LC Series
Chillers
Engineering Catalog

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R75380 · Rev. A · 140220
(ACP 30092)

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Features and Benefits

Flexibility of Design
The AAON LC Series chiller is available from 5 to 54 tons. These capacity ranges make the LC Series chiller suitable for a variety of applications. Multiple smaller capacity chillers can be more economical, practical, and efficient than a single, centralized, chilled water plant. While especially useful in part-load applications, multiple LC Series chillers provide redundancy for scheduled service and maintenance.

For new installations, LC Series chillers can provide any tonnage requirement through a combination of units. For building upgrades or renovations, the LC Series chiller can be added to an existing system for needed capacity. Pumping packages can be factory installed to minimize field installation time and unnecessary complications.

Efficiency
All AAON LC Series chillers are provided with load matching variable capacity scroll compressors on each refrigerant circuit. With these compressors, the LC Series chiller can provide part-load to low-load operation without requiring hot gas bypass.

The LC Series chiller also utilizes Variable Speed Condenser Fans. By reducing fan speed, the LC Series chiller can operate more efficiently during part-load conditions, low-load conditions, and low-ambient temperatures.

Convenience and Serviceability
The LC Series chiller was designed to make installation, operation, and service of the unit as convenient as possible through the various standard and optional features. The LC Series chiller may be rooftop, platform, or ground-level slab mounted. All LC Series chillers have forklift slots and lifting lugs for installation. Water connections are accessed at the back of the cabinet, while remaining components are internal to the unit. The LC Series chiller does not require installation in remote, isolated, or protected areas to limit personnel access.

The access doors on all models are hinged and have zinc cast, lockable handles. The controls compartment provides convenient access to compressors, wiring, and control components. The components are labeled and all wiring is color-coded to match the unit wiring diagram, conveniently located on the access door interior.

Prior to shipping, factory installed wiring and piping is tested and inspected. Quality control testing is done through a factory monitored run test.

Figure 1 - Back of an LC Series Chiller

Reliability
Cabinet panels are constructed of galvanized G-90 sheet metal which provides the LC Series chiller with strength and rigidity. The condenser coils include louvered guards to reduce potential damage. The corrosion resistant paint on the external cabinet surpasses a 1,000 hour salt spray test. Additional corrosion protection is available

through a polymer e-coating on the condenser coil. This coating surpasses a 6,000 hour salt spray test. Each chiller is factory inspected and checked for leaks before leaving the factory.

Quiet Operation
Rubber isolation mounts are used to minimize vibrations from each compressor. Variable speed condenser fans reduce energy consumption and noise during low ambient conditions.

Smart Controls
Every LC Series chiller is furnished with a Micro Control System (MCS) Magnum controller. Despite possible wide ranging operating conditions, the MCS can maintain a constant leaving water temperature by modulating the variable capacity scroll compressors. The large graphical LCD display provides a convenient user interface. The 9 large function keys simplify making inputs into the menu driven prompts. Schedules are available with a seven day built-in time clock. Terminals are provided for remote stop-start and for remote reset of the leaving water temperature setpoint. The controller features a minimum of 12 sensor inputs, 4 digital inputs, 10 relay outputs, and 4 analog outputs. Non-volatile memory is used for all control functions. Additional features include an RS-485 and Ethernet port allowing monitoring from a Building Management System.

Figure 2 - Control and Display Panel

Factory Installed Pumping Packages
AAON has taken the lead with factory engineered and installed pumping packages that save time and expenses associated with the details of the jobsite construction of the equipment room. The LC Series effectively becomes a packaged outdoor mechanical room. Building owners can reallocate the valuable indoor floor space previously used for pumps.

Factory installed pumping packages are configurable and include a factory mounted inline air purge device. Grooved piping and fittings are furnished as a standard factory installed feature. Pumping packages include butterfly valves, air scoop, suction guide and strainers, ball valves, Armstrong® pump, and a combination valve (isolation, check, and balancing.

Figure 3 - Heat Exchanger and Pump

For added convenience, selection of pumping packages is handled through the AAON selection software, AAONEcat32™. Refer to the AAONEcat32 for further information. Manual selection of pumping package components is not possible due to the many combinations and applications conditions that may be selected. All LC Series chiller sizes can utilize pumping packages. Units 15 tons and above are available with dual arm pumps. After pump selection is made, the AAONECat32 software will generate a rating sheet, pump performance curves, and a piping diagram.

Application Information

Fluid Temperature Design Conditions

The chiller must not be operated with a leaving water temperature of less than 42°F for an untreated water application. When lower leaving fluid temperatures are required, an appropriate glycol solution must be used. The solution must have a freezing point at least 16°F lower than the design entering fluid temperature. The temperature difference between fluid entering and leaving the chiller must be in the range of 6 to 16°F.

The absolute maximum fluid temperature that can be continuously *circulated* through the evaporator is 116°F. Above 116ºF, thermal stresses may cause permanent damage to the evaporator heat exchanger. The compressor *operating* envelope limits the entering water temperature to 80ºF. Above this temperature the compressor will not receive adequate cooling and can be damaged. AAON recommends entering water temperature of 70ºF or less for continuous *operating* conditions.

Fluid Volume

Consideration must be given to the total volume of fluid in the system. In close coupled, low volume systems, the leaving fluid temperature will change quickly through large capacity control steps. This is not acceptable if tight temperature control is desired for comfort control or process cooling. If large capacity control steps are used, tight temperature control of the exiting water temperature requires an increase in fluid loop volume.

All LC Series chiller models contain variable capacity compressors. The compressor is designed with a capacity step of 10%. The unit capacity step for the LC-5 to LC-29 is 10% and the unit capacity step

for LC-38 to LC-54 is 5%. Compared to chillers with capacity control through compressor cycling, the variable capacity compressor can result in a significant reduction in required loop volume. Systems with large capacity steps may require additional water volume through a storage tank, while the LC Series chiller may not.

Use the following example as a guide to determine fluid loop volume from the required leaving water temperature tolerance.

Use the information in Table 1 that lists the maximum step of capacity in each model size and a factor for that model.

Note that during startup the variable capacity compressors on each circuit modulate up to 50% capacity.

Example Problem: An LC-15 is rated at 14.2 tons at the operating conditions. It is desired to have no greater than a ± 1°F leaving water temperature variation. What is the minimum water volume required in the chilled water loop?

Solution: Use the following equation to determine the minimum allowable water loop volume.

Minimum Water Loop Volume = Actual Tons x (Min. Volume Gal*°F_{swing}/ton) / Allowable °F_{swing}

Allowable °F_{swing} is specified in the problem statement. With a tolerance of ± 1°F, the total allowable swing is 2°F.

Select the value of Min. Volume Gal*°F_{swing}/Ton from Table 1.

Table 1 - Minimum Volume

Model	Maximum % Capacity Step	Minimum Volume (Gal*°F_{swing})/ton
LC-5 to LC-29	25	30
LC-38 to LC-54	12.5	15

Minimum Volume = 30 (Gal*°F_{swing})/ton

Thus, the Minimum Water Loop Volume with the known performance of 14.2 tons of cooling at the application conditions:

Minimum Water Loop Volume = 14.2 x 30 / 2 = 213 gallons

If this same system had two on/off compressors with a 50% capacity control step, the Minimum Water Loop Volume (Gal*°F_{swing}/ton) is 60. This would require 426 gallons of water in the loop. The LC Series chiller could eliminate the storage tank or reduce the required tank size when compared to a unit with on/off compressors.

Notice if this system was selected for a 43°F leaving water temperature, the temperature will vary between 42°F to 44°F (recall the variation tolerance ± 1°F) with the variable capacity compressors at a water loop volume of 213 gallons. The final selection should ensure the leaving water temperature does not drop below 42°F. If the leaving water temperature could go below 42°F, then the loop volume should be increased or glycol should be included with the design.

If the fluid loop contains glycol, the above water loop volume should be multiplied by the correction factor in Table 2.

Table 2 - Glycol Correction Factors

% by Weight	Glycol Volume Correction Factor	
	Ethylene	Propylene
10	1.038	1.017
20	1.066	1.033
30	1.100	1.058
40	1.140	1.092
50	1.192	1.142

It may be necessary to install a storage tank in the system to provide the necessary volume for tight temperature control. When this is done, the tank should be installed in the loop between the fluid coming from the building and returning to the chiller. Figure 4 illustrates a proper storage tank usage.

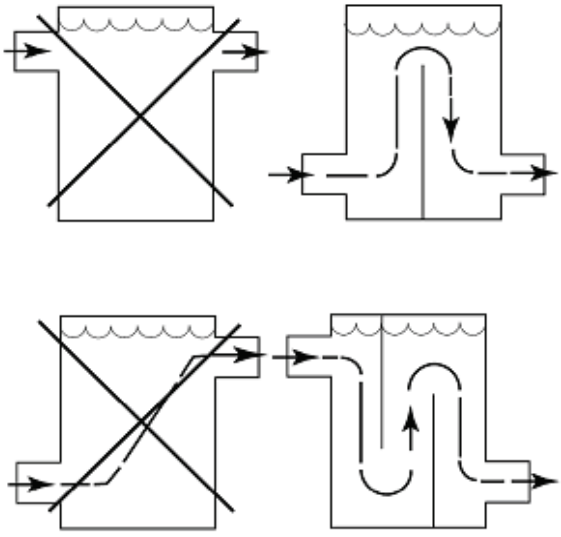

Figure 4 - Storage Tank Usage

Chiller Placement

The AAON LC Series chiller is designed for outdoor applications and mounting at ground level or on a roof. It must be placed on a level and solid foundation that has been prepared to support its weight. When installed at ground level, a one-piece concrete slab should be used with footings that extend below the frost line. The placement relative to the building air intakes and other structures is critical and must be carefully selected. Consult Figure 5 and Figure 6 for guidance.

