motivair®
COOLING SOLUTIONS

MLC-SC Air-Cooled Scroll Chillers

100 – 285 Tons

When commercial grade isn't enough

Businesses functioning in today's advanced industrial manufacturing and mission critical environments rely on chiller systems to provide a reliable source of chilled water which can improve overall system uptime and efficiencies.

Every critical cooling application is unique in its own way which is why the Motivair® MLC-SC scroll chiller range has been designed to accommodate a wide range of operating points and customization based specifically on the needs of the customer. No other air-cooled chiller offers such a broad range of features and benefits that can be used in combination to create a chiller best suited for your business's needs.

Designed for a Purpose...

SCROLL COMPRESSORS

Multiple high efficiency scroll compressors with R-410A refrigerant. Designed to operate at high efficiency across the entire operating range with lower sound and vibration than traditional compressors. Unique scroll compressor design allows for resistance to liquid slugging.

CONDENSER FAN & MOTORS

Each fan features Electronically Commutated (EC) variable speed motor technology, globally recognized as the most efficient axial fans available in today's HVAC market.

More efficient than VFD speed control, EC motors offer the highest efficiencies and added chiller redundancy. These exceptionally reliable motors feature a reversed stator and rotor, which eliminates the traditional fan motor shaft. The outer shell of the motor is the rotating body, to which the fan blades are bolted. This unique arrangement reduces torque stress on the blades, eliminates fan blade stress fractures, maximizes airflow and maintains efficiency over the entire fan performance curve.

CONDENSER & FREE COOLING OPTION

V-Coil profile constructed from seamless copper tubes expanded into aluminum fins creates a high efficiency design with minimal pressure drop. Coils are easily maintained with access through removable panels.

Optional Free-Cooling features exclusive integrated condenser/free-cooling coil with ultra-low pressure drop and inherent redundancy.

Modular design creates opportunities for custom coil configurations.

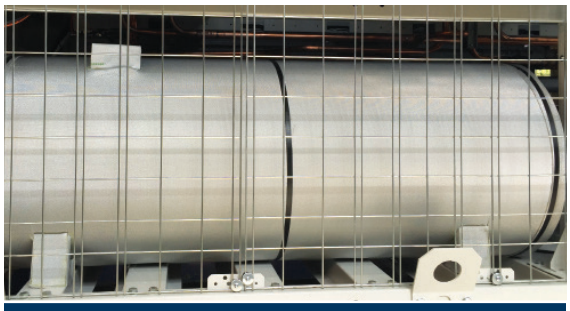
EVAPORATION

Shell and tube evaporator features two independent refrigeration circuits (optional 3 circuit design available). Low pressure drop design on both the water and refrigerant circuits creates maximum efficiency. Custom profile options allow for a wide operating range under various design conditions.

Application Defined Options

OPTIONAL DUPLEX PUMPS

- Simplex (1) Pump Package
- Duplex (2) Pump Package
- Storage Tank
- 3x Refrigeration Circuits
- Low Noise Package
- Ultra Low Noise Package
- High Ambient Package
- Stainless Steel Cabinet Construction
- Condenser Coil Coating
- Security Guards for Open Areas
- Integrated Free-Cooling System



OPTIONAL STORAGE TANK

STANDARD FEATURES:

- R-410A Refrigerant
- Factory Installed Flow Switch
- Locking Disconnect Switch
- Phase and Power Monitoring
- Advanced PLC Control System
- Heavy Duty Galvanized Steel Frame with Baked Powder Epoxy Coat Finish
- Designed for Easy Service Access
- Electrical Panel Heating & Cooling System

OPTIONAL 3X REFRIGERATION CIRCUITS

WHEN DOWNTIME IS NOT AN OPTION

Integrated Free-Cooling: The Ultimate Solution for Optimal Energy Savings

The Motivair® MLC-SC-FC chillers with integrated "Free-Cooling" are designed to provide the owner with optimal performance, year round, in varying ambient temperatures. This "Free-Cooling" option, available on all MLC-SC models and comes standard with Motivair's advanced PLC control package – a unique single package for year-round energy savings.

