Cooline

AIR CONDITIONERS

from Zamil

Condensing Units

CBL Series

CBL030 thru CBL360

2.5 TR thru 30 TR

9 kW thru 105 kW

R-134a

Higher quality of indoor living

Our product line ...


Room ACs & Mini-Splits Units


Free Standing & Cassette Units


Ducted Split Units


Condensing & Packaged Units


Chillers & Double Skin AHU's


Mobile AC


Controls

Company Business
Zamil Air Conditioners was founded in 1974 as one of the first air conditioning business to be established in Saudi Arabia and today is a leading international manufacturer of air conditioning systems and is No. 1 in the Middle East.

Zamil Air conditioners manufactures both consumer and central air conditioners and has sales operations in over 55 countries in the Middle East, Europe, Africa and Asia.

The company's operations are structured into four Strategic Business Units (SBUs) supporting five in-house product and service brands as well as a number of international brands under the OEM sales.

The five in-house brands are Classic, Cooline, CoolCare, Clima Tech and Geoclima.

The four SBUs are:
1. Consumer Business Unit supporting Classic, Cooline, GE and OEM brands for consumers.
2. Unitary & Applied Business Unit supporting Classic, Cooline, GE and OEM brands for commercial and industrial customers.
3. Zamil CoolCare providing engineering & project management services, HVAC maintenance, retrofit services and parts.
4. Geoclima srl is an independent business supporting other SBUs for their requirement of Chillers & Double skin AHU's.

The first three SBUs - Consumer Products, Unitary & Applied Products and CoolCare Service direct their business operations from the corporate headquarters at Dammam, Saudi Arabia.

Geoclima has its engineering & production departments located at Monfalcone, Italy and has a design center in Austria.

All the four SBUs, while operating independently, supplement each other's activities in a way that makes synergy work at its best and achieve the corporate goals of maximizing customer satisfaction.

Factories and Productions
Zamil Air Conditioners has two manufacturing plants in Dammam, Saudi Arabia and has one speciality production facility in Italy operated by Geoclima.

The company can produce up to 550,000 Room Air Conditioners, 300,000 Mini-Split systems and 50,000 Central Air Conditioning systems per year.

Quality & Product Certificates
The Quality systems and policies at Zamil Air Conditioners comply with the required ISO 9001:2000 certification.

Zamil Air Conditioners is the first company in Saudi Arabia to receive the SASO (Saudi Arabia's Standard Organization) Certificate for Room Air Conditioners. ZAC's products are also certified with:
1. CE (Council of European Community)
2. UL (Underwriters Laboratory)
3. Eurovent
4. DEMKO
5. ETL

Other awards include the prestigious Engineering Excellence Award of General Electric and the inaugural Prince Mohammed bin Fahd Al Saud Award for Factory Safety.

Our Products
In addition to the consumer products such as the Room Air Conditioners (RAC) and the Mini Splits, Zamil Air Conditioners manufacturers a host of residential, commercial and industrial air conditioners. This broad range extends from the Concealed Units up to 5 tons, the Ducted Splits up to 30 tons, the Packaged Units up to 90 tons, the Single and Double Skin Air Handling Units up to 70,630 CFM and the Water Chillers up to 660 tons cooling capacity.

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CONTINUING RESEARCH RESULTS IN STEADY IMPROVEMENTS.
THEREFORE, THESE SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

MODEL DECODING

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CBL CONDENSING UNIT **(R-134a)**	**030** **036** **042** **048** **060**	**L** : 380/415-3-50 (4 WIRE)	**S** : SINGLE	**C** : COOL ONLY	**N** : STANDARD **L** : LOW AMBIENT	**A** : ALUMINUM FIN **B** : COATED ALUMINUM FIN **C** : COPPER FIN **M** : ALUMINUM FIN WITH TG. **N** : COPPER FIN WITH TG.	**N** : STD. UNIT **F** : STD. UNIT WITH FILTER DRYER & SIGHT GLASS **P** : PDS **S** : STD. UNIT WITH PDS, FILTER DRYER & SIGHT GLASS	**N** : NO OPTION **U** : UVM **V** : VOLT FREE CONTACTS **C** : U & V	**N** : STD. UNIT (MATCHING WITH BQ SERIES) **K** : MATCHING WITH DOUBLE SKIN AHU
	075 **090** **100**		**S** : SINGLE **D** : DUAL						
	120 **150** **180** **220** **240** **300** **360**		**D** : DUAL						

UNIT FEATURES & OPTIONS

A. GENERAL

The COOLINE Condensing units are environment friendly units that use refrigerant R-134a and incorporate the latest innovative technology to provide quiet, reliable performance. The wrap-around coil not only adds to the aesthetical appeal, it also gives optimum heat transfer efficiency. The access panels provide access to the compressor, fan motor and to the electrical control box.

These condensing units can be combined with a wide variety of evaporator coils and blower packages to provide quiet and dependable comfort. These units can be installed on a roof or at ground level.

B. UNIT ENCLOSURE

All panels are of heavy gauge (G-90) galvanized steel sheet and completely weatherized for outdoor installation. Steel sheet panels are zinc coated and galvanized by the hot dip process of lock-forming quality conforming to ASTM A 653 commercial weight G-90, followed by baked on electrostatic polyester dry powder coat.

C. COMPRESSOR

Hermetic scroll compressors are used as standard as shown in the physical data. They are provided with all the standard controls necessary for proper and safe operation. These compressors have a self-regulating crankcase heater, improved internal pressure relief valve which provides high pressure protection to the refrigerant system and vibration isolators for quiet and efficient operation.

D. AIR COOLED CONDENSER

1. The large wrap-around condenser coil is of corrugated fin & tube type, constructed of enhanced copper tubes and mechanically bonded to aluminum fins. As an option to aluminum fins, coated aluminum fins or corrugated copper fins may be provided. Tube support sheets are of galvanized steel, formed to provide structural strength. Tubes are circuited to ensure minimum pressure drop and maximum heat transfer. Each coil is completely dehydrated, charged and sealed at the factory upon completion of pressure tests.

2. The fans are propeller type and direct-driven, upward discharge provided with fan grille.

3. Units are equipped with totally enclosed fan motors for greater reliability and dependable performance for many years. Inherent thermal protection is automatic reset type.

E. SERVICE VALVES

Both suction and liquid service valves are back seating type. Valves are externally located so refrigerant tube connections can be made quickly and easily. Each valve has a gauge pressure port for ease of checking refrigerant operating pressures.

F. CONTROL PANEL

The control panel design is equivalent to NEMA construction for easy access ensuring dust and weather proof construction. Internal power and control wiring is neatly routed, properly anchored and all wires identified with cable markers as per NEC standard applicable to HVAC units. The electrical controls used in the control panel are UL approved, which are reliable in operation at high ambient conditions for a long period.

The electrical circuit has been carefully designed with all necessary protection and circuit elements for safe operation of the unit.

G. LOW PRESSURE SWITCH

Auto reset SPST switch activated by refrigerant pressure - locks out the compressor, if the refrigerant pressure falls below 10 PSIG. Also provides additional protection against evaporator freeze up due to loss of indoor airflow.

H. HIGH PRESSURE SWITCH

Auto reset SPST switch activated by refrigerant pressure - locks out the compressor, if the refrigerant pressure rises above 350 PSIG. Also provides additional protection against compressor damage due to loss of outdoor airflow.

I. LOW AMBIENT (OPTIONAL)

Low ambient operation down to 45^0F using fan cycling switch.

J. PUMP DOWN SOLENOID VALVE (AVAILABLE AS OPTION for CBL075 & above)

Pump down solenoid valve keeps the evaporator coil dry of liquid refrigerant.

PHYSICAL DATA

SINGLE COMPRESSOR UNITS

MODEL NUMBER		CBL030	CBL036	CBL042	CBL048	CBL060	CBL075	CBL090	CBL100
NUMBER OF REFRIGERATION CIRCUIT		Single	Single	Single	Single	Single	Single	Single	Single
NOMINAL CAPACITY (TONS)*		2.5	3	3.5	4	5	6	7	8
COMPRESSOR	Type	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
	Quantity	1	1	1	1	1	1	1	1
	Oil (oz)	42	66	60	60	85	110	110	110
	Refrigerant	R–134a							
	Charge per system (oz)+	99	101	111	161	165	205	301	312
CONDENSER FAN	Type	Propeller							
	Qty. – Diameter (inch)	1 – 18	1 – 18	1 – 24	1 – 24	1 – 24	2 – 24	2 – 24	2 – 24
	Nominal CFM	2300	2300	3650	3650	3650	6500	6500	7150
	Motor HP – RPM	1/4–1100	1/4–1100	1/3–1100	1/3–1100	1/3–1100	1/3–1100	1/3–1100	1/3–1100
CONDENSER COIL	Type	Corrugated fin & tube							
	Tube Dia.- Rows - Fins Per Inch	3/8-2-16	3/8-2-16	3/8-1-16	3/8-2-16	3/8-2-16	3/8-2-16	3/8-2-16	3/8-2-16
	Total face area, Sq. ft.	10	10	16	16	16	21	21	24
HIGH PRESSURE SWITCH	Open (PSIG)	350 ± 10	350 ± 10	350 ± 10	350 ± 10	350 ± 10	350 ± 10	350 ± 10	350 ± 10
	Close (PSIG)	300 ± 10	300 ± 10	300 ± 10	300 ± 10	300 ± 10	300 ± 10	300 ± 10	300 ± 10
LOW PRESSURE SWITCH	Open (PSIG)	10 ± 5	10 ± 5	10 ± 5	10 ± 5	10 ± 5	10 ± 5	10 ± 5	10 ± 5
	Close (PSIG)	30 ± 5	30 ± 5	30 ± 5	30 ± 5	30 ± 5	30 ± 5	30 ± 5	30 ± 5
REFRIGERANT LINES**	Suction line size (OD) - inch	3/4	7/8	7/8	7/8	7/8	1-1/8	1-1/8	1-3/8
	Liquid line size (OD) - inch	3/8	3/8	3/8	1/2	1/2	5/8	5/8	5/8
SHIPPING WEIGHT	Kg.	76	82	108	108	136	225	240	240

* Refer to performance data for exact rating values.

