THERMAL MANAGEMENT

MLC Air-Cooled Chillers
MLC-FC Free-Cooling Chillers
MLC-AD Adiabatic Chillers

60-500 tons

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by Schneider Electric

The Ultimate Solution For Optimal Energy Savings

The pioneer of free-cooling chiller technology, Motivair's MLC-FC Chillers are ETL-Tested and Listed to current UL & CSA standards

The Motivair® MLC-FC chillers with "Free-Cooling" capability are designed to provide the owner with optimal performance, year-round, in varying ambient temperatures.

AVAILABLE MODELS

This "Free-Cooling" option, available on models MLC-FC 200 – MLC-FC 1750 is supplied with "Free-Cooling" coil and the PC05 advanced PLC control package – a unique single package for year-round energy savings.

The refrigerant plant is designed to cool the designated heat load during the highest summer temperatures.

When ambient temperatures fall overnight or during cooler seasonal weather, the integrated "Free-Cooling" system is automatically activated.

HOW THE SYSTEM WORKS

The system operates by directing the return chilled glycol through the "Free-Cooling" coil, before it enters the evaporator.

This is achieved via an automatic motorized valve, controlled the PLC, whenever the ambient falls below the return chilled glycol temperature set point.

The glycol is either partially or completely cooled in the "Free Cooling" coil for maximum energy savings.

THE BENEFITS OF FREE COOLING

As result, less mechanical refrigeration is required to achieve the chilled glycol set point, and the refrigeration compressors are cycled off by the PLC, which continuously monitors the system.

Energy savings in areas with cooler winter months are substantial.
Wear and tear on chiller components is dramatically reduced, due to fewer running hours during winter months.

Automatic switching between mechanical cooling and "Free Cooling" allows for optimal performance year-round.

As a general guideline, "Free-Cooling" savings more than pay for the initial investment in the first year of operation.

APPLICATION DEFINED FEATURES AND OPTIONS

1 INDUSTRIAL SCREW COMPRESSORS

All MLC chillers feature two heavy-duty, 3500-RPM semi-hermetic screw compressors mounted in two completely independent refrigeration circuits.

Each compressor features four steps of unloading for virtually unlimited capacity control.

2 CONDESNER FAN

Fans feature heavy-duty, composite blades, which do not flex or lose efficiency at the top of their performance curve.

Motors feature reversed stator and rotor, eliminating the traditional motor shaft. Motors are TEAO; suitable for outdoor use, and variable speed operation. Optional EC fan technology available.

3 EVAPORATORS

The MLC & MLC-FC chillers feature an ASME U stamped, dual circuited evaporator mounted on the chiller base. Carbon steel shell with heavy gauge copper tubes insures long life and highly efficient heat transfer under varying loads. All MLC evaporators feature removable end bonnets and pressure relief valves.
Low GWP options: R-1234ZE, R-513A.

4 ADDITIONAL OPTIONS

- Simplex (1) or Duplex (2) Pump Package
- Storage Tank
- Low Noise or Ultra Low Noise Package
- High Ambient Package
- Stainless Steel Cabinet Construction
- Condenser Coil Coating
- Security Guards for Open Areas
- Integrated Free-Cooling System
- Adiabatic System

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Adiabatic "Efficiency Boosting" System

AIR-COOLED CHILLER SYSTEMS

The Motivair Adiabatic "Efficiency Boosting" System uses a proprietary evaporative "Pre-Cooling" media designed to pre-cool warm ambient air before it reaches the air-cooled chiller condenser coils.

During warmer seasonal weather, the Adiabatic System automatically activates and allows a small flow of city water to wet the evaporative media.

Warm, dry air first passes through the evaporative media where it is pre-cooled before it enters the condenser coils. Water that is not evaporated is collected and recycled.

Depending on geographic location, inlet air temperatures can be reduced by up to 20°F yielding significant chiller efficiency gains, increased reliability during extreme summer weather, and reduced building energy demand loads.

The evaporative media is specifically designed for ultra-low pressure drop with virtually no added static to condenser fans.

As a factory supplied option, media thickness and air flow velocities are designed to allow zero water carry over onto the chiller coils.

The evaporative media is easily removed for field service, cleaning or inexpensive replacement.

Virtually maintenance-free and requiring little or no water treatment, the Adiabatic System is ideal for clients seeking simple and reliable efficiency gains for their air-cooled chiller system.

FREE-COOLING CHILLER SYSTEMS

Motivair Free-Cooling chillers can be ordered with the adiabatic option fitted.

By automatically turning on the system when Free Cooling is active and the ambient temperature is above freezing, partial and 100% Free-Cooling operating hours can be significantly increased.

This allows the refrigeration compressors to be turned off for longer periods of time, in addition to the improved summer air cooled efficiency described above.

The Adiabatic System is controlled and protected by the proprietary Motivair chiller PLC software and is completely automatic including auto fill, winter drain down, low water level and anti-freeze alarms.

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Gain Speed to Insight with Centurion Monitoring System

Available on select Motivair chillers as an optional feature, the Centurion ™ Monitoring System provides owners access to critical data and a range of safeties measures.

