

SYSTEM TEST PLAN / TEST RESULTS															STANDARDS									
Project Name										SPEM Class1.0														
RS version					1.4					Firmware /Software version						Ver2.3								
Test Environment Details					A voltmeter is connected across 1S and 2S and two ammeters, one in series with 1S and 1L and other in series with 2S and 2L. The serial port is connected to the PC via cables for checking parameter values.											Test bench Details/Configuration Details					Pulsar source.LNG reference meter.DSO.Multimeter			
System Test Cases																								
Test No.	Test ID	Test Date	Req. ID	Test Case Scenario Description	Test Description (explaining test Condition, Setup and other details)	Input Test Values		Test Case Designed For	Expected Result				Actual Result					Remarks (if any)						
						Data Element	Input Values		Output Parameter	UOM	Lower Limit	Upper Limit	WS006	WS007	WS008	WS009	WS010							
23	T3		R01, R02, R04, R05, R06, R07, R10, H04, H05, H07, H08, H11, H19	Accuracy Test of KWh	do	Phase Voltage	276V	BVA	Active Energy	% Error	Test result of test no.59 -3%	Test result of test no.59 + 3%	-0.15%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88					
						Phase Current	30A													Frequency	50Hz	PF	0.5lag	Time
24	T3		R01, R02, R04, R05, R06, R07, R10, H04, H05, H07, H08, H11, H19	Accuracy Test of KWh	do	Phase Voltage	276V	BVA	Active Energy	% Error	Test result of test no.59 -2.1%	Test result of test no.59 + 2.1%	-0.48%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88					
						Phase Current	60A													Frequency	50Hz	PF	1	Time
25	T3		R01, R02, R04, R05, R06, R07, R10, H04, H05, H07, H08, H11, H19	Accuracy Test of KWh	do	Phase Voltage	276V	BVA	Active Energy	% Error	Test result of test no.59 -3%	Test result of test no.59 + 3%	-1.40%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88					
						Phase Current	60A													Frequency	50Hz	PF	0.5lag	Time
26	T2		R01, R02, R04, R05, R06, R07, R10, H04, H05, H07, H08, H11, H19	Accuracy Test of KWh	The system is operated at a voltage which is -10% below the nominal operating voltage which will be applied between 1S and 2S. At this voltage, six different current values are specified for testing which will be adjusted by observing the reading on the ammeter connected to 1S. Each of these combinations of Phase current and Phase voltage are measured at 50Hz for accuracy. PF is varied between 0.5 lag and unity throughout these tests. Under these conditions, the KWh, and PF is measured and checked for accuracy as per International Standard specifications. The test will commence when the enter key is pressed thereafter exactly after one minute the enter key would be pressed again. During this duration, the EUT and a calibrated meter shall be given the same inputs and their readings will be compared to measure accuracy. The data from the meter will be read-out through the RS232 port.	Phase Voltage	216V	BVA	Active Energy	% Error	Test result of test no.59 -0.7%	Test result of test no.59 + 0.7%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88 (S13779)						
						Phase Current	500mA												Frequency	50Hz	PF	1	Time	1min
27	T2		R01, R02, R04, R05, R06, R07, R10, H04, H05, H07, H08, H11, H19	Accuracy Test of KWh	do	Phase Voltage	216V	BVA	Active Energy	% Error	NA	NA	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88					
						Phase Current	500mA													Frequency	50Hz	PF	0.5lag	Time
28	T2		R01, R02, R04, R05, R06, R07, R10, H04, H05, H07, H08, H11, H19	Accuracy Test of KWh	do	Phase Voltage	216V	BVA	Active Energy	% Error	Test result of test no.59 -0.7%	Test result of test no.59 + 0.7%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88 (S13779)					
						Phase Current	1A													Frequency	50Hz	PF	1	Time
29	T2		R01, R02, R04, R05, R06, R07, R10, H04, H05, H07, H08, H11, H19	Accuracy Test of KWh	do	Phase Voltage	216V	BVA	Active Energy	% Error	Test result of test no.59 -1%	Test result of test no.59 + 1%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88					
						Phase Current	1A													Frequency	50Hz	PF	0.5lag	Time
30	T2		R01, R02, R04, R05, R06, R07, R10, H04, H05, H07, H08, H11, H19	Accuracy Test of KWh	do	Phase Voltage	216V	BVA	Active Energy	% Error	Test result of test no.59 -0.7%	Test result of test no.59 + 0.7%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88					
						Phase Current	2A													Frequency	50Hz	PF	1	Time
31	T2		R01, R02, R04, R05, R06, R07, R10, H04, H05, H07, H08, H11, H19	Accuracy Test of KWh	do	Phase Voltage	216V	BVA	Active Energy	% Error	Test result of test no.59 -1%	Test result of test no.59 + 1%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88					
						Phase Current	2A													Frequency	50Hz	PF	0.5lag	Time
32	T2		R01, R02, R04, R05, R06, R07, R10, H04, H05, H07, H08, H11, H19	Accuracy Test of KWh	do	Phase Voltage	216V	BVA	Active Energy	% Error	Test result of test no.59 -0.7%	Test result of test no.59 + 0.7%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88					
						Phase Current	10A													Frequency	50Hz	PF	1	Time
33	T2		R01, R02, R04, R05, R06, R07, R10, H04, H05, H07, H08, H11, H19	Accuracy Test of KWh	do	Phase Voltage	216V	BVA	Active Energy	% Error	Test result of test no.59 -1%	Test result of test no.59 + 1%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88					
						Phase Current	10A													Frequency	50Hz	PF	0.5lag	Time
34	T2		R01, R02, R04, R05, R06, R07, R10, H04, H05, H07, H08, H11, H19	Accuracy Test of KWh	do	Phase Voltage	216V	BVA	Active Energy	% Error	Test result of test no.59 -0.7%	Test result of test no.59 + 0.7%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88					
						Phase Current	30A													Frequency	50Hz	PF	1	Time
35	T2		R01, R02, R04, R05, R06, R07, R10, H04, H05, H07, H08, H11, H19	Accuracy Test of KWh	do	Phase Voltage	216V	BVA	Active Energy	% Error	Test result of test no.59 -1%	Test result of test no.59 + 1%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88					
						Phase Current	30A													Frequency	50Hz	PF	0.5lag	Time
36	T2		R01, R02, R04, R05, R06, R07, R10, H04, H05, H07, H08, H11, H19	Accuracy Test of KWh	do	Phase Voltage	216V	BVA	Active Energy	% Error	Test result of test no.59 -0.7%	Test result of test no.59 + 0.7%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88					
