

PALMER

Aluminum Case Pressure and Temperature Recorders



Palmer Aluminum Case Pressure and Temperature Chart Recorders provide proven reliability for accurate measurement and recording of pressure and temperature in many applications. Since 1962 we have manufactured and supplied recorders for industry in the U.S. and around the world. Palmer Recorders are designed for indoor or outdoor use, and provide long service life, even in harsh conditions. Many of our Recorders are still in service after 50 years!

Each Recorder is custom made to order, enabling you to specify the options necessary for your requirements.

Palmer Recorders are available in 8" or 12" models in heavy die cast aluminum. Palmer Recorders come complete with a battery operated chart drive and up to three (3) felt tip pens. Electric or Spring Wound chart drives are also available. Case mounting styles are Wall, Flush, Pedestal, Pipestand or Portable. The many combinations of case mounts and internals we offer allow selections which will meet your specific requirements without limiting performance or demanding a custom price.

Aluminum Case Features

- The heavy-duty die cast aluminum case has a corrosion resistant under coat and a top White Powder Coat for a long lasting corrosion resistant finish, even in extreme environments. Black Powder Coat or Gray Powder Coat are available.
- The case is heat treated to prevent distortion or warping. Doors and windows are weather tight, and can be selected as solid or with a glass or plexiglass window. Shatter-proof glass is also available.
- Doors close with a draw pull latch with hasp. Flush Mount case closes with a black lever handle. Double cam latch bar with padlock type handle is available as an option on a solid door.
- Temperature and/or pressure connections are located at the back, top, or bottom of case, depending on mounting style or your specific requirements.
- Pressure Recorders have 1/2" diameter air vent holes in case. All internal components are corrosion resistant.

Aluminum Case Styles

Wall Mount - Supplied with capillary or pressure connection at the bottom of case unless otherwise specified.

Flush Mount - Supplied with capillary or pressure connection at the back of the case. Black lever handle standard.

Pipestand Mount - Supplied with capillary or pressure connection at the bottom of case unless otherwise specified.

Portable - Supplied with capillary or pressure connection at the back of the case unless otherwise specified.

Pedestal Mount - Supplied with capillary or pressure connection at the back of the case unless otherwise specified.

Case Dimensions: (Exterior box only, depending on case style)

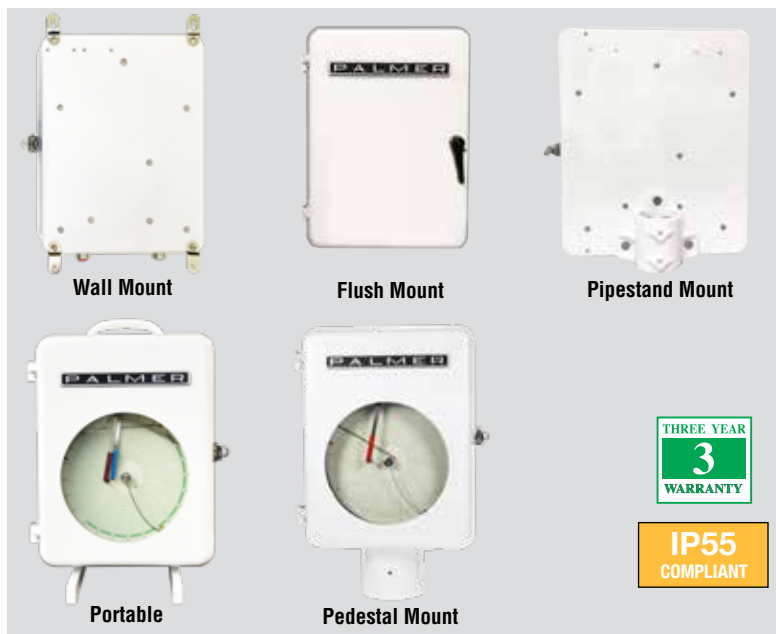
8 inch Case - 10-9/16" Wide x 13-5/8" High x 4-7/8" Deep
(268.3 x 346.0 x 123.8 mm).

12 inch Case - 13-1/16" Wide x 15-13/16" High x 4-7/8" Deep
(331.8 x 401.6 x 123.8 mm).

Case Weight: (Empty box only)

8 inch Case - approx 12 lbs (5.44 kg).

12 inch Case - approx 16 lbs (7.25 kg).



