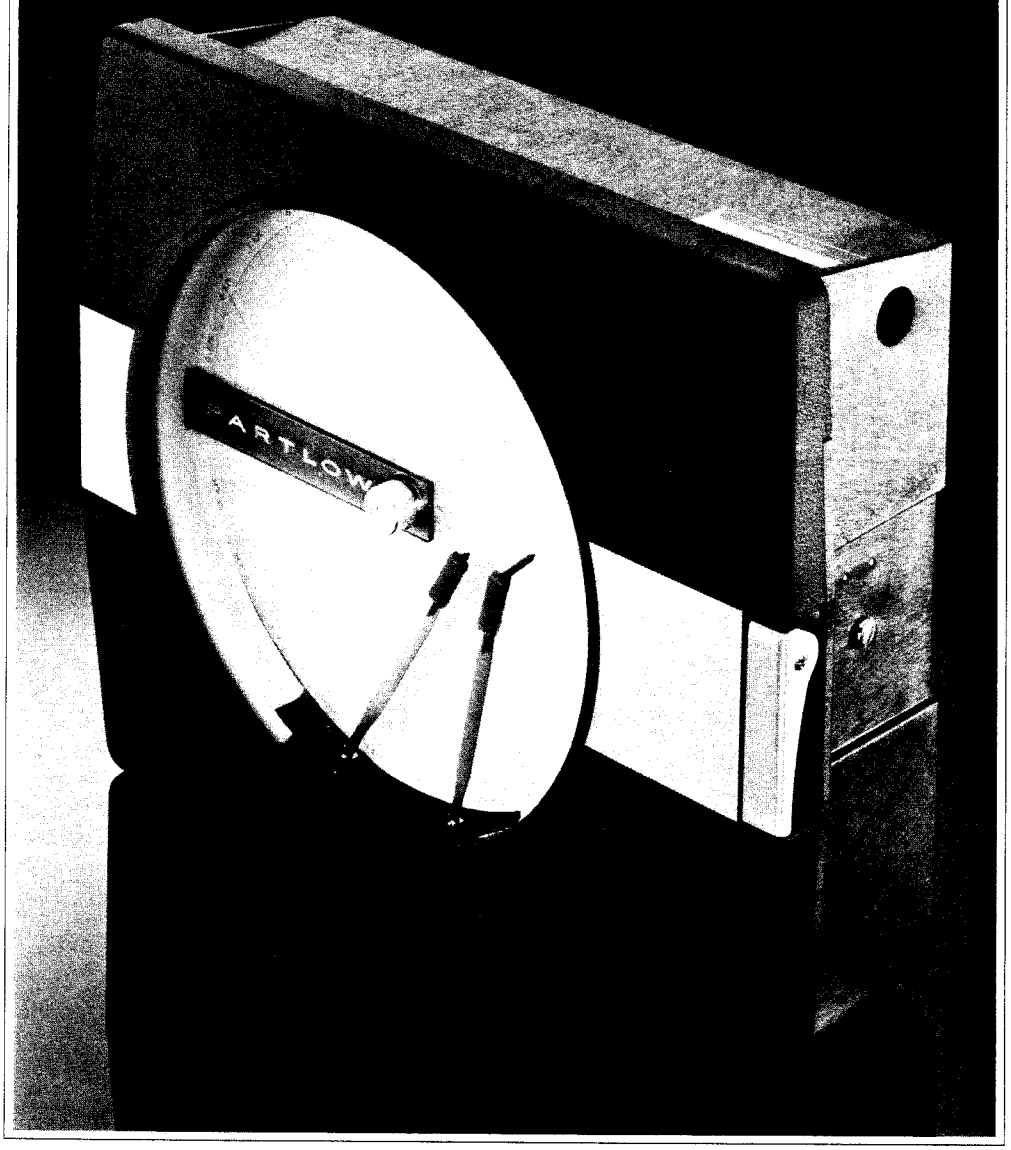
DUAL MECHANICAL RECORDING THERMOMETER

The RFHTT is a dual recording thermometer designed to sense and record temperature from two separate locations simultaneously on a single chart. It derives its simplicity and efficiency from the Piston-Pak filled systems sensing element and is available in 16 ranges within an overall span of -30°F to 1100°F.



