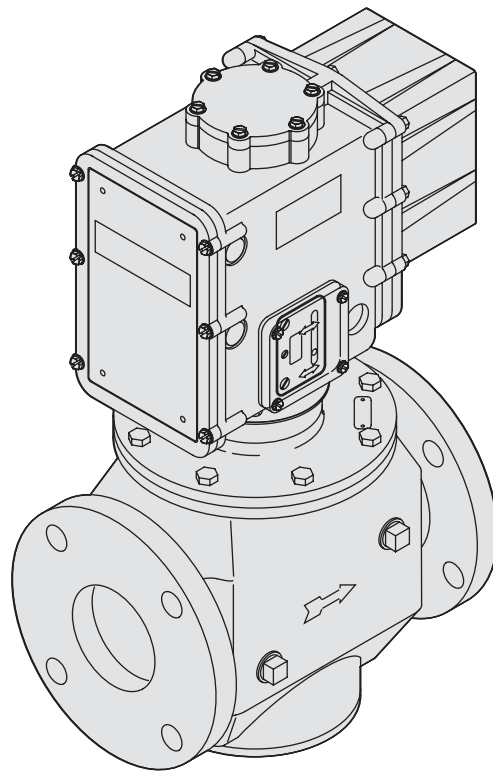
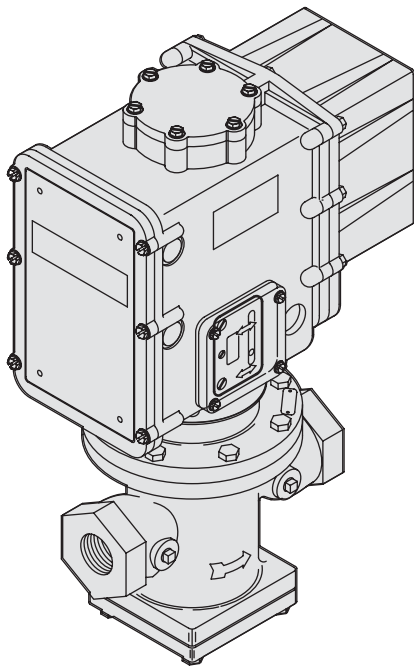


# *Eclipse AutoTite Automatic Gas Shut-Off Valves*

**2000AT Series**

Version 2



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This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



Indicates a hazardous situation which, if not avoided, will result in death or serious injury.



Indicates a hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

***NOTICE***

Is used to address practices not related to personal injury.

**NOTE**

Indicates an important part of text. Read thoroughly.



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# Introduction

1

## Product Description

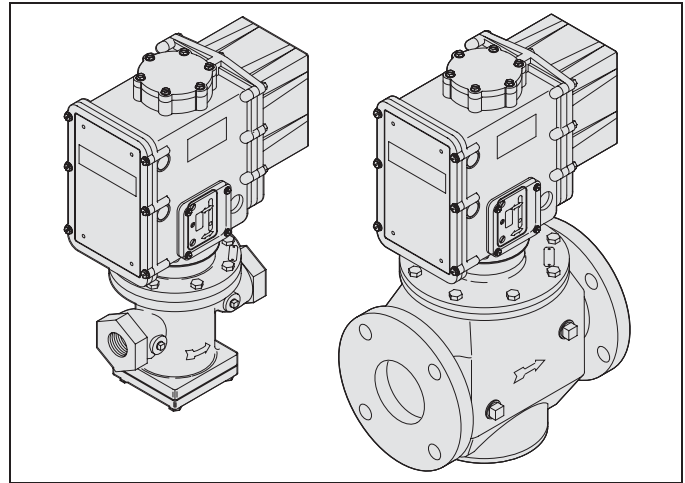
The Eclipse AutoTite Series 2000AT valve is designed to be an automatic gas supply shut-off to a combustion system. The valve has a 30 psi (2 bar) differential pressure rating and opens smoothly, minimizing any gas pressure surge to downstream components. When either an interlocking switch in the system opens or electrical power fails, the valve closes within one second.

The AutoTite valve is available in sizes of 1" through 3" and is offered with NPT threads. They are UL listed, FM approved and CSA certified. These valves meet the system shut-off requirements of NFPA 86, IRI, FM and EN746-2 which include position indication and proof of closure.

