Indoor Packaged Equipment

Water-Cooled Self-Contained Units
L-Series – 62 to 105 Tons

Preliminary Engineering Guide

Water-Cooled Self-Contained Units

Features and Benefits

LOW OWNERSHIP COST

Lower Installation Cost

- Single point power connections.
- Single condenser water inlet and outlet connections. Factory installed internal piping.
- Comprehensive factory testing of refrigerant, condenser water piping, supply fan, and control system.
- Factory installed internal condensate drain connection.
- Compact design allows smaller mechanical equipment room.
- Optional low service clearance units allow installation in even smaller mechanical equipment rooms.
- Optional multiple piece shipment allows installation in tight spaces. No field refrigerant or water piping is required.
- Condenser water piping connections from the top of the unit minimizes piping in mechanical equipment room.

Lower Operating Cost

Efficient Operation

- Plenum fan with backward inclined airfoil blades provides required airflow at a lower energy consumption compared to the most competitive units.
- All scroll compressors combined with highly efficient condenser and evaporator coil design provides efficient cooling, lowering energy consumption.
- Water economizer and air economizer options provide free cooling to reduce power consumption.
- Partial occupancy on any floor reduces power consumption, due to multiple compressor operation and optional variable frequency drive to match capacity to the load.
- After hours operation on any floor only requires unit on that floor with partial operation of cooling tower and pumps. This saves significant amount of energy over chilled water systems.
- Variable condenser water flow option, with internal actuated valve(s), prevents flow through units not requiring cooling, saving pump energy.
- Evaporator coil circuiting supports low leaving air temperature designs to reduce design air flow and reduce fan operating energy.
- High efficiency evaporator coil available for lower air flow, low leaving air temperature applications.

Easier Maintenance

- Large, intuitive operator interface makes for quick set up and easier diagnostics. It is on the external panel for easy viewing.
- Operator interface for optional variable frequency drive on the external panel.

- Easy access to important components through hinged doors for easy maintenance.
- Easily viewable components out of the air stream allow adjustment of components, including expansion valves, while unit is operating.
- Easy filter access for inspection, removal, and replacement.
- Easy access to internally trapped condensate drain cleanout.
- Available BACnet communications with Building Automation System allows for easier control of larger installations.
- Emergency stop input.

Indoor Air Quality

- Condensate drain pan sloped in all directions to the drain point.
- Stainless steel drain pan standard
- High efficiency filters option with pre-filters.
- Evaporator and waterside economizer coils surface may be cleaned from air entering side as well as air leaving side.
- Easy access to internally trapped condensate drain cleanout.
- Matt faced fiberglass insulation.

Quieter Acoustic Performance

- Plenum fan with backward inclined airfoil blades provides required airflow at a lower sound power level compared to the most competitive units.
- Unique placement of internal components minimizes amount of acoustic energy leaving the unit.
- Supply fan and motor assembly mounted on a frame and isolated with springs.
- Optional discharge plenum configurations allow horizontal supply air discharge, minimizing the outlet sound and pressure losses.
- Optional inlet plenum configuration minimizes sound escaping the unit inlet.
- Multiple scroll compressors, due to their smoother flow and stepped operation, minimize the sound associated with the refrigerant system.
- The compressors are located out side air stream, including all the refrigerant piping and condenser water piping.

Standard Features

Controls

- Microprocessor based control system proven algorithms.
- Large 32 key operator interface with large display, in clear language, accessible without opening panel.
- Alarms and faults displayed and stored in the controller memory.
- Occupied and Unoccupied mode operation.
- Timed Override operation.
- Supply airflow proving switch.
- Condensing pressure control when condenser valves are present.
- All refrigerant controls like thermostatic expansion valves, sight glass are out of the air stream and adjustable while unit is working.

- ETL and CETL listing for US and Canada.

Refrigerant circuits

- Multiple scroll compressors for better temperature control. Up to 6 compressors.
- All compressors have independent refrigerant circuits and independent short circuit protection.
- Automatic compressor lead-lag.
- Environmentally friendly R410A refrigerant.
- Completely factory piped, charged, and protected refrigerant circuits.
- Each refrigerant circuit with suction and discharge pressure transducers for enhanced diagnostics and control.
- Evaporator coil frost protection
- Mechanically cleanable shell and tube condenser, factory tested and piped.
- Factory leak and pressure tested refrigerant piping
- Low ambient compressor lockout.

Supply Fan

- Plenum fan with backward inclined airfoil blades provides required airflow at lower energy consumption, and sound compared to the most competitive units.
- Minimum class II fans for high static requirements. Class III fans available.
- Supply fan and motor assembly is isolated with springs to minimize the vibration and sound transmission to the rest of the unit and beyond.
- Bearing lubrication line brought to one location for easy maintenance.

Unit Cabinet

- Welded base made out of 10 gauge galvanized steel frame and structural members.
- External cabinet parts made out of painted 16 gauge galvanized steel.
- External panels made out of painted 18 gauge galvanized steel.
- Lifting lugs to lift the unit without skid.
- Hinged 2 inch thick access doors covering the coil, compressors, condensers, water piping, electrical components, and fan access. Insulated where necessary with 2 inch matt faced fiberglass insulation.
- Stainless steel drain pan with insulation, sloped in all directions.
- Condensate drain with cleanout and proper slope towards the drain.

Filters Section

- Filter section made out of 18 gauge painted galvanized steel.
- 2 inch thick medium efficiency filters are standard.

Condenser Water Piping

- Factory installed and tested piped condenser water piping.
- Condenser water piping exiting unit from the top for easier and shorter field connections.

Optional Features

Variable Frequency Drive

- Factory installed, wired and commissioned Variable Frequency Drive (VFD) controls the fan speed in conjunction with the unit controller, based on a signal from controller.
- Unit installed duct static pressure sensor, to sense duct static using fields installed pneumatic tubes.
- Optional manual electrical bypass to manually enable to run the supply fan motor, at full speed, in case the VFD failure.

Waterside Economizer

- Waterside economizer which uses colder condenser water, available during colder outdoor conditions, to provide cooling by passing cold condenser water through additional water economy coil upstream of the evaporator coil in terms of air flow.
  Internal temperature sensors determine suitability of condenser water for full or partial free cooling and route condenser water flow through the water economy coil when suitable. Internal water piping and valves are included.
- Water economy coil with optional mechanically cleanable return bends is available.

Heating

- Hot water coil with factory installed and tested water piping and valve for modulated control. Controlled by the unit controller.
- Steam coil, steam distributing type, factory installed with piping and control valves supplied and installed by others.
- Electric heat, factory installed, wired, and tested.
- All the heating options are in reheat position. However, the heating will only be used when cooling is off.
- Only one heating option is available in any unit.

Controls

- Factory installed and wired non-fused disconnect switch for the unit power. Disconnect switch is accessible without opening unit doors.
- BACnet (MSTP) interface for communication with BAS system.

Filtration

- High efficiency filtration with medium efficiency pre-filter.

High Efficiency Evaporator Coils

- High efficiency evaporator coil for lower air flow, low leaving air temperature applications. Provides higher EER and higher capacity.

Modular Construction

- Unit shipped in multiple sections. All refrigerant piping, condenser water piping, and condensate drain piping is factory assembled and does not require additional field work. Various sections are as follows:
  - Refrigerant and heating section consisting of evaporator coil, water economy coil, condensers, compressors, condenser water piping, and heating options.
  - fan and power section consisting of supply fan and motor assembly, power and control panels, VFD
  - Filter section, including the filters

Low service clearance

- For areas with limited mechanical equipment room space, optional configuration of the unit requiring less (4 inch) than standard clearance on left of the unit as you look at the unit from the fan side is required. Less (4 inch) service clearance on the fan side is also available.

Field Installed Accessories

- Discharge plenum/Outlet plenum
    - Full discharge plenum is factory manufactured discharge plenum with 3 inch thick matt faced insulation and 20 gauge perforated galvanized steel liner, with or without factory cut openings.
    - Half discharge plenum is factory manufactured discharge plenum with 3 inch thick matt faced insulation and 20 gauge perforated galvanized steel liner, with or without factory cut openings.
- Airside economizer with outdoor air connection, damper, and damper actuator at the top, return air connection, damper, and damper actuator at the back. Provided with connecting harness for the actuators and sensors, installed by others. Different control options
    - Dry bulb
    - Single enthalpy
    - Dual enthalpy
- Inlet sound attenuating plenum attaches to the filter section for reducing further the sound emitted through the unit air inlet.

Selection Procedure

1. Design criteria should be available to make a qualified selection. This includes the design airflow, entering air conditions to the unit, total and sensible loads, condenser water conditions, external static pressure, electrical service and which factory-installed options are to be provided with the unit. This would include:
   - Acoustical discharge plenum
   - Waterside economizer coil
   - Heating options if applicable (hydronic, steam, or electric)

     a. If heat is to be provided, winter design criteria would be needed. This would include entering dry bulb, load, water conditions (for hot water heating only), or steam conditions (for steam only)
   - Return inlet options

     a. Filter efficiency and thickness

     b. Inlet sound attenuator

     c. Airside economizer mixing box
2. To establish the smallest Model divide the design airflow by the maximum acceptable face velocity. Use the general data table on page 9 to obtain the unit size that would have a coil face area the same or greater than the calculated minimum face area. Larger units may be used to lower the static pressure losses and/or to decrease the fan break horsepower because a larger fan could be used.
3. Divide the design airflow by the airflow in the capacity table to establish the correction factor for the total and sensible capacity for mechanical cooling, waterside economizer cooling, and compressor kW. *Use the table at the bottom of this page for those factors.*
4. Divide required total and sensible capacities with appropriate multipliers to determine adjusted capacities. Use the capacity tables to see if the catalogued compressor combination will meet the adjusted capacities. If not, use a bigger unit or contact the local sales representative for additional selection possibilities using other compressor combinations or DX coil options.
5. To establish the correct compressor kW and condenser water flow, multiply the compressor kW by compressor kW factor and water flow from the capacity table by total capacity correction factor.

Correction Table	DX Cooling			Waterside Economizer	
CFM Compared To Rated Quantity	Total Capacity	Sensible Capacity	Compressor kW	Total Capacity	Sensible Capacity
-20%	0.968	0.900	0.980	0.920	0.870
-15%	0.971	0.925	0.985		
-10%	0.985	0.952	0.989	0.960	0.930
-5%	0.991	0.974	0.995		
Standard	1.000	1.000	1.000	1.000	1.000
5%	1.006	1.024	1.004		
10%	1.012	1.048	1.006	1.040	1.060
15%	1.019	1.070	1.011		
20%	1.025	1.093	1.017	1.080	1.120

- For 50 Hz applications, derate total and sensible capacities using 0.89 and 0.94 respectively
- An altitude correction must be made for units applied over 2500 feet in elevation.

- If the application requires any of the above, contact the local sales office to make the selection.

6. Determine the waterside economizer cooling in a similar fashion from steps 3, 4, and 5.

7. If the application requires heat, consult factory

8. Establish the type of return section needed. Several options are available: filter section, airside economizer/filter section, or sound attenuator/filter section.

9. With all the internal components selected, calculate the internal static pressure loss using the design airflow. Add this to the external static pressure loss to obtain the total static pressure. Use the corresponding fan curves to establish the fan motor break horsepower and rpm. The supply fan motor horsepower would be the next available line above the fan break horsepower point. The fan curves include the static loss for the cabinet.

10. To calculate the net cooling, the fan motor heat needs to be subtracted from the gross cooling. This is true because the fan is in the draw through position. The fan motor heat is equal to the fan brake horsepower multiplied by 2.8. This is expressed in MBh.

11. Determine the leaving air conditions at the coil (indicating gross capacity) by using a psychrometric chart.

12. The water pressure drop(s) need to be calculated for the condenser, waterside economizer, head pressure control valve, and/or hot water coil. The pressure drops include the heat exchangers, piping, and valve package (if applicable). (Refer to page 21)

13. The MCA (Minimum Circuit Ampacity) and MOP (Maximum Overcurrent Protection) need to be established. The MCA value is used to size the wire for the power service to the unit. The MOP is used to size either the breaker or fuse for the entire unit. Use the following formula and data on page 22 to calculate these.