						Phase Current	60A													Frequency	50Hz	PF	1	Time
37	T2		R01, R02, R04, R05, R06, R07, R10, H04, H05, H07, H08, H11, H19	Accuracy Test of KWh	do	Phase Voltage	216V	BVA	Active Energy	% Error	Test result of test no.59 -1%	Test result of test no.59 + 1%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88					
						Phase Current	60A													Frequency	50Hz	PF	0.5lag	Time
38	T2		R01, R02, R04, R05, R06, R07, R10, H04, H05, H07, H08, H11, H19	Accuracy Test of KWh	The system is operated at a voltage which is +10% above the nominal operating voltage which will be applied between 1S and 2S. At this voltage, six different current values are specified for testing which will be adjusted by observing the reading on the ammeter connected to 1S. Each of these combinations of Phase current and Phase voltage are measured at 50Hz for accuracy. PF is varied between 0.5 lag and unity throughout these tests. Under these conditions, the KWh, and PF is measured and checked for accuracy as per International Standard specifications. The test will commence when the enter key is pressed thereafter exactly after one minute the enter key would be pressed again. During this duration, the EUT and a calibrated meter shall be given the same inputs and their readings will be compared to measure accuracy. The data from the meter will be read-out through the RS232 port.	Phase Voltage	264V	BVA	Active Energy	% Error	Test result of test no.59 -0.7%	Test result of test no.59 + 0.7%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88 (S13779)					
						Phase Current	500mA													Frequency	50Hz	PF	1	Time
39	T2		R01, R02, R04, R05, R06, R07, R10, H04, H05, H07, H08, H11, H19	Accuracy Test of KWh	do	Phase Voltage	264V	BVA	Active Energy	% Error	NA	NA	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88					
						Phase Current	500mA													Frequency	50Hz	PF	0.5lag	Time
40	T2		R01, R02, R04, R05, R06, R07, R10, H04, H05, H07, H08, H11, H19	Accuracy Test of KWh	do	Phase Voltage	264V	BVA	Active Energy	% Error	Test result of test no.59 -0.7%	Test result of test no.59 + 0.7%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88					
						Phase Current	1A													Frequency	50Hz	PF	1	Time
41	T2		R01, R02, R04, R05, R06, R07, R10, H04, H05, H07, H08, H11, H19	Accuracy Test of KWh	do	Phase Voltage	264V	BVA	Active Energy	% Error	Test result of test no.59 -1%	Test result of test no.59 + 1%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88					
						Phase Current	1A													Frequency	50Hz	PF	0.5lag	Time

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Test No.	Test ID	Test Date	Req. ID	Test Case Scenario Description	Test Description (explaining test Condition, Setup and other details)	Input Test Values		Test Case Designed For	Expected Result				Actual Result					Remarks (if any)			
						Data Element	Input Values		Output Parameter	UOM	Lower Limit	Upper Limit	WS006	WS007	WS008	WS009	WS010				
42	T2			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	264V 2A 50Hz 1 1min	BVA	Active Energy	% Error	Test result of test no.59 + 0.7%	Test result of test no.59 + 0.7%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88	
43	T2			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	264V 2A 50Hz 0.5lag 1min	BVA	Active Energy	% Error	Test result of test no.59 -1%	Test result of test no.59 + 1%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88
44	T2			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	264V 10A 50Hz 1 1min	BVA	Active Energy	% Error	Test result of test no.59 - 0.7%	Test result of test no.59 + 0.7%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88
45	T2			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	264V 10A 50Hz 0.5lag 1min	BVA	Active Energy	% Error	Test result of test no.59 -1%	Test result of test no.59 + 1%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88
46	T2			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	264V 30A 50Hz 1 1min	BVA	Active Energy	% Error	Test result of test no.59 - 0.7%	Test result of test no.59 + 0.7%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88
47	T2			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	264V 30A 50Hz 0.5lag 1min	BVA	Active Energy	% Error	Test result of test no.59 -1%	Test result of test no.59 + 1%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88
48	T2			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	264V 60A 50Hz 1 1min	BVA	Active Energy	% Error	Test result of test no.59 - 0.7%	Test result of test no.59 + 0.7%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88
49	T2			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	264V 10A 50Hz 0.5lag 1min	BVA	Active Energy	% Error	Test result of test no.59 -1%	Test result of test no.59 + 1%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	CBIP88
50	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	The system is operated at the nominal operating voltage which will be applied between 1S and 2S.At this voltage six different current values are specified for testing which will be adjusted by observing the reading on the ammeter connected to 1S. Each of these combinations of Phase current and Phase voltage are measured at 50Hz for accuracy. PF is varied between 0.5 lag, unity and 0.8 lead throughout these tests. Under these conditions, the KWh is measured and checked for accuracy as per International Standard specifications. The test will commence when the enter key is pressed thereafter exactly after one minute the enter key would be pressed again. During this duration, the EUT and a calibrated meter shall be given the same inputs and their readings will be compared to measure accuracy. The data from the meter will be read-out through the RS232 port.	Phase Voltage Phase Current Frequency PF Time	240V 200mA 50Hz 1 1min	BVA	Active Energy	% Error	-2%	+2%	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	CBIP88 IS1379	
51	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 500mA 50Hz 0.5lag 1min	BVA	Active Energy	% Error	-2%	+2%	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	CBIP88	
