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# INSTRUCTIONS FOR MODELS SG6540 & SG6541 PRESSURE SWITCHES

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THIS BOOKLET CONTAINS PROPRIETARY INFORMATION OF  
ADVANCED SPECIALTY GAS EQUIPMENT CORP. AND IS PROVIDED  
TO THE PURCHASER SOLELY FOR USE IN CONJUNCTION WITH  
MODELS SG6540 & SG6541 PRESSURE SWITCHES.



Model SG6540

## IMPORTANT

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These instructions are for experienced operators who know the general principles and safety precautions to be observed in electrical wiring and handling specialty gases. If you are not certain you fully understand the safety precautions for handling gases, we urge you to obtain and read the Material Safety Data Sheet (MSDS) for each gas being used.

Do not permit untrained persons to install, operate, or maintain these pressure switches. Do not attempt to install or operate this pressure switch until you have read and fully understand these instructions. If you do not fully understand these instructions, contact your Advanced Specialty Gas Equipment Distributor.

**Be sure this information reaches the operator. Your supplier has extra copies.**



## **SAFETY PRECAUTIONS**

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Protect yourself and others. Read and understand the following instructions before attempting to use these pressure switches. Failure to understand and follow these instructions could result in serious personal injury and/or damage to equipment.

- Know and understand the physical and chemical properties of the gas being used.
- Wiring must comply with Local and National Electric Codes.
- Observe safety precautions for the gas being used.
- Read and follow precautions on cylinder labels.
- Never use these pressure switches with gases not compatible with the materials of construction. The use of gases not compatible with the materials of construction may cause damage to equipment or injury to personnel.
- If flammable gases are used with these pressure switches, use Explosion-Proof Model SG6541.
- We recommend the use of the Explosion-Proof Model SG6541 for Oxygen Applications. This model contains a hermetically sealed switching element, which provides a safe environment for handling pure oxygen.
- If toxic or flammable gases are used with these pressure switches, emergency equipment applicable to the gases in use should be available in the operating area.
- Many gases can cause asphyxiation by displacing oxygen in the atmosphere. Make certain the area where pressure switches are connected is well ventilated. Provide a device to warn personnel of oxygen depletion in the work area.
- Electrical rating must be within range stated on the switch name plate (see page 7). Failure to stay within the rating of the switch may result in damage to, or premature failure of, the electrical contacts.
- Disconnect electrical power supply to switch before removal or inspection.
- Relief devices should be installed and properly vented in all gas handling systems to protect against overpressurization.
- Never use oil or grease on these switches. Oil and grease are easily ignited and may combine violently with some gases under pressure.
- Never connect a pressure switch to a supply source having a pressure greater than the maximum rated pressure of the pressure switch. Refer to Product Specifications (see page 7) for maximum inlet pressures.

## **MANUFACTURER STATEMENT**

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The information contained in this instruction booklet has been compiled by Advanced Specialty Gas Equipment Corp., (the Company), from what it believes are authoritative sources and is offered solely as a convenience to its customers. While the Company believes that this information is accurate and factual as of the date printed, the information including design specifications is subject to change without prior notice.

## **DESCRIPTION**

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The Models SG6540 and SG6541 pressure switches are designed to monitor line pressure and activate an external alarm (not supplied) when a certain predetermined pressure is reached. They can be set to activate on either increasing or decreasing pressure.

The pressure sensing element of the pressure switch is a force-balance, piston-actuated assembly, sealed by a flexible Stainless Steel diaphragm and a static O-Ring. There are three wetted parts to the pressure switch: a pressure port, a diaphragm and an O-Ring seal (Fig.2 see pg.9). Media pressure on the piston counteracts the force of the range spring (adjustable by the set point adjusting nut) which moves the piston shaft only a few thousandths of an inch to directly actuate the switching element.

