

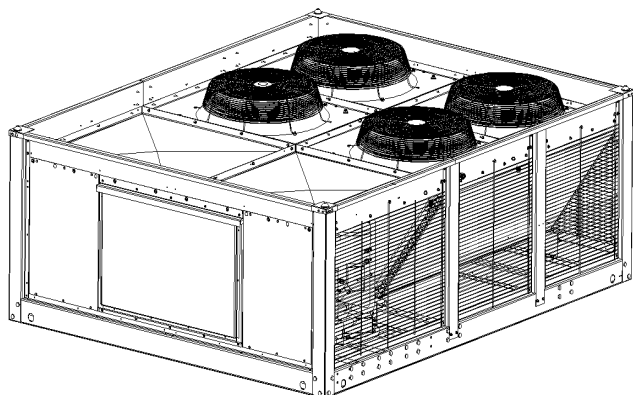


Heating and Air Conditioning

TECHNICAL GUIDE

SPLIT-SYSTEM AIR-COOLED CONDENSING UNITS

HA300, HB360, HB480 & HB600
25 thru 50 NOMINAL TONS
(50 Hz)



DESCRIPTION

These units are completely assembled, piped and wired at the factory to provide one-piece shipment and rigging. Each unit is pressurized with a holding charge of refrigerant-22 for storage and/or shipping.

The compact design, clean styling, low silhouette, and quiet operation make these condensing units suitable for almost any outdoor location. On rooftops . . . because they weigh much less than a single package unit of similar capacity and are much easier to rig and support. At ground level . . . because their ample sub-cooling capacity allows them to be located three or more stories below the evaporator coil.

Every condenser coil is pressurized with air to 325 psig and leak tested under water. After assembly, the unit is pressurized with a combination of refrigerant-22 and nitrogen to 450 psig for pressure testing and additional leak testing. During this pressure test, the operation of the high pressure control is checked. As the unit is being evacuated and dehydrated, the operation of the low pressure control is checked. Every compressor, condenser fan motor, crankcase heater, and electrical control circuit is checked to assure a trouble-free start-up and years of reliable operation.

The condenser fan guards are vinyl-coated to provide additional rust protection and to enhance the appearance of the unit.

Compressors are mounted on rubber isolators to reduce the transmission of vibration. Vertical discharge condenser fans direct sound upward and away from any surrounding structures.

All sheet metal parts are constructed of commercial grade (G90) galvanized steel. After fabrication, each part is thoroughly cleaned to remove any grease or dirt from its surfaces. The external parts are coated with a powder paint to assure a quality finish for many years. This UL approved coating system has passed the 750 hour, 20% salt spray test per ASTM Standard B117.

A matching line of Evaporator Blower units is also offered to meet your precise capacity and air handling requirements.

FEATURES

- Copeland Scroll compressors provide both high efficiency and reliability.
- Condenser coils are constructed of copper tubes and aluminum fins for durability and long lasting efficient operation.
- Crankcase heaters that will be de-energized when the compressor is operating.
- Both high and low pressure controls. Since these controls are self-contained, there are no capillary lines to be damaged.
- Solid state or internal line break compressor motor protection.
- Class 2, 24-volt thermostat control circuit.



- A sight glass and filter-drier is shipped in the unit's control box for field installation in the liquid line near the evaporator coil. Two are provided on all 30, 40 and 50 ton models.
- Copper stub-outs are factory mounted on the suction and liquid lines to simplify the field piping connections.
- Multiple controls to provide stable system operation at ambient temperatures down to 40°F.
- Capacity reduction for more economical operation and more even temperature levels within the conditioned space.
- A lockout circuit to prevent the unit from cycling on safety control.
- Pumpout on unit startup to prevent allowing liquid refrigerant returning to the compressor.

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TABLE 1: RATINGS*

Condensing Unit	Evaporator Blower Unit	Capacity, MBH	EER
HA300	LA300	320	10.0
HB360	LB360	376	9.5
HB480	LB480	485	8.8
HB480	LB600	510	9.7
HB600	LB600	600	9.5

*Rated in accordance with ARI Standard 360 (60 Hz).

EER = Energy Efficiency Ratio at full load - the cooling capacity in Btu's per hour (Btuh) divided by the power input in watts, expressed in Btuh per watt (Btuh/watt).

TABLE 2: UNIT APPLICATION DATA

Voltage Variation ¹ Min./Max.	380/415V-3-50	342/456
Ambient Air on Condenser Coil Min./Max.		40°F/125°F ²

¹ Utilization range "A" in accordance with ARI Standard 110.

² These units can operate in an ambient temperature of 125°F providing the wet bulb temperature of the air entering the evaporator coil does not exceed 67°F.

