

Cooling System

A high capacity" precision cooling in room with high availability (HA) " air conditioning unit designed to maximize sensible cooling for high efficiency operation.

This feature enables data center for sensible cooling of the IT load and humidity control of the entire data center.

General Terms & Conditions

1	Product should be CE Certified and complying to international standards.
2	Must Quote Onsite Design, Configuration & Installation
3	Must Provide OEM Manufacturer Authorization Letter
4	The Returning Organization (RO) must not be blacklisted in the past by any Federal and/or Provincial Organization.
5	OEM must be present in Pakistan with their representative and MAF Letter should be issued by their representative

General Summary

These specifications describe requirements for Mission Critical Cooling system. The system shall be designed to control temperature and humidity conditions in rooms containing electronic equipment, with good insulation and vapour barrier. The manufacturer shall design and furnish all equipment to be fully compatible with heat dissipation requirements of the room.

Product Specification

1. Overall Parameters

- 1)* The system shall have a total cooling capacity of atleast 20kW, with a sensible cooling capacity of atleast 19kW, based on an entering air of 24°C dry bulb and 50% Relative Humidity. Air quantity atleast 6000 m3/h.
- 2)* The unit is to be supplied with 380-460volt/3ph/50-60Hzfor indoor unitand outdoor unit. The outdoor unit connects power from indoor unit.

2. Cabinet & Frame Section

- 1) The exterior panels shall be constructed of zinc coated sheet steel and insulated with foam insulation. The cabinetofindoorunit shall be powder coated in RL9005 color.
- 2) The size of indoor unit is 750mm(width) * 700mm(depth) * 1900mm(height).
- 3) The front door of the cabinet is steel type with locking.

3. Fan Section

- 1)* The indoor unit fan type is EC Fan with backward curved blades and external rotor.
- 2) The fans shall be located to draw air over the coil to ensure even air distribution and maximum coil performance.
- 3) The fan assembly shall be easy to replace with cable connection terminals.

4. Air Filter Section

- 1) The rated efficiency shall be to EU4/G4 standards.
- 2) The filters shall be an integral part of the system and withdrawable from the front of the unit. Filtration shall be provided by flat form, dry disposable media housed in a metal frame.

5. Controller and Display System Section

- 1) The controls shall be composed of the following components.
 - a) Microprocessor control board of Carel brand housed inside the electrical cabinet.
 - b) Standard seven-inch LCD touch screen display (color) mounted and viewed from the front of the unit.
- 2) The microprocessor control board shall contain the settings and programs of all the stored operating parameters which can be used, viewed, and set on the user display interface.
- 3) User interface (7-in. LCD touch screen display) shall be password protected, and menu driven.
- 4) The auto restart feature will automatically restart the system after a power failure.
- 5) The unit shall include modbus-RTU protocol via RS485 for remote monitoring integration, and an optional network port activated by license to provide management through a computer network SNMP.
- 6) Management through the network shall include the ability to change setpoints and view and clear alarms.
- 7) The controller shall come with a web-server that allow browser logon the unit address to view working status.
- 8) The high pressure and low pressure of refrigerant system shall be recorded in the controller and be viewed with curve and data through display.
- 9) The controller shall be able to work in teamwork mode with more than 64 units as one group.
- 10) The electric box shall be front accessible for easy maintenance.

6. Refrigeration System

- 1) The refrigeration system shall be of the direct expansion type with variable capacity and incorporate one inverter compressor.
- 2) The system shall include a high pressure switch, high & low pressure transducer, electronic expansion valve, high sensitivity refrigerant sight glass, large capacity filter drier.
- 3) The evaporator coil shall be slab shape incorporating draw-through air design for uniform air distribution. The coil shall be constructed of enhanced surface aluminium fins mechanically bonded to enhanced surface copper tubes. The coil frame is fabricated from anti-corrosion aluminium sheet metal and the stainless steel condensate drip tray.

7. Remote Condenser Section


- 1) Factory matched air cooled condensers shall be the low profile, weatherproof type incorporating inverter driver, and high efficiency direct drive external rotor motor with axial blade fans.
- 2) The condenser shall be constructed from corrosion resistant components.
- 3) The high performance heat exchanger condenser shall include mechanically expanded enhanced surface copper tubes and aluminium fins for efficient heat transfer.

8. Reheater Section

- 1) The reheating capacity shall be no less than 6.0 kW
- 2) Shall consist of PTC (Positive Temperature Coefficient) heating elements, complete with reset over temperature thermostat to cut off the power supply to the heater and activate an alarm in the event of overheating.

9. Humidification Section

- 1) The humidification capacity shall be no less than 4.5 kg/h.
- 2) Humidifier shall be self-contained, steam-generating type, factory piped and wired.

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10. Installation Services

- 1). End to End Installation should be done by bidder/OEM team including copper piping, drain pipe, PPRC, etc
- 2) Auto Phase Reversal Panel should also be included at the input side.
- 3) Dedicated Water supply with filter for Precision Cooling units should be installed
- 4) Three years warranty should be included.
- 5) Quarterly Preventive Maintenance should also be included.

Quote Services as per below BOQ:

Description	Qty.	UOM
IDU & ODU unpacking, Assembling, placement & Fixing	2	No.
Supply & Installation of 7/8" copper Tube with insulation, where necessary, complete in all respect (Trox / Mueller)	140	Rft
Supply & Installation of 5/8" copper Tube with insulation, where necessary, complete in all respect (Trox / Mueller)	140	Rft
Supply of UPVC pipe for condensate drain size 1" dia with insulation where necessary, complete in all respect	100	Rft
Supply of PPRC pipe for humidifier water supply size 25mm OD with valves, accessories, complete in all respect	100	Rft
Supply and installation of water filter for humidifier	1	No.
Flushing, Pressure testing and vacuum of refrigerant circuits	2	Cir.
Supply & Charging of Refrigerant R-410 (Frio+/Honeywell)	3	Cyl.
Supply, laying and termination of control cable between indoor to outdoor units with PVC conduiting where necessary, complete in all respect	150	Rft
AC ODU Brick PADs size 12" x 12" x 18"	2	Nos.
Supply, fabrication and installation of Powder coated metallic Trunking (18 Swg) with Hangers & supports (12" x 3") complete in all respect.	80	Rft.
Supply and implementation of outdoor header coating for environmental protection	2	Nos.
Testing Run and Commissioning Support	2	Nos.
Supply & Installation of Phase Reversal Panel	1	Job
Water Filers	2	Nos
Quarterly Preventive Maintenance (Optional)	6	Nos



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