DAIKIN

# Magnitude™ Magnetic Bearing Centrifugal Chillers

*Engineered for flexibility and performance™*

# Daikin McQuay Magnitude™ Chillers

## *Everything You Want in a Chiller... and More*

### *Energy Savings*

The Daikin Magnitude™ chiller is the most energy efficient chiller in its size range with part load performance as low as .31 kW/ton IPLV.

### *How Much Can You Save?*

Using the Energy Analyzer™ program, the estimated energy savings with a Magnitude chiller are impressive. In many applications your payback could be as short as 2 years, as shown by these examples.

**Magnetic Bearing Chiller Annual Energy Savings Comparison**

| Location | Tampa | Chicago | New York City |
|---|---|---|---|
| Chiller Type | Screw vs Magnetic Bearing | Centrifugal vs Magnetic Bearing | Centrifugal vs Magnetic Bearing |
| Building Type | Hospital | 3-Story Office | Hotel |
| Square Footage | 37,000 | 56,400 | 158,000 |
| Design Cooling Load (tons) | 150 | 150 | 300 |
| Annual Cooling (ton-Hr) | 561,524 | 102,870 | 454,232 |
| On - Peak Charge ($/kWh) | $.05 | $.064 | $.109 |
| Off - Peak Charge ($/kWh) | $.021 | $.044 | $.109 |
| Annual Energy Savings | $6,008 | $2,252 | $4,428 |
| Simple Payback (years) | 1.89 | 2.54 | 2.36 |

### *Quiet*

The Daikin Magnitude™ chiller is the quietest chiller in its size range with sound pressure readings as low as 76 dBA, tested according to AHRI Standard 575. Sound levels will be even lower at reduced loads and non-standard design conditions. That makes it ideal for sound sensitive environments such as schools, performance halls, museums, condominiums and libraries.

"The magnetic bearing chiller that we have at the California State University-Stockton is so quiet that we have to walk up to it to see if it's running."

**Chris Rasmussen**, Facility Management Department, The Grupe Company

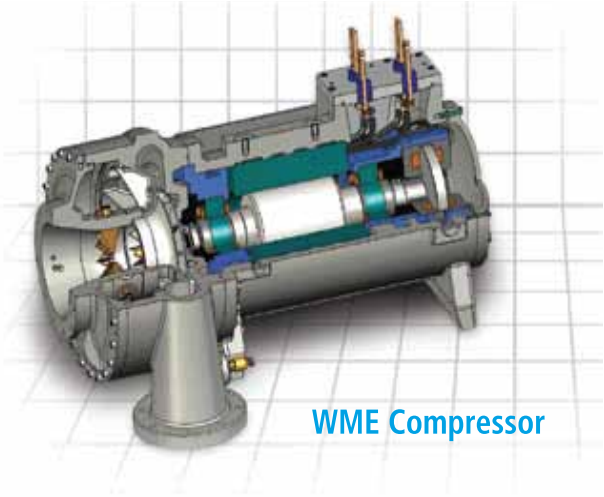
# Magnetic Bearing Compressors

## *As Reliable As They Are Efficient*

- Magnetic bearings eliminate mechanical seals and wear surfaces for longer machine life.
- The simplicity of a direct-drive motor and shaft eliminates gears, slide valves and extra parts to increase reliability.
- VFD designed as an integrated component with the compressor and optimized by digital controls to reduce power consumption while maximizing chiller performance.
- Reduced in-rush current by utilizing a VFD; a gradual soft start that lessens mechanical and thermal stresses leading to increased motor life.
- Onboard digital controls to continuously monitor operating status and provide fault protections.
- Oil-free design eliminates oil management systems for improved compressor and system reliability. The oil-free design also eliminates the possibility of efficiency-robbing oil contamination of heat-transfer surfaces.

### *Power Protection for Long-Term Viability*

*The compressor's ability to protect itself from low power quality, and to have controlled response in power loss situations, is a feature that enhances long-term compressor viability and reduces downtime. Magnitude chillers can often remain on-line through minor power disturbances and some models meet industry voltage sag immunity standard SEMI F47. In extreme or extended power disruptions, Magnitude compressors are designed to regenerate power from the spinning motor and feed that power back to the bearings and control system. This regenerative power mode allows the compressor shaft to coast down and gently reseat onto touchdown bearings.*



WME Compressor

## *Why Magnetic Bearing Compressors Are the Right Technology for Today*

The frictionless magnetic bearing compressor was developed to improve performance, reliability and reduce service requirements as compared with conventional centrifugal compressor designs.

