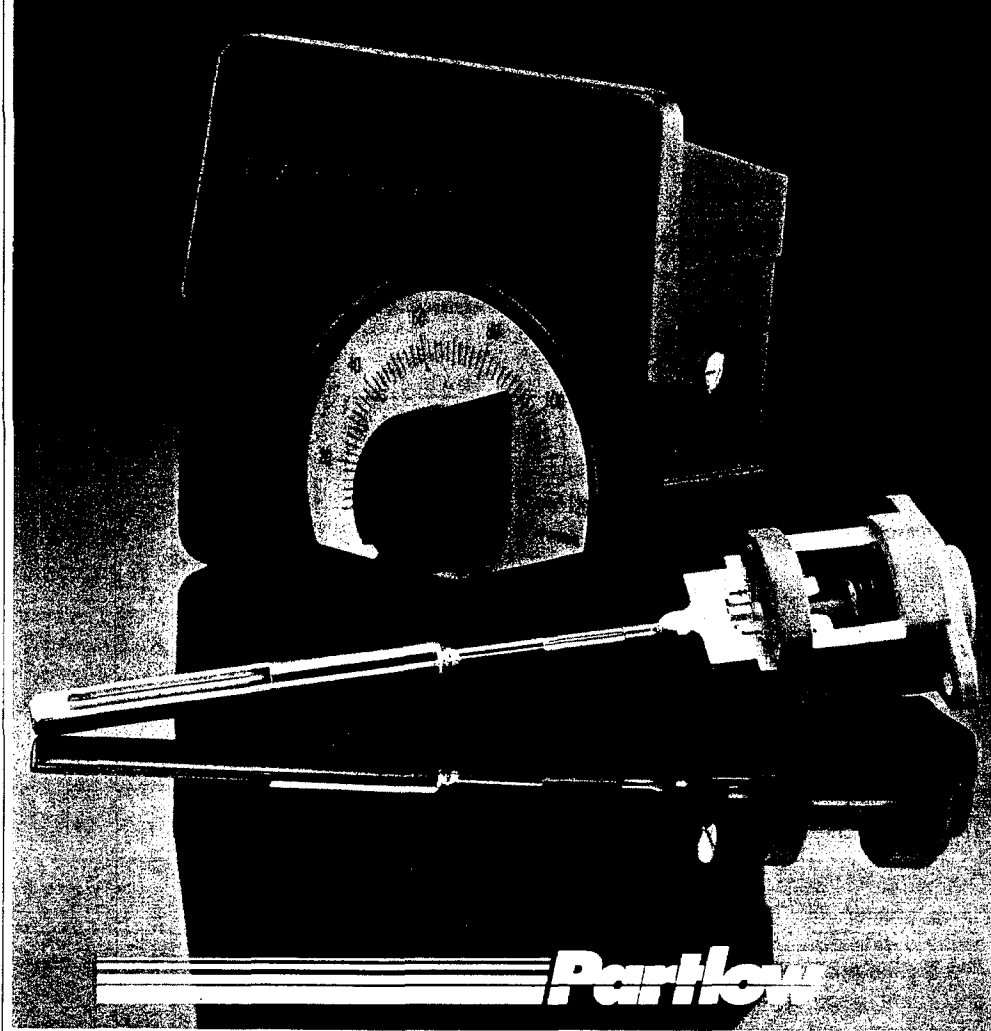


# **COMPACT SINGLE SWITCH NON-INDICATING CONTROLLER**

The ZF79 is a compact single switch non-indicating controller which operates fuel valves or relays which start and stop heating or cooling systems in a wide variety of applications. It derives its simplicity and efficiency from the Piston-Pak filled systems sensing element.

