



REVOLUTIONARY ENERGY SAVINGS FOR THE BUILT ENVIRONMENT

From the global #1 in oil-free centrifugal chillers

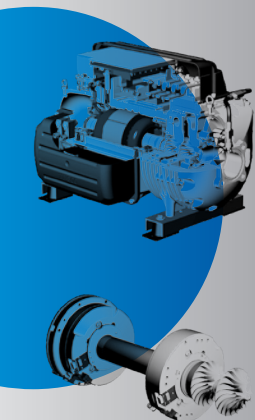
SMARTD



The Smardt Chiller Group now has some 8000 operating chiller installations across the world – all delivering high reliability, outstanding part-load efficiencies and the overall lowest cost of ownership to building owners. Achieving these goals as consistently and simply as possible remains Smardt’s core purpose, and clearly differentiates it from competitors with conventional machines.



Smardt chillers optimize the benefits of revolutionary Turbocor® oil-free centrifugal technology.



Advanced electronics mean that mechanical forces can be managed with extraordinarily fine tolerances, achieving very high reliability. Not a surprise, when the shaft position is automatically measured and adjusted 120 times per revolution. At a maximum operating speed of 48,000 rpm, this means six million times a minute.

THE SMARTD CHILLER GROUP WORLD LEADER IN OIL-FREE CHILLER EFFICIENCY

Smardt was established by a Turbocor® founder to maximize the customer benefits of the Turbocor® oil-free centrifugal compressor technology in chiller performance. Driving whole life costs of ownership way down, your Smardt chiller saves you money, year after long year, while reducing your carbon footprint and making a major contribution to the future of the planet.

DECADES OF DEVELOPMENT

The Smardt engineering, development and manufacturing teams share more than 25 years’ experience working together with magnetic bearings and oil-free centrifugal chillers – a greater body of oil-free centrifugal experience than any other chiller company in the world. The Group’s long experience actually developing the Turbocor® compressor technology and its applications brings the definitive high-performance range of water-cooled and air-cooled oil-free centrifugal chillers to the world market. The team makes sure each Smardt chiller saves its owners money throughout its long operating life— money in operating costs, money in maintenance costs, money because of high reliability, and redundancy which practically remove mechanical risk altogether.

Algorithms used in all Smardt chiller controllers further enhance the intelligence built-in to the compressor – achieving further efficiencies across each compressor’s operating map and further optimizing each compressor’s intrinsic part-load efficiencies in delivering integrated chiller efficiencies that are currently unmatched.

GLOBAL REACH, SINGLE FOCUS

Smardt’s engineering DNA developed from origins in Stuttgart in 1987, Melbourne in 1993 and Montreal in 2005. It expanded into Plattsburgh, New York in 2010, Singapore in 2011 and Guangzhou in 2013.

The heart of every Smardt chiller is its Turbocor® oil-free centrifugal compressor, which integrates rugged magnetic bearing systems with variable-speed drive, high-efficiency centrifugal compression and on-board digital electronics to achieve a revolutionary leap, a quantum leap, in part-load energy efficiency.

Smardt’s worldwide leadership in chiller energy

efficiency means there are more Smardt oil-free centrifugal chillers operating across the globe (some 8000 already) than any other chiller brand – testament to their continued reliable delivery of energy savings in an array of different applications.

A QUANTUM LEAP IN ENERGY EFFICIENCY

Smardt offers the widest range in the world of oil-free centrifugal chillers, and all Smardt chillers, whether water-cooled, air-cooled, adiabatic, modular, split or condenser-less are designed to use oil-free magnetic bearings and variable-speed drives to deliver better IPLV efficiencies than conventional oil-lubricated centrifugal, reciprocating, scroll and screw compressors. They are also high-speed – up to 48,000 rpm, very compact, very quiet, rugged and reliable, delivering a power factor as high as .92.

Proprietary *magnetic bearings* replace conventional oil-lubricated bearings, eliminating high friction losses, mechanical wear and high-maintenance oil management systems to deliver energy savings of 35% and more over conventional chillers while ensuring long-term reliability. Over 90,000 magnetic bearing machines are operating in the field, mainly in high-end vacuum pumps and CNC spindles – any innovation risk with this component technology has been long overcome.

Turbocor’s main moving part (rotor shaft and impellers) is levitated during rotation by a digitally controlled magnetic bearing system. Position sensors at each magnetic bearing provide real-time feedback to the bearing control system, 120 times each revolution, ensuring constantly centered rotation.

Oil-free design optimizes heat transfer

The well-known ASHRAE study (Research Project 751) concluded that typical lubricated chiller circuits show reductions in design heat transfer efficiency of 15-25%, as lubricant accumulates on heat transfer surfaces, denaturing and blocking normal thermodynamic transfer processes. Logically, no oil in your chiller means no oil contamination over time, so design efficiency is maintained effortlessly.

Oil-free means major lifetime maintenance savings

Oil-free means no need to check or change oil, no need for crankcase heaters, and no purge system. Maintenance needs and costs are cut in half compared with a lubricated chiller.

