

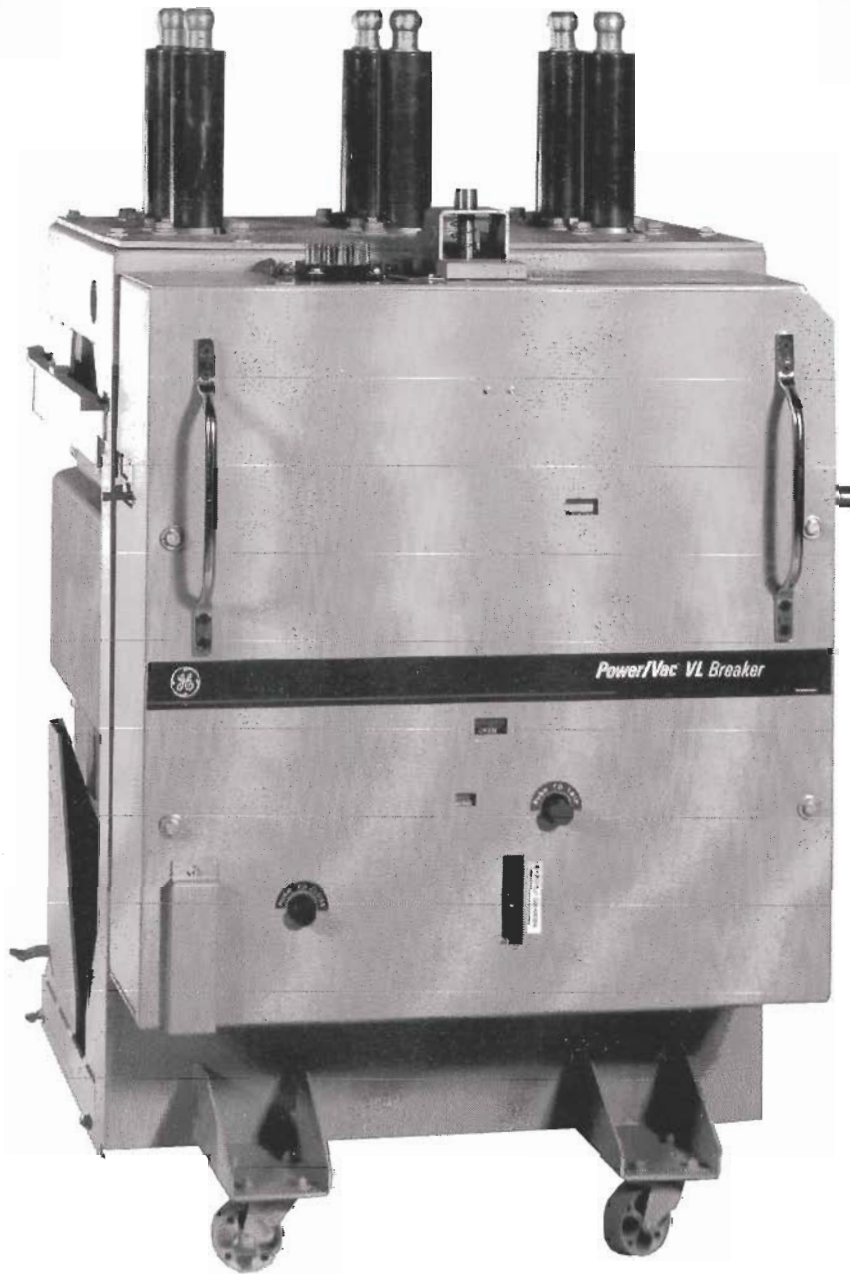


Power/Vac[®] VL

*Replacement Breakers for
GE Magne-Blast Type AM*

5kV-AMH

5kV-AM



15kV-AM

GE *Power/Vac*[®] VL Breakers provide an economical solution to the replacement and upgrading of your GE Magna-Blast breakers - Type 5kV-AM, 5kV-AMH, 7.2kV-AM and 15kV-AM.

