**MULTIPLEX CYCLING REFRIGERATED AIR DRYER (3,600-24,000 SCFM)**

**PRODUCT SPECIFICATION**

**SCOPE**

The dryer system shall be complete in all respects, including integral component equipment, inter-connecting piping, wiring, controls and sequencer. The modular dryer shall only require single-point connections to utilities by others.



For reference only

**EXCHANGER TECHNOLOGY**

The precooler / reheater and chiller heat exchangers in each module 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 module of the 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
* Pneumatically actuated no-loss drain
* Module Controls and Instrumentation

**PRECOOLER/REHEATER**

Dryer module 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(s), thermal mass fluid (propylene glycol water mixture), circulator pumps, and interconnecting tubing / piping to the brazed plate evaporator. The number of thermal mass reservoirs will vary based upon the number of modules configured for each Multiplex design

**THERMAL MASS COOLING SYSTEM (Continued)**

The thermal mass shall allow the refrigeration compressor within each module to cycle on and off depending on the heat load to the module. A fully-insulated storage container(s) 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 chiller section via each module’s thermal mass fluid pump. Pump shall be maintenance-free, circulator pump, designed for continuous operation.

**REFRIGERATION SYSTEM**

Each module’s 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 each dryer module 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 pneumatically operated no loss drain with liquid level switch shall be provided as standard and shall be monitored by the module controller continuously when the module is powered.
* 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**

Each module’s 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
* RS485 communicates
* 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.

**SEQUENCER CONTROLLER**

The MutliPlex dryer shall include a Sequencer microprocessor controller that is configured with a proprietary control program that continuously monitors the compressor operating hours of each module. The Sequencer shall re-adjust the chiller temperature set-points of each module to achieve uniform operating hours for each module.

The Sequencer shall:

* Continuously monitor the compressed air inlet & outlet temperature & pressure values while the unit is operational.
* Permit the dryer to be remotely operated via a field supplied remote contact.
* Be provided with a RS-485 central communications port that will allow for remote monitoring for the operating parameters of each module & the inlet & outlet compressed air conditions.

The Sequencer program shall be:

* Configured for the number of modules in a Multiplex
* Wired to each module controller via RS-485 communications to allow for continuous monitoring for each module.
* Designed with the same user interface as the individual modules in order to permit ease of use.

END PRODUCT SPECIFICATION