The magnetic bearing compressor is a single rotating component – the compressor shaft – levitated on a magnetic cushion. This cushion results in the shaft not being in contact with any other part of the compressor while operating. The compressor shaft is kept perfectly aligned in all directions by sensors at each magnetic bearing providing real-time feedback to the digital bearing control system. This cutting edge magnetic bearing technology enables outstanding energy efficiency and reliable, long-life operation.

## *Contributing to LEED® Points*

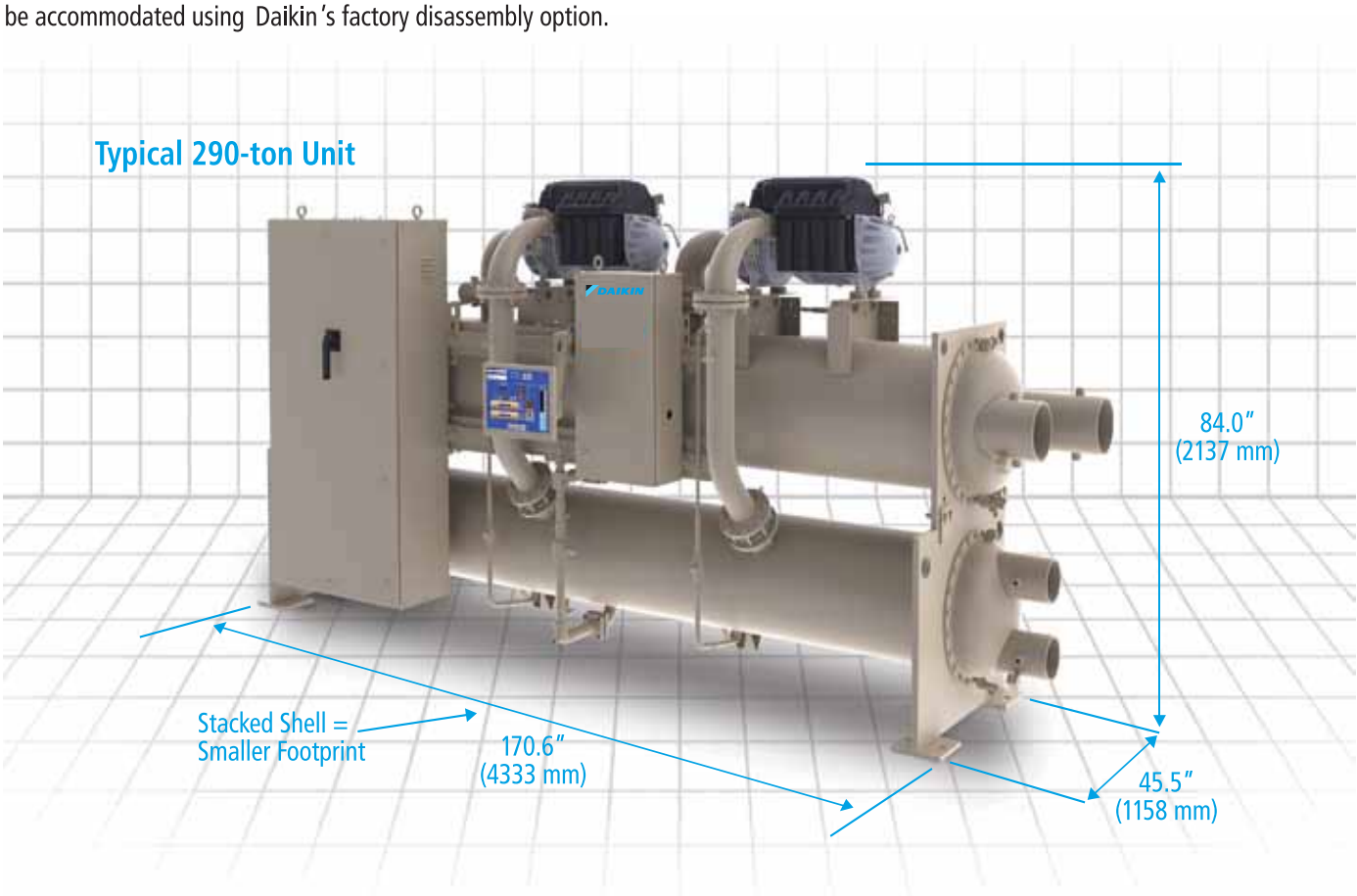
The efficiency and sustainability of the Daikin Magnitude chiller's performance can contribute to LEED points in two categories.