Model SG6540 is a general service pressure switch for use with non-flammable gases. The explosion-proof Model SG6541 is UL listed and CSA certified for use in hazardous locations; Class I group A, B, C, D and Class II group E, F, G. Each model has a single-pole, double throw, electrical switch with a maximum rating of 15 amps at 250 VAC. Their NEMA 4X weathertight housings are constructed of aluminum.

Each pressure switch is supplied with two compression-type male connectors and five feet of  $\frac{1}{8}$  in. OD stainless steel tubing for connection to a manifold or pipeline.

## **MOUNTING**

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**WARNING: Before attempting to install and operate these pressure switches, read and fully understand the safety precautions on page 2 in this booklet. Failure to follow the safety precautions may result in serious personal injury and/or damage to equipment.**

1. Pressure switches are usually mounted adjacent to the end of the manifold and connected to the manifold header with  $\frac{1}{8}$  inch tubing and compression-type male connectors supplied with each unit.
2. The device can be mounted in any position however, for weather tight installation in high humidity areas, orient housing so electrical connection is at the 6 o'clock position to prevent condensate from collecting in the housing enclosure.

**Note:** Line mounting by either process connection or electrical connection is not recommended.

3. Secure housing mounting pad to the wall or other support with two suitable  $\frac{1}{4}$  inch bolts.

**Note:** When mounting to irregular or uneven surface, install rubber washers (provided) on bolts between housing and mounting surface to prevent deformation of housing, which could change relative positions of internal parts and affect calibration or render the device inoperative.

## **PROCESS CONNECTION**

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**WARNING: DO NOT exceed pressure and temperature specifications during operation. DO NOT operate the pressure switch under any circumstances if it leaking or otherwise malfunctioning. Damage to equipment and/or injury to personnel may result.**

1. Connect  $\frac{1}{4}$  in. NPT male x  $\frac{1}{8}$  compression connector to pressure switch using two wrenches: one to hold hex flats on pressure port, the other to tighten male connector. Use Teflon<sup>®</sup> tape on all pipe threads to prevent galling.

**Note:** Be certain process connection is tightened and positioned so bending and torsional forces imposed on pressure switch are minimal. Use care not to loosen pressure port from body or body from housing.

2. Connect  $\frac{1}{8}$  in. NPT male x  $\frac{1}{8}$  compression connector to manifold or pipeline.
3. Install  $\frac{1}{8}$  in. tubing between pressure switch and manifold or pipeline using the male connectors installed in steps 1 and 2 above.
4. Leak test all connections with a nonhazardous gas using either a soap solution, such as Snoop<sup>®</sup> or a gas leak detector.

## ELECTRICAL CONNECTION

**WARNING:** Electrical power must be disconnected prior to connecting wiring to pressure switch. Damage to equipment and/or injury to personnel may result.

Each model has a single-pole, double throw, electrical switch with a maximum rating of 15 amps at 250 VAC. For decreasing pressure activation use the normally closed (NC) contact. For increasing pressure activation the normally open (NO) contact must be connected.

**Note:** Storing excess wire or making wire lead splices inside the pressure switch housing will interfere with pressure switch operation.

### General Service Switches

Electrical connections are made to the three screw-type terminals inside the housing with wiring access through a ¼ in. NPT female conduit connection (Fig.3 see pg.9). The three switch terminals are clearly marked: normally open (NO), normally closed (NC) and common (C).

### Explosion-Proof Switches

Electrical connections are free leads; 18 gauge, 18 in. with ground wire and ¾ in. NPT female conduit connection (Fig.4 see pg.10). The wiring is clearly marked: Black-normally opened (NO), Red-normally closed (NC), Blue-common (C) and Green-ground (GND) (Fig. 1 below).

**Note:** The hermetically sealed, explosion-proof switching element capsule located within the pressure switch housing, has UL Listed/CSA Certified factory-sealed leads. Consequently, an external seal fitting is not required between the pressure switch and junction box of the external electrical circuit.

