



# Swimming Pool & Spa Dehumidification



HI-E DRY dehumidifiers remove two to three times more water per kilowatt hour of electricity than conventional dehumidifiers.

## **Low Cost. Lower Energy Costs. Higher Efficiency.**

Therma-Stor designed an efficient, durable, and economical system for controlling the moisture loads in pool rooms. The HI-E DRY dehumidifiers utilize heat transfer innovations that dramatically improve performance. This enables Therma-Stor to build higher capacity dehumidification systems with smaller refrigeration systems resulting in lower equipment costs. A smaller refrigeration system requires a smaller electrical load. All HI-E DRY units can plug into a standard electrical outlet lowering your energy costs.



# HI-E Dry Dehumidifiers

Therma-Stor Products developed the first HI-E DRY dehumidifier in the late 1980s. Utilizing the patented *Reevaporator* process, this unit removed more than twice the amount of water per kilowatt hour of electricity than any other refrigerant dehumidifier.

HI-E DRY dehumidifiers are designed and built with emphasis on efficiency and durability. Today's HI-E Dry dehumidifiers remove up to seven pints of water per kilowatt hour, while the industry average remains at only two to three pints.

The high-efficiency design of HI-E DRY dehumidifiers offer more than just dramatically reduced utility costs. The larger water removal capacity from a smaller, more efficient refrigeration system eliminates the need for 220 volt circuits in many applications. The smaller refrigeration system allows HI-E DRY dehumidifiers to cost less than other commercial dehumidifiers of equal capacity.

With our system, a dedicated room heating system is required. If the room is not opened up in the summer months, a dedicated room cooling system will be required. This can be a standard forced air or radiator system. Even with this requirement the HI-E DRY system is a less expensive total equipment cost than a large package system.

**Call 1-800-533-7533 for  
a free, no obligation  
consultation and  
equipment estimate.**



HI-E DRY Vehere



**“The HI-E unit  
has no problem  
handling the  
rooms humidity.”**

*Jim, Massachusetts*

## Clear Windows, Dry Walls

HI-E DRY dehumidifiers control damaging moisture and humidity in a wide range of applications. Designed to operate in a variety of conditions, HI-E DRY dehumidifiers will reduce the relative humidity of inlet air with a dew point above 35°F. The ability to function effectively in lower temperatures is built into every HI-E DRY dehumidifier. Under all conditions, the lower operating cost, lower unit cost, and availability of high capacity “plug-in” installation on most models, make HI-E DRY dehumidifiers the right solution to most humidity problems.



HI-E DRY Model 100



HI-E DRY Model 195

## Save with HI-E DRY Dehumidifiers

1. HI-E DRY dehumidifiers utilize heat transfer innovations that dramatically improve performance. This enables Therma-Stor to build higher capacity dehumidifiers with smaller refrigeration systems. That results in lower equipment cost.
2. A smaller refrigeration system requires a smaller electrical load. The Vehere removes over 190 pounds of water a day (80°F 60% RH) while drawing only twelve amps of electricity.

The HI-E DRY model 195 removes over 190 pounds of water a day (80°F 60% RH).

