transfer. The internal geometry of the pad ... a "built-in angle" ... continually directs the water to the air entry side. This results in:

- 1. Much higher cooling efficiency** – up to 90% in the 400-500 FPM velocity range in a typical 12" depth of Turbodek ... slightly higher in Fiberdek.
- 2. Much higher face velocity** – because of the "built-in angle", the maximum air velocity without water carryover is approximately 750 FPM for Turbodek. This compares to approximately 200 FPM for conventional pads!
- 3. Self-cleaning design** – Turbodek pads are unaffected by atmospheric dust or sand. When the recirculating water is turned on, especially without air flow, the water flushes the surface areas, with the greatest concentration at the entering side where debris normally accumulates. This also serves as protection against mineral buildup.



FORMULAS FOR ESTIMATING



Standard washer section on an HECD.

DEFINITIONS

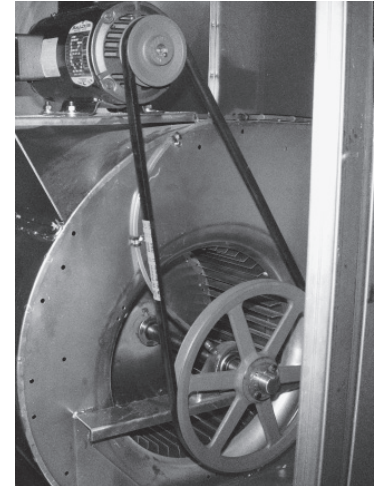
DRY BULB TEMPERATURE:

Atmospheric temperature as measured by a standard thermometer.

WET BULB TEMPERATURE:

Temperature recorded by thermometer with wet sock over bulb in moving air stream.

A measuring instrument which has a thermometer in this arrangement is a sling psychrometer. The wet bulb temperature is the lowest temperature to which air can be cooled by evaporation.



Blower compartment access panel removed showing accessibility to blower, motor and V-belt drive.

ABBREVIATIONS

A = Filter area, sq. ft.

Em = Blower motor voltage

Ep = Pump voltage

FF = Phase factor (1 for 1Ø, 1.73 for 3Ø)

FPM = Feet per minute

GPH = Gallons per hour

Im = Blower motor amperage

Ip = Pump amperage

ODB = Outdoor dry bulb temp.

OWB = Outdoor wet bulb temp.

PF = Power factor

SE = Saturating effectiveness of Turbocell

TCFM = CFM rating of Turbocell

FORMULAS

Desired	Formula	Example
Leaving Air Temp. from Turbocell	$ODB - SE (ODB - OWB)$	$95 - [.87 \times (95 - 66)] = 70^{\circ}F^{(1)}$
Exhaust fan rating ⁽²⁾ (positive room pressure)	$0.9 (TCFM)$	$0.9 (6000) = 5400 \text{ CFM}$
Exhaust fan rating (negative room pressure)	$1.1 (TCFM)$	$1.1 (6000) = 6600 \text{ CFM}$
Relief Opening ⁽³⁾	$CFM/250$	$6000/250 = 24 \text{ sq. ft.}$
Water Evaporation	$(CFM/1000) \times (ODB - OWB)/10$	$(6000/1000) \times (95 - 65)/10 = 18 \text{ GPH}$
Daily Operating Cost	$\frac{(Ip \times Ep) + (Im \times Em \times FF)}{1000} \times PF \times (HRS./DAY) \times (\$/KW-HR)$	$\frac{(5 \times 115) + (2.5 \times 460 \times 1.73)}{1000} \times 0.7 \times 8 \times \$0.07 = \$1.01$

NOTES

- (1) The 87% efficiency used in the example is the Turbocell minimum efficiency as determined by factory tests. With proper maintenance, the Turbocell high efficiencies remain constant throughout the life of the unit.
- (2) Air removal is an important factor in maintaining comfort in an evaporative cooling system. Air removal will prevent an uncomfortable build-up of humidity as well as keep the air in circulation. An exhaust fan is highly recommended. In areas such as restaurant kitchens or hotel laundry rooms, where odors should remain in the room when doors are opened, the exhaust fan should be sized approximately 110% of the Turbocell rating. This will create a negative room pressure, thus causing the air movement to be into the room rather than out when the doors are opened. In other cases, such as a coin operated laundry, where it is desirable to greet customers with a cool breeze upon opening the door, the exhaust fan should be sized approximately 90% of the Turbocell rating. This will create a positive room pressure, which will cause the air movement to be out of the room when doors are opened. This will also help prevent outside air from entering.
- (3) When an exhaust fan is not used, the formula will determine the free area that must be provided from open windows, doors, etc.