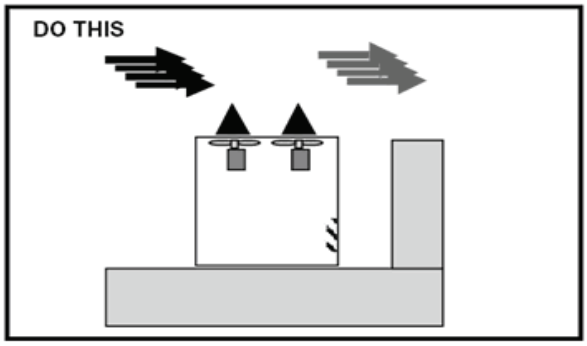

Figure 5 - Proper Chiller Placement

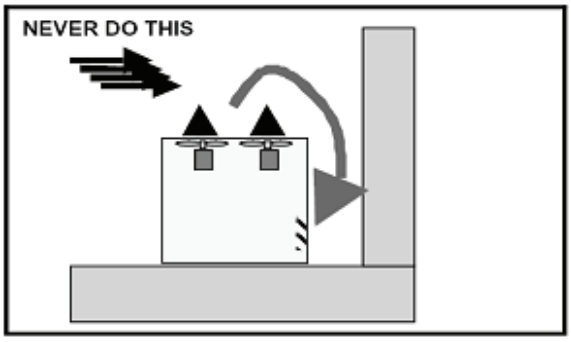

Figure 6 - Improper Chiller Placement

Be sure to observe the dimensions that are on the rating plate of the chiller for operational and service clearances. For proper unit operation, the immediate area must remain free of debris that may be drawn in and obstruct airflow in the condensing section. Table 3 displays the typical clearances found on the rating plate of each unit.

Table 3 - Service Clearances

Location	Model
	All
Back - Evaporator Access	48”
Front - Controls Access	48”
Left Side - Condenser	36”
Right Side - Condenser	36”
Top	Unobstructed

Remember, there should be no obstruction above the unit that could deflect the discharge air downward where it could recirculate to the inlet of the condensing

section. The position of the chiller must provide sufficient side and end clearance to allow air to enter, as well as, to permit the access for any future service. If the low ambient option has been ordered with the equipment then special consideration must be given to snow accumulation when placing the unit. Condenser coils and fans must be free of snow or any other obstructions in order to start and operate properly with a correct amount of airflow.

Access Doors
When planning the placement of the chiller, take into consideration the access doors to the equipment. An access door is provided to the compressor and controls compartment. A separate access door is also provided to the evaporator/heat exchanger compartment.

Mounting Isolation
For roof mounted applications or anytime vibration transmission may be a factor, vibration isolators may be considered.

Electrical Power Supply
The power and control wiring is brought through the utility entry to the power supply terminal blocks. The DDC controller furnished with the unit is supplied with its own power supply factory wired to the main power of the chiller. The voltage to the chiller must be within plus or minus 10% of the nameplate rating value on the unit.

All LC Series chillers are available with 208V three phase, 230V three phase, and 460V three phase power inputs. The LC-5 through LC-8 chillers are available with the additional option for 208V and 230V single phase power input. The LC-19 through LC-54 chillers are available with the additional option for 575V three phase power input.

Electrical Data
When a pumping package is selected, the amp draw of the pump is added to the standard electrical data. This will increase the minimum circuit ampacity (MCA) and the maximum fuse size. Consult the Electrical Service Sizing Data section of this catalog for electrical sizing information.

Dimensional Drawings
AAONECat32 should be used with all the job application information in order to receive an accurate drawing for a specific model and feature set.

Optional Oversized Heat Exchangers
These heat exchangers are available on all model sizes. They may be selected for improved performance with water or they may be selected for use with systems that contain glycol to aid in offsetting the decreased capacity due to the thermal properties of glycol.

Factory Insulated Water System
The evaporator is insulated and heat traced at the factory. As an option, the water piping can be heat traced at the factory before shipment. Since, shipping vibrations may loosen connections in the water piping, the water system must be leak tested in the field prior to startup.

Unit Selection

Selection Procedure
Chiller selection with AAONEcat32 will require knowledge of: **system load, designed leaving water temperature, chilled fluid type / glycol percentage, building pressure drop, temperature drop through the evaporator, ambient temperature conditions, desired chiller evaporator, and evaporator fouling factor.**

An approximation of the chilled water flow rate in gallons per minute (GPM) is given by the following equation:

GPM = (Tons x 24) / ΔT

AAON provides a software program, AAONEcat32, for unit selection and rating. This is the fastest and easiest method of inputting all the job requirements and making an equipment selection. The software will produce thermal performance data, and additionally, will contain complete specifications and unit drawings for the product selected.

Leaving Fluid Temperature
A minimum leaving fluid temperature of 42°F is allowed when water is used as a heat transfer fluid to ensure freeze protection and continued operation of the heat exchanger. When lower leaving temperatures are desired, glycol must be added to the circulating fluid. Apply the appropriate correction factor from Table 4 for ethylene glycol, and Table 5 for propylene glycol correction.

In situations where the transfer fluid will have a fouling factor other than 0.0001, the factors found in Table 6 can be used to correct the unit capacity and power.

Table 4 - Ethylene Glycol

% Weight of Ethylene Glycol	Freeze Point ºF	Capacity Factor	Power Factor	Pressure Drop Factor	Flow Factor
10	26	0.998	0.998	1.03	24.9
20	17	0.995	0.997	1.09	25.6
30	5	0.970	0.990	1.15	26.4
40	-10	0.941	0.985	1.23	27.4
50	-32	0.950	0.970	1.31	28.6

Table 5 - Propylene Glycol

% Weight of Propylene Glycol	Freeze Point ºF	Capacity Factor	Power Factor	Pressure Drop Factor	Flow Factor
10	26	0.998	0.996	1.08	24.4
20	19	0.975	0.975	1.21	24.8
30	9	0.960	0.985	1.40	25.4
40	-6	0.921	0.975	1.67	26.2
50	-28	0.910	0.965	1.98	27.4

Table 6 - Fouling Factor

	0.0001		0.00025		0.00075		0.00175	
Chilled Water ΔT (ºF)	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power
6	0.990	0.998	0.989	0.996	0.962	0.986	0.920	0.973
8	0.994	0.999	0.991	0.998	0.965	0.988	0.923	0.975
10	1.000	1.000	0.993	0.999	0.970	0.991	0.928	0.978
12	1.005	1.001	0.999	1.000	0.975	0.993	0.933	0.980
14	1.008	1.002	1.005	1.001	0.980	0.996	0.937	0.983
16	1.010	1.003	1.008	1.003	0.984	0.998	0.941	0.985

Example 1
Required System Load = 22 tons
Entering Water Temperature = 54ºF
Air Cooled Condenser High Water Flow
Chilled Water Flowrate = 62.4 gpm
Design Ambient Temperature = 95ºF
Standard Brazed Plate Evaporator

LC-26 Unit Capacity = 24.67 tons
Unit Power = 34.20 kW
Water Pressure Drop = 17.93 feet water
Water Temperature Drop = 9.49ºF

If the water system were changed to 40% by weight propylene glycol / water mixture, the correction factors in Table 5 are applied.

New Capacity = 24.67 tons x 0.921
= 22.72 tons

New Flowrate = 22.72 tons x 26.2 /9.49
= 62.73 gpm

New Power = 34.20 kW x 0.975
= 33.35 kW

Use the corrected flowrate of 62.73 gpm in Figure 8 to find the intersection with LC-26. The pressure drop for a water system is now 18 feet of water.

Propylene Glycol Corrected Pressure Drop = 18 feet of water x 1.67 = 30.08 feet of water.

Example 2
Required System Load = 47 tons
Entering Water Temperature = 54ºF
Air Condenser Low Water Flow
Chilled Water Flowrate = 112.8 gpm
Design Ambient Temperature = 95ºF
Oversized Shell and Tube Evaporator

LC-47 Unit Capacity = 47.49
Unit Power = 52.01 kW
Water Pressure Drop = 11.44 feet water
Water Temperature Drop = 10.1ºF

If the water system were changed to 20% by weight ethylene glycol / water mixture, the correction factors in Table 4 are applied.

New Capacity = 47.49 tons x 0.995
= 47.25 tons

New Flowrate = 47.25 tons x 25.6/10.1
= 119.76 gpm

New Power = 52.01 kW x 0.997
= 51.85 kW

Use the corrected flowrate of 119.76 gpm in Figure 14 to find the intersection with LC-47. The pressure drop for a water system is now 12 feet of water.

Ethylene Glycol Corrected Pressure Drop = 12 feet of water x 1.09 = 13.08 feet of water.

