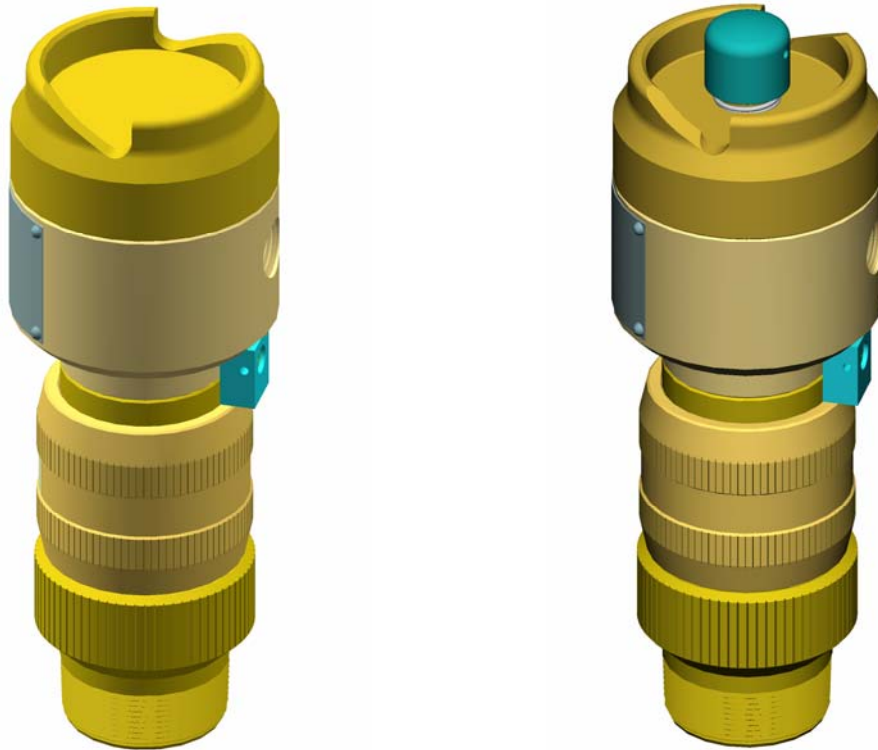


# PRESSURE SWITCHES (DUAL SEAL)

## Installation, Operation, and Maintenance Manual



**Dedicated to Improving Your Operations for Over 45 Years**

**Argus Machine Co. Ltd. • 5820 – 97 Street, Edmonton, Alberta T6E 3J1**

Phone: (780) 434-9451 • Fax: (780) 434-9909 • [www.argusmachine.com](http://www.argusmachine.com)

