

Protocol Family

Environmental Benefits Compared to Traditional Rack Systems.

- Better energy efficiency reduces use of fossil fuels, reduces air pollution.
- Significantly smaller refrigerant charge reduces use of HFCs.
- Significantly lower refrigerant leak rate.



PROTOCOL

Sustainable Solutions.

Protocol is the most widely used refrigeration system directly addressing today's environmental concerns. We are using the phrase "Sustainable Solutions" to underscore Protocol's important role in helping address environmental issues. Hussmann is committed to developing advanced technologies that reduce the use of HFCs and improve energy efficiency. Protocol is just one of many alternatives we offer to promote sustainable solutions.



How do we define sustainable in today's food store.

- Small carbon footprint.
- Low Total Equivalent Warming Impact (TEWI).
- High energy efficiency.
- Reduced use of HFC refrigerants.
- Low rate of refrigerant leaks.
- Reduced use of copper piping and other materials.

Protocol gets high marks in all these areas, making it an excellent alternative in the effort to protect our environment.

The Protocol distributed concept.

The Protocol concept utilizes compact multiple compressor refrigeration units. Unlike backroom systems, individual Protocol units are “distributed” throughout the store or on the roof, close to the display case loads. This reduces the amount of refrigerant in the system while increasing energy efficiency.

Protocol uses high efficiency, vapor injected scroll compressors for both low and medium temperature applications. This produces the most energy efficient refrigeration option available for virtually all food store applications.

Reduced use of refrigerants.

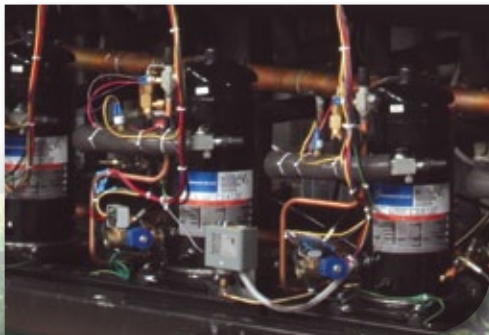
Protocol units use less refrigerant than backroom rack systems because they are placed closer to their load. This means 50-70% less piping and 60-80% less refrigerant, which reduces costs while significantly helping to protect the environment.

High efficiency scrolls for low temperature.

For low temperature applications, Protocol uses high efficiency vapor injected scroll compressors in a parallel configuration. The economizer cycle enhances the system performance by sub-cooling the liquid refrigerant via “mid-pocket” interstage injection. Traditionally, this feature has only been available on large commercial screw compressors, but is now available with vapor injected scroll compressors.

High efficiency scrolls for medium temperature.

The scroll compressors used in medium temp Protocol units have been specifically designed for energy saving performance. The design has been optimized to provide improved efficiency at lower condensing temperatures while maintaining efficiency and capacity at typical design conditions.



Scroll compressors in a parallel configuration.



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Advantages of Protocol compared to traditional parallel systems.

- Reduces refrigerant charge, normally by 60-80%.
- Uses 50-75% less refrigerant piping.
- Uses 50-75% fewer braze joints.
- Reduces refrigerant leaks.
- Eliminates or decreases use of EPRs.
- Eliminates need for machine room.
- Better energy efficiency in virtually all applications.
- Lower installation costs.

Other advantages.

- Easy to service and maintain for any service person familiar with parallel systems.
- Air or water-cooled condensing.
- Off-time, electric or gas defrost.
- Provides back-up protection and load matching with multiplexed compressors.



With Protocol, sustainable also means low cost operation.

The Protocol alternative provides improvements in sustainability and to your bottom line. Low refrigerant charge, improved energy efficiency, shorter piping runs, fewer leaks, and simple maintenance all benefit your business profits as well as environmental concerns.



Original unit design with 2 to 6 scroll compressors in horizontal or vertical cabinets.

Flexible design options to fit your application.

Protocol is offered in a variety of configurations, including vertical units, horizontal units, outdoor low profile units and even larger 8 compressor units. Using these options, a complete Protocol store can be installed with minimum copper piping and no sales floor space needed.

A typical 50,000 square foot supermarket approximately 6-8 units to handle all refrigeration loads. For example, one 4 compressor unit can refrigerate 48 doors of Hussmann reach-ins with Innovator doors operating at ice cream temperatures.

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Protocol OLP Outdoor Low Profile Unit.



Protocol OLP mounts on roof near case line-up.

The OLP mounts on the roof directly above its case load for ease of installation and traditional charge reduction benefits. This is perfect for interior store displays, such as wide island or reach-in line-ups using standard loop piping. And, it may not require a roof curb, saving installation costs.

Design flexibility.

OLP units are modular, allowing up to six compressors per enclosure. They can stand alone or be mounted to a matched Krack condenser.

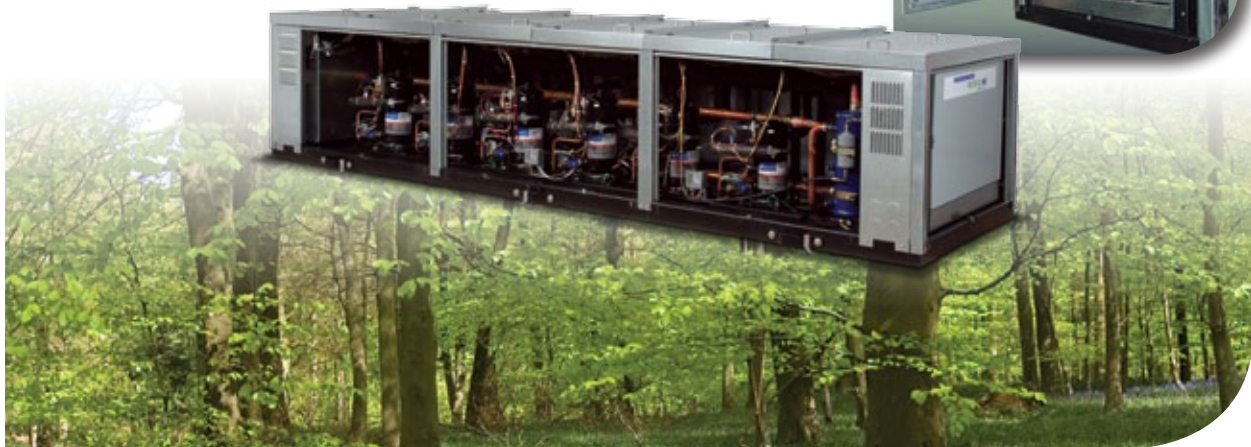
Two compressor options.

Protocol OLP can use either scroll compressors or reciprocating compressors for greater application flexibility. Consult your application engineer for specific design options.

Excellent electrical capacity and flexibility.

Protocol OLP has a large, flexible electrical panel configuration. This may reduce the need for other remote panels and switch gear.

Circuits can be easily added or removed as your load requirements change.



PROTOCOL

Protocol 8 Compressor Unit.



More refrigeration capacity with 8 compressors.

The original Hussmann Protocol units held a maximum of six compressors. The new 8 compressor unit will allow you to pack more refrigeration capacity into a single horizontal enclosure. This gives you greater horsepower with less floor space required than with two units.

More electrical capacity and flexibility.

The 8 compressor Protocol has a larger electrical panel configuration that allows more electrical circuits. This may reduce the need for other remote panels and switch gear.

Reduce two units to one.

In applications requiring only 8 compressors, such as a convenience store or a supermarket remodel, the entire job can be completed with only one Protocol unit, saving installation cost and floor space.



Circuits can be easily added or removed as your load requirements change.



Enabling excellence in food retailing.

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