





 <p>Yadav Measurements</p>	TEST REPORT		  <p>TC-6594</p>
	<p>Issued by : YADAV MEASUREMENTS PRIVATE LIMITED Plot No. F-373-375 RIICO Bhamashah Industrial Area, Kaladwas, Udaipur-Rajasthan-313003, INDIA Tel: 0091-294-2650127, 28, Fax: 0091-294-2650129 Email: Yadav.measurements@yadavmeasurements.com website: www.yadavmeasurements.com CIN number: U31909RJ2003PTC018450</p>		




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1a.	Tested for:	AIWAA SYSTEMS PRIVATE LIMITED No 109, 2 Floor BTM 4 Stage 80 Feet Road, Bangalore Bengaluru Urban, KARNATAKA, 560076
1b.	Submitted by:	AIWAA SYSTEMS PRIVATE LIMITED No 109, 2 Floor BTM 4 Stage 80 Feet Road, Bangalore Bengaluru Urban, KARNATAKA, 560076
1c.	Test Certificate as per:	IEC 62052-11 and IEC 62053-22:2020 Amend 0
1d.	Location of testing:	YADAV MEASUREMENTS PRIVATE LIMITED Plot no. F-373-375 RIICO Bhamashah Industrial Area, Kaladwas , Udaipur-Rajasthan-313003, INDIA
2.	Reference:	Customer order number: nil Service Request form number: 2024-2025/2652/2 Date of receipt of the instrument: December 24, 2024 Condition of item on receipt: Satisfactory
3.	Test certificate:	Date of issue: February 11, 2025 Date of testing: From January 04, 2025 To January 06, 2025
4.	Description of equipment under test:	
	Number of sample(s):	1
	Nature of sample(s):	3 Phase 4 Wire ac Static Energy Meter
	Type/Model:	PEA2488
	Meter constant:	16000 Imp/kWh #
	Unit:	-
	Serial Number(s):	2400000073
	Reference voltage(Vref):	240 V LN #
	Basic Current(Ib):	5A
	Rated maximum current(I _{max}):	7.5A
	Reference Frequency:	50 Hz #
	Accuracy class:	0.2s
	Make:	AIWAA SYSTEM
	Year of manufacture:	17/12/2024
	Auxiliary supply:	240 V #
	Minimum Current(I _{min}):	0.005A

<p>Checked by : Annapurna Shaktawat </p>	<p>Approved by :   Himanshu Was</p>	
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5. Status :- D = Test done, ND = Test not done, NA = Test not applicable, PD = Test partially done
 Result :- C=Conform, NC=Non Conform, NA = Not applicable
 DR:- Decision Rule

5.1 Test procedure as per standard: IEC 62052-11 and IEC 62053-22:2020 Amend 0

Clause Name	S.No.	Test Name	Decision Rule	Status	Result
TEST OF SAFETY REQUIREMENTS	1	TESTS RELATED TO SAFETY	-	ND	NA
TESTS OF MECHANICAL REQUIREMENTS	1	SHOCK TEST	-	ND	NA
	2	VIBRATION TEST	-	ND	NA
	3	TERMINALS – TERMINAL BLOCK(S)	-	ND	NA
TESTS OF GENERAL REQUIREMENTS	1	POWER CONSUMPTION	-	ND	NA
	2	OPTICAL TEST OUTPUT	-	ND	NA
	3	ELECTRICAL PULSE OUTPUT	-	ND	NA
	4	ELECTRICAL PULSE INPUT	-	ND	NA
	5	METER MARKING: GENERAL INFORMATION	-	ND	NA
	6	METER MARKING: GENERAL INFORMATION FOR INSTALLATION AND COMMISSIONING	-	ND	NA
	7	METER MARKING: GENERAL INFORMATION FOR USE	-	ND	NA
	8	METER MARKING: GENERAL INFORMATION FOR MAINTENANCE	-	ND	NA
	9	METER MARKING: INFORMATION SPECIFIC FOR METERS	-	ND	NA
	10	METER MARKING: INFORMATION SPECIFIC FOR STAND-ALONE TARIFF AND LOAD CONTROL EQUIPMENT	-	ND	NA
TEST OF ACCURACY REQUIREMENTS	1	LIMITS OF ERROR DUE TO VARIATION OF THE CURRENT	DR6	D	C
	2	METER CONSTANT	DR6	D	C
	3	INITIAL START-UP OF THE METER	DR3	D	C
	4	STARTING CURRENT TEST	DR3	D	C
	5	TEST OF NO-LOAD CONDITION	DR3	D	C
	6	REPEATABILITY TEST	DR6	D	C