Evaporator Pressure Drops

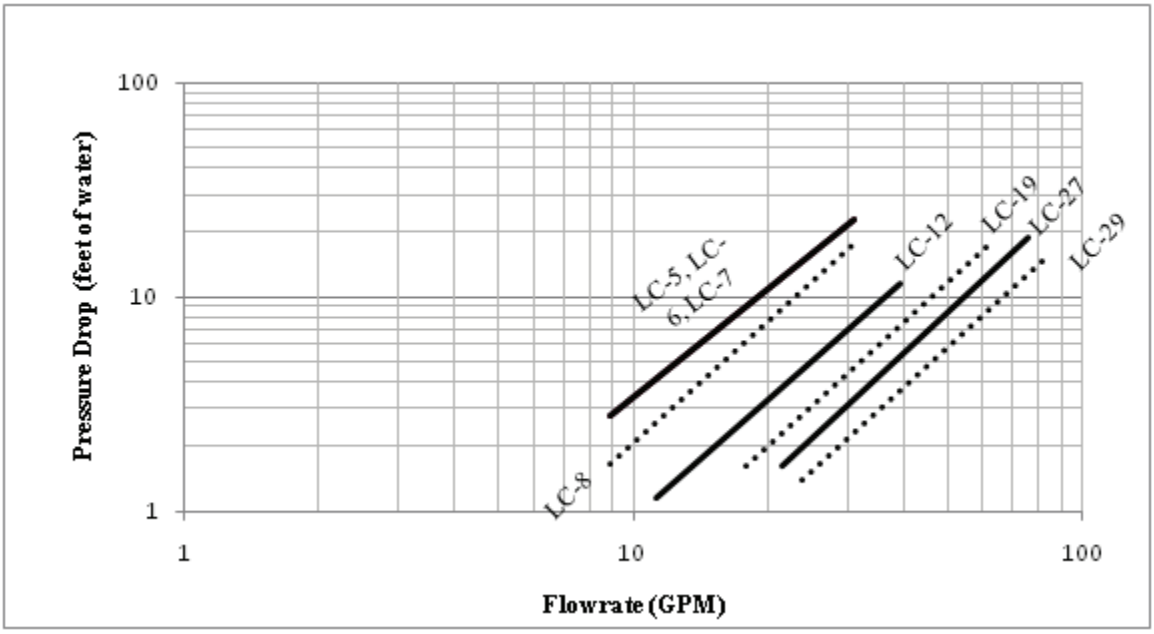

Figure 7 - Brazed Plate Pressure Drops 1

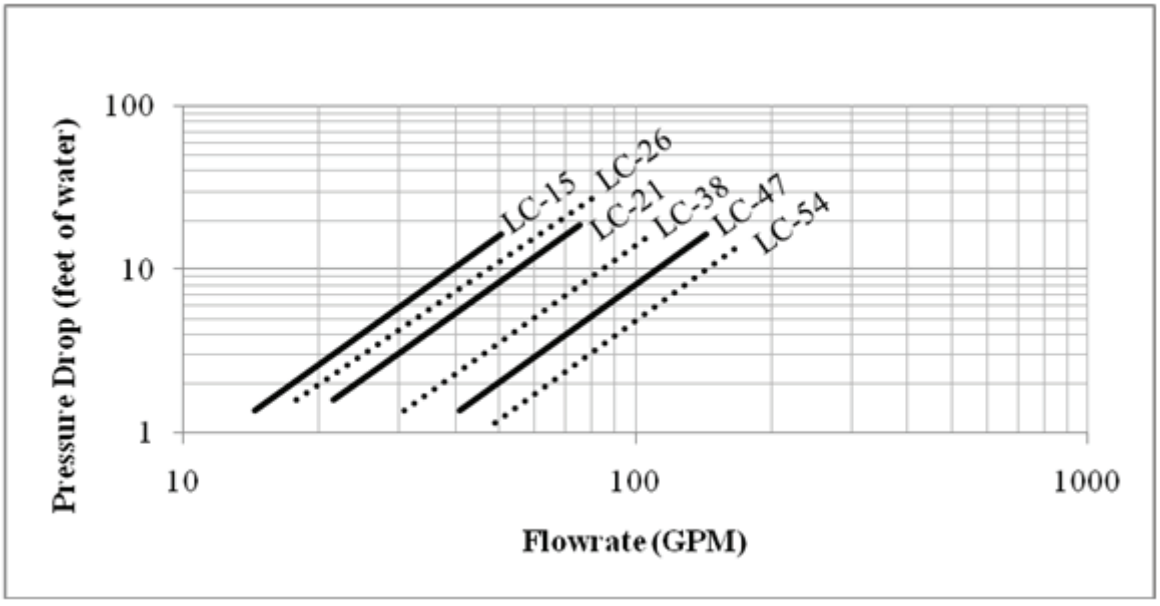

Figure 8 - Brazed Plate Pressure Drops 2

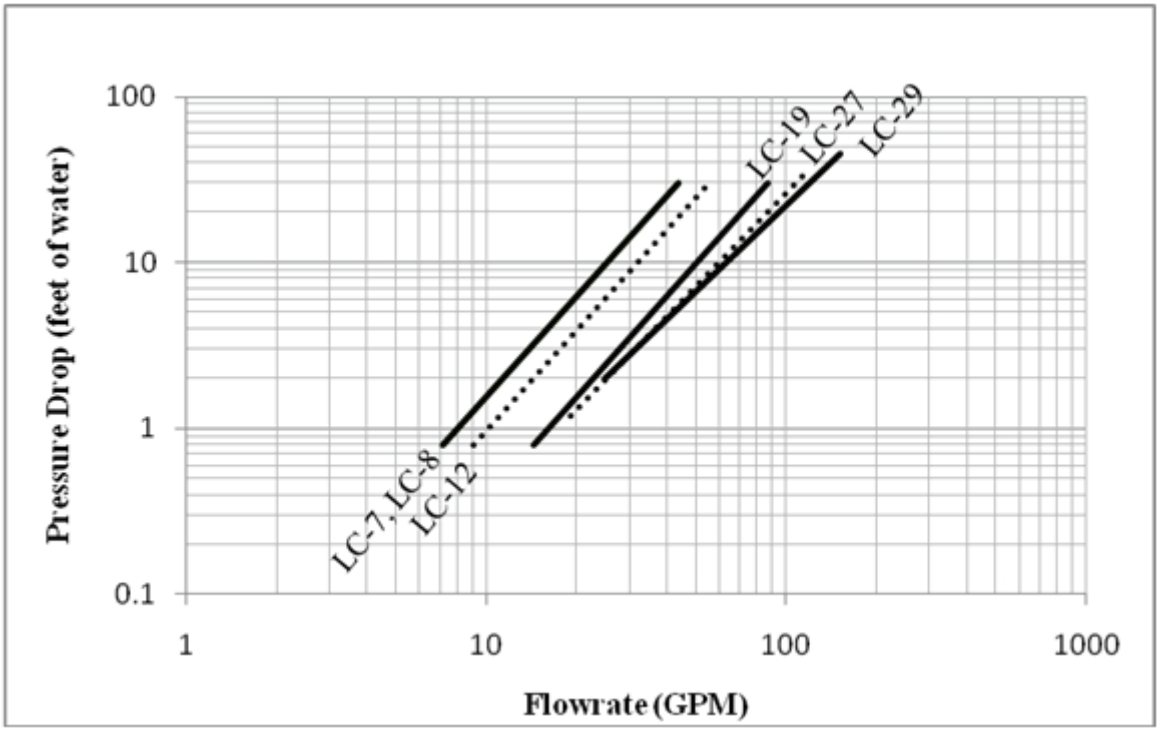

Figure 9 - Oversized Brazed Plate Pressure Drops 1

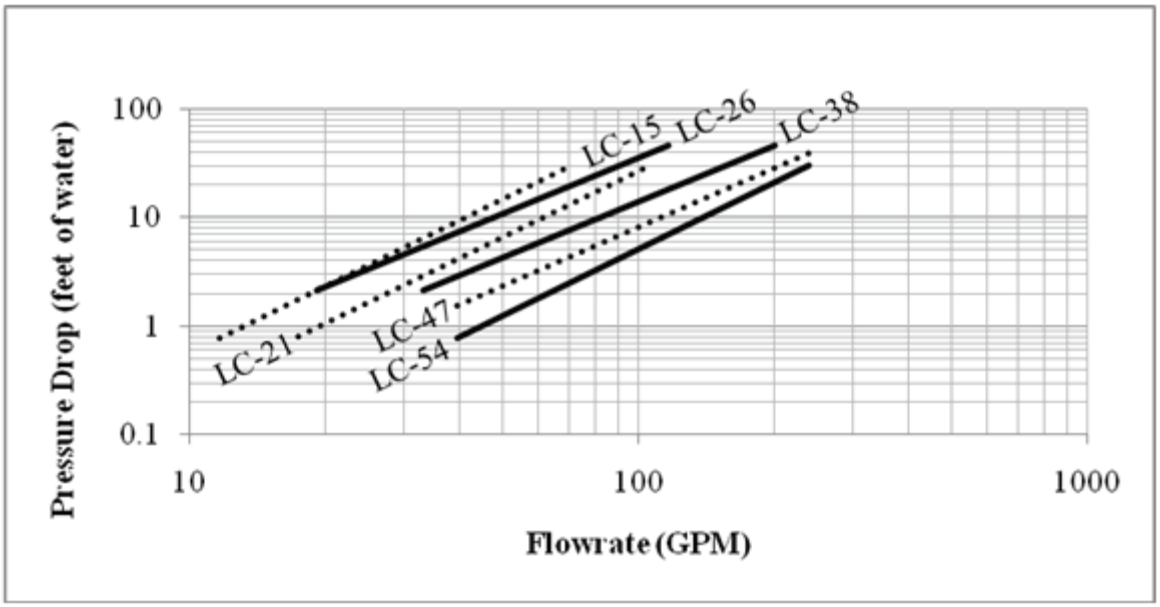

Figure 10 - Oversized Brazed Plate Pressure Drops 2

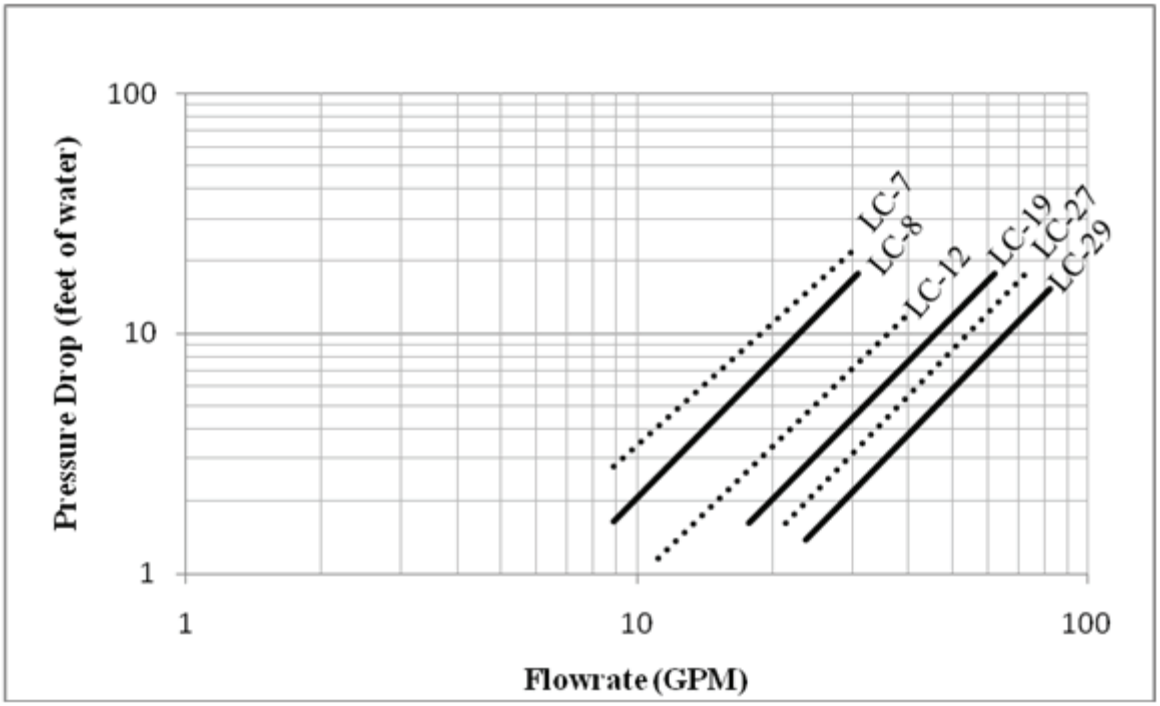

Figure 11 - Shell and Tube Pressure Drops 1