Extraordinary soft-start efficiency

The compressor's power electronics, further enhanced by Smardt's proprietary chiller controllers, require only 2 Amps for start-up, compared with 500-600 Amps in conventional machines. Further savings for owners, who can reduce maximum power loads and reduce backup generator size, cost and capacity.

Built-in protection against power failure

Each compressor has a bank of capacitors for energy storage and to filter DC voltage fluctuations. In case of a power failure, the capacitors provide continuous power to the bearings to keep the shaft levitated, allowing the motor to turn into a generator and to power itself down to a stop. Extended life testing confirms the system's remarkable durability.

HFC-134a refrigerants and low-GWP

R134a has no Ozone Depletion Potential and no phase-out schedule under the Montreal Protocol. Low-GWP alternatives to R134a are now offered by Smardt across the world. R1234ze is used in Smardt's G-Class range, and other options including high-performance blends are also available.

Very quiet

Very low sound and vibration levels, due to lack of physical contact between moving metal parts, eliminate the need for expensive attenuation. Smardt chillers are typically so quiet, in fact, that a novice cannot tell whether they are actually operating. Testing of Smardt water-cooled chillers with reference to AHRI standard 575 yields readings as low as 77 dBA at 1 meter.

Energy cost savings can be spectacular

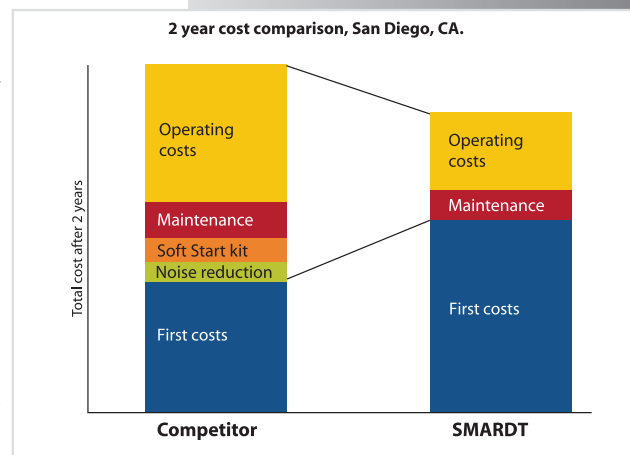
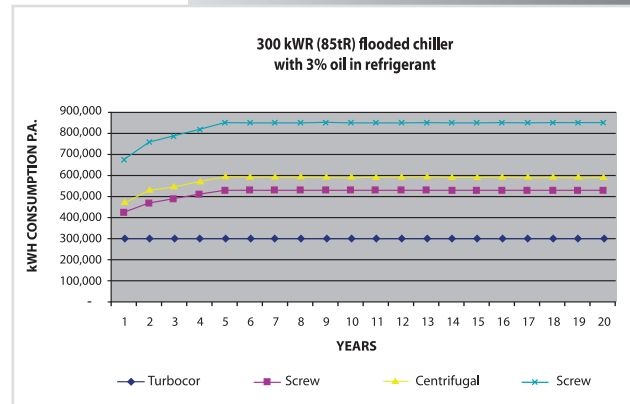
Compared with a new screw chiller, Smardt IPLV energy efficiency is routinely more than 32% better. Compared with older lubricated reciprocating, screw, scroll or centrifugal chillers, year round savings with a Smardt chiller can be spectacular, with well over 50% savings.

Under AHRI conditions, Smardt IPLV performance is unbeatable.

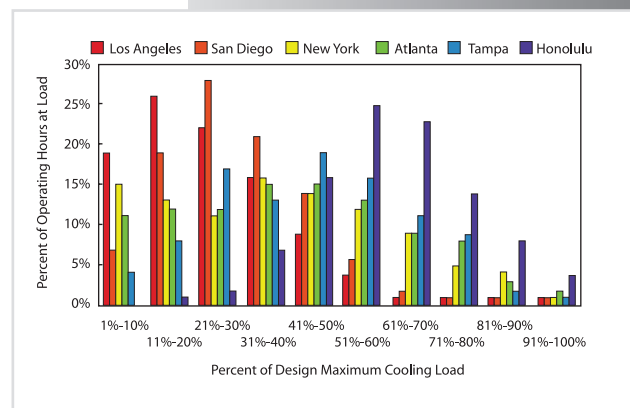
Why part loads are critical

The graph below (data source: AHRI, 2005) shows very simply that a wide range of large US cities all demand the vast bulk of their chiller operations at partload – enabling much lower operating costs from a Smardt chiller than from a lubricated alternative.

As this comparative ASHRAE study showed, over 20% of a lubricated chiller's operating efficiency is routinely lost in the early years as a result of oil clogging of heat transfer surfaces.



This decision between two different chillers has long term positive consequences for the hotel which made it. The left-hand option is a low-cost lubricated screw chiller. The right hand option is a 300 TR Smardt water-cooled chiller.





This standard design 1140 TR water-cooled chiller uses a flooded shell and tube evaporator with shell and tube condenser with both pressure vessels using high performance copper tube profiles. The approach of less than 1 deg K allows very high part-load efficiencies.

