

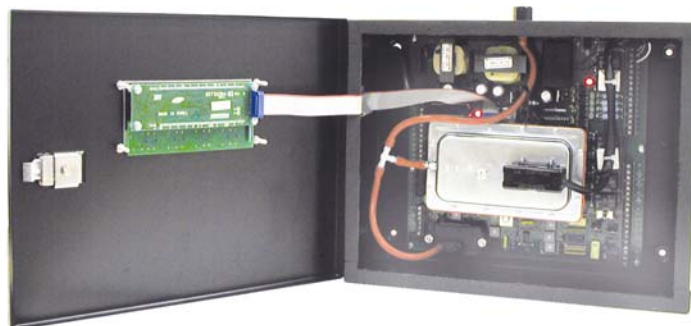


POWER FLAME, INC.

Commissioning Guide

DC3 Draft Control System

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INSTALLATION TIPS

MOUNTING

1. Unpack **DC3 DRAFT CONTROL SYSTEM** carefully, retaining the carton and packing materials in case the unit must be shipped to the factory in the future. Confirm that the DC3 control unit, sensor wire (if this option is included) and Instruction Manual DC3.0X are present. **PLEASE READ THIS COMMISSIONING GUIDE AND THE INSTRUCTION MANUAL BEFORE STARTING THE INSTALLATION AND SET UP.**
2. Mount the DC3 control unit in a vertical location free from dust, moisture and vibration.

WIRING

1. Only an experienced electrician or control/instrument technician should work on system wiring.
2. Conform to local codes and standards.
3. Run all 4-20, Modbus, and thermocouple wires in a separate conduit from 120 VAC.
4. Keep all 3-phase wiring 12 inches away from draft control wiring.
5. On installations where the burner terminal from the flame safeguard is not available, jumper terminal L to terminal D and terminal M to terminal B.

ACTUATOR SET UP

1. **Hays Cleveland Model F-0914X-0000 Linear Actuator**
 - a. Confirm actuator wiring. **Confirm** the jumper from terminal 4 to terminal 6.
2. **Hays Cleveland Model F-0914X-0101 Linear Actuator**
 - a. Confirm actuator wiring. **Discard** the jumper from terminal 4 to terminal 6.
 - b. Move the **adjustable start switch** so that the damper stops at the appropriate light off position.
3. **Hays Cleveland Model F-0872-SER-15/30-110-60-1E Actuator**
 - a. Confirm actuator wiring. **Discard** the jumper from terminal 4 to terminal 6.
 - b. Adjust S3 switch so that the damper stops at the appropriate light off position.
 - c. See **DC3 Instruction Manual** for more information on installations using the **F-0872 Ser actuator**.
4. **Honeywell Actuator**
 - a. With the limit string open and the open/auto/closed switch in the auto position, the damper should be in the closed position. The adjustable start LED (D4) should be **on** and the open damper LED (D6) should be **off**.
 - b. Place the open/auto/closed switch in the open position. Set the actuator's **blue** cam so that the **open damper LED (D6)** comes on at the open damper position.
 - c. Set the light-off position for the damper by adjusting the actuator's **red** cam so that the actuator stops at the desired light-off **position**.
 - d. Return the open/auto/closed switch to the **auto** position.
 - e. See **DC3 Instruction Manual** for more information on installations using this type of actuator.

START-UP TIPS

REVIEW PARAMETERS

Parameter	Factory Setting	Parameter	Factory Setting
Set Point	0.10"w.c. *	Flue Gas Temperature Units**	Degrees F
Dead band	0.01"w.c.	Flue Gas Alarm 1**	450F
Proportional band	0.15"w.c.	Flue Gas Alarm 2**	600F
Damping	0.00 seconds	Modbus Address	1
Prepurge Timer	20 seconds	Baud Rate	19.2
Post purge Timer	120 seconds		
*Reset to the burner manufacturer's recommendations. **If included: these features are options.			

