



Cutler-Hammer

Test Certification

for the 3000A Type 150 VCP-WG 50 Generator Circuit Breaker

Required Ratings Assigned in accordance with IEEE standard C37.013-1997:

Maximum voltage:	15 kV rms
Power frequency:	60 Hz
Continuous current:	3,000 A rms
Dielectric strength:	
- Power frequency withstand voltage:	36 kV rms
- Lightning impulse withstand voltage:	95 kV peak
Standard operating duty:	CO - 30 m - CO
Interrupting time:	(3-Cycles) 50 ms
Closing time:	46 ms
Short-circuit current:	50 kA rms
- Asymmetrical current interrupting capability:	75 %
- Short-time current carrying capability:	50 kA rms
- Duration of short-time current:	3 s
Closing and latching capability:	137 kA peak
First generator-source symmetrical current interrupting capability:	25 kA rms
First generator-source asymmetrical current interrupting capability:	130 %
Inherent transient recovery voltage - Rate of Rise of Recovery Voltage (RRRV):	3.4 kV / μ s
- Transient recovery voltage - Peak (E2 = 1.84 x V):	27.6 kV peak
- Transient recovery voltage - Time to Peak (T2):	9.3 μ s
Load current switching endurance capability:	5,000 operations
No-load mechanical endurance capability:	5,000 operations
Out-of-phase current switching capability:	25 kA
90° out-of-phase power frequency recovery voltage (= 1.5 x sqrt(2/3) x V):	18.4 kV rms
90° out-of-phase inherent TRV - Rate of Rise of Recovery Voltage (RRRV):	3.3 kV / μ s
- Transient recovery voltage - Peak (E2 = 2.6 x V):	39 kV peak
- Transient recovery voltage - Time to Peak (T2):	13.4 μ s

TESTS PERFORMED: The applicable industry standard is IEEE standard C37.013-1997.

All tests were performed in a 15 kV Type VC-W, 50 kA enclosure, according to IEEE standard C37.013-1997.

[A] Short Circuit Tests: Interruption, Close-and-Latch, Short-Time:

Short-circuit current, at Rated Maximum Voltage:	50 kA at 15 kV
- Asymmetrical current interrupting capability:	75 %
- Short-time current carrying capability:	64 kA rms
- Duration of short-time current:	3 s
- Closing and latching capability:	142 kA peak
- First generator-source symmetrical current interrupting capability:	25 kA rms
- First generator-source asymmetrical current interrupting capability:	135 %
Inherent transient recovery voltage - Rate of Rise of Recovery Voltage (RRRV):	3.5 kV / μ s
- Transient recovery voltage Peak (E2):	27 kV peak
- Transient Recovery Voltage Time to Peak (T2):	8.8 μ s
Standard operating duty:	CO - 30 m - CO
Interrupting time:	50 ms
Closing time:	46 ms

[B] Dielectric Tests:

- Power frequency withstand voltage (1 minute):	36 kV rms
- Lightning impulse withstand voltage (1.2 x 50 μ s wave):	95 kV peak

[C] Electrical and Mechanical Endurance Tests:

Load current switching endurance capability:	5,000 operations
No-load mechanical endurance capability:	5,000 operations
Number of operations between servicing:	1,000 operations

[D] Continuous Current Thermal Tests:

When tested in a 15 kV Type VC-W, 63 kA enclosure:	3,000 A rms
Maximum temperature rise:	65 C
Maximum temperature in a 40 °C ambient:	105 C

[F] Out-of-Phase Switching Tests:

Out-of-phase power frequency recovery voltage :	31.5 kA
Out-of-phase inherent TRV - Rate of Rise of Recovery Voltage (RRRV):	21.1 kV rms
- Transient recovery voltage - Peak (E2):	3.4 kV / μ s
- Transient recovery voltage - Time to Peak (T2):	45 kV peak
	15 μ s

CERTIFICATION:

The above is a true and correct summary of data obtained from tests performed by the CESI Laboratory, Milano, Italy, and the Cutler-Hammer T&Q Center, Pittsburgh, PA, USA. The test results demonstrate the capability of the Cutler-Hammer 3000 A Type 150 VCP-WG 50 Generator Circuit Breaker to operate properly under normal and Short-Circuit conditions when applied within its ratings in accordance with IEEE standard C37.013-1997.

Date: August 22, 2002

Name: R. W. Long

Signature: 