The new GE *Power/Vac*[®] VL Breaker is an excellent way of upgrading a switchgear line-up with a substantial cost savings over replacement of the switchgear equipment and breakers. Directly replacing the worn or obsolete GE Magna-Blast Type AM breaker with new GE *Power/Vac*[®] VL Breaker provides exacting mechanical and electrical interchangeability. Who better knows the exacting requirements than GE, the original circuit breaker manufacturer.

Replacement with GE *Power/Vac*[®] VL Breaker provides the following:

- **Direct replacement with minimal downtime.** The GE *Power/Vac*[®] VL Breaker is complete and ready for immediate insertion into existing equipment.
- **Extends useful life of present GE Magne-Blast Switchgear.** The majority of wear considerations of Switchgear is related to the drawout breaker which encompasses the interrupters, primary bushings, and operating mechanism. By replacing the breaker and inspection of the equipment, the useful life span of the switchgear can be greatly extended.
- **No used components.** All components of GE *Power/Vac*[®] VL Breaker are new, not reused. Reuse of old components minimizes the extended life of the switchgear.
- **Use of fixtures and tooling designed from original drawings.** All breakers are assembled using fixtures and tools made from the original documentation for the GE Magne-Blast Type AM and AMH breakers. Use of these gauges eliminates alignment issues of interlocks and primary and secondary disconnects at installation due to breaker misalignment and assures that the breaker is interchangeable between equally rated compartments. See Figure "A".

- **No disassembly of existing cables and wiring.** As the breaker is a direct replacement, replacement of the GE Vertical Lift equipment is not required and cost and down time is minimized.
- **Eliminates asbestos arc chute.** Eliminates personnel exposure to asbestos fibers and provides interruption in vacuum bottle.
- **Interrupting the arc in vacuum** eliminates the need for large, heavy, expensive arc chutes. Arc interruption in vacuum does not produce hot ionized gases or other arcing byproducts.
- **Improved Interrupting rating time.** The original GE Magna-Blast Type AM breaker interrupting time was 8-cycles. Later production breakers were 5-cycles. By converting to GE *Power/Vac*[®] VL Breaker, interrupting time for all breakers will be 5-cycles.
- **Upgrade MVA ratings.** In many cases the GE *Power/Vac*[®] VL Breaker can be upgraded at time of order and modification can be made to upgrade the GE Magne-Blast equipment. As an example, in most cases to upgrade from 13.8-500 MVA to 13.8-750 MVA requires only minor changes. To upgrade from 13.8-500 MVA to 13.8-1000 MVA requires modification to the bus structure in the equipment. Kits and services are available for these modifications. Other rating modifications are similar. Contact the factory for additional upgrade information.
- **Manufactured by personnel** with access to the original engineering documentation from which the existing GE Magna-Blast Breakers and equipment were furnished. This ensures exact mechanical and electrical replacement of existing GE Magne-Blast AM Breakers.
- **Instruction books that coordinate with original GE Magne-Blast instruction books.** As GE was the original manufacturer of the switchgear and breaker, all instruction books are available for reference to be sure breaker is exact replacement both mechanically and electrically.

- **Uses proven Power/Vac[®] mechanism design.** The front accessible mechanism used on the GE Power/Vac[®] VL Breaker has been field proven in the GE Power/Vac[®] Vacuum Breaker. Long life and low maintenance save up to 50% on maintenance costs. Vacuum breakers are generally simpler in design and have less powerful operating mechanisms that tend to have longer, more trouble free life than their air break counterparts. The GE Power/Vac[®] VL Breaker has no suggested maintenance below 10,000 no-load operations, 5000 load operations, and 15 full rated fault current operations.
- **Assured Quality Control.** All breakers are built in ISO registered facilities. All breakers have documented records for building and testing and have been interfaced in stationary gauge cells to be sure of correct operation.
- **Mechanical interlocks.** Mechanical interlocks conform to ANSI standards. All interlocks are designed and built to conform with original documentation. All interlocks are fixtured and checked in stationary structures built per original documentation to assure minimal interface issues in the field for breaker interchangeability.
- **Many Renewal parts are the same as GE Power/Vac[®] Vacuum Breaker.** Renewal parts like the motor, trip & close coils are the same parts used on the GE Power/Vac[®] Vacuum Breaker. As parts are used in current production, parts availability is not a problem.

