

SPACE-SAVING HIGH-DENSITY MODULAR DATA CENTER AND AN ENERGY-EFFICIENT COOLING SYSTEM

ABSTRACT

A space-saving, high-density modular data pod system and an energy-efficient cooling system are disclosed. The modular data pod system includes a central free-cooling system and a plurality of modular data pods, each of which includes a heat exchange assembly coupled to the central free-cooling system, and a distributed mechanical cooling system coupled to the heat exchange assembly. The modular data pods include a data enclosure having at least five walls arranged in the shape of a polygon, a plurality of computer racks arranged in a circular or U-shaped pattern, and a cover to create hot and cold aisles, and an air circulator configured to continuously circulate air between the hot and cold aisles. Each modular data pod also includes an auxiliary enclosure containing a shared fluid and electrical circuit section that is configured to connect to adjacent shared fluid and electrical circuit sections to form a shared fluid and electrical circuit that connects to the central free-cooling system. The auxiliary enclosure contains at least a portion of the distributed mechanical cooling system, which is configured to trim the cooling performed by the central free-cooling system.

Figure 2A