Note: Pedestal Mount is not available in Pressure - Temperature Recorders

ISO 9001:2015
CERTIFIED QUALITY
MANAGEMENT SYSTEM

MNC
Manufactured in North Carolina

Specifications subject to change without notice.

October
2020

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Palmer / Wahl
BEYOND THE SCALE

Chart Drives - Flexibility for the Field

Quartz Multi-Speed Chart Drives offer complete flexibility for recording - even in the most demanding applications

Designed for outdoor use, Palmer's hermetically sealed PC-11 and PC-12 chart drives have a broad operating temperature range of -40°F to 160°F and operate reliably even in wet or dirty environments. Freezer tested to -40°F, they will withstand extreme temperatures below 10°F when used with a "C" size 3.6V Lithium Thionyl Chloride Battery. The highly adaptable design will fit any chart recorder, and makes exchange in the field a snap.

The multi speed dial on the front of the case allows field selectable recording intervals from 30 minutes (PC-12) to 32 days (PC-11). The dial also turns the unit off to conserve battery power (PC-11 model). A pulsating LED indicator behind the dial shows that the battery is charged and that the unit is operating.

Our PC-11 and PC-12 are rated Intrinsically Safe, which makes them ideal for use by gas utility companies and in other situations where hazardous or combustible materials are present.



PC-11 & PC-12 Clock Features

- PC-11 - 11 Speeds: switch selectable, choose from 60 min., 96 min., 12 hr., 24 hr., 48 hr., 7 day, 8 day, 14 day, 16 day, 31 day or 32 day recording intervals and OFF.
- PC-12 - 12 Speeds: switch selectable, choose from 30 min., 60 min., 2 hr., 4 hr., 6 hr., 8 hr., 12 hr., 24 hr., 48 hr., 3 day, 4 day, or 7 day recording intervals. No OFF.
- Universal Mounting Bracket: fits all chart recorders for easy replacement.
- .25" Drive Shaft with flat: accepts different drive hubs.
- High Torque: 25 oz/in torque increases life and improves accuracy.
- No Axial or Angular Backlash: charts don't shift.
- Battery: 1.5 volt "C" alkaline battery (not included). For temperatures below 10°F use with a "C" size 3.6V Lithium Thionyl Chloride Battery.
- Molded Body Pilot: Permits field exchange without recalibration.
- Maintenance-Free: Closed construction case protects all moving parts.
- Separate Battery Compartment: prevents drive damage from corrosion.
- UL Listed: Class I, Groups C and D, Intrinsically Safe, CSA Certified.

Spring Wound Chart Drive

Switchable Dual Speed Clock. - By use of a shift lever, the drive can be set for 24 hour or 7 day rotation. 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.

Standard Rotation: 24 hour / 7 day

Special Order Rotations:

- Dual Speed: 15 minute / 1 hour
- 1 hour / 3 hour
- 2 hour / 8 hour
- 96 minute / 24 hour

Single Speed: 4 hour



Electric Chart Drive

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

Not available for DP Recorders.

Standard Rotation: 7 day, 110/120V - 60 Hz

Optional Rotation: 24 hr, 110/120V - 60 Hz

Special Order Rotations:

- 12 hr, 110/120V - 60Hz
- 1 hr, 220V - 50 Hz
- 2 day, 110/120V - 60Hz
- 24 hr, 220V - 50 Hz
- 24 hr, 110V - 50Hz
- 7 day, 220V - 60Hz



AVAILABLE CLOCK ROTATIONS FOR ALL CLOCKS: Select one for Factory Setting

Code	Rotation Options	PC-11	PC-12	Spring Wound	110V Clock	220V Clock
A	15 Min			Special Order		
B	30 Min		✓			
C	60 Min	✓	✓	Special Order		Special Order
D	96 Min	✓		Special Order		
E	2 Hour		✓	Special Order		
X	3 Hour			Special Order		
F	4 Hour		✓	Special Order		
G	6 Hour		✓			
H	8 Hour		✓	Special Order		
J	12 Hour	✓	✓		Special Order	
K	24 Hour	✓	✓	✓	✓	Special Order
L	48 Hour	✓	✓		Special Order	
M	3 Day		✓			
N	4 Day		✓			
P	7 Day	✓	✓	✓	✓	Special Order
R	8 Day	✓				
S	14 Day	✓				
T	16 Day	✓				
U	31 Day	✓				
V	32 Day	✓				

Specifications subject to change without notice.