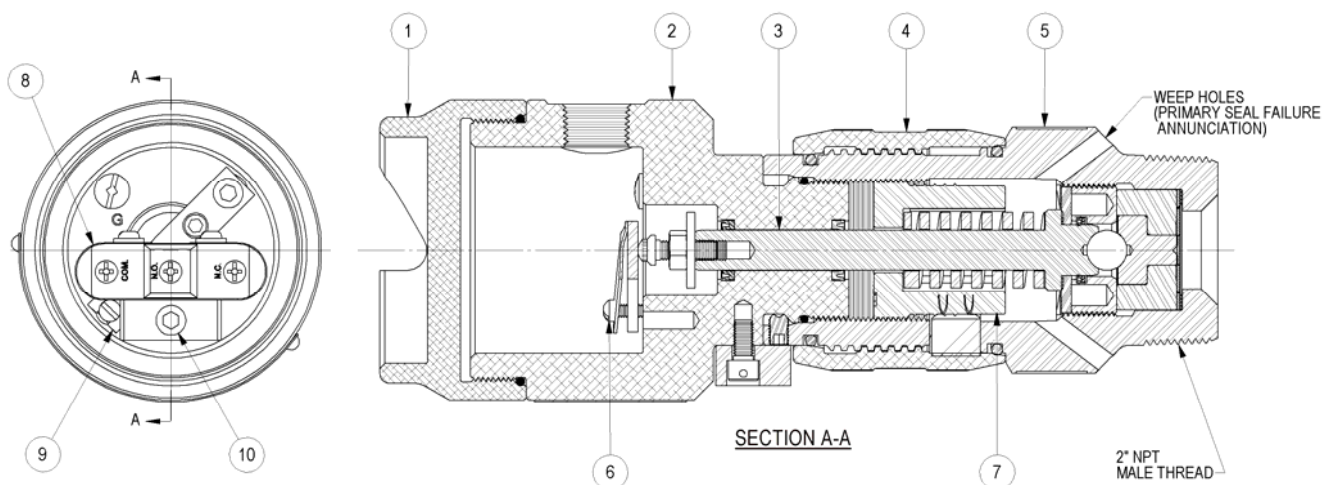
# TABLE OF CONTENTS

|                                 |          |
|---------------------------------|----------|
| <b>1.0 SCOPE</b>                | <b>2</b> |
| <b>2.0 GENERAL</b>              | <b>2</b> |
| <b>3.0 APPLICABLE STANDARDS</b> | <b>3</b> |
| <b>4.0 SAFETY</b>               | <b>3</b> |
| <b>5.0 HANDLING AND STORAGE</b> | <b>3</b> |
| 5.1 HANDLING                    | 3        |
| 5.2 STORAGE                     | 3        |
| <b>6.0 INSTALLATION</b>         | <b>3</b> |
| 6.1 GENERAL NOTES               | 3        |
| 6.2 INSTALLATION INSTRUCTIONS   | 4        |
| <b>7.0 OPERATION</b>            | <b>5</b> |
| 7.1 OPERATING INSTRUCTIONS      | 5        |
| 7.2 PRESSURE SETTING            | 5        |
| 7.3 MICROSWITCH REPLACEMENT     | 6        |
| <b>8.0 MAINTENANCE</b>          | <b>6</b> |
| <b>9.0 TROUBLESHOOTING</b>      | <b>7</b> |
| <b>10.0 CONTACT INFORMATION</b> | <b>7</b> |

## **ATTACHMENTS:**

|  |                     |    |
|--|---------------------|----|
| INSTALLATION AND OPERATION INSTRUCTIONS        | (TB-PS-001, Page 1) | 8  |
| IMPORTANT NOTICE, CAPACITOR DISCHARGE IGNITION | (TB-PS-001, Page 2) | 9  |
| WIRING INSTRUCTIONS (ARGUS WIRING HARNESS)     | (TB-PS-002)         | 10 |





## Argus Pressure Switch (Automatic Reset - Model 'AEF')

| <u>Item</u> | <u>Description</u> | <u>Item</u> | <u>Description</u>           |
|-------------|--------------------|-------------|------------------------------|
| 1           | Cap                | 6           | Adjusting Screw, Leaf Spring |
| 2           | Switch Housing     | 7           | Spring Adjustment Nut        |
| 3           | Main Stem          | 8           | Microswitch                  |
| 4           | Access Collar      | 9           | Leaf Spring                  |
| 5           | Bottom Sub         | 10          | Locking Screw, Switch Block  |

### 1.0 SCOPE

Argus Machine Co. Ltd. manufactures pressure switches (automatic or manual reset) used to make or break an electrical circuit (an electric motor, a gas engine, etc.) upon sensing either 'high' or 'low' flow line pressure. This manual details the procedures for installation, operation and maintenance of Argus Pressure Switch Models 'AEF' and 'MBF' which are certified and marked for "Dual Seal" applications (September 2007).

