

# LIEBERT DS

## CABINET AND FLOOR PLANNING DIMENSIONAL DATA

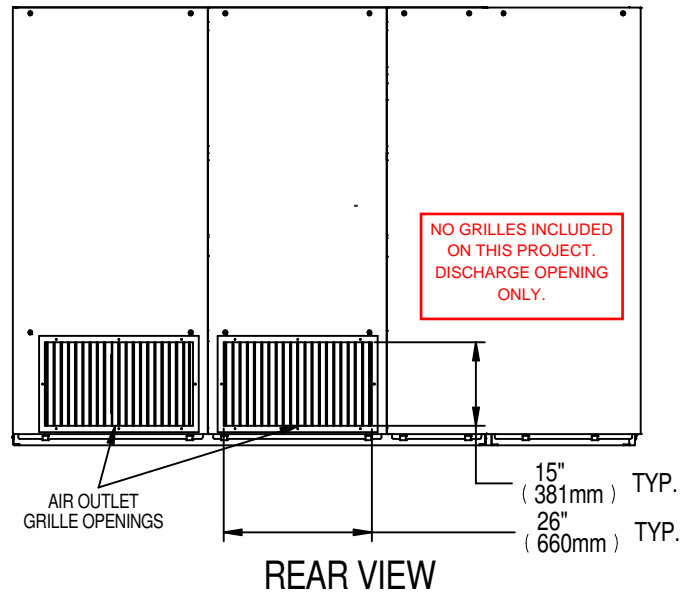
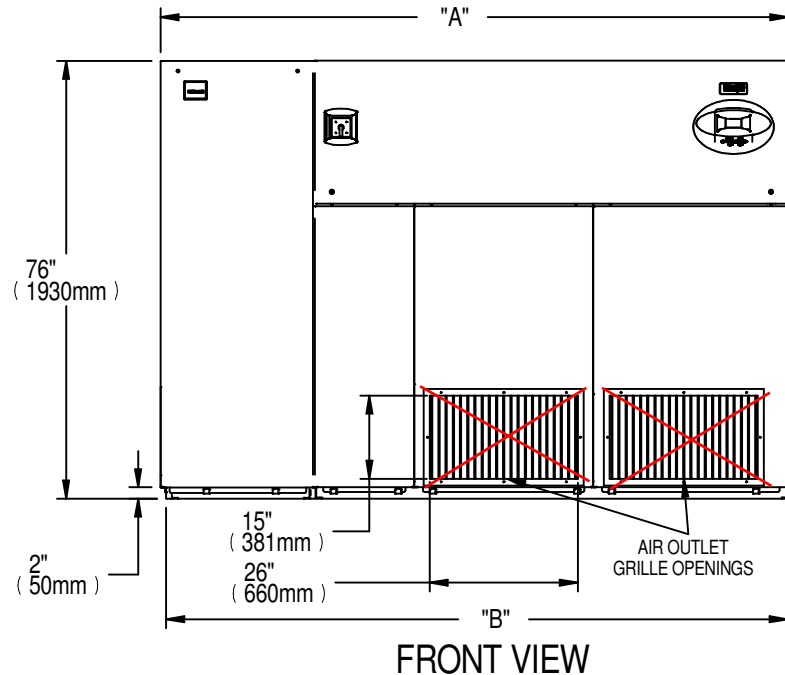
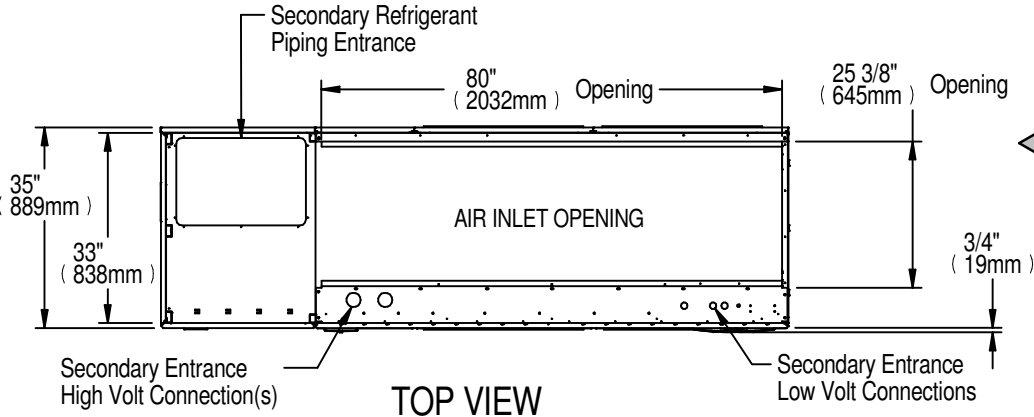
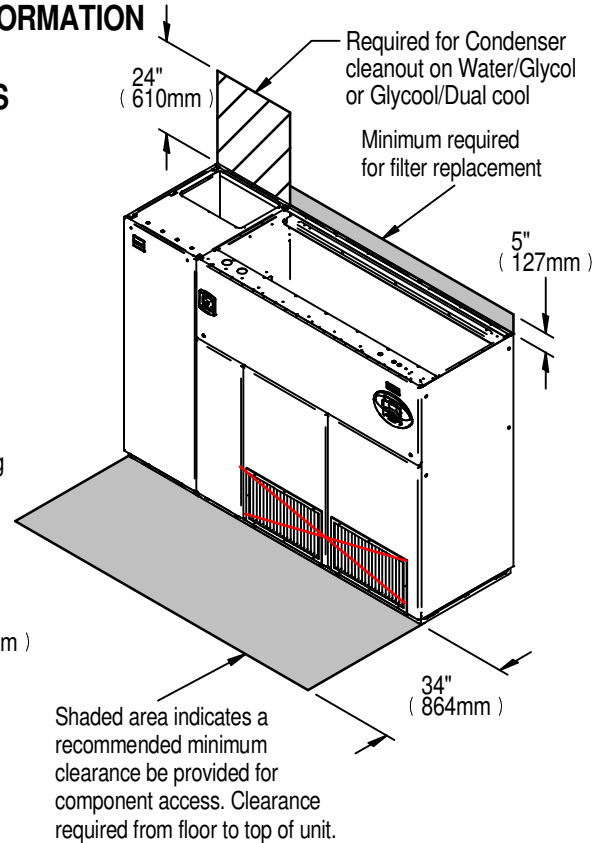
### DOWNFLOW 53-77kW (15-22 TONS) MODELS

