

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 and Arctic Cool, with thousands of HVAC and Process chiller installations worldwide.

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.

Secure remote monitoring and control is available either as a WiFi or Ethernet hard wired protocol. This enables technicians to monitor equipment and understand operations and trends in real time from anywhere in the world.

## Water-Cooled Chillers to 1,500 tons

Arctic Cool standard water-cooled chillers are AHRI Certified and available from 60 tons to 1,500 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 450 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.



**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 over a decade with over 50,000 deployed and more than 75 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. Arctic 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.

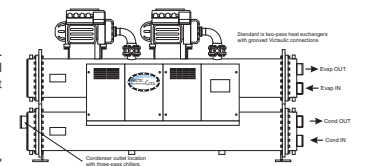
## Two Controller Choices - Genuine Danfoss or Tridium

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 Danfoss 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	800	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 - Condensersless						
						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 Turbocor 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 1,500 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.

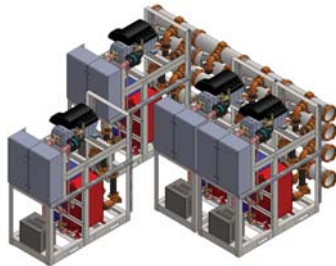
**CONTINUOUS ENERGY OPTIMIZATION** - Compressor settings, tower fan speed, bypass and system resets are correlated directly with compressor pressure ratio. The magnetic drive provides performance at lower energy levels than any oil system can attain. With pump staging, fan speed and bypass valve control, 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 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.



