

TURBOSPRAY

EVAPORATIVE COOLING

Catalog HEDM-3



FILTON®

***Q**uality Engineered Products Since 1946*

TURBOSPRAY

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, and with capacities from 3,000 to 52,000 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 climatic conditions and operational requirements.

Comfort Anywhere.

On a humid day in Chicago the Turbospray can reduce 95°F air to a relatively cool 78°-80°F. In drier Phoenix, 102°F outside air can be brought down 20°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 Turbospray blower continues to operate, pumping in plenty of fresh outside air.

WHY EVAPORATIVE COOLING IS COMFORTABLE

Lowers Temperature.

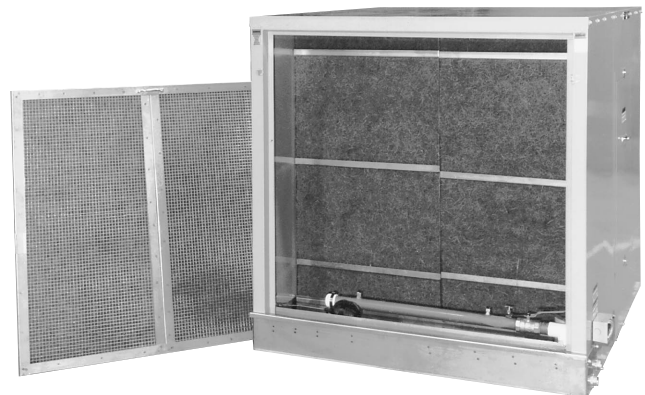
The Turbospray pumps in cool air lowering room temperature.

Lowers the Temperature You Feel.

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

HOW THE TURBOSPRAY 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 cooled. This demonstrates the basic principle of evaporative cooling. The Turbospray works by drawing outside air through a pre-cooling filter before it meets a virtual wall of water created by the water spray system. The air is cleaned and cooled using the natural way of evaporation. The air then passes through the primary cooling and eliminator filters where dust, dirt and entrained moisture are removed before the air flows into the work area providing a clean, cool environment.



Pre-cooling filter removed showing Turbospray Water System and primary cooling filter.

Carries Away Radiated Heat.

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

Fresh Air.

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

Cleans Air.

Turbospray filters remove dust, dirt, pollen, and foreign matter, creating a more refreshing environment.



TURBOSPRAY FEATURES

A Triple-Filter Action.

Maxaire filters are durable, permanently fire retardant and carry full U.L. approval Class II. They are latex coated, treated with an active bacteriostat, and will not sag or wear thin. All filters are housed in 304 stainless steel filter frames and are easily removable. Maxaire filters soften when wet and do not decay or rot out as aspen wood filters do. When the unit is off, the filters dry instead of remaining wet and promoting rust.

B Eliminator Filter.

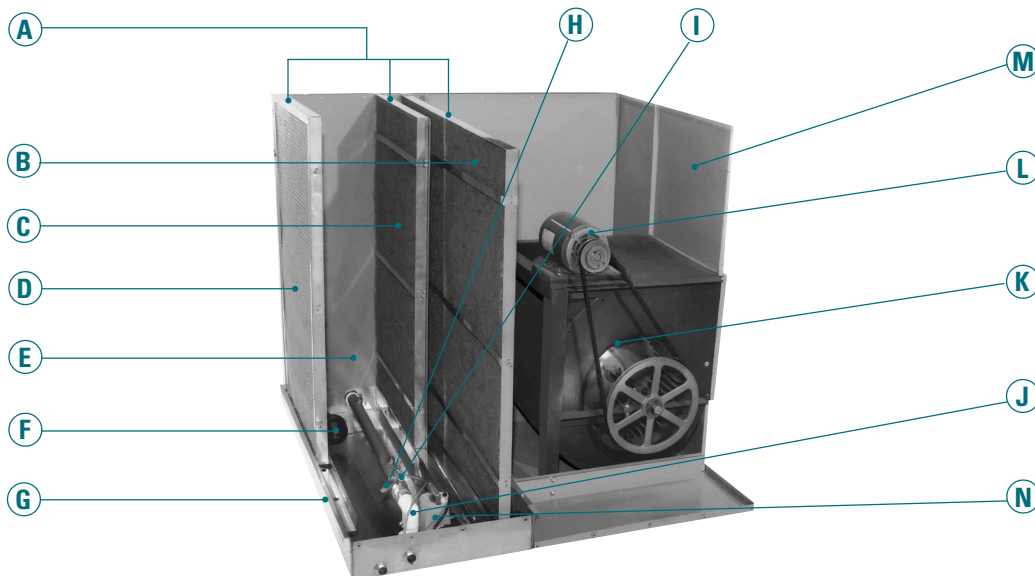
Traps entrained moisture. Water is evaporated or returned to sump. Keeps water from reaching blower compartment.

C Primary Cooling Filter.

Most of the cooling takes place here.

D Pre-Cooling Filter.

Keeps bugs, dust, dirt and other airborne particles out of water compartment. Reduces odor producing algae by keeping out sunlight. Aids evaporative action



E Washer Cabinet.

Galvanized steel, rigid construction, corrosion-resistant, enamel finish.

F Float Operated Valve.

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

G Water Pan.

304 stainless steel, field replaceable.

H Water Spray Regulator Valve.

Brass construction, water spray volume can be field set.

I Bleed-Off Valve.

Reduces mineral buildup, helps prevent nozzle clogging.

J Water Spray Manifold.

Heavy-duty PVC Brass 95° spray nozzles.

K Blower.

Centrifugal, forward curved, DIDW, tested according to AMCA Standard 210.

L Motor.

U.L. listed single or three-phase, multi-voltage. V-belt drive, slotted base, adjustable type sheave to 10 HP.

M Blower Cabinet.

Galvanized steel, rigid construction, corrosion-resistant, enamel finish.

N Pump.

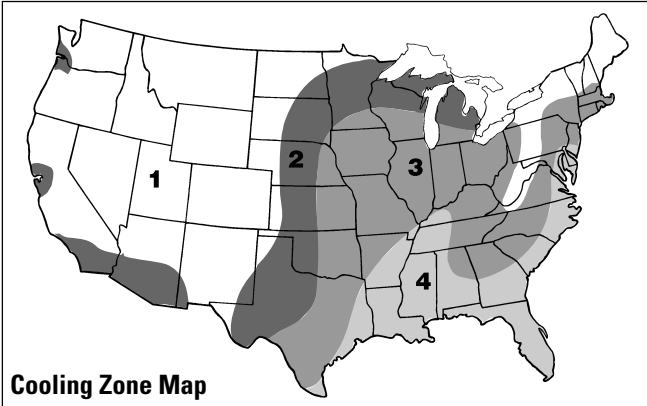
Submersible, centrifugal, U.L. listed, dielectric oil-filled motor, lubricated for life. Lightweight and compact with strainer to prevent clogging. Available for 115 or 230V, single-phase operation.

EQUIPMENT OPTIONS

- The Turbospray washer compartment may be purchased separately as our WDM 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.
- Motorized discharge damper for volume control.

