Test Report No. CSC-302(1)/2/2025-LAB

राष्ट्रीय सौर ऊर्जा संस्थान

(नवीन और नवीकरणीय ऊर्जा मंत्रालय, भारत सरकार का एक स्वायत्त संस्थान)

National Institute of Solar Energy

(An autonomous Institute of the Ministry of New and Renewable Energy, Govt. of India)
गुरुग्राम फरीदाबाद मार्ग -, ग्वाल पहाड़ी, गुरुग्राम -122003, हरियाणा, भारत
Gurugram - Faridabad Road, Gwal Pahari, Gurugram – 122003, Haryana, India
ई-मेल / Email: csc@nise.res.in दूरभाष / Phone: 0124-2853110

Test Report

1.	**Service Request No.**	13/0625, 14/0625, 15/0625, 16/0625			
2.	**Requested By (Name & Address of the organization)**	M/S RISHABH INSTRUMENTS PVT. LTD. F-31, MIDC, SATPUR, NASHIK, MAHARASHTRA, PIN-422007			
3.	**Details of the test item**				
	a) Nomenclature	On-grid Solar String Inverter			
	b) Manufactured By	M/s RISHABH INSTRUMENTS PVT. LTD.			
	c) Model / Type No.	✓ **(Representative Model)** iUNO-INV(1)-5K0-1M-BT-XXXXXX ✓ **(Series Model)** iUNO-INV(1)-0K85-1M-BT-XXXXXX iUNO-INV(1)-1K0-1M-BT-XXXXXX **iUNO-INV(1)-1K5-1M-BT-XXXXXX** iUNO-INV(1)-2K0-1M-BT-XXXXXX **iUNO-INV(1)-2K5-1M-BT-XXXXXX** iUNO-INV(1)-3K0-1M-BT-XXXXXX iUNO-INV(1)-3K3-1M-BT-XXXXXX **iUNO-INV(1)-3K6-1M-BT-XXXXXX** iUNO-INV(1)-3K8-1M-BT-XXXXXX iUNO-INV(1)-4K0-1M-BT-XXXXXX iUNO-INV(1)-4K2-1M-BT-XXXXXX iUNO-INV(1)-4K4-1M-BT-XXXXXX iUNO-INV(1)-4K6-1M-BT-XXXXXX iUNO-INV(1)-4K8-1M-BT-XXXXXX **Manufacturer declaration at Annexure-I**			
	d) Model difference provided	**Yes**			
	e) Model difference verified as per MNRE guide line	**Yes**			
	f) Serial Nos.	**5 kW**	**1.5 kW**	**2.5 kW**	**3.6 kW**
		RI-2506000007	RI-2506000001	RI-2506000002	RI-2506000003
	g) Trade Mark	RADIUS RISHABH			

Deepak Yadav
Tested and Prepared By
Mr. Deepak Yadav
EA-I (Tech.)

Kamlesh
Reviewed By
Dr. Kamlesh Yadav
Deputy Director (Tech.)

CSC NISE

07/08/2025
Authorized Signatory
Dr. Birinchi Bora
Deputy Director (Tech.)

	h) Testing parameters	**At Representative Model** **iUNO-INV(1)-5K0-1M-BT-XXXXXX** ✓ MPPT efficiency test and overall system efficiency as per IS 17980: 2022 / IEC 62891: 2020/ EN 50530:2010 ✓ Islanding test –as per IS 16169: 2019/IEC 62116: 2014 "Test procedure of islanding prevention measures for utility-interconnected photovoltaic inverters" ✓ Grid parallel operation test - as per IS/IEC 61727:2004 "Photovoltaic (PV) systems -Characteristics of the utility interface" ✓ Environmental test as per Cold test IS/IEC 60068-2 -1:2007 Dry Heat IS/IEC 60068-2 -2:2007 Change in temperature IS/IEC 60068-2 -14:2023 Damp Heat Cyclic IS/IEC 60068-2 -14:2005 ✓ MPPT efficiency test and overall system efficiency as per IS 17980: 2022 / IEC 62891: 2020/ EN 50530:2010 **at iUNO-INV(1)-5K0-1M-BT-XXXXXX,** **iUNO-INV(1)-3K6-1M-BT-XXXXXX,** **iUNO-INV(1)-2K5-1M-BT-XXXXXX,** **iUNO-INV(1)-1K5-1M-BT-XXXXXX,** ✓ Inverter Efficiency Test Result as per IS/IEC-61683: 1999 **iUNO-INV(1)-5K0-1M-BT-XXXXXX,**
4.	**Date of samples receipt**	03/07/2025
5.	**Condition of samples on receipt**	Good
6.	**Date of starting of test**	04/07/2025
7.	**Date of Completion of Tests**	04/08/2025
8.	**Date of issue of test report**	07/08/2025
9.	**Name and location of the testing laboratory**	Power Electronics Laboratory, Aditya Bhawan, NISE, Gurugram

