

COMPARISON OF SOLAR COLLECTORS OPERATION METHODS

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ABSTRACT

Solar collector's operation methods investigated on the IPE solar energy polygon according different parameters. The most common types of solar collector's operation were investigated and compared: by the time, by the heat carrier temperature differences of input and output, by the solar radiation intensity and operation control methods in various combinations.

Theoretical and practical advantages and disadvantages of using each control methods were analyzed.

Currently, companies that offer solar collectors, offer solar collectors complete set with all necessary equipments for the solar collector connection for hot water supply system, or for home heating operation system by the temperature difference of input and output. None of them offer solar collectors operation systems by the various parameters.

Except the manual operation system the worst solar collector's operation system is the operation system by time. Usually equipments of the operation system are primitive and those could not used for individual program for each day, thus one program is used for all days of the solar collector's operation time. Thereby the fact that the weekly average value of solar radiation is changes, and changes the sun sunshine hours, then it is not possible fully use the obtaining solar energy in sunny days and fully use the solar collectors operation time of spring and autumn periods, in this time the heat storage tank will be more cooled than heated.

The solar collector operation system by the flow and return temperature is one type of solar collectors for operational system. Through this system can provide instantaneous accession and if it is necessary can regulate solar collector operation system; by this operation the system can get instantaneous maximum efficiency. It is necessary to find the optimal speed of heat carrier flows speed.

Solar collector's operation system could be regulated in accordance with the solar radiation intensity, by the boiler lower temperatures and by the outdoor air temperature to determine precisely the solar collector efficiency of the parameter changes. This may help to avoid the previous operation system testing regime deficiencies.

The precision of solar collectors operation depends on the type of operation systems: heat losses and the collector efficiency calculation accuracy, the sensor is accuracy, the time between the regulation regimes, and the range of heat carrier pumps action operation sensors.