** Pipe sizes are for runs up to 25 feet to indoor unit. For refrigerant lines longer than 25 feet, use next larger size.

+ Operating system charge is applicable when matched with BQ series air handling units & connected by 25 feet of refrigerant piping.

PHYSICAL DATA

DUAL COMPRESSOR UNITS

MODEL NUMBER		CBL075	CBL090	CBL100	CBL120	CBL150	CBL180	CBL220	CBL240	CBL300	CBL360
NUMBER OF REFRIGERATION CIRCUIT		Dual	Dual	Dual	Dual	Dual	Dual	Dual	Dual	Dual	Dual
NOMINAL CAPACITY (TONS)*		6	7	8	10	12	15	18	20	25	30
COMPRESSOR	Type	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
	Quantity	2	2	2	2	2	2	2	2	2	2
	Oil per system (oz)	66x2	85x2	85x2	11 0x2	110x2	11 0x2	110x2	148 & 110	148x2	230x2
	Refrigerant	R–134a									
	Charge per system (oz)+	112x2	151x2	150x2	155x2	160x2	230x2	251x2	360x2	450x2	540x2
CONDENSER FAN	Type	Propeller									
	Qty. – Diameter (inch)	2 – 24	2 – 24	2 – 24	2 – 24	2 – 26	2 – 26	2 – 26	2 – 30	2 – 30	3 – 30
	Nominal CFM	6500	6500	7150	7150	10000	12000	12000	13200	13000	19800
	Motor HP – RPM	1/3–1100	1/3–1100	1/3–1100	1/3 – 1100	1/3 – 850	3/4 – 950	3/4 – 950	1.5 – 950	1.5 – 950	1.5 – 950
CONDENSER COIL	Type	Corrugated fin & tube									
	Tube Dia.– Rows – Fins per inch	3/8-2-16	3/8-2-16	3/8-2-16	3/8–2–16	3/8–2–16	3/8–2–16	3/8–2–16	3/8–4–14	3/8–5–14	3/8–4–14
	Total face area, Sq. ft.	21	21	24	24	38	38	38	28	28	47
HIGH PRESSURE SWITCH	Open (PSIG)	350 ± 10	350 ± 10	350 ± 1	350 ± 10	350 ± 10	350 ± 10	350 ± 10	350 ± 10	350 ± 10	350 ± 10
	Close (PSIG)	300 ± 10	300 ± 10	300 ± 10	300 ± 10	300 ± 10	300 ± 10	300 ± 10	300 ± 10	300 ± 10	300 ± 10
LOW PRESSURE SWITCH	Open (PSIG)	10 ± 5	10 ± 5	10 ± 5	10 ± 5	10 ± 5	10 ± 5	10 ± 5	10 ± 5	10 ± 5	10 ± 5
	Close (PSIG)	30 ± 5	30 ± 5	30 ± 5	30 ± 5	30 ± 5	30 ± 5	30 ± 5	30 ± 5	30 ± 5	30 ± 5
REFRIGERANT LINES**	Suction line size (OD), inch	7/8 (2)	7/8 (2)	7/8 (2)	7/8 (2)	7/8 (2)	1-3/8 (2)	1-3/8 (2)	1-3/8 (2)	1-3/8 (2)	1-5/8 (2)
	Liquid line size (OD), inch	1/2 (2)	1/2 (2)	1/2 (2)	1/2 (2)	1/2 (2)	5/8 (2)	5/8 (2)	5/8 (2)	5/8 (2)	7/8 (2)
SHIPPING WEIGHT	Kg.	253	242	272	284	457	546	604	830	990	1047

* Refer to performance data for exact rating values.

** Pipe sizes are for runs up to 25 feet to indoor unit. For refrigerant lines longer than 25 feet, use next larger size.

+ Operating system charge is applicable when matched with BQ series air handling units & connected by 25 feet of refrigerant piping.

SELECTION PROCEDURE

1. Enter performance tables at specified SST and desired ambient conditions.
2. HEAT REJECTION:
   Calculate condenser Total Heat Rejection Capacity as follows:
   HR = Unit cooling capacity + (3.41 x Total Unit Power Input, Watts).
3. HEAD PRESSURE:
   To determine head pressure (psig) use the following conversion table:

Condensing Temp. - ^{0}F.	100	110	120	130	140	150	160
(R-134a) Head Pressure - PSIG.	124.1	146.4	171.1	198.7	229.2	262.8	299.9

4. CORRECTION FACTORS FOR ALTITUDE:

ALTITUDE (FEET)		2000	4000	6000	8000	10000
FACTOR	Condensing Unit Cooling Capacity	.99	.98	.96	.95	.94
	Condensing Unit & Evaporator	.98	.96	.93	.90	.88

PERFORMANCE DATA

SINGLE COMPRESSOR UNITS

MODEL No.: CBL030

SST (^{0}F)		AMBIENT TEMPERATURE - ^{0}F					
		75	85	95	105	115	125
30	TC	30.00	27.13	24.76	22.20	19.70	17.23
	CT	98	107	117	125	133	142
	kW	2.35	2.44	2.52	2.61	2.70	2.84
35	TC	33.80	30.90	28.22	25.35	22.38	19.80
	CT	101	111	119	127	135	144
	kW	2.42	2.56	2.65	2.80	2.91	3.02
40	TC	37.52	34.35	31.50	28.50	25.20	22.28
	CT	105	113	121	130	138	147
	kW	2.55	2.72	2.88	3.00	3.21	3.36
45	TC	41.60	37.13	34.00	31.60	28.22	25.10
	CT	108	116	124	133	141	149
	kW	2.72	2.95	3.16	3.22	3.36	3.45
50	TC	45.44	41.80	38.71	35.10	31.20	28.10
	CT	111	119	126	135	144	150
	kW	2.92	3.05	3.20	3.39	3.64	3.78
55	TC	48.61	45.54	42.00	38.12	34.60	30.90
	CT	113	122	128	137	146	152
	kW	3.06	3.26	3.42	3.62	3.81	4.00

MODEL No.: CBL036

SST (^{0}F)		AMBIENT TEMPERATURE - ^{0}F					
		75	85	95	105	115	125
30	TC	35.64	32.70	29.70	26.70	24.10	21.40
	CT	104	112	121	129	137	146
	kW	3.30	3.45	3.61	3.75	3.85	4.10
35	TC	39.60	36.63	33.70	30.70	27.40	24.40
	CT	109	116	124	132	141	149
	kW	3.53	3.66	3.80	3.95	4.18	4.35
40	TC	43.90	40.60	37.62	33.90	30.70	27.70
	CT	112	120	127	136	144	151
	kW	3.69	3.88	4.10	4.25	4.44	4.65
45	TC	48.51	44.80	41.60	37.60	34.20	30.70
	CT	115	123	130	139	147	154
	kW	3.92	4.14	4.38	4.56	4.78	4.98
50	TC	52.50	48.90	45.50	41.60	37.62	33.70
	CT	118	125	132	141	148	157
	kW	4.22	4.40	4.62	4.95	5.10	5.25
55	TC	57.00	52.90	49.30	45.10	40.80	36.80
	CT	120	127	134	144	151	158
	kW	4.45	4.50	4.90	5.15	5.30	5.55

MODEL No.: CBL042

SST (^{0}F)		AMBIENT TEMPERATURE - ^{0}F					
		75	85	95	105	115	125
30	TC	40.40	37.30	33.90	30.70	28.20	24.40
	CT	102	110	118	125	135	143
	kW	3.50	3.61	3.75	3.90	4.15	4.22
35	TC	45.40	42.10	38.20	34.70	31.10	27.90
	CT	104	112	120	128	138	145
	kW	3.65	3.85	3.98	4.14	4.28	4.46
40	TC	50.00	46.80	42.70	39.00	35.10	31.50
	CT	107	115	123	131	141	148
	kW	3.85	4.05	4.25	4.39	4.55	4.70
45	TC	55.20	51.40	46.90	43.20	39.20	35.40
	CT	110	118	126	134	143	150
	kW	4.15	4.31	4.48	4.71	4.92	5.10
50	TC	60.40	54.30	51.90	47.30	43.40	38.90
	CT	112	120	128	136	145	152
	kW	4.30	4.45	4.68	4.84	5.10	5.31
55	TC	65.50	61.20	56.30	51.80	47.10	42.70
	CT	114	122	131	139	147	154
	kW	4.45	4.77	4.92	5.10	5.36	5.55

MODEL No.: CBL048

SST (^{0}F)		AMBIENT TEMPERATURE - ^{0}F					
		75	85	95	105	115	125
30	TC	41.30	38.60	35.80	32.90	29.85	28.40
	CT	98	107	116	125	134	141
	kW	3.44	3.62	3.75	3.92	4.10	4.18
35	TC	46.10	43.00	40.20	36.90	33.70	30.80
	CT	101	110	118	127	136	144
	kW	3.55	3.72	3.95	4.12	4.35	4.46
40	TC	50.90	47.60	44.65	40.92	37.70	34.45
	CT	104	113	121	130	139	146
	kW	3.70	3.95	4.16	4.38	4.62	4.76
45	TC	55.70	52.20	48.65	45.10	41.40	38.20
	CT	107	115	124	132	141	149
	kW	3.90	4.14	4.36	4.65	4.88	5.20
50	TC	60.50	56.73	53.00	49.30	45.30	41.70
	CT	109	118	126	134	144	152
	kW	4.00	4.28	4.66	4.95	5.20	5.40
55	TC	65.10	60.90	57.00	53.30	49.10	45.10
	CT	111	120	128	137	146	153
	kW	4.18	4.50	4.80	5.12	5.45	5.70