Palmer Pressure Elements and Ranges

Pressure Elements

Each Palmer Pressure Element is individually designed and calibrated for each selected pressure range span. Palmer subjects these elements to extensive testing during calibration to ensure better than specified accuracy. The all-welded system prevents deterioration.

- Accuracy: $\pm 1/2$ chart graduation.

Optional: $\pm 1/4$ chart graduation - available on the Top Pen only, for ranges 30 to 10,000 PSI only (using the Standard Pressure Element only). (Factory setting only). Not available on DP Recorder.

- Angular deflection of the pen arm of 22.5° for 8" Case and 36° for 12" Case.
- Standard pressure ranges are available in pounds per square inch, bar, inches of water, inches of mercury, kilopascals, and ounces per square inch.
- All welded construction offers over-range protection for ranges over 10,000 PSI and up to 30,000 PSI.
- Ranges 10,000 PSI and under come standard with 1/4" NPT female connection. 10,000 PSI may choose an optional Autoclave fitting. Ranges above 10,000 require a 9/16"-18 UNF high pressure female Autoclave style fitting. (Also requires user supplied tubing assembly).
- Pre-calibrated pressure elements for field replacement are also available.

Low Pressure Element:
316 Stainless Steel bellows diaphragm, tubing and fittings for ranges below 30 PSI with 1/4" NPT.



Standard Pressure Element:
316 Stainless Steel helical coil bourdon tube with Stainless Steel Fittings and tubing for ranges 30 to 10,000 PSI, with 1/4" NPT.

High Pressure Element: 316 Stainless Steel helical coil bourdon tube for ranges 10,000 PSI, 15,000, 20,000 and 30,000 PSI with autoclave fitting (with calibration on rise only for 15,000 and above.)



Pressure Ranges

Chart Recorder Standard Pressure Ranges							
PSI Ranges			Hg Ranges	kPa Ranges	in H ₂ O Ranges	Bar Ranges	
0 to 1 PSI*	0 to 75 PSI*	0 to 1,500 PSI	0 to 10 Hg	0 to 5 kPa	0 to 10 in H ₂ O	0 to 6 Bar*	0 to 250 Bar
0 to 3 PSI*	0 to 100 PSI*	0 to 2,000 PSI	0 to 30 Hg	0 to 20 kPa	0 to 15 in H ₂ O	0 to 10 Bar*	0 to 300 Bar
0 to 5 PSI*	0 to 120 PSI*	0 to 2,500 PSI	0 to 50 Hg	0 to 80 kPa	0 to 20 in H ₂ O	0 to 16 Bar*	0 to 400 Bar
0 to 6 PSI*	0 to 150 PSI*	0 to 3,000 PSI	oz/in ² Ranges	0 to 100 kPa	0 to 25 in H ₂ O	0 to 25 Bar*	0 to 500 Bar
0 to 8 PSI*	0 to 200 PSI*	0 to 4,000 PSI	0 to 10 oz/in ²	0 to 500 kPa	0 to 30 in H ₂ O	0 to 40 Bar*	0 to 600 Bar
0 to 10 PSI*	0 to 250 PSI*	0 to 5,000 PSI	0 to 15 oz/in ²	0 to 800 kPa	0 to 40 in H ₂ O	0 to 50 Bar*	0 to 1,000 Bar
0 to 15 PSI*	0 to 300 PSI*	0 to 6,000 PSI	0 to 20 oz/in ²	0 to 1,000 kPa	0 to 50 in H ₂ O	0 to 60 Bar*	0 to 1,200 Bar
0 to 20 PSI*	0 to 350 PSI*	0 to 8,000 PSI	0 to 25 oz/in ²	0 to 2,000 kPa	0 to 60 in H ₂ O	0 to 100 Bar	0 to 1,600 Bar
0 to 25 PSI*	0 to 400 PSI*	0 to 10,000 PSI	0 to 30 oz/in ²	0 to 5,000 kPa	0 to 100 in H ₂ O	0 to 160 Bar	0 to 2,000 Bar
0 to 30 PSI*	0 to 500 PSI*	0 to 15,000 PSI	0 to 50 oz/in ²			0 to 200 Bar	
0 to 35 PSI*	0 to 600 PSI*	0 to 20,000 PSI					
0 to 45 PSI*	0 to 750 PSI*	0 to 30,000 PSI					
0 to 50 PSI*	0 to 800 PSI*						
0 to 60 PSI*	0 to 1,000 PSI*						

Note: Beige boxes denote Static Pressure Ranges available for additional pens on a DP Recorder.