SEQUENCE OF OPERATION Rev C

MODEL DC3-2

- On **call for heat**, power is applied to terminal D (Limits-In); D21 lights up.
- The controller applies power to terminal 6 (D3 lights up) and the actuator (if F-09141-0101) drives to the **adjustable start** position, **or** the actuator (if F-09141-0001) drives to **open damper** position.
- When the actuator reaches the adjustable start position (F-09141-0101) **or** the actuator reaches the open damper position (F-09141-0001, 5 to 5A jumpered), **end of travel** signal is sent to terminal 5 of the draft controller. D1 lights up.
- When sufficient draft has been maintained for 8 seconds (D15 lights up), the D to C circuit is made (Limits Out, D16 lights up).
- At this point, the flame programmer starts its light off sequence.
- The burner management system energizes the fuel valve (D22 lights up) and releases the draft controller to modulate the damper.
- **GAS OR OIL APPLICATIONS:**
When the call for heat cycle is complete and the call for heat signal is removed from terminal D, the actuator drives to the closed position.
Flame Failure:
 - Flame safeguard removes the fuel valve input.
 - Actuator drives to the adjustable start position.
 - Flame safeguard removes the burner input and the actuator closes the damper.**Pilot Flame Failure:**
 - Actuator drives to the adjustable start position.
 - Flame safeguard removes the burner input and the actuator closes the damper.
- **STOKER APPLICATIONS:**
When the call for heat cycle is complete, and the call for heat signal is removed from terminal D, damper **modulation continues** until the next call for heat.

MODEL DC3-3

- On call for heat, power is applied to terminal D (Limits-In), D21 lights up.
- The controller applies power to terminal 6 (D3 lights up) and the actuator (if F-09141-0101) drives to the adjustable start position or the actuator (if F-09141-0000) drives to open damper position.
- When the actuator reaches the adjustable start position (F-09141-0101) **or** the actuator reaches the open damper position (F-09141-0001, 5 to 5A jumpered), **end of travel** signal is sent to terminal 5 of the draft controller. D1 lights up.
- When sufficient draft has been maintained for 8 seconds (D15 lights up) the D to C circuit is made (Limits Out, D16 lights up).
- At this point, the flame programmer starts its light off sequence.
- When the fuel valve is energized (D22 lights up), the draft controller is released to modulation.
- When the call for heat cycle is complete and the call for heat signal is removed from terminal D, the actuator drives to the open damper position. When the post purge timer has expired the actuator drives closed.
- **Flame Failure:**
 - Flame safeguard removes fuel valve input.
 - Actuator drives to the open damper position for post purge.
 - Flame safeguard removes the burner input and the actuator closes the damper.
- **Pilot Flame Failure:**
 - Actuator drives to the open damper position for post purge.
 - Flame safeguard removes the burner input and the actuator closes the damper.

MODEL DC3-4

- Call for heat: power is applied to terminal D (Limits-In), D21 lights up.
- The J to K circuit is completed (D17 lights up) and the ID fan is started.
- The controller applies power to terminal 4 and actuator drives to open damper position.
- When sufficient draft is established (terminals 9 to 10), the D to C circuit is made (D16 lights up).
- At this point the flame programmer starts its light off sequence and power is applied to the burner input, terminal L (D24).
- When the actuator reaches the open damper position, D2 lights up and the prepurge timer starts timing.
- When the prepurge timer has expired, the 16 to 17 circuit is made: D6 lights up, completing the purge interlock circuit. Power is applied to terminal 6, D3 lights up, and the actuator drives to the adjustable start position.
- When the actuator reaches the adjustable start position, power is applied to terminal 5 of controller (D1 lights up).
- After 8 seconds, the 14 to 15 circuit is made (D4 lights up), completing the low fire interlock circuit.
- When the fuel valve is energized (D22 lights up for one second), the draft controller is released to modulation.
- When the call for heat cycle is complete and the call for heat signal is removed from terminal D, the actuator drives to the open damper position. When the post purge timer expires or the burner motor turns off (which ever takes longer), the ID fan turns off and the actuator drives to the closed position.
- The ID fan turns off when the flame safeguard turns the burner motor off.
- Flame Failure
 - Flame safeguard removes the fuel valve input.
 - The actuator drives to open the damper position for post purge.
 - Flame safeguard removes the burner input.
 - The ID fan shuts off and the actuator drives to closed damper position when the post purge timer has expired and the burner input has been removed.
- Pilot Flame Failure
 - The Flame safeguard removes the burner input.
 - The actuator drives to the open damper position. When the post purge timer expires, the ID fan shuts off and actuator drives to the closed position.

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