#### FRONT AND / OR REAR DISCHARGE INFORMATION WITH EC FANS AND WITH SINGLE DEFLECTION GRILLES

Notes:  
Filters are accessible through top of unit only.

Customer piping and wiring connections

- For primary connection locations see standard submittals DPN000928, DPN000929 or DPN000933.  
A minimum of a 9" floorstand is recommended if primary connections locations are to be used.
- If no floorstand is used and unit is placed directly on the floor then do the following.
  - Use secondary connection locations (shown on standard floor planning submittals).
  - Order a condensate pump.
  - Field pipe condensate and humidifier line (if ordered) to secondary connection point in compressor section.
  - Or order additional SFA's to relocate connection locations.



DRY WEIGHT lb(kg) APPROXIMATE					DIMENSIONS	
Unit with:	Model	53	70	77	"A"	"B"
Semi-Hermetic Compressors	Air-Cooled	2350 (1069)	2400 (1091)	2450 (1114)	109" (2769mm)	108" (2743mm)
	Dual-Cool	2530 (1150)	2580 (1173)	2630 (1196)	109" (2769mm)	108" (2743mm)
Scroll / Digital Compressors	Air-Cooled	1920 (873)	1970 (896)	2020 (919)	98" (2489mm)	97" (2464mm)
	Dual-Cool	2100 (955)	2150 (978)	2200 (1000)	98" (2489mm)	97" (2464mm)
Semi-Hermetic Compressors	Water/Glycol	2650 (1205)	2700 (1228)	2750 (1250)	109" (2769mm)	108" (2743mm)
	Glycool/Dual-Cool	2830 (1287)	2880 (1310)	2930 (1332)	109" (2769mm)	108" (2743mm)
Scroll / Digital Compressors	Water/Glycol	2220 (1010)	2270 (1032)	2320 (1055)	109" (2769mm)	108" (2743mm)
	Glycool/Dual Cool	2400 (1091)	2450 (1114)	2500 (1137)	109" (2769mm)	108" (2743mm)