## Water Cooled Chiller Data

Water Cooled Oil Free 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	Dimensions L x W x H	Weight (Lbs)
ACW075AT3044	25-80	TT300	1	4	67/266	4	115/462	80	73.4	100/180	94x44x79	4,000
ACW080AT308P	25-80	TT300	1	1	52/192	1	26/240	100	80.9	125/225	77x34x79	3,000
ACW090AT3044	25-90	TT300	1	4	85/339	4	83/332	120	92.1	150/270	94x45x82	4,250
ACW090AT3544	40-90	TT350	1	4	85/339	4	83/332	120	98.3	160/290	98x45x82	4,300
ACW125AT3544	40-125	TT350	1	4	103/410	4	103/410	135	119.7	169/304	100x43x81	4,850
ACW150AT4022	40-150	TT400	1	2	217/868	2	212/849	140	138.7	175/315	118x45x85	4,600
ACW150AT4044	40-150	TT400	1	4	174/694	4	171/682	140	129.1	175/315	104x54x91	4,860
ACW150BT3044	25-180	TT300	2	4	176/702	4	170/679	160	130.9	180/260	103x53x90	4,860
ACW150BT3044C	25-180	TT300	2	4	176/702	4	170/679	160	168.1	180/260	104x54x91	7,100
ACW150BT3022	25-180	TT300	2	2	133/533	2	158/632	160	173.9	180/260	142x54x91	4,860
ACW180BT3022	25-180	TT300	2	2	192/768	2	186/745	200	179.1	225/325	142x54x79	5,900
ACW200BT3522	40-250	TT350	2	2	192/768	2	186/744	240	234.5	270/390	142x45x83	6,600
ACW200BT3521L	40-250	TT350	2	2	192/768	2	186/744	240	234.5	270/390	142x50x87	7,000
ACW250BT3522	40-250	TT350	2	2	240/960	2	234/938	300	252.0	337/487	148x45x83	7,860
ACW250BT3521L	40-250	TT350	2	2	240/960	2	234/938	300	252.0	337/487	148x54x87	7,860
ACW250BT4022	40-300	TT400	2	2	240/960	2	234/938	240	223.5	270/390	159x50x89	7,860
ACW250BT4021L	40-300	TT400	2	2	240/960	2	234/938	240	223.5	270/390	132x55x69	7,860
ACW250BT4044L	40-300	TT400	2	4	205/960	4	285/938	240	237.5	270/390	97x72x76	7,860
ACW250BT4032	40-300	TT400	2	3	160/640	2	233/932	240	223.5	270/390	169x50x88	7,500
ACW250BT4033C	40-300	TT400	2	3	240/960	3	234/938	240	223.5	270/390	100x62x102	7,500
ACW270CT3022	25-270	TT300	3	2	243/971	2	233/932	300	253.9	325/425	173x46x94	8,560
ACW300BT4022	40-325	TT400	2	2	348/1392	2	341/1365	280	264.5	315/455	155x48x94	8,800
ACW300BT4021L	40-325	TT400	2	2	348/1392	2	341/1365	280	264.5	315/455	144x56x89	8,600
ACW325BT5022	50-350	TT500	2	2	347/1387	2	342/1368	300	273.3	337/487	155x48x94	9,000
ACW360DT3022	25-360	TT300	4	2	240/960	2	344/1377	400	339.6	425/525	168x57x95	9,500
ACW375CT3522	40-375	TT350	3	2	240/960	2	344/1377	450	378.3	487/637	168x49x97	9,260
ACW375CT4022	40-450	TT400	3	2	240/960	2	341/1364	360	334.6	390/510	168x49x97	9,260
ACW400BT5022	50-400	TT500	2	2	431/1724	2	423/1693	340	330.3	383/553	169x66x75	10,600
ACW400BT5021L	50-400	TT500	2	2	431/1724	2	423/1693	340	330.3	383/553	173x66x75	10,860
ACW450CT4022	40-460	TT400	3	2	436/1744	2	424/1695	450	388.3	487/637	176x53x101	11,600
ACW450CT4021L	40-460	TT400	3	2	436/1744	2	424/1695	450	388.3	487/637	169x65x68	13,830
ACW525DT4022	40-600	TT400	4	2	434/1738	2	426/1703	480	434.6	510/630	171x65x104	12,700
ACW525CT5022	50-600	TT500	3	2	434/1738	2	426/1703	480	445.2	520/680	171x57x105	13,500
ACW525CT5021L	50-600	TT500	3	2	434/1738	2	426/1703	480	445.2	520/680	171x72x70	13,500
ACW600DT4022	40-600	TT400	4	2	461/1857	2	454/1815	600	524.7	687/787	172x69x112	14,150
ACW600CT5022	50-600	TT500	3	2	461/1857	2	454/1815	510	261.2	553/723	172x69x112	14,150
ACW700BT4022	40-750	TT400	5	2	573/2292	2	555/2220	750	647.2	787/937	174x68x118	16,530
ACW800DT5022	50-800	TT500	4	2	862/3447	2	817/3269	680	614.4	722/892	172x71x118	17,250
ACW900BT4022	40-900	TT400	6	2	858/3434	2	821/3282	817	777.8	850/1000	221x68x111	20,250
ACW900BT5022	50-1000	TT500	5	2	858/3434	2	821/3282	850	778.6	892/1062	221x68x111	19,950
ACW1000BT5022	50-1000	TT500	5	2	862/3448	2	812/3249	850	781.2	892/1062	221x68x111	19,950
ACW1100BT5022	50-1200	TT500	6	2	754/3017	2	717/2870	960	963.2	1000/1160	221x68x111	20,500
ACW1200BT5022	50-1200	TT500	6	2	823/3291	2	782/3131	978	937.4	1018/1201	242x72x98	24,500
ACW1400GT5011	50-1400	TT500	7	1	1023/4092	1	1814/7256	1190	1055.3	1232/1402	251x90x89	34,500
ACW1400GT5022	50-1400	TT500	7	2	1548/6192	2	798/3192	1190	1110.6	1232/1402	239x106x91	30,200
ACW1500HT5022	50-1600	TT500	8	2	1659/6634	2	855/3420	1301	1240.0	1343/1600	283x62x70	31,500

\* All Electrical data is based on nominal capacities at 402/300 service as tested and Certified by AHRI. Refer to AHRI for specific testing criteria and efficiency data. 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 Turboacor centrifugal compressor technology. Our leaders have been engineering chillers using the Turboacor 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



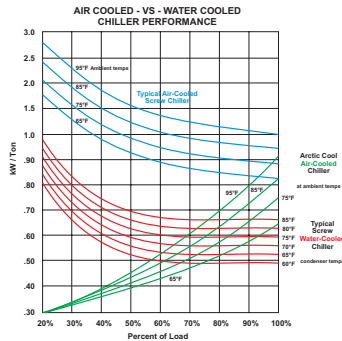
Quietly Keeping Sports Fans Cool  
Arctic Cool was chosen to provide their remarkable air cooled chillers with highest energy efficiency, lowest noise-levels and integrated free-cooling.