52	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 500mA 50Hz 0.8 lead 1min	BVA	Active Energy	% Error	-2%	+2%	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	CBIP88	
53	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 1A 50Hz 1 1min	BVA	Active Energy	% Error	-1%	1%	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	CBIP88	
54	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 1A 50Hz 0.5 lag 1min	BVA	Active Energy	% Error	-1.5%	+1.5%	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	CBIP88	
55	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 1A 50Hz 0.8 lead 1min	BVA	Active Energy	% Error	-1.5%	+1.5%	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	CBIP88	
56	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 2A 50Hz 1 1min	BVA	Active Energy	% Error	-1%	+1%	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	CBIP88	
57	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 2A 50Hz 0.5 lag 1min	BVA	Active Energy	% Error	-1.5%	+1.5%	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	CBIP88	
58	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 2A 50Hz 0.8 lead 1min	BVA	Active Energy	% Error	-1.5%	+1.5%	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	CBIP88	
59	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 10A 50Hz 1 1min	BVA	Active Energy	% Error	-1%	+1%	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	CBIP88	
60	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 10A 50Hz 0.5 lag 1min	BVA	Active Energy	% Error	-1%	+1%	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	CBIP88	

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						Data Element	Input Values		Output Parameter	UOM	Lower Limit	Upper Limit	WS006	WS007	WS008	WS009	WS010				
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61	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 10A 50Hz 0.8 lead 1min	BVA	Active Energy	% Error	-1%	+1%	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	CBIP88	
62	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 30A 50Hz 1 1min	BVA	Active Energy	% Error	-1%	+1%	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	CBIP88
63	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 30A 50Hz 0.5 lag 1min	BVA	Active Energy	% Error	-1%	+1%	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	CBIP88
64	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 30A 50Hz 0.8 lead 1min	BVA	Active Energy	% Error	-1%	+1%	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	CBIP88
65	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 60A 50Hz 1 1min	BVA	Active Energy	% Error	-1%	+1%	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	CBIP88
66	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 60A 50Hz 0.5 lag 1min	BVA	Active Energy	% Error	-1%	+1%	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	CBIP88
67	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 60A 50Hz 0.8 lead 1min	BVA	Active Energy	% Error	-1%	+1%	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	CBIP88
68	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	The system is operated at the nominal operating voltage which will be applied between 1S and 2S. At this voltage six different current values are specified for testing which will be adjusted by observing the reading on the ammeter connected to 1S. Each of these combinations of Phase current and Phase voltage are measured at 52.5Hz and 47.5Hz for accuracy. PF is varied between 0.5 lag and unity throughout these tests. Under these conditions, the KWh is measured and checked for accuracy as per International Standard specifications. The test will commence when the enter key is pressed thereafter exactly after one minute the enter key would be pressed again. During this duration, the EUT and a calibrated meter shall be given the same inputs and their readings will be compared to measure accuracy. The data from the meter will be read-out through the RS232 port.	Phase Voltage Phase Current Frequency PF Time	240V 500mA 52.5Hz 1 1min	BVA	Active Energy	% Error	Test result of test no.59 - 0.8%	Test result of test no.59 + 0.8%	0.35%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779	
69	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 500mA 52.5Hz 0.5lag 1min	BVA	Active Energy	% Error	NA	NA	-1.80%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779	
70	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 500mA 47.5Hz 1 1min	BVA	Active Energy	% Error	Test result of test no.59 - 0.8%	Test result of test no.59 + 0.8%	0.36%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779	
71	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 500mA 47.5Hz 0.5lag 1min	BVA	Active Energy	% Error	NA	NA	-1.30%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779	
72	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 1A 52.5Hz 1 1min	BVA	Active Energy	% Error	Test result of test no.59 - 0.8%	Test result of test no.59 + 0.8%	0.20%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779	
73	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 1A 52.5Hz 0.5lag 1min	BVA	Active Energy	% Error	Test result of test no.59 -1%	Test result of test no.59 + 1%	-1.20%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779	
74	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 1A 47.5Hz 1 1min	BVA	Active Energy	% Error	Test result of test no.59 - 0.8%	Test result of test no.59 + 0.8%	0.25%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779	
75	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 1A 47.5Hz 0.5lag 1min	BVA	Active Energy	% Error	Test result of test no.59 -1%	Test result of test no.59 + 1%	-0.80%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779	
76	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 2A 52.5Hz 1 1min	BVA	Active Energy	% Error	Test result of test no.59 - 0.8%	Test result of test no.59 + 0.8%	0.09%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779	
77	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 2A 52.5Hz 0.5lag 1min	BVA	Active Energy	% Error	Test result of test no.59 -1%	Test result of test no.59 + 1%	0.30%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779	