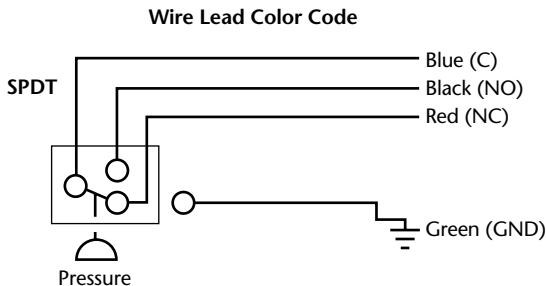


Figure 1 – Model SG6541 Wiring Diagram Schematic

## CALIBRATION

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The switch is factory-set to operate at the pressure specified by the purchaser. It may, however, be adjusted within its adjustable range. Refer to Product Specifications (see page 7) for adjustable ranges.

**WARNING: Electrical power must be disconnected prior to changing pressure settings. Damage to equipment and/or injury to personnel may result.**

1. To change the pressure switch set point, remove the weathertight cover from the housing.
2. Use a  $\frac{3}{4}$  in. open-end wrench to turn hex adjusting nut clockwise to increase set point; counterclockwise to decrease set point. Approximate set point can be obtained by sighting across top of adjusting nut to calibration scale on interior wall of housing.  
**Note:** If precise set point is required, it will be necessary to use a regulated pressure source, a suitable continuity tester and a  $\frac{1}{4}$ % test gauge.
3. Replace housing cover and gasket to ensure weathertightness.

## MAINTENANCE AND REPAIRS

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Pressure switches do not normally require periodic service. If a pressure switch leaks or malfunctions, take it out of service immediately. Do not attempt to repair, modify or changeout wetted parts. Repairs or modifications should be made by Advanced Specialty Gas Equipment Corp. who have the special tools, test equipment and trained personnel required to make a safe repair. Contact your Advanced Specialty Gas Equipment Distributor to arrange for repair.

*Warranty Repairs* are only available through Advanced Specialty Gas Equipment Corp., and will be performed at no charge for parts and labor. For information on warranty, see the last page of this instruction booklet.

*Non-Warranty Repairs* are available through your distributor. Upon receipt at the factory, the pressure switch will be inspected and you will be contacted by your distributor with a repair cost estimate. No item will be repaired until approval is received. There will be an evaluation charge assessed for equipment not repaired.

## SPECIFICATIONS

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Maximum Operating Pressure	See Table 1
Operating Temperature Range	-30°F to +200°F (+32°F to +400°F with Viton® seals)
Adjustable Pressure Range	See Table 1
Electrical Rating	15 amps at 250 VAC (max.)
Minimum Current Required	100mA
DC Rating (resistive loads)	Low Level (30 volts) - 5 amps High Level (125 volts) - 0.4 amp
Housing	NEMA 4, 4X, 1P65
Pressure Port Connection	¼ in. NPT female
Male Connectors (2 supplied)	¼ in. NPT male by ½ in. compression ¼ in. NPT male by ½ in. compression.
Tubing	5 ft. x ¼ in. O.D.
Weight (approx.)	2 lb. (Model SG6540) 3 lb. (Model SG6541)

## MATERIALS OF CONSTRUCTION

Housing	Aluminum
Diaphragm	Type 316 Stainless Steel
Pressure Port	Type 316 Stainless Steel
Seals	See Table 1
Male Connectors	Type 316 Stainless Steel
Tubing	Type 316 Stainless Steel

**Table 1**

General Service Part Number	Explosion-Proof Service Part Number	Max. Inlet Pressure (psig)	Adjustable Range* (psig)	O-Ring Seal Material
SG6540-2-N-(* )	SG6541-2-N-(* )	3000	12–100	Neoprene
SG6540-2-V-(* )	SG6541-2-V-(* )	3000	12–100	Viton®
SG6540-3-N-(* )	SG6541-3-N-(* )	3000	45–550	Neoprene
SG6540-3-V-(* )	SG6541-3-V-(* )	3000	45–550	Viton®
SG6540-4-N-(* )	SG6541-4-N-(* )	5000	500–4000	Neoprene
SG6540-4-V-(* )	SG6541-4-V-(* )	5000	500–4000	Viton®

**Note:** Where “(\* )” is indicated above, insert desired pressure setting. Example: SG6540–2-N-20. Switch will be factory set to activate at 20 psig.

