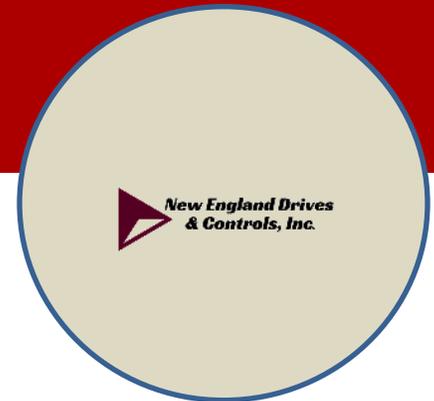


Connections

Breaker-breaker-one-nine.

I often date myself with old sayings that only half my audience may get. The title of this month's whitepaper proves that yet again.



“Know the function of a fuse box and the appearance of a tripped circuit breaker.”

- Marilyn Vos Savant

As New England Drives & Controls constantly strives to become a better asset to our customers, our whitepaper series will feature new technologies or helpful insights that may be pertinent to the reader. It is our sincere hope that this information will be beneficial in both relating, and applying content to your industrial needs.

We hope you find this whitepaper series an enjoyable and informative read.

We always welcome your questions and comments.

It is old CB radio slang that used to be constantly used by truckers to break into a conversation on CB channel 19, which was the official channel to monitor if you were a trucker driving down any one of our country's wonderful highways. If you've never heard of this, you most likely were born in the late 80's or 90's, and this is just like the other weird things you've heard about; dialing a phone, playing a record, cranking down the car window. It is time specific. The older half of the audience gets it, and the younger half does not. If you don't get it, it's not your fault. It is just something that has improved, and because of this you did not experience it or have it for a frame of reference. It is as they say, "Historical."

When you look at the symbol to the right, what do you see? Did you say the "Smiley Face" emoji? 😊 Although correct, it is not what I was

going for. The electrical guys will get this, the rest probably will not... It is a schematic symbol for a circuit breaker.

A circuit breaker is a device that works exactly like a fuse, only it can be reset when it is tripped. In your house wiring, it lives in the "fuse box" which very well may no longer contain fuses. The fuses or breakers trip upon sensing a short circuit or overcurrent situation. This prevents things like melting the insulation off of your internal house wiring, and preventing a fire. It also might protect some devices plugged into the circuit, as well as people holding onto these devices. It is like an electrical circuit insurance policy.

In a machine's cabinetry, you will usually find circuit breakers as well. They are there protecting the electronic components downstream. Power supplies, Motor Drives, Controllers, Sensors, HMIs, you name it. In a perfect world they should not be needed. But as you know, our world is less than perfect!



There are many types of circuit breakers out there, and different technologies that each uses. There are thermal circuit breakers that trip when current-carrying heating elements warm up.

There are thermomagnetic circuit breakers, which are equipped with two tripping mechanisms. The thermal part of the mechanism in the form of a bimetal reacts to pending overloads with a time delay. The magnetic tripping, which occurs by means of a solenoid in a plunging or hinged armature switches off the pending current, and reacts to high overload currents. It can react to short-circuit currents within milliseconds.

There are electronic device circuit breakers that have active current limitation. As such, this enables longer cable paths between the power supply unit and the load. These circuit breakers switch off within approx. 100 to 800 milliseconds in the event of a short circuit. The current is continuously measured with an integrated sensor and is switched off within a matter of milliseconds in the event of an overload current or short circuit.



There are also other electronic circuit breakers which are programmable. These breakers protect multiple circuits, and can be reset remotely.



This allows them to be located in hard to reach areas. They can even be reset via networked connections.

As you can see there are lots of options, even with a simple circuit breaker. Not to mention other concepts such as surge suppression, and line filtering. Contact your friendly New England Drives Representative, and feel free to ask any questions you might have about any of these components, or anything else for that matter.

-Peter Lavoie (Engineering Manager)



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