- EA Credit 1, up to 19 points possible
- EA Credit 4, 2 points possible

Like all chillers, the Magnitude chiller uses HFC-134a refrigerant, which has no ozone depletion potential and no phase-out schedule, making it the environmentally responsible choice for today and tomorrow.

## *Ideal for Retrofit and Replacement*

The compact size of the Magnitude™ chiller makes it ideal for retrofit and replacement installations. In addition, the space that would have used for equipment can now be put to more productive use in the facility. Some models can even fit through a standard 36-inch door without disassembling the shells. Even the most challenging access projects can be accommodated using Daikin's factory disassembly option.





## *Service and Maintenance Savings*

*Because the Magnitude magnetic bearing chiller has fewer moving parts, requires no oil, nor oil-circulation equipment, it therefore requires less maintenance and service. With oil removed from the system, maintenance tasks such as oil samples, oil changes, oil filter changes, oil disposal and leaks from shaft seals are eliminated. The results are reduced operational costs and maintenance savings each and every year!*

*Over the life of the equipment – approximately 20 to 25 years – the total maintenance savings could be significant. Savings an owner would realize depend on maintenance practices, age and efficiency of other equipment, energy prices, etc.*

# Our Bottom Line For Your Bottom Line

## *Lowest Total Cost of Ownership*

**Magnetic bearing centrifugal compressor** eliminates the efficiency-robbing friction inherent in traditional centrifugal chillers.

**Integrated VFD** optimized part load efficiency, a key performance feature since most chillers operate at part load 99% of their life.

**Sustainable performance** assured for the operating life of the chiller. The positive pressure, oil-free design eliminates performance degradation due to non-condensables and oil contamination of the refrigerant.

**Easy integration** with our Open Choices™ feature using BACnet®, LonWorks® or Modbus® communications without an expensive gateway panel.

**R-134a refrigerant** has no ozone depletion potential and no phase-out schedule.

**Reduced maintenance** costs due to elimination of the oil, oil system, purge system, and shaft seals found in older technology chillers.