PRODUCT NOMENCLATURE
YORK OUTDOOR SPLIT CONDENSING UNITS

H B 360 C 00 A 7 A AA 1 A

Model #	Model Number Description	Options
H	Product Category	H = Air Conditioner Split System
A	Product Identifier	A = R-22 Standard Efficiency 2-Pipe B = R-22 Standard Efficiency 4-Pipe
300	Nominal Cooling Capacity MBH	300 = 25 Ton 360 = 30 Ton 480 = 40 Ton 600 = 50 Ton
C	Heat Type	C = Cooling Only
00	Nominal Heating Capacity	00 = No Heat Installed
A	Airflow Options	A = Standard Motor
7	Voltage	7 = 380/415-3-50
A	Installation Options	A = None B = Disconnect
AA	Additional Options	AA = None AC = Technicoated Coil
1	Product Generation	1 = 1st Generation 2 = 2nd Generation
A	Product Style	A = Style A B = Style B

TABLE 3: PHYSICAL DATA

Model HA / HB	Compressor ¹		Condenser											Unit Weight (Lbs.)		Charge, R-22	
			Fan (Propeller)				Fan Motor		Coil (Copper Tube-Aluminum Fin)								
	Nominal Capacity (tons)	Capacity Stages	Qty.	Dia.	Pitch Deg.	Nom. CFM	HP	RPM	Face Area (Ft. ²)	Rows Deep	Coil Width (In.)	Tube OD (In.)	Fins per inch	Shipping	Operation	Operation (Lbs.-Oz.)	Holding (Lbs.)
300	25	2	4	24	34	25200	1	1425	50	2	60	3/8	16	1598	1648	50.3	1.0
360	15	2	2	24	36	12600	1		25		60			1710	1770	31.5	1.0
System 1									25		60			31.5			
System 2	15	2	2	24	36	12600	1		25		60			31.5			
480	20	2	2	30	20	16550	1 1/2		32.5		78			1941	2017	38.1	1.0
System 1									32.5		78			38.1			
System 2	20	2	2	30	20	16550	1 1/2		32.5		78						
600	25	2	2	30	26	19725	1 1/2		52		78			2450	2543	47.3	1.0
System 1									52		78			47.3			
System 2	25	2	2	30	26	19725	1 1/2		52		78					47.3	

¹ All compressors are Copeland Scrolls.

² One of the fan motors is controlled by a pressure switch and will not operate until system pressure reaches 320 psig and drops below 180 psig.

TABLE 4: ELECTRICAL DATA

Unit Model Designation	Compressor				Fan Motor				Unit Ampacity (Amps)	Max. Fuse Size (Amps)	Min. Disconnect Size (Amps)
	Power Supply	Qty. (*)	RLA (each)	LRA (each)	Power Supply	HP	Qty.	FLA (each)			
HA300C00A7AAA1	380/415-3-50	2	25.0	158.0	380/415-3-50	1	2	1.7	63.0	70.0	70.0
							2	1.7			
HB360C00A7AAA1	380/415-3-50	2	16.4	95.0	380/415-3-50	1	2	1.7	76.5	90.0	90.0
							2	1.7			
HB480C00A7AAA1	380/415-3-50	2	19.2	125.0	380/415-3-50	1.5	2	2.6	92.0	110.0	110.0
							2	2.6			
HB600C00A7AAA1	380/415-3-50	2	25.0	158.0	380/415-3-50	1.5	2	2.6	111.5	125.0	125.0
							2	2.6			

* Denotes (2) Dual/Tandem Copeland Scrolls.

TABLE 5: UNIT COOLING CAPACITIES AND POWER REQUIREMENTS - CONDENSING UNIT ONLY

Model	Suction Press. & Corresponding Temp. @ Saturation		Temperature of Air on Condenser Coil, °F											
			65		75		85		95		105		115	
	PSIG	°F	MBH	KW*	MBH	KW*	MBH	KW*	MBH	KW*	MBH	KW*	MBH	KW*
HA300	61.5	35	258	22.0	247	23.6	236	25.5	225	27.6	213	30.1	202	33.0
	68.5	40	282	22.4	270	24.0	258	25.8	245	28.0	232	30.5	220	33.4
	76.0	45	308	22.8	294	24.3	280	26.2	266	28.3	253	30.9	239	33.7
	84.0	50	322	23.2	319	24.7	304	26.5	289	28.7	274	31.2	259	34.1
HB360	61.5	35	316	26.3	301	28.2	385	30.5	269	33.2	253	36.0	237	39.4
	68.5	40	343	26.8	327	28.8	310	31.2	294	33.8	277	36.6	260	39.9
	76.0	45	371	27.4	354	29.5	337	31.8	319	34.5	302	37.2	284	40.6
	84.0	50	400	28.1	382	30.1	364	32.5	346	35.2	328	37.8	309	41.2
HB480	61.5	35	423	33.6	404	36.2	384	39.2	364	42.6	344	46.5	324	50.9
	68.5	40	458	34.4	438	37.0	417	40.0	396	43.4	375	47.3	354	51.7
	76.0	45	494	35.3	473	37.9	451	40.8	429	44.3	406	48.1	384	52.5
	84.0	50	531	36.2	509	38.8	486	41.8	462	45.2	439	49.0	415	53.4
HB600	61.5	35	514	39.6	492	42.9	470	46.7	447	51.0	425	56.1	402	61.8
	68.5	40	561	40.4	537	43.6	512	47.4	487	51.8	462	56.9	437	62.6
	76.0	45	610	41.3	584	44.5	556	48.2	529	52.6	502	57.7	474	63.5
	84.0	50	661	42.2	632	45.3	603	49.0	573	53.4	544	58.5	514	64.4

*These power requirements include the following condenser fan motor KW.

