



FreeDry™ Dehumidification System for Ice Arenas

Benefits

- Up to 75% more energy savings
- All electric unit (gas piping not required)
- Cooling for summer non-ice events
- Longer wheel life
- ETL/ETL-C Listed
- Low operating and maintenance cost
- Complements waste heat system

FreeDry™ Dehumidification System for Ice Arenas

FreeDry™ combines advanced low temperature desiccant technology with refrigeration based cooling. Utilizing the benefit of both technologies provides an extremely energy efficient arena dehumidification system which delivers properly conditioned dry air without the need for natural gas. The normal supply air temperature leaving the Munters FreeDry™ during the dehumidification season varies between 65°F to 75°F. The FreeDry™ leaving temperatures are significantly cooler than conventional desiccant dehumidification systems that typically supply dry air between 100°F to 125°F (200mm rotor). The cooler supply air substantially reduces the cooling load for the ice refrigeration compressors during the warmer operating season.

The basic FreeDry™ system contains a single compressor heat pump circuit and desiccant wheel. The evaporator side of the heat pump circuit reclaims the waste-heat from the refrigeration compressors. The condenser side of the heat pump circuit is designed to heat outdoor air in order to regenerate the desiccant rotor. The inherent efficiencies of the heat reclaim and heat pump circuit to reactivate the desiccant wheel makes the Munters FreeDry™ unit the most energy efficient system in use today. The performance of the FreeDry™ dehumidifier is unsurpassed by any conventional desiccant systems with reactivation heat recovery or traditional cooling-based dehumidification technologies.



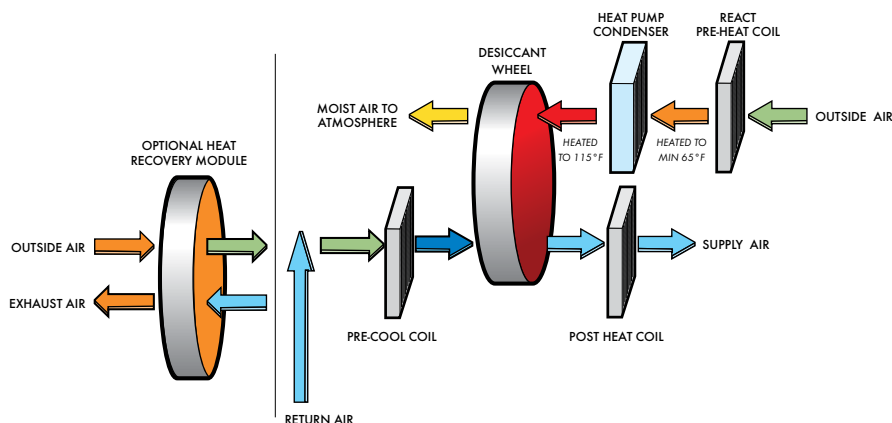
FreeDry™ Capacity Chart

Airflow CFM	Performance 0% Fresh Air ¹			Performance 100% Fresh Air ¹			Dimensions L x W x H	Weight Pounds
	Energy Input ²	Moisture Removal	Supply Air ⁴	Energy Input ²	Moisture Removal	Supply Air ⁴		
6,000	7.0 kW	54 lbs/hr	68°F	22.1 kW	231 lbs/hr	77°F	203 x 96 x 71	6,300
8,000	9.4 kW	68 lbs/hr	69°F	29.5 kW	324 lbs/hr	75°F	203 x 96 x 86	8,500
12,000	14.1 kW	108 lbs/hr	68°F	44.2 kW	462 lbs/hr	77°F	371 x 126 x 102	16,000
16,000	18.8 kW	136 lbs/hr	69°F	59.0 kW	648 lbs/hr	75°F	402 x 126 x 102	18,000

(1) Return Air Conditions = 55°F, 32 gr/lb / Fresh Air Conditions = 80°F, 120 gr/lb
(2) Heat Pump Compressor Only

(3) Heat Pump Compressor & Pre-Cool Energy
(4) Supply Air Temperature Indicated in Dehumidification Mode

FreeDry™ Airflow & Schematic



FreeDry™ Features

- Advanced low-temperature regenerated desiccant wheel
- Utilizes waste-heat from refrigeration compressors to regenerate the desiccant wheel
- Dual heat-pump and desiccant technology for unsurpassed efficiency
- Waste-heat from refrigeration compressors for winter space heating
- Liquid or Packaged DX pre-cooling coil
- Variable Frequency Drives for optimum performance
- Microprocessor controls with available BMS interface
- Foam injected 2" double wall casing
- Optional heat recovery module available for LEED certification



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System Overview

A standard liquid or DX pre-cooling coil augments the moisture removal capacity of the FreeDry™ unit during periods of high humidity or increased ventilation. The liquid pre-cooling coil can use either brine from the refrigeration plant or geothermal cooling energy. The FreeDry™ unit with DX pre-cool selection is constructed with an integrated condensing section that does not require any additional cooling energy from the refrigeration plant. Configured with standard cooling and heat reclaim heating coils, the FreeDry™ unit provides exceptional comfort levels for both ice and non-ice (summer) activities.

Several FreeDry™ models and capacities are available to ensure that building owners/operators meet local and ASHRAE Guidelines for acceptable indoor air quality without compromising on indoor space conditions or ice quality. FreeDry™ models are available for both seasonal and year-round facilities.

The FreeDry™ unit normally operates in 100% return air mode. Upon call for dehumidification, the supply and reactivation fans (not illustrated) are energized along with the desiccant wheel. The heat pump circuit is energized and a coaxial evaporator coil (not illustrated) reclaims waste heat from the ice plant. The heat-pump circuit condenser coil heats outdoor air to 115°F in order to reactivate the desiccant wheel. When outdoor ambient temperatures drop below 65°F, a reactivation pre-heat coil which also reclaims waste-heat from the ice plant pre-heats outdoor air to a minimum 65°F before entering the condenser coil thereby ensuring sufficient heat is always available to regenerate the desiccant wheel.

Upon call for higher quantities of fresh air, a pre-cool coil shall stage-on as necessary to supplement the desiccant rotor and perform both sensible and at times latent cooling.

Upon call for space heating or cooling, either the pre-cooling coil or heating coil shall stage-on as necessary to maintain space temperature set point.

Protected by one or more of the following U.S. Patents. 5435958; 5505769; 5423934; 5500402; 6375914; 6557365; 6622508; 6711907; 6875299; 7047751. U.S. and worldwide Patents Pending.



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