78	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 2A 47.5Hz 1 1min	BVA	Active Energy	% Error	Test result of test no.59 - 0.8%	Test result of test no.59 + 0.8%	0.10%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779	
79	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF Time	240V 2A 47.5Hz 0.5lag 1min	BVA	Active Energy	% Error	Test result of test no.59 -1%	Test result of test no.59 + 1%	0.50%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779	
80	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11, H19	Accuracy Test of KWh	do	Phase Voltage Phase Current Frequency PF	240V 10A 52.5Hz	BVA	Active Energy	% Error	Test result of test no.59 - 0.8%	Test result of test no.59 + 0.8%							IS13779	

SYSTEM TEST PLAN / TEST RESULTS																				STANDARDS									
Project Name										SPEM Class1.0																			
RS version					1.4					Firmware /Software version					Ver2.3														
Test Environment Details										Test bench Details/Configuration Details										Pulsar source.LNG reference meter.DSO.Multimeter									
System Test Cases																													
Test No.	Test ID	Test Date	Req. ID	Test Case Scenario Description	Test Description (explaining test Condition, Setup and other details)	Input Test Values		Test Case Designed For	Expected Result				Actual Result					Remarks (if any)											
						Data Element	Input Values		Output Parameter	UOM	Lower Limit	Upper Limit	WS006	WS007	WS008	WS009	WS010												
81	T2.T3			H05.H07, H08.H11 R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11	Accuracy Test of kWh	do	Phase Voltage 240V Phase Current 10A Frequency 52.5Hz PF 1 Time 1min	BVA	Active Energy	% Error	Test result of test no.59 -1%	Test result of test no.59 + 1%	-0.10%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779										
82	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11	Accuracy Test of kWh	do	Phase Voltage 240V Phase Current 10A Frequency 47.5Hz PF 1 Time 1min	BVA	Active Energy	% Error	Test result of test no.59 -0.8%	Test result of test no.59 + 0.8%	-0.02%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779										
83	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11	Accuracy Test of kWh	do	Phase Voltage 240V Phase Current 10A Frequency 47.5Hz PF 1 Time 1min	BVA	Active Energy	% Error	Test result of test no.59 -1%	Test result of test no.59 + 1%	-0.15%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779										
84	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11	Accuracy Test of kWh	do	Phase Voltage 240V Phase Current 30A Frequency 52.5Hz PF 1 Time 1min	BVA	Active Energy	% Error	Test result of test no.59 -0.8%	Test result of test no.59 + 0.8%	-0.32%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779										
85	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11	Accuracy Test of kWh	do	Phase Voltage 240V Phase Current 30A Frequency 52.5Hz PF 1 Time 1min	BVA	Active Energy	% Error	Test result of test no.59 -1%	Test result of test no.59 + 1%	-0.30%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779										
86	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11	Accuracy Test of kWh	do	Phase Voltage 240V Phase Current 30A Frequency 47.5Hz PF 1 Time 1min	BVA	Active Energy	% Error	Test result of test no.59 -0.8%	Test result of test no.59 + 0.8%	-0.70%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779										
87	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11	Accuracy Test of kWh	do	Phase Voltage 240V Phase Current 30A Frequency 47.5Hz PF 1 Time 1min	BVA	Active Energy	% Error	Test result of test no.59 -1%	Test result of test no.59 + 1%	-0.50%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779										
88	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11	Accuracy Test of kWh	do	Phase Voltage 240V Phase Current 60A Frequency 52.5Hz PF 1 Time 1min	BVA	Active Energy	% Error	Test result of test no.59 -0.8%	Test result of test no.59 + 0.8%	-0.80%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779										
89	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11	Accuracy Test of kWh	do	Phase Voltage 240V Phase Current 60A Frequency 52.5Hz PF 1 Time 1min	BVA	Active Energy	% Error	Test result of test no.59 -1%	Test result of test no.59 + 1%	-0.30%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779										
90	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11	Accuracy Test of kWh	do	Phase Voltage 240V Phase Current 30A Frequency 47.5Hz PF 1 Time 1min	BVA	Active Energy	% Error	Test result of test no.59 -0.8%	Test result of test no.59 + 0.8%	-0.70%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779										
91	T2.T3			R01.R02, R04.R05, R06.R07, R10.H04, H05.H07, H08.H11	Accuracy Test of kWh	do	Phase Voltage 240V Phase Current 60A Frequency 47.5Hz PF 1 Time 1min	BVA	Active Energy	% Error	Test result of test no.59 -1%	Test result of test no.59 + 1%	-0.50%	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	IS13779										
92	T6		R03.R19	Accuracy Test of RMS Current	The system will be operated at nominal voltage and nominal current. The operating frequency will be maintained at 50Hz throughout this test. Only the power factor will be varied and will be observed over a duration of one minute.	do	Phase Voltage 240V Phase Current 0.5A Frequency 50Hz PF 0.5lag	BVA	AMPERE	A	0.49	0.51	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	IEC62053-21										
93	T6		R03.R19	Accuracy Test of RMS Current	do	do	Phase Voltage 240V Phase Current 0.5A Frequency 50Hz PF 0.8lead	SV	AMPERE	A	0.49	0.51	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	IEC62053-21										
94	T6		R03.R19	Accuracy Test of RMS Current	do	do	Phase Voltage 240V Phase Current 0.5A Frequency 50Hz PF 0.8lead	BVA	AMPERE	A	0.49	0.51	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	IEC62053-21										
95	T7		R03.R19	Accuracy Test of RMS Current	do	do	Phase Voltage 240V Phase Current 4A Frequency 50Hz PF 0.5lag	BVA	AMPERE	A	3.92	4.08	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	IEC62053-21										
96	T7		R03.R19	Accuracy Test of RMS Current	do	do	Phase Voltage 240V Phase Current 4A Frequency 50Hz PF 1	SV	AMPERE	A	3.92	4.08	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	IEC62053-21										