Note: 1

The environmental tests Environmental test as per Cold test IS/IEC 60068-2 -1:2007, Dry Heat IS/IEC 60068-2 -2:2007, Change in temperature IS/IEC 60068-2 -14:2023, Damp Heat Cyclic IS/IEC 60068-2 -14:2005 Islanding test –as per IS 16169: 2019/IEC 62116: 2014 "Test procedure of islanding prevention measures for utility-interconnected photovoltaic inverters" and Grid parallel operation test - as per IS/IEC 61727:2004 "Photovoltaic (PV) systems - Characteristics of the utility interface" were conducted only on the representative model (**iUNO-INV(1)-5K0-1M-BT XXXXXX**), in accordance with the MNRE series guidelines for inverters and accordingly these test results shall be applicable to the series models based on the family declaration provided by the manufacturer, attached as **Annexure-I**.

Deepak Yadav
Tested and Prepared By
Mr. Deepak Yadav
EA-I (Tech.)

Kamlesh
Reviewed By
Dr. Kamlesh Yadav
Deputy Director (Tech.)

CSC NISE

07/08/2025
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ESTD. 1975
TC-14619

SUMMARY OF TEST REPORT NO. **259999250814KUNIT8000** DATED **20/09/2025**
(Number of pages in test report: page no. 1 to 30)

TEST FORMAT AS PER IS 17980:2022/IEC 62891:2020

1. Name of Manufacturer: Rishabh Instruments Pvt. Ltd.
   F31 MIDC, SATPUR, NEAR CEAT TYRES, SATPUR,NASHIK, NASIK, MAHARASHTRA, 422007
2. Product: Utility-Interconnected Photovoltaic Inverters
3. Model(s) : **Lead model:** iUNO-INV(1)-5K0-1M-BT-XXXXXX
   Series models: iUNO-INV(1)-0K85-1M-BT-XXXXXX, iUNO-INV(1)-1K5-1M-BT-XXXXXX, iUNO-INV(1)-2K0-1M-BT-XXXXXX, iUNO-INV(1)-2K5-1M-BT-XXXXXX, iUNO-INV(1)-3K0-1M-BT-XXXXXX, iUNO-INV(1)-3K3-1M-BT-XXXXXX, iUNO-INV(1)-3K6-1M-BT-XXXXXX, iUNO-INV(1)-4K0-1M-BT-XXXXXX, iUNO-INV(1)-4K4-1M-BT-XXXXXX

   Model differences provided (if applicable) : Yes / ~~No~~
4. Model differences verified as per MNRE Guidelines for series formulation : Yes / ~~No~~
5. Test Results : See below

PART A : GENERAL

SL. NO.	TEST REQUIREMENT	CLAUSE	VERDICT
1.	MPPT efficiencies	4	P
2.	Calculation of the overall efficiency	5	P
3.	Requirements on the measuring apparatus	Annex A	P
4.	Test conditions for dynamic MPPT efficiency	Annex B	P
5.	Models of current/voltage characteristic of PV generator	Annex C	P
6.	Efficiency weighting factors	Annex D	P
7.	Specification of the static MPPT and conversion Efficiency in terms of normalised rated AC power	Annex E	P

General Information:
1. The conformity certificates of critical components are verified to ensure complete testing of apparatus under test and details regarding harmonized IEC standards (where IEC standards are not available) are also provided in the list of critical component.

CONCLUSION:
1. Sample meets all relevant requirements of IS 17980:2022/IEC 62891:2020.
2. ~~Sample fails to meet the following test requirements~~:

I, hereby, undertake that the verdict stated in the test reports for all the tests matches with the test results. The sample meets all relevant requirements of IS 17980:2022/IEC 62891:2020 ~~does not meet the requirements stated above at 2)~~ of conclusion. If any deviation is found, suitable punitive action may be taken by BIS.

