

Serial No. \_\_\_\_\_



**OPERATING USER MANUAL**  
*for*  
**PRESSURE RECORDERS**



MNW-004 Rev. E  
03/21/16

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*Thank you* for purchasing a Palmer Pressure Recorder. All our Recorders are high quality, functionally sensitive instruments, proudly made in the USA, and shipped from our factory as a calibrated system.

## TABLE OF CONTENTS

<u>MOUNTING OPTIONS</u>	3
<u>CASE</u>	4
<u>CHARTS</u>	4
<u>INSTALLING CHARTS</u>	5
<u>PENS</u>	7
<u>CHANGING A PEN</u>	7
<u>HOW TO ORDER RECORDER PENS</u>	8
<u>CHART DRIVES</u>	9
<u>REPLACING A CHART DRIVE</u>	10
<u>REPLACING THE BATTERY IN BATTERY OPERATED DRIVES</u>	10
<u>REPLACING THE WINDOW</u>	11
<u>PRESSURE ELEMENTS AND RANGES</u>	11-12
<u>PRESSURE CALIBRATION INSTRUCTIONS - CALIBRATION CHECK</u>	13-14
<u>REORDER PENS AND CHARTS</u>	15

**WARRANTY & CALIBRATION  
REGISTRATION at  
[www.palmerwahl.com/register](http://www.palmerwahl.com/register)**

Registration is fast and easy. In about a minute you can have your product automatically registered for Warranty Protection and our Calibration Reminder service. Let Palmer Wahl help you protect your investment, and maintain product accuracy and compliance with ISO and other quality standards.

Questions? Call Customer Service  
at 1-800-421-2853 or 828-658-3131  
Or email: [register@palmerwahl.com](mailto:register@palmerwahl.com)



## MOUNTING OPTIONS

**Wall Mount** - Furnished with flexible armor or pressure connection at the bottom of case unless otherwise specified.



**Flush Mount** - Furnished with flexible armor or pressure connection at the back of the case. Front door latch standard.



**Pipestand Mount (Rear View)** - Furnished with flexible armor or pressure connection at the bottom of case unless otherwise specified.



**Pedestal Mount** - Flexible armor or pressure connection may be furnished at the back, top, or bottom of case as specified by customer.



3" Slip-on Connection

**Portable** – Cast Aluminum or plastic molded Pelican® Case models furnished with flexible armor or pressure connection at the back of the case only.



## CASE

Palmer Recorders are available in a die cast aluminum case in wall, flush, pipestand and pedestal mount. The portable mount recorder comes in either die cast aluminum or a Pelican® case. For proper operation the recorder must be installed (or used in the portable model) with the case in an upright position. Door can be solid, (no window) glass, plexiglass or shatterproof glass. The interior of case should be kept clean and free of dust. Dust may prevent the pens from marking clearly, and can interfere with the free movement of pivots and linkages.

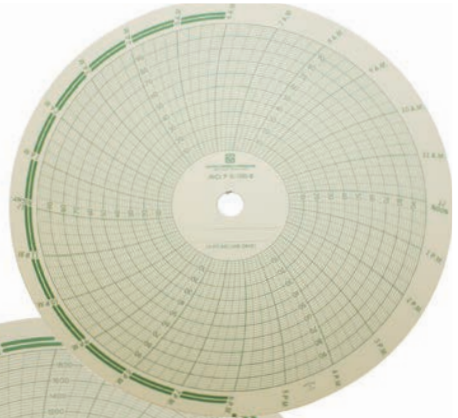
The aluminum case recorder is equipped with an adjustable closing hasp to seal the case against dust and moisture. The hasp is easily adjusted to maintain proper pressure between door gasket and case. It comes standard in Hammertone Gray. Other colors are available.

The Pelican case recorder has double-throw latches and a watertight O-ring seal. An automatic pressure equalization valve releases built-up pressure and prevents moisture intrusion. The Pelican case comes in black.

