
Testing of Switchgear and Motor Control Equipment

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Although each particular product line is governed by its own industry standards, switchgear and motor control equipment of the types built by Powell are generally subject to three major categories of tests. As defined in ANSI/IEEE C37.20.2-1987 for Metal-Clad and Station-Type Cubicle Switchgear, these categories are:

Design Tests: Tests made by the manufacturer to determine the adequacy of the design of a particular type, style or model of equipment or its component parts to meet its assigned ratings and to operate satisfactorily under normal service conditions or under special service conditions if specified, and may be used to demonstrate compliance with the applicable standards of the industry.

Production Tests: Tests made for quality control by the manufacturer on every device or on representative samples, or on parts, or materials required to verify during production that the product meets the design specifications and applicable standards.

Conformance Tests: Conformance tests demonstrate compliance with the applicable standards. The test specimen is normally subjected to all planned production tests prior to the initiation of the conformance test program.

Typical design tests for equipment and circuit breakers will include continuous current (heat runs), momentary and short time current, low-frequency withstand (hipot), impulse withstand (BIL) for medium-voltage equipment, and mechanical tests to demonstrate the effectiveness of interlocks. In addition, circuit breakers are subjected to a series of interrupting tests to demonstrate their ability to interrupt currents of various magnitudes, operational life tests, and several types of timing tests. Many of these tests are somewhat destructive, and therefore they are run on manufacturer's prototypes, not on production equipment which is supplied to customers.

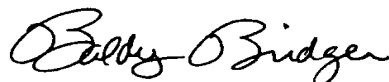
Conformance tests generally include certain of the design tests, chosen to demonstrate compliance with the standards. These tests are frequently used for third-party certification of a design.

Production tests include hipot to demonstrate insulation integrity and mechanical and control circuit tests to demonstrate proper operation. In addition, circuit breakers receive timing tests to show proper closing and opening speed. Records of these tests, which Powell furnishes to customers on request, can be used as baseline data for future maintenance programs.

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Each type of test, and each test within a given type, has a particular part to play in the overall process of producing quality equipment properly rated for a user's needs. No single test demonstrates the proper design and operation of switchgear or motor control equipment. It takes a combination of tests to do the job properly.



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