WATER-COOLED CHILLER RANGE 60 TR THROUGH 3600 TR

Lowest lifetime operating costs

Smardt works hard to minimize complexity in chiller design and operation – Smardt simplicity is reflected in low Smardt operating costs. The thinking makes simple sense – with no oil, flooded shell-and-tube evaporation, soft start, low power consumption, low maintenance costs and high reliability with only one main moving part.

Operational flexibility means further savings

Multiple compressor design enables efficient capacity turn-down to 5-10% and major turn-down in chilled water and condenser water flows. This means lower chiller energy usage and lower pump power requirements.

Smardt field reliability has been outstanding – not surprising when you consider that some 80% of all chiller problems in the field are due to failures in compressor oil return. And Smardt chillers use no oil.

The worldwide fraternity of Smardt-trained engineers and technicians suggests that total maintenance costs for oil-free chillers run at well under half the costs of traditional lubricated chillers. This may be very conservative.

Serviceability

Always important in minimizing operating costs, service access is swift and simple, as is access to operating history through remote monitoring. Operating history, compressor and chiller set points are all accessible remotely by trained and authorized service personnel.

Simple BAS integration

Integration with Modbus, BACnet and LonWorks building management systems is standard, as is connectivity with most industry-standard protocols.

Custom design and problem solving

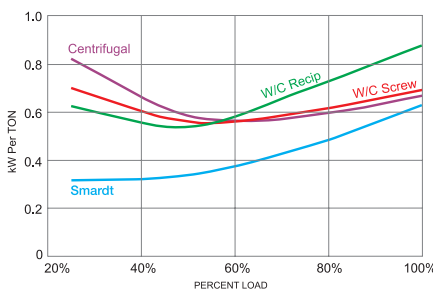
The group's design engineers are happy to resolve special equipment design challenges for you, but please allow some extra time and, possibly, some extra cost for these.

For example, high-efficiency heat recovery and free-cooling applications can all be supplied competitively. Marine water boxes, corrosion protection and other options are available and can be supplied on request.

Redundancy

Use of multiple compressors allows unusual redundancy safeguards; and if multiple circuits are indicated, these can be designed in and supplied. Smardt's redundancy potential can offer system designers unique opportunities to eliminate multiple chillers, multiple controls and multiple pumps. More savings for owners.

Multiple compressors also allows system designers to save on low-load or pony chillers, because with a VFD integrated into each compressor control, a chiller which uses multiple compressors can be efficiently driven right down below 10% or even 5% load.



This simple comparison uses generic industry performance data for 250 TR water-cooled chillers (data source: AHRJ) to plot the relative efficiencies of different compressor modalities as they unload.



SMARTD V-CLASS WATER-COOLED CHILLERS 350 TR TO 3600 TR

Smardt uses Turbocor's VTT compressor range to bring new levels of efficiency, reliability and turndown to the large water-cooled chiller market – up to 3600 TR. The VTT design – two-stage with enabled addition of Smardt economizer technology - continues the use of proprietary magnetic bearings in oil-free operation with integrated variable speed drive. Both drive and motor are actively cooled by refrigerant, and robustness is enhanced with built-in DC coils and fuses.

Capacity control is precise and simple, using an elegant flow valve system which eliminates the need for inlet guide vanes or mechanical variable diffusers. This enhances full-load efficiency – conservatively, .55 kW/TR is routinely delivered. V-Class offers the highest part-load efficiency on the market – conservatively, below .35 kW/TR, while also allowing greater turndown – below 7% of maximum capacity is often utilized in cooler climates.

Fully exploiting the VTT compressor capabilities required more than a year's development work – in controls, in systems integration and in heat exchangers. The V-Class evaporators, for instance, use a modified refrigerant distribution system coordinated with variable diameter high-performance tube bundles.

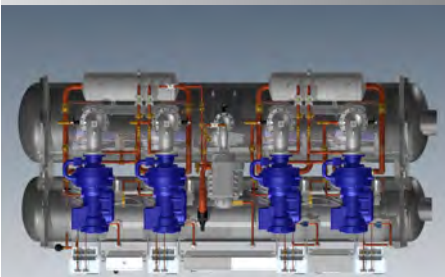
The Smardt systems design approach allows continuous chiller operation during chiller maintenance – vital in mission-critical applications. Smardt's V-Class installations so far have all occurred within the demanding application requirements of data centers or pharmaceutical manufacturing.

District cooling applications are an obvious extension, as is replacement of multiple-chiller plants using 4160 v power.