The high efficiency scroll compressor plant is designed to cool the designated heat load during summer months. When ambient temperatures fall overnight or during cooler seasonal weather, the integrated "Free-Cooling" system is automatically activated.

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 by 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.

As a result, less mechanical refrigeration is required to achieve the chilled glycol set point, and the scroll compressors are staged down and eventually turned off by the PLC, which continuously monitors the system. Energy savings in areas with cooler winter months are substantial. The ability to allow the compressors to stage off in cooler weather further drives overall chiller efficiencies. Wear and tear on chiller components is dramatically reduced, due to fewer start-ups and running hours during winter months.

Automatic switching between mechanical cooling and "Free-Cooling" is seamless, which allows optimal performance year round. As a general rule of thumb, "Free-Cooling" savings more than pay for the initial investment in the first year of operation!

THE PIONEER OF FREE-COOLING CHILLERS

When Maximum Uptime And Lowest TCO Matter Most

- MLC-FC Chiller Range has been designed, built and tested specifically as packaged Free Cooling Chillers
- ETL-Tested and Listed to current UL & CSA standards

PLC Controls

WHEN MAXIMUM UPTIME AND LOWEST TCO MATTER MOST

The MLC-SC 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.

BOARD INTELLIGENT CHILLER RESPONSE

The latest generation of Motivair® software allows the chillers to respond to system changes in real time and to adjust performance accordingly. The proprietary control logic in the MLC-SC or MLC-SC-FC chillers provides:

- 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 transition between refrigeration and optional Free Cooling mode based on system load, chilled water temperature, ambient temperatures 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)

MLC & MLC-FC CONTROLS
PC05 Display PC05

CENTURION MONITORING SYSTEM

This optional feature empowers the owner by providing a wide range of safeties and access to critical data from a remote location via cellular service, outside of the customer's 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.

FEATURES:

- Data trending
- Password protected multi-level access
- Adjustable warning thresholds