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SPECIFICATIONS
INSTALLATION
OPERATION

RFHTT

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

RFHTT PRODUCT SPECIFICATIONS

Dimensions	15 1/8" W x 13 3/16" H x 4 7/8" D
Surface Mounting	Brackets included
Flush Mount Cutout	13 1/2" W 12 11/16" H
Chart Diameter	10 inch
Chart Marking	Ink Type
Chart Drive	Electric with toggle switch, or spring wound
Chart Rotation Periods	24 and 48 hours, 7 day, other options.
Electrical Hookup	Terminal block accessible with cover open
Conduit Openings	7/8" diameter opening on top left and right side of case to accept 1/2" electrical fitting. Drill guide hole is spotted in rear of case for flush mount intallation (see Figure 5)
Rated Accuracy	1% or element range
Approx. Net Weight*	9 lbs
Approx. Shipping Weight*	14 lbs

* Weight may vary depending on element lengths.

RFHTT ORDER MATRIX

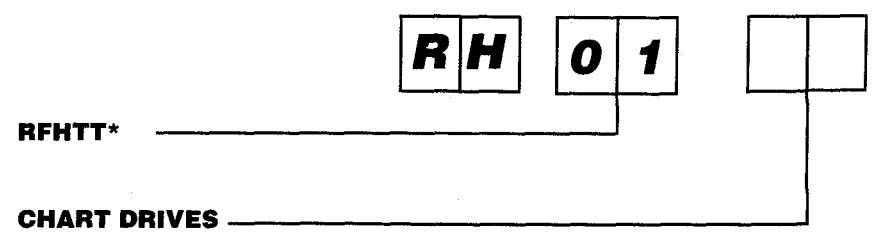


CHART DRIVES

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	125V/50Hz 7 Day
07	Spring Wound 24 Hour
08	Spring Wound 7 Day
09	250V/50Hz 24 Hour
10	250V/50Hz 7 Day

*Requires two thermal elements of the same range; must be L-type element plunger. Remaining element specifications may be varied.

PISTON-PAK THERMAL SENSING ELEMENT

Two Piston-Pak Thermal Sensing Elements must be specified for each RFHTT. Use Partlow Form 3028 "Mechanical Instrumentation Products Cross Reference and Pricing Guide" to configure the matrix number for the sensing element.

INSTALLATION AND WIRING

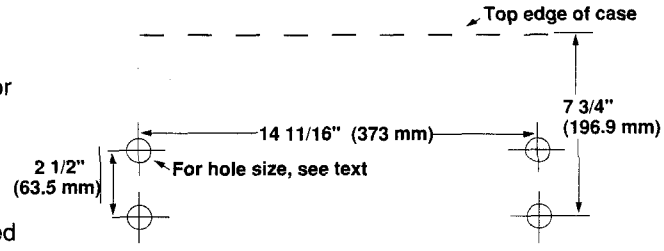
LOCATION

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 50°F (0°C to 66°C) for high temperature 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

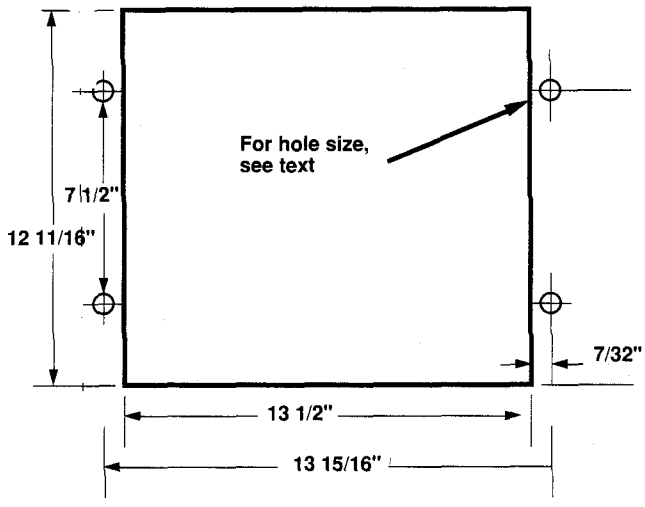
The instrument(s) are shipped to be flush mounted. Figure 1 illustrates hole placement for surface mount condition. Note: hole in brackets supplied are 9/32 clearance holes for 1/4" bolts. The four holes called out in the drawing may be any size that will accommodate the fastening requirement, ie: 9/32 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



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" wide x 12 5/8" high. Drill 9/32 clearance holes in four locations if 1/4" thru-bolt with nut installation is desired. Should a tapped hole be more preferred, drill a #7 hole in four locations for a 1/4" x 20 NC or a #3 hole in four locations for a 1/4 x 28 NF. Note: all configurations require a flat head screw for proper door operation.

