PRESSURE SWITCH

MODEL AEF – MBF – AEFHT – MBFHT
FIELD CALIBRATION & SETTING



USER MANUAL

ARGUS
Manufacturing Intelligent Solutions

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PRESSURE SWITCH

1.0 Scope

Argus manufactures automatic and manual reset Pressure Switches designed to make or break an electrical circuit upon sensing 'High' or 'Low' flow line pressure. This manual covers field calibration and testing of models 'AEF', 'MBF', 'AEF-HT, and 'MBF-HT switches.

2.0 General

Calibration and setting of Pressure Switches shall comply with the procedures described in this manual.

⚠ **WARNING:** This manual covers the calibration and testing of an Argus Pressure Switch if an Argus Isolation Valve is installed between the process line and the Pressure Switch. If there is no means to isolate the switch from the flow line, an Isolation Valve must be installed or the switch must be removed and calibrated in a service shop.

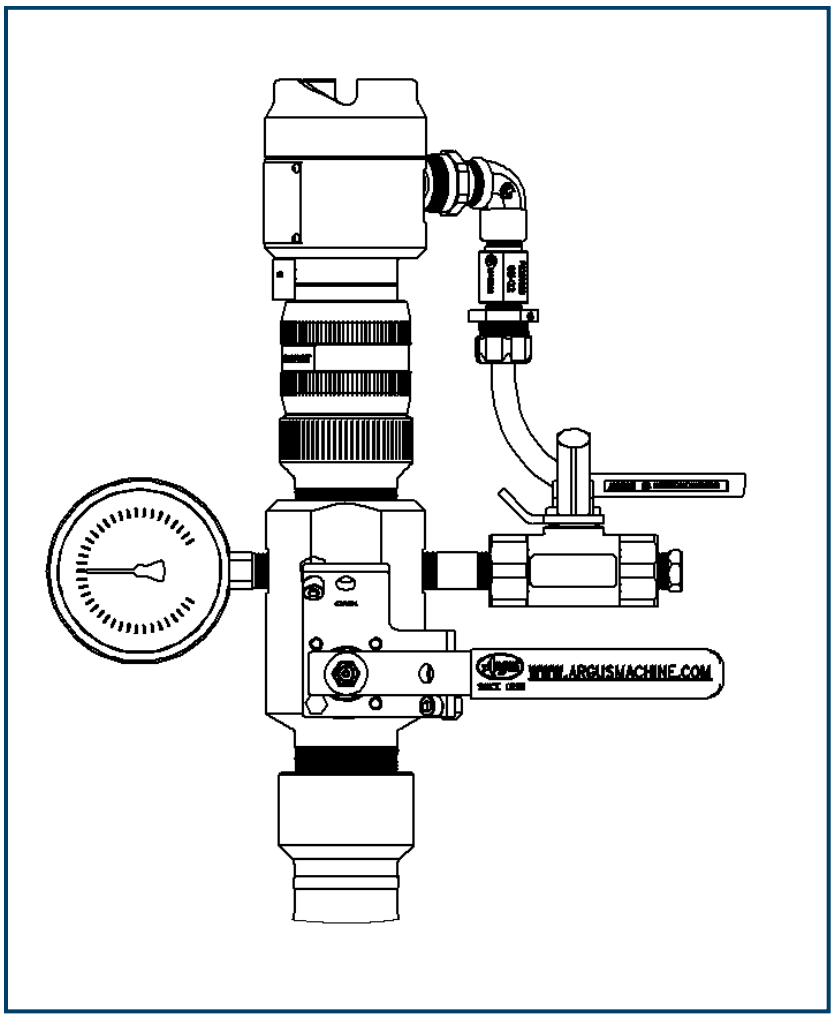


Figure 1: Typical Argus Pressure Switch and Isolation Valve Configuration

3.0 Calibration Tools

The following tools are required to perform the proper calibration and setting of the Pressure Switch.

- Dial indictor, c/w extended probe and mounting block, Argus item number P2200150.
- Dual indicator, c/w extended probes and mounting block, Argus item number P2200233 (Alternate).
- Pressure gauge suitable for the pressure range of the Pressure Switch.
- Pressure pump c/w fittings to connect to ½" NPT port in the Isolation Valve.
- Flat blade screwdriver.
- Test light/multimeter.

