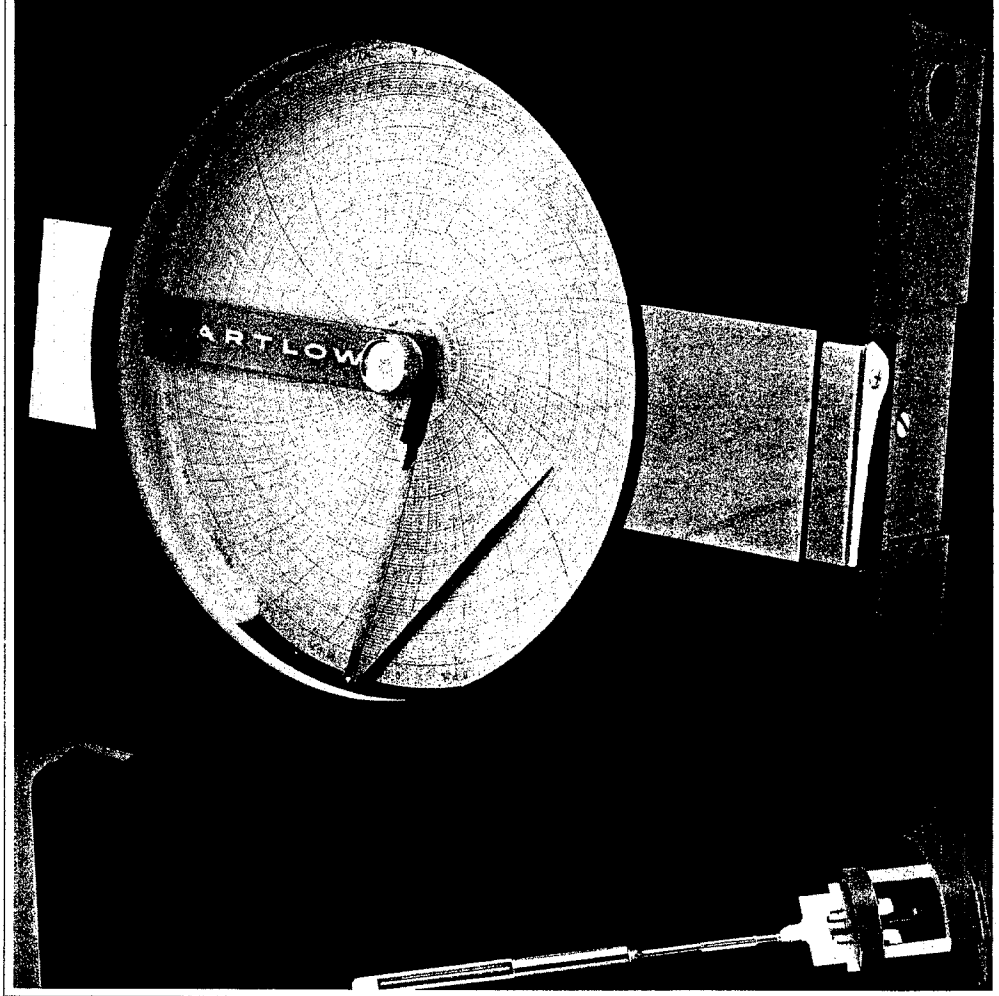
TWO SWITCH, SINGLE PEN MECHANICAL RECORDING CONTROLLER

The RF15-79 is a ten inch recording temperature controller designed to provide accuracy, reliability and easy operation in harsh industrial environments. It derives its simplicity and efficiency from the Piston-Pak filled system sensing element. This document outlines the specifications of the RF15-79 and provides installation and operation instructions.



Form Number 3003
Revised Nov. 1991
Second Edition

ISO 9002 REGISTERED

SPECIFICATIONS INSTALLATION OPERATION

RF15-79

Partlow
The Partlow Corporation • Two Campion Rd. • New Hartford, NY 13413 USA • 315-797-2222 • FAX 315-797-0403

QUALITY INSTRUMENTATION DESIGNED & 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.

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 process 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 servidce assistance to the end user.

