

Dear ICIC Express Letters Editor,

Thank you for considering our paper entitled by ‘Application of Photovoltaic-Thermal (PV-T) Power for Cooling Systems’, Reference No.: ICICIC2018-001 with Author(s): Syafaruddin., Faharuddin., Moeh. R. Adymulya and Satriani Latief in the publication of *ICIC-Express Letters Part B: Applications (ICIC-ELB)*.

We would like to thank to reviewers for the beneficial comments and suggestions in order to improve the quality of the paper. We have revised our paper according to the ICIC-ELB template and answered the following the reviewer comments as shown in the bold font as follows:

Best regards,

Syafaruddin

Universitas Hasanuddin, Indonesia

The paper has been accepted for oral presentation in the 13th International Conference on Innovative Computing, Information and Control (ICICIC2018), to be held in Lianyungang, China, August 20-23, 2018.

In addition, we are pleased to let you know that your paper will be recommended for possible publication in either a Scopus, or an Ei indexed journal (subject to meeting indexing standard), after significant modifications and re-review, after ICICIC2018.

**Thank you for your beneficial comments and suggestion to improve the quality of our paper.**

---

**Answer for Reviewer Comments:**

- 1) Generally, noun or noun phrases should be chosen as keywords. Please reconsider the keyword of "photovoltaic-thermal".

**All the keywords are in noun or noun phrase forms. The ‘photovoltaic-thermal’ is then changed to ‘photovoltaic-thermal system’.**

- 2) Is the proposed cooling system or the effects of refrigerant pressure the focus of the study? From the paper title and the body of the manuscript, it is very confusing. In Conclusion, authors compare the effects of R134a and R22. What is its relationship with the proposed cooling system?

**The study is focused on the photovoltaic-thermal power for cooling systems; not the effect of refrigerant pressure in cooling system. Therefore, the title has been changed into the Application of photovoltaic-thermal (PV-T) power for cooling systems. The purpose of this study is clearly stated in the abstract as the paper presents the cooling systems powered by the photovoltaic panels by extracting the thermal energy from**

**the heat extraction box designed at the backside of PV module. The cooling system is measured by the refrigerant performance in terms of temperature evaporation and power consumption. It is expected that the low temperature refrigerant and low power consumption for the output measurement of this current study. These two points are restated in the conclusion to answer the purpose of this study.**

- 3) In Introduction, background introduction like Paragraph 1 is suggested to be shortened and the contributions of the proposed system should be more highlighted. For example, what is the superiority of the proposed study when comparing with the conventional cooling system?

**The first paragraph has been shortened and focused to present the contribution of our proposed system. The comparison of proposed method with the conventional cooling system is highlighted in the second paragraph. Please find the modification of the first and second paragraph as follows:**

**The abundance of sunlight intensity in equator region can be used for the additional energy sources of different applications. In this case, the solar energy is applied for cooling system which is quite uncommon utilization of solar energy. The cooling system based solar energy is one of the most important applications in equator region due to hot daily temperature condition and high humidity. Mostly, the cooling system is provided with the conventional method by means the provision of air conditioning systems. As results, a significant portion of electricity energy consumption goes to the air cooling system due to the operation of air conditioning system for comfortable room temperature.**

**Conventional cooling system works basically following the principle of heat transfer. Initially, the compressor section functions as the driving force to drain the Freon refrigerant in the tube. The compressor motor to rotate and provide pressure in all cooling materials. The refrigerant when given the pressure will be the gas pressure in high temperature. This is the reason why the electricity consumption of cooling system is quite high because the use of compressor to circulate and to raise the temperature of refrigerant. In this research, the use of electrical power can be saved by utilizing of solar energy for cooling systems. The heat energy from sunlight can be used to replace the function of compressor to raise the temperature of the refrigerant. In addition, the proposed cooling system may maintain the electricity power consumption of PV module after utilizing the low-power motor for water and refrigerant circulations.**

- 4) In Figure 1, in consideration of black and white print, to use color to differentiate "hot water, refrigerant and cold water" is not workable.

**Figure 1 has been modified to accommodate the black and white print including to put the "hot water, refrigerant and cold water" at the appropriate location in the picture.**

- 5) In Section 3, what is the time period of the test? "1:30 to 2:00 p.m." or "12:30 to 14:00"? Different description is given.

**Thank you for your kind comments and suggestion. We confirm that the time period of testing is 12:30 to 14:00. For this reason, we have changed the time period in the manuscript following the consistent results of power consumption measurement in Table 1.**

- 6) There is no reason to repeat the first sentence in Paragraph 2 of Section 3 in the beginning of Paragraph 4 of the same section.

**The repetition of similar sentence in paragraph 2 and paragraph 4 of section 3 has been eliminated. The paragraph 2 has been modified without using the first sentence of ‘This research is focused on the cooling systems according to the refrigerant types in different pressure levels.’**

**Paragraph 2:**

**A refrigerant is a cooling agent that may absorb the heat of other materials. In steam compression cycles, the refrigerant is continuously evaporated and condensed. Chemical compounds can be used as the refrigerant if they are safe and economic in terms of chemical physical characteristics as well as the thermodynamic performance. In addition, management of temperature and pressure of refrigerant is also one of the important aspects in determining the performance of cooling systems. To fulfil these criteria, the common refrigerant which might be from halocarbon, inorganic, hydrocarbon chemical compounds are commonly used.**

- 7) How the test in Section 3 shows the advantages of the proposed system like simple design as stated in the last paragraph of this section? Please clarify this.

**It is clearly stated in the paragraph that simple design means the system components of our proposed design are easily found in the nearby market. Not only the simple design, but the saving electricity is stated in this paragraph including the increase in overall efficiency performance of photovoltaic panels. The paragraph 3 has been changed as follows:**

**The proposed design of cooling system has several advantageous compared to other conventional cooling systems. The construction is simple where the system components are easily found in the nearby market. The photovoltaic panels including the charge controller, battery and other materials are nowadays unexclusively found in small markets. Especially the refrigerant liquid, the refrigerant types of R22 and R134a are commonly used for conventional air conditioning systems; therefore, they are available in refrigerant shops. In our design, the saving electricity energy consumption of domestic application might be reduced due to the increasing temperature of refrigerant is from the solar thermal energy, not from grid electricity as principally worked in conventional cooling systems. The overall result is the efficiency of photovoltaic systems is indirectly improved as the electricity and thermal energy can be simultaneously utilized in the load side.**

- 8) There exist some grammar errors in the language presentation of the manuscript. For example, "by means of" should be used instead of "by means" in the beginning of Paragraph 3 on Page 2; "because" instead of "because of" should be used to lead a sentence in the 6th line of Paragraph 2 on Page 3. Similar grammar errors as above exist a lot in the manuscript.

**Thank you for the language correction. We have completely checked and corrected the English in the manuscript.**

---