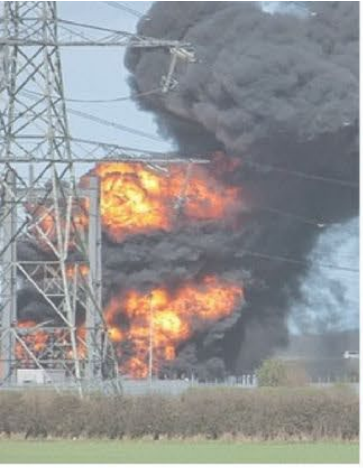
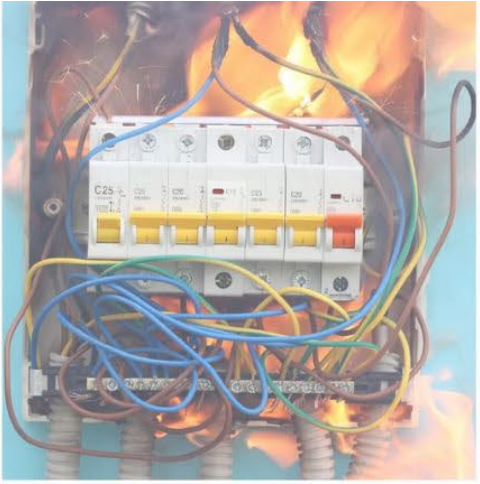

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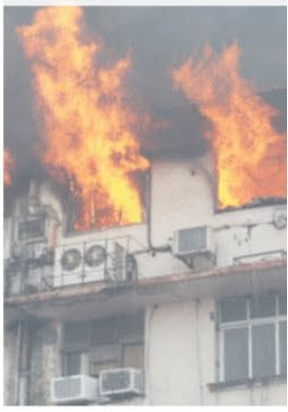
IOT DEVICE FOR ELECTRICAL SAFETY

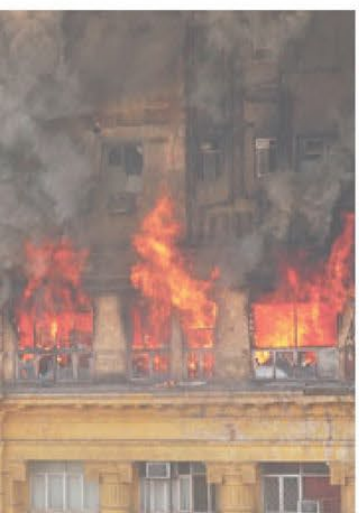
FACTS Vs FICTION






Fire in Maharashtra

"Every year, India loses 8,000 to 12,000 people because of electric shock and around 2,500 people due to lightning. While 1,200 to 1,500 fire incidents claim lives of around 25,000 people in India every year, only about 8,000 die in China because of such accident

An illusionary device termed “IoT - based microcontroller device tested and verified by NABL accredited lab" has recently been wrongly portrayed as a panacea for all electrical and fire hazards. Since the orders came from the Government and the implementing machinery who are responsible for the safety of the citizens under Article 21 of the Constitution are themselves aiding such a misconceived idea jeopardising the safety of the citizens, it has become necessary to project the facts and circumstances that can endanger the persons and properties. This article evaluates the technical parameters published by the manufacturer, the test certificate issued by a laboratory, Government Orders, and circulars of Government departments and shows how fallacious product claims with misleading information, create an environment of non-compliant and unsafe electrical installations.

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1 Introduction

An illusionary device termed “IoT-based warning and fault clearing system” has recently been wrongly portrayed as a panacea for all electrical and fire hazards. Since the orders came from the Government and the implementing machinery who are responsible for the safety of the citizens under Article 21 of the Constitution are themselves aiding such a misconceived idea jeopardising the safety of the citizens, it has become necessary to project the facts and circumstances that can endanger the persons and properties. This article evaluates the technical parameters published by the manufacturer, the test certificate issued by a laboratory, Government Orders, and circulars of Government departments and shows how fallacious product claims with misleading information, such as "tested by NABL accredited lab," create an environment of non-compliant and unsafe electrical installations.

2 Reference

The following references quoted in this document and available with us are produced as Annex:

i. The Circular MUVINI-2021/Pro. No. 114/Energy-5, dated 27/08/2021 by the Industries, Energy and Labour Department of Government of Maharashtra *(Annex G).*

ii. Certificate of Accreditation no CEI/TECH/139/2022 dt 31 May 2022 by Chief Electrical Inspector, Industries, Energy and Labour Department *(Annex C)*.

iii. Performance evaluation report by CPRI *(Annex I)*.

iv. Test report no. Test/21-22/TR/ENE/42 dt 30.06.2021 from M/S Nashik Engineering Cluster, referred as test report by NABL Accredited testing and calibration laboratory *(Annex A)*.

v. Mumbai fire Brigade daily circular no 66 dt 14.10.2022 regarding installation of IOT based security device for electrical system in all high-rise buildings and other non-residential buildings within Brihanmumbai Municipal Corporation limits *(Annex E)*.

vi. CEI/1/9/2020/263-294 dt 03.05.2021 (Page no. P-1 to 3) *(not available)*.

vii. MGC/F/7433 dated 26.08.2022 *(not available)*.

viii. CEI/TECH/277 dated 27.09.2022 *(not available)*.

ix. CEI/Tech/ 36 /2024 Dt.24/09/2024 Advisory for installation of IOT (Internet of things) devices in high-rise buildings by the Chief Electrical Inspector, Industries, Energy & Labour Department *(Annex D)*.

x. IS732: Code of Practice for Electrical Wiring *(can be downloaded from BIS website).*

xi. IEC 61010: Safety requirements for electrical equipment for measurement, control *(can be purchased from IEC website)*.

xii. CEA Measures relating to Safety and Electric Supply Regulations 2023. (CEA regulation) *(can be downloaded from CEA website).*

xiii. Confirmation from NABL about test report mentioned in sl. no 4 as wrong claim, misleading, and action taken against the laboratory *(Annex B)*.

xiv. Government Circular No: MCO-2024/Pro.No.349/Navi-14 dt 29 November 2024 by Maharashtra Government Urban Development Department *(Annex H)*.

xv. Extract from BMC/Mumbai Fire Brigade demanding IOT based device for fire NOC *(Annex F).*

3 Safety Provisions and Verification tests

Observance of the healthiness of an electrical installation involves an initial physical verification test followed by periodical verification which is a pre-requisite.

The Central Electricity Authority (Measures relating to Safety in Electric Supply) Regulations, 2023, and the Bureau of Indian Standards prescribing provisions applicable for the safety of electrical installations are furnished below:

i. Regulation 14(3) insists that the material and apparatus used shall conform to the relevant standards. The IOT based microcontroller, subject of this document is not in compliance to any standards. Any practice of practice involving materials and apparatus without any specific standards is a violation of Regulation 14(3).

ii. Regulation 33 (2) stipulates that the testing and verifications shall be carried out as per relevant standards.

iii. The relevant standards prescribing verification tests of electrical installations are governed by the following clauses of IS 732-2019: Code of Practice for Electrical Wiring Installations:

a) continuity of conductors (Cl. 6.4.3.2)
b) insulation resistance (Cl. 6.4.3.3)
c) insulation resistance testing to confirm the effectiveness of protection by SELV, PELV or electrical separation (Cl. 6.4.3.4)
d) insulation resistance testing to confirm the effectiveness of floor and wall resistance/impedance (Cl. 6.4.3.5)
e) polarity test (Cl.6.4.3.6)
f) testing to confirm effectiveness of automatic disconnection of supply (Cl.6.4.3.7);
g) testing to confirm the effectiveness of additional protection (Cl.6.4.3.8)
h) test of phase sequence (Cl.6.4.3.9)
i) functional tests (Cl.6.4.3.10)
j) voltage drop (Cl.6.4.3.11)

The tests mentioned above are physical tests by a skilled person with test instruments as per standards mentioned in the test requirement. It should be noted that the standards insist that in the event of any test furnished above indicating failure to comply, that test and any preceding test, the results of which may have been influenced by the fault indicated, shall be repeated after the fault has been rectified.

iv. Every circuit need to be tested once installed and before energisation as per Regulation 45(5). It may be noted that every electrical installation comprises several of such circuits.

v. Regulation 32 insists on periodical inspection of every electrical installation, in addition to an initial verification, to ensure its upkeep over time.

The testing devices used in the initial verifications must be compliant with IEC 61557-1 to meet the required operating uncertainty under various influential quantities (accuracy and performance), over-voltage categories, EMC compatibility etc. As a result of challenging technological issues, manufacturers are marketing such devices internationally in a portable arrangement only instead of sleek panel-mounted ones. Any sleek panel-mounted monitoring device without any national or international product standard will be fancy or have a crude and

non-standard arrangement, resulting in wrong monitoring and an unnecessary power outage or misinformation on the threshold limits of safety parameters.

The statutory provisions outlined above aim to facilitate accurate diagnosis of sensitive electrical issues to avoid fire and loss of life and property. Hence, any compromise or lapse in adhering to these provisions will undermine the system's purpose, compromising the safety and reliability of the electrical system.

4 IoT-based warning and fault-clearing system - a false claim

i. The product, IoT-based microcontroller system is contained in a small box of approximately 200*200*100 mm, consisting of one incomer 3 pole, 32 amps MCB with a shunt trip, and a display for various energy parameters. The product called Smart Electrical Auditor claims that it,

   - Identifies 20 unique electrical problems and protect against over current, earth leakage, over voltage, under voltage, earth voltage, loose connection, current unbalance, current harmonics, power factor, voltage harmonics short term interruptions, voltage variation, voltage unbalance, inrush current, reverse current, etc.
   - enables effective correction to complex electrical faults, and
   - reports the root cause of an accident.
   - The product also claims that it operates on the principle of IoT (IoT - Internet of Things) by collecting data on the cloud in real-time and it can ensure that the protection system is functioning accordingly by retrieving the said data. The product further recommends that It enables preventive measures by collecting and analysing the related information.

ii. The IoT device can fetch the data, monitor the data for any abnormality, and then initiate the required signals to warn or trip the faulty circuit. However, the accuracy of the data from the circuit, setting limits for monitoring by the IoT device, and initiating the required command for warning or tripping of the faulty circuit to avoid supply outages, are the factors to ensure the safety and reliability of supply.

iii. Accordingly, the following points must be taken care of to declare that IoT will safeguard the installation against electrical hazards:

4.1 Discrimination to afford supply continuity.

It is learnt that the IoT device is nothing but a multifunction meter with provisions for initiating required commands and it is installed at the incoming point of the electrical installation. Hence, it must be configured to trip the faulty circuit alone to avoid disruption of the entire supply to the installation which is objectionable for essential and critical loads. To achieve this purpose, many such meters/devices must be installed at vantage locations to analyse and discriminate against the faulty circuit from the healthy circuits of the installation to avoid disruption of supply for the entire installation for a tail-end fault.

4.2 Communication and tripping arrangement of protective gears

Since the IoT is fixed at the incoming point of the electrical installation, it must trip the faulty circuit alone to avoid disruption of the entire supply to the installation. For this, all the circuit protective gears should be incorporated with communication facilities with the IoT device and tripping arrangement actuated from an external command from the IoT device.

The programming of the device should consider the limits of various parameters that could cause harm if unattended so that a command is initiated either to trip or to warn depending upon the importance of the circuit. Though the tripping of the faulty circuit by the protective gears, say, MCB, fuse, breaker, AFDD etc. normally happens due to the inherent characteristics of the protective gears, there should be a provision for overriding the switch gear and tripping the circuit

from the commands of IoT device during faults to assure the claim and purpose assured by the IoT device.

4.3 Reliability of data fetched by the device.

The accuracy of measurement of the circuit parameters to communicate the relevant data to the device is very important. It is the deciding factor that makes the objective of IoT devices in ensuring electrical safety to be meaningful. e.g. The initial verification of earth loop impedance during the installation involves portable equipment to measure and provide results with sufficient accuracy in each circuit as per IEC 61557. After such an initial verification, further verifications are done periodically to assess the health of the electrical installation.

Since IoT devices are claimed to afford protection on a 24x7 basis, required data must be fetched from the protective gears of each circuit through permanently installed sensing devices/transducers which are calibrated to function at the declared level of accuracy. Periodical calibration will also be required for such transducers etc. to ensure the reliability of data for monitoring. Otherwise, the possibility of wrong warning or tripping will occur due to errors beyond the limits in the data. But such communication from the protective gears like a fuse, AFDD, etc is not feasible. Further, deploying protective devices incorporated with communication and tripping elements in the entire circuits in the installation to feed the required input data to the IoT devices is highly impractical and are not available commercially.

