

**GAO-A4, GMH-A4, and GML-A4  
Gas Pressure Switch  
Installation Instructions**

**SPECIFICATIONS**

High/low ventless gas pressure switch (SPDT) with automatic or manual reset. Includes visual indication of switch position. Gas connection 1/4" NPT pipe mount.

**Gases**

Natural gas, propane, butane, air; other noncorrosive gases. Suitable for up to 0.1% by volume, dry H<sub>2</sub>S.

**Switch action**

GAO: high/low limit, NC breaks on rise, automatic reset  
GMH: high limit, NC breaks on rise, manual reset  
GML: low limit, NO breaks on fall, manual reset

**Switch Type and Contact Rating**

SPDT; 10 A res., 8 FLA, 48 LRA @120 Vac

**Vent Limiter**

Incorporates a vent limiter as per UL 353 and limits the escape of gas less than 1.0 CFH of natural gas at 7 PSI if internal switch diaphragm rupture.

**Electrical Connection**

1/2" NPT conduit connection via screw terminals

**Enclosure Rating**

NEMA Type 4

**Maximum Operating Pressure**

7 PSI (500 mbar)

**Ambient / Fluid Temperature**

Versions -2, -3, -5, & -6; -40°F to +140°F; (-40°C to +60°C)  
Version -8; -20°F to +140°F; (-30°C to +60°C)

**Materials in contact with Gas**

Housing: Aluminum, Steel; diaphragms: NBR-based rubber

**Approvals**

UL Listed: File # MH 16628

FM Approved: File # J.I. 1Y9A9.AF

CSA Certified: File # LR 73925

Commonwealth of Massachusetts Approved Product

Approval code G3-0106-191



**ATTENTION**

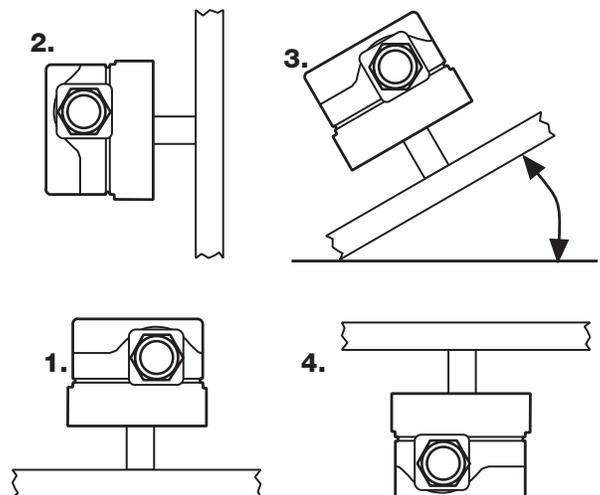
- Read these instructions carefully.
- Failure to follow them and/or improper installation may cause explosion, property damage and injuries.
- Installation must be done with the supervision of a licensed burner technician.
- The system must meet all applicable national and local code requirements such as but not limited to NFPA 85, NFPA 86, UL 795, CSD-1, ANSI Z83.4, ANSI Z83.18, ANSI Z21.13, and CSA B149.3.
- Check the ratings in the specifications to make sure that they are suitable for your application.
- Never perform work if gas pressure or power is applied, or in the presence of an open flame.
- Once installed, perform a complete checkout including leak testing.
- Verify proper operation after servicing.
- Switch should be installed onto a surface free of vibration.

**MOUNTING**

**Location**

Model GAO-A4-4, GMH-A4-4, and GML-A4-4 can be mounted directly to 1/4" NPT pipe. The pressure switch should be mounted in locations meeting the requirements of the applicable code.

1. Standard installation position
2. When installed horizontally, the pressure switch switches at a pressure higher from the set point reference value by approximately 0.2 in. W.C. (0.5 mbar).
3. When installed in positions other than 1,2, or 4 the pressure switch switches at pressure deviating (higher or lower) from the set point reference value by max. ±0.2 in. W.C. (0.5 mbar).
4. When installed upside down, the pressure switch switches at a pressure lower from the set point reference value by approximately 0.2 in. W.C. (0.5 mbar).



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## MOUNTING

### Recommended Mounting Procedure

- Use new, properly reamed and threaded pipe free of chips.
- Apply good quality pipe sealant, putting a moderate amount on the male threads only. If using LP gas, use pipe sealant rated for use with LP gas.

- Use 13/16" Wrench to secure the switch to the pipe.  
**DO NOT exceed 177 lb-in of torque**
- After installation is complete, perform a leak test.

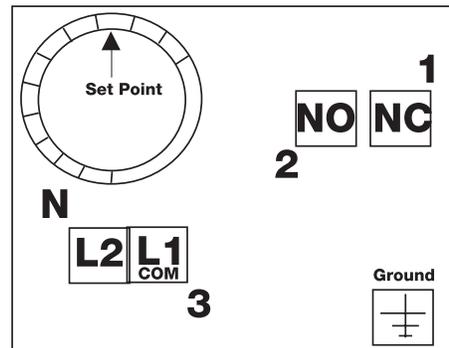
Venting might NOT be required, subject to the authority having jurisdiction. The switches have a built in vent limiter.

