



CLIMATEWORX
INTERNATIONAL

MISSION CRITICAL Air Conditioning Systems

Maintenance Guide

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MAINTENANCE

The ClimateWorx *Series Vertical Floor Mount* family computer room air-conditioning unit employs carefully selected components of proven quality to ensure prolonged trouble-free operations. Maintenance-free solid state controllers also enhance the reliability of the whole system.

ClimateWorx uses one microprocessor controller to centralize all control and monitoring functions which makes the machine user friendly and simplifies maintenance routine and fault finding procedure. The maintenance practice which are given below are for guidance only and are for general service and maintenance to minimize wear and tear resulting from normal operation and for insurance that the machine will be operating under the most efficient condition.

Maintenance is classified into two categories, i.e. general service and preventive maintenance. General service, including regular inspection may be carried out by unskilled personnel of the client. Preventive maintenance however must be performed by competent service personnel familiar with the servicing of air-conditioning, electrical and electronic engineering equipment. Our authorized service agents have been carefully chosen to provide efficient and quality service to our clients.

GENERAL SERVICE AND INSPECTION

Although the status of the machine and the environmental conditions are under the constant surveillance of the controller and any abnormality will be announced either as out-of-limit warning or alarm, there is, however no place for complacency if efficient and reliable service is demanded from these well engineered machines. We recommend that the following procedures should be followed.

REGULAR INSPECTION

The machine should be inspected periodically to ensure that no unusual noise or changes in operation are present. Any abnormalities should be investigated immediately by qualified air-conditioning personnel.

SENSOR CALIBRATION CHECK

This procedure should be followed if sensor is found to be out of calibration.

Advanced M52 Sensor Calibration

1. Go to setting tab on page 6 and scroll down to the bottom of the page where you will find Temperature and Humidity offset settings. While measuring the actual temperature and humidity in the space you can make adjustments to these settings to have the sensor read the space temperature and humidity more accurately. This is the only calibration function available. If the sensor is still reading out of specification sensor should be replaced.

M52 Sensor Calibration Temperature

2. Power off unit, locate temperature/humidity sensor board and set the jumper, JP1, to points 1 and 2 for zero setting. The pin 1 and 2 of the sensor board should read approximately 1000 ohms which corresponds to 0°C for the Hycal PT100 sensor.

3. Switch unit on, wait 60-120 seconds, and login to security level 1. Go to the sensor page under the [Test mode] tab, press the “Def.” and then “Set 0” key next to the temp1 reading. The Temp1 reading should now read 0° C
4. Power off the machine and reset the jumper, JP1, to point 3 and 2 on the sensor board.

The zeroing of the temperature sensor is now complete. You can further fine tune sensor to what you actually measure by simply entering the measured temperature in ° C in the Main Temp setting under the [Setting] tab.

Relative Humidity

There is no zeroing function for the humidity sensor.

1. Login security level 1. Go to the sensor page under the [Test mode] tab and press the “Def.” Key next to the Humid. 1 reading.
2. If required, fine tune sensor to what you actually measure by simply entering the measured relative humidity in the Main Humidity setting under the [Setting] tab.

SERIES V Calibration procedure

This procedure should be followed if sensor is found to be out of calibration or changed.

Switch unit on and allow room to stabilize. Measure dry bulb temperature and relative humidity using a sling- psychrometer or similar device. Enter top security mode (see user guide) and enter the dry bulb reading into address 44 on the controller'. Enter relative humidity into address 47 on the controller. This adjusts the correction factor in the controller automatically calibrating the sensor.

- 1) If the unit is set to display in °F enter the actual room temperature in °F minus 32. ie: Room temperature is 68 enter 36 in address 44

PREVENTIVE MAINTENANCE: QUARTERLY

For the machine’s warranty to be valid, regular maintenance comprising four visits per annum should be undertaken by qualified personnel or staff of our appointed agents.

REPLACEMENT OF AIR FILTERS

Visually check the air filters for cleanliness. If in doubt, use a manometer to measure the pressure differential before and after the filter. If the pressure-drop is more than 0.8 inches w.g., the filters should be replaced. Ensure filters being replaced are being replaced with filter with the same MERV rating.

I. Changing filters on down flow machine

Switch off the machine and open the side panel(s) of the machine on either (or both) side. The filters are on the upper part of the unit and can be taken out by sliding the filter horizontally out from the machine. After removing all dirty filters, put new clean filters in ensuring that airflow direction arrow points into machine. Restore panels back to the machine.

II. Changing filters on up flow machine

Switch off machine, open the side panel(s) on the rear return air machines or the front panels on standard machines. The air filters can be taken out by sliding horizontally to either end of the machine. Install clean filters and ensure that airflow direction arrows point into machine. Restore plenum panels onto the machine.

III. Changing filters on packaged air cooled section only

Switch off machine, open the side panel(s) on the condenser section. The air filters can be taken out by sliding horizontally to either end of the machine. Install clean filters and ensure that airflow direction arrows point into the machine. Securely close and latch panels(s) and switch on the machine.

