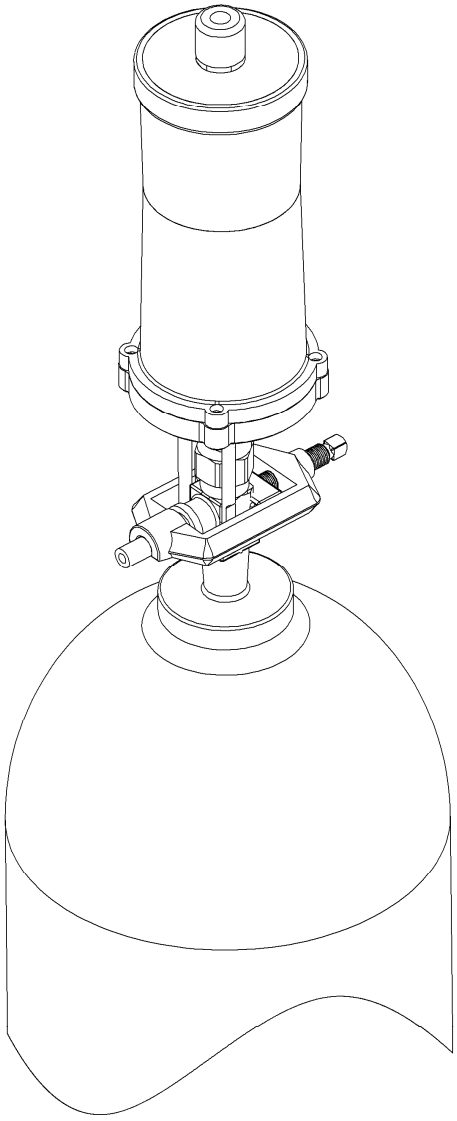
HALOGEN VALVE SYSTEMS, INC.

Terminator Actuator tm

Installation, Operations and Maintenance Manual



Emergency
Shutoff System

For 150-lb.
Chlorine Cylinders

Practical Safety
Technology For
Chlorine Handling

These instructions generally describe the installation, operation and maintenance of **Halogen Valve System's,** automatic **Terminator Actuator tm** safety system. **Halogen Valve Systems** reserves the right to make engineering refinements that may not be described herein. Any questions that cannot be answered by these instructions should be directed to **Halogen Valve Systems** or your local sales representative.

Halogen Valve Systems takes all possible precautions in packaging each item to prevent shipping damage. Carefully inspect each item and report damages to the shipping agent, **Halogen Valve Systems,** or your local sales representative. Inspect all packing materials before discarding to prevent loss of accessories, mounting hardware or instructions.

Halogen Valve Systems or your local sales representative can provide technical consultation and personnel training on the installation and operation of this system.

For more information concerning procedures for the handling of chlorine cylinders refer to *The Chlorine Manual* published by The Chlorine Institute, Washington, DC.

17961 Sky Park Circle, Ste A
Irvine, CA 92614

Phone No. **949-261-5030**
Toll Free **877-476-4222**
Fax **949-261-5033**

Halogen Web Site:
www.halogenvalve.com

Table of Contents

I. Introduction

A. General

The ***Halogen Valve Systems*** system controller and the **Terminator Actuator tm** are designed to be used with the standard 150-lbs. cylinder valve approved for chlorine service by *The Chlorine Institute*. The **Terminator Actuator tm** is an automatic-closing, fail-safe valve closer that supplements the manual operation of these valves by providing for powered valve closure in case of an emergency. No modification of existing container valve or related hardware is required to install the system controller or the actuator.

B. Warranty

Halogen Valve Systems **Terminator Actuator** tm is warranted to be free of manufacturing defects for a period of 1 year. Any defective components shall be replaced free of charge during the warranty period with the exception of the battery. See Warranty or the Annual Certification Program documents for exclusion and extended warranty provisions. Damages due to negligence or other outside and environmental forces are excluded.

C. Standard Equipment

The Halogen emergency shutoff system consists of the following major components and accessories:

Major Components

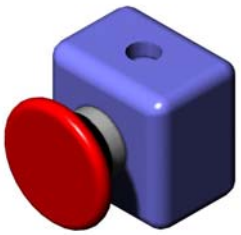
1. An electromechanical **Terminator Actuator** tm which mounts directly to the valve and yoke assembly.

2. **Gemini Controller** and power supply designed to be mounted adjacent to cylinder hookup.

3. **Power cable** assembly to provide a flexible two-wire connection between the system controller and the actuator.

Standard Accessories

1. **Wall bracket** to provide for temporary placement of the actuator during cylinder changes or maintenance and testing.



2. A red, mushroom style, **emergency shutoff switch** and enclosure.

Additional elements required for installation

1. 115 VAC or 230 VAC electrical source (dedicated disconnect).
2. Corrosion resistant conduit and fittings.
3. Suitable anchors for rigid wall mount of control module, stowage brackets and emergency shutoff button.
4. Suitable location and fixture for exterior mounting of array (solar option).

Options

1. Special circuit board Relay Interface Module to send powered signals to other systems when actuators are activated or complete.

Specially engineered options are available for multiple unit control modules, satellite cable locations and remote activation devices. Consult your local representative or the factory.

D. Specifications

Test torque ---------- 30-40 ft.-lb.
Emergency torque ---------- 40-50 ft.-lb.
Motor speed---------- 1600 RPM
Charge current @ 115 /230 VAC------0.9 amp.
Charge current (solar) @ 12v dc ------.34 amp.
Battery ----------8.0 amp-hr. High Rate
Relay Output---------- 0.2 amp @ 24 VDC
Valve ----------C.I. ** DWG's 110,113
Yoke---------- C.I.** DWG's 189,131

The C.I. (Chlorine Institute), Wash., DC torque specified : Test 20-30ft.-lbs. Emerg. 40-50ft.-lbs.
**Compatible with C.I. and CGA (Compressed Gas Association) No. 820, 820C.