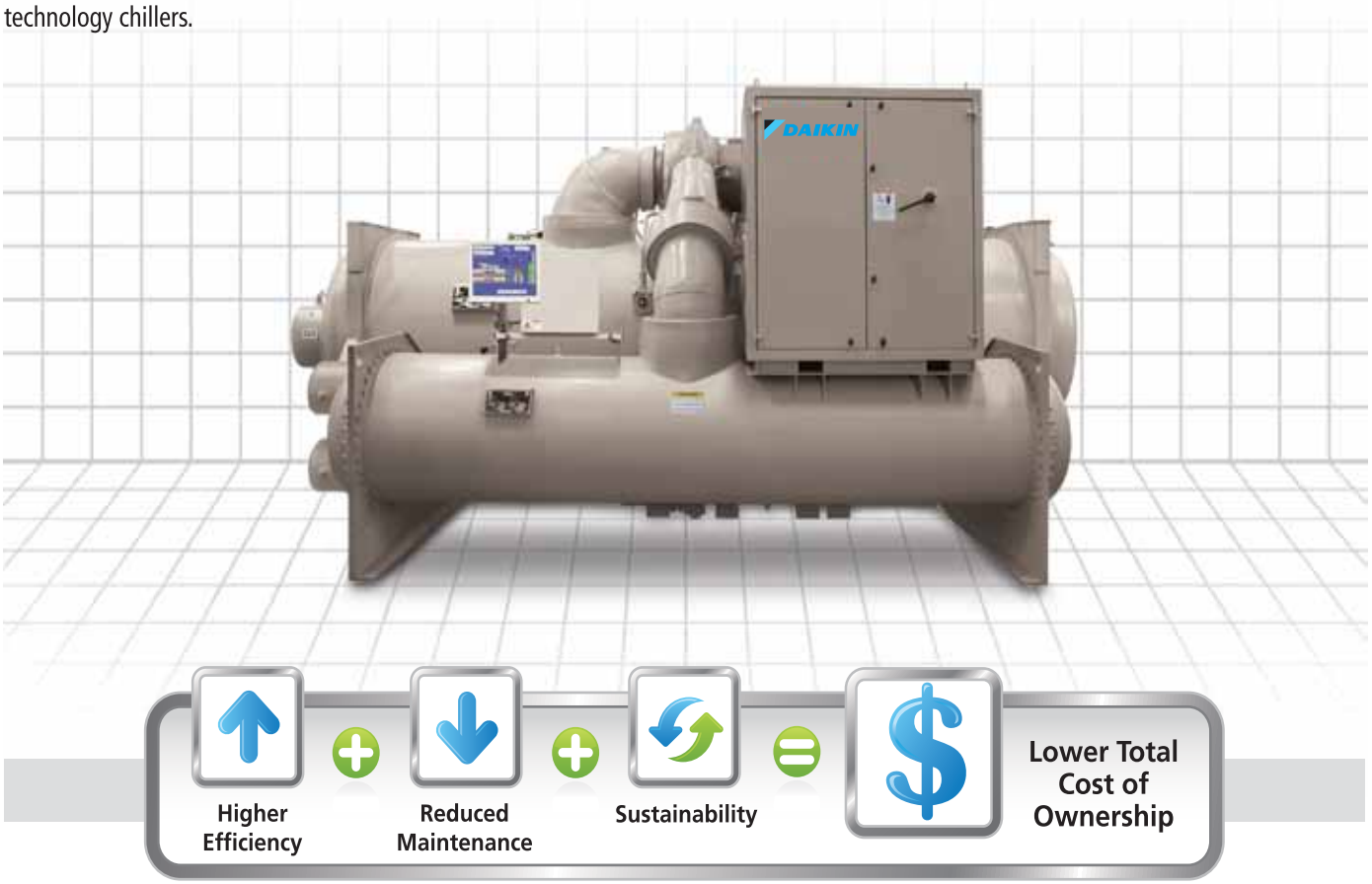
**Small unit footprint** helps the Magnitude™ chiller fit in buildings where space is limited, making it ideal for retrofit projects.

**Unmatched unloading** with the integrated VFDs since the on-board digital controls reduce compressor speed to match the load.

**Low inrush current at startup** is ideal for operation with backup or emergency power systems.

**Touch screen operator panel** is graphically intuitive and easy to use for enhanced operator productivity. Important status and control information is available at a glance or a touch.

**Quality assurance and quicker start-up** are enhanced by the factory testing of every unit at job site conditions.



# What the Owners of Daikin Magnitude™ Chillers Say About Their Units

## *Johnson County Office Building in Olathe, Kansas*

We **save 57% on energy costs** compared to a similar county office building down the road. And with the high performance McQuay frictionless chiller as part of our system, we earned **LEED® Gold certification** from the U.S. Green Building Council.

**Neil Angrisano**, *AIA, Deputy Facility Manager for Johnson County*

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## *Sarasota Bradenton International Airport Sarasota, Florida*

The 500-ton variable speed magnetic bearing chillers will provide the airport with an electrical consumption savings estimated to be 30%. The new chiller technology also extends the chiller life, reduces annual maintenance costs, improves controls of the chiller tower operation, and is LEED® qualified.

## *Northbrook Junior High School in Northbrook, Illinois*

We were sold on the **quiet operation** of the chillers because the plant is located next to three classrooms. The 18% reduction in energy costs with the McQuay frictionless chillers helped us earn an **Energy Star® School** rating from the U. S. EPA after our mechanical system modernization.

**Russ Jensen**, *Director of Buildings and Grounds for Northbrook School District 28*


## *McNamara Alumni Center at the University of Minnesota in Minneapolis*

The **compact design** of the chiller worked in our very tight design. Because the unit is so **quiet** we could avoid installing a housekeeping pad typically used to isolate sound, thus greatly reducing the weight and physical footprint.

**Jon McCombs**, *Operations Manager, McNamara Alumni Center*

## Choose a Daikin Magnitude™ Chiller

### WMC

**145 to 400-ton Magnitude™ Chiller**

Water–Cooled Chiller

### WME


**400 to 570-ton Magnitude™ Chiller**

Water–Cooled Chiller

***DAIKIN MIDDLE EAST & AFRICA***

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