

APPIONTM
Star Performance



The W.S.R. Advantage

Weight, Speed and Reliability

Appion G5 Twin

The next generation in Refrigerant Recovery.

The W, S, R. Advantage:

Weight, Speed, and Reliability.

A BRIEF HISTORY OF RECOVERY MACHINES

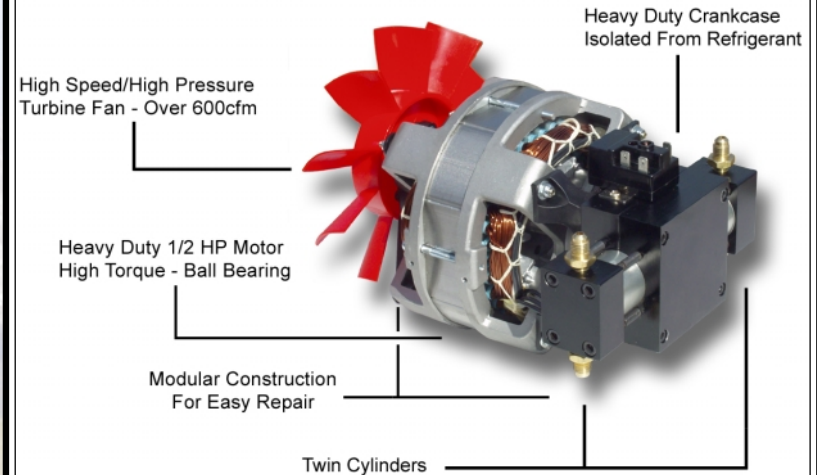
Since the inception of refrigerant recovery, weight, speed and reliability have been major issues. The original units weighed in around 70 - 125 lbs. and cost \$2,000 - \$3,000 because they used hermetic compressors. Those were absolutely the wrong compressors to use. They ran at 3450 rpm, were oil filled, and had reed valves. They were never designed to handle liquid, which all recovery machines must do. Those units were **slow** (almost the entire process had to be done in vapor), **heavy** (try getting a 70 lb. unit up on a rooftop), and **unreliable** (extra components were needed to protect the compressor from liquid). The majority of the manufacturers that made these units are now out of business.

Then, in the early 1990's, Greg Sundheim developed a compressor from scratch, designed for the application. Many technicians will remember that blue, plastic-encased machine -- it was oil-less, manufactured out of machined aircraft aluminum, ran at 1725 rpm, had spring-loaded poppet valves, more condensing surface, more air flow and weighed 30 lbs. Superior in weight, speed, and reliability at the time, that unit rapidly became the number one unit in the world for those reasons. Even still, that original blue plastic recovery machine is now **the old technology**.

The evolution continues...

Weight, Speed, Reliability

Featuring better cooling and a refrigerant-isolated crankcase, the lightweight G5 Twin is designed for the fastest speeds, longest life, and overall maximum reliability.



Patent Pending

Features and Benefits

The G5 Twin is loaded with advantages over the competition. Here are just some of the key features of the G5 Twin:

- ♦ **Lightweight & Compact:** only 24 lbs., lighter and smaller than most other recovery machines.
- ♦ **Faster Recovery Rates:** up to four times faster certified recovery rates than most units in its class; consistent high performance for life of machine.
- ♦ **Pumps Liquid & Vapor:** fast liquid and vapor recovery with no throttling.
- ♦ **Cooler Operation:** the high speed, high static pressure 600 CFM fan and the Twin Condenser design results in **40-50 degree cooler** compressor heads.

