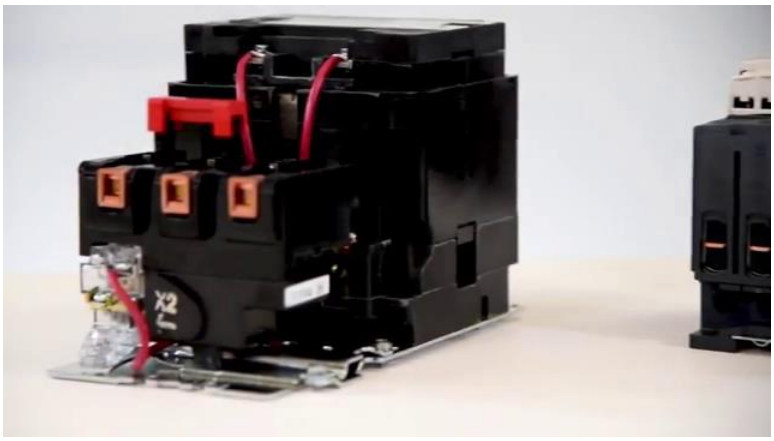
Motor Starter Basics

[0m:0s]

[0m:4s] Hi I'm Josh Bloom, welcome to another video in the RSP Supply education series. Today we're going to be talking about motor starters and motor control basics. The primary purpose of a motor starter is to allow us to start and stop a motor safely. It also allows us to start and stop a motor from a remote location. So essentially a motor starter is an electrically operated switching device. They are primarily made up of just a few components. The first is a contactor, the second is an overload, and they are commonly used with some sort of circuit protection. So contactors actually provide the current to our motor. Their job is to establish and interrupt power in an electrical circuit.



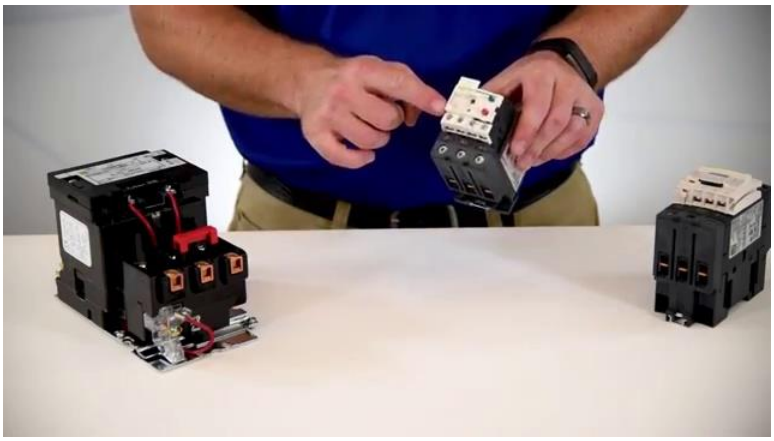
[0m:46s] Overload protection protects the motor from drawing too much current over a longer period of time, which can cause the motor to overheat and burn up.

[0m:55s] So let's first talk about the contactor.

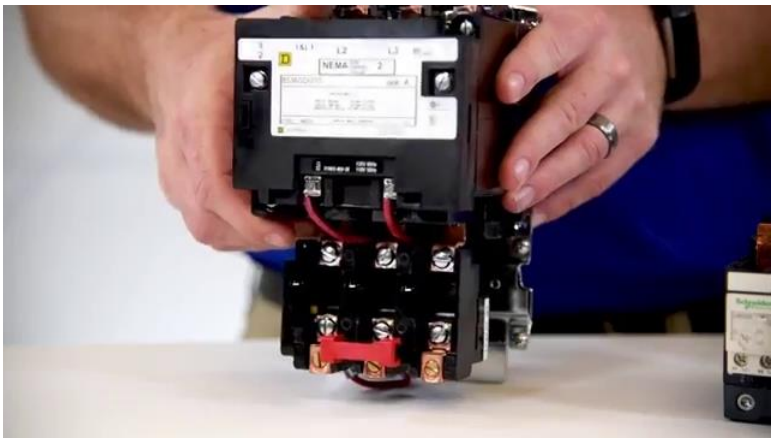
[0m:57s] A contactor operates much like a relay in that when electricity is applied to the coil, it slams the contact shut allowing current to pass through providing power to our motor. For more information on how relays and contactors work, please see our other video we'll link that in the description below. A magnetic contactor is operated electromechanically without any need for intervention. This allows us to operate the contactor remotely so we don't have to put any kind of operators in any sort of dangerous situation that might be close to our motor starter.

[1m:28s] So in order to function properly, a contactor uses a small control current to open and close the contactor. Most contactors typically have auxiliary contacts as well. These contacts allow us to monitor the state of the contactor whether the motor is actually on or off. Some contractors have multiple auxiliary contacts to monitor other types of systems in the contactor. Next let's talk about overload protection. An overload is designed to protect the motor against a prolonged overcurrent. What this means is, if the motor is running at too high of a current for too long, it can overheat and destroy the motor. How the overload provides this protection is it has a current sensing unit built within the overload itself.

[2m:11s] We have either an electronic current sensing unit or a thermal current sensing unit depending on the type of overload that we use. So, for example, on an electronic overload, we have the ability to set via a dial on the overload the amount of current that we want to allow to our motor for a specific period of time.



[2m:29s] So on the thermal overload, we have the ability to insert a thermal element to our specific application and need. So, once the overload has sensed that the motor has drawn too much current for a sustained period of time, it has the ability to disconnect the current that is passing through the starter. So, to meet protection needs, overloads have a time delay to allow small overloads to occur without breaking the circuit. This allows us to operate our motor without having it turn on and off frequently because of small overloads.



[2m:59s] Lastly, commonly used with motor starters, are motor circuit protectors. These are essentially circuit breakers that are specifically designed to be used with motor starters. They operate by preventing large spikes in current that might be caused from a short circuit.

[3m:15s] Motor circuit protectors use a form of magnetic protection which is specifically designed for these types of spikes in voltage. For more information on magnetic protection, please see our circuit breaker video that talks about this. We will link in the description below. Another type of protection that is used in place of motor circuit protectors is some type of fused disconnect. However, it is important that we use fuses that are designed for this type of application.

[3m:39s] So let's talk about a few things that we want to consider when we're purchasing a motor starter. First, we want to determine whether we need a NEMA starter or an IEC starter. Then we want to make sure that we match up our motor with a specific type of motor starter that we purchase. In order to do this, we need to know the motor voltage. We also need to know the motor full load amps or horsepower. And we also want to make sure we know what we need our coil voltage to be.

[4m:3s] In knowing these things, we can better determine what type of motor starter to buy.

[4m:7s] For a full line of contactors, overloads, or motor circuit protectors and thousands of other products, please go to our website. For more information or other educational videos, go to RSPSupply.com, the Internet's top source for industrial hardware. Also, don't forget: like and subscribe.

[4m:22s]