ENGINEERING SPECIFICATIONS

1.0 The evaporative cooling unit shall be weatherproof and self-contained. It consists of component parts as listed in the following paragraphs. Units shall be Turbocell as sold by Alton located in Dallas, Texas or approved equal.

2.0 TURBOCELL EVAPORATIVE SECTION

2.1 The Turbocell evaporative cooling section shall contain the Turbocell water system, 12" deep cell cooling media, float valve, overflow, and drain connections. Evaporative module to be built separately from the blower section, and no water is to flow into the blower compartment at any time. Evaporative and blower sections are to be firmly attached. Cabinet shall be fabricated from 304 stainless steel. The cooling media shall be easily removable through a full size access panel located on the side of the casing. The side access panel shall also permit easy access to the pump, float, water regulating and bleed-off valves.

2.2 Turbodek cooling media shall be 12" deep fluted cellulose, high efficiency evaporative media, impregnated with insoluble anti-rot chemicals. Maximum air velocity without water carryover is approximately 700 FPM.

2.3 Turbocell water system shall produce a fine spray action which uniformly saturates the 12" deep Turbodek media. Turbocell system to include a submersible pump with U.L. listed, hermetically sealed, dielectric oil-filled motor and Buna-N seal. Horsepower rating of the pump shall not be less than 1/6 HP. Pump to be centrifugal type with suction strainer to prevent the intake of solid matter. Pump assembly shall discharge into a distribution manifold fabricated from heavy-duty PVC pipe with metered orifices. A water regulating valve shall be installed in the distribution manifold and will permit field adjustment of water flow over the media. A manual pet-cock metering valve shall be installed in the distribution manifold allowing continuous bleed-off, thus minimizing the build-up of minerals and salts. The Turbocell water system assembly shall be available for 115 or 230 volt single phase operation.

2.4 An adjustable brass float valve shall maintain a constant water level in the Turbocell tank.

2.5 The Turbocell evaporative cooling unit shall have a minimum saturation effectiveness of 88 percent at 700 FPM. Saturating effectiveness is defined as:

$$SE = \frac{T_1 - T_2}{T_1 - T_3} \times 100$$

Where: T1 = Outside air, dry bulb temperature, °F.

T2 = Leaving air, dry bulb temperature, °F.

T3 = Outside air, wet bulb temperature, °F.

3.0 BLOWER SECTION

3.1 The blower section shall include a fan of the centrifugal type and be complete with motor and drive equipment. The fan shall be tested in accordance with standards set forth in Standard 210 of AMCA (Air Movement and Control Association). All air ratings are based on delivery against the external static pressure specified with Turbocell system operating. Fan wheels shall have two (2) bearings, one mounted on each side of the wheel. Bearings shall be self-aligning, pillow block, ball bearing type with screw-in grease zerks fittings for relubrication. Fan shaft shall be ground and polished with key seats and keys for mounting wheel and fan pulley. Fan shall be connected to motor by means of an approved V-belt drive with grooved pulleys. Motor pulleys shall be the adjustable pitch diameter type through 7 1/2 HP. The motor shall be designed to suit the characteristics of the available electric service. Motor shall be mounted on a base with adjusting slots which will permit easy belt adjustment.

3.2 Blower wheels shall be the centrifugal center hub type with multiple forward curved blades and double intake.

3.3 Blower scroll housing to be welded construction. When the fan motor is located above the blower housing, a frame shall support the adjustable motor base. In no case will the motor frame rest directly on the blower housing.

3.4 Standard unit construction to have top horizontal discharge from front of cabinet, with bottom horizontal, top vertical, or bottom vertical discharge available upon request.

3.5 Blower cabinet to be fabricated from galvanized steel. A removable panel permitting access to blower motor and drive shall be provided. Access panel is to be a minimum of 16" wide by 29" high and shall include two stainless steel retainers, handle and weatherproof gasket. Blower cabinet to be rigidly constructed, corrosion-resistant, and have a primer/enamel exterior finish.

MEDIA SPECIFICATIONS

CONDITION	TURBODEK	FIBERDEK
maximum water temp.	130°F	165°F
maximum air temp.	300°F	300°F
ph range	6-9	5-10
dry weight	2.4 lb/ft ³	4.5 lb/ft ³
wet weight	5.6 lb/ft ³	9.0 lb/ft ³
operating weight	8.0 lb/ft ³	11.4 lb/ft ³
water flow rate (gpm/sq. ft.)	1.5	1.5

Sold By:



4830 Transport Drive, Dallas, TX 75247

Phone: 214-638-6010

FAX: 214-638-2395



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