## WIRING

### For GAO-A4 Switches

- Remove the clear cover from the switch.
- Use 14 or 16 AWG wire rated for at least 75°C
- Route the wires through the conduit connector
- Connect the wiring to the appropriate screw terminals on the terminal strip.
- GAO for high pressure: Wire the neon light between the NO and the neutral contacts. The switch is factory wired as a high pressure switch. Light indicates tripped switch.
- GAO for low pressure: Wire the neon light between the NC and the neutral contacts. A trained technician needs to switch the lead from the NO terminal to the NC terminal. Light indicates tripped switch.

### Wiring Terminal Illustration



### For GMH-A4 & GML-A4 Switches

- Remove the clear cover from the switch.
- Use 14 or 16 AWG wire rated for at least 75°C
- Route the wires through the conduit connector
- Connect the wiring to the appropriate screw terminals.
- The switch is factory wired for the neon light to indicate a tripped switch.

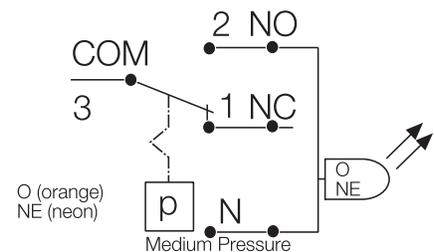
**CAUTION:** All wiring must comply with local electrical codes, ordinances and regulations.

**CAUTION:** Do not exceed the switch rating given in the specifications and on the switch.

**NOTE:** Always calibrate the switch in the desired mounting position.

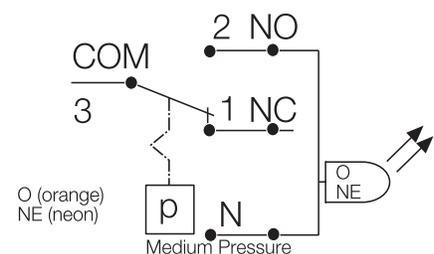
### GAO (Operation stated shown as a high gas limit).

**As pressure rises** above set point, 1 NC opens, 2 NO closes, Neon light ON (fault). **As pressure falls** below set point, switch automatically resets: 1 NC closes and 2 NO opens.



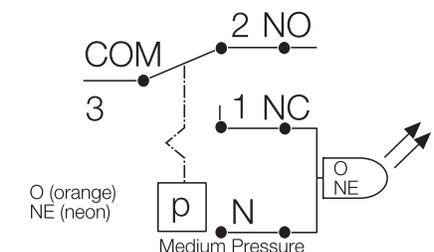
### GMH (Operating state shown)

**As pressure rises**, 2 NO closes, 1 NC opens, and Neon light ON (fault), switch trips and locks out.



### GML (Operating state shown)

**As pressure falls**, 2 NO opens, 1 NC closes, Neon light ON (fault), switch trips and locks out.



## OPERATION AND ADJUSTMENT

### Annually check the switch for proper operation

#### Set Point Calibration

The set point of the GAO and GMH is factory calibrated with increasing pressure (GML: decreasing pressure). Due to hysteresis the GAO switch will actuate at a slightly lower point when the pressure decreases.

#### Adjusting the Set Point

- Remove plastic cover.
- Turn the dial until the desired trip pressure is opposite the white mark on the yellow dial face.
- After adjusting the set point, check the switch operation by using a calibrated monometer connected to the test nipple. (See test nipple below)
- Replace the clear cover.

#### Calibration / Test Nipple

The test nipple is integrated into the side of the lower housing. It may be used to verify the set point of the switch.

- Loosen the screw by turning it counterclockwise.
- Attach a manometer to the test nipple.
- When satisfied with the calibration, tighten the screw by turning it clockwise.

- Test the nipple for tightness by putting a soapy compound on the screw making sure that no bubbles appear.
- Use a multimeter to check the switch contacts.
- The NC contact of the GAO breaks when pressure rises above the set point. It makes automatically when pressure falls below the set point. Neon light indicates tripped switch.

#### Manual and Automatic Reset

- The NC contact of the GMH and GAO series breaks when pressure rises to the set point. The NO contact of the GML breaks when pressure falls to the set point.
- Only the GAO series will return to its former position automatically. In order to reset the GMH and GML series, wait until the pressure returns to normal operating level, and then press and release the clear cover over the red reset button in the center of the yellow dial face. It is not necessary to remove the cover. Neon light indicates tripped switch.