RF15-79 PRODUCT SPECIFICATIONS

• Dimensions	15 1/8" W x 13 3/16" H x 4 7/8" D
• Chart Markings	Ink cartridge type standard.
• Chart Rotation Periods	24 hour, 48 hour, 7 day and others available.
• Chart Drives	Electric with toggle switch, or spring wound.
• Chart Diameter	10 - Inch
• Panel Mount Opening	13 1/2 inches wide by 12 5/8 inches high.
• Surface Mounting	Brackets included.
• Switch Type	Three wire single pole double throw. 2 per mechanism.
• Switch Sensitivities	Normal 1% of range (#79 Switch) standard Super Sensitive (#73) 0.5% of range optional
• Electrical Connection	Terminal block accessible with instrument cover open.
• Conduit Openings	One 7/8 inch diameter hole on each side of the case for 1/2 inch conduit fitting; drill guide hole spotted in the rear of the case showing optional rear opening location.
• Electrical Rating	50VA, inductive; 500VA, non inductive; 250V maximum AC only.
• Agency Approvals	Underwriters Laboratories and Canadian Standards Association
• Warranty	One year, details on the last page.
• Approx. Net Weight*	9 lbs
• Approx. Ship. Weight*	14 lbs

* Weight will vary depending on length of element.

RF15-79 ORDER MATRIX

RF 02 _ _ _

RF15-79*
(Replaces RFS, RF4, RF7)

CHART DRIVES
01 125V/60Hz 24 Hour
02 125V/60Hz 7 Day
03 125V/60Hz 12 Hour
04 125V/60Hz 48 Hour
05 125V/50Hz 24 Hour
06 12V5/50Hz 7 Day
07 Spring Wound 24 Hour
08 Spring Wound 7 Day
09 250V/50Hz 24 Hour
10 250V/50 Hz 7 Day

ACCESSORIES
0 None
1 257AP Low Limit Switch

** The first switch is always a #15. The standard second switch on the RF15-79 is a #79 which 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 separately and will be shipped separately. User must remove the factory standard #79 switch and install the #73 switch. (See SWITCH REPLACEMENT section in this document). To order the #73 switch specify part # 64403018.*

PISTON-PAK THERMAL SENSING ELEMENT
A Piston-Pak Thermal Sensing Element must be specified for each RF15-79. Use Partlow Form Number 3028 "Mechanical Products Cross Reference and Pricing Guide" to configure the matrix number for the sensing element.

INSTALLATION AND WIRING

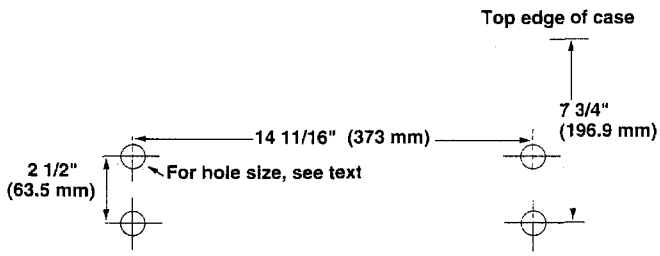
LOCATION

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 assemblies. These temperature limitations must be considered when determining the instruments location. It should be located in an area as free from vibration as possible.

MOUNTING

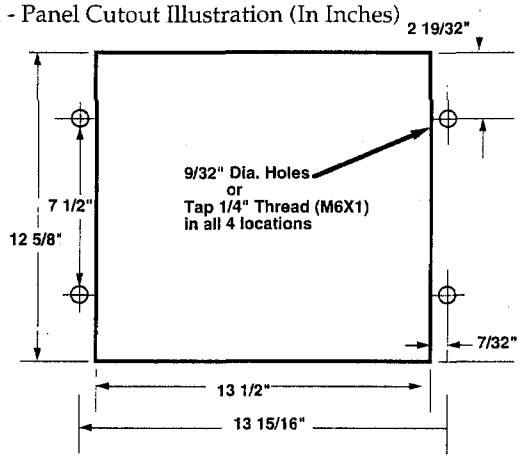
The instrument(s) are shipped to be surface mounted. Figure 1 illustrates hole placement for surface mount condition. ***Note: Holes in brackets supplied are 9/32 clearance holes for 1/4" bolts.*** Four holes called out in the drawing may be any size that will accommodate the fastening requirement, ie: 9/32 for 1/4" thru-bolt with nut fastening, or #7 drill for 1/4" x 20 NC tapped hole fastening or #3 drill for 1/4" x 28 NF tapped hole fastening.