* Pressure Ranges available for Test & Valve Recorders.

**We build to order:
if your process requires
a pressure range not
shown here please call
Customer Service.**

Process Connections

- 1/4" FNPT, Standard
- 1/2" FNPT, Optional
- 9/16"-18 UNF High Pressure Female Autoclave style fitting required on PSI ranges 15,000 and above, optional for 10,000 PSI.



Standard Pressure Connection:
1/4" FNPT Female pressure connections for ranges up to 10,000 PSI.



Autoclave Pressure Connection:
9/16"-18 UNF High Pressure Female Autoclave style fitting - optional for 10,000 PSI, required for ranges 15,000 and above. (Also requires user supplied tubing assembly).

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2020

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Palmer Wahl
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Palmer Temperature Elements and Ranges

Temperature Elements

Palmer Temperature Elements (or bulbs) must pass the same stringent quality control as the most precise scientific laboratory thermometers. All mercury filled systems conform to ASME 5B. Non-mercury systems conform to 1A over 30 feet and 1B under 30 feet. Each system is pressurized after filling for overrange capabilities above and below its specified range.

Rapid response to changes in temperature make it extremely accurate and reliable. The system is completely welded to prevent deterioration. Points most susceptible to physical damage are reinforced with added flexible armor.

Temperature elements are remote from the recorder case and offered in a choice of standard Mercury filled and Non-Mercury filled probes. Our engineering department can also custom design probes for a wide variety of applications.

- Accuracy ± 1 chart graduation.
- Heat treated coil provides superior spring action.
- Durable, low maintenance design: thermal system and other parts can be easily replaced by field technician.
- 300 Series stainless steel bulb, interconnection capillary, and armor available on certain designs.
- Standard case compensated system for uncompensated capillary lengths not exceeding 25 feet.
- Pre-calibrated temperature elements for field replacement are also available.

Temperature Ranges

Chart Recorder Standard Temperature Ranges

°F Ranges	°C Ranges
-30° to 120°F	0° to 60°C
0° to 100°F	0° to 100°C
0° to 120°F	0° to 120°C
0° to 150°F	0° to 150°C
0° to 200°F	0° to 200°C
0° to 250°F	0° to 250°C
0° to 300°F	0° to 300°C
0° to 400°F	0° to 350°C
0° to 500°F	0° to 400°C
0° to 600°F	0° to 500°C
0° to 800°F	0° to 600°C
0° to 1,000°F	

We offer a wide variety of standard temperature ranges to meet the needs of many different applications. Each temperature element is precisely calibrated to the required range.

Note: all ranges are available in Mercury filled elements. Beige boxes denote ranges available in Non-Mercury filled and DP Recorder. Temperature recorders with mercury bulbs may be restricted for sale in some states or countries. Call for more information.

Temperature System Capillary

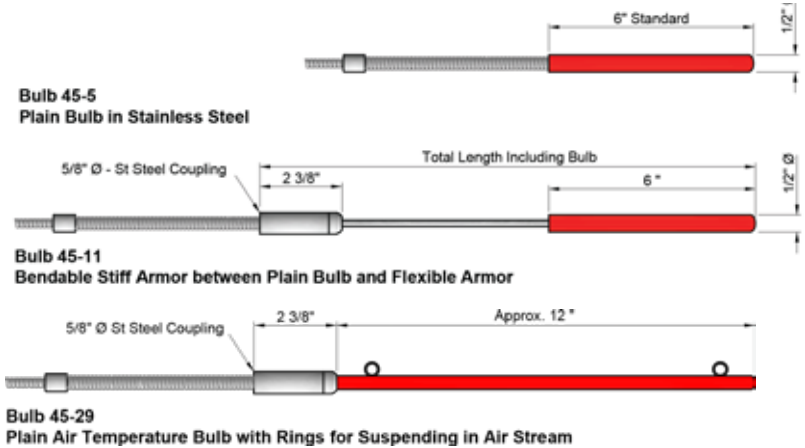
Standard capillary length for Recorders is 5 feet, for DP Recorders standard is 10 ft, both in 1/4" diameter flex armor. 3/16" diameter, Bendable stiff armor is optional for mercury filled systems only. Capillary for Mercury filled systems is 304SS, with optional lengths up to 25 feet*; non-mercury systems is 316SS, with optional lengths up to 99 feet.

*Lengths up to 50 feet are also available in applications where the ambient temperature remains consistent.