II. Operation

A. General

The **Halogen Valve System's Terminator Actuator** tm provides an electric powered closure for a 150-lb. chlorine cylinder valve. The valve must be opened manually with the chlorine wrench and checked for leaks prior to installing the actuator. During an emergency, the actuator will close the cylinder container valve when triggered by a gas leak detector, remote switch, or any combination of automatic or manual controls.

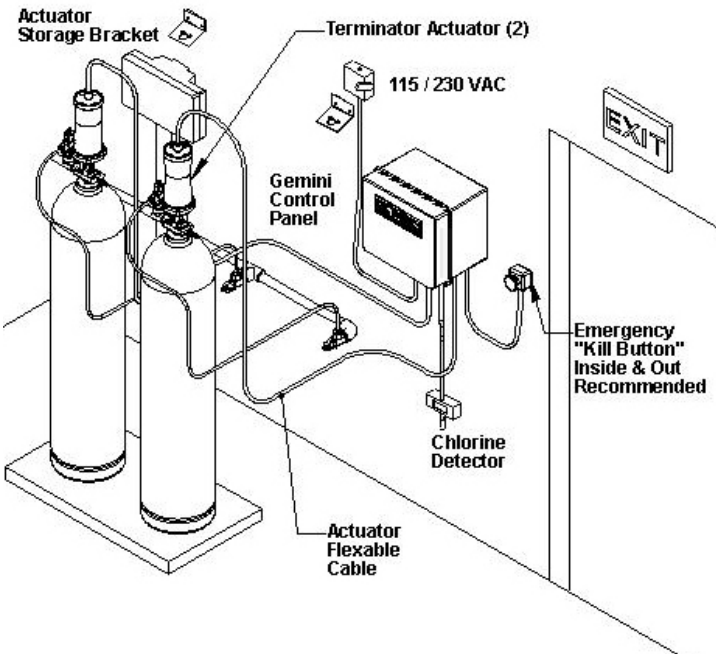
The **Terminator Actuator tm** is constructed of specific materials selected for liquid or dry chlorine gas service. There are three Viton "O" rings in the Xenoy plastic alloy housing, designed to seal the internal motor and drive section. One is in the bearing and two are between Xenoy surfaces.

Power for the **Terminator Actuator tm** is provided by a self-contained 12-volt battery and charger that are monitored continuously by a microprocessor located in the control panel. The microprocessor consumes a small amount of battery power to continuously display the status of the battery and control system. The system uses 115 or 230 volt alternating current. In the event electrical power is lost, the battery will retain enough power to close the valve for up to 7 days. During a prolonged power outage, the microprocessor will automatically close the valves before the battery is depleted.

NOTE
The Terminator Actuator tm cannot power the valve open. Opening the valve must be accomplished manually.

The recommended installation includes an emergency shutoff switch (kill button), provided as a standard accessory. This should be located within easy reach of operating personnel, along the path of egress from the cylinder area. It is also recommended that a second kill button be located on the exterior wall of a secondary exit for access outside the confined chlorine area.

For the typical chlorine valve that is open one full turn, the actuator will close the valve many times faster (approximately three seconds) than can be done manually with a wrench.



Typical Gemini System

III. Installation

A. General

The control system panel box, enclosure fittings (MAX-LOC cord grip) and cables are NEMA-4X rated. It is recommended that all components be located indoors or within a weather-protected building or gas cabinet. **The actuator mechanism, cylinder, and cylinder valve must be within a weather-protected enclosure when mounted and in service**.

NOTE
The actuator mechanism must be within a weather-protected enclosure.

CAUTION

Do not connect power to the control unit until instructed to do so. All other connections should be completed first. Connecting AC power to the improper terminal block will damage the control unit.

B. Control and Accessories

Installation of the control panel should be performed by an electrician in accordance with applicable electrical codes.

Mount Control Box On The Wall

The enclosure is equipped with both tapped screw holes and mounting tabs for this purpose. Insert the mounting tabs that are included with the controller. Fasten the mounting tabs to the wall using the proper fastener for the structure. The control panel and status lights must be easily observable by operating personnel working on the cylinder.

Mounting Tabs

The control system is mounted within a gasketed enclosure rated for a corrosive chemical environment. The control panel should be rigidly mounted to a wall or other permanent structure within the length of the electrical cable and convenient to the cylinder valve and the actuator stowage bracket. Installation of the control panel should be performed by an electrician in accordance with applicable electrical codes.

It is recommended that 115 / 230 VAC power to the control panel be supplied from a circuit breaker. Wiring should be through rigid PVC or flexible PVC coated conduit such as "Liquid-tite." Connections and terminations should be made only in enclosures rated for the corrosive environment encountered in chlorine facilities (NEMA 4X). The control panel entry fittings should be of the proper size and type to insure that the gas-tight integrity of the enclosure is not broken at wire or conduit entrances. Daniel Woodhead "Max Loc" or similar fittings are preferred.

Gemini Controller

C. Wall Brackets

Install wall bracket in location convenient to cylinder change. This bracket helps prevent floor damage to the actuator and cord.

A wall mounted actuator storage bracket is provided for temporary placement of the actuator when it is not installed on the cylinder. This should be mounted to a wall or structure convenient to the cylinder valve location and within the reach of the actuator cable.

