

**Section:** High Voltage  
**Number:** HV-11-PB003  
**Revision:** 1  
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**ROUTINE TEST PROGRAM  
FOR COUPLING CAPACITOR VOLTAGE TRANSFORMERS**

TEST	ANSI C93.1 – 1990	RITZ	REMARKS
Capacitance and Dissipation Factor Measurement	Ref. Cl 6.3.1.1 Conducted at power frequency test voltages of 10% rated voltage and at maximum rated voltage.	As per ANSI cl 6.3.1 D.F. at maximum rated voltage must be less than 0.8%.	Low loss design ensures long life. D.F. measurement verifies uniformity of production.
Dielectric Test Power Frequency Withstand Voltage Test	Ref. Cl 6.3.1.2 The test is made on individual sections of coupling capacitors for a duration of one minute, dry. The test voltage is at the prorated voltage across the unit based on the test voltage of the entire assembly.	As per ANSI cl. 6.3.2.1	
Basic Lighting Impulse Insulation Level Voltage Test	Not Required	The test is made on the individual sections of a capacitor assembly by applying five consecutive impulse under dry conditions. The test wave is a 1.2.-5.0x40-60 microsecond wave of negative polarity. The test voltage is at the prorated voltage across the unit based on the test voltage of the assembly.	The test maintains a high quality standard effectively detecting any insulation flaw.
Partial Discharge Test	Not Required	The test is made on the individual capacitor section after applying the PFWV. Partial discharge is measured at $1.2 \times 1.05 \times U_m / \sqrt{3}$ : 10 pC after 1 min. $1.0 \times 1.05 \times U_m / \sqrt{3}$ : 5 pC after 1 minute. Where $U_m$ = Max system voltage.	The test ensures long time reliability by effectively detecting partial discharges within the insulation system of the unit..
Capacitance & Dissipation Factor Measurement	Test using the same atmospheric conditions and methods as in cl 6.3.1.1. The test shall be conducted at power frequency and the same test voltage as used before the dielectric tests.	As per ANSI cl 6.3.1.1	
Sealing Test	Not required	A leak test at 65°C for 12 hours is performed on each coupling capacitor units.	This test insures oil retention during extreme temp. excursions verifying long time reliability.

**ELECTROMAGNETIC UNITS**

Dielectric Withstand Test on primary winding	The primary circuit of the electromagnetic unit shall withstand an inducted-potential test of 4 times the performance reference voltage multiplied by the stack capacitor ratio of $C1/(C1+C2)$ Ref. Cl 6.3.2.2.1	The test is made by applying four times the rated voltage at 400 Hz for 18 second duration to the secondary winding with all other windings open, one end of each winding being grounded. The excitation current is measured.	To verify the uniformity of production and integrity of intermediate voltage insulation system.
Saturation Test on Reactor	The reactive elements of the EMU shall withstand a test voltage of four times nominal. Ref. cl. 6.3.2.2.2	As per ANSI cl. 6.3.2.2.2	
AC Withstand an LV Terminal	Not required	Ritz Standard Test	Verify the uniformity of production and the integrity of the LV insulation system.
AC Withstand of Earthed Terminal	Not required.	The ground end of the primary circuit is tested at 4kV for 1 minute.	
Power Frequency Withstand Test on Secondary Windings	Ref. Cl 6.3.2.2.3 Each winding in the electromagnetic unit shall be tested separately, and withstand a 2.5 kV RMS power frequency. Applied potential test for one (1) minute between the windings and ground and between windings.	As per ANSI cl 6.3.2.2.3	
Ferroresonance Suppression Device Test	Not Required	Ritz Standard Test	No sustained ferroresonance verify the uniformity of production and integrity of ferroresonance suppression system.
Saturation Curve on Electromagnetic Unit	Not required	Volt amp curve of EMU	Verify uniformity of production

**COMPLETE UNIT ASSEMBLY**

Accuracy & Polarity Test and Determination of Error	Ref. cl 6.3.5 & 6.3.6 The test is made with the complete assembly at the performance voltage and rated frequency. The accuracy performance at zero and maximum rated burden is checked for each secondary.	As per ANSI cl 6.3.5 & 6.3.6	
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Ferroresonance Test	Not required	The test is done at A1.0, 1.1 and 1.2 P.U. voltage with essentially no burden connected to the unit. The secondary is short circuited momentarily. The secondary voltage is observed with an oscilloscope and voltmeter. the performance is considered satisfactory if the secondary recovers its normal wave form and value after the secondary short circuit. Applied consecutively five times minimum to confirm consistency of ferroresonance performance.	The test is preformed to ensure that CVT's are satisfactory in ferroresonance suppression.
Protective Gap Setting	Ref. c. 6.3.4 Gap sparkeover ratings shall be verified by the application of power freq. voltage to the gaps.	As per ANSI cl. 6.3.4	
Megger Test	Not required	The carrier terminal and the secondary terminals are individually megger tested to ground.	The test is done to ensure adequate dielectric strength between windings and ground.
Sealing Test	Not required	Unit is placed under two complete thermal cycles of 12 hours.	To verify the integrity of all oil seals for long term operational reliability.
Continuity Test	Not required	All circuits are checked for continuity	
<b>FOR UNITS EQUIPPED WITH CARRIER ACCESSORIES</b>			
Low Voltage Terminal Power Frequency Withstand Voltage	Not required	4 kV RMS applied for one minute	Ensures insulation strength of LV terminal.
Drain Coil Voltage Drop	Not required	Voltage drop measured with max. rated voltage across assembly.	Ensures functionality of drain coil.
Drain Coil Inductance and Quality Factor	Not required	Measured to verify compliance at 120 and 1000 Hz.	
Protective Gap Setting	Ref. 6.3.3	As per ANSI 6.3.3	
Choke Coil Inductance	Not required	Measure to verify compliance with Ritz specifications	