

Title (en)  
DEVICE AND METHOD FOR CRYOGENIC REFRIGERATION

Title (de)  
VORRICHTUNG UND VERFAHREN ZUR KRYOGENEN KÜHLUNG

Title (fr)  
DISPOSITIF ET PROCEDE DE REFRIGERATION CRYOGENIQUE

Publication  
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Application  
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Abstract (en)  
[origin: WO2009066044A2] The invention relates to a cryogenic refrigeration device intended to transfer heat from a cold source (15) to a hot source (1) via a working fluid flowing through a closed working circuit (200) including the following portions in series, namely: a portion for the substantially isothermal compression of the fluid, a portion for the substantially isobaric cooling of the fluid, a portion for the substantially isothermal expansion of the fluid, and a portion for the substantially isobaric heating of the fluid. The compression portion of the working circuit (200) includes at least two compressors (7, 5, 3) disposed in series and the expansion portion of the working circuit (200) includes at least one expansion turbine (9, 11, 13), said compressors (7, 5, 3) and expansion turbine(s) (9, 11, 13) being driven by at least one high-speed motor (70) including an output shaft. One end of the output shaft supports and rotates, by means of direct coupling, a first compressor (7, 5, 3), while the other end of the output shaft supports and rotates, by means of direct coupling, a second compressor (7, 5, 3) or an expansion turbine (9, 11, 13).

Abstract (fr)  
Dispositif de réfrigération cryogénique destiné à transférer de la chaleur d'une source froide (15) vers une source (1) chaude via un fluide de travail circulant dans un circuit (200) de travail fermé comprenant en série : une portion de compression sensiblement isotherme du fluide, une portion de refroidissement sensiblement isobare du fluide, une portion de détente sensiblement isotherme du fluide et une portion de réchauffement sensiblement isobare du fluide, la portion de compression du circuit (200) de travail comprenant au moins deux compresseurs (7, 5, 3) disposés en série, la portion de détente du circuit (200) de travail comprenant au moins une turbine (9, 11, 13) de détente, les compresseurs (7, 5, 3) et la ou les turbines (9, 11, 13) de détente étant entraînés par au moins un moteur (70) dit à haute vitesse comprenant un arbre de sortie dont l'une des extrémité porte et entraîne en rotation par accouplement direct un premier compresseur (7, 5, 3) et dont l'autre extrémité porte et entraîne en rotation par accouplement direct un second compresseur (7, 5, 3) ou une turbine (9, 11, 13) de détente

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