GE Power/Vac[®] VL vacuum replacement breakers are available in the ratings shown below for insertion into GE Magne-Blast AM or AMH breaker compartments

Symmetrical Rating Basis ANSI C37.06 (1979)

Identification		Rated Values							Related Required Capabilities				
Nominal Voltage Class kV,rms	Nominal 3-phase mVA Class	Voltage		Insulation Level		Current		Rated Interrupting Time Cycles	Rated Permissible Tripping Delay, Y sec	Rated Maximum Voltage Divided by K kv, rms	Current Values		
		Rated Maximum Voltage kV, rms	Rated Voltage Range Factor, K	Rated Withstand Test Voltage		Rated Continuous Current at 60 Hz amp, rms	Rated Short-circuit Current (at Rated Max kV) kA, rms				Maximum Symmetrical Interrupting Capability	3 Sec Short-time Current Carrying Capability	Closing and Latching Capability 1.6 K Times Rated Short-circuit Current kA, rms
				Low Freq. kV, rms	Impulse kC Crest								
4.16	250	4.76	1.24	19	60	1200	29	5	2	3.85	36	36	58
4.16	250	4.76	1.24	19	60	2000	29	5	2	3.85	36	36	58
4.16	*350	4.76	1.19	19	60	1200	41	5	2	4.0	49	49	78
4.16	*350	4.76	1.19	19	60	2000	41	5	2	4.0	49	49	78
4.16	*350	4.76	1.19	19	60	3000	41	5	2	4.0	49	49	78
7.20	500	8.25	1.25	36	95	1200	33	5	2	6.6	41	41	66
7.20	500	8.25	1.25	36	95	2000	33	5	2	6.6	41	41	66
7.20	500	8.25	1.25	36	95	2500	33	5	2	6.6	41	41	66
13.8	500	15	1.30	36	95	1200	18	5	2	11.5	23	23	37
13.8	500	15	1.30	36	95	2000	18	5	2	11.5	23	23	37
13.8	500	15	1.30	36	95	2500	18	5	2	11.5	23	23	37
13.8	750	15	1.30	36	95	1200	28	5	2	11.5	36	36	58
13.8	750	15	1.30	36	95	2000	28	5	2	11.5	36	36	58
13.8	750	15	1.30	36	95	2500	28	5	2	11.5	36	36	58
13.8	1000	15	1.30	36	95	1200	37	5	2	11.5	48	48	77
13.8	1000	15	1.30	36	95	2000	37	5	2	11.5	48	48	77
13.8	1000	15	1.30	36	95	3000	37	5	2	11.5	48	48	77
13.8	1000	15	1.30	36	95	4000	37	5	2	11.5	48	48	77
13.8	1000	15	1.30	36	95	**5000	37	5	2	11.5	48	48	77

NOTE: * For 350 MVA quotations, Consult GE Burlington Customer Service
 ** 5000A breaker is fan cooled

Complete information is required for quotation/order entry. Information required to order a replacement breaker is found on the breaker and equipment nameplates. The following nameplate sheets should be filled in to match the breaker and equipment nameplates and attached for quotation. If upgrade is required, information on upgrade

requirements must also be attached. A copy of the in-field original breaker connection drawing should be reviewed by the customer to note any field modifications to the wiring. Connection and/or wiring changes should be forwarded with the breaker and equipment information.

GENERAL ELECTRIC		POWER CIRCUIT BREAKER		TYPE		SER. NO.	
RATED MAX. VOLTAGE	KV	RATED AMP.	Hz	WITHSTAND IMPULSE	KV	INT TIME	CY
RATED SHORT CIRCUIT AMPS.	KA	RATED VOLTAGE RANGE FACTOR		CLOSE & LATCH CAPABILITY			KA
CLOSING COIL	VOLTS	CLOSING AMPS.		C VOLT RANGE			
POTENTIAL TRIP COIL	VOLTS	TRIPPING AMPS.		C VOLT RANGE			
UV TRIP COIL	VOLTS	CURRENT TRIP COIL		AMP. AC			
CONNECTION DIAGRAM	WT.	MECH TYPE		DATE MFG.			
CAUTION! BEFORE INSTALLING OR OPERATING READ INST.						MADE IN U.S.A. PHILADELPHIA, PA.	