LEGEND: **SST** - Saturated Suction Temperature; **TC** - Total Capacity (1000 Btuh) Gross; **CT** - Condensing Temperature (^{0}F); **kW** - Total unit power input

PERFORMANCE DATA

SINGLE COMPRESSOR UNITS

MODEL No.: CBL060

SST (^{0}F)		AMBIENT TEMPERATURE - ^{0}F					
		75	85	95	105	115	125
30	TC	52.10	48.40	45.50	42.40	39.30	36.20
	CT	102	111	119	130	139	146
	kW	5.05	5.40	5.76	5.90	6.15	6.40
35	TC	57.63	54.60	51.30	47.95	44.40	41.30
	CT	106	115	123	132	141	148
	kW	5.35	5.71	5.94	6.22	6.60	6.84
40	TC	63.75	60.20	56.60	53.30	49.50	46.20
	CT	108	118	127	135	144	151
	kW	5.62	6.05	6.35	6.68	7.08	7.40
45	TC	69.90	65.80	62.20	58.70	54.60	51.00
	CT	111	121	130	138	146	153
	kW	5.91	6.29	6.68	7.10	7.35	7.55
50	TC	75.74	71.90	67.83	63.80	59.70	55.60
	CT	114	124	132	140	147	155
	kW	6.25	6.68	7.10	7.40	7.80	8.05
55	TC	81.60	77.30	73.44	69.40	64.80	70.90
	CT	116	126	134	143	151	157
	kW	6.41	6.92	7.45	7.91	8.40	8.60

MODEL No.: CBL075

SST (^{0}F)		AMBIENT TEMPERATURE - ^{0}F					
		75	85	95	105	115	125
30	TC	61.00	57.00	54.00	50.00	46.00	42.00
	CT	93	101	111	121	129	139
	kW	5.55	5.86	6.29	6.67	6.96	7.30
35	TC	68.00	64.50	60.00	55.50	51.50	47.00
	CT	97	106	114	124	133	141
	kW	5.85	6.28	6.54	6.97	7.40	7.75
40	TC	75.00	70.00	66.00	62.00	57.00	52.50
	CT	99	109	117	127	136	143
	kW	6.15	6.56	6.94	7.42	7.91	8.06
45	TC	81.50	77.00	72.00	67.50	62.50	57.00
	CT	101	111	120	129	139	145
	kW	6.50	6.95	7.25	7.68	8.16	8.50
50	TC	88.50	84.00	79.00	74.00	68.00	62.00
	CT	104	113	122	131	141	147
	kW	6.71	7.22	7.65	8.10	8.58	8.96
55	TC	96.00	91.00	85.00	80.00	74.00	67.00
	CT	107	116	124	133	143	150
	kW	7.11	7.62	8.05	8.45	8.98	9.30

MODEL No.: CBL090

SST (^{0}F)		AMBIENT TEMPERATURE - ^{0}F					
		75	85	95	105	115	125
30	TC	79.40	73.37	65.33	58.79	51.26	45.23
	CT	98	106	116	123	129	141
	kW	6.45	6.66	6.90	6.97	7.08	7.38
35	TC	88.94	81.91	73.87	66.83	58.79	52.26
	CT	101	119	118	125	134	145
	kW	6.76	7.02	7.28	7.38	7.65	7.91
40	TC	97.99	90.45	81.91	74.37	66.33	59.30
	CT	104	112	122	127	138	146
	kW	7.18	7.38	7.70	7.91	8.22	8.43
45	TC	107.54	99.50	90.45	81.91	73.37	65.33
	CT	106	115	122	129	140	148
	kW	7.49	7.85	8.16	8.37	8.74	9.05
50	TC	117.08	108.04	98.99	89.95	80.90	72.36
	CT	109	118	125	133	142	149
	kW	7.91	8.32	8.53	8.89	9.26	9.57
55	TC	125.63	116.58	106.53	97.49	87.94	79.90
	CT	110	119	128	135	144	151
	kW	8.27	8.58	9.00	9.36	9.73	10.10

MODEL No.: CBL100

SST (^{0}F)		AMBIENT TEMPERATURE - ^{0}F					
		75	85	95	105	115	125
30	TC	83.42	77.60	70.81	64.02	57.72	50.44
	CT	102	109	118	128	135	143
	kW	7.07	7.22	7.37	7.58	7.73	7.93
35	TC	93.12	87.30	79.54	72.75	65.48	58.20
	CT	105	113	121	130	138	146
	kW	7.37	7.63	7.86	8.03	8.23	8.48
40	TC	102.82	96.03	88.76	81.00	72.75	65.96
	CT	107	115	125	132	141	149
	kW	7.78	7.98	8.28	8.59	8.84	9.09
45	TC	112.52	105.73	97.49	89.24	81.00	73.72
	CT	110	117	127	133	143	151
	kW	8.18	8.38	8.79	9.09	9.44	9.70
50	TC	123.19	114.95	106.70	98.46	88.76	81.48
	CT	113	118	128	135	145	153
	kW	8.64	8.89	9.29	9.65	10.05	10.40
55	TC	132.89	124.65	115.43	106.22	96.52	88.27
	CT	115	121	130	137	147	155
	kW	9.04	9.39	9.80	10.20	10.66	11.21

LEGEND:

SST - Saturated Suction Temperature

TC - Total Capacity (1000 Btuh) Gross

CT - Condensing Temperature (^{0}F)

kW - Total unit power input

PERFOPERFORMANCE DATA

DUAL COMPRESSOR UNITS

MODEL No.: CBL075

SST (^{0}F)		AMBIENT TEMPERATURE - ^{0}F					
		75	85	95	105	115	125
30	TC	66.30	62.40	56.90	52.00	46.50	41.60
	CT	93	103	111	119	137	138
	kW	5.55	5.70	5.80	5.98	6.08	6.22
35	TC	74.30	69.80	64.40	58.40	53.00	47.50
	CT	97	106	114	123	131	141
	kW	5.70	5.90	6.10	6.21	6.41	6.64
40	TC	82.20	76.70	71.30	65.30	59.50	53.50
	CT	99	118	118	126	135	142
	kW	5.80	6.00	6.30	6.60	6.85	7.05
45	TC	90.10	84.20	78.20	71.80	65.30	58.90
	CT	101	110	119	128	137	145
	kW	5.90	6.30	6.50	6.85	7.20	7.62
50	TC	98.00	92.10	85.15	78.20	71.30	64.40
	CT	101	112	121	129	139	148
	kW	6.10	6.40	6.80	7.21	7.61	8.10
55	TC	105.50	98.50	92.10	84.20	78.20	70.30
	CT	106	114	123	131	141	150
	kW	6.30	6.60	7.10	7.62	8.00	8.57

MODEL No.: CBL090

SST (^{0}F)		AMBIENT TEMPERATURE - ^{0}F					
		75	85	95	105	115	125
30	TC	76.50	71.00	64.20	59.80	53.80	47.50
	CT	97	106	115	123	131	141
	kW	6.40	6.67	6.80	7.10	7.25	7.42
35	TC	87.50	82.00	74.80	68.50	62.40	55.50
	CT	100	109	118	126	134	143
	kW	6.75	6.92	7.22	7.40	7.61	7.85
40	TC	98.50	91.80	84.00	78.00	71.00	63.50
	CT	103	112	121	129	137	145
	kW	7.10	7.30	7.60	7.84	8.18	8.50
45	TC	110.00	102.00	94.00	87.00	79.00	71.50
	CT	105	115	123	131	140	147
	kW	7.22	7.60	8.10	8.38	8.65	9.05
50	TC	119.50	111.00	103.00	94.00	85.00	76.00
	CT	108	118	125	134	142	151
	kW	7.60	8.05	8.45	8.91	9.30	9.72
55	TC	129.10	120.50	110.00	102.00	93.50	84.00
	CT	111	121	128	137	145	153
	kW	7.95	8.50	8.92	9.35	9.80	10.30

MODEL No.: CBL100

SST (^{0}F)		AMBIENT TEMPERATURE - ^{0}F					
		75	85	95	105	115	125
30	TC	85.00	79.00	73.00	67.00	61.50	55.00
	CT	98	108	116	125	135	143
	kW	8.35	8.70	9.10	9.30	9.54	10.00
35	TC	94.00	89.00	82.00	75.00	69.00	62.50
	CT	102	111	118	128	138	146
	kW	8.70	9.00	9.52	9.85	10.25	10.65
40	TC	105.00	96.00	91.00	84.00	76.00	69.00
	CT	105	114	121	131	141	149
	kW	9.05	9.50	9.90	10.40	10.90	11.34
45	TC	114.00	107.00	99.00	91.00	85.00	77.00
	CT	108	116	123	133	143	151
	kW	9.45	9.92	10.40	10.90	11.40	12.00
50	TC	123.00	115.50	108.00	100.00	92.00	84.50
	CT	110	118	125	136	145	153
	kW	9.74	10.28	10.90	11.64	12.12	12.67
55	TC	132.50	124.00	116.00	108.00	100.00	91.00
	CT	112	120	127	138	147	155
	kW	10.05	10.70	11.50	12.20	12.75	13.32

