

## TROUBLE SHOOTING CHART

### DUO-THERM 65900 SERIES FORCED AIR FURNACE

- A. Pilot won't light**
1. No gas to furnace: Check tank valve, regulator; check for restriction in piping.
  2. Plugged pilot orifice: Clean with lacquer thinner or compressed air, or replace orifice.
  3. Restricted pilot tube: Clean tube; if crimped, replace tubing.
  4. Defective gas control: Check pilot adjustment screw. If open, control is internally restricted. Replace control.
  5. Ignitor electrode not arcing: Check for improper electrode setting. Re-adjust if necessary. Electrode should have 1/8" gap to pilot hood. Also check for cracked electrode or wire insulation. Check spark pump. Should be able to create strong arc across 1/8" gap.
- B. Pilot goes out when button is released**
1. Flame not hitting thermocouple: Check pilot adjustment screw, pilot orifice; check for restriction in pilot burner.
  2. Defective thermocouple: Check output with millivolt meter and thermocouple adaptor (ITT #103050 G). If output is less than 8 millivolts, replace thermocouple.
  3. Loose thermocouple connection: Connection should be finger-tight, plus 1/4" turn. DO NOT OVER TIGHTEN.
  4. Defective magnet in gas control: Replace control.
- C. Main burner won't light - blower runs when thermostat is closed.**
1. Air prover switch not closing: Check blower rotation. If 12 volt polarity is reversed, blower will run backwards; however, air prover switch will not close. Also, if battery voltage is low, air prover switch will not close. Blower wheel should

- |  |                                |   |
|--|--------------------------------|---|
|  |                                | be clean for proper air flow. Check for proper alignment of actuator blade with blower housing; realign if necessary. If air prover switch is internally defective, replace switch. |
|  | 2. Open limit switch:          | Check voltage across switch. Voltage reading indicates open switch. If defective replace.   |
|  | 3. Defective gas control:      | Check control dial - must be in "on" position. Check voltage at control terminals. If 12 volts is present and burner does not light, control is defective; replace.                 |
| D. Main burner won't shut off when blower shuts off. | 1. Defective gas control:      | Replace control.  |
| E. Blower won't start when thermostat is closed.     | 1. No power to unit:           | Check fuses, wiring connections. Note: special fuse in heater does not change appearance when blown.  |
|  | 2. Defective thermostat:       | Check by by-passing thermostat; if defective, replace.  |
|  | 3. Broken thermostat wire:     | Check by shorting together thermostat wire connections in heater. Repair or replace thermostat wire if needed.  |
|  | 4. Defective thermostat relay: | Check by shorting across terminals 5 and 7 on relay. Blower should start. Replace relay if defective.   |
|  | 5. Defective blower motor:     | Apply 12 volts to black and red motor leads. If motor does not run replace motor.   |
|  | 6. Stuck blower wheel:         | Turn wheel by hand. Realign or replace wheel if necessary.  |
| F. Blower won't shut off.                            | 1. Defective thermostat:       | Check for closed thermostat contacts. If damaged or defective, replace thermostat.  |
|  | 2. Short in thermostat wire:   | Remove thermostat wire at heater. If blower stops, check wiring for shorts. Repair short or replace wire, if needed.  |
|  | 3. Stuck thermostat relay:     | Remove blue wire from terminal. Check voltage across terminals 5 and 7. No reading indicates contacts are closed. Replace relay.  |

- |   |   |   |
|---|---|---|
|   | 4. Stuck fan switch:                        | Check voltage across switch. No reading indicates closed contacts. If contacts remain closed after cool-down, replace fan switch.             |
| G. Thermostat anticipator burned out.     | 1. Internal short in gas control:           | Replace control and thermostat.   |
| H. Fuse blown.                            | 1. Defective blower motor:                  | Check amp draw; replace motor if defective.   |
|   | 2. Short to ground inside unit:             | Check wiring connections; check for loose wires, or wire connections touching metal casing.   |
| I. Pilot outage (during high fire cycle). | 1. Air restriction:                         | Check intake and exhaust vents for air restrictions. Check draft blower wheel for tightness. Wheel should be clean for proper air flow.       |
| J. Pilot outage (pilot stage).            | 1. Air leak in sealed system:               | Check all gaskets, vent connections, draft blower assembly, etc. Air tightness is important for proper operation.                             |
|   | 2. Pilot flame too large:                   | Check gas pressure. Adjust pilot at control. If pilot orifice is damaged or enlarged, replace orifice.  |
|   | 3. Weak thermocouple: (See also Section B.) | Check thermocouple output with millivolt meter and thermocouple adaptor (ITT #103050G) If output is below 8 millivolts, replace thermocouple. |

## CONVERTOR PROBLEMS

### COMBINATION 110 - 12 VOLT UNITS ONLY

- 1A. Unit fails to switch from battery to 110 volt operation.
1. No 110 volt power to unit: Check fuses and connections in power supply.
  2. Defective transformer: Check transformer output. Yellow to black - approximately 14 volts. Yellow to yellow, 28 to 30 volts. If defective, replace transformer. Note: Before replacing transformer check rectifier for shorts. A defective rectifier will cause transformer to fail again.
  3. Defective rectifier: Check with ohm meter. Place one probe on "+" terminal and touch other probe to both AC terminals, in turn. Reverse probes and repeat test. Meter should show continuity on one test, open reading on other test. If meter shows continuity or open on both tests, replace rectifier.
  4. Defective switching relay: Apply 12 VDC to terminals A and B. Relay should switch. If defective, replace relay.