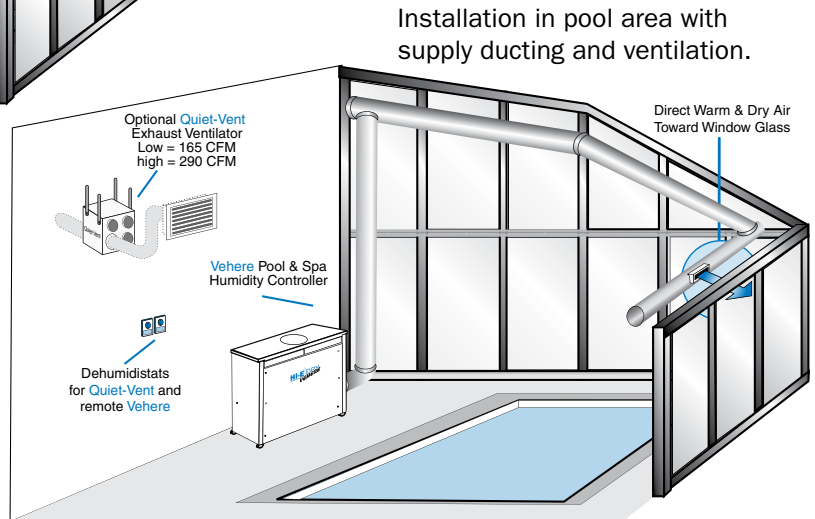
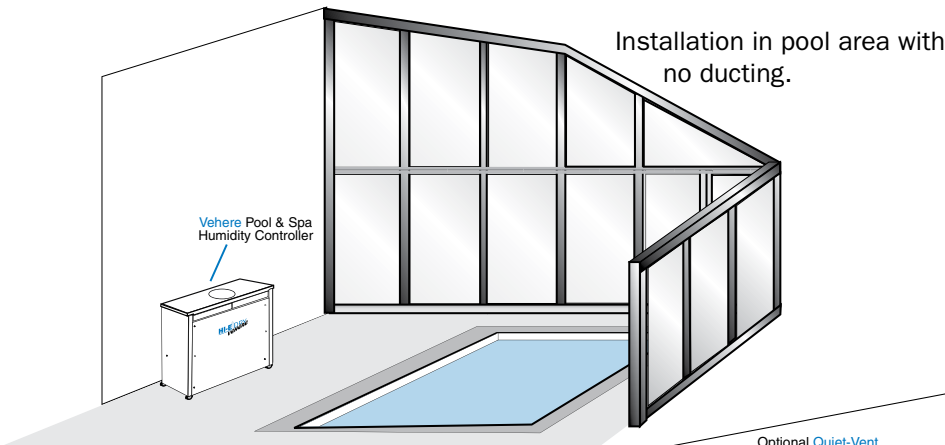
Both the Vehere and the HI-E DRY 195 draw only twelve amps of electricity and plug into a 115 volt 20 amp outlet, providing all the humidity control necessary for a 450 square foot pool. (82°F air temp, 80°F water temp, 60% relative humidity) ASHRAE standards.

3. HI-E DRY dehumidifiers remove two to three times more water per kilowatt hour of electricity than conventional dehumidifiers.

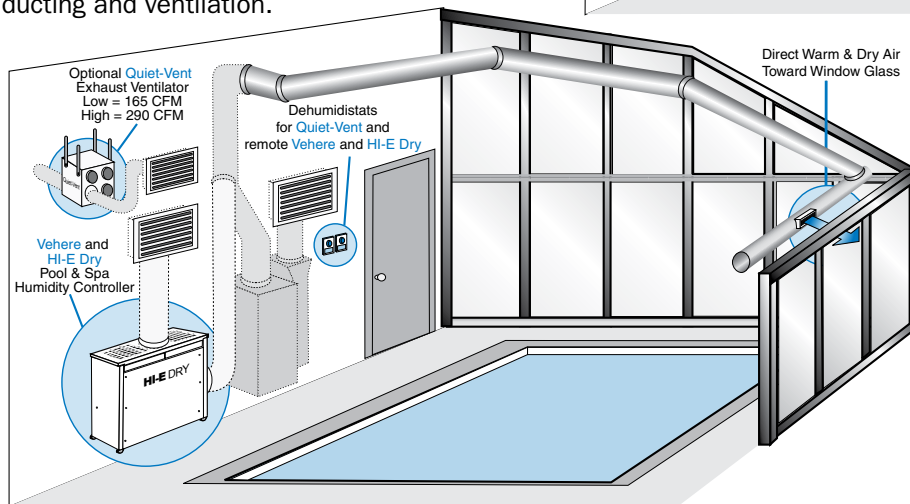


**“The unit is energy efficient, easy to operate and highly effective in it’s purpose.”**

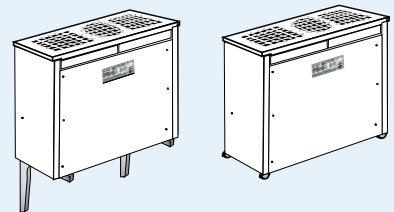
*Sharon Gutwin, RehabGYM  
Vermont*



Remote installation area with ducting and ventilation.