Model	HA300	HB360	HB480	HB600
KW	3.4	4.3	4.3	3.8

LINE SIZING

When sizing refrigerant pipe for a split-system air conditioner, check the following:

1. Suction line pressure drop due to friction.
2. Liquid line pressure drop due to friction.
3. Suction line velocity for oil return.
4. Liquid line pressure drop due to vertical rise.

Tables 6 and 7 list friction losses for both the suction and liquid lines on the condensing section. For certain piping arrangements, different sizes of suction line pipe may have to be used. The velocity of the refrigerant vapor must always be great enough to carry the oil back to the compressor.

Evaporator Below Condensing Section - On a split system where the evaporator blower is located below the condensing section, the suction line must be sized for both pressure drop and for oil return. Oil traps may be required on this type of application. See Table 6.

Condensing Section Below Evaporator - When the condensing section is located below the evaporator blower, the liquid line must be designed for the pressure drop due to both friction loss and vertical rise. See Table 7. If the pressure drop due to vertical rise and friction exceeds 40 psi, some refrigerant will flash before it reaches the thermal expansion valve.

Flash Gas:

1. Increases the liquid line pressure loss due to friction which in turn causes further flashing.
2. Reduces the capacity of the refrigerant control device which starves the evaporator.
3. Erodes the seat of the refrigerant control device.
4. Causes erratic control of the refrigerant entering the evaporator. (See Installation Instructions for more detail.)

TABLE 6: SUCTION LINES

Model Designation		Nominal Capacity (Tons)	Refrigerant Flow Rate (Lbs./Min.)	Copper Tubing (Inches, O.D.)	Refrigerant Gas Velocity (Ft./Min.)	Friction Loss (PSI/100 Ft.)		
HA300	System #1	Full Capacity	25	80	2 1/8	2449	5.0	
					2 5/8	1587	1.6	
					3 1/8	1111	0.7	
	System #1	Half Capacity	12.5	40	2 1/8	1225	1.3	
					2 5/8	793	0.5	
					3 1/8	556	0.2	
HB360	System #1	Full Capacity	15	47	1 3/8	3529	14.3	
					1 5/8	2498	6.3	
					2 1/8	1439	1.7	
		System #1	Half Capacity	7.5	23.5	1 3/8	1765	4.3
						1 5/8	1249	1.9
						2 1/8	720	0.5
	System #2	Full Capacity	15	47	1 3/8	3529	14.3	
					1 5/8	2498	6.3	
					2 1/8	1439	1.7	
		System #2	Half Capacity	7.5	23.5	1 3/8	1765	4.3
						1 5/8	1249	1.9
						2 1/8	720	0.5
HB480	System #1	Full Capacity	20	64	1 5/8	3402	11.1	
					2 1/8	1960	2.9	
					2 5/8	1269	1.0	
		System #1	Half Capacity	10	32	1 5/8	1701	3.2
						2 1/8	980	0.8
						2 5/8	635	0.3
	System #2	Full Capacity	20	64	1 5/8	3402	11.1	
					2 1/8	1960	2.9	
					2 5/8	1269	1.0	
		System #2	Half Capacity	10	32	1 5/8	1701	3.2
						2 1/8	980	0.8
						2 5/8	635	0.3
HB600	System #1	Full Capacity	25	76	1 5/8	4039	14.9	
					2 1/8	2327	3.9	
					2 5/8	1507	1.4	
		System #1	Half Capacity	12.5	38	1 5/8	2020	4.3
						2 1/8	1163	1.1
						2 5/8	754	0.4
	System #2	Full Capacity	25	76	1 5/8	4039	14.9	
					2 1/8	2327	3.9	
					2 5/8	1507	1.4	
		System #2	Half Capacity	12.5	38	1 5/8	2020	4.3
						2 1/8	1163	1.1
						2 5/8	754	0.4

