عنوان مقاله:

Investigation of optimization algorithms and their operating parameters in different types of heat exchangers

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خلاصه مقاله:

In this study, five different heat exchangers (HE) including, plate-fin (PFHE), fin tube (FTHE), rotary regenerator (RR), shell and tube (STHE) and gasket plate (GPHE) are optimized using four different algorithms including the binary genetic algorithm (BGA), real parameter genetic algorithm (RGA), particle swarm optimization (PSO) algorithm and the differential evolution (DE) algorithm. Verified codes are used for all heat exchangers and total annual cost (TAC) is considered as the objective function and heat exchanger configuration parameters are chosen as design parameters in all studied exchangers. RGA has the lowest insensitivity to the algorithm input parameters, or lowest relative standard deviation (RSD), for all studied heat exchangers. The best TAC in the GPHE, FTHE, PFHE, RR, STHE can be achieved in the points = (۰,۰.۶), (۰, ۱.۹۵), (۰, ۱.۵), (۰, ۲.۱), (۰, ۱.۶۵) and < , > = (۲.۴,۲.۴), (۱, ۲.۴), (۳.۲۵, ۳.۷۵), (۳.۱۵, ۳), (۲.۶, ۲.۸) where the lowest run- time and RSD are our basic requirements, respectively. The results also reveal that DE has the worst result in the case of RSD and GA has the worst result in the case of run-time. Finally, RGA is recommended for the optimization of different types of heat exchangers.

کلمات کلیدی:

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https://civilica.com/doc/1377354