MODEL No.: CBL120

SST (^{0}F)		AMBIENT TEMPERATURE - ^{0}F					
		75	85	95	105	115	125
30	TC	101.00	95.00	88.00	83.00	76.50	70.00
	CT	105.00	114.00	121.00	130.00	139.00	147.00
	kW	9.90	10.50	10.90	11.70	12.10	12.50
35	TC	112.00	107.00	99.00	92.50	86.00	79.00
	CT	107.00	117.00	124.00	133.00	142.00	150.00
	kW	10.50	11.00	11.60	12.25	12.90	13.60
40	TC	124.00	116.00	109.00	113.00	95.00	90.00
	CT	111.00	119.00	127.00	135.00	145.00	152.00
	kW	11.00	11.70	12.25	13.80	13.75	14.30
45	TC	134.00	129.00	123.00	123.00	105.00	99.00
	CT	113.00	121.00	130.00	138.00	148.00	154.00
	kW	11.60	12.25	13.10	13.85	14.40	15.20
50	TC	146.00	140.00	132.00	124.00	116.00	108.00
	CT	115.00	125.00	132.00	140.00	150.00	156.00
	kW	12.30	12.90	13.70	14.50	15.40	16.20
55	TC	158.00	150.00	141.00	132.00	125.00	116.00
	CT	118.00	127.00	134.00	143.00	153.00	157.00
	kW	12.85	13.60	14.30	15.40	16.00	17.10

MODEL No.: CBL150

SST (^{0}F)		AMBIENT TEMPERATURE - ^{0}F					
		75	85	95	105	115	125
30	TC	125.00	119.00	112.00	105.00	97.00	90.00
	CT	94.00	102.00	113.00	122.00	132.00	140.00
	kW	11.50	12.50	13.30	14.10	15.00	15.60
35	TC	139.00	131.00	125.00	115.00	107.00	100.00
	CT	97.00	107.00	117.00	125.00	134.00	143.00
	kW	12.40	13.30	14.20	15.00	15.60	16.40
40	TC	152.00	145.00	136.00	127.00	118.00	110.00
	CT	99.00	109.00	118.00	128.00	137.00	146.00
	kW	12.90	13.80	14.80	15.70	16.30	17.40
45	TC	168.00	159.00	150.00	142.00	131.00	122.00
	CT	101.00	111.00	121.00	129.00	138.00	147.00
	kW	13.50	14.40	15.40	16.50	17.40	18.30
50	TC	183.00	172.00	163.00	152.00	142.00	121.00
	CT	103.00	113.00	123.00	130.00	140.00	149.00
	kW	14.10	15.20	16.40	17.30	18.20	19.10
55	TC	202.00	188.00	176.00	164.00	153.00	142.00
	CT	104.00	114.00	124.00	133.00	141.00	150.00
	kW	14.50	15.70	16.90	17.80	18.80	20.00

MODEL No.: CBL180

SST (^{0}F)		AMBIENT TEMPERATURE - ^{0}F					
		75	85	95	105	115	125
30	TC	163.00	154.00	151.00	138.00	130.00	121.00
	CT	97.00	106.00	117.00	126.00	135.00	144.00
	kW	13.00	14.30	16.10	17.90	19.40	20.90
35	TC	179.00	174.00	161.00	151.00	144.00	134.00
	CT	99.00	108.00	118.00	129.00	137.00	146.00
	kW	13.20	14.80	16.40	18.30	19.70	21.50
40	TC	198.00	187.00	177.00	173.00	160.00	149.00
	CT	101.00	110.00	121.00	131.00	139.00	148.00
	kW	13.40	14.90	17.00	18.70	20.20	21.60
45	TC	214.00	203.00	193.00	182.00	173.00	163.00
	CT	103.00	113.00	124.00	134.00	141.00	150.00
	kW	13.65	15.50	17.50	19.10	20.40	21.74
50	TC	231.00	216.00	208.00	198.00	187.00	178.00
	CT	104.00	115.00	126.00	136.00	143.00	151.00
	kW	13.80	15.80	18.00	19.60	20.90	22.20
55	TC	247.00	236.00	224.00	213.00	202.00	193.00
	CT	105.00	116.00	128.00	138.00	145.00	152.00
	kW	14.10	16.20	18.45	20.10	21.45	22.60

LEGEND: SST - Saturated Suction Temperature; **TC** - Total Capacity (1000 Btuh) Gross; **CT** - Condensing Temperature (^{0}F); **kW** - Total unit power input

PERFORMANCE DATA

DUAL COMPRESSOR UNITS

MODEL No.: CBL220

SST (^{0}F)		AMBIENT TEMPERATURE - ^{0}F					
		75	85	95	105	115	125
30	TC	188	177	168	158.5	148.5	138
	CT	101	111	121	131	141	148
	kW	14.7	16.7	18.8	209	21	23.5
35	TC	206	195	185.5	174	162	152
	CT	104	115	124	134	143	150
	kW	15.4	17	19.4	21.4	23.4	25
40	TC	225	214	203	191	180	168
	CT	108	117	127	136	144	151
	kW	16	18.1	20.1	22.2	23.9	25.4
45	TC	241	230	219	206	196	187
	CT	110	120	129	138	146	153
	kW	16.9	18.9	20.7	22.9	24.3	26
50	TC	261	249	237	223	212	198
	CT	112	122	131	140	149	155
	kW	17.3	19.2	21.4	23.3	24.7	26.5
55	TC	279	265.5	255	239	227	214
	CT	115	125	133	142	151	157
	kW	17.7	19.9	21.6	23.8	26.35	26.7

MODEL No.: CBL240

SST (^{0}F)		AMBIENT TEMPERATURE - ^{0}F					
		75	85	95	105	115	125
30	TC	222	207	194	182	168	158
	CT	101	110	121	131	141	150
	kW	18.18	20.4	22.9	25.3	27.6	29.64
35	TC	245	229	215	205	189	178
	CT	103	113	123	133	143	152
	kW	19.2	21	23.6	26	29	31.1
40	TC	267	251	236	223	208	198
	CT	107	117	126	135	145	154
	kW	20.1	22.2	24.3	26.4	29.4	31.6
45	TC	289	272	258	244	229	218
	CT	110	119	129	137	147	155
	kW	20.8	22.7	25	26.9	29.8	32
50	TC	311	293	279	264	248	238
	CT	112	121	131	139	149	157
	kW	21.1	23.1	25.6	27.7	30.4	32.6
55	TC	335	314	300	285	269	258
	CT	114	123	133	141	151	159
	kW	21.6	23.75	26.12	28.1	31.1	35.6

MODEL No.: CBL300

SST (^{0}F)		AMBIENT TEMPERATURE - ^{0}F					
		75	85	95	105	115	125
30	TC	273	258	242	230	218	201
	CT	101	111	119	129	140	144
	kW	21.53	25.1	27.5	30.3	33.5	34.72
35	TC	299	284	267	254	239	223
	CT	103	113	123	132	141	147
	kW	22.8	25.8	28.9	31.8	34	36.2
40	TC	326	310	292	277	260	245
	CT	105	115	126	135	143	150
	kW	23.6	26.7	29.6	32.7	34.6	37.9
45	TC	353	336	316	300	282	266
	CT	107	118	128	137	146	152
	kW	24.32	27.75	30.3	33.1	35.4	39.4
50	TC	379	361	340	323	303	288
	CT	109	121	130	139	149	155
	kW	24.8	28.4	30.75	33.7	36.9	40.95
55	TC	406	387	365	346	326	309
	CT	112	123	133	141	152	158
	kW	25.6	28.64	31.51	34.1	38.12	42.39

MODEL No.: CBL360

SST (^{0}F)		AMBIENT TEMPERATURE - ^{0}F					
		75	85	95	105	115	125
30	TC	296	282	265.3	249.9	234.8	219.3
	CT	99	109	118	127	137	145
	kW	27.1	29.29	31.51	33.63	36	38.18
35	TC	328.4	313.2	294.7	278.3	261.3	244.8
	CT	101	111	121	129	139	147
	kW	27.52	29.8	32.12	34.34	36.56	38.86
40	TC	360.7	344.2	324.2	366.8	287.7	270.3
	CT	103	113	123	131	141	149
	kW	28.04	30.2	32.52	34.74	37.17	39.29
45	TC	393.1	375.3	353.6	335.2	314.2	295.8
	CT	105	114	125	133	143	152
	kW	28.48	30.89	33.13	35.35	37.57	39.59
50	TC	425.6	406.4	383	363.7	340.6	321.3
	CT	106	115	127	135	145	155
	kW	28.68	31.21	33.53	35.75	37.77	39.9
55	TC	457.8	437.5	412.4	392.1	367.1	346.8
	CT	108	117	129	137	149	157
	kW	29.1	31.51	33.94	36.16	38.28	40.91

LEGEND:

SST - Saturated Suction Temperature

TC - Total Capacity (1000 Btuh) Gross

CT - Condensing Temperature (^{0}F)

kW - Total unit power input

ELECTRICAL DATA

SINGLE COMPRESSOR UNITS

MODEL NUMBER	POWER SUPPLY (V-Ph-Hz)	VOLTAGE RANGE		COMPRESSOR		* FAN MOTOR FLA (each)	MCA	MOCP
		MIN.	MAX.	RLA	LRA			
CBL030	380/415-3-50 (4 WIRE)	342	457	7.9	50	1.8	11.7	15
CBL036	380/415-3-50 (4 WIRE)	342	457	10	66	1.8	14.3	20
CBL042	380/415-3-50 (4 WIRE)	342	457	10	74	2.3	14.8	20
CBL048	380/415-3-50 (4 WIRE)	342	457	12.9	100	2.3	18.5	30
CBL060	380/415-3-50 (4 WIRE)	342	457	17.3	114	2.3	24	40
CBL075	380/415-3-50 (4 WIRE)	342	457	17.9	125	2.3 x 2	27	40
CBL090	380/415-3-50 (4 WIRE)	342	457	17.5	118	2.3 x 2	26.5	40
CBL100	380/415-3-50 (4 WIRE)	342	457	24.4	173	2.3 x 2	35.1	50