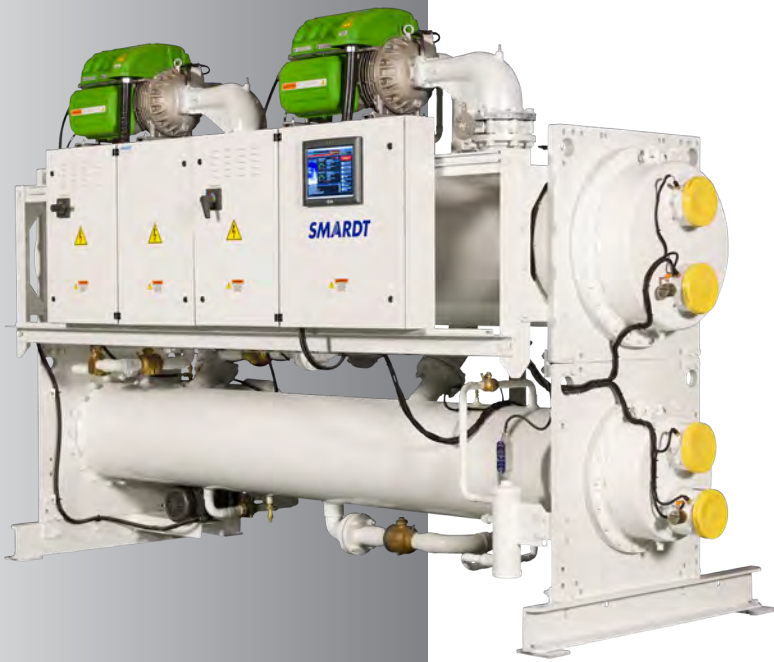
In summary, the V-Class range offers the lowest life-cycle cost in its class.

V-Class "Pony Express"

Smardt eliminates the need for a low-load or "pony" chiller, adding chiller plant efficiency and reducing scarce plant room space requirements, by integrating a lower-capacity TT compressor within a V-Class system. On a 2500 TR V-Class chiller, this enables effortless high-efficiency operation at cooling loads well below 50 TR or 2% of chiller capacity.



This overhead view of a 1600 TR Pony Express chiller shows its compelling simplicity of design.



SMARTD G-CLASS

WATER-COOLED CHILLERS

90 TR TO 880 TR USING R1234ZE

Designed, developed and tested by Smardt Germany, the G-class range uses low-GWP refrigerant R1234ze – with a GWP 99% lower than current R134a. Other low-GWP refrigerants and refrigerant blends are currently under test.

With R1234ze, Smardt G-class water-cooled chillers deliver a full-load efficiency of 0.52 kW/TR and an IPLV efficiency below 0.31 kW/TR, with an extended range of operating temperatures (to 40 deg F CWI).

As with Smardt's other water-cooled oil-free centrifugal ranges, built-in redundancy minimizes chiller downtime, and systems integration allows continuous operation during maintenance.

In summary, the Smardt G-class offers the lowest lifecycle cost in its low-GWP class.

SMARTD T-CLASS WATER-COOLED CHILLERS

60 TR TO 1200 TR

Several thousand of these oil-free centrifugal machines are operating efficiently across the world, some for more than 13 years. All use Turbocor's TF-series oil-free centrifugal compressors.

The array of available options is probably the widest on the planet.

In configuration, you can choose between high profile and low profile, modular, split, condenserless or SKD. Ask your representative about optional refrigerants, optional alloys for use in seawater or difficult fluids, optional shock resistance or other special condition requirements. Marine applications? Please ask.



Over only 5 days, 400 TR of high-efficiency cooling was installed, commissioned and running at a fully tenanted downtown Toronto complex, using access only through standard doorways, stairs and elevators. Access savings – demolition, crange and the costs of closing a busy downtown street – were enormous.



YOUR PLANT ROOM ACCESS PROBLEMS SOLVED – ONLY SMARTD OFFERS TWO EASY OPTIONS

Compact Modular and Split Chiller ranges;
60 TR TO 1200 TR

Smardt's compact modular and split-vessel chillers elevate the modular chiller into the high-efficiency, low-operating-cost world. No longer does modularity have to be compromised by efficiency sacrifices.

Now you can use the modularity concept to upgrade plant operating efficiency while minimizing plant room access costs – saving high costs of demolition, rigging and crange. Savings can be enormous, because the Smardt Compact Modular range is designed to move through a standard elevator and a standard door, through to a footprint smaller than any other high-efficiency chiller.

SPLIT DESIGNS: ONE STEP UP FROM MODULAR IN FIRST-COST EFFICIENCY

Smardt's Split Chiller range (patent pending) minimizes chiller first cost including operating cost as well as access cost. Each split chiller, once factory-tested as a complete chiller, becomes a special disassembled kit so you need only use standard doors, standard elevators (and standard people instead of demolition crews and cranes) and optimizing standard capex budgets.

NEED A KNOCKED DOWN KIT?

If access is a challenge to your chiller replacement project, Smardt can help with solutions all along the way. Modular or split chillers often solve the problem, but not always. Once the chiller is built and factory-tested, we can offer not only simple removal of compressors and control panel but also complete disassembly.

This standard 90 TR Compact Modular chiller can be doubled up with the same footprint, then expanded by up to 5 further modular steps, allowing a wide range of high-efficiency modular options.





Smardt air-cooled performance at this Florida university delivered the expected 40% energy savings.

Service access is outstandingly simple.

AIR-COOLED PACKAGED CHILLER RANGE

60 TR TO 600 TR

The Smardt air-cooled range offers the smallest footprint, the quietest operation and the highest air-cooled operating efficiencies in its market.

Condenser coils use a V configuration to optimize heat rejection and footprint. Coils are baked and double-coated with sealed edges as standard to extend the coil's physical protection from environmental corrosion.

REMOTE AIR-COOLED CONDENSING

Remote location of the condenser can be a preferred option in some applications. Smardt can supply a full package if desired, or on a condenser-less basis.

