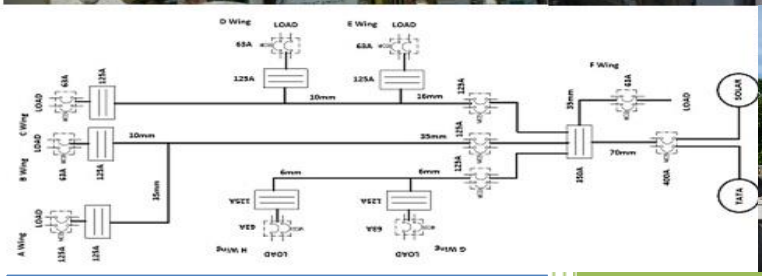
SAUR ENGINEERS & CONSULTANTS PVT. LTD.

Registered Energy Auditor "CLASS-A" -MEDA, Govt. of Maharashtra, Licensed Electrical Contractor - IE&L Govt. of Maharashtra, Registered Electrical Contractor CLASS-A, ISO 14001:2015, Certified Solar Grid Engineers NISE-MNRE, Govt. of India.

- Liasoning
- Energy Audit
- Safety Audit
- Electrical Projects
- Solar Projects

Shailendra Degree College, Shailendra Education Society, Dahisar (East), 400068.



Report By

M/s. Saur Engineers & Consultants Pvt. Ltd., Mumbai.

- Registered Energy Auditor
- Power Consultant
- Channel Partner-MNRE, Govt. of India.
- Channel Partner-MEDA, Govt. of Maharashtra.
- Solar Grid Engineers, NISE, Govt. of India
- Licensed Electrical Contractor,

Detailed Report

Energy Audit

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Project Beneficiary
2021-2022

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Shailendra Degree College

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Shailendra Education Society
Dahisar East 400068.

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Consultants & Auditor

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SAUR
Engineers & Consultants
Pvt. Ltd.

REGISTRATION NO. : EA-28

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D-8, Plot No. 108, Akshay, Rsc-16,
Gorai-1, Borivali (west), Mumbai-400092
MAHARASHTRA
+919867499812/+919168402909

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Certificate

This is to certify that Detailed Energy Audit has been successfully completed by M/s. Saur Engineers & Consultants Pvt. Ltd. Empanelled Energy Auditor(CLASS-A) MEDA, Government of Maharashtra and suggestions for improvements have been given. The Audit activity has been executed for beneficiary with following Details:-

Name of Beneficiary: Shailendra Degree College

Registration Number: NA

Address: Shailendra Education Society Dahisar East 400068.

Contact Person: Dr. Swati Pitale

Contact Number: 09869571492

Date of Audit: 10th January 2023

The report is generated from data, information, answer to asked questions, standards and procedures defined by different and concerned authorities time to time, available site condition, weather condition, operational and availability conditions provided by beneficiary on the day of survey. If any changes on above said measures on any other parameters affecting these measures may lead to change, alter, in-corrections even falsifying calculations, results, recommendations and suggestions. The values, figures, amounts mentioned are indicative to the site situation and condition; it may not reflect each and every aspect of it. The report is generated restricted to given scope and available conditions and measures.

EA-28

ENERGY AUDITOR "CLASS-A" No. EA-28
SAUR ENGINEERS & CONSULTANTS PVT. LTD.
Plot No. 108, D-8, Gorai-1, Borivali (W),
Mumbai - 400 091.

Sign & Seal

Saur Engineers & Consultants Pvt. Ltd.
Registration No: EA-28
Empanelled Energy Auditor-CLASSA,
MEDA, Government of Maharashtra

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1. Introduction

1.1. Background

Energy Audit is a Basic essential activity to be done for saving in electrical billing and also allied with any energy saving projects like renewable energy project and solar projects. Energy Audit is an assessment of usage, consumption and pattern of energy used in the premises based on all above parameters along with conditions and benchmarks as resource and Building Envelope Analysis, working, operational and Maintenance Procedure Analysis, Utility Data Analysis, Load Data Analysis, Analysis of Energy Consumption, Load Evaluation, consumption pattern and billing history, back-up systems and also the administrative requirements, assessment of safety concerns, assessment of operating and occupancy schedules for Equipment, Power Quality and Environmental Parameters Analysis, Efficiency and Wastage Analysis and assessment of potential risk factors.

Energy Audit is a process of systematic identification, quantification, recording, reporting and analysis of energy usage properties of institute. It aims to analyze within and surrounding the place concerned, which will see interrelation with eco-friendly atmosphere. Energy audit is a valuable means for an Institution related to educational area to determine how and where they are connected with Energy conservation drive of nation. Understanding these conditions the institution can make plans for day to day working, future expansions as well as an eco-friendly view of life while making changes and planning for savings. It provides better understanding of impact of energy consumption on working conditions to staff and visitors. As the Energy availability is becoming an increasingly important issue for the nation, the role of higher education institute is more vital and prevalent in relation with the issue.

The rapid urbanization and economic development at local, regional and global level has led to Energy availability and quality crisis. On this background it becomes essential to adopt the system of Energy efficient and safe Campus for the institution which leads for sustainable development and at the same time persisting the quality of the same while travelling on the growth path. Moreover, it is social responsibility of a Highenergy consuming institution to ensure that they contribute towards the saving of Energy and thus making it available who are destitute in term of energy availability.

1.2. Objective

In recent times, the Energy audit of an institution has becoming the paramount important for self-assessment of the Institution which reflects in the role of the institution in mitigation to current problem of reducing Energy availability and quality. The institution has been putting efforts to keep reducing and standardizing energy usage since its inception. Therefore the purpose of present Energy audit is to identification, quantification, recording, reporting and analysis of components of Energy utilization and electrical safety properties of institute framework of energy conservation in compliance with the applicable regulations, policies and standards.

The main objectives to carrying out the energy audit are:-

- To have overview of premises
- To record and document geographical location data
- To record and document Utility data
- To record and document Load profile data
- To record and document basic Electrical Safety observations data
- To record and document Key Observations
- To record and document Energy Conservations (if any)
- To record and document Suggestions or Recommendations (if any) to fulfill the purpose

1.3. Methodology

The purpose of Energy Audit of is to ensure that the practices followed in the campus are in accordance with the Energy Conservation Policy of the Country. The methodology includes: collection of data, physical inspection of the campus, observation and review of the documentation and data analysis.

The report is based on the documents obtained while on site, visual inspection and data collection carried out during the assessment period. All the measurements recorded on site are indicative loads and duties. All readings are collected for analysis and improvement planning. Cost estimates are indicative only as more detailed design and acceptance of suggestions will be required to improve the accuracy of these estimates.

The measurement campaign, data collection, interviews, analysis and recommendations are provided within the different material listed below:

- Electricity Bills
- Maps/Layout
- Site Report
- PQA report
- Thermal Imaging
- Metrics results and Various calculations

The units are selected from SI (international standards) with meters, Celsius degrees, Etc.

1.4. Energy Audit Statement

The building is adopting the "Energy Efficient Campus" system for Energy conservation and sustainability. There are main three pillars i.e. Energy saving by technology and Operation & Maintenance procedures, safe working on occupational health and performance and 100% inmates demonstrating energy efficiency literacy. The goal is to maintain safe working environment, reduce energy consumption, while creating an atmosphere where inmates can work and live healthy.

1.5. Monitoring Equipments used

1. Power Quality Analyzer
2. Clamp Meter
3. Digital Multi-meter
4. Stop watch
5. Noise Meter
6. Lux meter
7. RH Meter
8. Anemometer
9. Mega Ohm Meter
10. Earth Tester
11. IR Thermometer
12. IR Camera

1.6. Standards and References

(Resolutions, rules, regulations, guidelines, papers and programs issued by authorities time to time)

1.6.1. Bureau of Energy Efficiency
1.6.2. Maharashtra Energy Development Agency
1.6.3. Ministry of New and Renewable Energy
1.6.4. Department of Industry, Electricity and Labour
1.6.5. Inspectorate of Electricity
1.6.6. Central Electricity Regulatory Commission
1.6.7. Central Electricity Authority
1.6.8. Indian Electricity Act 2003
1.6.9. Maharashtra Electricity Regulatory Commission
1.6.10. American Council of Energy Efficiency Economy
1.6.11. Indian Electricity Rule 1956
1.6.12. Electricity Conservation Act 2001

2. Executive Summary

Recommendations:

a) Plot, building and Floor map to be prepared along with markings of critical loads, fire safety equipment positions, breakers positions and emergency exit.
b) Electrical SLD to be prepared.
c) Registers of Records to be prepared and maintained for electrical operations, maintenance and accidents.
d) List of load to be updated every time after adding a new load.
e) IOT Smart Energy Monitoring system to be installed for tracking consumption.
f) Awareness about safety and conservation to be created amongst workers
g) Nameplate data of each equipment to be preserved maintain and make easily available
h) Install and Maintain Earthings (3 pits for building + 2 for Solar) regularly.
i) Labeling of circuit breakers to be done
j) Direct and easy access to DBS to be provided
k) All bodies to be grounded properly
l) Emergency numbers to be displayed and prompt location.
m) Insulation mats to be installed near power source.
n) Clean and Re-fill sand buckets near power source.

General Suggestions:

a) Appoint a Qualified Electrician for general maintenance available full time.
b) Follow Annual Test procedure for:
    a. Lighting Arrestor
    b. Earthing
    c. Insulation Resistance
    d. Earth Leakage
c) Fire Extinguishers/ Sand Buckets to be placed at Meter cabin.
d) Danger Sign Boards to be placed.
e) Switch off Lights, Fans and other loads when not in use.
f) Keep Lights and fans switched off over unoccupied desk/cabin.
g) Use ACs with higher star ratings.
h) Keep ACs at 26^0C; use thermostats.
i) Install and Use main switch cut off to shut down unconditioned or unused rooms.
j) Install occupancy Sensor based switches for equipments in passage and toilets. Use Energy Efficient Fans.

IE/CEA Regulations compatibility:

Following Regulations have been breached by electric connections present

Regulation-3

Register of Designated person, events, accidents and other electrical work to be maintained

Regulation-12

Replace wiring for Air conditioners at DB4 with higher size

Regulation-16

Install New Earthing pits and Network

Regulation-18

Install Danger Notice Board

Regulation-19

Install Insulating floor mats in meter cabin

Regulation-27

Fire Buckets with sand Filled are to be cleaned and conditioned

First Aid Box to be placed most visible

Regulation-28

Instructions for resuscitation from electric Shock to be affixed at various locations

Designated Person is to be available for resuscitation from electric Shock

Regulation-41

Install New Earthing pits and Network

Record of Earth Resistance to be maintained

ENCONs:

SL No	ENCON	Investment	Saving	Payback
	Suggestion	Rs	Rs/Year	Months
1	Clean SPV GCRT- 30Kwp	NIL	40,000	00
2	Replace Conventional Fans with BLDC Fans	5,65,000	2,20,000	30

3. Critical Problems

Problem	Un cleaned Solar Modules
Description	Solar Modules are un-cleaned hence there is an obstruction to generate electricity and yield is lost.
Impact/Risk 1. Less generation 2. Reduces life of module 3. Can create hotspot leading to permanent damage to modules	
Solution	Cleaning to be done regularly

Problem	Poor Earthing
Description	Earthing connectivity is poor at few locations DG Earthing is not done as per standard Earth pits and Testlink or rod/pipe head is not visible and accessible
Impact/Risk 1. Safety hazard 2. Violation of CEA Regulation -41 (iv, v and vi) 3. Risk of damaging equipments	
Solution	Earthing connectivity Diagram to be prepared and appropriate connection to be done. DG Earthing to be done as per IE/IS Standards. Earthpits to be restored Testlink or rod/pipe head to be available for testing. Maintain Earthing at standard values.

Problem	Old Iron Clad switches
Description	Many IC switches are present in building, which are too old.
Impact/Risk 1. Safety hazard 2. Risk of power outrage 3. Frequent Blow out	
Solution	These are to be replaced with new efficient MCBs.

Analysis of Premises

1.1 Electrical System Analysis

SL No	CA No	Meter No	Sanctioned Load	DISCOM	Phase
1	100295862	9078590	38.75(CD)	AECL	Three
2	100261947	9106449	11	AECL	Three

Observations:-

1. Both The meters are merged together.
2. All loads are connected to Meter-1.
3. Meter-2 can be used as back-up.
4. SLD is not prepared and maintained.

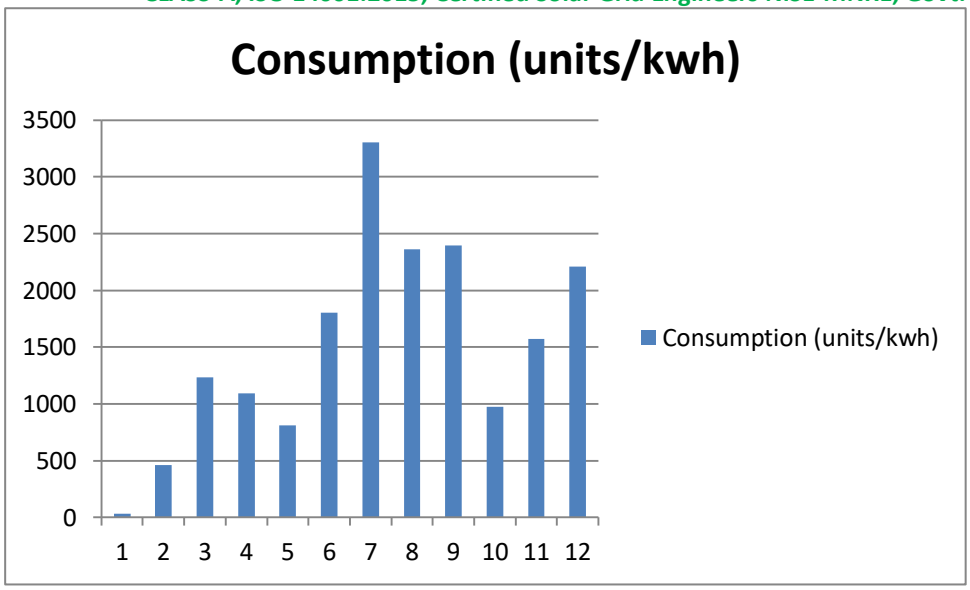
1.2 Billing Analysis

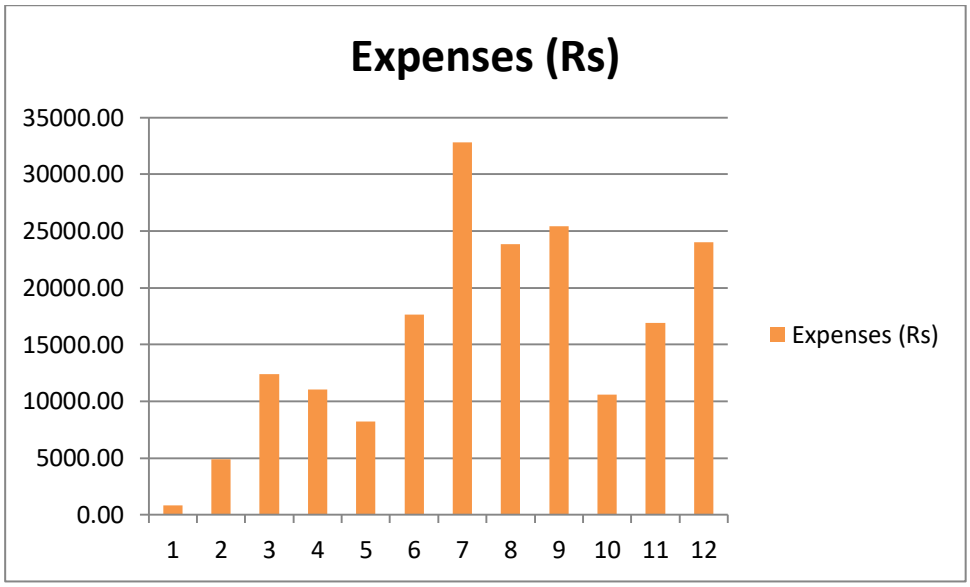
Meter-1

Billing Summary Meter-1			
Month	**Consumption**	**Expenses**	**Rate**
(name)	(units/kwh)	(Rs)	(Rs/Kwh)
January	32	820.00	12.97
February	462	4880.00	9.69
March	1231	12408.00	9.75
April	1092	11021.00	9.70
May	811	8229.00	9.62
June	1806	17660.00	9.54
July	3306	32812.00	9.80
August	2360	23856.00	9.93
September	2394	25440.00	10.45
October	974	10610.00	10.46
November	1573	16884.00	10.46
December	2212	24032.00	10.67

Summary	Usage (Kwh)	Payment (Rs)	Duration
Total	18253	188652	Annual
Min	32	820	January
Max	3306	32812	July
Average	1521.1	15721.0	Annual

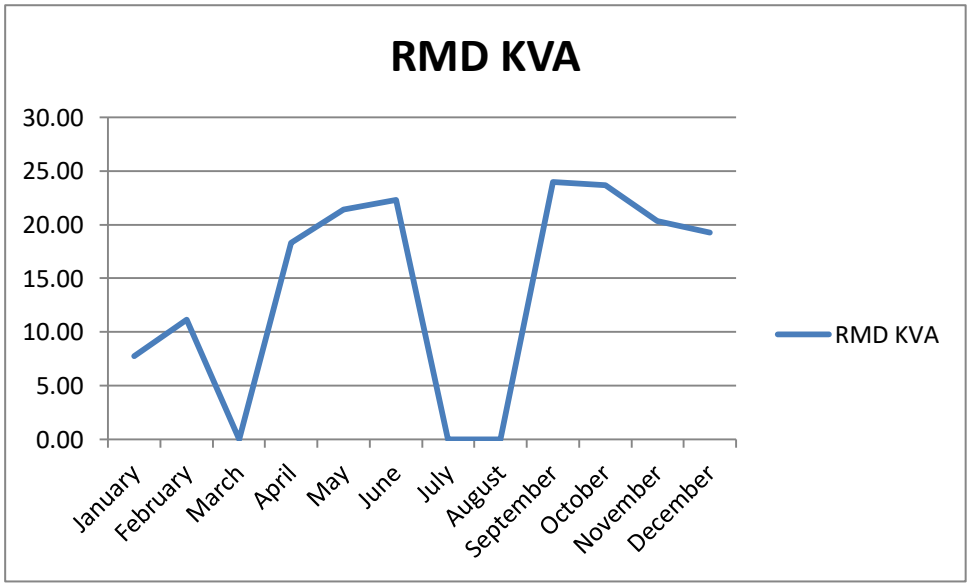
(Data for March, July and August is not given; calculated on the basis of average)

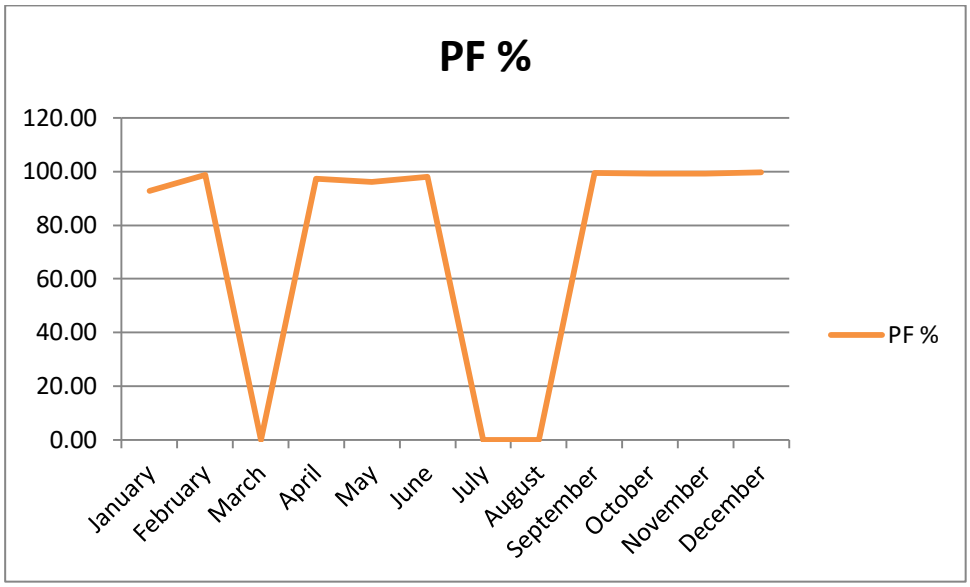

Consumption (units/kwh)
3500
3000
2500
2000
1500
1000
500
0
1 2 3 4 5 6 7 8 9 10 11 12
Consumption (units/kwh)


Expenses (Rs)
35000.00
30000.00
25000.00
20000.00
15000.00
10000.00
5000.00
0.00
1 2 3 4 5 6 7 8 9 10 11 12
Expenses (Rs)

Load Properties		
Month	**RMD**	**PF**
(name)	KVA	%
January	7.72	92.70
February	11.16	98.70
March	0.00	0.00
April	18.28	97.30
May	21.40	96.10
June	22.30	98.00
July	0.00	0.00
August	0.00	0.00
September	23.96	99.50
October	23.64	99.10
November	20.30	99.10
December	19.26	99.70

(Data for March, July and August is not given)





Meter-2

No Load is connected.