Form Number 3021  
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First Edition

## **SPECIFICATIONS INSTALLATION OPERATION**



# ZF79

The Partlow Corporation • Two Campion Road • New Hartford, New York 13413 USA  
**QUALITY INSTRUMENTATION DESIGNED AND MANUFACTURED IN THE USA**

## Dynapar, Veeder Root, and Eagle Signal Brands:

Sales, Repair, and Application Support:  
1675 Delany Rd.  
Gurnee, IL. 60031  
847-662-4150 Sales/Order Entry Fax  
847-782-5277 Applications Support Fax  
800-873-8731 Sales/Order Entry  
800-234-8731 Applications Support

## NorthStar Brand:

Sales, Repair, and Application Support:  
1675 Delany Rd.  
Gurnee, IL. 60031  
847-782-5288 Sales/Order Entry Fax  
847-782-5277 Applications Support Fax  
800-326-6216 Sales/Order Entry  
800-326-6216 Applications Support

## Partlow, West, Rustrak, and LFE Brands:

Sales, Repair, and Application Support:  
1675 Delany Rd.  
Gurnee, IL. 60031  
847-662-4150 Sales/Order Entry Fax  
847-782-5277 Applications Support Fax  
800-873-8731 Sales/Order Entry  
800-866-6659 Applications Support

Please disregard all phone numbers and addresses in this manual. The phone numbers and address on this page are the correct phone number and addresses to use for sales, repair, and application support.

## ZF79 PRODUCT SPECIFICATIONS

Dimensions	6 1/8" W X 5 1/2" H X 3 1/2" D
Surface Mounting	Brackets included
Flush Mount Cutout	4 3/4" W X 5" H
Switch Type	Three wire single pole double throw
Switch Sensitivities	Normal 1 % of range (Factory standard #79 Switch) Super Sensitive 1/2 % of element range (Optional #73 Switch)
Electrical Hookup	Internal terminal block
Conduit Opening	7/8" diameter opening in top of case for 1/2" electrical fitting; drill-guide hole spotted in rear of case for flush-mount installations
Electrical Rating	50 VA, inductive; 500 VA, non-inductive; 250 V maximum AC only
Agency Approvals	UL and CSA
Approx. Net Weight*	5 lbs.
Approx. Ship. Weight*	8 lbs.

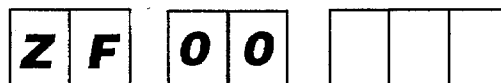
\* Weight may vary depending on length of element.

### Note:

**It is strongly recommended that Partlow equipped applications incorporate a high or low limit protective device which will shut down the equipment at a preset temperature condition in order to preclude possible damage to property or product.**

**This document should accompany the instrument to its final installation in order to provide operational and service assistance to the end user.**

## ZF79 ORDER MATRIX



<b>ZF79*</b>	<b>127</b>
<b>ZF79 w/Acc.243*</b>	<b>235</b>

\* An L-type plunger is required.  
Specify dial scale required. Acc. 243 requires inverted scale. (Refer to element ordering matrix for range needed)

\* The standard switch on a ZF79 is a #79 and offers an accuracy of 1% of span. Accuracy of 0.5 % of span may be achieved by specifying a #73 Switch. However, a #73 Switch must be ordered individually and will be shipped separate. User must remove the factory standard #79 Switch and install the #73 Switch. (See SWITCH REPLACEMENT section in this document, page 4). To order the #73 Switch specify part #64403018.

### PISTON-PAK THERMAL SENSING ELEMENT

A Piston-Pak Thermal Sensing Element must be specified for each ZF79. Use Partlow Form 2787 "Piston-Pak Order Matrix and Price List" to configure the matrix number for the sensing element.

# INSTALLATION AND WIRING

## LOCATION

The element head assembly is subject to ambient temperature limitations of -30°F to 125° F (-35°C to 52°C) for low temperature head assemblies, and 32°F to 150°F (0°C to 66°C) for high temperature head assemblies. These temperature limitations must be considered when determining the instrument location. It should be located in an area as free from vibration as possible.

## MOUNTING

The instrument(s) may be surface or flush mounted. For flush mounting proceed as follows: Cut the panel opening to the sizes illustrated in Figure 1. Then drill 7/32 inch clearance holes and if desired, tap for No. 10 flat head screws.

## WIRING

The top conduit hole should be used to make all electrical connections. An optional rear hole may be used if drilled out. It is spotted on rear of case, see Figure 7 (page 6). Make necessary electrical connections using short sections of flexible cable or conduit according to applicable electrical codes, ordinances and regulations regarding the use of conduit, etc. Next, access the connection terminal block by removing the setting knob and instrument cover. The terminal block is labeled H, C and L (See Figure 2, below). H represents normally open, C common and L normally closed. Make your necessary electrical connections using Figure 2 as a guide. Re-install cover and setting knob.

