4/15/2024

608-238-6001 [TEL]

greg@infinityturbine.com [Email]

supercritical-co2-organic-rankine-cycle-heat-pump-experimenter-platform-by-infinity-turbine

Infinity Turbine LLC

Supercritical CO2 Organic Rankine Cycle Heat Pump Experimenter Platform

This webpage QR code

Structured Data

<script type= "application/ld+json">
{"@context":"http://schema.org",
"@graph":[
{
"@type" : "Organization",
"@id" : "https://infinityturbine.com/#organization",
"name" : "Infinity Turbine LLC",
"url" : "https://infinityturbine.com",
"sameAs":
["https://www.youtube.com/channel/UCsobpvy0xqc13uvhA71Cv4w",
"https://x.com/InfinityTurbine",
"https://www.instagram.com/infinityturbine/"],
"telephone" : "608-238-6001",
"email" : "greg@infinityturbine.com",
"logo" : "https://infinityturbine.com/logo.png"
},
{
"@type":"WebSite",
"@id":"https://infinityturbine.com",
"url":"https://infinityturbine.com",
"name":"Supercritical CO2 Organic Rankine Cycle Heat Pump Experimenter Platform",
"description":"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."
}
,{
"@type":"NewsArticle",
"mainEntityOfPage":{
"@type":"WebPage",
"@id":"https://infinityturbine.com/supercritical-co2-organic-rankine-cycle-heat-pump-experimenter-platform-by-infinity-turbine.html"},
"headline":"Supercritical CO2 Organic Rankine Cycle Heat Pump Experimenter Platform",
"image":"https://infinityturbine.com/images/20220614-infinity-turbine-orc-heat-pump-cart.png",
"datePublished":"2024-04-15T08:00:00+08:00",
"dateModified":"2024-04-15T09:20:00+08:00",
"author":{
"@type":"Organization",
"name":"Infinity Turbine LLC",
"url":"https://infinityturbine.com"
},
"publisher":{
"@type":"Organization",
"name":"Infinity Turbine LLC",
"logo":{
"@type":"ImageObject",
"url":"https://infinityturbine.com/logo.png"
}}}

]}</script>

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/supercritical-co2-organic-rankine-cycle-heat-pump-experimenter-platform-by-infinitv-turbine.html

Infinity ORC Heat Pump Experimenters System Cart

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.
Application 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.

Standard Package

Includes :
-chiller
-spare parts (o-rings and some consumables)
-professional build plywood and framed crate
-surface freight with professional lift-gate pick-up and delivery
-freight insurance to anywhere lower 48 USA
-professional training via Zoom or online

Made in the USA using parts fabricated and assembled in the USA.

This system is built like a tank. Powder coated caster beams with 5 inch heavy duty casters for easy movement.

This system is compact and will fit through any standard door, hallway, or elevator.

System operation is manually set parameters, with automatic feedback PID to maintain temperature and pressure. Set it and watch the extraction.

System is designed for maximum 2,000 psi operation. Most processors use 1,400 psi or less.

4/15/2024

Capabilities of CO2 Phase Change System

1. ORC
2. Heat Pump
3. Closed Loop or One Pass
4. Multiple Chambers
5. Pressurized or Vacuum
6. Vapor Deposition
7. Coatings
8. Extraction
9. Separation
10. Tunable and Expandable

4/15/2024

4/15/2024

4/15/2024

4/15/2024

Supercritical CO2 Hops Extractor

Botanical extract: Supercritical CO2 is the best method to harvest valuable plant terpenes and essential oil.

4/15/2024

4/15/2024

Advantages of Buying a Ready Made System

Plug-and-play: Our systems are built to provide a system that is ready to use after you uncrate. We include a basic installation kit to connect to a small chiller, and vent line for the CO2. Simply attach those, and your CO2 cylinders to fill and run the system. Training is required for this system.

One moving part: Our system is unique in that it has one moving part, the liquid CO2 pump.

Built in the USA: Proudly built in the USA. Many parts we fabricated in our shop. Our system is engineer peer reviewed and certified. Pressure vessels and closure systems are built and fabricated to ASME certification, by a certified shop in the USA.

Extractors For Hemp. Make quality 85 percent CB D full spectrum oil right out of the machine (no post processing – ready to bottle).

4/15/2024

System Operation When Run as a Oil Extractor Process

Electrostatic Precipitator: Infinity is the first in the industry to utilize static electricity to assist in collection of oil. Commonly known as ESP, electrostatic precipitation is a method used in many industries to remove particulates in a gas flow. In this case, we're applying some same technology (but with our own invention) to collect oil. A small charge accumulates in the entrained oil, which makes it adhere to the first collection vessel.

Semi-Automated: Turn the CO2 pump on, and leave it on. You can adust the pump speed, which sets the pressure. The system runs in a steady-state once started. This is a 2,000 psi or less working pressure system. Typical runs will be at 1,300 to 1,800 psi. The system working pressure is rated for 2,000 psi. A safety relief vavle is provided to release any pressure which goes above 2,000 psi. Targets oil at or below 2,000 psi to minimize post processing. High Pressure Systems (above 2000 psi) = lots of post processing.

Fittings: We use quality Swagelok fittings. System is made in the USA.

FlowBar: The CO2 FlowBar enhances the CO2 delivery and distribution within the botanicals extraction vessel. While almost every CO2 extraction system enters in one end and exits the other, our new concept delivers CO2 in a uniform manner throughout the entire extraction vessel. The result is a much faster, and more thorough extraction.

4/15/2024

4/15/2024

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 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.

4/15/2024

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.

4/15/2024

4/15/2024

4/15/2024

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 heaving 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 of 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.

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.

4/15/2024

4/15/2024

4/15/2024

4/15/2024

4/15/2024