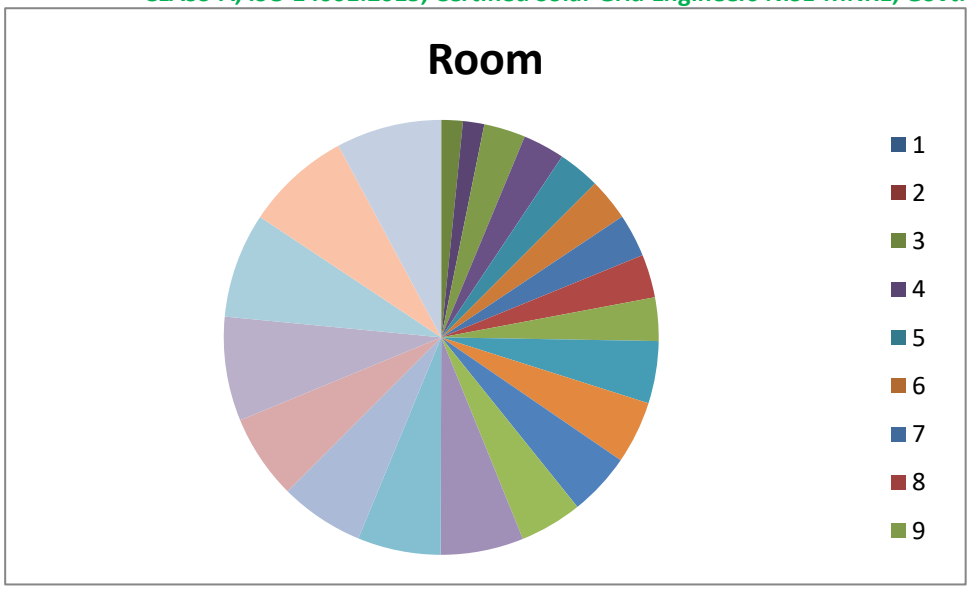
Meter-2 is Idle.

Observations:-

1. Billing in March April and May is zero due to solar export.
2. Increase in consumption and expenses shows rainy season where solar output is low.
3. MD Variation found normal.
4. PF variation found Normal.

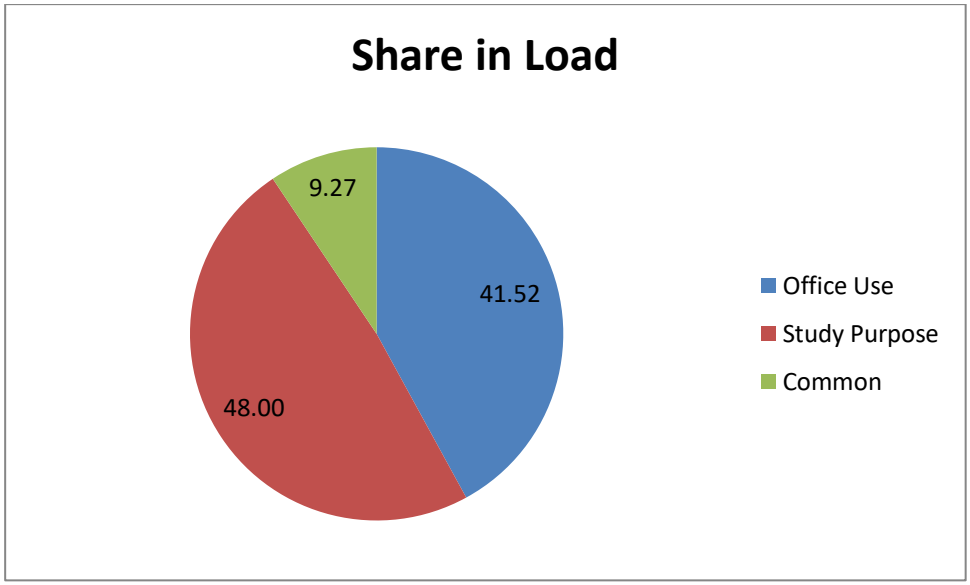
1.3 Connected Load Analysis

SL No	Room	Load	Percentage
1	Principal Office	3.6	6.53
2	Office	4.8	8.55
3	104	0.28	0.49
4	103	0.27	0.46
5	DigiLab	10.2	17.24
6	IQAC	3.6	5.99
7	Staff room	5.5	8.99
8	Kitchen	4.1	6.60
9	201	0.6	0.95
10	202	0.1	0.16
11	203	0.9	1.38
12	204	0.9	1.36
13	208	0.9	1.34
14	209	0.8	1.17
15	210	0.8	1.16
16	Toilet	0.1	0.14
17	301	0.4	0.56
18	303	0.5	0.69
19	304	0.5	0.68
20	LCR	0.6	0.81
21	302	0.6	0.80
22	Toilet	0.3	0.39
23	Toilet	0.1	0.13
24	Library	2.5	3.20
25	Library	2.1	2.65
26	Research Room	0.6	0.75
27	UGC	3.3	4.07
28	401	0.5	0.61
29	402	0.5	0.60
30	CR	2.1	2.50
31	408	0.5	0.59
32	409	0.5	0.58
33	HC	0.1	0.11
34	504	0.5	0.57
35	508	0.5	0.56
36	509	0.5	0.55
37	510	0.5	0.55



Distribution

SL No	Usage	Load
1	Office Use	22.9
2	Study Purpose	26.95
3	Common	5.3



1.4 Supply Source Analysis

1.4.1 Actual Cable Size (at meter): 50 Sqmm
1.4.2 Year of Installation: NA
1.4.3 Actual Available Cut-out Size: 100A
1.4.4 Year of Installation: NA
1.4.5 Actual Required ELCB Size: 63 A Present at Branches
1.4.6 Meter Cabin Condition: Good
1.4.7 Availability of Fire extinguisher/ Sand Buckets: **Yes (Bad Condition)**
1.4.8 Water proofing/Seepage: No
1.4.9 Damages/Tampering: No
1.4.10 Adequacy in connections/Termination/Joints: Good
1.4.11 Ease of accessibility: Good
1.4.12 Danger Signs: **NO**
1.4.13 Smoke detectors : Yes
1.4.14 Alarm system: **NO**
1.4.15 Emergency Entry/Exit door: Yes
1.4.16 Emergency evacuation plan: **NO**
1.4.17 Fire extinguishers: Yes
1.4.18 Public Address system : YES
1.4.19 Rodent arrester: **NO**
1.4.20 CCTV: Yes
1.4.21 Meter cabin: Good Condition
1.4.21.1 Leakage: **NO**
1.4.21.2 Damaged/tempered/cracks: **NO**
1.4.21.3 Name plate: **No**
1.4.21.4 Water logging possibility: **No**
1.4.22 Physical Inspection of Power source : Good Condition
1.4.22.1 Adequacy as per standards **OK**
1.4.22.2 Rusting of panel **NO**
1.4.22.3 Visible scaling **NO**
1.4.22.4 Scaled/ Unclean wires breakers **NO**
1.4.22.5 Wet / Dampness **NO**
1.4.22.6 Service Provider Earthing **YES**
1.4.22.7 Consumer Earthing **NO**

1.5 Lighting System Analysis

Usage of LED lights has been done. No CFL/Bulb/incandescence lamps found. Only 10 conventional Tubelights found.

Room	LUX	Remark
Principal Office	146	Adequate
Office	145	Adequate
104	150	Adequate
103	186	Adequate
DigiLab	200	Adequate
IQAC	140	Adequate
Staff room	300	Adequate
Kitchen	127	Adequate
201	205	Adequate
202	225	Adequate
203	150	Adequate
204	156	Adequate
208	210	Adequate
209	205	Adequate
210	225	Adequate
Toilet	115	Adequate
301	210	Adequate
303	212	Adequate
304	246	Adequate
LCR	145	Adequate
302	150	Adequate
Toilet	105	Adequate
Library	140	Adequate
Library	300	Adequate
Research Room	127	Adequate
UGC	205	Adequate
401	225	Adequate
402	150	Adequate
CR	156	Adequate
408	210	Adequate
409	205	Adequate
HC	225	Adequate
504	200	Adequate
508	210	Adequate
509	212	Adequate
510	220	Adequate

1.6 Cooling System Analysis

1.6.1 Air Conditioners

SL No	Room	AC	STAR
1	Principal Office	1	
2	Office	1	
3	DigiLab	2	3
4	IQAC	1	3
5	Staff room	2	3
6	Library	1	3
7	Research Room	1	3
8	UGC	1	3
9	CR	1	5

Notes:

1. All Lower Star Acs to be replaced by 5 Stars.
2. ACs shall be serviced regularly.
3. Air Filters to be cleaned regularly.
4. AC Savers to be installed to reduce consumption.

1.6.2 Fans: Total Fans Installed: 146

Room	Fans
Principal Office	1
Office	4
104	4
103	10
201	5
202	1
203	8
204	9
208	5
209	4
210	8
301	4
303	11
304	10
LCR	2
302	1
Library	13
Library	1
Research Room	1
401	4

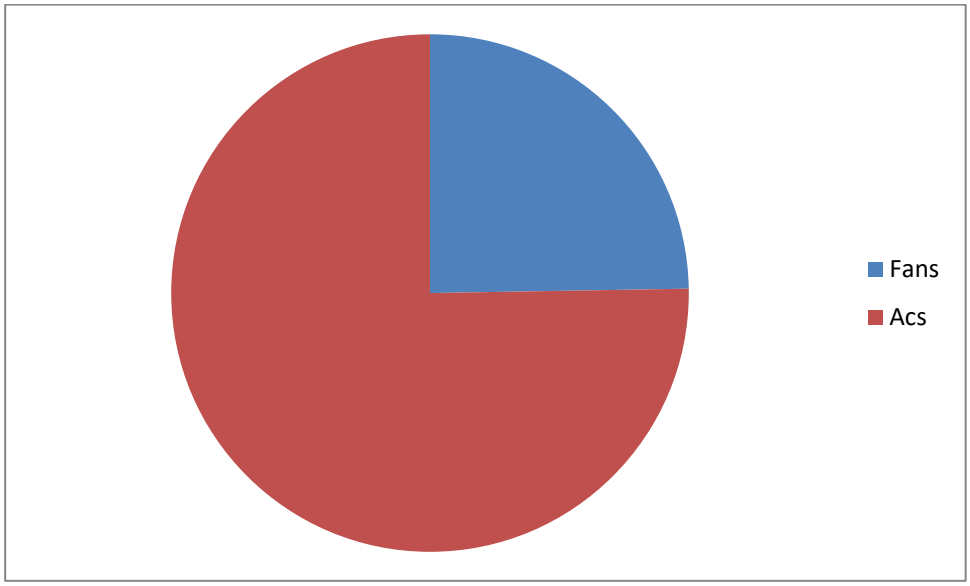
402	4
CR	2
408	5
409	8
HC	1
504	7
508	5
509	4
510	4

Notes:

1. All Fans to be replaced by BLDC Energy saving Fans.
2. Fans shall be cleaned regularly.

Cooling System

Cooling System	Fans	Acs
Numbers	146	11
Load(Kw)	10.95	33.33
Percentage	24.729	75.271



1.7 Renewable System Analysis

Solar Photo Voltaic Grid Connected Roof Top System is installed.

Capacity 30Kwp

Year of Installation Apr 2018

Total Yield 116880 Kwh

Amount Saved/Earned (considering Rate of Units Rs11.20): Rs. 1309056

Expected Average yield: 102 to 125Kwh/Day

Current Average yield: 80Kwh/Day

Month	Generation	Yield
(name)	KVA	%
March	3189.00	102.87
April	3334.00	111.13
May	3208.00	103.48
June	2589.00	86.30
July	1116.00	36.00
August	1610.00	51.94
September	1820.00	60.67
October	2854.00	92.06
November	2516.00	83.87
December	1609.00	51.90
January	1890.00	60.97
February	209.00	52.25

Observations:-

1. Solar Modules are not cleaned regularly/properly.
2. Few Modules covered with shadow are still not lifted up.

1.8 Conservation Analysis

SL No	Wastage Type	Quantity	Action
1	Biomass	1-2Kg per day (as discussed)	Feeding to Composting
2	Paper	2-5Kg approx. per month	Send for recycling through third party
3	Water	50-100Ltrs approx. per year due to leakage	Not considered
4	E-Waste	Un-quantified	Send for recycling through third party
5	Bio-Hazardous	NIL	NIL
6	Fuel	Electricity Wastage by running fans and lights for uncounted time after room cleaning	NIL
7	Production	NIL	NIL
8	Process	Occasional electricity wastage by room user/s accidently keeping equipments switched On while leaving the room.	NIL
9	Food	Occasionally wastage in very low quantity	Cleaned by housekeeping and sent to municipal wastage
10	Man-Hours	NIL	NIL

Best Practices

1. Install a Bin in reception area to collect paper wastage (point no.2).
2. Fix all taps, replace old pipelines, use Teflon tapes on ties, and use sealants for joints to avoid leakage (point no.3).
3. Install a Bin in reception area to collect E- wastage like damaged or dead luminaries, mobiles, computer or spare-parts, Etc. hand over it to proper scrap vendor once bin is full (point no.4).
4. Update SOP of cleaning with statement "Switch OFF Fans after 5 Minutes once room is cleaned". (point no.6)
5. Fix a Notice on Back-side of Exit Door of Room-"SWITCH OFF all electrical equipments and Taps". (point no.8 and 6)
6. In present scenario observed there is no any recycling procedure is thought, documented or observed in premises.
7. Recycling of one side used papers to be observed.
8. Prepare and observed a Generalized SOP having attributes specialize on each type of wastage and it's re-usage and/or recycling.

1.9 Power Quality Analysis

Refer Annexure-1

1.10 Thermography Analysis

Refer Annexure-2

1.11 Safety Analysis

1.11.1 Overview

Name: Shailendra Degree College
Area: Metropolitan
Name of the Power supply Company: AECL
Type of Power supply: LT
Electrical Power Input: Three Phase
Category: LT IV(B)
Total Load Requirement(KW): 68
Sanctioned Load(KW): 40
Electrical Wiring Diagram with Updating: Not Provided
Total no. of Control panels/DB : 9
Whether MCBs are ISI approved: Yes
Whether MCBs are of appropriate rating: Yes
Capacity of UPS System: No
APFC Panel installed: No
Whether all Electrical cables/ wirings are of appropriate rating, ISI approved: Yes

1.11.2 Legal Requirements and Documentation Analysis

1.11.2.1 Floor Map with Markings (Emergency exit, Fire extinguishers, Sprinklers, Electrical safety Devices/ Cut Offs) **NOT AVAILABLE**
1.11.2.2 Copy of SLD **NOT AVAILABLE**
1.11.2.3 Earthing Layout **NOT AVAILABLE**
1.11.2.4 Wiring Diagram **NOT AVAILABLE**
1.11.2.5 Control Panel Diagram/Layout **NOT AVAILABLE**
1.11.2.6 DG Set Layout **NOT AVAILABLE**
1.11.2.7 UPS Layout **NA**
1.11.2.8 Renewable Energy System layout **NA**
1.11.2.9 Study of Existing safety measures (Copy of Document.) Existing scenario in safety **NOT AVAILABLE**
1.11.2.10 **Verification of circulars, Records of Preventive measurements** (Copy of Document.)
1.11.2.11 **Verify compliances with standards NOT AVAILABLE**
1.11.2.12 **Verification of Behavioral SOP** (Copy of Document.) **NOT AVAILABLE**
1.11.2.13 **Verification of O & M SOP** (Copy of Document.) **NOT AVAILABLE**
1.11.2.14 **Checking Provision for electric shock response and treatment** (Copy of Document.) Knowledge and awareness about hazards **NOT AVAILABLE**
1.11.2.15 **Checking Log of Electrical accidents** (Copy of Document.) History **NOT AVAILABLE**
1.11.2.16 **Checking Provision of Danger Sign Boards** (Copy of Document.) Emergency response **NOT AVAILABLE**
1.11.2.17 **Checking Workmen involved in electric work** (Copy of Document.) Readiness and safety of first respondents **NOT AVAILABLE**
1.11.2.18 **Checking Provision and Height of work** (Copy of Document) Safe working **NOT AVAILABLE**
1.11.2.19 **Checking availability of First Aid** Emergency response **NOT AVAILABLE**

1.11.3 Presence of hazard Analysis

SL No	Safety Hazard Yes/No Remarks	Yes/No	Remarks
1)	Existence of non ISI/standardized appliances	NO	
2)	Whether the existing wiring is more than 20 years old.(Wiring more than 20 years old must be recommended for replacement)	NO	
3)	Whether Fire detection and Alarm system is installed?	YES	
4)	Whether sufficient number of fire extinguishers is installed?	YES	
5)	Segregated UPS room with proper ventilation/exhaust is provided?	NA	
6)	Is their display of emergency telephone number of nearest fire station, hospital and key person?	NO	
7)	Whether frequent sparking at certain place(s) reported	NO	
8)	Whether switches found with burnt marks	NO	
9)	Existence of non-standardized tube lights/CFLs/Bulbs and TL starters and chokes	NO	
10)	Dampness in walls and ceiling	NO	
11)	Loose switches/plugs	NO	
12)	Naked wiring or connections	NO	
13)	All Electrical cables/wiring are in conduits and are protected by a fire proof insulation	YES	
14)	Seepage /Leakage of water in walls or on and around electrical installations	NO	
15)	Whether connection to each AC is provided through an individual MCB of appropriate rating & of standard make and ISI approved.	YES	
16)	Whether there are frequent tripping due to overloads?	NO	

1.11.4 Installation & Usage safety Analysis

SL No	Safety Point/Room	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	No main Cut-Off for room	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	Un-labelled Circuit Breakers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Wrong Sized Circuit Breakers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	Height/Obstruction to DB	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	Ungrounded Metal Bodies	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	Old wire/socket/machine	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1
7	Non/single insulated Portable tools	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	Multi-plug sockets	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	Exposed Electrical parts	1	1	1	1	1	0	1	1	0	1	1	1	1	0	1	1	1	1	0
10	Damaged Socket/Plug	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0
11	Old connections not removed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	Cable lying through passage	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	Loose/Hanging connection	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
14	Inadequate wiring	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	Damaged Cable	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16	Cable lying by hot/gas/water	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	Visible Overload	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
18	Non Standard Equipments	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
19	Un-tagged Faulty/Unused machines	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1
20	Cracks/Damages/Leakage	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
21	Exit Blocked	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22	Rodents/Pigeons/Termite	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
23	Fire Fighting Provision	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
24	MCB to Critical Loads	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
25	Color code of cables	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

SL No	Safety Point/Room	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
1	No main Cut-Off for room	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	Un-labelled Circuit Breakers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Wrong Sized Circuit Breakers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	Height/Obstruction to DB	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1
5	Ungrounded Metal Bodies	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	Old wire/socket/machine	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	Non/single insulated Portable tools	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	Multi-plug sockets	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
9	Exposed Electrical parts	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	Damaged Socket/Plug	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1
11	Old connections not removed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	Cable lying through passage	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	Loose/Hanging connection	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1
14	Inadequate wiring	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	Damaged Cable	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16	Cable lying by hot/gas/water	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	Visible Overload	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
18	Non Standard Equipments	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
19	Un-tagged Faulty/Unused machines	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20	Cracks/Damages/Leakage	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1
21	Exit Blocked	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22	Rodents/Pigeons/Termite	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
23	Fire Fighting Provision	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
24	MCB to Critical Loads	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
25	Color code of cables	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Note: (1 is available 0 is not available)

1.11.5 Visual Inspection

1.11.5.1 Earthing Pits Unconditioned

1.11.5.2 Elevators

SL No	Check Point	Lift-1
1	Safe travelling in elevators	Ok
2	Bullion Movement	Ok
3	Door Safety	OK
4	Alarm	No
5	Overloading	Ok
6	Automatic Rescue	No
7	Fireman Switch	No
8	Intercom	No
9	Wiring in Machine Room	Ok
10	Light and Fans	Ok

1.11.5.3 Power Source

SL No	Check Point	Source-1	Source-2
1	Adequacy as per standards	OK	OK
2	Rusting of panel	OK	OK
3	Visible scaling	OK	OK
4	Scaled/ Unclean wires breakers	OK	Ok
5	Wet / Dampness	OK	OK

1.11.5.4 Rating and Capacity of Cables

SLD data is not available while audit, results can be opted with SLD.

1.11.5.5 Rating and Capacity of Protection devices

SLD data is not available while audit, results can be opted with SLD.