MLC-SC/MLC-SC-FC Specifications

MLC-SC-A CHILLER RANGE WITH SCROLL COMPRESSORS	MLC-SC	200	270	340	390	460	490	510	560	600	660	690	820	930	1100	1150
Nominal Cooling Capacity*	BTU/HR	825,244	988,899	1,207,163	1,336,735	1,466,341	1,691,402	1,834,600	1,953,961	2,185,851	2,318,838	2,434,784	2,932,648	3,109,964	3,607,829	3,805,636
Nominal Cooling Capacity	TON	69	82	101	111	122	141	153	163	182	193	203	244	259	301	317
Type Of Refrigerant	TYPE	R-410a														
Number Of Refrigerating Circuits	QTY	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3
Total Compressor Running Current	A	112	149	160	186	217	232	260	288	301	332	365	431	482	477	521
Number Of Compressors	QTY	4	4	4	4	4	4	6	6	6	6	6	9	9	9	9
Capacity Steps	QTY	4	4	4	4	4	4	4	4	4	4	4	6	6	6	6
EVAPORATOR		**Shell & Tube**														
Nominal Flow Rate	GPM	183	219	267	296	325	375	407	433	484	514	540	650	689	799	843
Pressure Drops (Evaporator + Valves + Piping)	PSI	10	8	10	9	9	11	10	10	10	10	9	10	9	11	10
PUMP & TANK (OPTIONAL)		**Simplex or Duplex Pump Options, Carbon Steel or Stainless Steel Tank Options**														
Maximum Pump Absorbed Power	KW	7.5	11	11	15	15	18.5	18.5	18.5	22	22	30	30	CF	CF	CF
Maximum Pump Absorbed Current	A	13.2	20.3	20.3	26.9	26.9	32.1	32.1	32.1	39.5	39.5	52	52	CF	CF	CF
Available External Pressure (Single)	PSI	32.2	36.9	35.0	40.3	36.7	33.6	31.8	33.2	42.7	43.5	38.6	31.3	CF	CF	CF
Tank Volume	GAL	79	100	100	132	132	132	132	132	159	159	159	159	159	159	159
FANS & CONDENSER		**Axial EC Fans & Copper Tube with Aluminum Fin Condenser**														
Fan Electronic Fan Speed Control	TYPE	EC														
Fan Quantity	QTY	4	4	6	6	6	8	8	8	10	10	10	12	12	18	18
Fan Total Absorbed Power	kW	10.2	10.2	15.4	15.4	15.4	20.5	20.5	20.5	25.6	25.6	25.6	30.7	30.7	46.1	46.1
Fan Total Absorbed Current	A	15.6	15.6	23.4	23.4	23.4	31.2	31.2	31.2	39.0	39.0	39.0	46.8	46.8	70.2	70.2
Total Air Flow	CFM	51,324	51,324	76,986	76,986	76,986	102,648	102,648	102,648	128,310	128,310	128,310	153,972	153,972	230,958	230,958
NOISE DATA		**Distance measured in an open field at 33 feet from Condenser**														
Sound Pressure Level	DB(A)	68.1	70.0	70.3	70.0	72.0	73.7	71.7	71.5	73.4	74.4	75.3	73.3	74.8	76.4	77.2
ELECTRICAL DATA		**Does not include optional pump(s)**														
Power Circuit	V/PH/HZ	460/3/60														
Full Load Current (FLA)	FLA	128	165	184	209	241	263	291	319	340	371	404	478	529	547	591
Minimum Circuit Ampacity (MCA)	MCA	135	174	194	221	254	277	302	331	353	385	419	490	542	560	606
Maximum Overcurrent Protection (MOP)	MOP	163	211	234	268	309	335	346	379	403	440	480	538	596	613	664
DIMENSIONS & WEIGHTS																
Length	IN	127	127	178	178	178	230	230	230	281	281	281	332	332	471	471
Width	IN	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
Height	IN	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96
Estimated. Shipping Weight	LBS.	5,732	5,732	7,341	7,341	7,341	9,789	9,789	9,789	12,236	12,236	12,236	15,939	15,939	22,024	22,024
Hydraulic Connections (Inlet/Outlet)	IN	5	5	5	6	6	6	6	6	6	6	8	8	8	8	8