Figure 1A - Panel Cutout Illustration (in inches)

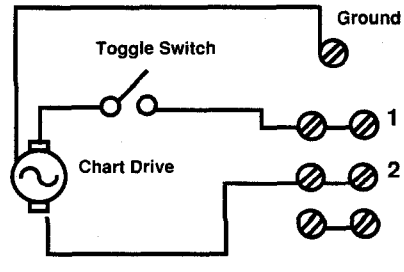


With the instrument in the upright position, insert it and the element into the panel opening and tilt into place. Depending upon your panel size it may be easier to make electrical connections before finally securing the instrument into the panel.

WIRING

Check applicable electrical codes, ordinances and regulations regarding use of conduit, etc. If acceptable, make connection using short sections of 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 instrument's hinged cover and remove the insulator covering connection terminal black. Note that the terminals are designated 1, 2. Connect the power supply specified to terminals 1 and 2 (chart drive terminals) according to Figure 2. Re-install insulator over terminal block and close the instrument cover.

Figure 2 - Wiring Diagram



STUFFING BOX INSTALLATION (IF APPLICABLE)

Overtightening of 21-T-105 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 130 to 180 inch-pounds for stainless steel.

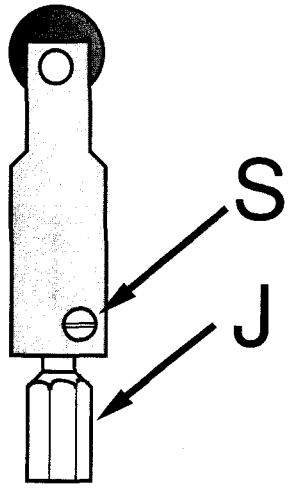
PLACING THE THERMAL SENSING ELEMENT

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 bulbs 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 protective material. The bulb may be elevated up to 40 feet above the instrument without affecting calibration.

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.

Figure 3 - Re-Zeroing



The RFHTT is essentially two independent recording thermometers mounted in one recorder body. Each has its own individual thermal element, mechanism and recording pen. Each of the two thermometer mechanisms operate in the same manner. Expanding or contracting in response to temperature changes in the sensed medium, provides a strong positive force on the plunger in the element head. The plunger, in turn, moving up or down in response to this force, positions mechanical linkage within the instrument to move the recording pen along the calibrated chart. To prevent interference between the two pens, the right-hand pen records 1/12 revolution (two-hour differential on a 24-hour chart) behind the left-hand pen.

MAINTAINING YOUR RFHTT

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 RFHTT. Wait for the temperature to stabilize, then compare the test thermometer reading with that of the pen indicated temperature of the mechanism. If the two readings do not agree, The RFHTT should be re-zeroed.

RE-ZEROING YOUR RFHTT

Be sure that the process temperature is stable. Note the amount of temperature difference between the test thermometer reading and the pen indicated temperature on either mechanism. 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 (counter-clockwise) raises the pen indication temperature; shortening shaft J (clockwise) lowers pen reading. 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. After the temperature stabilizes, the pen indicated temperature should now agree with the reading of the test thermometer. Re-tighten screw S and close the instrument cover. If the temperatures do not agree, repeat the procedure.

PISTON-PAK THERMAL SENSING ELEMENT IDENTIFICATION

An element designation number is stamped on the bottom of the element head (Figure 4, below). 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 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 RFHTT and requires its own matrix number. To determine the correct sensing element configuration for your instrument(s) and application, see Partlow Form 3028 "Mechanical Instrumentation Products Cross Reference and Pricing Guide."