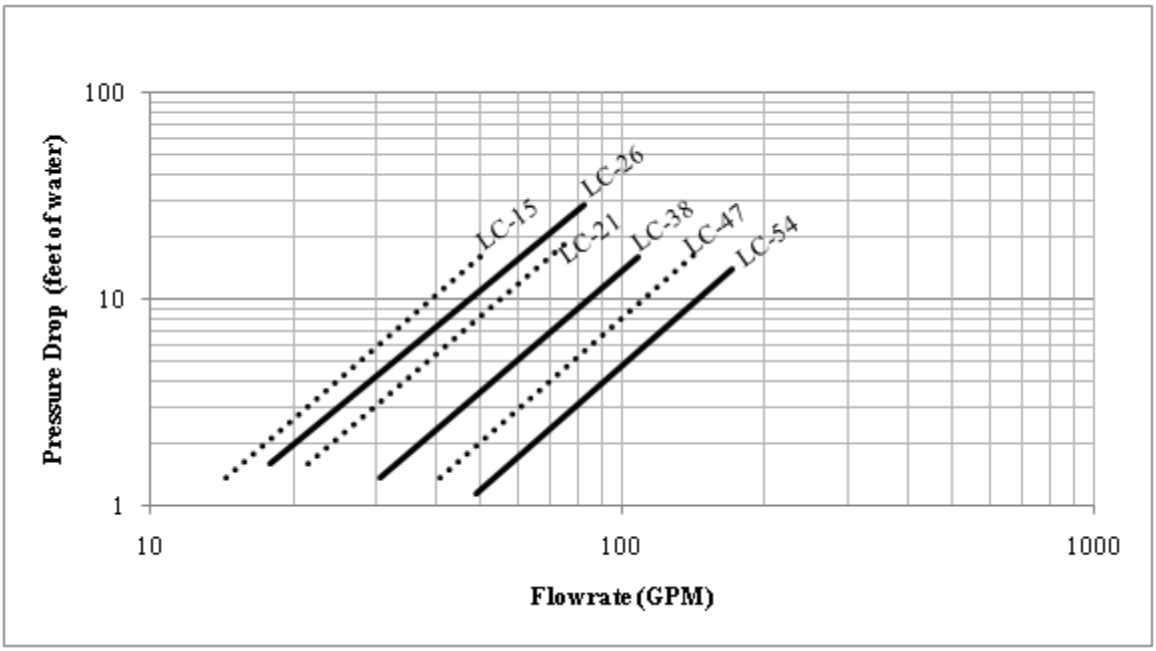

Figure 12 - Shell and Tube Pressure Drops 2

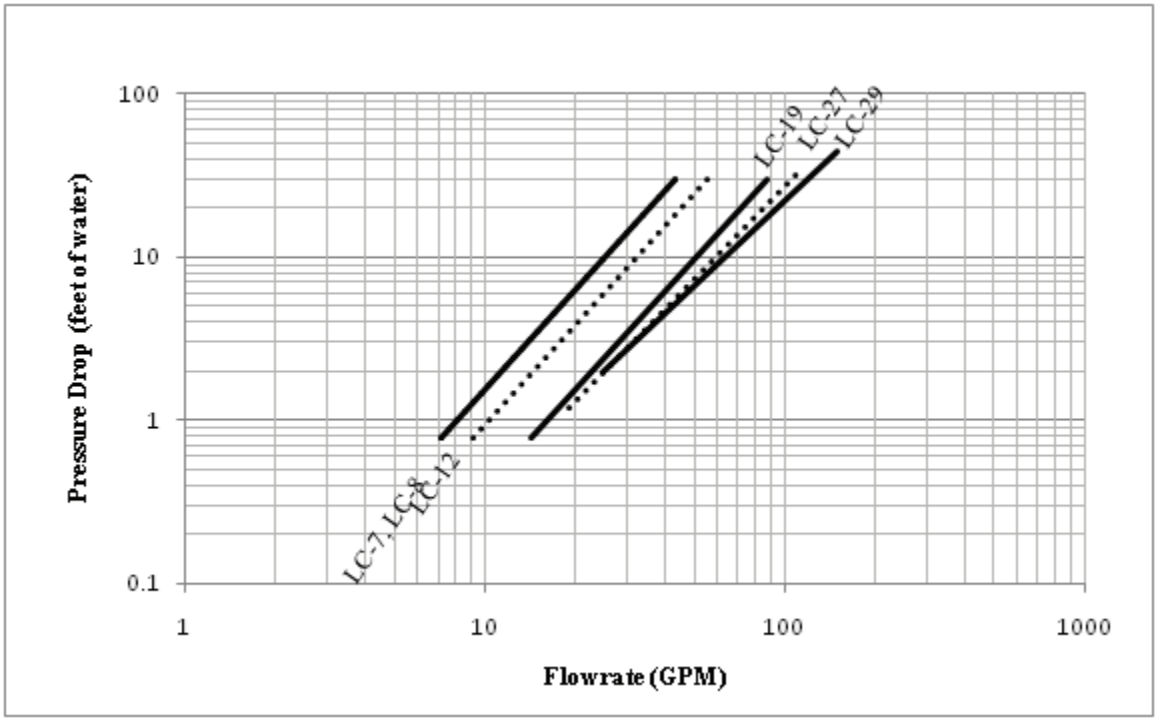

Figure 13 - Oversized Shell and Tube Pressure Drops 1

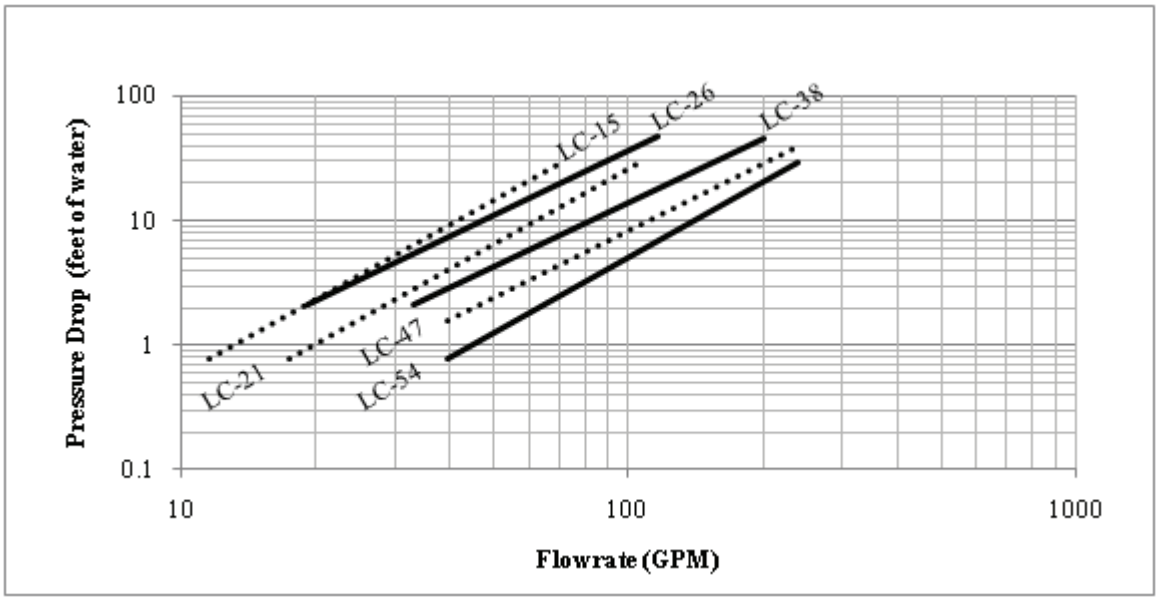

Figure 14 - Oversized Shell and Tube Pressure Drops 2

LC Base Model Description

Model Number

LC	-	A38	-	3	-	0	-	A	A	0	A	-	0	0	0
Series and Generation		Unit Size		Voltage		Blank		A1	A2	A3	A4		B1	B2	B3