MCA

For units with cooling capability (all concurrent loads) with or without hot water heating and circuits with motor loads only:

MCA = 1.25 (largest motor RLA or FLA) + other loads + 2 amps

For units with cooling capability and non-concurrent electric heat capability: In the cooling mode, the loads will be composed of supply fan motor and compressors. In heating mode, the loads will be composed of a supply fan motor and electric heater. The MCA is calculated for unit running in either mode; the highest value obtained is used for the MCA.

For unit in cooling mode:

MCA = 1.25 (largest RLA or FLA) + other loads + 2 amps

For unit in heating mode:

MCA = 1.25 (electric heat FLA + supply fan motor FLA) + 2 amps

MOP

For units with cooling capability (all concurrent loads) with or without hot water heating and circuits with motor loads only:

MOP = 2.25 (largest motor RLA or FLA) + other loads + 2 amps

For units with cooling capability and non-concurrent electric heat capability: In the cooling mode, the loads will be composed of supply fan motor and compressors. In heating mode, the loads will be composed of a supply fan motor and electric heater. The *MOP* is calculated for the unit running in either mode; the highest value obtained is used for the MCA.

For unit in cooling mode:

MOP = 2.25 (largest RLA or FLA) + other loads + 2 amps

For unit in heating mode:

MOP = 2.25 (electric heat FLA + supply fan motor FLA) + 2 amps

14. The component weights are located on page 23. Add the individual weights of each option to obtain the total shipping weight. To calculate the operating weight, add the corresponding water weight for the condenser, waterside economizer (if applicable), or hot water coil (if applicable).

WCSC PRODUCT MODEL NUMBER

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
L	S	W	U	A	0	9	5	U	P	4	6	S	P	D	4	0	O	H	3	6	P	2	V	V	C	O	0	0	0

UNIT TYPE (1–4)
LSWU = Water Cooled, Self Contained

DESIGN SEQUENCE (5)
A = Initial Design

NOMINAL CAPACITY (6–8)
062 = 62 Ton
070 = 70 Ton
080 = 80 Ton
095 = 95 Ton
105 = 105 Ton

AIRFLOW DIRECTION (9–10)
UP = Up Flow
DN = Down Flow

SUPPLY VOLTAGE (11–12)
28 = 208/230V-3-60
46 = 460V-3-60
58 = 575V-3-60

POWER SUPPLY CONNECTION (13–15)
SPT = Single Point Terminal Block
SPD = Single Point Disconnect Switch
DPT = Dual Point Terminal Block
DPD = Dual Point Disconnect Switch

SUPPLY MOTOR HP (16–17)
07 = 7-1/2 HP
10 = 10 HP
15 = 15 HP
20 = 20 HP
25 = 25 HP
30 = 30 HP
40 = 40 HP
50 = 50 HP

SUPPLY MOTOR TYPE (18–19)
OH = ODP High Eff.
OP = ODP Premium Eff.
TH = TEFC High Eff.
TP = TEFC Premium Eff.

FAN SIZE (20–21)
36 = 36 inch
40 = 40 inch

FAN CLASS (22–23)
P2 = Class 2, Plenum
P3 = Class 3, Plenum

VFD OPTION (24–25)
CV = Constant Volume
VV = Variable Air Volume
VB = VAV with Bypass
VR = VFD Ready

HEAT OPTION (26–27)
CO = Cooling Only
HW = Hot Water
ST = Steam Coil
EH = Electric Heat

ELECTRIC HEAT SIZE (28–30)
000 = No EH
017 = 17 KW
034 = 34 KW
068 = 68 KW

Water-Cooled Self- Contained Unit Data

Model Nominal Tons		062	070	080	095	105
Nominal Capacity		62	70	80	95	105
Air Flow Range	Maximum Desgn Air Flow - Standard - CFM	24,400	29,800	33,900	36,100	36,100
	Maximum Desgn Air Flow- High Efficiency - CFM	20,300	24,800	28,200	30,100	30,100
	Minimum Desgn Air Flow - CFM	16,300	19,900	22,600	24,200	24,200
Cabinet Dimensions	Depth (Excluding Filter Section) - Inches	96	96	96	96	96
	Length - Inches	130	130	130	130	130
	Height - Inches	102	102	102	102	102
EER		13.2	12.8	13.1	12.6	12.6
EER - High Efficiency		15.4	14.5	14.1	13.4	14.2
Cooling Coil 3/8" OD	Face Area - Square Feet	40.7	49.7	56.5	60.3	60.3
	Rows	4	4	5	5	6
	Fins Per Inch (Standard/High Efficiency)	12/17	12/17	12/17	12/17	12/17
Supply Fan	Fan Type	Airfoil Plenum Fan (SWSI)				
	Diameter - Inches/Class - Standard	36/Class II	36/Class II	36/Class II	40/Class II	40/Class II
	Diameter - Inches/Class - High Capacity Fan	None	40/Class II	40/Class II	40/Class III	40/Class III
	Fan Motor HP	15 - 40	15 - 40	15 - 40	20 - 50	20 - 50
Filters	2 Inch Deep - Medium Efficiency 20X20X2 / 24X20X2	8 / 12	8 / 12	8 / 12	8 / 12	8 / 12
	4 Inch Deep - Medium Efficiency 20X20X2 / 24X20X2	8 / 12	8 / 12	8 / 12	8 / 12	8 / 12
	4 Inch Deep - High Efficiency 20X20X2 / 24X20X2	8 / 12	8 / 12	8 / 12	8 / 12	8 / 12
Compressors	Type	Scroll				
	Compressor Quantity / Nominal HP	2 - 15 + 2 - 11	2 - 15 + 2 - 13	4 - 15	6 - 13	6 - 15
Condensers	Type	Shell and Tube				
	Quantity (2 refrigerant circuits per condenser)	2	2	2	3	3
Condenser Water Connections	Water In and Out Copper Victaulic Connections - Inches	3.125	3.125	3.125	3.125	3.125
Waterside Economizer Coil 1/2" OD	Face Area - Square Feet	40.7	49.7	56.5	60.3	60.3
	Rows/Fins Per Inch	4/12	4/12	4/12	4/12	4/12
Heating	Hot Water Coil Face Area - Square Feet	29.3	35.8	40.6	43.3	43.3
	Hot Water Coil Rows/Fins Per Inch	1/12	1/12	1/12	1/12	1/12
	Steam Coil	Consult Factory				
	Electric Heat - KW	Consult Factory				

LSWU062 - Air Flow 24,500 CFM

		EWT 80 LWT 90						EWT 80 LWT 92						EWT 85 LWT 95					
EDB	EWB	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM
75	57																		
75	62																		
75	67																		
80	62																		
80	67																		
80	72																		
85	67																		
85	72																		
85	77																		

LSWU062 - Air Flow 24,500 CFM

		EWT 85 LWT 97						EWT 90 LWT 100						EWT 90 LWT 102					
EDB	EWB	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM
75	57																		
75	62																		
75	67																		
80	62																		
80	67																		
80	72																		
85	67																		
85	72																		
85	77																		

LSWU062 - Air Flow 20,000 CFM - High Efficiency

		EWT 80 LWT 90						EWT 80 LWT 92						EWT 85 LWT 95					
EDB	EWB	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM
75	57																		
75	62																		
75	67																		
80	62																		
80	67																		
80	72																		
85	67																		
85	72																		
85	77																		

LSWU062 - Air Flow 20,000 CFM - High Efficiency

		EWT 85 LWT 97						EWT 90 LWT 100						EWT 90 LWT 102					
EDB	EWB	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM
75	57																		
75	62																		
75	67																		
80	62																		
80	67																		
80	72																		
85	67																		
85	72																		
85	77																		

LSWU070 - Air Flow: 28,000 CFM

		EWT 80 LWT 90						EWT 80 LWT 92						EWT 85 LWT 95					
EDB	EWB	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM
	57	782	782	49.8	46.2	42.5	187.9	777	777	50.0	46.3	43.4	156.0	769	769	50.2	46.4	44.8	186.6
75	62	802	682	52.9	52.0	42.7	191.2	797	679	52.9	52.0	43.6	158.8	787	674	53.1	52.2	45.0	189.9
75	67	851	513	57.6	57.2	43.5	202.9	846	511	57.7	57.2	44.3	168.4	834	506	57.8	57.4	45.6	200.4
80	62	829	807	53.5	51.4	43.2	196.9	824	806	53.6	51.6	44.1	164.5	814	799	53.8	51.7	45.5	197.0
80	67	858	656	57.8	57.0	43.5	204.0	850	653	57.9	57.1	44.4	169.3	839	648	58.0	57.2	45.7	201.6
80	72	924	501	62.9	62.4	44.6	217.3	917	499	63.0	62.5	45.4	180.4	904	495	63.1	62.7	46.7	215.0
85	67	889	804	58.7	56.8	44.2	210.5	883	800	58.7	56.9	45.0	174.8	873	795	58.9	57.0	46.4	208.1
85	72	924	628	63.0	62.1	44.6	217.3	916	625	63.0	62.2	45.4	180.4						
85	77	999	488	68.3	67.8	45.9	234.1	991	485	68.4	67.9	46.7	194.5						

LSWU070 - Air Flow: 28,000 CFM

		EWT 85 LWT 97						EWT 90 LWT 100						EWT 90 LWT 102					
EDB	EWB	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM
####	57	763	763	50.4	46.5	45.7	154.0	753.9	753.9	50.7	46.6	47.2	186.3	748	748	50.9	46.7	48.2	154.2
75	62	780	670	53.2	52.2	45.9	158.1	771.1	664.9	53.3	52.4	47.4	189.7	765	662	53.4	52.4	48.3	156.0
75	67	829	504	57.9	57.4	46.5	166.7	817.0	499.0	58.0	57.6	48.0	199.1	810	496	58.1	57.6	48.9	164.8
80	62	808	797	54.0	51.8	46.4	163.8	799.3	790.9	54.2	51.9	47.9	195.5	794	789	54.4	52.0	48.9	161.7
80	67	833	646	58.1	57.3	46.6	167.7	824.6	646.5	58.3	57.5	48.1	200.2	816	643	58.4	57.6	49.1	166.8
80	72	897	493	63.2	62.7	47.6	178.9	884.7	488.2	63.3	62.9	49.0	212.5	878	486	63.4	62.9	50.0	176.1
85	67	866	791	59.0	57.1	47.3	173.1	855.2	785.5	59.1	57.2	48.7	206.8	849	782	59.2	57.3	49.7	172.4
85	72	898	618	63.2	62.4	47.6	176.7	885.5	613.4	63.4	62.5	49.0	211.1	878	610	63.5	62.6	50.0	176.1
85	77	971	479	68.6	68.0	48.9	190.8	958.2	474.2	68.7	68.2	50.3	226.9	950	471	68.8	68.2	51.2	188.2

LSWU070 - Air Flow: 24,500 CFM - High Efficiency

		EWT 80 LWT 90						EWT 80 LWT 92						EWT 85 LWT 95					
EDB	EWB	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM
75	57	801	801	45.7	44.2	42.8	189.9	795	795	45.9	44.3	43.7	157.5	787	787	46.2	44.5	45.1	188.6
75	62	827	677	50.4	50.2	43.1	195.7	821	674	50.5	50.3	44.0	162.4	810	669	50.6	50.4	45.3	194.5
75	67	881	525	55.5	55.5	43.9	207.0	875	522	55.6	55.6	44.7	170.7	863	517	55.8	55.8	46.1	204.6
80	62	854	808	50.2	49.6	43.7	201.0	849	808	50.3	49.7	44.5	166.9	839	802	50.5	49.8	45.9	199.9
80	67	890	668	55.6	55.5	44.1	207.8	883	665	55.7	55.6	44.9	172.6	873	662	55.9	55.8	46.3	206.9
80	72	957	519	60.9	60.8	45.2	222.5	950	516	61.0	60.9	46.0	184.7	937	511	61.2	61.1	47.3	221.7
85	67	920	806	55.6	55.1	44.7	214.5	913	803	55.7	55.2	45.6	178.1	902	798	55.8	55.3	46.9	213.5
85	72	959	650	60.8	60.7	45.2	223.7	951	647	60.9	60.8	46.1	185.8	940	642	61.1	61.0	47.3	220.2
85	77	1,038	511	66.3	66.3	46.7	241.6	1,029	508	66.4	66.4	47.5	199.7	1,016	504	66.6	66.5	48.7	239.8

