

# Cooline<sup>®</sup>

AIR CONDITIONERS

from  **Zamil**



## Condensing Units

CCL Series  
CCL020 thru CCL095  
18 TR thru 93 TR  
63 kW thru 327 kW

# R-407c

*Higher quality of indoor living*

*Our product line ...*



## **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

1, 2 & 3 BASIC CONDENSING UNIT (R-407c)	4, 5 & 6 NOMINAL COOLING CAPACITY (TONS)	7 ELECTRICAL SUPPLY (V-Ph-Hz)	8 REFRIGERATION CIRCUIT TYPE	9 ELECTRICAL KITS OPTION	10 CONDENSER COIL	11 UNIT ENCLOSURE	12 MECHANICAL KITS OPTIONS	13 REFRIGERANT CHARGING (R-407c)
CCL	020 025 030 035 040 050 055 065 080 095	L : 380/415-3-50 (4 WIRE)	S : DUAL SCROLL * H : DUAL SEMI-HERMETIC RECIPROCATING** L : DUAL SEMI-HERMETIC RECIPROCATING WITH UNLOADER** (LEAD COMPRESSOR)	A : STANDARD OPTIONS+ K : FAN CYCLING AND ADJUSTABLE HIGH & LOW PRESSURE SWITCHES V : VOLT FREE CONTACTS*** C : COMPRESSOR CIRCUIT BREAKER P : PUMPDOWN SOLENOID VALVE B : K & V COMBO E : K & C COMBO G : K & P COMBO T : K, V & C COMBO M : K, V & P COMBO N : V, C & P COMBO L : K, V, C & P COMBO	A : ALUMINUM FIN B : COATED ALUMINUM FIN C : COPPER FIN D : ALUMINUM FIN WITH THERMO-GUARD COATING E : COPPER FIN WITH THERMO-GUARD COATING	A : STANDARD G : COIL GUARD F : UNIT GUARD C : COMPRESSOR ENCLOSURE (SOUND ATTENUA- TOR)+++ E : G & C COMBO J : F & C COMBO	A : STANDARD OPTIONS+ M : REPLACEABLE CORE FILTER DRIER & SHUT-OFF VALVE DISCHARGE) P : PRESSURE GAUGES (SUCTION & DISCHARGE) O : PRESSURE GAUGES (SUCTION, DISCHARGE & OIL)++ H : HOT GAS BYPASS VALVE R : CONDENSER PRESSURE RELIEF VALVE J : M & P COMBO K : M & O COMBO N : M & H COMBO Q : M & R COMBO S : M, H & R COMBO T : M, H & P COMBO U : M, H & O COMBO V : A, H & R COMBO F : A, H & P COMBO G : A, H & O COMBO L : A, H, P & R COMBO B : M, H, O & R COMBO	H : HOLDING CHARGE F : FULLY CHARGE

**NOTES:** \* – Dual scroll compressors are available up to models CCL055 only.

\*\* – Dual semi-hermetic compressors are available for models CCL065 - CCL095 only.

\*\*\* – A combination of volt free contact option: 1. Unit ON indication, 2. Compressor RUN/TRIP, 3. Unit trip indication.

+ – Standard options (for models up to CCL055 only) contain sealed type filter drier, fixed low & high pressure switches.

++ – Standard options (for models CCL065 - CCL095 only) contain replaceable filter drier, ball valve, sight glass, muffler and without spring isolator.

+++ – Oil pressure gauge is applicable for semi-hermetic compressors only.

++++ – Sound attenuator is applicable for semi-hermetic compressors only.

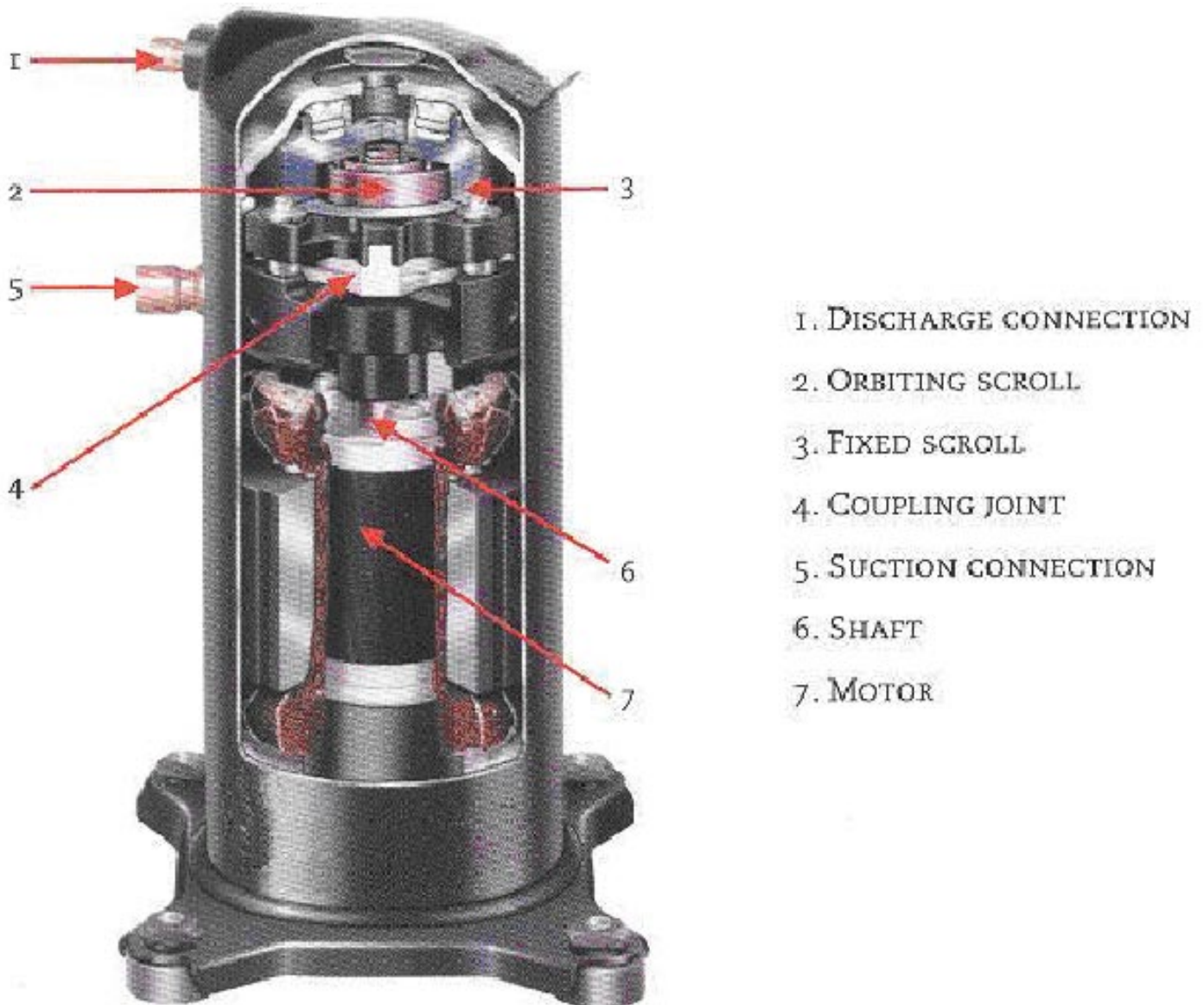
## INTRODUCTION

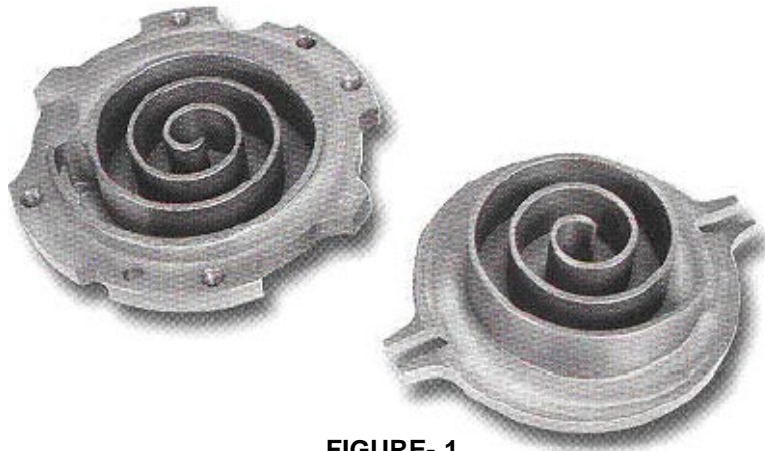
The CCL series air cooled condensing units from Cooline Air Conditioners are designed to provide engineering excellence in comfort air conditioning and industrial cooling with a superior combination of energy saving, performance, application flexibility, ease of service & maintenance and ability to withstand extreme ambient temperatures. These units can be combined with a wide variety of evaporator coils and blower packages to provide quite and dependable comfort. These units can be installed on a roof tops or at ground level.

The CCL series are designed to use environmental friendly HFC R-407c refrigerant. HFC R-407c has zero ozone depletion zeotropic blends of HFC refrigerants. It closely matches the properties of R-22 and used in many air conditioning applications.

### Scroll Compressor:

The scroll compressors are consists of two involutes or Archimedean spirals (Figure-1). One spiral is positioned inside the other to form a series of crescent-shaped pockets. During compression the upper spiral remains stationary and the lower one, being eccentrically mounted on the drive shaft, describes an orbital rather than a simple rotary motion.





**FIGURE- 1**

**How a Scroll Compressor works:**



Compression in the scroll is created by the interaction of an orbiting spiral and a stationary spiral. A refrigerant enters the outer openings as one of the spirals orbits.



The open passages are sealed off as gas is drawn into the spiral.



As the spiral continues to orbit, the gas is compressed into two increasingly smaller pockets.



By the time the gas arrives at the center port, discharge pressure has been reached.