Because of the deficiencies explained above, the IoT device must be installed with the required additionalities explained above to prove its claim of ensuring the safety of the entire electrical installation. As a result, an optimum design cannot be assured by a single IoT device at the incoming point of the installation and the installation design will become an economically prohibitive one.

5 Wrong certifications supporting the false claim of the IoT device

i. The product manufacturer furnishes a certificate for the device Power easy SMART OPTIMISER and Power easy smart DB with OPTIMISER, issued by a laboratory, namely, Nashik Engineering Cluster, Nashik as per para “Reference 2 iv” (Pl see Annex A) to substantiate the exaggerated claims by portraying the product as a panacea to all electrical hazards.

ii. However, the certificate has turned out to be incorrect after verification with the national level body instituted for this purpose. Ironically, the laboratory is not accredited for the safety parameters mentioned in the certificate as confirmed by the National Accreditation Board for Testing and Calibration Laboratories (NABL) as per para “Reference 2 xiii” (Pl see Annex B).

iii. The parameters stated in the test report neither state the operation of the protective devices nor the fact of data transfer between the circuit protective device and the IoT device. It just states the functioning of the IoT device to receive and send signals to a processor and not the protective device. It has not considered any electrical fault event in the circuit to prove the purpose of the product.

6 Wrong interpretations and misconceptions

i. The Industries, Energy, and Labour Department of Government of Maharashtra is relied upon by the Government to issue a circular containing instructions for implementing the electrical and fire safety measures through the implementing departments. The Chief Electrical Inspector, Govt of Maharashtra issued “CERTIFICATE OF ACCEREDIATION” in letter no CEI/TECH/139/2022 dt 31 May 2022 to Power easy SMART OPTIMISER after verifying the test report (as per para 2. Reference ii & annex C). This certificate of accreditation wrongly claims that the device is a real-time data recorder that measures,

detects, reports, **and takes corrective actions on different types of electrical mishaps adhering to IS732:2019**. The authenticity of NABL accreditation for the scope of parameters and the norms prescribed by the IS 732 are not verified for issuing the certificate of accreditation. Cl. 6.2.3.1 of IS 732 prescribes ten parameters of verification protocol to ensure electrical safety in an installation (as per para 3. Safety Provisions and verification tests cl.3 ii to iv). Ironically, none of the safety parameters referred to in the certificate was tested by the laboratory as corroborated by the NABL. Thus, the certificate issued by the Chief Electrical Inspector is to be treated as a marketing brochure to promote the manufacturer's tall claims as if it is a panacea for electrical hazards without taking into account of the safety measures prescribed by the Standards and Regulations of our country. This certificate was given validity for a period of two years.

ii. Subsequently, an Advisory for the installation of IOT devices in high-rise buildings was issued by the Chief Electrical Inspector, Industries, Energy & Labour Department in CEI/Tech/36/2024 with an annexure of verification & checklist for IOT based Microcontroller device, identifying and reporting of all faults as per GR No: 2021/114/urja5 (as per para 2 “Reference” Cl.2 ix and as per Annex D).

Both the above documents create misconceptions, and the fact is that no such product approval is available in any of the National or International Standards to claim that it can afford protection against all the hazards of electrical nature.

iii. Mumbai Fire Brigade (Brihanmumbai Municipal Corporation) in Routine Circular No. 66 dated 14.10.2022 (refer V and annex D) insists on the following compliances while issuing the no objection certificate to the construction proposal with effect from 15.10.2022 (refer Annex D):

a) The IOT based Micro Controller Devices shall be provided in the electrical installation of the building as per the requirement stipulated in circular no. Government Circular No. Muvini-2021/Pro.No.114/Energy-5.
b) The IOT based Micro Controller Devices shall be tested and verified by NABL accredited testing agency / laboratory in accordance with the recognized IS:732-2019 Code of practice for electrical wiring installation.
c) The complete installation of IOT based Micro Controller Devices shall be checked and certified by the Chief Electrical Inspector, Govt. of Maharashtra and certificate to that effect shall be issued at the time of compliance.
d) The data and the alert generated by IOT based Micro Controller Devices shall be monitored by building management system and the necessary corrective measures shall be taken by the Owner, Occupier immediately.
e) The data generated by IOT based Micro Controller Devices shall be made available to fire brigade department as and when required to investigate the cause of fire.

It's worth noting that the provisions outlined above fall under the statutory powers vested in officials under the Chief Electrical Inspector. However, it is not clear how these provisions can be effectively exercised by the Fire Department. In particular, items 3(d) and 3(e) raise a critical question. In the event of a fault, such as an electrical shock or fire, how can data alerts provide timely protection when the situation demands immediate action, often within a matter of milliseconds?

7 Government circulars

Reference: (MUVINI-2021/Pro.No. 114/Energy-5), dated 27/08/2021(Annex G) and Government Circular No: MCO-2024/Pro.No.349/Navi-14 dt 29 November 2024 by Maharashtra Government Urban Development Department (Annex H).

In the above orders, the Government of Maharashtra, explains that safety as per IS732 and Regulations is mandatory, and it is necessary to monitor the electrical parameters (para 3 iii, Safety Provisions and verification tests). Various departments are instructed to insist installation of a specific product, namely, IOT BASED MICRO CONTROLLER DEVICE which is tested and certified by NABL accredited lab and it provides multiple safety measures as per IS 732 (as per para 2 “Reference” Cl.2 v and annex G and annex H). Since IS 732, IS 17512, and the CEA regulations do not prescribe safety measures through monitoring of electrical parameters, justification for ensuring safe electrical installation by IoT devices is not made in the Government orders. Without realising that a NABL accreditation system cannot be created or exist on the product referred, the GO (in reference XIV & annex G) insisted on installing NABL certified, IOT-based continuous monitoring system (in buildings covered under this notice), to comply with the requirements of National Electrical Code 2023 (NEC), the electrical wiring code IS 732 (Code of Practice for Electrical Wiring Installation) and related standards, and the Central Electrical Authority (Measures relating to Safety and Electric Supply) Regulations, 2023 (CEA), to prevent fires arising from electric short circuits.

8 Site Study

Few of the sites, where such a device is installed are being verified. On verification it is found that the product is an improved version of a multi-function meter with communication facility, and multi-function meters are already in use at the buildings in the form of Building Management System, Energy Management System. The manufacturer improvised the meters by developing an app to monitor the energy parameters and falsely claimed that it could offer extraordinary safety measures and named it as "IOT based microcontroller device". The products used in this IOT based device for metering are non-compliant to IEC 61010-1 and hence a violation of CEA regulations and could create an unsafe situation.

9 Violations of Regulations, Code of Practice and Standards

The product is in violation of IS/IEC standards and CEA Measures relating to Safety and Electric Supply Regulations 2023 in respect of the observance of all the provisions contained in para 3 above, especially, the following specific provisions.

1. Any practice or practice involving materials and apparatus without any specific standards, is a violation of CEA safety regulation 14(3). There is no product standard exist for the subject product.
2. Regulation 33 (2) stipulates that the testing and verifications shall be carried out as per relevant standards.
    - The important parameters involved in such verifications as per standards are insulation resistance as per Regulation 35 and earth fault loop impedance as per Regulation 43 (xi).
    - Every circuit need to be tested once installed and before energisation as per Regulation.
    - Every installation comprises tens to hundreds of circuits and hence an online verification by a device connected at the mains incoming of the supply claiming to monitor all the downstream circuits is impractical and illogical.
    - Periodic verification as per the relevant standards is also mandated in the Regulation, which is also violated by the IOT based device.
3. Regulation 33 (3) stipulates that the testing equipment shall be calibrated by a Government authorised or National Accreditation Board for Testing and Calibration Laboratories accredited laboratory at periodical intervals as per the periodicity specified.
4. IS 732 recommends that the testing devices used in the verifications shall comply IEC 61557, whereas the IOT based device is noncompliant to the IS/IEC standard.

10 Conclusion

1. NABL Accreditation is not applicable for the IOT based microcontroller as it is not covered under the scope of NABL.
2. According to NABL, the test report offered for this product is wrong & misleading, hence they are taking action against the lab which issued the certificate.
3. IS 732 is not a product standard. No products can be made and tested to ensure all safety parameters mentioned in IS732.
4. Monitoring of parameters cannot make safe electrical Installation.
5. The claims in the Government of Maharashtra documents (e.g. monitoring electrical parameters and storing in cloud can make safe installation) are against the safety regulations and safety standards.
6. The claims of the product manufacturer are illogical and mere MARKETING CLAIMS.

11 Recommendation:

1. The Government departments should withdraw all the notices referred in this document and immediately publish documents not to use non-standard products.
2. Engineers in both energy department and fire brigade are to be trained on the safety requirements in Regulations and Code of Practices.
3. State Electrical inspectorate shall implement all safety measures recommended in the CEA Regulation, Code of Practices and Standards.
4. It is crucial that the Government conducts a review to ensure compliance with fundamental safety requirements, especially, among engineers handling electrical safety-related subjects in the capacity of implementers as per Regulation.

Since the government departments are promoting this unsafe and non-compliant product, in case of any accident due to this unsafe product the responsibility lies with the government, especially the energy department and fire safety department.

12 Confirmation by the authors

The authors hereby confirm that the subjects explained in the document are true and hence ready to explain them in front of anybody who has doubts in the subjects of this document.

Published by National Federation of Engineers for Electrical Safety, prepared by

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Annexures

Annex A

Test report in Test/21-22/TR/ENE/42 dt 30.06.2021 issued by a laboratory, namely, M/S Nashik Engineering Cluster, reportedly mentioned as an NABL accredited Testing Lab, for a product not covered under NABL scope.

NASHIK ENGINEERING CLUSTER

(Under the aegis of Department of Industrial Policy & Promotion, (DIPP), Ministry of Commerce & Industry, Govt. of India, New Delhi)
NABL Accredited Testing & Calibration Laboratory as per ISO/IEC: 17025:2005, Certificate No.: TC-5448 & CC-2248

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TEST REPORT

Page No.: 01 of 05
TEST REPORT NO.: TEST/21-22/TR/ENE/42
Date: 30.06.2021

1.0	**Name and address of customer**	: M/S JHAVERI POWER LABS LLP Unit No. 225, 2nd Floor, A to Z Industrial Estate, Ganpatrao Kadam Marg, Lower Parel, Mumbai-400013
2.0	**Customer letter/Ref No./DC No.Date**	: Tested at JHAVERI POWER LABS LLP, Mumbai-400013 : 25.06.2021
3.0	**Condition Of test sample**	: 25.06.2021 Satisfactory
4.0	**Description of test sample**	: TSRF No. : TEST/21-22/TSRF/ENE/41

Sr. No.	Part Name	NEC Sample ID No.
1	Three Phase POWEReasy Smart Optimizer	TEST/21-22/ID/ENE/3692
2	Three Phase POWEReasy Smart DB With Optimizer	TEST/21-22/ID/ENE/3693

5.0	**Test method**	: As per customer requirement complying to IS 732,IS 12360, IS 60898 & IS 12640.
6.0	**Date of testing**	: 25.06.2021
7.0	**Details of test**	: Functional Test for all 20 electrical faults & IOT data communication
8.0	**Witnessed By**	: Mr.Vishal Kale- NEC,Nashik
9.0	**Enclosure**	: --

Note:
1. This report relates only to the particular sample witnessed in good condition by NEC.
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 the cause has 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:
Vishal Kale
(Testing Engineer)

Checked By:
Rahul Golesar
(Dy. General Manager)

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Approved By:
Jalindar Shinde
(General Manager)

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TEST REPORT NO.: TEST/21-22/TR/ENE/42
Date: 30.06.2021

Functional Test for Three Phase System:

Sr. No.	Condition	Clause of IS 732	Test	Outcome
1	Short Circuit	Clause 4.1.2.6.3 as per IS60898	Visual verification	Pass
		-	Report of issue on dashboard and by SMS to verify successful operation of IOT functionalities	Pass
2	Overcurrent	Clause 4.1.2.6.3 as per IS60898	Visual verification	Pass
		-	Report of issue on dashboard and by SMS to verify successful operation of IOT functionalities	Pass
3	Earth Leakage	Clause 4.1.2.6.3 and IS12640	Isolate supply if earth leakage is above set point in less than 200ms	Pass
		-	Report of issue on dashboard and by SMS to verify successful operation of IOT functionalities	Pass
4	Earth Voltage	Clause: 4.2.11.3.2.3 and 4.1.2.2	Warn if earth voltage is greater than 3V and isolate supply above 7V	Pass
		-	Report of issue on dashboard and by SMS to verify successful operation of IOT functionalities	Pass
5	Overvoltage	Clause 4.1.2.6.3 / 4.2.14.1 as per IS12360	From 230 to 290V correct with inbuilt stabilizer. Warn if voltage is greater than 253V & isolate supply above 290V	Pass
		-	Report of issue on dashboard and by SMS to verify successful operation of IOT functionalities	Pass
6	Undervoltage	Clause 4.1.2.6.3 / 4.2.14.1 as per IS12360	From 180 to 230V correct with inbuilt stabilizer. Warn if voltage is less than 207V & isolate supply below 184V	Pass
		-	Report of issue on dashboard and by SMS to verify successful operation of IOT functionalities	Pass

Prepared By:
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(Testing Engineer)

NASHIK ENGINEERING CLUSTER NASHIK AMBAD NASHIK

Approved By:
Jalindar Shinde
(General Manager)

QR/NEC/TC/01

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E-mail : calibration@nec.org.in, quality.lab@nec.org.in, testinglab@nec.org.in, info@nec.org.in, website: www.nec.org.in

Functional Test for Three Phase System:

Sr. No.	Condition	Clause of IS 732	Test	Outcome
7	Arcing	Clause 4.1.2.3	Isolate supply in case of a high intensity arcing event created on arcing test jig	Pass
		-	Report of issue on dashboard and by SMS to verify successful operation of IOT functionalities	Pass
8	Neutral loss	Clause 4.5.2.1b	Isolate supply in case of loss of supply to neutral in 80ms	Pass
		-	Report of issue on dashboard and by SMS to verify successful operation of IOT functionalities	Pass
9	Phase loss	Clause 4.1.2.6.3	Isolate supply in case of loss of supply to 1 phase	Pass
		-	Report of issue on dashboard and by SMS to verify successful operation of IOT functionalities	Pass
10	Phase Reversal	Clause 5.3.7.6.4.3	Isolate supply in case of input phase sequence reversed at startup	Pass
		-	Report of issue on dashboard and by SMS to verify successful operation of IOT functionalities	Pass
11	Power Factor	Clause 4.1.4.4	Report on screen if PF is less than 0.9 with recommendation for value of kVAR compensation required	Pass
		-	Report of issue on dashboard and by SMS to verify successful operation of IOT functionalities	Pass
12	Current Harmonics	Clause 4.1.4.4	Report on screen if harmonic is greater than 12% with identification of faulty load	Pass
		-	Report of issue on dashboard and by SMS to verify successful operation of IOT functionalities	Pass

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QR/NEC/TC/01

NASHIK ENGINEERING CLUSTER

(Under the aegis of Department of Industrial Policy & Promotion, (DIPP), Ministry of Commerce & Industry, Govt. of India, New Delhi)
NABL Accredited Testing & Calibration Laboratory as per ISO/IEC: 17025:2005, Certificate No.: TC-5448 & CC-2248

" 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 NO.: TEST/21-22/TR/ENE/42
Date: 30.06.2021

Functional Test for Three Phase System:

Sr. No.	Condition	Clause of IS 732	Test	Outcome
13	Voltage Harmonics	Clause 4.1.4.4	Warn if voltage harmonics is greater than 5% and isolate supply if it is greater than 8% (3 minute delay)	Pass
		-	Report of issue on dashboard and by SMS to verify successful operation of IOT functionalities	Pass
14	Unbalanced Currents	Clause 4.1.4.4	Report to dashboard after 24 hours analysis	Pass
		-	Report of issue on dashboard and by SMS to verify successful operation of IOT functionalities	Pass
15	Inrush currents	Clause 4.1.4.4	Report to dashboard and on display	Pass
		-	Report of issue on dashboard and by SMS to verify successful operation of IOT functionalities	Pass
16	Voltage Surge		Isolate supply for momentary voltage surge > 300V and report on display	Pass
		-	Report of issue on dashboard and by SMS to verify successful operation of IOT functionalities	Pass
17	Voltage Unbalance		Report to dashboard and on display	Pass
		-	Report of issue on dashboard and by SMS to verify successful operation of IOT functionalities	Pass
18	Voltage Variation		Report to dashboard and on display after 24 hours analysis	Pass
		-	Report of issue on dashboard and by SMS to verify successful operation of IOT functionalities	Pass
19	Short term interruption		Report to dashboard and on display	Pass
		-	Report of issue on dashboard and by SMS to verify successful operation of IOT functionalities	Pass
20	Reverse current		Report to dashboard and on display	Pass
		-	Report of issue on dashboard and by SMS to verify successful operation of IOT functionalities	Pass
21	Metering	Class II	Metering parameters displays on screen and on dashboard	Pass
		-	Report energy data on dashboard to verify successful operation of IOT functionalities	Pass

Prepared By:
Vishal Kale
(Testing Engineer)

NASHIK ENGINEERING CLUSTER NASHIK AMBAD NASHIK

Approved By:
Jalindar Shinde
(General Manager)

QR/NEC/TC/01

NASHIK ENGINEERING CLUSTER

(Under the aegis of Department of Industrial Policy & Promotion, (DIPP), Ministry of Commerce & Industry, Govt. of India, New Delhi)
NABL Accredited Testing & Calibration Laboratory as per ISO/IEC: 17025:2005, Certificate No.: TC-5448 & CC-2248

" 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

Three Phase

POWEReasy Smart Optimizer

	
Model No : 3P20EX **Rating : 15KVA**	**Model No : 3P40EX** **Rating : 30KVA**

POWEReasy Smart DB with Optimizer

	
Model No : 3P20DX **Rating : 15KVA**	**Model No : 3P40DX** **Rating : 30KVA**

Prepared By:
Vishal Kale
(Testing Engineer)

NASHIK ENGINEERING CLUSTER NASHIK AMBAD, NASHIK

Approved By:
Jalindar Shinde
(General Manager)

****** End of Test Report ******

Annex B

Confirmation from NABL about test report Test/21-22/TR/ENE/42 dt 30.06.2021 as wrong and the action taken against the Lab

From: **complaints complaints** complaints@nabl.qcin.org
Subject: Re: NABL accredited lab tested IOT based microcontroller as per IS732 Test report No: TEST/21-22/TR/ENE/42 dt 30.06.2021 from Nashik Engineering Cluster (NEC).
Date: 13 November 2024 at 6:14 PM
To: President - National Federation Of Engineers for Electrical Safety president@nfees.org

Dear Sir,

Acknowledge the receipt of your e-mail.

We wish to inform that NABL provides accreditation services to Testing Laboratories (in accordance with ISO/IEC 17025) for the specific scope of accreditation. We have reviewed the concerned test report and also understood that these test parameters are not under the scope of accreditation of the referred laboratory. Under such a situation, use of NABL symbol or claim of NABL accreditation is not permitted. However, the laboratory has mentioned a narrative reference of being accredited by NABL which is not acceptable. Hence we will deal this issue as per laid down procedure for handling with complaints.

We also wish to inform that the laboratories are required to adhere to terms and conditions (mentioned in NABL 131) for obtaining and maintaining NABL Accreditation.

Sincerely,

नवीन जांगड़ा / Naveen Jangra
उप निदेशक / Deputy Director
Complaints Team
राष्ट्रीय परीक्षण और अंशशोधन प्रयोगशाला प्रत्यायन बोर्ड /
National Accreditation Board for Testing & Calibration Laboratories
भारतीय गुणवत्ता परिषद / Quality Council of India
एनएबीएल हाउस, प्लॉट नंबर 45, **सैक्टर** 44, **गुरुग्राम** – 122003, **हरियाणा** /
NABL House, Plot No. 45, Sector 44, Gurugram–122003, Haryana
Phone No.: +91 124 4679 700, Fax No. +91 124 4679 799

आज़ादी का अमृत महोत्सव

From: President - National Federation Of Engineers for Electrical Safety <president@nfees.org>
Sent: Friday, November 8, 2024 10:48 AM
To: CEO NABL <ceo@nabl.qcin.org>
Cc: complaints complaints <complaints@nabl.qcin.org>; Secretary - National Federation Of Engineers for Electrical Safety <secretary@nfees.org>; Anil Jauhri <jauhrianil@gmail.com>
Subject: Fwd: NABL accredited lab tested IOT based microcontroller as per IS732 Test report No: TEST/21-22/TR/ENE/42 dt 30.06.2021 from Nashik Engineering Cluster (NEC).

Kind Attn: CEO, NABL

Dear Sir.

Based on the below e mail, we would like to inform you that the laboratory **Nashik Engineering Cluster** (called as NEC) is not accredited for making an electrical test based on IS732. Scope of accreditation of the said lab for testing and calibration is attached herewith. How ever, by issuing reports on letterhead with claim of NABL accreditation, NEC mislead customers and users. (Test repor issued by the lab is attached herewith).

By issuing a misleading information in the letter head of the test report, a complete ecosystem is being created, where the use the government believes that this test report is "NABL Accredited". As a result government of Maharashtra issued notifications IOT based device tested in NABL Accredited Lab. The proofs were attached in the earlier e mail, where you were marked in C

Finally this misleading information create a highly "UNSAFE" and "NON COMPLIANT" electrical installation.

Hence we request you accept this e mail as a complaint and to instruct the said lab to issue a latter explaining that th lab is not "Accredited" to issue the test report as claimed in various documents of the subject matter.

We also request you to ensure that the labs are not misusing the "NABL Accreditation" in any of the test reports issu them for NON-Accredited Tests.

We would like to point out that the "NABL ACCREDITATION" Seal on the accredited tests are not enough to ensure misusing, to make a "NO NABL ACCREDITATION" seal also in such test reports, where accreditation is not approved.

Thanking you and awaiting your reply
Best Regards
S Gopa Kumar
President
National Federation of Engineers for Electrical Safety.
Chennai

Begin forwarded message:

From: President - National Federation Of Engineers for Electrical Safety <president@nfees.org>
Subject: Re: NABL accredited lab tested IOT based microcontroller as per IS732 Test report No: TEST/21-22/TR/ENE/42 dt 30.06.2021 from Nashik Engineering Cluster (NEC).
Date: 30 October 2024 at 5:47:33 PM IST
To: "info@nec.org.in" <info@nec.org.in>
Cc: GOLIYA NARENDRA <narendra.goliya@rishabh.co.in>, "ceo@nabl.qcin.org" <ceo@nabl.qcin.org>, "complaints@nabl.qcin.org" <complaints@nabl.qcin.org>, Secretary - National Federation Of Engineers for Electrical Safety <secretary@nfees.org>, Admin - National Federation Of Engineers for Electrical Safety <admin@nfees.org>, Head Electrotechnical <heetd@bis.gov.in>, Etd Department <eetd@bis.gov.in>

Dear Sir

Shall I consider that your answer has considered the attached test report issued by NEC (sl no TEST/21-22/TR/ENE/42 dt 30.06.2021), which was a part of the earlier e mail correspondence. The said test report is being circulated and submitted to several government/private organisations, referred in several government documents as a proof of approval of the product by an NABL accredited lab.

Thanking you and awaiting your reply.

Best Regards
S Gopa Kumar

On 30 Oct 2024, at 5:02 PM, NEC_Info <info@nec.org.in> wrote:

Dear Sir
Nasiik Engineering Cluster is a fully self sustaining Section 8 Not for Profit company serving more than 2000 industries on pan India basis for last 17 years. We are a NABL accredited Testing Laboratory,following highest levels of professional standards. However , we are surprised to receive an e mail from technical association of Electrical Safety Engineers who should be aware about the following facts :

1. The Testing data and other details are proprietary information of the Customer and the service provider and we are bound by Non Disclosure and data confidentiality clauses of service agreement .So, for any clarifications / details you need to approach the Customer or the agency who has provided you the information you have claimed in your mail.
2. We are not a party related to any GRs or circular's issued by authorities as claimed by you .
3. As you are an association of very learned Electrical Engineers so, you must be fully aware about the fact that NABL Testing is carried out strictly as per the scope defined and permitted by NABL standards. And you are fully aware that for any NABL Test report **" Use of NABL symbol is mandatory for parameters/ tests covered under NABL accredited**

Annex C

Certificate of Accreditation no CEI/TECH/139/2022 dt 31 May 2022 by Chief Electrical Inspector, Industries, Energy and Labour Department.