THE OLD TECHNOLOGY

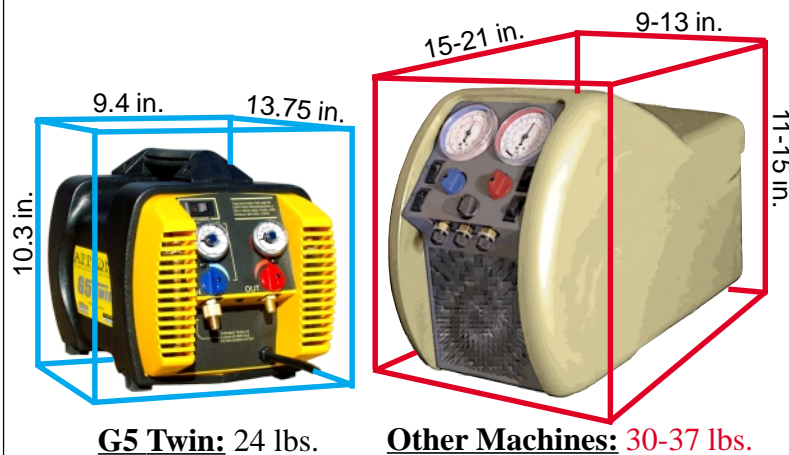
Other manufacturers started switching to oil-less technology using a modified air compressor from a leading Air Compressor Manufacturer. The problem with those designs was the rpm at which they operated -- 3450 rpm, just like the hermetic compressors used in the early days. The problem? —**Liquid**. Force equals mass times acceleration. That means the faster the rpm, the more force on the piston and connecting rod. With vapor this is fine, but with liquid it's not. So, in the 1990's, Greg's original design was the best-suited for properly handling refrigerant recovery.

However, in any design there is always room for improvement as field results come back and certain areas are found to be in need of change. Even though it was the most advanced and reliable compressor for its time, items needed to be improved. **Newer technology was needed.**

