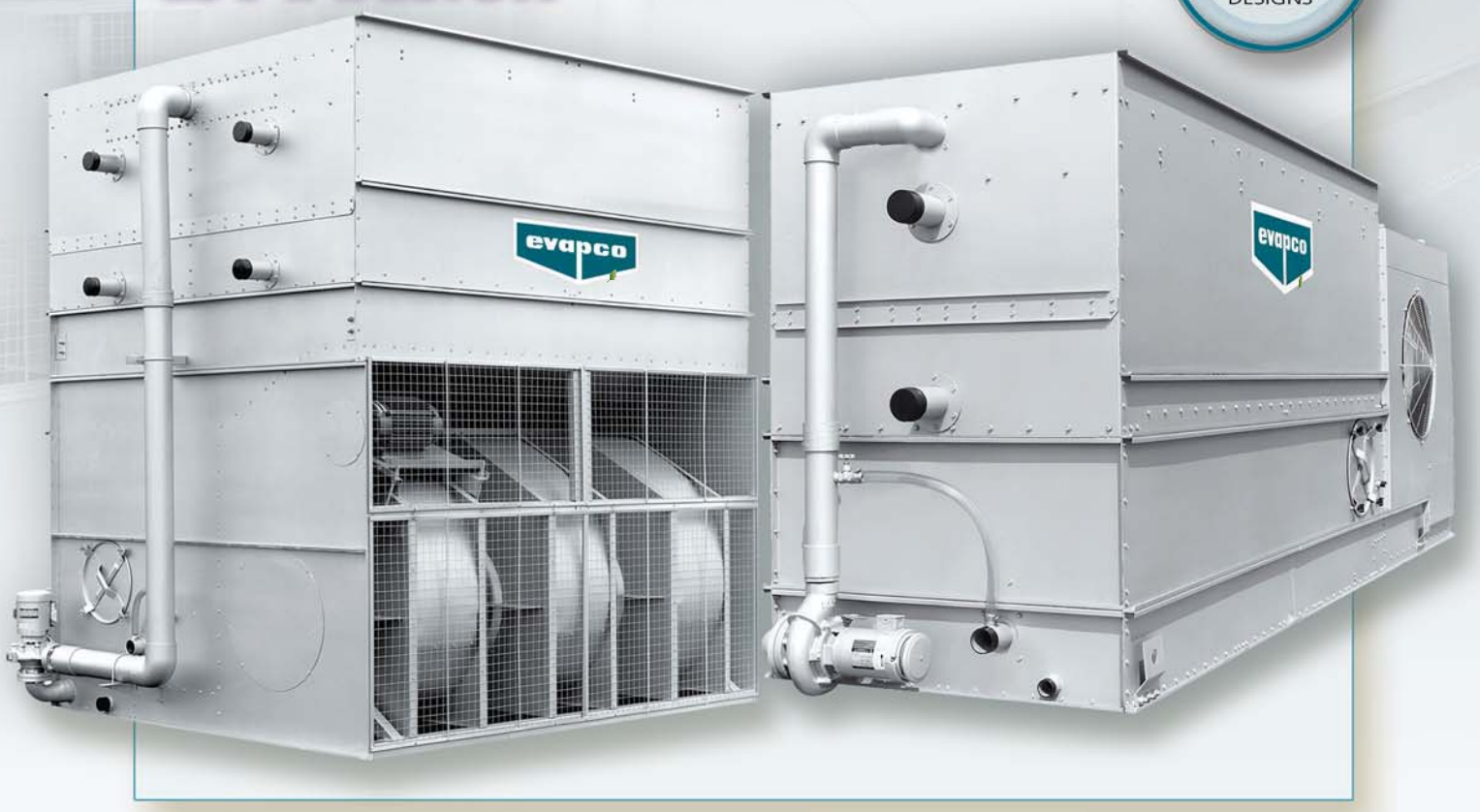
evapco®

LSC-E/LRC

EVAPORATIVE CONDENSERS

NEW! ENHANCED LSC-E DESIGN

IBC COMPLIANT DESIGNS



Available with Optional

Pulse~Pure®

Water Treatment System

MOTOR AND DRIVE 5 Year WARRANTY

Technology for the Future...Available Today!

U.S. GREEN BUILDING COUNCIL MEMBER

IARW International Association of Refrigerated Warehouses

Member of iiar International Institute of Ammonia Refrigeration www.iiar.org

LSC-E/LRC Design and Construction Features

The LSC-E and LRC units are a result of EVAPCO's extensive experience in forced draft centrifugal fan designs. Both models are designed for easy maintenance and long, trouble free operation. These units are also designed with IBC Compliant construction. All features shown are available on all models.

Thermal Pak II Heat Transfer Technology

- More surface area per plan area than competitive designs.
- Improved heat transfer efficiency due to tube geometry and orientation of tubes.
- Lower refrigerant charge.
- Optional TITAN Stainless Steel Coil technology.

Water Saver Drift Eliminators

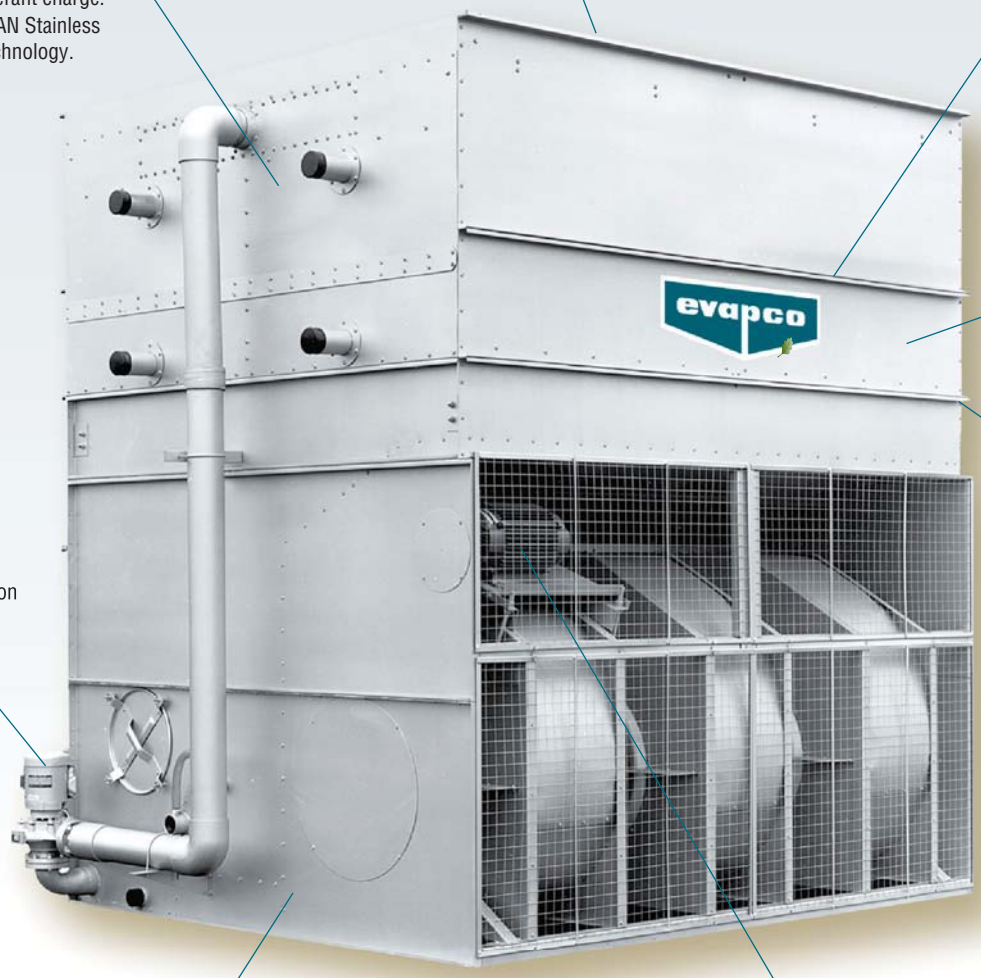
NEW!

- New patented design reduces drift rate to 0.001%.
- Saves water and reduces water treatment cost.
- Greater structural integrity vs.old style blade-type.
- Recessed into casing for greater protection.

U.S. Patent No. 6,315,804

Double-Brake Flange Joints

- Stronger than single-brake designs by others
- Greater structural integrity
- Minimizes water leaks at field joints



LSC-E

G-235 Heavy Mill-Dip Galvanized Steel Construction

(Stainless steel available as an affordable option)

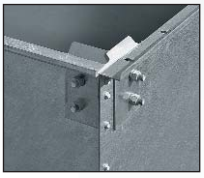
Totally Enclosed Pump Motors

- Help assure long, trouble-free operation

NEW!

Unique Field Seam

- Eliminates up to 66% of fasteners.
- Self guiding channels improve quality of field seam to eliminate leaks.
- Easy to install.
- Lower installation cost.

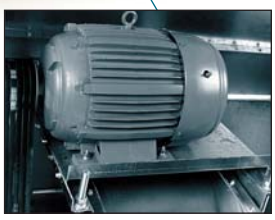


(on LSC-E units only)

NEW!

Sloped Pan Bottom

- Pan bottom slopes to drain.
- Easy to clean.
- Stainless steel strainer resists corrosion.



Totally Enclosed Fan Motors and Superior Drive System

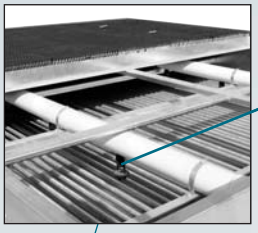
- Assures long life.
- All normal maintenance can be performed quickly from outside the unit.
- If required, motor may be easily removed.
- One piece fan shaft–no oil lubrication.

NEW!

- Motors located outboard on multi-cell units for easier drive system access.

IBC Certification Label

- Provided with every unit to indicate independent certification and compliance

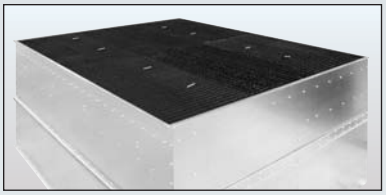


NEW

ZERO MAINTENANCE ZM II SPRAY NOZZLE

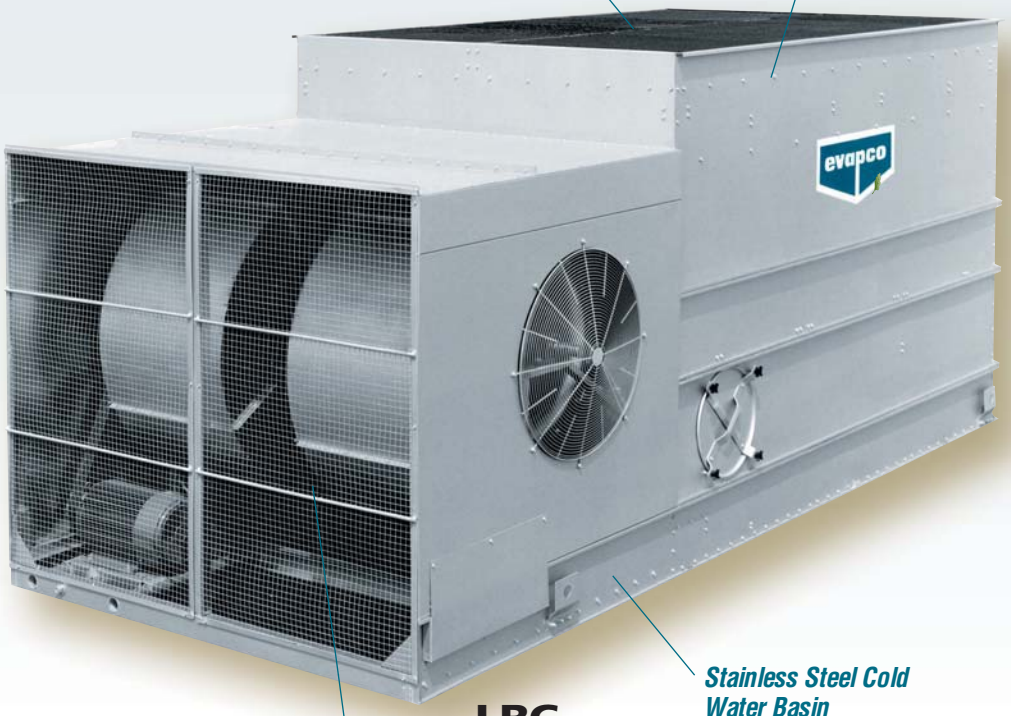
PVC Spray Distribution Header with ZM® II Nozzles

- Large orifice nozzles prevent clogging (no moving parts).
- Redesigned nozzles for superior water distribution.
- Nozzles are threaded into header at proper orientation.
- Fixed position nozzles require zero maintenance.
- Threaded end caps for ease of cleaning.
- Guaranteed for life.



Efficient Drift Eliminators

- Advanced design limits maximum drift rate to 0.001% of circulated spray water rate
- Corrosion resistant PVC for long life

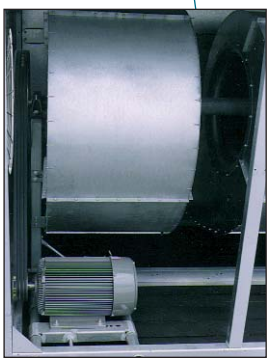


LRC

Stainless Steel Cold Water Basin

- Eliminates the need for unreliable epoxy coatings

(standard on LRC units only)



Easy to Service Motor & Drive System

- Belt tensioning and bearing lubrication can be performed from outside the unit
- Locking mechanism can also be used as a wrench to adjust the belts (LRC only)
- Motor is fully accessible by removing one inlet screen
- Split fan housings allow removal of all mechanical equipment through the end of the unit (LRC only)

Pulse~Pure®

Optional *Pulse*~Pure® Water Treatment System

All units are available with EVAPCO's optional ***Pulse*~Pure®** non-chemical water treatment system. The ***Pulse*~Pure®** Water Treatment System utilizes pulsed-power technology to provide CHEMICAL FREE Water Treatment. EVAPCO's ***Pulse*~Pure®** system is an environmentally responsible alternative for treating water in evaporative cooled equipment. It does not release harmful by-products to the environment and eliminates chemicals completely from cooler drift and blowdown. The ***Pulse*~Pure®** system delivers short, high-frequency bursts of low energy electromagnetic fields to the recirculating water in the LSC-E and LRC and will:

- Control bacteria to levels well below traditional chemical water treatment
- Control the formation of mineral scale
- Save water by operating at higher cycles of concentration
- Yield corrosion rates equivalent to chemical water treatment

U.S. Patent No. 7,704,364

Since its founding in 1976, EVAPCO, Incorporated has become an industry leader in the engineering and manufacturing of quality heat transfer products around the world. EVAPCO's mission is to provide first class service and quality products for the following markets:

- Industrial Refrigeration
- Commercial HVAC
- Industrial Process
- Power

EVAPCO's powerful combination of financial strength and technical expertise has established the company as a recognized manufacturer of market-leading products on a worldwide basis. EVAPCO is also recognized for the superior technology of their environmentally friendly product innovations in sound reduction and water management.

EVAPCO is an employee owned company with a strong emphasis on research & development and modern manufacturing plants. EVAPCO has earned a reputation for technological innovation and superior product quality by featuring products that are designed to offer these operating advantages:

- Higher System Efficiency
- Environmentally Friendly
- Lower Annual Operating Costs
- Reliable, Simple Operation and Maintenance

With an ongoing commitment to Research & Development programs, EVAPCO provides the most advanced products in the industry – ***Technology for the Future, Available Today***!

EVAPCO products are manufactured in 17 locations in 8 countries around the world and supplied through a sales network consisting of over 170 offices.