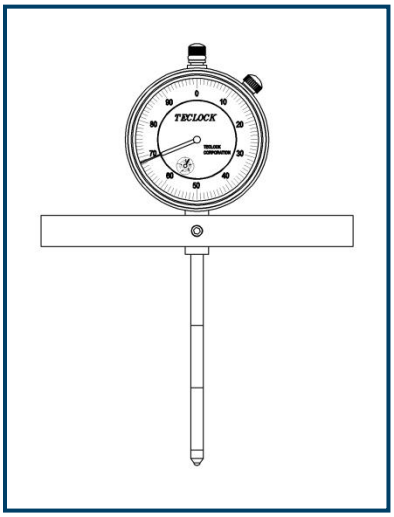


Figure 2: Indicator Assembly (Item number P2200150)

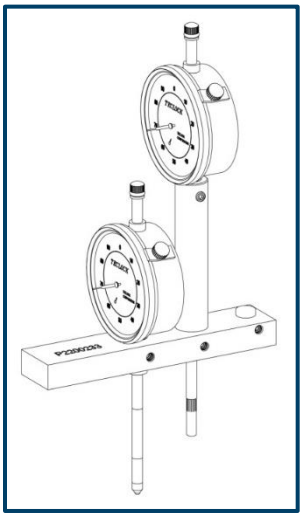


Figure 3: Dual Indicator Assembly (Item number P2200233)

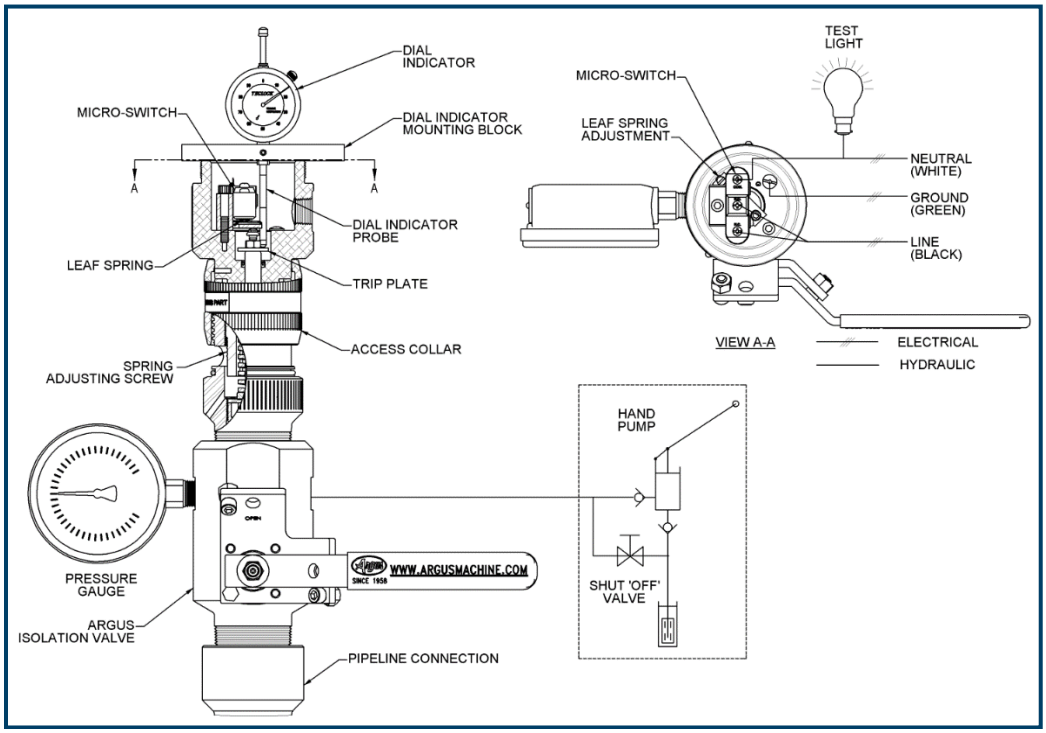


Figure 4: Calibration and Pressure Adjustment

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 that should be observed are listed below:

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

5.0 Calibration Adjustment

NOTE: When calibrating a manual reset Pressure Switch the technician must reset the micro-switch manually every time it trips.

