Title (en)

Microcontroller controlled electric steam generator without separate sensors

Title (de)

Mikroprozessor gesteuerter elektrischer Dampferzeuger ohne separate Sensoren

Title (fr)

Générateur de vapeur électrique commandé par un micro-processeur sans capteurs séparés

Publication

EP 1010937 B1 20030903 (EN)

Application

EP 99204312 A 19991215

Priority

NL 1010813 A 19981215

Abstract (en)

[origin: EP1010937A1] An apparatus with which, by means of electric energy, steam can be generated. The invention makes use of the positive temperature coefficient of the heating resistance of the heating element. Through the use of a microcontroller in the electronics, the current through and the voltage across the heating element can continuously be determined and hence be used for determining and controlling the steam humidity and the pressure of the steam. For this, in principle, no other, separate sensors are needed anymore. Due to the small mass of the through-flow heater, the electronic control can respond rapidly to fluctuations. In view of a predictable through-flow, a spiral-shaped labyrinth is provided. During operation, water flows through the labyrinth. In the first part, the temperature rises from starting temperature to boiling temperature. After that, the temperature of the water up to the outlet of the through-flow heater can be at boiling temperature. Said temperature variation determines the resistance of the heating element. The steam humidity can be adjusted through the system by controlling the pump power. When the flow rate is increased, the steam humidity rises, which is measured by the drop of the resistance of the heating element and can be controlled thereby. Depending on the type of steam generator, an electronically settable excess-pressure valve can be provided on the outlet of the through-flow heater. Upon blocking of the steam outlet, the current supply to the heating element is interrupted. The boiling dry of the through-flow heater leads to direct switching off as well. The electronics are self-testing and switch off the through-flow heater if an error occurs. <IMAGE>

IPC 1-7

F22B 1/28

IPC 8 full level

F22B 1/28 (2006.01)

CPC (source: EP)

F22B 1/288 (2013.01)

Cited by

CN114263953A; EP1516632A1; US7476369B2; US7801424B2; EP1484961B2; EP1815737B1

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