REV: 1  
REF DATE: 04/03/17  
NAME: DTC  
SFA: E32047  
SHEET 2

## 4 Planning Guidelines

### 4.1 Shipping Dimensions and Unit Weights

Table 4.1 Vertiv™ Liebert® DS Shipping Dimensions—Domestic and Export

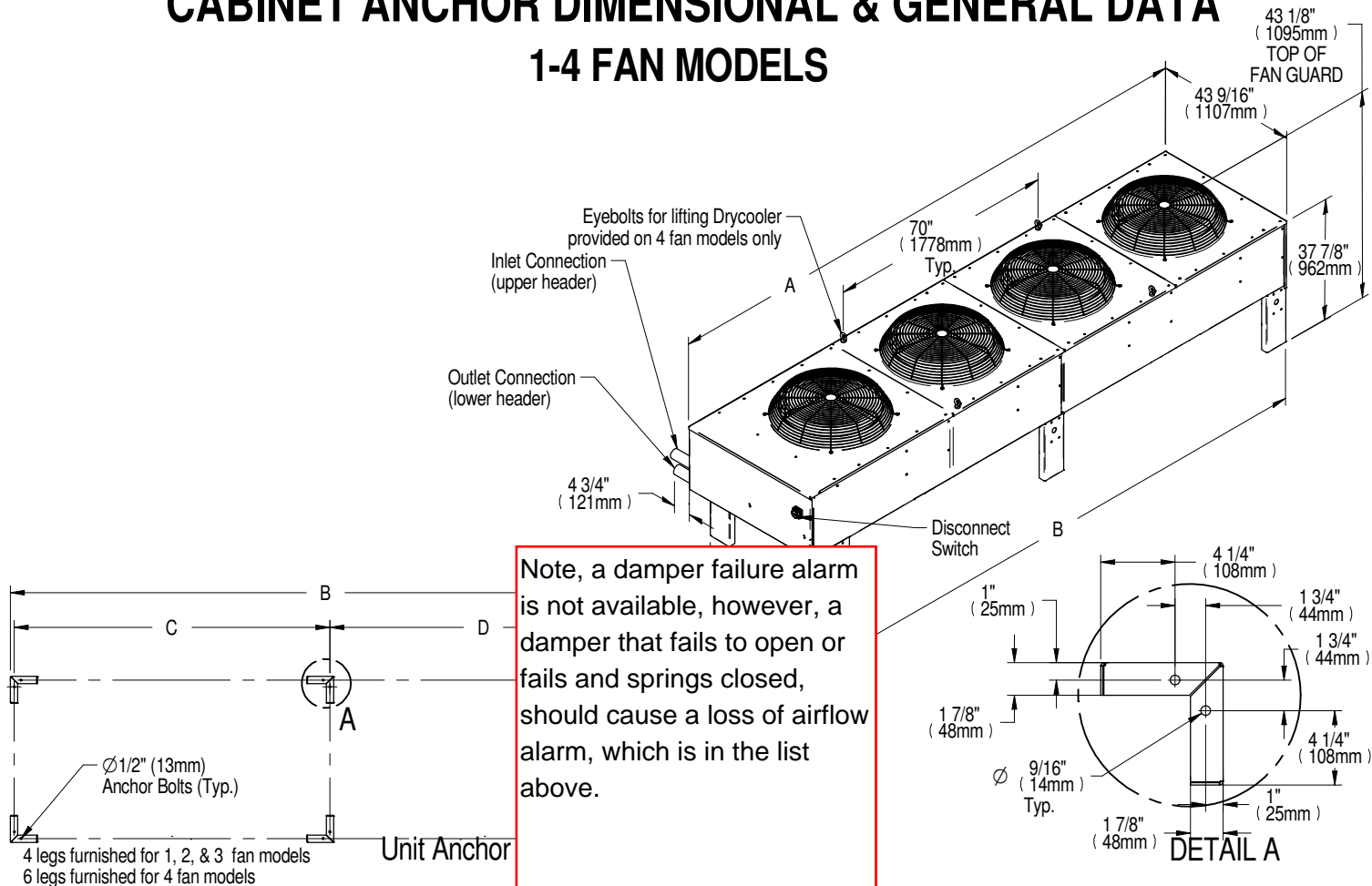
Cooling Type	Compressor Type	035/042	053/070/077	105
		LxWxH, in. (mm)	LxWxH, in. (mm)	LxWxH, in. (mm)
<del>Air, Dual-Cool Air</del>	<del>Scroll or Digital- scroll</del>	<del>90x42x82 (2286x1067x2083)</del>	<del>102x42x82 (2591x1067x2083)</del>	<del>136x42x82 (3454x1067x2083)</del>
<del>Air, Dual-Cool Air</del>	Semi-hermetic	—	<del>114x42x82 (2896x1067x2083)</del>	<del>136x42x82 (3454x1067x2083)</del>
<del>Water/Glycol, GLYCOOL/Dual-Cool Water</del>	<del>Scroll or Digital- scroll</del>	<del>90x42x82 (2286x1067x2083)</del>	<del>114x42x82 (2896x1067x2083)</del>	—
Water/Glycol, GLYCOOL/Dual-Cool Water	Semi-hermetic	—	114x42x82 (2896x1067x2083)	<del>136x42x82 (3454x1067x2083)</del>

