TITAN AIR INCORPORATED

START-UP PROCEDURE

100% OUTSIDE AIR MAKE-UP UNITS WITH RTC SOLUTIONS DISCHARGE TEMPERATURE CONTROL

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

The following general start-up procedure applies directly to standard 100% air make-up units. 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, Gas Train/Burner Specifications, Sequence of Operation, Parts Lists, and Electrical Schematic) supplied with each unit.

STEP 1

Turn off incoming electrical power and gas supply to the unit. Electrical power can be turned off at the unit disconnect. Gas supply shut-off is at the inlet of unit's gas manifold.
Turn the unit off and the temperature selector to the lowest setting.

STEP 2

Verify that incoming electrical and gas supply match the name plate requirements (i.e., voltage/amp capacity, gas pressure and volume capacities, etc). If they do not, stop at this point and contact Titan Air.

STEP 3

Open the access doors to 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

Check all gas, pilot, vent, and pressure sensing lines are properly connected and unobstructed. Verify the incoming gas line was "blown out" to flush out debris prior to connecting gas line to unit. Also verify incoming gas line has been purged of air up to unit's gas inlet.

STEP 5

At manifold pressure test port, downstream of the modulating gas valve (VM-1), connect a gas pressure gauge (pressure gauge must read inches of water column to 10" with the capability of reading a negative pressure).

STEP 6

Turn on incoming electrical power at unit disconnect. Make sure the blower access door is securely held open. Turn the blower service switch (SW-5) to the on position.

STEP 7

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 SW-5 and the disconnect switch off. For 3 phase motors,

reverse any two leads.

STEP 8

With proper blower rotation verified, check and record the RPM of the blower. If the blower speed needs to be adjusted to change the rated CFM of the unit, contact the factory.

STEP 9

Turn the unit off. Close and latch the blower access door.

STEP 10

Start unit with SW-5. Check and record the motor amp draw. If the motor amp draw exceeds listed Full Load Amps (FLA), stop and call the factory.

STEP 11

Turn on the main gas valve. If the unit is supplied with a low gas pressure switch (P-2), reset to on position.

STEP 12

If the unit is equipped with an inlet ductstat (T-1), set this stat above the outside air temperature. Start unit with SW-5 and enable the burner with the burner service switch (SW-6).

STEP 13

If the unit does not cycle through its burner ignition sequence after a few attempts, refer to the service information in the following section for troubleshooting instructions.

STEP 14

Carefully remove the wire from terminal one (1) on gas modulating actuator (VM-1). Do not allow the wire to touch the unit casing or any metal. Release actuator gear by pressing black button on side of actuator (see figure 1), rotating mechanism counterclockwise to stop. Check to make sure the flame extends the full length of the burner with no breaks in the flame. If the low fire setting is adjusted, verify that the low fire manifold pressure is correct. See figure 1 at end of start-up procedure for low fire adjustments if necessary.

STEP 15

Once low fire is achieved, release actuator gear by pressing black button on side of actuator (see figure 1) and rotate mechanism clockwise to stop. This will force the burner into high fire. On your manifold pressure gauge, check the manifold pressure. The resulting pressure should be compared to the unit's <u>rated</u> manifold pressure. If the total is higher or lower than the rated pressure, adjustment can be made at the gas pressure regulator. Total manifold pressure should not exceed unit’s rated manifold pressure.

STEP 16

With the burner on high fire, turn the high temperature limit (TL-1) to its lowest setting. The limit should trip out and shut down the burner. Turn TL-1 back to the factory setting of 185 deg. F and reset the control. Reconnect wire at VM-1.

STEP 17

With all wiring in place and the unit operating in the winter mode, adjust temperature setpoint on the remote mounted controller (TD-1) up and down (from highest to lowest setting) observing the modulation of the burner. When actual

discharge air is below TD-1's setpoint, the unit should discharge maximum temperature. When actual discharge air is above TD-1's setpoint, the unit should discharge minimum temperature.

STEP 18

With the unit operating in the summer mode, cycle the burner from SW-6. Verify that burner fully lights within a few seconds.

STEP 19

If the unit is equipped with a low temperature safety (LTS-1), check this control's operation. Standard LTS-1 can be checked by disconnecting the sensor wires. The unit should then shut down after the built-in timer setting has "timed-out". Replace the sensor wires when proper operation has been verified. Turn the unit off and back on to reset LTS-1.

STEP 20

With the unit operating in the winter mode, close the manual gas shutoff valve (GT-3). The burner should shut down in a few seconds (look for flame LED to go out on FS-1) with the unit shutting down in 30 seconds or less. Open the gas valve and turn the unit off and on to reset FS-1.

STEP 21

Turn SW-5, SW-6 and the disconnect off. Verify all terminals, electrical connections and hardware (bearings, sheaves, blower wheels, etc.) are securely tightened. Adjust all controls to desired settings. Remove all gauges, meters, and hand tools from the unit. Replace all covers on controls. Make sure all safety devices are reset.

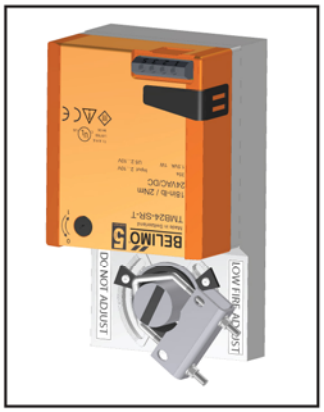
STEP 22

Turn the disconnect on. Start the unit from the remote panel. Verify proper operation in all modes according to unit's sequence of operation.

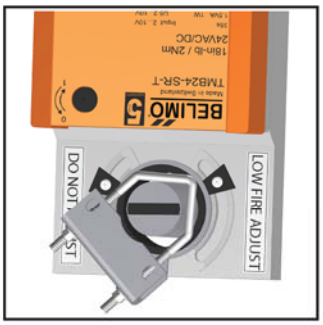
The unit should be ready for operation. If any problems arise, refer to the service information on the following page. To assure long lasting and efficient operation of Titan equipment, a regular service inspection should be set up. Refer to the maintenance section at the back of this manual for detailed maintenance information.

Figure 1

BELIMO ACTUATOR COUPLED WITH MODULATING VALVE



Low Fire Adjustment:
Disconnect wire at terminal #1 on actuator. Press "clutch" to manually rotate shaft as needed. Adjust mechanical stop at counterclockwise end of actuator's stroke to set low fire. Need contintous flame across burner AND strong amplified signal at flame safeguard test ports.



High Fire Adjustment:
Adjust high fire at seperate regulator Do NOT adjust mechanical stop at clockwise end of actuator's stroke. Refer to instructions in start-up procedure.

Actuator Replacement/ Installation:
Installation of a replacement actuator should be made with actuator rotated to high fire position. Clockwise high fire mechanical stop should be set and line mark on modulating valve stem should be parallel with pipe as shown in "High Fire Position" photo above. Set low fire mechanical stop similar to original actuator. Adjust low fire per start-up procedure.