

## Title (en)

Frost-proof steam cycle process device and method for its operation

## Title (de)

Frostsichere Dampfkreisprozessvorrichtung und Verfahren für deren Betrieb

## Title (fr)

Dispositif de processus de circuit de vapeur protégé contre le gel et son procédé de fonctionnement

## Publication

**EP 2466079 A1 20120620 (DE)**

## Application

**EP 11006563 A 20110810**

## Priority

DE 102010054667 A 20101215

## Abstract (en)

The steam cycle device comprises: a reservoir (1) for a liquid working medium; an emptying pump (6) for supplying the working medium from the reservoir to an evaporator (3) in which the working medium evaporates; an expander (4), which is supplied from the evaporator in a vapor state of the working medium; a condenser (5) that follows the expander and stands with the reservoir in fluid connection, where the working medium is liquidized in the condenser; and an emptying pump for the working medium that is arranged in a bypass pipe between the reservoir and a switchable valve device. The steam cycle device comprises: a reservoir (1) for a liquid working medium; an emptying pump (6) for supplying the working medium from the reservoir to an evaporator (3) in which the working medium evaporates; an expander (4), which is supplied from the evaporator in a vapor state of the working medium; a condenser (5) that follows the expander and stands with the reservoir in fluid connection, where the working medium is liquidized in the condenser; and an emptying pump for the working medium that is arranged in a bypass pipe between the reservoir and a switchable valve device fluidically connected with a further component of the steam cycle device. The emptying pump is formed: as reservable pump conveying in two flow directions; and with dry-run capability in frost-proof manner. The emptying pump and the valve device are associated with a control device, which is indirectly connected with a temperature sensor for determining an ambient temperature and/or an operating temperature of the steam cycle device. The control device for supplying power is directly connected with a battery to another power generator. A feed pump is not formed with dry-run capability. The valve device is indirectly connected with the feed pump so that the emptying pump is flooded with the working medium in a pumping operation from the reservoir of the feed pump. An independent claim is included for a method for operating steam cycle device.

## Abstract (de)

Die Erfindung betrifft eine Dampfkreisprozessvorrichtung umfassend ein Reservoir für ein flüssiges Arbeitsmittel; eine Speisepumpe zur Zuführung von Arbeitsmittel vom Reservoir zu einem Verdampfer, in dem das Arbeitsmittel verdampft; einen Expander, dem vom Verdampfer dampfförmiges Arbeitsmittel zugeführt wird, das im Expander unter Verrichtung mechanischer Arbeit entspannt; einen Kondensator, der dem Expander nachfolgt und der mit dem Reservoir in fluidischer Verbindung steht, wobei im Kondensator das Arbeitsmittel verflüssigt wird; Die Erfindung ist dadurch gekennzeichnet, dass die Dampfkreisprozessvorrichtung eine Entleerpumpe für das Arbeitsmittel umfasst, die in einer Bypassleitung zwischen dem Reservoir und einer schaltbaren, mit wenigstens einer weiteren Komponente der Dampfkreisprozessvorrichtung fluidisch verbundenen Ventilverrichtung angeordnet ist.

## IPC 8 full level

**F01K 13/00** (2006.01); **F01K 23/06** (2006.01)

## CPC (source: EP US)

**F01K 13/006** (2013.01 - EP US); **F01K 23/065** (2013.01 - EP US)

## Citation (applicant)

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- CH 371813 A 19630915 - SULZER AG [CH]
- US 5896746 A 19990427 - PLATELL OVE [SE]
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## Citation (search report)

- [A] DE 10228868 A1 20040122 - ENGINION AG [DE]
- [A] DE 102007020086 B3 20081030 - VOITH PATENT GMBH [DE]

## Cited by

US9163530B2; WO2012123230A3; WO2012152602A1

## Designated contracting state (EPC)

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## Designated extension state (EPC)

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## DOCDB simple family (application)

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