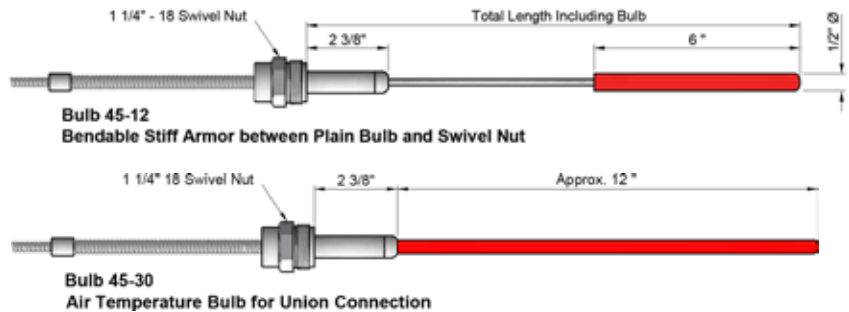
MERCURY FILLED TEMPERATURE ELEMENTS

Models 45-5 and 45-11 are bulb and capillary systems designed to be dropped into a tank or bin and hung from the capillary. **Model 45-11** has a bendable section in the middle to expand possible insertion options.

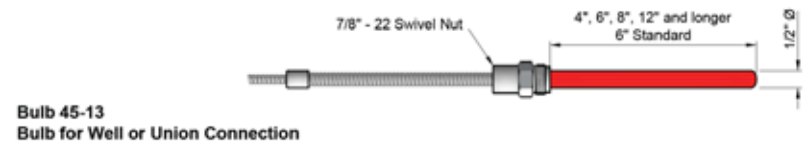
Model 45-29 is a bulb and capillary system designed to be hung by two mounting rings for air temperature measurement. For best results, bulb should be mounted in the center of the flow.



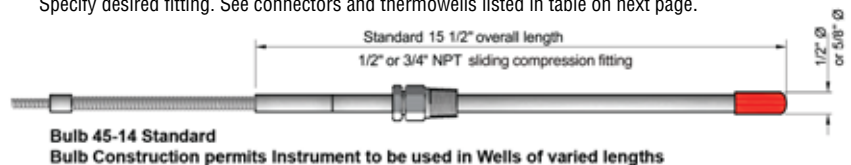
Models 45-12 and 45-30 are bulb and capillary systems designed to be hung from a threaded connection and dropped into a tank or bin. See compatible connectors listed in table on next page.



Model 45-13 is a bulb and capillary system designed to be inserted into a thermowell (closed receptacle) in the process or through a union hub (open end) directly into the process. See compatible connectors and thermowells listed in table on next page.



Model 45-14 is a bulb and capillary system designed to be inserted into thermowells of various lengths (closed receptacle) in the process or through a union hub (open end) directly into the process, or using the 1/2" NPT or 3/4" NPT probe sliding compression fitting directly into the process. Specify desired fitting. See connectors and thermowells listed in table on next page.

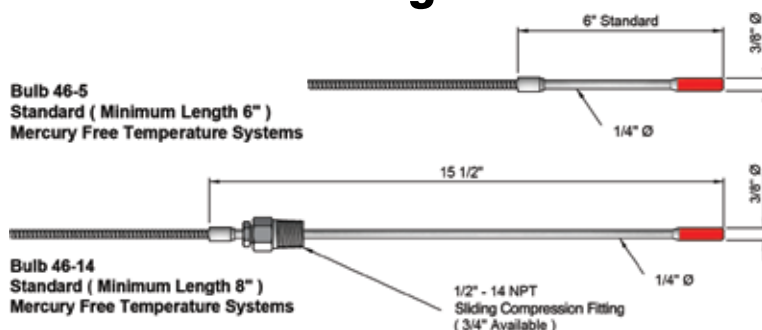


Palmer Temperature Elements and Ranges

NON-MERCURY TEMPERATURE ELEMENTS

Model 46-5 is a bulb and capillary system designed for air temperature or to be dropped into a tank or bin and hung from the capillary.

Model 46-14 is a bulb and capillary system designed to be inserted into a thermowell (closed receptacle) in the process or through a union hub (open end) directly into the process or using the 1/2" NPT or 3/4" NPT probe sliding compression fitting directly into the process. Specify desired fitting. See compatible connectors listed in the table below.



