Does my Phase Monitor Relay require a Short Circuit Current Rating?

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Since the 2005 edition, the NFPA70: National Electrical Code (NEC) requires that industrial control panels must be marked with an appropriate short circuit current rating (SCCR).

The SCCR value in kA, at a defined voltage, is an indication of what fault current the industrial control panel can withstand (without unacceptable damage) in the event of a fault.

Furthermore, an industrial control panel shall not be installed where the available fault current exceeds its short circuit current rating.

To comply with this NEC requirement, panel designers and builders have two options:

1. Use the SCCR of a listed and labeled assembly, which requires testing the individual panel design and then recording the test results for each panel design.

2. **Utilizing an approved method.** This translates to applying the method described in UL508A Supplement SB for calculating the SCCR for Industrial Control Panels.

For many years, the UL508A Supplement SB has been the approved method for calculation and determination of the short circuit current rating for industrial control panels. It involves three essential steps:

1. **Establishing the short circuit current ratings of the individual, relevant power circuit components.**

2. Applying current limiting components to modify the SCCR within a portion of a circuit in the panel.

3. Determining the overall SCCR of the industrial control panel.

Establishing the short circuit current ratings of the individual, relevant power circuit components.

Which components are relevant?

All POWER CIRCUIT COMPONENTS, including the disconnect switches, branch circuit protective devices, branch circuit fuse holders, load controllers, motor overload relays, terminal blocks and bus bars.

Figure 1 shows the relevant components are the devices outlined in purple rectangles in the power circuit (highlighted by red dashed line). Devices in the power circuit are the ones that are carrying the current, meaning that the current flows through them as part of the systems power circuit.

In the event of a short circuit fault, the short circuit current will flow through these devices and therefore, they must be rated appropriately to handle this current.

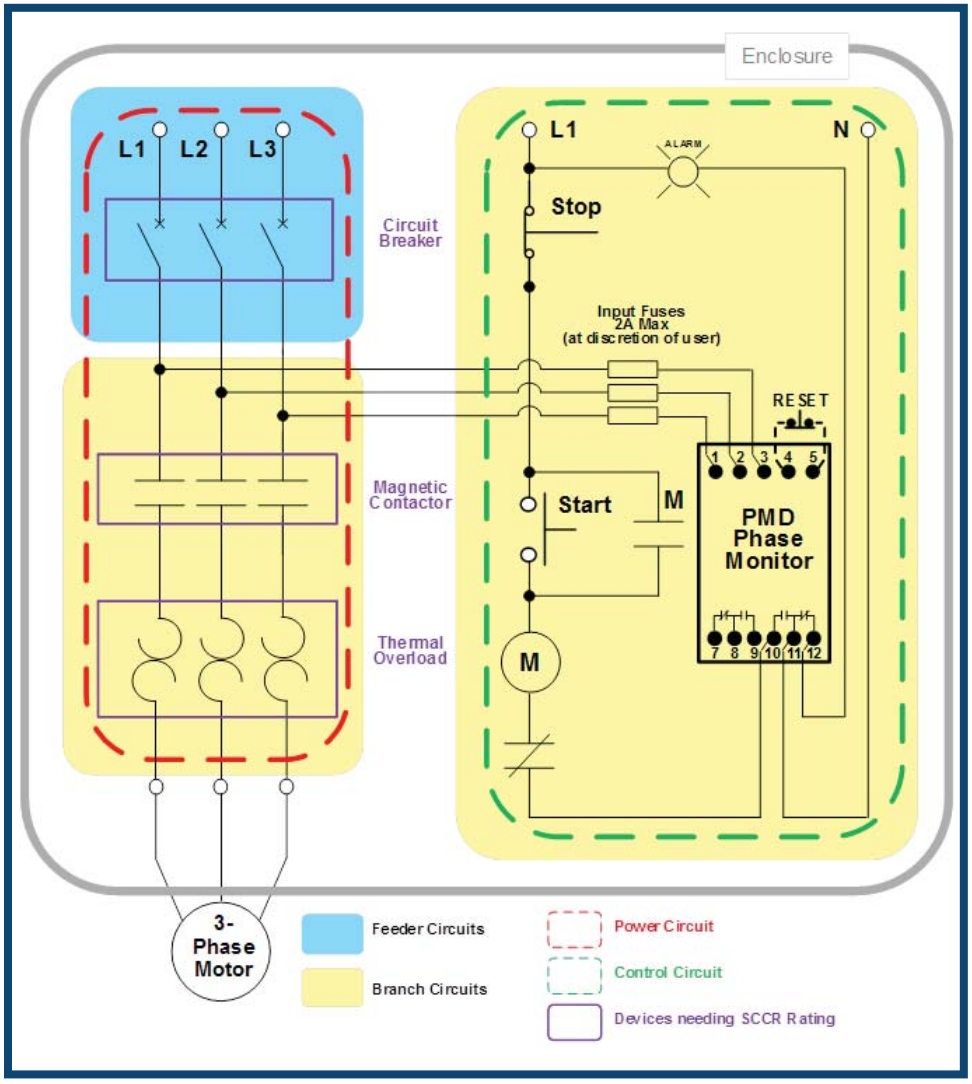

Figure 1

Phase Monitor Relays

Phase monitor relays monitor the voltage of the three-phase power circuit, but the current from the power circuit does not flow through the phase monitor.

Phase monitor relays work in the same manner as a voltmeter by measuring the circuit voltage without being in the power circuit current path. In the event of a short circuit fault, the short circuit current does not flow through the phase monitoring relay and therefore does not require a short circuit current rating (SCCR).

This exception is defined in the UL 508A standard under SB4.2.1, Exception No. 1. Among other exceptions, it states that voltmeter devices are not required to have short circuit current ratings, nor are they considered in calculating the SCCR of a system.

The relay outputs contacts of phase monitors are typically used within control circuits (highlighted by the dashed green line in Figure 1), not within power circuits where short circuit current ratings (SCCR) are required.

A typical application would be to use the relay contacts to pickup or dropout the coil of a motor contactor. In this case, the relay contacts of the phase monitor operate the contactor coil which is part of the control circuit. It is the contactor's contacts that operate the load, which is part of the power circuit, and must then be considered in calculating the short circuit current ratings (SCCR) for the system. Individual control circuit components do not require short circuit current ratings (SCCR) and are not used in calculating the SCCR of the overall system because they are not part of the power circuit.

In the case of plug-in type phase monitor relays, Exception No. 1 of SB4.2.1 includes the relay and socket together as they are evaluated by UL as a relay-socket combination.

If your application requires use of the phase monitor relay output contacts within a power circuit, the short circuit current rating (SCCR) of the contacts can be determined using UL508A table SB4.1. Use the table entry for motor controllers 0-50HP yielding a 5kA SCCR.

For complete information on Macromatic's Phase Monitor Relays, click here.

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