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TESTS FOR ELECTROMAGNETIC COMPATIBILITY (EMC) AND LIMITS OF ERROR DUE TO INFLUENCE QUANTITIES	1	VOLTAGE DIPS AND SHORT INTERRUPTIONS	-	ND	NA
	2	ELECTROSTATIC DISCHARGE IMMUNITY TEST	-	ND	NA
	3	RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD IMMUNITY TEST – TEST WITHOUT CURRENT	-	ND	NA
	4	RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD IMMUNITY TEST – TEST WITH CURRENT	-	ND	NA
	5	ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST	-	ND	NA
	6	IMMUNITY TO CONDUCTED DISTURBANCES, INDUCED BY RADIO-FREQUENCY FIELDS	-	ND	NA
	7	TEST FOR IMMUNITY TO CONDUCTED, DIFFERENTIAL MODE DISTURBANCES AND SIGNALLING IN THE FREQUENCY RANGE 2 KHZ TO 150 KHZ AT AC POWER PORTS	-	ND	NA
	8	SURGE IMMUNITY TEST	-	ND	NA
	9	RING WAVE IMMUNITY TEST	-	ND	NA
	10	DAMPED OSCILLATORY WAVE IMMUNITY TEST	-	ND	NA
	11	EXTERNAL STATIC MAGNETIC FIELDS	-	ND	NA
	12	POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST	-	ND	NA
	13	EMISSION REQUIREMENTS	-	ND	NA
	14	LIMITS OF PERCENTAGE ERROR DUE TO INFLUENCE QUANTITIES	-	NA	NA

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TESTS OF IMMUNITY TO OTHER INFLUENCE QUANTITIES	1	HARMONICS IN THE CURRENT AND VOLTAGE CIRCUITS 5TH HARMONIC TEST	-	ND	NA
	2	INTERHARMONICS IN THE CURRENT CIRCUIT – BURST FIRED WAVEFORM TEST	-	ND	NA
	3	ODD HARMONICS IN THE CURRENT CIRCUIT	-	ND	NA
	4	VOLTAGE VARIATION	-	ND	NA
	5	AMBIENT TEMPERATURE VARIATION	-	ND	NA
	6	INTERRUPTION OF PHASE VOLTAGE	-	ND	NA
	7	FREQUENCY VARIATION	-	ND	NA
	8	REVERSED PHASE SEQUENCE	-	ND	NA
	9	AUXILIARY VOLTAGE VARIATION	-	ND	NA
	10	OPERATION OF AUXILIARY DEVICES	-	ND	NA
	11	SHORT TIME OVERCURRENTS	-	ND	NA
	12	SELF-HEATING	-	ND	NA
	13	FAST LOAD CURRENT VARIATIONS	-	ND	NA
	14	EARTH FAULT	-	ND	NA
TEST OF THE EFFECT OF THE CLIMATIC ENVIRONMENTS	1	DRY HEAT TEST	-	ND	NA
	2	COLD TEST	-	ND	NA
	3	DAMP HEAT, CYCLIC TEST	-	ND	NA
	4	PROTECTION AGAINST SOLAR RADIATION	-	NA	NA
	5	DURABILITY	-	ND	NA
CONSTRUCTION REQUIREMENTS	1	WINDOW	-	ND	NA
	2	SEALING PROVISIONS	-	ND	NA
	3	DISPLAY OF MEASURED VALUES	-	ND	NA
	4	STORAGE OF MEASURED VALUES	-	ND	NA
	5	AUXILIARY POWER SUPPLY	-	ND	NA
	6	OPERATION INDICATOR	-	ND	NA
MARKING AND DOCUMENTATION	1	METER MARKING	-	ND	NA
	2	CONNECTION DIAGRAMS AND TERMINAL MARKING	-	ND	NA
	3	SYMBOLS	-	ND	NA
	4	DOCUMENTATION	-	ND	NA

