Outdoor Parallel Rack Systems
Sales Brochure
Outdoor Parallel Rack Systems

Kysor/Warren Outdoor Parallel Rack Systems are designed to be a complete refrigeration system—significantly simplifying the installation process and providing improved total cost of ownership.

Kysor/Warren Outdoor Parallel Rack Systems provide significant benefits to food retail customers:

- Ease of installation
- May eliminate need for separate mechanical room or mezzanine
- Maximization of merchandising space
- Ease of serviceability and maintenance

Our outdoor product portfolio contains three market leading platforms:

- Distributed Scroll Pack (DSP)
- OHS/OHD
- OHW

Outdoor Systems Capacity Ranges

(Individual Systems)

<table>
<thead>
<tr>
<th>System Type</th>
<th>Low end of capacity</th>
<th>Top end of capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSP</td>
<td>Low Temperature</td>
<td>Medium Temperature</td>
</tr>
<tr>
<td>OHS</td>
<td>44,367 BTUH</td>
<td>78,959 BTUH</td>
</tr>
<tr>
<td>OHD</td>
<td>80,100 BTUH</td>
<td>128,847 BTUH</td>
</tr>
<tr>
<td>OHW</td>
<td>325,600 BTUH</td>
<td>875,000 BTUH</td>
</tr>
</tbody>
</table>

ASSUMPTIONS:
- LOW TEMPERATURE: 100°F AMBIENT / 110 SCT / -20 SST / -50°F SUBCOOLING (LT LOW END IS NON-SUBCOOLED)
- MEDIUM TEMPERATURE: 100°F AMBIENT / 115 SCT / 20 SST / NON-SUBCOOLED

Common Applications

- On top of roof
- Retrofits/remodels
- Outdoors, ground mounted
- Outdoors, roof mounted
- Outdoors, roof mounted

About Kysor/Warren

Kysor/Warren, a brand of Heatcraft Worldwide Refrigeration, has been creating solutions with customers for over 125 years. Built on a tradition of excellence, we are proud of our commercial refrigeration products, services and commitment to our customers. Solutions that help our customers achieve their goals for sustainability, profitability and compete in today’s changing commercial refrigeration marketplace.

We provide unparalleled customer service and are on the leading edge of technology in the manufacture of frozen and medium temp display merchandisers, mechanical refrigeration systems and remote mechanical and electrical houses.

Our core values are fundamental to our success, building relationships and creating solutions for our customers. These values define who we are and set us apart from our competition.

Our outdoor product portfolio contains three market leading platforms:

- Distributed Scroll Pack (DSP)
- OHS/OHD
- OHW
Distributed Scroll Pack

Reduced Refrigerant Charge, Ease of Installation, Accessibility

The Distributed Scroll Pack from Kysor/Warren includes an environmentally friendly design offering reduced refrigerant charge and leak potential. The integrated rack/condenser package allows for ease of installation and maximum flexibility. This innovative system significantly reduces refrigerant charge when applied near refrigeration loads.

Reduced Refrigerant Charge and Leak Potential
- Up to a 80% reduction in refrigerant charge as compared to a traditional centralized rack system

Ease of Installation and Operation
- Maximizes merchandising space by eliminating need for a machine room
- Reduction of field brazed joints means easier installation (less brazing and pipe work) and reduced leak potential
- Additional units can be added to existing facilities

Ease of Accessibility
- Hinged front doors provide easy access to compressor and electrical components
- Assembly to provide a complete high-side refrigeration system solution

Energy Efficient Design
- Features energy efficient Scroll compressors
- Optimal grouping of systems to more closely match suction temperature requirements

The refrigerant reducing Distributed Scroll Pak is an innovative product solution from Heatcraft that significantly improves the total Life Cycle Climate Performance (LCCP) of refrigeration systems, helping our customers become better environmental stewards.