### 2.0 GENERAL

The Argus Pressure Switch (automatic or manual reset) is designed to make or break an electrical circuit (an electric motor, a gas engine, etc.) upon sensing either 'high' or 'low' flow line pressure. Installation, operation, and maintenance of Argus Pressure Switches shall comply with procedures as described in this manual. The Argus Pressure Switch (automatic or manual reset) is designed for:

- 1) Rated Maximum Operating Pressure of 5000 PSI (34,475 kPa).
- 2) Ambient temperature range of  $-50^{\circ}\text{F}$  ( $-46^{\circ}\text{C}$ ) to  $+104^{\circ}\text{F}$  ( $+40^{\circ}\text{C}$ ); Switch Housing temperature range of  $-50^{\circ}\text{F}$  ( $-46^{\circ}\text{C}$ ) to  $+212^{\circ}\text{F}$  ( $+100^{\circ}\text{C}$ ); Process Media temperature range of  $-50^{\circ}\text{F}$  ( $-46^{\circ}\text{C}$ ) to  $+675^{\circ}\text{F}$  ( $+357^{\circ}\text{C}$ );
- 3) Manufactured for sweet and sour service
- 4) Certified by CSA and have the NRTL/C mark signifying that they are suitable for use in Canada and the United States for Class I, Group D, Hazardous Locations (Division 1 and 2), Dual Seal
- 5) NEMA 4 and 7 enclosure



### 3.0 APPLICABLE STANDARDS

Argus Type 'F' Pressure Switches are designed to meet the following standards:

- 1) **ABSA:** CRN No. OF2161.2134
- 2) **ASME:** B31.3
- 3) **CSA:** C22.2 No. 30
- 4) **ANSI/ISA:** 12.27.01
- 5) **NACE:** MR0175

### 4.0 SAFETY

Many routine procedures are potentially hazardous if executed incorrectly or in unsafe conditions, particularly when toxic/flammable product is present. Caution must be exercised when high temperature and/or pressure exists in the system. Other precautions should be observed are listed below:

- 1) Disconnect power supply before opening cap.
- 2) Avoid getting moisture inside cap; keep all electrical components dry.
- 3) Pressure Switches must meet the service requirements for the application.
- 4) Always follow government and site safety regulations.
- 5) Use of appropriate safety equipment and clothing is mandatory. Eye protection should be used when operating Pressure Switches.
- 6) Never Strike the Pressure Switch or attached equipment.
- 7) Do not stand on the Pressure Switch, or use it as a step.
- 8) Any fittings or accessories must meet the service requirements for the application.
- 9) Always use Argus O.E.M. parts for service or repair.

### 5.0 HANDLING AND STORAGE

#### 5.1 HANDLING

- 1) Care must be taken to prevent the Pressure Switch from being damaged.

#### 5.2 STORAGE

- 1) Pressure Switches should be stored in a dry environment and should be left in the original packaging prior to installation.
- 2) Thread protectors should remain in place until the Pressure Switch is to be installed.

### 6.0 INSTALLATION

#### 6.1 GENERAL NOTES

Argus Pressure Switches may be supplied alone or with a CSA approved Argus Wiring Harness assembly. (Refer to Argus Pressure Switch brochure for more information).



PRESSURE SWITCH (DUAL SEAL)  
INSTALLATION, OPERATION, AND MAINTENANCE

MN-PS-003  
Sept 2007  
Page 3

On request, Argus technicians can attach the Argus Wiring Harness assembly to the Pressure Switch in the factory. This eliminates the need to remove the Cap when installing an Argus Pressure Switch in the field.

Argus Pressure Switches are adjusted through a window in the Bottom Sub (it is not necessary to open the Cap when adjusting the pressure setting), hidden under the Access Collar.

Argus Pressure Switches are normally supplied with a 2" NPT male threaded connection on the Bottom Sub. Other connections may be available on special request. Ask your Argus representative for special application connections.

## 6.2 INSTALLATION INSTRUCTIONS

- 1) Every Argus Pressure Switch is shipped in its own cardboard packaging carton and contains an Installation and Operation instruction sheet (Bulletin No. TB-PS-001). Remove this sheet and verify that the shipment description at the bottom of the page is correct. This contains information regarding the Pressure Switch Model Number, Serial Number, factory settings and pressure setting range. Please keep this instruction sheet for future reference.
- 2) Check female threads in the flow line fitting for any burrs, dirt, debris, or visible signs of damage before installing the Pressure Switch.
- 3) Remove thread protectors from the end of the Pressure Switch as well as the 1/2" NPT port (if applicable).
- 4) Check all threads for any signs of damage, dirt or debris.