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TEST OF TIME KEEPING ACCURACY	1	TEST OF CRYSTAL-CONTROLLED TIME SWITCHES SUPPLIED BY MAINS	-	ND	NA
	2	TEST OF CRYSTAL-CONTROLLED TIME SWITCHES ON OPERATION RESERVE	-	ND	NA
	3	TEST OF TIME-KEEPING ACCURACY OF CRYSTAL-CONTROLLED TIME SWITCHES WITH TEMPERATURE	-	ND	NA
	4	TEST OF SYNCHRONOUS TIME SWITCHES SUPPLIED BY MAINS	-	ND	NA
	5	TEST OF SYNCHRONOUS TIME SWITCHES ON OPERATION RESERVE	-	ND	NA

6. Notes/Remarks



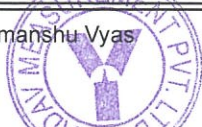
6.1) Remarks (if any):

a) "#" Information as provided by customer.

6.2) Notes:

- a) This certificate relates only to the particular sample(s) received for testing at YMPL.
- b) Only the test(s) asked by the customer has been carried out.
- c) This certificate, in full or in part, shall not be published, advertised, used for any legal action, unless prior permission has been secured.
- d) Any anomaly/discrepancy in this test report/certificate should be brought to our notice within 45 days from the date of issue.
- e) Authenticity of this certificate can be verified by sending details of certificate to Yadav.measurements@yadavmeasurements.com
- f) Wherever referred reference temperature of meter(s) =
- g) Testing has been done in environmental conditions as specified by the standard (if any). If required by the standard Temperature(°C): 23±2 Relative Humidity(%RH): <75 is maintained.
- h) Lab is responsible for the information provided in test report except for the information supplied by the customer.
- i) Wherever referred (critical change) value of X =
- j) Decision Rule (DR3):
 The decision rule applied in the test report for the decision of conform or non-conform is as below;
 When consideration of measurement uncertainty (MU) is not inherent in standard / specification of the test then;
 Conform- when the measured / applied value is within the acceptance Limit (AL), where AL = TL - w.(TL=tolerance limit)
 Non-conform- the measured value is above the acceptance limit, AL= TL - w
 where guard band w is such that the probability of correct conformance decision is greater than or equal to 50.0%.
 (w=r.Ux where Ux is test setup expanded uncertainty such that TUR is greater than or equal to 2 and r = 0 is a guard band multiplier associated with above probability of correct conformance decision.)
 Decision Rule (DR6):
 The decision rule applied in the test report for the decision of conform or non-conform is as below;
 When consideration of MU is inherent in standard / specification of the test then;
 Conform- when the measured value is equal to or within the tolerance limit TL.
 Non-conform - the measured value is above the tolerance limit TL.
 The probability of correct conformance (or non-conformance) decision is as per the requirement of test mentioned in the standard / specification.
- k) This certificate is issued in accordance with the laboratory accreditation requirements of the National Accreditation Board for testing and calibration laboratories (NABL). This certificate may not be reproduced other than full, except with the prior written approval of the issuing laboratory.
- l) These test/tests are covered under below mention Discipline and Group:
 Discipline: Electrical
 Group: Electrical indicating & recording instruments

7. Test Results: - The test results are given on next page(s).

Checked by : Annapurna Shaktawat 	Approved by : Himanshu Vyas  
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Yadav Measurements

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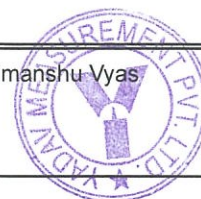
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PHOTOGRAPH(S) OF EUT



