



Efficiency
Simplicity
Power



RadMax Gas Expander

In principle, gas expansion is compression running in reverse. The positive-displacement RadMax gas expander is able to capture and convert both kinetic and pressure-volume energy in gas-expansion applications.

The RadMax positive-displacement gas expander is characterized by:

- Efficient expansion of low density and lower volume flow of gases
- Better handling of gas entrained liquids
- High internal expansion ratios (up to 20:1)
- Lower speed with high work efficiency that can directly drive off-the-shelf generators without the need for speed changing gearboxes



RadMax Prototype Gas Expander

Applications

- Prime mover (stand-alone and as a turbine engine)
- Natural gas throttling energy recovery (pipeline distribution & compressing stations)
- Air conditioning systems throttling energy recovery
- Waste energy recovery (turbocharger)
- Power generation

RadMax Technology Advantages

- Compact size & weight
- High power to weight ratio
- High volume output to size and weight ratios
- High internal compression, expansion and pump ratios possible (up to 20:1)
- Continual, smooth, low noise rotary motion
- Low part count and fewer moving parts; conducive to rapid change-out replacement, reduced maintenance costs and increased reliability
- Rotary motion input and output porting does not require complicated valving systems
- Easily scalable from small to very large
- Multiple devices in one compact unit are possible



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RadMax Technologies, Inc. is a wholly owned subsidiary of REGI US, Inc.

**Positive
Displacement
Gas Expanders**

Introducing RadMax

A truly revolutionary rotary concept, RadMax patented devices are designed for Efficiency, Simplicity and Power. If your application calls for highly efficient power, or pumping in a light and small footprint, RadMax has a solution for you!

SIMPLICITY: Only 2 unique moving parts, the vanes and rotor – does not use pistons or valves, reducing assembly and maintenance costs.

POWER: Compact size and high output results in up to 6 times size and weight savings over a piston engine of same horsepower.

EFFICIENCY: Delivers better than 1 hp per pound of engine weight, and more than 1.5 hp per cubic inch of engine displacement.

RadMax Product Family

RadMax devices are a family of efficient, lightweight, and low noise internal combustion engines, compressors, gas expanders and pumps.

Internal Combustion Engines

Configurable as a compression ignition (diesel) or spark ignition using gasoline, natural gas, or other fuels.

- Compact size & weight
- High power to weight ratio
- Low part count and fewer moving parts

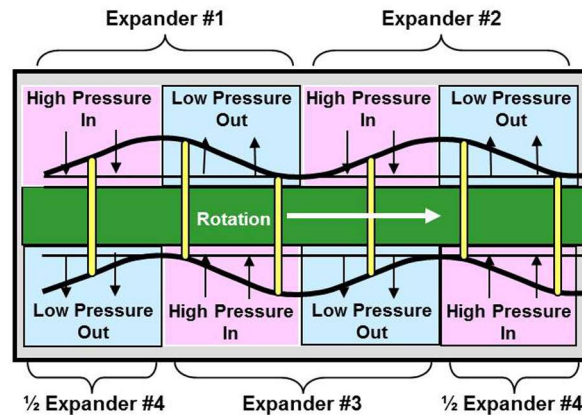
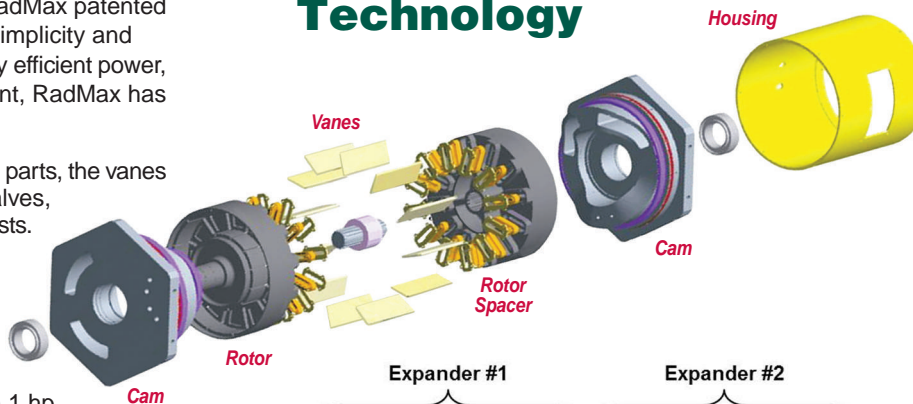
Compressors & Gas Expanders

- Incorporates the advantages of both positive displacement and centrifugal devices
- High internal compression ratios possible (20:1)
- High volume output to size ratio

Positive Displacement Pumps

- Positive displacement with the simplicity and efficiency of a centrifugal pump
- High output volume to size and weight ratios
- Self-priming & auto re-priming

RadMax Technology



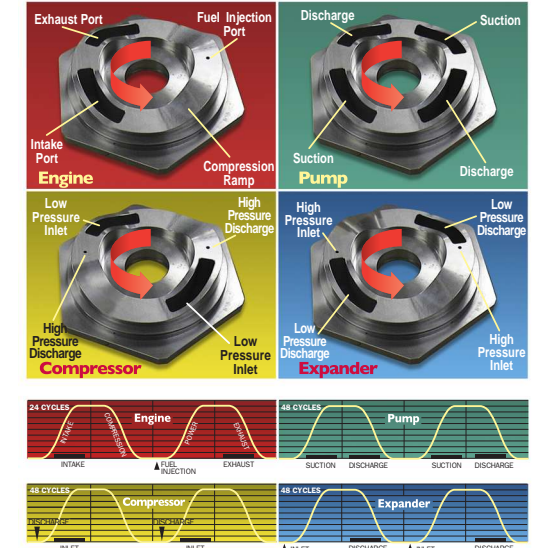
RadMax Gas Expander Cycle

The RadMax gas-expander design is a combination of four distinct sections; two complete intake and discharge expansion cycles on each cam in the standard two cam configuration. This unique design allows for each of these sections to potentially be configured with different expansion ratios. Different porting options into and between the sections allow for stable expander speed control due to changing gas-flow conditions, and the capability for multi-stage expansion in one device.

One Technology; Multiple Functions

By simply changing the cam profile and/or intake and exhaust porting locations, a RadMax device can be designed as an internal combustion engine, compressor, pump, gas expander, or a combination of the functions.

VERSATILE RADMAX CAM CONFIGURATION



Gas Expansion Work Principle

During a free gas expansion process like that found in an air-conditioning expansion valve or a mechanical gas-expanding throttling valve, pressure energy is converted into internal energy with no actual work being accomplished.

In contrast, pressure energy is converted by the RadMax positive-displacement gas expander to output-shaft work instead of being converted to non-productive internal energy.

Key Advantages

- Able to efficiently expand low density gases
- Can better handle gas entrained liquids
- High internal expansion ratios possible (20:1)
- Higher work efficiency at lower speed
- Scalable from small to very large devices