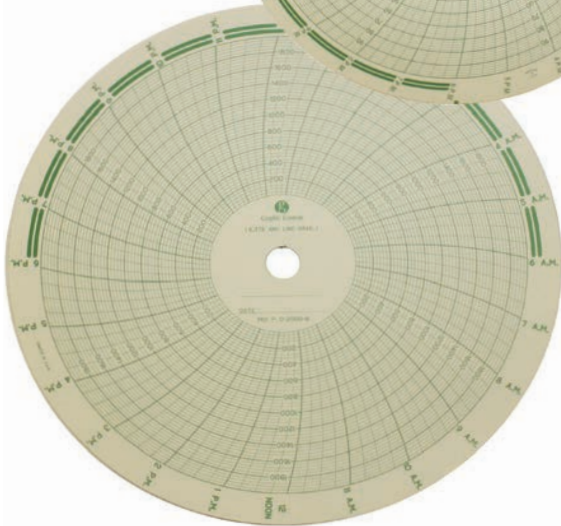
## CHARTS

Charts are available in 8 inch and 12 inch, and in a wide variety of ranges and rotations. Please call Customer Service for the correct chart for your application.

8 inch Chart

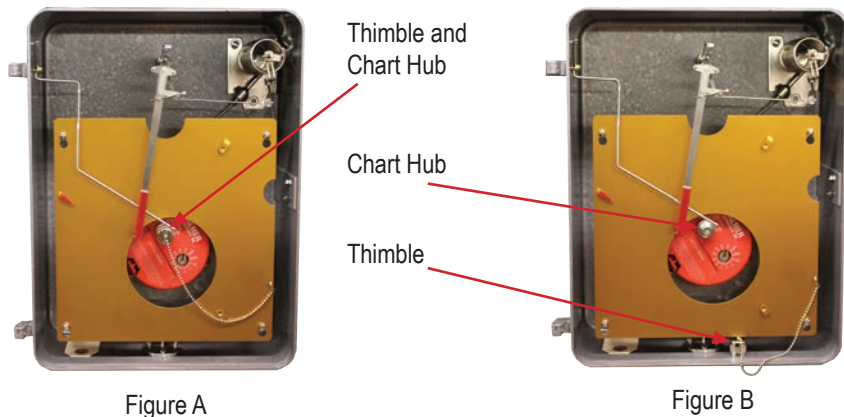


12 inch Chart



## INSTALLING CHARTS

To install a chart, unscrew the thimble and remove it from chart hub. (Figures A and B)

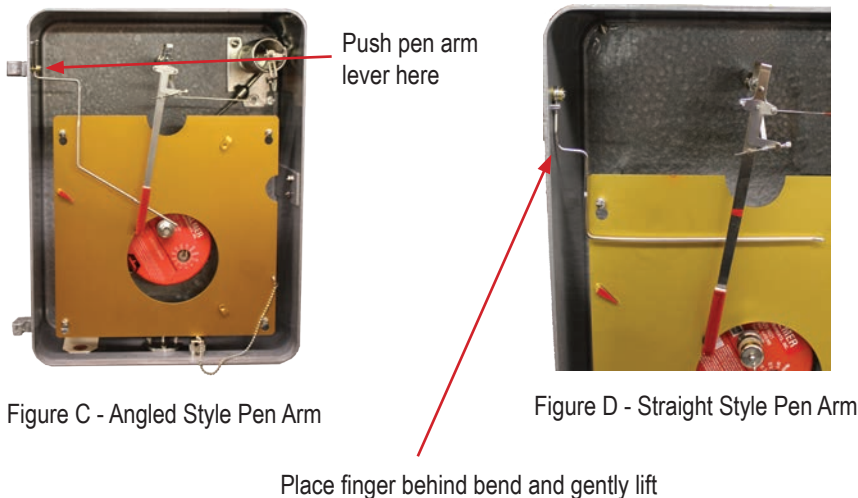


Next, raise pen arm(s) using the pen arm lifter.

There are two styles of pen arm lifter:

Angled Style --- lift by pushing pen arm lever rod gently back as shown below in Figure C to lift pen arm.

Straight Style – place finger behind bend of pen arm lever as shown below in Figure D and gently lift.



Place chart on hub and slide under chart guide on top right side of chart plate. Rotate chart so that the current time of day lines up with the red pointer on the left side of chart plate.

The pen lifter may now be lowered in order to place pen pointer into contact with the chart. Be sure to line up the top pen on the Arc line. Additional pens should be as close as possible to the Arc line and to each other.

The thimble can then be replaced on the chart hub as shown in Figure E.