(Signature of Authorized person with Stamp)

Delhii Test House Global LLP
Plot No. 50, Phase-IV, Sector-57,
HSIIDC, Indl. Estate,
Behind Hasija Hospital, Kundli
Sonipat-131028 (Haryana)

Bar Code: 250115CRS
Sample Code: SC25SPI02673
Encoded Code: 25ED8E6N

ULR – TC1461925000000060F

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TC-14619

Discipline : Electronics, Group: Miscellaneous Products ULR – TC1461925000000060F

TEST REPORT
IS 17980:2022/IEC 62891:2020
Maximum Power Point Tracking Efficiency of Grid Connected Photovoltaic Inverters

Report reference number	259999250814KUNIT8000
Date of issue	20/09/2025
Total number of pages	30
Testing laboratory name	Delhi Test House
Address	Plot No-50, Phase-IV,Sector-57, HSIIDC Kundli-131028, Haryana, India
Accreditation	
Manufacture's name	Rishabh Instruments Pvt. Ltd.
Address	F31 MIDC, SATPUR, NEAR CEAT TYRES, SATPUR,NASHIK, NASIK, MAHARASHTRA, 422007
Test specification:	
Standard	IS 17980:2022/IEC 62891:2020
Test Report Form No.	-
Test Report Form(s) Originator	-
Master TRF	-
Test item description	**Utility-Interconnected Photovoltaic Inverters**
Trade Mark	RISHABH
Model/Type	**Lead model: iUNO-INV(1)-5K0-1M-BT-XXXXXX** Series models: iUNO-INV(1)-0K85-1M-BT-XXXXXX, iUNO-INV(1)-1K5-1M-BT-XXXXXX, iUNO-INV(1)-2K0-1M-BT-XXXXXX, iUNO-INV(1)-2K5-1M-BT-XXXXXX, iUNO-INV(1)-3K0-1M-BT-XXXXXX, iUNO-INV(1)-3K3-1M-BT-XXXXXX, iUNO-INV(1)-3K6-1M-BT-XXXXXX, iUNO-INV(1)-4K0-1M-BT-XXXXXX, iUNO-INV(1)-4K4-1M-BT-XXXXXX
Ratings	U DC max : 550V, I DC max : 1*20.0A, Isc max: 1*25 A U DC Range: 60-510V, V AC nom : 1/N/PE 230V/400V, f AC nom: 50/60Hz, P AC nom 5000W/5500VA, Power Factor: 0.8 cap. – 0.8 ind., I AC nom: 21.7Arms, I AC max : 23.8Arms, Protection Degree IP66, Protection Class 1, Ambient Temperature: 25°C…… +60°C (For series models rating, see copy of marking plate)

Delhii Test House Global LLP
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HSIIDC, Indl. Estate,
Behind Hasija Hospital, Kundli
Sonipat-131028 (Haryana)

Nashik Engineering Cluster

(Under the aegis of Department of Industrial Policy & Promotion, (DIPP), Ministry of Commerce & Industry, Govt. of India, New Delhi)

ISO / IEC 17025 : 2017 Accredited Testing laboratory by NABL vide certificate number TC-5448

TC-5448

" Sahastrarashmi", C-10, MIDC, Ambad, Nashik-422 010. Tel.: +91 253 6699231,32,91 TeleFax: + 91 253 6699222
E-mail : calibration@nec.org.in, quality.lab@nec.org.in, testinglab@nec.org.in, info@nec.org.in, website: www.nec.org.in

TEST REPORT

TEST REPORT NO.:TEST/25-26/TR/141
ULR NO. TC544825000000409F
Date: 11.06.2025

1.0	**Name and address of customer**	: Rishabh Instruments Ltd. F-31, MIDC Satpur, Nashik – 422 007.
2.0	**Customer letter/Ref No./ DC No.**	: 11108 **Date:** 02.06.2025
3.0	**Date of receipt**	: 02.06.2025 **Condition of test sample:** Satisfactory
4.0	**Description of test sample**	:

TSRF No.	TEST/25-26/TSRF/59
Sample Name	iUNO-INV(1)-5K0-1M-BT Sr. No.: RI-2506000005
NEC Sample ID No.	TEST/25-26/ID/130

5.0	**Test method**	: IEC 60529:2019
6.0	**Date of testing**	: 02.06.2025 – 03.06.2025
7.0	**Details of test**	: IP 66 Test
8.0	**Witnessed By**	: --
9.0	**Enclosure**	: DRG No.: UNOHSNG0005, UNOHSNG0006.

Test Result: The Sample **Conforms** to the requirements of IP 66 test as per IEC 60529:2019.

Note: 1. This report relates only to the particular sample tested at NEC, Nashik.
2. This report cannot be reproduced in part under any circumstances.
3. Publication of this report requires prior permission in writing from CEO, NEC.
4. Only tests asked for by the customer have been carried out.
5. In case of any dispute, Nashik will be the exclusive jurisdiction & shall be construed as where cause arised.
6. Any Error in this report should be brought in our notice within 30 days from the date of issue of this report.