Actuator in Wall Bracket

D. Actuator Cable

Run all rough wiring, using conduit and entry fittings that maintain gas-tight integrity of panel (NEMA 4X). The actuator is shipped with a 7-ft. electrical cable pre-wired to the actuator drive motor. If longer cable lengths are necessary, consult the factory. Connect actuator cables to the actuator control block inside the control unit. Verify that the actuator wire colors correspond with the positive and negative leads on the circuit board control blocks and that they have the proper polarity. (White is positive and black is negative.)

Cable in Entry Fittings

CAUTION
Verify that power is turned off before connecting power leads to the control unit. Do not apply power to the unit until installation is complete.

E. Input Wiring

Connect wires from remote kill button and/or gas detector to the remote input or "TB1" terminal block shown on pages 9 and 11. **Use 24 AWG twisted and shielded wire (such as Belden 9501 or equivalent).** Note, inputs can be configured for either normally open or normally closed contacts via the remote input jumper setting, JP1, on the controller circuit board shown on page 9 and 11 The controller default setting is normally open. This setting will cause all attached valves to close during a EMERGENCY CLOSE situation, if any contact switch is activated thereby completing the circuit.

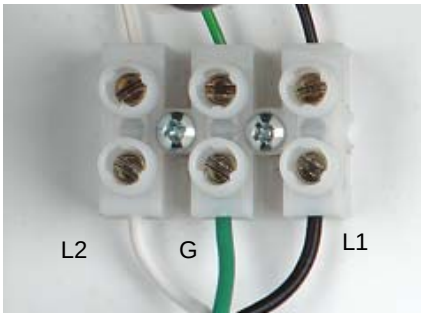
F. Output - Relay Interface Module (Optional)

The Relay Interface Module is needed to provide a closed contact or powered output if such an event is desired to indicate the completion of the emergency closing sequence. The TB2 connection block can be wired to the K1 or K2 relay control block as shown on Pages 11 and 12 to provide the output signal to activate the relays. Relays K1 & K2 are provided as momentary relays but are available as latching relays, as an additional option.

CAUTION
Do not connect unauthorized power relays or other devices inside the system control box. This will prevent magnetic pulses from damaging the computer and also void the Warranty.

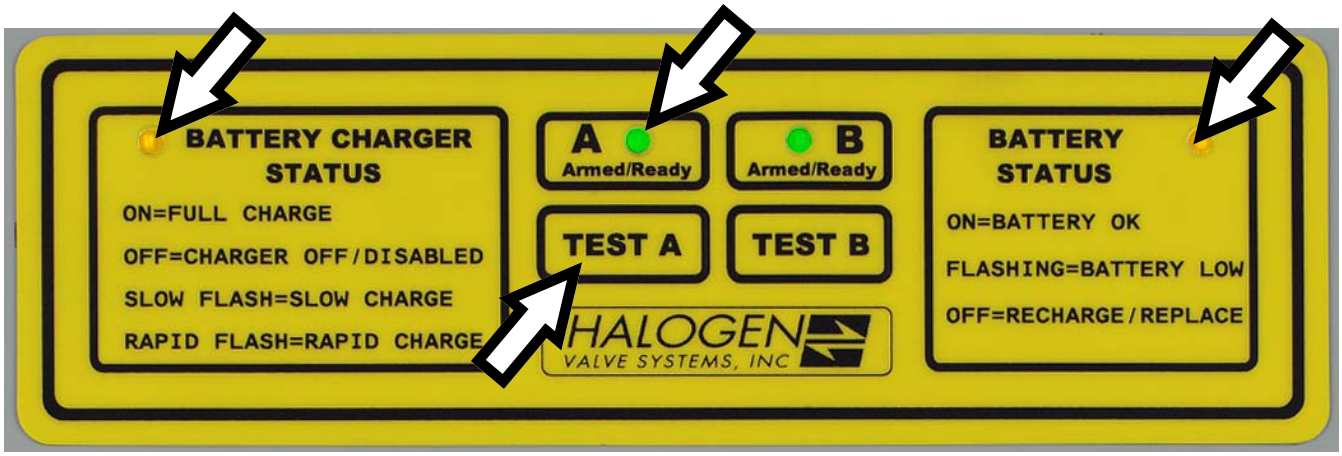
G. 115 / 230 VAC Power

Connect AC power, after the control panel is mounted and all I/O connections are made. Connect the 115 / 230 VAC powered leads to the terminal blocks marked "BLK" (L1, high side), "WHT" (L2, low side) and "GRN" (G, ground). Conduit and fittings should be rated NEMA-4X to maintain a gas and liquid-tight seal for the control enclosure.



Terminal Block

H. Battery



CAUTION
If battery or fuse is disconnected system will not operate, even if Armed/ Ready lights are flashing.

CAUTION
BATTERY STATUS: Does not indicate battery information, if charger is on.

Connect the positive terminal of the battery to the **Red** controller wire and slide the battery into the bracket. Install the battery cross bar and tighten the captive screws. Connect the negative terminal of the battery to the **Black** controller wire. The "Armed/Ready" light should be flashing green. Apply
115 / 230 VAC power to the control system. The "CHARGER STATUS" light should either flash slow or fast depending on the state of the charge for the battery.

Gemini Controller

If the battery is fully charged the amber light will be steady. Press the microprocessor "RESET" button inside the controller to insure initiation of the control program. **Pushing the "RESET" button is required whenever a new battery is installed or if the battery connections are interrupted during control system set-up.**

If the amber "BATTERY STATUS" light is flashing after 115 or 230 VAC power is applied, the battery may have discharged during storage or transit. It should go to a steady light after a few minutes. Do not proceed with the remainder of the installation until the "BATTERY STATUS" light is steady. If required, see the troubleshooting section of this manual for battery test or replacement procedures.