LSC-E/LRC Design Features

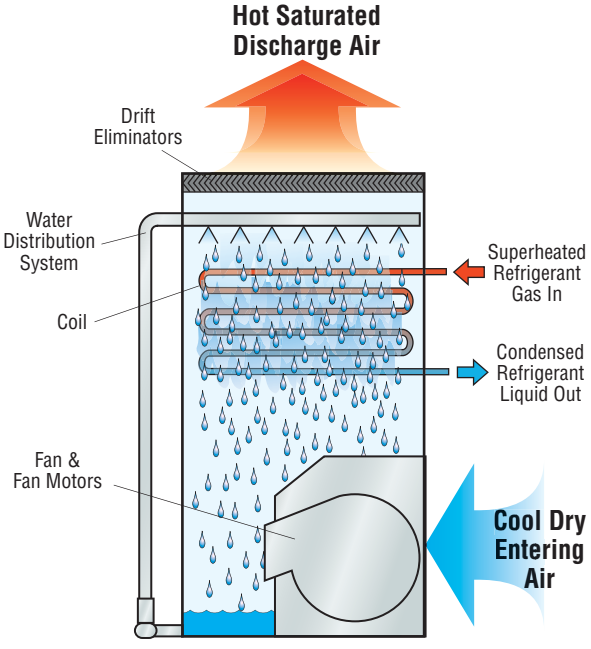
Proven Performance and Design Flexibility

Principle of Operation

The refrigerant gas is discharged from the compressor into the inlet connection of the evaporative condenser. Water from the condenser's sump is continuously distributed over the condenser coil, while ambient air is simultaneously forced into the unit. As the ambient air moves up through the coil section, a portion of the spray water is evaporated into the air stream.

The evaporative process cools the spray water, which in turn cools the tubes conatining the refrigerant gas. The cool tube walls cause the refrigerant gas to give up heat and condense into a liquid. The condensed liquid flows out of the coil's sloping tubes to the high pressure liquid receiver for return to the system.

The hot saturated air is driven through the drift eliminators, where any entrained water droplets are removed. The condenser's fan then discharges this air stream out of the top of the unit at a high velocity, where it can dissipate harmlessly into the atmosphere. The water which was not evaporated falls into the sump and is recirculated by the spray pump to the water distribution system above the condensing coil section.



Example of an LSC-E

LSC-E/LRC Design Features

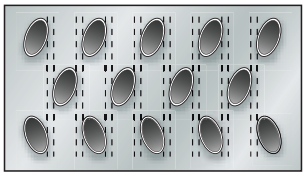
Thermal-Pak® II Coil

EVAPCO'S Thermal-Pak® II condensing coils are designed for maximum heat transfer efficiency. This unique coil design utilizes counterflow heat transfer. The rows of elliptical tubes are staggered and angled in the direction of airflow to enhance air turbulance, thereby increasing heat transfer while minimizing airside pressure drop.

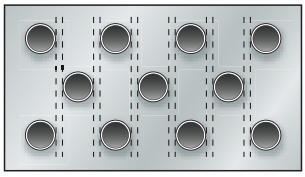
The design features of EVAPCO's Thermal-Pak® II condensing coils ensure the end user will receive the best evaporative heat transfer efficiency.

These characteristics and other engineering advancements of the Thermal-Pak® II have been proven in EVAPCO'S world-class research and development laboratory resulting in the following end user benefits:

- Lower Operating Refrigerant Charge
- Low Power Consumption Per Ton
- Lower Operating Weight
- Small Plan Area Per Ton



Thermal-Pak® II Coil by EVAPCO



Round Tube Coil by Others

The coils are manufactured from high quality steel tubing following the most stringent quality control procedures. Each circuit is inspected to assure the material quality and then tested before being assembled into a coil. Finally, the assembled coil is tested at 400 P.S.I.G. air pressure under water to make sure it is leak free.

To protect the coil against corrosion, it is placed in a heavy-duty steel frame and the entire assembly is dipped in molten zinc (hot dip galvanized) at a temperature of approximately 800°F.

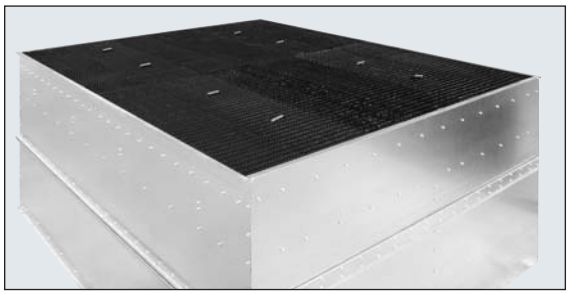
Thermal-Pak® II Coil

Efficient Drift Eliminators

The LSC-E & LRC are provided with an efficient drift eliminator system that effectively reduces entrained water droplets from the air discharge to less than 0.001% of the spray water flow rate.

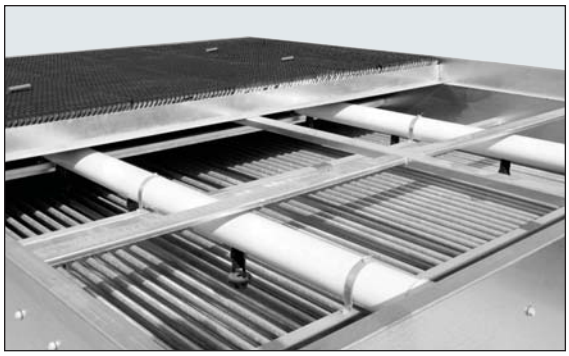
The eliminators are constructed of non-corrosive PVC with a multi-pass design for maximum drift reduction. They are assembled in modular sections for easy removal and access to the water distribution system.

In addition to reducing drift, the eliminators protect the spray system from debris and prevent sunlight from entering the condenser.



U.S. Patent # 6,315,804

LSC-E and LRC Drift Eliminator



Drift Eliminators Removed for Coil Inspection

LSC-E/LRC Design Features

Construction Features

EVAPCO, long known for using premium materials of construction, has developed the ultimate system for corrosion protection in galvanized steel construction – the EVAPCOAT Corrosion Protection System. Marrying corrosion free materials with heavy gauge mill hot-dip galvanized steel construction to provide the longest life product with the best value.

G-235 Mill Hot-Dip Galvanized Steel Construction

Mill hot-dip galvanized steel has been successfully used for over 40 years for the protection of evaporative condensers against corrosion. There are various grades of mill galvanized steel each with differing amounts of zinc protection. EVAPCO has been a leader in the industry in developing heavier galvanizing, and was the first to standardize on G-235 mill hot-dip galvanized steel.

G-235 designation means there is a minimum of 2.35 ounces of zinc per square foot of surface area as measured in a triple spot test. G-235 is the heaviest level of galvanizing available for manufacturing evaporative condensers and has a minimum of 12% more zinc protection than competitive designs using G-210 steel.

During fabrication, all panel edges are coated with a 95% pure zinc-rich compound for extended corrosion resistance.

Type 304 Stainless Steel Strainers

Subjected to excessive wear and corrosion, the sump strainer is critical to the successful operation of the condenser. EVAPCO uses only stainless steel for this very important component.

Unique Seam Design–Eliminate Field Leaks

The LSC-E features Evapco's unique panel construction design which includes a special butyl tape sealer with an integral sealing gasket. Each joint is then backed with a secondary caulking compound and encased in a double-brake flange for added strength and structural integrity. This unique sealing system has been proven effective in both laboratory tests and years of field application.

Easy Field Assembly for LSC-E

Fewer Fasteners–Lower Installed Cost

The LSC-E features a unique field seam design which ensures easier assembly and fewer field seam leaks. The field seam incorporates self-guiding channels to guide the coil casing section into position and set in place on the bottom basin section of the condenser.

In addition, the design eliminates up to 66% of the fasteners typically used to join the condenser sections in the field significantly reducing the contractor labor costs for installation.

Improved Maintenance

ZM® II Spray Nozzle Water Distribution System

Even and constant water distribution is paramount for reliable, scale-free evaporative condensing. EVAPCO'S Zero Maintenance ZM® II Spray Nozzle remains clog-free under the toughest conditions to deliver approximately 6 GPM to every square foot of coil plan area.

The heavy-duty ABS ZM® II Spray Nozzles have a 1-1/4" diameter opening and a 1-1/4" splash plate clearance. The fixed position ZM® II Spray Nozzles are mounted in corrosion-free PVC water distribution pipes that have threaded end caps. Together, these elements combine to provide unequaled coil coverage, enhanced droplet formation and make the industries best performing maintenance-free water distribution system.

ZM® II Nozzle

Alternate Materials of Construction

For particularly corrosive environments, EVAPCO condensers available with Stainless Steel construction for the basin, casing and/or coil.

Stainless Steel Basin

The basin area of a condenser is often subjected to high concentrations of impurities and silt. In addition to the EVAPCOAT Corrosion Protection System, EVAPCO offers optional stainless steel construction for superior corrosion resistance. This option provides Type 304 or Type 316 stainless steel for the entire basin section. **304 stainless steel basin is standard on the LRC.**

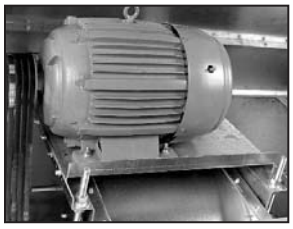
Stainless Steel Coils

The heat exchanger coil is the heart of the evaporative condenser. For this critical component, EVAPCO offers the option of Type 304L stainless steel construction using the Thermal Pak® II coil design. Highly efficient heat transfer coils with the ultimate corrosion protection for evaporative cooling applications.

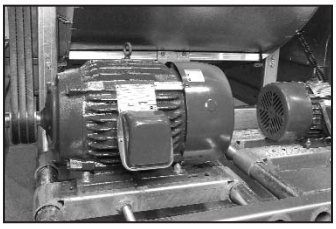
LSC-E/LRC Design Features

Fan Motor Mount

Premium efficient TEFC fan motors are mounted in a convienent open area for ease of belt tensioning, motor lubrication and electrical connection. The motor base is designed for easy adjustment and to be locked into position to maintain proper belt tension.



Example LSC-E Fan Motor Mount



LRC Fan Motor Mount
(shown with optional pony motor)

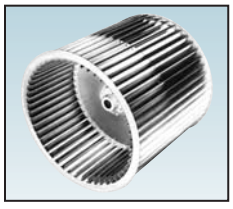
Fan Access-Split Housing

Another unique feature of the LRC Evaporative Condenser is the split fan housing. The split fan housing on the LRC allows quick removal of the fans from the front end of the unit. This feature allows fan removal when units are placed side by side where space is minimal.

Mechanical Drive System Access

The LSC-E and LRC mechanical drive systems are easy to maintain. Bearing lubrication and belt adjustment can be performed from outside the unit. **Motors are now mounted outboard on multi-cell units to facilitate access for maintenance.** There is no need to remove fan screens to maintain important drive components. In addition, the locking mechanism used to maintain belt tension can also work as a wrench to adjust the belt.

Centrifugal Fan Assembly



Fans on LSC-E and LRC Evaporative Condensers are of the forward curved centrifugal design with hot-dip galvanized steel construction. All fans are statically and dynamically balanced and are mounted in a hot-dip galvanized steel housing.

Forged Bearing Journal

The fan shafts used on all LSC-E and LRC models are standard with forged bearing journals, eliminating the two-piece fan shaft with welded journals, which is susceptible to rusting and eventual failure. The solid forged design of the LSC-E fan shaft provides durable long-lasting operation, free from premature mechanical failure. The LRC uses a ground and polished steel fan shaft, similar to what is used on EVAPCO's Induced Draft Evaporative Condensers.

Basin Access

The basin/fan section of a centrifugal fan unit is designed for accessibility and ease of maintenance. Fan and drive components are positioned to allow easy adjustment and cleaning. All grease fittings are in convenient locations for periodic lubrication.

Large circular access doors are provided to allow entry into the basin. All float valve and strainer assemblies are located near the door for easy adjustment and cleaning. The sump is designed to catch the dirt accumulated. This can be flushed out simply with a hose. The stainless steel strainers may be easily removed for periodic cleaning.

Capacity Control

All LSC-E and LRC models come standard with premium efficient, inverter capable fan motors that can be used with variable frequency drive (VFD) systems for precise capacity control. VFD systems can control the speed of a fan motor by modulating the voltage and frequency of the motor input electrical signal. When connected to a building automation system a VFD can receive signals varying fan speeds to meet demand loads. This popular method of capacity control can yield significant energy savings.

Evapco offers two-speed fan motors as an option for alternative capacity control. In periods of lightened loads or reduced wet bulb temperatures the fans can operate at low speed providing about 60% of full speed capacity yet consuming only about 15% of full speed power. In addition to the energy savings the sound levels of the unit can be greatly reduced by operating at low speed. These motors do not require the use of VFD systems however they can only operate at two speeds: full or low.

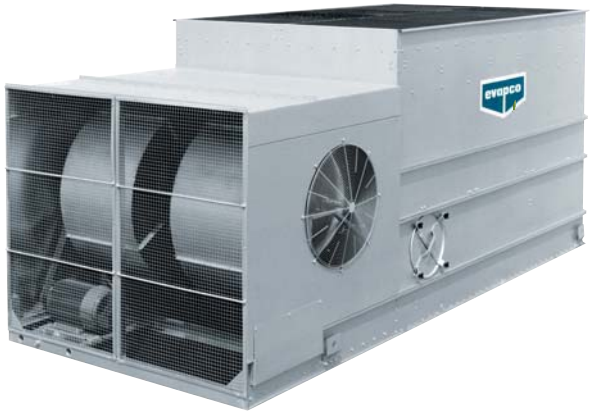
Pony motors are available as another capacity control method. Pony motors are smaller fan motors for use in times of reduced loading. The pony motor is typically 1/4 of the Hp of the primary motor and can significantly reduce energy consumption.

LSC-E/LRC Design Features

Application Versatility

Centrifugal units are recommended for a wide range of installations. They are quiet, can easily be hidden, and the increase in fan HP over propeller fan units is generally not significant in the small size range. They are also excellent for installations where sound is sensitive, such as residential neighborhoods, and when the unit must handle external static pressure.

LSC-E Unit



LRC Unit

Very Quiet Operation

Centrifugal fan units operate at low sound levels which make this design preferred for installations with external static pressure where noise is a concern. Additionally, since the sound from the fans is directional, single sided air entry models can be turned away from critical areas avoiding a sound problem. When even quieter operation is necessary, centrifugal fan models can be equipped with optional sound attenuation packages. See the Sound Reducing Options section of this catalog or consult the factory for details.

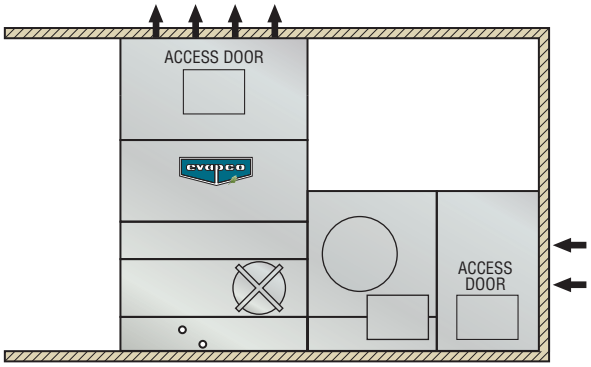
In addition, the LRC features a specially engineered fan enclosure and drive system that is designed to offer very quiet operation without the high cost of external attenuation packages. The LRC fan system was developed through hundreds of hours of laboratory tests resulting in the lowest standardized sound levels available in the industry. In fact, the sound level of the LRC on average is 2 dBA quieter than competitors' similar models.

Indoor Installation

All LSC-E and LRC Evaporative Condensers can be installed indoors where they normally require ductwork to and from the unit. The design of the ductwork should be symmetrical to provide even air distribution across both intake and discharge openings. Guidelines for Ducted Applications:

1) The static pressure loss imposed by the ductwork must not exceed 1/2". The fan motor size must be increased for ESP up to 1/2".
2) For ducted installations, the solid bottom panel option must be ordered. On the LRC blank off plates will also be provided in lieu of the side air inlet screens with this option.
3) NOTE: Access Doors must be located in the ductwork for service to the fan drive components and water distribution system.

