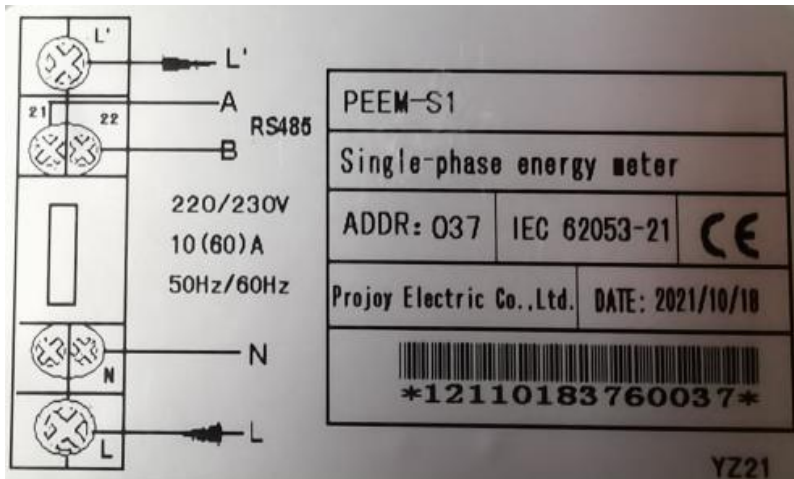


Technical Construction File EN IEC 62053-21:2021 Electricity metering equipment - Particular requirements - Part 21: Static meters for AC active energy(classes 0,5, 1 and 2) (IEC 62053-21:2020)	
Report Reference No.....:	TLJS21120835220
Tested by (name + signature).....:	
Approved by (name + signature).....:	Stephen Zhang
	Kosoco Yu
Date of issue.....:	December 09, 2021
Testing laboratory name:	Shanghai Global Testing Services Co., Ltd
Address.....:	Floor 2nd, Building D-1, No. 128, Shenfu Road, Minhang District, Shanghai, China.
Applicant's name:	Projoy Electric Co.,Ltd.
Address.....:	No. 2266, Taiyang Road, Xiangcheng District, Suzhou, China
Manufacturer.....	Projoy Electric Co.,Ltd.
Address.....	No. 2266, Taiyang Road, Xiangcheng District, Suzhou, China
Test specification::	
Standard.....	EN IEC 62053-21:2021
Test procedure	PEEM
Non-standard test method.....:	N/A
Test Report Form No:	EN 62053-21
TRF originator.....:	GTS
Master TRF.....:	2021-07



Test item	
Type of test object	PEEM
Trademark	/
Test model and/or type reference.....	PEEM-S1
Equipment mobility.....	/
Operating condition	/
Tested for IT power systems :	No
IT testing, phase-phase voltage (V) :	220V/230V, 10(60)A, 50Hz/60Hz
Class of equipment :	/
Testing	
Date of receipt of test item.....	December 01, 2021
Date(s) of performance of test.....	December 01, 2021 to December 09, 2021
Possible test case verdicts	
Test case does not apply to the test object.....	N(.A.)
Test object does meet the requirement.....	P(ass)
Test object does not meet the requirement.....	F(ail)
General remarks	
<p>“(see remark #)” refers to a remark appended to the report.</p> <p>“(see appended table)” refers to a table appended to the report.</p> <p>Throughout this report a comma is used as the decimal separator.</p> <p>The test results presented in this report relate only to the object tested.</p> <p>This report shall not be reproduced except in full without the written approval of the testing laboratory.</p>	
Brief description of the tested sample(s):	
Ambient temperature: 22°C~25°C, humidity: 50%~55%RH.	
Complete test was conducted on PEEM-S1	

Marking:



EN IEC 62053-21:2021																					
Clause	Requirement-Test	Result-Remark	Verdict																		
4	Standard electrical values		--																		
	The values given in IEC 62052-11:2020 apply.	See the test report of IEC 62052-11	P																		
4.1	Voltages		--																		
	The values given in IEC 62052-11:2020 apply.	See the test report of IEC 62052-11	P																		
4.2	Currents		--																		
4.2.1	Nominal currents		--																		
	The values given in IEC 62052-11:2020 apply.	See the test report of IEC 62052-11	P																		
4.2.2	Starting current		--																		
	The requirements and acceptance criteria of IEC 62052-11:2020 apply (see Table 1)	See the test report of IEC 62052-11	P																		
Table 1 – Starting current																					
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Meters for</th> <th colspan="3">Starting current I_{st}</th> <th rowspan="2">Power factor $\cos \phi$</th> </tr> <tr> <th>class 0,5</th> <th>class 1</th> <th>class 2</th> </tr> </thead> <tbody> <tr> <td>Direct connection</td> <td>0,004 I_n</td> <td>0,004 I_n</td> <td>0,005 I_n</td> <td>1</td> </tr> <tr> <td>Connection through current transformers</td> <td>0,002 I_n</td> <td>0,002 I_n</td> <td>0,003 I_n</td> <td>1</td> </tr> </tbody> </table>				Meters for	Starting current I_{st}			Power factor $\cos \phi$	class 0,5	class 1	class 2	Direct connection	0,004 I_n	0,004 I_n	0,005 I_n	1	Connection through current transformers	0,002 I_n	0,002 I_n	0,003 I_n	1
Meters for	Starting current I_{st}				Power factor $\cos \phi$																
	class 0,5	class 1	class 2																		
Direct connection	0,004 I_n	0,004 I_n	0,005 I_n	1																	
Connection through current transformers	0,002 I_n	0,002 I_n	0,003 I_n	1																	
4.2.3	Minimum current																				
	The requirements and acceptance criteria of IEC 62052-11:2020 apply (see Table 2).		P																		
Table 2 – Minimum current																					
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Meters for</th> <th>Minimum current I_{min} class 0,5, class 1 and class 2</th> </tr> </thead> <tbody> <tr> <td>Direct connection</td> <td>0,05 I_n</td> </tr> <tr> <td>Connection through current transformers</td> <td>0,02 I_n</td> </tr> </tbody> </table>				Meters for	Minimum current I_{min} class 0,5, class 1 and class 2	Direct connection	0,05 I_n	Connection through current transformers	0,02 I_n												
Meters for	Minimum current I_{min} class 0,5, class 1 and class 2																				
Direct connection	0,05 I_n																				
Connection through current transformers	0,02 I_n																				
4.2.4	Maximum current		--																		
	The requirements and acceptance criteria of IEC 62052-11:2020 apply	See the test report of IEC 62052-11	P																		
4.3	Frequencies		--																		
	The values given in IEC 62052-11:2020 apply.																				
4.4	Power consumption		--																		
	The requirements, test conditions and procedures, and acceptance criteria of IEC 62052-11:2020 apply	See the test report of IEC 62052-11	P																		
5	Construction requirements		--																		

	The requirements, test conditions and procedures, and acceptance criteria of IEC 62052-11:2020 apply.	See the test report of IEC 62052-11	P
6	Meter marking and documentation		--
	The requirements of IEC 62052-11:2020 apply.	See the test report of IEC 62052-11	P
7	Accuracy requirements		--
7.1	General test condition		--
	The test conditions of IEC 62052-11:2020 apply	See the test report of IEC 62052-11	P
7.2	Methods of accuracy verification		--
	The requirements, test conditions and procedures, and acceptance criteria of IEC 62052-11:2020 apply	See the test report of IEC 62052-11	P
7.3	Measurement uncertainty		--
	The requirements, test conditions and procedures, and acceptance criteria of IEC 62052-11:2020 apply.	See the test report of IEC 62052-11	P
7.4	Meter constant	No damage	--
	The requirements, test conditions and procedures, and acceptance criteria of IEC 62052-11:2020 apply.	See the test report of IEC 62052-11	P
7.5	Initial start-up of the meter		--
	The requirements, test conditions and procedures, and acceptance criteria of IEC 62052-11:2020 apply.	See the test report of IEC 62052-11	P
7.6	Test of no-load condition		--
	The requirements, test conditions and procedures, and acceptance criteria of IEC 62052-11:2020 apply.	See the test report of IEC 62052-11	P
7.7	Starting current test		--
	The requirements, test conditions and procedures, and acceptance criteria of IEC 62052-11:2020 apply.	See the test report of IEC 62052-11	P
7.8	Repeatability test		--
	The requirements, test conditions and procedures, and acceptance criteria of IEC 62052-11:2020 apply.		P
7.9	Limits of error due to variation of the current		--
	When the meter is operated under the reference conditions given in IEC 62052-11:2020, 7.1 , the percentage errors shall not exceed the limits for the relevant accuracy class given in Table 3.		P
	If the meter is designed for the measurement of energy in both directions, the values in Table 3 shall apply for each direction.		P
	If the meter is rated for multiple connection modes, the accuracy testing results are valid only for the connection modes tested and cannot be used to claim accuracy for other, untested connection modes.		P
7.10	Limits of error due to influence quantities		--
	Tests and test conditions given in IEC 62052-	See the test report of IEC 62052-	P