LSWU070 - Air Flow: 24,500 CFM - High Efficiency

		EWT 85 LWT 97						EWT 90 LWT 100						EWT 90 LWT 102					
EDB	EWB	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM
75	57	780	780	46.4	44.6	46.0	156.8	771.8	771.8	46.7	44.7	47.5	188.4	766	766	46.9	44.8	48.5	156.9
75	62	805	666	50.7	50.5	46.2	160.6	794.2	660.7	50.9	50.7	47.7	193.1	788	657	51.0	50.8	48.7	159.7
75	67	856	514	55.9	55.8	47.0	170.2	843.6	509.2	56.1	56.0	48.4	203.4	836	506	56.2	56.1	49.4	168.4
80	62	832	799	50.6	49.9	46.8	166.3	821.8	792.5	50.8	50.1	48.3	198.5	817	791	50.9	50.2	49.2	164.3
80	67	865	659	56.0	55.9	47.2	172.1	854.3	654.2	56.1	56.0	48.6	204.3	847	652	56.3	56.2	49.6	170.2
80	72	929	508	61.3	61.2	48.2	182.2	916.9	503.5	61.4	61.3	49.6	218.0	908	500	61.5	61.5	50.5	180.6
85	67	895	794	55.9	55.4	47.8	176.5	884.4	789.5	56.1	55.5	49.2	211.0	877	786	56.2	55.6	50.2	175.9
85	72	934	645	61.2	61.1	48.3	183.2	920.7	639.8	61.4	61.3	49.7	219.1	913	637	61.5	61.4	50.6	181.5
85	77	1,007	501	66.7	66.6	49.6	197.3	993.4	496.3	66.8	66.7	51.0	236.2	983	493	66.9	66.9	51.9	194.8

LSWU080 - Air Flow 32,000 CFM

		EWT 80 LWT 90						EWT 80 LWT 92						EWT 85 LWT 95					
EDB	EWB	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM
75	57	891	891	49.8	46.2	46.5	213.2	885	885	50.0	46.3	47.4	176.1	876	876	50.3	46.4	48.9	211.2
75	62	908	796	52.5	52.1	46.8	215.4	902	793	52.5	52.2	47.7	179.0	891	787	52.7	52.3	49.2	214.5
75	67	958	597	57.5	57.4	47.7	226.9							939	589	57.7	57.6	50.0	223.3
80	62	948	948	53.5	51.7	47.6	224.8	942	942	53.6	51.8	48.5	186.4	931	931	53.9	51.9	50.0	223.3
80	67	978	794	57.8	57.5	48.1	230.8	971	791	57.9	57.6	49.1	192.1	959	786	58.0	57.7	50.5	229.0
80	72	1,037	587	62.8	62.7	49.4	243.1	1,028	583	62.9	62.8	50.3	203.0	1,017	579	63.0	62.9	51.7	241.3
85	67	1,006	956	57.8	57.0	48.8	238.0	1,001	957	57.9	57.1	49.7	196.5	989	952	58.0	57.2	51.2	235.4
85	72	1,047	771	62.9	62.7	49.6	245.4	1,039	767	63.0	62.8	50.4	202.8	1,026	762	63.1	62.9	51.9	242.7
85	77	1,120	573	68.2	68.1	51.3	261.8	1,112	572	68.3	68.1	52.2	217.7	1,098	567	68.4	68.2	53.5	258.9

LSWU080 - Air Flow 32,000 CFM

		EWT 85 LWT 97						EWT 90 LWT 100						EWT 90 LWT 102					
EDB	EWB	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM
75	57	870	870	50.4	46.5	50.0	175.8	860	859.6	50.7	46.6	51.6	209.8	852	852	50.9	46.7	52.7	174.8
75	62	884	784	52.8	52.4	50.2	177.3	872	778.4	52.9	52.5	51.8	211.9	865	775	53.0	52.6	52.9	176.6
75	67	931	586	57.8	57.7	51.0	185.8	917	580.6	57.9	57.8	52.6	222.4	910	578	58.0	57.9	53.7	184.2
80	62	925	925	54.1	52.0	51.0	186.1	914	914.3	54.4	52.1	52.6	222.1	907	907	54.6	52.2	53.7	184.6
80	67	952	782	58.1	57.7	51.5	189.5	940	776.9	58.2	57.9	53.1	226.7	933	773	58.3	57.9	54.1	187.9
80	72	1,007	575	63.1	63.0	52.6	200.4	995	571.2	63.2	63.1	54.2	237.7	985	567	63.3	63.2	55.2	198.3
85	67	982	948	58.1	57.3	52.1	195.2	971	944.7	58.3	57.5	53.7	233.3	963	940	58.4	57.5	54.8	193.3
85	72	1,019	764	63.3	63.0	52.9	202.8	1,007	761.0	63.4	63.1	54.5	241.3	1,000	762	63.5	63.3	55.5	200.1
85	77	1,089	564	68.5	68.3	54.5	215.5	1,075	559.3	68.6	68.4	56.0	255.7	1,065	556	68.7	68.5	57.0	212.4

LSWU080 - Air Flow 28,000 CFM - High Efficiency

		EWT 80 LWT 90						EWT 80 LWT 92						EWT 85 LWT 95					
EDB	EWB	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM
75	57	885	885	46.6	44.7	46.4	211.1	881	881	46.7	44.7	47.4	175.1	871	871	47.0	44.9	48.9	209.9
75	62	911	761	50.7	50.6	46.9	216.7	904	757	50.8	50.7	47.8	179.9	895	753	50.9	50.8	49.2	214.3
75	67	965	583	56.0	56.0	47.9	228.6	958	580	56.1	56.1	48.8	190.3	946	575	56.2	56.2	50.2	225.7
80	62	943	923	50.5	50.2	47.5	224.5	937	920	50.6	50.2	48.4	185.4	927	915	50.8	50.4	49.9	220.8
80	67	982	757	56.1	56.1	48.2	232.4	975	754	56.2	56.1	49.1	192.3	964	750	56.3	56.3	50.6	228.7
80	72	1,047	576	61.4	61.3	49.6	245.3	1,039	573	61.4	61.4	50.4	202.8	1,026	568	61.6	61.6	51.9	243.5
85	67	1,011	914	55.8	55.6	48.9	237.7	1,005	911	55.9	55.6	49.8	197.4	993	906	56.0	55.8	51.2	235.3
85	72	1,055	742	61.4	61.4	49.8	247.7	1,048	739	61.5	61.5	50.7	204.6	1,035	735	61.6	61.6	52.1	244.3
85	77	1,132	568	66.8	66.8	51.6	264.1	1,123	565	66.9	66.8	52.4	219.4	1,110	560	67.0	67.0	53.8	261.0

LSWU080 - Air Flow 28,000 CFM - High Efficiency

		EWT 85 LWT 97						EWT 90 LWT 100						EWT 90 LWT 102					
EDB	EWB	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM
75	57	864	864	47.2	45.0	49.9	174.5	854	854	47.5	45.1	51.5	208.5	848	848	47.7	45.2	52.6	173.8
75	62	888	749	51.0	50.9	50.3	178.3	876	744	51.2	51.1	51.9	213.1	869	740	51.3	51.2	53.0	177.7
75	67	938	572	56.3	56.3	51.2	187.8	926	567	56.5	56.5	52.8	223.5	917	564	56.6	56.6	53.8	185.1
80	62	919	910	50.9	50.5	50.9	183.9	908	904	51.1	50.6	52.6	221.1	902	900	51.2	50.7	53.6	182.1
80	67	956	747	56.4	56.4	51.6	190.6	944	741	56.6	56.5	53.2	227.8	936	738	56.7	56.6	54.2	189.0
80	72	1,017	565	61.7	61.7	52.8	201.6	1,004	560	61.8	61.8	54.4	239.9	995	557	61.9	61.9	55.4	199.1
85	67	985	902	56.1	55.9	52.2	196.1	973	897	56.3	56.0	53.8	234.8	965	893	56.4	56.1	54.9	193.5
85	72	1,025	731	61.7	61.7	53.1	203.5	1,015	729	61.9	61.9	54.6	242.2	1,006	726	62.0	61.9	55.7	201.0
85	77	1,101	557	67.1	67.1	54.8	217.3	1,086	552	67.2	67.2	56.3	257.8	1,076	549	67.3	67.3	57.3	213.9

LSWU095 - Air Flow 36,000 CFM

		EWT 80 LWT 90						EWT 80 LWT 92						EWT 85 LWT 95					
EDB	EWB	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM
75	57																		
75	62																		
75	67																		
80	62																		
80	67																		
80	72																		
85	67																		
85	72																		
85	77																		

LSWU095 - Air Flow 36,000 CFM

		EWT 85 LWT 97						EWT 90 LWT 100						EWT 90 LWT 102					
EDB	EWB	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM
75	57																		
75	62																		
75	67																		
80	62																		
80	67																		
80	72																		
85	67																		
85	72																		
85	77																		

LSWU095 - Air Flow 28,000 CFM - High Efficiency

		EWT 80 LWT 90						EWT 80 LWT 92						EWT 85 LWT 95					
EDB	EWB	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM
75	57																		
75	62																		
75	67																		
80	62																		
80	67																		
80	72																		
85	67																		
85	72																		
85	77																		

LSWU095 - Air Flow 28,000 CFM - High Efficiency

		EWT 85 LWT 97						EWT 90 LWT 100						EWT 90 LWT 102					
EDB	EWB	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM
75	57																		
75	62																		
75	67																		
80	62																		
80	67																		
80	72																		
85	67																		
85	72																		
85	77																		

LSWU105 - Air Flow: 36,000 CFM

		EWT 80 LWT 90						EWT 80 LWT 92						EWT 85 LWT 95					
EDB	EWB	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM
75	57	1,182	1,182	45.2	44.0	67.0	282.0	1,178	1,178	45.6	44.2	68.5	233.8	1,165	1,165	45.9	44.4	70.8	279.8
75	62	1,200	922	49.1	49.0	67.3	284.6	1,191	918	49.2	49.1	68.7	235.7	1,175	911	49.4	49.2	70.9	283.0
75	67	1,304	736	54.8	54.7	69.0	308.6	1,295	732	54.9	54.8	70.5	258.1	1,279	726	55.1	54.9	72.7	306.5
80	62	1,261	1,188	49.9	49.4	68.3	299.1	1,253	1,183	50.0	49.5	69.7	249.3	1,239	1,176	50.2	49.6	72.0	296.8
80	67	1,302	900	54.4	54.2	69.0	310.0	1,293	896	54.5	54.3	70.4	256.3	1,276	889	54.7	54.5	72.6	304.7
80	72	1,412	714	60.2	60.0	71.0	333.9	1,471	733	59.6	59.5	71.9	271.7	1,384	703	60.4	60.3	74.6	331.6
85	67	1,351	1,184	55.3	54.9	69.9	320.0	1,342	1,181	55.4	55.0	71.3	267.2	1,328	1,175	55.6	55.2	73.5	317.5
85	72	1,408	870	59.8	59.5	70.9	328.8	1,397	866	59.9	59.6	72.3	272.9	1,380	859	60.0	59.8	74.5	325.9
85	77	1,521	679	65.6	65.4	73.3	354.4	1,515	687	65.7	65.6	74.7	294.0	1,483	675	66.0	65.8	76.8	351.2

LSWU105 - Air Flow: 36,000 CFM

		EWT 85 LWT 97						EWT 90 LWT 100						EWT 90 LWT 102					
EDB	EWB	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM
75	57	1,157	1,157	46.1	44.5	72.3	233.1	1,144	1,144	46.4	44.6	74.8	278.4	1,135	1,135	46.7	44.7	76.5	231.1
75	62	1,187	960	50.2	50.0	72.8	239.6	1,172	953	50.3	50.1	75.3	286.0	1,162	948	50.4	50.3	76.9	237.6
75	67	1,269	722	55.1	55.0	74.1	252.6	1,253	715	55.3	55.2	76.6	301.7	1,241	710	55.4	55.3	78.2	251.5
80	62	1,230	1,171	50.3	49.7	73.5	245.9	1,216	1,163	50.5	49.9	76.0	295.0	1,206	1,158	50.6	50.0	77.6	245.6
80	67	1,266	885	54.8	54.6	74.1	252.3	1,249	877	54.9	54.7	76.5	301.0	1,238	873	55.0	54.8	78.1	250.3
80	72	1,373	699	60.5	60.4	76.1	274.4	1,356	692	60.6	60.5	78.5	328.3	1,344	688	60.8	60.6	80.1	272.8
85	67	1,318	1,170	55.7	55.3	75.1	264.6	1,283	1,154	56.0	55.6	77.6	318.0	1,292	1,157	56.0	55.5	79.1	260.9
85	72	1,369	855	60.1	59.9	76.0	271.2	1,351	848	60.3	60.0	78.3	322.8	1,340	843	60.4	60.1	80.0	270.3
85	77	1,486	677	65.9	65.8	78.2	290.3	1,466	670	66.1	65.9	80.6	347.6	1,453	665	66.2	66.0	82.2	290.1

