

Title (en)
GEOTHERMAL HEAT PUMP DEVICE

Title (de)
GEOTHERMISCHE WÄRMEPUMPENVORRICHTUNG

Title (fr)
DISPOSITIF DE POMPE À CHALEUR GÉOTHERMIQUE

Publication
EP 3594588 A4 20200408 (EN)

Application
EP 17899277 A 20170309

Priority
JP 2017009420 W 20170309

Abstract (en)
[origin: EP3594588A1] A geothermal heat pump device includes a heat pump heat source unit having a refrigerant circuit in which a compressor, a water-refrigerant heat exchanger, an expansion valve, and a refrigerant-brine heat exchanger in which a heat medium from an underground heat exchanger buried underground is connected such that the heat medium circulates are serially connected, a warm-water heater unit configured to supply warm water heated at the water-refrigerant heat exchanger to heating and air conditioning and hot water supply such that the warm water circulates, and a controller configured to control an upper limit of an operation frequency of the compressor based on a heat collection limit value set by comparing a unit necessary evaporation capacity calculated from information on the underground heat exchanger with a unit actual evaporation capacity calculated from inlet and outlet temperatures and a circulation flow rate of the heat medium circulating through the refrigerant-brine heat exchanger.

IPC 8 full level
F25B 1/00 (2006.01); **F24H 4/02** (2006.01); **F25B 27/00** (2006.01); **F25B 30/02** (2006.01); **F25B 30/06** (2006.01); **F25B 49/02** (2006.01)

CPC (source: EP US)
F24D 3/18 (2013.01 - EP); **F24D 17/02** (2013.01 - EP); **F24D 19/1072** (2013.01 - EP US); **F24H 15/238** (2022.01 - EP US); **F24H 15/38** (2022.01 - EP US); **F24H 15/45** (2022.01 - EP US); **F25B 1/00** (2013.01 - EP); **F25B 27/00** (2013.01 - EP); **F25B 30/02** (2013.01 - EP); **F25B 30/06** (2013.01 - EP); **F25B 49/022** (2013.01 - EP); **F24D 2200/08** (2013.01 - EP); **F24D 2200/11** (2013.01 - EP); **F24D 2200/12** (2013.01 - EP); **F24H 15/212** (2022.01 - EP US); **F24H 15/227** (2022.01 - EP US); **F24H 15/281** (2022.01 - EP US); **F24H 15/385** (2022.01 - EP US); **F25B 2313/002** (2013.01 - EP); **F25B 2313/003** (2013.01 - EP); **F25B 2313/004** (2013.01 - EP)

Citation (search report)

- [IY] EP 2918949 A1 20150916 - MITSUBISHI ELECTRIC CORP [JP]
- [Y] KR 20110103696 A 20110921 - NAT UNIV HANBAT INDUSTRY [KR]
- [A] EP 2827082 A1 20150121 - BOSCH GMBH ROBERT [DE]
- [A] JP 2013061102 A 20130404 - CORONA CORP
- [A] CHO CHANGYONG ET AL: "Experimental investigation of a multi-function heat pump under various operating modes", RENEWABLE ENERGY, PERGAMON PRESS, OXFORD, GB, vol. 54, 11 August 2012 (2012-08-11), pages 253 - 258, XP028970432, ISSN: 0960-1481, DOI: 10.1016/J.RENENE.2012.07.017
- See references of WO 2018163347A1

Designated contracting state (EPC)
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)
BA ME

DOCDB simple family (publication)
EP 3594588 A1 20200115; EP 3594588 A4 20200408; EP 3594588 B1 20220713; JP WO2018163347 A1 20191107;
WO 2018163347 A1 20180913

DOCDB simple family (application)
EP 17899277 A 20170309; JP 2017009420 W 20170309; JP 2019504218 A 20170309