1. Shut off any current going to the Pressure Switch, remove cap, and disconnect the power leads from the micro-switch.

⚠ WARNING: Failure to shut down the well pump and/or shut off any power to the Pressure Switch prior to calibration can result in damage to property, personal injury, or death.

2. Close and lock the Isolation Valve.
3. Ensure the bleed valve is Closed.
4. Remove the plug from port of the bleed valve.
5. Purge any fluid or gas from the Isolation Valve cavity into a suitable container or attached disposal line as per company protocol.
6. Install a pressure gauge into the opposite port in the Isolation Valve if one isn't present.
7. Attach the pressure pump to the bleed valve port.
8. Turn the access collar counterclockwise to expose the spring adjusting screw on the side of the Pressure Switch.
9. Ensure the spring adjusting screw is turned down to provide sufficient spring force to achieve proper calibration. (At least two horizontal indicator lines of the adjusting screw should be exposed.)
10. Set up dial indicator, as shown in Figure 3, to measure stem movement. The end of the indicator probe must touch the top of the trip plate.

    NOTE: Ensure the indicator probe does not come in contact with any other components inside the switch housing.

11. Connect a test light or multi-meter to the common and normally closed terminal on the micro-switch. The test light should be on, or the meter should indicate continuity.

12. Close the shutoff valve and zero the dial indicator.

13. Using the hand pump, increase pressure as per test the Standard Max. Set Pressure values in TB-PS-007. The needle movement on the dial indicator should be smooth as the pressure increases. Refer to TB-PS-008 to determine the "Stem Travel at **Test** Pressure".

    NOTE: The current model of the Argus Isolation Valve has a maximum working pressure of 4000 PSI (27580 kPa) and cannot be used for testing any of the 50 series of Pressure Switches having a test pressure of 5000 PSI (34475 kPa). The Argus Double Block and Bleed Isolation Valve has a working pressure of 5000 PSI. (34475 kPa).

14. Gradually decrease the pressure by opening the shutoff valve until the dial indicator reading meets the requirements of TB-PS-008 to determine the "Stem Travel at **Set** Pressure".

15. If the light is off (no continuity), turn the leaf spring adjustment screw clockwise until the micro-switch trips and the light goes on. If the light initially was on (continuity), turn the leaf spring adjustment screw counterclockwise until the light goes off.

16. Release the pressure by opening the shutoff valve.

17. Close the shutoff valve and gradually increase pressure until the micro-switch trips and the light goes off (no continuity). If necessary, repeat previous steps until the required parameter is achieved.