## PLACING THE THERMAL SENSING ELEMENT

Locate the thermal sensing bulb in the most agitated part of the medium to be measured and completely immerse it. (When U and Y type bulbs are used note separation coupling between bulb and capillary). Be sure to immerse the element up to the coupling for correct temperature indication. Do not bend capillary to less than 1/2 inch radius and never bend it too close to the element bulb or element head. Pencil type bulbs must never be bent as this will affect instrument accuracy. U and Y type bulbs may be bent, but never to less than a two inch radius. Anchor the excess capillary securely to prevent vibration damage. These bulbs may be elevated up to 40 feet above the instrument without affecting calibration. For elevations over 40 feet consult your local Partlow Representative, Distributor or the Factory.

## STUFFING BOX INSTALLATION (IF APPLICABLE)

Overtightening of 21-T-105 steel or stainless steel stuffing boxes can damage the thermal element by restricting the capillary bore. To prevent damage, the stuffing box gland nut should be turned 1/2 to 3/4 of a revolution from a finger-tight position. This is equivalent to a torque of 65 to 100 inch-pounds for steel and 130 to 180 inch-pounds for stainless steel.

# INSTRUMENT OPERATION

Prior to putting the instrument into service, check it against an accurate test thermometer. As with any precision instrument minor adjustments may be necessary after shipment and installation. If you are unfamiliar with how to perform this check refer to the CHECKING TEMPERATURE and RE-ZEROING section of this document.

Control temperature is established by turning the setting knob on the front of the control to the desired point on the segmented scale. Temperature changes at the sensing bulb, positions mechanical linkage in the instrument to actuate the control switch which opens or closes the circuit controlling the heating or cooling input to the application.

Figure 1 - Panel Cutout illustration (in inches)

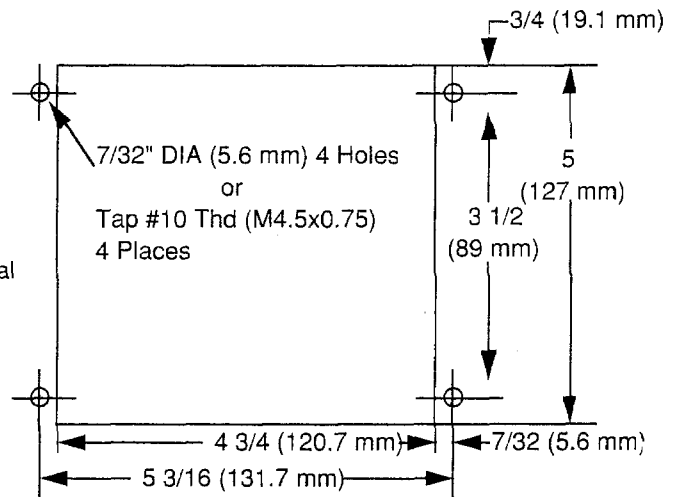
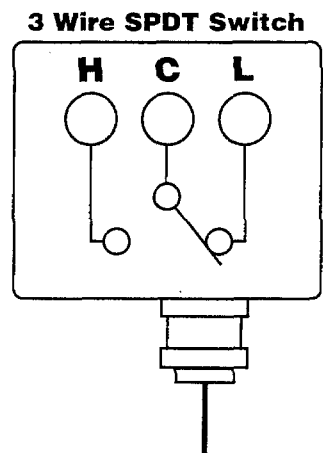


Figure 2 - Wiring



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## MAINTAINING YOUR ZF79

### CHECKING TEMPERATURE

When checking and verifying your temperature be sure to use a test thermometer of known accuracy. Position the test thermometer sensing bulb or probe adjacent to the thermal sensing bulb from the ZF79. Turn the setting knob on the instrument cover to the desired control temperature. Wait for the temperature to stabilize then compare the test thermometer reading with that of the ZF79 knob setting. If the knob setting does not agree with that of the test thermometer, the ZF79 should be re-zeroed.