1.11.5.6 Cable Terminations at Panel & DBs

DB							Breakers					Cables			
No	Floor	Condition	Burn	Gland	Joint	ISI	MCB	RCB	Test	Condition	Heat	Material	Capacity	Condition	Heat
1	First	√	X	√	X	√	16T	F40	√	√	X	Cu	4X4	Good	X
2	First	√	X	√	X	√	0	F40	√	√	x	Cu	4X4	Good	X
3	First	√	X	√	X	√	0	F40	√	√	X	Cu	4X2.5	Good	X
4	Second	√	X	x	X	√	F40	F40	√	√	X	Cu	4X4	Good	X
5	Third	√	X	X	X	√	16T	F63	√	√	X	Cu	4X4	Good	X
6	Fourth	√	X	X	X	√	16T	X	√	√	X	Cu	4X4	Good	X
7	Fourth	√	X	X	X	√	16T	F40	√	√	X	Cu	4X4	Good	X
8	Fifth	√	X	X	X	√	X	D40	√	√	X	Cu	4X2.5	Good	X
9	Fifth	√	x	√	X	√	X	F40	√	√	X	Cu	4X4	Good	X

Condition: Rusted, Broken, pale, unclean, Hanging (x) Burnt: Burning marks, sparking (x)
Glands: yes, No, loose, broken (x) ISI: Check ISI for Breaker, Cable and other (x)
Test: Done, Not Done, Pass, fail (MCB/RCB) (x)

1.11.6 Insulation Mats

NOT AVAILABLE

1.11.7 IE/CEA Regulations compatibility

Following Regulations have been breached by electric connections present

Regulation-3

Register of Designated Person not found

Regulation-12

Visible Sign of Overloading in respect of apparatus wiring at Air condition wire of DB-4

Regulation-16

i. **Earth Terminal provided by supplier not satisfactory**
ii. **General visible condition of Earth system not satisfactory**

Regulation-18

Danger Notice Board Not Found

Regulation-19

Insulating floor or mats to IS-15652-2006 have been not provided

Regulation-27

i. **Fire Buckets with sand Filled are not cleaned and conditioned**
ii. **First Aid Box Not Found**

Regulation-28

i. **No instructions in any manner is affixed for resuscitation from electric Shock**
ii. **No Designated Person is available for resuscitation from electric Shock**

Regulation-41

iii. **Consumer Earth Electrode not available for testing**
iv. **Earth wire is not terminated properly**
v. **Record of Earth Resistance not maintained**

Disclaimer

The report is generated from data, information, answer to asked questions, standards and procedures defined by different and concerned authorities time to time, available site condition, weather condition, operational and availability conditions provided by beneficiary on the day of survey. If any changes on above said measures on any other parameters affecting these measures may lead to change, alter, in-corrections even falsifying calculations, results, recommendations and suggestions. The values, figures, amounts mentioned are indicative to the site situation and condition; it may not reflect each and every aspect of it. The report is generated restricted to given scope and available conditions and measures.

Conclusion

We hereby conclude report for "Energy Audit" of the Work done under scope of "Shailendra Degree College, Shailendra Education Society Dahisar East 400068". Please study it thoroughly and implement recommendations and suggestions at earliest.

Lexicon

Symbol	Abbreviation
A	Ampere
V	Volts
KV	Kilo volts
KVA	Kilo volt ampere
KVAR	Kilo volt ampere reactive
KW	Kilo watts
MD	Maximum demand
%THD	Percentage Total harmonic distortion
% THDv	Percentage voltage Total harmonic distortion
% THDi	Percentage current Total harmonic distortion
% TIHDv	Percentage voltage Total inter harmonic distortion
% TIHDi	Percentage current Total inter harmonic distortion
Voltage sag	Reduction in RMS voltage from 90% to 10% for the time period from 10 msec. to 1 min.
Voltage swell	Increase in RMS voltage from 110% to 180% for the time period from 10 msec. to 1 min.
Transient	Sudden non-power frequency change in the voltage or current from steady state.
%Vunb	Percentage voltage unbalance factor
%Iunb	Percentage current unbalance factor
KF	Crest factor
%U2, U3,……..,U50	Percentage individual voltage harmonics from 2 orders to 50 orders
%I2,I3,……..,I50	Percentage individual current harmonics from 2 orders to 50 orders
Max.val.	Maximum value of the parameter over the measurement period
Avg. val.	Average value of the parameter over the measurement period
Min.val.	Minimum value of the parameter over the measurement period

SAUR ENGINEERS & CONSULTANTS PVT. LTD.
Registered Energy Auditor (Class-A), Licensed Electrical Contractor, IE&L,
Registered Electrical Contractor (A-GRADE) Govt. of Maharashtra,
ISO 14001:2015, Certified Solar Rooftop Grid Engineers

Power Quality Analysis Report

Report start	[154,1,0]
Report end	[155,1,0]
Report duration	[156,1,0]
Instrument ID	PEL103 120912UBH

Database File Name: SES.dvb

Operator

Saur Engineers & Consultants Pvt Ltd
Anup A Samant
D8, Plot No. 108 Akshay Gorai-1
Borivali west
Mumbai, Maharashtra 400091
9168402909

Test Site

Shailendra Degree College
Principal
Shailendra Education Society
Shailendra Nagar, Dahisar West
Mumbai, Maharashtra 400068

Comments

[Summary]

a.Voltage (Volts)

i.Phase to Phase

R-Y	Y-B	B-R
406.8	404.9	408.0

ii.Phase to Neutral

R-N	Y-N	B-N
236.1	233.9	234.3

b.Current (Amps)

R	Y	B	N
06.74	11.90	09.07	14.32

c.Frequency (Hz) : 49.50

d.Active Power (KW): 4.31

e.Reactive Power (KVAr): 1.41

f.Apparent Power (KVA): 5.99

g.Power Factor: 0.965

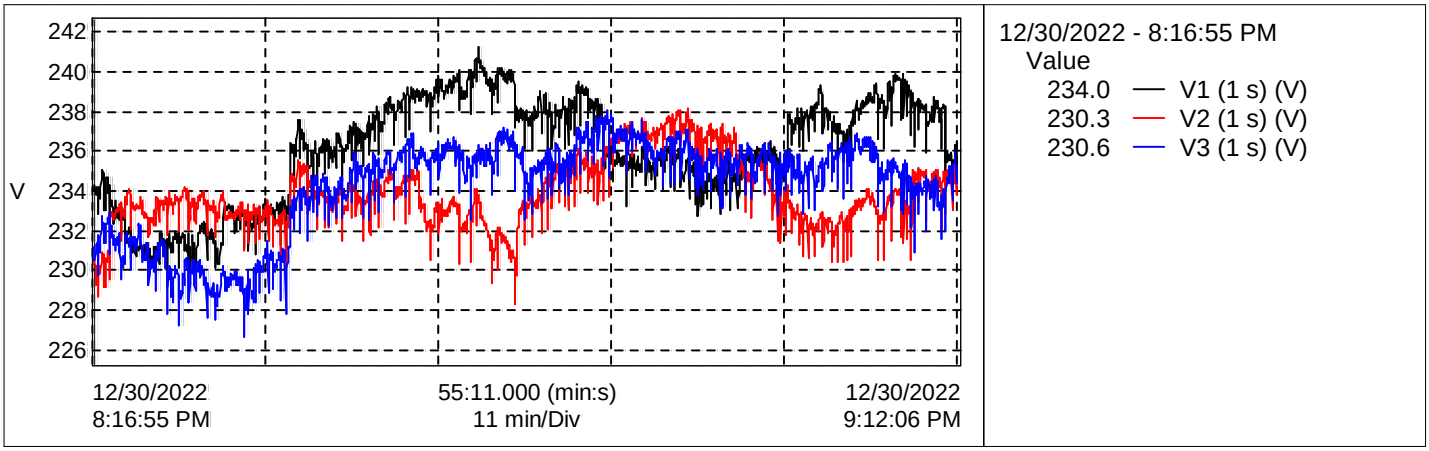
k.THDv

V1	V2	V3	U1	U2	U3
2.31	2.19	20.5	1.65	1.58	1.56

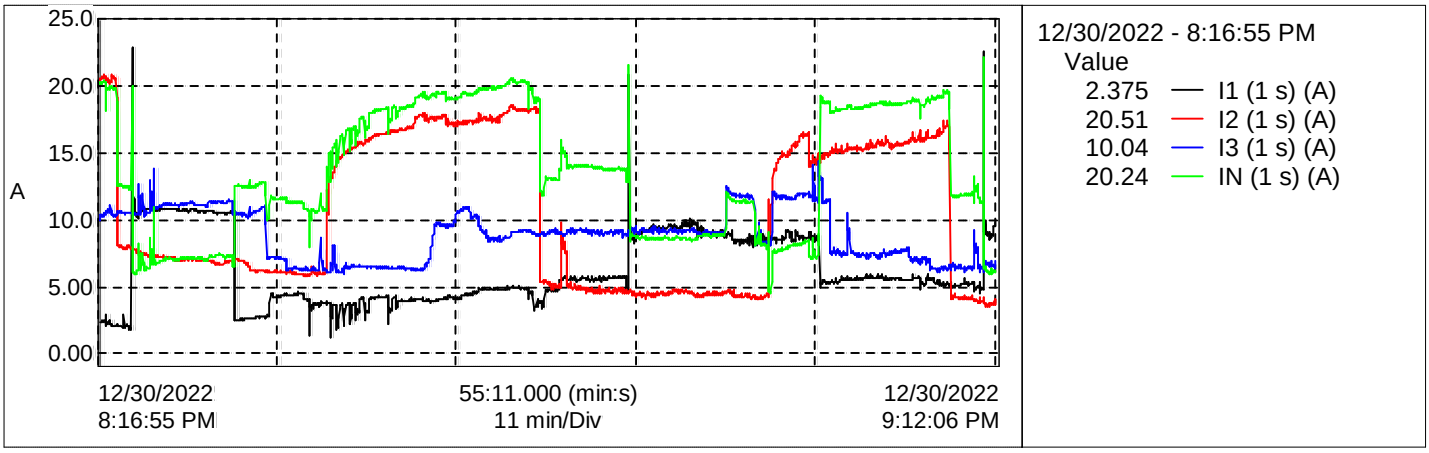
k.THDi

I1	I2	I3	IN
27.83	21.15	29.68	29.00

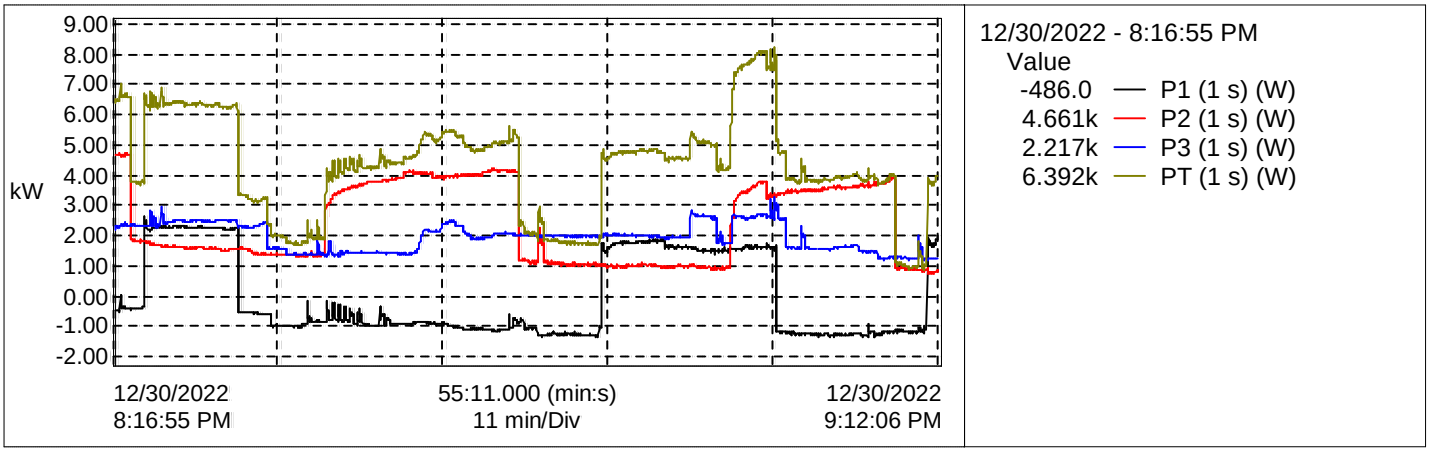
Name	AVG	MIN	MIN date	MIN time	MAX	MAX date	MAX time	Units
V1 (1 s)	236.1	229.8	12/30/2022	8:20:53 PM	241.3	12/30/2022	8:41:29 PM	V
V2 (1 s)	233.9	228.3	12/30/2022	8:43:52 PM	238.2	12/30/2022	8:54:55 PM	V
V3 (1 s)	234.3	226.7	12/30/2022	8:26:33 PM	238.1	12/30/2022	8:49:41 PM	V



Name	AVG	MIN	MIN date	MIN time	MAX	MAX date	MAX time	Units
I1 (1 s)	6.749	1.208	12/30/2022	8:31:09 PM	22.87	12/30/2022	8:18:56 PM	A
I2 (1 s)	11.90	3.453	12/30/2022	9:11:25 PM	20.93	12/30/2022	8:17:40 PM	A
I3 (1 s)	9.073	5.986	12/30/2022	8:31:59 PM	14.38	12/30/2022	9:01:08 PM	A
IN (1 s)	14.32	4.521	12/30/2022	8:58:12 PM	22.18	12/30/2022	9:11:20 PM	A

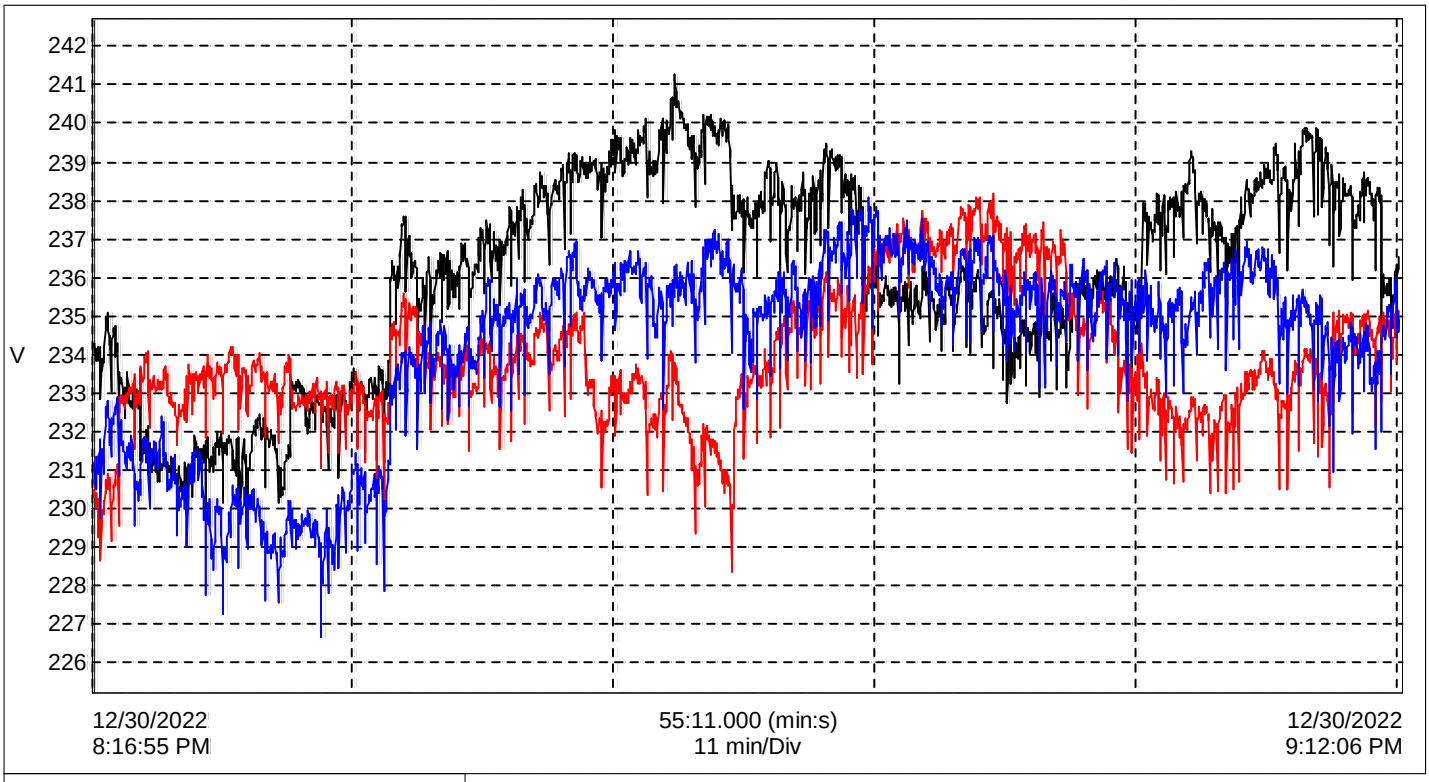


Name	AVG	MIN	MIN date	MIN time	MAX	MAX date	MAX time	Units
P1 (1 s)	-0.025	-1.358	12/30/2022	9:04:47 PM	2.643	12/30/2022	8:18:56 PM	kW
P2 (1 s)	2.390	0.708	12/30/2022	9:11:25 PM	4.730	12/30/2022	8:17:40 PM	kW
P3 (1 s)	1.945	1.185	12/30/2022	9:11:05 PM	3.287	12/30/2022	9:01:08 PM	kW
PT (1 s)	4.310	0.860	12/30/2022	9:11:05 PM	8.225	12/30/2022	9:01:08 PM	kW



Phase-to-Neutral Voltage RMS

Name	AVG	MIN	MIN date	MIN time	MAX	MAX date	MAX time	Units
V1 (1 s)	236.1	229.8	12/30/2022	8:20:53 PM	241.3	12/30/2022	8:41:29 PM	V
V2 (1 s)	233.9	228.3	12/30/2022	8:43:52 PM	238.2	12/30/2022	8:54:55 PM	V
V3 (1 s)	234.3	226.7	12/30/2022	8:26:33 PM	238.1	12/30/2022	8:49:41 PM	V



12/30/2022 - 8:16:55 PM
Value
234.0 — V1 (1 s) (V)
230.3 — V2 (1 s) (V)
230.6 — V3 (1 s) (V)

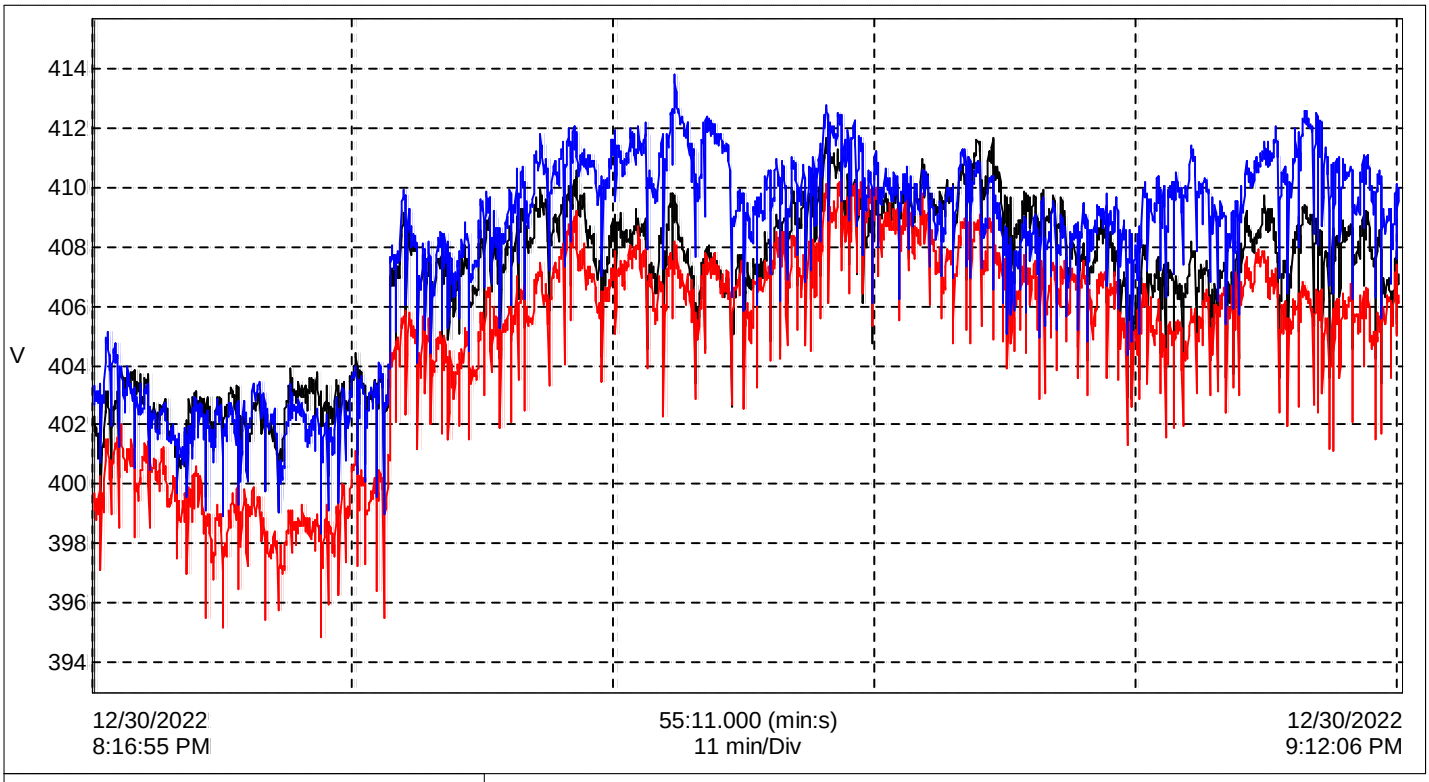
V1 (1 s) (V)			
Date	Time	Val	Units
12/30/2022	8:16:55 PM	234.0	V
12/30/2022	8:16:56 PM	234.2	V
12/30/2022	8:16:57 PM	234.2	V
12/30/2022	8:16:58 PM	234.3	V
12/30/2022	8:16:59 PM	234.2	V
12/30/2022	8:17:00 PM	234.1	V
12/30/2022	8:17:01 PM	234.2	V
12/30/2022	8:17:02 PM	234.1	V
12/30/2022	8:17:03 PM	233.9	V
12/30/2022	8:17:04 PM	233.8	V
12/30/2022	8:17:05 PM	234.2	V
12/30/2022	8:17:06 PM	234.2	V
12/30/2022	8:17:07 PM	234.0	V