Typical Breaker Nameplate

GENERAL ELECTRIC		SWITCHGEAR	
REQ.	_____	SUM.	_____
ELEM.	_____		_____
PHILADELPHIA, PA		MADE IN USA	

Typical Equipment Nameplate

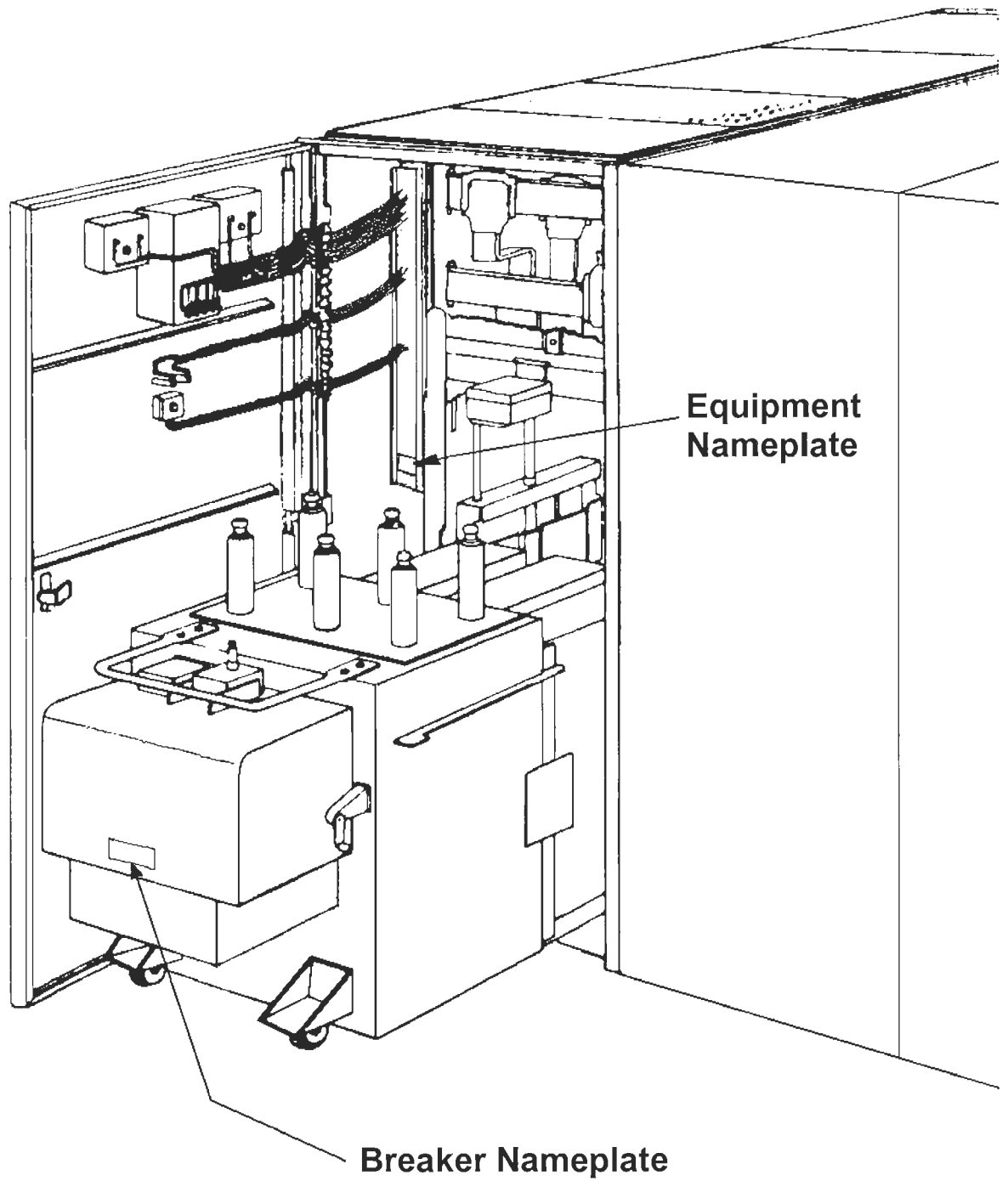
Upgrade Information

Is Breaker upgrade required. No Yes

Is Switchgear upgrade required. No Yes

What is required 5kV rating. 350 MVA

What is required 15kV rating. 500 MVA 750 MVA 1000MVA



Location of nameplates in Vertical Lift Lineup

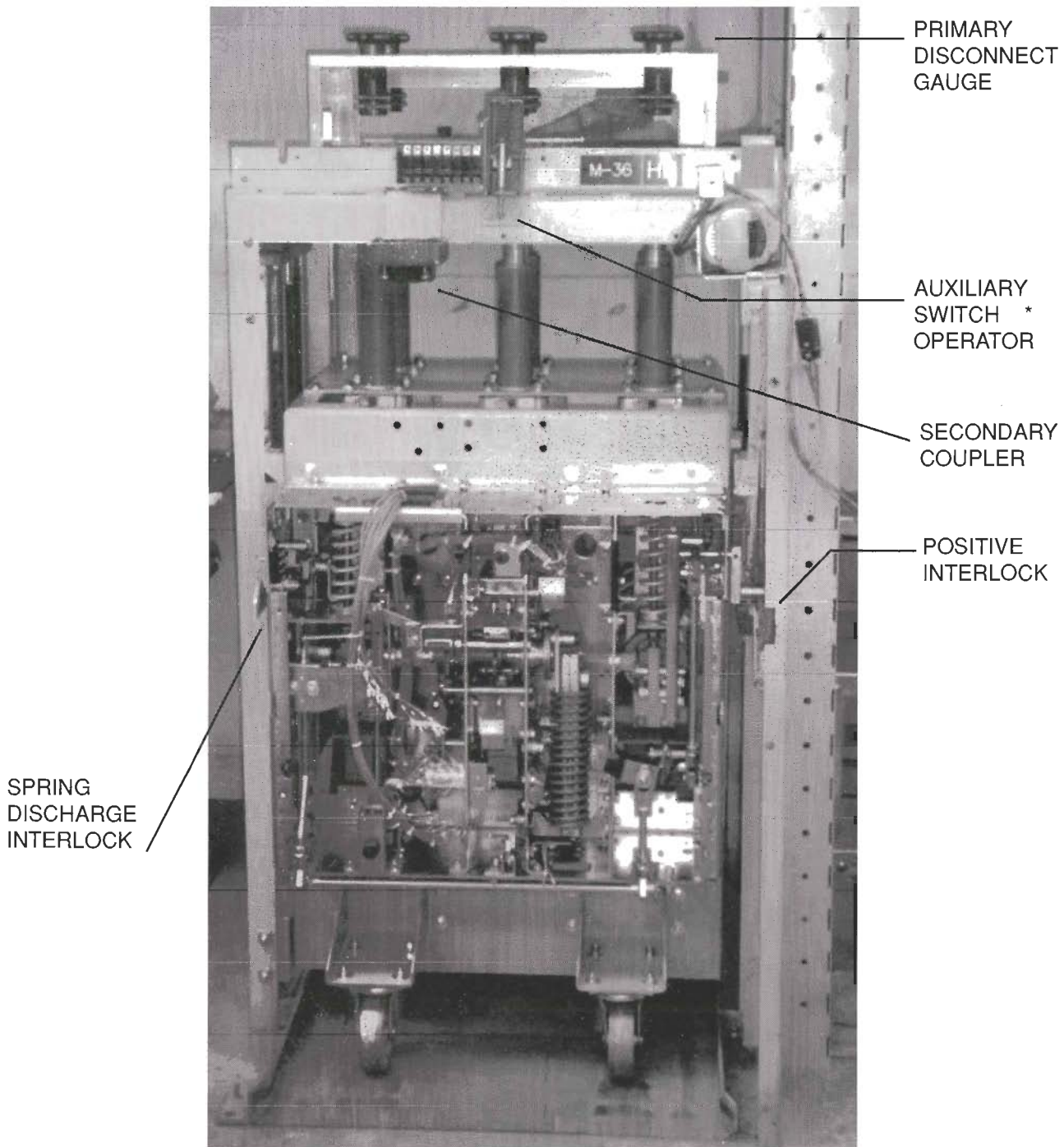


Figure A

View of Power/Vac VL Breaker in Gauge Fixture

Items referenced are important features that have been fixtured in the factory to minimize issues at installation.

*The Auxiliary switch operator has more than enough energy to actuate the heavy duty switch springs of the equipment mounted Auxiliary Switch (MOC).

Power/Vac® VL Vacuum Replacement/Conversion Breakers for GE Magne-Blast Type AM Switchgear

Guideform Specification

GE Power/Vac® VL circuit breakers shall be used in the replacement of GE Magne-Blast Type (AM) (AMH) circuit breakers rated nominally 4.16kV(250MVA to 350MVA), 7.2 kV(250MVA to 500MVA) to 13.8 kV(150MVA to 1000MVA).

The replacement breaker shall be a direct roll-in assembly featuring all new components, including Power/Vac® vacuum circuit breaker, frame, interlock mechanisms and bushings shipped completely assembled for immediate insertion into an existing GE Magne-Blast Type (AM) (AMH) circuit breaker compartment.