### RE-ZEROING YOUR ZF79

Be sure that the process temperature is stable. Adjust the setting knob to agree with the test thermometer reading. Remove setting knob, being careful not to disturb setting shaft. Remove the front cover. Loosen set screw S (Figure 3, below). Zeroing is accomplished by turning pinion shaft J with the tip of a screwdriver. Shortening shaft J raises the temperature, lengthening shaft J lowers the temperature. Carefully turn shaft J accordingly until the switch and equipment cycle. Re-tighten set screw S. Check the adjustment by allowing the temperature to stabilize and compare the knob setting with reading of text thermometer. Repeat these steps, if necessary.

### SWITCH REPLACEMENT & #73 SWITCH INSTALLATION

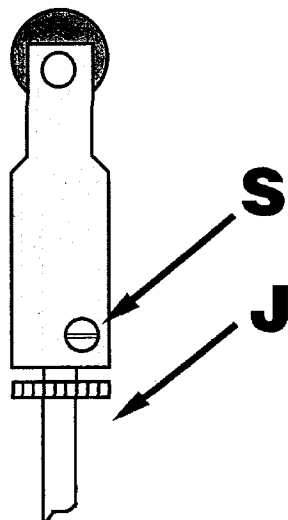
Turn the power to the ZF79 off. Remove instrument knob and cover and remove the two screws holding the switch to the switch arm. Take out the existing switch and remove the wires. Re-connect the wires to the replacement switch one wire at a time to avoid confusion (when installing a #73 switch re-connect the wires to the same respective terminals as on the #79). Then re-assemble the switch in the mechanism, replace the front cover and knob. Then turn the power on. **Note: After replacing the switch, it will be necessary to re-zero the instrument, see above for procedure.**

### BRAKE TIGHTENING

Periodically, the setting shaft brake may require tightening. If the setting knob turns too freely, tighten the brake by turning the hex head screw U clockwise (Figure 4, below), be careful not to overtighten.

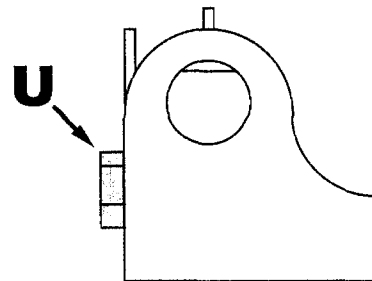
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Figure 3 - Re-Zeroing




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Switch 4 - Brake Tightening



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### PISTON-PAK THERMAL ELEMENT IDENTIFICATION

An element designation number is stamped on the bottom of the element head. This is a coded description of the element specifications and should be used whenever a replacement element is ordered. The number appearing on the side of the element head (Figure 5, below) is the element age code, which may be required in establishing warranty.

### ORDERING/SPECIFYING THE PISTON-PAK SENSING ELEMENT

The sensing element is ordered separately from the ZF79 and requires its own matrix number. To determine the correct sensing element configuration for your instrument(s) and application, see Partlow Form 2787 "Piston-Pak Element Order Matrix and Price List".

### ELEMENT REPLACEMENT

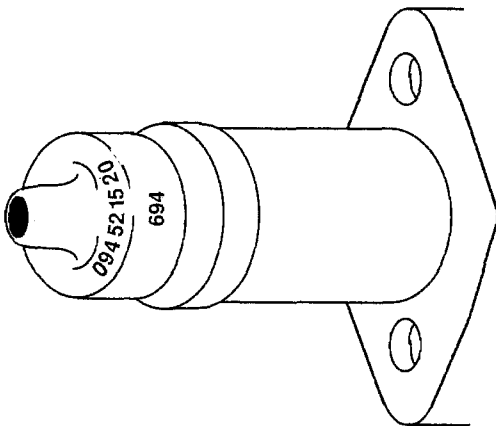
To change a thermal sensing element, start by removing screws D (Figure 6, below) and withdrawing the element from the instrument body. Then remove the element bulb from the medium. Install the new element and replace screws D. Insert the new element bulb into the medium being measured.

