

Ultra-Efficiency and
Sustainability Meet
Affordability



Arctic Cool High-Efficiency Chillers
With Magnetic Oil-Free Compressors

Better from the ground up

Arctic Cool Chillers, Ltd. is a division of the Arctic Chiller Group which includes ArctiChill, Freeze Co and Arctic Cool. With thousands of HVAC and Process chiller installations in North America and overseas.

With our two manufacturing facilities in Ontario and South Carolina, Arctic Cool can offer strong manufacturing capabilities with a high standard of quality. Both facilities are equipped with state of the art performance test labs. All chillers are run tested at the factory.

A Better Overall Approach

The Arctic Cool engineering people are veterans leveraging the remarkable Danfoss Turbocor technology. We optimize the world's leading Oil-Free magnetic bearing compressor together with the Genuine Danfoss MCX control system, and heat exchangers designed for industry leading performance.

Arctic Cool delivers a compelling combination of innovative energy efficient products using ultra-reliable direct OEM controls and the best customer support in the industry.

History of Innovation and Quality

We are one of the pioneers with Turbocor technology, and have created many innovations around its use in process and HVAC applications. We understand the foundational requirement for rock-solid control of the machine.

Using either the Genuine Danfoss MCX Adaptive Logic Controller or Tridium JACE technology, we can properly and safely provide operation that squeezes capacity and efficiency from the compressor while assuring normalized operation.

The controller simply and elegantly provides that sought after blend of reliability and optimized energy efficiency across multiple chillers, including the control of VSD cooling tower fans and bypass valves. It provides equipment scheduling and chilled water temperature resets for even higher energy savings when loads permit.

Water-Cooled Chillers to 1,400 tons

Arctic Cool standard water-cooled chillers are AHRI Certified and available from 60 tons to 1,400 tons in various configurations and with many standard options or enhancements, including economizers, trim-cooling, free-cooling and pumping systems. Chiller plants can consist of several networked chillers and related equipment and include Tridium JACE plant controllers.

Air-Cooled Chillers to 420 tons

The air-cooled chiller range includes traditional coil designs or evaporative condensing. Standard chillers are AHRI Certified. The chiller is designed with up to four independent refrigerant circuits to increase ambient range, provide redundancy and facilitate compressor staging. All air-cooled chillers are equipped with refrigerant sub-cooler circuits to maximize performance. Free cooling is available to achieve optimal energy efficiency at low ambient conditions. Options include adiabatic systems to increase efficiency in high ambients and extreme-duty 10,000 Hour Salt-Spray coatings.

Modular Chiller Range

Modular design chiller systems allow plants to operate and monitor banks of multiple chiller modules within a single PLC control. This can provide the benefit of system redundancy for assured up-time and dynamic load balancing by staging chillers and their refrigeration circuits.

- Compact Modules fit through doors.
- Allows for easy tube service.
- Master/Slave control system.
- Redundancy and Expandability.
- Modules can run independently.
- Single-point electrical and pumping option.



NEW ArcticJACE Tridium Controllers

For larger chillers up to 12 compressors and for seamless integration with our Tridium plant controllers.

The Turbocor Phenomenon

Arctic Cool Chillers are powered by the Oil Free Centrifugal Turbocor Compressor. On the Market for a decade now with over 35,000 deployed and more than 55 Million hours of operation, Danfoss Turbocor technology advancements enable new advantages for the HVACR industry.



Outstanding Energy Efficiency

The Arctic Cool chillers industry leading full load and part load efficiency enables our customers to well exceed ASHRAE 90.1 and California Title 24 energy efficiency requirements.

Totally Oil-Free

No oil management hardware, controls or oil-related downtime costs. Along with the high efficiency copper tubing and high CFM fans, excellent coil performance is obtained.

Extended life, Minimal Maintenance

Solid-state electronics, no lubrication or no metal-to-metal contact of components significantly reduces maintenance.

Onboard Controls and Power Electronics

Enables effective monitoring, control and self-diagnosis and correction of system operation.

Exceptionally Quiet Operation

70dBA (conversation level) sound with virtually no vibration. New fan diffusers can reduce air cooled fan noise by over 7dBa!

Compact Size and Low Weight

50% less footprint and 1/5 the weight of traditional compressors. The operating weight is around 300 pounds while conventional screw compressors can weigh over 1,200 pounds. Compact chiller designs are available to further reduce footprint.