- Stainless washer compartment.
- Stainless blower compartment.
- Remote control panel.
- 2 speed motors for volume control.
- OA/RA mixing plenum.
- Fill and drain kit.
- Spring isolated blower assembly.
- Special motors: E-Plus, TEFC.
- One foot cabinet section for coil mounting.

SELECTING A TURBOSPRAY



The Turbospray 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 Turbospray 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 Turbospray should be installed so it discharges into the lower part of the room while an exhaust fan draws air from the upper level.

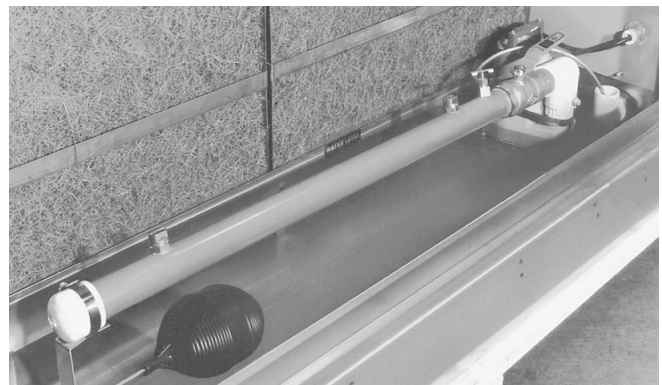
- Step 6.** Reduce the building size by the room taken up with machinery, inventory, etc. (Building size in ft³) – (Machinery, etc. in ft³) = (Space to cool in ft³).
- Step 7.** Divide the (Space to cool in ft³) from step 6 by the (Number of minutes required per air change) from step 4. This gives the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

EXAMPLE:

- Step 1.** Small plastics factory located in Houston, Texas. See "Cooling Zone Map" to get Zone 4.
- Step 2.** Factory has mold machines 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 HEDM-2880.

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 400-1,000 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.



Turbospray Water System showing regulator valve, bleed-off valve and spray manifold.



TURBOSPRAY SERIES AIR DELIVERY TABLE

MODEL NO.	PUMP HP	CFM	BLOWER HORSEPOWER AND SPEED REQUIRED AT EXTERNAL S.P. ("W.C.)													
			1/8"		1/4"		1/2"		3/4"		1"		1-1/4"		1-1/2"	
			HP	RPM	HP	RPM	HP	RPM	HP	RPM	HP	RPM	HP	RPM	HP	RPM
HEDM-550 (WDM-550) FFA-14.1 sq. ft. 18" FC DWDI	1/6	3000	0.5	343	0.5	392	0.75	504	CF	CF	CF	CF	CF	CF	CF	CF
		4000	0.75	374	0.75	422	1.5	516	1.5	586	2	627	CF	CF	CF	CF
		5000	1.5	408	1.5	458	2	534	2	601	3	663	3	720	3	774
		6000	2	482	3	514	3	570	3	642	3	695	5	746	5	806
		7000	3	551	3	581	5	640	5	696	5	748	5	797	5	844
HEDM-750 (WDM-750) FFA-17.7 sq. ft. 20" FC DWDI	1/6	6000	1.5	354	1.5	390	2	455	2	515	CF	CF	CF	CF	CF	CF
		7000	2	387	2	417	3	473	3	534	3	591	3	643	CF	CF
		8000	3	423	3	452	3	506	5	558	5	602	5	651	5	695
		9000	3	464	5	487	5	536	5	586	5	628	7.5	672	7.5	717
		10,000	5	504	5	528	5	573	7.5	617	7.5	658	7.5	704	7.5	748
HEDM-1250 (WDM-1250) FFA-21.8 sq. ft. 25" FC DWDI	1/6	9000	2	288	2	318	3	371	CF	CF	CF	CF	CF	CF	CF	CF
		10,000	3	309	3	331	3	385	CF	CF	CF	CF	CF	CF	CF	CF
		11,000	3	333	3	352	5	404	5	447	CF	CF	CF	CF	CF	CF
		12,000	5	354	5	380	5	419	7.5	463	CF	CF	CF	CF	CF	CF
HEDM-1680 (WDM-1550) FFA-34.0 sq. ft. 27" FC DWDI	1/6	14,000	3	282	5	309	5	346	5	386	5	426	CF	CF	CF	CF
		15,000	5	296	5	321	5	356	7.5	395	7.5	437	CF	CF	CF	CF
		16,000	5	312	5	337	7.5	378	7.5	409	7.5	448	CF	CF	CF	CF
		17,000	5	328	7.5	344	7.5	386	7.5	419	10	453	10	486	CF	CF
		18,000	7.5	344	7.5	360	7.5	401	10	433	10	464	10	490	CF	CF
		19,000	7.5	359	7.5	380	10	417	10	447	10	473	15	498	15	525
HEDM-2480 (2) (WDM-1250) FFA-43.6 sq. ft. 27" FC DWDI	1/6 (Qty. 2)	18,000	5	319	7.5	336	7.5	371	7.5	406	10	436	10	471	10	484
		19,000	7.5	331	7.5	350	7.5	382	10	420	10	447	10	478	15	491
		20,000	7.5	345	7.5	359	10	398	10	434	10	457	15	482	15	500
		21,000	7.5	362	10	376	10	406	10	441	15	472	15	493	15	507
		22,000	10	377	10	391	10	418	15	453	15	481	15	506	15	516
		23,000	10	391	10	405	15	432	15	459	15	488	15	513	15	526
		24,000	15	404	15	414	15	445	15	468	15	498	20	526	20	536
HEDM-2050 (WDM-2050) FFA-46.1 sq. ft. 33" FC DWDI	1/6	21,000	5	252	7.5	273	7.5	303	7.5	337	10	371	CF	CF	CF	CF
		22,000	7.5	267	7.5	278	7.5	315	10	344	10	377	CF	CF	CF	CF
		23,000	7.5	273	7.5	288	10	319	10	351	15	385	CF	CF	CF	CF
		24,000	7.5	279	10	294	10	328	10	354	15	391	15	412	CF	CF
		25,000	10	289	10	303	10	334	15	359	15	389	15	419	CF	CF
		26,000	10	301	10	314	15	341	15	367	15	392	15	422	20	442
HEDM-3680 (2) (WDM-1550) FFA-68 sq. ft. 33" FC DWDI	1/6 (Qty. 2)	24,000	7.5	245	7.5	261	10	293	10	311	15	351	15	378	15	404
		26,000	10	259	10	275	10	303	15	333	15	361	15	385	15	410
		28,000	10	276	10	291	15	320	15	346	15	371	15	396	20	419
		30,000	15	280	15	307	15	334	15	360	20	384	20	407	20	429
		32,000	15	309	15	323	20	349	20	373	20	396	20	418	20	439
		33,000	15	318	15	331	20	357	20	381	20	403	25	424	25	445
		34,000	20	326	20	339	20	364	20	387	25	409	25	430	25	451
		35,000	20	335	20	348	20	372	25	395	25	416	25	437	25	457
		36,000	20	343	20	355	25	379	25	401	25	423	30	443	30	462
HEDM-4080 (2) (WDM-1550) FFA-68 sq. ft. 36" FC DWDI	1/6 (Qty. 2)	26,000	7.5	237	7.5	253	10	285	10	314	15	338	15	367	15	374
		28,000	10	251	10	267	10	293	15	323	15	347	15	371	15	382
		30,000	10	269	10	278	15	308	15	335	15	353	20	379	20	390
		32,000	15	283	15	293	15	318	15	343	20	362	20	388	20	400
		34,000	15	296	15	307	15	332	20	353	20	372	20	396	25	410
		36,000	15	312	20	322	20	344	20	368	25	389	25	409	25	421
		37,000	20	318	20	330	20	351	25	371	25	392	25	413	30	427
		38,000	20	327	20	337	20	358	25	378	25	397	30	418	30	433
HEDM-5080 (2) (WDM-2050) FFA-92.2 sq. ft. 42" FC DWDI	1/6 (Qty. 2)	36,000	10	208	10	220	15	245	15	269	15	292	20	315	20	337
		38,000	10	218	15	230	15	253	15	276	20	298	20	320	25	341
		40,000	15	229	15	240	15	262	15	284	20	306	20	326	25	346
		42,000	15	238	15	249	15	270	20	292	20	312	25	332	25	351
		44,000	15	248	15	258	20	279	20	299	25	319	25	338	30	357
		46,000	20	258	20	268	20	288	25	307	25	326	30	345	30	363
		48,000	20	269	20	279	25	297	25	316	30	335	30	353	30	370
		50,000	20	280	25	289	25	307	30	325	30	343	30	360	40	377
		52,000	25	291	25	299	30	317	30	334	40	351	40	368	40	385