Enter the G5 Twin. →

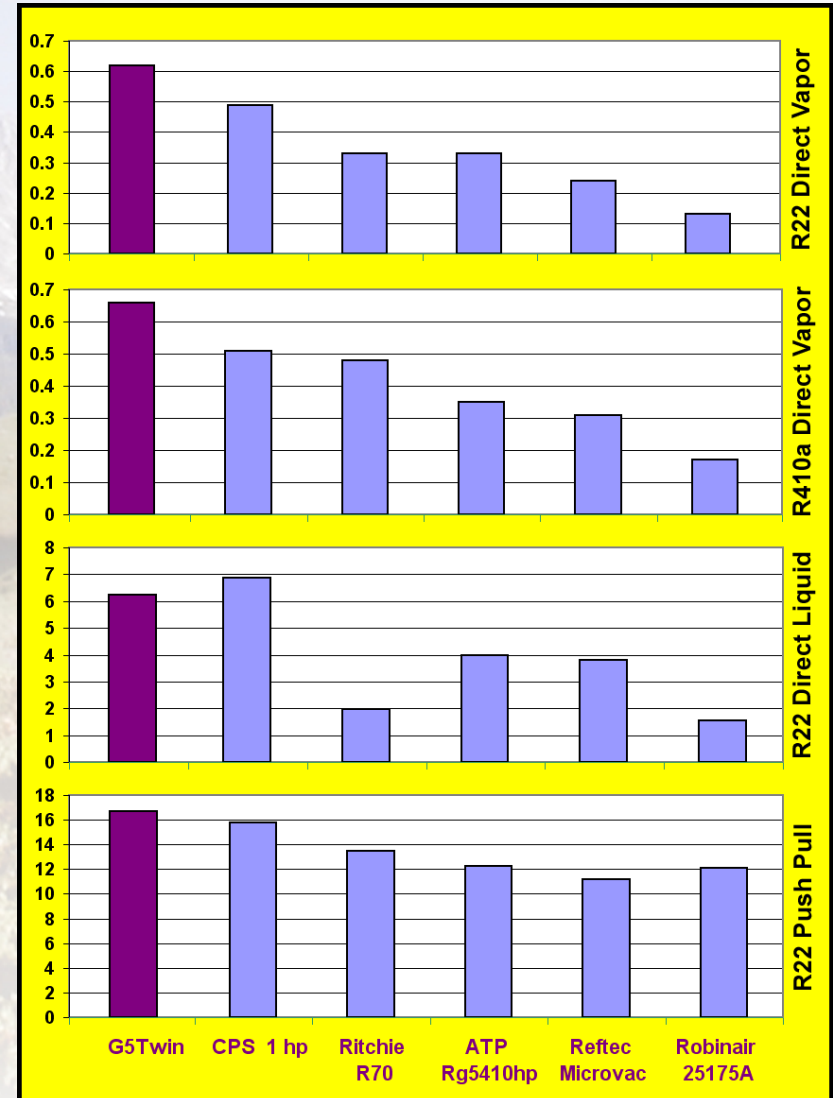
W.S.R - Size & Weight

The G5 Twin is smaller and lighter than most other machines.



W.S.R - Speed

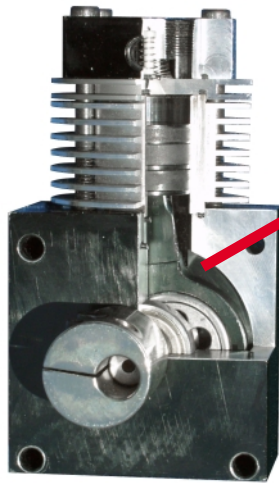
Check out these UL-certified performance comparisons to the G5 Twin. Across the board, the G5 Twin is **up to 4 times faster** in all conditions compared to units in its



Refrigerant in the Compressor Crankcase.

Having refrigerant in the compressor crankcase where the bearings are located caused the bearings to be exposed to acid, sludge, tar, etc. from the recovered refrigerant. The reason refrigerant had to be in the crankcase was for pressure equalization upon start up. On single-cylinder compressors, there has to be an equal amount of pressure above and below the piston to allow the low starting torque motors to start -- most other machines provide this back pressure by *flooding the crankcase with refrigerant*.

Enter the G5 Twin. Thanks to the opposing twin cylinder design, the **G5 Twin** has equal pressure on the top of each opposing piston; therefore it doesn't need gas in the crankcase. There is *no refrigerant* in the permanently lubricated crankcase, eliminating bearing contamination altogether, much like a grease-packed wheel bearing in your car.

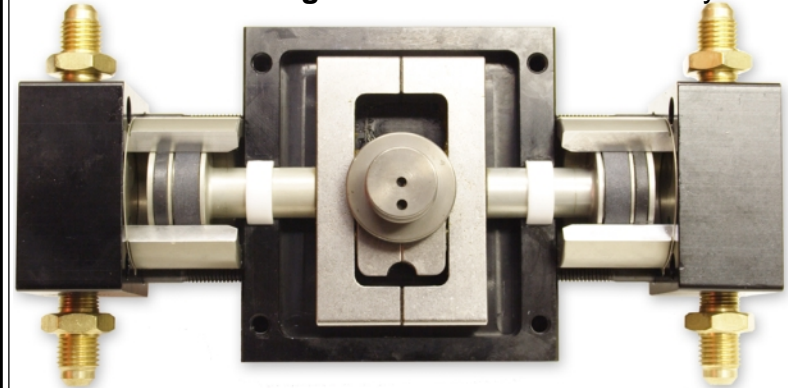


*In other recovery machines, the crankcase is **flooded with refrigerant** to provide back pressure for the pistons. The constant presence of refrigerant subjects the internal components to the detrimental effects of corrosive materials.*

Refrigerant-flooded crankcase found in other recovery machines.

W.S.R - Reliability

The G5 Twin's permanently lubricated crankcase is **isolated from refrigerant** for maximum reliability.



