

Method of Minimizing Electric Field Computer by Fitted Earthing (Grounding) on the Stop Contacts to Safety and Comfort Work

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ABSTRACT

Computer can used Widely and the computer can not be separated from the use of electricity power. Electric power is used with different load and is affected by load conditions, so that electric power is not eligible to be used as a means of computer loads.

Electric power used should have quite good criteria and fitted earthing. Data obtain by measuring the direct the earthing (Grounding) in the research. Earthing already are mounted on The Stop Contacts (Socket Outlet) which used in the study with a load of computer, having a data load electric field 15 Volt /meter. Data of Stop Contacts (Socket) without earthing have electric field 632 Volt/meter and has voltage at the iron of 17 volts which enough to make unsafe and uncomfortable. Data of Stop Contacts which are mounted earthing, have impedance of 60 Ohm and produce electric field 5 Volt / meter.

The results showed that of Stop Contacts which connect with earthing with the computer load can decrease the level of the electric field that affects the level of security and convenience for the users computer. Besides, the reduction of the electric field can be done by adjusting the distance eye with a computer.

Keywords

Earthing, Electric Field, Safety And Convenience Work

1. INTRODUCTION

The computer is the tool most favored by people in Indonesia to be more creative in an effort to improve lives in doing an activity. The activities carried out is a reciprocal relationship between require and which are necessary namely in the form of form of long-distance trade business activities. This activity does not end there but it further and even personal.

Computers are goods that are no expensive again in the size of the business that produce and can increase income which is fixed for life in the future. The use of computers can be done at home or in the form of an office and in use on matter of hours or all day. The use of computers in the too long capacity can cause a disruption in the eye. The use of computers long enough can experience radiation of the electric field issued by the computer. Sick caused by the influence of the electric field in detail until now unclear, is still under debate. Because the computer has been widely used, it is necessary to provide a simple solution to find out how to reduce the influence of the electric field emitted by the computer. Simple ways that will be given to reduce the electric field on the computer that affect the wearer's body through a study conducted. Electric

field has symbol in Volt / meter, which means that the voltage issued by the monitor screen in the distance measure with the monitor screen. Thus the distance of eye with a computer is very influential to the received electric field [4], [5], [10], [11]. Based on a practical standpoint, recommendations the distance to eye to computer is 45.7 to 71.1 cm, already are recognized by the standard of ergonomics [8], [12].

Conducted a study to determine the effect of earthing (Grounding) which are installed to reduce the electric field issued by the computer. Results of the study will be a reference for computer users.

1.1 Problem Formulation

From the description above can be made problem formulation as follows,

1. How large the electric field on earthing (Grounding) which has been existing?.
2. Is there any influence without the earthing of the electric field?.
3. Is the with made new earthing can reduce electric field?
4. Is the electric field decline and mounting the of stop contacts (Socket Outlet) can improve security and Convenience User Computer?.

1.2 Benefits Research

1. Can be used as a reference by students for further research.
2. Can give a clear picture on the computer user.

2. HOW RESEARCH DONE

1. Conduct research on already existing earthing system.
2. Conduct research on systems without earthing (earthed removable).
3. Conducting research with earthing which be made that has value the earthing as big as 60 Ohm.

3. RESULTS AND DISCUSSION

3.1 Results.

This data is the result after the measurements on a research study of stop Contacts (Socket) at household. The study was conducted after preparation to obtain research data.

Table 1. Data Result Research On Computer

Circumstances of Stop Contacts (Socket)	Electric Field
Electric Field with Earthing which already Installed (Volt / meter)	15
Electric field and voltage at the iron sheath of computer Without earthing, 1. Electric Field (Volt / meter) 2. The voltage on iron the upholstery of computer (Volt)	632 17
The Stop Contacts with Earthing (Grounding) has custody 60 Ohm and has large electric field with symbol (volts / meter) 1. Long Earthing 150 cm with a diameter of 10 inchi 2. Liaison between of stop Contacts with earthing using wire BC 6 inchi.	5

Result Research [9]

The data generated through the research results can give an idea to do repair on each mounting of stop Contacts that is connected to a computer to do the work and effort.

Table 2. Security Analysis, Convenience of the User Computer Before and After Installation of Earthing on of Stop Contacts.

Variable	N	Before Installed Earthing		After Installed Earthing		increase From	P
		Mean	SD	Mean	SD		
Security	30	26.867	5.178	38.800	3.872	11.933	0.000
Comfort	30	27.767	4.431	41.733	2.273	13.967	0.000

Result Research [9]

3.2 Discussion

3.2.1 Large of electric fields on earthing which already is mounted.

Effects from the earthing on electric field can be seen in Table 1. On the Table 1 shows the results after done the measurement as big as 15 volts / meter. Earthing (grounding) that is used is the overall earthing which installed in the place where the research is done. Earthing serves as a conductor of electric current directly into the earth or ground happen the event leak isolation or sparks on electrical surge [6],[7].

3.2.2 Effect of The Stop contacts (Socket Outlet) of work without earthing.

Stop contact (Socket outlet) used in research without earthing possess an electric field as big as 632 volts /meter. The electric field is much increase compared to the of stop contact with earthing. With difference which very huge on electrical field then in the use of computers then become shoulds of stop contact be fitted with earthing. Installation of earthing should be done coincide with the house was built, if installed after finished built it somewhat difficult to install earthing and add costs that should not be done. In a home electrical installations, grounding shall be installed as part of safety for the electrical installation of the house itself. However, most

people still do not understand how important the earthing function [3].