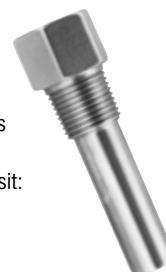
Palmer Connections and Thermowells

Palmer has manufactured a wide selection of thermowells and fittings since the 1940's. Our machined wells are built in our factory in Asheville, North Carolina for complete control of the production process. Our attention to detail allows us to produce precision products to meet your needs.

Below is a reference chart to help direct you to the correct connectors or thermowells compatible with our temperature bulbs.

If your application requires use of a flange, or other options not shown here please call our Customer Service department.

For a complete selection, dimensions and material options for all thermowells and connections please see the Palmer Thermowells and Fittings catalog, or visit: www.palmerwahl.com.



Thermowells • Union Connections • Flange Options for Temperature Bulbs

	Bulb Type	Mercury Filled Bulbs								Non-Mercury Bulbs	
	Bulb Model Number	45-12	45-13	45-14				45-30		46-14	
	Bulb Diameter	1/2"	1/2"	1/2"	1/2"	5/8"	5/8"	5/16"	3/8"	3/8"	3/8"
	Probe Connection	1-1/4"-18 Swivel Nut*	7/8"-22 Swivel Nut*	1/2" NPT	3/4" NPT	1/2" NPT	3/4" NPT	1-1/4"-18 Swivel Nut*	1-1/4"-18 Swivel Nut*	1/2" NPT	3/4" NPT
OPEN ENDED	Standard Union Connection 3/4" NPT*	1140-7	1150-7	1120-7	NA	1120-7	NA	1140-7	1140-7	1120-7	NA
	Standard Union Connection 1" NPT*	1140-8	1150-8	1120-8	NA	1120-8	NA	1140-8	1140-8	1120-8	NA
	Extension Neck Lagging Union Connection 3/4" NPT*	1141-7	1151-7	1121-7	NA	1121-7	NA	1141-7	1141-7	1121-7	NA
	Extension Neck Lagging Union Connection 1" NPT*	1141-8	1151-8	1121-8	NA	1121-8	NA	1141-8	1141-8	1121-8	NA
	Surface Mount Flanged Union Connection	1140-9	1150-9	1120-9	NA	1120-9	NA	1140-9	1140-9	1120-9	NA
CLOSED RECEPTACLE	Standard Thermowell	NA	1150	CP-2083	NA	CP-970	NA	NA	NA	1130	NA
	Extension Neck Lagging Thermowell	NA	1151	NA	NA	NA	NA	NA	NA	1131	NA
	Built-up Heavy Wall Thermowell	NA	1154	NA	NA	NA	NA	NA	NA	NA	NA
	Built-up Extension Neck Lagging Heavy Wall Thermowell	NA	1155	NA	NA	NA	NA	NA	NA	NA	NA
	Weld-in Thermowell	NA	1156	NA	NA	NA	NA	NA	NA	1136	NA
	Flanged Thermowell	NA	1157	NA	NA	NA	NA	NA	NA	1137	NA

* Requires use of Thermowell or Union Hub. See same column as desired Bulb.

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Palmer Wahl
BEYOND THE SCALE

Recorder Charts and Pens

Palmer Recorders use superior quality chart paper and pens engineered to work together for optimum performance and accuracy.

Recorder Charts

Palmer Recorder Charts: Our superior quality charts meet or exceed OEM standards for accuracy and performance. Charts are manufactured to provide stiffness and curl control for use in the field for normal and high stress conditions. A wide assortment of single, dual and triple range charts are available in both 8" and 12" diameters, in a large selection of rotation speeds. Charts are packaged 100 per box.

Standard Palmer Recorder charts have an Arc Line of 6-3/8". The top pen follows the arc line. We can supply any maker chart you need, as well as order custom range charts.



Recorder Pens

Palmer Recorder Pens: Our Recorder pens are engineered to produce superior image quality in the most demanding conditions. Our pen assembly transmits the movement of the sensors into a smooth, gliding arc across the chart. This prevents burrowing, resulting in longer pen life and better accuracy and readability.

Palmer Recorder Pens come in different NIB Heights and are installed on separate Pen Arms which have different lengths and heights. This enables the pens to overlap and operate independently of each other. On a standard Recorder the Top Pen follows the Arc Line of 6-3/8".

Replaceable fine point, felt tip pens are available in packages of 5 in Red, Blue, Green, and Black. Be sure to order the correct pen for the desired position. Standard color pens, shown here, are recommended. Other colors and configurations are available as special order.