Drawings are available showing recommended ductwork connections. See EVAPCO's Layout Guidelines for additional information.

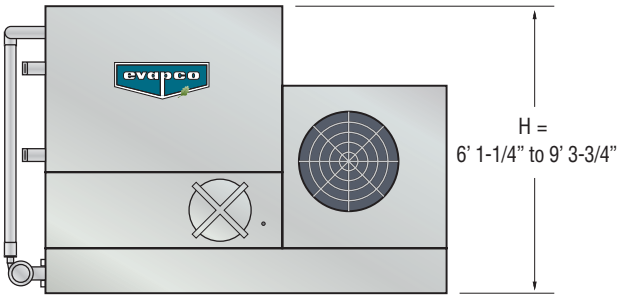


LRC Design Features

LRC Reduced Height and Maintenance Accessibility

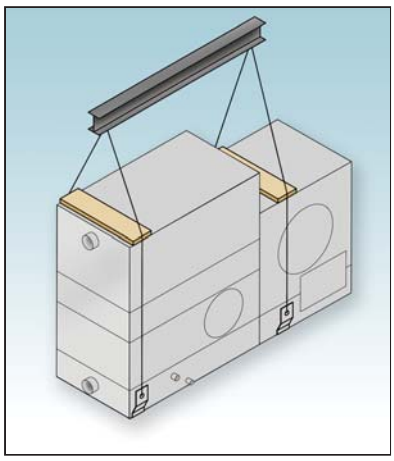
The LRC has been designed to satisfy installation requirements where height limits must be observed. The lower profile design of the LRC does not, however, sacrifice maintenance accessibility for reduced height. Its unique casing design allows the water distribution system, cold water basin, fan section and other unit components to be easily maintained.

Small, light-weight sections of the drift eliminators can be easily removed to access the water distribution system. A large circular access door is located on the side of the cold water basin to allow adjustment of the float assembly, removal of the stainless steel strainers and cleaning of the basin. The fan motor and drive system are located at one end of the unit and are completely accessible by removing the inlet screens. Routine bearing lubrication and belt tensioning can be performed from the exterior of the unit without removing the inlet screens.



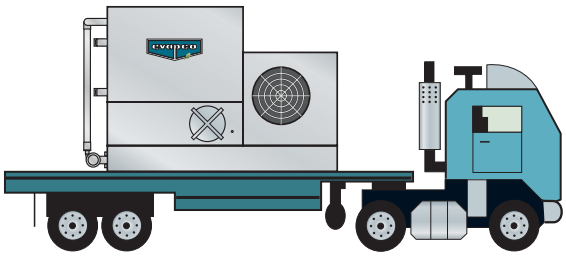
Low Installed Costs

The compact, unitary design of the LRC Evaporative Condenser allows it to be shipped completely assembled. This results in lower transportation costs and no assembly requirements at the job site. Note: Options such as sound attenuation and discharge hoods will require additional lifts and some minor assembly.



Transport of a Pre-Assembled Unit

Since the LRC ships fully assembled, it is ideal for truck-mounted applications, for remote sites or temporary installations.

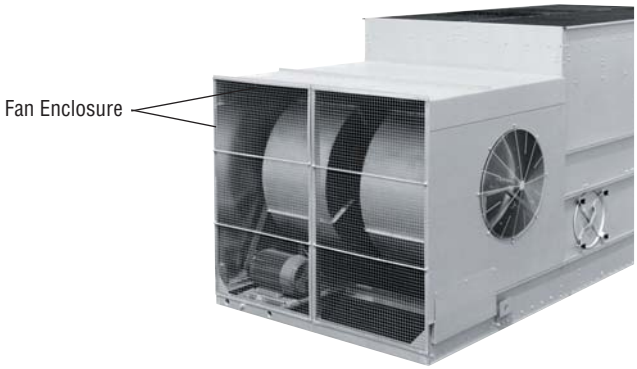


Stainless Steel Cold Water Basin–Standard

The LRC is standard with a stainless steel cold water basin. Optional upgrades to stainless steel water touch basins, stainless steel water touch units and all stainless steel construction are also available on the LRC.

Integral Fan Enclosure for Lower Sound

The LRC comes standard with an integral fan enclosure that reduces sound levels by 2 dB. This 3-sided enclosure also protects the fan and drive system for longer equipment life.



IBC COMPLIANCE

IBC Compliance

EVAPCO has been applying advanced structural technology to evaporative condensers for many years. Following seismic events in the mid 1990's EVAPCO introduced the UB Series of induced draft cooling towers, fluid coolers and evaporative condensers. These products were designed, built and independently certified for extreme seismic and wind forces. With the advent of the International Building Code, EVAPCO is now offering a new line of LSC-E/LRC Evaporative Condensers that is IBC 2006 compliant as standard construction.

International Building Code

The International Building Code (IBC) is a comprehensive set of regulations addressing the structural design and installation requirements for building systems – including HVAC and industrial refrigeration equipment. As of June 2008, all 50 states plus Washington D.C have adopted the International Building Code. Compared to previous building codes that solely examined anchorage, the earthquake provisions contained within the International Building Code address anchorage, structural integrity, and operational capability of a component following a seismic event. The goal of the IBC is to minimize the loss of life and improve the capability of essential facilities to operate after a seismic event.

The International Building Code (IBC) was developed to replace the *BOCA National Building Code*, ICBO's *Uniform Building Code* and SBCCI's *Standard Building Code*. The International Building Code specifies that all components be designed to resist the equivalent seismic forces as the structure to which they are installed whereas previous building codes focused exclusively on the structure of the building to provide resistance against seismic forces. These components include all aspects of the building architectural, electrical and mechanical systems. The failure of these components during a seismic event has been a common occurrence in recent history. Although the structure of the building may be relatively undamaged from an earthquake, the damage to the nonstructural components could be significant and result in considerable secondary damage to the building (ie. flooding, fire, structural damage).

Seismic Design

The IBC specifies that all installed components must meet the requirements of ASCE 7-05 (American Society of Civil Engineers, *Minimum Design Loads for Buildings and Other Structures*). Exemptions noted in the code are for all mechanical components assigned to seismic design categories A or B. ASCE 7-05 explicitly states that in addition to the attachment and supports, the component itself must be designed to withstand the seismic forces prescribed in the code. Simply stated, the code provisions require that evaporative cooling equipment and all other components permanently installed on a structure must meet the same seismic design criteria as the building.

The seismic design force, utilized for component design, represents an equivalent static force that is applied to the components' center of gravity as described in the following equation:

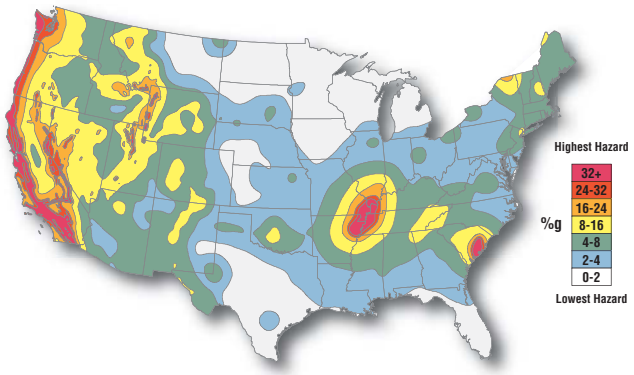
$$F_p = [(0.4 * (a_p) * (S_{DS}) * (W_p)) / (R_p / I_p)] * (1 + 2 * (z / h))$$

- F_p = Seismic Design Force centered at the component's center of gravity
- S_{DS} = Design spectral response acceleration, short period
- a_p = Component amplification factor
- I_p = Component importance factor
- W_p = Component operating weight
- R_p = Component response modification factor
- z = Height in structure of point of attachment of component with respect to the base
- h = Average roof height of structure with respect to the base

The minimum and maximum design force limits are specified as:

$$F_p\text{-min} = 0.3\ SDS\ I_p\ W_p$$
$$F_p\text{-max} = 1.6\ SDS\ I_p\ W_p$$

A series of charts and graphs are used to determine the appropriate factors based on the location of the installation and ultimately the "importance" of the facility. A chart of the potential seismic activity in the United States is shown below.



Map courtesy US Geological Survey website

IBC COMPLIANCE

Importance Factor (Ip)

A major parameter that must be determined prior to calculating the seismic design force is the component importance factor (Ip). ASCE 7-05 defines the component importance factor as:

Importance Factor, Ip	Classification
1.5	• Life safety component required to function after seismic event. • Component containing hazardous content • Components installed at Group III (essential) facilities
1.0	All other components

Products such as ammonia refrigerant condensers should always be assigned an importance factor of 1.5 since they contain ammonia. The IBC identifies ammonia as hazardous content in reference of OSHA standards. According to the American Society of Civil Engineers (ASCE) Manual, 07-05 edition, section 13.1.3, hazardous materials require an importance factor of 1.5.

Design Implementation

In order to achieve this goal, an architect or civil engineer is responsible for analyzing the soil and the design of a structure to determine the factors to be used. A mechanical consulting engineer and/or design build contractor applies these factors to advise the manufacturer on the proper design for the application. EVAPCO takes this information and determines the necessary equipment to meet IBC regulations. Evapco then determines the condenser design requirements based on the IBC criteria. The standard LSC-E/LRC design is independently certified to meet the 1g IBC compliance factors. For applications that require a more severe seismic duty, EVAPCO offers an optional 5.12g construction design. This process ensures that the mechanical equipment and its components are seismically compliant per the provisions of the International Building Code.

Independent Certification

As required by the International Building Code, EVAPCO supplies a certificate of compliance as part of its submittal documents. The certificate of compliance should demonstrate that the equipment/unit has been independently tested and analyzed in accordance with the IBC program. Evapco has worked closely with Vibrations Mountings and Controls Group (VMC) to complete the independent equipment testing and analysis. A sample of the certificate of compliance and unit label is presented below:

evapco

Certificate of Compliance

LSTE, LPT and PMTQ Cooling Towers
PMWQ, LSWE, LRWB Closed Circuit Coolers
PMC-E, LSC-E and LRC Evaporative Condensers

Are certified to meet or exceed the Seismic and Wind Load Provisions set forth in the applicable building codes for this project.

These products have been manufactured following all applicable quality assurance programs.

Applicable Building Codes:
IBC 2006
ASCE-7
NFPA 5000

Referenced Report:
VMA-43387

Approval Agency:
VMC Seismic Consulting Group

EVAPCO...Specialists in Heat Transfer Products and Services.

FD IBC COC 001

evapco

Seismic and Wind Load Certification

LSTE, LPT and PMTQ Cooling Towers
PMWQ, LSWE and LRWB Closed Circuit Coolers
PMC-E, LSC-E and LRC Evaporative Condensers

Units Designed and Manufactured to Meet the Seismic & Wind Load Requirements of:
IBC 2006 ASCE-7 NFPA 5000

Independent Certification By:

IBC Serial Number: 43387

15-248PA

LSC-E/LRC Selection Procedure

Two methods of selection are presented, the first is based on the total heat of rejection as described immediately below. The second and more simple method is based on evaporator tons. The evaporator ton method is only applicable to systems with open type reciprocating compressors.

The heat of rejection method is applicable to all but centrifugal compressor applications and is normally used for selecting evaporative condensers for use with hermetic compressors and screw compressors. It can also be used for standard open type reciprocating compressors as an alternate to the evaporator ton method.

The evaporator ton method is based on the estimated heat of compression. **The heat of rejection method of selection is more accurate and should be used whenever possible.**

Refer to the factory for selections on systems with centrifugal compressors.

Heat of Rejection Method

In the heat of rejection method, a factor for the specified operating conditions (condensing temperature and wet bulb) is obtained from Table 1 or 2 and multiplied times the heat of rejection. The resultant figure is used to select a unit from Table 3. Unit capacities are given in Table 3 in thousands of BTU/Hr or MBH.

If the heat of rejection is not known, it can be determined by one of the following formulaes:

Open Compressors:

Heat of Rejection = Evaporator Load (BTU/Hr) + Compressor BHP x 2545

Hermetic Compressors:

Heat of Rejection = Evaporator Load (BTU/Hr) + K.W. Compressor Input x 3415

EXAMPLE

Given: 250 ton load, ammonia refrigerant 96.3° condensing temperature, 78° W.B. temperature and 300 compressor BHP.

Selection: Heat of Rejection

250 tons x 12000	=	3,000,000 BTU/Hr
300 BHP x 2545	=	763,500 BTU/Hr
Total		3,763,500 BTU/Hr

From Table 2 the capacity factor for 96.3° condensing and 78° W.B. = 1.37 3,763,500 x 1.37 = 5,155,995 BTU/Hr or 5156 MBH. Therefore, select model LSC-355E-1g or LRC-361-1g.

Note: For screw compressor selections employing water cooled oil cooling, select a condenser for the total MBH as in the example. The condenser can then function in one of two ways:

(1) Recirculating water from the water sump can be used directly in the oil cooler. A separate pump should be employed and the return water should be directed into the water sump at the opposite end from the pump suction.

(2) The condenser coil can be circuited so that water or a glycol-water mixture for the oil cooler can be cooled in a separate section of the coil. Specify load and water flow required.

For refrigerant injection cooled screw compressors, select the condenser in the same manner as shown in the example.

If the oil cooler is supplied by water from a separate source, then the oil cooling load should be deducted from the heat of rejection before making the selection.