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 MOC/P	Dimensions L x W x H	Weight (Lbs)
ACA070AT304F	40-85	4	TT300	1	4	66/264	125	86	167/287	115x96x117	6,000
ACA080AT306F	40-90	6	TT300	1	4	85/341	150	96	175/295	162x96x117	9,360
ACA110AT356F	50-120	6	TT350	1	4	85/338	180	144	226/386	162x96x110	9,360
ACA110BT306F	40-125	6	TT300	2	2	132/528	100	261	296/416	162x96x110	10,300
ACA150BT308F	40-170	8	TT300	2	2	133/533	125	268	304/424	217x96x111	14,100
ACA165BT3010F	40-170	10	TT300	2	2	193/773	150	275	313/433	254x96x110	15,300
ACA200BT3510F	50-220	10	TT350	2	2	185/738	175	355	403/563	254x96x110	15,500
ACA220BT3512F	50-220	12	TT350	2	2	185/741	200	362	412/572	301x96x111	16,500
ACA240CT3012F	40-250	12	TT300	3	2	240/960	150	402	442/562	301x96x111	16,500
ACA330CT3518F	50-330	18	TT350	3	2	344/1377	150	543	597/757	436x96x110	24,000
ACA400DT3520F	50-450	20	TT350	4	2	436/1745	175	710	766/926	545x96x111	34,600

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 MOC/P	Dimensions L x W x H	Weight (Lbs)
ACA070AT304F	40-85	4	TT300	1	4	66/264	90	114	142/242	117x96x117	6,000
ACA080AT306F	40-90	6	TT300	1	4	85/341	110	121	151/251	162x96x117	9,800
ACA110BT306F	40-125	6	TT300	2	2	132/528	75	221	251/351	162x96x110	10,300
ACA150BT308F	40-170	8	TT300	2	2	133/533	100	228	259/359	217x96x111	14,100
ACA165BT3010F	40-170	10	TT300	2	2	193/773	125	235	268/368	254x96x110	15,300
ACA240CT3012F	40-250	12	TT300	3	2	240/960	110	342	377/477	301x96x111	16,700

\* All Electrical data is based on nominal capacities at 460/3/60 service as tested and Certified by AHRI. Refer to AHRI for specific testing criteria and efficiency data. 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.

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



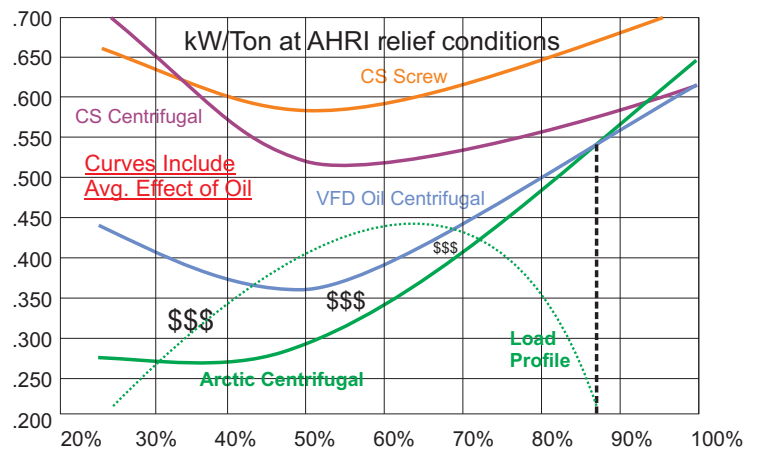
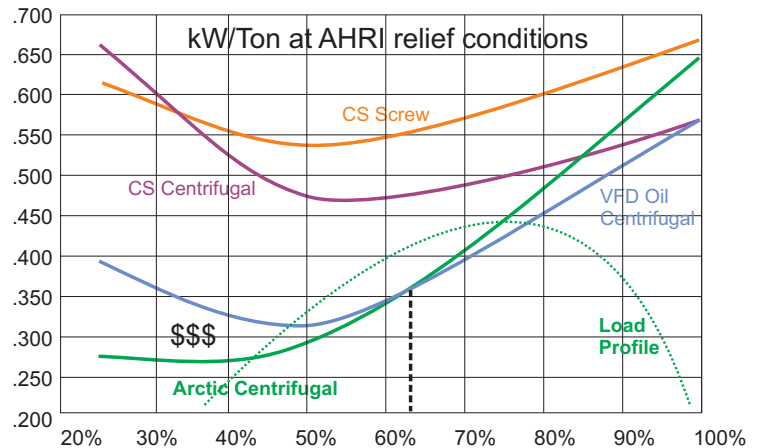
# OIL-FREE means SUSTAINABLE

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...



Manufacturing Facilities  
Ontario, Canada  
South Carolina, USA  
Padua, Italy

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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