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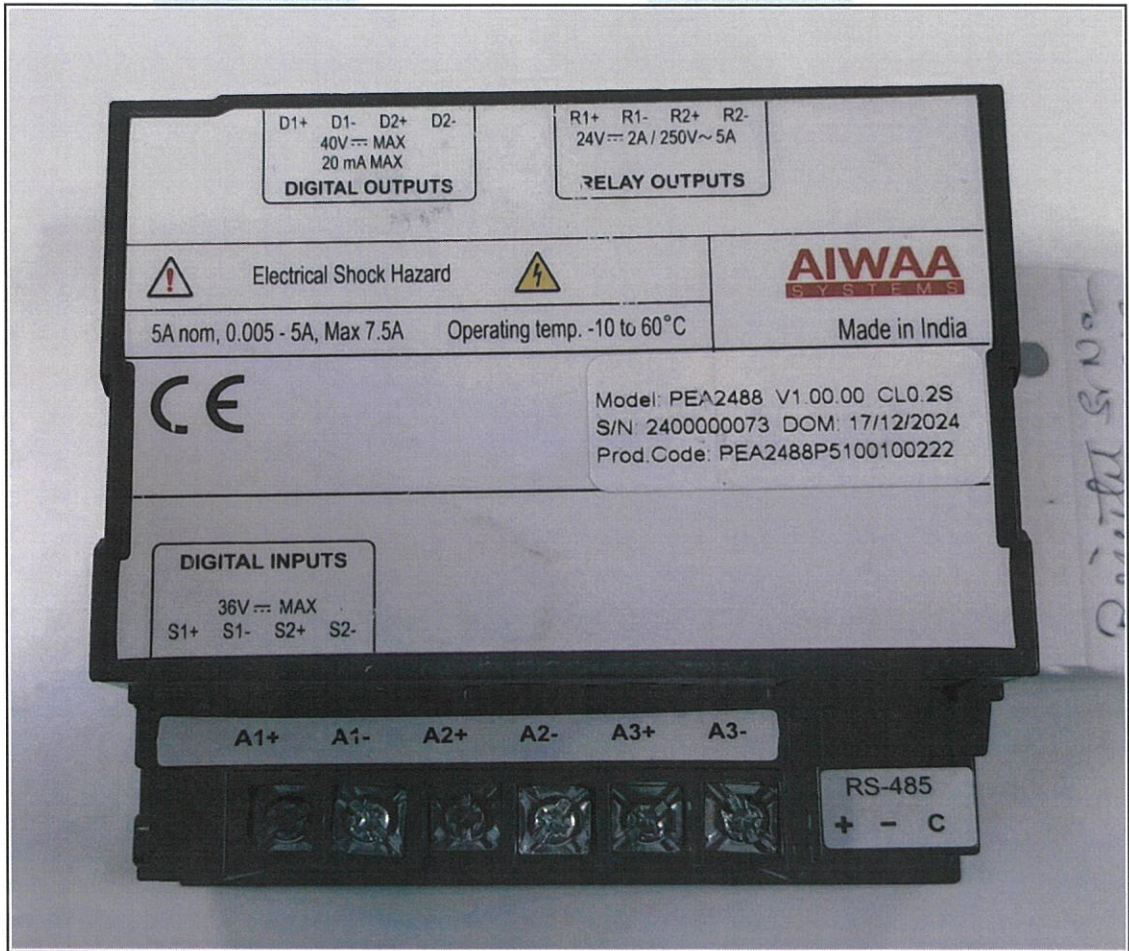
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Sr. No.	Requirement as per specification	Measured Values/Observations	Conclusion
8	TEST OF ACCURACY REQUIREMENTS		
8.1	LIMITS OF ERROR DUE TO VARIATION OF THE CURRENT (Clause No.-7.9 of IEC 62052-11:2020 and IEC 62053-22:2020)		Conform
	Balance Load Error :- Meter (s) are energized under reference condition with polyphase voltages and balanced currents. Active energy error (Import mode)		
	Current	CosØ	Allowed % error
			2400000073
	I _{max}	1.0	±0.2
			-0.02
	I _{max}	0.5 ind.	±0.3
			-0.04
	I _{max}	0.8 cap.	±0.3
			0.00
	I _n	1.0	±0.2
			-0.01
	I _n	0.5 ind.	±0.3
			-0.02
	I _n	0.8 cap.	±0.3
			-0.01
	0.1I _n	1.0	±0.2
			-0.02
	0.1I _n	0.5 ind.	±0.3
			0.13
	0.1I _n	0.8 cap.	±0.3
			-0.09
	0.05I _n	1.0	±0.2
			-0.02
	0.02I _n	0.5 ind.	±0.5
			0.15
	0.02I _n	0.8 cap.	±0.5
			-0.02
	I _{min}	1.0	±0.4
			0.07