Environmentally Responsible

Optimized for CFC-free HFC-134a, Non Ozone depleting, plus high-energy efficiency means reduced greenhouse gas emissions. Can also operate with new R1234ZE refrigerant for the worlds lowest carbon-footprint.

Two Controller Choices - Genuine Danfoss or Tridium

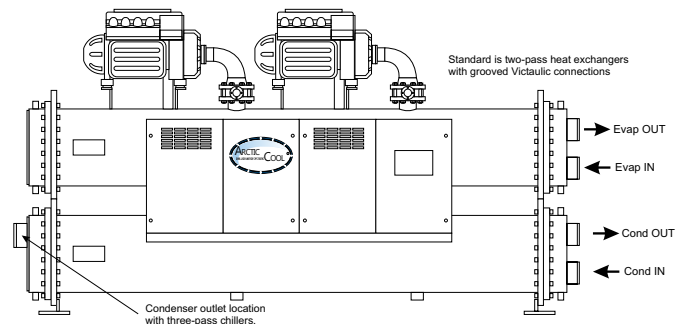
The Danfoss MCX chiller controller is designed by Danfoss specifically for their own Danfoss Turbocor compressor. The controller delivers optimized and self-redundant performance for up to 32 networked compressors. The MCX manages the operation of up to eight Turbocor compressors per chiller and avoids surge and choke operation.

The ArcticView interface has a built-in Web Server allowing the building engineer to connect to the chiller remotely and be advised by email of any critical alarm from the chiller. Arctic Cool Chillers are compatible with all BMS protocols.

Product Nomenclature

ACW	740	D	T 4 0	22	
					Tube Passes
					1 - Single Pass
					2 - Two Pass
					4 - Four Pass
					Compressor Model
					T30 - TT300 T40 - TT400
					T35 - TT350 T50 - TT500
					Compressor Quantity
				A - 1	D - 4
				B - 2	E - 5
				C - 3	F - 6
					Nominal Tons
					AHRI Conditions
					ACW - Water Cooled
					ACA - Air Cooled
					ACC - Condenserless

For Air Cooled Chillers the last characters designates fan quantity.



Marine water box connections are available as grooved or flanged connections and hinged covers for ease of service.

WORLDS BEST VALUE - Water Cooled Chillers

Arctic Cool air and water cooled chillers represent the leading edge of product performance and proven reliability in a wide range of HVAC and process applications. Our objective is providing the *Worlds Best Total Cost of Ownership*.

Ultra-efficient Danfoss Turboacor compressors are controlled by Genuine Danfoss controllers developed by Danfoss to properly control, stage, optimize and network the compressors.



WIDEST PRODUCT RANGE - Water cooled models are available up to 1,400 nominal tons in vertical stacked designs, low profile side-by-side designs and condenser-less designs for coupling to remote air cooled condensing systems. Single-circuit design is standard for highest efficiency and multiple circuits is optional.

CONTINUOUS ENERGY OPTIMIZATION - Compressor settings, tower fan speed, bypass and system resets are correlated directly with compressor pressure ratio. The magnetic drive provides performance at lower energy levels than any oil system can attain. With pump staging, fan speed and bypass valve control, a mini-chiller-plant can be obtained right from the chiller controller.

INDEPENDENT TOUCH-SCREEN INTERFACE - The Arctic Cool industrial-grade touch-screen interface is non-proprietary, widely available anywhere and very reliable. It is fully independent of the controller so the chiller operation is not dependent on the screen - this is a better approach. In fact on Danfoss controllers, owners have redundant chiller operation screens.

CHILLER STAGING - Genuine Danfoss or Tridium JACE. Up to 32 compressors across eight chillers are properly controlled, staged and energy-optimized using the high-speed network. Master-slave configuration allows floating redundant master. Equipment scheduler and load-based set-point resets are built in.

ARCTICJACE TRIDIUM OPTION - Niagara Framework native open-protocol controllers are optional and are hardware based not "SoftJace" that requires a middle-ware that runs slower compiled code. ArcticJACE is true open-protocol and runs in live execution mode for ultimate reliability, visibility and serviceability. NO need for PC with multiple processors, MS Windows, VNC or added cost.

BACKPLANE ELECTRICAL PANEL - All controls are mounted onto modern backplane for component access ease, neatness of wiring and ease and safety for service technicians. If an I/O fails, Arctic Cool can reallocate the I/O without replacing the hardware.



Low-Profile, Modular and field-assembly chillers can facility access for almost any installation.



