Monitor Temperature, Chart Recorder, Data Loggers

The need to monitor and document temperature or has never been greater in the history of mankind. Over 70% of all measurements of process variables are of temperature. Many if not most products and manufacturing processes are temperature sensitive, or temperature critical.

Because the quality and safety of so many products is dependent on temperature it has been become, not only crucial, but even mandatory that temperature be monitored during the manufacturing, storage and transportation phases of many products life cycles. Private certifying agencies and government regulations are requiring an increasing number of products to be temperature monitored and documented.

There are basically three ways to monitor temperature; manually, mechanically or electronically.

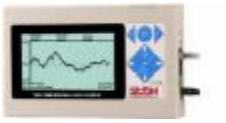
Monitor temperature: The manual method

The manual way is the least accurate and would appear to be the least expensive. It is actually the most expensive but the costs are hidden so that they aren't noticed as much. An employee assigned to periodically check and record the temperature may only need five or ten minutes a day to record the temperature but that can add up to over 50 hours a year if he is only recording the temperature once a day. Even if the employee is paid minimum wages this can amount to over $ 500/year once you add in employee perks and wasted time to get a pencil, change and file the temperature record, etc…

Monitor temperature: The mechanical method

Recording time mechanically requires a chart recorder. This device is more accurate than the manual method. It draws a line on a paper chart to show a temperature history over a day, week, or month, at which time the chart must be replaced with a new one and the old one filed away. The chart recorder is even more expensive than the manual method, since it requires employee labor to change the chart and pen periodically and you have to buy the charts and pens. The chart recorder itself can cost between $ 300 and $ 1200, while the charts and pens can add an additional $ 50/year. On top of all this you still have several hundred dollars of employee time.

Monitor temperature: The electronic method



The most accurate and least expensive way to document temperature is with a data logger. Data loggers come with or without an LCD display. The display is useful if you need to monitor the temperature and not just document it. Data loggers without a display must be programmed by wiring them up to a computer.

Data loggers are programmed to sample and store temperature electronically, after which they can be downloaded to a computer to generate a printed record to be reviewed or filed

away. The initial cost is less than the chart recorder and the collected data must be downloaded only once every few months so there is really no ongoing maintenance or consumables to purchase.

The chart below compares some of the features of the three methods of monitoring and/or documenting temperature.

Technology	Electronic	Mechanical	Manual
Number of Sensors	**2**	**1**	
Sensor positioning	20 ft - 200 ft	10 inch	thermometer
Temp Range	-250°F to 2500°F	-22°F to 122°F	??
Temp Accuracy	1.0°C - 0.1°C	1.0°C	1.0°C
Temp displayed	305 days	1, 7, 31 Days	Minute by minute
Alarm	High/Low relay	High/Low	none
PC software	Included	Not available	
Initial Cost	$ 549.00	$ 499.00	
Recurring costs	0.00	60.00/yr	89.00/yr
Total Cost	**$ 549.00**	**$ 569.00 + ???**	**???**