**WHAT THE HECK IS A LOAD CONTROL?**

**Or a Power Sensor for that Matter?**

Just about all industrial machines or processes are driven by an electric motor. If you monitor the load on the motor, it will often give you valuable information about what is happening inside the machine or process. Here are some examples:

**Mixers or Agitators** — When the mixture gets thicker, it will take more power to keep things stirred. This could be a signal that the batch is done.

**Drills and Other Machine Tools** — When the tool gets dull, it takes more power to make the hole. This can be a signal that it's time to change the tool.

**Pumps** — The more liquid you pump, the more power it takes. But, if the pump is dry, the power drops right off. Many new-fangled pumps don't do well when they run dry. A load control can stop the pump before expensive damage is done.

**Grinding Machines** — A grinder wheel is always wearing down, but on an automatic machine you need to get the wheel on the workpiece quickly or you spend a lot of time "grinding air." A load control senses the sharp increase in power when the wheel touches the workpiece, stops the infeed and starts the grinding cycle.

Monitoring the load on the motor that is driving a machine or process can give you valuable information since this motor reflects the changes that are going on.

On a mixer or agitator, for example, as the viscosity increases, it will take more power to stir the mixture and when it thinks the load goes down. When cutting metal, as a tool gets dull, it takes more power to make the cut. And, when a pump runs dry, the load drops off sharply.

Here are a few other applications:

- Monitor Pump or Fan Flow
- Sense the Beginning or End of a Process
- Control Optimum Feed Rate
- Sense Overload
- Loss of Load

A power sensor can measure these load changes and send a signal to meters, computers, programmable controllers, recorders or data collection systems. A load control senses the load and has built-in relays to sound alarms, change feed rates, stop the machine, etc.

**Power Sensors**

You can know the load on an electric motor by measuring the electric current going to the motor (Amps). But, this is not the best way to do it since a lightly-loaded motor doesn't use the electricity very efficiently. (In technical terms, the power factor is low.)

A better way to know the load is to measure the motor power. (Power is measured in Horsepower or Watts.) Motor power gives you a straight line so it works well even when the motor is lightly loaded.

The Power Sensors that we make measure the motor load (Horsepower or Watts) and send a signal to meters or computers. The operator can see what the status is on the meter or, the computer can make decisions.

The typical way to measure power is fairly complex. However, our Power Cell gives our customers a simple solution.

**Load Controls**

A load control also measures motor power. In addition, it has built-in relays and set points. You can adjust the set point so that when the load on the motor reaches the set point, a relay will trip. (A relay is just a switch, you use it to turn off the machine, sound an alarm, or adjust the feed rate.)

**WHY MONITOR POWER INSTEAD OF AMPS?**

As you start to load a motor, the power factor improves rapidly. The current doesn't change significantly until the motor reaches 50% of capacity.

- Power is linear. A change in load is a change in power (horsepower or kilowatts).
- It gives you the signal that you need for machine or process monitoring and control:
  - When the load is low, Power is low
  - When the load is high, Power is high
- At light loads, Power is 10X more sensitive than amps

**WHAT IS POWER FACTOR?**

In an induction motor, the current ALWAYS lags the voltage. Power factor is the cosine of this angular lag. For a lightly loaded motor, the power factor can be as low as .1. You can think of this low power factor as electrical inefficiency. Current is flowing to the motor but it is not doing useful work (Power). As the load increases, the power factor improves and is typically .9 for a fully loaded motor.