WARNING
If the polarity of the battery connection is accidentally reversed, the circuit board will be damaged. Return the board to the factory for repairs.

I. System Connection & Checks

Before proceeding to the system tests, check to be sure the mechanical movement of the actuator has not been damaged in shipment or storage. With the actuator dismounted, rotate the shaft clockwise and counter-clockwise about one-quarter of a turn. The shaft should turn smoothly in both directions until you meet a mechanical stop. Then turn the shaft clockwise to the mechanical stop. Turn it further in the same direction (clockwise). There will be mild resistance in that direction but continue for about one turn. If the shaft does not turn after you get to the mechanical stop or significant force is required to turn the shaft, please call the factory.

Terminator Actuator tm

The electrical system may be checked for proper polarity and status indication by test running the actuator motor with the actuator dismounted. Initiate the test sequence by depressing the "Test" button on the Gemini control panel. Observe that the actuator shaft rotates in the counter clockwise direction as viewed from the bottom. The actuator motor should run for about 3 seconds and then shut off automatically. **The actuator cables and controls are of the proper polarity when the motor drives the shaft in the counter clockwise direction as seen from the bottom of the actuator. This should be the same direction that closes the valve.**

If the system checks out properly you may proceed to the "Mounting to a Cylinder Valve", Section IV for further testing of the system.

IV. Mounting to a Cylinder Valve

Follow these procedures:

1. Make sure all piping connections are in accordance with *The Chlorine Manual* or local procedures. The yoke (Part No. 5151.00) and CGA 820 connection are the standard connection adapters to the container valve outlet. Always install a fresh gasket between the valve face and the CGA 820 connection.
2. Tightening the yoke bolt (in picture) will compress the gasket and secure the yoke rigidly to the valve by coupling the valve outlet flange to the process tubing or pipe with a CGA 820 Connection.

3. After making sure there are no leaks in the connections, or the valve and the valve stem has been opened to no more than one (1) turn, the **Terminator Actuator** tm shown in figure 1 is ready to be put on the valve.
4. Align the actuator shaft and bronze drive bushing with the valve stem. With the actuator rods parallel to the sides of the valve, let the actuator slide down on the valve while rotating the drive bushing to align the bushing and valve stem flats.
5. The bronze drive bushing located at the base of the actuator should fully engage the wrench flats on the valve stem.
6. The **Terminator Actuator** tm mounting rods are designed to straddle and loosely grasp the valve on either side of the gas nozzle as shown in figure 2.
7. The two rods on the actuator will fit inside the standard yoke, if one is used, and fit loosely on either side of the valve nozzle after the drive bushing is seated as shown in Figure 3.

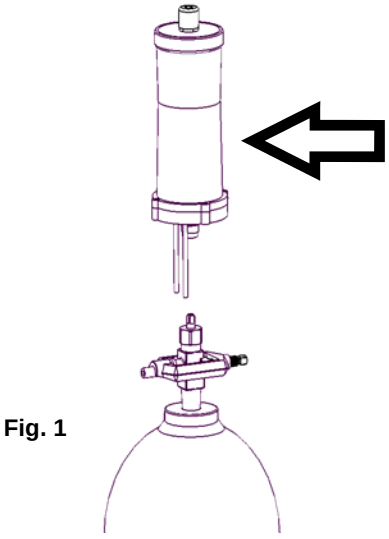


Fig. 1

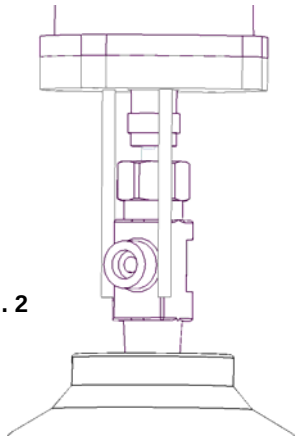


Fig. 2

8. Check for proper alignment of the actuator and the valve stem by visually checking the actuator bronze drive bushing and the Monel valve shaft.
9. The **Terminator Actuator** tm is designed to fit loosely and rest directly on the 150-lb. cylinder valve stem. The actuator will, upon activation, make a loud ratcheting noise and move around slightly during the closing of the valve**.**
10. The **Terminator Actuator** tm weighs about 8 pounds and gravity along with a secure fit on the cylinder valve will keep the actuator in place during activation.
11. After testing the unit with the test button, remove the Terminator actuator from the valve to check for leaks. Reopen the valve to no more than one (1) turn and replace the **Terminator Actuator** tm using procedures 5 through 8 outlined above. Check, as you reopen the valve, that the actuator has applied enough torque to completely seat the valve.

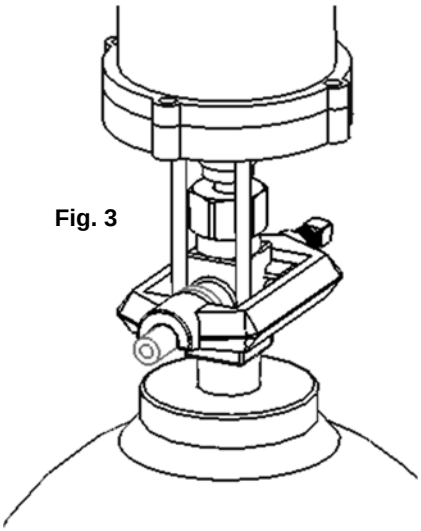


Fig. 3

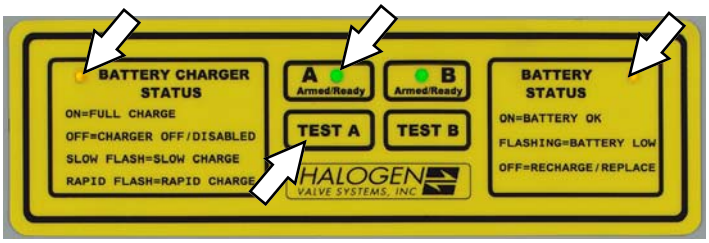
V. Placing in Operation

A. Opening the valve

Before opening any chlorine valve, make sure that the yoke or regulator clamp is firmly tight. Never re-use a gasket that has been compressed previously.
It is recommended that all pressure connections be made and tested as described in The Chlorine Manual, and Section IV of this manual, before operating the valve actuator. This will insure that the valve can be operated manually and the leak testing has been completed prior to installing the actuator.