LSC-E/LRC Selection Procedure

Table 1 - HCFC-22 and HFC-134a Heat Rejection Factors

Condensing Pres. psig		Cond. Temp. °F	Wet Bulb Temperature, (°F)																
HCFC-22	HFC-134a		50	55	60	62	64	66	68	70	72	74	75	76	77	78	80	82	84	86
156	95	85	1.10	1.22	1.39	1.50	1.61	1.75	1.93	2.13	2.42	2.78	3.02	3.29	3.64	4.00	-	-	-	-
168	104	90	.93	1.02	1.14	1.21	1.28	1.36	1.45	1.57	1.71	1.89	2.00	2.12	2.25	2.38	2.85	3.50	-	-
182	114	95	.80	.87	.95	1.00	1.05	1.10	1.15	1.22	1.31	1.40	1.45	1.50	1.56	1.64	1.82	2.07	2.37	2.77
196	124	100	.71	.76	.82	.85	.88	.91	.94	.98	1.03	1.09	1.12	1.15	1.20	1.24	1.34	1.46	1.63	1.82
211	135	105	.63	.66	.70	.72	.75	.77	.80	.83	.87	.91	.93	.95	.97	1.00	1.06	1.13	1.23	1.35
226	146	110	.56	.59	.62	.64	.65	.67	.69	.71	.74	.77	.78	.80	.82	.84	.88	.93	.98	1.04

Table 2 - Ammonia (R-717) Heat Rejection Factors

Condensing Pres. psig	Cond. Temp. °F	Wet Bulb Temperature, (°F)																	
		50	55	60	62	64	66	68	70	72	74	75	76	77	78	80	82	84	86
152	85	.98	1.09	1.24	1.34	1.44	1.56	1.72	1.90	2.16	2.48	2.70	2.94	3.25	3.57	-	-	-	-
166	90	.83	.91	1.02	1.08	1.14	1.21	1.29	1.40	1.53	1.69	1.79	1.89	2.01	2.12	2.54	3.12	-	-
181	95	.71	.78	.85	.89	.94	.98	1.03	1.09	1.17	1.25	1.29	1.34	1.39	1.47	1.63	1.85	2.12	2.47
185	96.3	.69	.75	.82	.86	.90	.94	.98	1.03	1.10	1.18	1.22	1.26	1.31	1.37	1.51	1.71	1.94	2.25
197	100	.63	.68	.73	.76	.79	.81	.84	.87	.92	.97	1.00	1.03	1.07	1.11	1.20	1.30	1.46	1.63
214	105	.56	.59	.62	.64	.67	.69	.71	.74	.78	.81	.83	.85	.87	.89	.95	1.01	1.10	1.21
232	110	.50	.53	.55	.57	.58	.60	.62	.63	.66	.69	.70	.71	.73	.75	.79	.83	.87	.93

Table 3 - Unit Heat Rejection

LSC-E Models

Model	MBH Base	Model	MBH Base	Model	MBH Base
LSC-36E-1g	529	LSC-225E-1g	3,308	LSC-650E-1g	9,555
LSC-41E-1g	603	LSC-240E-1g	3,528	LSC-690E-1g	10,143
LSC-48E-1g	706	LSC-250E-1g	3,675	LSC-720E-1g	10,584
LSC-54E-1g	794	LSC-280E-1g	4,116	LSC-755E-1g	11,099
LSC-65E-1g	956	LSC-300E-1g	4,410	LSC-800E-1g	11,760
LSC-70E-1g	1,029	LSC-315E-1g	4,631	LSC-805E-1g	11,834
LSC-75E-1g	1,103	LSC-335E-1g	4,925	LSC-860E-1g	12,642
LSC-80E-1g	1,176	LSC-355E-1g	5,219	LSC-900E-1g	13,230
LSC-90E-1g	1,323	LSC-370E-1g	5,439	LSC-960E-1g	14,112
LSC-100E-1g	1,470	LSC-385E-1g	5,660	LSC-1000E-1g	14,700
LSC-110E-1g	1,617	LSC-400E-1g	5,880	LSC-1030E-1g	15,141
LSC-120E-1g	1,764	LSC-430E-1g	6,321	LSC-1100E-1g	16,170
LSC-135E-1g	1,985	LSC-450E-1g	6,615	LSC-1180E-1g	17,346
LSC-150E-1g	2,205	LSC-480E-1g	7,056	LSC-1250E-1g	18,375
LSC-155E-1g	2,279	LSC-500E-1g	7,350	LSC-1310E-1g	19,257
LSC-170E-1g	2,499	LSC-515E-1g	7,571	LSC-1380E-1g	20,286
LSC-185E-1g	2,720	LSC-550E-1g	8,085	LSC-1440E-1g	21,168
LSC-200E-1g	2,940	LSC-500E-1g	8,673	LSC-1510E-1g	22,197
LSC-210E-1g	3,087	LSC-625E-1g	9,188	LSC-1610E-1g	23,667

LRC Models

Model	MBH Base	Model	MBH Base	Model	MBH Base
LRC-25-1g	368	LRC-101-1g	1,485	LRC-213-1g	3,131
LRC-27-1g	397	LRC-108-1g	1,588	LRC-225-1g	3,308
LRC-29-1g	426	LRC-114-1g	1,676	LRC-227-1g	3,337
LRC-35-1g	515	LRC-116-1g	1,705	LRC-233-1g	3,425
LRC-38-1g	559	LRC-128-1g	1,882	LRC-240-1g	3,528
LRC-42-1g	617	LRC-131-1g	1,926	LRC-246-1g	3,616
LRC-48-1g	706	LRC-140-1g	2,058	LRC-249-1g	3,660
LRC-51-1g	750	LRC-155-1g	2,279	LRC-255-1g	3,749
LRC-58-1g	853	LRC-174-1g	2,558	LRC-269-1g	3,954
LRC-65-1g	956	LRC-183-1g	2,690	LRC-287-1g	4,219
LRC-72-1g	1,058	LRC-188-1g	2,764	LRC-300-1g	4,410
LRC-76-1g	1,117	LRC-190-1g	2,793	LRC-321-1g	4,719
LRC-84-1g	1,235	LRC-210-1g	2,955	LRC-336-1g	4,939
LRC-91-1g	1,338	LRC-211-1g	3,102	LRC-361-1g	5,307
				LRC-379-1g	5,571

Note: Table 3 presents only the standard model selections. Other models exist for special horsepower or layout applications. Please consult the factory or EVAPCO Representative for the special situations.

LSC-E/LRC Selection Procedure

Evaporator Ton Method

In the evaporator ton method, factors for the specified operating conditions (suction temperature, condensing temperature and wet bulb) are obtained from either Table 5 or 6 and multiplied times the heat load in tons. The resultant figure is used to select a unit from Table 4. The condenser model in Table 4 is equal to the unit capacity in evaporator tons for HCFC-22 or HFC-134a conditions of 105°F condensing, 40°F suction and 78° wet bulb.

EXAMPLE

Given: 200 ton evaporator load, R-717, condensing at 95° F, with +10° F suction and 76° F wet bulb temperatures.

Selection: The capacity factor from Table 6 for the given condensing and wet bulb conditions is 1.38, and the capacity factor for the suction temperature of +10° F is 1.03, so the corrected capacity required may be determined as:

200 X 1.38 X 1.03 = 284 corrected tons. Therefore, select a model LSC-300E-1g or LRC-287-1g depending on unit type desired, and any layout or horsepower considerations.

Table 4 - Unit Sizes

LSC-E Models			
LSC-36E-1g	LSC-170E-1g	LSC-430E-1g	LSC-900E-1g
LSC-41E-1g	LSC-185E-1g	LSC-450E-1g	LSC-960E-1g
LSC-48-1g	LSC-200E-1g	LSC-480E-1g	LSC-1000E-1g
LSC-54E-1g	LSC-210E-1g	LSC-500E-1g	LSC-1030E-1g
LSC-65E-1g	LSC-225E-1g	LSC-515E-1g	LSC-1100E-1g
LSC-70E-1g	LSC-240E-1g	LSC-550E-1g	LSC-1180E-1g
LSC-75E-1g	LSC-250E-1g	LSC-590E-1g	LSC-1250E-1g
LSC-80E-1g	LSC-280E-1g	LSC-625E-1g	LSC-1310E-1g
LSC-90E-1g	LSC-300E-1g	LSC-650E-1g	LSC-1380E-1g
LSC-100E-1g	LSC-315E-1g	LSC-690E-1g	LSC-1440E-1g
LSC-110-1g	LSC-335E-1g	LSC-720E-1g	LSC-1510E-1g
LSC-120E-1g	LSC-355E-1g	LSC-755E-1g	LSC-1610E-1g
LSC-135E-1g	LSC-370E-1g	LSC-800E-1g	
LSC-150E-1g	LSC-385E-1g	LSC-805E-1g	
LSC-155E-1g	LSC-400E-1g	LSC-860E-1g	

LRC Models			
LRC-25-1g	LRC-76-1g	LRC-174-1g	LRC-246-1g
LRC-27-1g	LRC-84-1g	LRC-183-1g	LRC-249-1g
LRC-29-1g	LRC-91-1g	LRC-188-1g	LRC-255-1g
LRC-35-1g	LRC-101-1g	LRC-190-1g	LRC-269-1g
LRC-38-1g	LRC-108-1g	LRC-201-1g	LRC-287-1g
LRC-42-1g	LRC-114-1g	LRC-211-1g	LRC-300-1g
LRC-48-1g	LRC-116-1g	LRC-213-1g	LRC-321-1g
LRC-51-1g	LRC-128-1g	LRC-225-1g	LRC-336-1g
LRC-58-1g	LRC-131-1g	LRC-227-1g	LRC-361-1g
LRC-65-1g	LRC-140-1g	LRC-233-1g	LRC-379-1g
LRC-72-1g	LRC-155-1g	LRC-240-1g	

LSC-E/LRC Selection Procedure

Table 5 - HCFC-22 and HFC-134a Capacity Factors

Condensing Pres. psig		Cond. Temp. °F	Wet Bulb Temperature, (°F)																
HCFC-22	HFC 134a		50	55	60	62	64	66	68	70	72	74	75	76	77	78	80	82	84	86
156	95	85	1.05	1.16	1.32	1.43	1.53	1.66	1.83	2.02	2.30	2.64	2.87	3.13	3.46	3.80	-	-	-	-
168	104	90	.90	.98	1.10	1.17	1.24	1.31	1.40	1.52	1.65	1.82	1.93	2.05	2.17	2.30	2.75	3.38	-	-
182	114	95	.78	.85	.93	.98	1.02	1.07	1.12	1.19	1.28	1.37	1.42	1.46	1.52	1.60	1.78	2.02	2.31	2.70
196	124	100	.70	.75	.81	.84	.87	.90	.93	.97	1.02	1.08	1.11	1.14	1.19	1.23	1.33	1.44	1.61	1.80
211	135	105	.63	.66	.70	.72	.75	.77	.80	.83	.87	.91	.93	.95	.97	1.00	1.06	1.13	1.23	1.35
226	146	110	.57	.60	.63	.65	.66	.68	.70	.72	.75	.78	.79	.81	.83	.85	.89	.94	.99	1.05

Suction Temp. °F		-20°	-10°	-0°	+10°	+20°	+30°	+40°	+50°
Suction Press. (psig)	HCFC-22	10.1	16.5	24.0	32.8	43.0	54.9	68.5	84.0
	HFC-134a	-1.8	1.9	6.5	11.9	18.4	26.1	35.0	45.4
Capacity Factor		1.22	1.17	1.13	1.09	1.06	1.03	1.00	0.97

Table 6 - Ammonia (R-717) Capacity Factors

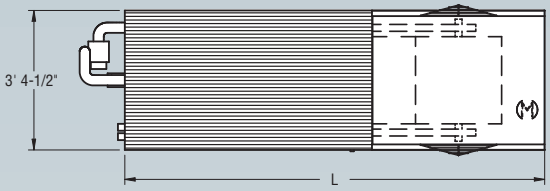
Condensing Pres. psig	Cond. Temp. °F	Wet Bulb Temperature, (°F)																	
		50	55	60	62	64	66	68	70	72	74	75	76	77	78	80	82	84	86
152	85	.99	1.09	1.25	1.34	1.44	1.57	1.73	1.91	2.17	2.49	2.71	2.95	3.26	3.59	-	-	-	-
166	90	.84	.93	1.03	1.10	1.16	1.23	1.32	1.42	1.55	1.71	1.81	1.92	2.04	2.16	2.59	3.17	-	-
181	95	.74	.80	.87	.92	.97	1.01	1.06	1.12	1.21	1.29	1.33	1.38	1.44	1.51	1.68	1.91	2.18	2.55
185	96.3	.72	.78	.85	.89	.93	.97	1.01	1.07	1.14	1.22	1.26	1.30	1.35	1.41	1.56	1.76	2.01	2.33
197	100	.66	.71	.76	.79	.82	.85	.87	.91	.96	1.01	1.04	1.07	1.12	1.15	1.25	1.36	1.52	1.69
214	105	.59	.62	.66	.68	.71	.73	.75	.78	.82	.86	.88	.90	.91	.94	1.00	1.07	1.16	1.27
232	110	.53	.56	.59	.61	.62	.64	.66	.68	.71	.73	.74	.76	.78	.80	.84	.89	.93	.99

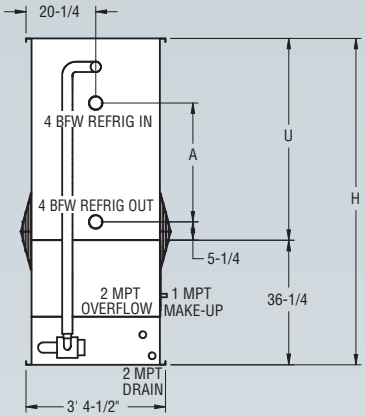
Suction Temp. °F	-30°	-20°	-10°	0°	+10°	+20°	+30°	+40°
Suction Press. (psig)	-1.6	3.6	9.0	15.7	23.8	33.5	45.0	58.6
Capacity Factor	1.18	1.14	1.10	1.07	1.03	1.00	0.97	0.95

Note: Table 4 presents only the standard model selections. Other models exist for special horsepower or layout applications. Please consult the factory or EVAPCO Representative for the special situations.

Engineering Data & Dimensions

Models LRC-25-1g to 72-1g





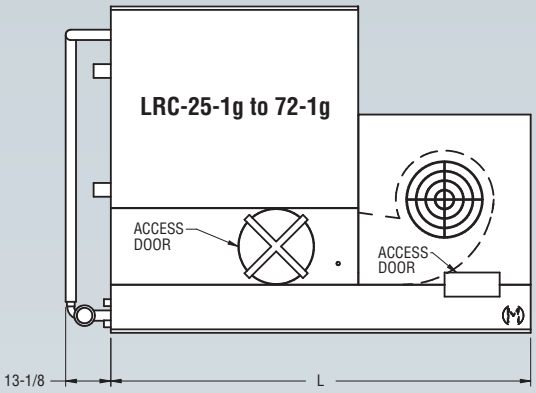


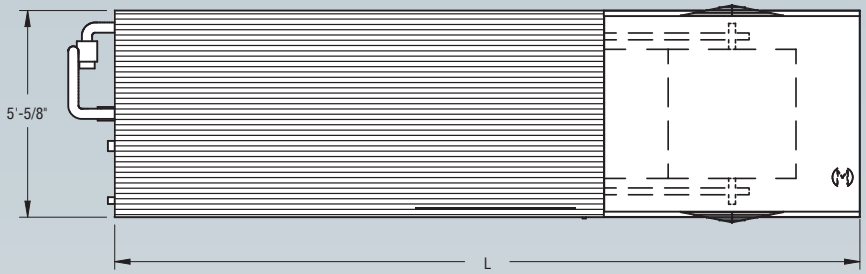
Table 7 Engineering Data

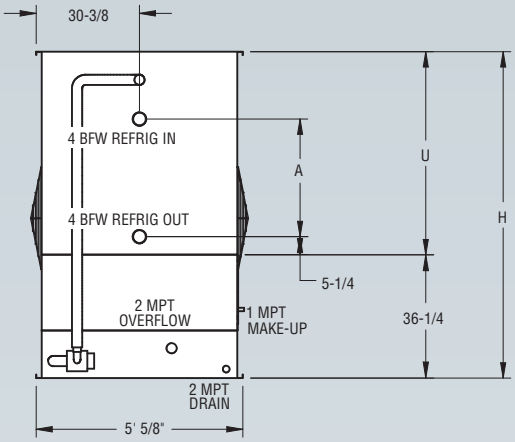
Model No.*	R-717 Tons*	Fans		Weights		Refrigerant Charge lbs.†	Coil Volume ft^3	Spray Pump		Remote Pump			Dimensions			
		HP**	CFM	Shipping	Operating			HP	GPM	Gallons Req'd***	Conn. Size	Operating Weight	Height H	Upper U	Coil A	Length L
LRC-25-1g	18	1	6,630	2,270	3,280	30	4	1/2	100	80	4"	2,430	6' 7-3/4"	43-1/2"	12"	10' 1-7/8"
LRC-27-1g	19	1-1/2	7,580	2,270	3,290	30	4	1/2	100	80	4"	2,430	6' 7-3/4"	43-1/2"	12"	10' 1-7/8"
LRC-29-1g	21	2	8,340	2,270	3,290	30	4	1/2	100	80	4"	2,430	6' 7-3/4"	43-1/2"	12"	10' 1-7/8"
LRC-35-1g	25	1-1/2	7,420	2,580	3,610	40	6	1/2	100	80	4"	2,760	6' 7-3/4"	43-1/2"	19-1/2"	10' 1-7/8"
LRC-38-1g	27	2	8,180	2,580	3,610	40	6	1/2	100	80	4"	2,760	6' 7-3/4"	43-1/2"	19-1/2"	10' 1-7/8"
LRC-42-1g	30	3	9,370	2,590	3,630	40	6	1/2	100	80	4"	2,770	6' 7-3/4"	43-1/2"	19-1/2"	10' 1-7/8"
LRC-48-1g	34	5	11,110	2,600	3,640	40	6	1/2	100	80	4"	2,780	6' 7-3/4"	43-1/2"	19-1/2"	10' 1-7/8"
LRC-51-1g	36	3	9,180	2,920	3,980	55	7	1/2	100	80	4"	3,120	7' 3-1/4"	51"	27"	10' 1-7/8"
LRC-58-1g	41	5	10,890	2,930	3,990	55	7	1/2	100	80	4"	3,130	7' 3-1/4"	51"	27"	10' 1-7/8"
LRC-65-1g	46	5	10,680	3,290	4,360	65	9	1/2	100	80	4"	3,500	7' 10-3/4"	58-1/2"	34-1/2"	10' 1-7/8"
LRC-72-1g	51	7-1/2	12,220	3,330	4,400	65	9	1/2	100	80	4"	3,540	7' 10-3/4"	58-1/2"	34-1/2"	10' 1-7/8"

* Tons at standard conditions: HCFC-22 and HFC-134a. 105°F condensing, 40°F suction and 78°F W.B.; ammonia 96.3°F condensing, 20°F suction and 78°F W.B.
** For dry operation or for external static pressure up to 1/2" use next larger size fan motor.
*** Gallons shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (12" would normally be sufficient.)
† Refrigerant charge is shown for R-717. Multiply by 1.93 for R-22 and 1.98 for R-134a.
Dimensions are subject to change. Do not use for pre-fabrication.