Government of Maharashtra
Office of the Chief Electrical Inspector
Industries, Energy & Labour Department
3rd Floor, Administrative Building,
Ramakrishna Chemburkar Marg, Chembur (East),
Mumbai-400071

स्वातंत्र्याचा अमृत महोत्सव

e-mail : ceimumbai.nrg-mh@gov.in
Website : www.ceimah.in
Phone- 022-25274613
No.CEI/TECH/139 / 2022
Date- 31 MAY 2022

To,
Jhaveri Power Labs L.L.P,
2 Floor Anand Udyog Co-op Society Ltd,Agrawal Estate,
168, CST Road, Kalina, Santacruz (E)
Mumbai- 400098.

Subject: CERTIFICATE OF ACCEREDIATION

Reference: 1. Performance Evaluation of POWER easy SMART OPTIMIZER by CPRI, Bangalore
2. Nashik Engineering Cluster, NABL Accredited Testing And Calibration Laboratory Test reports No. TEST/21-22/TR/ENE/42 Dated 30.06.2021
3. This office Letter No. CEI/Tech/195/2021 Dated 23.04.2021.

Dear Sir,

With Reference to above subject, this is to certify that, POWER easy SMART OPTIMIZER, NABL accredited Laboratory tested is verified in accordance with the recognized IS: 732-2019: Code of Practice for electrical wiring installations, Fourth Revision (also. EC 60335)

This IoT based microcontroller device is a real time data recorder that measure, detect, report and takes corrective actions on different types of electrical mishaps adhering to IS: 732-2019, such as Protection to minimize the risk of arcing, Short Circuit protection, Over current protection, Earth leakage protection, Over voltage protection, Under voltage protection, Phase loss protection, Phase reversal protection, Consideration during loss of supply to neutral, Voltage quality detection of loads with low power factor, Detection of loads with high harmonics, Detection of loads with high inrush Detection of unbalanced or asymmetric loads.

With its wall mounting products namely **1) 3P20WEX-15KVA and 2) 3P40WEX-30KVA** it has superior preventive Maintenance alerts related to electrical faults and fire hazards along with ability to correct voltage quality issues which aids improving energy efficiency. Thereby it finds a wide scope in new as well as existing power distribution systems where precise and accurate energy optimization along with diagnosis of electrical faults and fire prevention management is desired. In addition, data from these systems can be used as an alternative to existing electrical safety audits to enable it in real time and on a year round basis.

This IoT based device complies the provision of guidelines issued by Government of Maharashtra vid Government Notification No. CEI-2021/C.R.141/Energy-5 dated 27.08.2021.

IN TESTIMONY THEREOF AFTER TECHNICAL EVALUATION
WE ACKNOWLEDGED OUTSTANDING COMPETENCE OF POWER easy.
(Note-This Certificate is valid for Two years from date of issue)

Office Of The Chief Electrical Inspector I. E. & L. Dept. GOVT. OF MAHARASHTRA Chembur, Mumbai-71

(Dinesh Khonde)
Chief Electrical Inspector
Industries, Energy and Labour Department,
Government of Maharashtra

Annex D

Advisory issued by the Chief Electrical Inspector for the installation of IoT (Internet of things) devices in high-rise buildings CEI/Tech/ 36 /2024 Dt.24/09/2024

Advisory for the usage of IOT based Microcontroller devices which can sense the abnormal conditions in the electrical circuits and can collect such data on cloud which can be used to analyse the probable faults in the circuits and convey the same to technical person maintaining the installation.

SUBJECT:- Advisory for installation of IOT (Internet of things) devices in high rise buildings.

REFERENCE:- 1. Government resolution CEI /2021/PR KR 114/ URJA-5 Dt. 27.08.2021
2. Mumbai fire brigade circular number 66 dated 14-10 2022

The Brihanmumbai Municipal Corporation has made it mandatory to incorporate and observe installation of IOT devices In the no-objection certificates issued by BMC for all the high rise buildings.

The chief fire officer of Brihanmumbai Municipal Corporation has sought the compliance regarding installation of IOT based microcontroller devices from the office of Chief Electrical Inspector, Government of Maharashtra.

The Plan approvals and the initial charging permissions for the complete electrical installation of high-rise buildings are issued from the office of the respective Electrical Inspectors. Hence for the compliance of the referred advisory from the chief fire officer, it is instructed to the individual electrical inspectors that during the plan approval process, provision for IOT based micro controller device shall be checked and at the time of issuing the initial charging permission, operation of the IOT based micro controller device shall be checked.

A chart containing Minimum Mandatory requirements to ascertain the genuinity of the product, and the tests which are required to be carried out at site to ascertain the functionality of the equipment is Annexed herewith, so that uniformity can be maintained by all the Electrical Inspectors while issuing the initial charging permission.

This annexure shall form as a part of the Test report submitted from the licenced electrical contractor to the electrical inspector's office.

The documentary requirements and the tests to be carried out at site are the minimum set of requirements. The electrical inspectors are at liberty to carry out any other tests or ask for additional documents which are required to ascertain the genuinity of the product and the functionality of the equipment.

Enclosed:- Annexure

SANDEEP ARVIND PATIL
Digitally signed by SANDEEP ARVIND PATIL
Date: 2024.09.24 16:25:54 +05'30'

Chief Electrical Inspector,

Industry,Energy,Labour and Mining department

Maharashtra

Outward No. CEI/Tech/ **36** /2024
Dt.**24/09/2024**
Office of the Chief Electrical Inspector, Industries, Energy & Labour Department,3rd Floor, Administrative Building,Ramakrishna Chemburkar Marg,Chembur {_East), Mumbai-400071.

Copy Submitted to:

1) Hon. Additional Chief Secretary, Energy department, Mantralaya, Govt. of Maharashtra for information.

Copy to:

2) Joint Secretary, Energy-1 , Energy department, Mantralaya, Govt. of Maharashtra for information.
3) Chief Fire Officer, Brihanmumbai Municipal Corporation.
4) Director, Maharashtra Fire Services, Santacruz (E), Mumbai.

Copy Forwarded to:

5) Superintending Engineer, Regional Electrical Inspection Circle, Mumbai / Pune / Nagpur / Aurangabad.
6) All Electrical Inspector's Maharashtra State.

Annexure

Verification & checklist for IOT based Microcontroller device (IoT device)

Checks during design verification of SLD submitted to Electrical Inspector		
1.	Total installed load capacity.	KVA
2.	Count of single-Phase DB.	Nos
3.	Total number of single Phase IOT devices.	Nos
4.	Count of three Phase DB.	Nos
5.	Total number of three Phase IOT devices.	Nos
6.	Current rating of IOT device matching current rating of DB.	Yes/No
7.	IOT device between meter and DB.	Yes/No

IOT Unit No._____

Checks during installation verification by Electrical Inspector prior to issue compliance.		
1.	Installed IOT device verified by NABL approved lab and meeting requirements for identification and reporting of all faults as per **GR No: 2021/114/urja5.**	Document
2.	Current rating of IOT device matching current rating of DB.	Yes/No
3.	IOT device between meter and DB.	Yes/No
4.	Installation of IOT device as per approved SLD.	Yes/No
5.	IOT device is confirmed to have stored data on cloud.	Yes/No
6.	In case of electrical abnormalities, are the issues corrected by the owner through the licensed electrical contractor/licensee.	Yes/No
7.	Response to Short Circuit test and storage on cloud.	Yes/No
8.	Response to Open Circuit test and storage on cloud.	Yes/No
9.	Response to Earth Leakage test and storage on cloud.	Yes/No
10.	Response to Neutral loss test and storage on cloud.	Yes/No
11.	Response to Current Unbalance test and storage on cloud.	Yes/No
12.	Response to Phase reversal test and storage on cloud.	Yes/No
13.	Response to Inrush Test and storage on cloud.	Yes/No
14.	Response to Reverse current test and storage on cloud.	Yes/No

Copy of Responses on cloud is enclosed.

Checked and tested by

IOT Device Installer Govt. Licensed Electrical Contractor

Annex E

Mumbai Fire Brigade daily circular no 66 dt 14.10.2022

बृहन्मुंबई महानगरपालिका
मुंबई अग्निशमन दल

मुंबई अग्निशमन दल नित्य परिपत्रक क्र. 66 दिनांक 14.10.2022

विषय: बृहन्मुंबई महानगरपालिका हद्दीमधील सर्व उत्तुंग इमारती व अन्य अनिवासी इमारतीतील विद्युत प्रणालीसाठी आय ओ टी (इंटरनेट ऑफ थींग्ज) आधारीत सुरक्षा उपकरणे स्थापित करणेबाबत.

संदर्भ: 1.CEI/1/9/2020/263-294 dated 03.05.2021 (पृष्ठ क्र.प-1 ते 3)
2.शासन परिपत्रक क्र.मुविनि-2021/प्र.क्र.114/ऊर्जा-5 दि. 27.08.2021
3.एमजीसी/एफ़/7433 दिनांक 26.08.2022
4.CEI/TECH/277/2022 dated 27.09.2022

इमारतीतील विद्युत प्रणालीं सुरक्षेसंबधी केंद्र शासनाद्वारे निर्गमीत केलेल्या मार्गदर्शक सुचना आणि त्याअनुषंगाने महाराष्ट्र राज्याद्वारे निर्गमीत अधीसुचना क्रं.2021/114/उर्जा-5 दि.27.08.2021 विचारात घेता इमारतीतील विद्युत प्रणालीचे लेखा परिक्षणाची तरतुद करण्यात आलेली आहे. भारतीय मानक आयएस 732 नुसार इमारतीतील विद्युत प्रणालीचे लेखा परिक्षणासंबधी मार्गदर्शक तत्वे आखुन देण्यात आलेली आहेत. याच प्रमाणे इमारतीतील विद्युत प्रणालीं सुरक्षेसाठी रुग्णालये व अनिवासी व्यावसायीक इमारतीतील विद्युत संचाच्या मांडणीत इमारतीतील विद्युत प्रणालीं मध्ये होणा-या बिघाडांची पूर्वसुचना देणारे आय ओ टी (इंटरनेट ऑफ थींग्ज) आधारीत सुरक्षा उपकरणे स्थापित करण्याविषयी सुचीत करण्यात आलेले आहे.

त्यानुसार बृहन्मुंबई महानगरपालिकेच्या हद्दीतील रुग्णालये, सर्व उत्तुंग रहिवाशी इमारती व अनिवासी इमारतीच्या बांधकामाचे प्रस्ताव प्राप्त झाल्यास त्यांना देण्यात येणा-या ना-हरकत प्रमाणपत्रामध्ये आय ओ टी (इंटरनेट ऑफ थींग्ज) आधारीत सुरक्षा उपकरणे स्थापित करण्याची अट समाविष्ट करण्यास मा.आयुक्त यांची उपरोक्त संदर्भ क्रमांक 3 नुसार मंजुरी प्राप्त झाली आहे.

तरी संबंधित सर्व अधिका-यांना निर्देश देण्यात येत आहे की, बांधकाम प्रस्तावास ना-हरकत प्रमाणपत्र देताना खालील बाबींचे तंतोतंत पालन करण्यात यावे.

1. The IOT based Micro Controller Devices shall be provided in the electrical installation of the building as per the requirement stipulated in circular No. शासन परिपत्रक क्र.मुविनि-2021/प्र.क्र.114/ऊर्जा-5
2. The IOT based Micro Controller Devices shall be tested and verified by NABL accredited testing agency / laboratory in accordance with the recognized IS:732-2019 code for practice for Electrcial wiring installation.

22-23/HCH- 206

3. The complete installation of IOT based Micro Controller Devices shall be checked and certified by the Chief Electrical Inspector, Govt. of Maharashtra and certificate to that effect shall be issued at the time of compliance.

4. The data and the alert generated by IOT based Micro Controller Devices shall be monitored by building management system and the necessary corrective measures shall be taken by the Owner , Occupier immediately.

5. The data generated by IOT based Micro Controller Devices shall be made available to fire brigade department as and when required to investigate the cause of fire.

सदर निर्देश दिनांक 15.10.2022 पासून प्रभाव्य राहील.