DUAL COMPRESSOR UNITS

MODEL NUMBER	POWER SUPPLY (V-Ph-Hz)	VOLTAGE RANGE		COMPRESSOR (each)		* FAN MOTOR FLA (each)	MCA	MOCP
		MIN.	MAX.	RLA	LRA			
CBL075	380/415-3-50 (4 WIRE)	342	457	10	65.5	2.3 x 2	27.1	35
CBL090	380/415-3-50 (4 WIRE)	342	457	10	74	2.3 x 2	27.1	35
CBL100	380/415-3-50 (4 WIRE)	342	457	12.9	95	2.3 x 2	33.7	40
CBL120	380/415-3-50 (4 WIRE)	342	457	17.3	114	2.3 x 2	43.6	55
CBL150	380/415-3-50 (4 WIRE)	342	457	17.9 & 17.5	125 & 118	2.5 x 2	44.9	60
CBL180	380/415-3-50 (4 WIRE)	342	457	22.4	140	2 x 2	54.6	70
CBL220	380/415-3-50 (4 WIRE)	342	457	24.4	173	2 x 2	59.1	80
CBL240	380/415-3-50 (4 WIRE)	342	457	30.1 & 24.4	225 & 173	3.15 x 2	68.4	90
CBL300	380/415-3-50 (4 WIRE)	342	457	30.1	225	3.15 x 2	74.1	100
CBL360	380/415-3-50 (4 WIRE)	342	457	43.6	272	3.15 x 3	107.6	140

LEGEND:

FLA - Full Load Amps

LRA - Locked Rotor Amps

RLA - Rated Load Amps

MCA - Minimum Circuit Amps

MOCP - Maximum Over Current Protection

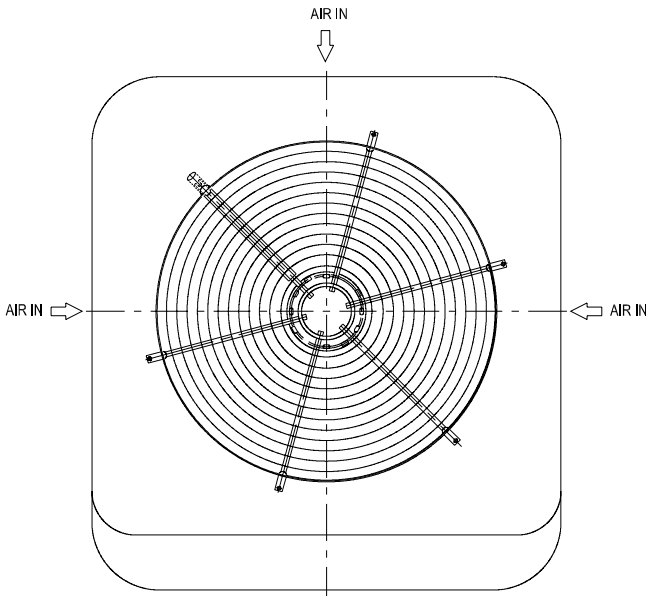
***** Single phase motors (220/240V-1Ph-50Hz), up to CBL150 only

NOTE:

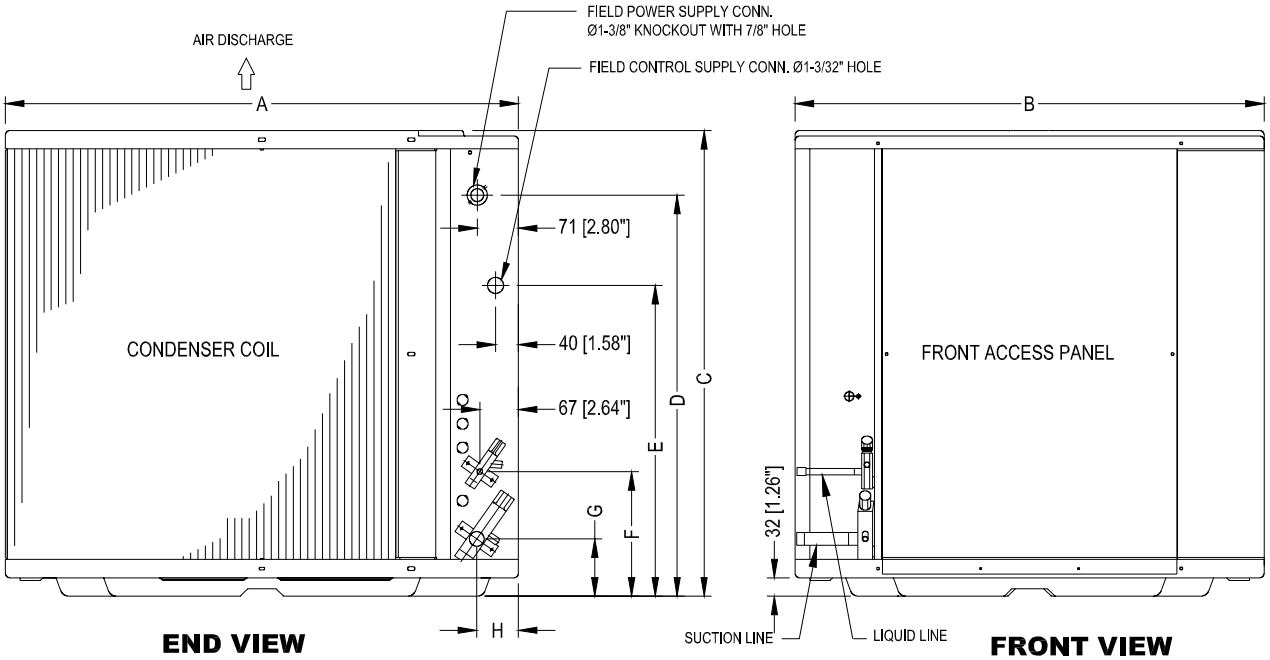
If other than 90^{0}C copper wire is used, size can be determined from unit ampacity given in above table and applicable table of NEC. Wire size selected must have current capacity not less than that of copper wire specified and voltage drop should not exceed 2% of rated voltage. Must use copper wire from disconnect switch to the unit.

DIMENSIONS

CBL030 - CBL060



TOP VIEW



END VIEW **FRONT VIEW**

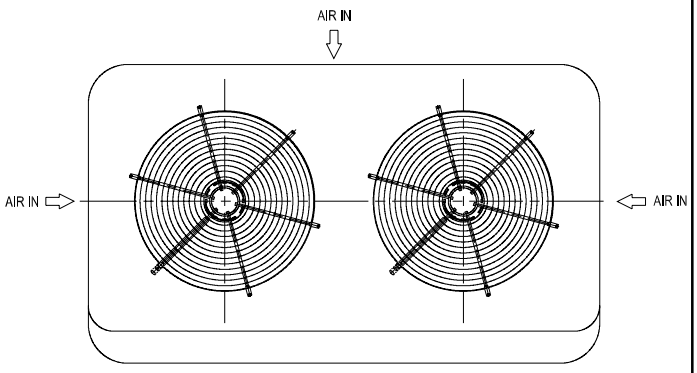
NOTES:

1. All dimensions are in mm, (dimensions in brackets are in inches).
2. Allow 32" (812mm) clearance to service end of the unit, 12" (305mm) on remaining sides and 24" (610mm) between units for proper airflow.

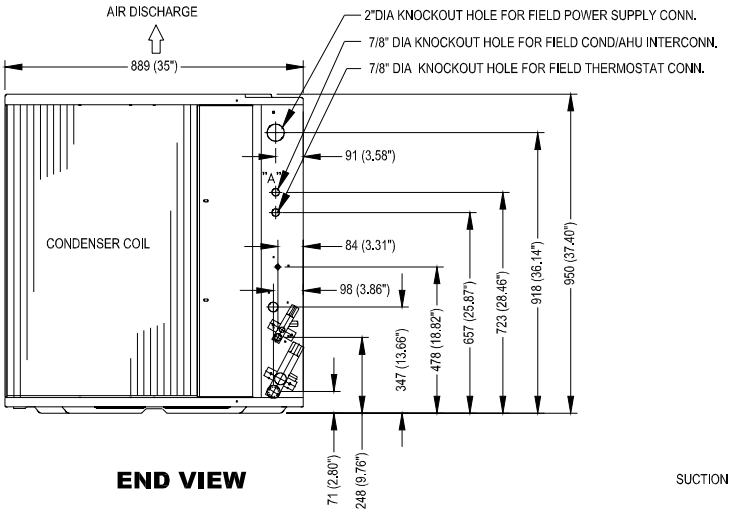
MODEL NUMBER	A	B	C	D	E	F	G	H
CBL030 - CBL036	711	610	708	596	440	175	86	57
CBL042 - CBL060	889	813	806	695	538	216	99	72