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

FFA = Filter Face Area

CF = Consult Factory

- Maxaire prefilter 0.30" WG
- Discharge damper 0.13" WG
- OA/RA mixing plenum 0.15" WG

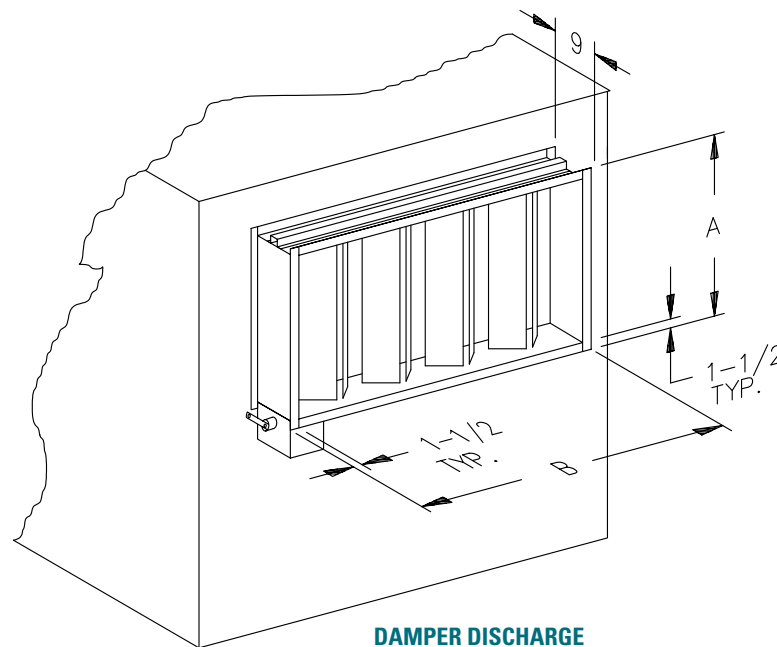
ALTON MOTORIZED VOLUME CONTROL DAMPERS

The Alton HEDM Turbospray 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 Turbospray 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.

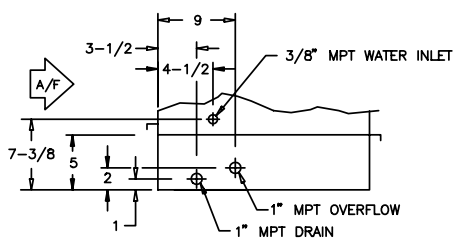
Field results have proven that the motorized discharge damper option can be a valuable addition to your Alton HEDM Turbospray unit.



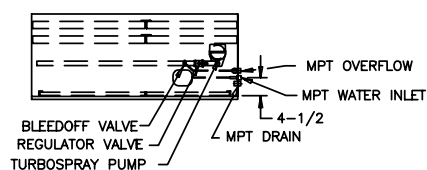
DIMENSIONS	MODEL								
	HEDM-550	HEDM-750	HEDM-1250	HEDM-1680	HEDM-2480	HEDM-2050	HEDM-3680	HEDM-4080	HEDM-5080
A	22-7/8	28-3/4	38-1/4	38-1/4	38-1/4	47	47	47	48
B	26-15/16	29-3/4	39-1/4	39-1/4	39-1/4	43-3/8	43-3/8	53	65-1/8

DIMENSIONS

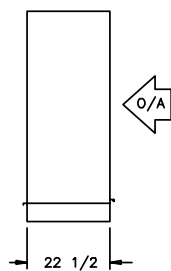
WDM-550, 750, 1250, 1550, 2050



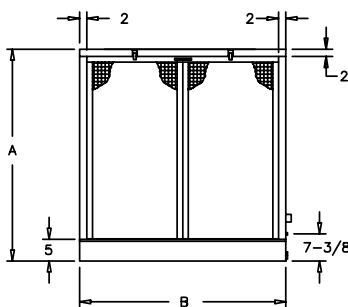
DETAIL "A"



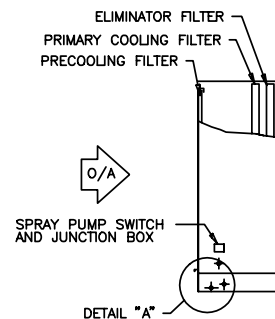
PLAN VIEW



LEFT SIDE VIEW



REAR VIEW



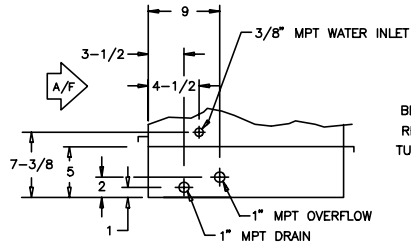
RIGHT SIDE VIEW

MODEL	TURBOSPRAY PUMP	EVAP. MEDIA	A	B	NET WT.	OPERATING WT.
WDM-550	1/6 H.P.	(6) 25 x 46 x 1	50	50	162 lbs.	314 lbs.
WDM-750	1/6 H.P.	(6) 28 x 51 x 1	56	56	176 lbs.	346 lbs.
WDM-1250	1/6 H.P.	(6) 30 x 58 x 1	62	60	189 lbs.	372 lbs.
WDM-1550	1/6 H.P.	(6) 38 x 70 x 1	75	75	346 lbs.	574 lbs.
WDM-2050	1/6 H.P.	(6) 43 x 83 x 1	88	88	489 lbs.	757 lbs.