Exceptions

Name	Date	Time	Duration	Duration Units	MIN	MAX	AVG	Units

Phase-to-Phase Voltage RMS

Name	AVG	MIN	MIN date	MIN time	MAX	MAX date	MAX time	Units
U12 (1 s)	406.8	399.1	12/30/2022	8:24:43 PM	411.7	12/30/2022	8:54:55 PM	V
U23 (1 s)	404.9	394.9	12/30/2022	8:26:33 PM	410.3	12/30/2022	8:48:31 PM	V
U31 (1 s)	408.0	398.4	12/30/2022	8:26:33 PM	413.8	12/30/2022	8:41:29 PM	V



12/30/2022 - 8:16:55 PM
Value
401.8 — U12 (1 s) (V)
399.1 — U23 (1 s) (V)
402.7 — U31 (1 s) (V)

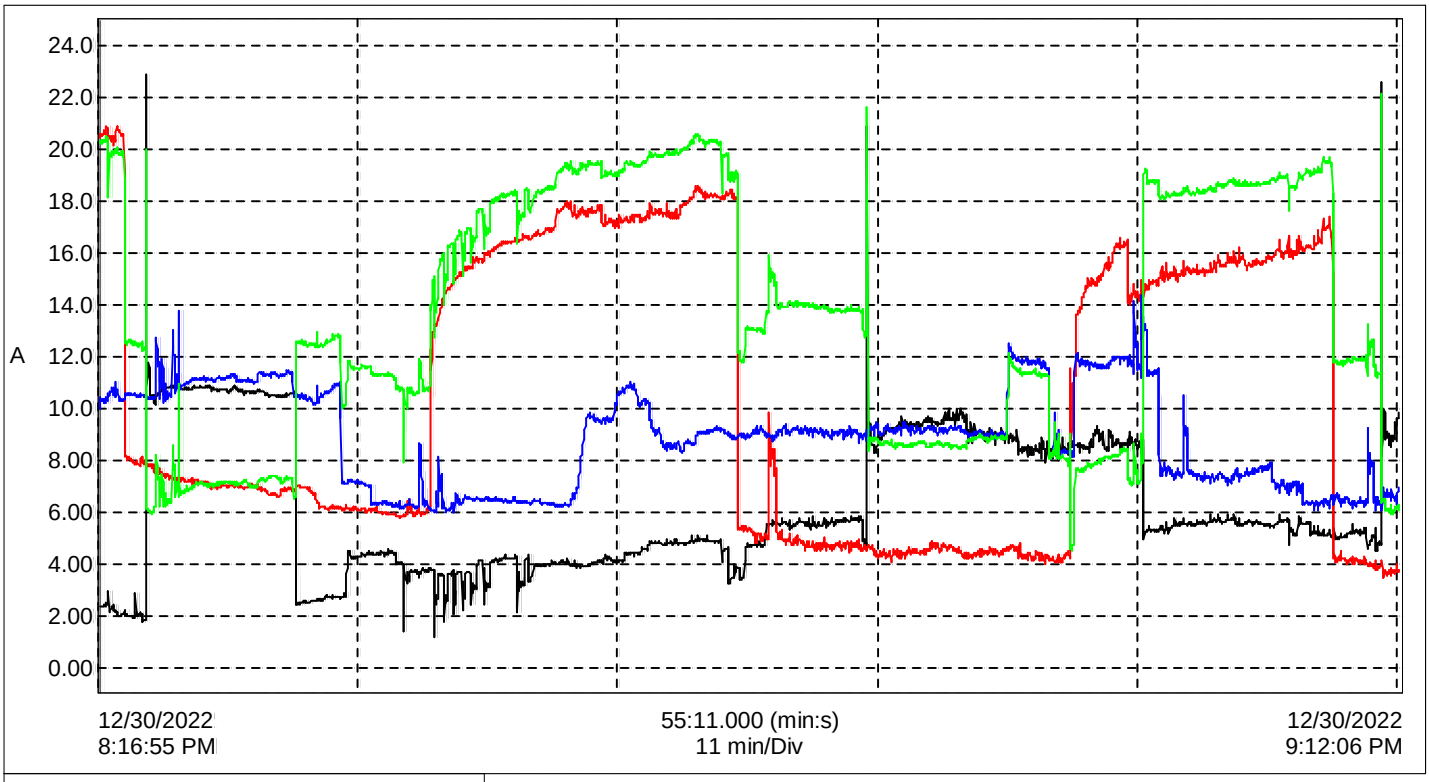
U12 (1 s) (V)			
Date	Time	Val	Units
12/30/2022	8:16:55 PM	401.8	V
12/30/2022	8:16:56 PM	402.2	V
12/30/2022	8:16:57 PM	402.0	V
12/30/2022	8:16:58 PM	402.3	V
12/30/2022	8:16:59 PM	402.0	V
12/30/2022	8:17:00 PM	401.9	V
12/30/2022	8:17:01 PM	401.9	V
12/30/2022	8:17:02 PM	401.7	V
12/30/2022	8:17:03 PM	401.7	V
12/30/2022	8:17:04 PM	401.6	V
12/30/2022	8:17:05 PM	401.7	V
12/30/2022	8:17:06 PM	400.9	V
12/30/2022	8:17:07 PM	401.4	V

Exceptions

Name	Date	Time	Duration	Duration Units	MIN	MAX	AVG	Units

Current RMS

Name	AVG	MIN	MIN date	MIN time	MAX	MAX date	MAX time	Units
I1 (1 s)	6.749	1.208	12/30/2022	8:31:09 PM	22.87	12/30/2022	8:18:56 PM	A
I2 (1 s)	11.90	3.453	12/30/2022	9:11:25 PM	20.93	12/30/2022	8:17:40 PM	A
I3 (1 s)	9.073	5.986	12/30/2022	8:31:59 PM	14.38	12/30/2022	9:01:08 PM	A
IN (1 s)	14.32	4.521	12/30/2022	8:58:12 PM	22.18	12/30/2022	9:11:20 PM	A



12/30/2022 - 8:16:55 PM
Value
2.375 — I1 (1 s) (A)
20.51 — I2 (1 s) (A)
10.04 — I3 (1 s) (A)

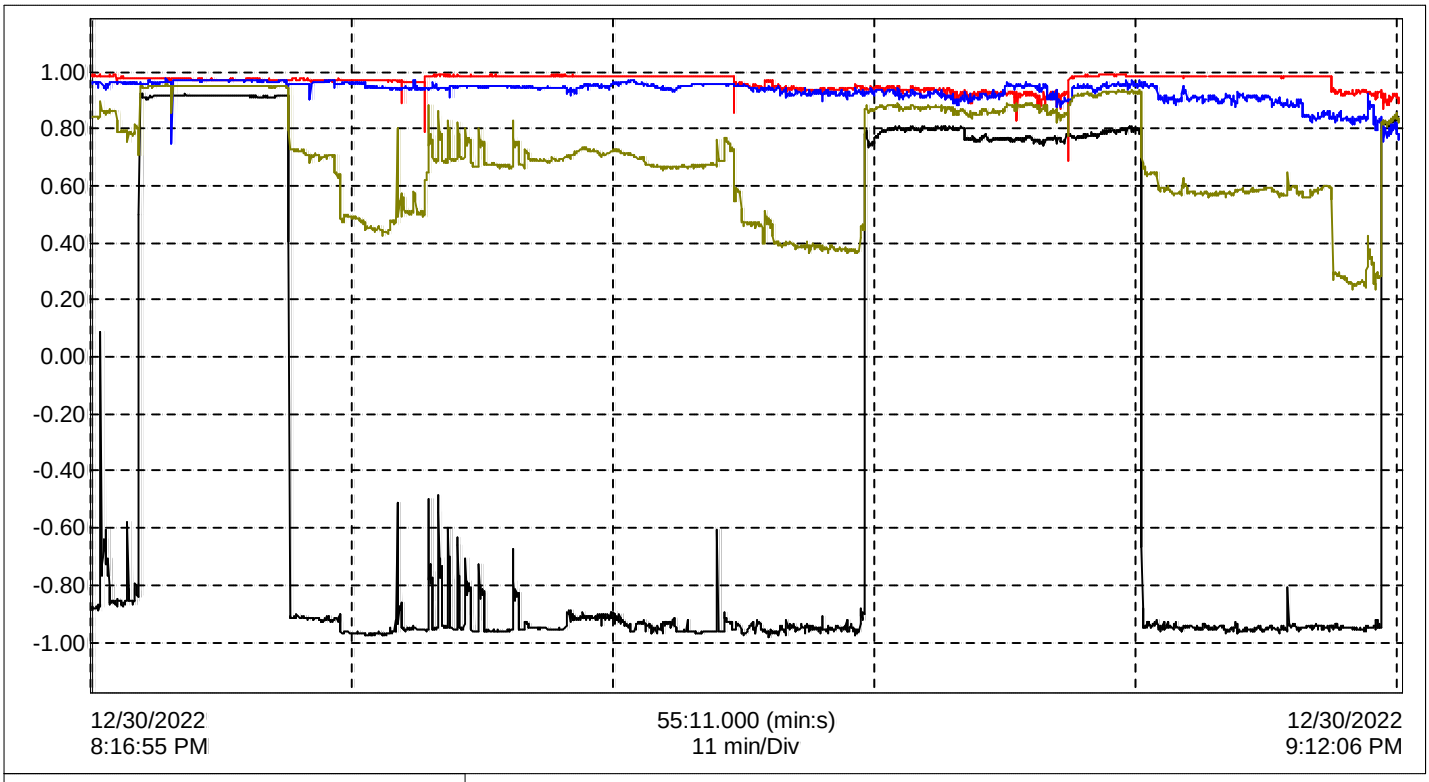
I1 (1 s) (A)			
Date	Time	Val	Units
12/30/2022	8:16:55 PM	2.375	A
12/30/2022	8:16:56 PM	2.394	A
12/30/2022	8:16:57 PM	2.385	A
12/30/2022	8:16:58 PM	2.358	A
12/30/2022	8:16:59 PM	2.384	A
12/30/2022	8:17:00 PM	2.375	A
12/30/2022	8:17:01 PM	2.355	A
12/30/2022	8:17:02 PM	2.357	A
12/30/2022	8:17:03 PM	2.369	A
12/30/2022	8:17:04 PM	2.374	A
12/30/2022	8:17:05 PM	2.352	A
12/30/2022	8:17:06 PM	2.372	A
12/30/2022	8:17:07 PM	2.403	A

Exceptions

Name	Date	Time	Duration	Duration Units	MIN	MAX	AVG	Units

Power Factor

Name	AVG	MIN	MIN date	MIN time	MAX	MAX date	MAX time	Units
PF1 (1 s)	-0.333	-0.981	12/30/2022	8:45:31 PM	0.926	12/30/2022	8:19:00 PM	
PF2 (1 s)	0.965	0.690	12/30/2022	8:58:08 PM	0.988	12/30/2022	8:59:50 PM	
PF3 (1 s)	0.932	0.750	12/30/2022	8:20:19 PM	0.977	12/30/2022	8:20:02 PM	
PFT (1 s)	0.698	0.234	12/30/2022	9:10:07 PM	0.956	12/30/2022	8:20:02 PM	



12/30/2022 - 8:16:55 PM
Value
-0.875 — PF1 (1 s) ()
0.987 — PF2 (1 s) ()
0.957 — PF3 (1 s) ()

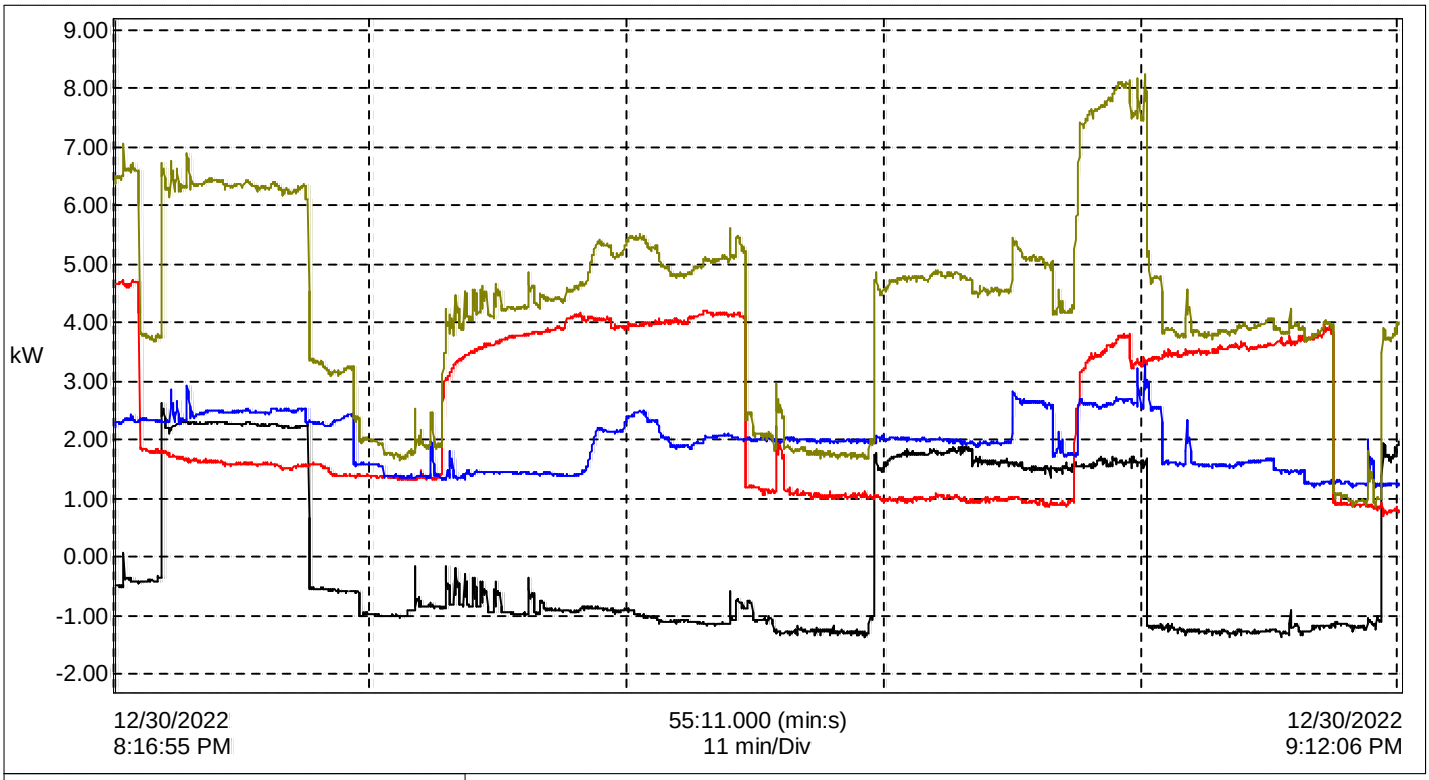
PF1 (1 s) ()		
Date	Time	Val
12/30/2022	8:16:55 PM	-874.9m
12/30/2022	8:16:56 PM	-872.2m
12/30/2022	8:16:57 PM	-881.1m
12/30/2022	8:16:58 PM	-886.3m
12/30/2022	8:16:59 PM	-882.3m
12/30/2022	8:17:00 PM	-880.9m
12/30/2022	8:17:01 PM	-881.3m
12/30/2022	8:17:02 PM	-879.9m
12/30/2022	8:17:03 PM	-884.5m
12/30/2022	8:17:04 PM	-883.6m
12/30/2022	8:17:05 PM	-880.4m
12/30/2022	8:17:06 PM	-877.7m
12/30/2022	8:17:07 PM	-880.0m

Exceptions

Name	Date	Time	Duration	Duration Units	MIN	MAX	AVG	Units

Active Power P (kW)

Name	AVG	MIN	MAX	Units
P1 (1 s)	-0.025	-1.358	2.643	kW
P2 (1 s)	2.390	0.708	4.730	kW
P3 (1 s)	1.945	1.185	3.287	kW
PT (1 s)	4.310	0.860	8.225	kW



12/30/2022 - 8:16:55 PM
Value
-486.0 — P1 (1 s) (W)
4.661k — P2 (1 s) (W)
2.217k — P3 (1 s) (W)

P1 (1 s) (W)

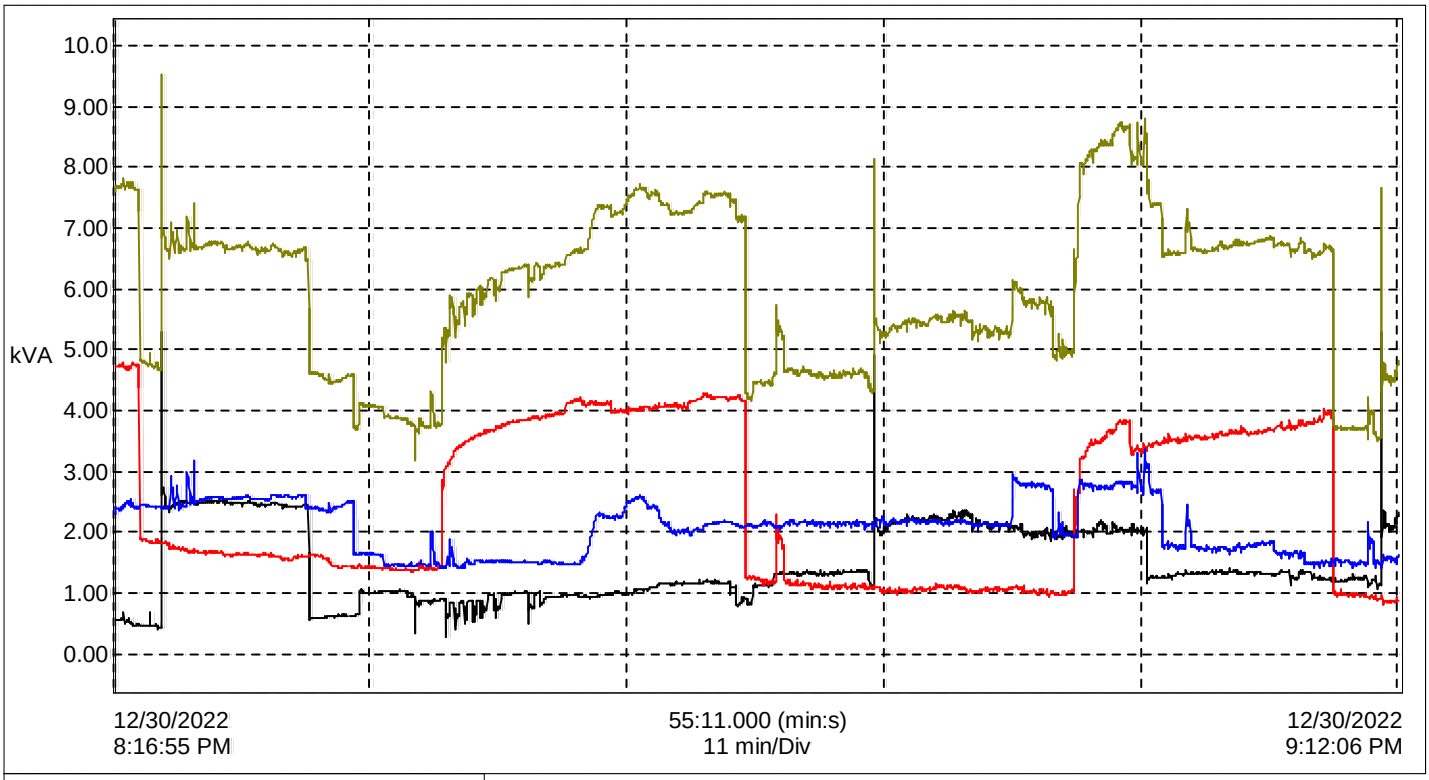
Date	Time	Val	Units
12/30/2022	8:16:55 PM	-486.0	W
12/30/2022	8:16:56 PM	-489.0	W
12/30/2022	8:16:57 PM	-492.0	W
12/30/2022	8:16:58 PM	-490.0	W
12/30/2022	8:16:59 PM	-493.0	W
12/30/2022	8:17:00 PM	-490.0	W
12/30/2022	8:17:01 PM	-486.0	W
12/30/2022	8:17:02 PM	-486.0	W
12/30/2022	8:17:03 PM	-490.0	W
12/30/2022	8:17:04 PM	-491.0	W
12/30/2022	8:17:05 PM	-485.0	W
12/30/2022	8:17:06 PM	-487.0	W
12/30/2022	8:17:07 PM	-495.0	W

Exceptions

Name	Date	Time	Duration	Duration Units	MIN	MAX	AVG	Units

Apparent Power S (kVA)

Name	AVG	MIN	MAX	Units
S1 (1 s)	1.462	0.285	5.292	kVA
S2 (1 s)	2.451	0.812	4.795	kVA
S3 (1 s)	2.079	1.402	3.384	kVA
ST (1 s)	5.993	3.182	9.524	kVA



12/30/2022 - 8:16:55 PM
Value
556.0 — S1 (1 s) (VA)
4.724k — S2 (1 s) (VA)
2.316k — S3 (1 s) (VA)