BASE MODEL

SERIES AND GENERATION

LC

UNIT SIZE

A05 = 5 Nominal Tons
A06 = 6 Nominal Tons
A07 = 7 Nominal Tons
A08 = 8 Nominal Tons
A12 = 12 Nominal Tons
A15 = 15 Nominal Tons
A19 = 19 Nominal Tons
A21 = 21 Nominal Tons
A27 = 27 Nominal Tons
A29 = 29 Nominal Tons
A38 = 38 Nominal Tons
A47 = 47 Nominal Tons
A54 = 54 Nominal Tons

VOLTAGE

1 = 230V/1Φ/60Hz
2 = 230V/3Φ/60Hz
3 = 460V/3Φ/60Hz
4 = 575V/3Φ/60Hz
8 = 208V/3Φ/60Hz
9 = 208V/1Φ/60Hz

BLANK

0 = Standard

MODEL OPTION A: COOLING

A1 : COOLING STYLE

A = R-410A Variable Capacity Scroll Compressors

A2: COOLING CONFIGURATION

0 = Air-Cooled Condenser, Low Water Flow
A = Air-Cooled Condenser, High Water Flow

A3: COOLING COATING

0 = Standard
1 = Polymer E-Coated Condenser Coil

A4: COOLING STAGING

A = Shell and Tube Heat Exchanger
B = Brazed Plate Heat Exchanger
C = Oversized Shell and Tube Heat Exchanger
D = Oversized Brazed Plate Heat Exchanger

MODEL OPTION B: BLANK

B1: BLANK

0 = Standard

B2: BLANK

0 = Standard

B3: BLANK

0 = Standard

LC Features Description

Feature Number

:	B	G	J	G	-	0
	1A	1B	1C	1D		2

FEATURE 1: BUILDING PUMPING

1A: PUMP OPTIONS

0 = Standard, No Building Pump
B = Primary Pumping System

1B: PUMP CONFIGURATION

0 = Standard, No Building Pump
A = 1 Pump - Std Eff, 1170 RPM
C = *dualArm* Pump - Std Eff, 1170 RPM
D = 1 Pump - Prem Eff, 1170 RPM
F = *dualArm* Pump - Prem Eff, 1170 RPM
G = 1 Pump w/ VFD - 1170 RPM
J = *dualArm* Pump w/ 2 VFDs - 1170 RPM
K = 1 Pump - Std Eff, 1760 RPM
M = *dualArm* Pump - Std Eff, 1760 RPM
N = 1 Pump - Prem Eff, 1760 RPM
Q = *dualArm* Pump - Prem Eff, 1760 RPM
R = 1 Pump w/ VFD - 1760 RPM
T = *dualArm* Pump w/ 2 VFDs - 1760 RPM
U = 1 Pump - Std Eff, 3520 RPM
W = *dualArm* Pump - Std Eff, 3520 RPM
Y = 1 Pump - Prem Eff, 3520 RPM
1 = *dualArm* Pump - Prem Eff, 3520 RPM
2 = 1 Pump w/ VFD - 3520 RPM
4 = *dualArm* Pump w/ 2 VFDs - 3520 RPM

1C: PUMP SIZE

0 = Standard, No Building Pump
A = Pump 4360 1.5B
B = Pump 4360 2B
C = Pump 4360 2D
D = Pump 4380 1.5x1.5x6
E = Pump 4380 2x2x6
F = Pump 4380/4382 3x3x6
G = Pump 4380/4382 4x4x6
H = Pump 4380 1.5x1.5x8
J = Pump 4380 2x2x8
K = Pump 4380/4382 3x3x8
L = Pump 4380/4382 4x4x8
M = Pump 4380 5x5x8
N = Pump 4380/4382 6x6x8
P = Pump 4380 2x2x10
Q = Pump 4380/4382 3x3x10
R = Pump 4380/4382 4x4x10
S = Pump 4380/4382 6x6x10
T = Pump 4380/4382 8x8x10
U = Pump 4380 4x4x11.5
V = Pump 4380 5x5x11.5
W = Pump 4380 6x6x11.5
Y = Pump 4380 8x8x11.5
Z = Pump 4380 4x4x13
1 = Pump 4380 6x6x13
2 = Pump 4380 8x8x13
3 = Pump 4382 6x6x6
4 = Pump 4382 8x8x8
5 = Pump 4360 3D

1D: PUMP MOTOR

0 = Standard, No Building Pump
A = 0.5 hp
B = 0.75 hp
C = 1 hp
D = 1.5 hp
E = 2 hp
F = 3 hp
G = 5 hp
H = 7.5 hp
J = 10 hp

FEATURE 2: WATER PIPING OPTIONS

0 = Standard, Back Water Connections
B = Back Water Connection + Factory Installed Pipe Trace Heating Cable

LC Features Description

Feature Number

F	B	-	0	0	0	-	0	0	0	-	A	0	0	B	0
3	4		5A	5B	5C		6A	6B	6C		7	8	9	10	11

FEATURE 3: CHILLER ACCESSORIES

0 = Heat Trace and Insulation on Water Evaporator
A = Heat Trace and Insulation on Glycol Evaporator
D = Heat Trace and Insulation on Water Evaporator with Air Scoop
E = Heat Trace and Insulation on Glycol Evaporator with Air Scoop
F = Heat Trace and Insulation on Water Evaporator with Air Scoop, Thermometers, and Differential Pressure Gauge
H = Heat Trace and Insulation on Glycol Evaporator with Air Scoop, Thermometers, and Differential Pressure Gauge

FEATURE 4: LOW AMBIENT

0 = Standard, Variable Speed Condenser Fans
A = Variable Speed Condenser Fans with Low Ambient on One Refrigerant Circuit
B = Variable Speed Condenser Fans with Low Ambient on Two Refrigerant Circuits

FEATURE 5: BLANK

5A: BLANK

0 = Standard

5B: BLANK

0 = Standard

5C: BLANK

0=Standard

FEATURE 6: BLANK

6A: BLANK

0=Standard

6B: BLANK

0 = Standard

6C: BLANK

0 = Standard

FEATURE 7: SERVICE OPTIONS

0 = Standard
A = Factory Wired 115 V Outlet
B = Field Wired 115 V Outlet

FEATURE 8: BLANK

0 = Standard

FEATURE 9: REFRIGERATION ACCESSORIES

0 = Standard
A = Sight Glass
B = Compressor Isolation Valves
C = Sight Glass and Compressor Isolation Valves

FEATURE 10: POWER OPTIONS

0 = Standard, Power Block
A = Power Switch (60 amps)
B = Power Switch (100 amps)
C = Power Switch (150 amps)
D = Power Switch (225 amps)
E = Power Switch (400 amps)

FEATURE 11: BLANK

0 = Standard

LC Features Description

Feature Number

B	0	-	0	0	-	0	0	0	A	0	0	0	0	B
12	13		14A	14B		15	16	17	18	19	20	21	22	23

FEATURE 12: CONTROLS
0 = Standard
B = Phase and Brown Out Protection

FEATURE 13: SPECIAL CONTROLS
0 = Standard MCS Magnum Controller
A = Standard MCS Magnum with Modem
B = Standard MCS Magnum with LonTalk Connection
C = Standard MCS Magnum with Diagnostics
D = Standard MCS Magnum with LonTalk Connection and Diagnostics
E = Standard MCS Magnum with LonTalk Connection and Modem
F = Standard MCS Magnum with Diagnostics and Modem
G = Standard MCS Magnum with LonTalk Connection, Diagnostics, and Modem

FEATURE 14: BLANK
14A: BLANK
0 = Standard

14B: BLANK
0 = Standard

FEATURE 15: BLANK
0 = Standard

FEATURE 16: CABINET OPTIONS
0 = Standard
A = California OSHPD Certified
B = Shake Table Certified (ASCE 7-05/ICC-ES AC 156)
C = Seismic Construction (Non-Certified)

FEATURE 17: BLANK
0 = Standard

FEATURE 18: WARRANTY
0 = Standard
A = Second to Fifth Year Extended Compressor Warranty

FEATURE 19: CODE OPTIONS
0 = Standard ETL USA Listing

FEATURE 20: BLANK
0 = Standard

FEATURE 21: BLANK
0 = Standard

FEATURE 22: BLANK
0 = Standard

FEATURE 23: TYPE
B = Standard Paint
U = Special Price Authorization and Special Paint
X = Special Price Authorization w/ Standard Paint

Model Number
Unit Size

Example: LC-**A38**-2-0-AA0A-000:BGJG-0FB-000-000-A00D0B0-00-000A0000B

The first number of the model string designates nominal cooling capacity (tons) at AHRI conditions for an air-cooled condenser unit with a standard shell and tube chiller barrel. Actual capacities will vary with conditions. Refer to the AAONECat32 software for performance and cooling capacities at design conditions.

