**HEATSINK CYCLING REFRIGERATED AIR DRYER (1800-3000 SCFM)**

**PRODUCT SPECIFICATION**

**SCOPE**

The dryer shall be complete in all respects, including integral component equipment, inter-connecting piping, wiring and controls. The dryer shall only require connection to utilities furnished by others.

For reference only



**EXCHANGER TECHNOLOGY**

The precooler / reheater and chiller heat exchangers shall be manufactured within a single, all-aluminum module. The module shall include an integral moisture separator. The heat exchanger sections shall be comprised of a stacked array of extruded aluminum plates that contain a plurality of uniform internal passages for optimal heat transfer.

**COMPONENTS AND CONSTRUCTION**

Each dryer system shall be complete with the following items:

* Precooler/Reheater exchanger
* Compressed Air Chiller Section
* Moisture separator
* Thermal mass cooling system
* Thermal mass circulating system
* Refrigeration system
* Electronic solenoid drain to automatically discharge condensate
* Controls and Instrumentation

**PRECOOLER/REHEATER**

Dryer shall be equipped with an air-to-air heat exchanger to precool incoming compressed

air and reheat outgoing compressed air. Precooling the air reduces the air temperature entering the chiller section, thereby reducing energy requirements. Warm, reheated air exiting the dryer reduces potential for pipe sweat at dryer outlet. Air-to-air heat exchanger shall be integral to the exchanger module.

**AIR CHILLER**

Compressed air from the precooler/reheater shall be delivered to the air chiller, where the air is cooled, thereby condensing out moisture. The air chiller shall be integral to the exchanger module.

**AIR/MOISTURE SEPARATOR**

A moisture separator shall be located after the air chiller. Separator shall be integral to the exchanger module. Compressed air and water condensed in the air chiller shall be delivered to the separator for the separation and subsequent removal of the water from the compressed air.

Separation shall be performed at the coldest point in the system, with the bulk moisture separation occurring at the bottom of the separator section. Moisture re-entrainment shall be prevented by centrifugal acceleration that results from the air stream’s 180 degree turn within the module. These separation mechanisms shall provide for separation efficiency in excess of 99%.

**THERMAL MASS COOLING SYSTEM**

The thermal mass cooling system shall consist of a thermal mass reservoir, thermal mass fluid and brazed plate evaporator. The thermal mass fluid is cooled as it is circulated through the brazed plate evaporator and heat transfer occurs between the thermal mass and the refrigerant when the refrigeration compressor is operating.

**THERMAL MASS COOLING SYSTEM (Continued)**

The thermal mass shall thus allow the refrigeration compressor to cycle on and off automatically depending on the heat load to the dryer. A fully-insulated storage container shall be furnished to store the chilled thermal mass fluid. The storage container and exchanger system shall be designed to deliver a 38°F PDP.

**THERMAL MASS CIRCULATING SYSTEM**

Thermal mass fluid shall be transferred to the thermal mass fluid to air heat exchanger via the thermal mass fluid pump. Pump shall be maintenance-free, circulator pump, designed for continuous operation when the dryer is activated for operation.

**REFRIGERATION SYSTEM**

The refrigeration system shall be designed to dry a set amount of compressed air. The refrigeration system shall consist of one hermetically sealed, high-efficiency scroll compressor, air or water cooled condenser, brazed-plate evaporator (glycol-to-refrigerant), automatic thermostatic expansion valve, liquid line solenoid valve, suction line accumulator, and other refrigeration components needed for proper operation. Refrigerant R410A shall be used to minimize environmental hazard.

No hot gas by-pass valve or similar capacity modulating device shall be used in the refrigeration system.

**FILTRATION**

A dual element, inlet filter assembly complete with two factory installed general purpose filter elements shall be provided within the dryer as standard to protect the heat exchanger from piping system debris upstream of the dryer and to improve the delivered air quality. The inlet filter assembly shall be provided with a timed solenoid drain to expel accumulated condensate.

**DRAIN ASSEMBLY**

Dryer shall be equipped with two drains:

* Heat Exchanger Module Drain – A dual solenoid drain / float switch assembly shall be provided. The dryer’s controller shall permit drains to operate automatically via the internal floats within the separator section or timed operation.
* Inlet Filter Drain – A dedicated solenoid drain with adjustable on / off timer shall enable full removal of condensed moisture from the inlet filter assembly.

**CONTROLS AND INSTRUMENTATION**

The chiller section and associated refrigeration system shall be controlled and monitored by a fully integrated microprocessor. The microprocessor shall control the chiller section to prevent freeze-up. Additionally, the standard microprocessor shall incorporate the following features:

* Chiller Temperature Digital Readout
* Ambient Air Temperature Readout
* High Chiller Temperature Alarm
* Low Chiller Temperature Alarm
* Adjustable Exchanger Temperature
* Compressor Shell Temperature
* Drain Test Function
* Compressor Anti-short Cycling Function
* Suction Pressure Digital Readout
* Discharge Pressure Digital Readout
* Suction Temperature Digital Readout
* High Discharge Pressure Cutout Alarm
* Low Suction Pressure Cutout Alarm
* High Filter Pressure Drop Alarm
* Expedited Compressor Crankcase Heater Startup Sequence
* Phase Monitor Fault Alarm (Phase protection, under & over voltage protection)
* RS485 Communication
* Adjustable Baud Rate

Microprocessor shall also incorporate field programmable chiller temperature settings to allow the dryer to more closely match seasonal demands. A higher chiller temperature setting shall allow refrigerant compressors to experience a lighter load thereby conserving more energy and further reducing compressor run time.

END PRODUCT SPECIFICATION