**NOTE:** NFPA 86 standard requires that burner systems over 150,000 BTU/hr be equipped with safety shut-off valves with position indication. It also requires that systems over 400,000 BTU/hr include at least one valve that meets a "proven closed" requirement when integrated into the pre-ignition interlock circuit. The 2000AT Valve, with dual proof-of-closure switches, meets both of these requirements.

**NOTE:** EN746-2 standards require that a closed position switch be provided for interlocking into control systems for verifying position before automatic start-up of burner(s). The 2000AT meets this requirement.

Each AutoTite valve actuator has four switches for auxiliary function uses. Two switches are factory set to activate when the valve is opened and can be adjusted in the field to operate at any point in the valve stroke. The other two switches are proof-of-closure and are factory set to activate after the valve is fully closed and are not field adjustable. These switches can be used to activate other controls within the user's system.



**Figure 1.1. Eclipse AutoTite Automatic Gas Shut-Off Valves**

The AutoTite valve is available with 110V 50Hz, 120V 60Hz, 220V 50Hz and 240V 60Hz actuators with general purpose, watertight, dust tight, drip tight & oil tight enclosures. These actuators can be rotated 360° for ease of installation. Additional options shown at left are:

### **The Quick Disconnect Option**

The Quick Disconnect Option which includes an electrical connector allowing quick installation and removal in portable applications providing greater maintainability.



**Quick Disconnect Option**

## **Additional Features**

- Actuator is field replaceable without removing valve body.
- The valve is not position conscious.
- 1/4" ports, located upstream and downstream on both sides of the valve body, can be used for pressure tap fittings, pressure gages, leak detection systems and pressure switch connections.
- One second maximum closing time.
- Positive shut-off using soft-seat disc.
- Four built-in auxiliary switches.
- Visual indication of valve position.
- Cast iron body with stainless steel internals.
- Factory tested before shipment.

## **Audience**

This manual has been written for personnel already familiar with all aspects of this product.

These aspects are:

- Installation
- Use
- Maintenance
- Safety

The audience is expected to be qualified and have experience with this type of equipment and its working environment.

## **Purpose**

The purpose of this manual is to make sure that you carry out the installation of a safe, effective and trouble-free system.

# Installation

## 2

### Introduction

In this section you will find the information and instructions that you need to install the valve and actuator. The 2000AT valve is designed to provide control of gaseous fluid (air, natural gas, propane and butane) flow in applications in which there is minimal exposure to water.



### CAUTION

- **The presence of water in the gas can result in corrosion which will limit the life of the valve. Also, at temperatures below 32°F (0°C), the water will freeze which could result in valve failure.**

The 2000AT valve is operated by a hydraulic actuator which allows the valve to close when power is discontinued. When mounted together, the actuator and valve can be installed in any position. Sufficient clearance should be maintained to allow for installation and servicing. See dimensional and mounting information provided in the Datasheet 756-1.

### Valve Installation



### WARNING

- **Shut off gas supply and disconnect actuator power prior to valve installation.**
  - Gas flow through the valve must be in the direction indicated by the arrow on the valve body: otherwise, the valve may not shut off.
  - The valve must be installed in a location that will remain within the temperature limits stated in the Datasheet 756-1.
  - Do not use the valve to support adjacent piping.
  - Pipe must be free of scale or other foreign materials before connecting to the valve body.
  - A strainer shall be installed in the gas line upstream of the shut-off valve to prevent the ingress of foreign matter which can damage the valve and cause leakage.
  - For ease of installation, install the valve body prior to attaching the actuator. This will also prevent possible actuator damage.

- Do not remove the protective plastic cap from the top of the valve until just before installing the actuator.

**NOTE:** Prior to installation, ensure that there will be 2" (51mm) clearance above the actuator to allow for installation or removal.

### Valve / Pipe Connections

#### 1" through 2" Sizes

1. Remove the protective caps from the ends of the valve.
2. Apply a moderate amount of pipe sealant to the **male pipe threads only**.

**NOTE:** Excessive pipe sealant could contaminate the valve seat, thus preventing the valve from closing properly.

3. Install the valve with the flow in the direction of the arrow on the valve body.
4. Tighten the pipe into the valve body, reacting the torque at the cast hex portion of the valve body, adjacent to that pipe.