"QUIETEST IN THE INDUSTRY!"

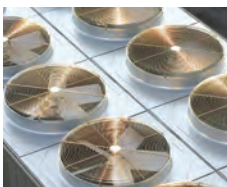
Standard Smardt air-cooled chillers are over 70% lower in sound power than a standard screw machine. Even lower sound levels are deliverable when you need them.

EVAPORATIVE PRE-COOLING FURTHER DROPS POWER CONSUMPTION

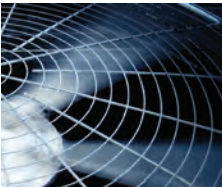
Use of evaporative pre-cooling to lower the incident air temperature on the coil can dramatically reduce energy consumption, effectively shifting heat rejection from ambient dry bulb (95 deg F or 35 deg C) towards ambient wet bulb (say 75 deg F or 24 deg C). In warmer, dryer climates, Smardt reference sites show further savings of over 30% compared with normal Smardt air-cooled operation.

SMARTD FREE-COOLING CAN DRIVE EFFICIENCIES OFF THE PLANET

Adding a Smardt Free-Cooling package (special bypass circuitry, controls and safeguards) can drive air-cooled chiller efficiencies to spectacular levels with appropriately low ambient temperatures. Payback periods can be very short.



Use of evaporative pre-cooling to minimize air-cooled power consumption is very efficient from an operating cost perspective.



SMARTD E-CLASS

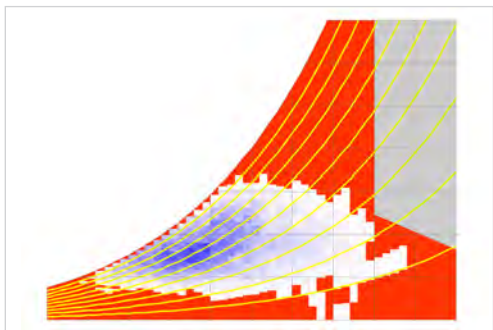
ADIABATIC CHILLERS 70 TR TO 300 TR

Especially in warm, dry climatic conditions, Smardt's adiabatic oil-free centrifugal chiller range sets new standards of operating efficiency while eliminating the need for cooling towers and totally removing the risk of Legionella infection.

The external media panels of these machines, moistened with slow-dripping water, use latent heat of phase change to reduce the temperature of the incident air on the condenser coil to almost water-cooled levels. Not surprisingly, operating efficiency rises as incident air temperature falls.

Special water treatment is not required. Media panel maintenance is simple and low-cost. Smardt's installed base is very large.

Full-load operating efficiency will reflect ambient conditions of temperature and humidity, but has been recorded up to .70 kW/TR. IPLV efficiencies can be as high as .40 kW/TR, but again reflecting ambient conditions.



This psychrometric chart maps temperature and humidity to show ideal operating conditions for adiabatic chillers (shaded blue above). Climates showing high humidity or low temperature are not appropriate for this technology. (Primary data source: DOE, USA).

T-CLASS AIR-COOLED CHILLERS

70 TR TO 600 TR

Smardt's T-Class AE series air-cooled oil-free centrifugal chillers offer new standards in oil-free centrifugal efficiency, especially when ambient conditions allow the use of free-cooling modalities. All fans are EC variable speed; all condenser coils use low pressure drop microtubes. V-coil condenser designs protect the chiller against damage from dust, dirt, hail and ultra-violet rays. Special coatings protect against insidious corrosion. Smardt engineers work hard to use all available opportunities to drive high efficiency, low maintenance and long life while keeping designs as elegant and robust as possible.

This new Smardt air-cooled chiller is now installed in a large data center. This mission-critical market sector accounts for a large proportion of the Smardt installed base.

Sound ratings are typically below 85 dBA at 1 meter – some 20 dBA lower than orthodox screw chillers in air-cooled mode. Measurements are made in accordance with the AHRI-575 standard.

Additionally, the chiller's base frame is heavy duty hot-dip galvanized and the screws and fixings above the base are stainless steel as standard for optimal corrosion protection.



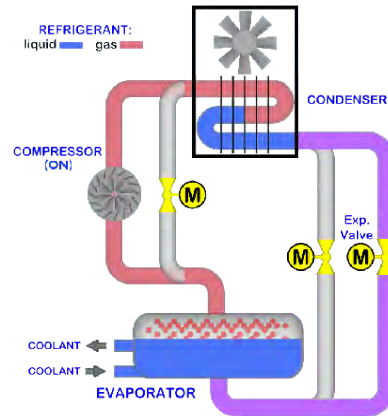
This T-Class air-cooled installation at a major hospital in Hong Kong is one of a series – specified because of lowest lifecycle costs and high reliability with unmatched redundancy.



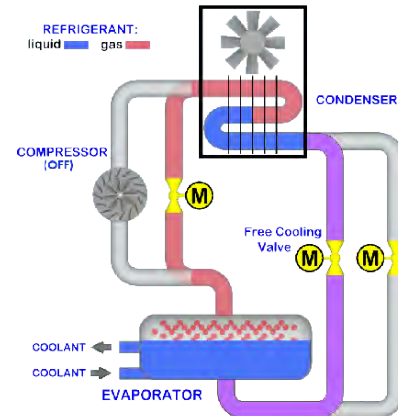
SMARTD FREE-COOLING MODE

Smartd's integrated free-cooling mode means that when it's cold outside, the compressor can be turned off and cooling is achieved using the natural thermosyphoning properties of refrigerant.

