

After process return to initial state

If a system after undergoing a series of processes, returns to the initial state then:

Answer: sum of heat transfer and work will be zero

For a system that returns to the initial state the total energy will not change, all heat transfer in or out of the system will be equal to all work added or subtracted from the system. The system can produce work, this net work will be equal to the net heat input. Like the total energy the entropy of the initial state of the system will not change as entropy is a state function, by returning to the initial state the entropy change will be zero. Processes can be executed in open systems (think about a power plant). Boilers, pumps, turbines and condensers are all open systems.