Replacement breakers shall meet all applicable ANSI/IEEE industry and design testing requirements for new general purpose breakers, including interface/interlocks, dielectric, momentary, temperature rise and mechanical life:

- ANSI C37.04 Rating structure for AC High Voltage Circuit Breakers rated on a symmetrical current basis.
- ANSI C37.09 Standard Test Procedures for High Voltage Circuit Breakers.
- ANSI C37.54 Conformance Test Procedures.
- ANSI C37.59 Standard Requirements for Conversion of Power Switchgear Equipment.

Tested to applicable standards.

Breakers have been designed and tested per ANSI/IEEE standards for dielectric, temperature rise, momentary, and mechanical interface. This includes ANSI C37.59 for conversion of power switchgear assemblies. Conformance tests are available. In addition to these tests each breaker is required to go through production tests that include 300+ mechanical operations, high potential testing, min./max. control voltage testing, control circuits testing, timing and travel curves.

Production Testing:

Each replacement breaker shall undergo standard ANSI production tests including 300 mechanical operations, final adjustments, one minute high potential, min/max control voltage and timing/travel curves.

Technical Requirements:

Provide ANSI tested replacement breaker assemblies rated:

___ kV ___ MVA ___ Amps
 (refer to rating table for available combinations)

Replacement Breaker(s) need to be equipped to operate on the following control voltages:

Trip Voltage	___48VDC	___125VDC	___250VDC	___Capacitor Trip
Close voltage	___48VDC	___125VDC	___250VDC	___115VAC 230VAC
Charge voltage	___48VDC	___125VDC	___250VDC	___115VAC 230VAC

Roll-in breaker assembly shall be a direct electrical and mechanical replacement for existing GE Magne-Blast circuit breaker:

Customer Name _____

Type AM ___-___-___

Serial No. _____

Model No. _____

All breakers will be furnished with Surge Suppressors unless otherwise specified.

Quotation/Ordering:

The above information as well as the nameplate information on page 4 is required before a quotation/order is entered.

Documentation:

Manufacturer shall supply components summary and wiring diagram for replacement breaker.
 Manufacturer shall supply complete instructions for installation and maintenance as well as renewal parts information.

Manufacturer shall ensure availability of exact replacement parts for a minimum of 10 years after product obsolescence and functional replacement parts for twenty years after product obsolescence.

Replacement breakers shall receive manufacturer's standard warranty of 18 months after shipment or one year after startup, whichever occurs first.



GE Electrical Distribution & Control