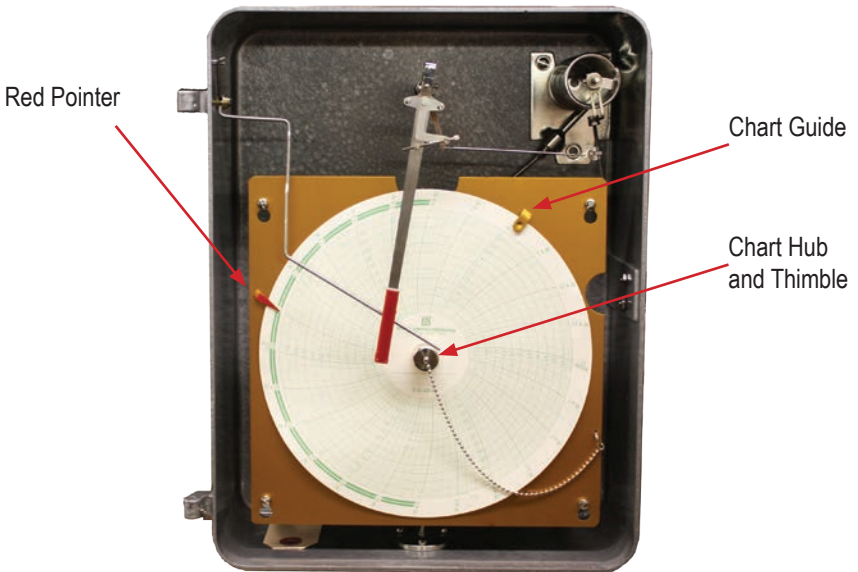


Figure E

## PENS

**Chart Recorder Pens** – Recorder Pens are included for each system specified. Standard colors are Red, Green and Blue. Black and Purple are also available. Pens should be checked periodically for cleanliness and sufficient ink. Replace as necessary.



## CHANGING A PEN

To change a Recorder pen grasp the pen arm and gently pull the pen off the arm. Slide the new pen onto the pen arm by inserting the pen arm into the grooves on the underside of the pen as in Figure F. Remove the protective cap from the pen tip. Lay the pen arm back down and be certain it lines up with the arc line on the chart. Pen should always track arc line. Make adjustments as needed.

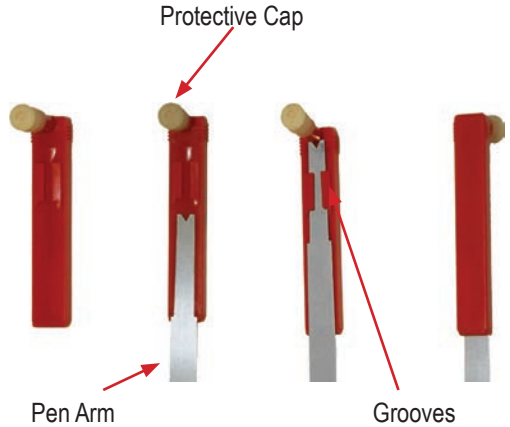


Figure F

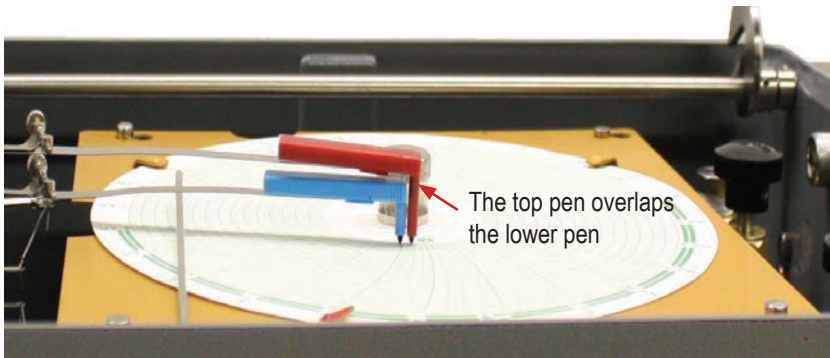
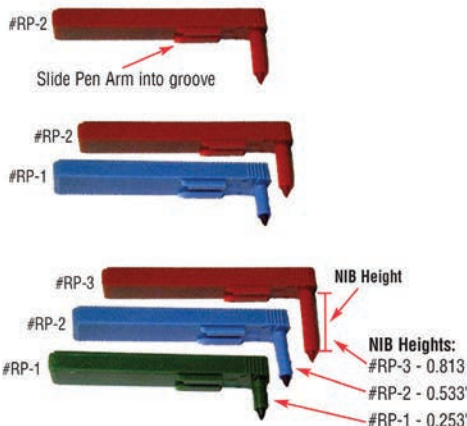


Figure G

Pen arms have different lengths, and are mounted at different heights, enabling the pens to overlap and operate independently of each other. Be sure to order the correct size pen for the desired position. See next page for details.