प्रमुख अग्निशमन अधिकारी

प्रत रवाना-

1) सर्व उपप्रमुख अग्निशमन अधिकारी
2) सर्व विभागीय अग्निशमन अधिकारी
3) सर्व सहाय्यक विभागीय अग्निशमन अधिकारी

उपप्रमुख अग्निशमन अधिकारी (प्रशासन)

22-23/HCH- 207

Annex F

Extract from BMC/Mumbai Fire Brigade demanding IoT based device for fire NOC

BRIHANMUMBAI MUNICIPAL CORPORATION
MUMBAI FIRE BRIGADE

Sub: Provisional Fire Safety Approval for the Proposed Construction of High-rise Residential Building for (Redevelopment of residential Qrts. for Reserve Bank of India) on plot bearing CTS no 132A of K/E Ward at Chakala, Andheri (E), Mumbai.

Ref: 1) Online submission from **Mr. Jitendra Kulkarni, Architects**
2) Online file No. **P-21660/2024/(132A)/K/E Ward/CHAKALA-CFO/1/New.**

NAME OF OWNER:
RESERVE BANK OF INDIA

This is a proposal for the construction of High-rise residential building comprising three wings designated as **Wing 'A', 'B' & 'C'** where **each wing** are having Common 02 level Basements i.e. 2nd Basement floor (at -8.70 mtrs) & 1st Basement floor (at -4.20 mtrs) for car parking by the way of 6.00 mtrs wide two way ramp + Common Ground floor on part stilts for car parking + 1st to 11th upper residential floors with a total height of 35.10 mtrs measured from general ground level to terrace level.
Floor wise users of the building:

18) INTERNET OF THINGS SYSTEM (For Wing 'A', 'B' & 'C'):

a) The IOT based Micro Controller Device shall be provided in the electrical installation of the building as per the requirement stipulated in circular No. शासन परिपत्रक क्र. मुविनि-२०२१/प्र. क्र. ११४/ऊर्जा -५.

b) The IOT based Micro Controller Device shall be tested and verified by NABL accredited testing agency / laboratory in accordance with the recognized IS:732-2019 code for practice for Electrical wiring installation.

c) The complete installation of IOT based Micro Controller Devices shall be checked and certified by the Chief Electrical Inspector, Govt. of Maharashtra and certificate to that effect shall be issued at that time of compliance.

d) The data and the alert generated by IOT based Micro Controller Devices shall be monitored by building management system and the necessary corrective measures shall be taken by the owner, occupier immediately.

e) The data generated by IOT based Micro Controller Devices shall be made available to fire brigade department as and when required to investigate the cause of fire.

OR

Smart meter with provision of the parameters included in the IOT devises is provided by electricity power supplier with specified certification.

PURUSHOTTAM DASACHARY SANDIKAR
Digitally signed by PURUSHOTTAM DASACHARY SANDIKAR
Date: 2024.09.04 19:32:41 +05'30'
Divisional Fire Officer
(Scrutinized & Prepared)

HARISHCHANDRA RAGHU SHETTY
Digitally signed by HARISHCHANDRA RAGHU SHETTY
Date: 2024.09.04 22:30:38 +05'30'
Deputy Chief Fire Officer
Final Approval

Copy to:-
1) E.E.B.P.(W.S.)
2) Mr. Jitendra Kulkarni, Architects

Annex G

Circular Number MUVINI-2021/Pro.No. 114/Energy-5, dated 27/08/2021, Energy Department, Government of Maharashtra

कोविड-१९ या संसर्गजन्य रोगाच्या प्रादुर्भावामुळे उद्भवलेल्या परिस्थितीत राज्यातील शासकीय व खाजगी रुग्णालये तसेच सार्वजनिक इमारतींमधील शॉर्ट सर्कीट तसेच इतर विद्युत दोषांमुळे आग लागण्याच्या घटनांना आळा घालण्याकरीता प्रतिबंधात्मक उपायोजनांबाबत मार्गदर्शक सूचना.

महाराष्ट्र शासन
उद्योग, ऊर्जा व कामगार विभाग
शासन परिपत्रक क्र.: मुविनि-२०२१/प्र.क्र. ११४/ऊर्जा-५
हुतात्मा राजगुरु चौक, मादाम कामा मार्ग,
मंत्रालय, मुंबई-४०० ०३२.
दिनांक: २७ ऑगस्ट, २०२१.

वाचा: १) महाराष्ट्र उद्वाहन अधिनियम, १९३९
२) महाराष्ट्र उद्वाहन नियम, १९५८
३) केंद्रीय विद्युत प्राधिकरण (विद्युत पुरवठा व सुरक्षा संबंधी उपाययोजना) विनियम, २०१०
४) विद्युत सुरक्षेसंबंधित विविध आय. एस. कोड.
५) महाराष्ट्र विद्युत नियामक आयोग (विद्युत पुरवठा संहिता, वितरण परवानाधारकांच्या कृतीची मानके आणि पॉवर क्वालिटी) विनियम, २०२१.
६) या विभागाचे पत्र क्र. मुविनि-२०२१/प्र.क्र. ५५/ऊर्जा-५, दि. २६/०४/२०२१.
७) मुख्य विद्युत निरीक्षक, मुंबई यांचे पत्र क्र.मुविनि/तांत्रिक/८७४/२०२१, दि.१४ /०७/२०२१.

शासन परिपत्रक:

राज्यातील कोविड-१९ या संसर्गजन्य रोगाच्या प्रादुर्भावामुळे उत्पन्न झालेल्या भीषण परिस्थितीत संपुर्ण राज्यातील शासकीय व खाजगी रुग्णालयांमध्ये गरजुंना आवश्यक ती वैद्यकीय उपचार सेवा अहोरात्र पुरविणे गरजेचे होते. त्यामुळे राज्यातील सर्व शासकीय व खाजगी रुग्णालयातील पायाभूत सुविधांवर फार मोठया प्रमाणात ताण पडला. यात प्रामुख्याने रुग्णालयातील वीज पुरवठा अखंडीत ठेवणे, जनित्र संच तसेच इन्व्हर्टरच्या माध्यमातून अंतर्गत वीज पुरवठा उपलब्ध करणे, शस्त्रक्रियागार (Operation theatre)/ अतिदक्षता कक्ष (ICU) येथील वातानुकूलीत यंत्रणा सुसज्ज ठेवणे, वापरात असलेल्या उद्वाहनांची नियमीत देखभाल व दुरुस्ती, अंतर्गत मेनपॅनल, सब पॅनल व वायरींग तसेच विद्युत स्विच गिअर्स यांची निगा व देखभाल, विद्युत उपकरणांची आणि वैद्यकीय उपकरणांची सुरक्षित हाताळणी तसेच अग्निशमन उपकरणांची उपलब्धता या बाबींवर प्रामुख्याने लक्ष देण्याची गरज भासली आहे. मुख्य विद्युत निरीक्षक, मुंबई यांच्याकडून याकरीता राज्यातील रुग्णालयाची वीज संचमांडणी केंद्रीय विद्युत प्राधिकरण (विद्युत पुरवठा व सुरक्षा संबंधी उपाययोजना) विनियम, २०१० च्या तरतुदी नुसार राखल्या जातात किंवा कसे याबाबत निरीक्षणे / तपासणी करण्यात आली. रुग्णालयातील आग लागण्याची नेमकी कारणे या निरीक्षणाच्या / तपासणीच्या माध्यमातून स्पष्ट झालेली आहेत. राज्यातील शासकीय व खाजगी रुग्णालयातील शॉर्ट सर्कीट तसेच इतर विद्युत बिघाड होऊन आग लागून जीवित तसेच वित्त हानी होऊ नये, याकरीता संपुर्ण राज्यातील शासकीय व खाजगी रुग्णालयातील आणि सार्वजनिक इमारती मधील वीज संचमांडणी सुरक्षित राखण्याकरीता व या ठिकाणी होणारा वीज पुरवठा अखंडीत ठेवण्याकरीता तसेच उद्वाहनांमध्ये होणारे

अपघात टाळण्याकरीता मार्गदर्शक सूचना अनुक्रमे सोबत जोडलेल्या **परिशिष्ट-१** व **परिशिष्ट-२** मध्ये नमूद केल्याप्रमाणे देण्यात येत आहेत.

२. सदर शासन परिपत्रक महाराष्ट्र शासनाच्या www.maharashtra.gov.in या संकेतस्थळावर उपलब्ध करण्यात आले असून त्याचा संकेतांक २०२१०८२७१६३११४२७१० असा आहे. हे परिपत्रक डिजीटल स्वाक्षरीने साक्षंकित करून काढण्यात येत आहे.

महाराष्ट्राचे राज्यपाल यांच्या आदेशानुसार व नावाने,

PRASHANT PUNDLIK BADGERI

Digitally signed by PRASHANT PUNDLIK BADGERI
Date: 2021.08.27 17:34:09 +05'30'

(प्रशांत पुं. बडगेरी)

उप सचिव, महाराष्ट्र शासन

प्रत,

१. मा. राज्यपाल यांचे सचिव, राजभवन, मलबार हिल, मुंबई,
२. मा. मुख्यमंत्री यांचे अपर मुख्य सचिव,
३. सर्व मा. मंत्री / राज्यमंत्री यांचे खाजगी सचिव,
४. मा. विरोधी पक्षनेता, विधानपरिषद / विधानसभा, विधानभवन, मुंबई.
५. सर्व मा. संसद सदस्य/ विधानमंडळ सदस्य, महाराष्ट्र राज्य,
६. मा. मुख्य सचिव,
७. अपर मुख्य सचिव, गृह विभाग, मंत्रालय, मुंबई-४०००३२.
८. अपर मुख्य सचिव, सार्वजनिक आरोग्य विभाग, मंत्रालय, मुंबई-४०००३२.
९. प्रधान सचिव, सार्वजनिक आरोग्य विभाग, मंत्रालय, मुंबई-४०००३२.
१०. प्रधान सचिव, नगरविकास विभाग, मंत्रालय, मुंबई-४०००३२.
११. प्रधान सचिव, उद्योग, ऊर्जा व कामगार विभाग (ऊर्जा), मंत्रालय, मुंबई-४०००३२.
१२. सर्व आयुक्त, महानगरपालीका/मुख्यधिकारी, नगरपरिषद/नगरपंचायत,
१३. मुख्य विद्युत निरीक्षक, ३ रा मजला, प्रशासकीय इमारत, रामकृष्ण चेंबूरकर मार्ग, चेंबूर (पूर्व), मुंबई-४०००७१.
१४. मुख्य अभियंता (विद्युत), सार्वजनिक बांधकाम विभाग, सार्वजनिक बांधकाम भवन, फोर्ट, मुंबई.
१५. सह सचिव/उप सचिव, उद्योग, ऊर्जा व कामगार विभाग, मंत्रालय, मुंबई-४०००३२.
१६. निवड नस्ती (ऊर्जा-५).

(शासन परिपत्रक क्र. मुविनि-२०२१/प्र.क्र. ११४/ऊर्जा-५, दि. २७/०८/२०२१ सोबतचे परिशिष्ट क्र. १)

परिशिष्ट :-१

राज्यातील शासकीय व खाजगी रुग्णालयातील आणि सार्वजनिक इमारती मधील अंतर्गत वीज संचमांडणी सुरक्षित राखण्याकरीता तसेच या ठिकाणी होणारा वीज पुरवठा अखंडीत राखण्याकरीता मार्गदर्शक सूचना

शासकीय व खाजगी रुग्णालये यामधील अंतर्गत वीज संचमांडणीची संरचना, हाताळणी, देखभाल व दुरुस्ती संबंधी आय.एस. ७३२(२०१९) - Code of Practice for Electrical Wiring Installations तसेच आय एस १७५१२(२०२१)- Requirements for Electrical Installations in Medical locations व केंद्रीय विद्युत प्राधिकरण विनियम,२०१० च्या सुरक्षा विनियमनुसार राखणे बंधनकारक आहे.

शॉर्ट सर्कीटमुळे किंवा इतर विद्युत दोषांमुळे अंतर्गत विज संचमांडणीस आग लागून कुठलीही संभाव्य जिवीत किंवा वित्त हानी होऊ नये याची जबाबदारी प्रामुख्याने रुग्णालय प्रशासन किंवा ग्राहक यांची आहे.

सार्वजनिक इमारतीं तसेच रुग्णालयात अंतर्गत वीज संचमांडणीच्या सुरक्षेसोबतच वीज पुरवठ्याची अखंडता (Reliability) तेवढीच महत्वाची आहे. अखंडीत विज पुरवठा राखण्याची रुगणालय प्रशासन / ग्राहक तसेच पुरवठाकार कंपनी यांची सामुहिक जबाबदारी आहे.