The HI-E DRY can also be wall mounted or free-standing

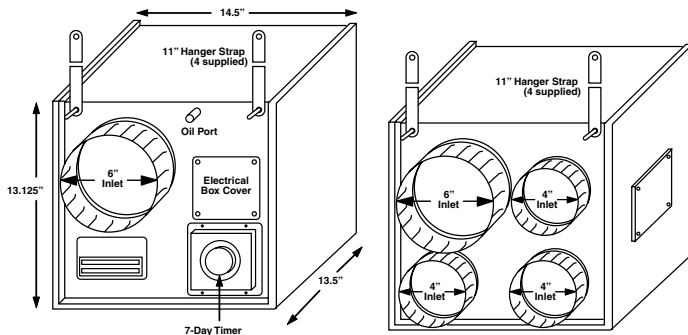
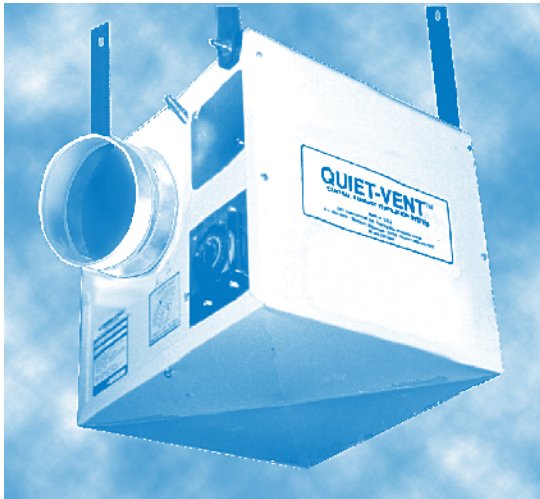


**“We installed two of your HI-E DRY 195 units and our pool humidity immediately came down to 50%!**

*David M. Renton,  
Howard Johnson Hotel, Connecticut*

# Quiet-Vent

Ventilation is also an important element of the HI-E DRY pool room dehumidification system. Ventilation should be to all local codes. At minimum, a simple negative (exhaust) pressure ventilation system should be used. This ventilation system is operated independently of the HI-E DRY unit and keeps the concentrations of corrosive pool chemicals to a minimum and keeps moisture from penetrating the rest of the structure.



## Quiet-Vent Specifications

**Fan Motor** 2 speed, 115 volt, 60 Hz  
1.1 amps, thermally protected  
95 watts/high speed  
50 watts/low speed  
115 volt, 10 amp circuit required

**Fan Capacity** .4" W.G. high speed 295 CFM  
.3" W.G. low speed 165 CFM

**Timer** 7-day timer (controls low speed)

**Remote Control Circuit** 115 volt (controls high speed)  
Prewired relay (included)

**Inlet Ducts** Three 4" and one 6"

**Outlet Duct** Single 6"

**Filter** Metal Screen (Cleanable)

**Sound Level** Less than 1 sone at exhaust grill

**Hangers** 4 vibration absorbing, 1.5" x 11" nylon reinforced rubber straps

**Weight** 30 lbs

**Dimensions** 14.5" (W) x 13.5" (L) x 13.125" (H)

*Caution: Do not use open combustion heating appliances (unless equipped with power exhaust) in a poolroom equipped with exhaust fans. Under certain conditions these exhaust fans may cause the backdrafting of toxic combustion by-products which are hazardous to human health and could cause death. Therefore, we strongly recommend using only closed combustion heating appliances.*

**Other ventilators with various cfm capacities are available.**



**Quiet-Vent  
is the quietest  
ventilation  
system in the  
industry\***

*\*ESL sound testing for  
Home Ventilating Institute (HVI) 9/5/97*

## Dehumidification and Ventilation Calculation Sheet

Use this worksheet to determine the dehumidification and ventilation needs of your pool or spa room.

### A. Moisture load from the water surface

1. Look up the lbs. per ft<sup>2</sup> per hour evaporation rate from the WATER EVAPORATION CHART using the desired pool water temperature, air temperature and % relative humidity (RH)

\_\_\_\_\_ lbs. of moisture load/ft<sup>2</sup>/hr x \_\_\_\_\_ ft<sup>2</sup> area of pool surface = \_\_\_\_\_ lbs/hr moisture load

2. Covered Pool (pools that are uncovered less than 2 hours/6 hours)

(\_\_\_\_\_ lbs/hr moisture load x \_\_\_\_\_ hrs/6 hours pool uncovered)/6 hrs/day = \_\_\_\_\_ lbs/hr (average)