Table 7 - Model Sizes

Model (Nominal Capacity)	Condenser	Compressor
LC-**A05**	Air-Cooled Condenser	2 Variable Capacity Scroll Compressors and 2 Refrigeration Circuits
LC-**A06**		
LC-**A07**		
LC-**A08**		
LC-**A12**		
LC-**A15**		
LC-**A19**		
LC-**A21**		
LC-**A27**		
LC-**A29**		
LC-**A38**		2 Variable Capacity Scroll Compressors, 2 On/Off Scroll Compressors and 2 Refrigeration Circuits
LC-**A47**		
LC-**A54**		

Model Number
Voltage

Example: LC-A38-**2**-0-AA0A-000:BGJG-0FB-000-000-A00D0B0-00-000A0000B

All units have single point power blocks with grounding lugs, 24 VAC control circuits, and branch circuit fusing.

1 = 230V/1Φ/60Hz
2 = 230V/3Φ/60Hz
3 = 460V/3Φ/60Hz
4 = 575V/3Φ/60Hz
8 = 208V/3Φ/60Hz
9 = 208V/1Φ/60Hz

Model Number
Blank

Example: LC-A38-2-**0**-AA0A-000:BGJG-0FB-000-000-A00D0B0-00-000A0000B

0 = *Standard*

Model Number
Model Option A1 - Cooling Style

Example: LC-A38-2-0-**A**A0A-000:BGJG-0FB-000-000-A00D0B0-00-000A0000B

A = *R-410A Variable Capacity Scroll Compressors* - Unit includes variable capacity R-410A scroll compressors on all circuits, which are capable of capacity modulation from 10-100%. Variable capacity scroll compressors provide the unit with accurate temperature control, low-load capability, and high efficiency at part-load conditions. Units with 4 compressors include a standard R-410A scroll compressor in tandem with a variable capacity compressor for each circuit. Each compressor shall be furnished with factory installed crankcase heaters.

Model Number
Model Option A2 - Cooling Configuration

Example: LC-A38-2-0-A**A**0A-000:BGJG-0FB-000-000-A00D0B0-00-000A0000B

0 = *Air-Cooled Condenser, Low Water Flow* - Air-cooled condenser unit intended for 14°F temperature drop across the chiller heat exchanger.
A = *Air-Cooled Condenser, High Water Flow* - Air-cooled condenser unit intended for 10°F temperature drop across the chiller heat exchanger.

Model Number
Model Option A3 - Cooling Coating

Example: LC-A38-2-0-AA**0**A-000:BGJG-0FB-000-000-A00D0B0-00-000A0000B

0 = *Standard* - No coil coating.
1 = *Polymer E-Coated Condenser Coil* - Polymer e-coating applied to the condenser coils. Coating exceeds a 6,000 hour salt spray test per ASTM B117-90, yet is only 0.8-1.2 mils thick and has excellent flexibility. Option is intended for use in coastal saltwater conditions under the stress of heat, salt, and wind and is applicable to all corrosive environments where a polymer e-coating is acceptable. Coating shall carry a 5 year non-prorated warranty.

Model Number
Model Option A4 - Cooling Staging

Example: LC-A38-2-0-AA0**A**-000:BGJG-0FB-000-000-A00D0B0-00-000A0000B

A = *Shell and Tube Heat Exchanger* - Shell and tube heat exchanger with grooved piping water connections and 3/4" closed-cell rubberized insulation. Option includes a 3/4" manual operation drain valve and 125 psig relief valve.
B = *Brazed Plate Heat Exchanger* - Brazed Plate heat exchanger with grooved piping water connections and 3/4" closed-cell rubberized insulation. Option includes a 3/4" manual operation drain valve.
C = *Oversized Shell and Tube Heat Exchanger* - Same as option A with an oversized shell and tube heat exchanger for glycol or high efficiency water applications. Option includes a 3/4" manual operation drain valve and 125 psig relief valve.
D = *Oversized Brazed Plate Heat Exchanger* - Same as option B with an oversized brazed plate heat exchanger for glycol or high efficiency water applications. Option includes a 3/4" manual operation drain valve.

Model Number
Model Option B1 - Blank

Example: LC-A38-2-0-AA0A-**0**00:BGJG-0FB-000-000-A00D0B0-00-000A0000B

0 = *Standard*

Model Number
Model Option B2 - Blank

Example: LC-A38-2-0-AA0A-0**0**0:BGJG-0FB-000-000-A00D0B0-00-000A0000B

0 = *Standard*

Model Number
Model Option B3 - Blank

Example: LC-A38-2-0-AA0A-00**0**:BGJG-0FB-000-000-A00D0B0-00-000A0000B

0 = *Standard*

Feature 1A
Building Pump Options

Example: LC-A38-2-0-AA0A-000:**B**GJG-0FB-000-000-A00D0B0-00-000A0000B

0 = *Standard, No Building Pump* - Grooved piping, fittings, and manual air vent are provided as a standard feature.
B = *Primary Pumping System* - Primary pumping package which includes a butterfly valve, air scoop, suction guide and strainers, ball valves, Armstrong® pump, and combination valve (isolation, check, and balancing). Grooved piping and fittings are provided.

Feature 1B
Building Pump Configuration

Example: LC-A38-2-0-AA0A-000:B**G**JG-0FB-000-000-A00D0B0-00-000A0000B

0 = *Standard, No Building Pump*
A = *1 Pump - Standard Efficiency, 1170 RPM Motor*
C = *dualArm Pump - Standard Efficiency, 1170 RPM Motors*
D = *1 Pump - Premium Efficiency, 1170 RPM Motor*
F = *dualArm Pump - Premium Efficiency, 1170 RPM Motors*
G = *1 Pump w/ VFD - 1170 RPM Motor*
J = *dualArm Pump w/ 2 VFDs - 1170 RPM Motors*
K = *1 Pump - Standard Efficiency, 1760 RPM Motor*
M = *dualArm Pump - Standard Efficiency, 1760 RPM Motors*
N = *1 Pump - Premium Efficiency, 1760 RPM Motor*
Q = *dualArm Pump - Premium Efficiency, 1760 RPM Motors*
R = *1 Pump w/ VFD - 1760 RPM Motor*
T = *dualArm Pump w/ 2 VFDs - 1760 RPM Motors*
U = *1 Pump - Standard Efficiency, 3520 RPM Motor*
W = *dualArm Pump - Standard Efficiency, 3520 RPM Motors*
Y= *1 Pump - Premium Efficiency, 3520 RPM Motor*
1 = *dualArm Pump - Premium Efficiency, 3520 RPM Motors*
2 = *1 Pump w/ VFD - 3520 RPM Motor*
4 = *dualArm Pump w/ 2 VFDs - 3520 RPM Motors*

AAONECat32 will select the correct available options for Feature 1B based on unit conditions and the input from the pump selection program. When creating a pump configuration with AAONECat32 you must first select a building pump option in Feature 1A. When all of the remaining features have been selected, you will be prompted by the “Pump Selection” window to select the unit conditions and building pump configuration. In the “Pump Selection” window you will be able to select number and size of the pumps, motor efficiency, number of VFDs, and view the pump curves.

Feature 1C
Building Pump Size

Example: LC-A38-2-0-AA0A-000:BG**J**G-0FB-000-000-A00D0B0-00-000A0000B

0 = *Standard, No Building Pump*
A = *Pump 4360 1.5B*
B = *Pump 4360 2B*
C = *Pump 4360 2D*
D = *Pump 4380 1.5x1.5x6*
E = *Pump 4380 2x2x6*
F = *Pump 4380/4382 3x3x6*
G = *Pump 4380/4382 4x4x6*
H = *Pump 4380 1.5x1.5x8*
J = *Pump 4380 2x2x8*
K = *Pump 4380/4382 3x3x8*
L = *Pump 4380/4382 4x4x8*
M = *Pump 4380 5x5x8*
N = *Pump 4380/4382 6x6x8*
P = *Pump 4380 2x2x10*
Q = *Pump 4380/4382 3x3x10*
R = *Pump 4380/4382 4x4x10*
S = *Pump 4380/4382 6x6x10*
T = *Pump 4380/4382 8x8x10*
U = *Pump 4380 4x4x11.5*
V = *Pump 4380 5x5x11.5*
W = *Pump 4380 6x6x11.5*
Y = *Pump 4380 8x8x11.5*
Z = *Pump 4380 4x4x13*
1 = *Pump 4380 6x6x13*
2 = *Pump 4380 8x8x13*
3 = *Pump 4382 6x6x6*
4 = *Pump 4382 8x8x8*
5 = *Pump 4360 3D*

AAONECat32 will select the correct available options for Feature 1C based on unit conditions and the input from the pump selection program. When creating a pump configuration with AAONECat32 you must first select a building pump option in Feature 1A. When all of the remaining features have been selected, you will be prompted by the “Pump Selection” window to select the unit conditions and building pump configuration. In the “Pump Selection” window you will be able to select number and size of the pumps, motor efficiency, number of VFDs, and view the pump curves.