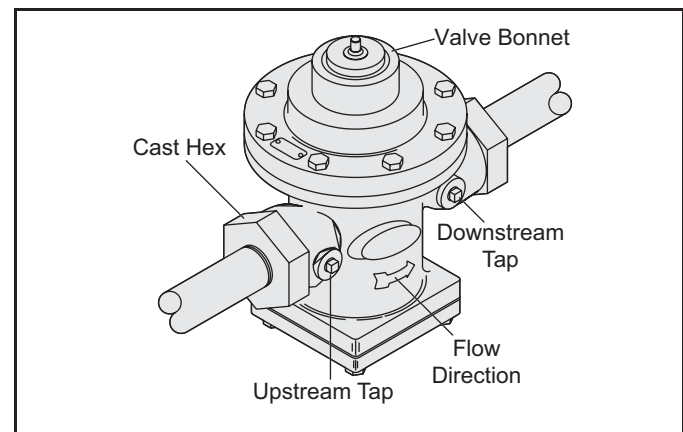


Figure 2.1

#### 2-1/2" through 3" Sizes, Threaded Flanges

1. Apply a moderate amount of pipe sealant to the **male pipe threads only**.
2. Insert the pipe into the flanges and tighten. Wipe excess pipe sealant from the inside of the pipe/flange connection. Handle the flanges in a manner which will prevent damage to the seal face.

**NOTE:** Excessive pipe sealant could contaminate the valve seat, thus preventing the valve from closing properly.

3. Remove the plastic caps from the ends of the valve. Handle the valves in a manner to prevent damage to the flange seal face.
4. Install the valve into the gas line with the flow in the direction of the arrow on the valve body.
5. Attach the pipe flanges to the valve flanges, installing gaskets between them. Make sure the gasket lies flat between the flanges.
6. Tighten the four bolts on each flange so that the faces bear uniformly on the gasket. **Torque the nuts to 61-75 lb-ft (82.7-101.7 Nm).**

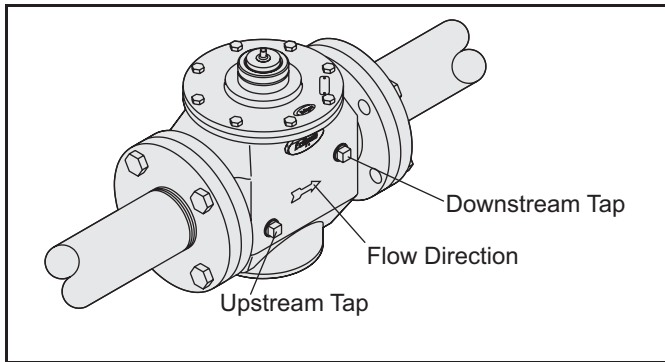


Figure 2.2

### 2-1/2" through 3" Sizes, Weld-On Flanges

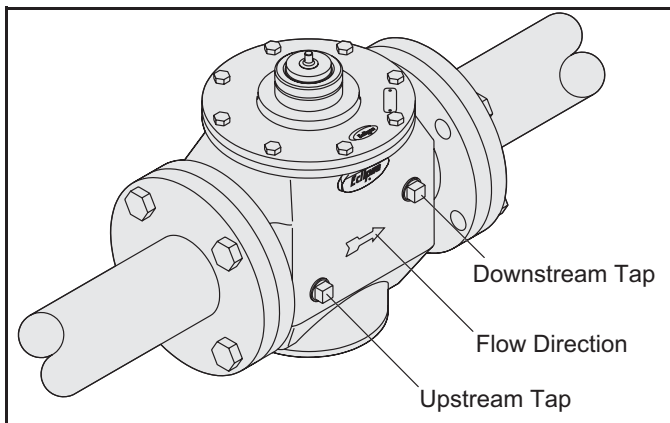


Figure 2.3

1. Remove the plastic caps from the ends of the valve. Handle the valves in a manner to prevent damage to the flange seal face.
2. Attach the pipe flanges to the valve flanges, installing gaskets between them. Make sure the gasket lies flat between the flanges.
3. Tighten the four bolts on each flange so that the faces bear uniformly on the gasket. **Do not torque at this time.**

4. Install the valve into the gas line with the flow in the direction of the arrow on the valve body. Insert the pipe into the flanges, stopping approximately 1/4" (6mm) from the flange face.
5. Tack weld the flanges to the pipe using a suitable filler material which is compatible with the ASTM A105 forged steel flanges and the steel pipe being used (probably ASTM A53 or A106).