Engineering Data & Dimensions

Models LRC-76-1g to 246-1g





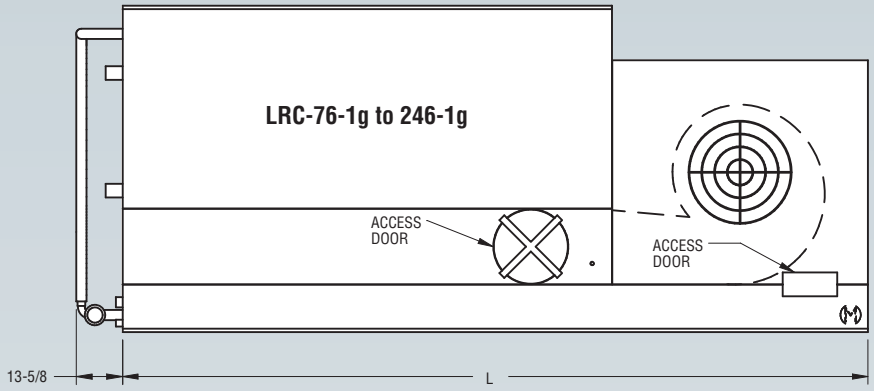


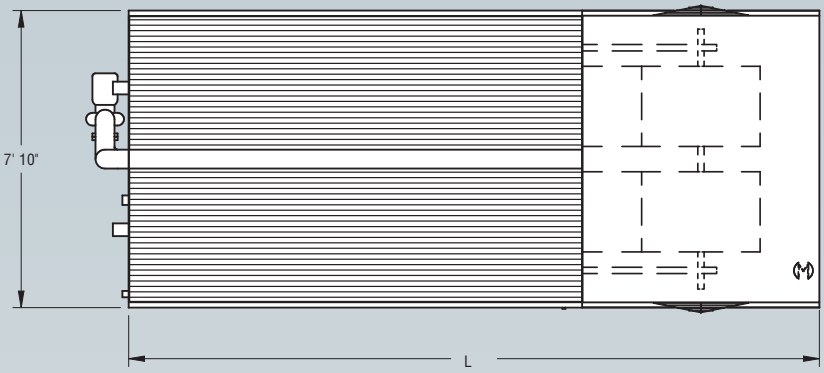
Table 8 Engineering Data

Model No.*	R-717 Tons*	Fans		Weights		Refrigerant Charge lbs.†	Coil Volume ft³	Spray Pump		Remote Pump			Dimensions			
		HP**	CFM	Shipping	Operating			HP	GPM	Gallons Req'd***	Conn. Size	Operating Weight	Height H	Upper U	Coil A	Length L
LRC-76-1g	54	5	16,030	3,900	5,730	65	9	1	160	120	6"	4,250	6' 7-3/4"	43-1/2"	19-1/2"	12' 2-7/8"
LRC-84-1g	60	7-1/2	18,370	3,940	5,770	65	9	1	160	120	6"	4,290	6' 7-3/4"	43-1/2"	19-1/2"	12' 2-7/8"
LRC-91-1g	65	5	15,730	4,390	6,250	85	11	1	160	120	6"	4,770	7' 3-1/4"	51"	27"	12' 2-7/8"
LRC-101-1g	72	7-1/2	18,010	4,480	6,330	85	11	1	160	120	6"	4,850	7' 3-1/4"	51"	27"	12' 2-7/8"
LRC-114-1g	81	7-1/2	17,650	4,980	6,860	105	14	1	160	120	6"	5,380	7' 10-3/4"	58-1/2"	34-1/2"	12' 2-7/8"
LRC-108-1g	77	7-1/2	22,450	5,040	7,790	95	13	1-1/2	255	170	6"	5,630	6' 7-3/4"	43-1/2"	19-1/2"	15' 2-1/4"
LRC-116-1g	82	10	24,690	5,080	7,820	95	13	1-1/2	255	170	6"	5,660	6' 7-3/4"	43-1/2"	19-1/2'	15' 2-1/4"
LRC-128-1g	91	15	28,280	5,190	7,930	95	13	1-1/2	255	170	6"	5,770	6' 7-3/4"	43-1/2"	19-1/2"	15' 2-1/4"
LRC-131-1g	93	7-1/2	22,000	5,790	8,580	125	17	1-1/2	255	170	6"	6,420	7' 3-1/4"	51"	27"	15' 2-1/4"
LRC-140-1g	99	10	24,240	5,830	8,620	125	17	1-1/2	255	170	6"	6,460	7' 3-1/4"	51"	27"	15' 2-1/4"
LRC-155-1g	110	15	27,740	5,940	8,730	125	17	1-1/2	255	170	6"	6,570	7' 3-1/4"	51"	27"	15' 2-1/4"
LRC-174-1g	123	15	27,160	6,740	9,570	150	21	1-1/2	255	170	6"	7,410	7' 10-3/4"	58-1/2"	34-1/2"	15' 2-1/4"
LRC-183-1g	130	15	26,620	7,410	10,290	180	25	1-1/2	255	170	6"	8,130	8' 6-1/4"	66"	42"	15' 2-1/4"
LRC-190-1g	135	20	34,220	7,260	11,070	165	22	2	345	240	8"	8,210	7' 4-1/4"	52"	27"	18' 2-5/8"
LRC-201-1g	143	25	36,860	7,270	11,080	165	22	2	345	240	8"	8,220	7' 4-1/4"	52"	27"	18' 2-5/8"
LRC-213-1g	151	20	33,500	8,250	12,120	200	28	2	345	240	8"	9,260	7' 11-3/4"	59-1/2"	34-1/2"	18' 2-5/8"
LRC-225-1g	160	25	36,080	8,260	12,130	200	28	2	345	240	8"	9,270	7' 11-3/4"	59-1/2"	34-1/2"	18' 2-5/8"
LRC-233-1g	165	30	38,360	8,280	12,150	200	28	2	345	240	8"	9,290	7' 11-3/4"	59-1/2"	34-1/2"	18' 2-5/8"
LRC-246-1g	174	30	37,580	9,210	13,120	240	33	2	345	240	8"	10,270	8' 7-1/4"	67"	42"	18' 2-5/8"

* Tons at standard conditions: HCFC-22 and HFC-134a. 105°F condensing, 40°F suction and 78°F W.B.; ammonia 96.3°F condensing, 20°F suction and 78°F W.B.
** For dry operation or for external static pressure up to 1/2" use next larger size fan motor.
*** Gallons shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (12" would normally be sufficient.)
† Refrigerant charge is shown for R-717. Multiply by 1.93 for R-22 and 1.98 for R-134a.
Dimensions are subject to change. Do not use for pre-fabrication.

Engineering Data & Dimensions

Models LRC-188-1g to 379-1g



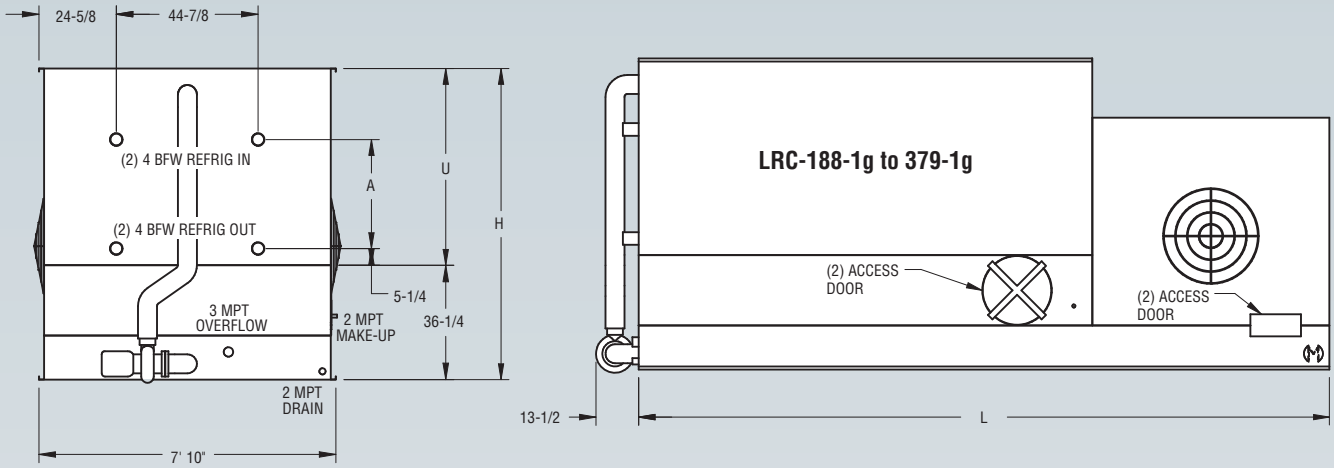


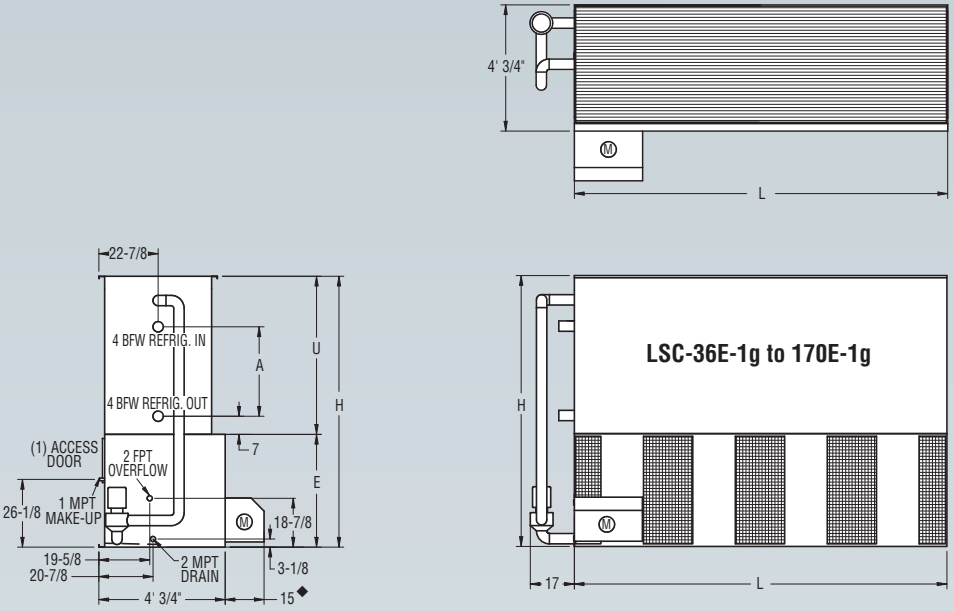
Table 9 Engineering Data

Model No.*	R-717 Tons*	Fans		Weights		Refrigerant Charge lbs.†	Coil Volume ft³	Spray Pump		Remote Pump			Dimensions			
		HP**	CFM	Shipping	Operating			HP	GPM	Gallons Req'd***	Conn. Size	Operating Weight	Height H	Upper U	Coil A	Length L
LRC-188-1g	133	20	41,820	7,820	12,360	150	18	2	405	250	8"	8,900	6' 11-1/2"	47-1/4"	19-1/2"	15' 2-1/4"
LRC-211-1g	150	15	37,210	8,940	13,540	195	24	2	405	250	8"	10,090	7' 7"	54-3/4"	27"	15' 2-1/4"
LRC-227-1g	161	20	40,970	8,950	13,560	195	24	2	405	250	8"	10,110	7' 7"	54-3/4"	27"	15' 2-1/4"
LRC-240-1g	170	25	44,160	8,970	13,570	195	24	2	405	250	8"	10,120	7' 7"	54-3/4"	27"	15' 2-1/4"
LRC-255-1g	181	20	40,190	10,380	15,050	240	29	2	405	250	8"	11,590	8' 2-1/2"	62-1/4"	34-1/2"	15' 2-1/4"
LRC-269-1g	191	25	43,240	10,390	15,060	240	29	2	405	250	8"	11,600	8' 2-1/2"	62-1/4"	34-1/2"	15' 2-1/4"
LRC-249-1g	177	30	55,830	9,340	15,490	195	24	3	545	360	10"	10,930	6' 11-1/2"	47-1/4"	19-1/2"	18' 2-5/8"
LRC-287-1g	204	25	51,560	10,770	17,020	255	31	3	545	360	10"	12,460	7' 7"	54-3/4"	27"	18' 2-5/8"
LRC-300-1g	213	30	54,790	10,790	17,040	255	31	3	545	360	10"	12,480	7' 7"	54-3/4"	27"	18' 2-5/8"
LRC-321-1g	228	25	50,510	12,300	18,640	320	39	3	545	360	10"	14,080	8' 2-1/2"	62-1/4"	34-1/2"	18' 2-5/8"
LRC-336-1g	238	30	53,650	12,320	18,660	320	39	3	545	360	10"	14,100	8' 2-1/2"	62-1/4"	34-1/2"	18' 2-5/8"
LRC-361-1g	256	40	59,060	12,620	18,950	320	39	3	545	360	10"	14,390	8' 2-1/2"	62-1/4"	34-1/2"	18' 2-5/8"
LRC-379-1g	269	40	57,920	14,050	20,470	380	46	3	545	360	10"	15,910	8' 10"	69-3/4"	42"	18' 2-5/8"

* Tons at standard conditions: HCFC-22 and HFC-134a. 105°F condensing, 40°F suction and 78°F W.B.; ammonia 96.3°F condensing, 20°F suction and 78°F W.B.
** For dry operation or for external static pressure up to 1/2" use next larger size fan motor.
*** Gallons shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (12" would normally be sufficient.)
† Refrigerant charge is shown for R-717. Multiply by 1.93 for R-22 and 1.98 for R-134a.
Dimensions are subject to change. Do not use for pre-fabrication.