Models SG6540-4 and SG6541-4 can be factory set to activate up to 2000 psig. Settings for pressures above 2000 must be field set.

\*Other ranges available on special order.



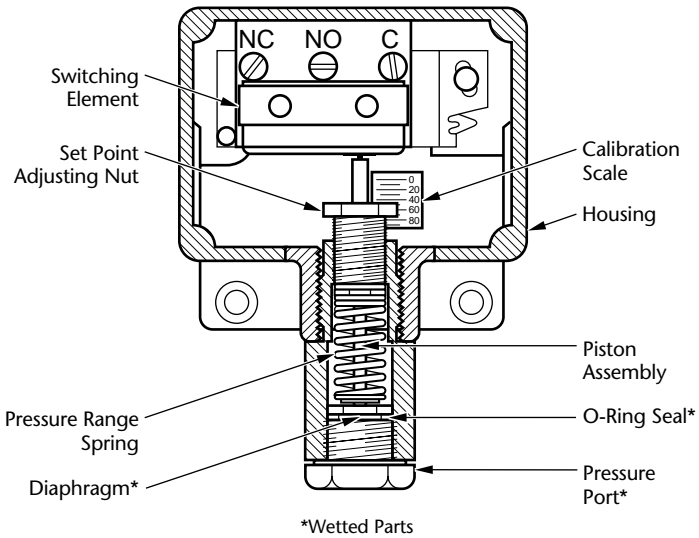


Figure 2 – Model SG6540 Internal View

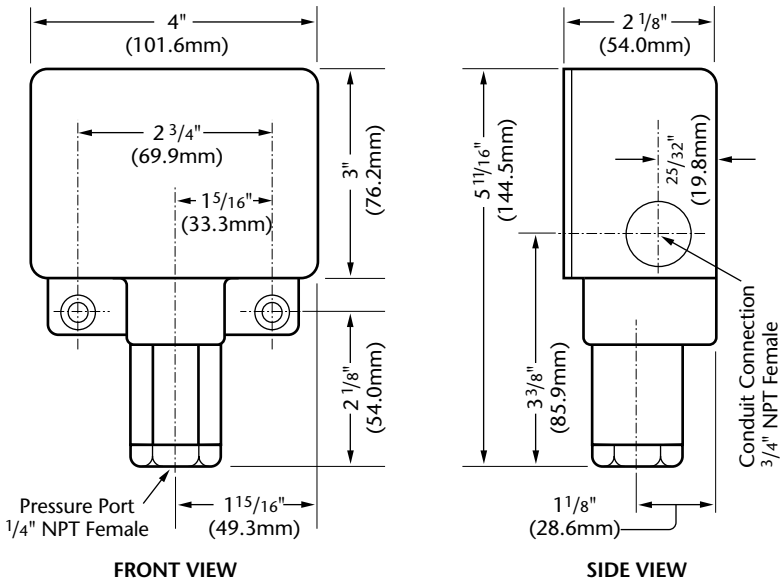
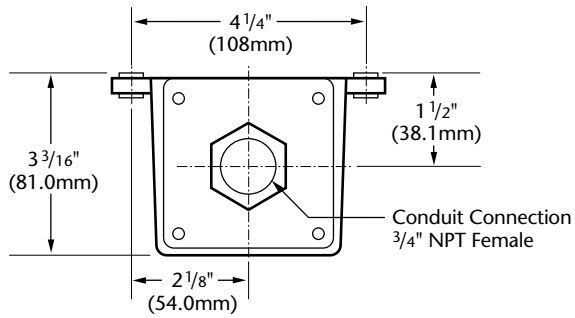
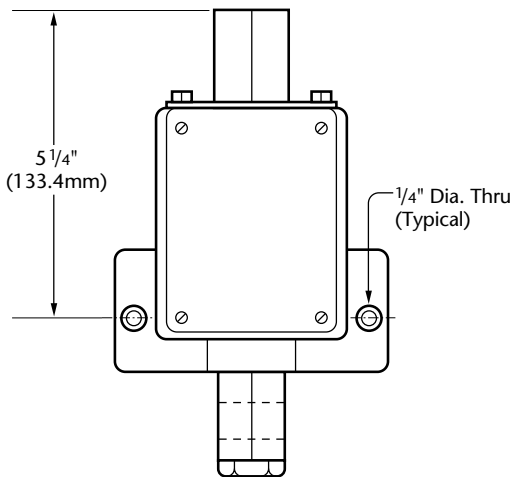


