

COMPLIANCE TEST REPORT


L&T EmSyS has carried out following conformance tests to meet IEC Standards for SPEM-2 hardware.

Operating voltage: 240V

Current Rating: 10-60A

SL NO	TEST	TEST CONDITIONS	ACCEPTANCE CRITERIA	RESULT
1.)	Fast Transient Burst Test. [IEC 61000 4-4]	Test Voltage on the current and voltage circuit: 4KV Common Mode Duration: 60s at each polarity Cable length between coupling device and EUT: 1m	During the test a temporary degradation or loss of function or performance is acceptable. The limits of error in percentage for Class1.0 meter is as follows: At Reference voltage (U_n) and basic current (I_b) the error must not exceed 4%.	CONFORMS [The variation of error was -0.96 %, which is less than specified limit.]
2.)	Surge Immunity Test. IEC 61000 4-5	Cable length between Surge generator and EUT: 1m Phase angle: pulses to be applied at 60 deg. and 240deg. after zero-crossing of AC Supply [240V] Test voltage: 4KV Generator impedance: 2Ω The application of the surge immunity test voltage shall not produce a change in the register of more than 0.01 KWh and the test output shall not produce a signal equivalent to more than 0.01 KWh.	During the test a temporary degradation or loss of function or performance is acceptable.	CONFORMS [There was no change in the register reading. No Blinking of calibration LED observed during the test.]

3.)	Short-time over-currents Test	<p>The test circuit shall be practically non-inductive.</p> <p>After the application of the short time over current with the voltage maintained at the terminals, the meter shall be allowed to return to the initial temperature with the voltage circuits energized for one hour individually.</p> <p>Short-time over current shall not damage the meter.</p> <p>The meter shall be able to carry a short time over current of 30 times I_{max} for one half cycle at rated frequency.</p>	Limits of Variation in Percentage error for class 1 meters is 1.5%	<p>CONFORMS</p> <p>[The variation of error was 0.2%, which is less than specified limit.]</p>	
4.)	DC Magnetic Induction Test	<p>The DC Magnetic Induction obtained by using the electromagnet with a DC current. This Magnetic field shall be applied to all accessible surfaces of the meter when it is mounted as for normal use. The value of the magnetic field strength is 0.2Telsa. (External origin)</p>	Limits of variation in percentage error for Class 1 meters is 4% at I_b [10 Amps]	<p>CONFORMS</p> <p>[The variation of error was less than specified limit as given below.]</p> <p>Bottom Top Side</p>	<p>0.21% 0.33% 0.01%</p>

5.)	AC Magnetic Induction Test	The AC Magnetic Induction obtained by using the electromagnet with a AC current. This Magnetic field shall be applied to all accessible surfaces of the meter when it is mounted as for normal use. The value of the magnetic field strength is 0.2Telsa. (External origin)	Limit of variation of error for Class 1 meter is 4% at Ib [10 Amps].	<p>CONFORMS</p> <p>[The variation of error was less than specified limit as given below].</p> <p>Bottom Top Side</p>	<p>-0.11 % 0.09 % 0.1 %</p>
6.)	Radiated Interference Test	The test for radio interference shall be carried out for conducted emission from 0.15 MHz to 30 MHz and for radiated emission om 30 MHz to 300 MHz.	The values measured From 0.15 MHz to 30 MHz are attached.	<p>Test Report 150 - 500 KHz.bmp</p> <p>Test Report 500KHz to 5000KHz.bmp</p> <p>Test Report 5MHz -30MHz.bmp</p>	CONFORM S
			The values measured From 30 MHz to 30 MHz is attached.	 "test report 30M to 300M Hz.bmp"	CONFORM S

7.)	Radiated Susceptibility Test IEC 61000 4-3	The test be shall be carried out under following conditions: Voltage and auxiliary circuits energized with reference voltage; Frequency Band: 80MHz to 1000MHz Cable length exposed to the field: 1m Carrier modulated within 80% AM at 1KHz sine wave a.) Test with current: Unmodulated Test Field Strength: 10V/m b.) Test severity level: 4	Limits of variation in percentage error for Class 1 meters is 2% at Ib [10 Amps].	<p>CONFORMS</p> <p>[There was a no change in the meter reading during the test, and No blinking of calibration LED was observed during the test.</p> <p>The variation of error was 1.06 % Which is less than specified limit.]</p>	
8.)	Conducted Susceptibility Test IEC 61000 4-6	The test be shall be carried out under following conditions: Voltage and auxiliary circuits energized with reference voltage; Frequency range –150KHz-80 MHz Voltage level : 10V.	Limit of variation in percentage error for Class 1 meters is 2% at Ib [10 Amps].	<p>CONFORMS</p> <p>There was no perturbation in meter during the test.</p> <p>The variation of error was 0.40 % Which is less than specified limit.]</p>	

ABBREVIATIONS

Un: Reference voltage
Ib: Basic Current
Imax: Maximum Current
T: Tesla
mT: milli-Tesla
Sqrt: Square root
EUT: Equipment under Test

Test Set up:

- 1: Current and Voltage Source.
- 2: Energy measurement Master meter.
- 3: Class 1.0 % EUT.