Distributed Scroll Pack Specifications

<table>
<thead>
<tr>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Painted steel cabinet</td>
</tr>
<tr>
<td>Hinged doors on front access areas</td>
</tr>
<tr>
<td>Available in 258V, 460V or 575V power input (dependent upon compressor availability)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compressors and Piping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to three 6hp scroll compressors</td>
</tr>
<tr>
<td>One suction group</td>
</tr>
<tr>
<td>Off-cycle defrost</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emerson E2 Controller</td>
</tr>
<tr>
<td>Factory installed disconnect up to 200A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Options (Contact Factory)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric defrost or connections for defrost</td>
</tr>
<tr>
<td>Optional auxiliary/shipped loose heat reclaim</td>
</tr>
<tr>
<td>Available with piping terminations through bottom or out end of unit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novar, Emerson or Danfoss rack controllers</td>
</tr>
</tbody>
</table>
OHD/OHS Outdoor Parallel Rack Systems

Ease of Installation, Accessibility, Maximized Merchandising Space

The OHD and OHS Outdoor Parallel Rack Systems product offering can be configured to very effectively for a variety of applications. This platform is designed to be applied with a Bohn Air-Cooled Condenser mounted beside the compressorized compartment. The unit is most often mounted on the store roof. This may eliminate the need for a separate machine room. These systems can be located close to refrigeration loads to significantly reduce refrigerant charge.

Reduced Refrigerant Charge and Leak Potential
- Up to a 40% reduction in refrigerant charge as compared to a traditional centralized rack system when applied in a distributed system arrangement

Ease of Installation and Operation
- Maximizes merchandising space by eliminating need for a machine room
- Reduction of field brazed joints means easier installation (less brazing and pipe work) and reduced leak potential
- Additional units can be added to existing facilities

Ease of Accessibility
- Easily combined with a Bohn™ Air-Cooled Condenser to provide a complete high-side refrigeration system solution

### Design and Construction
- Available in 208V, 460V, or 575V power input (dependent upon compressor availability)
- Available in single wide (OHS) or double-wide (OHD) configuration
- Features lift up access panels that provide protection from rain during installation and service
- Available with single or split suction groups
- Off-cycle defrost
- Piping terminations out bottom of unit (OHD/OHS)

**OHS:** up to 6 scroll or 4 semi-hermetic compressors
**OHD:** up to 7 scroll or 5 semi-hermetic compressors

### Compressors and Piping
- Available with single or split suction groups
- Off-cycle defrost
- Piping terminations out bottom of unit (OHD/OHS)

**OHS:** up to 6 scroll or 4 semi-hermetic compressors
**OHD:** up to 7 scroll or 5 semi-hermetic compressors

### Options (Contact Factory)
- Optional integrated hot water heat exchanger
- Available with Loop or individual circuit piping
- Heated receiver (OHD/OHS)
- Sound abating insulation (OHD/OHS)

### Components
- Novar, Emerson or Danfoss rack controllers

<table>
<thead>
<tr>
<th>Dimension (inches)</th>
<th>OHS</th>
<th>OHD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width (W)</td>
<td>50&quot;</td>
<td>88&quot;</td>
</tr>
<tr>
<td>Height (H)</td>
<td>59.06&quot;</td>
<td>59.06&quot;</td>
</tr>
<tr>
<td>Length (L) - add 24 for hot water heat exchanger</td>
<td>288&quot; (2 Fans)</td>
<td>288&quot; (4 Fans)</td>
</tr>
<tr>
<td></td>
<td>345&quot; (3 Fans)</td>
<td>345&quot; (6 Fans)</td>
</tr>
<tr>
<td></td>
<td>400&quot; (8 Fans)</td>
<td>400&quot; (8 Fans)</td>
</tr>
</tbody>
</table>
OHW Outdoor Parallel Rack Systems

Ease of Installation, Accessibility, Maximized Merchandising Space

The OHW Outdoor Parallel Rack Systems product offering can be configured to vary effectively for a variety of applications. The OHW parallel rack is designed to be applied with a Bohn Air-Cooled condenser mounted on top (OHW) of the compressorized compartment. The unit is move often mounted on the ground beside the building.