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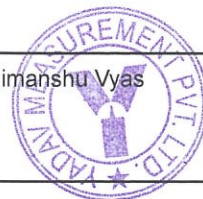
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Sr. No.	Requirement as per specification	Measured Values/Observations	Conclusion		
	Active energy error (Export mode)				
	Current	Cos ϕ	Allowed % error	2400000073	
	I _{max}	1.0	±0.2	-0.02	
	I _{max}	0.5 ind.	±0.3	-0.05	
	I _{max}	0.8 cap.	±0.3	-0.04	
	I _n	1.0	±0.2	-0.01	
	I _n	0.5 ind.	±0.3	0.00	
	I _n	0.8 cap.	±0.3	0.00	
	0.1I _n	1.0	±0.2	-0.02	
	0.1I _n	0.5 ind.	±0.3	0.02	
	0.1I _n	0.8 cap.	±0.3	-0.07	
	0.05I _n	1.0	±0.2	-0.01	
	0.02I _n	0.5 ind.	±0.5	0.08	
	0.02I _n	0.8 cap.	±0.5	0.05	
	I _{min}	1.0	±0.4	0.12	
	Unbalance Load Error :- Meter (s) are energized under reference condition with polyphase voltages and single phase currents.				

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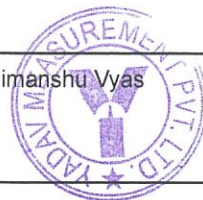
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Sr. No.	Requirement as per specification	Measured Values/Observations				Conclusion
		R-phase current applied (Import mode)				
		Current	Cos ϕ	Allowed % error	2400000073	
		I _{max}	1.0	±0.2	-0.02	
		I _{max}	0.5 ind.	±0.3	0.15	
		I _{max}	0.8 cap.	±0.3	-0.14	
		I _n	1.0	±0.2	-0.01	
		I _n	0.5 ind.	±0.3	0.00	
		I _n	0.8 cap.	±0.3	-0.02	
		0.1I _n	1.0	±0.2	-0.05	
		0.1I _n	0.5 ind.	±0.3	-0.02	
		0.1I _n	0.8 cap.	±0.3	-0.07	
		0.05I _n	1.0	±0.2	-0.06	
		0.02I _n	0.5 ind.	±0.5	-0.02	
		0.02I _n	0.8 cap.	±0.5	-0.06	
		I _{min}	1.0	±0.4	-0.12	




Checked by : Annapurna Shaktawat

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Approved by : Himanshu Vyas



[Signature]




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	Y-phase current applied (Import mode)					
	Current	CosØ	Allowed % error	2400000073		
	I _{max}	1.0	±0.2	-0.02		
	I _{max}	0.5 ind.	±0.3	-0.12		
	I _{max}	0.8 cap.	±0.3	0.02		
	I _n	1.0	±0.2	-0.01		
	I _n	0.5 ind.	±0.3	-0.07		
	I _n	0.8 cap.	±0.3	0.01		
	0.1I _n	1.0	±0.2	0.01		
	0.1I _n	0.5 ind.	±0.3	0.02		
	0.1I _n	0.8 cap.	±0.3	0.00		
	0.05I _n	1.0	±0.2	0.02		
	0.02I _n	0.5 ind.	±0.5	0.11		
	0.02I _n	0.8 cap.	±0.5	0.16		
	I _{min}	1.0	±0.4	0.33		

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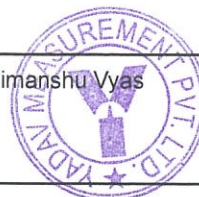
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	B-phase current applied (Import mode)					
	Current	CosØ	Allowed % error	2400000073		
	I _{max}	1.0	±0.2	-0.02		
	I _{max}	0.5 ind.	±0.3	0.01		
	I _{max}	0.8 cap.	±0.3	-0.09		
	I _n	1.0	±0.2	-0.02		
	I _n	0.5 ind.	±0.3	0.02		
	I _n	0.8 cap.	±0.3	-0.03		
	0.1I _n	1.0	±0.2	-0.03		
	0.1I _n	0.5 ind.	±0.3	0.01		
	0.1I _n	0.8 cap.	±0.3	-0.05		
	0.05I _n	1.0	±0.2	-0.03		
	0.02I _n	0.5 ind.	±0.5	0.05		
	0.02I _n	0.8 cap.	±0.5	-0.02		
	I _{min}	1.0	±0.4	0.05		