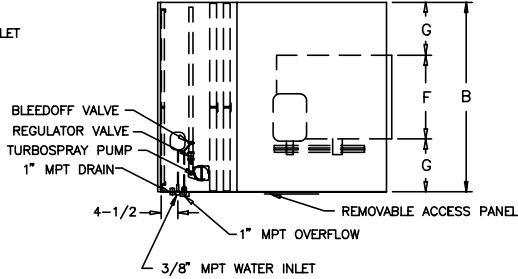
TURBOSPRAY

DIMENSIONS – BASIC UNIT

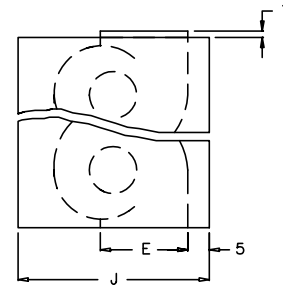
HEDM-550, 750, 1250, 1680, 2050



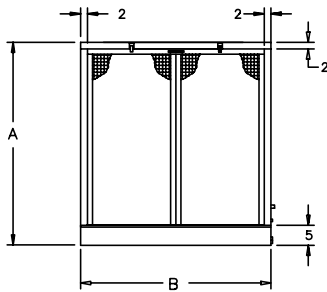
DETAIL "A"



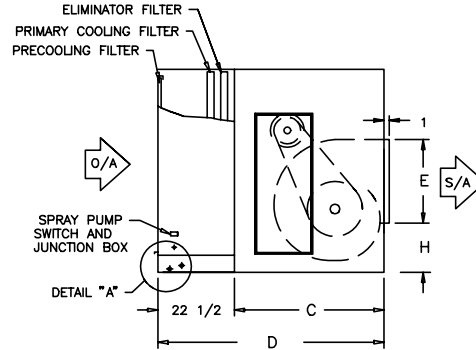
PLAN VIEW



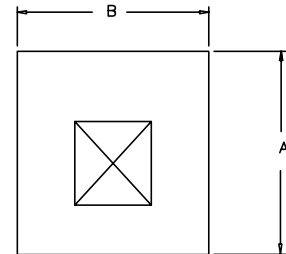
OPTIONAL FAN ARRANGEMENT



REAR VIEW



SIDE VIEW



FRONT VIEW

NOTE: When using internally isolated fan or optional fan arrangements "D" dimension will = "J" plus 22-1/2".

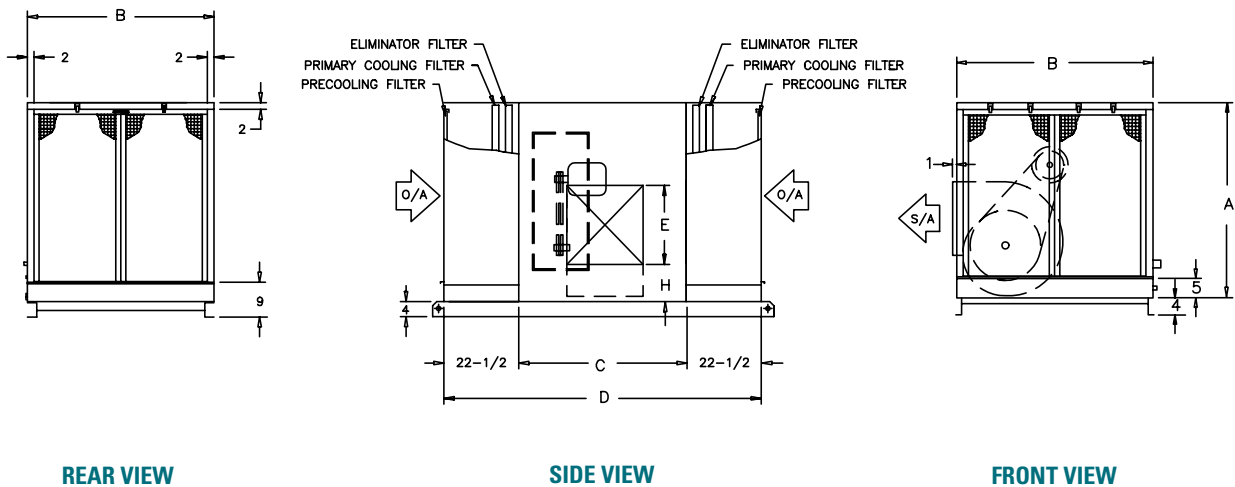
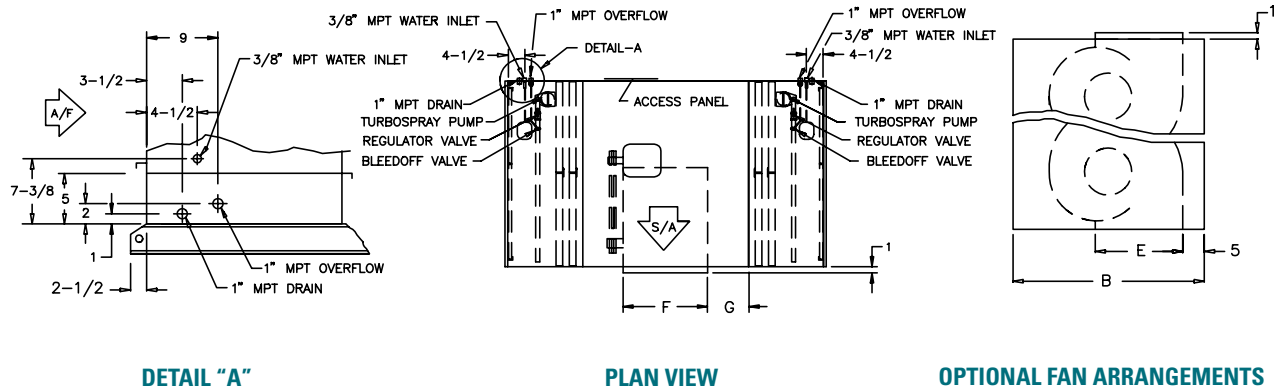
MODEL	BLOWER SIZE	TURBOSPRAY PUMP	EVAP. MEDIA	A	B	C	D	E	F	G	H	J	NET WT.	OPERATING WT.
HEDM-550	18" FC	1/6 H.P.	(6) 25 x 46 x 1	50	50	32	54-1/2	18-7/8	21-7/8	14-1/16	12-7/8	39	637 lbs.	789 lbs.
HEDM-750	20" FC	1/6 H.P.	(6) 28 x 51 x 1	56	56	35	57-1/2	24-3/4	24-7/8	15-9/16	13-1/2	44	776 lbs.	946 lbs.
HEDM-1250	25" FC	1/6 H.P.	(6) 30 x 58 x 1	62	60	42	64-1/2	31-1/4	31-3/8	14-5/16	15-7/8	53	914 lbs.	1097 lbs.
HEDM-1680	27" FC	1/6 H.P.	(6) 38 x 70 x 1	75	75	50	72-1/2	34-1/4	34-3/8	20-5/16	17-9/16	60	1491 lbs.	1849 lbs.
HEDM-2050	33" FC	1/6 H.P.	(6) 43 x 83 x 1	86	96	75	97-1/2	42-15/16	39-3/4	20	17-1/16	75	2015 lbs.	2535 lbs.