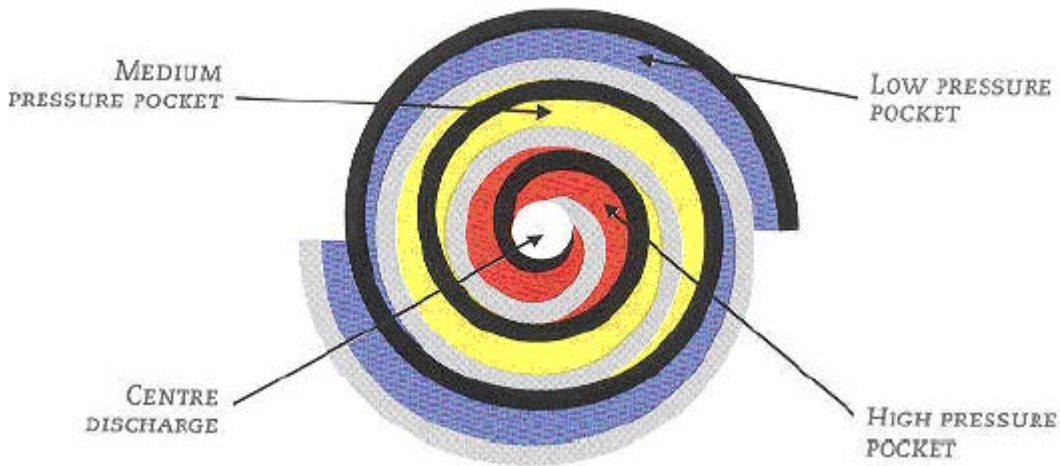
Actually, during operation, all six gas passages are in various stages of compression at all times, resulting in nearly continuous suction and discharge.

Refrigerant enters the compressor at the suction connection and flows around the motor's housing and enters at the bottom side through the openings.

Oil droplets separate from the refrigerant and fall into the oil sump.

All suction refrigerant passes through the electrical motor, ensuring full motor cooling.

After that the refrigerant enters the scroll elements.



### **Semi-hermetic Compressor:**

These Semi hermetic reciprocating compressors are accessible –hermetic type. Compressor and motor are enclosed in a hermetically sealed housing, with out shaft seal. The compressors are equipped with an oil sight glass through which the oil quantity and its conditions in the crankcase can be observed. These compressors can be disassembled in the field for service.

Refrigerant-cooled motor –compressors have an oil pressure lubrication system. This system is supplied by a positive displacement oil pump, working in either direction. It is protected by a screen and is made accessible for quick oil pressure checking by a Schrader check valve. The use of oil pressure control safeguards the lubrication system. These compressors can be provided with capacity control (optional). The use of unloading provides optimal part load capacities.

### **SALIENT FEATURES OF THE CCL SERIES:**

- \* HFC R-407c equipments are value add products and a giant leap toward addressing some of the issue relating to climate change and environmental protection.
- \* Compact unit design & excellent serviceability.
- \* High energy efficiency ratio (EER). Scroll and semi-hermetic reciprocating compressors.
- \* Independent refrigeration circuits.
- \* Integral sub cooling circuit provided to increase overall unit efficiency.
- \* Low noise condenser fans, direct drive with rolled form venturi design to eliminate airflow recycling.
- \* Condenser fan motors are totally enclosed air over type (TEAO) with class 'F' winding insulation.
- \* Microprocessor based controls.
- \* High safety standards with UL listed major electrical components.
- \* Quality assurance according to ISO 9001: 2000. Guarantees high and constant product quality.

# STANDARD SPECIFICATIONS

## A. UNIT CASING & CONSTRUCTION

Unit casing shall be fabricated of heavy gauge (G-90) galvanized steel. 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 backed on electrostatic polyester dry powder coat.

Condensing unit consists of dual or quadruple refrigeration compressors, condenser coil, propeller fans, control wiring and interconnecting piping completely factory assembled. The whole unit is mounted on pressed steel or 'C' channel base rail with lifting holes. The unit is provided with an integral weather resistant control panel suitable for remote thermostat control, ready for field connection.

## B. COMPRESSOR

Scroll compressors are used as standard for models CCL020-CCL055 and semi-hermetic reciprocating compressors are standard for models CCL065 - CCL095. All the compressors are conforming to ARI 540 standard. The compressors are equipped with internal motor protection, factory installed crankcase heaters and rubber vibration isolators for quiet and efficient operation. As an option, semi-hermetic compressor can be fixed on anti-vibration mounting (spring type) along with suction & discharge line vibration eliminators. Oil pressure control is provided on units with semi-hermetic compressor only. Each compressor has lock-out devices to protect it from short cycling when tripped by safety controls. Each compressor has separate condenser coil with safety controls. Sight glass and filter drier are standard for all models.

## C. CONDENSER COILS

**V & W**-configurations condenser coils are of the enhanced louvered fin-and-tube type, constructed of seamless 3/8" dia. & 0.014" (0.35mm) inner grooved copper tubes, mechanically bonded to aluminum fins for maximum heat transfer efficiency. **As an option, corrugated copper fins or acrylic coated aluminum fins or other coated coils may be provided.** The fins have full self spacing collars which completely cover each tube. The staggered tube design improves the thermal efficiency. End plates support sheets are heavy gauge galvanized steel with extruded collars for better tube support, formed to provide structural strength. Each coil is pressure tested in the factory at not less than 450 psi air pressure.

## D. CONDENSER FANS

Condenser fans are constructed of die cast aluminum blades/hubs with direct driven motors. All fans are statically and dynamically balanced to operate at minimum noise and vibration. Fan blades are designed with appropriate pitch angle which result in maximum airflow through the condenser coil.

## E. CONDENSER FAN MOTOR

Condenser fans, the impeller and motors are so constructed to form an integral unit. All fan motors shall be three phase with class 'F' winding insulation and ball bearings for high ambient application. These fan motors are of totally enclosed air over type (TEAO) with inherent thermal protection of automatic reset type & specially designed for outdoor applications.

## F. SERVICE VALVES

Both suction and liquid service valves are brass, back seating type with sweat connections. Valves are externally located so refrigerant piping connections can be made quickly and easily.

## G. CONTROL PANEL

The control panel design is equivalent to NEMA-4 standard with hinged door for easy access ensuring dust and weather-proof construction. Internal power and control wiring is neatly routed, properly anchored and all wires are 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.



## H. MICROPROCESSOR CONTROLLER

These condensing units are provided with a microprocessor control board incorporating the following features:

- **BALANCE LOADING OF COMPRESSORS:** The unit’s electronic control automatically operates lead/lag sequence of compressors. This is to load the compressors evenly over long periods of operation. If required however, compressor 1 can also be set to always lead. In this case, compressor 1 always starts first and stops last. (Selectable through dip switch setting on control board).
- **PUMP DOWN FUNCTION:** In units equipped with pump down system, the controller provides the time delay between solenoid’s opening and compressor starting to equalize the pressure in the system necessary for compressor to start-up. (Selectable through dip switch setting on control board).
- **COMPRESSOR ANTI-RECYCLING PROTECTION:** The controller has a built-in 3 minutes minimum off timer for compressor. This is for compressor protection in case of accidental manual re-set or immediate re-cycling of thermostat due to load demand.
- **COMPRESSOR LOCK-OUT FUNCTION:** If any of the unit’s safety control trips due to abnormal conditions, the electronic controls locks out the compressor after a pre-determined timing preventing a re-start unless attended by a qualified service technician. The unit can be re-started through thermostat re-set after ensuring safe system conditions.
- **FAULT DIAGNOSTICS:** In case of system fault, LED’s on the board emits a flashing signal indicating where the fault is. This is to guide the service technician in identifying the fault.
- **DIGITAL I/O’s:** The unit’s control board is compatible to operate with a DDC controller or any standard 24V a.c. thermostat commercially available.
- **SEQUENTIAL CONTROL:** With input signals from the thermostat, the motors in the equipment is started in sequential order: supply fan – condenser fan – compressor; at a pre-determined timings.

## I. COMPRESSOR OVER LOAD PROTECTOR

The compressors has built-in thermal protector for its protection against high winding temperatures. Motor starter control is equipped with an external overload relay as an additional protection against overload.

## J. UNDER VOLTAGE MONITOR (UVM)

This device protects the motors in the unit from faults such as; under or over voltage, unbalance & phase reversal of the power supply. When the device sensed such faults, it will cut-off the supply in the control circuit thereby cutting off power to the motors. The voltage monitor will re-set automatically when power is brought back to it’s normal conditions.

LINE VOLTAGE RANGE	TRIP & RE-SET VOLTAGE (% OF SET POINT)					
	UNDER VOLTAGE		OVER VOLTAGE		PHASE IMBALANCE	
	TRIP	RE-SET	TRIP	RE-SET	TRIP	RE-SET
190 - 480 VAC	90%	93%	110%	107%	6%	4.5%

## K. CRANKCASE HEATERS

Each compressor has crankcase heater. The compressor crankcase heater is always on when the compressor is de-energized. This protects the system against refrigerant migration, oil dilution and potential compressor failure.

## L. FILTER DRIER

Refrigerant circuits are kept free of harmful moisture, sludge, acids and oil contaminating particles by the filter drier. Cartridge (sealed type) is standard for model CCL020 - CCL055 and for all other models replaceable core filter drier is provided.

## M. SIGHT GLASS

Moisture indicating sight glass (supplied loose) to be installed in liquid line in the field. Easy to read color indicator shows moisture contents and provides a mean for checking the system refrigerant charge.

## OPTIONS & ACCESSORIES

### A. CAPACITY CONTROL

On semi-hermetic compressors, capacity control is achieved by cycling compressors on /off and cylinder unloading. The use of unloading provides good part load capacities.

### B. HOT GAS BYPASS CONTROL

Hot gas bypass is available as an option on the lead circuit to permit operation of the system down to 80 % of its unloaded capacity. Under low ambient condition, it controls temperature by eliminating the need to cycle the compressor on and off, ensuring narrow temperature swing and lengthen the life span of the compressor.

### C. ADVANCE MICROPROCESSOR

Advance microprocessor control can be offered to achieve precise control and safety functions of the condensing units. Microprocessor is simple to use, push button keyboard allows to access the operating conditions, control set points and alarm history clearly displayed on a multi-line backed illuminated LCD panel. Also it's compatible with building management system and adoptable to LON protocol.

### D. FAN CYCLE SWITCH HEAD PRESSURE CONTROL (FCS)

The capacity of air-cooled condensers varies with the difference between condensing temperature and condenser entering air temperate (ambient temperature). It increases as this difference increases. For a given capacity, a drop in the ambient temperature will lower the condensing temperatures and if the ambient temperature drops below a given limit, head pressure control is required.

Control shall be set for a minimum of 95°F (35°C) saturated refrigerant condensing temperature, or to suit the specified application.

### E. PUMP DOWN SOLENOID VALVE (PDS)

A pump down solenoid valve may be installed in the liquid line. When the room thermostat is satisfied, the valve closes and the compressor continues to run until a substantial portion of the refrigerant has been pumped out from the evaporator. The low-pressure switch will cycle off the compressor at a predetermined evaporator pressure.