# HOW TO ORDER RECORDER PENS

**Recorder Pens** are ordered by determining how many systems are on the recorder, and which pen arm they will be installed on, the Top, Middle, or Bottom. The different locations require a pen with the proper NIB height in order for the pens to operate overlapping each other.



## Standard Recorder Pens

### 1 Pen Recorder:

Order Pen: #RP-2, Red (#AR-3714-06).

### 2 Pen Recorder:

Order Pen #RP-2, Red (#AR-3714-06) for the TOP pen.

Order Pen #RP-1, Blue (#AR-3714-04) for the BOTTOM pen.

### 3 Pen Recorder:

Order Pen #RP-3, Red (#AR-3714-11) for the TOP pen.

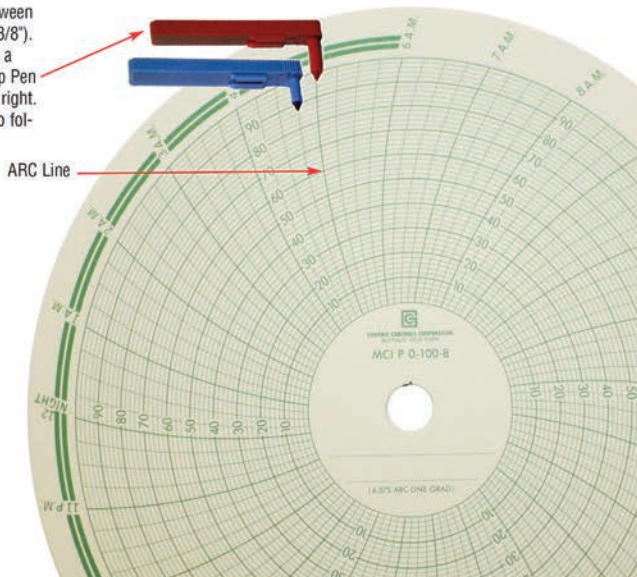
Order Pen #RP-2, Blue (#AR-3714-09) for the MIDDLE pen.

Order Pen #RP-1, Green (#AR-3714-03) for the BOTTOM pen.

Standard colors are recommended, however other colors and configurations are available. Please call Customer Service at: 1-800-421-2853 for more information.

## ARC Line:

The ARC Line is the distance between the pen pivot and the pen tip (6-3/8"). This is important when changing a pen in the field to be sure the Top Pen follows the arc line as shown on right. Pen can be adjusted as needed to follow the arc line.





## CHART DRIVES

There are three types of chart drives: **Multi-Speed Battery Operated, Spring Wound, and Electric.**

**Quartz Multi-Speed Battery Operated Chart Drives (BOCD)** – feature a rugged rotation speed selector. It is available in two models:

**PC-11** – 11 speed selectable chart drive: 60 min, 96 min, 12 hr, 1 day, 2 day, 7 day, 8 day, 14 day, 16 day, 31 day, or 32 day recording intervals, as well as OFF.

**PC-12** – 12-speed selectable chart drive: 30 min, 1 hr, 2 hr, 4 hr, 6 hr, 8 hr, 12 hr, 1 day, 2 day, 3 day, 4 day, or 7 day recording intervals, as well as OFF.

Rotation is set at factory to conform to your specifications. Verify that the drive is set properly. These battery operated drives are **UL Listed:** Class I, Groups C and D, Intrinsically Safe, **CSA Certified**, and are powered by a 1.5 volt “C” cell alkaline battery. It is recommended that the batteries be checked every three (3) months by a voltage meter. Inaccuracy and battery corrosion will develop if batteries are not replaced properly. See page 10 for directions for replacing a battery. This drive is good for operating temperatures of -40° to 160°F (-40° to 71°C). For operating temperatures below 10°F, a 3.6 volt “C” size lithium battery is recommended.

An “OFF” position saves battery life. When “ON”, a pulsating red status light indicates that the unit is working, eliminating the need to double check the chart movement. This is particularly valuable in applications requiring slow rotational speeds. A body pilot pin is used to locate the BOCD on the mounting plate. Removing 3 screws permits exchange of chart drive. No recalibration is necessary. See page 10 for directions for changing a chart drive.

