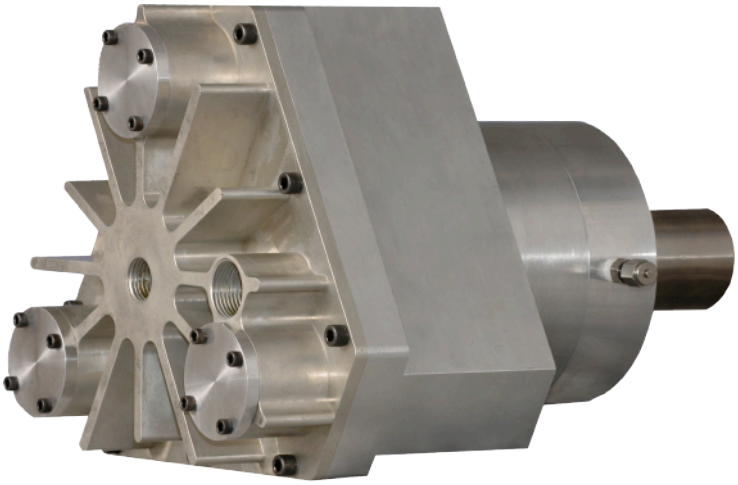
E15H22N4.25

1 kW Scroll Expander

40 Years of Scroll Technology

Certified to ISO 9001:2008

TÜVRheinland® Precisely Right.



Air Squared's patented E15H22N4.25 Scroll Expander produces up to 1kW quiet power for expansion generators in waste heat recovery systems

The new E15H22N4.25 Scroll Expander is designed for expansion generators used to convert waste heat energy from the exhaust gases or liquid-cooling systems of internal combustion engines, fuel cells, solar collectors and similar devices. With an expansion ratio of 3.5:1 and displacement of 12 cc/rev., the patented scroll expander is rated up to 1 kW, based on a maximum inlet pressure of 13.5 bar/200 psig. A magnetic coupling eliminates any leakage path for the working fluid, allowing the scroll to be used with many different types of refrigerant gases. Oil-free and lubricated models of the scroll allow design flexibility, with the lubricated version running at 80% efficiency and the oil-free version at 70%. Weighing just 20 lbs., the compact scroll measures just 11.6"L x 8.2"W x 9.1"H (295.8 x 208.5 x 230.8 mm)

The rotary scroll design provides quiet, balanced, pulse-free operation, with a noise level of just 50 dB(A). The operating element of a scroll compressor is made up of two identical involutes, which form right- and left-hand components. One scroll is indexed or phased 180 degrees with respect to the other to allow the scrolls to mesh. This indexing creates crescent shaped gas pockets, bounded by the involutes and base plates of both scrolls.

In operation, one scroll remains fixed; the other is attached to an eccentric that drives a generator shaft. As the moving scroll orbits around the fixed scroll, the tiny pockets formed by the meshed scrolls at the center follow the spiral outward and enlarge in size. The expander inlet is at the center of the scrolls. The entering gas is trapped in two diametrically opposed gas pockets and expands as the pockets move toward the periphery, where the discharge port is located. No valves are needed, which reduces noise and improves the durability of the unit.

Because scroll expanders use true rotary motion, they can be dynamically balanced for nearly vibration-free operation. Power delivery is continuous, which virtually eliminates pulsation and associated noise. Reliability is inherent, because there are only two primary moving parts, with no inlet or discharge valves to break or make noise, and no associated valve losses.

Output	1 kW (nominal)	
Max. Pressure	200 psia	13.8 bar
Max. Flow	12 cm^3/Rev.	
Max. Speed	3600 RPM	
Max Inlet Temperature	350°F	175°C
Avg. Sound Level	55 dB(A)	
Net Weight	20 lb	9.07 kg
Working Fluid	Refrigerant	
Standard ORC Fluid	R-134a and R-245fa	
Direct Drive	DC/AC Generators, Any Rotary Equipment	
Expansion Ratio	3.5	
Model Numbers	E15H22N4.25 (Oil-free)	
	E15H22N4.25L (Lubricated)	