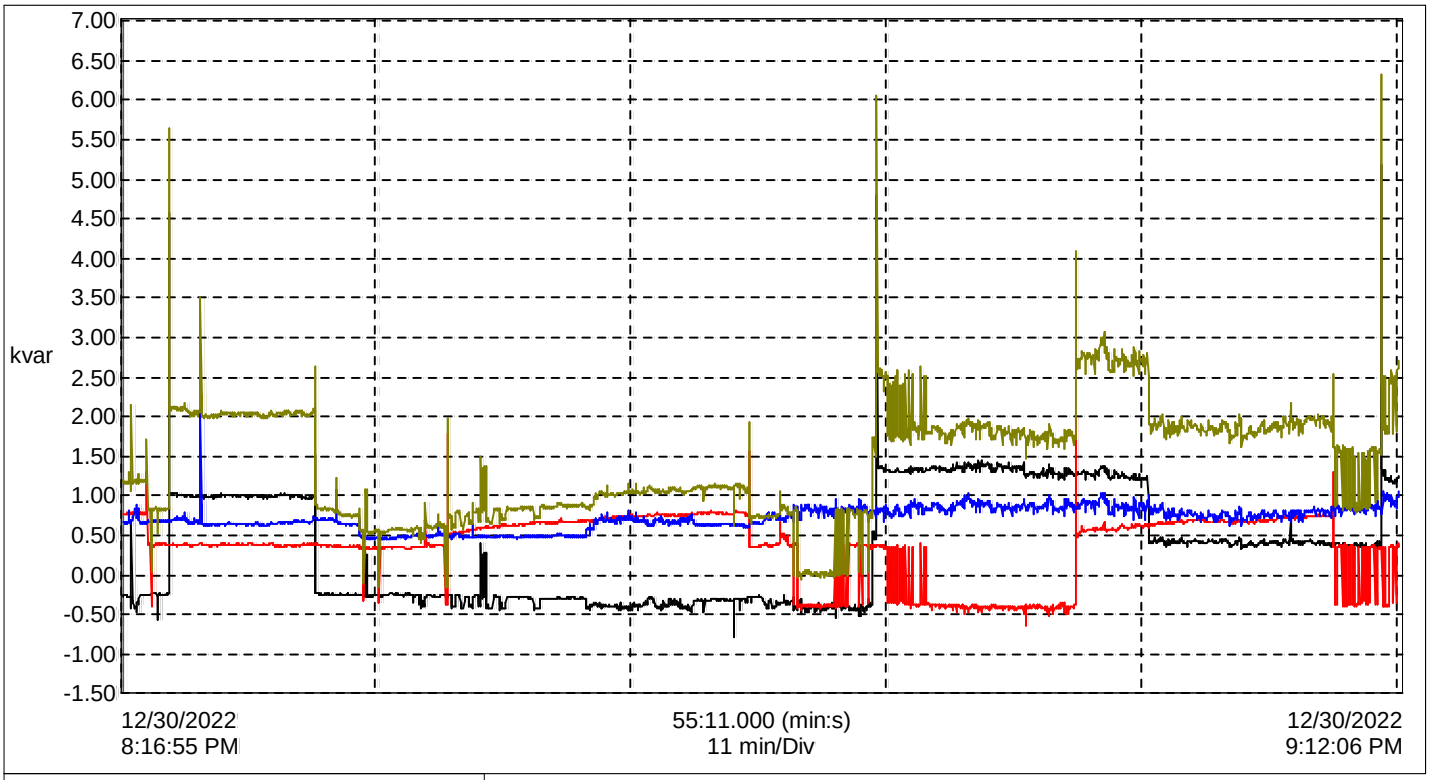
S1 (1 s) (VA)			
Date	Time	Val	Units
12/30/2022	8:16:55 PM	556.0	VA
12/30/2022	8:16:56 PM	561.0	VA
12/30/2022	8:16:57 PM	558.0	VA
12/30/2022	8:16:58 PM	552.0	VA
12/30/2022	8:16:59 PM	558.0	VA
12/30/2022	8:17:00 PM	556.0	VA
12/30/2022	8:17:01 PM	551.0	VA
12/30/2022	8:17:02 PM	552.0	VA
12/30/2022	8:17:03 PM	554.0	VA
12/30/2022	8:17:04 PM	555.0	VA
12/30/2022	8:17:05 PM	551.0	VA
12/30/2022	8:17:06 PM	555.0	VA
12/30/2022	8:17:07 PM	562.0	VA

Exceptions

Name	Date	Time	Duration	Duration Units	MIN	MAX	AVG	Units

Reactive Power Q (kvar)

Name	AVG	MIN	MAX	Units
Q1 (1 s)	0.339	-0.779	5.189	kvar
Q2 (1 s)	0.362	-0.637	1.971	kvar
Q3 (1 s)	0.714	0.443	2.109	kvar
QT (1 s)	1.415	-0.158	6.316	kvar



12/30/2022 - 8:16:55 PM

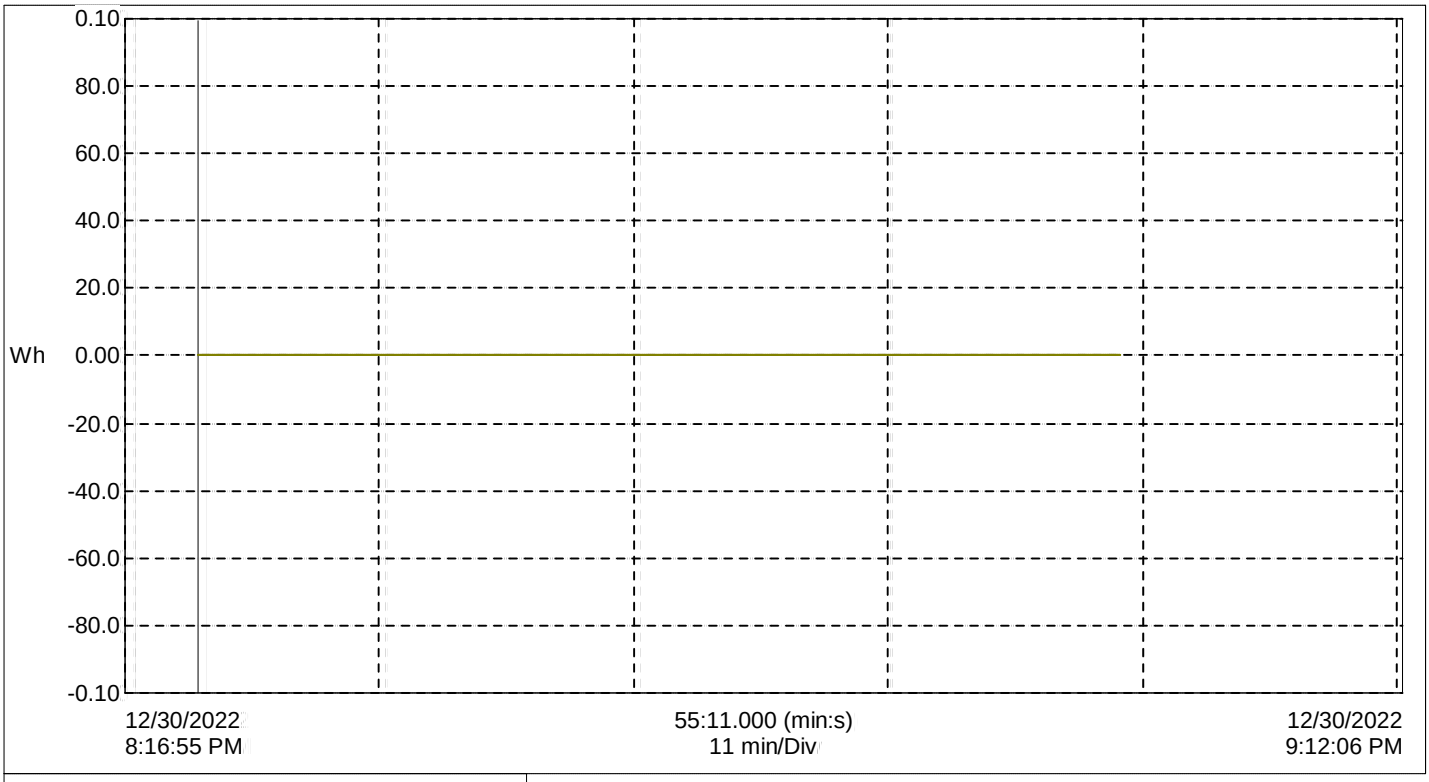
Value	
-269.0	Q1 (1 s) (var)
769.0	Q2 (1 s) (var)
670.0	Q3 (1 s) (var)

Q1 (1 s) (var)			
Date	Time	Val	Units
12/30/2022	8:16:55 PM	-269.0	var
12/30/2022	8:16:56 PM	-274.0	var
12/30/2022	8:16:57 PM	-264.0	var
12/30/2022	8:16:58 PM	-256.0	var
12/30/2022	8:16:59 PM	-263.0	var
12/30/2022	8:17:00 PM	-263.0	var
12/30/2022	8:17:01 PM	-261.0	var
12/30/2022	8:17:02 PM	-262.0	var
12/30/2022	8:17:03 PM	-259.0	var
12/30/2022	8:17:04 PM	-260.0	var
12/30/2022	8:17:05 PM	-261.0	var
12/30/2022	8:17:06 PM	-266.0	var
12/30/2022	8:17:07 PM	-267.0	var

Exceptions

Name	Date	Time	Duration	Duration Units	MIN	MAX	AVG	Units

Active Energy Ep (kWh)		
Name	MIN	Units
Ep (Wh) (10 min)	0.0	Wh
Ep+ (Wh) (10 min)	0.0	Wh
Ep- (Wh) (10 min)	0.0	Wh

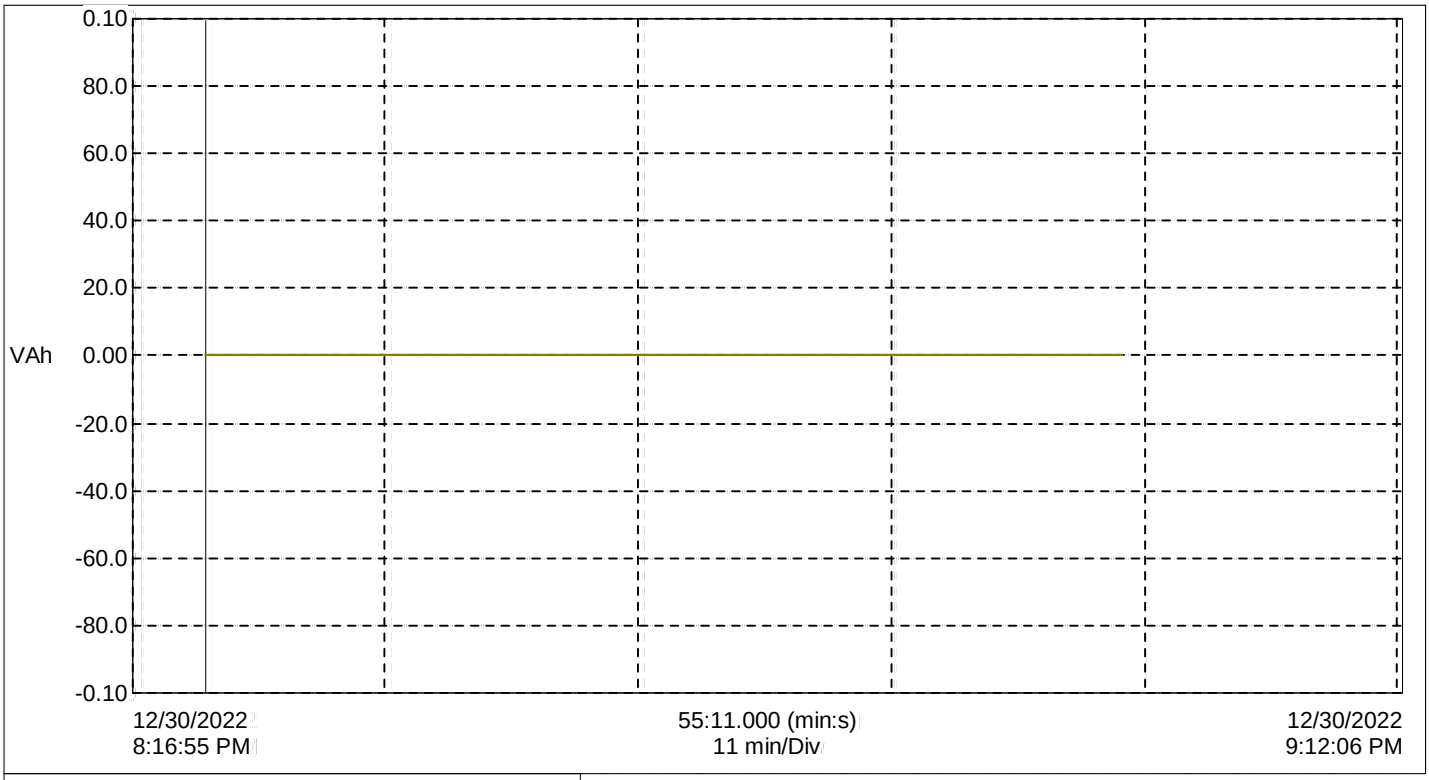


12/30/2022 - 8:20:01 PM
Value
0.0 — Ep (Wh) (10 min) (Wh)
0.0 — Ep+ (Wh) (10 min) (Wh)
0.0 — Ep- (Wh) (10 min) (Wh)

Ep (Wh) (10 min) (Wh)			
Date	Time	Val	Units
12/30/2022	8:20:01 PM	0.0	Wh
12/30/2022	8:30:01 PM	0.0	Wh
12/30/2022	8:40:01 PM	0.0	Wh
12/30/2022	8:50:01 PM	0.0	Wh
12/30/2022	9:00:01 PM	0.0	Wh

Apparent Energy Es (kVAh)

Name	MAX	Units
Es (VAh) (10 min)	0.0	VAh
Es+ (VAh) (10 min)	0.0	VAh
Es- (VAh) (10 min)	0.0	VAh

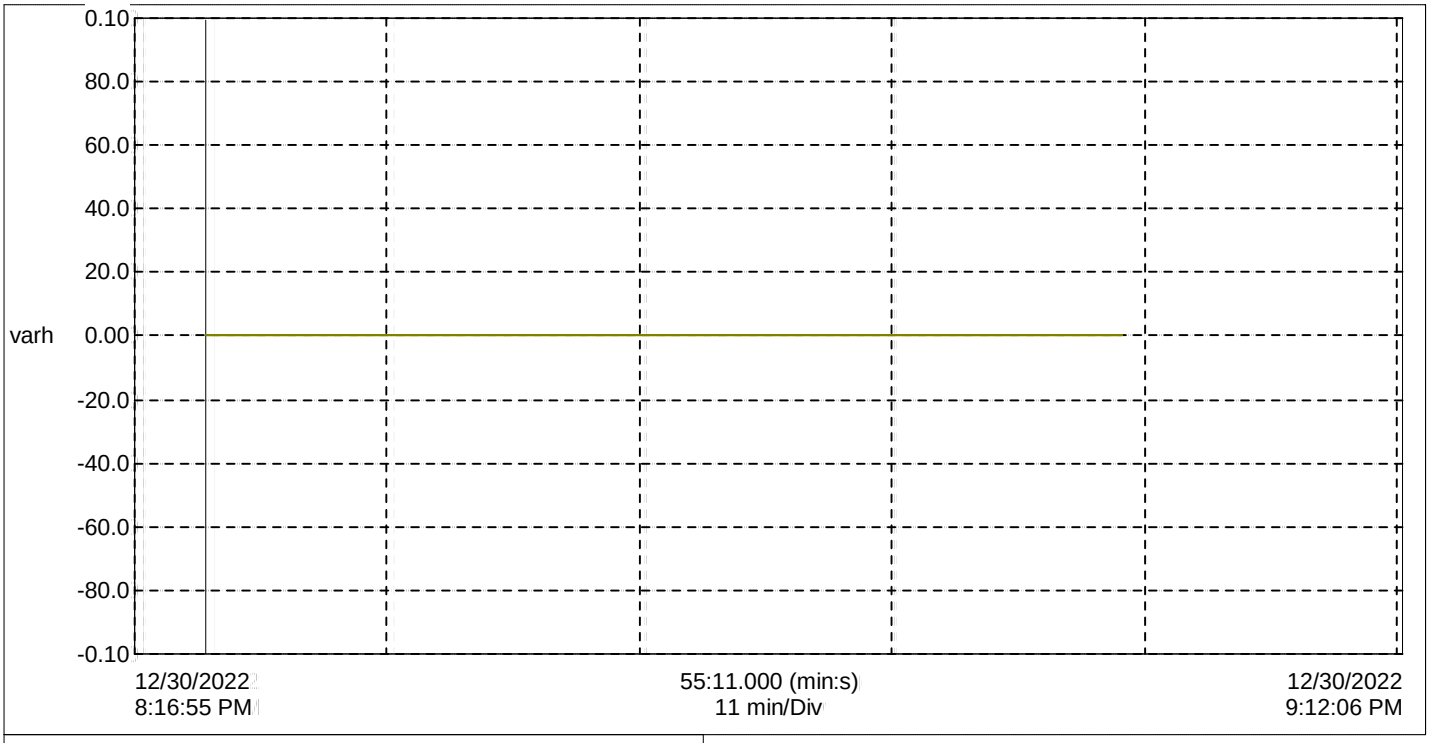


12/30/2022 - 8:20:01 PM
Value
0.0 — Es (VAh) (10 min) (VAh)
0.0 — Es+ (VAh) (10 min) (VAh)
0.0 — Es- (VAh) (10 min) (VAh)

Es (VAh) (10 min) (VAh)

Date	Time	Val	Units
12/30/2022	8:20:01 PM	0.0	VAh
12/30/2022	8:30:01 PM	0.0	VAh
12/30/2022	8:40:01 PM	0.0	VAh
12/30/2022	8:50:01 PM	0.0	VAh
12/30/2022	9:00:01 PM	0.0	VAh

Reactive Energy Eq (kvarh)		
Name	MAX	Units
Eq/q1 (varh) (10 min)	0.0	varh
Eq/q2 (varh) (10 min)	0.0	varh
Eq/q3 (varh) (10 min)	0.0	varh
Eq/q4 (varh) (10 min)	0.0	varh



12/30/2022 - 8:20:01 PM

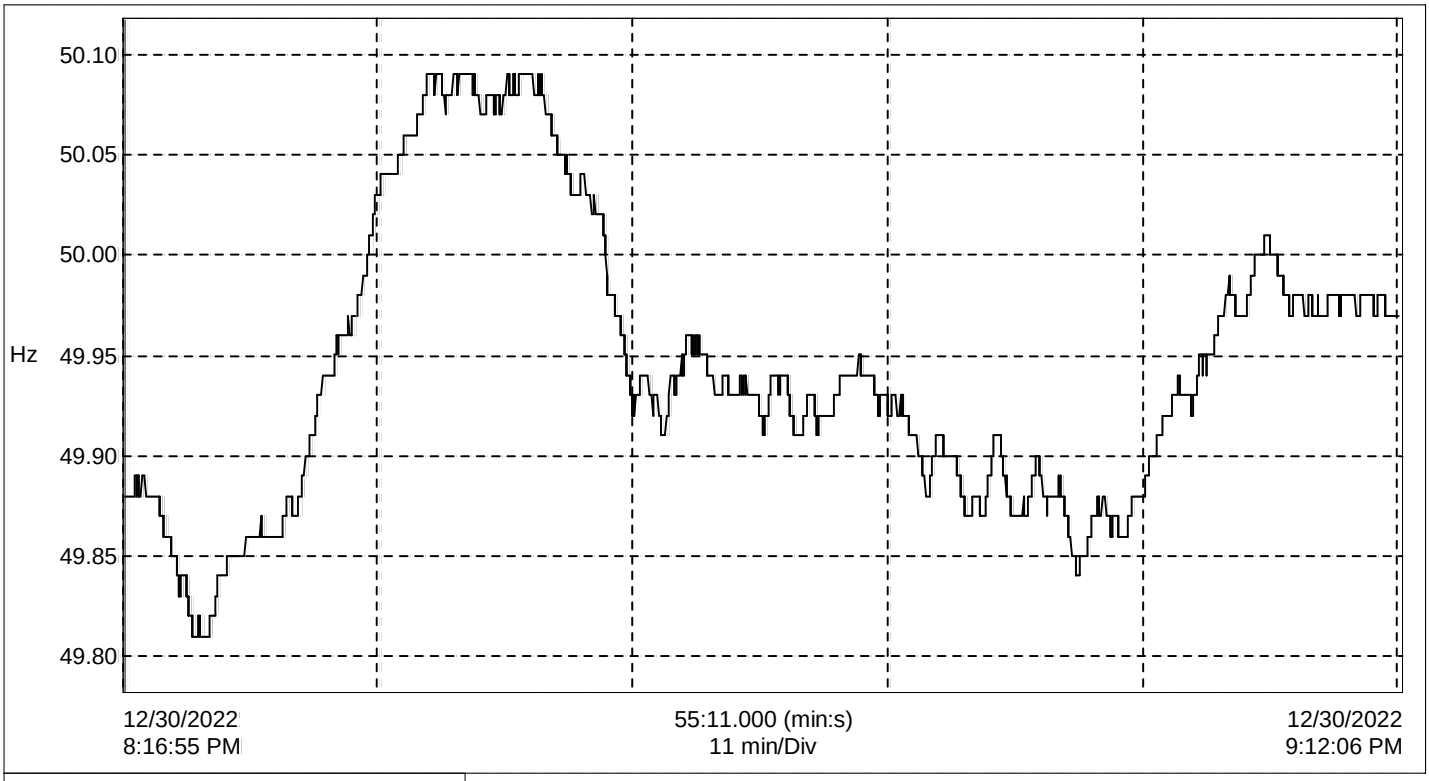
Value

0.0 — Eq/q1 (varh) (10 min) (varh)
0.0 — Eq/q2 (varh) (10 min) (varh)
0.0 — Eq/q3 (varh) (10 min) (varh)
0.0 — Eq/q4 (varh) (10 min) (varh)