### B. Exhaust ventilation to prevent moisture penetration of the structure and remove chemicals

1. Calculate the natural air leakage

- a. Volume of pool space

\_\_\_\_\_ ft length x \_\_\_\_\_ ft width x \_\_\_\_\_ ft ceiling height = \_\_\_\_\_ ft<sup>3</sup> pool room volume

- b. Estimate natural leakage, air changes per hour (ACH)

(\_\_\_\_\_ ft<sup>3</sup> pool room volume x \_\_\_\_\_ ACH natural leakage)/60 min/hr = \_\_\_\_\_ ft<sup>3</sup>/min natural air leakage

Extremely Tight Construction = .1 ACH natural leakage
Moderately Tight Construction = .2 ACH natural leakage
Typical Construction = .3 ACH natural leakage

2. Exhaust air flow required to prevent moist air penetration of the pool room insulation.

Recommend air exhaust rate 1.5 (minimum) times greater than the natural leakage rate of the structure.

\_\_\_\_\_ ft<sup>3</sup>/min natural air leakage x \_\_\_\_\_ (1.5) = \_\_\_\_\_ ft<sup>3</sup>/min. recommended exhaust air flow rate to depressurize the pool room (Prevents moisture penetration of the insulation)

3. Moisture removed by ventilation

- a. Look up the lbs of moisture removed per hour per 100 CFM of exhaust ventilation using the VENTILATION CHART at the desired room conditions.

\_\_\_\_\_ lbs moisture removed/100 CFM per hr of ventilation x (\_\_\_\_\_ CFM of exhaust ventilation/100 CFM) = \_\_\_\_\_ lbs of moisture per hour removed by ventilation

### C. Determining the amount of dehumidification needed

1. First method (uncovered pool or spa)

Requires that the moisture removal rate equals the moisture load. The RH is maintained with the exception of during times of high activity and pool splashing. This may generate two times the humidity load.

\_\_\_\_\_ lbs/hr moisture load - \_\_\_\_\_ lbs/hr moisture removed by ventilation = \_\_\_\_\_ lbs/hr of dehumidifier capacity

2. Second method (covered pool with low usage - less than 2 hours per 12 hours)

Allows a rise in the RH levels when water is uncovered by providing a return to normal RH levels 2-3 hours after the water is covered.

\_\_\_\_\_ lbs/hr average moisture load - \_\_\_\_\_ lbs/hr moisture removed by ventilation = \_\_\_\_\_ lbs/hr, estimated dehumidifier capacity

\_\_\_\_\_ CFM exhaust fan model \_\_\_\_\_ cost \$ \_\_\_\_\_ installation \$ \_\_\_\_\_ = \$ \_\_\_\_\_

\_\_\_\_\_ lbs/hr HI-E DRY model \_\_\_\_\_ cost \$ \_\_\_\_\_ installation \$ \_\_\_\_\_ = \$ \_\_\_\_\_

**TOTAL \$ \_\_\_\_\_**

## Water Evaporation Chart

Use the below chart as a guideline to determine the moisture load and the dehumidification requirement for your pool room. This chart is based on low activity and splash. During times of high activity, up to 2 times more moisture may be generated.