PC-11 or PC-12



Using a screwdriver, simply turn dial to desired rotation

**Spring Wound Drive** - is a dual speed type. By use of a shift lever, the drive can be set for 24 hour or 7 day rotation. Optional 15 minutes and 1 hour are available. Rotation is set at factory to conform to your specifications. Verify that the drive is set properly. To wind the drive, remove chart and use the key furnished with the recorder.

**Electric Drives** are furnished in various rotations and can be supplied with 110V/120V - 60 Hz., and 220V - 50 Hz.

The standard rotation periods are:  
120 V: 12 hr, 24 hr, 48 hr, and 7 days.  
220 V: 7 day only.

When installing, check to verify that proper voltage and cycles are used.



Winding Key

Speed Shift Lever



Electric Drive

## REPLACING A CHART DRIVE

Lift the pen arm to allow for clearance under the pens. Unscrew the thimble from the chart hub and remove the chart. Loosen the four screws holding the chart plate, Figure H, and gently push up on the plate. Lift the chart plate off the screws and pull the chart plate at the bottom to slide it out from under the pen arm. **Do not remove the chart drive from the mounting plate.** Unscrew the 3 screws from the universal mounting plate under the chart drive, Figure I. Remove the entire universal mounting plate with the chart drive attached. Use a small adjustable wrench to loosen and remove the three posts, replace with the posts provided. Replace the new chart drive (which comes attached to the universal mounting plate) in the same position by lining up the 3 holes in the mounting plate to the new posts behind it. Replace the 3 screws using the 6-40 screws provided, and tighten. Replace the chart plate, the chart, and the thimble. Lower the pens back in place, lining the top pen on the Arc line.

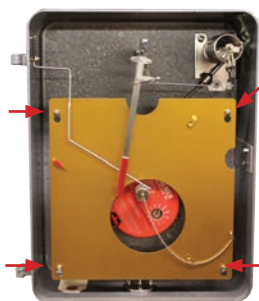


Figure H

Loosen 4 screws and push up on chart plate



Figure I

Remove 3 Screws and lift universal mounting plate with chart drive attached

## REPLACING THE BATTERY IN BATTERY OPERATED DRIVES

Lift the pen arm to allow for clearance under the pens. Unscrew the thimble from the chart hub and remove the chart. Loosen the four screws holding the chart plate, Figure J, and gently push up on the plate. Lift the chart plate off the screws and pull the chart plate at the bottom to slide it out from under the pen arm. Remove the battery cover as shown in Figure K, and replace battery and battery cover. Replace the chart plate, the chart, and the thimble. Lower the pens back in place, lining the top pen on the Arc line.



Figure J

Loosen 4 screws and push up on chart plate

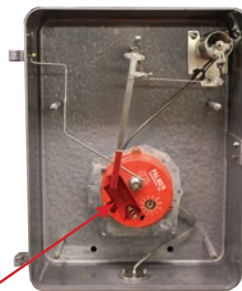


Figure K

Battery Compartment

## REPLACING THE WINDOW

Remove screws to replace window.

8 inch case – 4 Screws  
12 inch case – 5 Screws

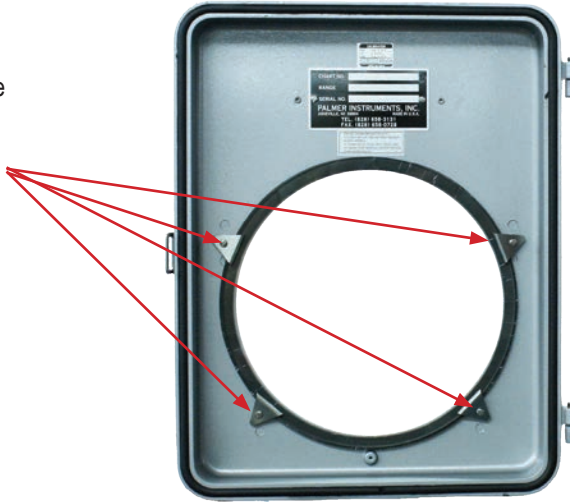


Figure L

## PRESSURE ELEMENTS

The sensing element of the pressure measuring and recording system must be properly installed in order to achieve maximum accuracy.