*Note: After the element has been replaced, check the temperature setting as re-zeroing may be necessary. If so see the CHECKING TEMPERATURE section, page 4.*

**Caution: The inside mechanism(s), particularly the inside of the element housing, should never be oiled. However, if the instrument is subject to corrosion or gunking conditions, the mechanical linkage should be sprayed periodically with corrosion inhibiting CRC2-26, 3-36, or 5-56. Use only CRC2-26, 3-36, or 5-56 as other lubricants may cause build up and sticking of internal parts. CRC2-26 may be purchased from Partlow in a 15 oz. container (part #63600401). CRC5-56 may be purchased locally from any hardware or automotive store.**

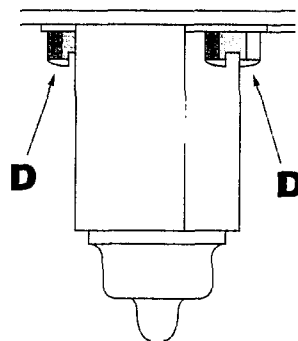
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Figure 5 - Sensing Element ID




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Figure 6 - Replacing Element



# DIMENSIONAL DRAWING

Figure 7 - Dimensional Drawing

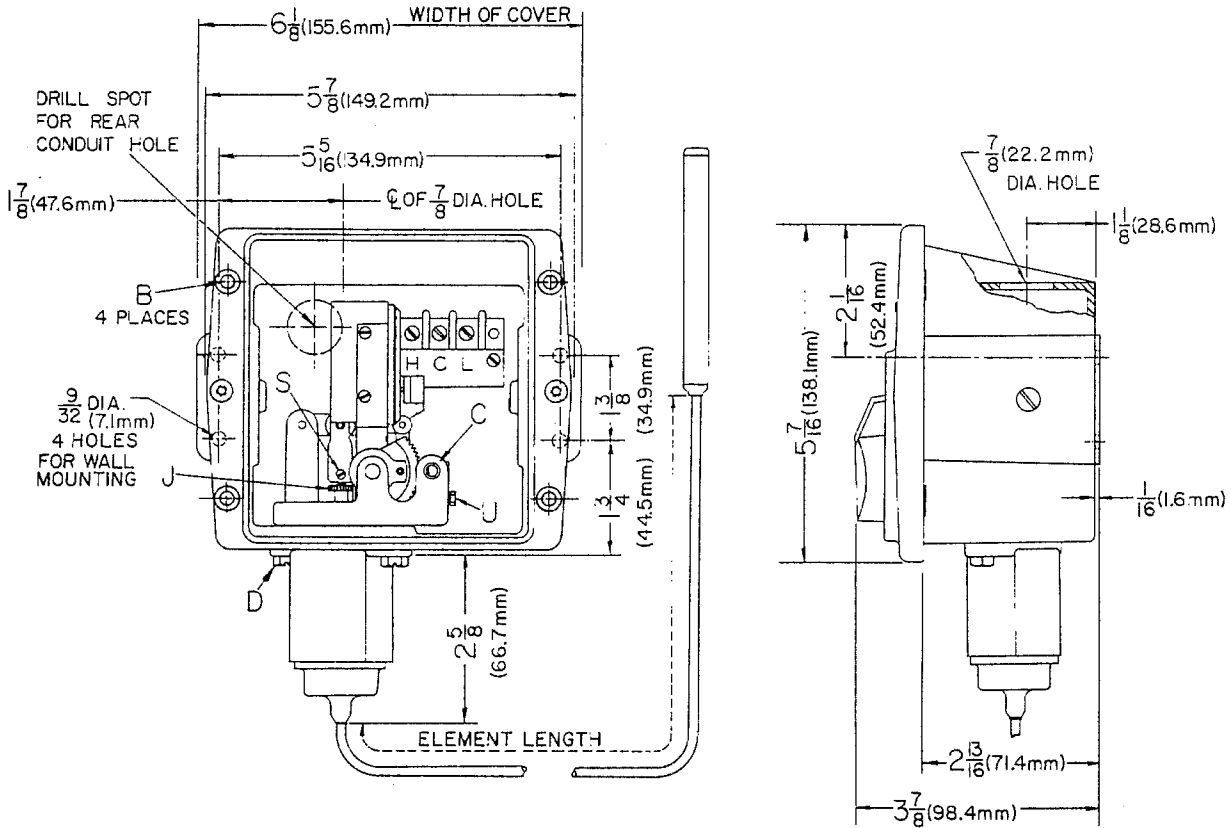
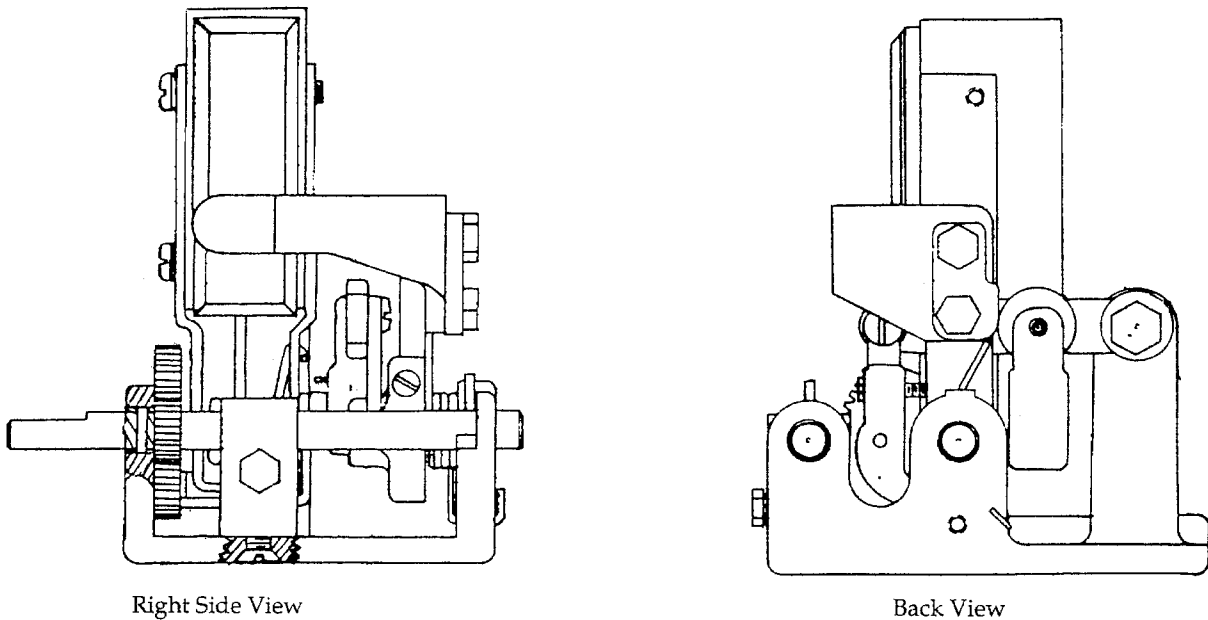
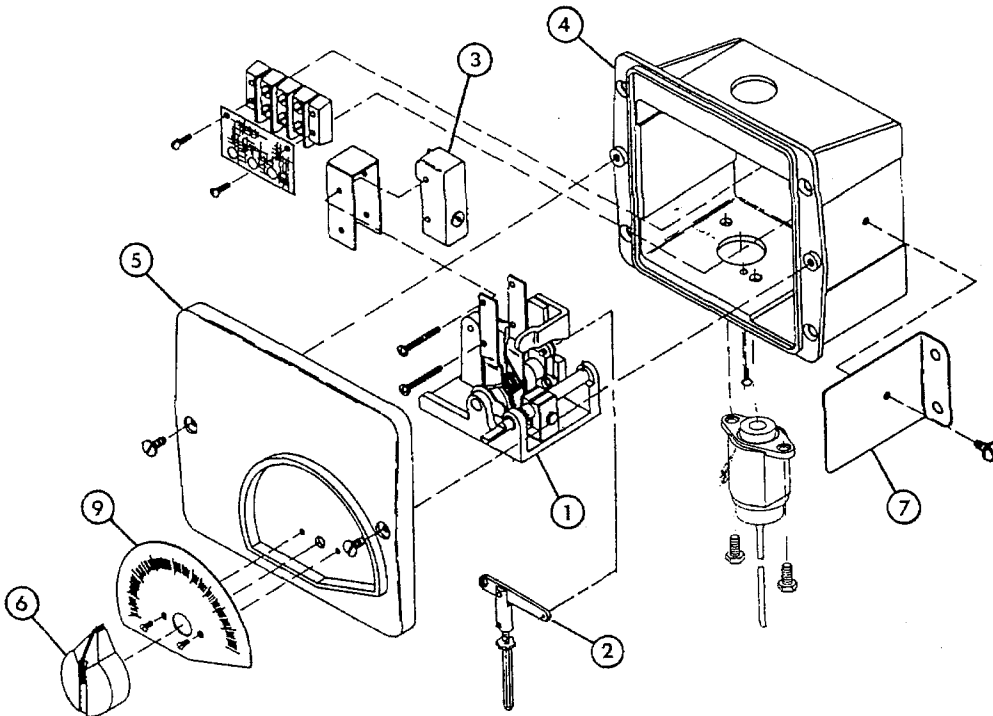


