

**Residential, And Light Commercial, Power Vented
Gas Products Service Handbook**

**SMARTVALVE™ TROUBLESHOOTING GUIDE
A O Smith Models: FPD, FPSH, FPCR, FPST, FPSE, BTI, BTF with SmartValve**

LED	INDICATES / CONDITION	CHECK / REPAIR
Off	No power to control.	<ol style="list-style-type: none"> 1. Appliance On/Off switch in the off position. 2. Check for 115 volts at wall outlet. 3. Check for 115 volt power to SmartValve between pin 3 and 6 on wiring harness plug. 4. Check system wiring harness and connections.
Bright - Dim	Normal operation.	Normal operation.
1 Flash	Set-point error-internal failure detected.	1. Replace SmartValve control.
2 Flashes	Blocked exhaust switch contacts remain closed longer than 30 seconds after a call for heat begins. Blower will not start. Switch contacts should have opened after previous cycle.	<ol style="list-style-type: none"> 1. Blocked exhaust switch stuck closed. 2. Blocked exhaust switch miswired or jumpered.
3 Flashes	<p>Blocked exhaust switch contacts remain open longer than 30 seconds after blower receives power.</p> <p>Blocked intake switch (FPD only) contacts remain open longer than 30 seconds after blower receives power.</p> <p>Vent temperature limit switch (if so equipped) contacts remain open longer than 30 seconds after the blower receives power.</p> <p>Blower stops, system goes into a 5 minute lockout with 3 flashes displayed. After 5 minute delay system will try again at beginning of sequence. SmartValve can cycle this way indefinitely.</p>	<ol style="list-style-type: none"> 1. Vent system length (equivalent feet) exceeded, too many elbows installed in vent system. 2. Blocked intake/exhaust switch tubing pulled off. 3. Blocked intake/exhaust switch remains open after set-point is reached - check with manometer or draft gage, replace intake/exhaust proving switch if defective. 4. Obstruction or restrictions in exhaust/intake pipe. 5. Vent temperature limit switch not cooled below 135°F - run blower - wait until switch cools down. 6. Vent temperature limit switch contacts stuck open - replace vent temperature limit switch. 7. Check that flue baffle is hung correctly and that flue restrictor (if so equipped) is also in place.
4 Flashes	Thermal cutoff (ECO) open - internal failure. Blower remains energized.	1. Replace SmartValve control.
5 Flashes	Flame signal sensed out of proper sequence. Blower remains energized. (during flame sense)	<ol style="list-style-type: none"> 1. Determine if flame is out of sequence - replace SmartValve control. 2. Check igniter wires are not loose at SmartValve.
6 Flashes	<p>System Lockout.</p> <p>4 trials for ignition failed or 4 loses of flame occurred before set-point was reached.</p> <p>After 1 hour "soft" lockout, SmartValve control will initiate a new ignition sequence if the call for heat is still present. (SmartValve can cycle this way indefinitely.)</p> <p>*Cycle power or a call for heat off & on for 2 seconds to reset SmartValve control.</p>	<ol style="list-style-type: none"> 1. Reversed polarity in 115 volt power supply. 2. Heater/burner not properly earth grounded, check pin 3 on wire harness plug (valve end) to burner tube for 115 volts, check ground path to burner. 3. Ground fault interruption (GFI) breaker causing intermittent operation, try non-GFI outlet. 4. Flame sense rod dirty or incorrectly positioned. 5. Vent system length exceeded, too many elbows, blocked exhaust/intake switch opens after light off. 6. Flame sense/HSI wiring condition/connections. 7. Low or no supply gas pressure. 8. Fluorescent lighting on same breaker as heater. 9. Damaged, defective, or incorrectly positioned HSI.
Continuous rapid blinking.	<p>Water in tank is below 36° F.</p> <p>Circuit board in SmartValve is cracked.</p>	<ol style="list-style-type: none"> 1. Increases water temperature. 2. Replace SmartValve control.