ELEMENT REPLACEMENT

To change a thermal sensing element start by removing screws D (Figure 5, below) 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 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. Also note that the latch assembly should never be lubricated with any chemical. On older style units, the latch assembly can be lubricated with graphite only, if necessary. 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.

Figure 4 - Element ID

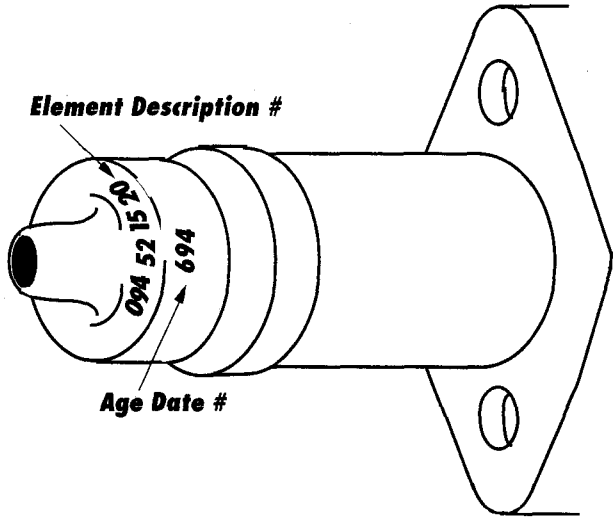
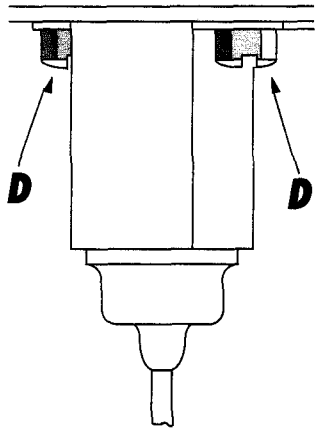