B. In-Service Testing

The Chlorine Manual recommends that the valve be opened no more than one turn. Usually ½ turn is all that is required to obtain sufficient flow. With the system pressurized and the flow of chlorine established, the emergency actuator system may be tested under actual conditions.



Check that the “Armed/Ready” green lights are flashing and “CHARGE STATUS” light is steady amber and that the “BATTERY STATUS” light is steady amber before proceeding with the test. Depress the “TEST” switch (“A” or “B“) on the control face for the actuator you wish to test. The “Armed/Ready” lights will be off during the valve actuation and return to blinking when ready for another close cycle.

C. Corroded Valves

WARNING
If the valve cannot be readily operated both manually and by the actuator, the cylinder should not be placed in service under any circumstances. It should be returned to the supplier.

Cylinder containers left in dispensing service for long periods may develop corrosion or fouling of the valve body, packing, packing nut, and stem. This can substantially increase the amount of torque required to close the valve**. In severe cases, the increase in the torque required could exceed the capacity of the actuator to close the valve.** To reduce the potential for fouling, implement the following policies and procedures**:**

1. Test cycle the actuator system at least once per month.
2. Specify that the chlorine supplier provide only cylinders equipped with Chlorine Institute approved Teflon packing. This greatly reduces friction between the packing and stem. In the past, graphite-impregnated, split packing rings were the only approved packing system for cylinder container valves. These require greater gland-nut tightness to seal, resulting in higher friction between the valve stem and packing. Friction is increased even more when the stem is corroded or fouled. The solid, non-split Teflon packing seals better, with less gland pressure and requires less force to open or close even when the stem is corroded. New seal kits are available for suppliers to convert existing valves to the new Teflon packing at nominal cost.
3. Wet chlorine is the primary cause of corrosion of the internal components of these valves. This may be due to poor quality control during the refilling of containers by the supplier. Additionally, moisture and/or other contaminants may not be fully evacuated from the chlorine container before refilling. In addition, moisture can enter the valve and cylinder through "suck-back" from the dispensing piping or atmosphere. This problem is the result of temperature changes or other design deficiencies in filling.
4. Consult with your supplier concerning refilling equipment and techniques as well as valve reconditioning and repackaging. Detailed procedures are covered in the Chlorine Institute (C.I.) Pamphlet # 17, *Cylinder and Ton Container Procedure for Chlorine Packing,* to insure high quality, dry chlorine and contaminant free valves that turn freely and easily (less than 10 ft-lb. of torque).

   Consider the installation of equipment that dispenses chlorine gas with a vacuum regulator. This can eliminate "suck-back" and the intrusion of atmospheric moisture. Your Halogen Valve Systems representative can provide information on devices engineered to dispense chlorine while precluding the introduction of contaminants.

D. Battery Characteristics

The system test sequence described in the paragraph, **In-Service Testing**, (section B on this page) should be performed each time that an empty cylinder is replaced with a full cylinder. For 150 lb. cylinders kept in extended service, this system test should be performed at least once per month, preferably once a week.

NOTE
If the “BATTERY STATUS” light flashes continuously, replace the battery. Use only factory certified parts.

The battery capacity is not appreciably affected by one or even several test cycles of the actuator when normal charging power is available.

VI. Gas Sensor

If a gas sensor detects chlorine gas and automatically shuts the chlorine valve, make sure that the room is completely clear of chlorine gas before resetting the Halogen Valve automatic shutoff system. Otherwise, the gas sensor will detect the residual chlorine gas in the room and shut the system down again as soon as it is turned on. This is also true when changing cylinders. A small amount of chlorine gas may leak out of a pig-tail which may set off a gas sensor. A time delay relay may be installed in the controller, **after consulting the factory**, to allow time to completely air out the room.

Sensor Testing

The testing or calibration of sensor or remote inputs to the controller may be checked by the following procedure. This procedure also provides a check of the electrical continuity of the entire system including the sensor wiring.

1. Place the actuator in the wall mount bracket with the cable connected.
2. Expose the sensor to a calibration gas or otherwise activate the control input to the control module.
3. The actuator should run for about 2½ seconds, indicating that the control unit received the signal.

Note that this procedure is similar to functional testing outlined previously, except that the triggering signal originates with the sensor rather than the test button and the actuator is not connected to the cylinder valve. This procedure may be repeated, at 15 second intervals, for numerous sensor calibrations without the necessity of re-opening the cylinder valve for each cycle. Additionally, the battery will not be depleted since there is no load on the drive motor.

VII. Maintennce

A. Battery

1. **Replacement**

Expected life of the battery is 2 to 3 years under normal conditions. However, **it is necessary to replace the battery annually, with a factory battery to insure system warranty and reliability of torque application.** The amperage of the battery will rapidly degrade after one year's use reducing the system's torque.

2. **Storage**

Spare batteries, when not supplied a sustaining charge, have a shelf life of approximately one year if stored in a cool, dry place. Periodic recharging through a regular service rotation will enhance shelf life.