### F. ADJUSTABLE HIGH PRESSURE SWITCH (HPS)

Field adjustable high pressure switch provides safety protection in the case of excessive discharge pressure. Typical factory pressure settings are shown in table below.

OPEN	CLOSE
450 ± 10 Psig	360 ± 15 Psig

### G. ADJUSTABLE LOW PRESSURE SWITCH (LPS)

Field adjustable low pressure switch provides safety protection in the case of low suction pressure and loss of refrigerant charge. Typical factory pressure settings are shown in table below.

OPEN	CLOSE
25 ± 5 Psig	50 ± 5 Psig

### H. CIRCUIT BREAKER

Protect against compressor & condenser fans branch circuit fault. When tripped (Manually or automatically), the breaker opens the power supply to the compressor and control circuit through auxiliary contacts.

### I. PRESSURE GAUGES

Suction, discharge and oil (semi hermetic compressor only) pressure gauges.

### J. DISCHARGE LINE MUFFLERS

Discharge line mufflers are installed to eliminate noise due to refrigerant pulsation.

**K. SPRING ISOLATORS (for semi-hermetic compressors only)**

Compressors with spring isolators and vibration eliminators reduces the vibration transmitted from compressor to the piping and unit structure.

**L. CONDENSER COIL GUARD**

Protect the condenser coil from physical damage.

**M. THERMO-GUARD COATED CONDENSER**

Copper/aluminum fins/ tubes condenser coils for seashore salty corrosive environment. Specify your requirement during order entry.

**STANDARD FEATURES/OPTIONS**

DESCRIPTION	STANDARD FEATURES	OPTIONS
Dual scroll compressor (for CCL020 - CCL055 only)	■	
Dual semi-hermetic compressor (for CCL065 - CCL095 only)	■	
Capacity control for semi-hermetic compressor on lead compressor		■
Compressor crankcase heaters	■	
Compressor circuit breakers		■
Compressor overload protection	■	
Spring isolators with vibration eliminators for semi-hermetic compressor		■
Compressor shut-off valves for scroll compressor		■
Condenser fan motor, totally enclosed air-over type	■	
Condenser fan - direct drive, propeller type	■	
Condenser fan guard	■	
UVM (Under Voltage Monitor)	■	
Filter drier (sealed type) for units upto CCL055	■	
Filter drier (replaceable type) for units CCL065 & above	■	
Sight glass (moisture indication)	■	
High/low pressure switch (fixed type)	■	
High/low pressure switch (adjustable type)		■
Fan cycling (low ambient)		■
Pump down solenoid valve		■
Pressure relief valve		■
Suction & discharge pressure gauges for scroll compressor		■
Suction, discharge & oil pressure gauges for semi-hermetic compressor		■
PIII controller	■	
Microsmart controller		■
Coil guard		■
Aluminum fins condenser coil	■	
Copper & coated fins condenser coil		■
Thermo-guard coating on aluminum/copper coil		■
Hot gas bypass		■
Liquid line isolating valves	■	
Volt free contact (status indication)		■
Discharge line muffler		■
Refrigerant charge		■

# PHYSICAL DATA

MODEL NUMBER		CCL020	CCL025	CCL030	CCL035	CCL040	CCL050	CCL055	CCL065	CCL080	CCL095
NOMINAL CAPACITY , TONS*		18	22.5	27.2	34.5	41.9	50	55.8	66	78	93.4
NUMBER OF REFRIGERATION CIRCUIT		Dual	Dual	Dual	Dual	Dual	Dual	Dual	Dual	Dual	Dual
COMPRESSOR	Type	Scroll							Semi-hermetic reciprocating		
	Oil per system (liters)	3.25	3.25	3.25	4.7	5.91	5.9/6.3	6.3	7.4	7.4	7.7
	Refrigerant	R-407c									
	Charge per system (oz)**	330	410	490	630	760	760/1010	1010	1190	1410	1680
CONDENSER FAN	Type	Propeller									
	Qty. – Diameter (inch)	2 – 30	2 – 32	2 – 32	4 – 30	4 – 30	4 – 32	4 – 32	6 – 32	6 – 32	6 – 32
	Nominal CFM	13000	20412	19092	26000	26000	39464	38184	59400	55152	62820
	Motor HP – RPM	1.5 – 950	2 – 920	2 – 920	1.5 – 950	1.5 – 950	2 – 920	2 – 920	2 – 920	2 – 920	2 – 920
CONDENSER COIL	Type	Inner grooved tubes and enhanced fins									
	Tube Dia–Rows–Fins per inch	3/8–3–14	3/8–3–14	3/8–4–14	3/8–3–14	3/8–4–14	3/8–4–14 3/8–3–14	3/8–4–14	3/8–3–14	3/8–4–14	3/8–4–14
	Total face area (Sq. ft.)	36.1	36.1	36.1	59.5	72.25	72.25	72.25	100	100	137
HIGH PRESSURE SWITCH	Open (PSIG)	450 ± 10	450 ± 10	450 ± 10	450 ± 10	450 ± 10	450 ± 10	450 ± 10	450 ± 10	450 ± 10	450 ± 10
	Close (PSIG)	360 ± 15	360 ± 15	360 ± 15	360 ± 15	360 ± 15	360 ± 15	360 ± 15	360 ± 15	360 ± 15	360 ± 15
LOW PRESSURE SWITCH	Open (PSIG)	25± 5	25± 5	25± 5	25± 5	25± 5	25± 5	25± 5	25± 5	25± 5	25± 5
	Close (PSIG)	50 ± 5	50 ± 5	50 ± 5	50 ± 5	50 ± 5	50 ± 5	50 ± 5	50 ± 5	50 ± 5	50 ± 5
REFRIGERANT LINES+	Suction line size (OD), inch	1-3/8	1-3/8	1-5/8	1-5/8	1-5/8	2-1/8	2-1/8	2-1/8	2-5/8	2-5/8
	Liquid line size (OD), inch	5/8	5/8	7/8	7/8	7/8	7/8	7/8	7/8	1-1/8	1-1/8
SOUND PRESSURE LEVEL, dBA (@ 3/5/10 meter)**		65.3/61.8/56.5	65.4/61.8/56.6	68.2/64.7/59.5	68.4/64.8/59.6	68.5/65/59.7	68.8/65.3/60	68.9/65.4/60.1	69.4/65.8/60.8	70.5/66.9/61.7	70.6/67/61.8
OPERATING WEIGHT, Kg.+++		748	765	1058	1159	1441	1486	1520	1835	2211	2558

**NOTE:**

- \* Nominal cooling capacity @ 95°F outdoor and 45°F saturated suction temperatures.
- \*\* Operating system charge is applicable when matched with air handling units & connected by 25 feet of refrigerant piping.
- + Pipe sizes are for runs up to 50 feet to indoor unit. For refrigerant lines longer than 50 feet, use next larger size.
- ++ Based on free field area at ARI conditions. Tolerance: ±2dBA.
- +++ Values indicated are for standard unit with aluminum fin condenser coils.

## SELECTION PROCEDURE

1. Enter performance tables at specified SST and desired ambient conditions to find gross capacity and power input.

2. HEAT REJECTION:

Calculate condenser Total Heat Rejection Capacity as follows:

$$HR = \text{Unit cooling capacity} + (3.41 \times \text{Total Unit Power Input, Watts}).$$

3. HEAD PRESSURE:

To determine head pressure (psig) use the following conversion table:

Condensing Temp. - °F.	100	110	120	130	140	150	160
(R-407c - Dew) Head Pressure - PSIG.	200	235	263	305	350	400	460

4. CORRECTION FACTORS FOR ALTITUDE:

ALTITUDE (FT.)		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

SST (°F)	AMBIENT TEMPERATURE																			
	85°F				95°F				105°F				115°F				122°F			
	TC (MBH)	CT (°F)	PI (kW)	TC (MBH)	CT (°F)	PI (kW)	TC (MBH)	CT (°F)	PI (kW)	TC (MBH)	CT (°F)	PI (kW)	TC (MBH)	CT (°F)	PI (kW)	TC (MBH)	CT (°F)	PI (kW)		
30 °F	CCL020	171	105	15.9	160	114	17.7	150	124	19.6	139	133	21.8	132	140	23.4				
	CCL025	214	103	19.5	201	12	21.5	188	122	23.8	174	132	26.2	164	138	27.9				
	CCL030	259	105	23	243	114	25.5	228	124	28.4	212	133	31.7	202	140	34.3				
	CCL035	330	105	29.8	311	115	32.9	288	124	36.7	263	133	41.2	243	140	44.9				
	CCL040	395	105	34.7	376	114	38.2	349	124	42.3	315	133	47	287	139	50.6				
	*CCL050	466	103	39.8	443	113	44.3	410	122	48.6	368	131	52.6	334	138	55.3				
	CCL055	531	105	44.6	501	114	50.1	460	124	54.4	409	132	57.8	368	138	59.6				
	CCL065	633	104	61.6	588	113	64.7	543	122	67.5	496	131	70.0	462	138	71.5				
	CCL080	751	105	71.4	695	114	75.2	639	123	78.4	585	132	81.1	547	139	82.7				
	CCL095	904	105	85.6	838	114	90.2	771	123	94.1	703	132	97.5	654	139	99.4				
35 °F	CCL020	189	106	16.2	177	116	18	166	125	20	155	135	22.2	147	142	23.8				
	CCL025	237	105	19.9	222	114	22.0	208	124	24.2	193	133	26.7	182	140	28.6				
	CCL030	286.4	106	23.4	269	116	26	252	125	29	235	135	32.4	224	142	35				
	CCL035	365	107	30.5	343	116	33.6	319	126	37.5	292	135	42.1	272	142	45.7				
	CCL040	435	106	35.5	410	116	39.1	389	126	43.4	370	135	48.4	359	142	52.5				
	*CCL050	516	105	40.7	485	114	44.6	455	124	49.8	428	134	56.4	410	141	61.9				
	CCL055	531	105	44.6	501	114	50.1	460	124	54.4	409	132	57.8	368	138	59.6				
	CCL065	701	106	64.2	653	115	67.8	603	124	71.0	550	133	73.8	512	139	75.6				
	CCL080	832	107	74.7	771	116	78.9	710	125	82.6	651	134	85.7	610	140	87.5				
	CCL095	999	107	89.4	928	116	94.5	855	125	99.0	780	134	102.9	726	140	105.2				
40 °F	CCL020	208	108	16.5	196	118	18.3	183	127	20.3	171	136	22.6	163	143	24.3				
	CCL025	261	106	20.3	225	116	22.4	229	125	24.8	213	135	27.3	202	141	29.2				
	CCL030	315	108	23.9	297	118	26.6	278	127	29.6	259	137	33	246	143	35.6				
	CCL035	401	109	31.2	378	118	34.5	352	127	38.4	323	137	43.0	302	143	46.6				
	CCL040	478	108	36.5	452	118	40.1	428	127	44.4	404	137	49.4	389	144	53.3				
	*CCL050	568	107	41.7	536	116	45.9	503	126	50.9	469	135	56.7	446	142	61.4				
	CCL055	647	109	46.7	608	118	51.6	567	127	57.6	524	137	64.6	493	143	70.1				
	CCL065	774	108	66.9	721	117	70.9	665	126	74.5	608	135	77.7	566	141	79.7				
	CCL080	918	109	78	851	118	82.7	785	127	86.8	721	136	90.3	677	142	92.4				
	CCL095	1100	109	93.1	1022	118	98.8	942	127	103.8	860	136	108.3	801	142	111.0				

**LEGEND:**

SST - Saturated Suction Temperature    TC - Total Capacity (1000 BTU/H) Gross    CT - Condensing Temperature    PI - Total unit power input  
 \* CCL050 has two different compressors. System 1 have 57% from total capacity.