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Prepared By:
Kiran Gosavi
(Testing Engineer)

Checked By:
Rahul Golesar
(General Manager)

NASHIK ENGINEERING CLUSTER NASHIK AMBAD, NASHIK

Authorised By:
Rahul Golesar
(General Manager)

RISHABH INSTRUMENTS LIMITED

CERTIFICATE OF CONFORMITY

Applicant & Manufacturer:	RISHABH INSTRUMENTS LIMITED
Address:	F31 MIDC, SATPUR, NEAR CEAT TYRES, SATPUR NASHIK, NASHIK - 422007, MAHARASHTRA, INDIA
Product(s):	PHOTOVOLTAIC INVERTER(s)
Model(s):	iUNO-INV(1)-5K0-1M-BT-XXXXXX, iUNO-INV(1)-0K85-1M-BT-XXXXXX, iUNO-INV(1)-1K5-1M-BT- XXXXXX, iUNO-INV(1)-2K0-1M-BT-XXXXXX, iUNO-INV(1)-2K5-1M-BT-XXXXXX, iUNO-INV(1)-2K5-1M-BT-XXXXXX, iUNO-INV(1)-3K0-1M-BT-XXXXXX, iUNO-INV(1)-3K3-1M-BT-XXXXXX, iUNO-INV(1)-3K6-1M-BT-XXXXXX, iUNO-INV(1)-4K0-1M-BT-XXXXXX, iUNO-INV(1)-4K4-1M-BT-XXXXXX
Applicable Directive(s):	LOW VOLTAGE DIRECTIVE 2014/35/EU ELECTROMAGNETIC COMPATIBILITY DIRECTIVE 2014/30/EU
Applicable Standard(s):	IEC/EN 61000-6-1:2016, IEC/EN 61000-6-2:2016, IEC/EN 61000-6-3:2020, IEC/EN 61000-6-4:2018, IEC/EN 61000-3-2:2018, IEC/EN 61000-3-3:2013, IEC/EN 61000-3-4:2013, IEC/EN 61000-3-11:2017, IEC/EN 61000-3-12:2011 & IEC 60255-27:2023
Technical Doc. Reference:	RTCL/EMC/2526/CS/141, RTCL/EMC/2526/EFT/140, RTCL/EMC/2526/ESD/143, RTCL/EMC/2526/Flk/145, RTCL/EMC/2526/Harm/146, RTCL/EMC/2526/PFMF/142, RTCL/EMC/2526/Surge/144

Based on successful review of technical construction file documentation of the above-mentioned products, RISHABH hereby confirms, conformity of the above-mentioned product(s) with the requirements of **Low Voltage Directive 2014/35/EU & Electromagnetic Compatibility Directive 2014/30/EU.**
The product liability rests with the manufacturer or his representative in accordance with applicable Directives and standards, after fulfilling of the relevant EU legislation requirements, the manufacturer shall affix to each device of the above referenced models, the CE-Mark according to this example:

CE

Issued Date: 07/10/2025

Authorised Signatory:

Rishabh Instruments Pvt. Ltd
Place: MAHARASHTRA, INDIA

Measure Control Record Analyze Optimize

SUMMARY OF TEST REPORTS No:4791837994.1.1-BIS-S1 DATED: 07/10/2025 (dd/mm/yyyy).
ULR No: TC616825000000701F

(Number of pages in test report: Page no.1 to 177)
TEST FORMAT AS PER IS 16221 (Part 2): 2015/ IEC 62109-2: 2011

1. Name of manufacturer:	Rishabh Instruments Pvt. Ltd. F31 MIDC, SATPUR, NEAR CEAT TYRES, SATPUR, NASHIK, NASIK, MAHARASHTRA, 422007.
2. Product:	Utility-Interconnected Photovoltaic Inverters
3. Models:	Lead Model: iUNO-INV(1)-5K0-1M-BT-XXXXXX Series Model: iUNO-INV(1)-0K85-1M-BT-XXXXXX iUNO-INV(1)-1K5-1M-BT-XXXXXX iUNO-INV(1)-2K0-1M-BT-XXXXXX iUNO-INV(1)-2K5-1M-BT-XXXXXX iUNO-INV(1)-3K0-1M-BT-XXXXXX iUNO-INV(1)-3K3-1M-BT-XXXXXX iUNO-INV(1)-3K6-1M-BT-XXXXXX iUNO-INV(1)-4K0-1M-BT-XXXXXX iUNO-INV(1)-4K4-1M-BT-XXXXXX
4. Model differences provided	Yes
5. Model differences verified as per MNRE Guidelines for series formulation	Yes