**NOTE:** Surfaces for welding shall be clean and free of paint, oil, rust, scale or other material which is detrimental to welding.

6. Unbolt and remove the valve. Apply fillet welds on the inside and outside between the flanges and the pipe. The inside weld is not to extend beyond the face of the flange.
7. Reinstall the valve into the gas train. Attach the pipe flanges to the valve flanges, installing gaskets between them. Make sure the gasket lies flat between the flanges.
8. Tighten the four bolts on each flange so that the faces bear uniformly on the gasket. **Torque the nuts to 61-75 lb-ft (82.7-101.7 Nm).**

### Actuator Installation



- **Shut off power before attaching wires to the actuator to prevent electrical shock.**
  - The actuator installs directly to the valve bonnet and is secured by four set screws.
  - The actuator should be positioned to allow access for making wire connections. Two knockouts for 1/2" conduit are located on each side of the actuator.
  - Wiring of actuators must be carried out by a competent person, who will comply with current regulations, standards and requirements.
  - After actuator installation is complete, check out the valve-actuator operation per the instructions defined in the "Operation Checkout" section on page 15.

### Actuator Mounting

1. Remove the plastic protective cap from the valve bonnet.
2. Loosen the four set screws in actuator collar using a 5/32 allen wrench. Back them out enough to clear the valve bonnet when the actuator is installed. (Photo A)
3. Insert black, rubber gasket onto the valve bonnet.
4. Slip the actuator onto the valve bonnet and press firmly (Photo B). The actuator weight is approximately 20lb / 9 kg. Rotate the actuator to the desired position to accommodate wiring.

5. Tighten the four set screws in the actuator collar (Photo C) The set screws will engage in the machined V-groove (Photo D) of the bonnet. **Torque the set screws between 75-95 lb-in (8.5-10.7 Nm).**

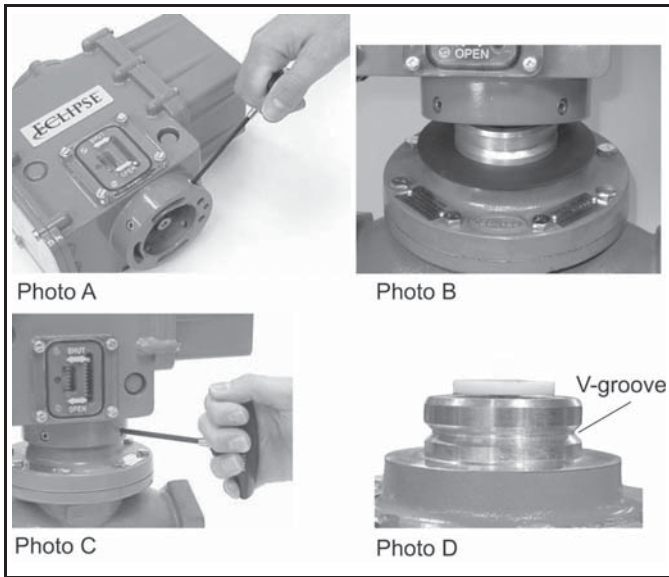


Figure 2.4

## Actuator Wiring

### ⚠ WARNING

- Shut off power before making electrical connections. Failure to do so could result in electrical shock or equipment damage.

**NOTE:** Wiring must comply with all applicable state and local electrical codes, ordinances and regulations.

1. Check actuator nameplate to make certain that electrical characteristics correspond with electrical service being used.
2. Remove the actuator nameplate. Figure 2.1 illustrates how the actuator will look with the cover removed.