3. **Operating Characteristics**

The "BATTERY STATUS" light flashes when the Gemini microprocessor detects a voltage of less than 12.5 volts across the battery. During activation or system test, the "BATTERY STATUS" light may flash intermittently. This is due to the high current draw of the motor during the closure and seating of the valve. As long as the "BATTERY STATUS" light is on and steady, the battery has sufficient charge.

A fully charged battery has the capacity to power the actuator through ten cycles, under load, in a five-minute period. Thereafter, allow five to ten minutes for cooling and recharging. After a test cycle, be sure that the "BATTERY STATUS" light is on before proceeding with the next test. Discharging below about 9 volts can damage the battery. At that point, the "BATTERY STATUS" light goes off and the battery cannot be recharged.

WARNING
If the "BATTERY STATUS" light is flashing the actuator may not operate even with charge power connected. If the battery is fully discharged, it will not recover regardless of charging time. The battery must be replaced.

4. **Battery Replacement**

a) Disconnect 115 VAC power.
b) Open control panel door and disconnect the black battery lead.
c) Loosen the two screws on the battery cross-bar and remove.
d) Pull the battery out about half way. Disconnect the red battery lead and remove the battery.
e) Place the new battery halfway into the bracket, with the battery terminals on the left. The positive terminal should be within the reach of the red battery lead. Connect the red lead, then slide the battery fully into the bracket.
f) Re-install the battery cross-bar and tighten the screws.
g) Connect the black lead to the negative terminal of the battery. (The armed ready light should illuminate.)
h) Re-connect 115 VAC power.
i) **Push "RESET" button.**

B. Microprocessor Circuit Board

All of the power management, display and diagnostic elements of the control panel are integrated on a single circuit board mounted within the control panel enclosure. The actuator power fuse, located in the upper right hand corner of the circuit board is the only replaceable component on the circuit board.

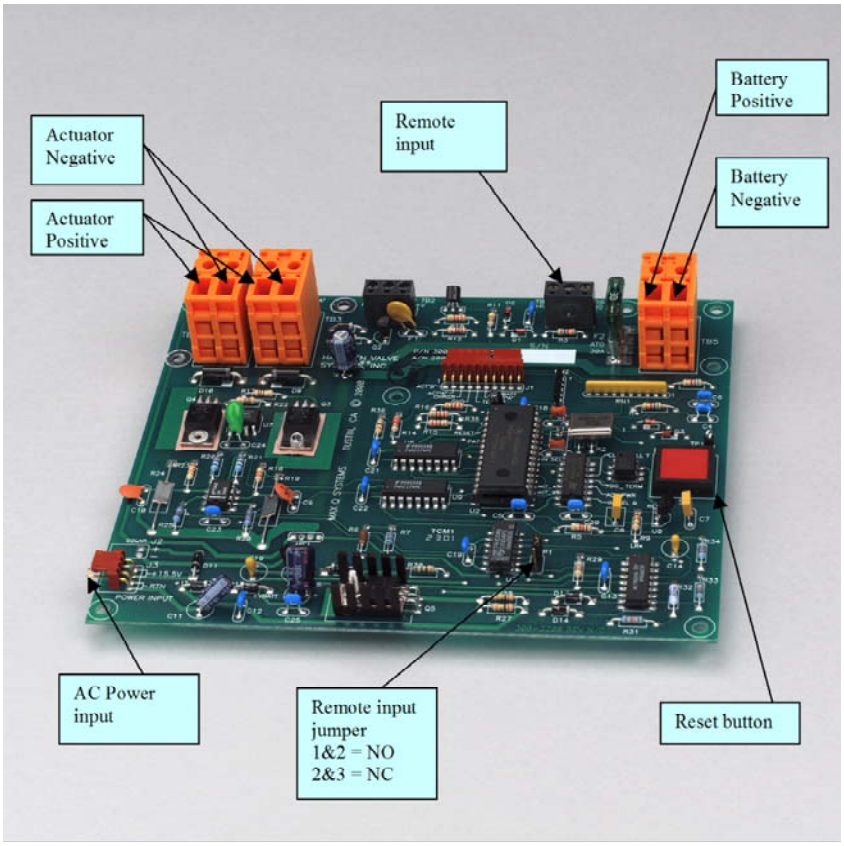
Two spare 30 amp fuses, color coded green, are shipped with this maintenance manual and are available from the factory as Part No. 4001-09. Another 30 amp fuse, color coded green, Part No. 257-030, may be substituted.

WARNING
Substitution of other fuses may result in damage to the control of circuitry and/or actuator failure.

The microprocessor program is stored in an EPROM memory chip that is pre-programmed at the factory. The board is not field repairable and, if it malfunctions, it must be exchanged with a new or rebuilt factory unit.

How to remove the circuit board for replacement or repair:

1. Disconnect 115 / 230 VAC power at the source external to the control enclosure.
2. Disconnect and remove the battery.
3. Disconnect the signal input and signal output from the circuit board.
4. Disconnect actuator cables.
5. The circuit board may now be removed.
6. Pull the circuit board down gently and it will pop out of the pin holders.



Gemini circuit board

Installation of a new circuit board is approximately the reverse of the above procedure. Refer to pages 4-5 to insure that both the battery and actuator cable connections are of the proper polarity. Be sure that the terminal post and cable connections are firmly tight in the terminal connectors.

C. Cables and connections

Check the continuity of the sensor input connections. Clean and tighten if necessary. When performing periodic sensor calibrations as called for by the sensor manufacturer, perform sensor test described in Section VI to verify the entire system.