Patent Pending

More Features and Benefits

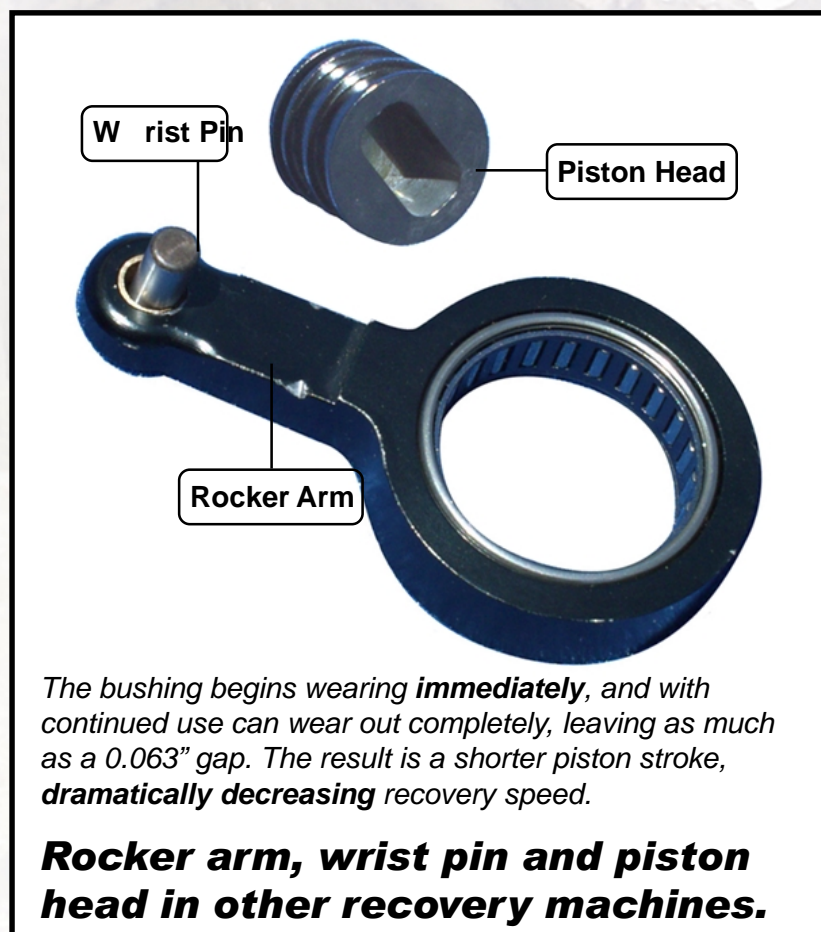
- ◆ **Refrigerant & Oil Compatibility:** Certified for use with Class III, IV and V Refrigerants. Also, all seals and o-rings are compatible with most common refrigerant oils, such as mineral, PAG and POE.
- ◆ **Works With R-410A:** 550 PSI shut off switch for use with R-410A.
- ◆ **Easy to Use:** with simple, two-valve operation, the G5 Twin's design **eliminates** the time-consuming purge cycle.
- ◆ **Onsite Field Serviceability:** the entire unit can be completely rebuilt in about 20-30 minutes **in the field** with just a screwdriver and an Allen wrench.

Actual Customer Quote:

"It's faster than venting!" -Anony mous

Wrist Pins and Bushing Wear.

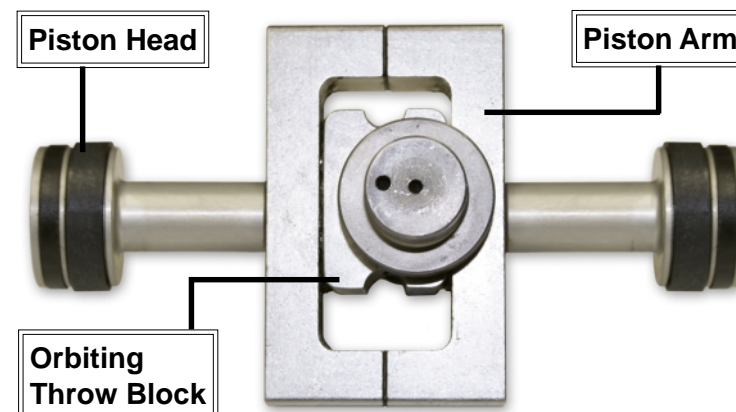
Inside refrigerant-flooded crankcases, there is a wrist pin in a bronze bushing that holds the piston to the connecting rod. The bushing begins wearing down immediately, creating a gap that can wear as large as 0.063". With continued wear, recovery *slows dramatically* as the piston no longer travels to the top of the chamber and does not clear out the refrigerant with each stroke. The resulting *reduced compression ratio* limits the maximum pressure that can be achieved.