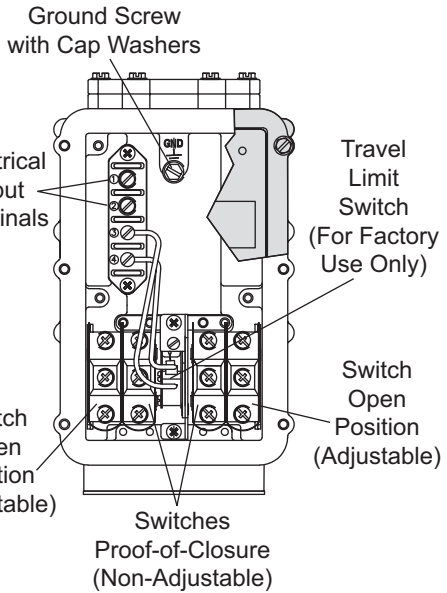


Figure 2.5 Internal Wiring Connections

3. Remove knockouts from actuator housing for 1/2" threaded conduit connections as required. Attach conduit to actuator.

### ⚠ CAUTION

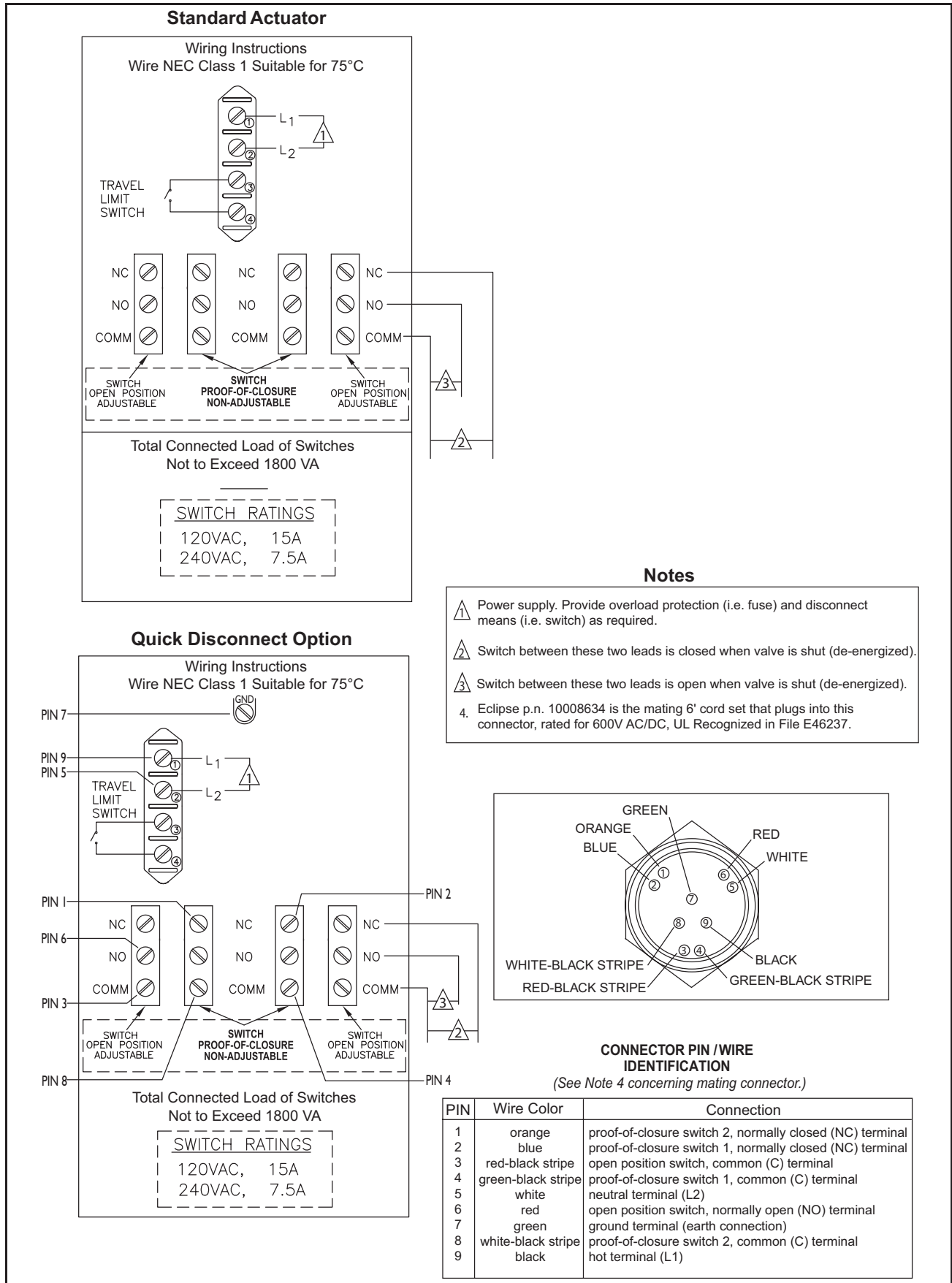
- Conduit must be attached to the actuator housing using a connector that is listed for watertight service (NEMA 4) to maintain the enclosure rating. For example, use a Thomas & Betts hub connector Catalog Number 370, when attaching rigid and intermediate type conduit.