DIMENSIONS

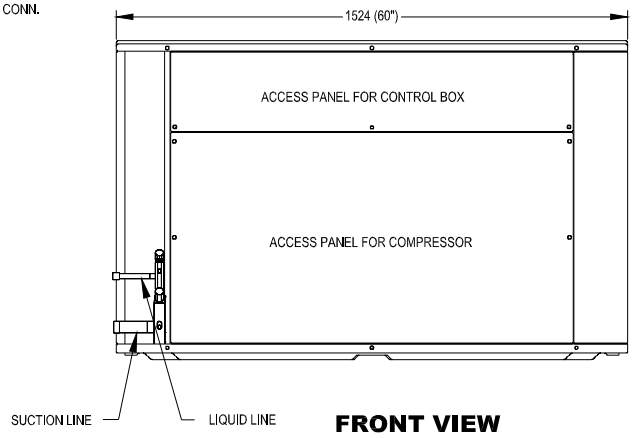
CBL075 - CBL120



TOP VIEW



END VIEW



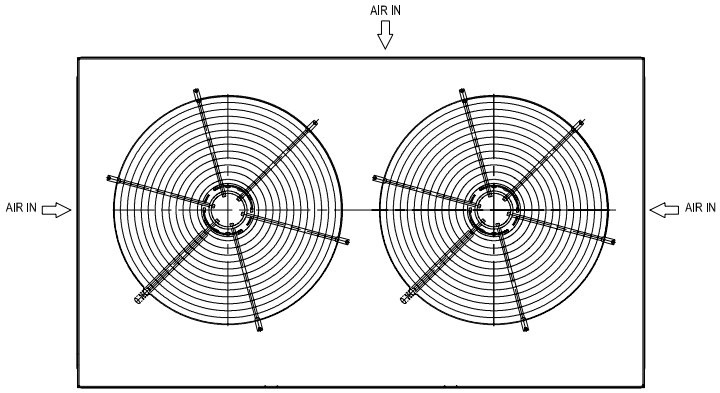
FRONT VIEW

NOTES:

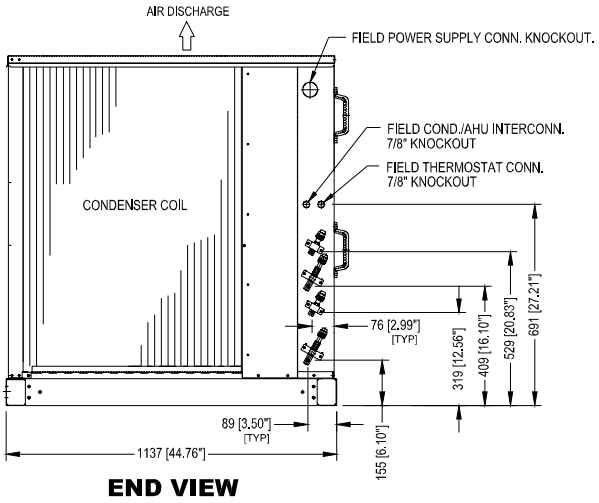
1. All dimensions are in mm, (dimensions in brackets are in inches).
2. Allow 32" (812 mm) clearance to service end of the unit, 24" (610 mm) on remaining sides and 48" (1219 mm) between units for proper airflow.

DIMENSIONS

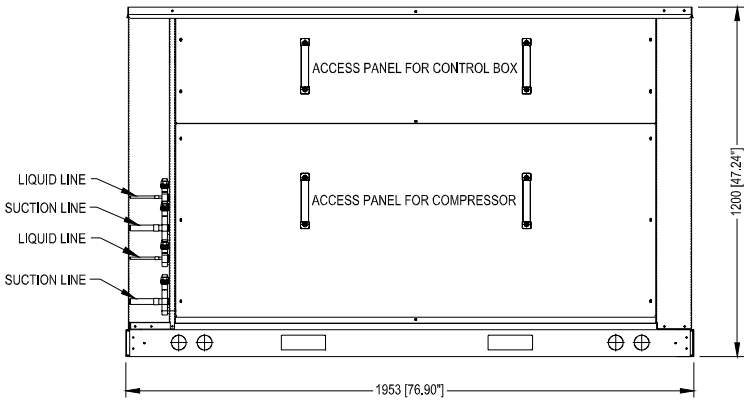
CBL150 - CBL220



TOP VIEW



END VIEW



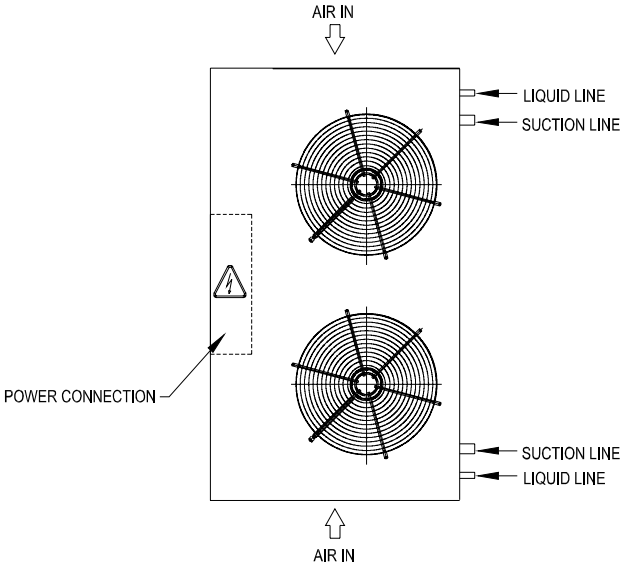
FRONT VIEW

NOTES:

1. All dimensions are in mm, (dimensions in brackets are in inches).
2. Allow 32" (812 mm) clearance to service end of the unit, 48" (1219 mm) on remaining sides for proper airflow.

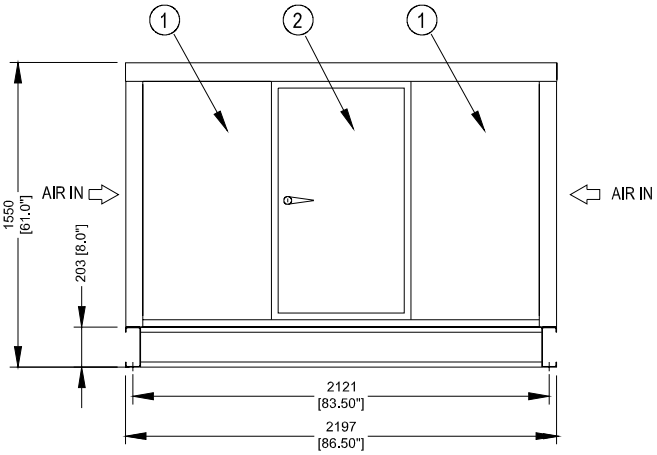
DIMENSIONS

CBL240 - CBL300

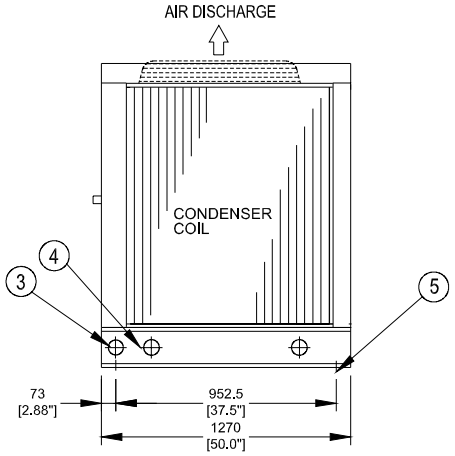


TOP VIEW

1. ACCESS PANEL
2. CONTROL BOX HINGED DOOR MINIMUM 36"FREE SPACE REQD. FROM CONTROL BOX
3. ELEC. POWER SUPPLYØ 3" OPENING (BOTH SIDE)
4. RIGGING HOLE Ø3"
5. MTG. HOLES 0.625Ø (2 Nos. EACH SIDE)



FRONT VIEW



END VIEW

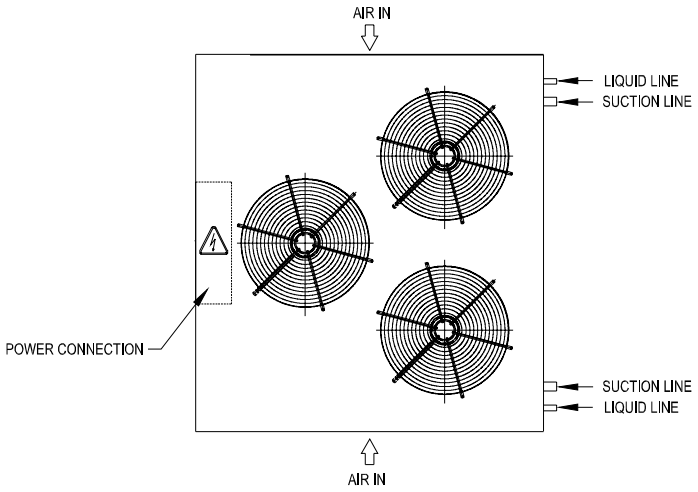
NOTES:

1. All dimensions are in mm, (dimensions in brackets are in inches).
2. Allow 48" (1219 mm) clearance on all sides for proper airflow.