TURBOSPRAY



DIMENSIONS – BASIC UNIT

HEDM-2480, 3680, 4080, 5080

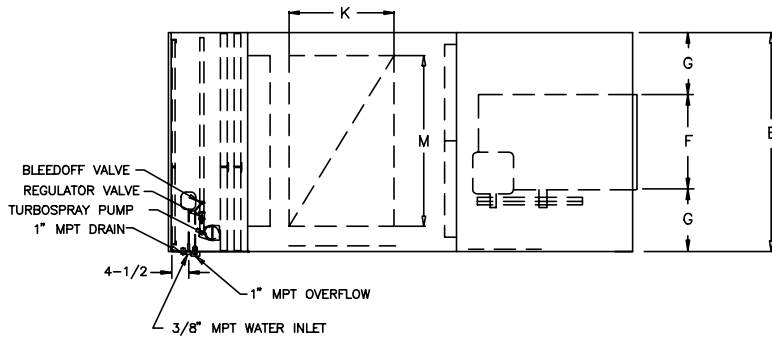


NOTE: When using internally isolated fan or optional fan arrangement on 2480 size ONLY, "C" dimension = 75" & "D" dimension = 120".

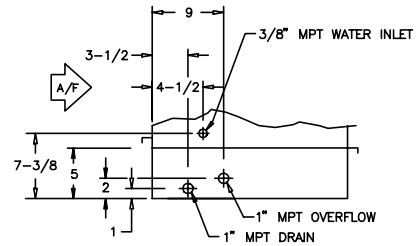
MODEL	BLOWER SIZE	TURBOSPRAY PUMP	EVAP. MEDIA	A	B	C	D	E	F	G	H	NET WT.	OPERATING WT.
HEDM-2480	27" FC	1/6 H.P.	(12) 30 x 58 x 1	62	60	53	98	34-1/4	34-3/8	9-1/16	17-9/16	1483 lbs.	1848 lbs.
HEDM-3680	33" FC	1/6 H.P.	(12) 38 x 70 x 1	75	75	96	141	42-15/16	39-7/8	20	17-1/16	2332 lbs.	2788 lbs.
HEDM-4080	36" FC	1/6 H.P.	(12) 38 x 70 x 1	75	75	96	141	42-15/16	42-3/4	17	17-1/16	2457 lbs.	2913 lbs.
HEDM-5080	42" FC	1/6 H.P.	(12) 43 x 83 x 1	86	96	129	174	44	60-1/4	30	36-1/2	3051 lbs.	3483 lbs.

DIMENSIONS – BASIC UNIT WITH OA AND RA

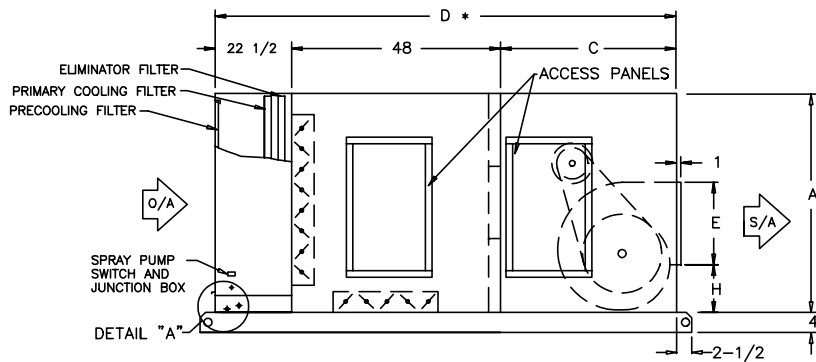
HEDM-550, 750, 1250, 1680, 2050



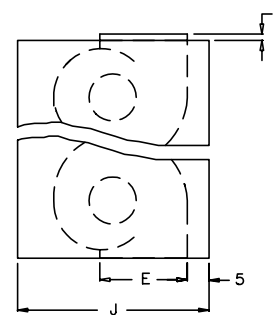
PLAN VIEW



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	M
HEDM-550	50	50	32	102-1/2	18-7/8	21-7/8	14-1/16	12-7/8	39	14-1/4	36
HEDM-750	56	56	35	105-1/2	24-3/4	24-7/8	15-9/16	13-1/2	44	20-1/4	34
HEDM-1250	62	60	42	112-1/2	31-1/4	31-3/8	14-5/16	15-7/8	53	20-1/4	42
HEDM-1680	75	75	50	120-1/2	34-1/4	34-3/8	20-5/16	17-9/16	60	32-1/4	62
HEDM-2050	86	96	75	145-1/2	42-15/16	39-3/4	20	17-1/16	75	32	75