4. Diagrams noting the external connections to the actuator are located on the backside of the actuator nameplate and shown in Figure 2.2.
5. Connect the power supply to terminals L1 and L2.
6. The position indicator switches are shown in Figure 2.2. For a typical combustion system wiring diagram, see Figure 2.3.

**NOTE:** Wiring to switches must be rated according to the load being switched, (less than or equal to 15A for 120V unit or 7.5A for 240V unit).

7. Reinstall the nameplate on the actuator when wiring connections are complete.





**Figure 2.6 External Wire Connections**

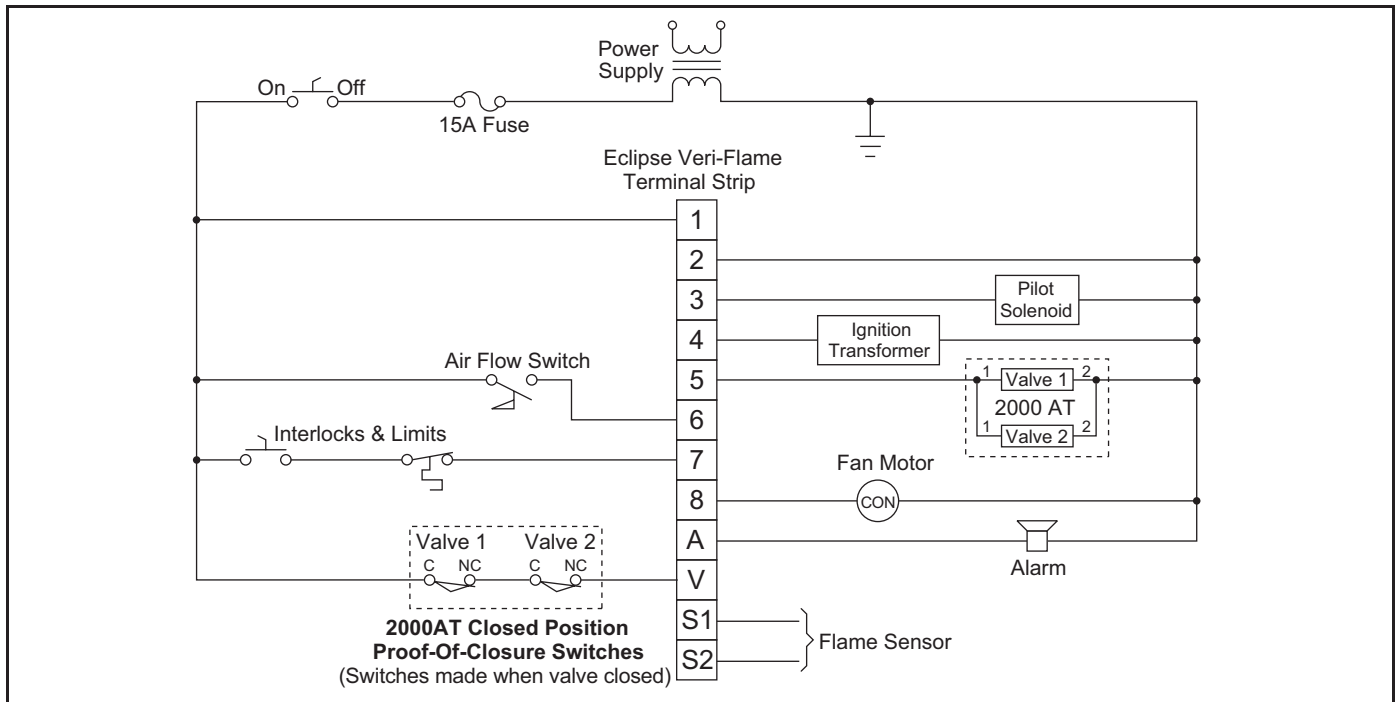


Figure 2.7 Typical Veri-Flame Combustion Safeguard Wiring Diagram Using Two 2000AT Valves per NFPA 86 or EN 746-2 Requirements as Applicable

### Auxiliary Switch Adjustment

**NOTE:** The open position auxiliary switches are field adjustable throughout the open stroke of the actuator. They are factory set to trip when the valve is approximately 90% open. The proof-of-closure switches are non-field adjustable.