# PERFORMANCE DATA

SST (°F)	MODEL	AMBIENT TEMPERATURE														
		85°F			95°F			105°F			115°F			122°F		
		TC (MBH)	CT (°F)	PI (KW)	TC (MBH)	CT (°F)	PI (KW)	TC (MBH)	CT (°F)	PI (KW)	TC (MBH)	CT (°F)	PI (KW)	TC (MBH)	CT (°F)	PI (KW)
45 °F	CCL020	229	110	16.8	215	119	18.7	202	129	20.7	188	138	23	179	145	24.8
	CCL025	286	108	20.8	269	118	22.9	252	127	25.3	235	136	27.9	222	143	29.9
	CCL030	346	110	24.4	326	119	27.2	306	129	30.2	285	138	33.6	270	145	36.3
	CCL035	440	111	32.1	415	120	35.4	387	129	39.3	356	138	43.9	333	145	47.5
	CCL040	538	111	37.6	503	120	41.3	480	128	45	456	139	51.5	437	145	55
	*CCL050	632	109	43.1	595	118	47.3	560	127	51.5	524	136	56.0	496	143	59.4
	CCL055	714	111	48.7	670	120	53.3	620	129	57.7	565	138	61.8	523	143	64.5
	CCL065	851	110	69.6	792	119	74.0	732	128	78.0	669	136	81.6	624	142	83.8
	CCL080	1009	111	81.5	936	120	86.5	865	129	91	794	138	95	746	144	97.4
	CCL095	1205	111	96.8	1121	120	103.1	1033	129	108.6	944	138	113.6	880	144	116.7
50 °F	CCL020	251	112	17.1	236	121	19	222	131	21.1	207	140	23.5	197	147	25.3
	CCL025	314	110	21.4	296	119	23.5	277	129	25.9	258	138	28.6	245	145	30.6
	CCL030	378	112	25	357	121	28.8	335	131	30.9	313	140	34.3	297	147	37
	CCL035	482	113	33.0	454	122	36.3	424	131	40.3	391	140	44.9	367	147	48.5
	CCL040	622	114	39.2	547	122	42.4	520	131	47.4	498	141	52.4	478	148	56.1
	*CCL050	710	112	44.4	656	120	48.5	611	129	54.0	578	139	59.0	555	146	63.4
	CCL055	782	113	49.7	736	122	54.6	687	131	60.3	636	140	66.9	599	147	72
	CCL065	932	112	72.3	868	121	77.1	803	130	81.5	736	138	85.4	688	144	87.9
	CCL080	1105	114	85	1027	122	90.4	949	131	95.3	870	140	99.8	814	146	102.6
	CCL095	1314	113	100.5	1222	122	107.2	1128	131	113.3	1032	139	118.8	963	145	122.2

**LEGEND:**

- SST - Saturated Suction Temperature
- TC - Total Capacity (1000 BTUH) Gross
- CT - Condensing Temperature
- PI - Total unit power input

\* CCL050 has two different compressors. System 1 have 57% from total capacity.

# ELECTRICAL DATA

MODEL NUMBER	SUPPLY VOLTAGE			COMPRESSOR				CONDENSER FAN MOTORS				CRANKCASE HEATER					
	Nominal (V-Ph-Hz)	Min.	Max.	MCA	MOCP	Qty.	RLA (each)	LRA (each)	CB Poles	Qty.	FLA (each)	LRA (each)	OUTPUT POWER	CB (Qty.)	Volts	Total Watts	Total Amps
CCL020	380/415-3-50	342	457	46.52	60	2	17.9	125	3	2	3.12	19	1.5	1	380	45	0.12
CCL025	380/415-3-50	342	457	51.53	70	2	20.5	140	3	2	2.7	13.9	2	1	380	90	0.24
CCL030	380/415-3-50	342	457	63	90	2	25.6	173	3	2	2.7	13.9	2	1	380	45	0.12
CCL035	380/415-3-50	342	457	80.21	110	2	30.1	225	3	4	3.12	19	1.5	2	380	61	0.16
CCL040	380/415-3-50	342	457	91.91	120	2	35.3	250	3	4	3.12	19	1.5	2	380	120	3.2
CCL050	380/415-3-50	342	457	109.48	160	2	35.3/50.7	250/310	3	4	2.7	13.9	2	2	380	120	3.2
CCL055	380/415-3-50	342	457	130.28	170	2	50.7	310	3	4	2.7	13.9	2	2	380	120	3.2
CCL065	380/415-3-50	342	457	150.75	210	2	59.8	304	3	6	2.7	13.9	2	3	240	200	0.83
CCL080	380/415-3-50	342	457	179.12	250	2	72.41	393	3	6	2.7	13.9	2	3	240	200	0.83
CCL095	380/415-3-50	342	457	191.93	290	2	85.3	476	3	6	2.7	13.9	2	3	240	200	0.83

**LEGEND:**

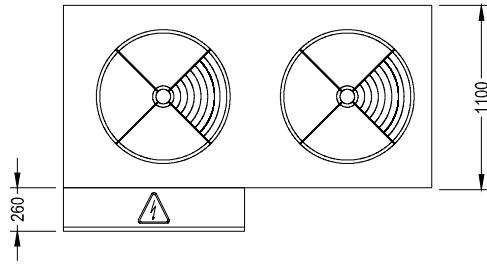
- MCA - Minimum Circuit Ampacity
- MOCP - Maximum Over Current Protection
- RLA - Rated Load Amps
- LRA - Locked Rotor Amps
- FLA - Full Load Amps
- CB - Circuit Breaker



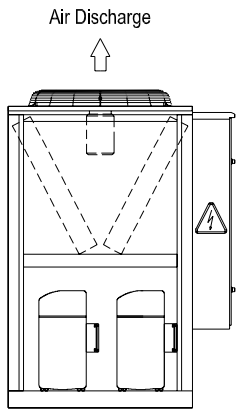
# DIMENSIONS

## CCL020, CCL025 & CCL030

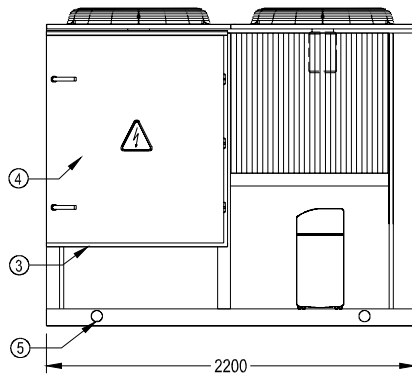
- ① System 1 Suction / Liquid
- ② System 2 Suction / Liquid
- ③ Electric power inlet
- ④ Electrical control box
- ⑤ Lifting points



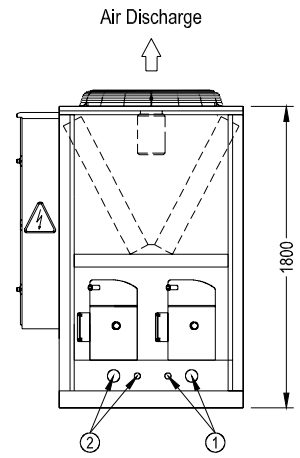
**TOP VIEW**



**END VIEW**



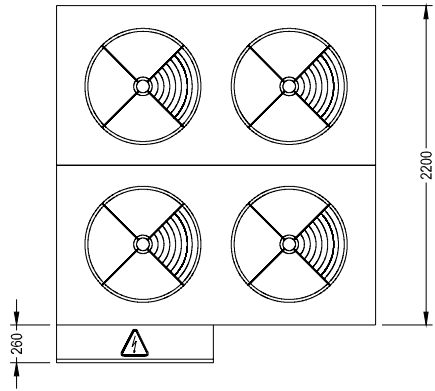
**FRONT VIEW**



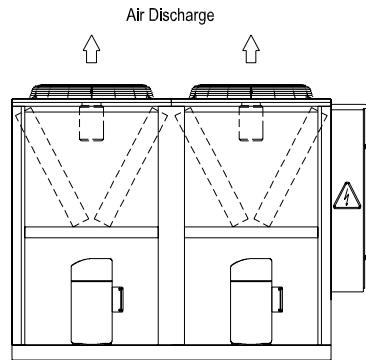
**END VIEW**

## CCL035, CCL040, CCL050 & CCL055

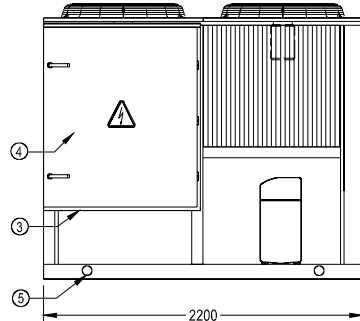
- ① System 1 Suction / Liquid
- ② System 2 Suction / Liquid
- ③ Electric power inlet
- ④ Electrical control box
- ⑤ Lifting points



