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plans-build-licensing-supercritical-co2-heat-pump-organic-rankine

Infinity Turbine
LLC

Plans Build Licensing Supercritical CO2
Heat Pump Organic Rankine System



This webpage QR code

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The supercritical CO2 phase change system is both a heat pump and organic rankine cycle which can be used for those purposes and as a supercritical extractor for advanced subcritical and supercritical extraction technology. Uses include producing nanoparticles, precious metal CO2 extraction, lithium battery recycling, and other applications. The modular construction of the system allow easy integration for new technology developments, and multi-role add-ons. The heart of the system is the phase change liquid pumping techniques, flow bar, and tribo effect electrostatic precipitation collection system. Many of these deployed technologies were developed by Infinity since 2015 making this system the most advanced in the industry. More than 100 of these commercial systems have been built and out around the world.

PDF Version of the webpage (first pages)

<https://infinityturbine.com/plans-build-licensing-supercritical-co2-heat-pump-organic-rankine-system-by-infinity-turbine.html>

Application: Producing Alcohol from Liquid CO2

Infinity has already built lots of closed-loop supercritical CO2 systems, and experimented with CO2 cavitation to make a one-moving-part liquid CO2 pump.

Infinity currently sells a cart-mounted portable on-demand supercritical CO2 phase change system which can be used for the experiments listed below, along with many others. It is a cart which was designed to fit through any standard door, hallway, or elevator and has heavy duty casters for mobility.

We are currently looking for funding to develop the following:

1. On-Demand CO2 to Alcohol: Using our closed-loop liquid CO2 phase change system, adding Nafion in the process to make alcohol. Inputs: Liquid CO2, water, and electricity. About 3-4 kW to make a liter of alcohol (from lab experiments).
2. CO2 to Alcohol with In-Situ Power Generation: Using our closed-loop supercritical CO2 phase change system, produce the power via miniature CO2 turbine generator or static electricity generator (SEG) to power the conversion via Nafion.
3. Spin-To-Liquid (STL): A novel one-step approach to producing alcohol from liquid CO2 using a cavitation device with Nafion. This is a one-moving-part device employing sonochemistry with inputs of water and liquid CO2. Electricity is produced in-situ. Shaft rotation is required to spin the device (this can be done via a electric motor, pressure expanding turbine, or other shaft rotation such as a wind turbine).

Teaser: Why was Nikola Tesla so fascinated with static electricity and spinning discs ? Our guess is that he had already found the worlds best battery - water. The Tesla turbine (while a fascinating pump) was actually a static electricity generator originally designed to charge water. All of his Colorado Springs experiments revolved around static electricity. Power generation and (wireless) transportation was via static electricity.

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CO2 ORC Heat Pump Experimenter Platform Build Licensing

Infinity is now offering build licenses for its popular and successful CO2 extraction system. Please email for pricing.

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Supercritical CO2 System Support Files Package

\$99 support package includes:

- A. Cat 310 Conversion Kit to CO2 Duty (for a fraction of the cost of purchasing a dedicated CO2 pump from Cat). Parts list only. Support is not included. Pressure seal manufacturer for high and low pressure seals as low as \$4.00 a seal versus \$30-50 a seal from Cat Pumps. Pump assembly checklist.
- B. 10L Botanical Basket Cad/Cam files including supplier in China for full build purchase.
- C. Infinity Supercritical 10L Consumable Parts List and Suppliers with links. Includes PID controller, Cat pump parts, hoses, motor pump coupler, down tube material, CC1 CC2 CC3 O-Rings part number and supplier, brass sleeve o-rings, extraction vessel o-rings, pump valve o-rings, exhaust hose, low and high pressure pump seals, 3 micron stainless steel filter for CC3 (to prevent any material from going into pump), Cat 310 pump valve replacement kit, pump brass sleeve replacement kit, and pump stainless steel retainer.
- D. Supercritical CO2 Automation Information including flowcharts, components, PID justification, and more.
- E. Customer Training Checklist.
- F. 10L Installation Checklist.
- G. 10L Flow Diagram.
- H. Crate build cad/cam and parts list.

The above information includes parts lists, part numbers, and suppliers when available. Support is optional and additional.

Package is available via download (zip file 98.4 mb) after payment is confirmed by Infinity.

ORC Heat Pump Experimenters Platform Licensing Solutions

Infinity is offering build licensing for single and unlimited systems. This is the perfect opportunity to access DIY single or unlimited commercial builds. Infinity is now offering plans for single build and unlimited build licensing. The supercritical CO2 system uses the best of legacy and advanced subcritical and supercritical phase change technology. Uses may include ORC systems, heat pumps, botanical extraction, producing nanoparticles, precious metal CO2 extraction, lithium battery recycling, and other applications.

All these applications can be done with the Organic Rankine Cycle.

The modular construction of the system allow easy integration for new technology developments, and multi-role additions. The heart of the system is the phase change liquid pumping techniques, flow bar, and tribo effect electrostatic precipitation collection system. Many of these deployed technologies were developed by Infinity since 2015 making this system the most advanced in the industry.

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ORC Heat Pump Platform Detailed Plans and Build Strategy

The 10L System and associated build plans and instructions are the result of over \$1 million in research and development since 2015. This also includes experience in CO₂ phase change, and pressure systems since 2005, when we developed a CO₂ gas to liquids process. During our extensive testing on hops during initial build development, we discovered the tribo characteristics of CO₂ when expanded over a hybrid food-grade material, which imparts a static charge, which allows the oil extract to stick to the collection vessels, which helps keep our liquid pump clean. We offer one of the best liquid CO₂ pump phase change systems in the industry.

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