1. Remove window screws (4) and window with gasket.
2. Loosen the camlock screw no more than 1/2 turn.
3. Reset the cam adjustment screw to the desired switching point and hold this screw until camlock screw is tightened.
4. Tighten the camlock screw. Cycle the actuator to verify the switch setting and readjust as required.
5. Reinstall the window with the gasket and torque screws evenly to 14 to 16 in – lb (1,6 to 1,8 Nm).

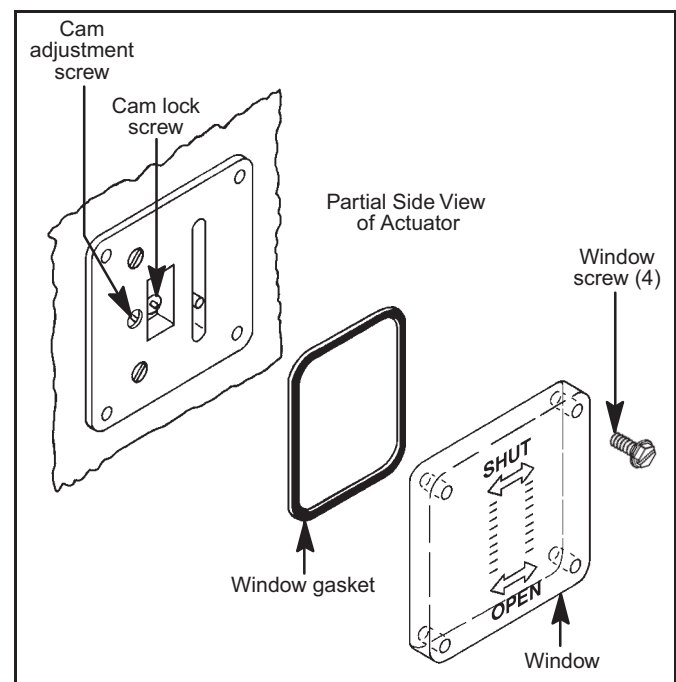


Figure 2.8 Auxiliary Switch Adjustment

## Operation Checkout



### **WARNING**

- Do not allow fuel to accumulate in the combustion chamber. Fuel/air mixture could be explosive.



### **CAUTION**

- Do not put system into service until proper checkouts have been performed. All tests to be performed by a trained technician. Close all manual shut-off valves as soon as trouble occurs. Failure to do so could result in explosion.

After installation is complete, cycle the valve several times (with the main manual gas shut-off valve closed) by energizing and de-energizing the actuator to open and close the valve.

# Maintenance & Troubleshooting

# 3

## Introduction

In this section, you will find the information and instructions that you need to maintain and troubleshoot the valve and actuator. There is also information to order replacement parts as needed.

## Maintenance

### **! WARNING**

- Turn off gas and disconnect electric supply before working on the valve and/or actuator. Service should be carried out by a competent person, who will comply with current regulations, standards and requirements.

## Scheduled Maintenance

- Set up an inspection and maintenance schedule for the 2000AT automatic shut-off valve and other valve train components.
- Inspect and clean or replace the strainer or filter screen installed upstream of the valve as required.
- Cycle the actuator/valve periodically. Interrupt electrical power to simulate an unsafe condition. If the valve does not close within one second, remove it from service and replace with a new unit.
- Perform a valve seat leak test with procedures that meet local standards and codes (reference NFPA 86). If the leakage rate is greater than the standard allows, remove the valve and replace with a new one.
- None of the components in the valve body assembly are replaceable and therefore should not be serviced in the field. The auxiliary switches in the actuator are field replaceable per the instructions defined below.

### **! WARNING**

- Replacement of proof-of-closure switches may invalidate compliance with local standards and codes.

If a switch fails, a replacement can be ordered for installation in the field. When replacing the switch in the field, follow the instructions listed below.

### **! WARNING**

- Shut off power and close manual gas cock before servicing actuator. Failure to do so could result in electrical shock or equipment damage.