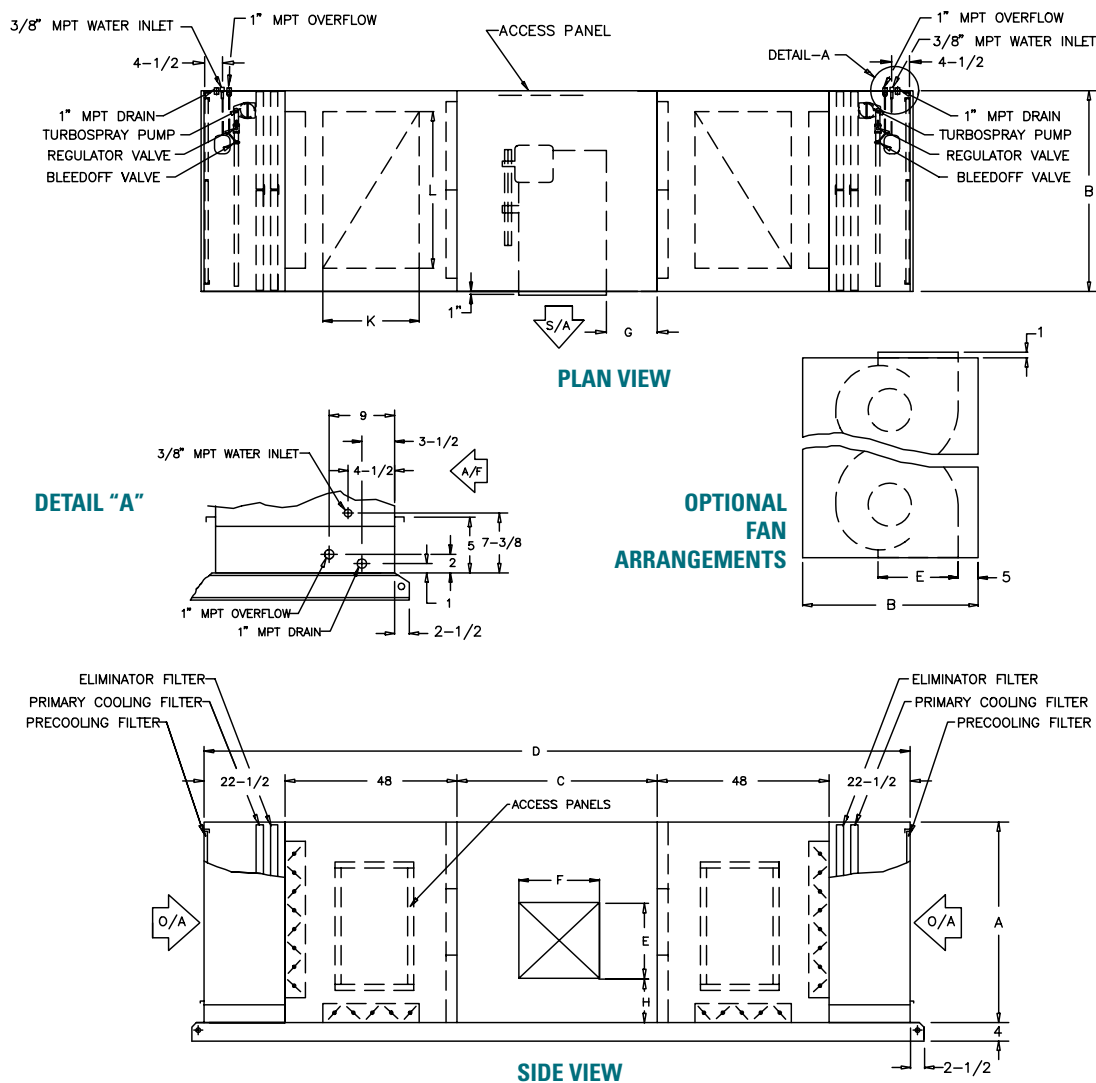
MODEL	BLOWER SIZE	TURBOSPRAY PUMP	EVAP. MEDIA	FILTER QTY. & SIZE	NET WT.	OPERATING WT.
HEDM-550	18" FC	1/6 H.P.	(6) 25 x 46 x 1	(6) 16 x 25 x 2	1087 lbs.	1239 lbs.
HEDM-750	20" FC	1/6 H.P.	(6) 28 x 51 x 1	(6) 16 x 25 x 2	1306 lbs.	1476 lbs.
HEDM-1250	25" FC	1/6 H.P.	(6) 30 x 58 x 1	(9) 20 x 20 x 2	1494 lbs.	1677 lbs.
HEDM-1680	27" FC	1/6 H.P.	(6) 38 x 70 x 1	(6) 16 x 25 x 2 (6) 20 x 25 x 2	2241 lbs.	2600 lbs.
HEDM-2050	33" FC	1/6 H.P.	(6) 43 x 83 x 1	(16) 20 x 24 x 2	3290 lbs.	3822 lbs.

TURBOSPRAY



DIMENSIONS – BASIC UNIT WITH OA AND RA

HEDM-2480, 3680, 4080, 5080

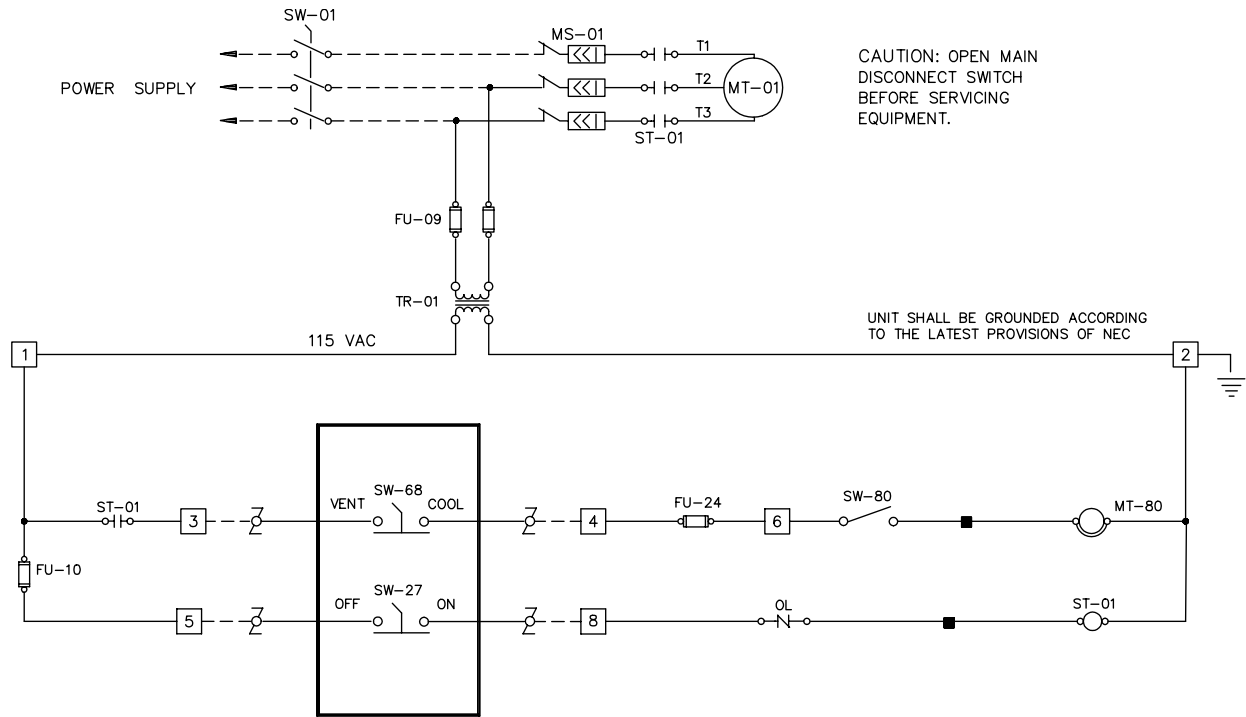


NOTE: When using internally isolated fan or optional fan arrangement on 2480 size ONLY, "C" dimension = 75" & "D" dimension = 216".

MODEL	A	B	C	D	E	F	G	H	K	L
HEDM-2480	62	60	53	194	34-1/4	34-3/8	9-1/16	17-9/16	20-1/4	42
HEDM-3680	75	75	96	237	42-15/16	39-7/8	20	17-1/16	32-1/4	62
HEDM-4080	75	75	96	237	42-15/16	42-3/4	17	17-1/16	32-1/4	62
HEDM-5080	86	96	129	270	44	60-1/4	30	36-1/2	32	75

MODEL	BLOWER SIZE	TURBOSPRAY PUMP	EVAP. MEDIA	FILTER QTY. & SIZE	NET WT.	OPERATING WT.
HEDM-2480	27" FC	1/6 H.P.	(12) 30 x 58 x 1	(18) 20 x 20 x 2	2643 lbs.	3008 lbs.
HEDM-3680	33" FC	1/6 H.P.	(12) 38 x 70 x 1	(12) 16 x 25 x 2 (12) 20 x 25 x 2	4044 lbs.	4520 lbs.
HEDM-4080	36" FC	1/6 H.P.	(12) 38 x 70 x 1	(12) 16 x 25 x 2 (12) 20 x 25 x 2	4219 lbs.	4695 lbs.
HEDM-5080	42" FC	1/6 H.P.	(12) 43 x 83 x 1	(32) 20 x 25 x 2	5624 lbs.	6210 lbs.