Figure 1 - Surface Mount Dimensions (In Inches)



The instrument may also be flush mounted. This is accomplished by removing the two surface mounting angle brackets from the instrument. Figure 1A illustrates panel cut out dimensions. Cut the panel opening to 13 1/2" x 12 5/8". Drill 9/32 clearance holes in four locations if 1/4" thru-bolt with nut installation is desired. Should a tapped hole be preferable, drill a #7 hole in four locations for 1/4" x 20 NC or a #3 holes in four locations for 1/4" 28 NF. ***Note: All configurations require a flat head screw for proper door operation. With the instrument in the upright position, insert it and the element with the panel opening and tilt into place. Depending upon your panel size, it may be easier to make electrical connections before finally securing the instrument into the panel.***

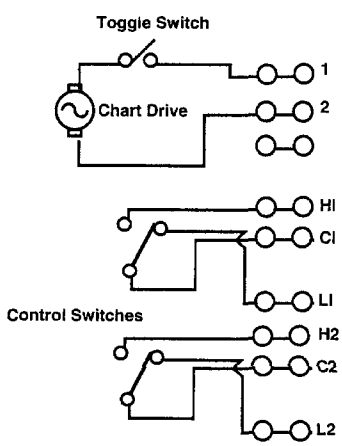
Figure 1A - Panel Cutout Illustration (In Inches)



WIRING

Check applicable electrical codes, ordinances and regulations regarding use of conduit, etc. **If acceptable, make connection using short sections fo flexible cable or conduit.** The rear conduit hole should be used for panel mount installations.A drill guide hole is spotted in the back of the case to accommodate field drilling (See Dimensional Drawing on Page 6). Refer to the wiring diagram in Figure 2 and proceed. Open the instruments hinged cover and remove the insulator covering connection terminal block. Note that the terminals are designated 1, 2, H1, C1, L1, H2, C2 and L2. Connect the power supply specified to terminals 1 and 2 (chart drive terminals). Make necessary connections to H1, C1, L1, and H2, C2, L2 terminals according to Figure 2. Re-install insulator over terminal block and close the instrument cover.

Figure 2 - Control Switch



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.

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 bulb are used note separation coupling between bulb and capillary). The element must be immersed 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. If the bulb is to be subjected to corrosive or scouring conditions, it should be protected by a thermal well, separable socket or other protected material. The bulb 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.

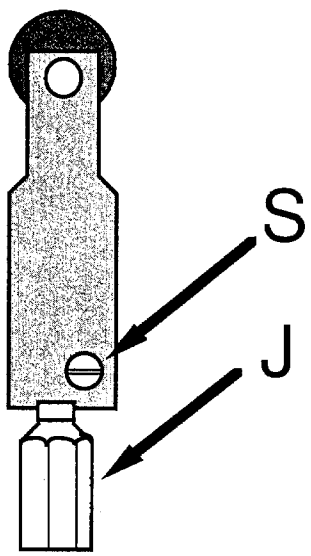
INSTRUMENT OPERATION

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 setting the T-handle inside the hinged cover and positioning the red set pointer along the chart to the desired temperature. This positions the two snap-acting switches at the control point. The recorder pen moves upscale or downscale in response to the Piston-Pak thermal sensing element. When the recorder pen moves in line with the red setpointer, the snap-acting switches are actuated and this opens or closes the circuit controlling the heating or cooling input to the application.

MAINTAINING YOUR RF15-79

Figure 3 - Re-Zeroing



CHECKING TEMPERATURE

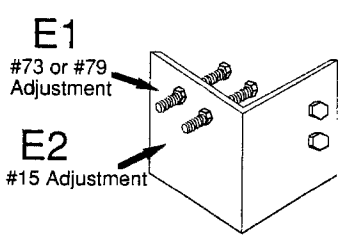
When checking and verifying your temperature be sure to use a test thermometer of known accuracy. Position the test thermometer sensing bulb or probe adjacent to the thermal sensing bulb from the RF15-79. Turn the red set pointer on the RF15-79 to the desired process temperature. Wait for the temperature to stabilize, then compare the test thermometer reading with that of the RF15-79. If the two readings do not agree, the RF15-79 should be re-zeroed.