TABLE 7: LIQUID LINES

Model Designation			Nominal Capacity (Tons)	Refrigerant Flow Rate (Lbs./Min.)	Copper Tubing (Inches, O.D.)	Refrigerant Liquid Velocity (Ft./Min.)	Friction Loss (PSI/100 Ft.)	
HA300	System #1	Full Capacity	25	80	5/8	435	32.5	
					7/8	300	5.6	
					1 1/8	176	1.6	
	System #1	Half Capacity	12.5	40	5/8	218	9.1	
					7/8	150	1.6	
					1 1/8	88	0.5	
HB360	System #1	Full Capacity	15	47	5/8	256	12.5	
					7/8	176	2.2	
					1 1/8	104	0.6	
		System #1	Half Capacity	7.5	23.5	5/8	128	3.5
						7/8	88	0.6
						1 1/8	52	0.2
	System #2	Full Capacity	15	47	5/8	256	12.5	
					7/8	176	2.2	
					1 1/8	104	0.6	
		System #2	Half Capacity	7.5	23.5	5/8	128	3.5
						7/8	88	0.6
						1 1/8	52	0.2
HB480	System #1	Full Capacity	20	64	5/8	348	22.1	
					7/8	240	3.9	
					1 1/8	141	1.1	
		System #1	Half Capacity	10	32	5/8	174	6.2
						7/8	120	1.0
						1 1/8	70	0.3
	System #2	Full Capacity	20	64	5/8	348	22.1	
					7/8	240	3.9	
					1 1/8	141	1.1	
		System #2	Half Capacity	10	32	5/8	174	6.2
						7/8	120	1.0
						1 1/8	70	0.3
HB600	System #1	Full Capacity	25	76	5/8	413	29.3	
					7/8	285	5.0	
					1 1/8	167	1.4	
		System #1	Half Capacity	12.5	38	5/8	207	8.3
						7/8	143	1.4
						1 1/8	84	0.4
	System #2	Full Capacity	25	76	5/8	413	29.3	
					7/8	285	5.0	
					1 1/8	167	1.4	
		System #2	Half Capacity	12.5	38	5/8	207	8.3
						7/8	143	1.4
						1 1/8	84	0.4

TABLE 8: R-22 LINE CHARGE¹

LINE SET, O.D. ²	O.D., (INCHES)	REFRIGERANT, LB/FT
LIQUID	7/8	0.236
SUCTION	1 5/8	0.019
	2 1/8	0.033

¹ Charges based on 40 °F suction temperature and 105°F liquid temperature.

² Type "L" copper tubing.

NOTE: Add the operating charge of the condensing unit, the evaporator coil and the refrigerant lines to determine the total refrigerant charge of the system.