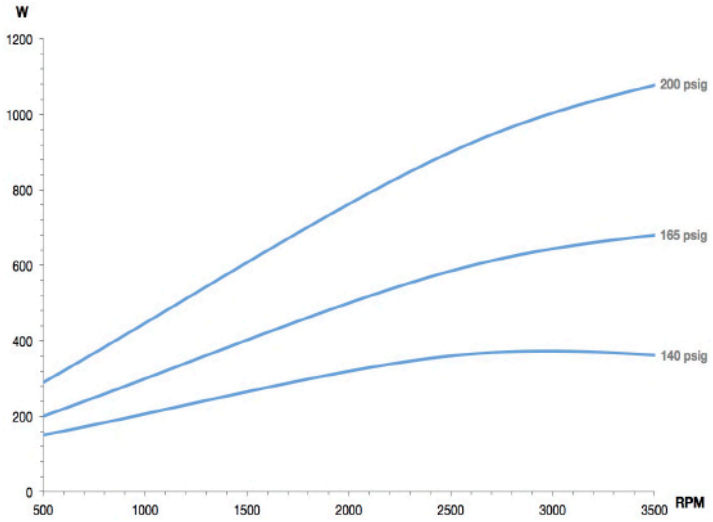
Air Squared
Manufacturing, Inc.

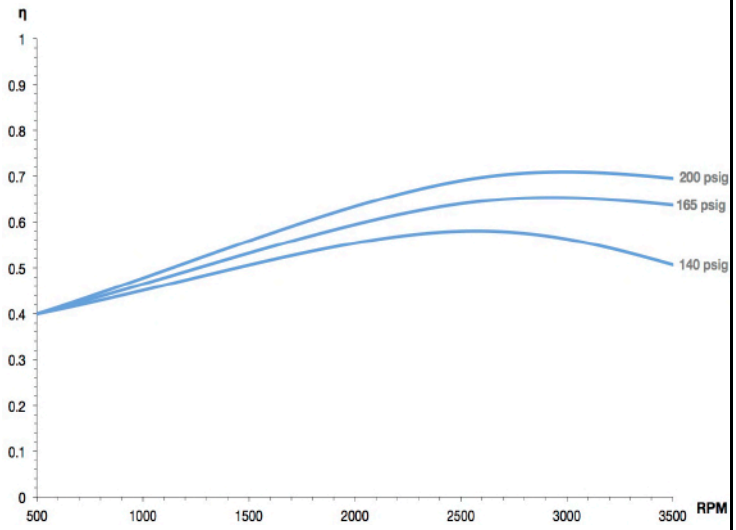
E15H22N4.25

Performance

R-134a (Oil-free)

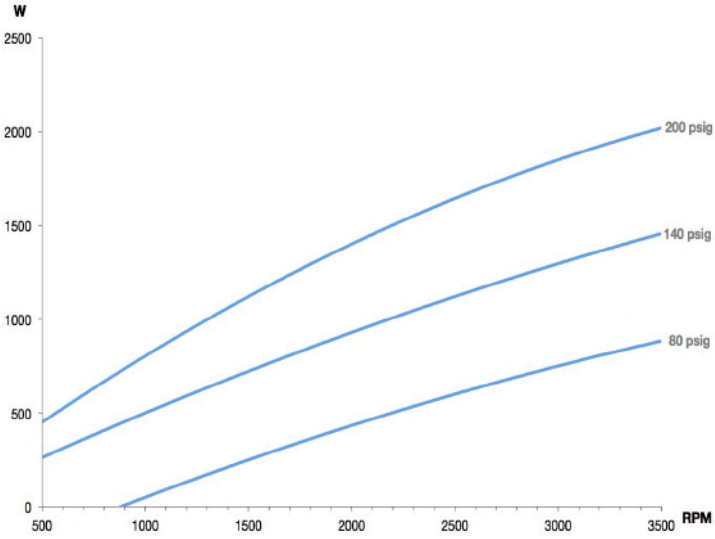
Condensing Pressure 80 psia (5.5 bar)