**CAUTION:** Do not attempt to install the Pressure Switch if there is any evidence of damage to any threads.

- 5) If any of the Pressure Switch threads are damaged, return to Argus for repair or replacement.
- 6) Apply a thin coat of a suitable thread sealant to male threads and hand-tighten bottom connection into the female flow line fitting.
- 7) When placing a wrench onto the bottom sub of the Pressure Switch, avoid contact with threads.

**CAUTION:** Do not wrench on the aluminum access collar.

- 8) Tighten with wrench until proper make-up is achieved. If make-up is difficult to achieve, remove the Pressure Switch and check for any foreign matter, thread damage or galling and repeat above procedure.
- 9) Check the female (box) threads on the Switch Housing for damage, dirt or debris. In the event of serious damage please return the Pressure Switch complete with the instruction sheet and packaging carton to your Argus representative. Do not attempt to install the electrical conduit if there is serious damage to the female (box) threads on the Switch Housing.
- 10) Remove the Cap from the Switch Housing (use a screwdriver in the break-out slots provided in the Cap if necessary).
- 11) The male (pin) threads on the electrical conduit must be dry (do not use any lubricant, teflon tape or thread dope). Feed the electrical wires through the port and screw the conduit into the Switch Housing female (box) port hand-tight only.
- 12) Use a pipe wrench on the electrical conduit to tighten it into the female (box) port until proper make-up is achieved. If this appears to be difficult to achieve, remove the conduit and check for any foreign matter, thread damage or galling.
- 13) Attach electrical wires to the Microswitch as per Argus Wiring Instruction sheet (Bulletin No. TB-PS-002).



**Microswitch Manufacturer's Recommended Torque (Maximum)**

- Mounting Screws.....3 in-lbs
- Terminal Screws..... 4 in-lbs
- Panel Mount Bushing..... 4-6 in-lbs

**CAUTION:** Tightening mounting screws above 3 in-lbs changes operating characteristics and increases the possibility of cracking the case. Applying excessive torque to the terminal screws when attaching the wires may cause damage to the Microswitch.

- 14) Install the Cap on the Switch Housing and hand-tighten only. When properly installed, the Cap should meet the shoulder on the Switch Housing. It is not necessary to wrench tighten the Cap to ensure a seal.

**CAUTION:** Do not over-tighten the Cap, as damage may occur.

- 15) Once installation is complete, the Argus Pressure Switch should be operated two (2) or three (3) times to verify the factory settings.

**7.0 OPERATION**

**7.1 OPERATING INSTRUCTIONS**

- 1) Once installation is complete, the Argus Pressure Switch will trip automatically.
  - a) If it is an automatic reset switch, it will reset automatically when the pressure returns to within normal operating range.
  - b) If it is a manual reset switch, it will reset when the operator pushes the reset button in top of the switch.

**7.2 PRESSURE SETTING**

- 1) Rotate Access Collar counter-clockwise until it hits the upper shoulder of the Switch Housing. This allows access to the port in the Bottom Sub. The slotted Spring Adjustment Nut should now be visible.
- 2) Using a flat blade (Standard) screwdriver, insert the blade into one of the slots and rotate the Spring Adjustment Nut to either increase or decrease the pressure setting as required. Rotating the Spring Adjustment Nut clockwise increases the set point, counter-clockwise decreases the set point. Continue adjusting until the desired set point is achieved. Refer to the Argus Pressure Switch brochure for the available pressure ranges as per the model number.
- 3) Rotate the Access Collar clockwise until it hits the lower shoulder of the Bottom Sub. The access port should now be covered to keep out moisture and debris. (In conditions of severe vibration, the optional Vibration Lock may be purchased and used. Install the Vibration Lock with the pins in one slot of the Spring Adjustment Nut prior to screwing the Access Collar down).