FEATURES

1 **DATA TRENDING**

2 **ADJUSTABLE WARNING THRESHOLDS**

3 **PASSWORD-PROTECTED MULTI-LEVEL ACCESS**

Leverage predictive analytics and gain insights to critical data from a remote location via cellular service, outside of the customer's firewall.

The new monitoring system empowers the owner by offering a fully transparent exchange of encrypted data between the owner and chiller from a remote location via cellular service, outside of the firewall. If the chiller is operating in an unsafe condition or in the unlikely event of an alarm, designated contacts are immediately notified by the chiller of its condition. The pending alarm can then be avoided or quickly corrected.

PLC CONTROL FEATURES:

The MLC range features the PCO5 control system, which is an advanced Programmable Logic Controller, with a base-operating platform that can be easily modified to adapt to various applications. A multi-character LCD display, and easy to follow directional prompts, gives the operator complete control over all chiller functions. Multiple digital and analog inputs as well as digital and PWM outputs offer unparalleled control possibilities.

INTELLIGENT CHILLER RESPONSE

Motivair® software allows the chiller to respond to system changes in real time, adjust performance accordingly, providing:

- Automatic restart after a power outage
- Rapid restart of refrigeration compressors after a power outage, while affording maximum compressor protection
- Selective decision on which compressor(s) to start first based on run-time and fastest possible response to system load
- Liquid injection to the compressors under high ambient operation
- Seamless change from refrigeration & optional Free Cooling mode based on system load, chilled water temp, ambient temp and installation profile.

CONTROL FEATURES:

- Highly visible LCD display
- Tactile push-buttons
- Adjustable alarm set points
- °F/°C selectable
- Compressor Lead/Lag control
- Anti-Compressor short cycle
- Compressor failure alarm
- Adjustable water set point
- Supply water temp. display
- Return water temp. display
- Low water temperature alarm
- Freeze alarm
- Low water/glycol flow alarm
- High water temperature alarm
- Low refrigeration pressure alarm
- High refrigeration pressure alarm
- Irregular voltage alarm
- General Alarm Relay
- Remote Start/Stop Relay
- Manual alarm reset
- RS 232/RS 485 communication
- Ethernet Communication
- LON, BACNET, MODBUS communication (optional)