Figure 8 - Mechanism Drawing



# EXPLODED ILLUSTRATION AND PARTS LIST

<p><b>1. Mechanism Assembly</b> Includes: Micro Switch, Wiring and Terminal Block, Push Rod.</p>	<p><b>10076107</b></p>	<p><b>6. Knob Assembly</b> Includes: Set Screw</p>	<p><b>ZFS7</b></p>
<p><b>2. Main Lever Assembly</b> Includes: Main Lever with Push Rod Cap, Push Rod, Set Screw.</p>	<p><b>64412301</b></p>	<p><b>7. Mounting Brackets</b> Consult factory for re-order.</p>	<p><b>64402002</b></p>
<p><b>3. Micro Switch</b> Includes: Terminal Screws #73 #79</p>	<p><b>64403018</b> <b>64403021</b></p>	<p><b>8. Standard Hardware Kit (not shown)</b> Includes: Cover Screws (2) Switch Screws (2) Dial Screws (2) Terminal Block Screws-9/16 (2) Terminal Block Screws-1/2 (2) Mechanism Holding Screw (1) Mounting Bracket Screws (2) Ground Screw (1)</p>	<p><b>64412501</b></p>
<p>Note: #73 replaces #7, #79 replaces #4.</p>			
<p><b>4. Case Assembly</b> Includes: Mounting Brackets</p>	<p><b>64412401</b></p>	<p><b>9. Dial Scale</b> Specify Range and Standard or Inverted Mount</p>	
<p><b>5. Cover Assembly</b> Includes: Dial Screws, Cover Screws. When ordering specify Dial range and if Stand or Inverted Mount.</p>	<p><b>64412601</b></p>		



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## Warranty

These products are sold by The Partlow Corporation ("Partlow") under the warranties set forth in the following paragraph. Such warranties are extended only with respect to a purchase of these products, as new merchandise, directly from Partlow or from a Partlow distributor, representative or reseller, and are extended only to the first buyer thereof who purchases them other than for the purpose of resale.

These products are warranted to be free from functional defects in materials and workmanship at the time the products leave the Partlow factory, and to conform at that same time to the specifications set forth in the relevant Partlow instrumentation sheet, sheets, manual or manuals for such products.

Partlow's sole and exclusive obligation and buyer's sole and exclusive remedy under the above warranties is limited to repairing or replacing, at Partlow's option free of charge, the products which are reported in writing to Partlow at its main office - The Partlow Corporation, 2 Campion Road, New Hartford, New York 13413 or FAX MAIL 1-315-797-0403 and which if so advised by Partlow, are returned with a statement of the observed deficiency to the designated facility during normal business hours, transportation charges prepaid and which upon examination by Partlow are found not to comply with the above warranties. PARTLOW SHALL NOT BE LIABLE FOR ANY INCIDENTAL DAMAGES, CONSEQUENTIAL DAMAGES, SPECIAL DAMAGES, OR ANY OTHER DAMAGES, COSTS OR EXPENSES, EXCEPTING ONLY THE COST OR EXPENSE OF REPAIR OR REPLACEMENT AS ABOVE DESCRIBED.

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