**CAUTION:** Leave the Access Collar in the “down” position after adjustments have been completed.

- 4) The optional Tamper Seal Block may be purchased and used to prevent anyone from tampering with the set point once it has been established. To use, simply install the Tamper Seal Block with the capscrew provided into the hole in the Switch Housing. Run a wire through the holes in both the Tamper Seal Block and the capscrew and fix with a leaded seal. If the seal is broken, tampering may have occurred and the set point should be checked.

### 7.3 MICROSWITCH REPLACEMENT

If the Microswitch should fail during normal operation it can be easily replaced in the field using the following procedure:

- 1) Make sure that the power supply to the Pressure Switch is turned off.
- 2) Remove the Cap from the Switch Housing (use break-out slots in the Cap if required).
- 3) Disconnect all of the electrical wires from the Microswitch and tuck them out of the way.
- 4) Using a 3/16" T-Handle hexagonal wrench, loosen and remove the Switch Block Locking Screw.
- 5) Lift out the entire Microswitch sub-assembly.
- 6) Place the new Microswitch sub-assembly in the Switch Housing and tighten the Switch Block Locking Screw with the 3/16" T-Handle hexagonal wrench.

**CAUTION:** Do not over-tighten, as damage may occur.

- 7) Re-attach all the electrical wires to the Microswitch as they were before. (Refer to Argus Wiring Instructions Bulletin No. TB-PS-002).
- 8) If necessary, make adjustments to the Leaf Spring. Use a flat blade screwdriver to tighten the Leaf Spring Adjusting Screw clockwise until it shoulders. Turn the Adjusting Screw counter-clockwise until you hear the Microswitch trip off (approximately 3 turns). Turn the Adjusting Screw 1 1/2 turns clockwise to set.
- 9) Install the Cap on the Switch Housing and tighten until the Cap shoulders with the Switch Housing.
- 10) Turn on the power supply to the Pressure Switch.

### 8.0 MAINTENANCE

Argus recommends that a preventive maintenance program be implemented to ensure the longevity of the Argus Pressure Switch.

- 1) Argus recommends that the operator periodically (quarterly) test each Pressure Switch to ensure that it is working properly.
- 2) Tests may consist of a pressure test and verification of unit shutdown.
  - a) For a Pressure Switch that is set for increasing pressure the operator may close a valve downstream and check that the Switch trips off at the appropriate set point. If the set point is incorrect, the operator should adjust it to the original setting. (See **7.2 Pressure Setting**).
  - b) For a Pressure Switch that is set for decreasing pressure the operator may close a valve upstream and check that the Switch trips off at the appropriate set point. If the set point is incorrect, the operator should adjust it to the original setting. (See **7.2 Pressure Setting**).
  - c) The Pressure Switch may also be taken off the line and sent to an Argus Service Center for testing and adjustment.
- 3) Visually check for excessive moisture in the Bottom Sub, by looking in the Access Port. If excessive moisture is present the Pressure Switch should be cleaned and serviced by Argus or one of their approved Service Centers.
- 4) Argus also recommends that the Pressure Switch be tested after a service rig has done any work on the well site.
- 5) The operator should visually check the Pressure Switch for any leaks or physical damage each time that he/she works on it. The Bottom Sub has two weep holes that will indicate when the internal gasket or diaphragm has failed. Ensure these weep holes are free of debris or foreign material. If excessive leaking (small amounts of moisture that is trapped inside the Bottom Sub may leak out normally) is evident the Pressure Switch should be replaced as soon as possible. The Pressure Switch may then be sent to an Argus Service Center for assessment and/or repair.
- 6) Argus recommends that due to the sensitivity of the Microswitch the customer should consider carrying one (1) spare Microswitch sub-assembly in inventory for every ten (10) Pressure Switches in the field.