Figure 5 - Replacing Element



DIMENSIONAL DRAWING

Figure 6 - Dimensional Drawing

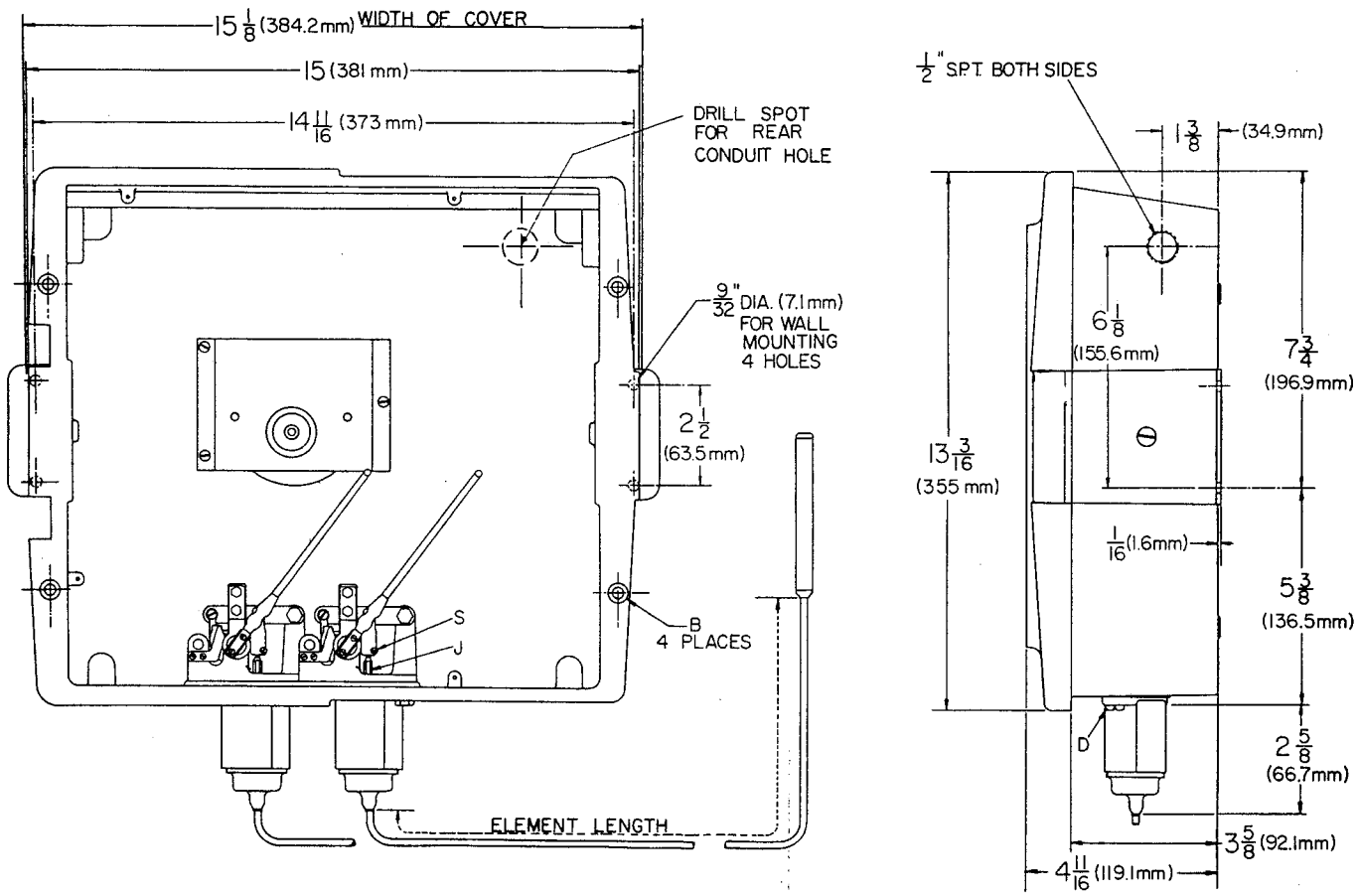
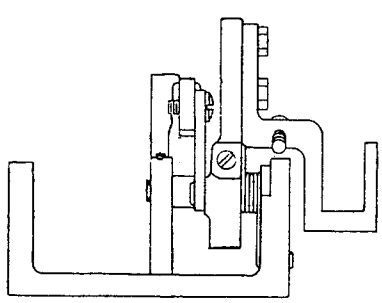
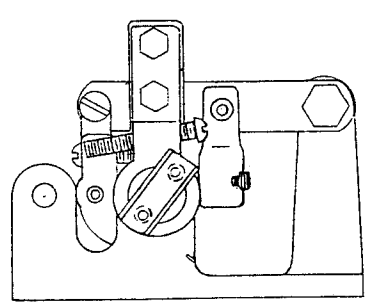


Figure 7 - Mechanism Drawing



Left Side View



Front View

EXPLODED ILLUSTRATION AND PARTS LIST

1. Case Assembly **64415102**
Includes: Case, Ground Plane, Latch Bracket, Mounting Brackets With Screws, Hinge Pins and Plates, Hub Strip Hinge.

2. Cover Assembly **SP10067403**
One Piece Cover

3. Right Mechanism Assembly **10070206**
Includes: Push Rod, Pen Arm and Ink Cartridge

4. Main Lever Assembly **64414901**
Includes: Main Lever With Push Rod Cap, Push Rod, Set Screw

5. Left Mechanism Assembly **10070205**
Includes: Push Rod, Pen Arm and Ink Cartridge

6. and 7 Pen Arm Kit **64402202**
Includes: 2 Arms, Cartridges and Screws

Cartridges, Green (In multiples of 5) **60500401**
Cartridges, Red (In multiples of 5) **60500404**

8. Chart Nut and Flange Kit
Includes: Hub Nut, Retaining Clip and Flange Assembly

For Stand Mounted Electric Drives **64415201**

For Platen Mounted Electric Drives **64415202**

For Stand Mounted Spring Wound Drives with Turrets, Only Nut and Clip are Included **64415204**