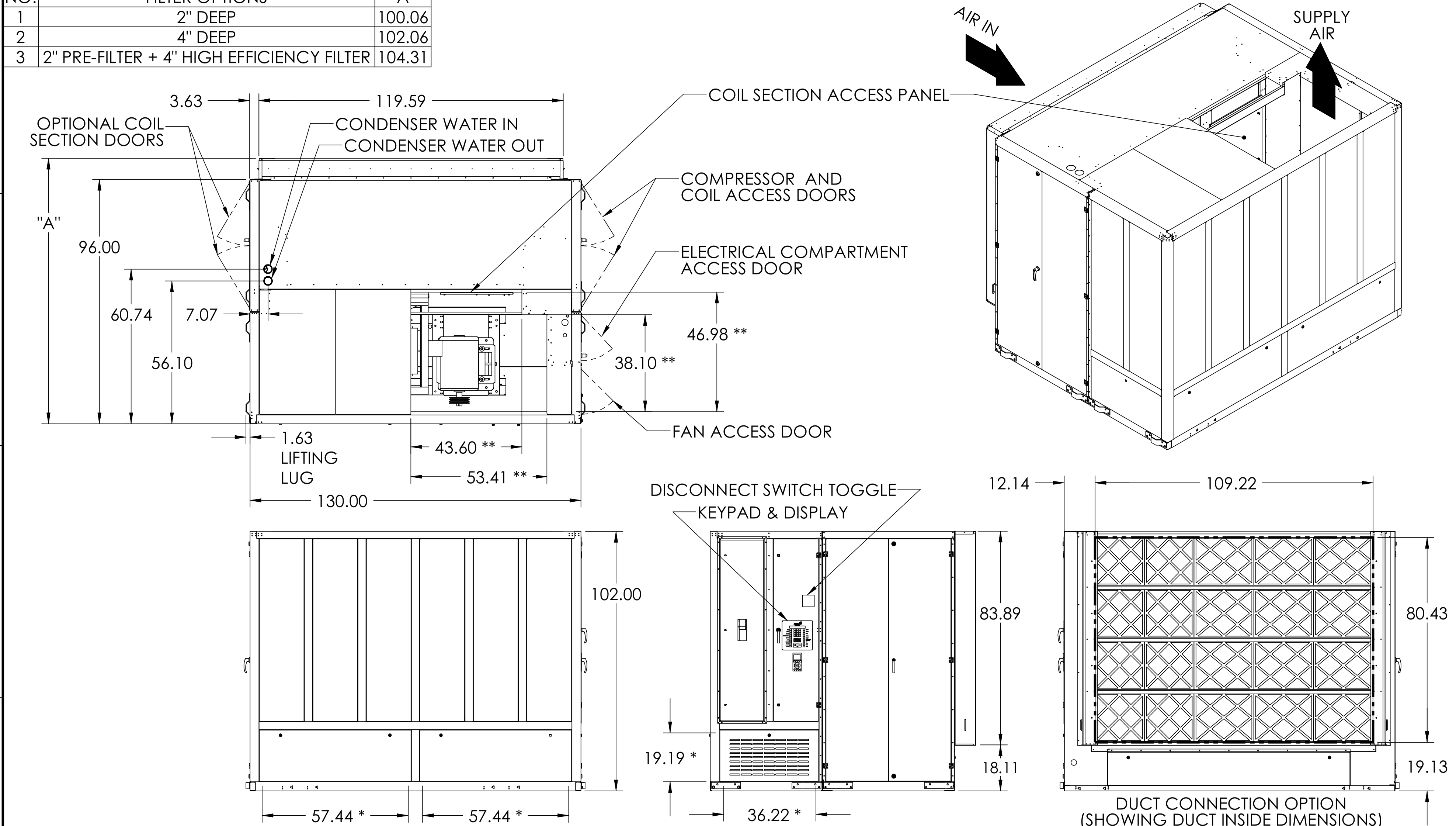
LSWU105 - Air Flow: 28,000 CFM - High Efficiency

		EWT 80 LWT 90						EWT 80 LWT 92						EWT 85 LWT 95					
EDB	EWB	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM
75	57							1,168	1,084	40.1	40.0	68.5	236.5	1,156	1,077	40.3	40.2	70.7	280.4
75	62	1,236	910	45.8	45.8	67.9	296.5	1,227	906	46.0	46.0	69.3	243.8	1,212	898	46.2	46.2	71.6	292.2
75	67	1,294	711	51.4	51.4	69.5	317.1	1,303	715	51.3	51.3	70.9	263.6	1,293	710	51.5	51.5	73.1	313.2
80	62	1,257	1,078	45.6	45.6	68.4	301.7	1,254	1,077	45.7	45.7	69.9	252.0	1,259	1,079	45.6	45.6	71.9	299.3
80	67	1,293	852	51.2	51.2	69.4	314.7	1,292	852	51.2	51.2	70.8	261.6	1,302	856	51.0	51.0	73.0	314.3
80	72	1,459	722	56.3	56.3	71.5	342.2	1,456	721	56.3	56.3	72.8	284.4	1,430	711	56.6	56.6	75.0	338.2
85	67	1,364	1,066	50.8	50.8	70.0	324.1	1,356	1,061	50.9	50.9	71.5	271.1	1,350	1,058	51.0	51.0	73.6	321.1
85	72	1,508	881	55.3	55.3	71.2	343.4	1,505	879	55.4	55.4	72.5	283.1	1,439	853	56.2	56.2	74.9	341.8
85	77	1,625	724	61.4	61.4	73.7	370.0	1,621	722	61.4	61.4	75.0	305.3	1,611	719	61.5	61.5	77.1	365.3

LSWU105 - Air Flow: 28,000 CFM - High Efficiency

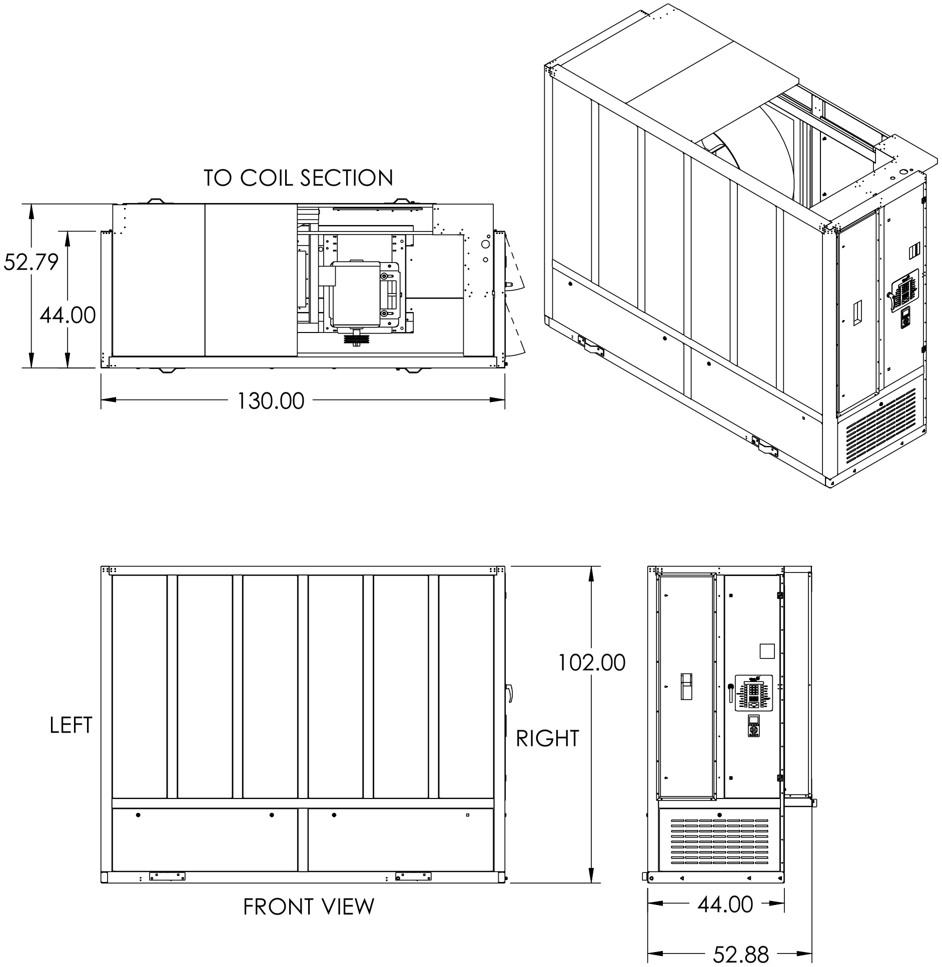
		EWT 85 LWT 97						EWT 90 LWT 100						EWT 90 LWT 102					
EDB	EWB	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM	TMBH	SMBH	LDB	LWB	Comp KW	Water Flow GPM
75	57	1,147	1,073	40.4	40.4	72.3	232.1	1,133	1,065	40.7	40.6	74.7	277.0	1,103	1,048	41.2	41.1	76.5	233.7
75	62	1,202	894	46.3	46.3	73.1	242.8	1,187	886	46.5	46.5	75.6	291.2	1,177	881	46.7	46.7	77.2	241.3
75	67	1,248	691	52.1	52.1	74.6	262.5	1,266	699	51.8	51.8	77.0	306.3						
80	62	1,208	1,054	46.3	46.3	73.8	251.6	1,203	1,051	46.4	46.4	76.2	300.7	1,195	1,047	46.5	46.5	77.8	247.3
80	67	1,299	855	51.1	51.1	74.5	261.6	1,292	852	51.2	51.2	76.8	306.9	1,289	850	51.2	51.2	78.4	255.1
80	72	1,389	694	57.1	57.1	76.7	283.6	1,389	694	57.1	57.1	79.0	336.8	1,385	693	57.1	57.1	80.5	279.7
85	67	1,347	1,057	51.1	51.1	75.1	267.3	1,340	1,054	51.2	51.2	77.4	315.4	1,303	1,037	51.6	51.6	79.3	264.9
85	72	1,400	837	56.6	56.6	76.7	285.0	1,392	833	56.7	56.7	79.0	339.8	1,388	832	56.8	56.8	80.5	281.2
85	77	1,511	684	62.6	62.6	79.1	303.7												