## 9.0 TROUBLESHOOTING

| Problem  | Possible Causes  | Possible Solutions   |
|--|--|--|
| Switch does not trip at proper pressure, or does not trip at all | <ul style="list-style-type: none"> <li>a) Faulty electrical cable or connections</li> <li>b) Pressure set point needs adjustment</li> <li>c) Microswitch needs to be recalibrated</li> <li>d) Microswitch failure</li> </ul> | <ul style="list-style-type: none"> <li>a) Check for damaged cable and/or loose connections</li> <li>b) Adjust pressure set point using the Spring Adjustment Nut, see Section 7.2</li> <li>c) Adjust switch using the Leaf Spring Adjusting Screw, see Section 7.3</li> <li>d) Replace Microswitch, see Section 7.3</li> </ul> |
| Leaking from weep holes  | <ul style="list-style-type: none"> <li>a) Pressure Switch gasket or diaphragm failure</li> </ul>   | <ul style="list-style-type: none"> <li>a) Remove switch from line and send for servicing</li> </ul>  |

## 10.0 CONTACT INFORMATION

For Ordering Argus Pressure Switches or for Service please contact us at:

Argus Machine Co. Ltd.  
**Order Desk (Assembly Division)**  
 5820-97 Street,  
 Edmonton, Alberta, Canada  
 T6E 3J1

Toll Free: 1-888-434-9451  
 Phone: (780) 434-9451  
 Fax: (780) 434-9909






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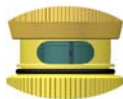
Technical Bulletin : TB-PS-001  
 Effective Date : October 17, 2005

## Pressure Switch ( Type 'F' ) - Installation and Operation

 Certified for Class I, Group D, Hazardous Locations (Division 1 and 2)  
 NRTL/C



MODEL 'AEF'  
(AUTOMATIC RESET)



INCREASE ←  
 → DECREASE

| CIRCUITRY    |      | ELECTRICAL DATA |                     |
|--------------|------|-----------------|---------------------|
| SINGLE POLE  | N.O. | 1/2 AMP         | 125 VDC             |
| COM.         |      | 1/4 AMP         | 250 VDC             |
| DOUBLE THROW | N.C. | SEE NOTE 1      | 125, 250 OR 480 VAC |

(1) HONEYWELL AUTOMATIC RESET MICROSWITCH P/N: BZ-2R-A2 15 AMPS  
 HONEYWELL MANUAL RESET MICROSWITCH P/N: BZ-RX 15 AMPS  
 HONEYWELL AUTOMATIC RESET MICROSWITCH P/N: BZ-2R244-A2 5 AMPS



MODEL 'MBF'  
(MANUAL RESET)



**Remove Top Cap ONLY for installing electrical wiring.**

**CAUTION**

**Power must be OFF before removing Top Cap.**

It is not necessary to remove the Top Cap to adjust Set Point. If microswitch replacement or adjustment is required, please refer to the label inside Top Cap or the Calibration Procedure in the Installation, Operation and Maintenance Manual.

← Access Collar

Tamper Seal (optional) →

← Vibration Lock (optional)

Access Collar →

**IMPORTANT**  
**ACCESS COLLAR TO BE UP ONLY WHEN ADJUSTING PRESSURE SETTING.**

**IMPORTANT**  
**ACCESS COLLAR MUST BE DOWN WHEN OPERATING.**  
 (Seals out weather)

**ADJUSTING PRESSURE SETTING**  
 Shown at 60% of Max. Pressure Setting (Three bands are showing).  
 NOTE: Max. Pressure Setting is with five bands showing (20% per band).  
 Adjust Pressure Setting with Screwdriver blade.

