

Title (en)

APPARATUS AND METHOD FOR CARRYING OUT A COLD STEAM PROCESS

Title (de)

VORRICHTUNG UND VERFAHREN ZUM DURCHFÜHREN EINES KALTDAMPFPROZESSES

Title (fr)

DISPOSITIF ET PROCÉDÉ PERMETTANT LA MISE EN UVRE D'UN PROCESSUS DE VAPORISATION À FROID

Publication

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Application

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Abstract (en)

[origin: WO2017021293A1] The present invention relates to an apparatus and to a method for carrying out a cold steam process. The apparatus has a motor-operated primary compressor (C1) which is designed to draw in a mass flow of a fluid, serving as refrigerant, at evaporator pressure and to compress this mass flow to high pressure, and a high-pressure heat exchanger (H) which is designed to cool the mass flow of the fluid at high pressure, to increase the density and to reduce a temperature of the fluid. Also provided is an expander (E) which is designed to expand to evaporator pressure, so as to perform work, the mass flow of the fluid coming from the high-pressure heat exchanger (H), and an evaporator (V) which is designed to take up heat such that the density of the fluid decreases as it passes through the evaporator and the temperature of the mass flow coming from the expander (E) at evaporator pressure, and of the fluid guided through the evaporator (V), increase. Finally, there is a sub-cooler (U), which is connected downstream of the high-pressure heat exchanger (H) and upstream of the expander (E), wherein downstream of the sub-cooler (U) and upstream of the expander (E) part of the fluid can be diverted from the mass flow and can be expanded by means of a high-pressure control valve (TH) to an intermediate pressure, such that the fluid then, at intermediate pressure, absorbs heat in counter-flow in the sub-cooler (U), and thus additionally sub-cools the mass flow which is at high pressure, and a high-pressure compressor (C2) which is mechanically directly connected to the expander (E) and is designed to compress, to high-pressure, only that part of the fluid that is diverted upstream of the expander (E) in the sub-cooler (U) and guided in counter-flow, and to mix this fluid, upstream of the high-pressure heat exchanger (H) with the mass flow coming from the motor-operated primary compressor (C1).

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