RECORDER PEN ORDER INFORMATION						
Pen Arm #	Pen Position	Color	Part Number	1 Pen Recorder	2 Pen Recorder	3 Pen Recorder
RP-3	TOP PEN on 3 Pen Recorder	Red	AR-3714-11			Std
		Blue	AR-3714-14			
		Green	AR-3714-13			
		Black	AR-3714-12			
RP-2	TOP or MIDDLE PEN on 2 or 3 Pen Recorder ONLY PEN on 1 Pen Recorder	Red	AR-3714-06	Std	Std	
		Blue	AR-3714-09			Std
		Green	AR-3714-08			
		Black	AR-3714-07			
RP-1	BOTTOM PEN on 2 or 3 Pen Recorder	Red	AR-3714-01			
		Blue	AR-3714-04		Std	
		Green	AR-3714-03			Std
		Black	AR-3714-02			

1 Pen Recorder:
ONLY PEN

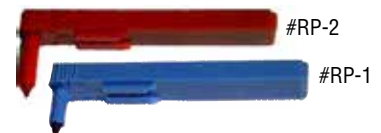
Order: #RP-2, Red - #AR-3714-06-6 (Standard)



2 Pen Recorder:

TOP PEN, Order: #RP-2, Red - #AR-3714-06-6 (Standard)

BOTTOM PEN, Order: #RP-1, Blue - #AR-3714-04-6 (Standard)

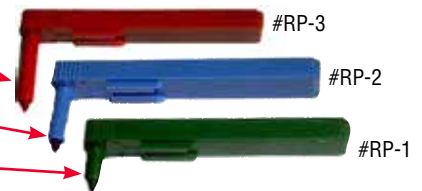


NIB Heights:

#RP-3 = 0.813"

#RP-2 = 0.533"

#RP-1 = 0.253"



3 Pen Recorder:

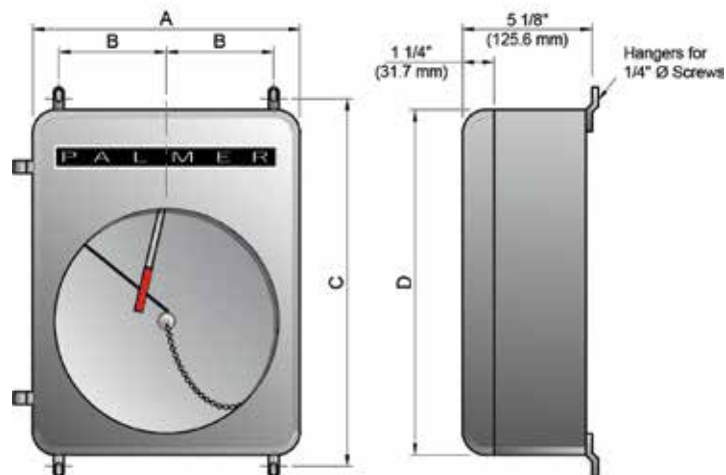
TOP PEN, Order: #RP-3, Red - #AR-3714-11-6 (Standard)

MIDDLE PEN, Order: #RP-2, Blue - #AR-3714-09-6 (Standard)

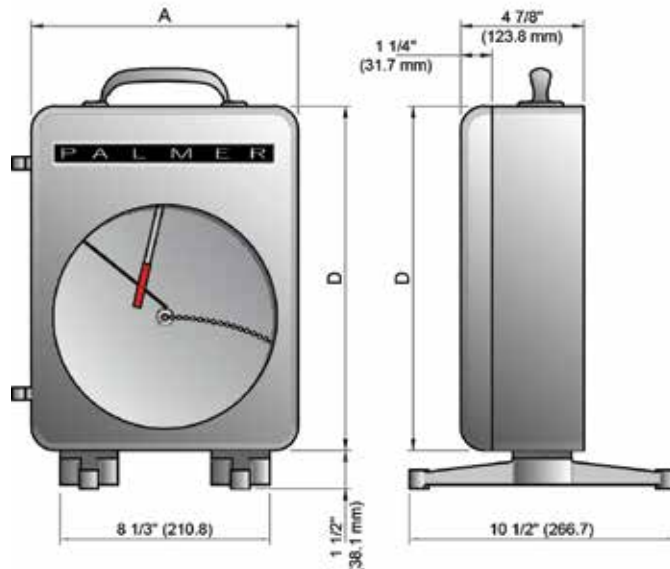
BOTTOM PEN, Order: #RP-1, Green - #AR-3714-03-6 (Standard)