NO.	FILTER OPTIONS	"A"
1	2" DEEP	100.06
2	4" DEEP	102.06
3	2" PRE-FILTER + 4" HIGH EFFICIENCY FILTER	104.31

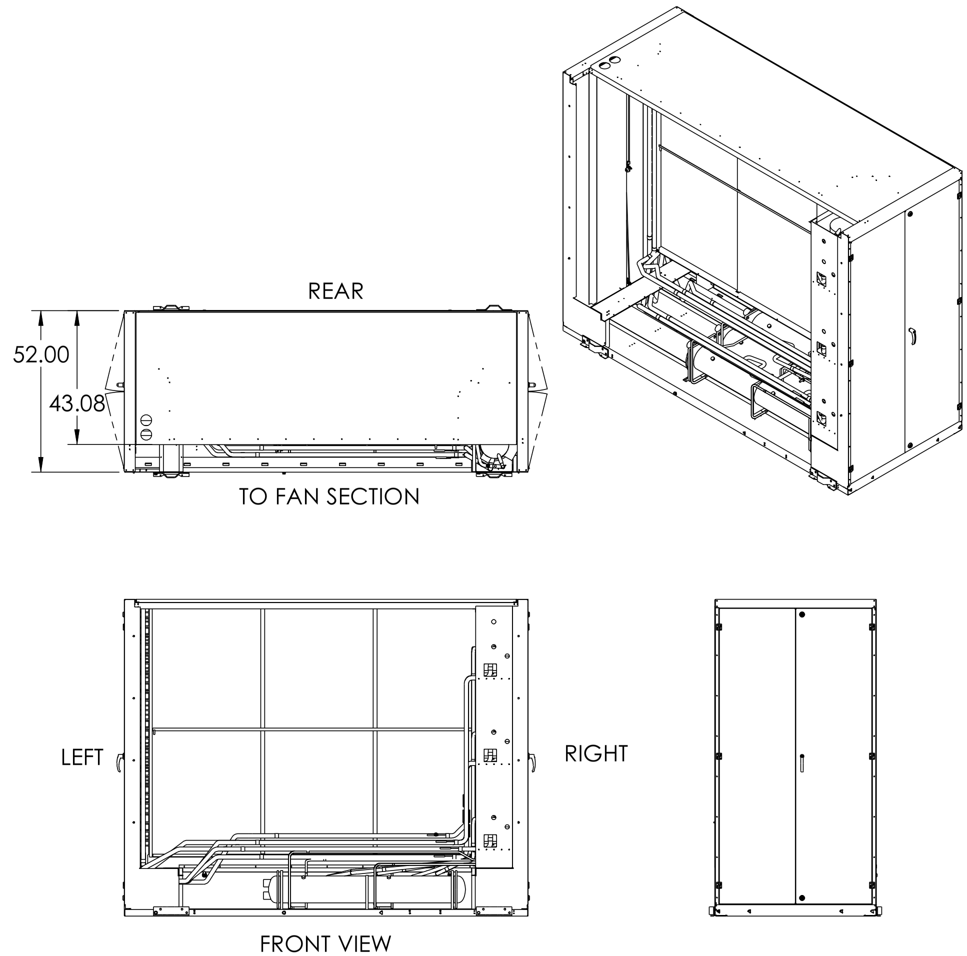


* LOWER ACCESS OPENING
** DISCHARGE OPENING

Johnson Controls	UNIT OVERVIEW COMBINED UNIT Model LARGE CABINET 62-105TON	DIMENSIONS ARE IN INCHES TOLERANCES ± 0.25" DIMENSIONS DO NOT INCLUDE SCREW HEADS, DOOR HANDLES, HINGES, LATCHES, SKIDS, ETC.	DRAWING NUMBER 075-83744-900 SHEET 1 OF 4	REVISION - Scale: 1:36



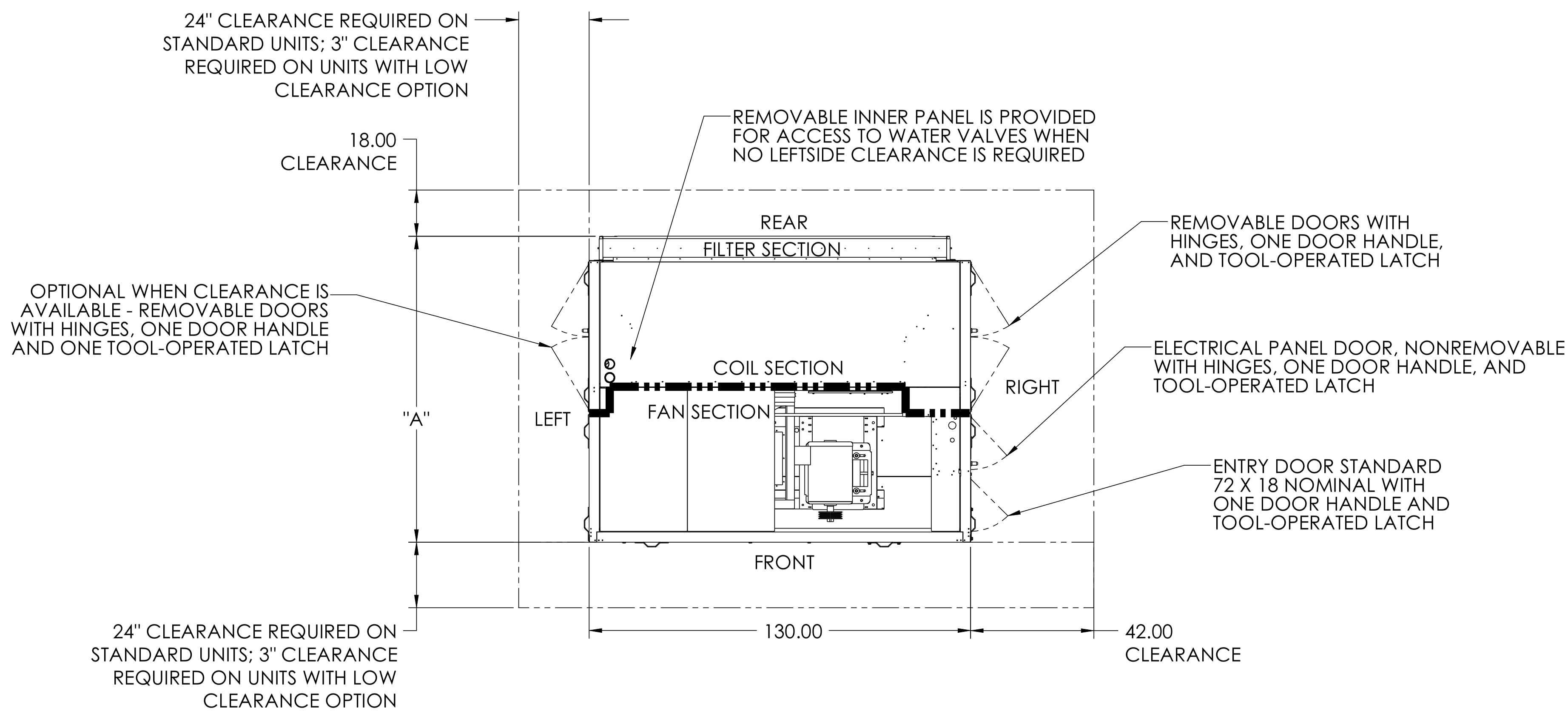
FAN SECTION



COIL SECTION

NOTE: FILTER SECTION IS NOT SHOWN AND WILL BE SHIPPED SEPARATELY.

Johnson Controls	UNIT OVERVIEW SPLIT SHIPMENT Model LARGE CABINET 62-105TON	DIMENSIONS ARE IN INCHES TOLERANCES ± 0.25" DIMENSIONS DO NOT INCLUDE SCREW HEADS, DOOR HANDLES, HINGES, LATCHES, SKIDS, ETC.	DRAWING NUMBER 075-83744-900 SHEET 2 OF 4	REVISION - Scale: 1:40



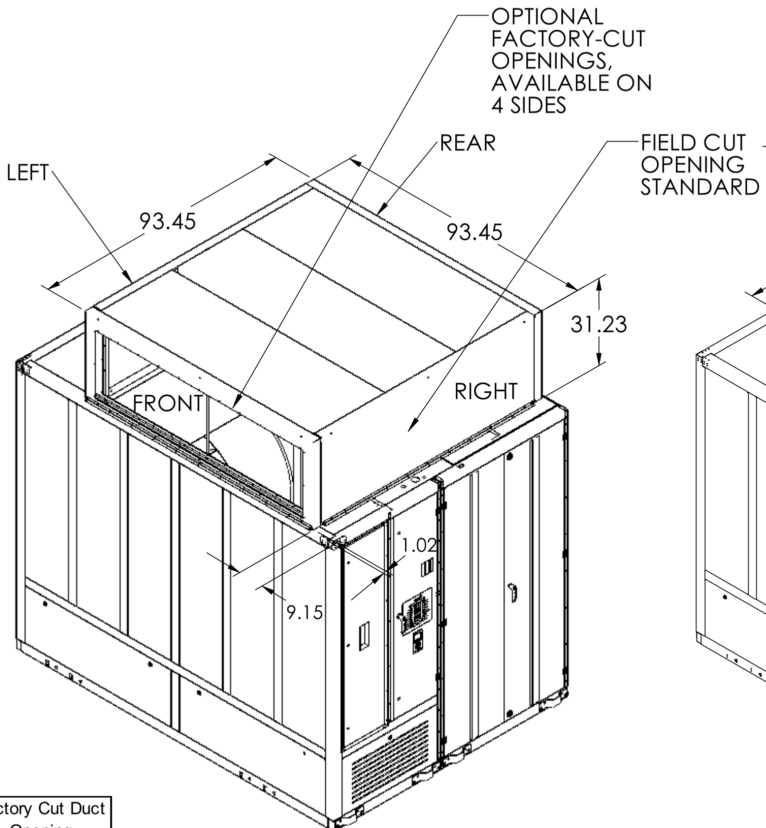
NO.	FILTER OPTIONS	"A"
1	2" DEEP	100.06
2	4" DEEP	102.06
3	2" PRE-FILTER + 4" HIGH EFFICIENCY FILTER	104.31

Johnson Controls

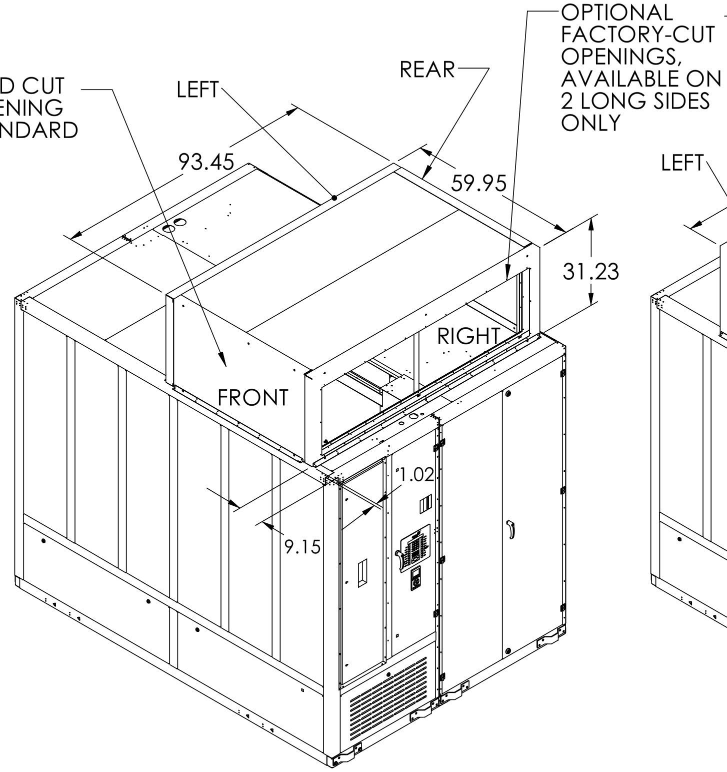
UNIT OVERVIEW
COMBINED UNIT
Model LARGE CABINET 62-105TON

DIMENSIONS ARE IN INCHES
TOLERANCES ± 0.25"
DIMENSIONS DO NOT INCLUDE SCREW HEADS, DOOR HANDLES, HINGES, LATCHES, SKIDS, ETC.