Engineering Data & Dimensions

Models LSC-36E-1g to LSC-170E-1g



◆ The side view motor dimension for LSC-135E-1g to 170E-1g equals 19"

Table 10 Engineering Data

Model No.*	R-717 Tons*	Fans		Weights			Refrigerant Operating Charge lbs.††	Coil Volume ft^3	Spray Pump		Remote Pump			Dimensions				
		HP	CFM	Shipping	Operating	Heaviest Section†			HP	GPM	Gallons Req'd**	Conn. Size	Operating Weight	Height H	Upper U	Lower E	Coil A	Length L
LSC-36E-1g	26	3	10,200	2,360	3,080	1,330	33	5	3/4	120	80	4"	2,660	6' 10"	38-1/2"	43-1/2"	12"	5' 11-7/8"
LSC-41E-1g	29	5	12,200	2,370	3,090	1,340	33	5	3/4	120	80	4"	2,670	6' 10"	38-1/2"	43-1/2"	12"	5' 11-7/8"
LSC-48E-1g	34	3	10,100	2,720	3,460	1,690	46	6	3/4	120	80	4"	3,030	7' 5-1/2"	46"	43-1/2"	19-/12"	5' 11-7/8"
LSC-54E-1g	38	5	11,900	2,730	3,470	1,700	46	6	3/4	120	80	4"	3,040	7' 5-1/2"	46"	43-1/2"	19-/12"	5' 11-7/8"
LSC-65E-1g	46	5	11,700	3,080	3,850	2,050	59	8	3/4	120	80	4"	3,420	8' 1"	53-1/2"	43-1/2"	27"	5' 11-7/8"
LSC-70E-1g	50	7-1/2	13,300	3,130	3,900	2,100	59	8	3/4	120	80	4"	3,470	8' 1"	53-1/2"	43-1/2"	27"	5' 11-7/8"
LSC-75E-1g	53	5	11,400	3,440	4,230	2,410	73	10	3/4	120	80	4"	3,810	8' 8-1/2"	61"	43-1/2"	34-1/2"	5' 11-7/8"
LSC-80E-1g	57	7-1/2	13,100	3,490	4,280	2,460	73	10	3/4	120	80	4"	3,860	8' 8-1/2"	61"	43-1/2"	34-1/2"	5' 11-7/8"
LSC-90E-1g	64	5	15,200	4,260	5,440	2,880	87	12	1	180	120	6"	4,890	8' 1"	53-1/2"	43-1/2"	27"	8' 11-1/4"
LSC-100E-1g	71	7-1/2	17,400	4,310	5,490	2,930	87	12	1	180	120	6"	4,940	8' 1"	53-1/2"	43-1/2"	27"	8' 11-1/4"
LSC-110E-1g	78	10	19,200	4,330	5,510	2,950	87	12	1	180	120	6"	4,960	8' 1"	53-1/2"	43-1/2"	27"	8' 11-1/4"
LSC-120E-1g	85	10	18,900	4,860	6,080	3,480	107	15	1	180	120	6"	5,520	8' 8-1/2"	61"	43-1/2"	34-1/2"	8' 11-1/4"
LSC-135E-1g	96	10	23,300	5,680	7,180	3,870	115	16	1-1/2	245	170	6"	6,570	8' 1"	53-1/2"	43-1/2"	27"	11' 11-3/4"
LSC-150E-1g	106	15	26,700	5,800	7,300	3,990	115	16	1-1/2	245	170	6"	6,690	8' 1"	53-1/2"	43-1/2"	27"	11' 11-3/4"
LSC-155E-1g	110	10	22,900	6,330	7,880	4,520	142	19	1-1/2	245	170	6"	7,300	8' 8-1/2"	61"	43-1/2"	34-1/2"	11' 11-3/4"
LSC-170E-1g	121	15	26,100	6,450	8,000	4,640	142	19	1-1/2	245	170	6"	7,420	8' 8-1/2"	61"	43-1/2"	34-1/2"	11' 11-3/4"

* Tons at standard conditions: HCFC-22 and HFC-134a. 105°F condensing, 40°F suction and 78°F W.B.; ammonia 96.3°F condensing, 20°F suction and 78°F W.B.

** For dry operation or for external static pressure up to 1/2" use next larger size fan motor.

*** Gallons shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (12" would normally be sufficient.)

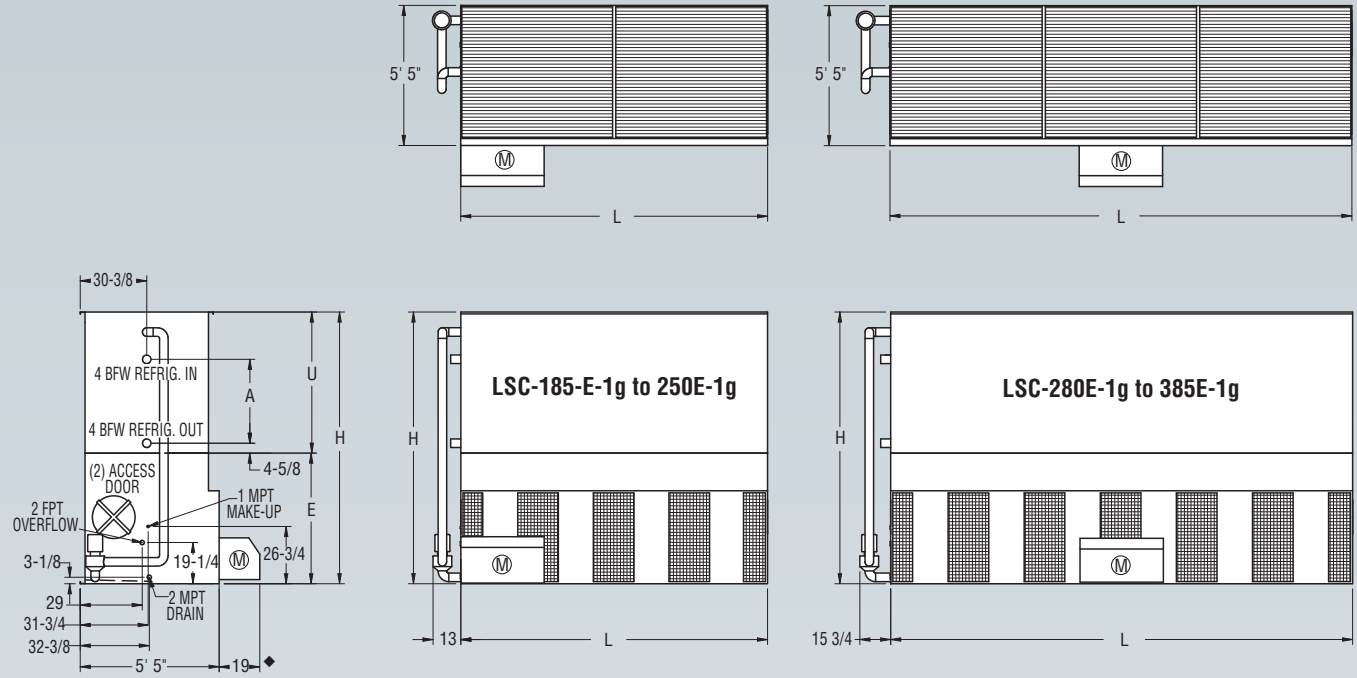
† Heaviest section is the coil section.

†† Refrigerant charge is shown for R-717. Multiply by 1.93 for R-22 and 1.98 for R-134a.

Dimensions are subject to change. Do not use for pre-fabrication.

Engineering Data & Dimensions

Models LSC-185E-1g to 385E-1g



◆ The side view motor dimension for LSC-280E-1g to 385E-1g equals 22"

Table 11 Engineering Data

Model No.*	R-717 Tons*	Fans		Weights			Refrigerant Operating Charge lbs.††	Coil Volume ft^3	Spray Pump		Remote Pump			Dimensions				
		HP	CFM	Shipping	Operating	Heaviest Section†			HP	GPM	Gallons Req'd**	Conn. Size	Operating Weight	Height H	Upper U	Lower E	Coil A	Length L
LSC-185E-1g	131	10	29,300	7,500	10,240	5,110	163	22	2	345	230	6"	8,550	9' 10-5/8"	57-1/2"	61-1/8"	30-3/4"	11' 11-1/2"
LSC-200E-1g	142	15	33,600	7,620	10,360	5,230	163	22	2	345	230	6"	8,670	9' 10-5/8"	57-1/2"	61-1/8"	30-3/4"	11' 11-1/2"
LSC-210E-1g	149	20	37,000	7,680	10,420	5,290	163	22	2	345	230	6"	8,730	9' 10-5/8"	57-1/2"	61-1/8"	30-3/4"	11' 11-1/2"
LSC-225E-1g	160	15	32,900	8,620	11,430	6,230	202	28	2	345	230	6"	9,750	10' 7-1/8"	66"	61-1/8"	39-1/4"	11' 11-1/2"
LSC-240E-1g	170	20	36,200	8,680	11,490	6,290	202	28	2	345	230	6"	9,810	10' 7-1/8"	66"	61-1/8"	39-1/4"	11' 11-1/2"
LSC-250E-1g	177	20	35,500	9,660	12,550	7,270	240	33	2	345	230	6"	10,880	11' 3-5/8"	74-1/2"	61-1/8"	47-3/4"	11' 11-1/2"
LSC-280E-1g	199	15	44,100	11,270	15,160	7,690	242	33	3	515	340	8"	12,180	9' 10-5/8"	57-1/2"	61-1/8"	30-3/4"	17' 11-7/8"
LSC-300E-1g	213	20	48,500	11,330	15,220	7,750	242	33	3	515	340	8"	12,240	9' 10-5/8"	57-1/2"	61-1/8"	30-3/4"	17' 11-7/8"
LSC-315E-1g	223	25	52,300	11,360	15,250	7,780	242	33	3	515	340	8"	12,270	9' 10-5/8"	57-1/2"	61-1/8"	30-3/4"	17' 11-7/8"
LSC-335E-1g	238	20	47,600	12,840	16,840	9,260	301	41	3	515	340	8"	13,880	10' 7-1/8"	66"	61-1/8"	39-1/4"	17' 11-7/8"
LSC-355E-1g	252	25	51,200	12,870	16,870	9,290	301	41	3	515	340	8"	13,910	10' 7-1/8"	66"	61-1/8"	39-1/4"	17' 11-7/8"
LSC-370E-1g	262	30	54,400	12,920	16,920	9,340	301	41	3	515	340	8"	13,960	10' 7-1/8"	66"	61-1/8"	39-1/4"	17' 11-7/8"
LSC-385E-1g	273	30	53,300	14,390	18,500	10,810	359	49	3	515	340	8"	15,570	11' 3-5/8"	74-1/2"	61-1/8"	47-3/4"	17' 11-7/8"

* Tons at standard conditions: HCFC-22 and HFC-134a. 105°F condensing, 40°F suction and 78°F W.B.; ammonia 96.3°F condensing, 20°F suction and 78°F W.B.

** For dry operation or for external static pressure up to 1/2" use next larger size fan motor.

*** Gallons shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (12" would normally be sufficient.)

† Heaviest section is the coil section.

†† Refrigerant charge is shown for R-717. Multiply by 1.93 for R-22 and 1.98 for R-134a.

Dimensions are subject to change. Do not use for pre-fabrication.

Engineering Data & Dimensions

Models LSC-400E-1g to LSC-805E-1g

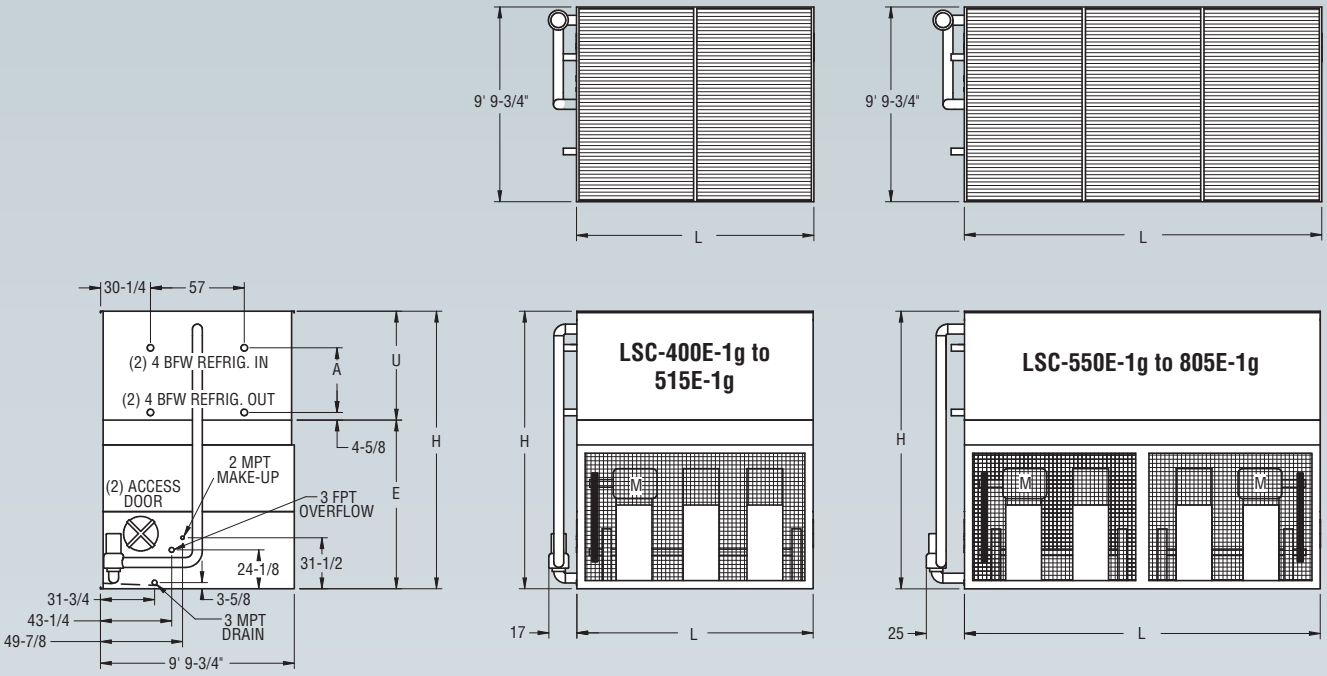


Table 12 Engineering Data

Model No.*	R-717 Tons*	Fans		Weights			Refrigerant Operating Charge lbs.††	Coil Volume ft³	Spray Pump		Remote Pump			Dimensions				
		HP	CFM	Shipping	Operating	Heaviest Section†			HP	GPM	Gallons Req'd**	Conn. Size	Operating Weight	Height H	Upper U	Lower E	Coil A	Length L
LSC-400E-1g	284	30	67,000	14,690	19,670	10,240	326	44	5	685	410	10"	17,600	13' 4-1/8"	57-5/8"	102-1/2"	30-3/4"	11' 11-3/4"
LSC-430E-1g	305	25	61,800	16,450	21,580	12,000	404	55	5	685	410	10"	19,680	14' 5/8"	66-1/8"	102-1/2"	39-1/4"	11' 11-3/4"
LSC-450E-1g	319	30	65,700	16,500	21,630	12,050	404	55	5	685	410	10"	19,730	14' 5/8"	66-1/8"	102-1/2"	39-1/4"	11' 11-3/4"
LSC-480E-1g	340	40	72,300	16,660	21,790	12,210	404	55	5	685	410	10"	19,890	14' 5/8"	66-1/8"	102-1/2"	39-1/4"	11' 11-3/4"
LSC-500E-1g	355	40	70,800	18,560	23,840	14,110	481	66	5	685	410	10"	22,120	14' 9-1/8"	74-5/8"	102-1/2"	47-3/4"	11' 11-3/4"
LSC-515E-1g	365	50	76,300	18,570	23,850	14,120	481	66	5	685	410	10"	22,130	14' 9-1/8"	74-5/8"	102-1/2"	47-3/4"	11' 11-3/4"
LSC-550E-1g	390	(2)15	88,100	21,350	28,910	14,940	484	66	7-1/2	1,030	600	12"	25,620	13' 4-1/8"	57-5/8"	102-1/2"	30-3/4"	18' 1/4"
LSC-590E-1g	418	(2)20	96,900	21,470	29,030	15,060	484	66	7-1/2	1,030	600	12"	25,740	13' 4-1/8"	57-5/8"	102-1/2"	30-3/4"	18' 1/4"
LSC-625E-1g	443	(2)25	104,400	21,530	29,090	15,120	484	66	7-1/2	1,030	600	12"	25,800	13' 4-1/8"	57-5/8"	102-1/2"	30-3/4"	18' 1/4"
LSC-650E-1g	461	(2)20	94,900	24,180	31,960	17,770	601	82	7-1/2	1,030	600	12"	28,930	14' 5/8"	66-1/8"	102-1/2"	39-1/4"	18' 1/4"
LSC-690E-1g	489	(2)25	102,300	24,240	32,020	17,830	601	82	7-1/2	1,030	600	12"	28,990	14' 5/8"	66-1/8"	102-1/2"	39-1/4"	18' 1/4"
LSC-720E-1g	511	(2)30	108,700	24,340	32,120	17,930	601	82	7-1/2	1,030	600	12"	29,090	14' 5/8"	66-1/8"	102-1/2"	39-1/4"	18' 1/4"
LSC-755E-1g	535	(2)30	106,500	27,160	35,160	20,750	718	98	7-1/2	1,030	600	12"	32,380	14' 9-1/8"	74-5/8"	102-1/2"	47-3/4"	18' 1/4"
LSC-805E-1g	571	(2)40	117,200	27,480	35,480	21,070	718	98	7-1/2	1,030	600	12"	32,700	14' 9-1/8"	74-5/8"	102-1/2"	47-3/4"	18' 1/4"

* Tons at standard conditions: HCFC-22 and HFC-134a. 105°F condensing, 40°F suction and 78°F W.B.; ammonia 96.3°F condensing, 20°F suction and 78°F W.B.