97	T7		R03.R19	Accuracy Test of RMS Current	do	do	Phase Voltage 240V Phase Current 4A Frequency 50Hz PF 0.8lead	BVA	AMPERE	A	3.92	4.08	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	IEC62053-21										
98	T8		R03.R19	Accuracy Test of RMS Current	do	do	Phase Voltage 240V Phase Current 10A Frequency 50Hz PF 0.5lag	BVA	AMPERE	A	9.8	10.2	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	IEC62053-21										
99	T8		R03.R19	Accuracy Test of RMS Current	do	do	Phase Voltage 240V Phase Current 10A Frequency 50Hz PF 1	SV	AMPERE	A	9.8	10.2	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	IEC62053-21										
100	T8		R03.R19	Accuracy Test of RMS Current	do	do	Phase Voltage 240V Phase Current 10A Frequency 50Hz PF 0.8lead	BVA	AMPERE	A	9.8	10.2	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	IEC62053-21										
101	T9		R03.R19	Accuracy Test of RMS Current	do	do	Phase Voltage 240V Phase Current 60A Frequency 50Hz PF 0.5lag	BVA	AMPERE	A	58.8	61.2	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	IEC62053-21										
102	T9		R03.R19	Accuracy Test of RMS Current	do	do	Phase Voltage 240V Phase Current 60A Frequency 50Hz PF 1	SV	AMPERE	A	58.8	61.2	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	IEC62053-21										
103	T9		R03.R19	Accuracy Test of RMS Current	do	do	Phase Voltage 240V Phase Current 60A Frequency 50Hz PF 0.8lead	BVA	AMPERE	A	58.8	61.2	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	Refer Accuracy Report for WS006 to WS010.doc	IEC62053-21										
					The System will be operated at nominal voltage and nominal current and the display sequence will be checked. The display shall scroll through the specified sequence for every 10 sec and repeat after the last parameter of the sequence has been displayed. The sequence of the parameters is as follows: 1. Cumulative Active Energy of tariff 1. 2. Cumulative Active Energy of tariff 2. 3. Cumulative Active Energy of tariff 3. 4. Cumulative Active Energy of tariff 4.	Up Scroll key	Released																						
						Down Scroll Key	Released																						
						MD reset key	Released																						

SYSTEM TEST PLAN / TEST RESULTS
SPEM Class1.0

Project Name		SYSTEM TEST PLAN / TEST RESULTS										STANDARDS					
RS version		1.4										Ver2.3					
Test Environment Details		A voltmeter is connected across 1S and 2S and two ammeters, one in series with 1S and 1L and other in series with 2S and 2L. The serial port is connected to the PC via cables for checking parameter values.					Firmware /Software version					Pulsar source.LNG reference meter.DSO.Multimeter					
Test Environment Details		A voltmeter is connected across 1S and 2S and two ammeters, one in series with 1S and 1L and other in series with 2S and 2L. The serial port is connected to the PC via cables for checking parameter values.					Test bench Details/Configuration Details					Pulsar source.LNG reference meter.DSO.Multimeter					
System Test Cases																	
Test No.	Test ID	Test Date	Req. ID	Test Case Scenario Description	Test Description (explaining test Condition, Setup and other details)	Input Test Values		Test Case Designed For	Expected Result			Actual Result					Remarks (if any)
						Data Element	Input Values		Output Parameter	UOM	Lower Limit	Upper Limit	WS006	WS007	WS008	WS009	
104	T21		R21.H13	Test for Autoscroll	6. Cumulative Apparent Energy of tariff 1 7. Cumulative Apparent Energy of tariff 2 8. Cumulative Apparent Energy of tariff 3 9. Cumulative Apparent Energy of tariff 4 10. Total Cumulative Energy (resolution 1 decimal points) 11. Instantaneous Power Factor. Please refer to RENO144UG01 (User Guide) for further details.	7.	9.	IOD	sequence of parameters is in accordance with the sequence specified.	NA	NA	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	
105	T12		R14.R21, UI01	Test of Scrolling Keys.MD reset.	Several combinations of these keys will be pressed to validate the proper operation of the system without letting the system to enter into any invalid state of operation.			IOD	The display will be checked whether the	NA	NA	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	
106	T13		R14.R21, UI01	<-do->	do			IOD	The display will be checked whether the	NA	NA	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	
107	T14		R14.R21, UI01	<-do->	Press the MD Reset key.Then MD value from the EEPROM will be read-out through the RS232 port and verified.			IOD	The back-up of the present MD value will be stored in the	NA	NA	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	
108	T15		R14.R21, UI01	<-do->	Several combinations of these keys will be pressed to validate the proper operation of the system without letting the system to enter into any invalid state of operation.			IOD	The specified keys will not perform any of their	NA	NA	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	
109	T16		R14.R21, UI01	<-do->	do			IOD	The specified keys will not perform any of their	NA	NA	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	
110	T16		R14.R21, UI01	<-do->	do			IOD	The specified keys will not perform any of their	NA	NA	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	
111	T16		R14.R21, UI01	<-do->	do			IOD	The specified keys will not perform any of their	NA	NA	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	
112	T16		R14.R21, UI01	<-do->	do			IOD	The specified keys will not perform any of their	NA	NA	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	
113	T16		R14.R21, UI01	<-do->	do			IOD	The specified keys will not perform any of their	NA	NA	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	
114	T16		R14.R21, UI01	<-do->	do			IOD	The specified keys will not perform any of their	NA	NA	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	Tested Ok.	
115	T17		R25.R10, R26.H11	Test of functionality of RS232 Optical port	Transmit the header of the frame for the protocol followed to the energy meter via the optical port. In response to this, the acknowledgement transmitted by the energymeter shall be compared with the "acknowledgement format" as specified in the protocol.(RENO144ASCP01 "Serial Communication Procedure")			IOD	Data received shall match with the specified acknowledgement format.	NA	NA	Tested OK.	Tested OK.	Tested OK.	Tested OK.	Tested OK.	