Table 4.2 Liebert® DS Downflow Unit Weights and Shipping Weights—Approximate

			Downflow	Downflow Shipping Weights, lb (kg)	
Model Number	Compressor Type	Cooling Type	EC Fan Unit Weight, lb (kg)	Domestic, lb (kg)	Export, lb (kg)
DS035-042	Scroll or Digital Scroll	<del>Air-Cooled</del>	<del>1470 (668)</del>	<del>1608 (730)</del>	<del>1778 (807)</del>
		<del>Dual-Cool Air</del>	<del>1620 (736)</del>	<del>1758 (798)</del>	<del>1928 (875)</del>
		<del>Water/Glycol</del>	<del>1780 (809)</del>	<del>1918 (870)</del>	<del>2088 (948)</del>
		<del>GLYCOOL/Dual-Cool Water</del>	<del>1930 (877)</del>	<del>2068 (939)</del>	<del>2238 (1016)</del>
DS053	Scroll or Digital Scroll	<del>Air-Cooled</del>	<del>1920 (871)</del>	<del>2070 (939)</del>	<del>2260 (1026)</del>
		<del>Dual-Cool Air</del>	<del>2100 (953)</del>	<del>2250 (1021)</del>	<del>2440 (1107)</del>
		<del>Water/Glycol</del>	<del>2220 (1010)</del>	<del>2382 (1081)</del>	<del>2582 (1172)</del>
		GLYCOOL/Dual Cool Water	2400 (1091)	2562 (1163)	2762 (1253)
DS070	Scroll or Digital Scroll	<del>Air-Cooled</del>	<del>1970 (894)</del>	<del>2120 (962)</del>	<del>2310 (1048)</del>
		<del>Dual-Cool Air</del>	<del>2150 (975)</del>	<del>2300 (1044)</del>	<del>2490 (1130)</del>
		<del>Water/Glycol</del>	<del>2270 (1032)</del>	<del>2432 (1104)</del>	<del>2632 (1194)</del>
		<del>GLYCOOL/Dual-Cool Water</del>	<del>2450 (1114)</del>	<del>2612 (1185)</del>	<del>2812 (1276)</del>
<del>DS077</del>	Standard Scroll (Digital Scroll is not available)	<del>Air-Cooled</del>	<del>2020 (916)</del>	<del>2170 (985)</del>	<del>2360 (1071)</del>
	Semi-hermetic	<del>Air-Cooled</del>	<del>2450 (1114)</del>	<del>2612 (1185)</del>	<del>2812 (1276)</del>
		<del>Dual-Cool Air</del>	<del>2630 (1196)</del>	<del>2792 (1267)</del>	<del>2992 (1358)</del>
		<del>Water/Glycol</del>	<del>2750 (1250)</del>	<del>2912 (1321)</del>	<del>3112 (1412)</del>
		<del>GLYCOOL/Dual-Cool Water</del>	<del>2930 (1332)</del>	<del>3092 (1403)</del>	<del>3292 (1494)</del>

