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How Hussmann Protocol High Efficiency Systems can Help You Achieve GreenChill Certification

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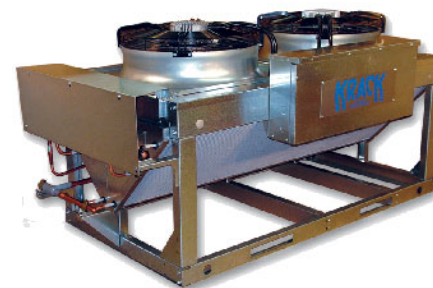
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How Protocol HE distributed systems can help you achieve GreenChill silver or gold certification:

Protocol systems are a great alternative to traditional racks in protecting the environment and achieving Greenchill certification. Thousands of supermarkets worldwide have chosen distributed systems to meet their environmental goals related to refrigerant reduction **without an energy penalty**.



- Compared to traditional back room parallel rack systems, Protocol systems generally use **50 – 80% less refrigerant**, depending on condensing method used
- New technology: Applying air cooled **microchannel condensers** can **reduce the charge in the condenser by 75 – 90%** and virtually eliminate leaks associated with traditional tube and fin condensers.
- Leak rates with Protocol systems are generally reduced by up to 85%.
 - So, a traditional rack system may leak 25-30% per year
 - Protocol systems normally have a **leak rate of 4 to 10%**



← New
Microchannel
Condenser



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How Protocol HE distributed systems can help you achieve GreenChill silver or gold certification:

- Why is the Protocol leak rate reduction so dramatic
 - In the unlikely event of a leak, the maximum potential refrigerant loss would be **80 to 275 lbs. of refrigerant**; compared to 1,200 to 1800 lbs. in a traditional rack
 - Lower leak rate on a smaller charge
 - Less vibration with scroll compressors
 - Pre-bent piping in Protocol systems is **engineered to dampen and eliminate vibration** and reduce joints
 - Elimination of traditional circuits with significantly smaller loop piping
 - There is **50 – 75% less field refrigerant piping** and braze joints
 - Elimination or reduction of leak points like EPR valves
 - Slower leaks are detected more quickly with Protocol systems
- Protocol systems work equally well in reducing charge and leaks in both medium **and low temperature applications**



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How Protocol HE distributed systems can help you achieve GreenChill silver or gold certification:

- Excellent **energy efficiency** with Protocol systems, usually **5% better** than most traditional DX rack systems due to **tight suction groupings** and proximity to the evaporator load
- **Significant maintenance reduction** vs. traditional reciprocating systems
 - Fewer moving parts to fail
- Certification levels with Protocol systems
 - Well applied **air cooled** Protocol system – **silver** certification
 - Air cooled Protocol system with **microchannel condensers** – **gold or silver** certification
 - **Water cooled** Protocol system – **gold** certification
- Conclusion
 - With Protocol distributed systems you can achieve either level of certification
 - Reduced charge / leak rate / maintenance / LT & MT solution
 - Reduces energy vs. other alternatives
 - **Additional environmental impact of reduced building steel / elimination of motor room and other materials**



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