



## START-UP PROCEDURE

### **ELECTRIC COIL AIR MAKE-UP AND HEATING SYSTEMS**

Start-up must be performed by a trained, experienced service person.

The following general start-up procedure applies directly to electric coil units with Titan Air's standard control scheme. Please note any added options for a specific unit which may affect the control sequence or terminal numbering prior to attempting start-up or service work. Read the entire start-up procedure and review all reference material (Unit Specifications, Sequence of Operation, Parts Lists, and Electrical Schematics [both Titan's schematic and coil manufacturer's schematic]) supplied with each unit.

Before installing and wiring the unit, consider the following items:

1. Consult with local code officials to make sure the system is in compliance with all applicable codes.
2. Verify that all electrical connections are per N.E.C. guidelines.
3. Verify that there is enough room around the unit to provide adequate service area.

#### STEP 1:

Make sure all incoming power is turned off. It may take more than one disconnect to shut the power off. One disconnect may serve the motor and control circuits with a second disconnect for the coil power.

At the remote panel, make sure the unit is turned off and the temperature set point (if supplied) is set at its lowest setting.

#### STEP 2:

Verify that the incoming electrical service (for both the blower motor/control and the coil) matches the unit name plate requirements (voltage, amp draw, etc.). If they do not, stop at this point and contact factory.

#### STEP 3:

Open access doors to the blower and control vestibule sections. Check all electrical connections and hardware (blower drives, bearings, damper linkages, etc.) for tightness and correct field wiring connections.

#### STEP 4:

Turn on the disconnect(s) that feeds the motor and control circuits.

#### STEP 5:

Turn blower service switch (SW-5) on.

#### STEP 6

If an optional intake or discharge damper is installed, the blower will not start until the damper motor's internal "proof open" end switch closes (damper motor and end switch wiring are generally completed in the field after damper is mounted). If an intake or discharge damper is not installed, the blower should start immediately. Check the blower for proper rotation direction. If the rotation is reversed, turn both the service switch and the disconnect switch off. For 3 phase motors, reverse any two leads. For single phase motors, see instructions on the motor.



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### STEP 7:

Check and record the blower RPM. The speed of the blower was set at the factory according to the static pressure that was specified. If you find that the unit is moving too much air the blower can be slowed, but care must be taken to ensure that there is proper air velocity across the elements of the coil.

### STEP 8:

Close the access door to the blower section and check and record the amp draw of the motor. Make sure to double check the full load amp draw on the motor and ensure that the motor is not running over loaded.

### STEP 9:

If there is a coil disconnect on the unit, place it in the on position.

### STEP 10:

Turn the heat service switch (SW-6) on.

### STEP 11:

Slowly turn the temperature set point up until the heating coil contractors start to pull in (or the SCR begins to cycle power to the first stage for a vernier SCR controlled coil). Do not let all of the contactors cycle on.

### STEP 12:

With as few contactors pulled in as possible (at least one), check the coil to ensure that there are no hot spots (the heating element glowing red). Slowly increase the temperature setpoint and observe additional contactors cycling on. For a full or vernier SCR controlled coil, the SCR will increase current flow to the appropriate stage(s). Modulation of the SCR controlled stage can be observed on the coil manufacturer's control board. Continue to observe the coil for the possible presence of hot spots.

### STEP 13:

Turn the set point up as high as possible so that all the contactors are pulled in and double check the coil for hot spots. If there are hot spots and the unit is delivering the rated air volume, it may be necessary to fabricate air diverters and install them in the intake section of the unit. The diverters will have to be adjusted so the coil receives proper air flow and no hot spots are present.

### STEP 14:

Turn the set point down and verify that the contactors cycle off (and SCR stage if applicable).

### STEP 15:

Place the blower and heat service switches in the off position. During normal operation from the remote panel, these switches must be in the off position.

### STEP 16:

Start the unit from the remote panel in both the heat off and heat on modes.



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### STEP 17:

In the winter mode (heat on), turn the set point up and down making sure that the contactors cycle on and off as the set point is moved up and down. Verify that the temperature control system accurately controls the discharge temperature. Note that there is a time delay between each stage. For units equipped with a sequencer, the throttling range of the temperature controller and time delay of the sequencer were set to provide stable temperature control for most applications. Instructions for calibrating the sequencer are provided by the coil manufacturer. Please contact Titan Air if the temperature control system does not respond in a stable manner. Keep in mind that a staged electric coil (without a vernier SCR stage) can only achieve a few specific discharge temperatures and will typically cycle at least one contactor on and off repeatedly. For this reason, any reductions in the time delay between stages or the throttling range of the temperature controller will likely increase the wear on the contactors.

### STEP 18:

If the unit is equipped with a fresh air/return air mixing section, verify that the controls for these dampers function properly.

### STEP 19:

Verify that the unit operates according to the sequence of operation provided with the unit specifications in this manual.

### STEP 20:

Before leaving the job, make sure all disconnects are turned on, all access doors are shut and latched and the control switches are placed in the required position.