MLC-SC-FC CHILLER RANGE WITH SCROLL COMPRESSORS	MLC-SC-FC	200	270	340	390	460	490	510	560	600	660	690	820	930	1100
Nominal Cooling Capacity*	BTU/HR	777,500	1,023,017	1,142,377	1,343,566	1,476,553	1,595,913	1,817,558	1,933,504	2,148,353	2,274,509	2,485,943	3,024,722	3,222,495	3,413,471
Nominal Cooling Capacity	TON	65	85	95	112	123	133	151	161	179	190	207	252	269	284
100% Free Cooling Ambient Temperature	°F	29	33	30	33	31	29	32	30	32	30	32	33	32	30
Type Of Refrigerant Gas	TYPE	R-410a													
Number Of Refrigerating Circuits	QTY	2	2	2	2	2	2	2	2	2	2	2	3	3	3
Total Compressor Running Current	A	119	144	171	185	215	249	263	291	308	339	357	416	461	509
Number Of Compressors	QTY	4	4	4	4	4	4	6	6	6	6	6	9	9	9
Capacity Steps	QTY	4	4	4	4	4	4	4	4	4	4	4	6	6	6
EVAPORATOR		**Shell & Tube**													
Nominal Flow Rate	GPM	172	227	253	298	327	354	403	428	476	504	551	670	714	756
Pressure Drops (Evaporator + Valves + Piping)	PSI	11	11	12	11	12	12	12	12	11	11	12	13	13	13
F.C. Pressure Drop (F.C. Coil + Evap + Valves + Piping)	PSI	18	20	19	20	23	21	22	20	21	19	22	22	23	21
PUMP & TANK (OPTIONAL)		**Simplex or Duplex Pump Options, Carbon Steel or Stainless Steel Tank Options**													
Maximum Pump Absorbed Power	KW	7.5	11	11	15	15	18.5	18.5	18.5	22	22	30	30	CF	CF
Maximum Pump Absorbed Current	A	13.2	20.3	20.3	26.9	26.9	32.1	32.1	32.1	39.5	39.5	52	52	CF	CF
Available External Pressure (Single)	PSI	32.2	36.9	35.0	40.3	36.7	33.6	31.8	33.2	42.7	43.5	38.6	31.3	CF	CF
Tank Volume	GAL	79	100	100	132	132	132	132	132	159	159	159	159	159	159
FANS & CONDENSER		**Axial EC Fans & Copper Tube with Aluminum Fin Condenser**													
Fan Electronic Fan Speed Control	TYPE	EC													
Fan Quantity	QTY	4	6	6	8	8	8	10	10	12	12	14	18	18	18
Fan Total Absorbed Power	kW	10.2	15.4	15.4	20.5	20.5	20.5	25.6	25.6	30.7	30.7	35.8	46.1	46.1	46.1
Fan Total Absorbed Current	A	15.6	23.4	23.4	31.2	31.2	31.2	39.0	39.0	46.8	46.8	54.6	70.2	70.2	70.2
Total Air Flow	CFM	45,203	67,804	67,804	90,406	90,406	90,406	113,007	113,007	135,608	135,608	158,210	203,412	203,412	203,412
NOISE DATA		**Distance measured in an open field at 33 feet from Condenser**													
Sound Pressure Level	DB(A)	68.1	70.6	70.3	70.5	72.4	73.7	72.1	71.9	73.6	74.7	75.6	74.1	75.4	76.4
ELECTRICAL DATA		**Does not include optional pump(s)**													
Power Circuit	V/PH/HZ	460/3/60													
Full Load Current (FLA)	FLA	135	167	194	216	246	280	302	330	354	386	412	486	531	579
Minimum Circuit Ampacity (MCA)	MCA	143	176	205	228	260	296	313	342	367	400	426	498	544	593
Maximum Overcurrent Protection (MOP)	MOP	172	212	248	274	314	358	357	391	418	457	486	544	596	650
DIMENSIONS & WEIGHTS															
Length	IN	127	178	178	230	230	230	281	281	332	332	383	471	471	471
Width	IN	87	87	87	87	87	87	87	87	87	87	87	87	87	87
Height	IN	96	96	96	96	96	96	96	96	96	96	96	96	96	96
Estimated. Shipping Weight	LBS.	5,732	7,341	7,341	9,789	9,789	9,789	12,236	12,236	14,683	14,683	17,086	22,024	22,024	22,024
Hydraulic Connections	IN	5	5	5	6	6	6	6	6	6	6	8	8	8	8

*Performance rated at 44°F outlet water, 54°F Inlet Water, 95°F Ambient, 100% water. Chiller capacity changes with operating conditions, consult Motivair for assistance. Location and installation of equipment by others

motivair®
COOLING SOLUTIONS

MPC & MPC-FC
1/2-50 ton packaged air-cooled or water-cooled chillers for Industrial cooling, Medical cooling or custom HVAC applications. Includes integrated microprocessor, pump station, and storage reservoir.

MLC & MLC-FC
60-500 tons air-cooled, water-cooled & split system chillers for industrial or HVAC applications. Available Integrated Free-Cooling.

ChilledDoor®
Advanced server rack cooling system fits and standard or OEM computer rack. Removes up to 75 kW of server heat per door.

CDU
Coolant Distribution Unit from 20kW -1MW heat removal for use with the ChilledDoor® or other computer cooling systems.

PTS
Pump/Tank Stations for chillers and cooling systems.

MFC
Closed loop dry-coolers for process cooling and remote "Free-Cooling" applications.

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