116	T18		H09.H21, H23.R13, R12.R08	LED Indication and Fault Indication Tests	The system shall be operated at the nominal operating voltage which will be applied between 1S and 2S. Starting current shall be fed to the system.			IOD	The KWH LED shall blink at a rate proportional to the power	NA	NA	Tested OK.	Tested OK.	Tested OK.	Tested OK.	Tested OK.	
117	T19		H09.H21, H23.R13, R12.R08	Current reversal indication	The Phase current is made to flow in opposite direction i.e. 1L to 1S. Nominal phase voltage shall be applied to the system.			EB,IOD	Reversal LED	NA	NA	Tested OK.	Tested OK.	Tested OK.	Tested OK.	Tested OK.	
118	T20		H09.H21, H23.R13, R12.R08	Earth Leakage Indication	The neutral current connection will be removed (2L) and the load will be connected to earth (1L).			EB,IOD	ELT LED	NA	NA	Tested OK.	Tested OK.	Tested OK.	Tested OK.	Tested OK.	
119	T22		R12.R13, H20.H21, H22.H23	Anti-Tampering and Anti-Fraud Testing	The meter shall operate at nominal voltage and current.During these tests, the various methods of tampering will be simulated on the meter and simultaneously the meter functionality will be tested for proper operation.			EB	The meter should be operational.			The meter is operational	The meter is operational	The meter is operational	The meter is operational	The meter is operational	
120	T23		R12.R13, H20.H21, H22.H23	<-do->	do			EB	The meter should not be powered ON.			The meter is not operational	The meter is not operational	The meter is not operational	The meter is not operational	The meter is not operational	
121	T23		R12.R13, H20.H21, H22.H23	<-do->	do			EB	The meter should not be powered ON.			The meter is not operational	The meter is not operational	The meter is not operational	The meter is not operational	The meter is not operational	
122	T23		R12.R13, H20.H21, H22.H23	<-do->	do			EB	The meter should be operational, powered up by the third CT.			The meter is operational	The meter is operational	The meter is operational	The meter is operational	The meter is operational	
123	T24		R12.R13, H20.H21, H22.H23	<-do->	do			EB	The meter should be operational.			The meter is operational	The meter is operational	The meter is operational	The meter is operational	The meter is operational	
124	T25		R12.R13, H20.H21, H22.H23	<-do->	do			EB	The meter should not be powered ON.			The meter is not operational	The meter is not operational	The meter is not operational	The meter is not operational	The meter is not operational	
125	T25		R12.R13, H20.H21, H22.H23	<-do->	do			EB	The meter should not be powered ON.			The meter is not operational	The meter is not operational	The meter is not operational	The meter is not operational	The meter is not operational	
126	T25		R12.R13, H20.H21, H22.H23	<-do->	do			EB	The meter should be operational, powered up by the third CT.			The meter is operational	The meter is operational	The meter is operational	The meter is operational	The meter is operational	

SYSTEM TEST PLAN / TEST RESULTS															STANDARDS				
Project Name		SPEM Class1.0																	
RS version			1.4			Firmware /Software version			Ver2.3										
Test Environment Details			A voltmeter is connected across 1S and 2S and two ammeters, one in series with 1S and 1L and other in series with 2S and 2L. The serial port is connected to the PC via cables for checking parameter values.			Test bench Details/Configuration Details			Pulsar source.LNG reference meter.DSO.Multimeter										
System Test Cases																			
Test No.	Test ID	Test Date	Req. ID	Test Case Scenario Description	Test Description (explaining test Condition, Setup and other details)	Input Test Values		Test Case Designed For	Expected Result				Actual Result					Remarks (if any)	
						Data Element	Input Values		Output Parameter	UOM	Lower Limit	Upper Limit	WS006	WS007	WS008	WS009	WS010		
127	T26		R10,R11, H19,H20, H21,H22	<-do>	do	Incoming Phase	Connected to outgoing Phase	EB	The meter should be operational and the "Reversal" LED shall glow.										
						Incoming Neutral	Connected												
						Outgoing Phase	Connected to incoming Phase												
						Outgoing Neutral	Connected												
						Phase Voltage	240V												
						Phase Current	10A												
128			R10,R11, H19,H20, H21,H22	Meter Bypass Test	The meter shall be bypassed using a low resistance wire between 1S and 1L.	Incoming Phase	Connected	EB	The meter should be operational and the "FL" LED shall glow.										
						Incoming Neutral	Connected												
						Outgoing Phase	Connected												
						Outgoing Neutral	Connected												
						Phase Voltage	240V												
						Phase Current	10A												
						Impulse Voltage	8KV												
129			H06	Impulse voltage test	The impulse of 8KV is applied 10 times with one polarity and then repeated with the other polarity. The minimum time between the impulses shall be 3s.Impulse voltage test of electric circuits relative to earth. This shall be only a functional test.			Functionality											
						Test Voltage R.M.S.:	4KV												
130			H06	AC Voltage Test	For Protective Class 1 Meters:Points of application of test voltage: a.) Between: On one hand, all the current and voltage circuits as well as the auxiliary circuits whose reference voltage is over 40V, connected together and on the other hand, earth. b.) Between circuits not intended to be connected together in service.The test voltage shall be substantially sinusoidal, having a frequency between 45Hz and 65Hz and applied for 1 min.			Insulation											
131			H06	Meter Constant	The relation between the test output and the indication on the display shall comply with the marking on the nameplate.			Conformity											
						Phase Voltage	276V												
						Time	3 Hr												
132			H06	Test of no-load condition	The current circuit must be open circuit and a voltage of 115 % of Un shall be applied to the voltage circuit. The test output of the meter shall not produce more than one output pulse court.The minimum test period will be $Dt^2 / (600 \times 106)(k \times X \times Un \times I_{max}) \text{ min}$ where k = number of pulses emitted by the output device of the meter														
						Phase Voltage	240V												
						Frequency	50Hz												
133			H06	Test of power consumption	The active and apparent power consumption in each voltage circuit of a meter at sinusoidal reference voltage (240V +1%), reference temperature (27°C+2%), reference frequency (50Hz +0.3%) and zero magnetic induction shall not exceed 1.5W and 8VA and for each current circuit at It shall not exceed														
						Voltage Variation	+10% of Un												
						Power Factor	1												
						Limits of Variation in Percentage error	0.70%												
134			H06	Test of influence of supply voltage	Voltage Range:The additional percentage error due to the change of influence quantities with respect to the reference quantities shall not exceed the limits given below.														