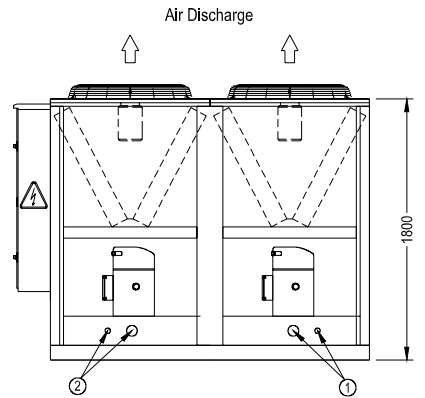
**TOP VIEW**



**END VIEW**



**FRONT VIEW**



**END VIEW**

**NOTE:** All dimensions are in mm.

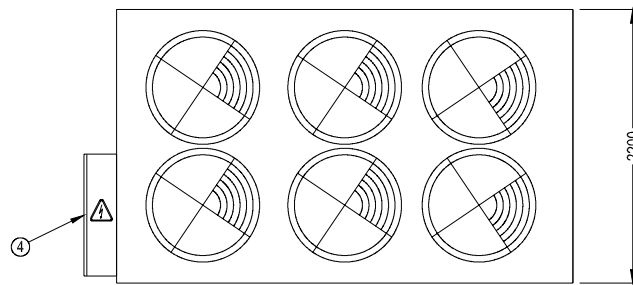
# DIMENSIONS

## CCL065, CCL080 & CCL095

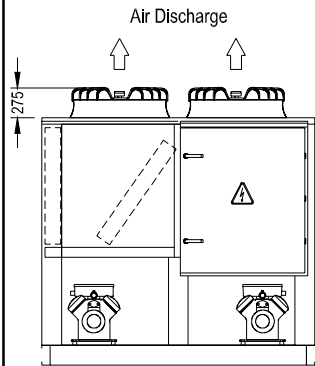
- ① System 1 Suction / Liquid
- ② System 2 Suction / Liquid
- ③ Electric power inlet
- ④ Electrical control box
- ⑤ Lifting points

### DIMENSIONS

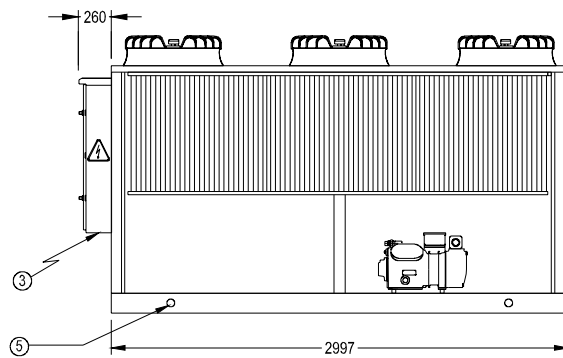
MODEL	H
CCL065	2075
CCL080	2075
CCL095	2405



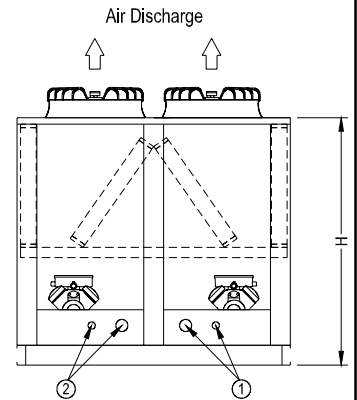
**TOP VIEW**



**END VIEW**



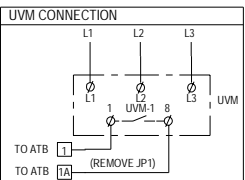
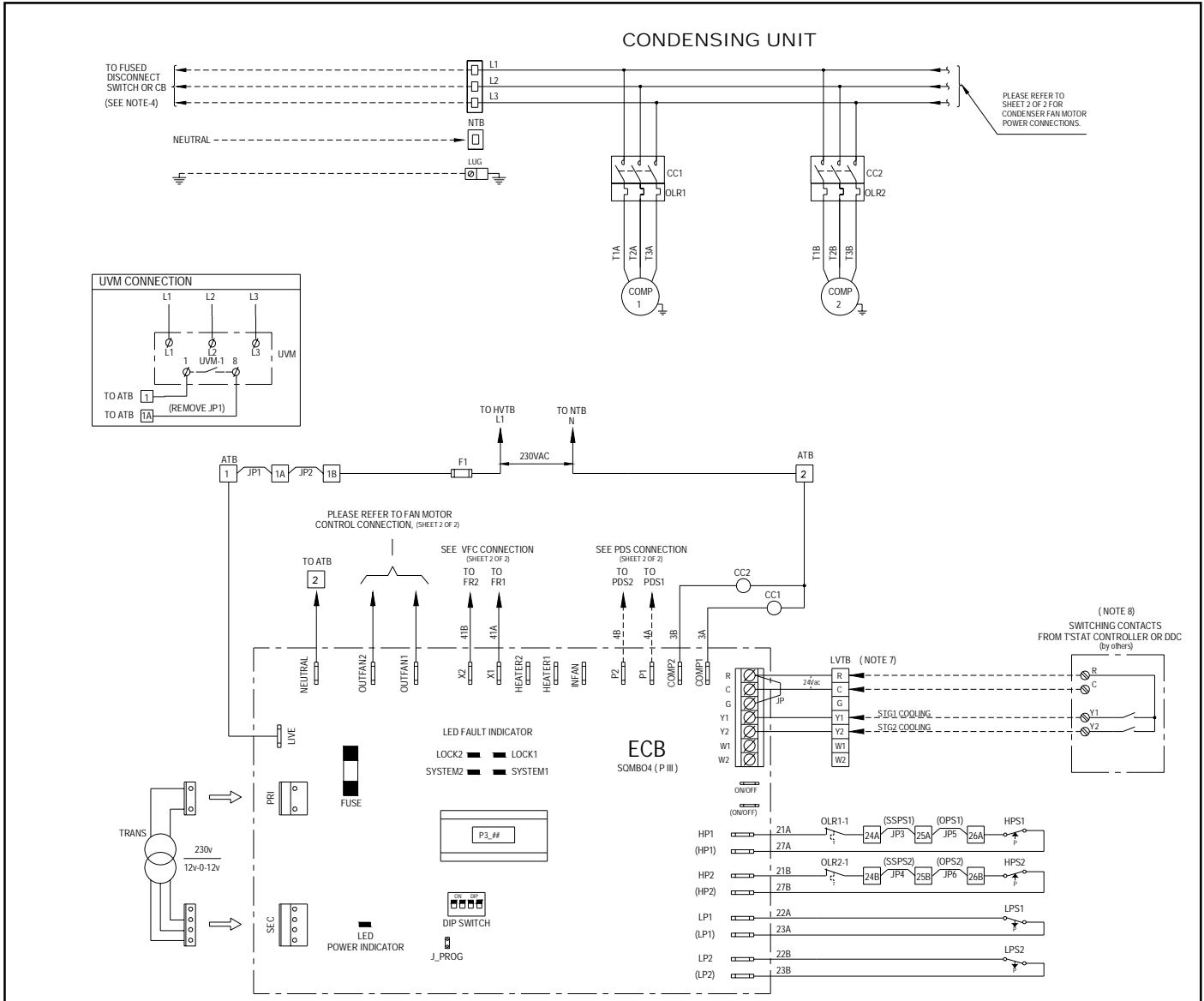
**FRONT VIEW**



**END VIEW**

**NOTE:** All dimensions are in mm.

# TYPICAL SCHEMATIC WIRING DIAGRAM

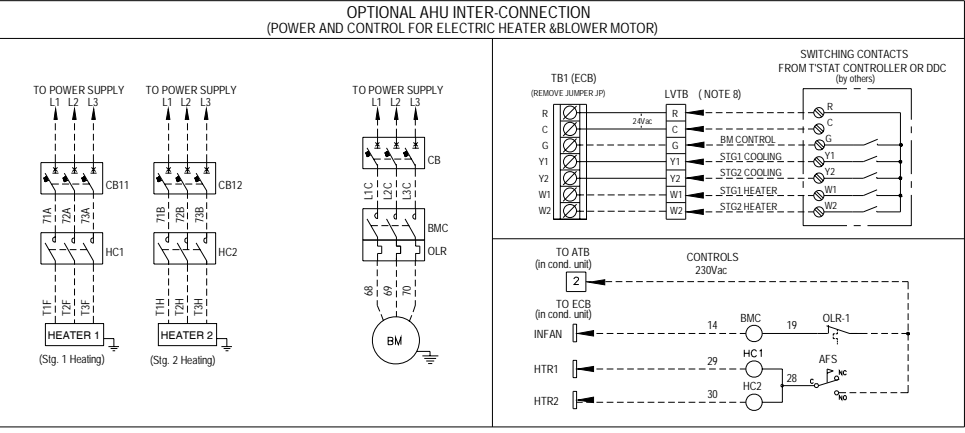


PLEASE REFER TO SHEET 2 OF 2 FOR CONDENSER FAN MOTOR POWER CONNECTIONS.

(NOTE 8) SWITCHING CONTACTS FROM TSTAT CONTROLLER OR DDC (By others)

PRESSURE SWITCH SETTINGS		
NAME	OPEN (PSIG)	CLOSE (PSIG)
LPS1 & 2	25 ± 5	50 ± 5
LPS & LPS3 & 4	55	45
LPS5 & 6	65	55
HPS1 & 2	450 ± 10	360 ± 15
FCS1 & 2	190 ± 10	290 ± 15