(I) अखंडीत वीज पुरवठा राखण्याकरीता व सुरक्षितेच्या दृष्टीने पुरवठाकार कंपनी / उपभोक्ता ग्राहक यांच्या जबाबदाऱ्या व कर्तव्ये खालील प्रमाणे आहेत : -

१) वीज पुरवठाकार कंपनी यांच्या जबाबदाऱ्या व कर्तव्ये:

(अ) उच्चदाब/मध्यमदाब (भुमिगत/उपरीतार मार्ग) फीडर्सची नियतकालिक नियमित पेट्रोलींग / पाहणी करणे.

(आ) फीडर्स करीताची रीलेईंग व प्रोटेक्शन प्रणाली नियतकालीक (सहा महिन्यातून एकदा) चाचण्या घेवून सुरळीत कार्यान्वित ठेवणे.

(इ) डीओ फ्युजेस / ए.बी. स्वीचेस / जंपर्स / ट्रान्सफॉर्मर बुशींग / वितरण पेटीतील संचमांडणी / बसबार या बाबी नियतकालिक (सहा महिन्यातून एकदा) तपासणी करून ते सुरक्षित कार्यान्वित ठेवणे.

(ई) पॉईन्ट ऑफ कमेंसमेंट ऑफ सप्लायच्या ठिकाणी सक्षम न्युट्रल व अर्थ टर्मीनलची व्यवस्था करणे.

(उ) आय.एस. मानकाप्रमाणे वीज पुरवठा करणा-या केबलची जोडणी (Service connections) मान्यता प्राप्त पध्दतीने करण्यात यावी.

(ऊ) प्रत्येक रुग्णालयाला मंजुर वीज भार अनुरुप केवळ एकाच वीज मिटरची व्यवस्था असावी.

(ऋ) उपभोक्ता करीता बसविलेले मिटर्स (एच.टी./एल.टी.) सीटी/पीटी क्युबीकल युनिटस/ अेबीटी मिटरींग / सीटी ऑपरेटेड मीटर्स तसेच स्मार्ट मीटर्स योग्य ठिकाणी संबंधीत आय. एस. मानकातील तसेच केंद्रीय विद्युत प्राधिकरण विनियम,२०१० मधील तरतुदीनुसार उभारण्यात यावे.

(ऌ) एल.टी. किंवा मध्यमदाब ग्राहक करीता ट्रान्सफॉर्मर किंवा डी.पी.स्ट्रक्चरवरील कुठलाही बिघाड झाल्यास विहित वेळेत विज पुरवठा पुर्ववत करणेबाबत दक्षता घ्यावी.

(ऍ) ग्राहकाचा जोडलेला किंवा वापरात असलेला विजभार हा मंजूर भारापेक्षा जास्त राहणार नाही याची नियतकालिक तपासणी करणे व याबाबत उपभोक्त्याला कळविण्याची दक्षता घ्यावी.

२) उपभोक्ता/ग्राहक यांच्या जबाबदाऱ्या व कर्तव्ये:

(अ) उपभोक्ता / ग्राहक यांनी योग्य क्षमतेच्या (लोड अनुरूप) आवश्यकतेनुसार जनित्रसंचाची/ इन्व्हर्टरची व्यवस्था करणे.

(आ) वीज पुरवठा खंडीत झाल्यास स्वयंचलीत यंत्रणे मार्फत (EMF Panel / Auto Change Over) पुर्ववत होईल अशी व्यवस्था असावी.

(इ) थ्री फेज फोर वायर संरचनेमधे आय.एस. मानकाप्रमाणे न्युट्रल योग्यरीत्या सक्षमपणे भुसंबंधन करणे अनिवार्य राहील.

(ई) न्युट्रल आणि अर्थ (भुसंबंधन) मधील विद्युतदाब हा नॅशनल इलेक्ट्रिक कोड तसेच आय.एस.मानकामधील तरतुदीनुसार राखण्यात यावा.

(उ) तिन्ही फेज वरील विजेचा भार (Load) संतुलीत असावा.

(ऊ) विजेचे मिटर आणि संबंधीत सर्व कंट्रोल उपकरणांची (एम.सी.सी.बी/ एम.सी.सी.बी.डी.बी/आर्यन क्लॅड मेटल स्वीच व इतर स्वीच) शक्यतो अँगल आर्यन फ्रेमवर अर्थीगच्या व्यवस्थेसह उभारणी करावी.

(ऋ) मीटररुम मध्ये योग्य ठिकाणी सी (C) टाईप अग्नीशमन यंत्रणेची व्यवस्था असने अनिवार्य राहिल.

(ऌ) मीटररुम मध्ये असलेले मीटरर्स / मेन पॅनल/सब पॅनलच्या समोर आय.एस.१५६५२ (२००६) मानका प्रमाणे रबरमॅट आच्छादित करणे अनिवार्य राहिल.

(ऍ) के.वि.प्रा.विनियम, २०१० विनियम ३६ अन्वये १५ मीटरपेक्षा उंच असलेल्या इमारतींना सक्षम प्राधिकरणामार्फत देण्यात येणारे वीज संचमांडणीचे ना-हरकत प्रमाणपत्र (High-rise Permission) वीज जोडणी देण्याआधी प्राप्त करून घेण्यात यावे.

(ऐ) प्रत्येक उच्चदाब शासकीय रुग्णालयास व सार्वजनिक इमारतींना अखंडीत विज पुरवठा व्हावा याकरीता आवश्यकतेनुसार एक्सप्रेस फिडरची व्यवस्था करणेबाबत रुग्णालय प्रशासनाने काळजी घ्यावी.

(II) **केंद्रीय विद्युत प्राधिकरण (विद्युत पुरवठा व सुरक्षा संबधी उपाययोजना) विनियम, २०१० नुसार विनियमतील खालील प्रमुख तरतुदी नुसार वीज संचमांडणी राखणे अनिवार्य राहील.**

१) केंद्रीय विद्युत प्राधिकरण विनियम, २०१० च्या विनियमाची अंमलबजावणी होण्याच्या दृष्टीने खालील बाबीचे पालन करण्याची दक्षता घ्यावी :-

(अ) योग्य ठिकाणी योग्य आकाराच्या वायु विजन व्यवस्थेसह मीटररूम असणे अनिवार्य राहिल.

(आ) मिटररुम शक्यतो अडचणीच्या ठिकाणी उदा. जिन्याखाली / बेसमेंट मधे नसावी.

पृष्ठ ८ पैकी ४

(इ) मीटर रूम/कंट्रोल रूम मध्ये कुठल्याही प्रकारचे ज्वालाग्राही व इतर साहित्याची साठवण करू नये.

(ई) मीटर रूम मध्ये एकाच ठिकाणी मीटर्स संख्या जास्त असल्यास बस बार ते मीटर्सपर्यंतची जोडणी योग्य क्षमतेच्या Unarmoured cable मार्फत नीट Clamping करून जोडण्यात यावी.

(उ) Main Panel/Sub Panel मध्ये वापरात असलेले स्वीच गिअर्स सर्कीट भार अनुरूप योग्य क्षमतेचे असावे व केबल टर्मिनेशन्स योग्य आकाराच्या lugs/glands मार्फत टर्मिनेट करण्यात यावी जेणे करुन केबल टर्मिनेशन्स सैल राहून उष्णतामान वाढून हॉट स्पॉट तयार होणार नाही.

(ऊ) तात्पुरती/विस्कळीत/जीर्ण व जोड दिलेले वायरिंग नसावे. आय.एस मानकाप्रमाणे P V C Pipes/ Casing Capping/ M S Conduits/ H G Conduits यामध्ये Open किंवा Concealed पद्धतीची वायरिंग असावी.

(ऋ) शक्यतो OT / ICU / NICU/ Testing Lab / MRI / CT Scan अश्या ठिकाणी छुप्या (Concealed) पद्धतीची वायरिंग असावी.

(ऌ) OT / ICU / NICU/ Testing Lab / MRI / CT Scan अश्या संवेदनशील ठिकाणी आय.एस १७५०५(२०२०)-Specification for thermosetting Insulated Fire Survival Cables मानकाप्रमाणे विहित केलेल्या FRLS तसेच Fire Survival Cables चा वापर करण्याची दक्षता घ्यावी.

(ॲ) रुग्णालयातील वातानुकुलीत यंत्रणेची क्षमता (capacity in Tonnes) ही (OT /ICU/ NICU/ Testing Lab etc.) अतिरिक्त क्षमतेच्या पर्यायसह आवश्यकतेनुसार राहील याची दक्षता घ्यावी.

(ऐ) वातानुकुलीत यंत्रणेची आवश्यकतेनुसार नियतकालिक देखभाल व दुरुस्ती करण्यात यावी. (वातानुकुलीत यंत्रणेचे Filters / Fans/ Copper Tubing's / PCB Circuits/ Blowers/ Condensers/ Gas pressure etc).

(ए) प्रत्येक वातानुकुलीत यंत्रणे करीता स्वतंत्र योग्य क्षमतेचे आयसोलेशन सह एम.सी.बी ची व्यवस्था अनिवार्य राहील व याबाबतचे कुठलेही सर्किट अतिभारीत (Overload) होणार नाही याची दक्षता घ्यावी.

(ऐ) Ceiling Mounted वातानुकुलीत यंत्रणे मधील पाण्याची गळती होणार नाही याची खबरदारी घेण्यात यावी.

(ऑ) वातानुकुलीत यंत्रणेच्या आउट डोअर युनिट योग्य ठिकाणी उभारणी करून उष्ण वायू सुलभतेने बाहेर जावे याबाबतची व्यवस्था करण्यात यावी.

२) <u>केंद्रीय विद्युत प्राधिकरण विनियम,२०१० च्या विनियम क्रमांक ३ व २९ अन्वये:-</u>

वीज संच मांडणीची उपकरणे ही केवळ अधिकृत परवानाधारक व्यक्तीमार्फतच हाताळली जावी तसेच संचमांडणीची नियमित देखभाल व दुरुस्ती, फेरफार (additions and alterations) शासन मान्यताप्राप्त परवानाधारक विद्युत ठेकेदारामार्फत करण्यात यावी.

३) केंद्रीय विद्युत प्राधिकरण विनियम,२०१० च्या विनियम क्रमांक ४१ अन्वये

उपभोक्ता/ ग्राहक यांनी आय.एस. ३०४३ (१९८७)- Code of Practice for Earthing या मानकाप्रमाणे सक्षम भुसंबंधन (अर्थींग) ची व्यवस्था करणे व नियमित तपासणी करून त्या बाबतची नोंद ठेवणे अनिवार्य राहील.

४) **केंद्रीय विद्युत प्राधिकरण विनियम,२०१० च्या विनियम क्रमांक ४२ अन्वये**

लायटींग लोड व पॉवर लोड करिता नॅशनल इलेक्ट्रिक कोड मधील तरतुदीनुसार स्वतंत्र वितरण सर्किट राहतील अशा पद्धतीची वायरिंग असावी तसेच लायटींग सर्किट मध्ये विजेचे क्षरण (Leakage) होऊन अपघात होऊ नये याकरिता योग्य क्षमतेचे ELCB/RCCB बसविणे अनिवार्य राहील.

५) **केंद्रीय विद्युत प्राधिकरण विनियम,२०१० च्या विनियम क्रमांक १९ अन्वये**

वीज संचमांडणीची व उपकरणांची हाताळणी करतांना सुरक्षा साधनांचा (Personnel Protective Equipments) वापर अनिवार्य राहील.

६) **केंद्रीय विद्युत प्राधिकरण विनियम,२०१० च्या विनियम क्रमांक ३० अन्वये**

अधिसूचित केलेल्या नोटीफाईड व्होल्टेज व त्या खालील सर्व रुग्णालयांनी प्राधिकरणामार्फत विद्युत सुरक्षिततेच्या दृष्टीने नियतकालिक तपासणी करून घेण्यात यावी व या संबधीचा विस्तृत अहवाल विद्युत निरीक्षक यांच्याकडे विहित नमुन्यात मान्यतेसाठी सादर करणे अनिवार्य राहील.

७) **केंद्रीय विद्युत प्राधिकरण विनियम,२०१० च्या विनियम क्रमांक ३६ अन्वये**

(अ) १५ मीटर्स पेक्षा उंच सर्व सार्वजनिक इमारती तसेच रुग्णालयांनी विद्युत सुरक्षिततेच्या दृष्टीने अंतर्गत वीज संचमांडणीचे निरीक्षण विद्युत निरीक्षक मार्फत वीज संचमांडणीचे ना-हरकत प्रमाणपत्र (High-rise Permission) मार्गदर्शक सूचना निर्गमित झाल्याच्या एक वर्षाच्या आत प्राप्त करून घेण्यात याव्यात.