Enter the G5 Twin. Thanks to twin opposing pistons that are solid-mounted to the orbiting ball bearing-lined crankcase, there are *no wrist pins or bronze bushings* to wear, insuring that the pumping capacity is always at its maximum throughout the entire life of the machine.

W.S.R - Reliability

There are **no wrist pins or bushings** to wear down due to the G5 Twin's opposing Twin Piston design.



Patent Pending

Head Temperature and Airflow Design.

Have you ever heard the expression "Heat is Death"? If you never have, you have now. In any machine with moving parts, the cooler it runs the better and longer it works. The way to keep a compressor cooler is to provide more air over the heads to remove the heat of compression. But ever since the beginning, manufacturers have chosen to use low static pressure 3-inch muffin fans (approx. 60 cfm).

They *might* move *some* air against a restriction, but the low static pressure results in minimal airflow over the heads and through the condenser. These fans need to *cool* the compressor heads and condensers in order to *condense* the high-pressure vapor into liquid before it goes into the tank. If there isn't enough airflow in high ambient conditions -- which is where the machines are operated the majority of the time -- the tank pressure will rise, as will the back pressure. With the degraded compression ratio of old-technology recovery machines and the low airflow from these fans, the recovery process *can slow to a halt*.

Some manufacturers use a 6-inch muffin fan with approximately 150 cfm. Once again, the airflow is rapidly diminished with each restriction, i.e. condensers, compressor heads and copper tubing.

3" muffin fan

Maximum Airflow: 75 cfm



6" muffin fan

Maximum Airflow: 150 cfm



The airflow from these **low static pressure fans** is dramatically reduced with each restriction, i.e. condensers, compressor heads and copper tubing.

Low-speed 3" and 6" muffin fans found in other recovery machines.

4-8x More Cooling Power



The G5's 7-inch, 10-blade turbine fan blasts **600 cfm** of high static pressure cooling air over the twin cylinders and twin condensers, ensuring **40°-50° cooler** compressor heads.

Patent Pending

Enter the G5 Twin. Designed with a 7-inch, 10-blade turbine fan geared up to 3000 rpm for moving high static pressure cooling air against restrictions. It offers *4 times the airflow* of the closest competitor. This results in 40-50 degree cooler compressor heads. In addition, this ensures superior airflow across the *dual condensers*, maximizing throughput even in the highest ambient conditions

The W.S.R. Advantage — Appion G5 Twin —

Designed from the ground up to be the **lightest** (only 24 lbs.), **fastest** (up to 4 times faster), and **most reliable** unit in its class. Truly the New Generation of recovery machines, once you experience the W.S.R. Advantage, you'll agree:

Nothing even comes close.

Available Locally At:



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About Appion Inc.:

Appion is Star Performance. We never stop challenging ourselves to develop smaller, lighter, easier, better and less expensive ways to help HVAC/R technicians perform their everyday tasks.

The products from Appion are made from decades of manufacturing experience and always with the needs of the HVAC/R technician in mind. Appion Inc. is founded by the same founder of Global Energy Engineering, and Promax (NYSE: SPW). The latter, a company many technicians are acquainted with.

Technicians know that we design our products for the best performance and ease of maintenance. Our commitment is to serve our customers well by providing the most innovative, user-friendly tools and equipment the HVAC/R market has to offer.

Good equipment design and manufacturing is just the start. The rest of the equation requires commitment to customer satisfaction from the distributor to the end user that goes beyond expectations.