CEILING HUNG COMPUTER ROOM AIR HANDLER

1.0 GENERAL

This section covers the specification of the **Computer room air-handler for data centre** which requires clean air well distributed with precisely controlled temperature and humidity for high sensible heat environment.

1.1 COMPUTER ROOM AIR CONDITIONING UNIT

Each unit shall be a complete environmental control unit factory packaged, wired, tested and specifically designed to provide temperature, humidity and dust control for computer room or telecommunications installations. Each unit shall be of **Visiontec** M**inicool ceiling mounted Computer room air-handler complete with advanced microprocessor control and high sensible heat factor** to suit the equipment cooling need.

2.0 INDOOR UNIT

2.1 FRAME AND CABINET

The casing of the unit shall be of heavy gauge steel panels, insulated with 12 mm thick x 1 ½ ib per cu. Ft mat faced fiberglass, tightly fitted with gasket on rigid frame, to guard against leaks of conditioned air and sound attenuation. The unit shall have welded structural steel frame for maximum strength. Side panel shall be easily opened and removed to all unit components for maintenance.

2.2 COIL SECTION

The unit shall be designed for **draw through application with large face areas for low velocity** to reduce turbulence, noise and provide greater efficiency in the cooling and dehumidification process. The cooling coils shall be of seamless copper tubes mechanically bonded to **hydrophilic coated aluminum fins** for cooling performance enhancement as well as corrosion resistance and tested under water to 2800 kPa. The chilled water flowrate shall be controlled using built-in modulating control valve.

2.3 BLOWER SECTION

The blower shall be **centrifugal forward curve, double width, double inlet blower** configuration for quiet operation. The unit shall be a direct drive system to minimise friction resistance and air contamination. The blower motor(s) shall be of **3-speed control system and connected to highest speed for maximum air-change.** The blowers shall be statically and dynamically balanced to ensure low noise and vibration. The motor shall be totally enclosed single phase PSC type.

2.4 FILTERS

The filter chamber shall be an integral part of the system, designed within the frame and cabinet. The filters shall be disposable type of **EU 4 equivalent to 90 % arrestance** based on ASHRAE 52-76.

2.5 ELECTRICAL REHEAT

The unit shall have minimum **three (3) stages stainless steel finned tubular electric reheat** coils capable of providing ample capacity to maintain room dry bulb conditions during a system call for dehumidification. The reheat shall be installed on the air discharge side of the cooling coil and shall have min. Three (3) stages to provide more accurate controlled response to the requirements of the sensitive equipment. The heating elements shall be protected by thermal safety switches.

4.0 MONITORING AND CONTROLLING SYSTEM

The controller shall be of latest state-of-art **16-bit microprocessor DDC controller.** The controller shall be linked to wall mounted liquid crystal display for ease of operation and maintenance. It shall display data centre's temperature, humidity, airflow, cleanliness and shall be able to provide component run times, alarm history, an automatic self-test of the microprocessor on system start-up. All of these messages shall be spelled out in full English Language on the liquid crystal display. Multiple alarms shall be able to be displayed sequentially in order of occurrence. The controllers of each units shall be able to be linked in a **network up to 8 units to provide duty/standby and lead-lag control.** It shall be **Modem, GSM and SMS ready** for alarm reporting. It shall have option of **Modbus, SNMP, Bacnet and Metasys protocol** to allow remote monitoring by building management system. It shall also able to linked to third party building management system (i.e. Bacnet, Lonwork, Modbus and SNMP) via standard gateway or communication card.

The user-friendly menu selection switch shall permit step-by-step programming and display of the following functions:

- Temperature set point 18 ^{o}oC to 29 ^{o}oC (65 ^{o}F to 85 ^{o}F)
- Temperature sensitivity 0.5 ^{o}C to 2.7 ^{o}C (1^{o}F to 5 ^{o}F)
- Humidity set point 40% to 60% RH
- Humidity sensitivity 1% to 10% RH
- Temperature alarm points
- Humidity alarm points
- Unit start time delay
- Current temperature (^{o}C or ^{o}F)
- Current humidity (%RH)
- Cooling stages 1, 2 as applicable
- Heating stages 1,2,3

- Humidification
- Dehumidification
- Current % of capacity and the average % of capacity for the last hour of operation for compressors, humidification, dehumidification, reheat and chilled water.

The unit shall have standard alarm system as follows:

- Compressor high pressure
- High and low temperature
- High and low humidity
- No air flow
- Change filter
- Humidifier failure
- Manual override
- Power failure restart
- Compressor short cycle
- Temperature sensor error
- Humidity sensor error
- Firestat tripped
- Local alarm (programmable)
- Maintenance due

The unit control shall have built-in fire relay which will receive fire stop signal and stop the unit operation during fire mode but the **control display shall be still operational** and give fire alarm.