POUNDS OF WATER PER HOUR PER SQ FT OF WATER SURFACE														
AIR TEMP	RH	DEW PT	Pool Water Temperature											
			76	78	80	82	84	86	88	90	92	94	100	104
68°F	40%	47	0.031	0.034	0.035	0.041	0.045	0.049	0.053	0.057	0.062	0.067	0.083	0.095
	50%	49	0.028	0.031	0.037	0.038	0.041	0.045	0.049	0.054	0.058	0.063	0.079	0.092
	60%	54	0.024	0.027	0.031	0.034	0.038	0.042	0.046	0.050	0.055	0.060	0.076	0.088
70°F	40%	45	0.030	0.033	0.037	0.040	0.044	0.048	0.052	0.056	0.061	0.066	0.082	0.094
	50%	51	0.026	0.030	0.033	0.036	0.040	0.044	0.048	0.052	0.057	0.062	0.075	0.090
	60%	55	0.023	0.027	0.030	0.033	0.037	0.041	0.045	0.049	0.054	0.059	0.075	0.087
72°F	40%	47	0.029	0.032	0.035	0.039	0.043	0.046	0.051	0.055	0.060	0.064	0.081	0.093
	50%	53	0.025	0.058	0.031	0.035	0.039	0.042	0.047	0.051	0.055	0.060	0.076	0.089
	60%	57	0.022	0.025	0.028	0.032	0.035	0.039	0.043	0.048	0.052	0.057	0.073	0.086
74°F	50%	54	0.024	0.027	0.031	0.034	0.038	0.042	0.046	0.050	0.055	0.060	0.076	0.088
	60%	59	0.020	0.023	0.026	0.030	0.034	0.038	0.042	0.046	0.051	0.055	0.072	0.084
	76°F	50%	56	0.023	0.026	0.029	0.033	0.036	0.040	0.044	0.049	0.053	0.058	0.074
78°F	60%	62	0.017	0.020	0.024	0.027	0.031	0.035	0.039	0.043	0.048	0.053	0.067	0.081
	50%	53	0.025	0.028	0.031	0.035	0.039	0.042	0.047	0.051	0.055	0.060	0.076	0.089
	60%	63	0.016	0.019	0.023	0.026	0.030	0.034	0.038	0.042	0.047	0.052	0.068	0.080
80°F	50%	60	0.019	0.022	0.026	0.029	0.033	0.037	0.041	0.045	0.050	0.054	0.071	0.083
	60%	65	0.014	0.017	0.021	0.024	0.028	0.032	0.036	0.040	0.045	0.049	0.066	0.078
	82°F	50%	62	0.017	0.020	<b>0.024</b>	0.027	0.031	0.035	0.039	0.043	0.048	0.053	0.069
84°F	60%	67	0.012	0.015	<b>0.018</b>	0.022	0.025	0.029	0.033	0.038	0.042	0.047	0.063	0.076
	50%	64	0.015	0.018	0.022	0.025	0.029	0.033	0.037	0.041	0.046	0.051	0.067	0.079
	60%	68	0.011	0.014	0.017	0.021	0.024	0.028	0.032	0.037	0.041	0.046	0.062	0.074
86°F	50%	65	0.014	0.017	0.021	0.024	0.028	0.032	0.036	0.040	0.045	0.049	0.066	0.078
	60%	71	0.007	0.010	0.013	0.017	0.021	0.024	0.029	0.033	0.037	0.042	0.058	0.071

## Ventilation Chart

The following chart should be used as a guide to determine the ventilation impact in your pool room. This chart is based on an average 80% outside relative humidity.

