

Claims

[Claim 1] A refrigeration cycle apparatus (1) comprising:

a refrigerant circuit (2) including

a compressor (4),

a condenser (5, 7),

a pressure-reducing device (6), and

an evaporator (5, 7); and

a controller (3) configured to control the refrigerant circuit (2), wherein

refrigerant circulating through the refrigerant circuit (2) is refrigerant containing propane or propylene,

the evaporator (5, 7) has a heat transfer pipe in which refrigerant flows,

a refrigerant port temperature sensor (22, 23) for detecting temperature of refrigerant is provided at an entrance port of the evaporator (5, 7),

an inner temperature sensor (24, 25) for detecting temperature of refrigerant is provided in the heat transfer pipe of the evaporator (5, 7),

in the evaporator (5, 7), a length of the heat transfer pipe between the entrance port of the evaporator (5, 7) and the inner temperature sensor (24, 25) is greater than or equal to 66% of a length of the heat transfer pipe between the entrance port of the evaporator (5, 7) and an exit port of the evaporator (5, 7), and less than or equal to 88% of the length

of the heat transfer pipe between the entrance port and the exit port,

the controller (3) sets a degree of superheat of refrigerant at an entrance port of the compressor (4) to be a value greater than or equal to 10 degrees, and

the controller (3) controls the refrigerant circuit (2) so that the temperature of refrigerant detected by the inner temperature sensor (24, 25) is higher than the temperature of refrigerant detected by the refrigerant port temperature sensor (22, 23).

[Claim 2] The refrigeration cycle apparatus (1) according to claim 1, wherein the controller (3) set the degree of superheat of refrigerant at the entrance port of the compressor (4) to be a value greater than or equal to 15.4 degrees and less than or equal to 20.6 degrees.

[Claim 3] The refrigeration cycle apparatus (1) according to claim 1 or 2, wherein the controller (3) starts an operation of the refrigerant circuit (2) in a state where an opening degree of the pressure-reducing device (6) is smaller than an opening degree of the pressure-reducing device (6) in a full open state.

[Claim 4] The refrigeration cycle apparatus (1) according to any one of claims 1 to 3, wherein

the condenser (5, 7) has a heat transfer pipe in which refrigerant flows,

an inner diameter of the heat transfer pipe of each of the condenser (5, 7) and the evaporator (5, 7) is less than or equal to 5 mm.

[Claim 5] The refrigeration cycle apparatus (1) according of any one of claims 1 to 4, wherein

each of the condenser (5, 7) and the evaporator (5, 7) is connected to the compressor (4) via a gas-side refrigerant path,

each of the condenser (5, 7) and the evaporator (5, 7) is connected to the pressure-reducing device (6) via a liquid-side refrigerant path,

an inner diameter of the gas-side refrigerant path is greater than or equal to 7.92 mm and less than or equal to 14.28 mm,

an inner diameter of the liquid-side refrigerant path is greater than or equal to 4.75 mm and less than or equal to 11.1 mm, and

a length of each of the gas-side refrigerant path and the liquid-side refrigerant path is less than or equal to 5 m.