(आ) महाराष्ट्र फायर प्रीव्हेन्शोन ॲन्ड लाईफ सेफ्टी ॲक्ट २००६ च्या तरतुदीनुसार सार्वजनिक इमारती तसेच रुग्णालय परिसरात Heat Detectors/ Smoke Detectors/ Sprinklers/ Fire Hydrant System इ. यंत्रणा बसविली याची दक्षता घ्यावी.

(इ) प्रत्येक रुग्णालयाने तसेच सार्वजनिक इमारतींनी या संबधीचे फायर ऑडीट नियमितपणे सक्षम संस्थेमार्फत करून अग्नी सुरक्षाप्रणाली सुरक्षित कार्यान्वित असल्याचे प्रमाणित करून घेण्यात यावे. तसेच आपातकालीन स्थितीमध्ये अग्नीशमन यंत्र हाताळण्याचे प्रशिक्षण देण्यात यावे.

८) **केंद्रीय विद्युत प्राधिकरण (विद्युत पुरवठा व सुरक्षा संबधी उपाययोजना) विनियम, २०१० नुसार** वीज संचमांडणी सुरक्षीत राखण्याकरीता ज्या कारणानी शॉर्ट सर्कीट तसेच इतर विद्युत बिघाड होवून आग लागण्याची शक्यता आहे अशा विविध संवेदनशील बाबींचे अचूक निदान करणे गरजेचे आहे. याकरीता खाली नमूद केलेल्या विविध संरक्षण प्रणालीचा वीज संच मांडणीत अंतर्भाव असावा व ती सुस्थितीत आहे याची वेळोवेळी तपासणी करून दक्षता घ्यावी.

I. Protection to minimize the risk of arcing
II. Short Circuit protection
III. Over current protection
IV. Earth leakage protection
V. Over voltage protection
VI. Under voltage
VII. Phase loss protection
VIII. Phase reversal protection

पृष्ठ ८ पैकी ६

IX. Consideration during loss of supply to neutral
X. Voltage quality
XI. Detection of Loads with low power factor
XII. Detection of Loads with high harmonics
XIII. Detection of Loads with high inrush
XIV. Detection of unbalanced or asymmetric loads

वरील सर्व बाबींचे अचुक निदान करणे करीता एका विशिष्ट यंत्रणेची आवश्यकता आहे. सद्यस्थितीत आयओटी (IoT-Internet of Things) तत्वावर चालणारे मायक्रोकंट्रोलर संयंत्र अंतर्गत विजसंच मांडणीच्या संरचनेमध्ये उत्पन्न होणा-या असामान्य बाबींचे (Faulty Electrical Conditions) रिअल टाईम नुसार माहिती क्लाउड वर संकलीत केल्यास सदर डाटा पुनर्प्राप्त करुन त्याप्रमाणे प्रोटेक्शन प्रणाली कार्यान्वित होत असल्याची खातरजमा करता येईल. याकरीता आय.ओ.टी. तत्वार चालणा-या मायक्रोकंट्रोलर सयंत्रणेमार्फत यासंबंधीची माहिती (Data) एकत्रित करुन आणि त्या यंत्रणेमार्फत उपलब्ध असलेल्या माहितीचे विश्लेषण करुन त्यावर प्रतिबंधात्मक उपाययोजना करणे सोयीचे होईल. याकरीता एन.ए.बी.एल.टेस्टिंग लॅब (NABL Testing lab) द्वारे प्रमाणीत आयओटी (IoT-Internet of Things) तत्वावर चालणारे मायक्रोकंट्रोलर सयंत्र सर्व शासकीय व खाजगी रुग्णालये तसेच सार्वजनिक इमारतींमध्ये बसविण्यात यावे.

याव्यतिरिक्त सर्व शासकीय व खाजगी रुग्णालयांतील वीज संच मांडणी सुरक्षित राखण्याकरीता आय एस १७५१२(२०२१)- Requirements for Electrical Installations in Medical locations मधील तरतुदीनुसार व त्यात वेळोवेळी होणाऱ्या सुधारणाचे अनुपालन करणे आवश्यक राहील.

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(शासन परिपत्रक क्र. मुविनि-२०२१/प्र.क्र. ११४/ऊर्जा-५, दि. २७/०८/२०२१ सोबतचे परिशिष्ट क्र. २)

परिशिष्ट -२

उद्वाहनांमध्ये होणारे अपघात टाळण्याकरिता मार्गदर्शक सूचना

शासकीय व खाजगी रुग्णालये तसेच सार्वजनिक इमारतींच्या परिसरात वापरात असलेले उद्वाहन महाराष्ट्र उद्वाहन अधिनियम, १९३९ व मुंबई उद्वाहन नियम, १९५८ मधील तरतुदीनुसार उद्वाहन सुरक्षित कार्यान्वित ठेवणे गरजेचे आहे. याकरीता खाली नमूद केलेल्या बाबींचे अनुपालन करण्यात यावे:-

१) उद्वाहन वापरण्याची अनुज्ञप्ती घेणे अनिवार्य राहील. अनुज्ञप्तीशिवाय उद्वाहनाचा वापर करण्यात येऊ नये.

२) उद्वाहनाची वार्षिक देखभाल, दुरुस्ती अनुज्ञप्तीधारक उद्वाहन ठेकेदारामार्फत करणे अनिवार्य राहील.

३) उद्वाहन ठेकेदाराने उद्वाहन सुरक्षा दृष्टीने कार्यान्वित असल्याची खातरजमा करणेकरिता वार्षिक देखभाल व दुरुस्तीच्या करारनाम्यातील अटी व शर्तीनुसार नियतकालिक (त्रैमासिक) आवश्यक त्या चाचण्या घेऊन याबाबतची नोंद लॉग बुक मध्ये घेण्यात यावी.

४) उद्वाहनाकरिता पर्यायी वीज पुरवठा जसे की A.R.D., (Automatic Rescue Device), Inverter back up अथवा जनित्र संच (ए.एम.एफ पॅनलसह) बसविण्यात यावे.

५) उद्वाहन कार मध्ये सी.सी.टी व्ही. यंत्रणा बसविण्यात यावी.

६) उद्वाहन कार मध्ये इमरजन्सी अलार्म बेल, पंखा, लाईट्स बॅटरी बॅकअप वर कार्यरत ठेवण्यात यावे.

७) उद्वाहन कार मध्ये उद्वाहन वापरासंबंधी सुचना फलक व देखभाल दुरुस्ती करणाऱ्या ठेकेदाराचे नाव व भ्रमणध्वनी क्रमांक असणे अनिवार्य राहील.

८) उद्वाहनातून तेरा वर्षांखालील मुलांना एकटयाने प्रवास करण्यास देऊ नये.

९) उद्वाहनाकरीता असलेल्या पिट मध्ये कुठेही पाण्याची साठवण तसेच शाफ्ट मध्ये पाण्याची गळती नसावी.

१०) फायर लिफ्टमध्ये फायर स्वीच योग्य प्रकारे कार्यान्वित असावे.

११) स्वयंचलित दरवाजे (Auto door) असलेल्या उद्वाहनामध्ये पूर्ण उंचीचे (Full Height) कार्य करणारे सेन्सर्स असणे अनिवार्य राहील.

१२) उद्वाहन मशीन रूम मध्ये इतर निकामी साहीत्य/ज्वालाग्राही पदार्थाची साठवण करू नये.

१३) उद्वाहन मशीन रूम मध्ये **"सी "**(C) टाईप अग्निशमन यंत्रणा बसविणे अनिवार्य राहील.

१४) उद्वाहनामध्ये अतिभार (ओव्हरलोड) यंत्रणा बसविणे अनिवार्य राहील.

१५) उद्वाहन मशीन रूम मध्ये Lighting Circuit करीता योग्य क्षमतेचे ELCB/RCCB बसविणे अनिवार्य राहील.

१६) उद्वाहन मशीन रूमच्या छतावर कुठल्याही प्रकारचे बांधकाम (पाण्याची टाकी / मोबाईल टॉवर) करू नये.

१७) उद्वाहन संचमांडणीतील आवश्यक फेरबदल मान्यताप्राप्त उद्वाहन ठेकेदाराकडूनच करून घेणे अनिवार्य राहील.

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Annex H

Government Circular No: MCO-2024/Pro.No.349/Navi-14 dt 29 November 2024 by Maharashtra Government, Urban Development Department.

राज्यातील महानगरपालिका, नगरपरिषदा/ नगरपंचायतींमधील उंच इमारती व वाणिज्यिक इमारतींच्या विद्युत सुरक्षिततेबाबतची मार्गदर्शक तत्वे.

महाराष्ट्र शासन

नगर विकास विभाग

शासन परिपत्रक क्रमांक : एमसीओ-२०२४/प्र.क्र.३४९/नवि-१४

मुख्य इमारत (४ था मजला), मंत्रालय,
हुतात्मा राजगुरू चौक, मादाम कामा रोड,
मुंबई- ४०० ०३२
दिनांक : २९ नोव्हेंबर, २०२४.

वाचा:- महाराष्ट्र आग प्रतिबंधक व जीवसंरक्षक अधिनियम, २००६.

शासन परिपत्रक:-

राज्यातील महानगरपालिका, नगरपरिषदा व नगरपंचायतींच्या कार्यक्षेत्रामध्ये उंच इमारती व वाणिज्यिक इमारती उदा. हास्पिटल, मॉल, मल्टीप्लेक्स व इतर कार्यालये यामध्ये दिवसांदिवस आग लागण्याचे प्रमाण वाढले असून, आग लागण्यास मुलत: विद्युत उपरकणे व शॉर्टसर्कीट इ. बाबी कारणीभूत असल्याचे व त्यामुळे, मोठ्या प्रमाणात मालमत्ता व जिवितहाणी होत असल्याचे निदर्शनास आले आहे.

महाराष्ट्र आग प्रतिबंधक व जीवसंरक्षक अधिनियम, २००६ व (सुधारणा) अधिनियम, २०२३ अन्वये रहिवासी इमारती व वाणिज्यिक इमारतींना आग प्रतिबंधक उपाययोजनांबाबत तरतूदी करण्यात आलेल्या आहेत. परंतू, विद्युत व विद्युत उपकरणांमुळे लागणारी आग यापासून संरक्षण करण्याबाबत अग्निशमन कायदयामध्ये पुरेशी तरतूद नाही. तथापि, National Electrical Code-२०२३ (NEC) व Central Electrical Authority (Measures relating to Safety and Electric Supply) Regulations, २०२३ (CEA) यामध्ये विद्युत उपकरणांमुळे निर्माण होणारे धोके व त्याकरीता करण्यांत येणारी उपाययोजना यांची तरतूद करण्यात आली आहे. तसेच, वीज संच मांडणीची संरचना आय.एस-७३२, देखभाल व दुरुस्ती संबंधी (IS-732- Code of Practice for Electrical Wiring Installation) उपाययोजना याची तरतूद करण्यांत आली आहे.

उपरोक्त वस्तुस्थिती विचारात घेता, स्वयंचलित निरंतर सनियंत्रण प्रणाली (Automated continuous monitoring system - IOT based) ही वर नमूद केलेल्या धोक्यांची माहिती संकलित करण्यांस, गंभीर घटनांसाठी वीज पुरवठा विलग करण्यास व उपयुक्त प्रतिबंधात्मक उपाय म्हणून मूळ कारण विश्लेषण करण्यासाठी डेटा पुर्नप्राप्त करण्यास सक्षम ठरु शकतील. तथापि या प्रणालीस NABL प्रमाणित परिक्षण

संस्थेची मान्यता असणे आवश्यक आहे. त्यानुषंगाने राज्यातील महानगरपालिका, नगरपरिषदा व नगरपंचायतींच्या कार्यक्षेत्रामध्ये उंच इमारती व वाणिज्यिक इमारतींच्या विद्युत सुरक्षिततेबाबतच्या मार्गदर्शक सूचना सोबत जोडलेल्या परिशिष्ट मध्ये नमुद केल्याप्रमाणे देण्यात येत आहे.

