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Cavgenx a division of Infinity Turbine LLC

Cavgenx. Turboshaft Heat Pump | Cooling and Hydraulic Power

This webpage QR code

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Combine a unique cavitation compressor heat pump with a turbine and what do you get. You get a common shaft power tool which can produce hydraulic pressure to run motors, wheels, and machinery, all while producing thermal cooling. Efficient in-situ cooling and enhanced performance in a compact, dual-role design. Ideal for industries leveraging both hydraulic and refrigeration systems, this approach promises enhanced efficiency and compact design. The new CO2 cavitation compressor pump replaces conventional refrigeration compressors.

PDF Version of the webpage (first pages)

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CavGenX

The turboshaft heat pump.

Data: Proposed Optimized System: Pump Diameter: 0.86in, Turbine Diameter: 1.6in, Speed: about 105kRPM, Flow: 37 GPM, Net Power Out: 25kW, Overall Efficiency: 6%.

The Concept: Combining a common shaft drive turbine to a compressor for heating, cooling, and hydraulic drive pressure is unique in its ability to serve multiple functions simultaneously.

Purpose: Provide cooling and hydraulic drive power.

Goals: AI processor cooling and hydraulic drive power.

How Does it Work ? A electric motor starts the common shaft compressor. Liquid working fluid is flashed to pressurized vapor by a cavitating disc. The vapor is then heated for more pressure. The pressurized vapor is then expanded through a common shaft turbine. The resulting shaft rotation drives the forward cavitating compressor, a hydraulic pump, and a feed pump. The vapor is then condensed (a cooling process) and can be used for cooling. In this ORC process, the evaporator is the thermal stage between the compressor and turbine. Evaporator heat can be provided by waste heat, solar thermal, AI processor heat, magnetic induction, conventional fuels, and more.

About: Infinity Turbine invented the Modular Block in 2004 and uses it for applications in Organic Rankine Cycle, cooling, and gas to liquid applications. Infinity has been developing ORC turbines, systems, and applications since 2008. In 2015, Infinity built production CO2 closed loop systems. This application is a synergy of thermal and power processing using the experience, knowledge and First Principles for turboshaft processing power.

Available for licensing. Experimenter kits and systems available.

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Cavgenx Heat Pump Turbine

The heat pump turbine is a product which has been in development for some time. It is a hybrid between the Brayton Cycle and Organic Rankine Cycle.

This amazing device can also be used simultaneously as a heat pump, which only leverages its use in range extending for electric cars.

The unique part of this turbine is that it can be closed-loop using CO2 as the working fluid taking advantage of sonochemistry (cavitation). Most refrigerants can be used as the working fluid for the Cavgenx heat pump turbine. The benefit is the ability to perform work using hydraulics and simultaneous cooling of the refrigerant.

Ideal for industries leveraging both hydraulic and refrigeration systems, this approach promises enhanced efficiency and compact design.

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TES or Thermal Batteries may have a USA 30-40 Percent Tax Credit or $45 per kWh

Pair the Cavgenx heat pump turbine with a 20 foot bulk liquid TES (Thermal Energy Storage) at 60 C could have a potential up to 24,000 liters of saltwater thermal capacity or 1,636 kWht.

Now multiply that with the proposed $45/kWh = $73,616 tax credit.

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Technology Readiness Level for Cavgenx

As defined by NASA, the TRL for this project is at or above a 5.

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The Hidden Cost of AI: How Every Query Contributes to Water Scarcity

In our digitally-driven world, artificial intelligence (AI) has become an integral part of our daily lives, from voice assistants and recommendation algorithms to chatbots and language models. We often use AI systems without realizing the environmental impact they may have. A recent study conducted by the University of California, Riverside, sheds light on a concerning aspect of AI technology: its hidden water footprint. Each time you run a ChatGPT artificial intelligence query, you unknowingly contribute to the depletion of our already overstressed freshwater resources.

The Water Footprint of AI

The research from the University of California, Riverside, has revealed a startling fact: running AI queries that rely on cloud computations in data processing centers consumes significant amounts of freshwater resources. With every 20 to 50 queries, approximately half a liter (around 17 ounces) of fresh water is lost in the form of steam emissions. This might not seem like much on an individual basis, but the cumulative impact of billions of AI queries worldwide is a cause for concern...

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Energy Strategy Technology Guide and Handbook: your ultimate resource for navigating the world of energy strategies and technologies

Discover the power of sustainable energy systems with our comprehensive guide on Organic Rankine Cycle, Thermal Storage, Heat Pump, and Energy Arbitrage. Learn how these technologies work, their benefits, and their role in maximizing energy efficiency. Explore the potential for renewable energy and energy storage, and stay ahead of the curve in the evolving landscape of sustainable solutions. Read now for a deep dive into these key components of a greener future. For business and residential use.

Updated monthly.

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Development of a Closed Loop Micro Satellite Plasma Ion Propulsion System Based on a Cavgenx Heat Pump Turbine

The following descriptions follow through development of a space propulsion system based on the Cavgenx Heat Pump Turbine concept.

Electrical power is needed to start the process and as a topping off heat additive when needed.

The turbine would power the cavitation compressor as well as supply shaft horsepower to spin induction magnetic heating.

The high COP of the liquid cavitation compressor (already shown by NASA - see link below) is used in concert with a induction heating system to power the cycle. Note that cavitating a liquid by use of a spinning disc was invented more than 100 years ago.

The spacecraft skin would be used as a condenser heat sink for the closed-loop CO2 Organic Rankine Cycle system.

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Infinity Turbine Gas Leverage Turbine Devices

Since 2004 Infinity has been working with and developing CO2 devices including expanders and cavitation mechanisms.

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Zeolites for Airborne Power Unit

One interesting application of Cavgenx is airborne electric aviation (including drones). For this application, heat transfer Zeolites can produce large amounts of heat when water is applied (exited as steam) for a closed-loop CO2 based turbine generator which can provide electricity to motors to provide propulsion.

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