6. Test Results: See below.

Sr. No.	TEST REQUIREMENTS	CLAUSE	VERDICT
1	General testing requirements	4.0	P
2	Marking and documentation	5.0	P
3	Environmental requirements and conditions	6.0	P
4	Protection against electric shock and energy hazards	7.0	P
5	Protection against mechanical hazards	8.0	P
6	Protection against fire hazards	9.0	P
7	Protection against sonic pressure hazards	10.0	P
8	Protection against liquid hazards	11.0	N/A
9	Protection against chemical hazards	12.0	N/A
10	Physical requirements	13.0	P
11	Components	14.0	P

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SUMMARY OF TEST REPORTS No:4791837994.1.1-BIS-S1 DATED: 07/10/2025(dd/mm/yyyy).
ULR No: TC616825000000701F

General Information:

The conformity certificates of critical components are verified to ensure complete testing of apparatus under test and details regarding harmonized IEC/UL standards (where IS standards are not available) are also provided in the list of critical components. This report of IS 16221 (Part 2) : 2015/ IEC 62109-2: 2011 includes the tests from IS 16221 (Part 1): 2016/ IEC 62109-1: 2010 and hence this is a combined test report.

CONCLUSION:

1) Sample meets all relevant requirements of IS 16221 (Part 2): 2015/ IEC 62109-2: 2011

~~2) Sample fails to meet the following test requirements:~~

I, hereby, undertake that the verdict stated in the test reports for all the tests matches with the test results. The sample meets all relevant requirements of IS 16221 (Part 2): 2015/ IEC 62109-2: 2011/~~does not meet the requirements stated above at 2) of conclusion~~. If any deviation is found, suitable punitive action may be taken by BIS.

Date:(dd/mm/yyyy):07/10/2025 **(Signature of Authorized person)**

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TC- 6168

SUMMARY OF TEST REPORT NO :	4791837994.2.1-BIS-S2
Number of pages in test report:	Page 1 to 51
ULR No.:	TC616825000000576F
Dated:	07-10-2025
TEST FORMAT AS PER IS 16169: 2019 / IEC 62116: 2014	
Name of Manufacturer	: Rishabh Instruments Pvt. Ltd.
Product	: Utility-Interconnected - Photovoltaic Inverters
Model(s)	: Lead Model: iUNO-INV(1)-5K0-1M-BT-XXXXXX Series Model: iUNO-INV(1)-0K85-1M-BT-XXXXXX iUNO-INV(1)-1K5-1M-BT-XXXXXX iUNO-INV(1)-2K0-1M-BT-XXXXXX iUNO-INV(1)-2K5-1M-BT-XXXXXX iUNO-INV(1)-3K0-1M-BT-XXXXXX iUNO-INV(1)-3K3-1M-BT-XXXXXX iUNO-INV(1)-3K6-1M-BT-XXXXXX iUNO-INV(1)-4K0-1M-BT-XXXXXX iUNO-INV(1)-4K4-1M-BT-XXXXXX
4.Model differences provided (if applicable)	: Yes ☒ or No ☐ or N/A ☐
5.Model differences verified as per MNRE Guidelines for series formulation	: Yes ☒ or No ☐ or N/A ☐
6.Test Result: See below Decision Rule: The laboratory employs simple acceptance rule in making Pass or fail decisions on test results with no guard band.	

Discipline	Electronics
Group	Miscellaneous

SL. NO'	TEST REQUIREMENT	CLAUSE	VERDICT
1	Test for single or multi-phase inverter	6.0	P
2	Islanding as it applies to PV systems (Informative)	Annex A	N/A
3	Test for independent islanding detection device	Annex B	N/A

UL INDIA PRIVATE LIMITED
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General Information:

1. The conformity certificates of critical components are verified to ensure complete compliance of apparatus under test and details regarding harmonized IEC standards (where IEC standards are not available) are also provided in the list of critical component.

Abbreviations: P = Pass N/A = Not Applicable

CONCLUSION:

I, hereby, undertake that the verdict stated in the test reports for all the tests matches with the test results.

1. Sample meets all relevant requirements of *IS* 16169: 2019/ IEC 62116: 2014. *Yes* ☒ *or No* ☐
2. Sample fails to meet the following test requirements: *Yes* ☐ *or No* ☒ :
3. If any deviation is found, suitable punitive action may be taken by BIS.

Date:07/10/2025(DD/MM/YYYY) (Signature of Authorized person with Stamp)