Technical Specification for Medium Voltage Replacement Circuit Breakers

Specification Number: 26 01 10.11
Product Name: Medium Voltage Replacement Circuit Breakers

1.01 SCOPE

1. This specification serves to define the requirements for a direct replacement medium voltage circuit breaker of equal continuous current rating and the same or greater interrupting rating, using vacuum or SF_6 technology. The direct replacement circuit breaker shall be compatible with the existing switchgear cubicles, with identical connections and interlocks.

2.01 STANDARDS

1. The equipment shall conform to and tests shall be conducted in accordance with the latest applicable standards of the American National Standards Institute (ANSI®), National Electrical Manufacturers' Association (NEMA®), and the Institute of Electrical and Electronic Engineers, Inc. (IEEE®) unless otherwise stated herein.

3.01 GENERAL REQUIREMENTS

1. The replacement circuit breaker shall be suitable for use in the existing metalclad switchgear, and have been fully tested in accordance with ANSI C37.59. Only vacuum and SF6 interrupters and mechanism assemblies that have passed appropriate ANSI design tests listed in C37.09 shall be used in the circuit breakers. Approved interrupter and mechanism manufacturers' are: Square D®/Schneider Electric, ASEA Brown Boveri, Cutler-Hammer, Toshiba, Merlin Gerin and Yaskawa.
2. Main current-carrying parts, insulators, supports, and housings of the circuit breakers shall have sufficient mechanical strength to withstand, without incurring damage, the effect of rated short circuit currents.

4.01 REPLACEMENT CIRCUIT BREAKERS

1. Unless otherwise specified, the circuit breakers shall be rated in accordance with the latest issues of ANSI C37.04 and table 2 of ANSI C37.06.
2. The mechanism shall be sized to operate the existing circuit breaker interlocks and shall be fully function tested according to ANSI C37.20.2, article 5.3.
3. The replacement circuit breaker shall have a stored-energy closing mechanism. The mechanism shall discharge the stored energy before or during the process of withdrawing from or inserting into the circuit breaker compartment.
4. The electrical operated mechanism shall be designed to match the existing air-magnetic circuits. Closing and tripping mechanisms shall operate satisfactorily over the voltage range in accordance with ANSI C37.06, table 10.
5. All primary current path components shall be manufactured of silver-plated copper.
6. Each circuit breaker mechanism shall be equipped with the following:
7. Operating counter
8. Main contact position indicator or target
9. Manual tripping and closing devices
10. Spring charged and discharged indicator or target
11. Each circuit breaker shall retain the existing size and style copper connection to the ground bus.
12. The circuit breaker shall retain the existing style racking mechanism and interlocks. The cell mechanism must be capable of moving the replacement circuit breaker, and operating the mechanical interlocks between the connected, test, and disconnected positions as originally designed.

13. Replacement circuit breakers safety and racking interlocks shall be constructed of ridged steel construction. No interlocks using flexible cables will be allowed.
14. The replacement circuit breakers shall be of new construction.
15. The replacement circuit breakers shall be design and routine tested according to ANSI C37.09 and C37.20.2.
16. As an alternative to this requirement, design tests on the vacuum or SF_6 sealed interrupter module may be submitted in lieu of performing the design tests listed in C37.09. The following ANSI C37.09 design tests would then be required on the complete replacement circuit breaker, consisting of the interrupter module mounted in a new frame manufactured to adapt the module to the existing air-magnetic circuit breaker configuration:
    (a) Rated Continuous Current-Carrying Test (Typically required only on ratings greater than 1,200 A)
    (b) Rated Full Wave Impulse Withstand Voltage Test
    (c) Momentary Current Test
    (d) Low Frequency Voltage Withstand Test
    (e) Interlock and Auxiliary Function Test
17. Certified test results may be submitted for acceptance in lieu of performing tests (16a) through (16d) above only if the supplier has tested circuit breakers identical to those specified.
18. Primary bushings shall be silver-plated copper insulated with cycloalphatic epoxy material. Bushings rated above 5,000 V shall contain shields.
19. Replacement circuit breaker frames shall be constructed with steel of the same or greater gauge as the original air-magnetic frame (0.25-in. thickness).

5.01 TESTS AND INSPECTION

1. Production tests shall be made in accordance with ANSI C37.09, article 5.1 and C37.20.2, article 5.3.
2. The purchaser shall have the right to inspect at the factory all equipment covered by these specifications, at any time during manufacture and assembly, and shall have the right to be present during any testing made on the equipment.
3. The vendor, upon request, shall furnish the purchaser with advance notice of final assembly and testing.
4. The vendor must have a dedicated quality assurance department that is separate from production, answerable only to the president of the company, to insure the quality workmanship of the production department. A copy of the vendor's quality assurance program must be included with the proposal.

6.01 DRAWINGS, DESCRIPTIVE MATERIALS, AND TEST REPORTS

1. Within 15 days ARO the vendor will supply the schematic diagram of the replacement circuit breaker.
2. Instruction books, certified test reports, complete parts list, and recommended spare parts list shall be furnished with the replacement circuit breaker.

7.01 INSTALLATION

1. The vendor will provide qualified installation technicians for installation conformance, if requested.

8.01 INSURANCE

1. Qualified converters/installers shall carry the following minimum insurance with insurance carriers rated A- or better by A. M. Best Company:

Description of Coverage	Limit of Liability
Comprehensive General Liability Insurance	$2 Million Combined Single Limit Bodily Injury and Property Damage
Automobile Liability Insurance Insurance	$2 Million Combined Single Limit Bodily Injury and Property Damage
Workers' Compensation	Statutory
Employer's Liability Comprehensive Liability Coverage	$2 Million