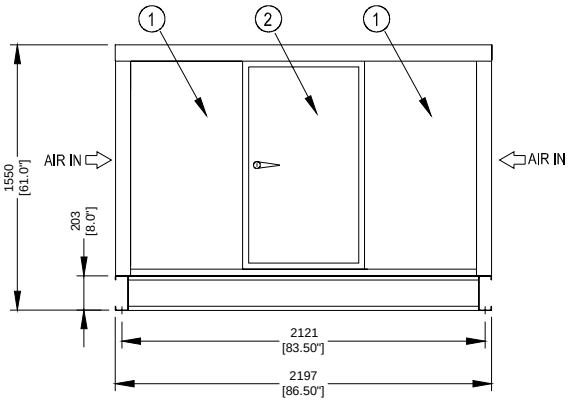
DIMENSIONS

CBL360

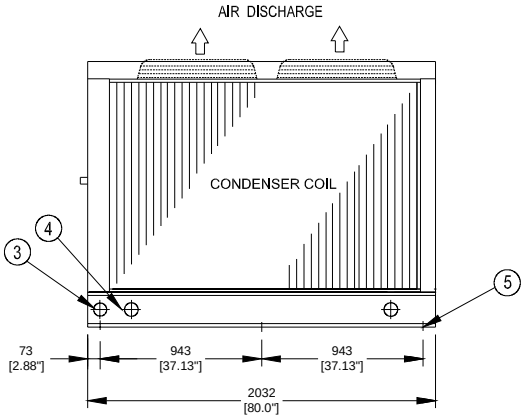
1. ACCESS PANEL
2. CONTROL BOX HINGED DOOR MINIMUM 36"FREE SPACE REQD. FROM CONTROL BOX
3. ELEC. POWER SUPPLYØ 3" OPENING (BOTH SIDE)
4. RIGGING HOLE Ø3"
5. MTG. HOLES 0.625Ø (3 Nos. EACH SIDE)



TOP VIEW



FRONT VIEW



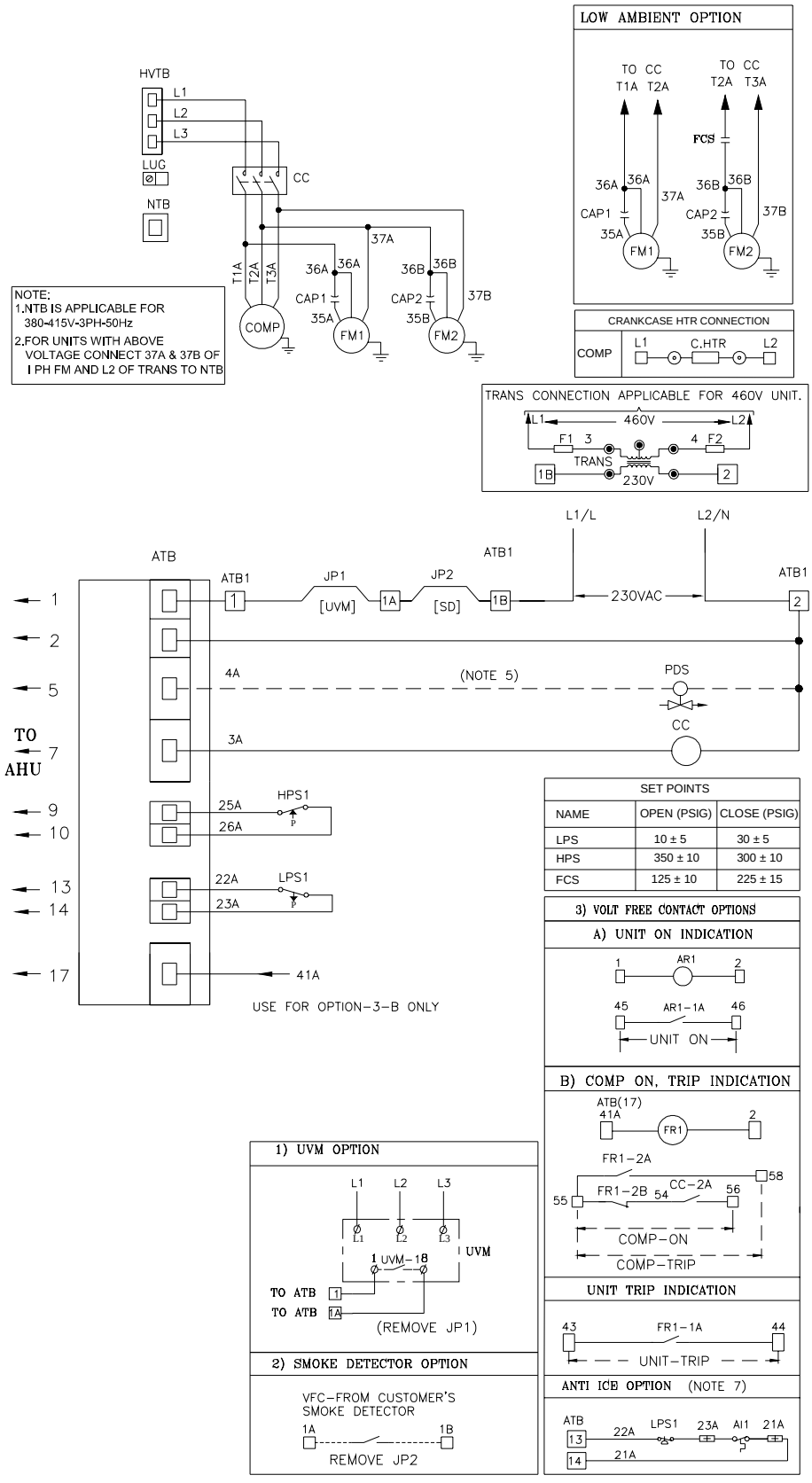
END VIEW

NOTES:

1. All dimensions are in mm, (dimensions in brackets are in inches).
2. Allow 48" (1219 mm) clearance on all sides for proper airflow.

TYPICAL SCHEMATIC WIRING DIAGRAM

Single compressor units



LEGEND	
AHU	AIR HANDLING UNIT
AI	ANTI ICE THERMOSTAT
AR	AUXILIARY RELAY
ATB	AUXILIARY TERMINAL BLOCK
CAP	CAPACITOR
CC	COMPRESSOR CONTACTOR
CB	CIRCUIT BREAKER
C. HTR	CRANKCASE HEATER
COMP	COMPRESSOR
FCS	FAN CYCLING SWITCH
FM	FAN MOTOR (CONDENSER)
FMC	FAN MOTOR CONTACTOR
FR	FAULT RELAY
HPS	HIGH PRESSURE SWITCH
HVTB	HIGH VOLTAGE TERMINAL BLOCK
JP	JUMPER
L1	LINE 1
L2	LINE 2
L3	LINE 3
LPS	LOW PRESSURE SWITCH
LUG	LUG GROUND
NTB	NEUTRAL TERMINAL BLOCK
SD	SMOKE DETECTOR
TRANS	TRANSFORMER
T'STAT	THERMOSTAT
UVM	UNDER VOLTAGE MONITOR
VFC	VOLT FREE CONTACT
- - -	FIELD WIRING
[+]	DISCONNECT TAB
⊙	SPLICE-CLOSED END
□	TERMINAL BLOCK

NOTES

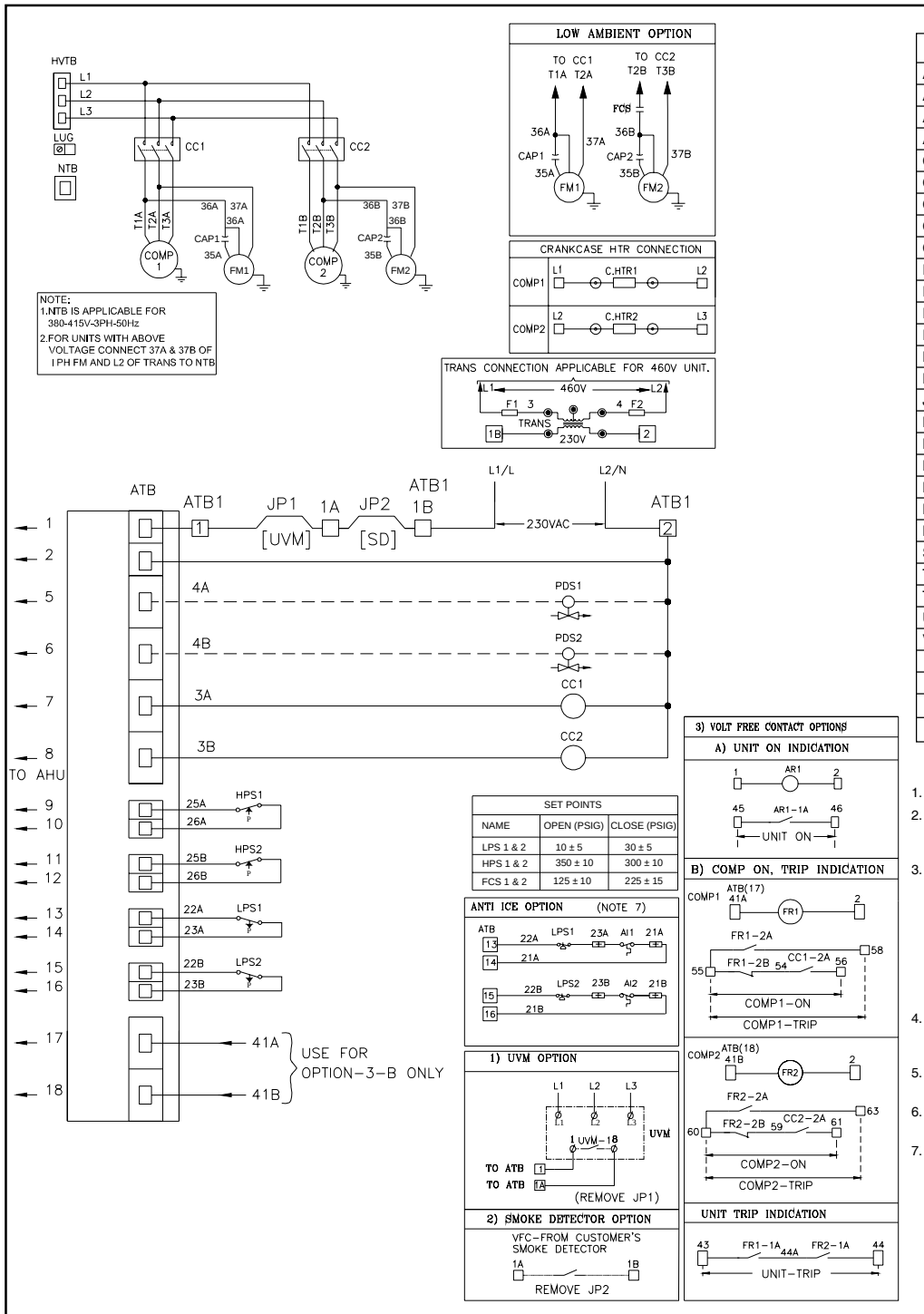
1. POWER SUPPLY, 380/415V-3Ph-50Hz.
2. ANY WIRE REPLACEMENT SHOULD BE OF THE 90°C OR ITS EQUIVALENT.
   USE COPPER CONDUCTOR WIRES ONLY.
3. POWER MUST BE SUPPLIED TO CRANKCASE HEATER FOR MINIMUM OF 12 HOURS PRIOR TO SYSTEM START UP.