Pool Room Air Temperature % Relative Humidity

POUNDS OF WATER REMOVED / HOUR / 100 CFM OF VENTILATION												
AIR TEMP	RH	Outside Air Temperature										
		-10	0	10	20	30	40	50	60	70	80	
68°F	50%	3.0	2.9	2.7	2.4	1.9	1.3	0.5	-0.6	-2.3	-4.6	
	60%	3.6	3.5	3.3	3.0	2.6	2.0	1.1	0.0	-1.6	-3.9	
70°F	50%	3.2	3.1	2.9	2.6	2.1	1.5	0.7	-0.4	-2.1	-4.4	
	60%	3.9	3.8	3.6	3.3	2.8	2.2	1.4	0.3	-1.4	-3.7	
72°F	50%	3.3	3.3	3.1	2.8	2.3	1.7	0.9	-0.3	-1.9	-4.2	
	60%	4.1	4.0	3.9	3.6	3.1	2.5	1.6	0.5	-1.1	-3.4	
74°F	50%	3.7	3.6	3.4	3.1	2.7	2.1	1.2	0.1	-1.5	-3.9	
	60%	4.5	4.4	4.2	3.9	3.4	2.8	2.0	0.9	-0.8	-3.1	
76°F	50%	4.1	4.0	3.9	3.6	3.1	2.5	1.6	0.5	-1.1	-3.4	
	60%	4.9	4.8	4.6	4.3	3.9	3.3	2.4	1.3	-0.3	-2.7	
78°F	50%	4.2	4.1	3.9	3.6	3.2	2.6	1.7	0.6	-1.0	-3.3	
	60%	5.1	5.1	4.9	4.6	4.1	3.5	2.7	1.5	-0.1	-2.4	
80°F	50%	4.5	4.5	4.3	4.0	3.5	2.9	2.1	0.9	-0.7	-3.0	
	60%	5.5	5.4	5.2	4.9	4.5	3.9	3.0	1.9	0.3	-2.1	
82°F	50%	<b>4.8</b>	<b>4.8</b>	<b>4.6</b>	<b>4.3</b>	<b>3.8</b>	<b>3.2</b>	<b>2.4</b>	<b>1.2</b>	<b>-0.4</b>	<b>-2.7</b>	
	60%	<b>5.8</b>	<b>5.7</b>	<b>5.6</b>	<b>5.3</b>	<b>4.8</b>	<b>4.2</b>	<b>3.3</b>	<b>2.2</b>	<b>0.6</b>	<b>-1.7</b>	
84°F	50%	5.2	5.1	4.9	4.6	4.2	3.6	2.7	1.6	0.0	-2.4	
	60%	5.8	5.7	5.6	5.3	4.8	4.2	3.3	2.2	0.6	-1.7	
86°F	50%	5.6	5.5	5.3	5.0	4.5	3.9	3.1	2.0	0.3	-2.0	
	60%	6.7	6.6	6.4	6.1	5.7	5.1	4.2	3.1	1.5	-0.9	
88°F	50%	5.9	5.8	5.7	5.4	4.9	4.3	3.4	2.3	0.7	-1.6	
	60%	7.2	7.1	6.9	6.6	6.2	5.6	4.7	3.6	2.0	-0.3	
90°F	50%	6.3	6.3	6.1	5.8	5.3	4.7	3.9	2.7	1.1	-1.2	
	60%	7.7	7.6	7.5	7.2	6.7	6.1	5.2	4.1	2.5	0.2	
92°F	50%	6.8	6.7	6.5	6.2	5.7	5.1	4.3	3.2	1.5	-0.8	
	60%	7.8	7.7	7.5	7.2	6.8	6.2	5.3	4.2	2.6	0.3	
94°F	50%	7.2	7.1	6.9	6.6	6.2	5.6	4.7	3.6	2.0	-0.3	
	60%	8.7	8.7	8.5	8.2	7.7	7.1	6.3	5.1	3.5	1.2	

ASHRAE Recommended Conditions



**HI-E DRY Model 100**

HI-E DRY 100 Duct Kit  
(#4021453)

Remote Dehumidistat  
(#4020175)

**Specifications:**

Power: 115 Volt, 7 Amps  
Blower: 220 cfm  
Temp. range: 33°F - 110°F  
Warranty: 5 year limited  
Duct Kit: 8" round (optional)

**Capacities per 24 hours**

80°F, 80% 142 pints  
80°F, 60% 100 pints  
60°F, 80% 83 pints

**Dimensions:**

Width: 20 inches  
Height: 36 inches  
Depth: 17 inches  
Weight: 110 lbs



**HI-E DRY Model 195**

HI-E DRY 195 Duct Kit  
(#4023684)

Remote Dehumidistat  
(#4020175)

**Specifications:**

Power: 115 Volt, 12 Amps  
Blower: 540 cfm  
Temp. range: 33°F - 110°F  
Warranty: 5 year limited  
Duct Kit: 12" round (optional)

**Capacities per 24 hours:**

80°F, 80% 239 pints  
80°F, 60% 183 pints  
60°F, 80% 159 pints

**Dimensions:**

Width: 36.6 inches  
Height: 42.0 inches  
Depth: 19.0 inches  
Weight: 175 lbs



**HI-E Vehere**  
(#4025276)

**Specifications:**

Power: 110-120 VAC, 12.0 Amps (7' power cord included)  
Blower: 540 CFM without external ducting  
510 CFM @ .15 IWG external static

Temp. Range: 33°F - 110°F

Warranty: 5 year limited

Capacity: 185 pints/day @ 80°F, 60% RH

Duct Flow Connections: 12" inlet & outlet

Includes 24 volt control and 12" starting collars for supply and return.

**Capacities per 24 hours:**

Air Temp/RH	Pints	KWH
80°F/80% RH	238	37.1
82°F/60% RH*	191	35.3
80°F/60% RH	185	34.3
60°F/80% RH	160	27.5

**Dimensions:**

Width: 36.5 inches  
Height: 40.0 inches  
Depth: 19.0 inches  
Weight: 180 lbs

\*ASHRAE Recommended Conditions