Feature 1D
Building Pump Motor

Example: LC-A38-2-0-AA0A-000:BGJ**G**-0FB-000-000-A00D0B0-00-000A0000B

0 = *Standard, No Building Pump*
A = *0.5 hp*
B = *0.75 hp*
C = *1 hp*
D = *1.5 hp*
E = *2 hp*
F = *3 hp*
G = *5 hp*
H = *7.5 hp*
J = *10 hp*

AAONECat32 will select the correct available options for Feature 1D based on unit conditions and the input from the pump selection program. When creating a pump configuration with AAONECat32 you must first select a building pump option in Feature 1A. When all of the remaining features have been selected, you will be prompted by the "Pump Selection" window to select the unit conditions and building pump configuration. In the "Pump Selection" window you will be able to select number and size of the pumps, motor efficiency, number of VFDs, and view the pump curves.

Feature 2
Water Connection Location

Example: LC-A38-2-0-AA0A-000:BGJG-**0**FB-000-000-A00D0B0-00-000A0000B

0 = *Back Water Connection* - Supply and return water connections are located at the back of the unit.
B = *Back Water Connection and Factory Installed Pipe Trace Heating Cable* - Supply and return water connections are located at the back of the unit. Factory shall install heat trace on water piping to prevent freezing in water line.

Shipping vibrations may loosen connections in the water piping. All options require leak testing of the water system prior to startup.

Figure 15 - Water Connection Location

Feature 3
Chiller Accessories

Example: LC-A38-2-0-AA0A-000:BGJG-0**F**B-000-000-A00D0B0-00-000A0000B

0 = *Heat Trace and Insulation on Evaporator for Water System* - Chilled water system without a pumping package includes a manual valve for air venting. Heat trace and insulation is factory installed on water evaporator.
A = *Heat Trace and Insulation on Evaporator for Glycol System* - Glycol system without a pumping package includes a manual valve for air venting. Heat trace and insulation is factory installed on glycol evaporator.
D = *Heat Trace and Insulation on Evaporator for Water System with Air Scoop* - Chilled water system with air scoop included in the water piping near the return water connection, upstream of the pump, to remove the air bubbles from the water. Air scoop is included with all pumping packages.
E = *Heat Trace and Insulation on Evaporator for Glycol System with Air Scoop* - Glycol system with air scoop included in the water piping near the return water connection, upstream of the pump, to remove the air bubbles from the water. Air scoop is included with all pumping packages.
F = *Heat Trace and Insulation on Evaporator for Water System with Air Scoop, Thermometers, and Differential Pressure Gauge* - Same as option D with thermometers and differential pressure gauge factory installed on the pumping package to indicate water temperature and pressure drop of various components. Air scoop is included with all pumping packages.
H = *Heat Trace and Insulation on Evaporator for Glycol System with Air Scoop, Thermometers, and Differential Pressure Gauge* - Same as option E with thermometers and pressure gauge are factory installed on the pumping package to indicate water temperature and pressure drop of various components. Air scoop is included with all pumping packages.

Feature 4
Low Ambient

Example: LC-A38-2-0-AA0A-000:BGJG-0F**B**-000-000-A00D0B0-00-000A0000B

0 = *Standard, Variable Speed Condenser Fans* - Air-cooled condenser chiller which can operate down to 25°F ambient with variable speed condenser fans and a standard ambient temperature activated switch.
A = *One Refrigerant Circuit with Variable Speed Condenser Fans* - Factory installed 0°F low ambient flooded condenser head pressure control on one refrigerant circuit. Flooding the condenser allows the system to operate at lower ambient temperatures.
B = *Two Refrigerant Circuits with Variable Speed Condenser Fans* - Same as option A except on both refrigerant circuits.

Feature 5A
Blank

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-**0**00-000-A00D0B0-00-000A0000B

0 = *Standard*

Feature 5B
Blank

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-0**0**0-000-A00D0B0-00-000A0000B

0 = *Standard*

Feature 5C
Blank

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-00**0**-000-A00D0B0-00-000A0000B

0 = *Standard*

Feature 6A

Blank

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-000-**0**00-A00D0B0-00-000A0000B

0 = *Standard*

Feature 6B

Blank

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-000-0**0**0-A00D0B0-00-000A0000B

0 = *Standard*

Feature 6C

Blank

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-000-00**0**-A00D0B0-00-000A0000B

0 = *Standard*

Feature 7
Service Options

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-000-000-**A**00D0B0-00-000A0000B

0 = *Standard* - Compressors and controls components are accessible in a service compartment that includes a hinged access door with zinc cast lockable handle, color-coded wiring diagram to match color-coded unit wiring, and unit nameplate. All components are labeled to improve serviceability.
A = *115V Convenience Outlet, Factory Wired* - Factory wired 2x4 inch electrical box with ground fault interrupter receptacle located within the service compartment. The circuit is rated at 15 amps maximum and is factory wired to a step-down transformer, fuse block, and outlet disconnect. The circuit is wired to the line side of the unit power block permitting use of the outlet while power to the unit is shut off. **Caution: When the power to the unit is disconnected with the factory installed unit power switch, the convenience outlet will remain live.**
B = *115V Convenience Outlet, Field Wired* - Field wired 2x4 inch electrical box with ground fault interrupter receptacle, located within the controls vestibule. Receptacle is rated for 15 amps. The outlet must be field wired to an 115VAC power supply.

Figure 16 - Convenience Outlet

Feature 8
Blank

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-000-000-A**0**0D0B0-00-000A0000B

0 = *Standard*

Feature 9
Refrigeration Accessories

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-000-000-A0**0**D0B0-00-000A0000B

0 = *Standard* - Each refrigeration circuit features a manual reset high pressure cutout, an automatic reset low pressure cutout, compressor overload protection, and thermal expansion valve. All compressors are isolated from the base pan with the compressor manufacturer's recommended rubber isolators to reduce any transmission of noise from the compressors.
A = *Sight Glass* - Moisture indication sight glass in the refrigeration circuit liquid lines. A green color refrigerant indicates a dry condition, a chartreuse (green with a yellow tint or bright green) color indicates caution and a yellow color indicates a wet condition. The sight glass is not a charge indicator.
B = *Compressor Isolations Valves* - Ball type service valves located close to the compressors on the refrigeration circuit discharge and suction lines permitting isolation of the compressor for service or replacement. Valves work through a quarter turn from open to closed. Teflon seals and gaskets are used with a nylon cap gasket to prevent accidental loss. Compressor isolation valves can reduce the amount of refrigerant that must be recovered during compressor service or replacement.
C = *Sight Glass and Compressor Isolations Valves* - Options A + B

Table 8 - Moisture Content

Sight Glass Indicator Color	75°F Liquid Line Temperature - R-410A Refrigerant
Green - DRY	Below 75ppm
Chartreuse - CAUTION	75-150ppm
Yellow - WET	Above 150ppm

Feature 10
Power Options

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-000-000-A00**D**0B0-00-000A0000B

0 = *Standard, Power Block* - Standard power block for wiring power to the unit. Individual components within the unit are fused.
A = Power Switch (60 Amps)
B = Power Switch (100 Amps)
C = Power Switch (150 Amps)
D = Power Switch (225 Amps)
E = Power Switch (400 Amps)

Switch options include molded case, nonfused, disconnect switch externally mounted. The switch is accessible from the exterior of the unit. The switch disconnects high voltage service to the unit. To add a switch, choose any option besides 0 in Feature 10. After selecting all options and sizing pumps, AAONEcat32 will calculate the minimum allowable ampacity and update Feature 10 to the correct size switch.

Feature 11
Blank

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-000-000-A00D**0**B0-00-000A0000B

0 = *Standard*

Feature 12
Controls

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-000-000-A00D0**B**0-00-000A0000B

0 = *Standard* - Terminal block for wiring standard controls
B = *Phase and Brown Out Protection* - Three phase voltage monitor prevents premature failure and damage of motors and compressors from voltage unbalance, high/low voltage, and phase loss. Reset is automatic.

Feature 13
Special Controls

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-000-000-A00D0B**0**-00-000A0000B

0 = *MCS Magnum Controller* - Micro Control Systems (MCS) Magnum controller package which maintains the chiller leaving water temperature. LCD interface is included within the controls compartment for unit configuration, setpoint adjustment, sensor status viewing, unit alarm view and occupancy scheduling. PC with MCS-Connect software connected to the controller via RS-232 or Ethernet can also be used for unit configuration, setpoint adjustment, sensor status viewing, unit alarm view and occupancy scheduling. Ethernet communications port is available for end user interfacing via the Modbus IP protocol or BACnet IP protocol. [EIA-485 communications port is available for end user interfacing via the Modbus RTU protocol or N2 protocol.]
A = *MCS Magnum Controller with Modem* - MCS Magnum controller with a 56K modem which can allow MCS, AAON or customer to remotely communicate with the unit in order to assist service in the field. This option can reduce field diagnostic time and allow field updates to the unit program.
B = *MCS Magnum Controller with LonTalk Connection* - Option 0 + Adapter communications port for end user interfacing via the LonTalk protocol.
C = *MCS Magnum Controller with Diagnostics* - MCS Magnum controller with a diagnostics package of suction and discharge pressure transducers, temperature sensors that monitor compressor performance and current sensors that confirm mode of operation.
D = *MCS Magnum Controller with LonTalk Connection and Diagnostics* - Options C + Adapter communications port for end user interfacing via the LonTalk protocol.
E = *MCS Magnum Controller with LonTalk Connection and Modem* - Options A + Adapter communications port for end user interfacing via the LonTalk protocol.
F = *MCS Magnum Controller with Diagnostics and Modem* - MCS Magnum controller with a diagnostics package of suction and discharge pressure transducers, temperature sensors that monitor compressor performance and current sensors that confirm mode of operation. This option also includes a 56K modem which can allow MCS, AAON or customer to remotely communicate with the unit in order to assist service in the field. This option can reduce field diagnostic time and allow field updates to the unit program.
G = *MCS Magnum Controller with LonTalk Connection, Diagnostics, and Modem* - Options F + Adapter communications port for end user interfacing via the LonTalk protocol.