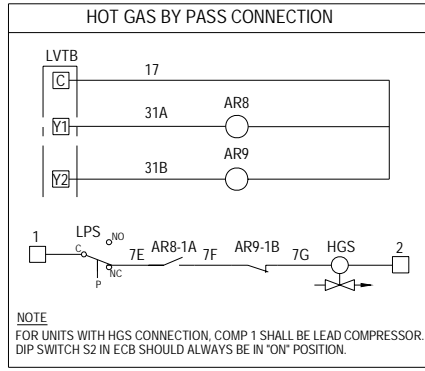
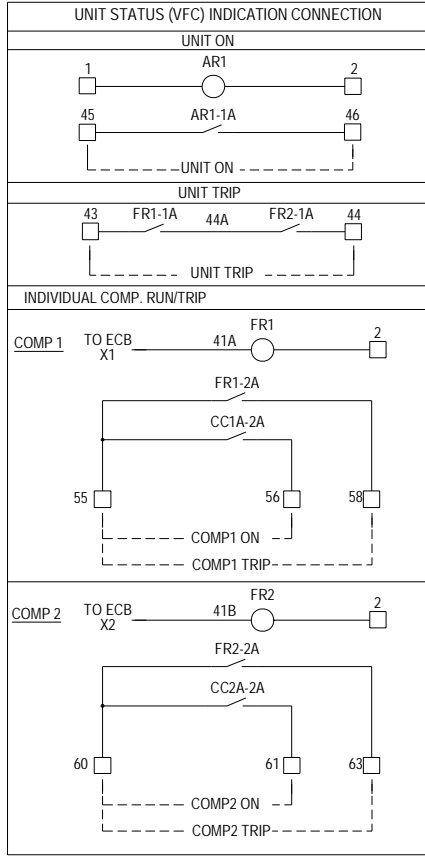
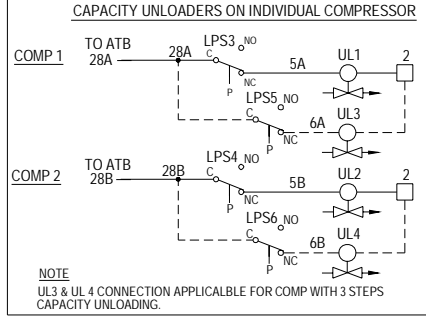
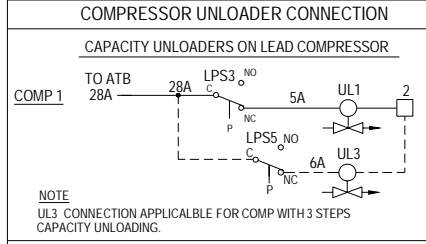
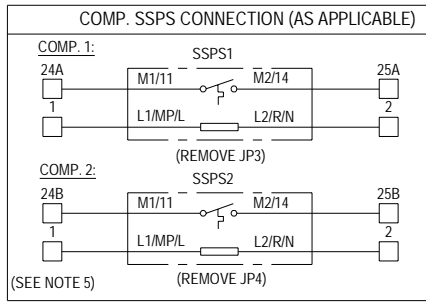
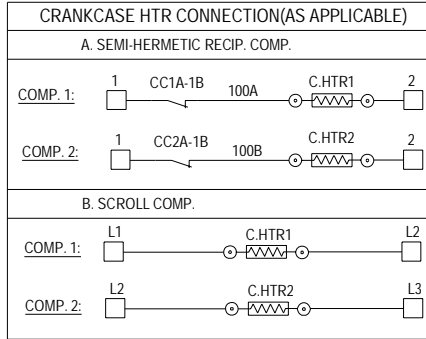
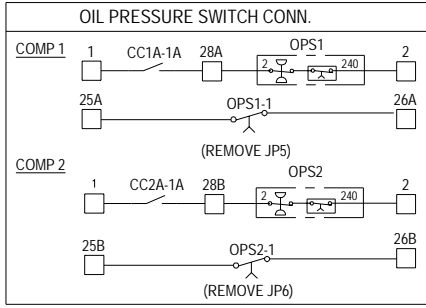
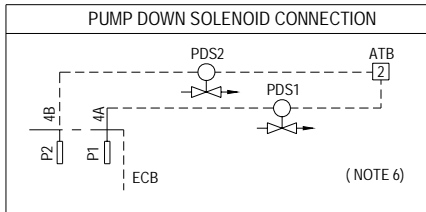
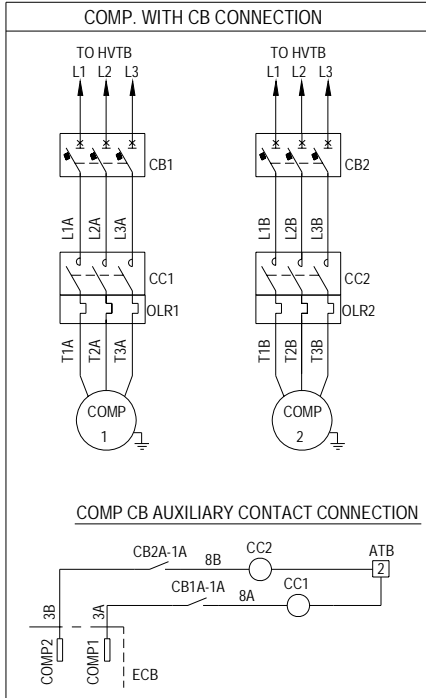
ECB DIP SWITCH SETTINGS & LED INDICATORS				
S1	OFF=TEST MODE DISABLE	ON= TEST MODE ENABLE		
S2	OFF= LOAD BALANCE (Comp1&2 Auto Lead Lag)	ON= COMPRESSOR 1 LEAD		
S3	OFF= WITHOUT PUMP DOWN	ON= WITH PUMP DOWN OPTION		
S4	on-board programming function (always set to on)			
FACTORY SETTINGS OF DIP SWITCHES			LED INDICATORS	
DIP SWITCH #	S1	S2	S3	S4
ON	✓	✓	✓	✓
OFF	✓	✓	✓	✓
note: Set dip switch #3 according to unit's option (pump down or no pump down)				
Green	power on/off indicator			
Red	system lock-out due to system fault			
Yellow	system 1 fault diagnostic			
	blinking slow - LPS1 ckt fault			
	blinking fast - HPS1 ckt fault			
Orange	system 2 fault diagnostic			
	blinking slow - LPS2 ckt fault			
	blinking fast - HPS2 ckt fault			



**NOTE:** 1. Refer to next page for legend, notes & wiring diagram for optional items.  
2. Refer to unit control box (inside panel) for exact wiring diagram.

# TYPICAL SCHEMATIC WIRING DIAGRAM

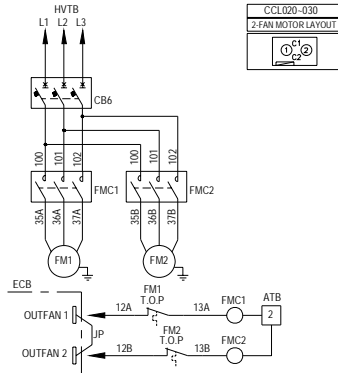
## OPTIONAL CONNECTIONS



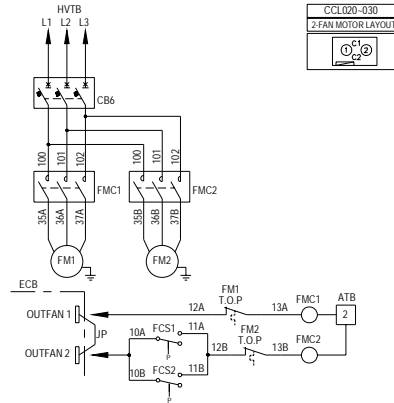
# TYPICAL SCHEMATIC WIRING DIAGRAM

## CONDENSER FAN MOTOR POWER & CONTROL CONNECTIONS

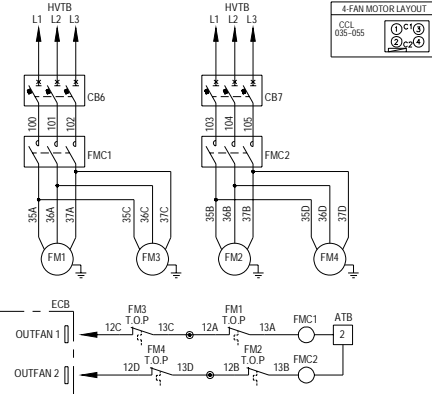
STANDARD CONNECTION (CCL020-030)



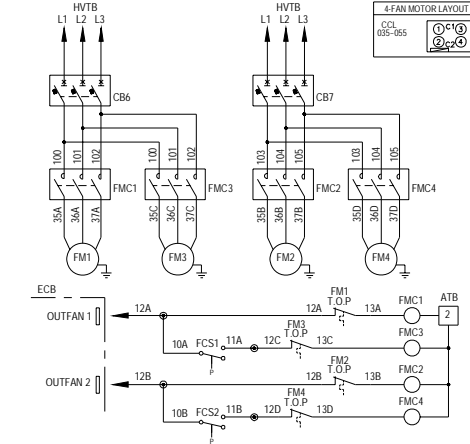
WITH OPTIONAL FCS CONNECTION (CCL020-030)



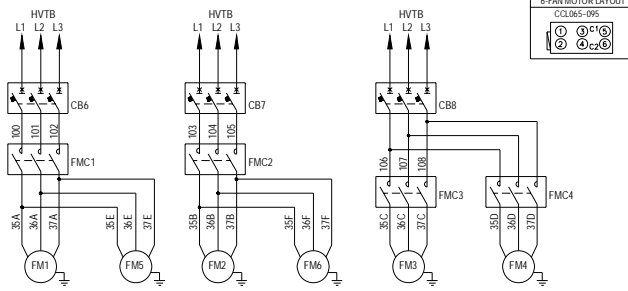
STANDARD CONNECTION (CCL035-055)



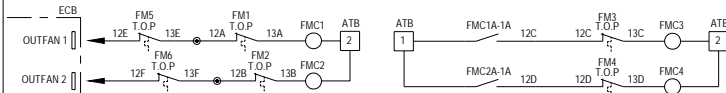
WITH OPTIONAL FCS CONNECTION (CCL035-055)



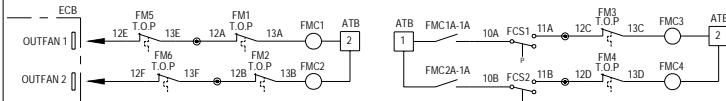
## FAN MOTOR POWER AND CONTROL CONNECTIONS (CCL065-095)



STANDARD CONNECTION (WITHOUT FCS)



WITH OPTIONAL FCS CONNECTION



### LEGEND

AHU	AIR HANDLING UNIT
AFS	AIR FLOW SWITCH
AR	AUXILIARY RELAY
ATB	AUXILIARY TERMINAL BLOCK
BM	BLOWER MOTOR
BMC	BLOWER MOTOR CONTACTOR
CC	COMPRESSOR CONTACTOR
CCA	CC AUXILIARY CONTACT
CB	CIRCUIT BREAKER
C. HTR	CRANKCASE HEATER
COMP	COMPRESSOR
ECB	ELECTRONIC CONTROL BOARD
F	FUSE
FCS	FAN CYCLING SWITCH
FM	FAN MOTOR (CONDENSER)
FMC	FAN MOTOR CONTACTOR
FMCA	FMC AUXILIARY CONTACT
FR	FAULT RELAY
HC	HEATER CONTACTOR
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
OLR	OVER LOAD RELAY
OPS	OIL PRESSURE SWITCH
P	PRESSURE
PDS	PUMP DOWN SOLENOID
S	DIP SWITCH (IN ECB)
SSPS	SOLID STATE PROTECTION SYSTEM
TOP	FM THERMAL OVERLOAD PROTECTION
TRANS	TRANSFORMER
UL	COMP. UNLOADER SOLENOID
UVM	UNDER VOLTAGE MONITOR
---	FIELD WIRING
□	TERMINAL BLOCK OR TERMINATION POINT
⊙	SPLICE-CLOSED END

### NOTES

- POWER SUPPLY, 380/415V-3Ph-50Hz.
- ANY WIRE REPLACEMENT SHOULD BE OF 90°C OR ITS EQUIVALENT. USE COPPER CONDUCTOR WIRES ONLY.
- 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.
- FUSED DISCONNECT SWITCH OR CIRCUIT BREAKER TO BE PROVIDED BY CONSUMER WITH RATING AS RECOMMENDED BY COOLINE.
- COMPRESSORS ARE PROVIDED WITH SSPS OR INTERNAL LINE BREAK THERMAL OVERLOAD PROTECTION.
- IF PDS IS FACTORY INSTALLED, PLEASE READ BROKEN LINES AS CONTINUOUS LINES.
- USE SHIELDED TYPE CABLE, #18 AWG (MIN.) FOR LVTB FIELD WIRING. GROUND CONNECT AT BOTH ENDS.
- COOLING OUTPUT SIGNAL FROM CONTROLLER SHOULD FOLLOW THE SEQUENCE:  
ON SEQUENCE - Y1 FIRST, THEN Y2.  
OFF SEQUENCE - Y2 FIRST, THEN Y1.