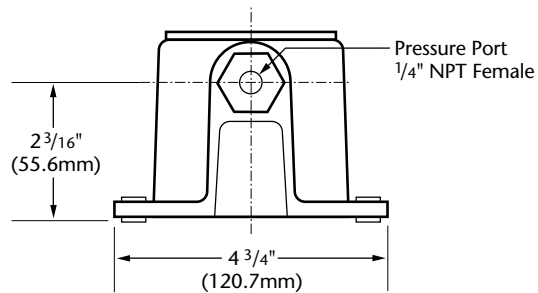
Figure 3 – SG6540 General Service Pressure Switch



**TOP VIEW**



**FRONT VIEW**



**BOTTOM VIEW**

*Figure 4 – SG6541 Explosion-Proof Pressure Switch*

## **WARRANTY**

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Advanced Specialty Gas Equipment Corp.,(the Company), warrants to the initial purchaser of each pressure switch described herein, that such equipment will be free from defects in material and workmanship which result in breakdown or failure under normal use during a period of 12 months from date of shipment by the Company if used and maintained according to Advanced Specialty Gas Equipment written instructions. This warranty does not cover damage or malfunction due to corrosion. Purchaser is aware that this equipment is designed for specific applications and that using this equipment with the wrong or improperly purged gas or at the wrong pressure may damage or corrode the unit and cause personal injury. Purchaser must confirm that this equipment is compatible with the gas being passed through it. If there is any doubt about compatibility, consult your Advanced Specialty Gas Equipment Corp. distributor.

The Company's liability under this warranty shall be limited to the repair, or at its option, replacement or refund of the purchase price, of such equipment which proves to be defective, provided; however, that this warranty shall only apply if the purchaser (1) gives the Company written notice within ten (10) days after discovery of such defect, (2) immediately on discovery of the claimed defect, discontinues all use of such equipment, and (3) returns such equipment freight prepaid to plant of manufacture.

**THERE ARE NO EXPRESS WARRANTIES OTHER THAN THOSE SPECIFIED HEREIN. NO WARRANTIES BY ADVANCED SPECIALTY GAS EQUIPMENT CORP.(OTHER THAN WARRANTY OF TITLE AS PROVIDED IN THE UNIFORM COMMERCIAL CODE) SHALL BE IMPLIED OR OTHERWISE CREATED UNDER ANY APPLICABLE LAW, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY AND WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.** No claim against the Company of any kind, whether as to equipment delivery or for nondelivery of equipment and whether or not based on contract, warranty, negligence, strict liability in tort or otherwise, shall be greater in amount than the purchase price of the equipment in respect of which such claim is made. Without limiting the generality of the foregoing, Advanced Specialty Gas Equipment Corp. shall not be liable for any special, indirect, or consequential damage, such as failure of parts resulting from corrosion.

If it is determined by Advanced Specialty Gas Equipment Corp. that the equipment is to be repaired or replaced under the terms of this warranty, the cost of returning said equipment to the initial purchaser will be paid by the Company. If, however, equipment returned to the Company in connection with a claim under this warranty is found by the Company not to be defective hereunder, then such equipment will be returned to the initial purchaser, shipping charges collect, and additionally, a service charge will be paid by the purchaser to the Company to cover the cost of handling and testing such equipment.



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