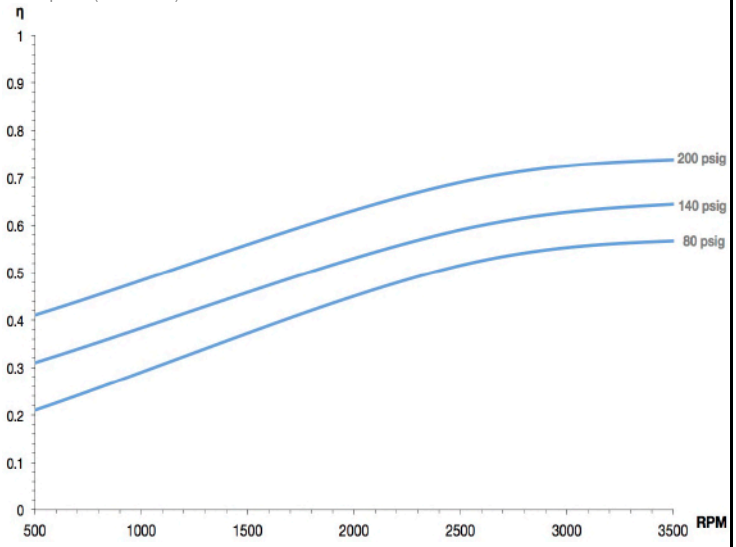




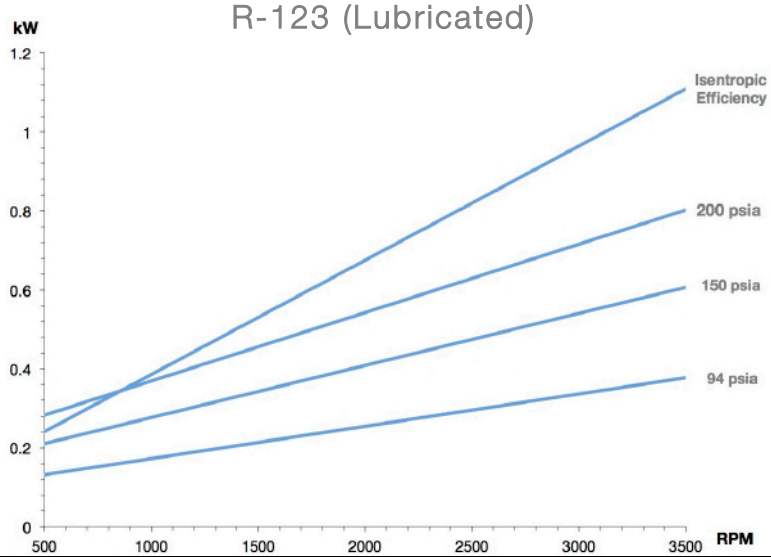
R-245fa (Oil-free)

Condensing Pressure 18 psia (1.25 bar)





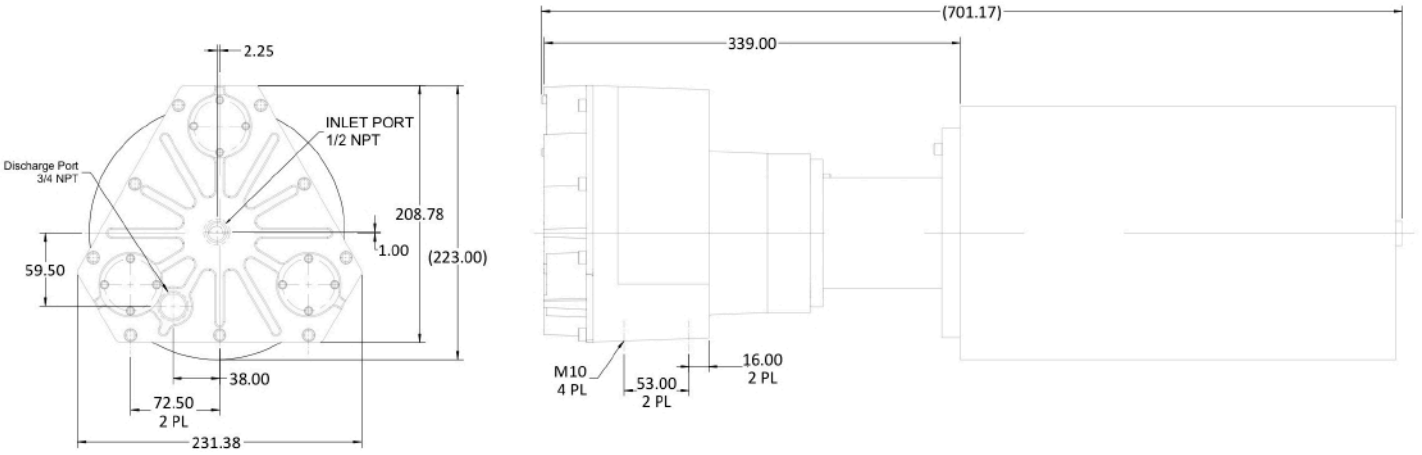
R-123 (Lubricated)



