START-UP PROCEDURE

CAREL c.pCO AND GRAPHICS DISPLAY INTERFACE

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

The following general start-up procedure applies directly to indirect fired heating systems. Please note any added options for a specific unit which may affect control sequence or terminal numbering prior to attempting start-up or service work. Read 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 unit. Electrical power can be turned off at unit disconnect. Gas supply shut-off is at the inlet of unit's gas manifold.

STEP 2

Verify that incoming electrical and gas supply match 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 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 that all gas, pilot, vent, and pressure sensing lines are properly connected and unobstructed. Verify incoming gas line was "blown out" to flush out debris prior to connecting gas line to unit. Verify gas supply line was purged of air up to unit's gas inlet.

STEP 5

At manifold pressure test port, downstream of modulating gas valve, connect your gas pressure gauge (pressure gauge must read inches of water column to 10" with capability of reading a negative pressure). If unfamiliar with the user interface, take time to review sequence of operation which includes a description of multiple screens available on GD-1.

STEP 6

Set remote panel Auto-Off-On switch to off position. Turn on incoming electrical power at unit disconnect. Scroll through gd-1 screens to verify that sensor inputs are valid. From user interface panel (GD-1), disable unit operation (HVAC_OFF mode) and set the temperature setpoint near its lowest setting.

STEP 7

Make sure blower access door is securely held open. Turn blower service switch (SW-5) on. If an optional intake or discharge damper is installed, blower will not start until 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, blower should start immediately. Check blower for proper rotation direction. If rotation is reversed, turn both service switch and disconnect switch off. For 3 phase motors, reverse any two leads. For single phase motors, see instructions on the motor.

STEP 8

With proper blower rotation verified, check and record RPM of blower. RPM of blower should only be increased or decreased if unit is not delivering rated CFM. Contact Titan Air before attempting to change CFM capacity of unit.

STEP 9

Turn unit off. Close and latch blower access door.

STEP 10

Start unit. Check and record motor amp draw. If motor amp draw exceeds listed Full Load Amps (FLA), stop and contact factory.

STEP 11

Turn unit off. Check pilot gas line for proper and tight connections with no leaks.

STEP 12

Turn on main gas valve and slowly open manual pilot gas valve. If unit is equipped with a low gas pressure switch (P-2), reset to on position.

STEP 13

Start unit and enable burner. Once flame safeguard enters pilot trial for ignition period place run-test switch (located on flame safeguard programmer module) in the test position. This will allow pilot to light without lighting main burner. Verify proper pilot ignition and operation.

Note that burner should not be operated continuously in check position for more than 1 minute because the ignition transformer is not rated for continuous duty.

STEP 14

Unit should go through its complete burner ignition sequence with only pilot ignited. Sequence can be observed by following the indicating LED's on flame safeguard. On new installations, resetting flame safeguard may be required to purge air from pilot line. If unit does not cycle through its burner ignition sequence after a few attempts, refer to the service information in following section for troubleshooting instructions.

STEP 15

On flame safety are 2 voltmeter test ports. Set volt-ohm meter to approximately 30 VDC scale and insert meter leads into test ports (common lead in black port, positive lead in red port).

STEP 16

With only the pilot operating, record DC volt signal. DCV range is noted on amplifier module of controller. There should be a steady DCV signal in the upper range stated on controller.

STEP 17

Once stable pilot is achieved, shut unit down and place run-check switch in run position. Start unit allowing it to operate in low fire. Check and record DC voltage as in previous step except that pilot and ignition transformer will be off and FS-1 is sensing low fire. See figure at the end of start-up procedure for low fire adjustments if necessary.

STEP 18

When the burner lights a qualified technician should analyze the flue gas composition and adjust the burner at low and high fire to meet the burner manufacture recommendations. This process if very important and vital to proper burner operation and is to be done by qualified technicians only.

STEP 19

Insert the 1070 ohm test resistor in place of discharge sensor. This will simulate a discharge temperature of approximately 70 degrees. Increase temperature setpoint to maximum. This will force modulating valve to a sustained high fire position. Check manifold pressure. Resulting total manifold pressure should be compared to unit's rated manifold pressure. If the total is higher or lower than rated pressure, adjustment can be made at gas pressure regulator. Do not set total manifold pressure over name plate rating.

STEP 20

With burner on high fire, turn high temperature limit (TL-1) to its lowest setting. The limit should trip out and shut down burner.

Turn TL-1 back to factory setting of 185 deg. F and reset control.

STEP 21

Remove test resistor and re-connect discharge sensor wiring.

STEP 22

With all wiring in place and unit operating in “HEAT” mode, adjust room or supply temperature (depending on type of temperature control) setpoint and observe modulation of burner.

If unit features room temperature control and sensed room temperature is below set point, unit should discharge maximum temperature as set in password protected technician screen. When room temperature is above set point, unit should discharge minimum temperature which is calculated as the room temperature setpoint plus the associated offset entered on technician screen . This offset can be positive or negative. Buildings with internal heat gain may need a negative offset from room temperature set point to minimum discharge temperature in order to prevent overheating the space.

For typical applications with limited internal heat gain, it is suggested that maximum discharge temperature be set at approximately 100°F and minimum discharge temperature be set at or slightly above desired room temperature (offset of 0°F to +10°F.

STEP 23

Low temperature safety function is built into the c.pCO controller. To test this function, remove discharge sensor wires and replace with a 1070 ohm resistor. From the technician setup screen, increase low temperature safety setpoint to 80 degrees. Unit should then shut down after built-in timer setting has "timed-out". Remove resistors and replace sensor wires when proper operation has been verified. Press and hold up and down arrow keys on MUI-1 for 4 seconds to reset the fault.

STEP 24

With unit operating and burner on, close 2nd manual gas shutoff valve. Burner should shut down in a few seconds (look for flame LED to go out on flame safety) with unit shutting down in 30 seconds or less. Open manual gas valve and reset flame safety by pressing button protruding through cover.

STEP 25

Turn disconnect off. Verify that 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 26

Turn disconnect on. Start unit from remote panel. Set all user interface modes and setpoints as desired. Verify proper unit operation in all modes according to unit's sequence of operation.

Unit should be ready for operation. To assure long lasting and efficient operation of Titan equipment, a regular service inspection should be set up. Refer to the maintenance section at back of this manual for detailed maintenance information.