No extra pumps, coils or fluid coolers are needed. In free-cooling mode, only the condenser fans operate, reaching an unprecedented efficiency of well over .10 kW/TR.



MECHANICAL
COMPRESSOR MODE



FREE-COOLING
THERMOSYPHON MODE

INTEGRATED COIL COATINGS EXTEND CHILLER LIFE

Smartd e-coating is a hydrophobic nano-polymer coating protecting the condenser coil from corrosive environments. This innovative nanotechnology is not only water and dirt repellent through its self-cleaning function, but it has also very high heat transfer capabilities and maintains a long-term efficient heat exchange because of reduced dirt build-up on the coils.




STATUS
MODE: CHWST STATE: RUN NORMAL

DATE
Thursday, January 25, 2018

TIME
12:12:09 PM 59.1°F/45.2°F

ERROR MSG
No System Fault


ACTIVE TIMER
Press to display all timers



SMARTD
REVOLUTIONARY ENERGY SAVINGS
FOR THE BUILT ENVIRONMENT

Enable Source DI-1 No Fault ✔

Percent Demand




Evaporator Info

Evaporator Leaving Water Temperature: 45.2°F Slope: 0.21°F

Evaporator Entering Water Temperature: 59.1°F Cool SP: 44.9°F

Percent Full Load kW



Condenser Info

Condenser Leaving Water Temperature: 82.4°F

Condenser Entering Water Temperature: 73.3°F

AUTO DI#-1

Chiller Overview

Compressor Page

System Overview

Trending

Alarms

Input/Output

Settings

Controller messages

01/25/2018 09:55:18, START STATE: Compressor's ID(s) selected to start: 2 1
01/25/2018 09:53:27, Compressor#2 Fault: VFD not in auto mode Fault.
01/25/2018 09:52:50, All Compressors Communications lost
01/25/2018 09:52:41, VTT-2 Lost communication
01/25/2018 09:52:35, VTT-1 Lost communication
01/25/2018 09:52:22, Compressor#2 Fault: Kinetic backup Fault
01/25/2018 09:52:18, Compressor#1 Fault: Kinetic backup Fault
G5 R25.21.18 240 SMARTD P2042 Chiller

USER-FRIENDLY CONTROLS

Smardt's Kiltech controller is very user-friendly, highly intuitive and allows optimization of both single and multiple compressor operations while enabling a rich array of communication options. The compressor's onboard digital controller proactively manages compressor operation while allowing external control and web-enabled monitoring of performance and reliability information.

Smardt's PLC-based microprocessor system has generated the state-of-the-art controls software that is used to maximize operating efficiencies and minimize maintenance and operating costs. Four tiers of control options are available.

This system provides several access levels for plant operators and commissioning, and offers a wide variety of options for flexible operation and optimization of power consumption, maximizing time spent operating at compressor sweet spots.



STATUS
MODE: CHWST STATE: IDLE

DATE
Thursday, February 22, 2018

TIME
11:12:34 AM -36.3°F/-36.3°F

ERROR MSG
Compressor(s) communication(s) : 100.0% error(s).

ACTIVE TIMER
Press to display all timers



Evaporator System Information

Evaporator Leaving Water Temperature: -36.3°F	Evaporator Approach Temperature: 104.6°	● Chilled Water Flow Status	Expansion Valve Set Point LiquidRefr. Level: 30.00
Evaporator Entering Water Temperature: -36.3°F	Active Set Point Temperature: 45.0°F		Liquid Refr. Level in Condenser: 0.0%
Evaporator Water Delta Temperature: 0.00°F	Chiller Start SetPoint Temperature: 47.0°F		Expansion Valve Position Signal: 50.0%
Saturated Refrigerant Temperature: -140.9°	Chiller Stop SepPoint Temperature: 43.0°F		

View Condenser

STATUS
MODE: CHWST STATE: IDLE

DATE
Thursday, April 12, 2018

TIME
11:12:34 AM -36.3°F/-36.3°F

ERROR MSG
Compressor(s) communication(s) : 100.0% error(s).

ACTIVE TIMER
Press to display all timers

Compressor Information

Compressor#1	Compressor#2	
Speed [RPM] 27494	Speed [RPM] 27494	● RUNNING
IGV Percent 110	IGV Percent 110	● RUNNING
Power [kW] 147 kW	Power [kW] 147 kW	
SSH [°] 13.0°F	SSH [°] 13.0°F	
Press Ratio 1.00	Press Ratio 1.00	

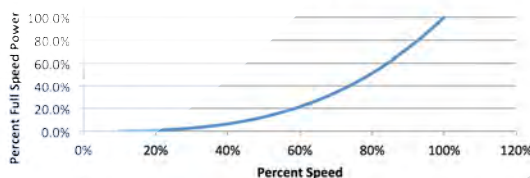


Smardt chiller controllers have been developed from the ground up using primary compressor performance maps, maximizing the performance potential within these, then optimizing the whole chiller's operation to minimize energy consumption.