TYPICAL WIRING DIAGRAM



NOTES

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

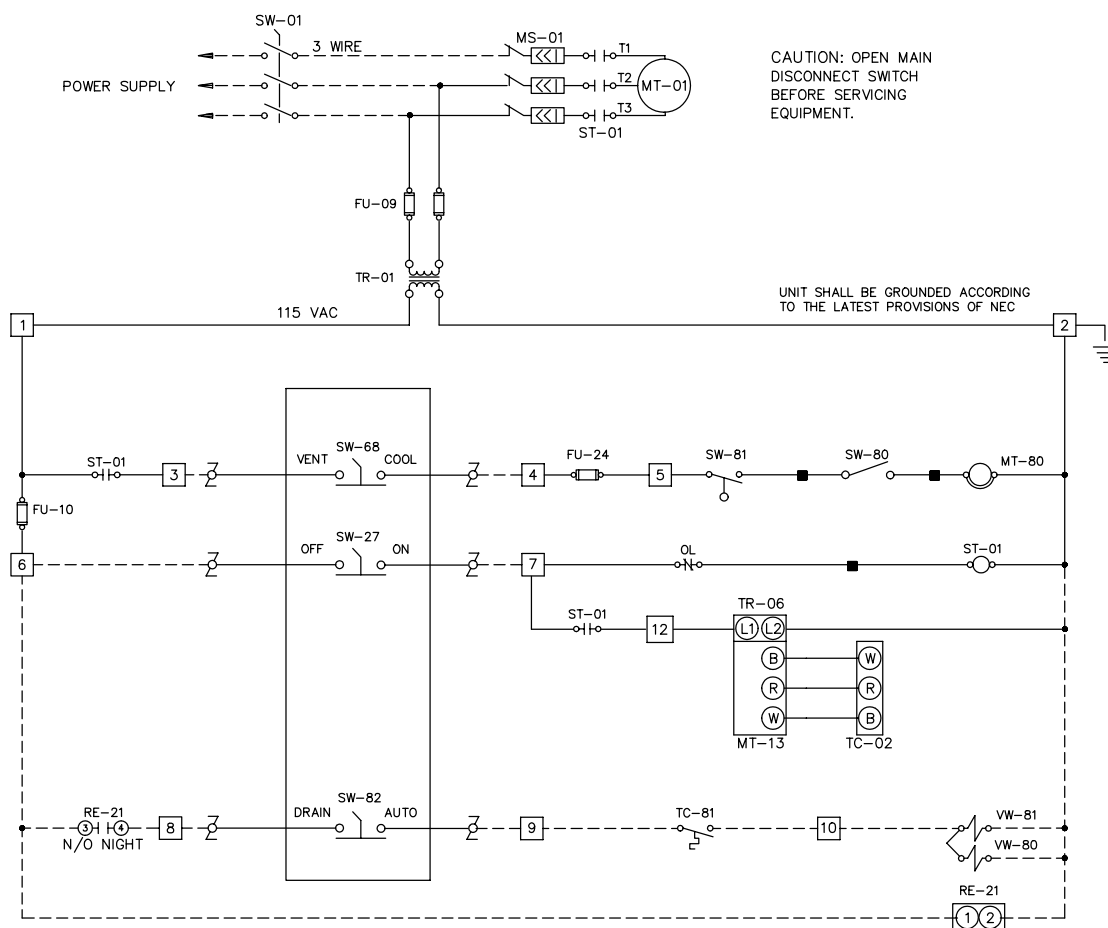
- DENOTES COMPONENT TERMINAL NUMBER AND WIRING
- DENOTES JUMPER WIRE
- DENOTES WIRE CONNECTION
- DENOTES CONTROL CABINET TERMINAL BLOCK AND WIRE NUMBER
- DENOTES COMPONENTS SUPPLIED AND WIRED BY OTHERS
- DENOTES WIRING BY OTHERS
- DENOTES WIRE NUMBER LEADS

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-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
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- 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.)

MAXAIRE FILTERS

Maxaire filters are widely used in all climates and in evaporative cooling applications where durability is mandatory. They are made from a scientific combination of natural fibers which are spun into an efficient, high loft, locking maze and bonded for added rigidity. They are spray bonded with a rugged latex binder for a harder working, longer lasting filter. The extraordinarily durable nature of Maxaire filters allows for an extremely long service life since they can be used over and over again.

In applications which require direct water or moisture contact, such as in the Alton HEDM Turbospray Series, Maxaire filters excel since the rugged materials used in them resist the breakdown which is common in adverse water conditions. Maxaire filters use 1" thick media to obtain the highest cooling efficiency with the lowest air pressure drop. The filter media is mounted in a frame made from 304 stainless steel with 1/2" mesh galvanized screen on the discharge side of the filter. To prevent sagging when it is wet, the media is secured to the screen with stainless steel clips.

Maxaire filters are fully treated with an active bacteriostat to protect against the growth of bacteria, fungus, mold, slime, and the odors associated with them.

Equipped with three sets of Maxaire filters in series, the Alton HEDM Turbospray also provides excellent filtration in the vent mode with an average dust holding capacity rating of 70%.

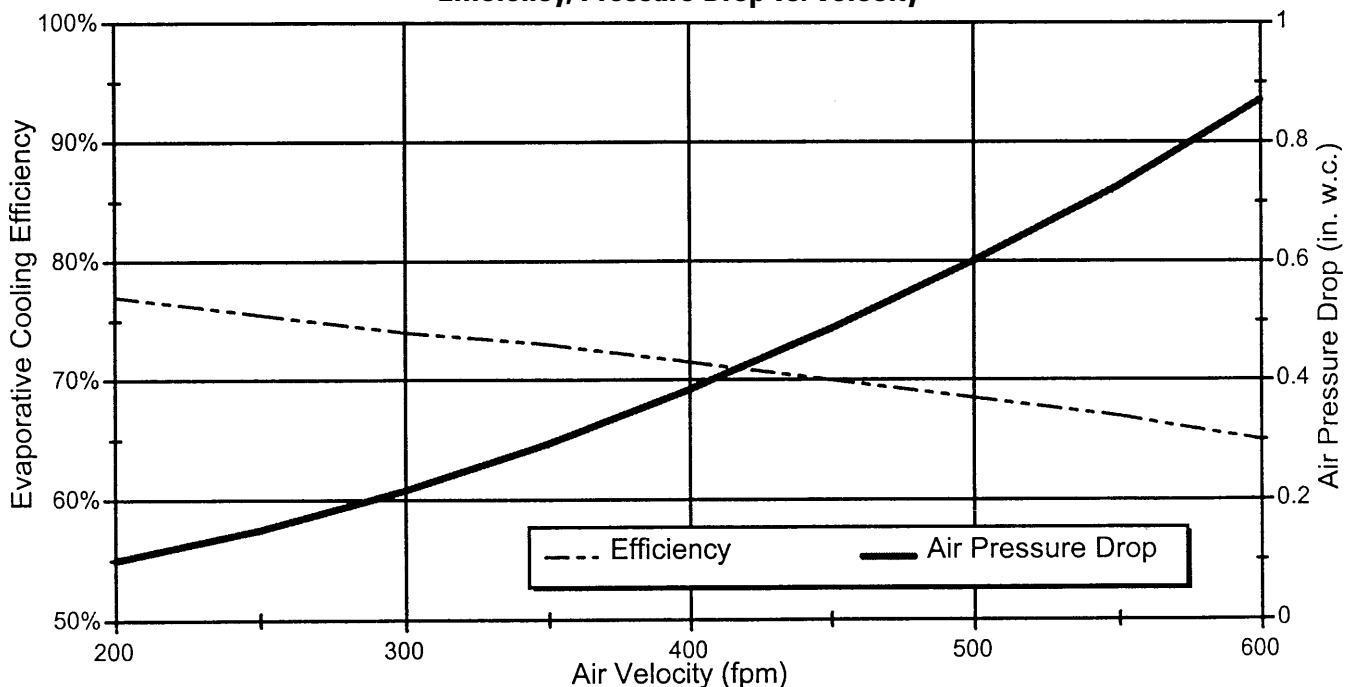
Maxaire filters are engineered to load throughout their entire depth, effectively eliminating surface loading that is likely to occur in adhesive coated fiberglass and metal washable filters. The high contaminant holding capability of Maxaire filters allows them to keep working 2½ - 3 times longer than ordinary filters, resulting in savings due to the lower number of filters used as well as reduced labor costs due to less frequent changeouts.