Aluminum Case Dimensional Drawings

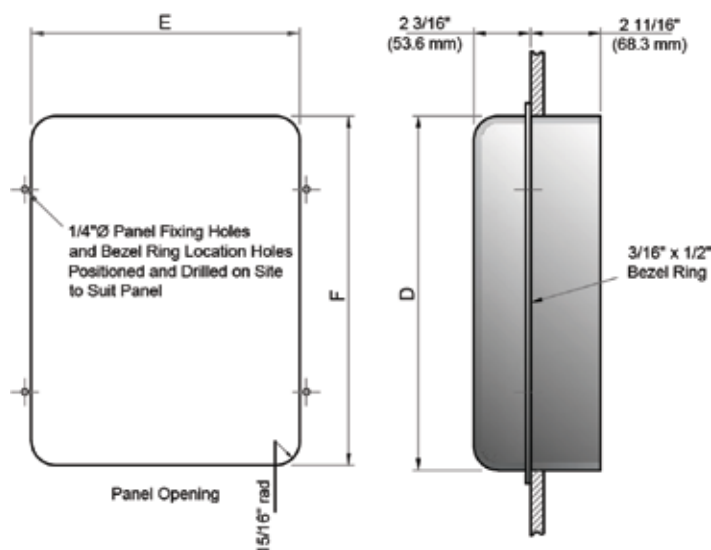
Wall Mounted



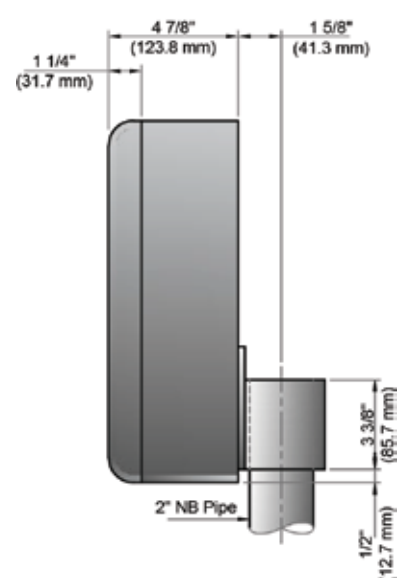
Portable



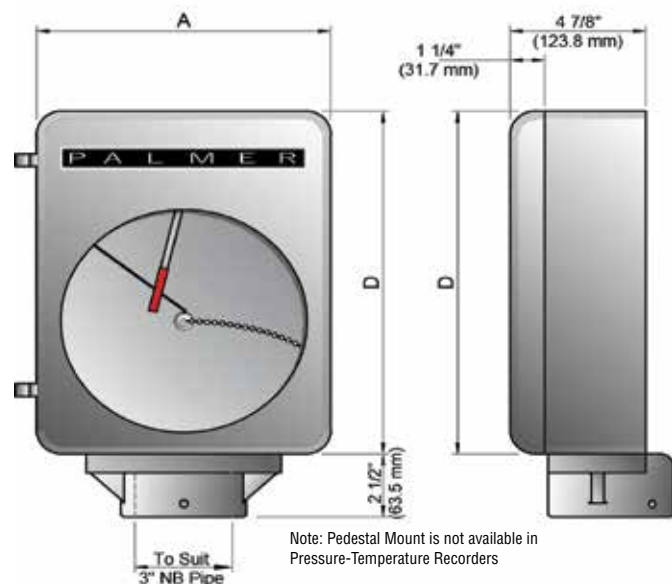
Flush Mounted



Pipestand Mounted



Pedestal Mounted



Note: Pedestal Mount is not available in Pressure-Temperature Recorders

Dimensions	8 inch Case		12 inch Case	
A	10-9/16 in	268.3 mm	13-1/16 in	331.8 mm
B	4-1/4 in	107.9 mm	4-1/2 in	114.3 mm
C	14-1/2 in	361.9 mm	16-3/8 in	415.9 mm
D	13-5/8 in	346.0 mm	15-13/16 in	401.6 mm
E	10-5/16 in	261.9 mm	12-13/16 in	325.4 mm
F	13-7/16 in	341.3 mm	15-9/16 in	395.3 mm
Weights	8 inch Case		12 inch Case	
Empty Box	approx 12 lbs (5.44 kg)		approx 16 lbs (7.25 kg)	
	Weight depending on Case style and # of systems			