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Technical Specifications

MLC & MLC-FC CHILLER RANGE WITH SCREW COMPRESSORS	MLC	200	270	340	390	510	560	600	660	820	930	1100	1150	1200	1400	1600	1750
Nominal Cooling Capacity*	BTU/HR	692,906	849,526	972,950	1,249,580	1,471,259	1,817,046	2,054,367	2,312,008	2,542,532	2,976,465	3,437,480	4,034,146	4,427,370	4,624,016	5,085,064	5,953,930
Nominal Cooling Capacity	TON	57.7	70.8	81.1	104.1	122.6	151.4	171.2	192.7	211.9	248.0	286.5	336.2	368.9	385.3	423.7	496.0
100% Free Cooling Ambient Temperature	°F	32.0	28.0	26.0	26.0	23.0	23.0	23.0	24.0	22.0	22.0	22.0	24.0	22.0	24.0	22.0	22.0
Refrigerating Circuit	QTY	2	2	2	2	2	2	2	2	2	2	2	2	2	4	4	4
Screw Compressor	QTY	2	2	2	2	2	2	2	2	2	2	2	2	2	4	4	4
Capacity Steps (Per Compressor)	QTY	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
FANS & CONDENSER		Axial EC Fans & Copper Tube with Aluminum Fin Condenser															
MLC Total Condenser Air Flow	CFM	72,848	67,273	64,273	64,273	85,697	85,697	107,121	128,545	128,545	171,394	171,394	214,242	235,667	257,090	257,090	342,788
MLC Fans	QTY	4	6	6	6	8	8	10	12	12	16	16	20	22	24	24	32
MLC-FC Total Condenser Air Flow	CFM	60,035	60,035	60,035	80,047	80,047	100,058	120,070	140,082	140,082	160,093	180,105	220,128	220,128	280,164	280,164	320,186
MLC-FC Fans	QTY	6	6	6	8	8	10	12	14	14	16	18	22	22	28	32	36
PUMP & TANK (OPTIONAL)		Simplex or Duplex Pump Options, Carbon Steel or Stainless Steel Tank Options															
Nominal Flow	GPM	140	171	196	252	296	366	414	466	512	600	692	813	892	932	1,024	1,200
Optional Pump Pressure	PSI	39.2	43.5	30.5	33.4	33.4	35	35.5	36.3	43.5	40.6	45	37.7	46.4	N/A	N/A	N/A
Optional Pump Absorbed Power	HP	7.5	10	10	15	15	20	25	25	30	30	40	50	60	N/A	N/A	N/A
Optional Pump Absorbed Current	A	11	14	14	21	21	27	34	34	40	40	52	65	77	N/A	N/A	N/A
Flanged Chilled Water Connections	IN	4	4	4	5	5	6	6	6	6	8	8	8	8	8	8	8
Optional Tank Volume	GAL	150	150	150	150	150	150	200	200	200	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ELECTRICAL DATA		Does not include optional pump(s)															
Power Circuit	V/Ph/Hz	460/3/60 (575/3/60 Optional)															
Auxiliary Circuit	V/Ph/Hz	(230-24)/1/60															
MLC Full Load Amps (FLA)	A	106	127.8	138.9	189.1	218.5	274.4	311.9	336.7	386.5	459	510.2	585.5	654.1	673.4	773	918
MLC Min Circuit Ampacity (MCA)	A	117.3	140.9	153.4	209.9	242	304.9	346.2	373.1	429.1	508.8	566.3	649.2	725.4	709.8	815.6	967.8
MLC Max Overcurrent Protection (MOP)	A	162.7	193.5	211.5	293.1	336	426.8	483.1	518.7	599.5	707.9	791	903.9	1010.7	855.4	986.1	1,166.9
MLC-FC Full Load Amps (FLA)	A	113.8	129.6	142.7	196.7	224.1	276.9	320.1	336.1	389.2	459.9	508.3	616.8	704.9	672.2	778.4	919.8
MLC-FC Min Circuit Ampacity (MCA)	A	125.2	143	157.6	217.5	248.3	306.8	345.4	374.3	434	513.1	567	683.5	782.6	710.4	823.3	972.9
MLC-FC Max Overcurrent Protection (MOP)	A	170.6	196.4	217.6	300.7	345.2	426.2	491.7	527.1	613.3	725.6	801.5	950.1	1093.3	863.2	1002.6	1,185.5
NOISE DATA		Distance measured in an open field at 33ft from condenser															
MLC Sound Pressure Level	dbA	65.1	66.7	67.9	67.4	68	70.4	72	71.3	71.5	72.6	72.8	73.7	74.4	72.8	73.7	74.4
MLC-FC Sound Pressure Level	dbA	65.9	66.7	67.9	67.9	68	70.7	72.2	71.5	71.8	72.6	72.9	73.8	74.4	72.9	73.8	74.4
DIMENSIONS & WEIGHTS																	
MLC Length	IN	122	159.4	159.4	159.4	196.9	196.9	234.3	271.7	271.7	346.5	346.5	421.3	458.7	567.4	567.4	693
MLC Width	IN	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
MLC Height	IN	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5
MLC-FC Length	IN	159.4	159.4	159.4	196.9	196.9	234.3	271.7	309.1	309.1	346.5	383.9	458.7	458.7	618.2	618.2	693
MLC-FC Width	IN	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
MLC-FC Height	IN	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5
MLC Weight - Dry Weight	LBS	6,945	9,039	9,259	9,480	10,141	10,362	12,897	14,330	14,551	18,519	18,739	22,928	24,912	28,660	29,102	37,038
MLC-FC Weight - Dry Weight	LBS	9,480	9,675	9,921	11,244	11,485	13,669	15,432	17,637	18,078	19,290	21,385	25,574	25,904	35,274	36,156	38,580

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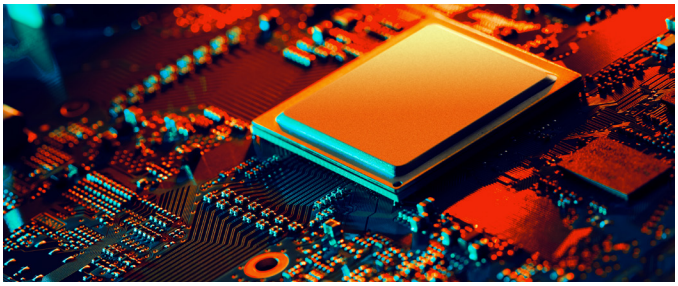
We cool the most advanced technology on the planet

We discover, design, and develop resilient thermal technologies and strategies, and convert that into actionable insights and unparalleled value for our clients.

From climate research to finance, cloud to artificial intelligence, customers trust Motivair's cooling technologies so they can break new boundaries and help deliver tomorrow's innovations faster.

We're helping our clients discover cures for diseases, combat climate change, and make tomorrow's data-driven services more reliable and accessible.

We are touching millions of lives each day by providing the critical cooling technology to support productivity and innovation that is changing our world.



DIRECT-TO-CHIP COOLING

Supercomputing isn't just in the lab anymore. The power of high-performance computing is scaling out as more enterprises and corporations look to utilize artificial intelligence for advanced decision-making and accelerate digital transformation.

DATA CENTER & IT COOLING

Designed for and used by the enterprise data center and supercomputer owners and operators, our cooling technology is engineered to help you leap forward in scale, quality, and speed.

THERMAL MANAGEMENT

When it comes to cooling your critical infrastructure, we work to customize specialty chiller technology for you, rather than selecting from a catalog

CLIENT SERVICES GROUP

Manage every aspect of your cooling infrastructure, from planning and design to start up, commissioning and post-sale performance. Your business depends not only on our products but also our ability to respond when you need us.

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