Water Cooled Chiller Data

Water Cooled Oil Free VSD Flooded Chillers	Operational Range, Tons	Compressors		Evaporator		Condenser		Electrical			Installation	
		Type	Qty	Flow Pass	Min/Max Flow*	Flow Pass	Min/Max Flow*	FLA	Amp Draw	MCA MOCp	Dimensions L x W x H	Weight (Lbs)
ACW075AT3044	25-80	TT300	1	4	67/266	4	115/462	80	66.9	100/180		
ACW080AT30BP	25-80	TT300	1	1		1		100	80.2	125/225		
ACW090AT3042	25-90	TT300	1	4	85/341	2	166/662	80	71.2	100/180		
ACW090AT3044	25-90	TT300	1	4	85/339	4	83/332	120	91.9	150/270		
ACW125AT3544	40-125	TT350	1	4	103/410	4	103/410	135	116.4	169/304		
ACW125AT3533	40-125	TT350	1	3	135/542	3	138/551	135	118.2	169/304		
ACW120BT3022	25-120	TT300	2	2	109/435	2	124/497	128	102.9	144/208		
ACW120BT3032	25-120	TT300	2	3	134/536	2	103/411	128	116.2	144/208		
ACW150AT4022	40-150	TT400	1	2	217/868	2	212/849	140	126.9	175/315		
ACW150AT4044	40-150	TT400	1	4	174/694	4	171/682	140	125.7	175/315		
ACW150BT3044	25-180	TT300	2	4	176/702	4	170/679	160	130.9	180/260		
ACW150BT3022	25-180	TT300	2	2	133/533	2	158/632	160	133.3	180/260		
ACW180BT3022	25-180	TT300	2	2	192/768	2	186/745	200	170.3	225/325		
ACW200AT5022	50-200	TT500	1	2	190/760	2	187/748	180	155.1	200/360		
ACW220BT3522	40-250	TT350	2	2	192/768	2	186/744	240	198.7	270/390		
ACW250BT3522	40-250	TT300	2	2	240/960	2	234/938	300	252.0	337/487		
ACW250BT4022	40-300	TT400	2	2	240/960	2	234/938	240	202.0	270/390		
ACW250BT4022C	40-300	TT400	2	2	273/1091	2	273/291	240	211.9	270/390		
ACW270CT3022	25-270	TT300	3	2	243/971	2	233/932	300	251.9	325/425		
ACW270CT3042	25-270	TT300	3	4	120/481	2	233/932	300	251.9	325/425		
ACW300BT4022	40-325	TT400	2	2	348/1392	2	341/1365	280	249.8	315/455		
ACW300BT4032	40-325	TT300	2	3	232/928	2	341/1365	280	249.8	315/455		
ACW325BT5022	50-350	TT500	2	2	347/1387	2	342/1368	300	260.2	337/487		
ACW360DT3022	25-360	TT300	4	2	240/960	2	344/1377	400	323.4	425/525		
ACW375CT3522	40-375	TT350	3	2	240/960	2	344/1377	450	378.0	487/637		
ACW375CT4032	40-450	TT400	3	3	159/637	2	341/1364	360	303.0	390/510		
ACW375CT4022	40-450	TT400	3	2	240/960	2	341/1364	360	303.0	390/510		
ACW400BT5022	50-400	TT500	2	2	431/1724	2	423/1693	340	303.5	383/553		
ACW450CT4032	40-460	TT400	3	3	289/1155	2	424/1695	450	388.3	487/637		
ACW450CT4022	40-460	TT400	3	2	436/1744	2	424/1695	450	388.3	487/637		
ACW525DT4022	40-600	TT400	4	2	434/1738	2	426/1703	480	434.6	510/630		
ACW525CT5022	50-600	TT500	3	2	434/1738	2	426/1703	480	420.4	520/680		
ACW600DT4022	40-600	TT400	4	2	461/1834	2	452/1808	600	516.4	687/787		
ACW600CT5022	50-600	TT500	3	2	464/1857	2	454/1815	510	456.9	553/723		
ACW740ET4022	40-750	TT400	5	2	573/2292	2	555/2220	750	645.8	787/937		
ACW740DT5022	50-800	TT500	4	2	573/2292	2	555/2220	680	593.0	722/892		
ACW800DT5022	50-800	TT500	4	2	862/3447	2	817/3269	680	605.6	722/892		
ACW950ET5032	50-1000	TT500	5	3	577/2309	2	814/3257	850	775.4	892/1062		
ACW950ET5022	50-1000	TT500	5	2	858/3434	2	821/3282	850	747.1	892/1062		
ACW1000ET5022	50-1000	TT500	5	2	862/3448	2	812/3249	850	766.4	892/1062		
ACW1110FT5022	50-1200	TT500	6	2	754/3017	2	717/2870	960	849.2	1000/1160		
ACW1400GT5011	50-1400	TT500	7	1	1023/4092	1	1814/7256	1190	1068.6	1232/1402		
ACW1400GT5022	50-1400	TT500	7	2	1548/6192	2	798/3192	1190	1094.1	1232/1402		