Eq/q1 (varh) (10 min) (varh)			
Date	Time	Val	Units
12/30/2022	8:20:01 PM	0.0	varh
12/30/2022	8:30:01 PM	0.0	varh
12/30/2022	8:40:01 PM	0.0	varh
12/30/2022	8:50:01 PM	0.0	varh
12/30/2022	9:00:01 PM	0.0	varh

F (Hz)

Name	AVG	MIN	MIN date	MIN time	MAX	MAX date	MAX time	Units
F (Hz) (1 s)	49.94	49.81	12/30/2022	8:19:54 PM	50.09	12/30/2022	8:29:59 PM	Hz



12/30/2022 - 8:16:55 PM
Value
49.88 — F (Hz) (1 s) (Hz)

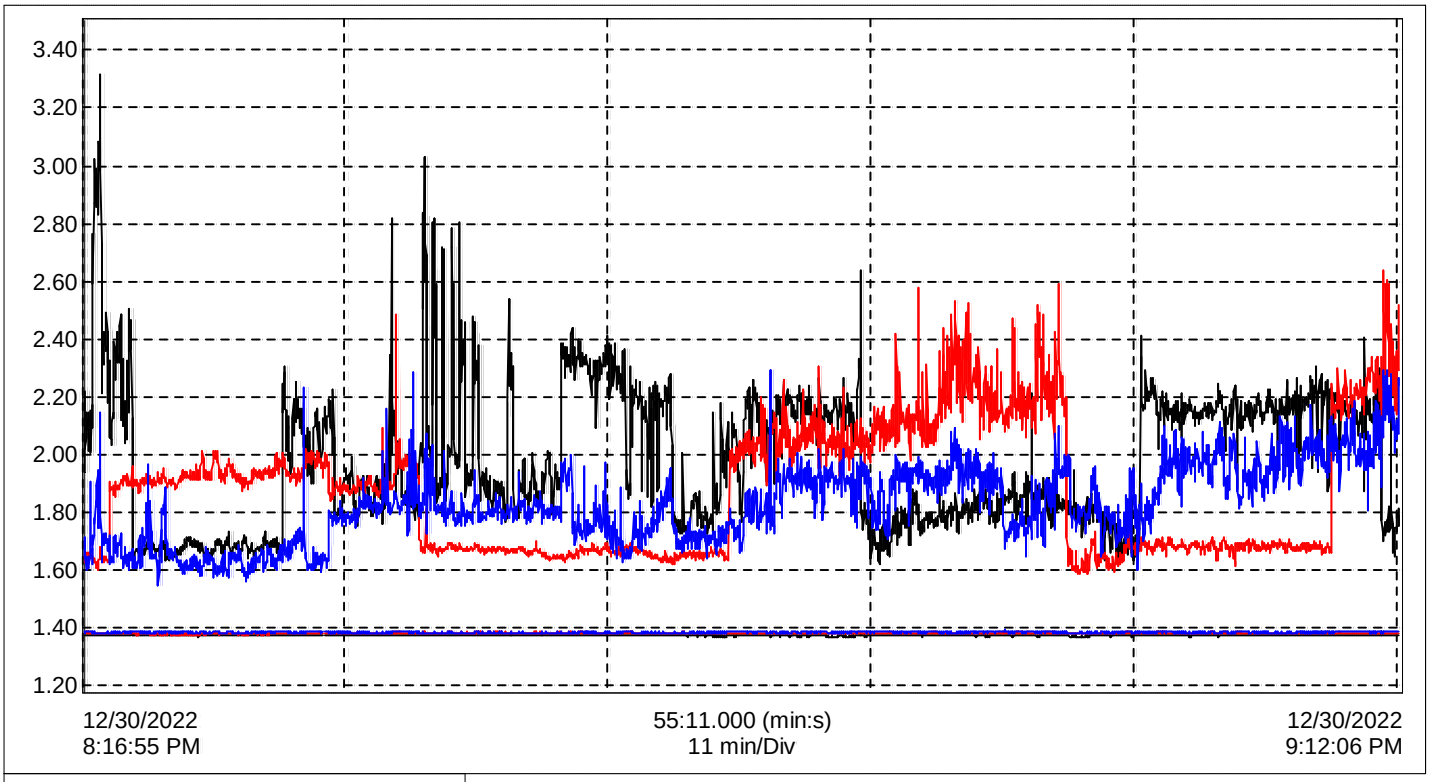
F (Hz) (1 s) (Hz)		
Date	Time	Val
12/30/2022	8:16:55 PM	49.88
12/30/2022	8:16:56 PM	49.88
12/30/2022	8:16:57 PM	49.88
12/30/2022	8:16:58 PM	49.88
12/30/2022	8:16:59 PM	49.88
12/30/2022	8:17:00 PM	49.88
12/30/2022	8:17:01 PM	49.88
12/30/2022	8:17:02 PM	49.88
12/30/2022	8:17:03 PM	49.88
12/30/2022	8:17:04 PM	49.88
12/30/2022	8:17:05 PM	49.88
12/30/2022	8:17:06 PM	49.88
12/30/2022	8:17:07 PM	49.88

Exceptions

Name	Date	Time	Duration	Duration Units	MIN	MAX	AVG	Units

CF

Name	AVG	MIN	MAX	Units
I1-CF (1 s)	1.980	1.617	3.315	
I2-CF (1 s)	1.875	1.582	2.634	
I3-CF (1 s)	1.823	1.545	2.292	
V1-CF (1 s)	1.371	1.367	1.383	



12/30/2022 - 8:16:55 PM
Value
1.370 — V1-CF (1 s) ()
1.378 — V2-CF (1 s) ()
1.381 — V3-CF (1 s) ()

I1-CF (1 s) ()

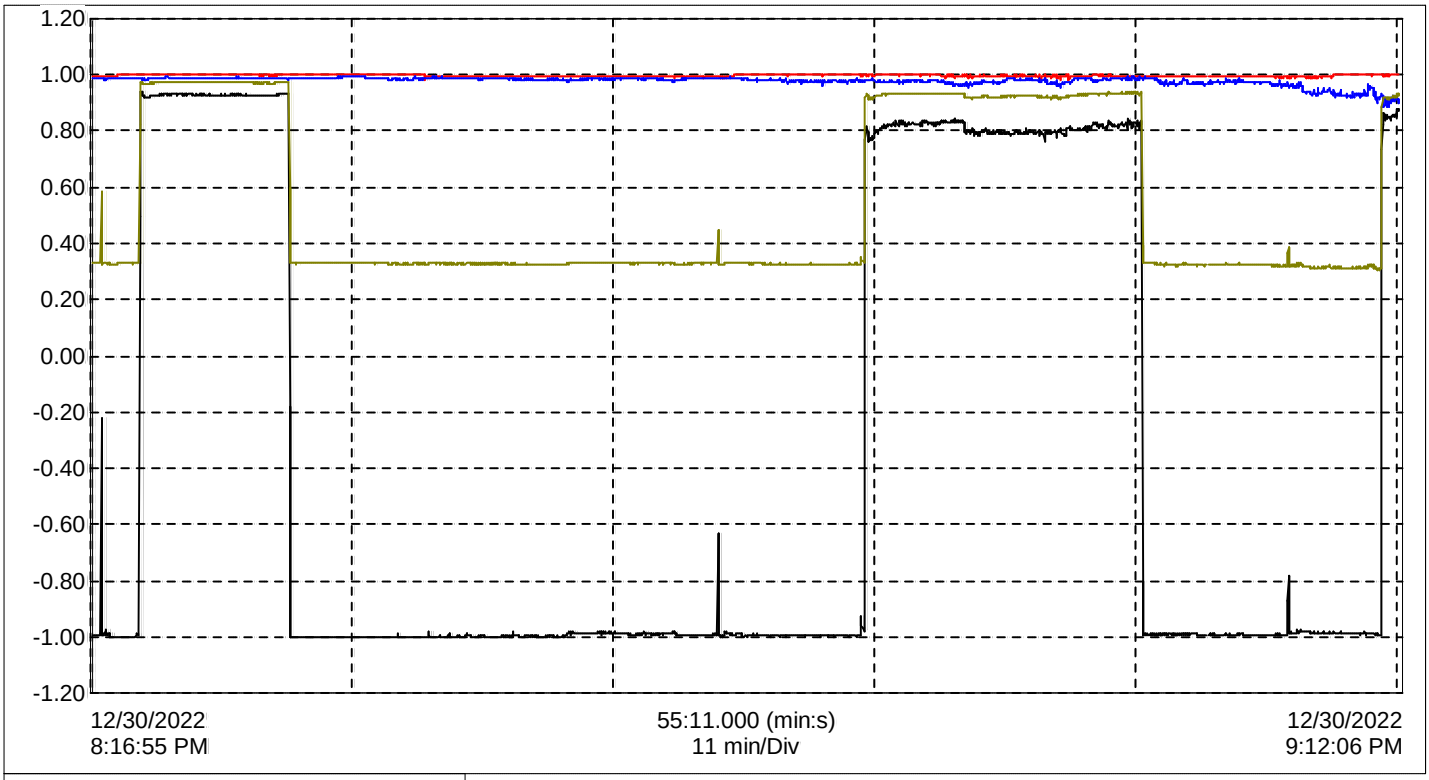
Date	Time	Val
12/30/2022	8:16:55 PM	1.936
12/30/2022	8:16:56 PM	2.219
12/30/2022	8:16:57 PM	2.027
12/30/2022	8:16:58 PM	2.006
12/30/2022	8:16:59 PM	2.017
12/30/2022	8:17:00 PM	2.059
12/30/2022	8:17:01 PM	2.113
12/30/2022	8:17:02 PM	2.145
12/30/2022	8:17:03 PM	2.058
12/30/2022	8:17:04 PM	2.084
12/30/2022	8:17:05 PM	2.121
12/30/2022	8:17:06 PM	2.144
12/30/2022	8:17:07 PM	2.120

Exceptions

Name	Date	Time	Duration	Duration Units	MIN	MAX	AVG Units

Cos φ (DPF)

Name	AVG	MIN	MAX	Units
Cos φ1 (1 s)	-0.365	-1.000	0.938	
Cos φ2 (1 s)	0.997	0.982	1.000	
Cos φ3 (1 s)	0.978	0.883	0.995	
Cos φT (1 s)	0.537	0.303	0.975	



12/30/2022 - 8:16:55 PM

Value

-0.994 — Cos φ1 (1 s) ()

0.994 — Cos φ2 (1 s) ()

0.988 — Cos φ3 (1 s) ()

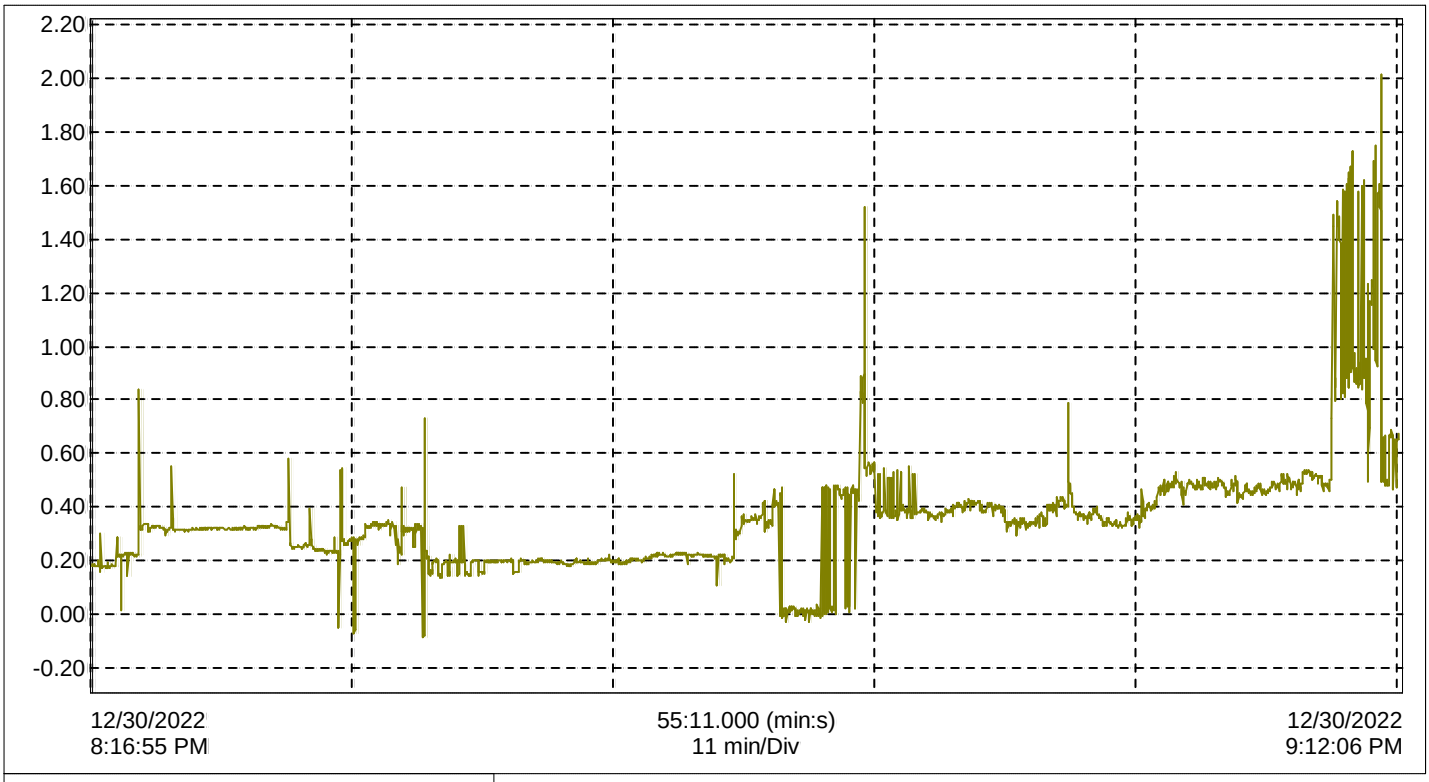
Cos φ1 (1 s) ()		
Date	Time	Val
12/30/2022	8:16:55 PM	-993.7m
12/30/2022	8:16:56 PM	-993.4m
12/30/2022	8:16:57 PM	-993.3m
12/30/2022	8:16:58 PM	-994.2m
12/30/2022	8:16:59 PM	-994.8m
12/30/2022	8:17:00 PM	-994.1m
12/30/2022	8:17:01 PM	-994.1m
12/30/2022	8:17:02 PM	-993.6m
12/30/2022	8:17:03 PM	-992.9m
12/30/2022	8:17:04 PM	-994.2m
12/30/2022	8:17:05 PM	-993.1m
12/30/2022	8:17:06 PM	-993.3m
12/30/2022	8:17:07 PM	-992.9m

Exceptions

Name	Date	Time	Duration	Duration Units	MIN	MAX	AVG

Tan Φ

Name	AVG	MIN	MAX	Units
Tan Φ (1 s)	0.353	-0.085	2.014	



12/30/2022 - 8:16:55 PM
Value
0.183 — Tan Φ (1 s) ()

Tan Φ (1 s) ()

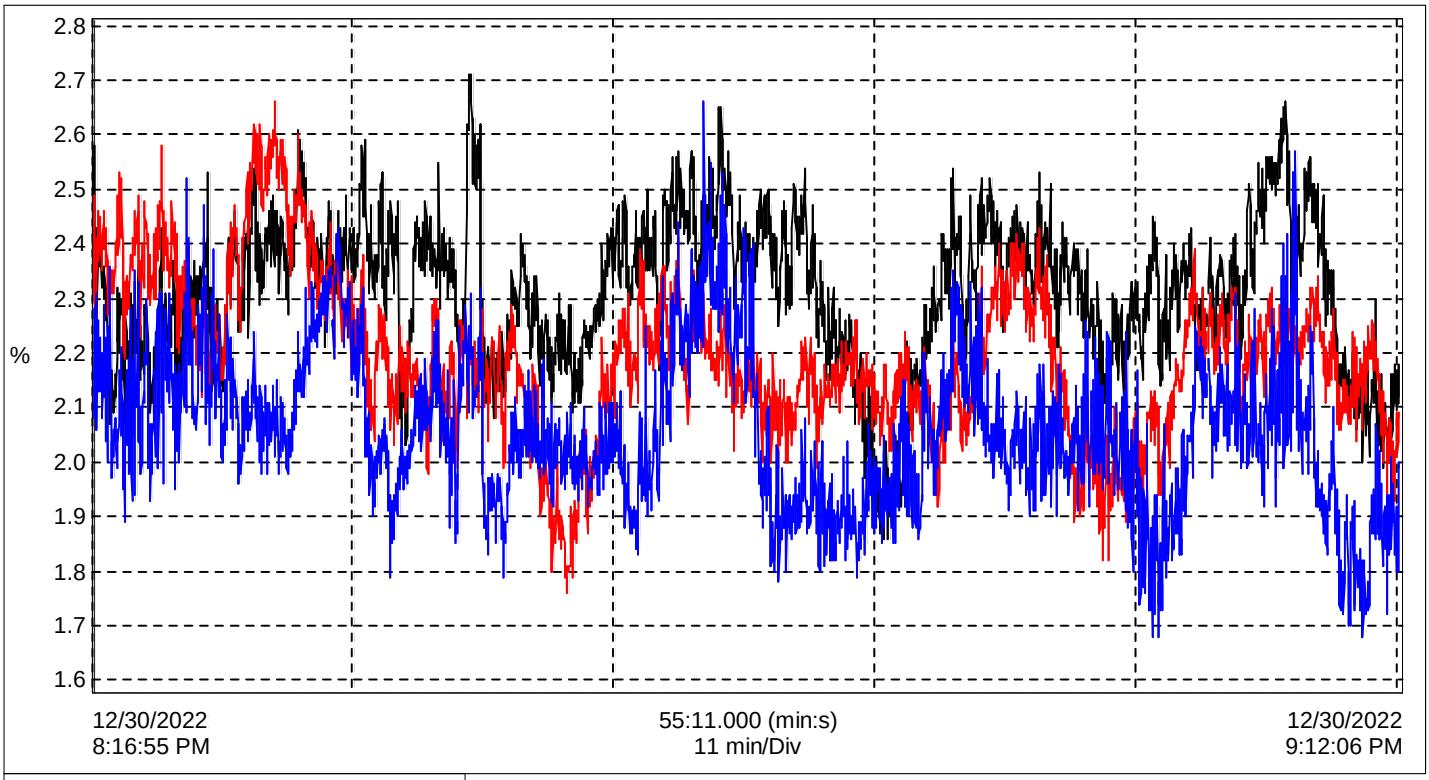
Date	Time	Val
12/30/2022	8:16:55 PM	183.0m
12/30/2022	8:16:56 PM	184.6m
12/30/2022	8:16:57 PM	181.0m
12/30/2022	8:16:58 PM	183.9m
12/30/2022	8:16:59 PM	181.5m
12/30/2022	8:17:00 PM	182.8m
12/30/2022	8:17:01 PM	181.1m
12/30/2022	8:17:02 PM	180.9m
12/30/2022	8:17:03 PM	182.6m
12/30/2022	8:17:04 PM	179.3m
12/30/2022	8:17:05 PM	181.5m
12/30/2022	8:17:06 PM	180.7m
12/30/2022	8:17:07 PM	182.1m

Exceptions

Name	Date	Time	Duration	Duration Units	MIN	MAX	AVG	Units

Phase-to-Neutral Total Harmonic Distortion

Name	AVG	MIN	MIN date	MIN time	MAX	MAX date	MAX time	Units
V1-THD (1 s)	2.313	1.860	12/30/2022	8:50:17 PM	2.710	12/30/2022	8:32:49 PM	%
V2-THD (1 s)	2.191	1.760	12/30/2022	8:36:54 PM	2.660	12/30/2022	8:24:35 PM	%
V3-THD (1 s)	2.056	1.680	12/30/2022	9:01:38 PM	2.660	12/30/2022	8:42:43 PM	%



12/30/2022 - 8:16:55 PM
Value
2.580 — V1-THD (1 s) (%)
2.490 — V2-THD (1 s) (%)
2.180 — V3-THD (1 s) (%)

V1-THD (1 s) (%)