The Maxaire filter consists of thousands of inter-connecting fibers that form a labyrinth media. No oil or adhesives are necessary to entrap dust and dirt. Instead, a highly effective electrostatic charge, which captures and holds contaminants, is created by the friction caused by air passing through the filter media.

Since oils and greasy adhesives are not necessary with Maxaire filters, they can be easily cleaned by vacuuming, tap water rinsing, hosing, or dousing in an ordinary detergent solution. When in the cooling mode, the spray action of the Turbospray system actually flushes the surface area of the primary cooling pad, effectively washing atmospheric dust and sand into the sump pan and reducing the need for additional cleaning.

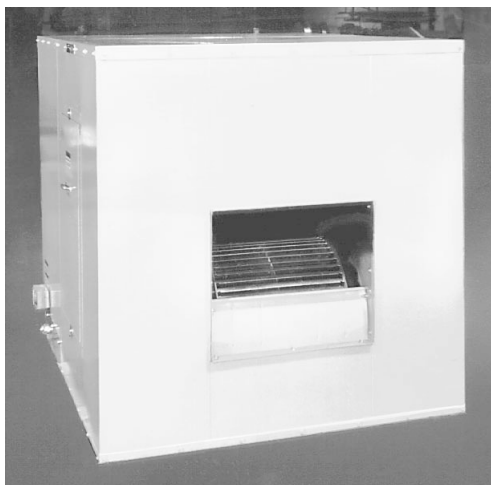
Maxaire filters are permanently fire retardant and are Underwriters Laboratories Listed Class 2.

TURBOSPRAY WDM
Efficiency, Pressure Drop vs. Velocity



NOTE: Air Pressure Drop is based on Evaporative Cooling Module only and does not include system effect for transitions or fan modules.

FORMULAS FOR ESTIMATING



Standard discharge arrangement on a HEDM-550. Note access panel on blower compartment.

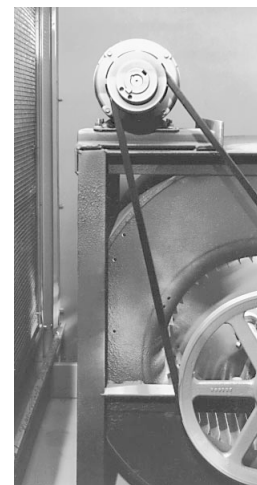
DEFINITIONS

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 Turbospray
TCFM = CFM rating of Turbospray

FORMULAS

Desired	Formula	Example
Leaving Air Temp. from Turbospray	$ODB - SE (ODB - OWB)$	$95 - [.87 \times (95 - 66)] = 70^{\circ}\text{F}^{(1)}$
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 70% efficiency used in the example is the Turbospray's minimum efficiency as determined by factory tests. With proper maintenance, the Turbospray 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 Turbospray 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 Turbospray 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, self-contained and consist of component parts as listed in the following paragraphs. Unit shall be Turbospray as sold by Alton Manufacturing Company located in Dallas, Texas, or approved equal.

2.0 TURBOSPRAY EVAPORATIVE SECTION

- 2.1** The Turbospray evaporative cooling section shall contain the Turbospray water system, a pre-cooling filter, primary cooling filter, eliminator filter, float valve, overflow, and drain connections. Evaporative module to be built separately from 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 galvanized steel, rigidly constructed, and finished with an industrial primer/enamel coating. Water sump pan of the cooling module shall be fabricated from 304 stainless steel and field replaceable. All filters shall be easily removed from the unit without the use of tools, permitting full access to the pump, float, water regulating and bleed-off valves.
- 2.2** Cooling filters shall be Maxaire media. Maxaire filters are durable, permanently fire retardant and carry full U.L. approval Class 2. Filters are latex coated and treated with an active bacteriostat. Maximum air velocity without water carryover is approximately 550 FPM.
- 2.3** Pre-cooling filter shall be mounted in a double section, 304 stainless steel frame. Both faces of filter to be held in frame by a 1/2" mesh galvanized screen. Filter frame to have lift-out handle for easy removal. Stainless steel retainers mounted on the cabinet shall secure frame in position.
- 2.4** Primary and eliminator filters shall be mounted in a single section, 304 stainless steel frame. The discharge face of the filters shall be held in position with a 1/2" mesh galvanized screen. The primary and eliminator filters are to be interchangeable. No entrained water is to be drawn through the eliminator filter, and water trapped by the eliminator is to be evaporated or returned to the sump.
- 2.5** Turbospray water system shall produce a high velocity spray action which uniformly saturates the surface of the primary cooling filter. Turbospray system to include a submersible pump with U.L. listed, hermetically sealed, dielectric oil-filled motor and Buna-N seal. Horsepower rating of 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 solid brass, 95° spray nozzles. A water regulating valve shall be installed in the distribution manifold and will permit field adjustment of the water spray. 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 Turbospray water system assembly shall be available for 115 or 230 volt single phase operation. Blower shall be capable of operating with water spray off, permitting unit to function as a ventilator.

- 2.6** An adjustable brass float valve shall maintain a constant water level in the Turbospray tank.
- 2.7** The Turbospray evaporative cooling unit shall have a minimum saturation effectiveness of 67 percent at 550 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 V-belt drive. 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 all filters in place and Turbospray 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 zerk fittings for relubrication. Fan shaft shall be ground and polished with key seats and keys for mounting wheel and fan pulley. 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.



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