Operation Range shows minimum single compressor turndown and maximum chiller capacity based on duty specific variables. All dimensions are in inches and approximate. All weights are in Lbs. All information is subject to change. Contact ArcticCool to obtain Certified dimensions and AHRI Certified selections. Minimum and Maximum flow rates are approximations based on fluid velocities inside the tubes. Nominal flow rates and changes in flow or capacity must correlate with the characteristics of the particular chiller model.

AIR SUPERIORITY - Air Cooled Chillers



Arctic Cool Air Cooled Chillers are known as the most reliable, energy efficient and serviceable chillers available with Turbocor centrifugal compressor technology. Our leaders have been engineering chillers using the Turbocor technology from its beginnings and innovated many advances.

- Highest Energy Efficiency
- New Compact footprint
- Independent Circuiting
- Robust industrial design
- Powder coated steel.
- Hot dip Galvanized base frame
- Weatherproof Electrical panels
- Coil Guards standard on all coils
- High Ambient operation capable.
- Economizers on all compressors
- Genuine Danfoss Controller
- All VFD Fans with Modbus option
- Ultra-Reliable Operational History
- Low Noise and Adiabatic Options



Quietly Keeping Sports Fans Cool
Arctic Cool was chosen to provide their remarkable air cooled chillers with highest energy efficiency, lowest noise-levels and integrated free-cooling.

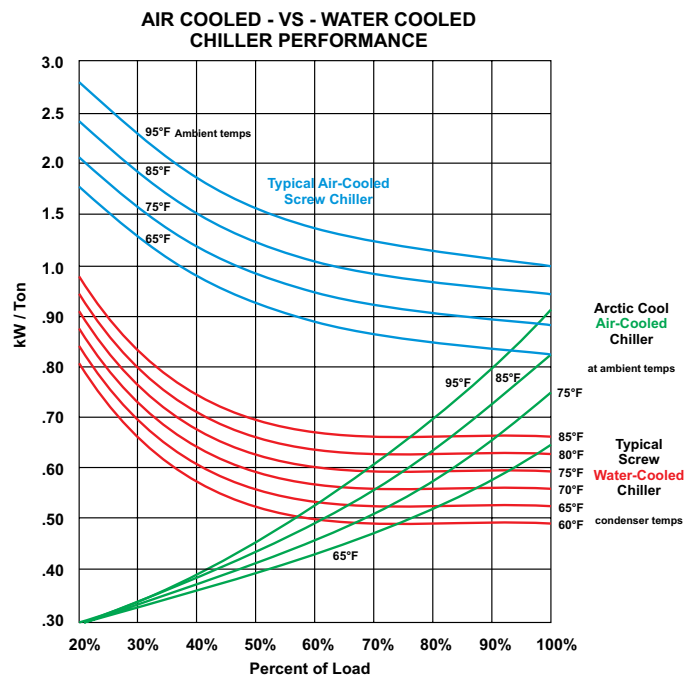


Economizer on Every Circuit
Increases capacity and efficiency and widens the range of normal high-ambient operation.



Trim and Free-Cooling
Arctic Cool makes systems to reduce chilled water temperatures using ambient air to reduce or eliminate the compressor capacity required to meet a building load.

Highest Efficiency • Oil-Free • Reliable Control
At the heart of Arctic Cool chillers is the worlds most reliable controls operating with the worlds most efficient oil-free centrifugal compressors and refrigeration systems properly designed to optimize energy savings and produce sustainable total cost of ownership benefits.