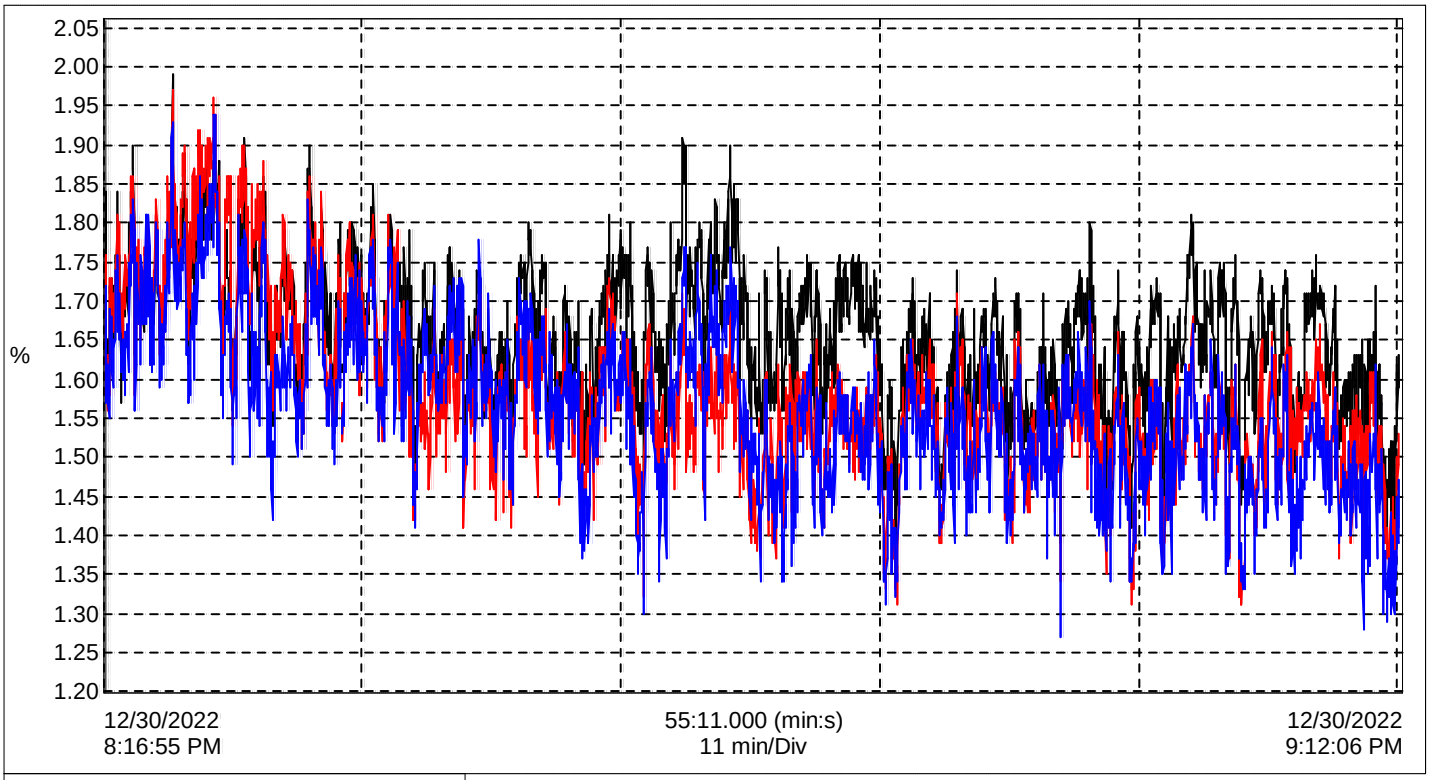
Date	Time	Val	Units
12/30/2022	8:16:55 PM	2.580	%
12/30/2022	8:16:56 PM	2.490	%
12/30/2022	8:16:57 PM	2.430	%
12/30/2022	8:16:58 PM	2.420	%
12/30/2022	8:16:59 PM	2.390	%
12/30/2022	8:17:00 PM	2.410	%
12/30/2022	8:17:01 PM	2.430	%
12/30/2022	8:17:02 PM	2.410	%
12/30/2022	8:17:03 PM	2.350	%
12/30/2022	8:17:04 PM	2.260	%
12/30/2022	8:17:05 PM	2.370	%
12/30/2022	8:17:06 PM	2.410	%
12/30/2022	8:17:07 PM	2.430	%

Exceptions

Name	Date	Time	Duration	Duration Units	MIN	MAX	AVG	Units

Phase-to-Phase Total Harmonic Distortion

Name	AVG	MIN	MIN date	MIN time	MAX	MAX date	MAX time	Units
U12-THD (1 s)	1.656	1.380	12/30/2022	9:11:51 PM	1.990	12/30/2022	8:19:47 PM	%
U23-THD (1 s)	1.581	1.310	12/30/2022	8:50:42 PM	1.970	12/30/2022	8:19:47 PM	%
U31-THD (1 s)	1.561	1.270	12/30/2022	8:57:39 PM	1.940	12/30/2022	8:21:35 PM	%



12/30/2022 - 8:16:55 PM
Value
1.840 — U12-THD (1 s) (%)
1.760 — U23-THD (1 s) (%)
1.720 — U31-THD (1 s) (%)

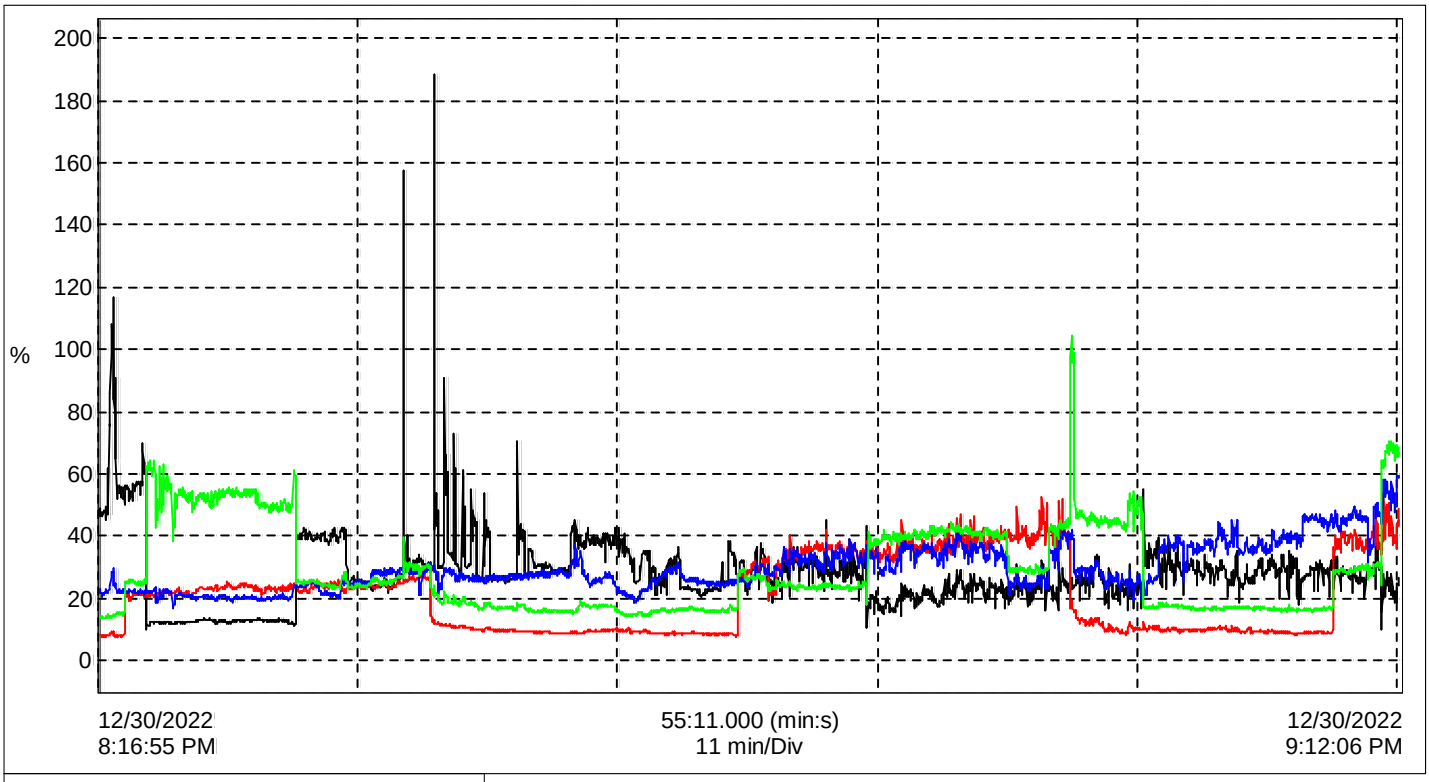
U12-THD (1 s) (%)			
Date	Time	Val	Units
12/30/2022	8:16:55 PM	1.840	%
12/30/2022	8:16:56 PM	1.710	%
12/30/2022	8:16:57 PM	1.680	%
12/30/2022	8:16:58 PM	1.660	%
12/30/2022	8:16:59 PM	1.630	%
12/30/2022	8:17:00 PM	1.590	%
12/30/2022	8:17:01 PM	1.610	%
12/30/2022	8:17:02 PM	1.650	%
12/30/2022	8:17:03 PM	1.650	%
12/30/2022	8:17:04 PM	1.610	%
12/30/2022	8:17:05 PM	1.660	%
12/30/2022	8:17:06 PM	1.700	%
12/30/2022	8:17:07 PM	1.720	%

Exceptions

Name	Date	Time	Duration	Duration Units	MIN	MAX	AVG	Units

Current Total Harmonic Distortion

Name	AVG	MIN	MIN date	MIN time	MAX	MAX date	MAX time	Units
I1-THD (1 s)	27.83	10.09	12/30/2022	8:18:56 PM	188.3	12/30/2022	8:31:09 PM	%
I2-THD (1 s)	21.15	7.590	12/30/2022	8:17:41 PM	54.04	12/30/2022	9:11:25 PM	%
I3-THD (1 s)	29.68	16.64	12/30/2022	8:20:03 PM	59.59	12/30/2022	9:12:05 PM	%
IN-THD (1 s)	29.00	13.39	12/30/2022	8:17:02 PM	104.4	12/30/2022	8:58:12 PM	%



12/30/2022 - 8:16:55 PM
Value
48.77 — I1-THD (1 s) (%)
7.870 — I2-THD (1 s) (%)
23.18 — I3-THD (1 s) (%)

I1-THD (1 s) (%)			
Date	Time	Val	Units
12/30/2022	8:16:55 PM	48.77	%
12/30/2022	8:16:56 PM	48.67	%
12/30/2022	8:16:57 PM	46.96	%
12/30/2022	8:16:58 PM	46.28	%
12/30/2022	8:16:59 PM	46.91	%
12/30/2022	8:17:00 PM	47.34	%
12/30/2022	8:17:01 PM	47.32	%
12/30/2022	8:17:02 PM	46.93	%
12/30/2022	8:17:03 PM	46.42	%
12/30/2022	8:17:04 PM	46.30	%
12/30/2022	8:17:05 PM	47.36	%
12/30/2022	8:17:06 PM	47.99	%
12/30/2022	8:17:07 PM	47.46	%

Exceptions

Name	Date	Time	Duration	Duration Units	MIN	MAX	AVG	Units

Events

Date	Time	Event
12/30/2022	8:16:55 PM	Start of recording
12/30/2022	9:12:06 PM	The user stopped (canceled) the recording before the scheduled time.

Total energies and costs		
Name	Value	Display cost
Ep Total (Wh)	3.949 kWh	
Ep+ Total (Wh)	3.949 kWh	
Ep- Total (Wh)	0 kWh	
Eq Total (varh)	1.296 kvarh	
Eq/q1 Total (varh)	1.296 kvarh	
Eq/q2 Total (varh)	0 kvarh	
Eq/q3 Total (varh)	0 kvarh	
Eq/q4 Total (varh)	0 kvarh	
Es Total (VAh)	5.493 kVAh	
Es+ Total (VAh)	5.493 kVAh	
Es- Total (VAh)	0 kVAh	

Configuration

Database File Name	SES.dvb
Session name	SES
Recording start	12/30/2022 8:16:54 PM
Recording end	12/30/2022 9:12:05 PM
Recording duration	00:55:11 (h:min:s)
1 s trend	Yes
1 s harmonics	Yes
PEL model	PEL103
PEL serial number	120912UBH
PEL name	
PEL location	
Firmware DSP version	1.28
Firmware microprocessor version	1.20
Hardware version	D.D
Aggregation period	1 min
Electrical hook-up	3-phase 4-wire Y
Nominal frequency	Auto
Primary nominal voltage	- - -
Secondary nominal voltage	- - -
Current sensor I1	MA193/A193/A196
Current sensor I2	MA193/A193/A196
Current sensor I3	MA193/A193/A196
Line flexible sensor range	100 A
Line flexible sensor wraps	1

Glossary of terms

---	- Indicates a value that cannot be calculated
VΦ-N	- Indicates the phase to neutral voltages
VΦ-Φ	- Indicates the phase to phase voltages
F	- Frequency
V	- Voltage
U	- Phase-to-phase Voltage
I	- Current
P	- Active Power
Q	- Reactive Power
S	- Apparent Power
PF	- Power Factor
Tan Φ	- Ratio between Reactive and Active Power
Ep	- Active Energy
Eq	- Reactive Energy
Es	- Apparent Energy
THD	- Total Harmonic Distortion

Thermography Analysis Report

SLNo	Image Location	Risk Level-1	Risk Level-2	Risk Level-3	Risk Level-4
		Up to 35^{0}C	35.1^{0}C to 45^{0}C	45.1^{0}C to 55^{0}C	above 55.1^{0}C
Range		Normal	To Observe	Alarm	Critical
1	DB1 Fifth Floor			51.0	
2	DB1 Fourth Floor	29.0			
3	DB2 Fourth Floor	29.9			
4	DB1 Third Floor	26.1			
5	DB1 Second Floor	29.6			
6	DB1 First Floor	30.6			
7	DB2 First Floor	31.0			
8	DB3 First Floor	29.8			

(Risk level is calculated out of four points as per colour code mentioned above; if anything found critical during observation for the same image Risk Level will be increase to next higher level till 4th; higher the risk, faster the actions to be taken.)

Comments:

1. Result for Image SL No.16 found NOT Normal. Correct Joints and terminations. Observe visible overloading, load distribution, improper termination. Risk 3/4.
2. Result for Image SL No.2 found Normal. Risk Level 1/4.
3. Result for Image SL No.3 found Normal. Risk Level 1/4.
4. Result for Image SL No.4 found Normal. Risk Level 1/4.
5. Result for Image SL No.5 found Normal. Risk Level 1/4.
6. Result for Image SL No.6 found Normal. Risk Level 1/4.
7. Result for Image SL No.7 found Normal. Risk Level 1/4.
8. Result for Image SL No.8 found Normal. Risk Level 1/4.

SAUR ENGINEERS & CONSULTANTS PVT. LTD.
Registered Energy Auditor Class-A, Licensed Electrical Contractor, CLASS A, ISO 14001:2015, Certified Solar Rooftop Grid Engineers, Governemnt of India

Measurements

Bx1	Max	51.0 °C
Li1	Max	48.1 °C
	Min	36.1 °C
	Average	40.9 °C
Dt1	3x1.Max - Ref. temp.	26.0 °C

