



Measuring, Metering And Monitoring Generators

◆ Controlling our machines

- ◆ To get the best out of machines, we must map its performance, measure, meter and monitor it on a continuous basis. This requires a user interface to enable the user to monitor its operations, check for efficient functioning, and intervene when required.

◆ Why Control Panel?

- ◆ Machines overheat, slow down, speed up or generally vary in their performance based on numerous factors such as fatigue, weather conditions, and the wear and tear of components and parts.
- ◆ In electrical machines, like generators, these varying changes constitute an electrical signal. These signals can be intelligently processed to control the performance of the machine. Modern generators have sensors to detect changes in all kinds of various parameters. These can be used to control the generator through a control panel.

◆ The Control Panel – what is it?

- ◆ Visually, a control panel is a set of displays that indicate the measurement of various parameters like voltage, current and frequency, through gauges and meters. These meters and gauges are set in a metallic body, usually corrosion proof, to protect from the effect of rain or snow. The panel may be set up on the body of the generator itself, which is usually the case with small generators. If they are mounted on the generator, they typically have vibration proof pads that help isolate the control panel from shocks. Control panels for a larger industrial generators can be completely separate from the generator and are typically large enough to stand upon their own. These units may also be shelf-mounted or wall-mounted next to the generator, which is common inside an enclosure or internal application like a data center.

◆ What is the role of buttons or switches?

- ◆ Control panels are usually fitted with buttons or switches that help to operate the generator such as a switch-off button or turn-on key. The switches and gauges are usually grouped on the basis of functionality. This makes the panel friendly and safe for use since it minimizes the possibility of an operator accidentally selecting or executing the wrong control. Imagine trying to shut down a vibrating generator with a spring loaded lever in the middle of the night and you will appreciate why having a simple cut of switch at the control panel makes sense.

◆ How does it work?

- ◆ The control panel is a piece of electronics with a microprocessor that can manipulate input from sensors to help give feedback to the machine to manage itself. One such feedback could be the temperature, indicating overheating, other examples would be over/under speed and low/high oil pressure. Typically, a heat sensor inside the generator would sense the build up of heat in the generator body and pass this to the microprocessor in the control panel. The microprocessor will then take effective measures to regulate the performance of the machine including shutdowns if, for example, the oil pressure is too low or the coolant temperature is too high, leading to buildup of heat. In industrial situations, this functionality of control panels is becoming increasingly critical. The microprocessor or microcontroller is embedded in the circuitry inside the control panel and is programmed to take in the sensor input and react to that with the programmed control rules.



ENERGY SOLUTIONS (PVT) LIMITED

Engineering solutions for your power needs

◆ **What is the role of ATS:**

- ◆ Control panels can be combined with an Automatic Transfer Switch (ATS) to maintain the continuity of electrical power. The ATS detects an outage of power when your local grid fails. It signals the control panel to start the generator. Depending on the type of generator being used, the control panel may activate glow plugs (for diesel) for an adjustable length of time. It will then start the generator using an automatic starter, similar to the one you engage when you turn the keys in the ignition of your car in the morning. As soon as the engine of the generator reaches an optimum speed, the starter is disengaged. The ATS then switches to the generator power, and you can go back to business as usual, without having to frantically run around to figure out what caused power loss. This aspect of a control panel makes it extremely useful in homes during bad weather and in industrial situations for ensuring mission-critical continuity.

◆ **What are Standard Control Panels:**

- ◆ Some of the common things standard control panels offer include; continuous digital readouts, large character LCD screens, displays with running time, oil pressure and water temperature sensors, set points and custom message options, wiring harnesses, remote and local start/stop capabilities, and of course shut-down capabilities.

◆ **What are Custom Control Panels and how ESL can help you?**

- ◆ You may have special requirements above and beyond the common feature set included with the standard units, such as gauges and meters, very specific parameters to be monitored, a preference for LCD indicators as opposed to analog meters, automation requirements, bumpless transfer features and various other factors that are not typically provided by the generator manufacturer's original control panel. In such a case, you can have a control panel custom designed and then fitted onto the generator, or look into purchasing one that meets your needs from a number of third-party vendors who specialize in control panels. Custom panels are quite popular in both industrial and residential generators.
- ◆ Whatever is the make, model and manufacturer of your generator, ESL offers Woodward Controllers for your applications. These are a world apart from other contemporary controllers.
- ◆ So, the next time you are evaluating a generator for your use or a modification in the existing one, please do consult ESL to check out, on your behalf, all the specifics on the control panel and the features it offers to make certain it will meet all the requirements for your specific needs.