

ADIABATIC HUMIDIFIERS	ADVANTAGES	LIMITATIONS	ANCILLARY EQUIPMENT
Centrifugal	<ul style="list-style-type: none"> ■ Simple ■ Provides evaporative cooling to surrounding air 	<ul style="list-style-type: none"> ■ Difficult to apply to air handling systems ■ Limited capacity ■ Possible plugging issues 	<ul style="list-style-type: none"> ■ N/A
Compressed Air and Water	<ul style="list-style-type: none"> ■ Adjusts to changes in demand, modulates output ■ High turndown of output ■ Provides evaporative cooling to surrounding air ■ Customizable to air handling systems ■ Available in a wide range of capacities 	<ul style="list-style-type: none"> ■ Requires sufficient volume of compressed air ■ Requires purified water ■ Longer evaporation distances ■ Requires sufficient pre-heat of air supply 	<ul style="list-style-type: none"> ■ Air compressor ■ Reverse osmosis water treatment system ■ Three way drain valve ■ Mist eliminator ■ Controls
High Pressure Atomizers	<ul style="list-style-type: none"> ■ Same benefits as Compressed Air & Water ■ Benefits of atomization without cost of compressed air 	<ul style="list-style-type: none"> ■ Requires purified water ■ Requires sufficient pre-heat of air supply ■ Longer evaporation distances 	<ul style="list-style-type: none"> ■ Reverse osmosis water treatment system ■ Mist eliminator ■ Controls
Ultrasonic	<ul style="list-style-type: none"> ■ Adjusts to changes in demand, modulates output ■ High turndown of output ■ Customizable to air handling systems ■ Provides evaporative cooling to surrounding air 	<ul style="list-style-type: none"> ■ Uses deionized (DI) water ■ Requires sufficient pre-heat of air supply ■ Longer evaporation distances ■ Needs to have an accurate reservoir liquid level ■ Limited output from each piezo crystal 	<ul style="list-style-type: none"> ■ Deionized water treatment system ■ Mist eliminator ■ Controls
Wetted Media Evaporative	<ul style="list-style-type: none"> ■ Available in a wide range of capacities ■ Provides evaporative cooling to surrounding air ■ Low energy consumption 	<ul style="list-style-type: none"> ■ Slow response to reduction in demand ■ Requires biocide ■ Non-purified water can lead to a build up of impurities ■ Water collection pan must be purged periodically 	<ul style="list-style-type: none"> ■ Controls ■ Recirculation pump

DIRECT INJECTION STEAM	ADVANTAGES	LIMITATIONS	ANCILLARY EQUIPMENT
Steam Cup	<ul style="list-style-type: none"> ■ Simple design 	<ul style="list-style-type: none"> ■ Limited performance features ■ Limits in control of steam output ■ Limitations in allowable steam capacity ■ Unrefined sound silencing ■ Can disperse boiler chemicals into air 	<ul style="list-style-type: none"> ■ N/A
Steam Separator	<ul style="list-style-type: none"> ■ Reliable performance ■ Available in a wide range of capacities ■ Adjusts to changes in demand ■ Separates steam from condensate ■ Sound silencing capability ■ Low maintenance requirements ■ Available with high turn-down or valve rangeability ■ Lifts condensate within stream pressure constraints ■ Control valve can be adjusted electrically or pneumatically 	<ul style="list-style-type: none"> ■ Requires availability of a steam boiler ■ Longer nonwetting distance than steam panel-type ■ Can disperse boiler chemicals into air 	<ul style="list-style-type: none"> ■ Steam trap ■ Wye type strainer ■ Temperature switch ■ Controls
Steam Panel	<ul style="list-style-type: none"> ■ Reliable performance ■ Available in a wide range of capacities ■ Adjusts to changes in demand ■ Separates steam from condensate ■ Sound silencing capability ■ Low maintenance requirements ■ Available with high turn-down or valve rangeability ■ Short nonwetting distances ■ Control valve can be adjusted electrically or pneumatically ■ Performs without steam jacket or manifolds ■ Can be insulated for energy savings 	<ul style="list-style-type: none"> ■ Requires availability of a steam boiler ■ Can disperse boiler chemicals into air ■ Difficulty lifting condensate from steam traps unless specified with an integral heat exchanger that vaporizes condensate 	<ul style="list-style-type: none"> ■ Wye type strainer ■ Controls ■ Condensate pump ■ Manufacturer supplied and installed panel insulation