** For dry operation or for external static pressure up to 1/2" use next larger size fan motor.

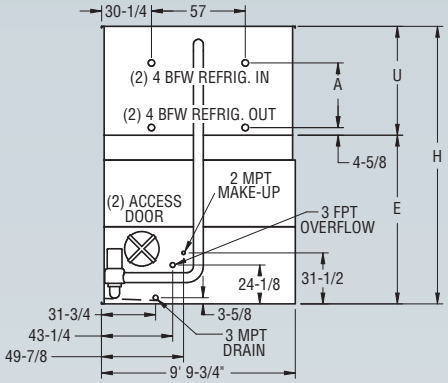
*** Gallons shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (12" would normally be sufficient.)

† Heaviest section is the coil section.

†† Refrigerant charge is shown for R-717. Multiply by 1.93 for R-22 and 1.98 for R-134a.
Dimensions are subject to change. Do not use for pre-fabrication.

Engineering Data & Dimensions

Models LSC-800E-1g to 1030E-1g



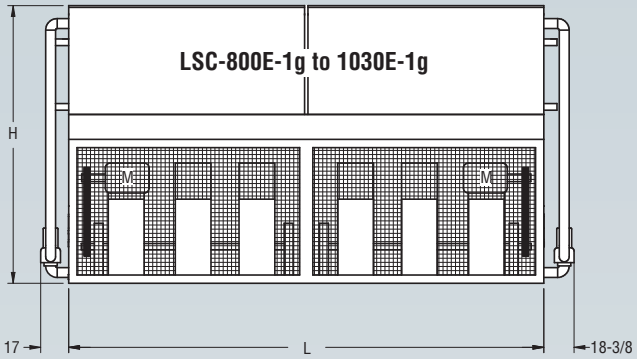


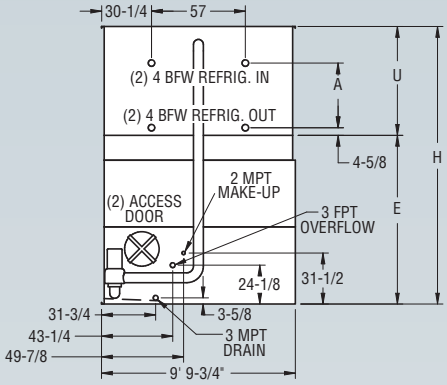
Table 13 Engineering Data

Model No.*	R-717 Tons*	Fans		Weights			Refrigerant Operating Charge lbs.††	Coil Volume ft^3	Spray Pump		Remote Pump			Dimensions				
		HP	CFM	Shipping	Operating	Heaviest Section†			HP	GPM	Gallons Req'd**	Conn. Size	Operating Weight	Height H	Upper U	Lower E	Coil A	Length L
LSC-800E-1g	567	(2)30	134,100	29,660	39,780	10,670	652	89	(2)5	1,370	820	(2)10"	35,300	13' 4-1/8"	57-5/8"	102-1/2"	30-3/4"	24' 1-1/4"
LSC-860E-1g	610	(2)25	123,600	33,100	43,520	12,390	807	110	(2)5	1,370	820	(2)10"	39,360	14' 5/8"	66-1/8"	102-1/2"	39-1/4"	24' 1-1/4"
LSC-900E-1g	638	(2)30	131,400	33,300	43,720	12,490	807	110	(2)5	1,370	820	(2)10"	39,560	14' 5/8"	66-1/8"	102-1/2"	39-1/4"	24' 1-1/4"
LSC-960E-1g	681	(2)40	144,600	33,940	44,360	12,810	807	110	(2)5	1,370	820	(2)10"	40,200	14' 5/8"	66-1/8"	102-1/2"	39-1/4"	24' 1-1/4"
LSC-1000E-1g	709	(2)40	141,600	37,740	48,460	14,710	962	131	(2)5	1,370	820	(2)10"	44,630	14' 9-1/8"	74-5/8"	102-1/2"	47-3/4"	24' 1-1/4"
LSC-1030E-1g	730	(2)50	152,600	37,780	48,500	14,730	962	131	(2)5	1,370	820	(2)10"	44,670	14' 9-1/8"	74-5/8"	102-1/2"	47-3/4"	24' 1-1/4"

* Tons at standard conditions: HCFC-22 and HFC-134a. 105°F condensing, 40°F suction and 78°F W.B.; ammonia 96.3°F condensing, 20°F suction and 78°F W.B.
** For dry operation or for external static pressure up to 1/2" use next larger size fan motor.
*** Gallons shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (12" would normally be sufficient.)
† Heaviest section is the coil section.
†† Refrigerant charge is shown for R-717. Multiply by 1.93 for R-22 and 1.98 for R-134a.
Dimensions are subject to change. Do not use for pre-fabrication.

Engineering Data & Dimensions

Models LSC-1100E-1g to 1610E-1g



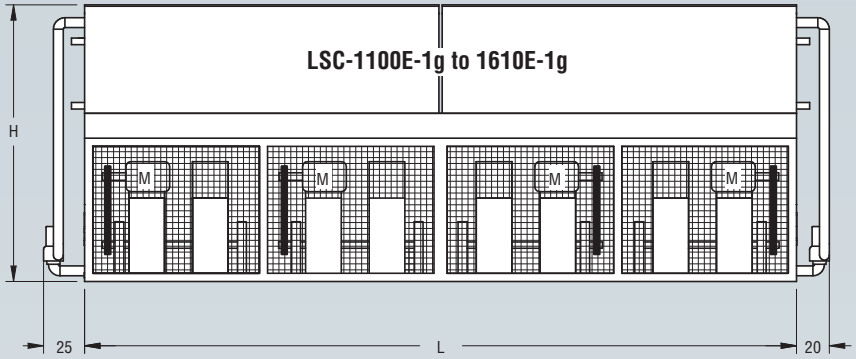


Table 14 Engineering Data

Model No.*	R-717 Tons*	Fans		Weights			Refrigerant Operating Charge lbs.††	Coil Volume ft^3	Spray Pump		Remote Pump			Dimensions				
		HP	CFM	Shipping	Operating	Heaviest Section†			HP	GPM	Gallons Req'd**	Conn. Size	Operating Weight	Height H	Upper U	Lower E	Coil A	Length L
LSC-1100E-1g	780	(4)15	176,000	43,840	58,970	15,540	969	132	(2) 7-1/2	2,060	1,500	(2)12"	52,500	13' 4-1/8"	57-5/8"	102-1/2"	30-3/4"	36' 2-1/2"
LSC-1180E-1g	837	(4)20	193,700	44,320	59,450	15,780	969	132	(2) 7-1/2	2,060	1,500	(2)12"	52,980	13' 4-1/8"	57-5/8"	102-1/2"	30-3/4"	36' 2-1/2"
LSC-1250E-1g	887	(4)25	208,700	44,560	59,690	15,900	969	132	(2) 7-1/2	2,060	1,500	(2)12"	53,220	13' 4-1/8"	57-5/8"	102-1/2"	30-3/4"	36' 2-1/2"
LSC-1310E-1g	929	(4)30	221,800	44,960	60,090	16,100	969	132	(2) 7-1/2	2,060	1,500	(2)12"	53,620	13' 4-1/8"	57-5/8"	102-1/2"	30-3/4"	36' 2-1/2"
LSC-1380E-1g	979	(4)25	204,500	49,980	65,550	18,610	1,203	164	(2) 7-1/2	2,060	1,500	(2)12"	59,600	14' 5/8"	66-1/8"	102-1/2"	39-1/4"	36' 2-1/2"
LSC-1440E-1g	1021	(4)30	217,400	50,380	65,950	18,810	1,203	164	(2) 7-1/2	2,060	1,500	(2)12"	60,000	14' 5/8"	66-1/8"	102-1/2"	39-1/4"	36' 2-1/2"
LSC-1510E-1g	1071	(4)30	212,900	56,000	72,010	21,620	1,437	196	(2) 7-1/2	2,060	1,500	(2)12"	66,580	14' 9-1/8"	74-5/8"	102-1/2"	47-3/4"	36' 2-1/2"
LSC-1610E-1g	1142	(4)40	234,400	57,280	73,290	22,260	1,437	196	(2) 7-1/2	2,060	1,500	(2)12"	67,860	14' 9-1/8"	74-5/8"	102-1/2"	47-3/4"	36' 2-1/2"

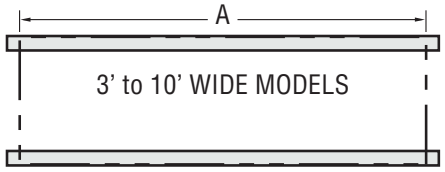
* Tons at standard conditions: HCFC-22 and HFC-134a. 105°F condensing, 40°F suction and 78°F W.B.; ammonia 96.3°F condensing, 20°F suction and 78°F W.B.
** For dry operation or for external static pressure up to 1/2" use next larger size fan motor.
*** Gallons shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (12" would normally be sufficient.)
† Heaviest section is the coil section.
†† Refrigerant charge is shown for R-717. Multiply by 1.93 for R-22 and 1.98 for R-134a.
Dimensions are subject to change. Do not use for pre-fabrication.

LSC-E/LRC Steel Support

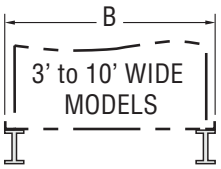
The recommended support for EVAPCO condensers is structural "I" beams located under the outer flanges and running the entire length of the unit. Mounting holes, 3/4" in diameter are located in the bottom channels of the pan section to provide for bolting to the structural steel. (Refer to certified drawings from the factory for bolt hole locations.)

Beams should be level to within 1/8" in 6' before setting the unit in place. Do not level the unit by shimming between it and the "I" beams as this will not provide proper longitudinal support.

Plan View



End Elevation

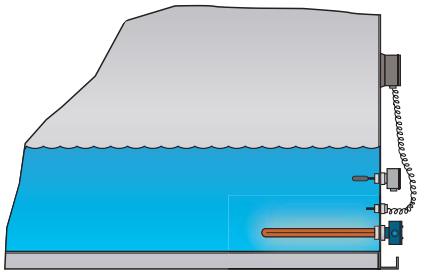


LSC-E DIMENSIONS		
4' Wide Models	**A**	**B**
LSC-36E-1g to 80E-1g	5' 11-7/8"	4' 5/8"
LSC-90E-1g to 120E-1g	8' 11-1/4"	4' 3/4"
LSC-135E-1g to 170E-1g	11' 11-3/4"	4' 5/8"
5' Wide Models	**A**	**B**
LSC-185E-1g to 250E-1g	11' 11-1/2"	5' 5"
LSC-280E-1g to 385E-1g	17' 11-7/8"	5' 5"
10' Wide Models	**A**	**B**
LSC-400E-1g to 515E-1g	11' 11-3/4"	9' 9-3/4"
LSC-550E-1g to 805E-1g	18' 1/4"	9' 9-3/4"
LSC-800E-1g to 1030E-1g	24' 1-1/4"	9' 9-3/4"
LSC-1100E-1g to 1610E-1g	36' 2-1/2"	9' 9-3/4"

LRC DIMENSIONS		
3' Wide Models	**A**	**B**
LRC-25-1g to 72-1g	10' 1-7/8"	3' 4-1/2"
5' Wide Models	**A**	**B**
LRC-76-1g to 114-1g	12' 2-7/8"	5' 5/8"
LRC-108-1g to 183-1g	15' 2-1/4"	5' 5/8"
LRC-190-1g to 246-1g	18' 2-5/8"	5' 5/8"
8' Wide Models	**A**	**B**
LRC-188-1g to 269-1g	15' 2-1/4"	7' 10"
LRC-249-1g to 379-1g	18' 2-5/8"	7' 10"

Electric Heaters

Electric immersion heaters are available factory installed in the basin of the condenser. They are sized to maintain a +40° F pan water temperature with the fans off and an ambient air temperature of 0°F, -20°F or -40°F. They are furnished with a thermostat and low water protection device to cycle the heater on when required and to prevent the heater elements from energizing unless they are completely submerged. All components are in weather proof enclosures for outdoor use. The heater power contactors and electric wiring are not included as standard.



LSC-E Basin Heater Sizing			
Unit Footprint	**kW (0°F)**	**kW (-20°F)**	**kW (-40°F)**
4' x 6'	(1) 2	(1) 3	(1) 4
4' x 9'	(1) 3	(1) 4	(1) 5
4' x 12'	(1) 3	(1) 5	(1) 7
4' x 18'	(1) 5	(1) 7	(1) 9
5' x 12'	(1) 4	(1) 6	(1) 8
5' x 18'	(2) 3	(2) 4	(1) 12
10' x 12'	(1) 7	(1) 10	(1) 15
10' x 18'	(2) 5	(2) 7	(2) 10
10' x 24'	(2) 7	(2) 10	(2) 15
10' x 36'	(2) 10	(4) 7	(4) 9

LRC Basin Heater Sizing			
Unit Footprint	**kW (0°F)**	**kW (-20°F)**	**kW (-40°F)**
3' x 6'	(1) 2	(1) 3	(1) 4
5' x 6'	(1) 3	(1) 5	(1) 6
5' x 9'	(1) 4	(1) 6	(1) 8
5' x 12'	(1) 6	(1) 8	(1) 12
8' x 9'	(1) 7	(1) 9	(1) 12
8' x 12'	(1) 9	(1) 12	(1) 16

LSC-E/LRC Optional Equipment

Pulse~Pure® is an environmentally sensitive non-chemical water treatment system for evaporative condensers. Developed by EVAPCO, Pulse~Pure offers an alternative to chemical water treatment programs. Utilizing pulse-power technology Pulse~Pure provides chemical-free treatment that is environmentally safe.

Self Supporting Service Platforms

Some LSC-E condensers are available with self-supporting service platforms that include access ladders which are designed for easy field installation. This option offers significant savings in comparison to field constructed, externally supported catwalks. The Evapco service platform option may be installed on either side or the end opposite the connections.

Multiple Circuit Coils

Condensers may be supplied with multiple circuit coils to match various system requirements such as split systems, or if a glycol or water circuit is desired for compressor head cooling.

ASME Coils

Evaporative condensers can be furnished with condensing coils manufactured in accordance with the ASME Pressure Vessel Code Section VIII, Division I. Coils built with this option will bear a U-stamp indicating their compliance with the ASME code.

TITAN Coils – Stainless Steel Construction

EVAPCO offers the option of Type 304L stainless steel construction using the Thermal Pak® II coil design. Highly efficient heat transfer coils with the ultimate corrosion protection.