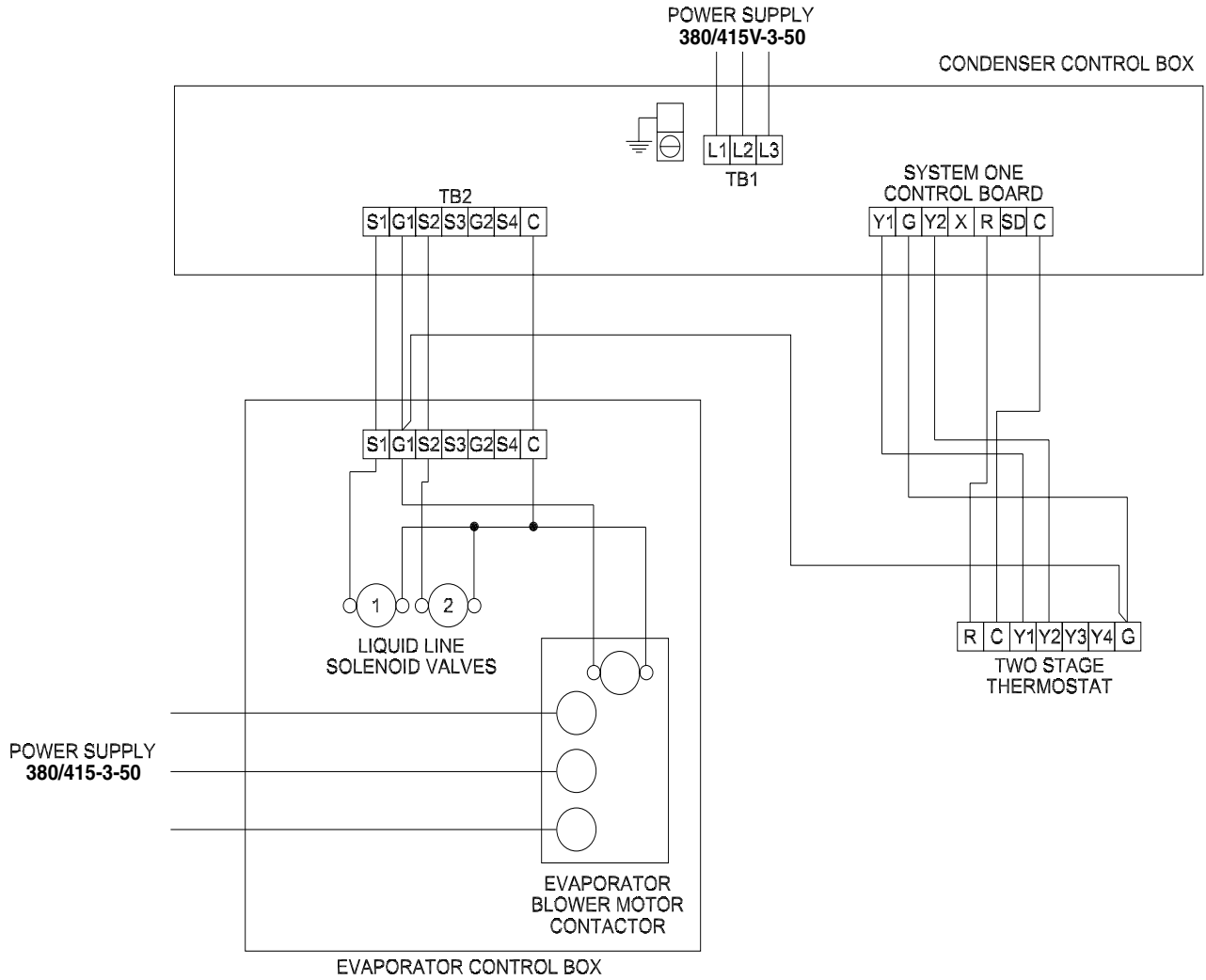


FIGURE 1: TYPICAL FIELD WIRING FOR HA300 & LA300

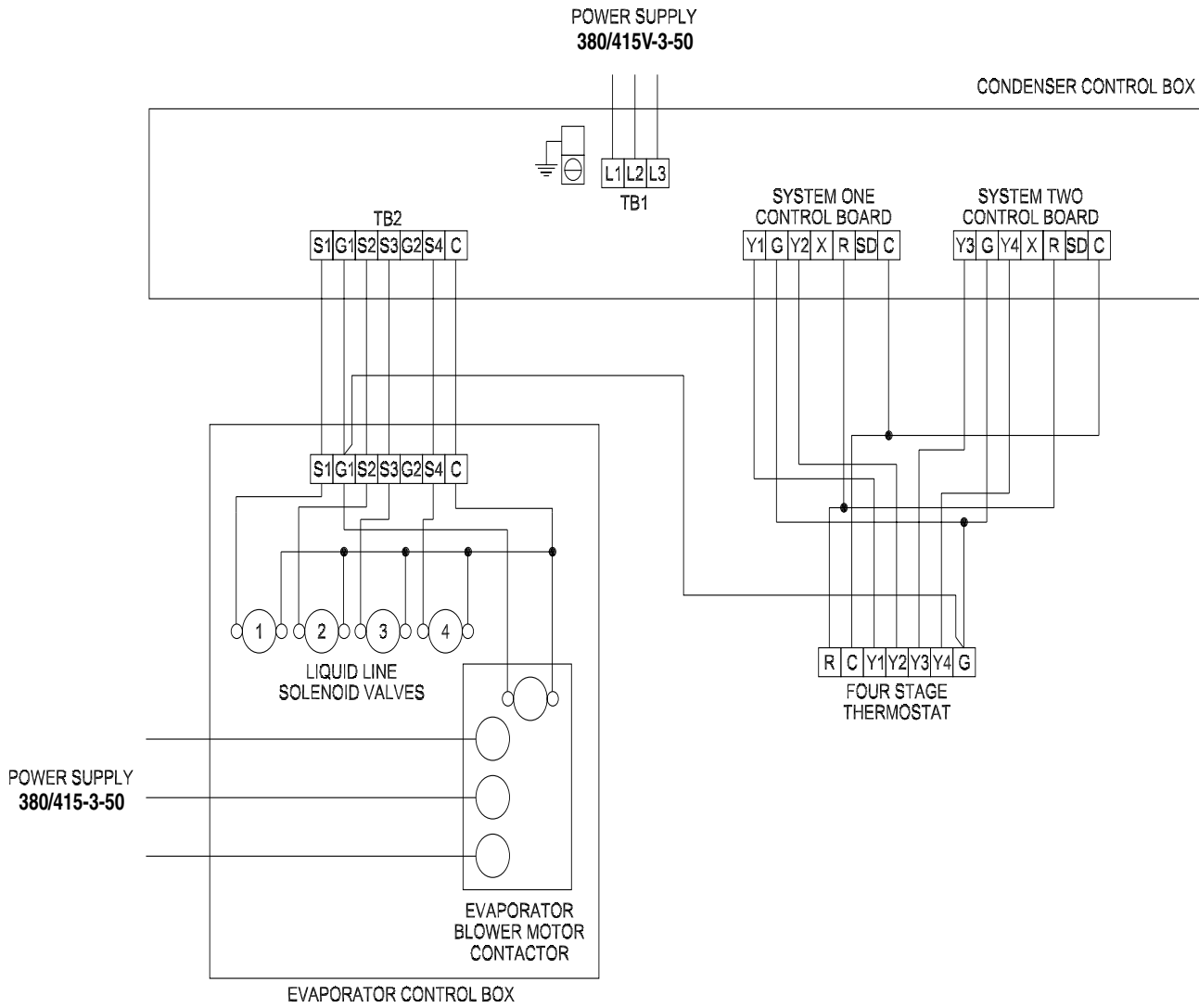


FIGURE 2: TYPICAL FIELD WIRING FOR HB360, 480, 600 & LB360, 480, 600

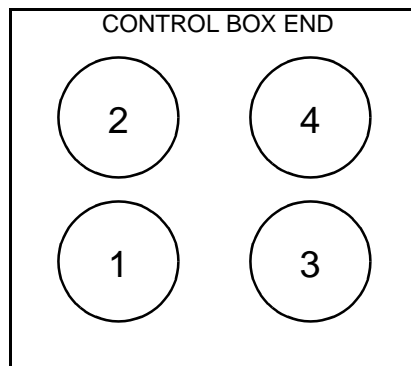


FIGURE 3: FAN ORIENTATION CONTROL BOX END

TABLE 14: CORNER WEIGHTS & CENTER OF GRAVITY

Unit Model	Unit Weight (Lbs.)		Unit Dimensions		A	B	C	D	Dim X	Dim Y	Weight AD	Weight BC
	Shipping	Operation	Length	Width								
HA300	1598	1648	110.46	88.46	406	339	388	465	60.3	47.2	871.6	726.4
HB360	1710	1770	110.46	88.46	518	366	342	484	64.7	42.8	1001.8	708.2
HB480	1941	2017	128.46	88.46	580	401	392	568	76.0	43.8	1147.7	793.3
HB600	2450	2543	128.46	88.46	737	481	487	746	77.8	44.5	1482.9	967.1