Feature 14A
Blank

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-000-000-A00D0B0-**0**0-000A0000B

0 = *Standard*

Feature 14B
Blank

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-000-000-A00D0B0-0**0**-000A0000B

0 = *Standard*

Feature 15
Blank

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-000-000-A00D0B0-00-**0**00A0000B

0 = *Standard*

Feature 16
Cabinet Options

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-000-000-A00D0B0-00-0**0**0A0000B

0 = *Standard*
A = *California OSHPD Certified* - State of California Office of Statewide Health Planning and Development (OSHPD) special seismic certification pre-approval. Specials (SPA's) are not available with OSHPD pre-approval. The anchorage between unit and building is field provided. This option is available on 6-29 ton units.
B = *Shake Table Certified(ASCE 7-05/ICC-ES AC 156)* - Unit is ASCE 7-05/ICC-ES AC 156 tested with engineer's approval for units that require seismic certification but contain options different than those included in the OSHPD tested units. This option requires a licensed engineer's approval of modifications to the unit that do not significantly change the mass or construction of the unit. The anchorage between unit and building is field provided. This option is available on 6-29 ton units.

Feature 16 - Cabinet Options Continued

C = *Seismic Construction (NonCertified)* - Units will be built with the same reinforcements of the OSHPD and AC156 seismically certified units but may include additional non-certified options. No seismic certification will be provided with the seismic construction option. This option is for units that require a reinforced construction for additional structural integrity but do not require seismic certification. The anchorage between unit and building is field provided. This option is available on 6-29 ton units.

Feature 17
Blank

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-000-000-A00D0B0-00-00**0**A0000B

0 = *Standard*

Feature 18
Warranty

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-000-000-A00D0B0-00-000**A**0000B

0 = *Standard*
A = *Second to Fifth Year Extended Compressor Warranty* - Option extends warranty coverage of compressors for the second to fifth years of unit operation.

Feature 19
Code Options

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-000-000-A00D0B0-00-000A**0**000B

0 = *Standard ETL USA Listing* - AAON units are ETL listed and tested in accordance with the latest revision of UL 1995. If a Special Pricing Authorization (SPA) is applied there may be additional costs incurred to secure the ETL label.

Feature 20
Blank

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-000-000-A00D0B0-00-000A0**0**00B

0 = *Standard*

Feature 21
Blank

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-000-000-A00D0B0-00-000A00**0**0B

0 = *Standard*

Feature 22
Blank

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-000-000-A00D0B0-00-000A000**0**B

0 = *Standard*

Feature 23
Type

Example: LC-A38-2-0-AA0A-000:BGJG-0FB-000-000-A00D0B0-00-000A0000**B**

B = *Standard* - Cabinet exterior includes paint which is gray in color and exceeds 1,000 hours when tested under ASTM B 117-95 requirements.
U = *Special Price Authorization and Special Paint* - If a special paint color is specified, a set-up charge and price add per unit is required. Use this designation if other special paint options are necessary. The Special Pricing Authorization (SPA) worksheet with comprehensive explanation of requirements must accompany the order documents.
X = *Special Price Authorization with Standard Paint* - The Applications Department must issue a Special Pricing Authorization (SPA) to include a non-standard option.

General Data
Unit Information

Table 9 - 5 to 8 Ton Unit Information

	Model			
	LC-005	LC-006	LC-007	LC-008
Compressors	*Quantity/Nominal Tons*			
R-410A, Variable Capacity Scroll Compressors	2/3 Var	2/4 Var	2/4 Var	2/5 Var
Number of Circuits	2			
Capacity Steps	10-100%			
Evaporator				
Maximum Water Pressure	125 psig			
Connection Sizes	1 5/8”			2”
Standard Shell and Tube				
Quantity	1			
Max GPM	NA	NA	31.1	31.1
Min GPM	NA	NA	8.9	8.9
Oversized Shell and Tube				
Quantity	1			
Max GPM	NA	NA	43.5	43.5
Min GPM	NA	NA	7.2	7.2
Brazed Plate				
Quantity	1			
Max GPM	31.1	31.1	31.1	31.1
Min GPM	8.9	8.9	8.9	8.9
Oversized Brazed Plate				
Quantity	1			
Max GPM	NA	NA	43.5	43.5
Min GPM	NA	NA	7.2	7.2
Air-Cooled Condenser Fans				
Quantity	1			
Type/hp	30” Propeller Fan/1.0			

Table 10 - 12 to 21 Ton Unit Information

	Model			
	LC-012	LC-015	LC-019	LC-021
Compressors	*Quantity/Nominal Tons*			
R-410A, Variable Capacity Scroll Compressors	2/6 Var	2/7 Var	2/10 Var	2/10 Var
Number of Circuits	2			
Capacity Steps	10-100%			
Evaporator				
Maximum Water Pressure	125 psig			
Connection Sizes	2”			
Standard Shell and Tube				
Quantity	1			
Max GPM	39.3	50.4	62.3	75.4
Min GPM	11.2	14.4	17.8	21.5
Oversized Shell and Tube				
Quantity	1			
Max GPM	55.0	70.6	87.2	105.6
Min GPM	9.1	11.6	14.4	17.4
Brazed Plate				
Quantity	1			
Max GPM	39.3	50.4	62.3	75.4
Min GPM	11.2	14.4	17.8	21.5
Oversized Brazed Plate				
Quantity	1			
Max GPM	55.0	70.6	87.2	105.6
Min GPM	9.1	11.6	14.4	17.4
Air-Cooled Condenser Fans				
Quantity	2			4
Type/hp	30” Propeller Fan/1.0			

Table 11 - 27 to 54 Ton Unit Information

	Model				
	LC-027	LC-029	LC-038	LC-047	LC-054
Compressors	*Quantity/Nominal Tons*				
R-410A, Lead Variable Capacity Scroll Compressors	2/13 Var	2/15 Var	2/10, 2/10 Var	2/13, 2/13 Var	2/15, 2/15 Var
Number of Circuits	2				
Capacity Steps	10-100%		5-100%		
Evaporator					
Maximum Water Pressure	125 psig				
Connection Sizes	2 1/2”		3”	4”	
Standard Shell and Tube					
Quantity	1				
Max GPM	75.4	83.0	107.5	143.1	171.0
Min GPM	21.5	23.7	30.7	40.9	48.9
Oversized Shell and Tube					
Quantity	1				
Max GPM	116.2	150.5	200.3	239.4	239.4
Min GPM	19.1	24.8	33.0	39.4	39.4
Brazed Plate					
Quantity	1				
Max GPM	75.4	83.0	107.5	143.1	171.0
Min GPM	21.5	23.7	30.7	40.9	48.9
Oversized Brazed Plate					
Quantity	1				
Max GPM	116.2	150.5	200.3	239.4	239.4
Min GPM	19.1	24.8	33.0	39.4	39.4
Air-Cooled Condenser Fans					
Quantity	4			6	
Type/hp	30” Propeller Fan/1.0				

Electrical Service Sizing Data

Use the following equations to correctly size the electrical service wiring and disconnect switch for the unit.

To calculate the correct Minimum Circuit Ampacity (MCA) and Maximum Overcurrent Protection (MOP) values for units use the equations shown below.

MCA = 1.25(Load 1) + Load 2 + Load 3

MOP = 2.25(Load 1) + Load 2 + Load 3

Where:
Load 1 = Current of the largest motor/compressor
Load 2 = Sum of the currents of the remaining motors, including pump motors and compressors
Load 3 = Additional currents

Use Rated Load Amps (RLA) for compressors and Full Load Amps (FLA) for all other motors. Use AAONEcat32 or check the unit nameplate for unit specific values.

Select a fuse rating equal to the MOP value. If the MOP does not equal a standard fuse rating select the next lower standard fuse rating. If the MOP is less than the MCA then select the fuse rating equal to or greater than the MCA.

Standard Ampere Ratings for Fuses (From NEC Handbook, 240-6)
The standard ratings for fuses shall be considered 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250, 300, 350, 400, 450, 500, 600, 700, 800 and 1000 amperes.

Disconnect (Power) Switch Size

To calculate the disconnect switch size use the equation shown below.

DSS $\geq$ MOP

Select the standard switch size equal to the calculated Disconnect Switch Size (DSS) value. If this value is not a standard size, select the next larger size.

Literature Change History

April 2011
Update of the catalog correcting the networking capabilities of the MCS Controller in Feature 13.

February 2014
Updated of the maximum percent capacity step values in the table Minimum Volume and updated the specs. Updated the values in the table 12 for the 21 Ton Unit Information. Added seismic options under feature 16.

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