9. Chart Hub Name Strip **RFS12**
(For CCW Chart Rotation)

10. Platen Assembly **SP10067701**
For Spring Wound or Electric Drives, Stand or Platen Mounted

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**

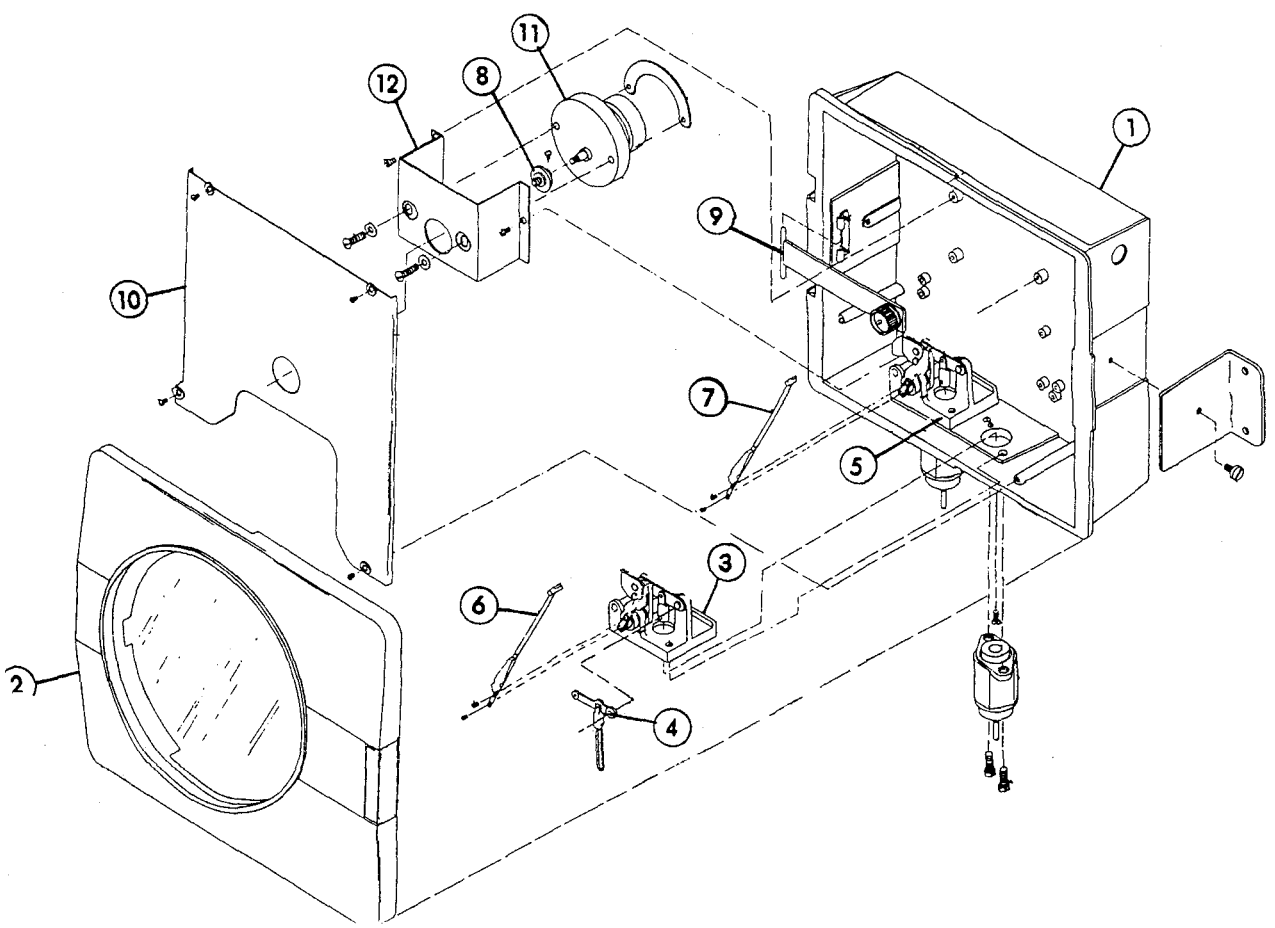
For 14, 31 Day Spring Wound CCW **64415603**

For Other Spring Wound with Turret on Drive **64415604**

Not Shown
Terminal Block Kit
Includes: Terminal Block, Insulators, Miscellaneous Hardware

For 3 Positions	**64415001**
For 6 Postions	**64415002**
For 9 Positions	**64415003**
For 12 Positions	**64415004**
For 14 Positions	**64415005**

Hardware Kit **64415701**
Includes All Body Fasteners and Element Flange Screws (May includes 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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