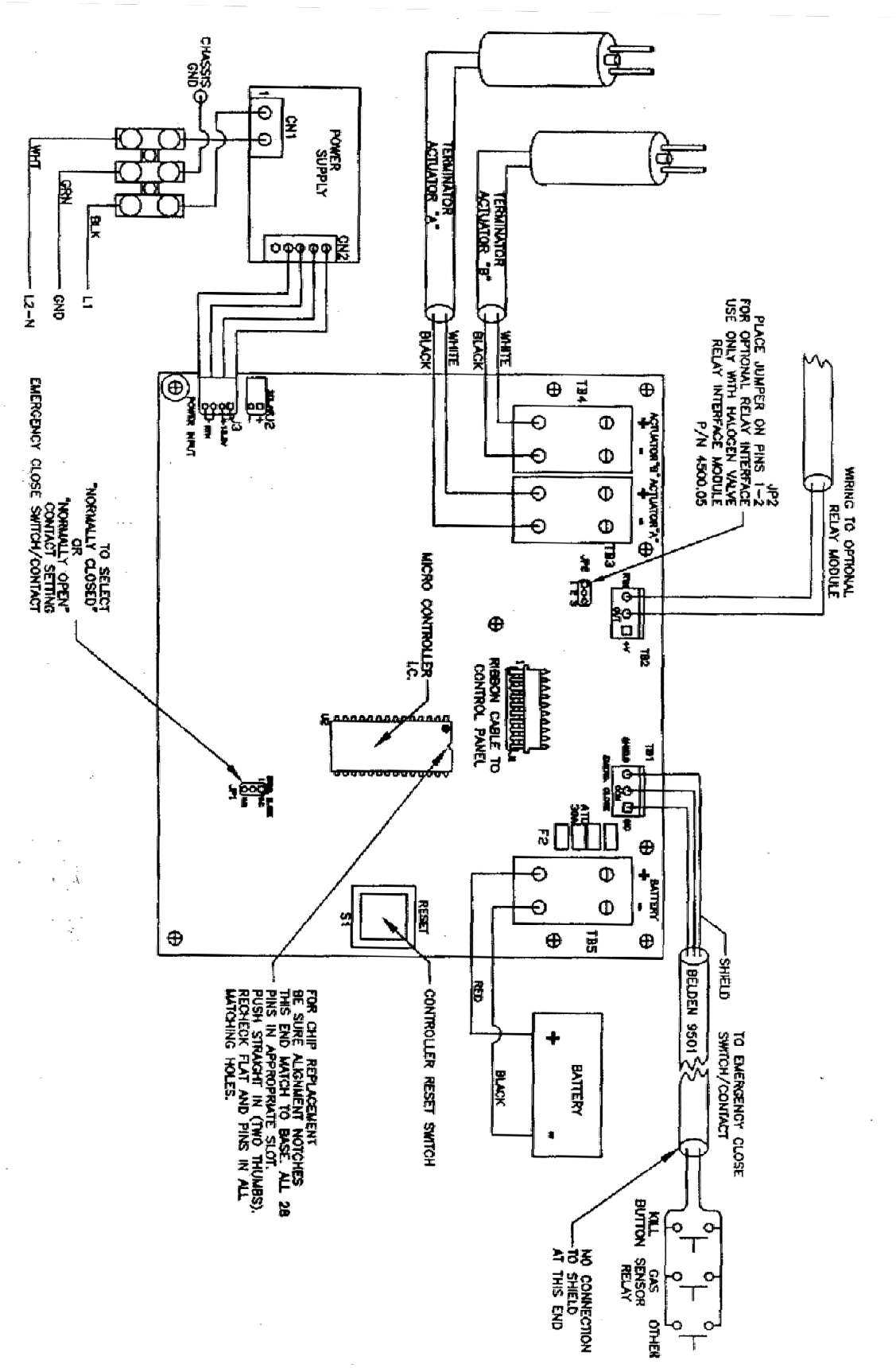
VIII. Troubleshoot

*For the **Gemini***

Trouble	Probable Cause	Corrective Action
"BATTERY STATUS" light Flashing or Off	A. Flashing - Low battery	1. Battery should recharge if "BATTERY CHARGER " light is on or flashing
	B. Off – Replace/ Recharge	1. Replace battery. Push microprocessor " RESET" button after installing. After removal from the control panel, verification of a bad battery can be accomplished by checking the voltage across the terminals with a voltmeter. Less than 12v indicates a defective battery. Otherwise, proceed with the following checks of the charging circuit. 2. Be sure 115 VAC power or solar cell power is available. Check the charging circuit as follows: a) "BATTERY CHARGER " light is on or flashing. b) Check that battery cable connections are secure at the circuit board terminals (refer to Maintenance Section for access to circuit board). Connect a DC voltmeter across the Red and Black battery cables. c) Must be at least 13-14 volts dc. Otherwise, replace circuit board (See Maintenance Section VIII).
Motor fails to operate when "TEST A" or "TEST B" button is pushed (Battery OK)	A. Microprocessor stalled	1. Push microprocessor " RESET" button.
	B. Power fuse blown	1. Check the 30 amp, blade-type fuse (See page 9). Replace with spare included with instructions. 2. Determine the cause of the blown fuse. Most likely cause of blown fuse is a cross-connect or short in the cable.
	C. Cable damaged or bad connection	1. Check cable terminations for proper polarity. Check for damaged cable. Check for secure connections at cable termination in control box. Return actuator and cable to factory.
"Armed/Ready" light off	A. No Power	1. Check battery LED. If off, go to top of table. 2. Check "BATTERY CHARGER " light. If off, check AC power to unit.
	B. Defective control Panel	1. Press reset and hold while observing control panel LEDs. All LEDs should be illuminated. If one or more but not all are illuminated, replace control panel.
	C. Defective control module	1. Press reset and hold while observing control panel LEDs. All LEDs should be illuminated. If none are illuminated, replace control module. Note: All LEDs should be off (dark) for 0.75 seconds after the reset button is released.