						Voltage Variation	+10% of Un												
						Power Factor	0.5lag												
						Limits of Variation in Percentage error	1.00%												
135			H06	<-do>	do														
						Voltage Variation	-20% to -10% of Un												
						Power Factor	1												
						Limits of Variation in Percentage error	2.10%												
136			H06	<-do>	do														
						Voltage Variation	-20% to -10% of Un												
						Power Factor	0.5lag												
						Limits of Variation in Percentage error	3.00%												
137			H06	<-do>	do														
						Voltage Variation	+10% to +15% of Un												
						Power Factor	1												
						Limits of Variation in Percentage error	2.10%												
138			H06	<-do>	do														
						Voltage Variation	+10% to +15% of Un												
						Power Factor	0.5lag												
						Limits of Variation in Percentage error	3.00%												
139			H06	<-do>	do														
						Voltage Variation	-20% to -30% of Un												
						Power Factor	1												
						Limits of Variation in Percentage error	+10% to -100%												
140			H06	<-do>	do														
						Voltage Interruptions	100%												
						interruption time	1s												
						number of	3												
						Restoring time	50ms												
141			H06	Voltage Dips and	For testing, MD display will be used. The voltage dips and short interruptions shall not produce a change in the register of more than 0.01 KWH. When the voltage is restored, there shall not														

SYSTEM TEST PLAN / TEST RESULTS
SPEM Class1.0

Project Name		SYSTEM TEST PLAN / TEST RESULTS										STANDARDS												
RS version		1.4					Firmware /Software version					Ver2.3												
Test Environment Details		A voltmeter is connected across 1S and 2S and two ammeters, one in series with 1S and 1L and other in series with 2S and 2L. The serial port is connected to the PC via cables for checking parameter values.					Test bench Details/Configuration Details					Pulsar source.LNG reference meter.DSO.Multimeter												
System Test Cases												Remarks (if any)												
Test No.	Test ID	Test Date	Req. ID	Test Case Scenario Description	Test Description (explaining test Condition, Setup and other details)	Input Test Values		Test Case Designed For	Expected Result				Actual Result											
						Data Element	Input Values		Output Parameter	UOM	Lower Limit	Upper Limit	WS006	WS007	WS008	WS009	WS010							
					short interruptions	Have suffered degradation or no meteorological characteristics. Test Conditions:- Voltage circuit energized by reference voltage. No current in current circuits																		
142			H06	do	do	Voltage interruptions interruption time number of interruptions Restoring time between interruptions	100% 20 ms 1	EB														CBIP88		
143			H06	do	do	Voltage interruptions Dip time Number of dips	50% 1 min 1	EB															CBIP88	
144			H06	Test of influence of short-time over-currents	After the application of the short-time overcurrent 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. The meter shall be able to carry a short-time overcurrent of 30 times Imax for one half cycle at rated frequency	Basic Current Power Factor Limits of Variation in Percentage error	10A 1 1.50%	EB															IS13779	
145			H06	Test of influence of self-heating	After the voltage circuits of the meter have been energized at nominal voltage and meters without any current in the current circuits for at least 2 hours, the rated maximum current shall be applied to the current circuits. The meter error shall be measured at unity power-factor and at 0.5 lag immediately after the current is applied and then at intervals short enough to allow a correct drawing to be made of the curve of error variation as a function of time.	Phase Voltage Phase Current Power Factor Limits of Variation in Percentage error	240V 10A 1 0.70%	EB		Test result of test no.59 - 0.7%	Test result of test no.58 + 0.7%												IS13779	
146			H06	<-do->	do	Phase Voltage Phase Current Power Factor Limits of Variation in Percentage error	240V 10A 0.5lag 1%	EB		Test result of test no.59 -1%	Test result of test no.59 +1%	0.6%												IS13779
147			H06	Fast Transient Burst Test		Test Voltage on the current and voltage circuit Duration Cable length between Limits of Variation in Percentage error	4K(Common Mode) 60s at each polarity 1m 4%	EB																CBIP88
148			H06	Test of immunity to electromagnetic RF fields	Carrier modulated within 80% AM at 1KHz sine wave a.) Test with current:Unmodulated Test Field Strength: 10V/m.During the test, the behavior of the equipment shall not be perturbed and the variation of error shall be within 2%.) Test without any current:Unmodulated Test Field Strength: 30V/m	Frequency Band: Cable length exposed to the field: Test Field Strength	80MHz to 2000MHz 1m 10V/m	EB																IEC62052-11 IEC62053-21
149			H06	<-do->	<-do->	Frequency Band: Cable length exposed to the field: Test Field Strength	80MHz to 2000MHz 1m 30V/m	EB																IEC62052-11 IEC62053-21
150			H06	Test of immunity to electrostatic discharge	Meter in operating condition- Voltage circuit energized with reference voltage (Un)- Without any current in the current circuits and the current circuit shall be open circuit.The application of the electrostatic discharge 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. Meter in non-operating condition- Voltage and current circuit shall be unenergized	Test voltage: Test severity level: Number of discharges: Type of Discharge	8KV 4 10 Contact	EB																CBIP88
