

Title (en)  
Refrigeration apparatus

Title (de)  
Kühlvorrichtung

Title (fr)  
Appareil de réfrigération

Publication  
**EP 2284460 A1 20110216 (EN)**

Application  
**EP 10172556 A 20100811**

Priority  
JP 2009187418 A 20090812

Abstract (en)

The present invention is proposed to ensure a desired refrigeration capacity while observing a regulation on a filling amount of a flammable refrigerant required for a refrigeration circuit. A refrigeration circuit 34 includes a compressor CM, a condenser CD, an expansion valve EV and an evaporator EP each of which is connected by refrigerant pipes 32, and a flammable refrigerant is circulated therethrough. In the refrigeration circuit 34, volume per circuit is set equal to or smaller than  $2200 \times 10^{-6} \text{ m}^3$ , and volume of the condenser CD is set equal to or smaller than  $750 \times 10^{-6} \text{ m}^3$ . Thus, a filling amount of the flammable refrigerant required for one refrigeration circuit 34 can be suppressed to or below a specified value.

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**F25B 2500/01** (2013.01 - EP)

Citation (applicant)  
JP 2004198062 A 20040715 - SANYO ELECTRIC CO

Citation (search report)

- [XI] EP 1326057 A1 20030709 - DAIKIN IND LTD [JP]
- [XI] JP 2004272587 A 20040930 - MATSUSHITA ELECTRIC IND CO LTD
- [XI] EP 0732550 A2 19960918 - TOSHIBA KK [JP]
- [XI] EP 1278026 A1 20030122 - DAIKIN IND LTD [JP]
- [A] "1998 ASHRAE Refrigeration Handbook, Chapter 2, System practices for halocarbon refrigerants", ASHRAE HANDBOOK, XX, XX, 1 January 1998 (1998-01-01), pages 2.1 - 2.9, XP002472727

Cited by  
US11761703B2; US10670322B2; US9052130B2; CN108474605A; EP3394529A4; US2018335239A1; US10598419B2; WO2013106725A1;  
WO2017112758A1; US10502472B2; US10677505B2; US11231218B2

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