**General Description:** The Marvair DAC (Door Air Cooling) and WAC (Wall Air Cooling) units are direct air cooling units designed to provide free cooling for telecom shelters and cabinets. The DAC is designed for installation on a door and the WAC is designed to be mounted on a wall.

The units consist of a 48 VDC backward curved, single inlet electronically commutated centrifugal fan, an outside (intake) air assembly with a motorized damper, a 4” (102 mm) disposable filter with a MERV value of 10, and the CoolLinks control board housed in a steel cabinet. Pressure relief is provided by a powered exhaust damper on the opposite side of the shelter or cabinet. Placement on the opposing wall ensures optimal air circulation throughout the building. An anti-corrosion protective coating on the cabinet and the internal components is available as an option.

**Operation:** On a call for cooling from a temperature sensor located in the building, the centrifugal fan in the DAC/WAC turns on and both the outside air damper in the unit and the external exhaust damper open. The fan speed varies based on the difference between the current building temperature and the first stage cooling set point temperature of 90°F (32.2°C). As the temperature approaches the set point, the fan speed increases to a maximum of 100% of rated air flow and, as the temperature recedes from the set point, the fan speed decreases to the minimum of 5% of rated air flow.

If the DAC/WAC is operating and the temperature rises above the first stage cooling set point of 90°F (32.2°C), the DAC/WAC will continue to operate and the evaporator blower in the ComPac air conditioner will turn on. If the temperature rises above the second set point temperature of 100°F (37.8°C), the DAC/WAC is turned off, the motorized damper and exhaust damper are both closed and the ComPac air conditioner turns on in mechanical cooling. The air conditioner runs until the temperature drops below the mechanical cooling disable set point of 80°F (26.7°C). At this point, the DAC/WAC is turned on and both the motorized damper and exhaust damper are opened. The ComPac air conditioner can also be turned on to provide a comfortable working temperature when technicians are in the shelter. Whenever the ComPac air conditioner is on, the DAC/WAC is turned off and all louvers are closed.

**CoolLinks™ 2.0 controller.** The DAC and the WAC and the air conditioner in the shelter or cabinet are controlled by the CoolLinks 2.0 controller.

**GENERAL**

1. The door mounted direct air cooling unit is to be manufactured by Marvair®, a division of Airxcel™, Inc., Model DAC2000S-X00. *(See the Model ID in the DAC product Data Sheet for a description on the model designation).* The door mounted direct air cooling unit shall be completely factory wired, assembled and tested, and shall include the DC air movers, the outside air intake assembly, a 4” (102 mm) filter, a CoolLinks control board and other necessary components in a corrosion resistant cabinet. All field wiring shall be in accordance with the National Electric Code and all local codes.

**APPROVALS**

1. The complete package shall be ETL Listed and tested to the current edition of UL Standard 1995 and the current edition of CAN/CSA-C22.2 No. 236-11. For quality assurance, the manufacturer of the direct air cooling unit shall be ISO 9001:2015 certified.

**CABINET**

1. The cabinet shall be constructed of 20 gauge zinc-coated, galvanized G90 steel with satin pebble grey polyester finish. The finish shall be highly resistant to abrasion, metal marking, staining, pressure mottling and require minimal maintenance. The cabinet shall include a sloped top and built-in mounting flanges for mounting on a door.

**AIR MOVERS**

1. The air mover shall be a backward curved, single inlet, electronically commutated (EC) centrifugal fan for operation on a nominal voltage of 48 VDC. The nominal voltage operating range shall be 36 to 57 volts. The motor shall have thermal overload protection. The impeller shall be constructed of aluminum. Operating temperature range shall be from minus 13°F (-25°C) to 140°F (60°C). Nominal air flow with the filter in place shall be 2,000 cfm.

**FILTER**

1. The filter shall be a 100% synthetic graduated density media continuously bonded to a 30 gauge galvanized, corrosion resistant, expanded metal support grid with an effective open area of 96%. The media shall be resistant to a wide range of chemicals, shall not absorb moisture and shall not support microbial growth. The diagonal support members of the frame shall be bonded to the entering and exiting apexes of each pleat to prevent pleat collapse and filter bowing. The filter shall be 4” (102 mm) thick have a MERV value of 10 (standard) or 11 (optional) (*select one)*.

**ELECTRICAL DISCONNECT**

1. The unit shall have a factory installed disconnect.

**OUTSIDE AIR DAMPER ASSEMBLY**

1. The outside air intake damper assembly shall be complete with a spring-return damper and actuator. The actuator shall be a direct mount onto the damper. Belts shall not be permitted.

**EXHAUST AIR DAMPER ASSEMBLY**

1. The outside air intake damper assembly shall be complete with a spring-return damper and damper actuator. The actuator shall be a direct mount on the damper assembly. Belts shall not be permitted.

**CONTROL CIRCUIT**

1. The DAC internal control circuit shall consist of a factory-installed electronic circuit board and shall be powered directly from an external 48 VDC source. This circuit board shall operate the indoor fan motor, the outside air damper and the outside air temperature and humidity sensor and shall have LEDs to indicate power status and fault conditions to assist the service technician. Communication to the CoolLinks 2.0 controller shall be accomplished through an on-board RJ45 Ethernet port.
	1. Modes of Operation

Normal*:* Upon a call for cooling from the CoolLinks 2.0 controller, the outside air damper and exhaust vent will be fully opened and the indoor fan will be set to the speed determined by the controller. The fan speed will be variable between 5% and 100% of rated motor speed and will be calculated by the controller based on the inside and outside ambient air temperature and humidity conditions. An interlock will prevent operation of the indoor fan if the outside air damper is not open.