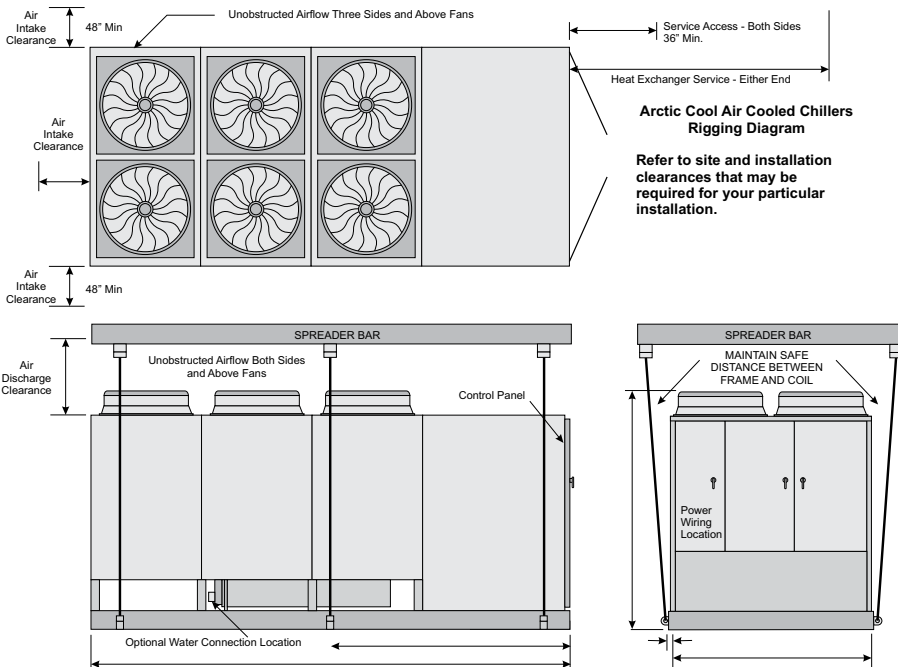


Compare Water Cooled Versus Air Cooled - Even at around 70% load, the AIR cooled chiller matches the performance of water cooled screw chillers and requires NO cooling tower, condenser pumps or water treatment.

Air Cooled Chiller Data

Air Cooled Oil Free Flooded Chillers 480/3/60	Nom Tons	Fans	Compressors		Chilled Water		Electrical			Installation	
			Type	Qty	Flow Passes	Min/Max Flow	Fuse	FLA	MCA MOCP	Dimensions L x W x H	Weight (Lbs)
ACA070AT304F	40-85	4	TT300	1	4	66/264	125	86	167/287		
ACA080AT306F	40-90	6	TT300	1	4	85/341	150	96	175/295		
ACA110AT356F	50-120	6	TT350	1	4	85/338	180	144	226/386		
ACA110BT306F	40-125	6	TT300	2	2	132/528	100	261	296/416		
ACA150BT308F	40-170	8	TT300	2	2	133/533	125	268	304/424		
ACA165BT3010F	40-170	10	TT300	2	2	193/773	150	275	313/433		
ACA180BT3510F	50-220	10	TT350	2	2	192/768	150	355	403/563		
ACA200BT3510F	50-220	10	TT350	2	2	185/738	175	355	403/563		
ACA220BT3512F	50-220	12	TT350	2	2	185/741	200	362	412/572		
ACA240CT3012F	40-250	12	TT300	3	2	240/960	150	402	442/562		
ACA320DT3016F	40-320	16	TT300	4	2	240/960	150	536	587/698		
ACA330CT3518F	50-330	18	TT350	3	2	344/1377	150	543	597/757		
ACA400DT3520F	50-500	20	TT350	4	2	436/1745	175	710	766/926		
ACA440DT3524F	425	24	TT350	4	2	431/1724	200	724	783/943		

Air Cooled Oil Free Flooded Chillers 575/3/60	Nom Tons	Fans	Compressors		Chilled Water		Electrical			Installation	
			Type	Qty	Flow Passes	Min/Max Flow	Fuse	FLA	MCA MOCP	Dimensions L x W x H	Weight (Lbs)
ACA070AT304F	40-85	4	TT300	1	4	66/264	90	114	142/242		
ACA080AT306F	40-90	6	TT300	1	4	85/341	110	121	151/251		
ACA110BT306F	40-125	6	TT300	2	2	132/528	75	221	251/351		
ACA150BT308F	40-170	8	TT300	2	2	133/533	100	228	259/359		
ACA165BT3010F	40-170	10	TT300	2	2	193/773	125	235	268/368		
ACA240CT3012F	40-250	12	TT300	3	2	240/960	110	342	377/477		



Note: All dimensions are in inches and approximate. All weights are in Lbs. Input Power is in kW. Current Draw is in Amps. Minimum and maximum flow rates are approximations based on fluid velocities required to maintain turbulent flow without excessive pressure drop or erosion.