## CABINET ANCHOR DIMENSIONAL & GENERAL DATA

### 1-4 FAN MODELS



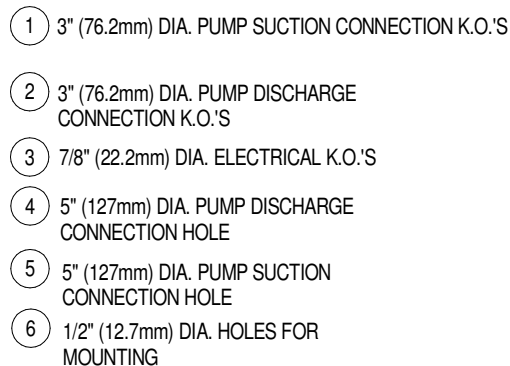
Liebert® Model	No. of fans	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	CFM (l/s) 60Hz (See note 1)	CFM (l/s) 50Hz (See note 1)	Internal Volume Gal. (Liters)	Dry Wt. Lbs. (kg)
*D**033	1	51-1/2 (1308)	44 (1118)	42 (1067)	N/A	7200 (3398)	6000 (2932)	1.2 (4.6)	355 (161)
*D**069						6866 (3240)	5722 (2700)	2.4 (9.2)	375 (170)
*D**092						6633 (3130)	5527 (2609)	3.7 (13.9)	395 (179)
*D**109						6322 (2984)	5268 (2486)	4.9 (18.6)	415 (188)
*D**112						6088 (2873)	5074 (2394)	5.8 (22)	435 (197)
*D**139	2	91-1/2 (2324)	84 (2134)	82 (2083)		13732 (6481)	11443 (5401)	4.8 (18.2)	500 (227)
*D**174						13265 (6261)	11054 (5217)	6.9 (26.2)	540 (245)
*D**197						12645 (5968)	10535 (4973)	9 (34)	580 (263)
*D**225						12177 (5748)	10147 (4789)	11.1 (42.1)	620 (281)
*D**260						19898 (9392)	16582 (7827)	10 (37.8)	735 (333)
*D**310	3	131-1/2 (3340)	124 (3150)	122 (3099)		18965 (8951)	15804 (7459)	13.1 (49.6)	795 (361)
*D**350						17398 (8212)	14499 (6843)	19.4 (73.3)	855 (388)
*D**352						24800 (11705)	20667 (9755)	13.1 (49.6)	940 (426)
*D**419	4	171-1/2 (4356)	164 (4166)	82 (2083)	80 (2032)	23650 (11163)	19708 (9302)	17.4 (65.9)	1020 (463)
*D**466						22770 (10747)	18975 (8956)	22 (83.3)	1050 (476)
*D**491						21700 (10242)	18083 (8535)	26.3 (99.6)	1100 (499)

Notes:

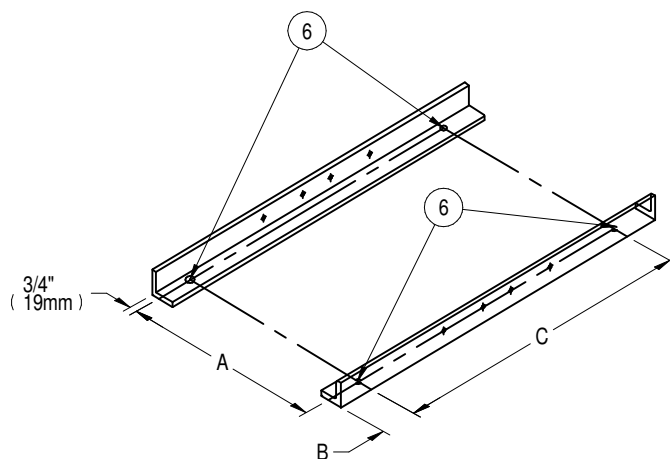
1. All Liebert® Drycooler motors are 3/4H.P.
2. A minimum clearance of 36" (914mm) is recommended on all sides for proper operation and component access.