	11:2020, 7.1 apply. If the meter is rated for multiple connection modes, the accuracy requirements apply for each of the connection modes. All tests of effects of influence quantities shall be performed in one connection mode selected to exercise the complete metrological capability of the meter.	11	
7.1 1	Time-keeping accuracy		--
	The requirements, test conditions and procedures, and acceptance criteria of IEC 62052-11 :2020 apply.	See the test report of IEC 62052-11	P
8	Climatic requirements		--
	The requirements, test conditions and procedures, and acceptance criteria of IEC 62052-11 :2020 apply.	See the test report of IEC 62052-11	P
9	The effects of external influences		--
	The requirements, test conditions and procedures, and acceptance criteria of IEC 62052-11 :2020 apply. Table 1 3 in IEC 62052-11:2020 gives an overview of the requirements. For tests with acceptance criteria A, Table 4 of this document shall be used	See the test report of IEC 62052-11	P
10	Type test		--
	The requirements given in IEC 62052-11 :2020 apply.	See the test report of IEC 62052-11	P

IEC 62052-11			
Clause	Requirement – Test	Result	Verdict
4	Standard electrical values		P
4.1	Standard reference voltages		P
	Direct connection	Direct connection(220V)	P
	Connection through voltage transformer(s)	Direct connection	N
4.2	Standard currents		P
	Direct connection (I _b)		P
	Connection through current transformer(s) (I _n)	Direct connection	N
4.2.1	Maximum current		P
	Direct connected meters is preferably an integral multiple of the basic current	10(60)A	P
	When the meter is operated from (a) current transformer(s), attention is drawn to the need to match the current range of the meter in relation to that of the secondary of the current transformer(s). The maximum current of the meter is 1,2 I _n , 1,5 I _n or 2 I _n .		N
4.3	Standard reference frequencies		P
	Frequencies: 50Hz and 60Hz	50Hz/60Hz	P
5	Mechanical requirements and tests		P
5.1	Personal safety against electric shock;	Pass muster	P
	Personal safety against effects of excessive temperature;	Pass muster	P
	Protection against spread of fire;	Pass muster	P
	Protection against penetration of solid objects, dust and water.	Pass muster	P
5.2	Case		P
5.2.1	The meter shall have a case which can be sealed in such a way that the internal parts of the meter are accessible only after breaking the seal(s).		P
	Not be removable without the use of a tool.		P
	Constructed and arranged that any non-permanent deformation cannot prevent the satisfactory operation of the meter.		P
	Unless otherwise specified, meters intended to be connected to a supply mains where the voltage under reference conditions exceeds 250 V to earth, and whose case is wholly or partially made of metal, shall be provided with a protective earth terminal.	220V/230V	N
5.2.2	Mechanical tests		
5.2.2.1	Spring hammer test		
	With IEC 60068-2-75, 0,2 J ± 0,02 J.	Not damage	P
5.2.2.2	Shock test		P
	Meter in non-operating condition, without the packing; half-sine pulse; peak acceleration: 30 gn (300 m/s ²); duration of the pulse: 18 ms.	Not damage or change of the information	P

5.2.2.3	Vibration test		P
	meter in non-operating condition, without the packing; frequency range: 10 Hz to 150 Hz; transition frequency: 60 Hz; $f < 60$ Hz, constant amplitude of movement 0,075 mm; $f > 60$ Hz, constant acceleration 9,8 m/s ² (1 g); single point control; number of sweep cycles per axis: 10.	Not damage or change of the information (f=50Hz)	P
5.3	Window		P
	One or more windows	One windows	P
	windows shall be of transparent material which cannot be removed undamaged without breaking the seal(s).		P
5.4	Terminals - Terminal block(s) - Protective earth terminal		P
	Terminals may be grouped in (a) terminal block(s) having adequate insulating properties and mechanical strength.		P
	Choosing insulating materials for the terminal block(s), adequate testing of materials shall be taken into account		P
	the terminal block is made shall be capable of passing the tests given in ISO 75-2 for a temperature of 135 ° C and a pressure of 1,8 MPa		P
	The holes in the insulating material which form an extension of the terminal holes shall be of sufficient size to also accommodate the insulation of the conductors.		P
	The manner is no risk of loosening or undue heating.		P
	Screw into a metal nut.		P
	The risk of corrosion resulting from contact with any other metal part is minimized.		P
	Electrical connections shall be so designed that contact pressure is not transmitted through insulating material.		P
	For current circuits, the voltage is considered to be the same as for the related voltage circuit.		P
	Terminals with different potentials which are grouped close together shall be protected against accidental short-circuiting		P
	Protection may be obtained by insulating barriers.		P
	Terminals of one current circuit are considered to be at the same potential.		P
	The terminals, the conductor fixing screws, or the external or internal conductors shall not be liable to come into contact with metal terminal covers.		P
	Protective earth terminal:		N
	a) shall be electrically bonded to the accessible metal parts;		N
	b) should, if possible, form part of the meter base;		N
	c) should preferably be located adjacent to its terminal block;		N
	d) shall accommodate a conductor having a cross-section at least equivalent to the main current conductors		N