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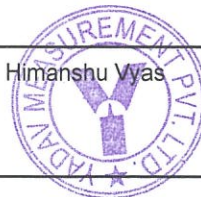
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Sr. No.	Requirement as per specification	Measured Values/Observations	Conclusion
	R-phase current applied (Export mode)		
	Current	CosØ	Allowed % error
	2400000073		
	I _{max}	1.0	±0.2
	-0.03		
	I _{max}	0.5 ind.	±0.3
	-0.05		
	I _{max}	0.8 cap.	±0.3
	-0.06		
	I _n	1.0	±0.2
	-0.02		
	I _n	0.5 ind.	±0.3
	-0.01		
	I _n	0.8 cap.	±0.3
	-0.03		
	0.1I _n	1.0	±0.2
	-0.04		
	0.1I _n	0.5 ind.	±0.3
	0.21		
	0.1I _n	0.8 cap.	±0.3
	-0.15		
	0.05I _n	1.0	±0.2
	-0.04		
	0.02I _n	0.5 ind.	±0.5
	0.21		
	0.02I _n	0.8 cap.	±0.5
	-0.10		
	I _{min}	1.0	±0.4
	-0.06		




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[Signature]




 Yadav Measurements	TEST REPORT	  TC-6594
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Sr. No.	Requirement as per specification	Measured Values/Observations	Conclusion
	Y-phase current applied (Export mode)		
	Current	Cos ϕ Allowed % error	2400000073
	I _{max}	1.0 \pm 0.2	-0.02
	I _{max}	0.5 ind. \pm 0.3	-0.12
	I _{max}	0.8 cap. \pm 0.3	0.02
	I _n	1.0 \pm 0.2	-0.01
	I _n	0.5 ind. \pm 0.3	-0.06
	I _n	0.8 cap. \pm 0.3	0.01
	0.1I _n	1.0 \pm 0.2	0.01
	0.1I _n	0.5 ind. \pm 0.3	0.07
	0.1I _n	0.8 cap. \pm 0.3	-0.02
	0.05I _n	1.0 \pm 0.2	0.03
	0.02I _n	0.5 ind. \pm 0.5	0.19
	0.02I _n	0.8 cap. \pm 0.5	0.19
	I _{min}	1.0 \pm 0.4	0.10

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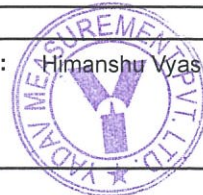
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Sr. No.	Requirement as per specification	Measured Values/Observations	Conclusion
	B-phase current applied (Export mode)		
	Current	CosØ	Allowed % error
	2400000073		
	I _{max}	1.0	±0.2
	-0.03		
	I _{max}	0.5 ind.	±0.3
	-0.01		
	I _{max}	0.8 cap.	±0.3
	-0.04		
	I _n	1.0	±0.2
	-0.02		
	I _n	0.5 ind.	±0.3
	0.02		
	I _n	0.8 cap.	±0.3
	-0.03		
	0.1I _n	1.0	±0.2
	-0.04		
	0.1I _n	0.5 ind.	±0.3
	0.00		
	0.1I _n	0.8 cap.	±0.3
	-0.06		
	0.05I _n	1.0	±0.2
	-0.04		
	0.02I _n	0.5 ind.	±0.5
	-0.04		
	0.02I _n	0.8 cap.	±0.5
	-0.05		
	I _{min}	1.0	±0.4
	0.01		
8.2	METER CONSTANT (Clause No.-7.4 of IEC 62052-11:2020 and IEC 62053-22:2020)		Conform
	<p>The relationship between the test output and the indication on the indicating display, if present, and/or the meter energy register content read through the communications interface, shall comply with the value of the meter constant.</p> <p>The difference between the value determined (or calculated) from the test output and the value on the indicating display, or the register content read via data communications port shall not exceed ±1/10th of the intrinsic error limit for the relevant accuracy class.</p> <p>The manufacturer documentation and the test report shall state the number of pulses required to verify this requirement. Conformity shall be checked by measuring a sufficient amount of energy, observing the test output and reading the display.</p>	<p>Satisfactory (For active energy)</p> <p>The difference between the value determined (or calculated) from the test output and the value on the indicating display is 0.01% which is not exceeded ±1/10th of the intrinsic error limit.</p> <p>Conformity is checked by measuring 19218 kWh energy, observing the test output and reading the display.</p>	
8.3	INITIAL START-UP OF THE METER (Clause No.-7.5 of IEC 62052-11:2020 and IEC 62053-22:2020)		Conform