## Open & Closed Positions Indication Switch Replacement

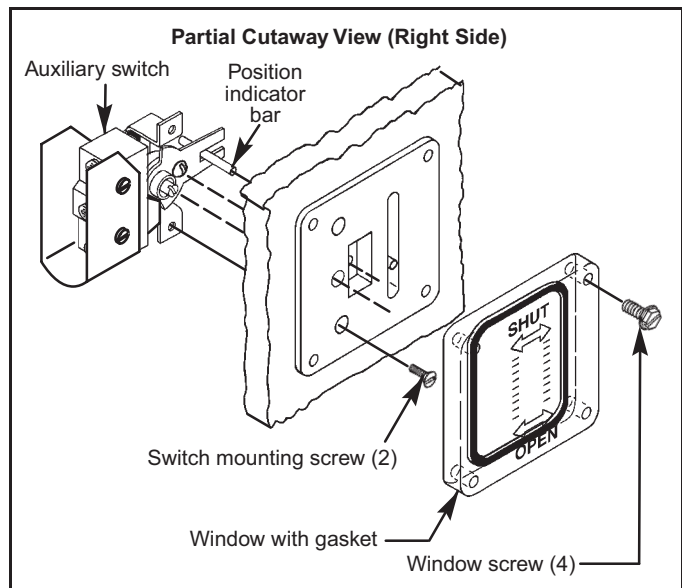


Figure 3.1

### **NOTICE**

- Label wires before disconnecting.
1. Remove the six cover screws and nameplate/ electrical cover with gasket. If necessary, disconnect the wiring and conduit.
  2. Disconnect all wiring.
  3. Using a 5/32 allen wrench, loosen the four set screws that secure the actuator to the valve bonnet (see photo A page 11 for screw locations). Remove the actuator from the valve.
  4. On auxiliary switch side of actuator, remove window screws (4) and window with gasket.

5. Remove auxiliary switch mounting screws (2) from side of actuator.
6. Disengage auxiliary switch from indicator bar and remove switch from indicator.
7. Install new auxiliary switch and reassemble in reverse order of disassembly.
8. Torque auxiliary switch mounting screws (2) evenly to 14 to 16 in-lbs (1,5 to 1,8 Nm).
9. Torque terminal screws 8 to 12 in-lbs (0,9 to 1,3 Nm).
10. Reinstall the actuator as described in the Actuator Mounting Section.
11. Reconnect the conduits and wiring as required.
12. Cycle the valve several times to verify operation of the replaced switch. If the open position switch was replaced, adjust as defined in the "Auxiliary Switch Adjustment" section.
13. Reinstall the window with gasket and torque screws evenly to 14 to 16 in-lbs (1,6 to 1,8 Nm).
14. Reinstall nameplate/electrical cover with gasket and screws (6) on actuator housing. Hand thread screws

as far as possible, then torque screws evenly in a crisscross manner to 30 to 35 in-lbs (3,4 to 4,0 Nm).

15. Operate actuator (complete system) through five cycles to verify proper operation.

### **Replacement Parts**

<b>Actuator Replacement Part Numbers</b>		
<b>Voltage</b>	<b>Part No.</b>	<b>NEMA Rating</b>
110/120V	16000-2	1, 2, 3, 3s, 4, 12 & 13 Standard
220/240V	16001-2	1, 2, 3, 3s, 4, 12 & 13 Standard
110/120V	10003259	1, 2, 3, 3s, 4, 12 & 13 Quick Disconnect

<b>Actuator Replacement Switch Part Numbers</b>	
<b>Part No.</b>	<b>Description</b>
10017289	Left Auxiliary Switch
10017290	Right Auxiliary Switch

### **Troubleshooting Procedures**

<b>Problem</b>	<b>Possible Cause</b>	<b>Solution</b>
Valve will not open	No power at actuator	Check power to actuator. Correct system problem.
	Actuator is incorrectly wired	Check power to actuator. Rewire power to terminals 1 & 2.
	Actuator is not functioning	Remove actuator from valve body and energize. Replace actuator.
	Valve is stuck	Replace valve and actuator.
Valve will not seal when closed	Contamination or mechanical damage	Valve body not field serviceable; replace valve and actuator.
Switch not made	Mechanical/electrical failure	Cycle valve (open/close) while checking valve with multi-meter. Replace switch.
	Switch is incorrectly wired	Check power to switch. Rewire switch.



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