6.0 Alternate Calibration Adjustment

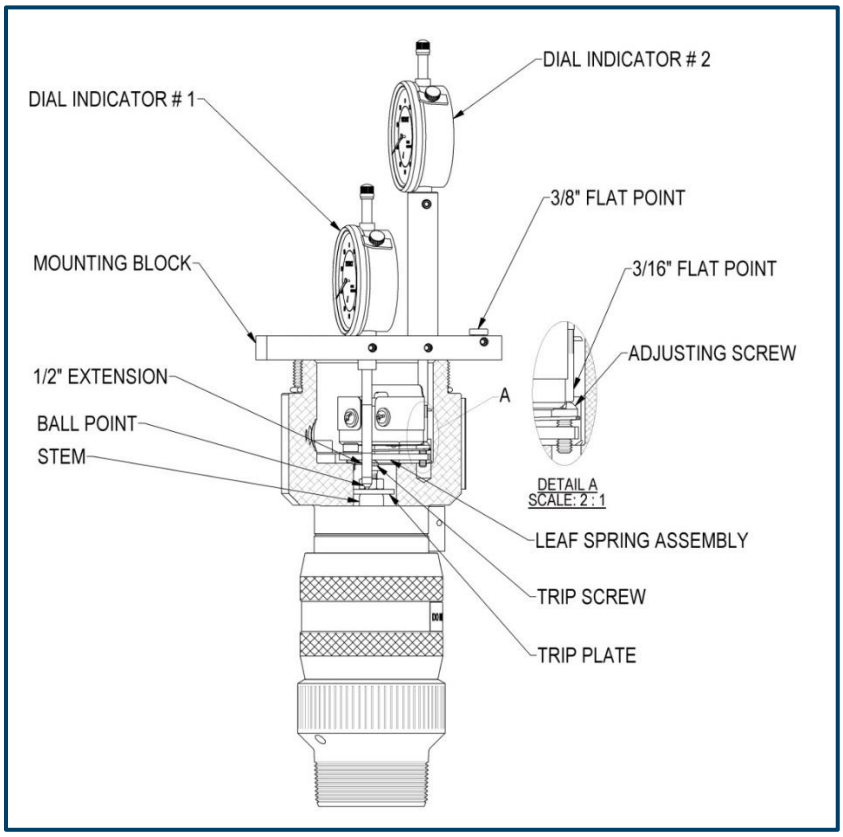


Figure 5: Dual Indicator Setup

1. Follow the setup procedure as per section 5.0 steps 1 thru 9.

2. Place the dual dial indicator assembly on top of the switch housing with the ball point of indicator # 1 on the trip plate and the 1/8" flat point of indicator # 2 on the adjusting screw (Detail A). Ensure the extensions are clear of any other components and are allowed to move freely up and down.

3. Close the shutoff valve on the hand pump and zero the dial indicators.

4. Using an appropriate pressure gauge suited for the Pressure Switch model being tested induce pressure as per test values (TB-PS-007) and hold for one minute.

   NOTE: The current model of the Argus Isolation Valve has a maximum working pressure of 4000 PSI (27580 kPa) and cannot be used for testing any of the 50 series of Pressure Switches having a test pressure of 5000 PSI (34475 kPa). The Argus Double Block and Bleed Isolation Valve has a working pressure of 5000 PSI. (34475 kPa).

5. The needle movement on the dial indicator #1 should be smooth as the pressure increases. See TB-PS-008 for Stem Travel at **Test** Pressure values.

6. The needle movement on dial indicator #2 should start at the same time as #1. If this does not occur this is an indication that the trip screw is not contacting the bottom of the leaf spring assembly.

7. To rectify the problem, remove the leaf spring assembly and raise the height of the trip screw to the upper end of the range listed in TB-PV-008.

8. Re-install the leaf spring assembly and observe the movement between the two dial indicators. Dial indicator #1 should show values as per Step 5 and dial indicator #2 will be approximately double the value.

9. Gradually decrease the pressure by opening the shutoff valve until the dial indicator reading meets the requirements of TB-PS-008 to determine the "Stem Travel at Set Pressure".

10. Remove the indicator assembly from the top of the switch housing.

11. Connect a test light or multi-meter to the common and normally closed terminal on the micro-switch.

12. If the light is off (no continuity), turn the leaf spring adjustment screw clockwise until the micro-switch trips and the light goes on. If the light initially was on (continuity), turn the leaf spring adjustment screw counterclockwise until the light goes off.

13. Release the pressure by opening the shutoff valve.

14. Close the shutoff valve and gradually increase pressure until the micro-switch trips and the light goes off (no continuity). If necessary, repeat previous steps until the required parameter is achieved.

7.0 Pressure Setting

Note: Turning the spring adjusting screw clockwise increases the trip set point and turning it counterclockwise decreases the trip set point.

7.1 Adjusting Pressure Setting: Decreasing Pressure 'On'

Note: Used for turning off a gas engine or turning on an electric motor.

1. Close the shutdown valve.

2. Switch the control valve to direct pressure to the appropriate pressure gauge for the required pressure range.

3. Attach the test light cables to the common and normally closed terminals on the microswitch. The test light should be on.

4. Increase pressure to the max pressure set value, the test light will be off. Gradually decrease the pressure and make note of the value in which the light turns back on. Slowly open the shutdown valve fully.