Standalone or Emergency Ventilation: If the circuit board in the DAC unit is unable to communicate with the controller for a period of sixty seconds, the circuit board will automatically select standalone mode. In standalone mode, the outside air damper will be fully opened and the indoor fan will operate at the last speed determined by the controller. When communications with the controller is restored, the control board will automatically drop out of standalone mode and return to normal controller-defined operation.

**CONTRACTOR INSTALLATION**

11.0 The DAC air cooling unit shall be installed in accordance with the written instructions provided by Marvair. Line and control voltage connections shall be made to the appropriate terminals within the unit’s control box.

**CORROSION PROTECTION OPTION (Select if Desired)**

12.0 **CoaT-all Corrosion Protection**

All metal components, including all exposed internal and external sheet metal and the damper assembly shall have an anti-corrosion coating speciﬁcally designed for the protection of HVAC components. The coating shall be UV and impact resistant. External fasteners shall be corrosion resistant.

*Marvair*® *is committed to continued product improvement, please consult Marvair's website at www.marvair.com for latest product literature. Specifications subject to change without notice. Unit must be installed in accordance with installation instructions. A complete warranty statement can be found in the Installation/Operation Manual, on our website or by contacting Marvair at 229-273-3636.*

**GENERAL**

1.0 The wall mounted direct air cooling unit is to be manufactured by Marvair®, a division of Airxcel™, Inc., Model WAC2000S-X00. *(See the Model ID in the DAC/WAC product Data Sheet for a description on the model designation).* The wall mounted direct air cooling unit shall be completely factory wired, assembled and tested, and shall include the DC air movers, the outside air intake assembly, a 4” (102 mm) filter, a CoolLinks control board and other necessary components in a corrosion resistant cabinet. All field wiring shall be in accordance with the National Electric Code and all local codes.

**APPROVALS**

2.0 The complete package shall be ETL Listed and tested to the current edition of UL Standard 1995 and the current edition of CAN/CSA-C22.2 No. 236-11. For quality assurance, the manufacturer of the direct air cooling unit shall be ISO 9001:2015 certified.

**CABINET**

1. The cabinet shall be constructed of 20 gauge zinc-coated, galvanized G90 steel with satin pebble grey polyester finish. The finish shall be highly resistant to abrasion, metal marking, staining, pressure mottling and require minimal maintenance. The cabinet shall include a sloped top and built-in mounting flanges for mounting on a wall. To prevent water intrusion, the cabinet shall have ½” spun aluminum filters on all intake air openings.

**AIR MOVERS**

1. The air mover shall be a backward curved, single inlet, electronically commutated (EC) centrifugal fan for operation on a nominal voltage of 48 VDC. The nominal voltage operating range shall be 36 to 57 volts. The motor shall have thermal overload protection. The impeller shall be constructed of aluminum. Operating temperature range shall be from minus 13°F (-25°C) to 140°F (60°C). Nominal air flow with the filter in place shall be 2,000 cfm.

**FILTER**

1. The filter shall be a 100% synthetic graduated density media continuously bonded to a 30 gauge galvanized, corrosion resistant, expanded metal support grid with an effective open area of 96%. The media shall be resistant to a wide range of chemicals, shall not absorb moisture and shall not support microbial growth. The diagonal support members of the frame shall be bonded to the entering and exiting apexes of each pleat to prevent pleat collapse and filter bowing. The filter shall be 4” (102 mm) thick have a MERV value of 10 (standard) or 11 (optional) (*select one)*.

**ELECTRICAL DISCONNECT**

1. The unit shall have a factory installed disconnect.

**OUTSIDE AIR DAMPER ASSEMBLY**

1. The outside air intake damper assembly shall be complete with a spring-return damper, linkage and damper actuator. Belts shall not be permitted.

**EXHAUST AIR DAMPER ASSEMBLY**

1. The outside air intake damper assembly shall be complete with a spring-return damper and damper actuator. The actuator shall be a direct mount on the damper assembly. Belts shall not be permitted.

**CONTROL CIRCUIT**

1. The WAC internal control circuit shall consist of a factory-installed electronic circuit board and shall be powered directly from an external 48 VDC source. This circuit board shall operate the indoor fan motor, the outside air damper and the outside air temperature and humidity sensor and shall have LEDs to indicate power status and fault conditions to assist the service technician. Communication to the CoolLinks 2.0 controller shall be accomplished through an on-board RJ45 Ethernet port.

10.0 Modes of Operation

Normal*:* Upon a call for cooling from the CoolLinks 2.0 controller, the outside air damper and exhaust vent will be fully opened and the indoor fan will be set to the speed determined by the controller. The fan speed will be variable between 5% and 100% of rated motor speed and will be calculated by the controller based on the inside and outside ambient air temperature and humidity conditions. An interlock will prevent operation of the indoor fan if the outside air damper is not open.

Standalone or Emergency Ventilation: If the circuit board in the WAC unit is unable to communicate with the controller for a period of sixty seconds, the circuit board will automatically select standalone mode. In standalone mode, the outside air damper will be fully opened and the indoor fan will operate at the last speed determined by the controller. When communications with the controller is restored, the control board will automatically drop out of standalone mode and return to normal controller-defined operation.

**CONTRACTOR INSTALLATION**

10.0 The WAC air cooling unit shall be installed in accordance with the written instructions provided by Marvair. Line and control voltage connections shall be made to the appropriate terminals within the unit’s control box.

**CORROSION PROTECTION OPTION (Select if Desired)**

11.0 **CoaT-all Corrosion Protection**

All metal components, including all exposed internal and external sheet metal and the damper assembly shall have an anti-corrosion coating speciﬁcally designed for the protection of HVAC components. The coating shall be UV and impact resistant. External fasteners shall be corrosion resistant.

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