

Detecting High DC Current

Measuring DC current is relatively easy using a ring of magnetically permeable metal and sandwiching a Hall element in a slot cut in the ring. The magnetic flux developed by the current is concentrated through the element, and the element produces a small voltage differential in proportion to the current. This method can be used to trigger a change in a solid-state “contact” or a relay. The amount of current needed to change the state of the transistors or the relay contacts can be adjusted with a potentiometer.

If there is current present over the setpoint, the output will switch either from open to closed, or the opposite. There are many applications where DC power is used including motors, welding operations and solar power production.

Interlocking Equipment

An example would be a gantry crane using DC power. When the equipment is in operation, a solenoid operated lock can be used to keep the control panel door from being opened. A current relay would be installed over one of the wires feeding the crane, and when the equipment is energized the relay contact would be closed to operate the solenoid as an interlock.



Welding Process

Another way this type of device can be used is to measure the time of a welding process. The sensor contact is closed while the weld is made, and the weld could be stopped after a specified interval. Total time of use can also be determined through the controller. The weld can also be stopped after a set number of operating hours to maintain the equipment.

DC Field Monitoring

If the field loses power, the rotation of the shaft will continue to increase in speed to the point of failure. A DC current relay can stop the motor in this condition.

DS1-FD DC Current Relay for Monitoring Loads up to 400 Amps or Higher

The large aperture and easy-to-install, solid-core design of the DS1-FD Current Relay allows for quick installation for monitoring DC loads. Just thread the conductor through the sensing window (aperture) and reconnect on the other side. The relay output is isolated from the monitored circuit and can switch up to two amps up to 125 VAC, or two amps to 30 VDC. The output contacts can reset to original condition on current fall or latch in the tripped condition. The trip point (where the output relay changes state) can be adjusted between 20 and 400 amps by adjusting two potentiometers. One provides a “coarse” adjustment; the second allows for fine tuning of the trip point. The sensor is designed to accommodate wire sizes for loads up to 400 amps or higher. The maximum current is unlimited, so current higher than the highest adjustment point will keep the relay in the tripped condition.