### SHIPMENT DESCRIPTION

S/N : PS

- Automatic Reset - Model AEF - \_\_\_\_\_
- Manual Reset - Model MBF - \_\_\_\_\_
- 2" NPT Male Thread (Bottom Connection)
- Other (Specify) : \_\_\_\_\_
- Factory Set  
 Increasing Pressure \_\_\_\_\_ PSI \_\_\_\_\_ kPa  
 OR  
 Decreasing Pressure \_\_\_\_\_ PSI \_\_\_\_\_ kPa  
 OR  
 Field Set

- 1.0 Range 20-100 PSI (140 - 690 kPa)
- 2.0 Range 40-200 PSI (275 - 1380 kPa)
- 8.0 Range 80-800 PSI (550 - 5515 kPa)
- 14 Range 150-1400 PSI (1035 - 9650 kPa)
- 20 Range 250-2000 PSI (1720 - 13790 kPa)
- 50 Range 1500-5000 PSI (10340 - 34470 kPa)

\* TRIM SUITABLE FOR SOUR, CORROSIVE SERVICE

\*\* MAXIMUM WORKING PRESSURE 5000 PSI (34475 kPa)

#### TEMPERATURE RANGE

|                | Model 'AEF'                           | Model 'MBF'                           |
|----------------|---------------------------------------|---------------------------------------|
| Ambient        | -50° F to +104° F (-46° C to +40° C)  | -50° F to +104° F (-46° C to +40° C)  |
| Switch Housing | -50° F to +212° F (-46° C to +100° C) | -50° F to +212° F (-46° C to +100° C) |
| Process Media  | -50° F to +675° F (-46° C to +357° C) | -50° F to +675° F (-46° C to +357° C) |

**Note : See reverse side for IMPORTANT NOTICE**

## **IMPORTANT NOTICE**

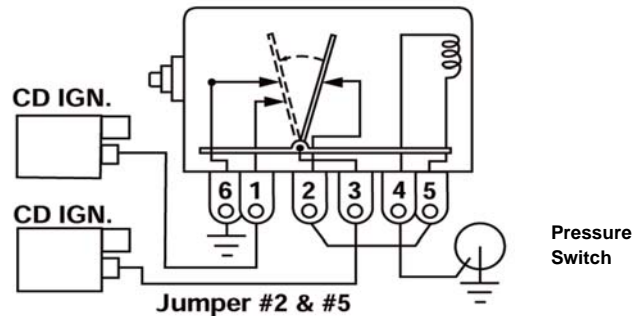
If the Argus Pressure Switch is being used in conjunction with a gas engine that has a CD (Capacitor Discharge) ignition (eg. : Kubota), precautions should be taken to eliminate any high (spiking) DC voltage from interfering with the operation of the microswitch.

High (spiking) DC voltage may cause premature failure of the microswitch.

See diagram below for one possible solution. This configuration may not work in all cases. Every application should be addressed by the installer at the time of installation.

### **TYPICAL WIRING DIAGRAM**

**MS 2100**



Argus Pressure Switches are designed and manufactured to meet the requirements of:

|      |                      |  |
|------|----------------------|--|
| ASME | B31.3                | Process Piping                                     |
| CSA  | C22.2 No. 30         | Explosion-Proof Enclosures for Hazardous Locations |
| NACE | MR0175               | Standard Material Requirements for Sour Service    |
| ABSA | CRN No.: OF2161.2134 | Alberta Boiler's Safety Association                |

Argus Pressure Switches are covered by the following patents:

Canada 2,129,290  
2,158,623  
2,178,401

United States 5,554,834  
5,670,766

**Note : For information on Product Warranty, please reference our website**

[www.argusmachine.com/terms.htm](http://www.argusmachine.com/terms.htm)



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Technical Bulletin: TB - PS - 002