Especially when using multiple chillers in a chilled water plant, very large energy savings can be reliably achieved when the whole system is optimized by a Kiltech CPECS installation using all-variable-speed drives.

Power Vs Speed - Centrifugal Pumps and Fans



INTEGRATED VARIABLE SPEED CHILLED WATER PLANTS

Kiltech CPECS optimizes total integrated energy efficiency

25-75% total improvement in both new and existing plants

After many years' observing and testing variable primary flow systems in chilled water cooling plants across a wide range of environments and applications, Smardt's associate – Kiltech Solutions – developed Central Plant Energy Control System (CPECS), a proprietary suite of functional algorithms which constantly minimize the total energy consumption of the chilled water cooling system. Not just the chillers, or the cooling towers, or the pumps, but the whole system. Perhaps surprisingly, optimizing the whole system can mean running an individual component machine away from its own optimum.

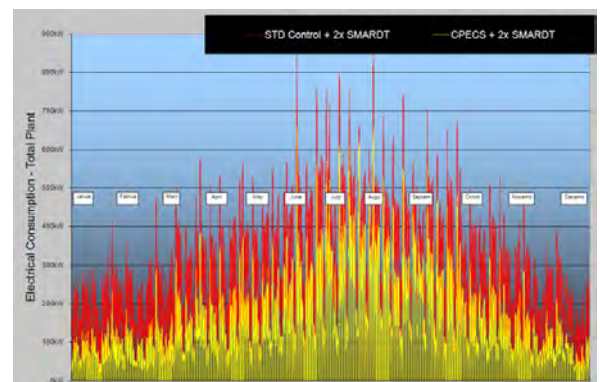
There are two simple but absolutely key concepts involved:

Reducing Operating Speed by X Reduces Operating Energy Consumption by X³

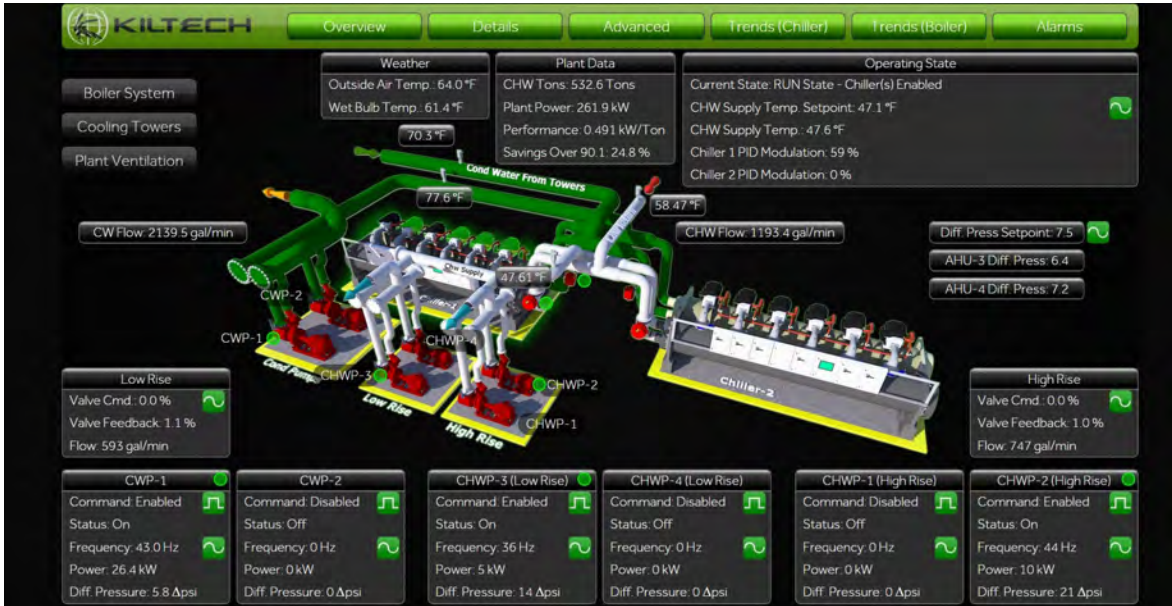
When each item of your variable speed equipment (e.g. your Smardt chiller) is operating at part-load, you save the cube of the differential of the load.

Obviously, it pays you to minimize the load on your variable speed equipment at all times.

Optimizing Operating Speed of a Total Variable Primary Flow System Aggregates Multiple Savings



A quick comparison between red and yellow bands above shows the consistent savings across a whole year achieved by a CPECS optimization system compared with a standard plant control.



Switching to CPECS Optimization Control Drives Major System-Management Savings Instantly

ALEXANDRA POINT COMMERCIAL COMPLEX ANNUAL ENERGY COSTS



Each component in this chilled water plant either has an in-built variable speed drive function (like the SmartChillers) or has had a VSD added to it. That is, the system's primary flow is inherently variable.

However, it is not until you actually engage the system's controller that you can see the significant and year-round impact on system savings.

The data above comes from Alexandra Point commercial complex in Singapore, (December 2013 to March 2015).