RE-ZEROING YOUR RF15-79

Be sure that the process temperature is stable. Note tne amount of temperature difference between the test thermometer reading and the pen indicated temperature. Open the instrument cover and loosen the set screw S (Figure 3). Zeroing is accomplished by turning hex shaft J with wrench provided. Lengthening shaft J (counterclockwise) raises the pen indicating temperature; shortening shaft J (clockwise) lowers pen reading. Position the red set pointer to the high end of the chart and shut off power to the instrument. Then turn shaft J, accordingly, and correct the pen reading the same number of degrees as was found to be the difference between the temperature indicated by the test thermometer and the instrument. Re-tighten set screw S. Return the red set pointer to its original setting and restore power. After the temperature stabilizes the pen indicated temperature should now agree with the reading of the test thermometer. Close the instrument cover. If the temperatures do not agree repeat the procedure.

Note: Power shut down described above prevents process temperature from building while adjustments are being made. If, however, the situation exists where power shutdown is not feasible, follow the same procedures but make shaft J adjustments as quickly as possible. In systems where temperature builds very rapidly, zeroing procedures may have to be repeated several times.

Figure 4 - Switch Adjustment Screws



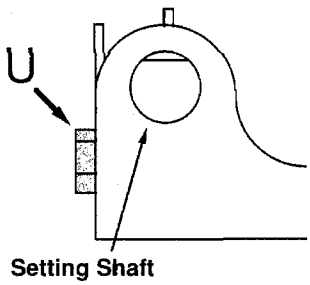
SWITCH REPLACEMENT

#15 Micro Switch (Leaf switch) Replacement (See Figure 9 for more detail)
Turn the power off to the instrument. Remove the chart and platen (see Exploded View Illustration on Page 6). Remove the switch mounting screws from the front switch. (Note: the #15 switch has a spring leg actuator attached to it). Transfer the switch wires from the existing switch to the replacement switch one wire change at a time to avoid wiring confusion. Reattach the replacement switch to the switch bracket with the two mounting screws. Note the routing of the switch wires–be sure they do not interfere with proper switch actuation. Be sure to check switch actuation and adjacent screw E1 (see Figure 4) as needed for proper control switch actuation.

#52 or #79 Micro Switch (Pin type) Replacement
Turn the power off to the instrument. Remove the chart and platen (see Exploded view on page 7). Remove the two switch mounting screws from mechanism (page 6). One switch mounting screw will be part of the lower mounting screw from the front #15 switch. The second switch mounting screw will be below the first and it will be set back on the mechanism. Remove the switch from the bracket. Remove the wires from the original switch and transfer them one at a time to the replacement switch. Re-install the new switch and the mounting screws. Note: routing of the switch wires, be sure that they do not interfere with proper switch actuation. Be sure to check switch actuation and adjust screw E2 (see Figure 4, page 4) as needed for proper control switch actuation.

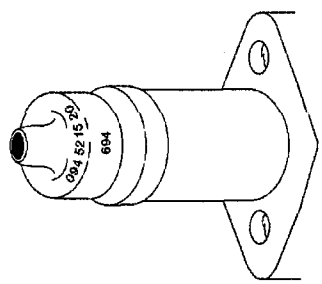
Note: After replacing either switch it may be necessary to make an adjustment to the switch actuation screws E (Figure 4, page 4). If, during normal process temperature cycling, the indicating pen registers a constant differential over or under the red set pointer adjust the actuation screw E to correct. Lengthening the screw lowers the temperature while shortening it raises the temperature. Note: there are two adjusting screws, the one closest to the platen is #15 adjustment and the one behind it is the #73 or #79 adjustment screw.