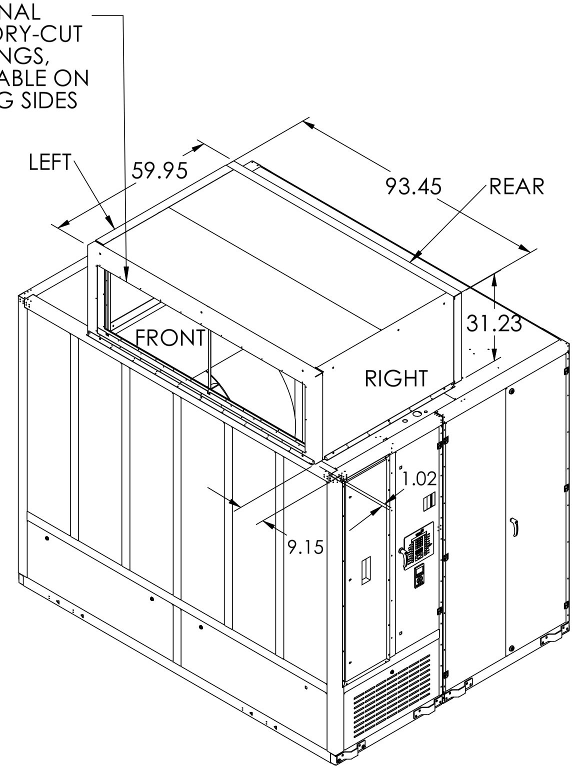
DRAWING NUMBER 075-83744-900
SHEET 3 OF 4
REVISION -
Scale: 1:40



OPTIONAL FULL PLENUM



OPTIONAL HALF PLENUM
(POSITIONED OVER
FAN & COIL SECTIONS)



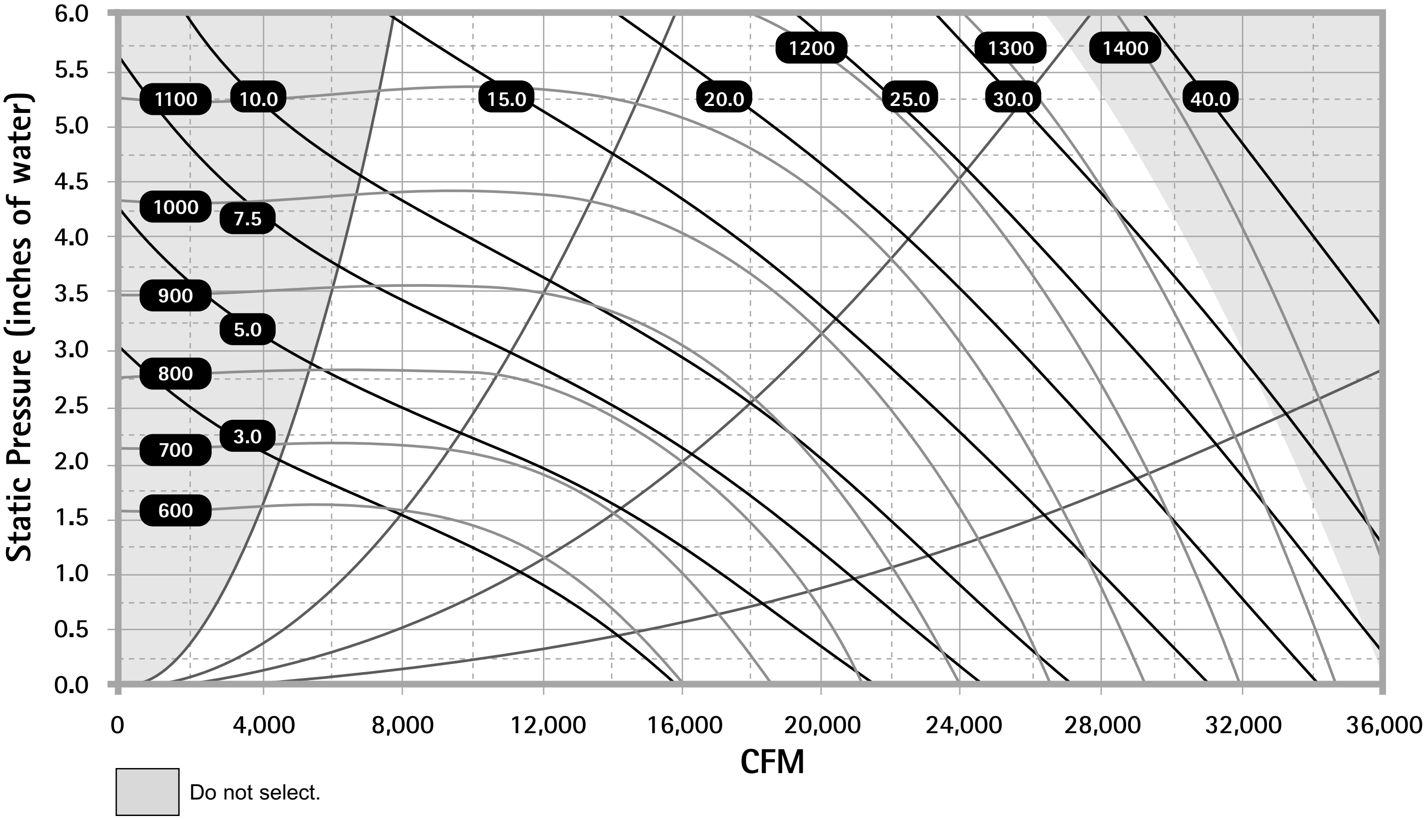
OPTIONAL HALF PLENUM
(POSITIONED ONLY
OVER FAN SECTION)

Factory Cut Duct Opening
Height Options
12"
14"
16"
18"
20"
22"
24"
Length Options
36"
42"
48"
54"
60"
66"
72"

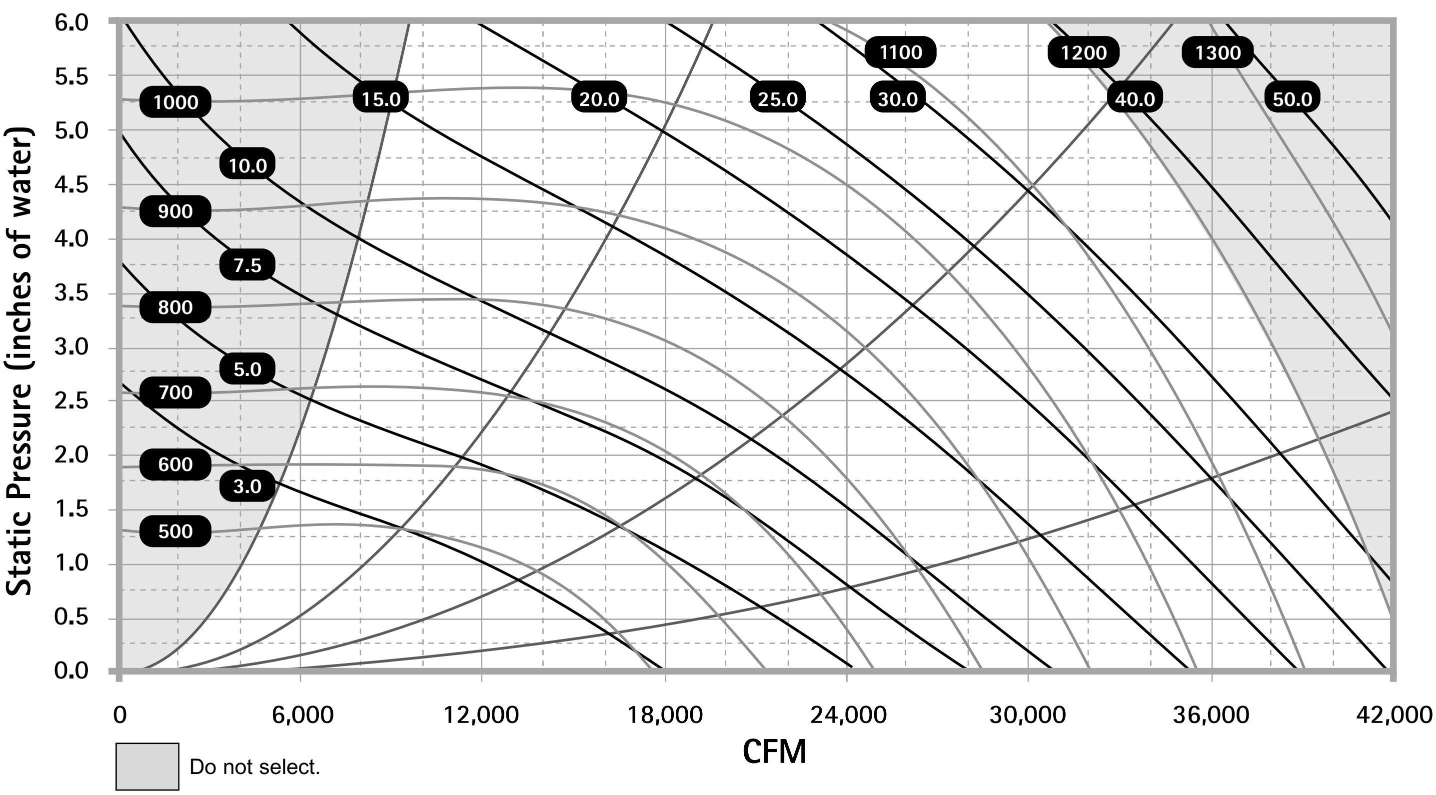
Johnson Controls	UNIT OVERVIEW PLENUM OPTIONS Model LARGE CABINET 62-105TON	DIMENSIONS ARE IN INCHES TOLERANCES ± 0.25" DIMENSIONS DO NOT INCLUDE SCREW HEADS, DOOR HANDLES, HINGES, LATCHES, SKIDS, ETC.	DRAWING NUMBER 075-83744-900 SHEET 4 OF 4	REVISION - Scale: 1:36

Air Pressure Drops (in. w.c.)									
Model	Airflow CFM	Evap Coil	Water Coil	MERV 8 Filters 4-30%	MERV 11 Filters 4-60%	MERV 15 Filters 4-90%	Oulet Plenum Front Discharge	Oulet Plenum Side Discharge	Inlet Plenum (Sound Attenuating)
LSWU062	24,400	0.72	0.67	0.36	0.57	0.36	0.18	0.13	0.06
	20,300	0.56	0.48	0.28	0.45	0.28	0.13	0.09	0.04
	16,200	0.41	0.33	0.21	0.33	0.21	0.08	0.06	0.03
LSWU070	29,800	0.72	0.66	0.36	0.57	0.36	0.27	0.20	0.10
	24,800	0.56	0.48	0.28	0.45	0.28	0.19	0.14	0.07
	19,900	0.41	0.33	0.21	0.34	0.21	0.12	0.09	0.04
LSWU080	33,900	0.90	0.67	0.36	0.57	0.36	0.36	0.25	0.12
	28,200	0.70	0.48	0.28	0.45	0.28	0.25	0.18	0.09
	22,600	0.51	0.33	0.21	0.33	0.21	0.16	0.11	0.06
LSWU095	36,100	0.90	0.66	0.36	0.57	0.36	0.40	0.29	0.14
	30,100	0.70	0.48	0.28	0.45	0.28	0.28	0.20	0.10
	24,200	0.52	0.33	0.21	0.34	0.21	0.18	0.13	0.06
LSWU105	36,100	1.08	0.66	0.36	0.57	0.36	0.40	0.29	0.14
	30,100	0.84	0.48	0.28	0.45	0.28	0.28	0.20	0.10
	24,200	0.62	0.33	0.21	0.34	0.21	0.18	0.13	0.06

36" PLENUM FAN – MODELS 072, 079, 090



40" PLENUM FAN – MODELS 079, 090



Condenser Water Pressure Drop (ft. w.c.)						
Water Flow	Condenser	Additional Waterside Economizer - When Active				
GPM	All Models	LSWU062	LSWU070	LSWU085	LSWU095	LSWU105
100	3.2	2.0	1.7	1.5	1.4	1.4
120	4.3	2.8	2.4	2.1	2.0	2.0
140	5.7	3.7	3.1	2.7	2.6	2.6
160	7.2	4.7	4.0	3.5	3.4	3.4
180	8.8	5.9	5.0	4.4	4.2	4.2
200	10.6	7.1	6.1	5.4	5.1	5.1
220	12.5	8.5	7.3	6.4	6.2	6.2
240	14.6	10.0	8.5	7.6	7.2	7.2
260	16.8	11.7	9.9	8.8	8.4	8.4
280	19.1	13.4	11.4	10.1	9.7	9.7
300	21.5	15.2	12.9	11.5	11.0	11.0
320	24.1	17.2	14.6	13.0	12.5	12.5
340	26.8	19.2	16.3	14.6	14.0	14.0
360	29.6	21.4	18.1	16.3	15.5	15.5
380	32.6	23.7	20.0	18.0	17.2	17.2
400	35.7	26.1	22.1	19.8	19.0	19.0

Electrical Data

Fan Motor Data

Horsepower	High Efficiency		Premium Efficiency	
	208-230/60/3 FLA	460/3/60 FLA	208-230/60/3 FLA	460/3/60 FLA
15	44.7/38.0	19.0	37.4/35.4	17.7
20	60.6/50.0	25.0	49.4/47.0	23.5
25	73.0/62.0	31.0	63.3/60.0	30.0
30	84.0/72.0	36.0	74.1/70.0	35.0
40	112/98.0	49.0	97.5/92.0	46.0
50	140.0/120.0	60.0	121.0/114.0	57.0

Compressor Motor Data

Horsepower	208-230/60/3		460/3/60	
	RLA	LRA	RLA	LRA
11	32.3	245.0	15.3	125.0
13	37.5	300.0	18.0	150.0
15	47.0	340.0	21.2	173.0