## DUAL PACKAGE 0.75 - 5 HP

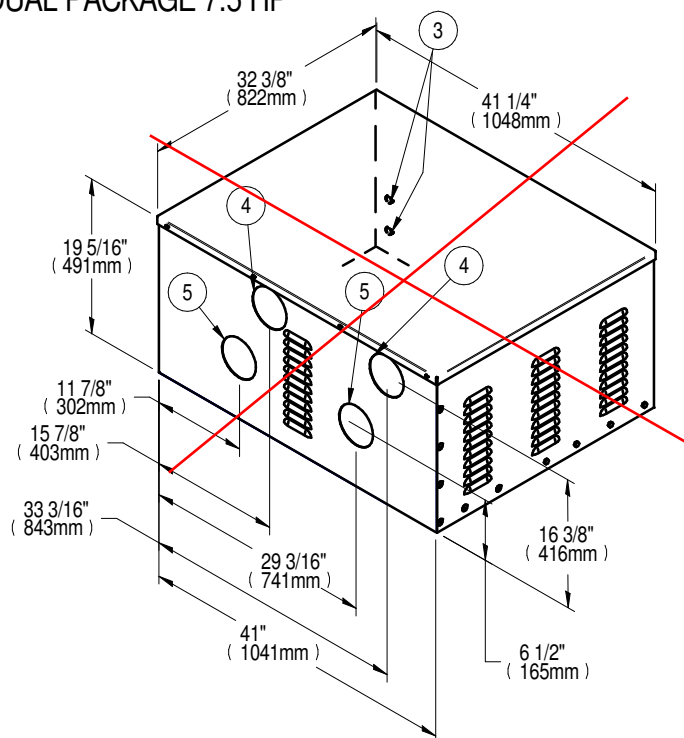


## PUMP PACKAGE MOUNTING ANGLES



NOTE:  
ANGLES LOCATED INSIDE, BOTTOM  
OF PUMP PACKAGE. VIEW USED FOR  
MOUNTING REFERENCE.

## DUAL PACKAGE 7.5 HP



Dual Pump Package Weights	
Model	Weight lb (kg)
<del>D.7.5</del>	<del>138 (63)</del>
<del>D1.5</del>	<del>140 (64)</del>
<del>D2</del>	
D3	164 (74)
<del>D5</del>	<del>220 (100)</del>
<del>D7.5</del>	<del>276 (125)</del>

Mounting Hole Dimensional Data in. (mm)			
Pump Package	A	B	C
Dual (0.75-5HP)	30-1/4 (768)	2-1/2 (64)	22-1/2 (572)
Dual (7.5HP)	39-5/16 (999)	1-3/4 (45)	26-7/8 (683)

# LIEBERT® OUTDOOR CONTROL ENCLOSURE™

## Quick Installation Guide



The Liebert Outdoor Control Enclosure is a NEMA 3R rated enclosure that mounts on Liebert condensers or drycoolers and provides control for one or more pumps and/or fan motors.

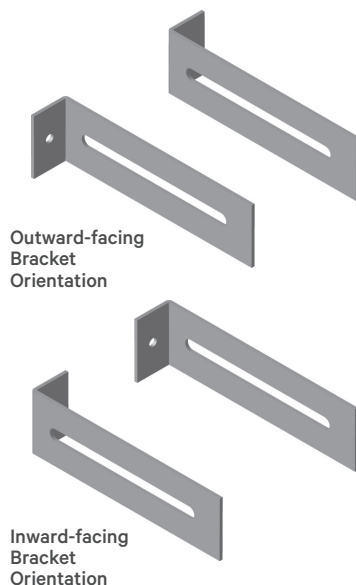
### INSTALLING THE ENCLOSURE

**⚠ WARNING:** Arc flash and electric shock hazard. Open all local and remote electric power-supply disconnect switches, verify with a voltmeter that power is off and wear appropriate OSHA-approved personal protective equipment per NFPA 70E before working within the electric control enclosure.

Installer must provide a remote, electric-power disconnect switch and earth ground to unit per NEC, CEC and local codes as applicable. Failure to comply can cause injury or death.

**NOTICE:** Risk of water leaks. Can cause equipment damage.

**NOTE:** To flush-mount the back of the enclosure, the adjustable brackets can be inverted. Refer to the “Dimensions” drawings on the following page.



**NOTE:** Alternate mounting locations are on a secure wall or building surface.

Use the provided mounting brackets to attach the enclosure to a Liebert condenser or drycooler.