UNITS CORNER WEIGHTS AND CENTER OF GRAVITY DIMENSIONS

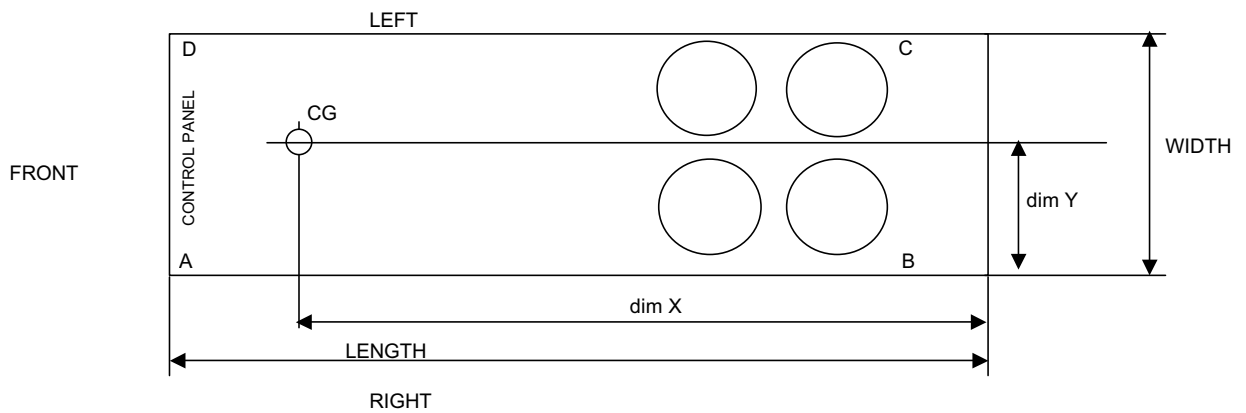


FIGURE 4: UNITS CORNER WEIGHTS AND CENTER OF GRAVITY DIMENSIONS

UNIT DIMENSIONS

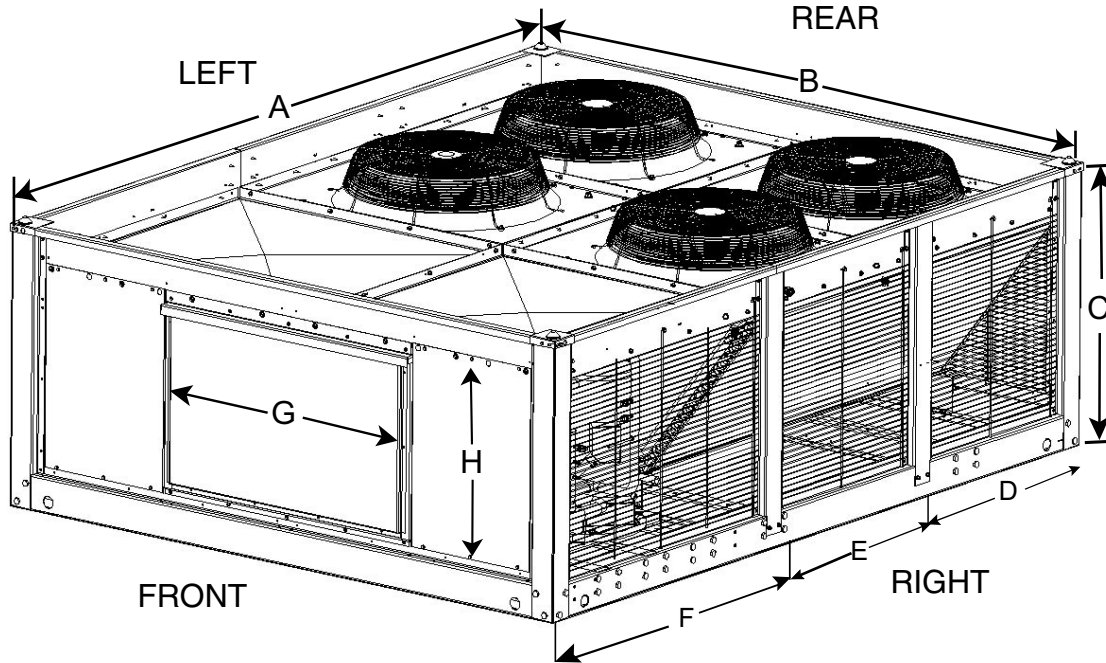


FIGURE 5: HA/HB UNIT DIMENSIONS

TABLE 15: UNIT DIMENSIONS

MODEL	A	B	C	D	E	F	G	H
HA300	110.5	88.5	37.5	32.8	31.0	46.1	37.1	23.6
HB360	110.5	88.5	37.5	32.8	31.0	46.1	37.1	23.6
HB480	128.5	88.5	37.5	41.8	40.0	46.1	37.1	23.6
HB600	128.5	88.5	57.7	41.8	40.0	46.1	37.1	23.6

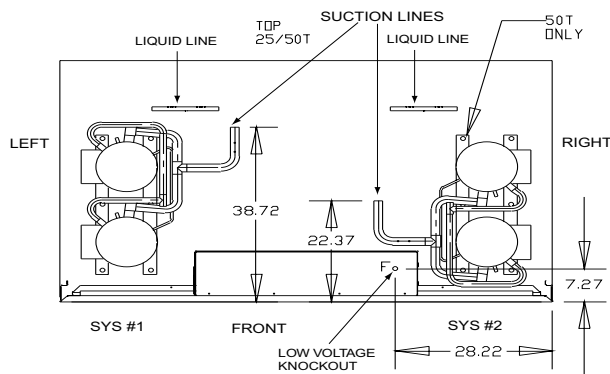
PIPING AND ELECTRICAL CONNECTIONS.

Piping connections can be made from either the left or the right of the unit. The high voltage connections are made from the left hand side of the unit. Low voltage is made from the top of the electrical box from either the left or right side. See the drawings on the following pages for details.

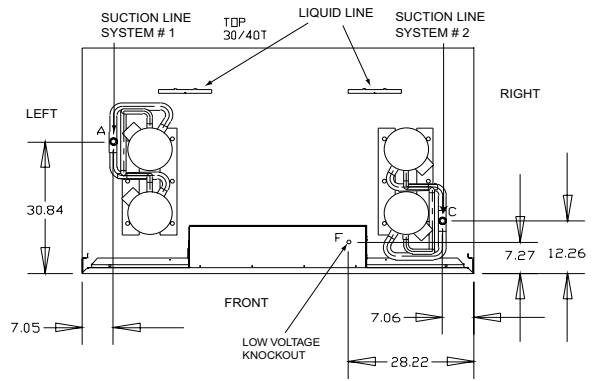
TABLE 16: UNIT CLEARANCES

Location	Dimensions
Overhead (Top) ¹	120"
Front access panels	36"
Left Side	30"
Right Side	30"
Rear	24"
Bottom ²	0"

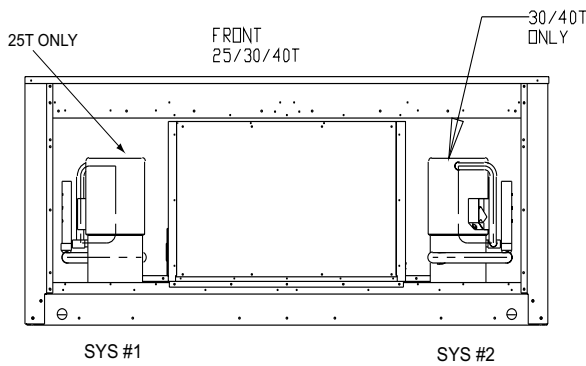
- ¹ Units must be installed outdoors. Overhanging structures or shrubs should not obstruct condenser air discharge.
- ² Adequate snow clearance must be provided if winter operation is expected.



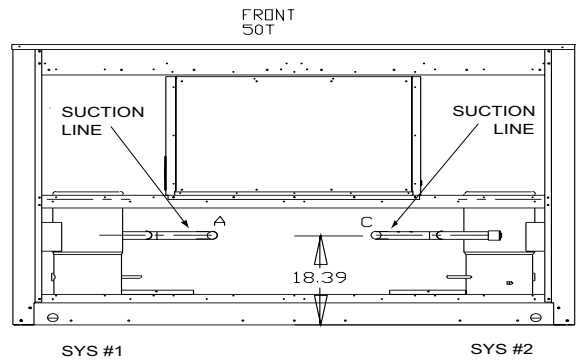
25 & 50 Ton Top View
 (*25 ton equipped with single tandems only)