महाराष्ट्राचे राज्यपाल यांच्या आदेशानुसार व नावाने,

Kulkarni-Chhapwale

(प्रियांका कुलकर्णी-छापवाले)
शासनाच्या उप सचिव

प्रति,

१. आयुक्त तथा संचालक, नगर परिषद प्रशासन संचालनालय, वरळी,मुंबई.
२. सर्व विभागीय आयुक्त तथा प्रादेशिक संचालक.
३. सर्व संबंधित जिल्हाधिकारी
४. संचालक, महाराष्ट्र अग्निशमन सेवा संचालनालय, मुंबई.
५. आयुक्त, सर्व महानगरपालिका.
६. सर्व नगरपरिषदा/ नगरपंचायती.

प्रतिलिपी,

१. मा.मुख्यमंत्री महोदयांचे प्रधान सचिव, मंत्रालय, मुंबई.
२. मा.उप मुख्यमंत्री महोदयांचे सचिव, मंत्रालय, मुंबई.
३. प्रधान सचिव (नवि-१), नगर विकास विभाग, मंत्रालय, मुंबई.
४. प्रधान सचिव (नवि-२), नगर विकास विभाग, मंत्रालय, मुंबई.
५. सर्व सह/उप सचिव, नगर विकास विभाग, मंत्रालय, मुंबई.
६. निवडनस्ती/नवि-१४.

परिशिष्ट

सर्व प्रकारच्या इमारतीसाठी बसविण्यात येणाऱ्या वीज संचमांडणीची संरचना, हाताळणी, चाचण्या, तपासणी, देखभाल व दुरुस्ती संबंधी आय.एस. ७३२, दुरुस्ती संबंधी (IS-732- Code of Practice for Electrical Wiring Installation) यामध्ये दर्शविलेल्या चाचण्या व तपासणीसुचीची अंमलबजावणी व केंद्रीय विद्युत प्राधिकरण (सुरक्षा आणि विद्युत पुरवठ्याशी संबंधित उपाय) नियम, २०२३ [Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, २०२३] च्या विनियमनुसार राखणे बंधनकारक आहे.

महाराष्ट्र आग प्रतिबंधक व जीवसंरक्षक अधिनियम, २००६ व (सुधारणा) अधिनियम, २०२३ मधील कलम ४५ मध्ये खालील नमूद केलेल्या इमारतीच्या विद्युत उपकरण करिता व अशा सर्व विद्युत वर चालणाऱ्या यंत्रणा करिता NABL प्रमाणित स्वयंचलित निरंतर सनियंत्रण प्रणाली (Automated continuous monitoring system-IOT based) बसविण्यात यावे.

कलम ४५ मध्ये नमूद केलेल्या इमारती:-

A) Building with height more than 30 metres and used for,-

(1) Hotel,

(2) Hospital,

(3) Business,

(4) Mercantile,

(5) Mixed occupancy of whatever kind or purposes.

B) Building used as, -

(1) Residential building with height more than 70 meters;

(2) Large oil and natural gas installation such as refineries, LPG bottling plant and other similar facilities;

(3) Industrial building with moderate hazardous activities in nature having built up area 30, 000 square meters or more and industrial building with high hazardous activities in nature having built up area of 10, 000 square meters or more.".

सदर प्रणाली बसविताना खाली दिलेल्या बाबीची दक्षता घ्यावी:-

- इमारतीच्या इलेक्ट्रिकल इन्स्टॉलेशनमध्ये IOT आधारित मायक्रो कंट्रोलर उपकरणे बसवावीत.
- IOT आधारित मायक्रो कंट्रोलर डिव्हाइसेसची चाचणी आणि पडताळणी NABL मान्यताप्राप्त चाचणी एजन्सी/ प्रयोगशाळेद्वारे करण्यात यावी.
- इलेक्ट्रिकल वायरिंग इंस्टॉलेशनच्या उभारणीसाठी मान्यताप्राप्त भारतीय मानक ७३२ - संहिता वायरिंग इंस्टॉलेशन्स चा वापर करण्यात यावा. सदर वायरिंग इंस्टॉलेशन्सचे डिजाईन, उभारणी, चाचण्या व तपासण्याबाबत संबंधितांनी सदरहू काम सर्व मानके, कोड व विनियम या अन्वये योग्य असल्याचे प्रमाणपत्र द्यावे.
- IOT आधारित मायक्रो कंट्रोलर उपकरणांची संपूर्ण स्थापना तपासण्यात यावी आणि सदर तपासणी मुख्य विद्युत निरीक्षक, महाराष्ट्र सरकार द्वारे प्रमाणित करुन अनुपालनाच्या वेळी त्या प्रभावाचे प्रमाणपत्र जारी करावे
- IOT आधारित मायक्रो कंट्रोलर उपकरणाद्वारे उत्पन्न केलेला डेटा आणि अलर्टचे निरीक्षण इमारत व्यवस्थापन प्रणालीद्वारे करण्यात यावे आणि आवश्यक सुधारात्मक उपाययोजना मालक, कब्जाधारकाने ताबडतोब कराव्यात.
- IOT आधारित मायक्रो कंट्रोलर डिव्हाइसमधून उत्पन केलेला डेटा आग लागण्याच्या कारणाचा तपास करण्यासाठी आवश्यकतेनुसार स्थानिक अग्निशमन सेवेस उपलब्ध करून द्यावा.

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Annex I

Performance evaluation report by CPRI

PERFORMANCE EVALUATION OF 30 kVA ENERGY SAVER

Manufactured by:

JHAVERILABS, MUMBAI

Installed at: JHAVERILABS, MUMBAI

REPORT NO.: CPRI/ERED/ES/01/2015

(Work order No. Nil dated 02/01/2015)

FEBRUARY-2015

Study conducted by

CENTRAL POWER RESEARCH INSTITUTE
(A Govt. of India Society)
ENERGY EFFICENCY AND RENEWABLE ENERGY DIVISION
P. B. No. : 8066, Prof. Sir.C.V. Raman Road
Sadashivanagar Sub. P.O. BANGALORE - 560 080.

PERFORMANCE EVALUATION OF 30 kVA ENERGY SAVER

Sl. No.	Particulars	Details
01	Test report no.	CPRI/ERED/ES/01/2015
02	Date	02/03/2015
03	Client's address	M/s. Jhaverilabs Anand Udyog Co-Op Society Ltd Agarwal Estate, 168, CST Road, Kalina, Santacruz (e), Mumbai – 400 098
04	Reference	Nil, Dated 02/01/2015
05	Manufacturer address	M/s. Jhaverilabs Anand Udyog Co-Op Society Ltd Agarwal Estate, 168, CST Road, Kalina, Santacruz (e), Mumbai – 400 098
06	Reference	--
07	Sample tested	30 KVA Energy saver
08	Place of installation	At manufacturer premises
09	Identification no.	3P4002-14-15
10	Model	Power Easy 30 kVA
11	Serial No	3P4002-14-15
12	Date (s) of the test	04/02/2015 to 06/02/2015
13	No. of samples tested	One
14	Test in accordance with standards/specifications	Performance evaluation of Energy Saving System. As per manufacturer specification
15	Client's requirement	Finding energy saving with lighting load and complex load
16	Deviation (if any)	Nil
17	Name of the witnessing persons	Shri. Lakshmikanta Mahapatra
18	Clients representative	Nil
19	Other than clients representative	Nil
20	No. of pages (including this page)	Twenty Nine
21	No. of oscillograms	Nil
22	No. of drawings	Nil
23	No. of graphs	Eight
24	No. of photos	Nil

Test Engineer

(M. Siddhartha Bhatt)
Additional Director

NOTE:

a) This is not a certificate of compliance.
b) These test results relate only to the items tested, which are selected and submitted by the client mentioned above.
c) The data reported in this test report are valid at the time of and under the stipulated conditions of measurements.
d) Publications or reproduction of this report in any form other than by complete set of the whole report and in the language written is not permitted without consent of CPRI.
e) Correction/erasing invalidate the test report.

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EXECUTIVE SUMMARY

PERFORMANCE REPORT OF ENERGY SAVER (POWER EASY)

SL No.	PARTICULARS	DETAILS
01	Title	Performance evaluation of Energy saver (Power Easy)
02	Name and address of the client	M/s. Jhaverilabs, Mumbai
03	Name of the person witnessing the test	Shri. Lakshmikanta Mahapatra M/s. Jhaverilabs, Mumbai
04	Location of study & test conducted	Premises of M/s. Jhaverilabs, Mumbai
05	Date and time of test	Lighting Load: 04/02/2015: 14.00 Hrs. to 15.55 Hrs. – bypass mode 04/02/2015: 16.00 Hrs. to 17.55 Hrs. – Power Easy Mode Complex Load: 05/02/2015: 11.00 Hrs. to 12.59 Hrs. – bypass mode 05/02/2015: 13.01 Hrs. to 15.00 Hrs. – Power Easy Mode
06	Energy Saver details	i). Make: M/s. Jhaverilabs, Mumbai. ii). Capacity – 30 kVA – AC - 3 Phase 4 wire system iii). Model : Power Easy iv). Sl. No. - 3P4002-14-15
07	Particulars of study & test conducted	i). Power measurement without Energy saver(by-pass mode) ii). Power measurement with Energy saver (Power easy mode) iii). Computation of energy saving
08	Meters used	Power analyzer: Make: Krykard Sl. No. 210844 (ALM 35), 296075 (ALM30) Calibration Valid Up to: 20/06/2015
09	Load connected	Refer Table -1
10	Results Obtained	Refer Table – 2 and 3
11	Signature of the Divisional Head	M. Siddhartha Bhatt (Additional Director, ERED)

TABLE -1: DETAILS OF THE LOAD USED FOR THE STUDY

Sl. No.	Particulars	Capacity	Quantity	Total Capacity
01	Load Used: Lighting load (tube Lights)	36 W	100 Nos	3.6 kW
02	LoadS Used: Complex load (tube Lights) Inductive load (fans) Air conditioner Heater Load Computer	36 W 250 W 2.0 Ton 1.5 Ton 1.0 Ton 1.5 kW 0.4 kW	100 Nos. 10 Nos. 1 No. 1 No. 1 No. 1 No. 7 Nos.	(rated capacity) 3.6 kW 2.5 kW 2.4 kW 1.8 kW 1.2 kW 1.5 kW 2.8 kW

Test Engineer

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TABLE-2: COMPARATIVE STATEMENT OF ENERGY CONSUMPTION
NORMAL VS ENERGY SAVER

Lighting Load (36 X 100 Nos. of tube Lights)

Sl. No.	*Particulars*	*Without Energy Saver*	*With Energy Saver*
1	Starting date	04/02/2015	04/02/2015
2	Finishing date	04/02/2015	04/02/2015
3	Initial energy meter reading (kWh)	0.16	19.29
4	Final energy meter reading (kWh)	18.64	34.18
5	Starting time	14.00 Hrs	16.00 Hrs
7	Finishing time	15.55 Hrs	17.55 Hrs
8	Energy consumption (kWh)	18.48	14.89
9	Load on duration	1 h 56 min	1 h 56 min
	Average consumption per hour (kWh)	9.57	7.71
10	Change in energy consumption in auto-mode	--	19.42 % (reduction)
	Measured details are provided in Annexure - Table -1 to 2 and figure 1 to 4		

TABLE-3: COMPARATIVE STATEMENT OF ENERGY CONSUMPTION
NORMAL VS ENERGY SAVER

Complex load (Light, Fan, AC etc.)

Sl. No.	*Particulars*	*Without Energy Saver*	*With Energy Saver*
1	Starting date	05/02/2015	05/02/2015
2	Finishing date	05/02/2015	05/02/2015
3	Initial energy meter reading (kWh)	0.25	33.04
4	Final energy meter reading (kWh)	32.54	59.51
5	Starting time	11.00 Hrs	13.01 Hrs
7	Finishing time	12.59 Hrs	15.00 Hrs
8	Energy consumption (kWh)	32.29	26.47
9	Load on duration	2 h 00 min	2 h 00 min
10	Average consumption per hour (kWh)	16.14	13.23
11	Change in energy consumption in auto-mode	--	18.02 % (reduction)
	Measured details are provided in Annexure Table -3 to 4 and figure 5 to 8		

Test Engineer

CONCLUSION

The Energy saver was installed in the building of M/s. Jhaverilabs and the power consumption monitored without the Energy Saver (Power Easy) and with the Energy saver. The evaluation study has been conducted using lighting load and complex load. The results obtained are as follows:

1. The reduction in energy observed by using Power Easy for lighting load (Tube lights) is 19.42 %.

2. The reduction in energy observed by using Power Easy for complex load (Tube lights, Fan, AC , heater load and computers) is 18.02 %.