Figure 5 - Brake Tightening



BRAKE TIGHTENING
Periodically the setting shaft brake may require tightening. If the brake is too loose, the over-travel movement of the pen arm will tend to drag the setpointer upscale from its set position. To tighten the brake, turn the adjustment screw U clockwise (Figure 5 at right). **Be sure not to over-tighten.**

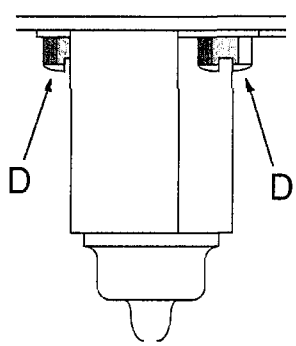
Figure 6 - Sensing Element ID



PISTON-PAK THERMAL SENSING 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 6 at right) 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 RF15-79 and requiries its own matrix number. To determine the correct sensing element configuration for your instrument(s) and application see, Partlow Form 3028 "Mechanical Products Cross Reference and Pricing Guide."

Figure 7 - Replacing Element



ELEMENT REPLACEMENT
To change a thermal sensing element start by removing screws D (Figure 7 at right) and withdrawing the element from the instrument body. Then remove the element bulb from the media. Install the new element and tighten screws D. Insert the new element bulb into the media 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 (page 4) section.

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 CRC 2-26, 3-36, or 5-56. Use only CRC 2-26, 3-36, or 5-56 as other lubricants may cause build up and sticking of internal parts. Also note that the latch handle assembly should never be lubricated with any chemical. Damage to the cover may result with use of any lubricating materials other than graphite. CRC 2-26 may be purchased from Partlow in a 15 oz. container (part #63600401). CRC 5-56 may be purchased locally from any hardware or automotive store.