5. If the pressure noted is lower than desired, turn the spring adjusting nut clockwise ("increase"). Each band on the outside of the adjusting nut represents approximately 20 % adjustment in pressure.

6. If the pressure noted is higher than desired, turn the spring adjustment nut counterclockwise ("decrease"). Each band on the outside of the adjusting nut represents approximately 20 % adjustment in pressure.

7. Close the shutdown valve.

8. Repeat step 4-7 and repeat if required.

9. Once the desired pressure is achieved to turn off the light for a decreasing pressure event, proceed to Section 8.0.

7.2 Adjusting Pressure Setting: Increasing Pressure 'Off'

NOTE: Used for turning off an electric motor.

1. Close the shutdown valve.

2. Switch the control valve to direct pressure to the appropriate pressure gauge for the required pressure range.

3. Attach the test light cables to the common and normally closed terminals on the microswitch. The test light should be on.

4. Increase the pressure to the desired set point.

5. If the light is off, turn the spring adjusting nut clockwise ("increase") until the test light goes on. Monitor the pressure as it will increase as you turn the nut, if it goes outside your allowance re-adjust with pump.

6. If the light is on, turn the spring adjusting nut counterclockwise ("decrease") until the test light goes off. Monitor the pressure as it will decrease as you turn the nut, if it goes outside your allowance re-adjust with valve.

7. Release pressure by opening the shutdown valve. The test light should be on.

8. Close the shutdown valve.

9. Gradually induce pressure to the required pressure set point. At this point the microswitch should trip and the test light should go off. If all these parameters are achieved, proceed to Section 8.0.

7.3 Adjusting Pressure Setting: Decreasing Pressure 'Off'

NOTE: Used for turning off an electric motor.

1. Close the shutdown valve.

2. Switch the control valve to direct pressure to the appropriate pressure gauge for the required pressure range.

3. Attach the test light cables to the common and normally open terminals on the microswitch. The test light should be off.

4. Increase pressure to the max pressure set value, the test light will be off. Gradually decrease the pressure and make note of the value in which the light turns back off. Slowly open the shutdown valve.

5. If the pressure noted is lower than desired, turn the spring adjusting nut clockwise ("increase"). Each band on the outside of the adjusting nut represents approx. 20 % adjustment in pressure.

6. If the pressure noted is higher than desired, turn the spring adjustment nut counterclockwise ("decrease"). Each band on the outside of the adjusting nut represents approx. 20 % adjustment in pressure.

7. Close the shutdown valve.

8. Repeat step 4-7 and repeat if required.

9. Once the desired pressure is achieved to turn off the light for a decreasing pressure event, proceed to Section 8.0.

7.4 Adjusting Pressure Setting: Increasing Pressure 'On'

NOTE: Used for turning off a gas engine.

1. Close the shutdown valve.

2. Switch the control valve to direct pressure to the appropriate pressure gauge for the required pressure range.

3. Attach the test light cables to the common and normally open terminals on the microswitch. The test light should be off.

4. Increase the pressure to the desired set point.

5. If the light is on, turn the spring adjusting nut clockwise ("increase") until the test light goes on. Monitor the pressure as it will increase as you turn the nut, if it goes outside your allowance re-adjust with pump.

6. If the light is off, turn the spring adjusting nut counterclockwise ("decrease") until the test light goes off. Monitor the pressure as it will decrease as you turn the nut, if it goes outside your allowance re-adjust with valve.

7. Release pressure by opening the shutdown valve. The test light should be off.

8. Close the shutdown valve.

9. Gradually induce pressure to the required pressure set point. At this point the microswitch should trip and the test light should go on. If all these parameters are achieved, proceed to Section 8.0.

8.0 Post Testing

1. Remove dial indicator from the top of the Pressure Switch.

2. Return the access collar to the original closed position.

3. Remove the hand pump connection from the Isolation Valve and install components as per pre-calibration and testing state.

4. Re-attach the power leads to the micro-switch.

5. Install cap onto Pressure Switch.

6. Turn power source on.

9.0 Contact Information

For ordering Argus Pressure Switches or for service please contact us at:

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Order Desk (Assembly Division)
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