- Tighten the bracket fasteners to maintain the weather rating of the enclosure.
- Ensure that the field wiring knockouts are facing down, and the enclosure cover is vertical.
- Ensure that the bolts securing the enclosure cover are in place and tightened securely when the installation is complete.

## ELECTRICAL CONNECTIONS

**⚠ WARNING:** Arc flash and electric shock hazard. Open all local and remote electric power-supply disconnect switches, verify with a voltmeter that power is off and wear appropriate OSHA-approved personal protective equipment per NFPA 70E before working within the electric control enclosure. Installer must provide a remote, electric-power disconnect switch and earth ground to unit per NEC, CEC and local codes as applicable. Failure to comply can cause injury or death.

### Hazardous-voltage Power-supply Wiring

Wire per NEC and local codes.

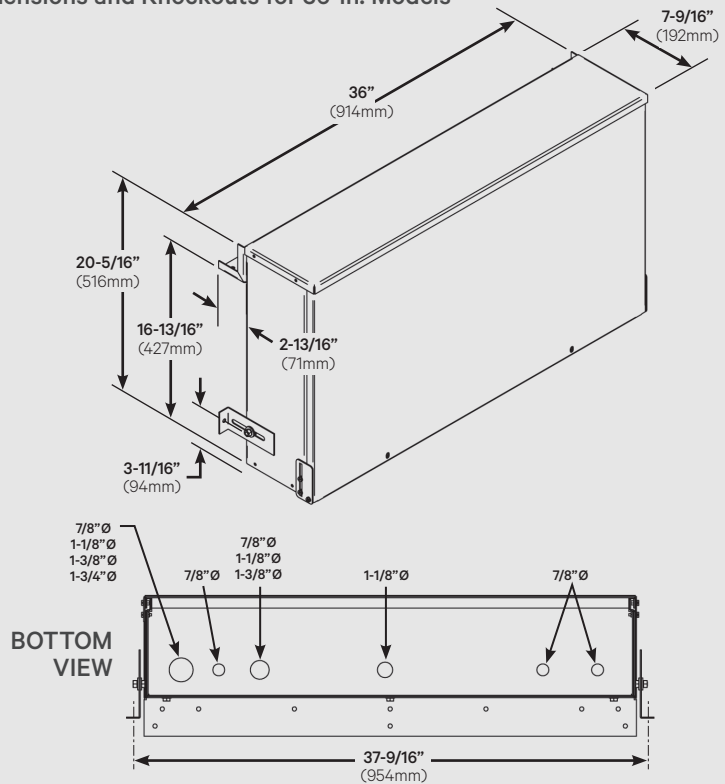
Hazardous-voltage electrical service is required at the location of the control enclosure. Use the knockouts provided at the bottom of the enclosure. This power supply does not have to be the same voltage as the Liebert indoor unit. This separate power source may be 110V, 208V, 230V, 460V or 575V, single-phase or three-phase, 60Hz; or it may be 200V, 230V, 380V or 415V, single-phase or three-phase, 50 Hz as appropriate.

### Extra-low-voltage Control Wiring

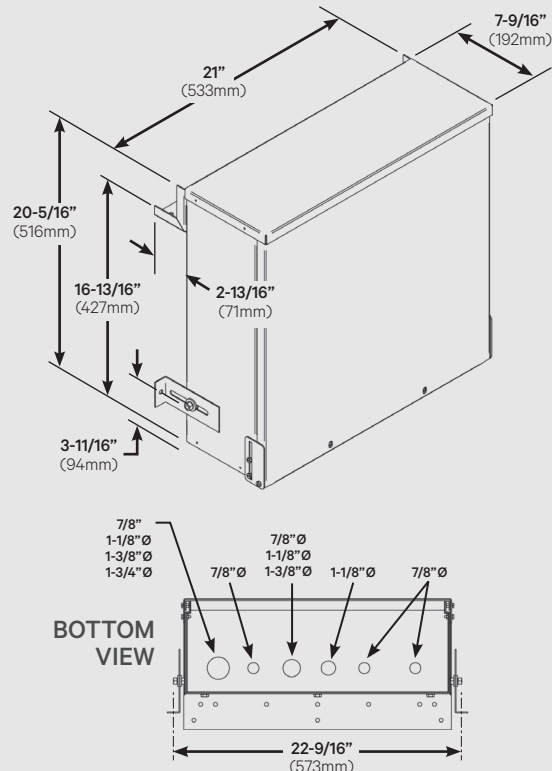
Control interlock between the control enclosure and the indoor unit(s) or other source(s) is required. Multiple indoor units may be connected in parallel if the controlled pumps will feed them all.