MICROPROCESSOR CONTROLLER

The state-of-art solid state microprocessor based controller is virtually trouble free and little or no maintenance is needed. Quarterly checks of the following are recommended for efficient operation of the machine. To control individual operations refer to ClimateWorx User Guide pages 34 to 36.

Note: The fan must be kept running through individual tests.

1. Check controller display.
2. Check alarm operation and calibrate where necessary.
3. Check accuracy of sensors and calibrate where necessary.
4. Check weekly operation program and real time clock.
5. Check keyboard functions.
6. Check output voltage of controller.

POWER PANEL

1. Check operation of all MCBs, and contactors.
2. Check current in each motor and heater circuit.
3. Check operation of overload devices.
4. Check cable terminations for tightness.

COMPRESSOR LUBRICATION

The refrigeration compressors must have adequate lubrication to ensure trouble-free operation and a long life. On the start-up of any new system, some oil will be lost to coat the inside of the piping, some logged in low velocity areas of the system, and some will be kept in circulation. This lost oil must be made up by adding new oil to the system after the initial start-up. Very low compressor oil levels can cause complete loss of lubrication and may result in an immediate compressor failure if not protected against.

The loss of oil can also be caused by flooded starts or refrigerant migrating to the oil during an off period and pulling the oil out of its sump during the sudden pressure drop of a start-up.

The level should be observed in the sight glass immediately after the compressor shutdown, while it is still warm. The level observed when the compressor is not running for a long period may be a mixture of oil and refrigerant which would not be a true indication of the oil level when the compressor is running.

If the oil level in the sightless of the compressor is less than one-eighth (1/2) up from the bottom of the glass, this indicates a low oil level. If the oil level is up more than one-half (3/4) from the bottom, his indicates a high oil level. Therefore, the oil level should be 1/2 to 3/4 up the sight glass when the compressor is running.

Notes:

1. Allow compressor to run for at least 10 minutes before checking sight glass.
2. Unit sizes 6 to 12 tons do not have sight glass.

COOLING COIL AND REFRIGERATION SYSTEM

The refrigeration circuit shall be inspected each month for proper function and signs of wear and abnormality. In most cases signs of deterioration of component parts give prior warning to system failure. Periodic inspection is essential to detect and prevent failure.

The liquid line sight glass should be inspected for the presence of bubbles and moisture. Bubbles in the circuit indicate a shortage of refrigerant in the system and changing of the indicator color from green to yellow denotes presence of moisture. If moisture is detected change filter drier and refrigerant as required. If charge is found to be low, check system for leak using current ODP procedures.

1. Check cleanliness of coil.
2. Check cleanliness of stainless steel drain pan and drain system.
3. Check operation of controls.
4. Check operation of drier filter, sight glass and valves.

Once all of the checking and adjusting of the refrigeration circuit is complete make sure that all pipes, distributor tube and capillary lines are not in contact with each other or other objects that will result in premature failure from wear. It is the responsibility of the maintenance personal to assure this step has been followed.

CONDENSER

a. Air Cooled Condensers

1. Check condition of condenser coil.
2. Check and clean all debris from underside of coil to ensure that airflow is not blocked.
3. Check refrigerant line for leakage or damage.

Note: On packaged air cooled Series 6 units there are filters that require maintenance. Please see note above in replacement of air filters section.

b. Water Cooled Condensers

1. Check operation of valves.
2. Check pipe work and fittings for leakage.

ELECTRIC MOTOR

Totally enclosed air cooled electric motor with class F insulation and IP55 is our standard.

1. Check motor current.
2. Check bearing condition and grease or replace where necessary.

BLOWER FAN

Special design blower fans with strengthened bearing and mounting arrangement driven by double belt pulley system is our standard design. Regular maintenance should include:

1. Check motor current and bearing.
2. Check fan belt tension and adjust where necessary.
3. Check fan bearing for noise and wear and tear for twin blower unit.
4. Check blower tightness on shaft.
5. Periodically clean dust and debris from blower wheel, as this can cause an imbalance and lead to further problems.

The fan belt shall be checked monthly for signs of wear and proper tension. Depressing the belts midway between pulley and sheaves should produce a displacement of between 10 mm to 20 mm. Tight belts may cause excessive bearing wear and loose belt will cause slippage. Belt tension can be adjusted by turning the adjustment screws on the motor mounting slide.

ELECTRIC HEATER

1. Check current of heater.
2. Check mounting bracket.

HUMIDIFIER

The humidifier consists of an electrode steam boiler for high efficiency and quick response. Automatic flushing of the water using an auto-adaptive process enhances boiler life and maintains full output over the life span of the boiler.

1. Check operation of fill and drain solenoid valves.
2. Check and clean fill valve inlet strainer.
3. Check high water level sensor. (When replacing steam boiler)
4. Check boiler condition and water level.

The humidifier is designed to operate on ordinary tap water. Minerals will collect in the disposable bottle and the microprocessor will alarm when the bottle requires replacing. The quantity of such deposits and the life span of the bottle depend on the quality of the city water supply.