

Bracing of Conductors in Switchboards and Current Transformer Compartments

The purpose of bracing is to restrain the conductors from violent movement during fault conditions. Conductors not properly braced may pull out of their terminals and cause severe damage of the electrical equipment, which in turn could result in fire or personal injury.

The Standard for Dead-Front Switchboards UL891 contains requirements for the construction of switchboards, current transformer compartments, cable termination cabinets, and similar equipment with a maximum 200,000 ampere short-circuit current.

Electrical equipment which has been tested for a rating of greater than 10,000 RMS symmetrical amperes, and which required conductor bracing to be installed during the test, must be marked. This section states in relative part that the marking shall indicate the "type of bracing to be added to the cables routed through the switchboard between the point of entry and the incoming terminals" and the marking "shall be located adjacent to the incoming terminals."

The marking shall state the following or the equivalent: Wrap line cables together with nominal 3/8-inch nylon rope or rope having a minimum tensile strength of 2000 pounds at;

1. 6 inches and 12 inches from the line terminals with five wraps, and
2. Wrap every additional 6 inches with five wraps or every 1 inch with one wrap

In addition, it is recommended that the manufacturer include a drawing that shows the required cable wrapping. Note: the description above is not applicable to equipment over 100kA short-circuit current rating (SCCR).

Electrical equipment that has been tested with cable bracing for a rating greater than 10,000 amperes must be marked with the cable bracing requirements. UL 891 does not require any marking indicating that the electrical equipment has been tested without cable bracing.

For all installations, electrical equipment must be marked with a short-circuit current rating that equals or exceeds the short-circuit current available at the equipment. See NEC 110.24 for field marking requirements regarding available fault current.

Information from Siemens *"Switchboard Instruction and Installation Guide"*

Section 4.15 Cable Lashing Requirements

For conductor lashing instructions on switchboards marked 65kA, 100kA or 200kA short circuit current ratings, refer to the following instructions:

4.15.1. Switchboards with a single fusible main switch rated 4000A or less do not require lashing.

4.15.2. Switchboards with a single main molded case circuit breaker rated 4000A or less do not require lashing.

When using a WL circuit breaker, lashing is required.

4.15.3. Switchboards with a single main fused circuit breaker rated 4000A and less do not require lashing.

4.15.4. Switchboards of single section construction with fusible disconnects, circuit breakers, or fusible circuit breakers do not require lashing.