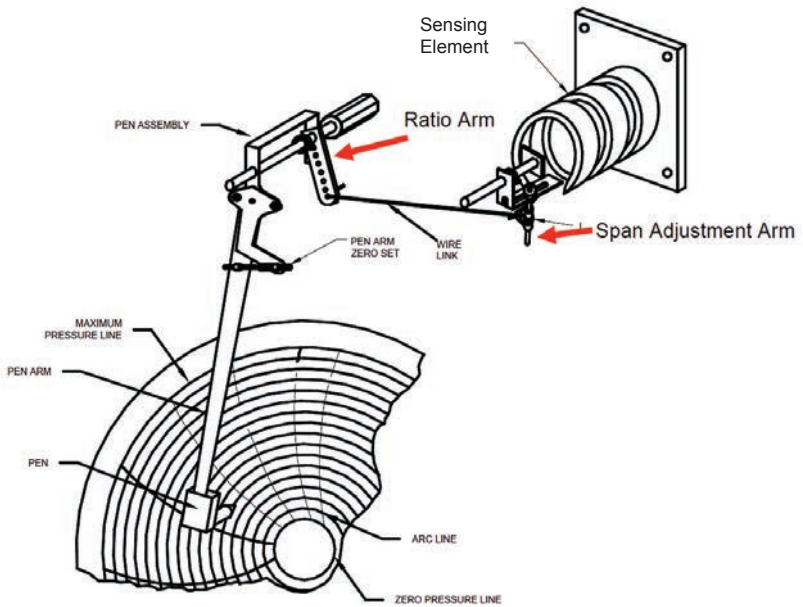


Figure M

## PRESSURE ELEMENTS AND RANGES

PSI Pressure Ranges	
0 to 1 PSI	0 to 350 PSI
0 to 3 PSI	0 to 400 PSI
0 to 5 PSI	0 to 500 PSI
0 to 6 PSI	0 to 600 PSI
0 to 8 PSI	0 to 750 PSI
0 to 10 PSI	0 to 800 PSI
0 to 15 PSI	0 to 1000 PSI
0 to 20 PSI	0 to 1500 PSI
0 to 25 PSI	0 to 2000 PSI
0 to 30 PSI	0 to 2500 PSI
0 to 35 PSI	0 to 3000 PSI
0 to 45 PSI	0 to 4000 PSI
0 to 50 PSI	0 to 5000 PSI
0 to 60 PSI	0 to 6000 PSI
0 to 75 PSI	0 to 8000 PSI
0 to 100 PSI	0 to 10,000 PSI
0 to 120 PSI	0 to 15,000 PSI
0 to 150 PSI	0 to 20,000 PSI
0 to 200 PSI	0 to 30,000 PSI
0 to 250 PSI	3 to 15# PSI
0 to 300 PSI	

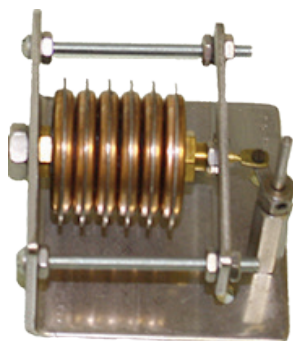
### Pressure Elements



High-pressure helical wound bourdon coil for ranges 30 PSIG and over.

kPa Pressure Ranges	inH <sub>2</sub> O Pressure Ranges
0 to 5 kPa	0 to 10 in H <sub>2</sub> O
0 to 20 kPa	0 to 15 in H <sub>2</sub> O
0 to 80 kPa	0 to 20 in H <sub>2</sub> O
0 to 100 kPa	0 to 25 in H <sub>2</sub> O
0 to 500 kPa	0 to 30 in H <sub>2</sub> O
0 to 800 kPa	0 to 40 in H <sub>2</sub> O
0 to 1000 kPa	0 to 50 in H <sub>2</sub> O
0 to 2000 kPa	0 to 60 in H <sub>2</sub> O
0 to 5000 kPa	0 to 100 in H <sub>2</sub> O

oz/in <sup>2</sup> Pressure Ranges	Hg Pressure Ranges
0 to 10 oz/in <sup>2</sup>	0 to 10 Hg
0 to 15 oz/in <sup>2</sup>	0 to 30 Hg
0 to 20 oz/in <sup>2</sup>	0 to 50 Hg
0 to 25 oz/in <sup>2</sup>	
0 to 30 oz/in <sup>2</sup>	
0 to 50 oz/in <sup>2</sup>	



Low-pressure diaphragm for ranges 25 PSIG and under.

