Romania ultra micro turbine

What is an ultra-micro scale gas turbine (umgt)?

1. Introduction An ultra-micro scale gas turbine (UMGT) is a miniaturised microscale gas turbine that generates electricity,and it is comprised of 5 main components: a radial turbine,a radial compressor,bearings,a combustor,and an electrical generator .

What is a microturbine (Mt)?

A microturbine (MT) is a small gas turbine with similar cycles and components to a heavy gas turbine. The MT power-to-weight ratio is better than a heavy gas turbine because the reduction of turbine diameters causes an increase in shaft rotational speed.

How much power does a microturbine produce?

MIT's millimeter size turbine will deliver 500-700 Wh/kg (820-1,140 kJ/lb) in the near term,rising to 1,200-1,500 Wh/kg (2,000-2,400 kJ/lb) in the longer term. A similar microturbine built by the Belgian Katholieke Universiteit Leuven has a rotor diameter of 20 mm and is expected to produce about 1,000 W (1.3 hp).

What is a microturbine used for?

Microturbines can be used for cogeneration and distributed generation as turbo alternators or turbogenerators, or to power hybrid electric vehicles.

How many RPM does a microturbine rotate?

They comprise a compressor,combustor,impeller /turbine and electric generator on a single shaft or two. They can have a recuperator capturing waste heat to improve the compressor efficiency,an intercooler and reheat. They rotate at over 40,000 RPM and a common single shaft microturbine rotate usually at 90,000 to 120,000 RPM.

How much power does a turbine have?

Early turbines of 30-70 kW (40-94 hp) grew to 200-250 kW (270-340 hp). They comprise a compressor,combustor,impeller /turbine and electric generator on a single shaft or two. They can have a recuperator capturing waste heat to improve the compressor efficiency,an intercooler and reheat.

The generator operates at the same speed as the turbine (up to 96,000 rpm) because the permanent magnet is located directly on its drive shaft. The high-frequency alternating current (1,600 Hz) generated in this way is rectified in the turbine"s power electronics and subsequently reversed to alternating current again (50 Hz / 400 V).

To reduce the size and weight of power generation machines for portable devices, several systems to replace the currently used heavy batteries are being investigated worldwide. As micro gas turbines are expected to

offer the highest power density, several research groups launched programs to develop ultra micro gas turbines: IHI firm (Japan), ...

The Technology Electronic military equipment weight as well as MAV flight time is highly dependent on achievable electric energy density. Therefore, the development of a 300W kerosene-driven Ultra Micro Gas Turbine (UMGT) prototype is proposed, which is foreseen to triple energy density compared to current Li-Ion batteries. UMGT developments of previous ...

Keywords: micro turbine, micro generator, permanent magnet INTRODUCTION Due to the increase in micro-power requirements, many efforts have been done over the past decade to build a micro heat engine able to produce electricity. ...

an ultra micro gas turbine engine of the present invention includes a rotating disk which has a compressor, a wave rotor and a turbine, a first stationary member which includes an inlet and a first wave rotor port end plate, a second stationary member which includes an outlet and a second wave rotor port end plate and a combustion chamber which includes a fuel inlet and an igniter.

A program for the simulation of the micro-turbine performance is developed, a series of tests are conducted with compressed air and the performance with R245fa is predicted. The impeller was ...

Our research contributions are the simulation of an ultra-micro gas turbine at a lower power output of about 1 kWe and the use of producer gas from leaf waste gasification as fuel in a gas turbine.

The increasing demand for miniaturized radio-controlled vehicles inspired the following research. The uses of these unmanned miniaturized/micro vehicles range from aero-modeling to drones for urban control and military ...

COMOTI National Research & Development Institute for Gas Turbines Bucharest, Romania ... Hence, micro gas turbines often operate at very high shaft speeds (up to 100000rpm). Micro gas turbines ...

In September 2000 Capstone Turbine Corporation commenced work on a US Department of Energy contract to develop and improve advanced microturbines for power generation with high electrical efficiency and reduced pollutants.

The particular nomenclature is UMGTG-UDR1 (Ultra-Micro Gas Turbine Generator). The final configuration of the prototype (for which a patent is pending) is described in the paper as well, together ...

MICRO-GENERATOR FOR ULTRA MICRO GAS TURBINE. Kang Shilah ... MME"02, The 13th Micromechanics Europe Workshop, October 6-8, 2002, Sinaia, Romania A MICROTURBINE FOR ELECTRIC POWER GENERATION Jan ...

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One of the types of gas turbines is a micro gas turbine (MGT) with power below 1 MWe [10], and a MGT with power in the range of 1-10 kWe could be called an ultra-micro gas turbine (UMGT) [11]. Air ...

Ultra Micro Gas Turbines Roberto Capata Department of Mechanical and Aerospac e Engineering, University of Roma 1, Faculty of Engineering, Roma Italy 1. Introduction 1.1 State of art Object of the present work is the detailed study, in every its aspect, of Ultra-Micro-Gas-Turbine Generator, that is a power device with high power density.

This paper will provide an insight into the ongoing development of an ultra micro gas turbine rated for an estimated electrical power output of 1 kW. For a safe operation of this gas turbine with hydrogen as a fuel a new combustion chamber has to be developed and tested using the proven micromix burning principle. Detailed investigations on the burning characteristics for different ...

An ultra-micro scale gas turbine (UMGT) is a miniaturised microscale gas turbine that generates electricity, and it is comprised of 5 main components: a radial turbine, a radial compressor, bearings, a combustor, and an electrical generator [1]. UMGTs are designed for a power range of 0-1000 W [2], and are of interest for a various range of ...

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