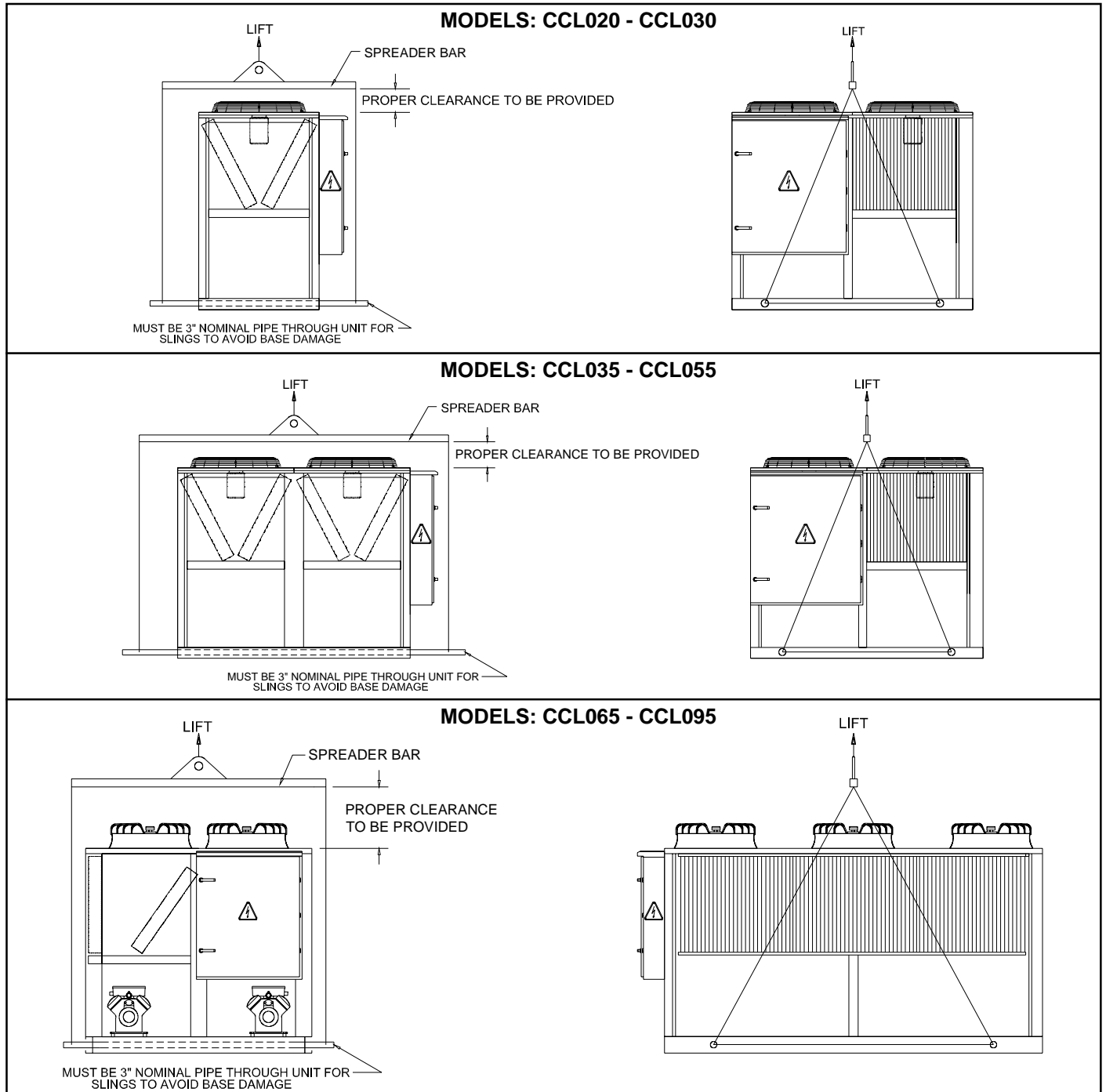
# RIGGING INSTRUCTIONS

## ATTENTION TO RIGGERS

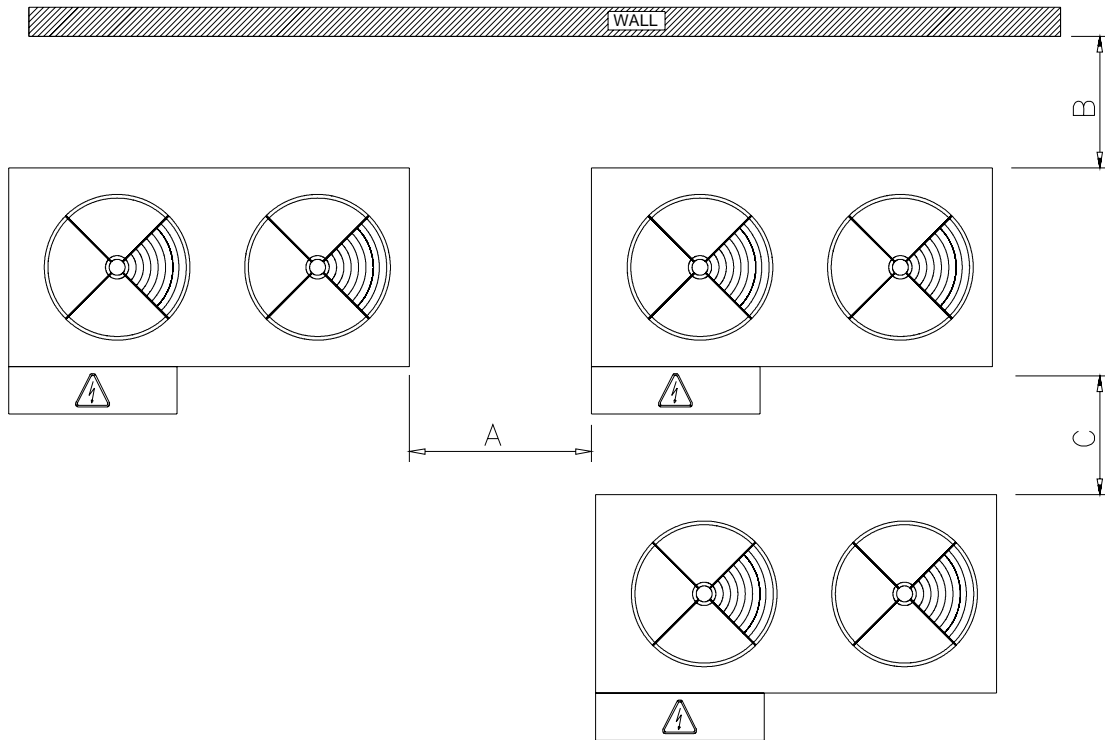
Hook rigging sling thru holes in base rail, as shown below.  
Holes in base rail are centered around the unit center of gravity.  
Center of gravity is not unit center line.  
Ensure center of gravity aligns with the main lifting point before lifting.  
Use spreader bar when rigging, to prevent the slings from damaging the unit.

## CAUTION

All panels should be in place when rigging.  
Care must be taken to avoid damage to the coils during handling.  
Insert packing material between coils & slings as necessary.

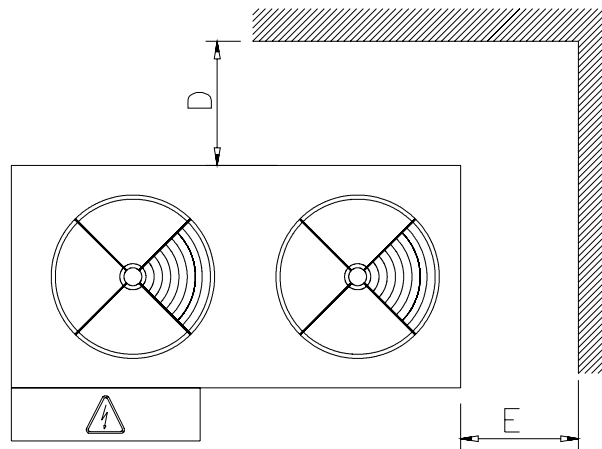


# INSTALLATION CLEARANCE



MODEL NUMBER	A	B	C	D	E
CCL020 - CCL030	1500	1500	1500	1500	1500
CCL035 - CCL055	1500	1500	2000	1500	1500
CCL065 - CCL095	2000	2000	3000	2000	2000

**FIGURE - 1  
STRAIGHT WALL**

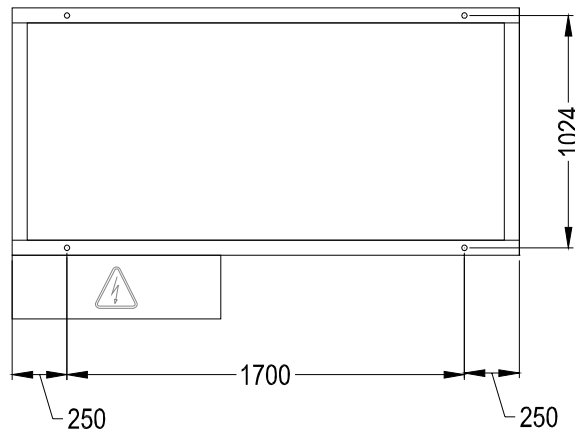


**FIGURE - 2  
CORNER WALL**

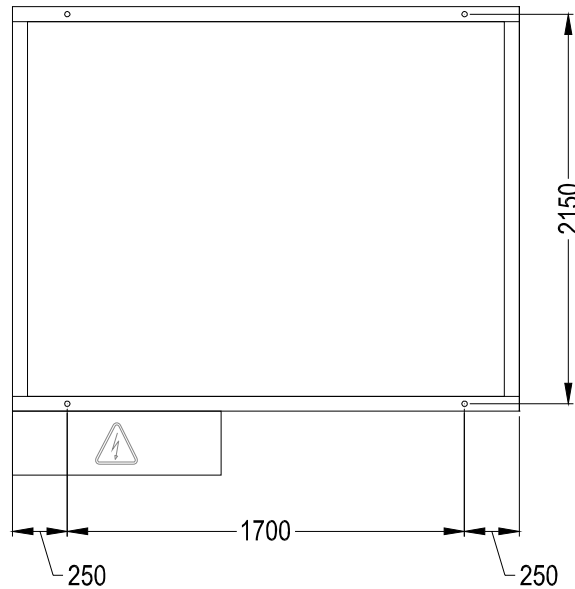
**NOTE:** 1. All dimensions are in mm.  
2. If unit is installed in special pit, please observe the same tolerance for walls. Pit height should not exceed the unit height.

