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CavGenX

The turboshaft heat pump.

Available for licensing.

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.

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).

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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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Technology Readiness Level for Cavgenx

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

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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.

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.
