

ABSTRACT

A cooling system has a cabinet and a plurality of separate cooling stages including an upstream cooling stage and a downstream cooling stage. At least the upstream cooling stage is a variable capacity cooling stage. Each cooling stage has a cooling circuit. Evaporators of the cooling circuits are arranged in the cabinet so that air passes over them in serial fashion. A controller when a Call for Cooling first reaches a point where cooling is needed, operating the upstream cooling circuit to provide cooling and not the downstream cooling circuit. When the Call for Cooling has increased to a second point, the controller additionally operates the downstream cooling circuit to provide cooling. The cooling capacity at which the upstream cooling circuit is being operated is less than its full capacity when the Call for Cooling reaches the second point.

5. The cooling system of claim 4 wherein the controller has a separate set of control parameters for each of the direct expansion cooling circuits.

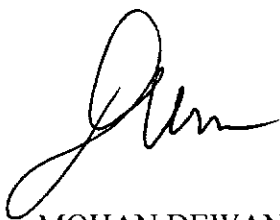
6. The cooling system of claim 1 wherein cooling system includes a second direct expansion circuit that also has a tandem compressor, a condenser, an electronic expansion valve and an evaporator, the tandem compressor of the second direct expansion circuit also including a digital scroll compressor and a fixed-capacity scroll compressor;

the cooling system having a plurality of separate cooling stages including an upstream cooling stage and a downstream cooling stage with each cooling stage having one of the direct expansion circuits, the evaporators of the cooling circuits arranged in the cabinet so that air to be cooled passes over them in serial fashion, first over the evaporator of the direct expansion cooling circuit of the upstream cooling stage and then over the evaporator of the direct expansion cooling circuit of the downstream cooling stage;

the controller also coupled to the electronic expansion valve of the second direct expansion cooling circuit and controlling the electronic expansion valve of the second direct expansion cooling circuit based on current operating status of each of the digital scroll compressor and fixed-capacity compressor of the tandem compressor of the second direct cooling circuit and otherwise in the same manner as it controls the electronic expansion valve of the other direct expansion circuit.

7. The cooling system of claim 6 wherein the controller has a separate set of control parameters for each of the direct expansion cooling circuits.

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