
ISSN: 2321-2152
IJMECE
International Journal of modern
electronics and communication engineering
E-Mail
editor.ijmece@gmail.com
editor@ijmece.com
www.ijmece.com

ISSN2321-2152www.ijmece .com

Vol 9, Issuse.1Jan 2021

SOLAR COLLECTOR 'S DEVELOPMENT DRAIN BACK SYSTEMS.

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Abstract. It was found that self-draining solar systems had the most potential for development, based on a review of drainage, antifreeze consumption, electric heating, and sluggish circulation.

Keywords: Thermal energy, solar heating systems and solar collectors are all forms of drain back and drainage methods.

Introduction

Drainage, use of antifreeze, electric heating, and slow circulation are the four primary strategies for protecting current solar collectors from damage. The merits and limitations of each approach were evaluated, and one was selected for improvement: self-draining solar devices.

Methodsofresearch

The solar heating and hot water supply systems of these structures is one of the most advantageous areas of solar energy utilization. This is not the case in the nation, though. There is a major reason why solar energy isn't being utilized more widely for heating buildings because of the significant capital expenditures required to create geosystems.

As the actual use of solar energy for hot water delivery and heating of different facilities in Uzbekistan rises, the development of self-draining solar devices highlights the problem of cost-effective, high-capacity single-circuit energy efficiency and reliability.

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With a broad range of external air temperatures, from low negative values in the winter to high positive values in the summer, the solar collectors of aquatic solar heat supply systems are critical components. As a consequence of freezing water at night, and as a result of boiling water in stagnation mode (when the circulation ceases and the temperature within solar collectors increases to 200oS and 300oC in vacuum), these circumstances may lead to the failure of solar collectors.

Owing to the vast surface area of solar collectors, using antifreeze in high-capacity solar devices is an extremely costly option; also, this approach does not address the issue of summer solar collector protection due to boiling antifreeze in the summer.

Results

To safeguard solar collectors, the circulation pump in self-draining systems is automatically shut off in both winter and summer seasons. Nevertheless, certain solutions for self-draining solar devices, which are widely used in world practice, include excessive electricity consumption to circulate the heat carrier, hydraulic shocks when circulating pumps stop, low reliability and large temperature potential losses in intermediate heat exchangers, which are widely used in world practice.

Energy consumption is reduced by 60%, hydraulic shocks are eliminated when the circulating pumps cease, and thermal efficiency rises by 20% with self-draining solar devices. These devices have a simple single-circuit, high-power solar system. output and implementation are emphasized.

Research priorities in the nation and government initiatives or research goals are linked to self-draining solar equipment.

Renewable energy production is a top goal for the Republic of China's science and technology, and these self-draining solar systems fit the bill.

In order to keep solar collectors safe, you may choose one of four strategies: Analysis of benefits and drawbacks led to a decision to enhance one of the following: drainage; use of antifreeze; electric heating; sluggish circulation. Self-draining solar systems with venturi pipes.

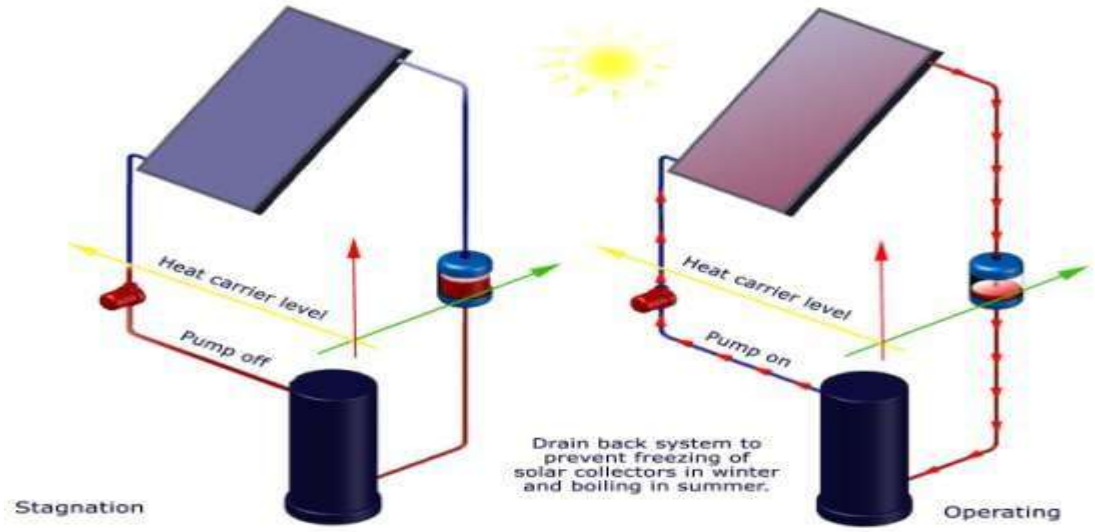

Fig.1.Modern solar gadgets use a self-draining technology called revisior drainage.

Scientists are doing theoretical and practical study on the theoretical and practical elements of solar energy conversion into heat utilizing flat collectors for water heating.

Conclusion

A significant contribution to this topic has been made by the computational-theoretical and practical work of D.A. Daffy and U.A. Beckman at the University of Wisconsin's Solar Energy Laboratory, where they studied the utilization of solar heat supply systems. Several scientific, practical, and design institutes throughout the globe employ these solar gadgets nowadays.

It is the responsibility of two international organizations to perform certification testing on solar collectors created in various nations.

Research on heat-resistant polymers and the development of better heat testing techniques was carried out at the Russian Academy of Sciences' Laboratory of Renewable Energy Sources and Energy Saving (OIVTAN) under the direction of O.S Popel. Self-draining solar systems are now being manufactured by 16 major firms throughout the globe.

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