Electric Water Level Control

Evaporative condensers may be ordered with an electric water level control in lieu of the standard mechanical float and make-up assembly. This package provides accurate control of water levels and does not require field adjustment.

Two Speed Motors

Two speed fan motors can provide an excellent means of capacity control. In periods of lightened loads or reduced wet bulb temperatures, the fans can operate at low speed, which will provide about 60% of full speed capacity, yet consume only about 15% of the power compared with high speed. In addition to the energy savings, the sound levels of the units will be greatly reduced at low speed.

Pony Motors

In addition to two speed fan motors, variable frequency drives (VFD's) and fan cycling on multiple motor units, pony motors are available as another capacity control method. Pony motors are smaller fan motors for use in times of reduced loading. The pony motor is typically 1/4 the hp of the primary motor and can significantly reduce energy requirements.

Remote Sump Configuration

For units operating in areas where temperatures may be very low, or where low temperatures may occur during periods when the unit is not operating, a sump located inside the building is the preferred means of ensuring that the basin water will not freeze. For these applications, the condenser will be supplied without the spray pump, suction strainers and all associated piping, but with an oversize bottom outlet.

Water Level Indicator

Condensers may be supplied with a water level indicator to provide a visual indication of basin water level without opening access doors or air inlet louvers. The level indicator can be furnished with an optional low and high level alarm switches or a transmitter for continuous level monitoring.

Screened Bottom Panels

Protective inlet screens are provided on the sides and/or end of the unit's air intake. Screens are not provided below the fan section since most units are mounted on the roof or at ground level. It is recommended that bottom screens be added to the unit when it will be elevated. These screens can be provided by the factory at an additional cost or added by the installing contractor.

Solid Bottom Panels for Ducted Installations

When centrifugal fan units are installed indoors and intake air is ducted to the unit, a solid bottom panel is required to completely enclose the fan section and prevent the unit from drawing air from the room into the fan intakes. When this option is ordered, air inlet screens are omitted.

Sound Attenuation Package

For extremely noise-sensitive applications, centrifugal fan models may be supplied with intake and/or discharge attenuation packages which greatly reduce sound levels. Oversize fan motors are required for this option in order to overcome the additional static pressure.

Oversized Access Door

For enhanced basin access, the Oversized Access Door option is available on LSC-E models LSC-400E through LSC-1610E. This option enables maintenance personnel to easily enter the basin for routine maintenance or for float valve adjustment.

LSC-E/LRC Product Applications

Design

EVAPCO Evaporative Condensers are of heavy-duty construction and designed for long trouble-free operation. Proper equipment selection, installation and maintenance is, however, necessary to ensure full unit performance. Some of the major considerations in the application of a cooler are presented below. For additional information, contact the factory.

Air Circulation

In reviewing the system design and unit location, it is important that proper air circulation be provided. The best location is on an unobstructed roof top or on ground level away from walls and other barriers. Care must be taken when locating condensers in wells or enclosures or next to high walls. The potential for recirculation of hot, moist discharge air back into the fan intake exists. Recirculation raises the wet bulb temperature of the entering air causing the tower pressure to rise above the design. For these cases, a discharge hood or ductwork should be provided to raise the overall unit height even with the adjacent wall, thereby reducing the chance of recirculation. Good engineering practice dictates that the cooling tower's discharge air not be directed or located close to or in the vicinity of building air intakes. Engineering assistance is available from the factory to identify potential recirculation problems and recommend solutions.

For additional information regarding layout of cooling towers, see EVAPCO Bulletin entitled "*Equipment Layout*".

Piping

Tower piping should be designed and installed in accordance with generally accepted engineering practice. All piping should be anchored by properly designed hangers and supports with allowance made for possible expansion and contraction. No external loads should be placed upon tower connections, nor should any of the pipe supports be anchored to the unit framework.

Recirculating Water Quality

Proper water treatment is an essential part of the maintenance required for evaporative cooling equipment. A well designed and consistently implemented water treatment program will help to ensure efficient system operation while maximizing the equipment's service life. A qualified water treatment company should design a site specific water treatment protocol based on equipment (including all metallurgies in the cooling system), location, makeup water quality, and usage.

Bleed off

Evaporative cooling equipment requires a bleed or blowdown line, located on the discharge side of the recirculating pump, to remove concentrated (cycled up) water from the system. Evapco recommends an automated conductivity controller to maximize the water efficiency of your system. Based on recommendations from your water treatment company, the conductivity controller should open and close a motorized ball or solenoid valve to maintain the conductivity of the recirculating water. If a manual valve is used to control the rate of bleed it should be set to maintain the conductivity of the recirculating water during periods of peak load at the maximum level recommended by your water treatment company.

Water Treatment

The water treatment program prescribed for the given conditions must be compatible with the unit's materials of construction, including any galvanized components. The initial commissioning and passivation period is a critical time for maximizing the service life of galvanized equipment. Evapco recommends that the site specific water treatment protocol includes a passivation procedure which details water chemistry, any necessary chemical addition, and visual inspections during the first six (6) to twelve (12) weeks of operation. During this passivation period, recirculating water pH should be maintained above 7.0 and below 8.0 at all times. Batch feeding of chemicals is not recommended.

Control of Biological Contaminants

Evaporative cooling equipment should be inspected regularly to ensure good microbiological control. Inspections should include both monitoring of microbial populations via culturing techniques and visual inspections for evidence of biofouling.

Poor microbiological control can result in loss of heat transfer efficiency, increase corrosion potential, and increase the risk of pathogens such as those that cause Legionnaires' disease. Your site specific water treatment protocol should include procedures for routine operation, startup after a shut-down period, and system lay-up, if applicable. If excessive microbiological contamination is detected, a more aggressive mechanical cleaning and/or water treatment program should be undertaken.

LSC-E/LRC Specifications

Furnish and install, as shown on the plans, an EVAPCO model _____ evaporative condenser. Each unit shall have condensing capacity of _____ BTUH heat rejection, operating with _____ refrigerant at _____ °F condensing temperature and _____ °F design wet bulb temperature.

Cold Water Basin – LRC

The complete cold water basin shall be constructed of Type 304 stainless steel for long life and durability.*

Standard cold water basin accessories shall include Type 304 stainless steel overflow, drain, anti-vortexing hood, strainers, brass make-up valve with unsinkable, foam filled plastic float and wastewater bleed line with adjustable valve.

Casing and Fan Section – LRC

The casing and fan section shall be constructed of G-235 galvanized steel for long life and durability. Fan section shall include fans, motors and drives. The entire drive system (including fans, motors, sheaves and belts) shall be located in the dry entering airstream.

Pan and Casing – LSC-E

The pan and casing shall be constructed of G-235 hot-dip galvanized steel for long life and durability. The heat transfer section shall be removable from the pan to provide easy handling and rigging.

The pan/fan section shall include fans, motors and drives mounted and aligned at the factory. These items shall be located in the dry entering air stream to provide maximum service life and easy maintenaince. Standard pan accessories shall include circular access doors, stainless steel strainers, wastewater bleed line with adjustable valve and brass makeup valve, with an unsinkable foam filled plastic float.

Centrifugal Fan Drives

Fans shall be forwardly curved centrifugal type of hot-dip galvanized construction. The fans shall be factory installed into the pan-fan section, and statically and dynamically balanced for vibration free operation. Fans shall be mounted on a hollow steel shaft with forged bearing journals. The fan shaft shall be supported by heavy-duty, self aligning bearings with cast-iron housings and lubrication fittings for maintenance.

The fan drive shall be V-belt type with taper lock bushings designed for 150% of motor nameplate horsepower. Drives are to be mounted and aligned at the factory.

Fan Motor

_____ horsepower premium efficient totally enclosed fan cooled motor(s) with 1.15 service factor shall be furnished suitable for outdoor service on _____ volts, _____ hertz, and _____ phase. Motor(s) shall be mounted on an adjustable base.

Heat Transfer Coil

The coil(s) shall be all prime surface steel, encased in steel framework with the entire assembly hot-dip galvanized after fabrication. Coil(s) shall be designed for free drainage of liquid refrigerant and tested to 400 psig air pressure under water.

Water Distribution System

The system shall provide a water flow rate of 6 GPM over each square foot of the unit face area to ensure proper flooding of the coil. The spray header shall be constructed of Schedule-40, PVC pipe for corrosion resistance. All spray branches shall be removable and include a threaded end plug for cleaning. The water shall be distributed over the entire coil surface by heavy-duty ABS spray nozzles with large 1-1/4" diameter opening and internal sludge ring to eliminate clogging. ZM nozzles are threaded into Schedule-40 Polyvinyl Chloride headers equipped with removable end plugs for ease of cleaning. Nozzles shall be threaded into a spray header to provide easy removal for maintenance.

Water Recirculation Pump

The pump(s) shall be a close-coupled, centrifugal type with mechanical seal. _____ horsepower totally enclosed, motor shall be furnished suitable for outdoor service on _____ volts, _____ hertz, and _____ phase.

Eliminators

The eliminators shall be constructed entirely of PVC that has been specially treated to resist ultra-violet light. Assembled in easily handled sections, the eliminator blades shall incorporate three changes in air direction to assure removal of entrained moisture from the discharge air stream. The maximum drift rate shall not exceed 0.001% of the recirculated water rate.

Finish-LSC-E

All pan and casing materials shall be constructed of G-235 heavy gauge mill hot-dip galvanized steel for maximum protection against corrosion. During fabrication, all panel edges shall be coated with 95% pure zinc-rich compound.

Finish-LRC

The complete cold water basin shall be constructed of Type 304 stainless steel for maximum corrosion protection.* The casing and fan section shall be constructed of G-235 heavy gauge mill hot-dip galvanized steel. During fabrication, all galvanized panel edges shall be coated with a 95% pure zinc compound.

* *Available in G-235 hot-dip galvanized steel construction as an option.*

EVAPCO Products are Manufactured Worldwide

EVAPCO, Inc. — World Headquarters & Research/Development Center

EVAPCO, Inc. • P.O. Box 1300 • Westminster, MD 21158 USA
PHONE: 410-756-2600 • FAX: 410-756-6450 • E-MAIL: marketing@evapco.com

EVAPCO North America

EVAPCO, Inc.
World Headquarters
P.O. Box 1300
Westminster, MD 21158 USA
Phone: 410-756-2600
Fax: 410-756-6450
E-mail: marketing@evapco.com

EVAPCO East
5151 Allendale Lane
Taneytown, MD 21787 USA
Phone: 410-756-2600
Fax: 410-756-6450
E-mail: marketing@evapco.com

EVAPCO Midwest
1723 York Road
Greenup, IL 62428 USA
Phone: 217-923-3431
Fax: 217-923-3300
E-mail: evapcomw@evapcomw.com

EVAPCO West
1900 West Almond Avenue
Madera, CA 93637 USA
Phone: 559-673-2207
Fax: 559-673-2378
E-mail: contact@evapcowest.com

EVAPCO Iowa
925 Quality Drive
Lake View, IA 51450 USA
Phone: 712-657-3223
Fax: 712-657-3226

EVAPCO Iowa
Sales & Engineering
1234 Brady Boulevard
Owatonna, MN 55060 USA
Phone: 507-446-8005
Fax: 507-446-8239
E-mail: evapcomn@evapcomn.com

Refrigeration Valves & Systems Corporation
A wholly owned subsidiary of EVAPCO, Inc.
1520 Crosswind Dr.
Bryan, TX 77808 USA
Phone: 979-778-0095
Fax: 979-778-0030
E-mail: rvs@rvscorp.com

McCormack Coil Company, Inc.
A wholly owned subsidiary of EVAPCO, Inc.
P.O. Box 1727
6333 S.W. Lakeview Boulevard
Lake Oswego, OR 97035 USA
Phone: 503-639-2137
Fax: 503-639-1800
E-mail: mail@mmccoil.com

EvapTech, Inc.
A wholly owned subsidiary of EVAPCO, Inc.
8331 Nieman Road
Lenexa, KS 66214 USA
Phone: 913-322-5165
Fax: 913-322-5166
E-mail: marketing@evaptech.com

Tower Components, Inc.
A wholly owned subsidiary of EVAPCO, Inc.
5960 US HWY 64E
Ramseur, NC 27316
Phone: 336-824-2102
Fax: 336-824-2190
E-mail: mail@towercomponentsinc.com

EVAPCO Newton
701 East Jourdan Street
Newton, IL 62448 USA
Phone: 618-783-3433
Fax: 618-783-3499
E-mail: evapcomw@evapcomw.com

EVAPCO...Specialists in Heat Transfer Products and Services.

EVAPCO Europe

EVAPCO Europe, N.V.
European Headquarters
Industrieterrein Oost 4010
3700 Tongeren, Belgium
Phone: (32) 12-395029
Fax: (32) 12-238527
E-mail: evapco.europe@evapco.be

EVAPCO Europe, S.r.l.
Via Ciro Menotti 10
I-20017 Passirana di Rho
Milan, Italy
Phone: (39) 02-939-9041
Fax: (39) 02-935-00840
E-mail: evapcoeurope@evapco.it

EVAPCO Europe, S.r.l.
Via Dosso 2
23020 Piateda Sondrio, Italy

EVAPCO Europe, GmbH
Bovert 22
D-40670 Meerbusch, Germany
Phone: (49) 2159-69560
Fax: (49) 2159-695611
E-mail: info@evapco.de

Flex coil a/s
A wholly owned subsidiary of EVAPCO, Inc.
Knøsgårdvej 115
DK-9440 Aabybro Denmark
Phone: (45) 9824 4999
Fax: (45) 9824 4990
E-mail: info@flexcoil.dk

EVAPCO S.A. (Pty.) Ltd.
A licensed manufacturer of EVAPCO, Inc.
18 Quality Road
Isando 1600
Republic of South Africa
Phone: (27) 11-392-6630
Fax: (27) 11-392-6615
E-mail: evapco@evapco.co.za

Evap Egypt Engineering Industries Co.
A licensed manufacturer of EVAPCO, Inc.
5 El Nasr Road
Nasr City, Cairo, Egypt
Phone: 2 02 24022866/2 02 24044997
Fax: 2 02 24044667/2 02 24044668
E-mail: Primacool@link.net / Shady@primacool.net

EVAPCO Asia/Pacific

EVAPCO Asia/Pacific Headquarters
1159 Luoning Rd. Baoshan Industrial Zone
Shanghai, P. R. China, Postal Code: 200949
Phone: (86) 21-6687-7786
Fax: (86) 21-6687-7008
E-mail: marketing@evapcochina.com

Evapco (Shanghai) Refrigeration Equipment Co., Ltd.
1159 Louning Rd., Baoshan Industrial Zone
Shanghai, P.R. China, Postal Code: 200949
Phone: (86) 21-6687-7786
Fax: (86) 21-6687-7008
E-mail: marketing@evapcochina.com

Beijing EVAPCO Refrigeration Equipment Co., Ltd.
Yan Qi Industrial Development District
Huai Rou County
Beijing, P.R. China, Postal Code: 101407
Phone: (86) 10 6166-7238
Fax: (86) 10 6166-7395
E-mail: evapcobj@evapcochina.com

Evapco Australia (Pty.) Ltd.
34-42 Melbourne Road
P.O. Box 436
Riverstone, N.S.W. Australia 2765
Phone: (61) 2 9627-3322
Fax: (61) 2 9627-1715
E-mail: sales@evapco.com.au

EvapTech Asia Pacific Sdn. Bhd
A wholly owned subsidiary of EvapTech, Inc.
IOI Business Park, 2/F Unit 21
Persiaran Puchong Jaya Selatan
Bandar Puchong Jaya,
47170 Puchong, Selangor, Malaysia
Phone: (60-3) 8070 7255
Fax: (60-3) 8070 5731
E-mail: marketing-ap@evaptech.com

Visit **EVAPCO's** Website at: **http://www.evapco.com**