Ultra micro turbine The Gambia

build a micro heat engine able to produce electricity. Among those systems, Onera decided to focus on the ultra micro gas turbine concept which seems very promising [1], [2]. Ultra micro ...

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. Among those systems, Onera decided to focus on the ultra micro gas turbine concept which seems very promising [1], [2].

1 Ultra Micro Gas Turbines Roberto Capata Department of Mechanical and Aerospace 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-GasTurbine Generator, that is a power device with high power density.

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 ...

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 ...

The ultra-micro gas turbine (UMGT) consists of a centrifugal compressor, a radial turbine, an annular combustor, and recuperators, and a high speed generator. It is designed to run 400,000rpm, compression ratio 3.0, and TIT 1200K. The ...

Ultra micro gas turbines are built on a millimeter scale and it is necessary for MEMS to be used to fabricate such an ultra micro gas turbine. Examples of ultra micro gas turbines can be...

Micro- and Ultra-Micro Gas Turbine (UMGT) devices, based on a micro compressor and a micro turbine installed on the same shaft, are more suitable for this scope for several reasons. They present a higher power density, both in terms of kW/kg and kW/m3, lower emissions, less moving elements, multi-fuel

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 applications too. The common characteristic of these vehicles is the need for a light and compact propulsion system. The radio-controlled (RC) turbines for ...

machine and power electronics interface that is capable of 104 105 106 100 102 104 106 108 power (W) rotational speed (rpm) [1] ultra-high speed region industrial gas turbines turbomachinery trend micro turbines

and compressors ETH project high-speed region emerging turbines and compressors Fig. 1: Power and speed ratings of turbines and ...

The ultra-micro gas turbine (UMGT) consists of a centrifugal compressor, a radial turbine, an annular combustor, and recuperators, and a high speed generator. It is designed to run 400,000rpm, compression ratio 3.0, and TIT 1200K. The requirement of UMGT is that the volume of UMGT should be less than 1L in the present research.

Several research groups have been involved in the development of micro gas turbines from two perspectives. One is the Micro-Electro-Mechanical Systems (MEMS)-based micro gas turbine engine proposed by a group at Massachusetts Institute of Technology (MIT) [2], [3], [4].A nickel (US coin)-sized gas turbine with a mass less than 1 g has been developed ...

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. These generators, although the ...

In order to establish the design methodology of an ultra micro centrifugal compressor, which is the most important component of an ultra micro gas turbine unit, a 10 times size of the final target ...

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 ...

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.

In order to investigate the design method for a micro centrifugal compressor, which is the most important component of an ultra micro gas turbine, an impeller having the outer diameter of 20mm was designed, manufactured and tested. The designed rotational speed is 500,000 rpm and the impeller has a fully 3-dimensional shape. The impeller was rotated at ...

Studies for an ultra micro gas turbine have been actively tried to use for very small mobile electrical power sources, ultra micro jet engines and so on, since the micro-electro-mechanical system (MEMS) and the micro-fabrication methods have been developed (Epstein et al., [1]-[9]). However, it is still unclear for the design methodology of ...

We experimentally investigate the feasibility of a 500-W class ultra-micro gas turbine power generator. System specifications include a design rotational speed of 400,000 rpm, a compressor ratio ...

Ultra Micro Gas Turbines (UuGT) are expected to be a next generation of power source for propulsion and

power generation, from aerospace to electronic industry. Knowing that the efficiency of the conventional turbomachinery is small at microscale, especially the one of the compressor, utilizing a wave rotor to improve the performance of an UuGT appears to be a ...

MICRO-GENERATOR FOR ULTRA MICRO GAS TURBINE O. Dessornes1*, C. Zwyssig2 1Onera, Palaiseau, France 2Celeroton, Zürich, Switzerland *Presenting Author: Olivier ssornes@onera Abstract: This paper reports the specification, the design, fabrication, and testing of a permanent-magnet generator suited for an ultra micro-gas turbine rotating at ...

Development of a hydrogen fuelled 1 kW ultra micro gas turbine with special respect to designing, testing and mapping of the µ-scale combustor December 2008 DOI: 10.1109/ICSET.2008.4747088

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), ...

This paper presents an overview of the background behind the development of ultra micro gas turbines, key technologies and applications, as well as describing our palm top-gas turbine (40mm ...

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).