   IF POWER IS OFF 6 HOURS OR MORE, CRANKCASE HEATER MUST BE ON FOR 12 HOURS BEFORE OPERATING THE SYSTEM.

   FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN COMPRESSOR DAMAGE.
4. FUSED DISCONNECT SWITCH OR CIRCUIT BREAKER TO BE PROVIDED BY END USER WITH RATING AS RECOMMENDED BY COOLINE.
5. IF PDS IS FACTORY INSTALLED, PLEASE READ BROKEN LINES AS CONTINUOUS LINES.
6. USE DISCONNECT TAB [+] OR SPLICE ONLY WHERE EVER REQUIRED FOR EXTENSION OF ORIGINAL WIRE.
7. ROUTE AI OPTION WIRES FROM AHU.

TYPICAL SCHEMATIC WIRING DIAGRAM

Dual compressor units



SET POINTS		
NAME	OPEN (PSIG)	CLOSE (PSIG)
LPS 1 & 2	10 ± 5	30 ± 5
HPS 1 & 2	350 ± 10	300 ± 10
FCS 1 & 2	125 ± 10	225 ± 15

LEGEND	
AHU	AIR HANDLING UNIT
AI	ANTI ICE THERMOSTAT
AR	AUXILIARY RELAY
ATB	AUXILIARY TERMINAL BLOCK
CAP	CAPACITOR
CC	COMPRESSOR CONTACTOR
CB	CIRCUIT BREAKER
C. HTR	CRANKCASE HEATER
COMP	COMPRESSOR
FCS	FAN CYCLING SWITCH
FM	FAN MOTOR (CONDENSER)
FMC	FAN MOTOR CONTACTOR
FR	FAULT RELAY
HPS	HIGH PRESSURE SWITCH
HVTB	HIGH VOLTAGE TERMINAL BLOCK
JP	JUMPER
L1	LINE 1
L2	LINE 2
L3	LINE 3
LPS	LOW PRESSURE SWITCH
LUG	LUG GROUND
NTB	NEUTRAL TERMINAL BLOCK
SD	SMOKE DETECTOR
TRANS	TRANSFORMER
T'STAT	THERMOSTAT
UVM	UNDER VOLTAGE MONITOR
VFC	VOLT FREE CONTACT
– – –	FIELD WIRING
+	DISCONNECT TAB
⦿	SPLICE-CLOSED END
□	TERMINAL BLOCK

NOTES

1. POWER SUPPLY, 380/415V-3Ph-50Hz.
2. ANY WIRE REPLACEMENT SHOULD BE OF THE 90°C OR ITS EQUIVALENT.
   USE COPPER CONDUCTOR WIRES ONLY.
3. POWER MUST BE SUPPLIED TO CRANKCASE HEATER FOR MINIMUM OF 12 HOURS PRIOR TO SYSTEM START UP.

   IF POWER IS OFF 6 HOURS OR MORE, CRANKCASE HEATER MUST BE ON FOR 12 HOURS BEFORE OPERATING THE SYSTEM.

   FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN COMPRESSOR DAMAGE.
4. FUSED DISCONNECT SWITCH OR CIRCUIT BREAKER TO BE PROVIDED BY END USER WITH RATING AS RECOMMENDED BY COOLINE.
5. IF PDS IS FACTORY INSTALLED, PLEASE READ BROKEN LINES AS CONTINUOUS LINES.
6. USE DISCONNECT TAB + OR SPLICE ONLY WHERE EVER REQUIRED FOR EXTENSION OF ORIGINAL WIRE.
7. ROUTE AI OPTION WIRES FROM AHU.

INSTALLATION & START-UP INSTRUCTIONS

SAFETY CONSIDERATIONS

Improper installation, service, maintenance or use can cause explosion, fire, electrical shock or other conditions which may cause personal injury or property damage. Check with your nearest COOLINE dealer/sales office for information or assistance.

Warning

Before installation or servicing the system, always turn off main power supply. Electrical shock can cause personal injury or death.

INSTALLATION

STEP-1:
Check equipment and job site

Unpack unit and move to final location taking care not to damage the unit. Remove screws holding the unit to wooden pallet and after removing wooden pallet, refix the screws.

STEP- 2:
Installation on a solid, level mounting pad

For proper drainage, the condensing unit must be raised off the mounting pad. If conditions require the unit be attached to the pad, tie down bolts should be used.

When installing, allow sufficient space for airflow clearance, wiring, refrigerant piping and service. Double the service access when multiple units are installed at one location.

On rooftop applications, locate unit at least 6" (152 mm) above roof surface. Place unit above a load-bearing wall, isolate unit and piping set from structure.

Arrange supporting members to adequately support unit and minimize transmission of vibration to building.

STEP-3:
Piping connections

Outdoor units should be connected to indoor units using field-supplied piping of refrigerant grade and correct size. The liquid and suction line diameters can be determined from the physical data table. For piping requirements beyond 25 ft (7.62m), obtain information from your nearest COOLINE dealer/sales office.

If either refrigerant piping or indoor coil is exposed to atmospheric conditions, it must be dehydrated to 500 microns to eliminate moisture contamination in the system.

It is advisable to size piping according to recommended ASHRAE methods. Install piping according to refrigeration standard practice. Run refrigerant pipes as directly as possible, avoiding unnecessary turns and bends. Install refrigerant pipes carefully to prevent damaging the suction pipe insulation and vibration transmission to the structure.

Outdoor unit connected to factory matched indoor unit

Outdoor unit contains correct system refrigerant charge for operation with matched indoor unit as given on cooling capacity table and when connected with up to 25 ft (7.62 m) of field-supplied piping. Check refrigerant charge for maximum efficiency.

Sweat connection

Use refrigerant grade piping. Service valves are closed from factory when shipped and ready for brazing. After wrapping the service valve with a wet cloth, the piping set can be brazed to service valve using either silver rod or silfos rod brazing material. When brazing completed, refrigerant piping and indoor coil are now ready for leak testing. This check should also include all field and factory brazed joints.

ELECTRICAL

STEP 1: INSTALLATION

A) Please ensure power supply to the unit is as per unit nameplate (Volts/Ph/Hz) requirements.

Caution: Operation of the unit on improper power supply will result in damage to the unit.

Note: Use copper wires of proper rating for all field wiring.

Warning: Before servicing or installation of the unit, always TURN OFF all power to the unit. There may be more than one disconnect switch. Ensure all of them are turned off. Electrical shock can cause personal injury or death.

B) Ground & power wires

Connect power wires to terminal block per wiring diagram.

Connect ground wire to the ground lug inside the control box.

C) Control wiring between outdoor & indoor unit

Use 16 gauge color-coded wire between the indoor and outdoor units (control wiring).

STEP 2: START-UP

1) Energize crankcase heater for a minimum of 12 hours prior to the system start-up. To energize crankcase heater only, set thermostat to "off" position and close electrical disconnect switch to the outdoor unit.
2) Fully open liquid/suction service valves.
3) Close electrical disconnect switch to energize the system.
4) Set room thermostat to desired temperature.

SYSTEM DESIGN

THE COOLINE CONDENSING UNIT SYSTEM HAS BEEN DESIGNED BASED ON THE FOLLOWING:

- Intended for outdoor installation with free air intake and discharge.
- Minimum outdoor operating air temperature during cooling without low ambient operation option is 55^0F.
- Maximum outdoor operating air temperature during cooling is 130^0F.
- For reliable operation, unit should be level on horizontal plane.
- Maximum elevation of indoor unit above or below the outdoor unit is: indoor unit above = 50 feet, indoor unit below =150 feet.
- For interconnecting refrigerant pipe lengths greater than 25 feet, check with your local COOLINE sales office.
- Use only copper wire for electric connection at unit. Aluminum and clad aluminum are not acceptable for the type of connector provided.

Cooline
AIR CONDITIONERS
from Zamil

In 1989, Zamil Air Conditioners (ZAC), one of the sector business of Zamil Industrial and the Number 1 Middle East manufacturer of air conditioning systems, introduced its international brand – Cooline, to the growing world market. Today, Cooline supplies air conditioners to more than 55 countries worldwide with major markets in GCC, Middle East, North Africa, Europe and Asia. In addition to the Head Office in Saudi Arabia, five regional offices handles Cooline's overall operations including more than 25 international distributors.

All ZAC Products are available under the Cooline brand. Cooline Products include an array of central air conditioners for residential, commercial and industrial use, including concealed units up to 5 tons, ducted splits up to 30 tons, packaged units up to 80 tons, single and double skin air handling units up to 70,630 CFM and water chillers up to 550 tons cooling capacity. New products include High Efficiency Ratio (EER) units which comply with the more demanding international codes and heat pump units with increased overall Coefficient of Performance (COP).

Cooline is the first brand from the Middle East to receive Eurovent for its air movement systems - a capacity/performance certification that has been made mandatory in Europe and is fast becoming a requirement in all regions. With the addition of the state-of-the-art testing facility, Ikhtebar, a 3rd party air conditioners testing facility built by Intertek Testing Services (ITS) and certified by Electrical Testing Labs (ETL) and accredited by the Saudi Accreditation Committee (SASO) for compliances with the international testing standards, Cooline is the only brand in the Middle East capable of guaranteeing product performance in compliance with local and international standards. It's no surprise that in 2003, Cooline received the Best GCC Brand of the Decade Award.

For more information, please visit our website **www.cooline.com**

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CU-C35-09/04