- Extra-low voltage, non-safety control wiring must be a minimum of 16 GA. (1.665 mm<sup>2</sup>) for up to 75 ft (22.9 m), or not to exceed 1-V drop in the control line.

Dimensions and Knockouts for 36-in. Models



Dimensions and Knockouts for 21-in. Models





- Install extra-low-voltage control wiring (24 V) from Terminals 70 and 71 on the wire raceway in the compressor compartment of the indoor unit to Terminals 70 and 71 of the control enclosure.
- Install extra-low-voltage control wiring between Terminals 24 and 50 from the control enclosure to the indoor cooling unit's common alarm or other alarm location for loss-of-flow indication.
- Install extra-low-voltage control wiring between the auxiliary terminals on the control panel to Terminals 70 and 71 on the drycooler.
- Connect the flow switch wiring to Terminals 77 and 74.
- Provide line voltage to power block(s) in the control enclosure as shown in the electrical schematic.
- Install optional field-supplied disconnect if desired.
- Run 3-phase line voltage from the control box to each individual pump motor.

## FLOW SWITCH INSTALLATION

**NOTE:** Only required for dual-pump package installation.

- Mount the flow switch in a section of coolant supply/return piping where there is a straight run of at least five (5) pipe diameters on each side of the flow switch.
- Mount the switch so the terminals or wire leads are easily accessible for wiring.
- Mount the flow switch in a standard 1-in. x 1-in. x 1-in. tee for one-inch pipe installation. Use a reducing tee for larger sizes of pipe to keep the flow switch near the pipe and to provide adequate paddle length in the flow stream.

- Screw the flow switch in position so the flat part of the paddle is at a right angle to the flow. The arrow on the side of the case must point in the direction of the flow.
- The flow switch must be mounted in a horizontal pipeline.

## DUAL PUMP CONTROLS SEQUENCE OF OPERATION

On a call for cooling, the compressor contactor and/or the Econ-O-Coil relay in the Liebert unit is energized. The relay and contactor are in the Liebert indoor evaporator section. Each compressor contactor has a side switch wired in parallel with the Econ-O-Coil relay and is responsible for closure of the low-voltage pump-control circuit.

This low-voltage circuit has a series of contactors, relays, selector switch and a flow switch. This circuit controls the start of the pumps and provides contact closure to interlock the drycooler(s) control circuit. Once the circuit is closed, 24V is passed to the pumps control circuit and the auxiliary relays are energized, closing the drycooler(s) control circuit.

Pump P1 is factory set to be the primary pump (Selector Switch 1-2). Voltage then passes through the normally closed contacts of the R2 relay (standby pump relay), through the current overloads and to the #1 pump contactor. At this point, the #1 pump and appropriate drycoolers are running.

When the pump establishes flow, it opens the system flow switch. The pump has approximately 10 seconds to establish full flow. If it does, the system will run in this state until the call for cooling is satisfied and the circuit drops out. If this pump cannot establish flow or if it has been running and fails, the flow switch will close and energize an adjustable relay, typically set for 10 seconds.

Once this relay times out, it energizes the R2 switch over relay. This relay will drop out the voltage to the #1 pump contactor and energize the #2 pump contactor. Along with the R2 relay the AL relay (alarm relay) will energize. This will provide a set of closed contacts for remote indication of the switch-over situation.

Once the problem with the lead pump is repaired, the controls must be reset. To reset the control box, turn Off the main power to the control box and then restore the main power to the control box. Pump P1 then becomes the primary pump again.



## **TECHNICAL SUPPORT AND SERVICE**

### **Vertiv Services, Inc.**

*24x7 dispatch of technicians for all  
products.*

1-800-543-2378

### **Liebert Thermal Management Products**

1-800-543-2778

### **Liebert Channel Products**

1-800-222-5877

### **Liebert AC and DC Power Products**

1-800-543-2378

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