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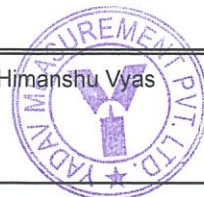
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Sr. No.	Requirement as per specification	Measured Values/Observations	Conclusion
	<p>The meter shall start to register energy after the start-up time specified by the manufacturer. Generally, the start-up time of the meter shall be not more than 10 s, except for multi-function meters.</p> <p>In the case of multi-function meters with a real-time operating system and complex embedded firmware, or in the case of meters with SCS that open during power down and close again once the meter is energized, 10 s may not be achievable or economically justifiable. In such cases, the manufacturer and the purchaser may agree on a larger value for start-up time.</p> <p>If the meter is rated for more than one nominal voltage, the lowest nominal voltage shall be used.</p>	<p>The meter started to register energy within 4sec which is less than the startup time declared by customer i.e. 10 sec.</p> <p>Not applicable.</p>	
8.4	STARTING CURRENT TEST (Clause No.-7.7 of IEC 62052-11:2020 and 4.2.2 of IEC 62053-22:2020)		Conform
	<p>The lowest specified nominal voltage of the meter shall be used.</p> <p>The meter shall start and continue to run at 0.001In and UPF for transformer operated meters.</p> <p>If the meter is designed for the measurement of energy in both directions, then the starting current test shall be applied with energy flowing in each direction.</p>	<p>Meter started and continued to record energy at 0.001In and UPF for both import and export active energy.</p>	
8.5	TEST OF NO-LOAD CONDITION (Clause No.-7.6 of IEC 62052-11:2020 and IEC 62053-22:2020)		Conform
	<p>When the voltage is applied to the voltage circuits and if present, to the auxiliary power supply circuit, with no current flowing in the current circuits, the test output of the meter shall not produce more than one pulse.</p> <p>For this test, the SCS if fitted, shall be closed, the current circuit shall be open-circuit and a voltage of 1,1 Un (110 % of the nominal voltage, i.e. the maximum specified operating voltage) shall be applied to the mains port. For meters rated for multiple nominal voltages, the highest rated nominal voltage shall be used.</p> <p>The minimum test period shall be $\Delta t \geq (240 \times 10^3) / (k \times m \times U_{test} \times I_{start})$ minutes.</p>	<p>Satisfactory</p> <p>The meter did not produce any test output pulse.</p>	
8.6	REPEATABILITY TEST (Clause No.-7.8 of IEC 62052-11:2020 and IEC 62053-22:2020)		Conform
	<p>The lowest specified nominal voltage of the meter shall be used.</p> <p>The repeatability shall be less than, or equal to 1/5th of the absolute intrinsic error limit for the relevant accuracy class.</p> <p>At least three measurements shall be done at each of the</p>		

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Sr. No.	Requirement as per specification	Measured Values/Observations	Conclusion		
	test points, at the same test conditions and in close succession, after the meter under test has achieved thermal stability	Repeatability test			
		% Error variation(Import active error)			
		Current	cos ϕ	% error limits	2400000073
		I _{max}	1.0	± 0.04	0.00
		I _{max}	0.5 ind.	± 0.06	0.02
		I _{max}	0.8 cap.	± 0.06	0.01
		I _n	1.0	± 0.04	0.02
		I _n	0.5 ind.	± 0.06	0.01
		I _n	0.8 cap.	± 0.06	0.02
		0.05I _n	1.0	± 0.04	0.00
		0.05I _n	0.5 ind.	± 0.1	0.00
		0.05I _n	0.8 cap.	± 0.1	0.00
		I _{min}	1.0	± 0.08	0.00

*** End of Report ***

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