## MAINTENANCE AND TESTING

### Annually check the switch for proper operation

#### Low Gas Pressure Switch:

- First, connect a meter capable of reading +/- 0 ohms to the NO and COM contacts, and verify that the NO and COM contacts are made. Measure the resistance, and if the resistance is more than 1 ohm, remove switch from service. is more than 1 ohm. (See terminal illustration below for guidance).
- (See the "Terminal Wiring Illustration on page 3 for guidance).
- Then, verify that the low gas pressure switch will change state when a low gas condition is sensed by connecting a meter capable or reading +/- 0 ohms to the NC and COM contacts and then by causing the switch to go into a fault condition. Once the fault occurs, measure the resistance, and if the resistance is more than 1 ohm, remove switch from service. is more than 1 ohm. (See terminal illustration below for guidance).
- To cause the fault, perform one of the two procedures:
  1. Turn the pressure switch setpoint counterclockwise until the switch trips.
  2. Depressurize the volume of gas the low gas pressure switch is sensing. Allow the burner to go through a startup sequence, and then verify that the burner faults and is not allowed to light off.
- Close all test taps (ports) and open upstream ball valve.
- When finished, close all pressure test points used, and then open the upstream ball valve **SLOWLY** to allow gas pressure to gradually bleed into the system.

**CAUTION: Opening the upstream ball valve too fast can permanently damage the regulator.**

#### High Gas Pressure Switch:

- First, connect a meter capable of reading +/- 0 ohms to the NC and COM contacts, and verify that the NC and COM contacts are made. Measure the resistance, and if the resistance is more than 1 ohm, remove switch from service. is more than 1 ohm. (See terminal illustration below for guidance).
- Then, verify that the high gas pressure switch will change state when a high gas condition is sensed by connecting a meter capable or reading +/- 0 ohms to the NO and COM contacts and then by causing the switch to go into a fault condition.
- To cause the fault, perform one of the two procedures:
  1. Turn the pressure switch setpoint clockwise until the switch trips.
  2. Pressurize the volume of gas the high gas pressure switch is sensing. This can be done by opening the test port on the pressure switch, and then using a pump to pressurize the test chamber.
- Measure the resistance across the NO and COM contacts. If the resistance is more than 1 ohm, remove switch from service.
- Allow the burner to go through a startup sequence, and then verify that the burner faults and is not allowed to light off.
- When finished, close all test taps (ports) and open the downstream ball valve.

**NOTE: A resistance exceeding 1 ohm indicates that the switch contacts are starting to either corrode or carbonize.**



**Do not simulate fault conditions while the burner is firing.**

## MODEL DESCRIPTION AND PART NUMBER

Type	Version	Order No.	Setting range in. W.C.	Switching hysteresis in. W.C	Factory Calibration
<b>GAO-A4... pressure switch</b>	GAO-A4-4-2	217-090A	0.16 - 1.20	≤ 0.12	
	GAO-A4-4-3	217-091A	0.40 - 4.00	≤ 0.20	
	GAO-A4-4-5	217-092A	2.00 - 20.00	≤ 0.40	
	GAO-A4-4-6	217-093A	12.0 - 60.0	≤ 1.2	
	GAO-A4-4-8	217-094A	40.0 - 200.0	≤ 4.0	
	GAO-A4-4-2 Gold	223-525A	0.16 - 1.20	≤ 0.12	
	GAO-A4-4-3 Gold	222-267A	0.40 - 4.00	≤ 0.20	
	GAO-A4-4-5 Gold	222-268A	2.00 - 20.00	≤ 0.40	
	GAO-A4-4-6 Gold	222-269A	12.0 - 60.0	≤ 1.2	
	GAO-A4-4-8 Gold	223-526A	40.0 - 200.0	≤ 4.0	
<b>GMH-A4... pressure switch</b>	GMH-A4-4-4	217-326A	1.00 - 20.00	--	
	GMH-A4-4-6	217-327A	12.0 - 60.0	--	
	GMH-A4-4-8	217-328A	40.0 - 200.0	--	
	GMH-A4-4-4 Gold	222-270A	1.00 - 20.00	--	
	GMH-A4-4-6 Gold	222-271A	12.0 - 60.0	--	
<b>GML-A4... pressure switch</b>	GML-A4-4-4	217-340A	1.00 - 20.00	--	
	GML-A4-4-6	217-341A	12.0 - 60.0	--	
	GML-A4-4-8	217-342A	40.0 - 200.0	--	
	GML-A4-4-4 Gold	222-272A	1.00 - 20.00	--	
<b>All switches with Silver contacts have 120 VAC neon lights factory installed</b>					
<b>All switches with Gold contacts have 24 V lights factory installed</b>					

## REPLACEMENT PARTS AND ACCESSORIES

Replacement cover (screws not included)	228-732 (for GAO switches) and 233-113 (for GMH and GML switches)
Screw for replacement cover	237-675
PG11 - 1/2" NPT conduit adapter	220-566
120VAC neon light (orange)	244-156
24VAC/VDC light (orange)	244-157
DIN connector (female plug)	210-318
Male plug for DIN connector	219-659 (for GAO switches) and 227-644 (for GMH and GML switches)