Reduced Refrigerant Charge and Leak Potential

- Up to a 40% reduction in refrigerant charge as compared to a traditional centralized rack system when applied in a distributed system arrangement

Ease of Installation and Operation

- Maximizes merchandising space by eliminating need for a machine room
- Reduction of field braze joints means easier installation (less brazing and pipe work) and reduced leak potential
- Additional units can be added to existing facilities

### Standard

- Available in 208V, 460V, or 575V power input (dependent upon compressor availability)
- Remove access panels

### Compressors and Piping

- Available with single or split suction groups
- Factory installed horizontal receiver
- Off-cycle defrost
- Piping terminations outside of unit
- Up to 14 scroll or 12 Semi-hermetic compressors

### Options (Contact Factory)

- Electric defrost or connections for hot gas defrost
- Optional integrated hot water heat exchanger
- Available with Loop or individual circuit piping
- Available with factory mounted; piped and wired air-cooled condenser
- Split Condenser

### Components

- Novar, Emerson or Danfoss rack controllers
Other Products - Air-Cooled Condenser Assembly

The newly redesigned Air-Cooled Condenser Assembly from our Kysor/Warren brand makes an excellent companion to our Distributed Systems products, offering ease of installation and reduced leak potential. The Air-Cooled Condenser Assembly offering can be configured as needed to fit customer needs.

Ease of Installation

- Condenser comes pre-piped to the receiver and other key components (valves, piping, etc.) on a common frame, which greatly simplifies installation
- Up to 20% weight reduction as compared to the previous condenser assembly frame design

Reduced Leak Potential

- Up to a 33% reduction in brazed joints and elbows, dramatically reducing opportunities for leaks

Features

<table>
<thead>
<tr>
<th>Round Tube Plate Fin Air-Cooled Condenser</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable Speed EC Motors</td>
</tr>
<tr>
<td>540 RPM Motors</td>
</tr>
<tr>
<td>830 RPM Motors</td>
</tr>
<tr>
<td>1140 RPM Motors</td>
</tr>
<tr>
<td>Microchannel Air-Cooled Condenser</td>
</tr>
<tr>
<td>Variable Speed EC 1050 RPM Motors</td>
</tr>
<tr>
<td>Fixed Speed, VFD Compatible Motors</td>
</tr>
<tr>
<td>Factory installed receiver standard</td>
</tr>
<tr>
<td>Factory installed VFD available</td>
</tr>
<tr>
<td>Split condenser available</td>
</tr>
<tr>
<td>Receiver bypass for ambient subcooling</td>
</tr>
<tr>
<td>Factory installed filter drivers available</td>
</tr>
</tbody>
</table>

Other Products - Composite Mechanical Enclosure

Ease of installation, environmental friendliness, and a robust design are important features in supermarket refrigeration equipment. The Composite Mechanical Enclosure combines all these qualities into one efficient product solution. This system requires only refrigerant and electrical connections to be fully operational, providing the flexibility to strategically position the refrigeration system in order to reduce refrigerant charge. It can also eliminate the need for a separate refrigeration mechanical room, freeing up valuable merchandising space.

Ease of Installation

- Completely assembled to customer specifications
- Factory brazed and wired refrigeration system reduces engineering and installation costs
- Eliminates the need for a machine room inside the store
- Approximately 40% reduction in weight vs. traditional mechanical enclosure design

Sustainability

- Composite “skin” has a recycled material content of approximately 50 percent
- No Volatile Organic Compounds (VOCs)
- No fabrication welding, reducing emissions and environmental impact
- Inert insulation and adhesives
- Improved interior visibility may reduce lighting requirements

Quality Design

- Less susceptible to rippling and other deformation, compared to traditional aluminum enclosures
- Skin material has a minimum expected service life of 20 years
- Standard product complies with many wind/hurricane code requirements (contact factory for details)
- Skin is UV resistant
- Skin and insulation material are impervious to POE oils, mineral oils, lubricating oils, motor oils and common refrigerants
- Surface can be easily cleaned