With continuous product improvement, all information is subject to change. Refer to ArcticCool to obtain Certified dimensions and AHRI test reports.

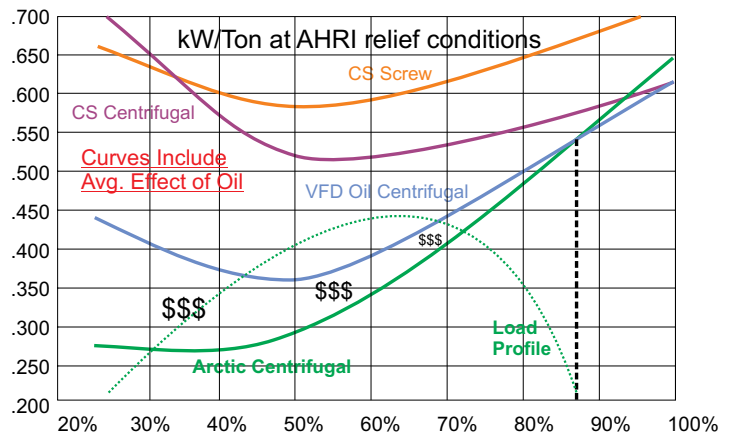
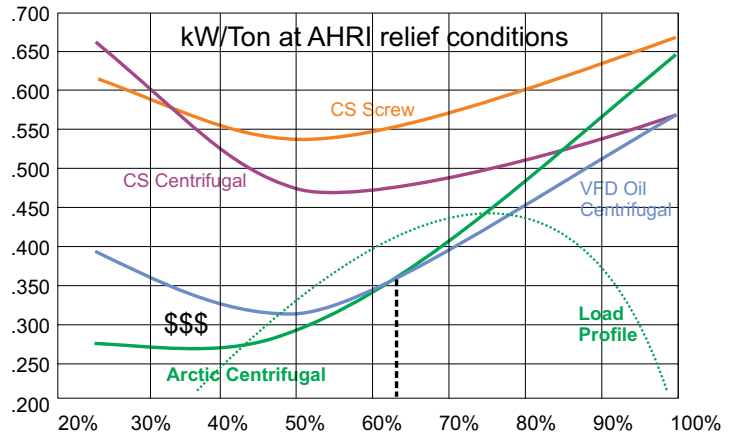
OIL-FREE spells SUSTAINABLE

Oil changes the heat transfer rate and increases fluid viscosity. It lodges in the tube wall enhancements of heat exchangers and over a few years builds an insulating barrier layer that prevents optimal heat transfer. ASHRAE proved it in a study. Then in 2001 NIST and DOE confirmed the energy-robbing effect of oil. Even an industry average of 8% U-value loss has huge energy implications.

Having no oil results in a sustainable system from the first day through its entire service life.

According to the studies with oil and R134a refrigerant:

- With high viscosity oil as in screws, properties that promote miscibility lead to reductions in heat transfer rates.
- Very small amounts of oil less than 0.5% show increased heat transfer rate but large reductions are seen between 0.5 and 1.3%. The effect increased linearly with respect to mass with the effect highest between 1.3% and 3.5%.
- Oil concentrations above 1.3% cause reductions in the bubble size at the tube surface which reduces heat transfer rates in the evaporator.
- 3.5% oil concentration correlates approximately to 8% U-Value loss which reduces the capacity and efficiency of chillers. This requires either reducing the Suction temperature or raising the chilled water temperature. This is a logarithmic effect.
- Oil service and oil related repairs are the number one service and maintenance cost to owners of chillers with traditional lubricated compressors.



Above graphs shows typical chiller performance before and after the inescapable effect of oil using the 8% average. Arctic Cool chillers show superior performance at loads below about 62% before but shows superior energy savings at much higher load points once oil has taken its toll on heat transfer rates. Properly loading the chiller and superimposing your load profile reveals areas for sustainable energy reductions over traditional lubricated bearing chillers.



Chillers featuring compressors by...



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Part of the Arctic Chiller Group

Arctic Cool Air and Water Cooled Chillers are Certified with AHRI Standard 550/590 for Water-Chilling Packages