HEATED TANK	ADVANTAGES	LIMITATIONS	ANCILLARY EQUIPMENT
Electric (electrode type)	<ul style="list-style-type: none"> ■ Compact size ■ Provides a modulated output to a variable demand signal ■ Available with cleanable or disposable tanks ■ Available with self-diagnostics ■ Typically wall-mounted 	<ul style="list-style-type: none"> ■ Water minerals precipitate out, remaining in tank ■ Cannot use extremely low conductivity water or purified water ■ Performance can be adversely affected by long steam distribution pipe runs 	<ul style="list-style-type: none"> ■ Fill cup extension kits for high back pressure applications ■ Optional tank drain water tempering device ■ Controls ■ Steam dispersion tube, steam dispersion panel for shorter non-wetting distance, or steam blower to disperse steam ■ Steam hose with clamps for steam dispersion
Electric (resistive type)	<ul style="list-style-type: none"> ■ Can use any type of fill water: tap, softened, RO/DI ■ Some provide modulated output through SCR/SSR control ■ Available with self-diagnostics ■ Can be wall, floor, or rooftop-mounted 	<ul style="list-style-type: none"> ■ Water minerals precipitate out, remaining in tank, unless using RO/DI water ■ Typically larger and heavier than electrode units 	<ul style="list-style-type: none"> ■ Optional tank drain water tempering device ■ Controls ■ Steam dispersion tube, steam dispersion panel for shorter non-wetting distance, or steam blower to disperse steam ■ Steam hose with clamps for steam dispersion ■ Roof curb for outdoor mounting
Infrared Steam Humidifiers	<ul style="list-style-type: none"> ■ Simple and compact design 	<ul style="list-style-type: none"> ■ Infrared bulbs are sensitive and fracture ■ Limited output capacity ■ Control accuracy ■ Radiant energy is converted to heat rather than evaporating water 	<ul style="list-style-type: none"> ■ N/A
Gas Fired Steam Humidifiers	<ul style="list-style-type: none"> ■ Can use any type of fill water: tap, softened, RO/DI ■ Low energy costs ■ Offers models with steam capacity greater than electric units ■ Available with self-diagnostics 	<ul style="list-style-type: none"> ■ Water minerals precipitate out, remaining in tank unless using RO/DI water ■ Limitations in placement due to venting requirement 	<ul style="list-style-type: none"> ■ Steam dispersion tube, steam dispersion panel for shorter non-wetting distance, or steam blower to disperse steam ■ Optional tank drain temperature tempering device ■ Controls ■ Sealed combustion option for dedicated combustion air ■ Roof curb for outdoor mounting

HEATED TANK	ADVANTAGES	LIMITATIONS	ANCILLARY EQUIPMENT
<p>Steam-to-Steam</p>	<ul style="list-style-type: none"> ■ Available with self-diagnostics ■ Chemical-free steam ■ High-capacity units available ■ Can be floor or rooftop-mounted 	<ul style="list-style-type: none"> ■ Water minerals precipitate out, remaining in tank unless using RO/DI water ■ Condensate pump required to lift condensate discharged from the steam trap 	<ul style="list-style-type: none"> ■ Control panel, control valve, steam trap, and strainer ■ Steam dispersion tube, steam dispersion panel for shorter non-wetting distance, or blower for dispersing steam ■ Roof curb for outdoor mounting ■ Optional tank drain water tempering device
<p>Hot Water Humidifiers</p>	<ul style="list-style-type: none"> ■ Available with self-diagnostics ■ Chemical free steam ■ High-capacity units available 	<ul style="list-style-type: none"> ■ Water minerals precipitate out, remaining in tank unless using RO/DI water ■ Minimum temperature of liquid heat source is 240 degrees F 	<ul style="list-style-type: none"> ■ Controls ■ Optional tank drain water tempering device ■ Control panel, control valve, steam trap, and strainer ■ Steam dispersion tube, steam dispersion panel for shorter non-wetting distance, or blower for dispersing steam