Operating Weights

Model	LSWU062	LSWU070	LSWU085	LSWU095	LSWU105
Coil Section	4,223	4,316	4,456	5,331	5,452
Water Economy Coil Option	676	783	1,036	1,036	1,036
Fan Section	2,040	2,040	2,040	2,040	2,040
Supply Fan					
36 Inch Class II	685	685	685	685	685
40 Inch Class II	920	920	920	920	920
40 Inch Class III	1065	1065	1065	1065	1065
Supply Fan Motor					
15 HP	326	326	326	326	326
20 HP	368	368	368	368	368
25 HP	495	495	495	495	495
30 HP	519	519	519	519	519
40 HP	602	602	602	602	602
50 HP	-	-	673	673	673
Variable Freqency Drive					
15 HP	96	96	96	96	96
20 HP	96	96	96	96	96
25 HP	115	115	115	115	115
30 HP	115	115	115	115	115
40 HP	115	115	115	115	115
50 HP	-	-	144	144	144
Filter Section					
4 Inch Filter Rack with 30% MERV 8 Filters.	257	257	257	257	257
4 Inch Filter Rack with 60% MERV 11 Filters.	306	306	306	306	306
4 Inch Filter Rack with 90% MERV 15 Filters.	306	306	306	306	306
2 Inch Prefilter and 4 Inch High Efficiency Filters	487	487	487	487	487
Plenums					
Inlet Plenum (Sound Attenuating)	439	335	335	335	335
Outlet Plenum - Half	415	341	341	341	341
Outlet Plenum - Full	556	455	455	455	455

All weights are in Lbs.
Please add Waterside Economizer weight, if selected, to Coil Section.
Please add selected fan, motor, and VFD weight to the fan section weight to get total Fan weight.
Please add Coil Section, Fan Section and Filter Section weights together to obtain total unit weight

Water-Cooled Self-Contained Up Flow Unit

CABINET CONSTRUCTION

Each unit shall be completely factory assembled and shipped in one piece or in multiple pieces if required. Unit base shall be constructed out of formed 10-gauge galvanized steel frame and 16-gauge bottom welded together for superior strength. Lifting brackets shall be bolted on the unit base with and shall accept hooks.

Unit framework shall be fabricated from formed galvanized steel members of 12-gauge and 16 gauge pre-painted galvanized steel. Exterior cabinet component and access panels shall be constructed of a minimum of 18-gauge pre-painted galvanized steel. Access panels for electrical compartment and compressors and refrigeration specialties shall be hinged. ***Unit shall require NO MORE THAN 3-inches of clearance on one or two sides***. All access panels shall be 2 inch deep and insulated with 2 inch thick, 1.5 lb/cu ft density matt faced fiberglass insulation where necessary. Walls separating compressor compartment from conditioned space shall be insulated with fiberglass. Fan section shall have an insulated double walled hinged walk-in door to access fan and drive components. Matte-faced insulation in fan section roof and left and right sides shall be covered with 20-gauge perforated galvanized sheet metal to provide additional sound attenuation.

Installation manual, start-up form, operating bulletin, maintenance bulletin, and a hard copy of the electrical wiring diagrams are supplied inside each unit. Units shall have labels to indicate caution areas for servicing the unit. The data plate (nameplate) is permanently attached to the unit on the external panel next to the user interface panel on the front of the unit.

Access to refrigerant components including compressors, expansion valves, sight glasses, filter driers, high pressure switches and refrigerant pressure transducers shall be through removable, hinged doors. These components shall be located out of airstream. Unit keypad will have pre-assigned keys for each menu option, for easy navigation. Discharge and suction pressures for each refrigerant circuit shall be available through unit display. Access to fan assembly shall be through a hinged door with glass window for observation. The door shall be complete with safety catch to protect against injuries in case the fan section is pressurized. Unit and VFD Keypad shall be accessible without opening any door.

The unit shall be shipped in sections. Assembly in the mechanical room shall not require interconnection of refrigerant or condenser water piping between sections. All control wiring connections between sections shall be through connector plugs. Should unit dismantling and reassembly be required, the contractor shall bear the cost for this work and ensure the manufacturer's warranty is not voided.

Filters

The filters shall be face-loading (removable from the back of the unit). For servicing the filters when return air is ducted, hinged and latched access door shall be provided on Left side of the unit. ***To improve indoor air quality and reduce filter changes, 4" thick filters shall be provided with a maximum face velocity of 500 FPM.*** The minimum efficiency shall be MERV 8 (efficiency 30%). ***Optionally, MERV 11, or 14 (efficiency 65%, or 95%) filters shall be provided.*** The construction of the filter shall have media resistant to water consisting of mini pleats.

When filters with rating higher than MERV 8 are used, additional filter section shall be optionally available, housing 4" thick pre-filters. This section shall attach to the unit air intake, upstream of the higher efficiency filters. All filters shall be Class II.

COOLING COIL

Direct Expansion (DX)—DX cooling coils shall be constructed of seamless 0.375 - inch outside diameter copper tubing with a minimum wall thickness of 0.012-inches. The copper tubes shall be mechanically expanded to the aluminum fins. Coils shall be a minimum of 3-rows, with minimum 12 fins per inch. An adjustable thermal expansion valve (TXV) including an external equalizer shall feed each circuit. The TXV shall be sized to operate with minimum entering condenser water temperatures of 55°F. The coil shall be leak tested with high-pressure nitrogen in a warm water bath.

The coil section shall include an integral drain pan constructed of 16-gauge, type 304 stainless steel. The minimum depth of the drain pan shall be 2 inches. The drain pan shall be sloped in all directions towards the condensate drain connection to provide positive drainage. The unit shall include a factory installed drain line and supplied with drain trap with a cleanout, for field installation to ensure adequate access to the trap. Drain pan design shall fully comply with ASHRAE 62.1.

Water-Cooled Self-Contained units shall meet the scheduled efficiency levels AND have a minimum EER of 12.5.

WATERSIDE ECONOMIZER

Waterside economizer cooling coil shall be constructed of seamless 0.50-inch outside diameter copper tubing with a wall thickness of 0.016-inches. The copper tubes shall be mechanically expanded to the aluminum fins. Coils shall be a minimum of 4- rows, with a minimum of 12 fins per inch. The circuiting of the coil shall be such to allow the lowest water pressure drop. Waterside economizer water coils shall have a vent and drain. The coil shall be provided to be chemically [optionally mechanically] cleanable. The coil shall be leak tested with high-pressure air in a warm water bath. The complete economizer package, including the coil, valves, and piping shall be rated for 400-psig waterside working pressure.

To control the condenser water flow through the coil, a factory installed modulating control valve package shall be provided. A valve package includes the valve(s), actuator(s), wiring, and piping internal to the unit. The condenser water piping connections shall be located inside, close to the exterior of the unit, located for easy connection to the building risers. One set of connections (one for inlet and one for outlet) is needed for each unit.

Economizer operation shall be controlled to maximize free cooling operation as the entering condenser water is colder than the entering air (mixed air = outdoor air + return air) temperature to the unit. If the condenser water is suitable for cooling, the economizer valve shall modulate to maintain temperature set point. If the cold condenser water cannot satisfy the cooling load, mechanical cooling shall assist the pre-cooling to achieve temperature set point. To maximize energy savings, the economizer shall pre-cool until disabled when the condenser water becomes too warm compared to the entering air temperature. When the economizer is disabled, the economizer valve shall shut and the condenser valve shall open to allow 100% water flow through the condenser.

When the unit is not in operation, the economizer is disabled and the economizer valve is always closed. The condenser valve can be set to either close or 100% open. If the condenser valve is closed, the system water flow shall be reduced, thus saving pumping energy. If the condenser valve is set to close in the unit is not in operation, the valves shall be controlled to work independent of the economizer valve. If the condenser valve is set to be 100% when the unit is not in operation, the valves shall work in reverse acting.

[*A non-averaging type freezestat shall be factory installed. When the freezestat senses the entering air temperature is below the set point, the unit shall be put into the unoccupied mode and the economizer valve shall be driven to 100% open and the condenser valve shall be driven closed*.]

HEATING (Optional)

Optional Heating shall be installed in the coil section on the leaving air side of the evaporator coil.

Hot Water—Hot water heating coils shall be constructed of seamless 0.50-inch outside diameter copper tubing with a wall thickness of 0.016-inches. The copper tubes shall be mechanically expanded to the aluminum fins. Coils shall be a 1-row with up to 12 fins per inch. The circuiting of the coil shall be such to allow the lowest water pressure drop. Hot water coils shall have a vent and drain. The coil shall be leak tested with high pressure air in a warm water bath. Convenient access to the coil for inspection and cleaning shall be from both sides of the unit. The coil shall be installed on the leaving side of the direct expansion coil, in a draw-through position.

To control the water flow through the coil, a factory installed two-way modulating valve package shall be provided. A valve package includes the valve, actuator, wiring, and piping internal to the unit. The piping connections shall be protruding through the casing, located for easy connection to the building risers.

[*A non-averaging type freezestat shall be factory installed. When the freezestat senses the entering air temperature is below the set point, the unit shall be put into the unoccupied mode and the hot water valve shall be signaled to drive 100% open*.]

Electric—2-staged electric heating coils shall be factory installed on the leaving side of the direct expansion coil, in a draw-through position. The heating elements in the coils shall be constructed of low-watt density, nickel-chromium elements. Safety controls shall include an automatic reset, high limit control for each heater element. Also, a manual reset backup line break protection in each heater element branch circuit is included. To meet NEC requirements, the heating element branch circuits shall be individually fused to a maximum of 48 amps.

Steam—Steam heating coils shall be constructed of seamless 0.625-inch or 1-inch outside diameter copper tubing with a minimum wall thickness of 0.016-inches. The copper tubes shall be mechanically expanded to the aluminum fins. Coils shall be a minimum of 1-row, with a minimum of 6 fins per inch. Steam coils shall have a vent and drain. For the drain, the return connection shall be at the lowest point to enable the condensate to empty from the coil. The coil shall be leak tested with high-pressure nitrogen in a warm water bath. The coil shall be installed in the draw-through position. A 0 to 10 Volt DC control signal to actuate external valve supplied by others will be provided by unit controller. Steam and condensate piping will be by others.

[*A non-averaging type freezestat shall be factory installed. When the freezestat senses the entering air temperature is below the set point, the unit shall be put into the unoccupied mode, and the steam valve shall be driven 100% open*.]

FAN SECTION

Supply Air Fan—*A single supply fan shall be provided comprised of a medium pressure, single width, and single-inlet (SWSI) centrifugal plenum fan wheel with a minimum of 9 airfoil blades. The fan wheel shall be a minimum of Class II construction to handle up to 6.0"*

total static pressure. Fan, bearings, and inlet cone shall be assembled on welded angle iron frame. The fan wheel and blades shall be constructed of painted steel. The fan shall be secured to a ground and polished solid steel shaft coated with rust inhibitor. The shaft shall be secured and supported by two heavy-duty pillow-block type grease lubricated bearings. Bearing diameter shall be the same size as the main shaft diameter. Bearings shall be sized to provide an L-50 life at 200,000 hours. The fan bearings shall have extended grease lines to a common location.

Fan Motor—Fan motor shall be heavy-duty 1750 rpm open drip-proof (ODP) type with grease lubricated ball bearings. The motors shall meet applicable EPACT efficiency requirements. Optionally, motor shall be premium efficiency. Motors shall be T-frame with class B insulation that is inverter duty. Motors shall be mounted on a heavy-duty adjustable base that provides for proper alignment and belt tension adjustment. The minimum service factor shall be 1.15 fixed pitch V-belt drives with a minimum of two belts shall be provided. Drive shall be selected at a service factor of 1.15. Optionally, the Drive shall be selected at a service factor of 1.5

Completed fan assembly, including fan, drive, motor assembly, and framework, shall be statically and dynamically balanced at the factory. Entire fan assembly shall be mounted on 1" spring isolators with seismic restraints. Optionally, 2" spring non seismic isolators shall be available. The inlet to the fan assembly shall be isolated from the unit with a flexible connection. The entire fan assembly shall be isolated within the unit, thus eliminating external spring isolation. Use of standard waffle pads between the bottom of the unit and the concrete housekeeping pad is sufficient. ***The fan and discharge plenum cabinet walls shall be treated with perforated metal liners to reduce discharge sound.***

Variable Frequency Drives (VFD)—Airflow modulation and static pressure control shall be achieved by increasing or decreasing the speed of the variable frequency drive. The Variable Frequency Drive shall be approved for plenum duty applications. In event of VFD failure, the bypass contactor shall be energized using operator interface. In the bypass mode, the fan shall operate at full design airflow and the VFD can be removed for service. The compressors shall be staged to meet the discharge air temperature set point.