The result of research of stop contact (Socket outlet) without earthing will provide voltage on the body of computer with a voltage of 17 volts. According to the General Regulation of Electrical Installations (PUIL, 2000), this voltage does not include a voltage that is dangerous, because the generated voltage not exceeding voltage is 50 Volts (Voltage safe). Voltage 17 volts enough to shock and did not feel safe and comfortable to work. Under these circumstances the computer users be expected in order to do a pretty good security system through a earthing on of work stop contact [6].

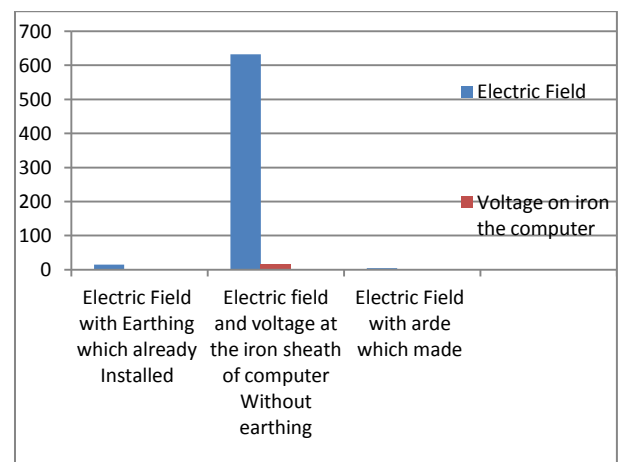
3.2.3 The Installation New Earthing On of Stop Contacts.

3.2.3.1. Installing earthing with prisoners 60 Ohm.

Installing the earthing on of Stop Contacts working that is not connected with of Stop Contacts another is better than of using the of Stop Contacts connected with to of Stop Contacts other working. Installation of Stop Contacts by earthing own is a good thing to get a great of impedance earthing vary. Impedance earthing be set so that impedansi which there are on of stop contacts become smaller. Smaller impendansi obtained on the earthing will have rate the working a better. If the earthing as a safety against voltages touch, then earthing must have impedansi of wire maximum of 5 Ohm [2].

Earthing on research of stop contact through a measurement obtained custody of 60 Ohm, is mounted on the rocky limestone area in Bukit Jimbaran area. Installation is done by drilling limestone with a special tool to break limestone. Earthing installed with a length of earthing 150 cm, diameter 10 inchi and connected by wire BC 10 inches. Installation of earthing on of stop contacts with prisoner 60 Ohm has a value of electric field as big as 5 volts / meter.

If seen from the results of research conducted from third of ways which can be concluded that between there are the earthing mounted and no earthing mounted has the distinction of good results. The third way is much better done to reduce the influence of an electric field. If in subsequent research can be done by improving the earthing prisoner becomes smaller, it can certainly influence of an electric field will be decline [1].



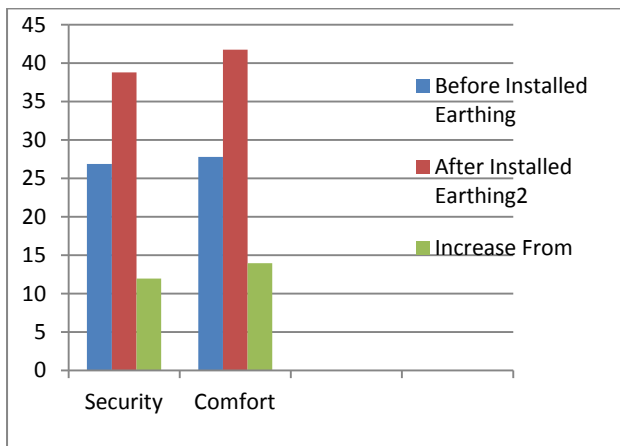
Graph 1. Electric Field and Voltage at the iron sheath On Computer

3.2.3.2 Adjusting the viewing angle of computer users and set lighting.

According to previous research, to get the smallest influence of the electric field, is done with arrangement of the distance between eyes to the computer according to anthropometry user [4], [5], [11], [12].

3.2.4 Security Analysis, Convenience of the User Computer Before and After instalation Earthing on of Stop Contacts.

After done installation on the of stop contacts and resulted in an reduction the electric field (Table 2) resulted in an increase on safety and comfort. Increased security and convenience having a very significant difference (because $p < 0.05$). This means security and comfort is achieved after done installation the of stop contacts and decrease the electric field.



Graph 2. Security and Convenience User Computer

4. CONCLUSION

The conclusions that can be made from the results of the above discussion is:

1. From of stop contacts which are connected to the computer should be given earthing in order to reduce the electric field of the computer. Earthing installed on of Stop Contacts the computer work should have impedance as small as possible (5 Ohm) to minimize the electric field generated computer. After installing the of stop contacts and earthing happen a reduction in the electric field which causes an increase in safety and comfort on the computer users.
2. The use of computers for a long time (within many hours), preferably on a computer must installed earthing qualified (with a small impedance) to reduce radiated the electric field.

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7. AUTHOR PROFILE

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