DIMENSIONAL DRAWING

Figure 8 - Dimensional Drawing

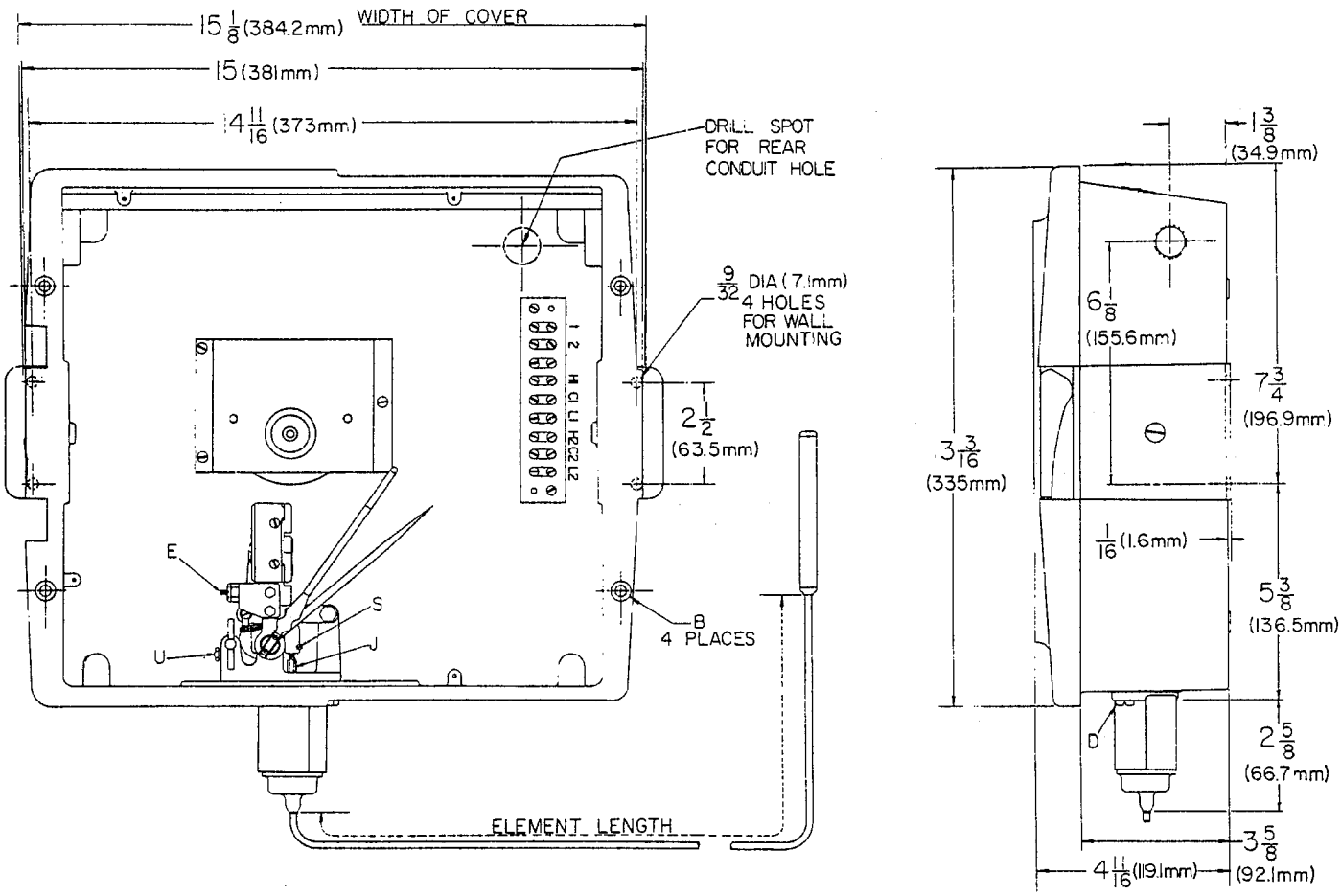
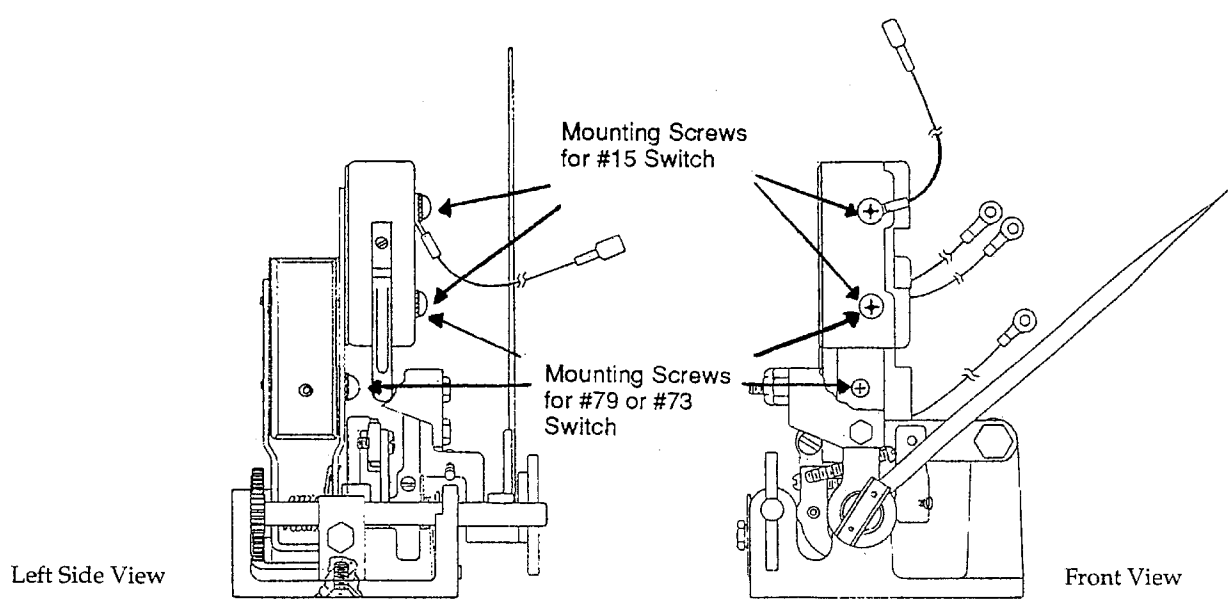


Figure 9 - Mechanism Drawing



EXPLODED VIEW AND PARTS LIST

1. Case Assembly **64415101**
Incluces: Case, Ground Plane, Latch Bracket, Mounting Brackets With Screws, Hinge Pins and Plates, Hub Strip Hinge.