Other ranges available.  
Call Customer Service for details.

## PRESSURE CALIBRATION INSTRUCTIONS - CALIBRATION CHECK

The pressure sensing device and attached linkages and pen(s) have been correctly set prior to shipment, so recalibration should not be required. However, if calibration is needed, proceed by performing the following steps: Do not do perform adjustments if the Recorder is still under warranty! See note below.

**Zero Setting Adjustment for Pressure System:** Check zero by disconnecting external pressure source. Pen should return to zero, indicating the recorder is properly calibrated. **If not**, adjust the pen arm position to the correct reading using the pen arm zero setting adjustment. See Figure N.

Pen **below** zero – Turn zero adjustment counterclockwise to move pen point up.

Pen **above** zero – Turn zero adjustment clockwise to move pen point down.

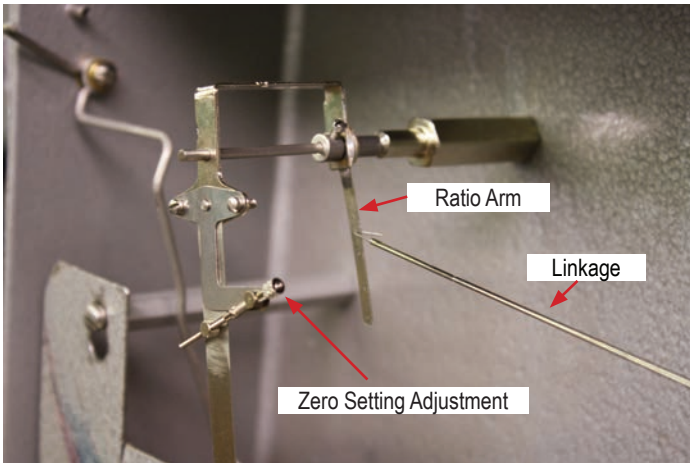


Figure N

**Note:** Do not perform these adjustments if the Recorder is still under warranty! If you break the Blue Sentry Seal to make adjustments, it will void the warranty.

Contact Customer Service at 1-800-421-2853 to return Recorder for calibration.

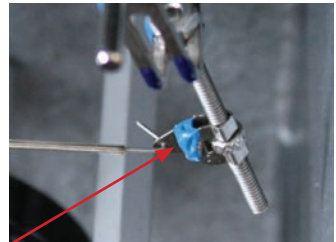


Figure O

Blue Sentry Seal

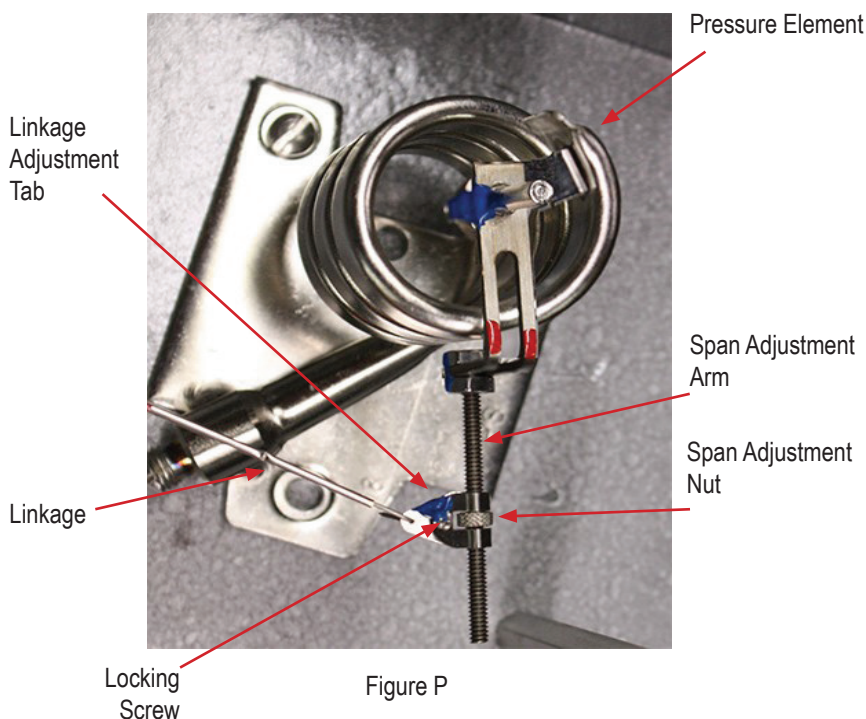
**Span Adjustment for Pressure System:** Do not do perform adjustments if the Recorder is still under warranty! See note on page 13.