	e) shall be clearly identified by the graphical symbol IEC 60417-5019: Protective earth								N			
	Not be possible to loosen the protective earth terminal without the use of a tool.								N			
5.5	Terminal cover(s)								P			
	The terminals of a meter, if grouped in a terminal block and if not protected by any other means, shall have a separate cover which can be sealed independently of the meter cover. The terminal cover shall enclose the actual terminals, the conductor fixing screws and, unless otherwise specified, a suitable length of the external conductors and their insulation.								P			
	When the meter is panel-mounted, no access to the terminals shall be possible without breaking the seal(s) of the terminal cover(s).								P			
5.6	Clearance and creepage distances								P			
	Class I	Voltage phase to earth derived from rated system voltage	Rate d impu lse volta ge	Minimum clearances		Minimum creepage distance		Minimum clearances	Minimum creepage distance	P		
				Indo or	Outd oor	Indo or	Ou tdo or					
				≤ 100	1500	0,5	1,0				1,4	2,5
				≤ 150	2500	1,5	1,5				1,6	2,5
				≤ 300	4000	3,0	3,0				3,2	5,0
	≤ 600	6000	5,5	5,5	6,3	10,0						
	class II	Voltage phase to earth derived from rated system voltage	Rate d impu lse volta ge	Minimum clearances		Minimum creepage distance		Minimum clearances	Minimum creepage distance	N		
				Indo or	Outd oor							
				≤ 100	2500	1,5	1,5				2,0	3,2
				≤ 150	4000	3,0	3,0				3,2	5,0
				≤ 300	6000	5,5	5,5				6,3	10,0
	≤ 600	8000	8,0	8,0	12,5	20,0						
5.7	Insulating encased meter of protective class II								N			
5.8	Resistance to heat and fire								P			
5.9	Protection against penetration of dust and water								P			
5.10	Display of measured values								P			
5.11	Output device								P			

5.12	Marking of meter		P
5.12.1	Name-plates		P
	a) manufacturer's name or trade mark	Projoy Electric Co.,Ltd.	P
	b) type	PEEM-S1	P
	c) the number of phases		P
	d) the serial number and year of manufacture.		P
	e) the reference voltage	220V/230V	P
	f) basic current and the maximum current	10(60)A	P
	g) frequency	50Hz/60Hz	P
	h) the meter constant;		P
	i) the class index of the meter;		P
	j) the reference temperature if different from 23 ° C;		N
	k) class II		N
5.12.2	Connection diagrams and terminal marking		P
	Every meter shall preferably be indelibly marked with a diagram of connections. If this is not possible reference shall be made to a connection diagram. For polyphase meters, this diagram shall also show the phase sequence for which the meter is intended. It is permissible to indicate the connection diagram by an identification figure in accordance with national standards.		P
	If the meter terminals are marked, this marking shall appear on the diagram.		N
6	Climatic conditions		P
6.1	Temperature range		P
6.2	Relative humidity		P
6.3	Tests of the effect of the climatic environments		P
6.3.1	Dry heat test	No damage or change	P
	meter in non-operating condition; temperature: +70 ° C ± 2 ° C; duration of the test: 72 h.		
6.3.2	Cold test	No damage or change	P
	meter in non-operating condition; temperature: .25 ° C ± 3 ° C for indoor meters; 40 ° C ± 3 ° C for outdoor meters; duration of the test: 72 h for indoor meters; 16 h for outdoor meters.		
6.3.3	Damp heat cyclic test	No damage or change	P
	voltage and auxiliary circuits energized with reference voltage; without any current in the current circuits; variant 1; upper temperature: +40 ° C ± 2 ° C for indoor meters; +55 ° C ± 2 ° C for outdoor meters;		

	no special precautions shall be taken regarding the removal of surface moisture; duration of the test: 6 cycles.		
6.3.4	Protection against solar radiation	Not alter or impair	P
7	Electrical requirements		P
7.1	Influence of supply voltage		P
7.2	Heating	<25k	P
7.3	Insulation	No flashover, disruptive discharge or puncture	P
7.4	Immunity to earth fault	No damage	P
7.5	Electromagnetic compatibility (EMC)		N/A
8	Type test		P

--- End of Test Report ---

Type of equipment, model: PEEM,
PEEM-S1

Details of:

View:

general

front

rear

right

left

top

bottom



Details of:

View:

general

front

rear

right

left

top

bottom