SETS NEW BENCHMARK IN WHOLE-PLANT ENERGY SAVINGS

The Kiltech CPECS uses complex algorithms generated by almost fifteen years of experimentation and research across the globe. When the CPECS is switched on, and your chilled water cooling system is optimized for energy efficiency, the dashboard looks like this:





SMARTD OIL-FREE CENTRIFUGAL TECHNOLOGY DRIVES CHILLER SYSTEM COST SAVINGS ACROSS THE WORLD, PROBABLY SOMEWHERE NEAR YOU

The Smardt Chiller Group now has some 8000 operating chiller installations across the world – all delivering high reliability, outstanding part-load efficiencies and the overall lowest cost of ownership to building owners. Achieving these goals as consistently and simply as possible remains Smardt's core purpose, and clearly differentiates it from competitors with conventional machines.

01. IN HOTELS

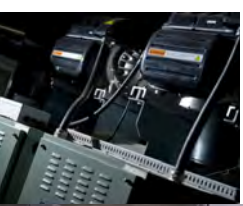
Very quiet operation with unmatched part-load efficiencies across the Smardt chiller range enables leading hotel groups across the world to maintain optimum indoor environmental comfort year round while also optimizing financial efficiency. Managing energy costs can be an ongoing challenge as seasons vary and occupancy levels fluctuate, but Smardt's flexibility and reliability provides hotel owners and operators with lowest total lifetime costs for their chillers.

02. IN HOSPITALS

Healthcare administrations across the globe find that their Smardt chillers make a critical contribution to the physical environment required for optimum patient comfort and quality care across all facilities including operating and data rooms. Unmatched redundancy from multiple compressors provides peace of mind while outstanding part-load efficiencies mean better operational performance and financial results. Some hospitals put special value on Smardt's **seismic certification** while others derive special benefits from Smardt's acoustic performance or the outstanding savings which can be delivered by heat recovery chillers.

03. IN OFFICE BUILDINGS

Energy savings throughout the year are a feature of all Smardt chiller installations, while reductions of maintenance costs of over 50% are routine, compared with lubricated standard chillers. Smardt's quiet operation and built-in redundancy are also valuable, but for most owners and managers of Smardt-cooled office buildings it is the chillers' overall lowest lifetime cost that means the most.





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01. IN SCHOOLS AND UNIVERSITIES

Comfortable classroom environments are essential pre-requisites for optimum learning performance, according to the array of modern academic studies available across the world. Minimizing lifetime chiller costs is an essential goal of K-12 school administrations, where energy cost is usually the next largest variable after staff.

In universities, commitment not only to energy efficiency but also to minimizing greenhouse gases is important to students and faculty alike. Administrators specify Smardt because of unmatched reliability and redundancy as well.

02. IN MANUFACTURING

Smardt chillers provide mission-critical cooling to leading companies in a wide range of industries – including pharmaceutical, manufacturing and research, food and beverage, automotive, chemical, petrochemical and aerospace. In addition to extraordinary reliability (no oil, so no oil system to need maintenance), significant savings in both operational energy efficiency and lower maintenance costs are routinely delivered.

03. IN DATA CENTERS

Smardt's share of new data center chiller applications is reportedly increasing across the world, as owners and operators better understand their mission-critical need not only for uninterrupted uptime throughout the year but also for optimum energy efficiency through each season. Depending on specific applications, Smardt has deployed a large number of different configurations in data centers – water-cooled, air-cooled and condenserless chillers partnered with evaporative condensers.



CERTIFICATION

All Smardt chillers are ETL-listed. Electrical safety for the life of the chiller is a fundamental requirement throughout the company. Smardt evaporators and condensers naturally conform to the ASME pressure vessel codes.



Their energy efficiency performance is certified according to AHRI standard 550/590, as is confirmed by AHRI on its website www.ahrinet.org. The IPLV performance of its chillers always exceeds minimum levels set out by ASHRAE standard 90.1, CSA 743, Eurovent, Australia's MEPS, China's CRAA and others, usually by a very considerable margin. Smardt, in company with the majority of the HVACR industry's leading engineers, considers the use of full-load energy efficiencies to predict any chiller's actual year-round energy-efficiency under US comfort-cooling conditions to be totally misleading, and therefore discourages their use.

Witness tests can be arranged on appropriate notice and for an appropriate fee on Smardt's AHRI-certified test stands in Montreal, Canada, Melbourne, Australia, Plattsburgh, USA and Guangzhou, China.

STRONG LEED CONTRIBUTION

Smardt technology can be very useful in achieving LEED certification for your building, whether in existing buildings, core and shell or new construction, because it can help win critical points in the Energy & Atmosphere category. Market research by the US Green Building Council finds that the streamlined LEED process is second only to rising energy costs as a driver for stronger adoption of green building practices and the transformation of the built environment towards sustainability. Smardt is a member of the USGBC.



STRONG SUPPORT FOR THE EPA'S RESPONSIBLE USE VISION

The EPA's Responsible Use vision encourages manufacturers, system designers and owners to invest in products and technologies which document sustainability of the highest efficiencies in tandem with lowest emissions. Smardt is a strong supporter of the vision, and the EPA.

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