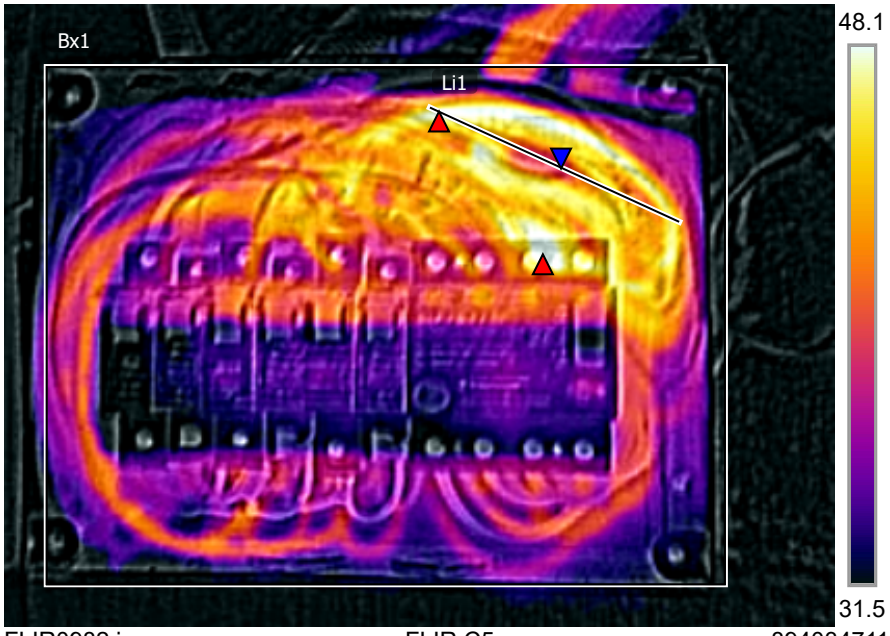
Parameters

Emissivity	0.95
Refl. temp.	25 °C

Note

Ses 5db1

2/4/2023 10:30:31 AM



FLIR0982.jpg FLIR C5 894034711

2/4/2023 10:30:31 AM

FLIR0982.jpg FLIR C5 894034711

Measurements

Bx1	Max	29.0 °C
Dt1	Bx1.Max - Ref. temp.	4.0 °C

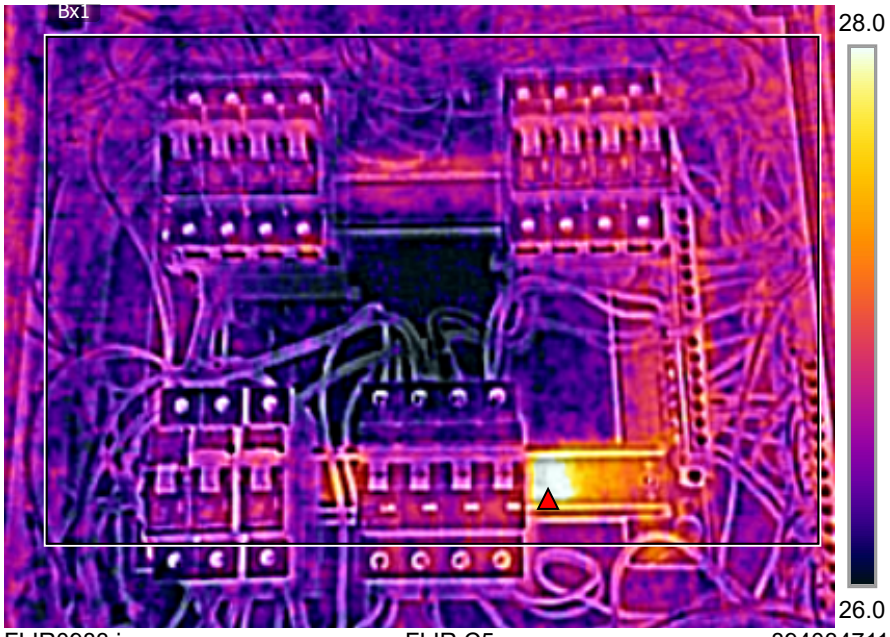
Parameters

Emissivity	0.95
Refl. temp.	25 °C

Note

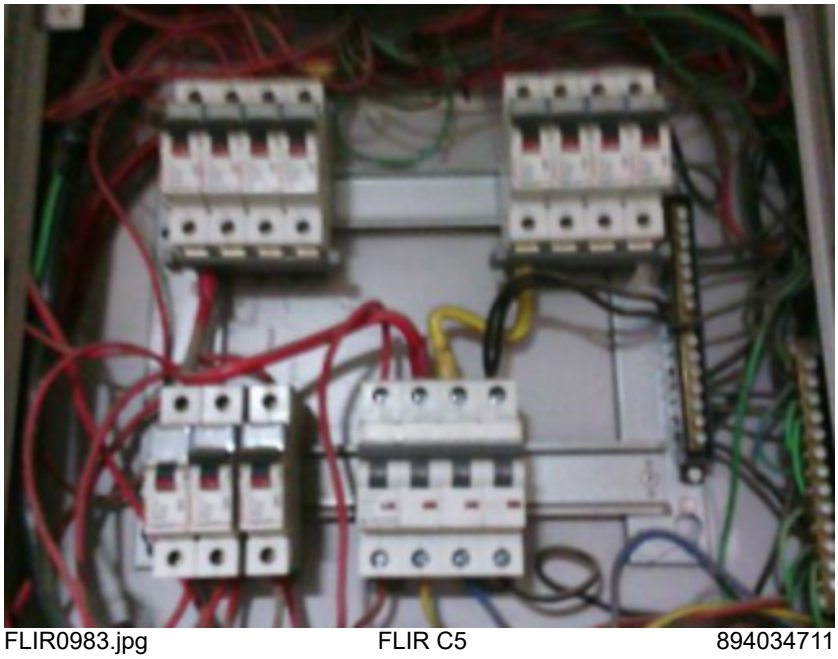
Ses 4db1 library

2/4/2023 10:36:49 AM



FLIR0983.jpg FLIR C5 894034711

2/4/2023 10:36:49 AM



FLIR0983.jpg FLIR C5 894034711

Measurements

Bx1	Max	29.9 °C
Dt1	Bx1.Max - Ref. temp.	4.9 °C

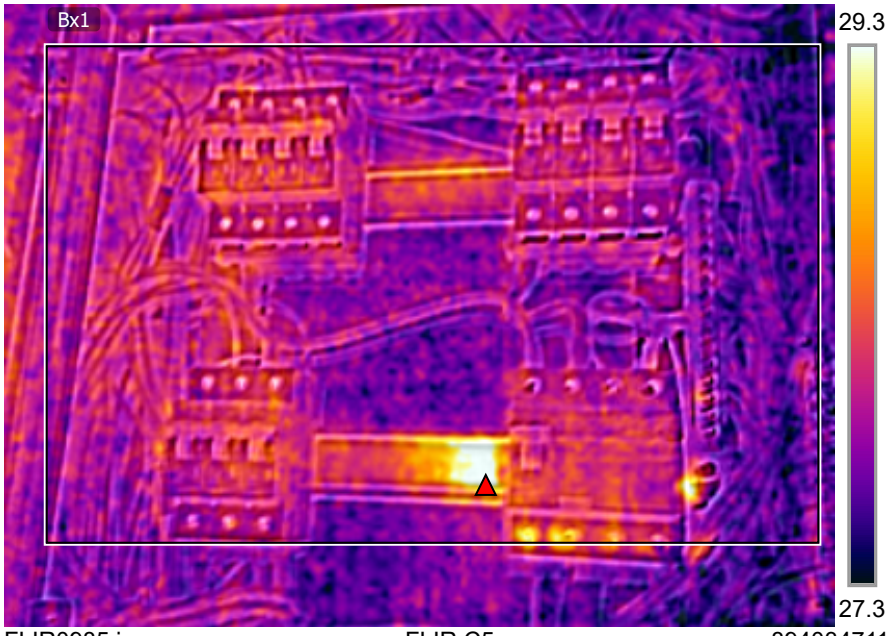
Parameters

Emissivity	0.95
Refl. temp.	25 °C

Note

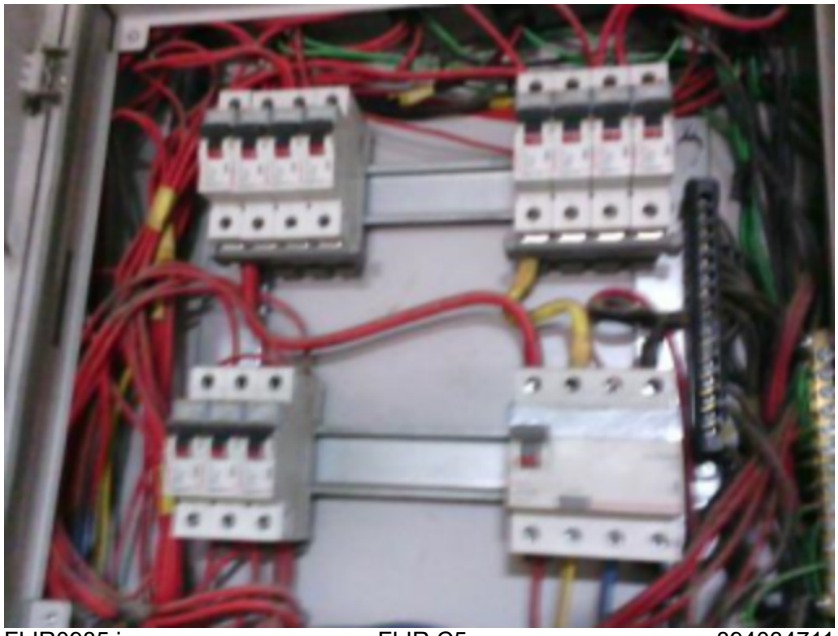
Ses 4db2 library

2/4/2023 10:37:46 AM



FLIR0985.jpg FLIR C5 894034711

2/4/2023 10:37:46 AM



FLIR0985.jpg FLIR C5 894034711

Measurements

Bx1	Max	26.1 °C
Dt1	3x1.Max - Ref. temp.	1.1 °C

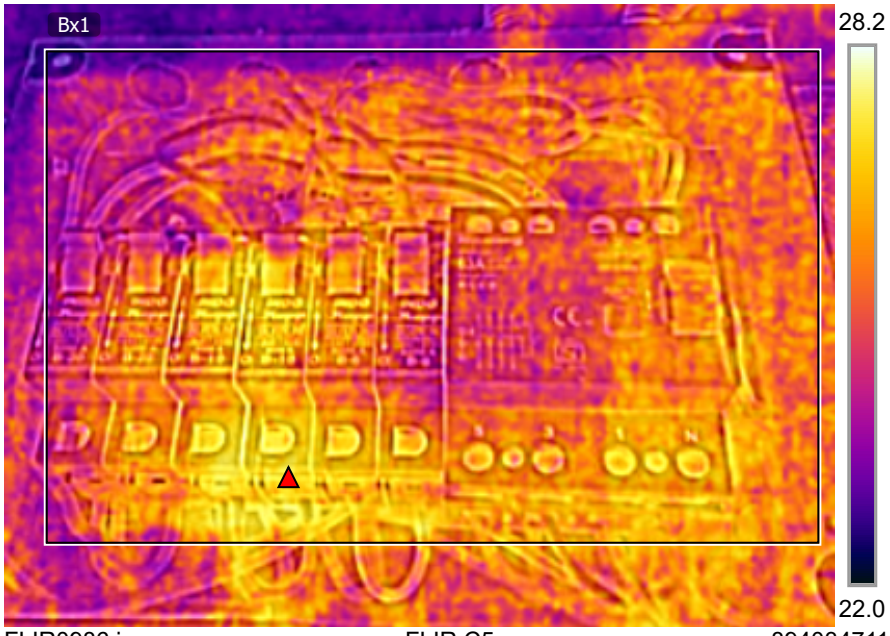
Parameters

Emissivity	0.95
Refl. temp.	25 °C

Note

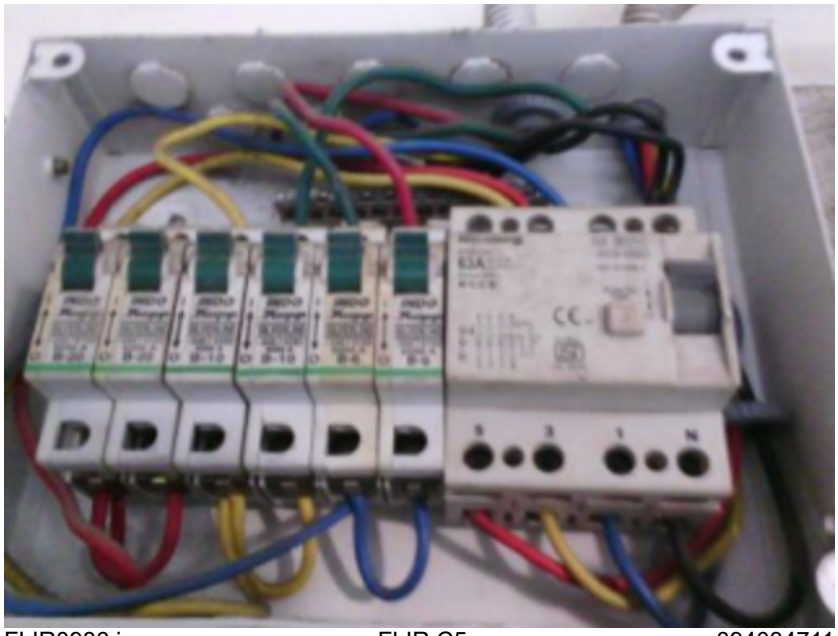
Ses 3db1

2/4/2023 10:44:29 AM



FLIR0986.jpg FLIR C5 894034711

2/4/2023 10:44:29 AM



FLIR0986.jpg FLIR C5 894034711

Measurements

Bx1	Max	29.6 °C
Dt1	Bx1.Max - Ref. temp.	4.6 °C

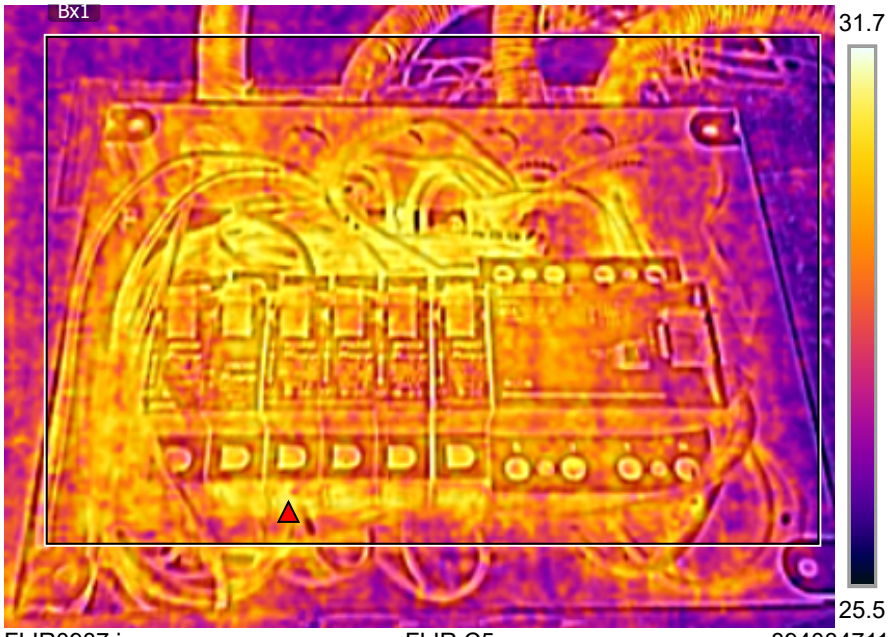
Parameters

Emissivity	0.95
Refl. temp.	25 °C

Note

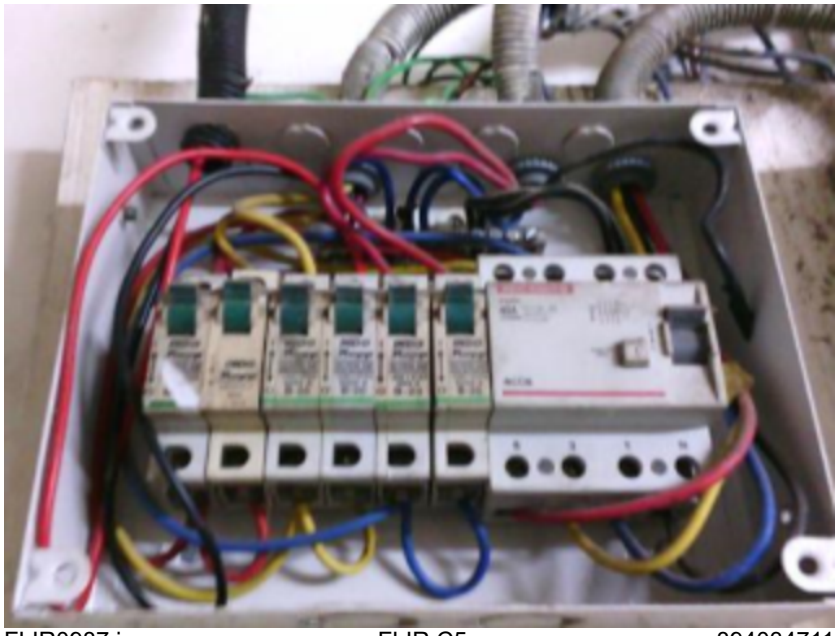
Ses 2db1

2/4/2023 10:49:14 AM



FLIR0987.jpg FLIR C5 894034711

2/4/2023 10:49:14 AM



FLIR0987.jpg FLIR C5 894034711

Measurements

Bx1	Max	30.6 °C
Dt1	3x1.Max - Ref. temp.	5.6 °C

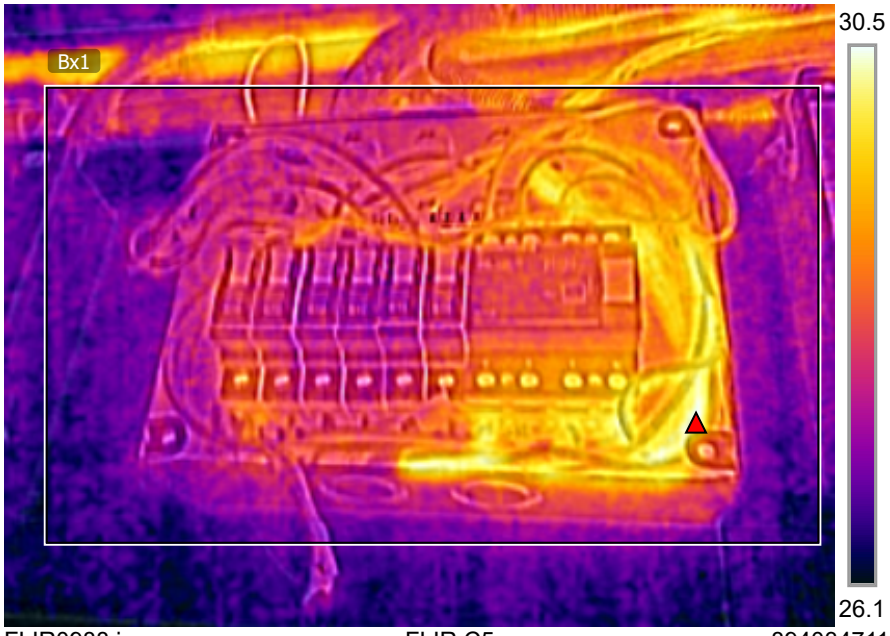
Parameters

Emissivity	0.95
Refl. temp.	25 °C

Note

Ses 1db1

2/4/2023 10:55:46 AM



FLIR0988.jpg FLIR C5 894034711

2/4/2023 10:55:46 AM

FLIR0988.jpg FLIR C5 894034711

Measurements

Bx1	Max	31.0 °C
Dt1	Bx1.Max - Ref. temp.	6.0 °C

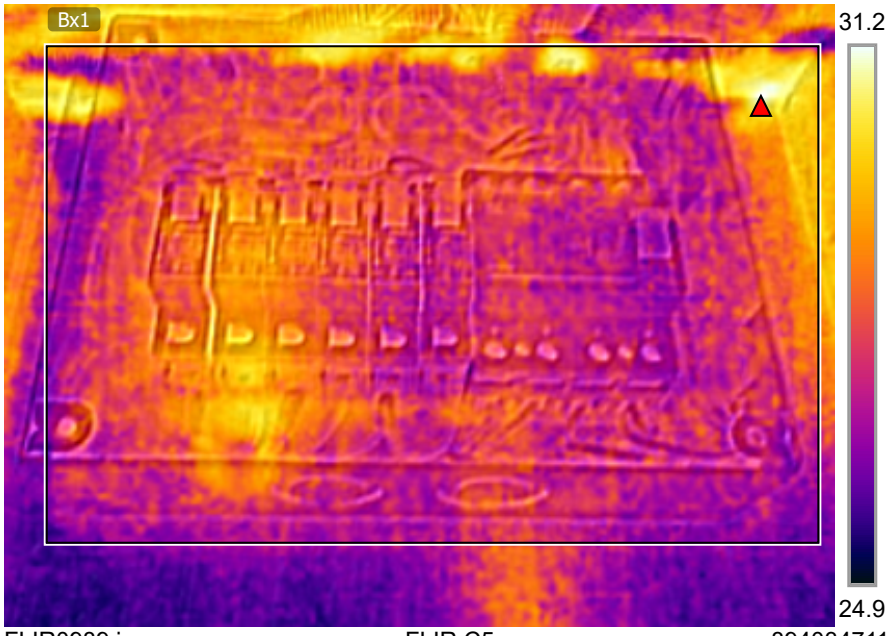
Parameters

Emissivity	0.95
Refl. temp.	25 °C

Note

Ses 1db2

2/4/2023 10:56:13 AM



FLIR0989.jpg FLIR C5 894034711

2/4/2023 10:56:13 AM

FLIR0989.jpg FLIR C5 894034711

Measurements

Bx1	Max	29.8 °C
Dt1	3x1.Max - Ref. temp.	4.8 °C

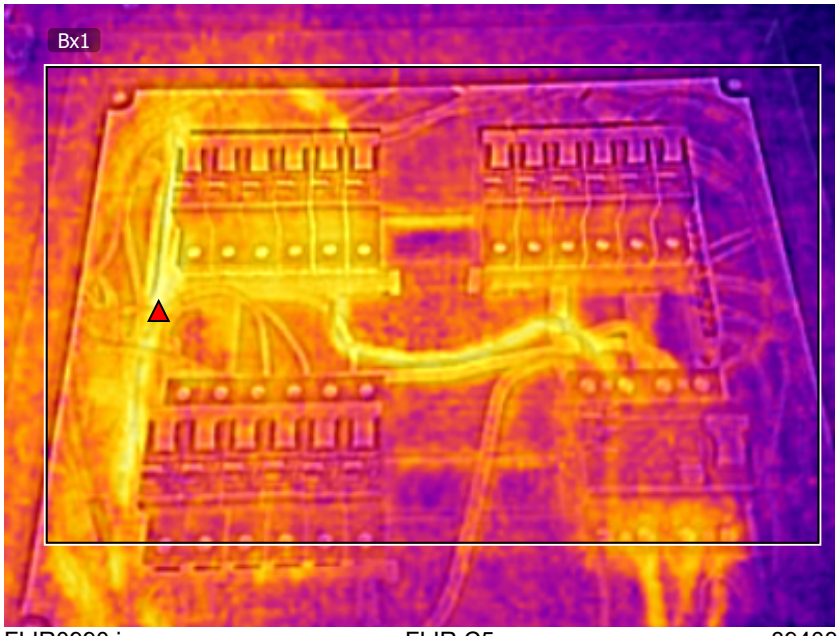
Parameters

Emissivity	0.95
Refl. temp.	25 °C

Note

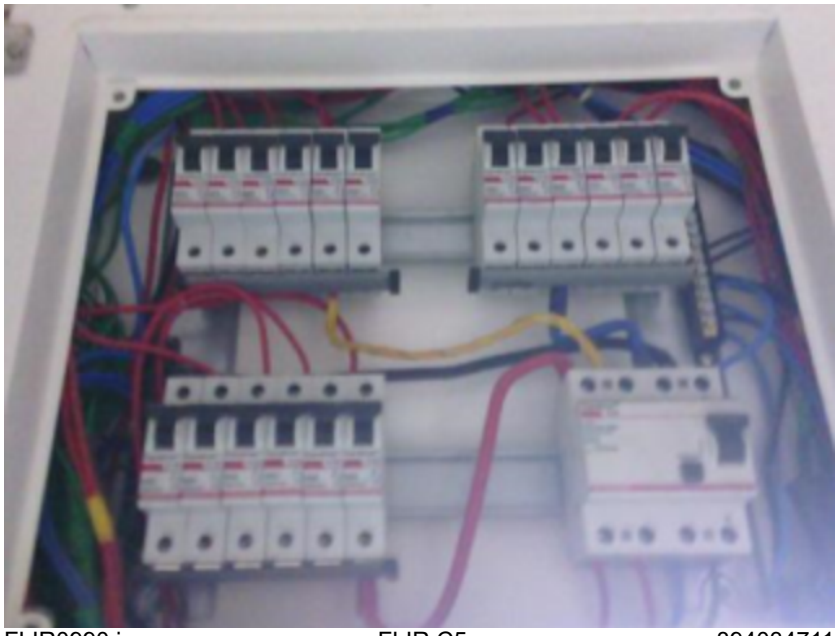
Ses 1db3

2/4/2023 10:57:15 AM



FLIR0990.jpg FLIR C5 894034711

2/4/2023 10:57:15 AM



FLIR0990.jpg FLIR C5 894034711

ANNEXURE-III

Green Environment Friendly Initiatives:

- College have made an MOU with the 'Threco' the recycling company. The e-waste was collected from students and staff by Nature Club and NSS and the above company had collected the e-waste and recycled the waste. On 26/5/2022, 5.4 kg of e-waste was picked –up by the company.
- In 2011 under UGC grant of Rs. 65000 we made a 2.30 ×1×0.4 cubic m shed with 6 working composting pits. Harvested compost is used in Butterfly garden and other green areas of the campus. Sale of a part of compost is conducted every year. Since then every year dry leaves in the campus and organic waste generated in the canteen were recycled by earthworms into valuable compost. More than 1000kg of vermicompost is harvested every year
- Instead of flex banners which are plastic coconut leaves are used to write slogans environment related to.
- We recycled waste pages from used notebooks and project files and made books more than 100 every year and distributed among the students in the adopted village.
- In the office and during exam result preparation we always make it a point that both side of the pages are used. Waste pages are always used for rough work before selling them for recycling. The college sells used papers for recycling. Confidential waste papers and exam pares are first processed by shredder machine and then sell for recycling.
- Our website shailendradegreecollege.in is the first step we took in reaching the students through digital media. All the notices, reports, rules and regulations, information about the college etc. are upload regularly in the website. Information about the admission process is uploaded in the website and thus make the system transparent.
- Whatsapp group of teaching, non-teaching and students are formed. Notices and necessary communications are done through these groups.
- Photographs are maintained in soft copy.
- Paperless office concept is implemented by college.
- AEMS office software is used in the office for digitalization of administration processes. Our in-house software "Shailendra Sarathi" developed by Asst. Prof. Hemchandra Kumbhar, Co-ordinator B. Sc. IT is used for the smooth functioning of administrative work.
- 30% of the class rooms are Smart/ ICT enabled.
- Soul 2.0 is used in Library for digitalizing the administrative work of Library. Staff members and Students get access to 6000 e-journals and 3135000 e-books through N-List. On line public access catalog are available in the library through OPAC software.
- Exam software **Inficare Quick Support** take care result preparation and Result analysis. Google class rooms are used.