Revision: 00

Effective Date: May 27, 2003

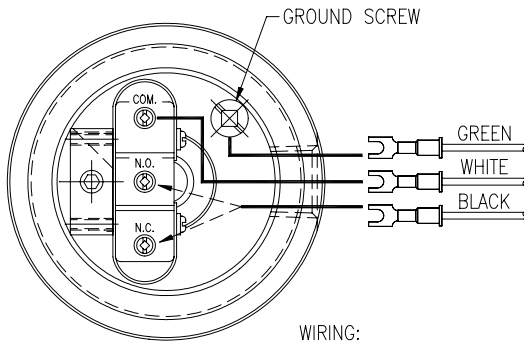
Prepared By: R. Chetram

Approved By: R. Wiltermuth

## Pressure Switch Wiring Harness Wiring Instructions

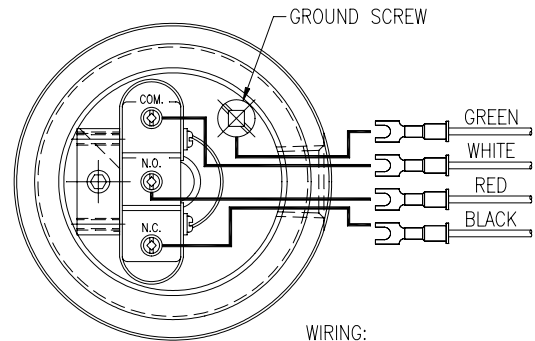
### General Notes:

1. The installer shall be responsible to ensure that after installation the Sealing Fitting (Wiring Harness) and Switch Housing (Pressure Switch) connection (1/2"-14 NPT) is tight and leakproof.
2. Manual Cap Assemblies may NOT be substituted for Automatic Caps (Microswitches are different).
3. If you experience any problems when installing an Argus Pressure Switch or Wiring Harness please call the manufacturer, or your local representative.



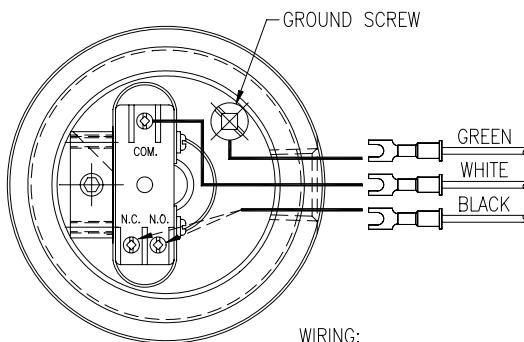
WIRING:  
 GREEN - GROUND SCREW  
 WHITE - COMMON  
 BLACK - NORMALLY CLOSED (ELECTRIC MOTOR)  
 BLACK - NORMALLY OPEN (MAGNETO GROUND)

**AUTOMATIC RESET  
3-WIRE**



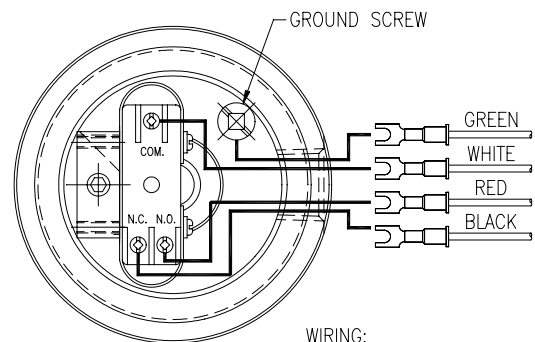
WIRING:  
 GREEN - GROUND SCREW  
 WHITE - COMMON  
 BLACK - NORMALLY CLOSED  
 RED - NORMALLY OPEN

**AUTOMATIC RESET  
4-WIRE**



WIRING:  
 GREEN - GROUND SCREW  
 WHITE - COMMON  
 BLACK - NORMALLY CLOSED (ELECTRIC MOTOR)  
 BLACK - NORMALLY OPEN (MAGNETO GROUND)

**MANUAL RESET  
3-WIRE**



WIRING:  
 GREEN - GROUND SCREW  
 WHITE - COMMON  
 BLACK - NORMALLY CLOSED  
 RED - NORMALLY OPEN

**MANUAL RESET  
4-WIRE**



Certified for Class I, Group D, Hazardous Locations (Division 1 and 2)