High Humidity Pre-Cooling Units

For Industrial and Commercial Refrigeration

Size Range : 1 to 20 Tons, Nominal 5MT per 2/4/6 hour Batch

Starcore Model Series Predx 40000, Predx60000 For Use With R22, R134 A, R717

Suitable for Pre cooling of Grapes, Litchi, Strawberry, Pomegrande, Apples and all vegetables.

All fruits and vegetables have to be pre-cooled to remove farm heat. Studies carried out on different fruits & vegetables show that 7/8 of the cooling should take place not later than 8 hrs from the time of plucking else all fruits and vegetables show an exponential decay in their shelf life.

In order to ensure that the fruit or vegetable does not shrink through water migration from fruit to air the water content in the air at any given point of time has to be greater than the water content in the fruit/vegetable to be pre cooled. Also there should no free moisture in the air to allow condensation otherwise chill injury may take place.

The Pre-cooler should be so designed to achieve a temp of 0 o C and a RH above 95% in an empty room without any loose water in the air to ensure zero shrinkage.

Starcore has innovated a precooler, Which is synchronous with the above regulations

System Description

- Floor Mounted with aluminum profile construction.
- Choice of manual / motorized pull up tarp.
- Single skin construction with GI Powder Coated Epoxy casing with Corrosion

Resistant paint.

- Axial flow fans with a static pressure of 400 Pa.
- Fans factory wired with an electrical junction box.
- Internally enhanced Copper tubes (For R22, R134 A)/ Plain SS304L or Aluminum tubes (For R717 Applications) Degreased and mechanically expanded With Aluminum fins, fin spacing varying from 3.175 mm to 4.23 mm furnace Brazed.
- Mixing chamber with Pressurized plenum for air discharge .
- 100% dry system with no water use for increasing Relative Humidity.
- Huge coil face area with special coil circuiting to ensure low coil LMTD

Quality Assurance

- All the Pre-coolers are made to comply with EC Machine Directives 89/392/EEC
- Safety of Electrical Appliances: As per EN/60/335-1 (CE61-50)
- Safety Applications as per CE-EN60/335-2-40 applicable for all air conditioners
- Electromagnetic Compatibility as per 89/336 EEC
- Low Tension application as per 73/23 EEC
- Fan Guards as per safety norms EN 294
- Coils Pressure tested to 250 Psig

Equipment

General :

Factory-assembled, two piece, high humidity, forced draft Pre-coolers, factory wired capable of working with refrigerants R22, R134A, R717.

Unit Cabinet :

Unit cabinet in single skin construction constructed of galvanized steel, coated with corrosion resistant epoxy powder coat paint of 50 to 100 micron thickness. All angular profiles made of Aluminum powder coated

Fans :

- Tube Axial flow fans with following degrees of protection:

  Degree of Protection for Motors: IP44

  Degree of Protection for Junction Box IP55.

- All Fan blades statically and dynamically balanced with adjustable pitch Blades for varying air quantity of fan along with effective static pressure

- Fan casing seamless non-welded with flange and motor mount epoxy powder coated, so designed to ensure maximum throw and even distribution.
- AMCA certified fans
- Static Pressures varying from 200 Pa to 500 Pa depending on storage box patterns

Evaporator Coil :

- Choice of three Tubes with Copper, SS304 or Aluminum based on application, Fining done with Aluminum.
- Tubes degreased and mechanically expanded, tested under a pressure of 250 Psig.
- Copper tubes are internally enhanced with rake ridges to increase the heat transfer coefficient.
- All Direct Expansion Coil provided with a multiple hole brass distributor and thermostatic expansion valve, while Flooded and Overfeed liquid systems provided with orifice plates in the headers to ensure even feed to all circuits.
- Choice of Half, Full Double Circuits available to ensure minimum pressure drop of refrigerant through coil.
- Built on COMPUTATIONAL FLUID DYNAMICS MODEL all coils are so designed for low dehumidification and frost accumulation and high turbulent flow ensuring a lesser surface area for high heat transfer.
- All coils are of staggered construction with variable fin pitch starting from 3.175 to 4.23 mm.

Refrigeration Components :

Pressure Ports are so provided to measure and thereby adjust coil superheat correctly, which can save energy in the excess of 8%.

Controls and Safeties :

Based on the coil temperature circuit feeding takes place and the Compressor gets actuated. Special microprocessor controls capable of drive actuation and circuit bypass are provided so that coils dehumidification does not take place.

- Control wire terminal blocks.
- Solenoid valves provided to ensure minimum coil dehumidification.

Electrical Requirements :

- Nominal unit electrical characteristics are 400 v, 3-ph, 50 Hz. The unit is capable of satisfactory operation within voltage limits of 380v to 420 v.
- Unit electrical power is a single-point connection.
- Unit control circuit is 220 Volts.

Special Features (OPTIONAL) :

- Fan Parking for High Discharge Pressure
- Varicoil Control
- User Defined Humidity Evaporators
- Unit-Mounted, Non-Fused Disconnect Switch In case of emergency:

Benefits :

- Increase shelf life by removing field heat fast.
- Rapid cooling systems with quick product turn around.
- Efficient operation.
- Modular construction allows for relocation.
- Simple installation compared to plenum type pre cooling systems.
- No special ducting required.
- No water resistant cartons required.
- Fans can operate at relatively high static pressures.
- More energy efficient than room cooling.
- Pre-cooling Equipment can be located in existing cold rooms.
- Ensures zero product shrinkage No more chill injury for your fruits and vegetables, dry rooms, no wet surfaces and no algae and fungi deposits due to loose water particles in the room.

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