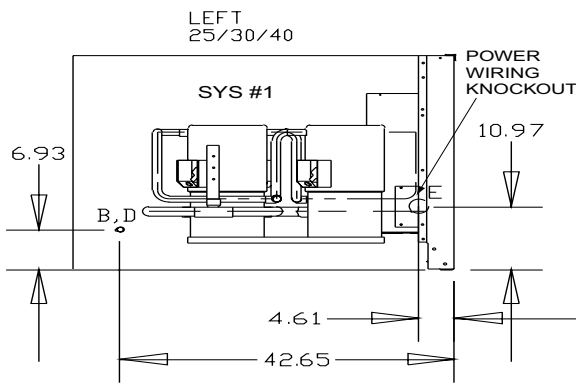
30 & 40 Ton Top View



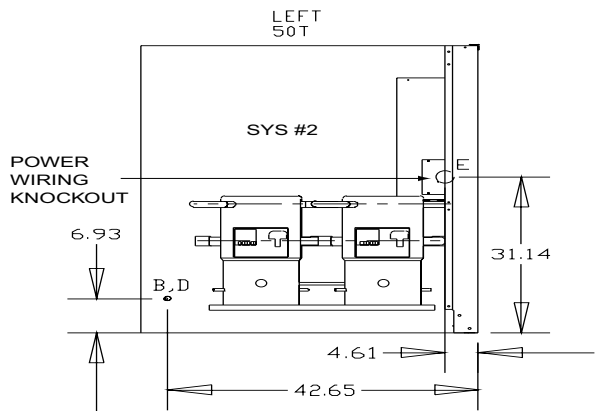
25, 30 & 40 Ton Front View



50 Ton Front View



25, 30 & 40 Ton Left View



50 Ton Left View

FIGURE 6: PIPING AND ELECTRICAL CONNECTION DIAGRAMS

PIPING AND ELECTRICAL CONNECTION SIZES

TABLE 17: PIPING AND ELECTRICAL CONNECTION SIZES (25T)

CONNECTION ENTRY		SIZE
A	SUCTION LINE SYS #1	1-5/8 OD
B	LIQUID LINE SYS #1	7/8 OD
E	POWER WIRING KNOCKOUT	SEE TABLE 19
F	CONTROL WIRING	7/8 HOLE

TABLE 18: PIPING AND ELECTRICAL CONNECTION SIZES (30/40/50T)

CONNECTION ENTRY		SIZE
A	SUCTION LINE SYS #1	1-5/8 OD
B	LIQUID LINE SYS #1	7/8 OD
C	SUCTION LINE SYS #2	1-5/8 OD
D	LIQUID LINE SYS #2	7/8 OD
E	POWER WIRING KNOCKOUT	SEE TABLE 19
F	CONTROL WIRING	7/8 HOLE

TABLE 19: ELECTRICAL POWER KNOCKOUT SIZES

CONNECTION ENTRY		25 Ton	30-40-50 Ton
E	POWER WIRING	1-1/2'	1-1/2'

GUIDE SPECIFICATIONS MODELS HA300, HB360, HB480 and HB600 CONDENSING UNITS

THE INSTALLER SHALL:

- Furnish YORK air-cooled condensing units or equivalent in accordance with the performance schedule shown on the plans, and
- Install each unit as shown on the plans in accordance with:
 - The manufacturers recommendations and
 - All applicable national and local codes

EACH UNIT SHALL BE:

- ETL and CETL approved.
- Completely assembled for one-piece shipping and rigging.
- Leak pressure and functionally tested at the factory to assure a trouble-free start-up after installation.
- Covered by a 1-year limited parts warranty on the complete unit.
- In current production with published literature available to check performance, limitations, specifications, power requirements, dimensions, operation and appearance.

EACH UNIT SHALL HAVE:

- A steel angle frame to provide the rigid support required for shipping, rigging and years of dependable operation.
- Zinc-coated steel that has been finished by a powder paint process to provide a long lasting, quality appearance.
- Removable panels for easy access to all internal components during maintenance and service.

THE DIMENSIONS OF EACH UNIT shall not exceed those specified on the plans.

EACH COMPRESSOR shall be mounted on isolators to minimize the transmission of vibration.

ALL CONDENSER COILS SHALL:

- Be draw thru
- Be constructed of copper tubes arranged in staggered rows and mechanically expanded into aluminum fins.

THE CONDENSER FAN MOTOR(S) SHALL:

- Be directly connected to the condenser fans.
- Have permanently lubricated ball bearings.
- Have inherent overload protection.
- Motors shall be three phase.
- The propeller-type condenser fans shall be arranged for vertical discharge of the condenser air.

THE WIRING FOR EACH UNIT SHALL INCLUDE:

- A crankcase heater (one per compressor)
- All 24-volt temperature control circuit.
- Both high and low pressure cutouts.
- Solid-state or internal line break compressor motor protection.
- Condenser fan motor control to assure stable operation at ambient temperatures down to 40°F.

THE REFRIGERANT PIPING of each system shall include:

- A filter-drier shipped separately for field installation.
- A liquid line, moisture-indicating, sight glass shipped separately for field installation.

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