

# Technical Specification for Medium Voltage Retrofill Converting Air Magnetic to Vacuum/SF6 Circuit Breaker

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**Specification Number:** 26 01 10.12

**Product Name:** Medium Voltage Retrofill Converting from Air  
Magnetic to Vacuum or SF6 Circuit Breakers

## 1.01 SCOPE

1. This specification serves to define requirements for the retrofitting of existing air magnetic circuit breaker cubicles to accept circuit breakers and housings of the same continuous, and the same or greater interrupting rating using vacuum or SF<sub>6</sub> interrupters. The circuit breakers shall be fully compatible with the existing switchgear controls.

## 2.01 STANDARDS

1. All supplied 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 Manufacturer Association (NEMA), and the Institute of Electrical and Electronics Engineers, Inc. (IEEE) unless otherwise stated herein.

## 3.01 GENERAL REQUIREMENTS

1. The 3-pole vacuum or SF<sub>6</sub> interrupter housing assembly shall be mounted in the existing circuit breaker cubicle. The retrofitted cubicle shall be suitable for use in the existing metalclad switchgear. Only vacuum and SF<sub>6</sub> interrupter and housing assemblies that have passed appropriate ANSI design tests shall be used in the retrofit. Acceptable interrupter and housing assembly manufacturers are: Square D, ASEA Brown Boveri, General Electric, Westinghouse, Toshiba, Merlin Gerin and Yaskawa.
2. Main current-carrying parts, insulators, supports, and housings of the retrofitted cubicle shall have sufficient mechanical strength to withstand, without incurring damage, the effect of rated short circuit currents.

## 4.01 CIRCUIT BREAKERS

1. Unless otherwise specified, the vacuum or SF<sub>6</sub> circuit breakers shall be rated in accordance with the latest issues of ANSI C-37.04 and table 2 of ANSI C37.06.
2. The circuit breaker shall be stored-energy-closing mechanism. The mechanism shall discharge the stored energy before or during withdrawing from or inserting into the circuit breaker compartment. The mechanism shall open, and remain in a trip-free state between the test and connected position.
3. Electrically operated mechanisms 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 1 0.
4. All primary current paths and fingers shall be silver or tin plated.
5. Each circuit breaker mechanism shall be equipped with the following:
  - (a) Operation counter
  - (b) Main contact position indicator or target
  - (c) Manual tripping and closing devices
  - (d) Spring charged and discharged indicator or target.
6. Each retrofitted cubicle shall have a bolted copper bus connection.
7. The circuit breaker shall be equipped with a new electrically operated mechanism. All springs, coils, and motors shall be new manufacture.
8. The circuit breakers and retrofitted housings shall be design and routine tested according to ANSI C37.09, C37.20.2, and C37.55. Certified test reports on the

identical circuit breakers may be submitted for acceptance in lieu of performing design tests.

9. The following additional ANSI C37.09 design tests on the circuit breaker and housing, mounted within the existing cubical frame shall be performed:
  - (a) Rated Continuous Current-Carrying Test (for currents greater than 1200A)
  - (b) Dielectric Tests (BIL and Low-Frequency Withstand)
  - (c) Momentary Current Test
  - (d) Mechanical Endurance TestCertified test results may be submitted for acceptance in lieu of performing tests (a) through (d) above only if the vendor has performed similar retrofits on the equipment listed in the purchase order.
10. The operating mechanisms shall be readily accessible for customer maintenance.

#### **5.01 CONTROL AND INDICATING DEVICES**

1. Control relays, auxiliary contacts, and small mechanisms shall be enclosed protected and accessible for maintenance.
2. All control relays, coils, motors, and mechanisms shall be new equipment.

#### **6.01 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 tests made on the equipment.
3. The vendor, upon request, shall furnish the purchaser with advance notice of final assembly and testing.
4. The supplier shall have in place a dedicated Quality Assurance Department that is separate from production.

#### **7.01 DRAWINGS**

1. Schematic Diagrams and nameplate information will be submitted to Vendor within (30) days of date of purchase order. Within thirty (30) days after receipt of schematic diagram and nameplate information from Purchaser, Vendor shall submit the following ACAD reproducible drawings for approval:
  - (a) Schematic control diagrams of the retrofitted circuit breaker and cubicle.
  - (b) Verification of nameplate designations as submitted by Purchaser.

#### **8.01 DESCRIPTIVE MATERIALS AND TEST REPORTS**

1. Instruction books, certified tests reports, complete parts list, and recommended spare parts lists shall be furnished with the retrofitted breakers and cubicles.

#### **9.01 INSTALLATION**

1. If requested, the Vendor can provide qualified installation technicians for installation conformance.

#### **10.01 INSURANCE**

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

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