# MOUNTING LOCATION

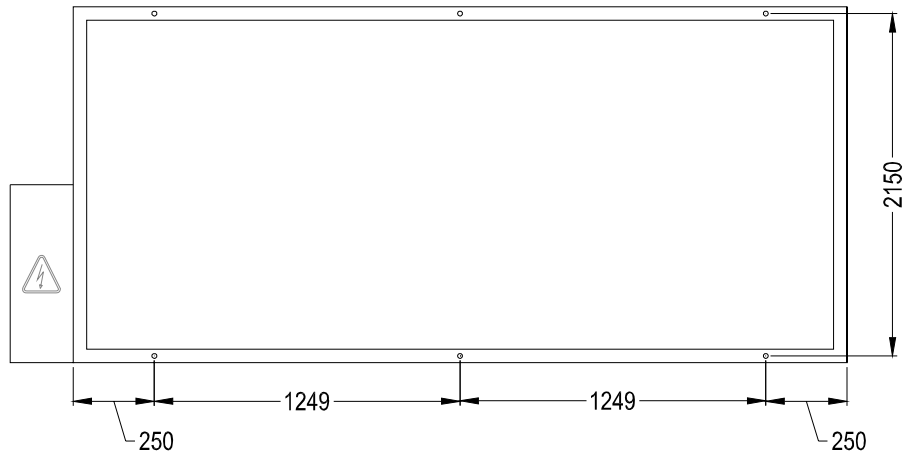
MODELS: CCL020 - CCL030



MODELS: CCL035 - CCL055



MODELS: CCL065 - CCL095



**NOTE:** All dimensions are in mm. Tolerance:  $\pm 2$ mm.

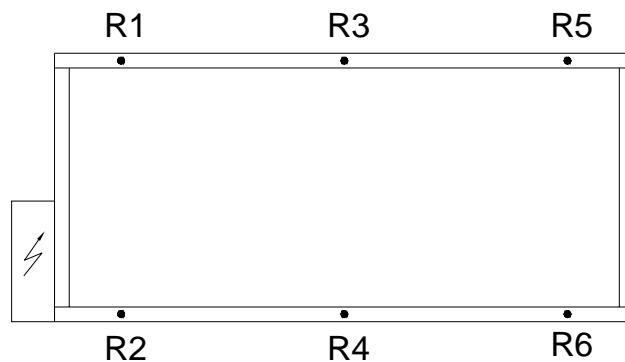
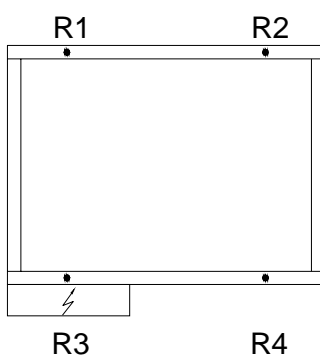


## LOAD DISTRIBUTION, kg. (ALUMINUM CONDENSER COIL)

MODEL No.	R1	R2	R3	R4	R5	R6
CCL020	140	210	195	203	-	-
CCL025	142	215	200	208	-	-
CCL030	217	278	275	288	-	-
CCL035	234	308	295	322	-	-
CCL040	296	392	350	403	-	-
CCL050	357	362	403	364		-
CCL055	364	370	410	376	-	-
CCL065	232	258	349	411	304	281
CCL080	289	315	450	465	343	349
CCL095	347	372	507	525	401	406

## LOAD DISTRIBUTION, kg. (COPPER CONDENSER COIL)

MODEL No.	R1	R2	R3	R4	R5	R6
CCL020	155	225	210	219	-	-
CCL025	161	241	230	238	-	-
CCL030	239	301	297	311	-	-
CCL035	267	341	328	355	-	-
CCL040	329	425	391	437	-	-
CCL050	382	387	427	391	-	-
CCL055	404	423	462	429	-	-
CCL065	269	296	395	453	331	319
CCL080	338	364	490	514	392	398
CCL095	413	439	574	591	467	473



# 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.

## SCROLL COMPRESSOR ROTATION

Scroll compressors are designed to operate in single direction only. Hence, care has to be taken to ensure correct rotation when the system is operated. Verification of correct rotation is by observing that the suction pressure drops and discharge pressure rises when compressor run. Reverse rotation results in abnormal sound, as well as, substantially low current draw and by interchanging power supply wire L1 & L3 will correct this problem.

## 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

When installing, allow sufficient space for airflow clearance, wiring, refrigerant piping and service. Allow proper clearance (refer to installation clearance diagram) all around and no obstruction above unit for proper airflow. 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. Use 4"x4"x1" thick rubber/cork mounting pads.

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 50 ft (15.24 m), obtain information from your nearest Cooline dealer/sales office.

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.

Compressors are already charged with the required amount of lubricant. There is no need to charge in the field. Make sure that no air & moisture enter the system as ester oil are hygroscopic in nature. The whole system should be leak tested and evacuated before charging the refrigerant.

#### Outdoor unit connected to factory matched indoor unit

Outdoor unit contains holding charge only. The correct system refrigerant charge for operation is given in the unit nameplate & physical data table 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.

**Warning:** Relieve all pressure before refrigerant system repair or final unit disposal to avoid personal injury or death. Use service ports and open all valves.

# 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.

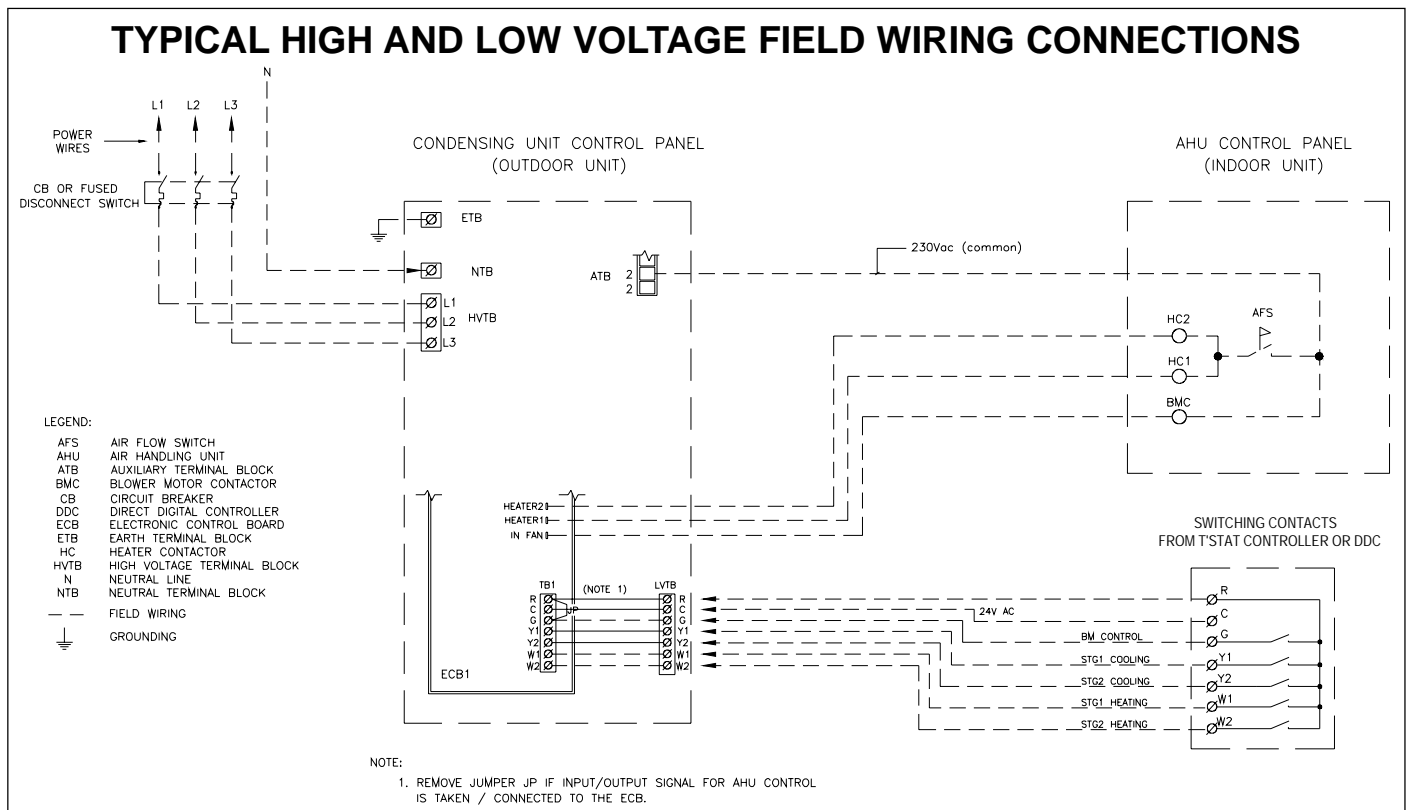
Connect ground wire to the ground lug inside the control box.

### 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

THESE 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 with low ambient operation option is 55°F.
- Maximum outdoor operating air temperature during cooling is 122°F.



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, Ikhtabar, 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](http://www.cooline.com)



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