The supply air fan drive output shall be controlled by the factory-installed unit control system. The VFD status and operating speed shall be monitored and displayed at the unit control panel. A factory mounted, field adjustable duct high-limit safety control shall be available to protect ductwork from excessive duct pressure. The installer shall provide and install sensor tubing from [a single unit mounted sensor] [two unit mounted sensors] to the duct location(s).

Optional VFD and bypass contactor shall be completely wired and run tested at the factory. Motor overload relay is sized to protect the motor during bypass mode.

COMPRESSORS

Each unit shall have multiple high-efficiency; heavy-duty, suction-cooled scroll compressors. The compressors shall be single speed operating at 3450 rpm at 60 Hz. A refrigerant pressure transducer shall be installed on the discharge and suction side of each compressor. These sensors shall be used to indicate high pressure, low pressure, motor protection, and identify other conditions that could frost the DX coil. A high pressure switch sensing refrigerant pressure at the compressor discharge will disable compressor by opening contactor circuit in case of high refrigerant pressure. Each compressor shall include motor overload protection, and a minimum three-minute interstage timer to prevent short cycling. The compressors shall be isolated internal to the unit by rubber in shear isolators. ***Each refrigerant circuit shall POE oil and charged with Refrigerant R-410A. R-407C is not acceptable***. The compressors shall be independently protected for overload using circuit breakers/manual starters. Each compressor will have individual refrigerant circuit. Compressor RLA will not exceed 21.2 Amps at 460 Volts or 47 Amps at 208 Volts.

CONDENSERS

Water-Cooled condensers shall utilize high-efficiency, compact, mechanically cleanable shell and tube design. The condenser shall have removable water heads to clean tubes. The condenser shall be constructed of enhanced, heavy-walled 5/8 inch OD copper tubes. The condenser shall have independent refrigerant circuits with a common water supply. Condensers shall be rated for 560 psig refrigerant and 300 psig waterside working pressure. Valve package shall be factory piped and completed condenser and piping assembly shall be leak tested at the factory.

CONTROLS

The unit shall be controlled by a stand-alone 32 bit microprocessor based controller. The controller along with all applicable sensors, transducers, and end devices shall be factory packaged, installed, and fully tested before shipment to insure reliable operation.

The control system shall include a keypad and 2 line x 40 character LCD display to be used as a man-machine interface. All text and messages displayed shall be in plain English. The user interface shall provide, at a minimum, the following information:

Setpoints

- Supply Air Temperature
- Morning Warm up / Occupied Heating Temperature
- Unoccupied Heating Temperature
- Duct Pressure
- Supply Air Temperature Reset via Outside Air Temperature
- Supply Air Temperature Reset via Return Air Temperature
- Supply Air Temperature Reset via VFD Speed (VAV Only)
- Supply Air Temperature Reset Limits

Safeties

- Low Suction Pressure (1 per compressor)
- High Discharge Pressure (1 per compressor)
- Compressor Motor Overload (1 per compressor)
- Supply Fan Motor Overload
- Low Entering Air Temperature
- Low Entering Water Temperature
- Excessive Duct Pressure

Operating Modes

- Unoccupied Heating
- Unoccupied Standby
- Unoccupied Cooling
- Morning Warm-Up
- Occupied Heating
- Occupied Standby
- Occupied Cooling
- Local Stop

Alarms / Warnings

- Compressor Safety
- Excessive Duct Pressure
- Hot Water Freeze
- Low Suction Pressure
- Supply Air Temperature Sensor Failure
- Supply Fan
- Return Air Temperature Sensor Failure
- Zone Temperature Sensor Failure
- Dirty Filter
- Suction Pressure Transducer Failure
- Discharge Pressure Transducer Failure
- Outside Air Temperature Sensor Failure (Units with Airside Economizer)
- Outside Air Humidity Sensor Failure (Units with Airside Economizer)
- Return Air Humidity Sensor Failure (Units with Airside Economizer)
- Duct Pressure Transducer Failure
- Low Water Flow (Units with Water Flow Switch)
- Low Water Temperature
- Entering Water Temperature Sensor Failure
- Leaving Water Temperature Sensor Failure

Field Wiring Inputs and Outputs

- Unit Shut Down (Emergency Stop) Input
- Occupancy Input
- Zone Temperature Input
- VAV Heat Relay Output
- Occupancy Indication Output
- Alarm Output
- Pump Start Output

Standard Control Sequences

- Unit can be indexed between Occupied and Unoccupied via four methods:
    i. Manually via OFF-AUTO-ON switch
    ii. Remotely via Field Wiring Input

iii. Remotely via BAS (BACnet or MODBUS)
iv. Automatically via internal scheduling

- Control sequences for CV, VAV and Flexsys (Underfloor VAV) built in.
- For VAV operation, four SAT Setpoint reset sequences can be selected:
  i. No Reset, fixed SAT Setpoint
  ii. Reset via Return/Zone Temperature
  iii. Reset via Outside Air Temperature
  iv. reset via VFD Speed
- Occupied Heating
- Unoccupied Heating (Night Set Back)
- Morning Warm-up
- Economizer Sequences Built-In
  v. Waterside Economizer with Adjustable Approach Setpoint
  vi. Airside Dry Bulb (Units equipped with Mixing Box)
  vii. Airside Single Enthalpy (Units equipped with Mixing Box)
  viii. Airside Dual Enthalpy (Units equipped with Mixing Box)

  Note, Economizer sequences allow for economizing with mechanical cooling when economizer alone is insufficient for load.
- Condenser Water Control Sequences Built-In
  i. No Condenser Valves
  ii. Condenser Valve Only – No Bypass
  iii. Condenser Valve With Bypass Valve
  iv. Condenser Valve With Water Economizer Valve
- Hot Water or Steam Control Sequences (Proportional)
- Staged Heat Sequences (4 Stages)

AUXILIARY CONTROL OPTIONS

Non-Fused Disconnect—A factory installed non-fused disconnect switch shall be provided for disconnecting electrical power at the unit. [Two factory installed non-fused disconnect switches shall be provided for disconnecting electrical power at the unit. One shall be sized for the controls and supply air fan motor. The other shall be sized for all the compressors.] The switch(es) shall be located at the front of the unit, visible and accessible without removing any access panels.

Phase Failure/Under Voltage Protection—A phase failure/under voltage protection device shall be provided to protect three-phase motors from damage due to single phasing, phase reversal and low voltage conditions.

Freezstat—A non-averaging type freezstat is factory mounted at the unit's entering face of the coil. When a temperature is sensed on any 18" of the freezestat below 38°F (adjustable 30°F to 40°F), an alarm signal shall be generated, the fan will shut down, and the waterside economizer [heating] [waterside economizer and heating] valve shall be driven to 100% open to allow full flow. This alarm requires a manual reset.

Head Pressure Control Valve—When the entering condenser water temperature is below 55ºF and the use of waterside economizer is not available, a factory installed and controlled modulating head pressure control valve shall be provided. The valve actuator shall be controlled through the factory installed main unit control system to maintain refrigerant head pressure.

Condenser Water Flow Switch – When unit is the mechanical cooling mode, compressors shall be enabled when the condenser water switch is made. Mechanical cooling shall be disabled when the condenser water flow switch opens during the operation, and all compressors shall be turned off.

Dirty Filter Switch—A factory installed pressure switch senses the pressure differential across the filters. When the differential pressure exceeds 1.0-inches WG (adjustable), the normally open contacts close. This signals the unit controller that the filters are loaded and are in need of a change.

FACTORY TEST

Each unit shall undergo a rigorous factory-run test prior to shipment and factory test sheets shall be available upon request. The factory test shall include dynamic balancing of the completed fan assembly, a compressor run check, a complete run test of all electrical components and safeties, a leak check of all refrigerant circuits, a leak check of all water circuits, and a final unit inspection.

AGENCY LISTING

The unit shall have ETL US/Canada listed by Intertek Testing Services, Inc.

BUILDING AUTOMATION SYSTEM INTERFACE

BACnet™ MS/TP communication protocol shall be available.

COMMON ALARM OUTPUT

This binary output signal is used to indicate an alarm signal. When the unit controller has processed an alarm condition, the normally closed dry contacts shall open. When the alarm has been cleared, the contacts shall return to the normal closed position.

OUTDOOR AIR DAMPER OUTPUT

This analog (0 to 10 volts DC) output signal is used to control the outdoor air damper. 0 volts corresponds with a closed damper and 10 volts with a fully open damper.

VAV BOX/HEAT

This binary output signal is used to put the VAV box in a heating or cooling mode. When the normally open contacts are closed, this represents a heating mode, and the VAV box should be at the maximum position. When the normally open contacts are open, this represents a cooling mode, and the VAV box should be in the cooling mode and maintaining the space/zone temperature. Voltage for the device(s) connected to the output needs to be provided from another source.

EXTERNAL STOP (FAN STOP)

This binary input signal is used to shut the unit down in an emergency. When the signal is open, the unit is in the shut down emergency mode. Thus, the unit is in the unoccupied mode. When the signal is closed, the unit shall be operating in the typical. After the unit has been in the emergency mode, when the signal is closed, the unit shall be controlled in the normal manner. Reset is not needed unless an alarm condition has occurred.

COOL/HEAT ENABLE

The keypad shall be used to enable or disable cooling and heating and allow the unit to be in the fan on mode. In the fan on mode for VAV units, the unit shall control duct static pressure.

OPTIONAL ACCESORIES

OUTLET PLENUM

Units shall be provided with an optional acoustical outlet plenum shipped loose for field installation. The duct opening(s) in the outlet plenum shall be located for horizontal duct connection(s). Single [Multiple] duct opening size(s) and location(s) shall be coordinated with the factory. Duct openings for the outlet plenum shall not require field cutting or modifications.

The plenum shall be constructed of formed 16-gauge galvanized steel. The exterior panels shall be fabricated from 18-gauge pre-painted galvanized steel. The plenum wall shall be insulated with 3-inch, 3.0 pcf density fiberglass acoustical insulation. For acoustical purposes, the interior walls of the plenum shall be lined with 22-gauge, galvanized steel, perforated liner.

Closed cell gasket and clear silicon caulking shall be placed between the unit and the outlet plenum to prevent air leakage. Brackets anchored with bolts shall attach the plenum to the unit. When the plenum is to be shipped loose, mounting hardware including bolts, brackets, gasket and caulking shall be provided from the factory. It shall be shipped inside the plenum.

AIRSIDE ECONOMIZER INLET PLENUM— For air economizer applications, an inlet plenum with integral low leak dampers shall be provided. This section shall be shipped separate from the unit for field installation. The inlet plenum panels shall be made from 18-gauge painted galvanized steel. The frame casing shall be constructed of 16-gauge galvanized steel. The section shall include dampers for the return and outdoor air. Dampers shall be airfoil shaped, and sealed by vinyl gasket along the edges for low leakage. The dampers shall be fabricated from 16-gauge galvanized steel and rotate on nylon bearings.

The return and outdoor air opening locations will be back and top respectively. Control actuator with linkages for the return air dampers and another for the outdoor air dampers shall be factory installed. The dampers actuator shall modulate in response to the cooling load during the economizer mode. The outdoor air damper and return air damper shall be controlled in a reverse-acting fashion by the unit controller.

Economizer operation shall be controlled to maximize free cooling operation based on outdoor air conditions. If outdoor air is suitable for cooling, the outdoor air dampers shall modulate to maintain temperature set point. If the outdoor air cannot satisfy the cooling load, mechanical cooling shall assist the pre-cooling to achieve temperature set point. To maximize energy savings, the economizer shall pre-cool until disabled by the enthalpy or temperature. When the economizer is disabled, the outdoor air dampers shall be set to the minimum position of 15% (keypad adjustable).

SOUND ATTENUATING INLET PLENUM – For additional sound attenuation, a field installed inlet plenum shall be provided. Inlet plenum will have return air access from Both sides and shall be made out of 4 inch 3 lbs/Lb density fiberglass with neoprene coating, and 20 gage galvanized steel perforated metal liner. The plenum shall be available on the units without low service clearance units.