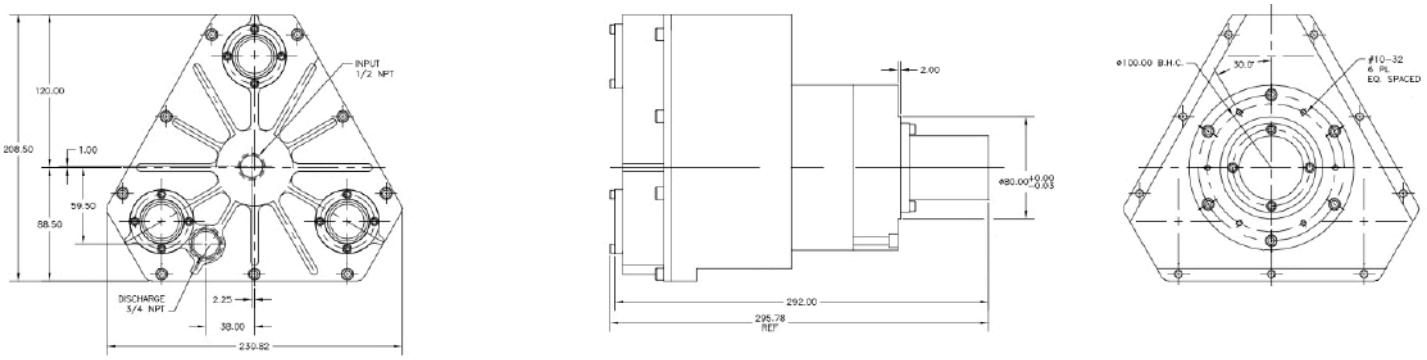
E15H22N4.25

Dimensions (mm)

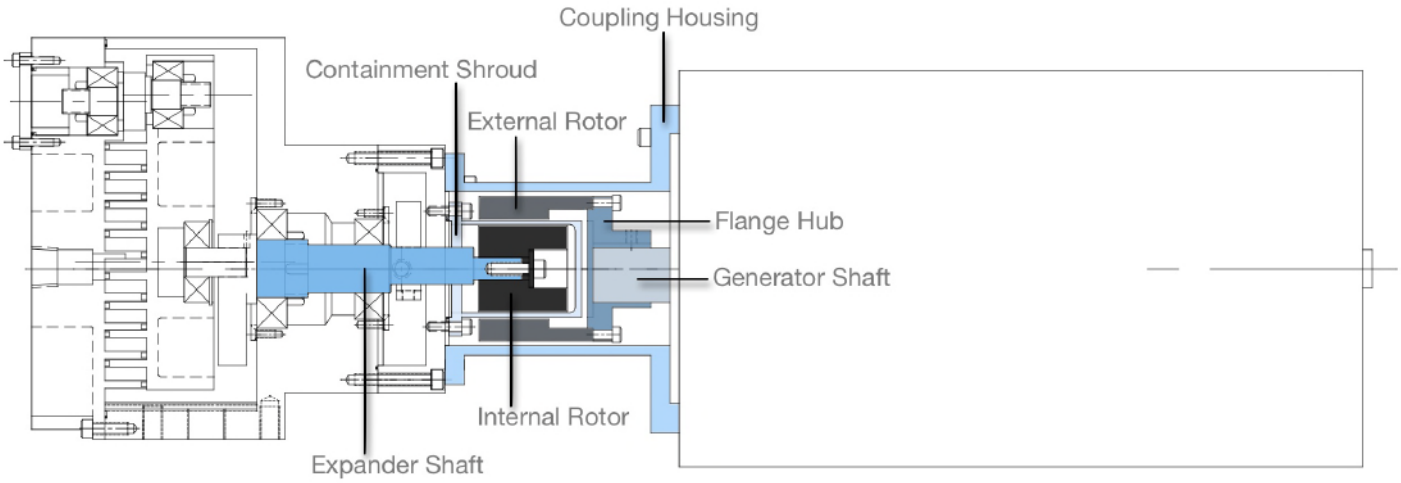
E15H22N2.5 – Magnetic Coupling, Coupling Housing, AC Generator



E15H22N2.5 – Magnetic Coupling



Connection Diagram



Notes

- Inner Rotor, External Rotor, Containment Shroud, and Flange Hub included when ordering unit with Magnetic Coupling.
- Flange Hub is customized to specified Generator Shaft size.
- Coupling Housing is optional.
- If Coupling Housing is not used, the Expander and Generator must be precision aligned to prevent damage to the Magnetic Coupling and voiding of warranty.

Air Squared
Manufacturing, Inc.
3001 Industrial Lane #3
Broomfield, CO 80020 USA
P: +1 (303) 466-2669
F: +1 (303) 466-4425
http://airsquared.com

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