Apply maximum pressure to element, using a dead weight tester or precision test gauge. If the reading on the chart agrees with the test equipment, the recorder is properly calibrated. **If not**, make a span adjustment by loosening the locking screw that holds the linkage adjustment tab on the span adjustment arm. (Figure P) This will allow the adjustment tab to be moved toward or away from the pressure element by turning the rotating span adjustment nut in the desired direction.

To **increase** span: Turn span adjustment nut to move linkage adjustment tab **away** from element.

To **decrease** span: Turn span adjustment nut to move linkage adjustment tab **toward** element.

Be sure to retighten the locking screw after this adjustment. Check at zero. Repeat zero and span adjustments as necessary until zero and full scales agree with test equipment. The readings should be within 1% of span of the calibration checkpoint pressures.



## REORDER PENS AND CHARTS

### Recorder Pen Reorder Numbers

Refer to pg 8 for directions on ordering the correct Recorder Pen. Black and Purple are Optional colors and may not be in stock

Sanford P/N	Color	Palmer P/N	1 Pen Recorder	2 Pen Recorder	3 Pen Recorder
<b>RP-1</b> NIB Height 0.253"	Red	AR-3714-01			
	Black	AR-3714-02			
	Green	AR-3714-03			Standard (Bottom Pen)
	Blue	AR-3714-04		Standard (Bottom Pen)	
	Purple	AR-3714-05			
<b>RP-2</b> NIB Height 0.533"	Red	AR-3714-06	Standard	Standard (Top Pen)	
	Black	AR-3714-07			
	Green	AR-3714-08			
	Blue	AR-3714-09			Standard (Middle Pen)
	Purple	AR-3714-10			
<b>RP-3</b> NIB Height 0.813"	Red	AR-3714-11			Standard (Top Pen)
	Black	AR-3714-12			
	Green	AR-3714-13			
	Blue	AR-3714-14			
	Purple	AR-3714-15			

### Charts

#### Recorder Charts

**12B, MI and PO only. All others Call for Quote.**

8" - Recorder Charts: 1 Box (100/Box) - IN STOCK ONLY (6-3/8" Arc Line) (see list below)

8" - Recorder Charts: 5 Boxes (Non-Stock Charts - 5 Box minimum)

12" - Recorder Charts: 1 Box (100/Box) - IN STOCK ONLY (6-3/8" Arc Line) (see list below)

12" - Recorder Charts: 5 Boxes (Non-Stock Charts - 5 Box minimum)

12" - 12-B - Recorder Charts: 1 Box (100/Box) - IN STOCK ONLY (7" Arc Line)

12" - 12-B - Recorder Charts: 5 Boxes (Non-Stock Charts - 5 Box minimum)

#### IN STOCK - 8" Pressure Recorder Charts

8" Ranges	24 Hr	7 Day	In-Stock
0° to 100°	P 0-100-8	P 0-100-8-S	\$37.00
0° to 150°	P 0-150-8		\$37.00
0° to 200°	P 0-200-8		\$37.00
0° to 250°	P 0-250-8		\$37.00
0° to 300°	P 0-300-8		\$37.00
0° to 1000°	P 0-1000-8		\$37.00
0° to 2000°	P 0-2000-8		\$37.00
0° to 3000°	P 0-3000-8		\$37.00
0° to 5000°	P 0-5000-8		\$37.00
0° to 10000°	P 0-10000-8		\$37.00

#### IN STOCK - 12" Pressure Recorder Charts

12" Ranges	24 Hr	7 Day	In-Stock
0° to 100°	P 0-100-12	P 0-100-12-S	\$37.00
0° to 150°	P 0-150-12	P 0-150-12-S	\$37.00
0° to 200°	P 0-200-12	P 0-200-12-S	\$37.00
0° to 1000°	P 0-1000-12		\$37.00
0° to 3000°	P 0-3000-12		\$37.00

100 Charts/box.

NO BOX MINIMUM ORDER REQUIRED on In-Stock Charts.  
Special Order Charts require 5 box minimum with discount applied.

**Custom Charts available.  
Call Customer Service for information.**



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