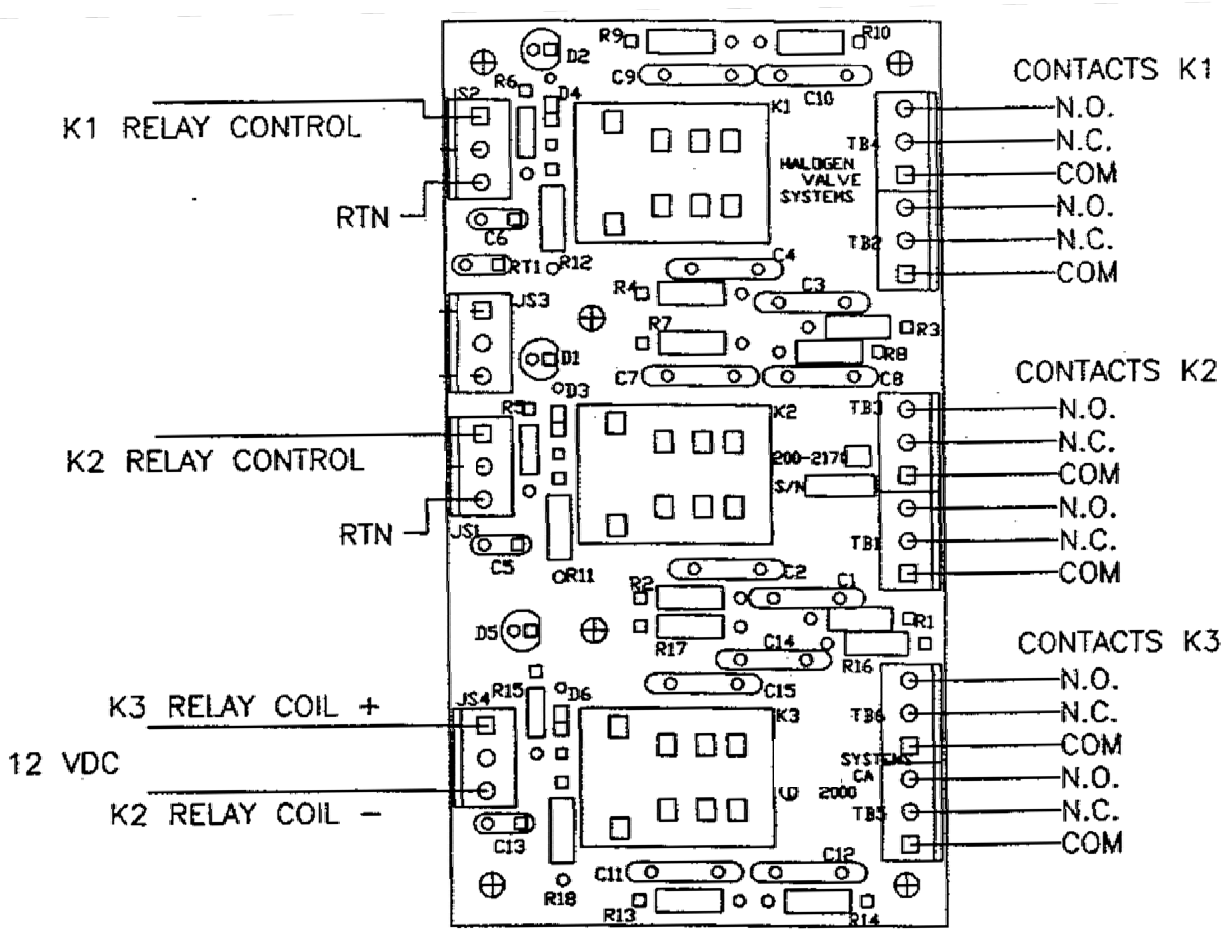
IX. Typical Circuit Board Wiring

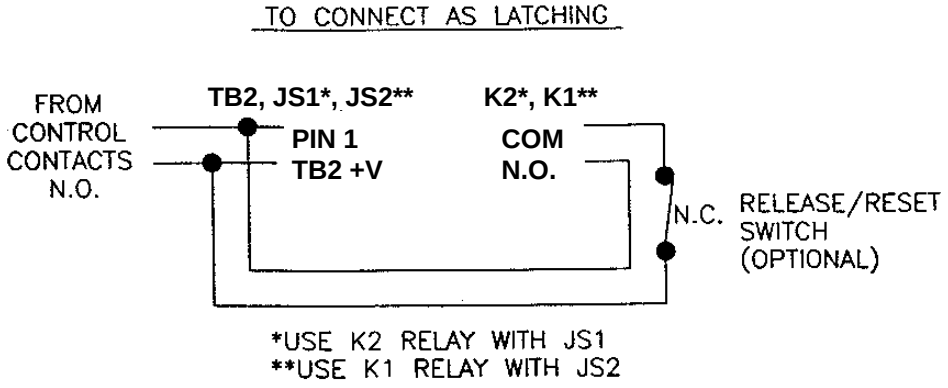
*For the **Gemini***



X. Relay Interface Module Circuit Board

*For the **Mercury** or **Gemini***





Represented by:

HALOGEN VALVE SYSTEMS, INC.

17961 Sky Park Circle, Ste. A
Irvine, CA 92614

Phone No. **949-261-5030**
Toll Free **877-476-4222**
Fax **949-261-5033**