2. Cover Assembly **SP50007603**
Includes: Cover, Glass, Glass Retaining Ring, Gaskets, Latch Handle Assembly.

3. Mechanism Assembly **10069320**
Includes: Switches #15 and #79, Wiring, Push Rod, Pen Arm and Ink Cartridge.

4. Main Lever Assembly **64414801**
Includes: Main Lever with Push Rod Cap, Push Rod, Set Screw.

5. Micro Switches
#15 Switch **64403008**
#79 **64403021**
#73 **64403018**
Includes Switch With The Terminal Screws.

6. Pen Arm Kit **64402201**
Includes: Arm, Cartridge and Screws.
Cartridge - Red (In multiples of 5). **60500403**

7. Chart Nut and Flange Kit
(Indicate the type of application this is for)
Includes: Hub nut, Retaining Clip and Flange Assembly*.
For Stand Mounted Drives **64415201**

For Platen Mounted Electric Drives **64415202**

* For Stand Mounted Spring Wound Drives with turrets only nut and clip are included. **64415204**

8. Chart Hub Name Strip **RFS12**
(CCW Chart Rotation)

9. Terminal Block Kit
Includes: Terminal Block, Insulators, Miscellaneous Hardware
For 6 Positions **64415002**
For 9 Positions **64415003**
For 12 Positions **64415004**
For 14 Positions **64415005**

10. Platen Assembly **SP10067701**
For spring wound or electric drives, stand or platen mounted. Includes chart drive switch.

11. Chart Drive
Contact Factory for re-order. Specify time base, voltage, cycle, and stand or platen mounted device being replaced.

12 Chart Drive Mounting Stand
(Not required for platen mounted drives)
Includes: All Fasteners and Clamp Plate.

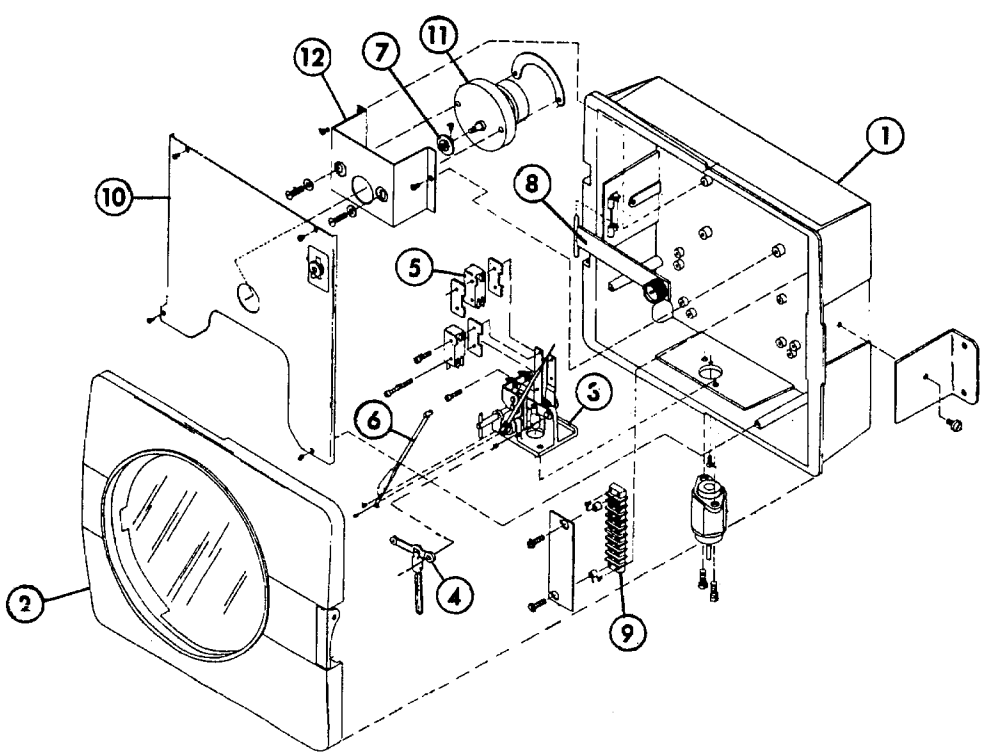
For All Electric Stand Mounted **64415601**

For 24, 48 Hour, 7 Day Spring Wound CCW **64415602**

For 14, 31 Day Spring Wound CCW **64415603**

For Other Spring Wound With Turret on Drive CCW **64415604**

Not Shown Hardware Kit **64415701**
Includes All Body Fasteners and Element Flange Screws (May include fasteners not required for specific models).



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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Form Number 3003
Revised Nov. 1991
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