

**COMPUTER ROOM AIR
CONDITIONING UNITS**

General

The Close Control Air Conditioning units shall be of the floor mounted, self-contained factory assembled, vertical, water cooled, air cooled or chilled water type as specified.

The units shall be of the type specifically designed for computer applications and shall be Hirotec or approved equal.

Each unit shall have, as a minimum, the capacity specified under the nominated conditions excluding heat input from fan motors.

The unit(s) shall be complete with casings, insulation, fans, refrigeration compressors, motors, DX valves, cooling coils, water cooled or air cooled condenser, humidifier, condensate pan and air filters, operating and safety controls and all other components necessary for essential operation of the unit.

The unit shall be completely pre-piped, pre-wired and ready for final pipe and electrical connections on the site.

Cabinet Construction

The cabinet frame shall be constructed from industrial grade aluminium box section support on a heavy gauge (___G.A) steel base suitably stiffened to supported the larger internal components within the base of the unit.

Panels shall be formed in zinc-anneal corrosion resistant sheet steel insulated with 25mm insulation fire rated to Australian Standard 1530 (indices 0,0,0,3)

The access doors for installation and service of the unit shall be front only, hinged for access and locked via ¼ turn tool operated hardware. An electrical disconnect isolator shall be located on the electrical access door.

The cabinet shall be powder coated with RAL 7035 colour and have a textured finish.

Fans

Supply air fans shall be of the forward curved centrifugal type DWDI dynamically and statically balanced to minimise vibration and noise. Fans shall be supported by self aligning ball bearings or sleeve bearings designed for a minimum life span of 40,000 hours and driven either by direct drive or through fixed pulleys.

An adjustable base for the drip proof metric frame motor shall be provided with the motor being sized for minimum of 110% of fan horsepower. All motors shall be sized for non-overloading capacity of the fan.

Coils

Coils shall have copper tubes and aluminium fins, evenly spaced, with a firm bond between fins and tube, not less than three rows deep, fitted with a stainless steel condensate pan.

The coils shall be complete with distribution header, and all necessary accessories and shall be connected to the compressor in a manner to ensure oil return and to prevent liquid reaching the compressor.

Coil face velocity shall not exceed 2.7 m/s

Refrigeration System

Each unit shall be equipped with at least two hermetic compressors, operating a minimum of two independent refrigeration circuits. Units with a cooling capacity less than 20kW, a single refrigeration circuit is acceptable.

Note: Single refrigeration circuit units may require hot gas capacity control if the room load is below 50% of the unit capacity.

Each circuit shall have a sight glass, moisture indicator, high pressure (manual reset) and low pressure (automatic reset) cut-out switch, thermal expansion valve, liquid line filter drier and interconnecting piping to form a complete refrigeration circuit.

Air cooled units shall be supplied with its refrigerant circuits charged with dry nitrogen and sealed

Water Cooled Condenser

The refrigeration circuit for water cooled units shall include a water cooled condenser/heat exchanger that shall be of the high efficiency counter flow stainless steel plate type. Water flow shall be controlled by a 2-way factory fitted, pressure actuated water regulating valve, installed inside the unit.

Compressor

The compressor shall be of high efficiency design, with an E.E.R of not less than 10.8 BTUH/watt (C.O.P of not less than 3.16) at ARI rating conditions. Each compressor shall have inbuilt overloads and be mounted on vibration isolators located on the steel base plate frame.

Humidifier

Humidification shall be provided by boiling water in a high temperature, polypropylene steam generator.

The humidifier shall have an efficiency of not less than 1.3kg/kW and be fitted with an auto flush cycle activated on demand from the unit's control system.

The humidifier shall be serviceable and waste water shall be flushed from the humidifier by activating the solenoid drain water valve.

Supply water to humidifier to include 1mm mesh strainer to prevent larger contaminants entering the system.

The steam shall be distributed evenly into the air-stream of the unit and the humidifier shall be capable of providing the moisture rate nominated in the schedule.

Heater

Electric heating elements shall be black heat finned type as per schedule and protected by a manually reset thermal cut out. The heater shall be wired to give an equal loading on all phases.

Filtration

Filtration shall be provided by dry media disposable filters capable of filtering the air to 95% efficiency (AS 1132) and removable from the front or the top of the unit.

Controls

The controller shall be a microprocessor based programmable logic controller that displays operating modes of cooling, heating, humidification and dehumidification on the panel. The panel shall also display unit number,

date, time, set and actual temperature, set and actual humidity, plus LEDs indicating power available, unit operating and active alarm.

The panel shall also indicate the unit status such as "OFF", "OPERATING" or "STANDBY" and whether the unit controlled locally or remotely. Fault indications shall be displayed on the panel visually in English and audibly with a mute button to silence the alarm.

The controller shall have the capability to connect up to (16) units in a network, and up to (3) units in the network shall be able to operate in a standby mode. Units operating in the network shall be able to be configured to function in the following modes.

"RUN - STANDBY" where the units rotate between duty and standby to share the run hours for the system.

"MASTER SLAVE" where (3) units may be selected in a sleep mode and these units become active if the operating units are unable to maintain the desired conditions. The selected master unit will not permit other units in the network from operating in opposing modes to its operation.

"SEQUENTIAL/CASCADE" where additional units in the network may be brought into operation to assist in maintaining room conditions.

The controller shall include :-

- Auto-restart after power failure with an adjustable delayed start.
- Lead/lag compressor operation (automatic)
- Temperature control priority over humidity.
- Fan "Run On" after the unit is stitched off. (adjustable)

- Fan operation on condenser water failure.
- Fault indication selected as "**ALARM**" or "**WARNING**"

Humidifier is capacity adjustable between 30% and 100%.

The controller shall include five (5) digital voltage free outputs to indicate an alert condition, the standard factory set alerts shall be

- Common Alarm (VFC)
- Unit Operational(VFC)
- High Temperature Alarm(VFC)
- High Humidity Alarm (VFC)
- Flood Indication (VFC)

Local screen display shall include the following:-

- High Return Air Temperature
- Low Return Air Temperature
- High Return Air Humidity
- Low Return Air Humidity
- Loss of Air
- Fan Motor Overload
- Compressor HP
- Compressor LP
- Element overheat
- Temperature probe faulty
- Humidifier low water
- Humidifier fault (NO CURRENT)
- Humidifier high current
- Loss of Condenser water
- Loss of Power terminal loss
- Supply air temperature (Optional)
- Clogg Filter (OPTION)
- Water under floor (OPTION)

A high level interface shall be available as an option via a RS 485 serial board to permit communication via Modbus to remote locations.

The controller shall be password protected to prevent unauthorised modifications to the settings, the levels of access shall be, USER, SERVICE, MAINTENANCE and FACTORY.

A Graphic panel shall be available to display room temperature and humidity in graphical form over the past 24 hours. The graph parameters shall be adjustable to permit more precise inspection of the graph and scrolling of the graph to compare individual time periods.

Options available for the controller shall include :-

The controller shall include a Electronic Flood Detector to indicate the presence of moisture at the position of the sensing element and the detector shall be capable of having (20) sensing elements connected to the system.

OR

The controller shall include an Electronic Cable Sensing system to pinpoint the presence of moisture over the area covered by the cable. The cable shall be available in various lengths to suite the site requirements plus the option of a visual display panel to identify the moisture location in the area covered by the cable.

The controller shall include a Clogg Filter sensor to indicate via the controller when the filter requires changing.