151			H06	Radio Interference Measurement	The test will be carried out according to CISPR22, under the following conditions:- For Class B equipment- Tested as table-top equipment- For connection to the voltage circuits, an unshielded cable length of 1m to each connector shall be used- Voltage circuits energized with reference voltage (Un)- With a current between 0.1lb and 0.2lb respectively. (Connected by unshielded cable length of 1m)			EB																IEC62052-11 IEC62053-21
152			H06	Surge Immunity Test	Cable length between Surge generator and EUT: 1mPhase angle: pulses to be applied at 60 deg, and 240deg, after zero-crossing of ACTest voltage: 4KV Generator impedance: 2W			EB																IEC62052-11 IEC62053-21
153	T27		R11_R14, UI01	MD test	The meter shall operate at a phase voltage of 240V and a Phase current of 10A and unity PF. Initially, a MD reset shall be done then the meter is operated for 30min at the same operating condition.	Phase Voltage Phase Current Power Factor Time	240V 10A 1 30min	SV		KW	2.376	2.424	2.399	2.397										
154	T28		R11_R14, UI01	<-do->	The meter shall now be operated at a relatively higher KW. The MD register shall be updated at the end of this test duration.	Phase Voltage Phase Current Power Factor Time	240V 20A 1 30min	SV		KW	4.752	4.848	4.82	4.822										
155	T29		R11_R14, UI01	<-do->	The meter shall now be operated at a relatively lower KW. The MD register shall not be updated at the end of this test duration.	Phase Voltage Phase Current Power Factor Time	240V 10A 1 30min	SV		KW	4.752	4.848	4.82	4.822										
156	T27		R11_R14, UI01	MD test	The meter shall operate at a Phase current of 240V and a Phase current of 10A and unity PF. Initially, a MD reset shall be done then the meter is operated for 60min at the same operating condition.	Phase Voltage Phase Current Power Factor Time	240V 10A 1 60min	SV		KW	2.376	2.424	2.418	2.415										
157	T28		R11_R14, UI01	<-do->	The meter shall now be operated at a relatively higher KW. The MD register shall be updated at the end of this test duration.	Phase Voltage Phase Current Power Factor Time	240V 20A 1 60min	SV		KW	4.752	4.848	4.818	4.823										
158	T29		R11_R14, UI01	<-do->	The power supply to the energymeter is switched off. The value of all the energies are noted before the commencement of this test to be compared with the data after the power is switched ON again with no current.	Phase Voltage Phase Current Power Factor Time	240V 10A 1 60min	SV		KW	4.752	4.84	4.818	4.823										

SYSTEM TEST PLAN / TEST RESULTS															STANDARDS			
Project Name		SPEM Class1.0																
RS version		1.4					Firmware /Software version		Ver2.3									
Test Environment Details		A voltmeter is connected across 1S and 2S and two ammeters, one in series with 1S and 1L and other in series with 2S and 2L. The serial port is connected to the PC via cables for checking parameter values.					Test bench Details/Configuration Details		Pulsar source.LNG reference meter.DSO.Multimeter									
System Test Cases																		
Test No.	Test ID	Test Date	Req. ID	Test Case Scenario Description	Test Description (explaining test Condition, Setup and other details)	Input Test Values		Test Case Designed For	Expected Result				Actual Result					Remarks (if any)
						Data Element	Input Values		Output Parameter	UOM	Lower Limit	Upper Limit	WS006	WS007	WS008	WS009	WS010	
159			R22	Power-Failure Interrupt	The power supply to the energymeter is switched off. The value of all the energies are noted before the commencement of this test to be compared with the data after the power is switched ON again with no current.	Power Factor	1	SV	The back-up data will be read from the EEPROM and shall be found equal to the values before the power failure.	Tested OK	Tested OK	Tested OK	Tested OK	Tested OK				
160			R15	Monthly Auto Reset	The RTC will be programmed to a suitable time very near to a month change-over. At the instant the month change-over occurs a back-up of the following parameters are taken in the EEPROM:(1) Cumulative Active & Apparent Energy (2) Maximum Demand in KW, (3) Date and Time from RTC (4) Type of Reset (5) Total Cumulative active energy	Phase Voltage	240V	SV	The values of the specified parameters at the time of RESET shall be read through serial port in the data collection mode.	Tested OK	Tested OK	Tested OK	Tested OK	Tested OK				
					Phase Current	10A												
					Power Factor	1												
161			R17,R10	Tariff update test	The meter shall be operated at the nominal voltage and current during the entire period of a specified tariff. During this period the energy consumed shall be updated in the respective tariff at the end of slot.	Phase Voltage	240V	SV	The LCD displays the respective tariff energies.	Tested OK	Tested OK	Tested OK	Tested OK	Tested OK				
					Phase Current	10A												
					PF	1												
					Frequency	50Hz												
162			R10, R17, R24, R25	Programming parameters	Refer the document RENO144SCP01(Serial Communication Procedure)programming various parameters	Phase Voltage	240V	SV	The result should as per the document	Tested OK	Tested OK	Tested OK	Tested OK	Tested OK				
					Phase Current	10A												
					PF	1												
					Frequency	50Hz												
163	T21		R21,H13	Manual scrolling to auto scrolling	Press the up or down key to switch the meter to manual scrolling mode and after 5 min the meter will again start scrolling in auto scrolling mode.	Phase Voltage	240V		The switch over from manual to auto scroll will be 5 min.	Tested OK	Tested OK	Tested OK	Tested OK	Tested OK				
					Phase Current	10A												
					PF	1												
					Frequency	50Hz												
					Time	5Min												