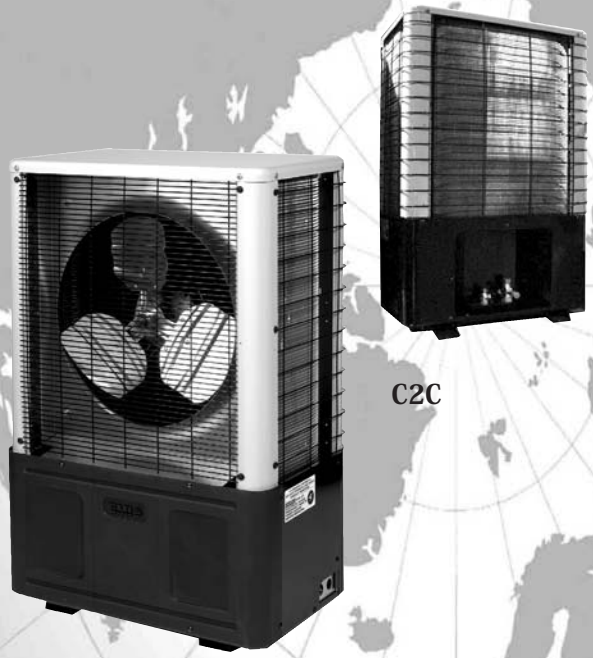
INSTALLATION, OPERATION AND MAINTENANCE MANUAL

C2C HIGH SEER DUCTLESS SPLIT SYSTEM SINGLE-ZONE CONDENSING UNIT

COOLING ONLY-C2C
Nominal Circuits:
9,000, 12,000, 15,000,
18,000 & 24,000 Btuh

EMI AmericaSeries
Comfort Where It Counts.



C2C

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An ECR International Brand
An ISO 9001-2000 Certified Company
P/N# 240004479, Rev. 1.3 [2/06]

C2C-COOLING ONLY SINGLE-ZONE DUCTLESS SPLIT CONDENSING UNIT

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

P/N 240004479, Rev. 1.3 [2/06]

This manual is intended as an aid to a qualified service personnel for proper installation, operation, and maintenance of EMI AmericaSeries high efficiency condensing units. Carefully read these instructions before attempting installation or operation. Failure to follow these instructions may result in improper installation, operation, service, or maintenance, possibly resulting in fire, electrical shock, property damage, personal injury, or death.

Shipping Damage MUST be Reported to the Carrier IMMEDIATELY!!! Examine the exterior. Remove cover and examine compressor and piping for signs of damage.

TO THE INSTALLER

(1) Retain this manual and warranty for future reference.

(2) Before leaving the premises, review this manual to be sure the unit has been installed correctly and run the unit for one complete cycle to make sure it functions properly.

To obtain technical service or warranty assistance during or after the installation of this unit, check our website @ www.enviromaster.com or call your installing contractor or distributor. Our technical service department may be contacted at 1-800-228-9364.

When calling for assistance, please have the following information ready:

- Model Number_____
- Serial Number_____
- Date of installation_____

⚠ DANGER ⚠

Tampering with the EMI AmericaSeries condensing unit is dangerous and may result in serious injury or death. Tampering voids all warranties. Do not attempt to modify or change this unit in any way.

SAFETY INSTRUCTIONS

- Read all instructions before using the EMI AmericaSeries high efficiency condensing unit. Install or locate this unit only in accordance with these instructions. Use this unit only for its intended use as described in this manual.
- Check the rating plate on the EMI AmericaSeries condensing unit before installation to make certain the voltage shown is the same as the electric supply to the unit.
- The EMI AmericaSeries condensing unit must be connected only to a properly grounded electrical supply. Do not fail to properly ground this unit.
- Turn off the electrical supply before servicing the EMI AmericaSeries condensing unit.
- Do not use the EMI AmericaSeries condensing unit if it has damaged wiring, is not working properly, or has been damaged or dropped.

[Save These Instructions]

PRODUCT DESCRIPTION

The AmericaSeries C2C condensing unit is an air-cooled, vertically arranged side discharge, super high efficiency unit designed specifically to meet a 13 SEER rating. *(See chart on page 8)*

The C2C 9,000-24,000 Btuh capacity condensing unit will provide cooling for a single evaporator, as identified in the chart in "C2C Specifications and Dimensions" on page 8. It is a quiet unit that can be recommended for both commercial and residential applications.

Installation of the C2C is simplified by a 24V control interconnection from the evaporator and multiple units can be lined up in close proximity to an exterior wall. All service valves are well concealed to reduce tampering and all 9,000-15,000 Btuh units are equipped with a Duratec Performance Package, that includes an oversized suction accumulator with surge baffles and enhanced oil management; a factory installed solid core filter drier, loss of charge switch, and an optional field installed crankcase heater is available (to be used when the low ambient control option is selected).

CONTROLS AND COMPONENTS (FACTORY INSTALLED OR SUPPLIED)

- Compressor and Fan Motor Contactor
- Run Capacitor
- Loss of Charge Switch (09 - 15 only)
- Low Voltage Terminal Connections
- Large Capacity Suction Accumulator (09 - 15 only)
- High Pressure Safety Switch (C2C 18 - 24)
- Solid Core Filter Drier (09 - 15 only)

NOTE: *CHP 12/24 and WHP 12/18/30 Air Handlers built after 4/05 may need a Piston/Orifice change at time of installation (factory supplied) see page 15.*

SYSTEM OPTIONS

- Low Ambient controls (specify this option if the system will operate in cooling mode at outside temperatures below 60º F)
  - Field Installed Kit – for operation down to 32º F
  - Factory Built – for operation down to 0º F (consult factory for availability)
- Crankcase heater (field installed) (9,000-15,000 Btuh only)
- Hard Start
- 115V (9,000-12,000 Btuh only) - *consult factory for availability*
- Copper/copper coils (sea coast use)
- Extended run 09P to 100' interconnect

INSTALLER SUPPLIED ITEMS

- Power wiring
- Low Volt wiring (18 awg minimum)
- Secure mounting pad or foundation
- Refrigerant piping (if not purchased from EMI)
- High Volt Disconnect

LOW AMBIENT OPTION

MUST BE SPECIFIED IF: The system will be asked to cool at outdoor temperatures below 60º F, which may cause damage to the compressor and coil, and could result in freezing that may void the warranty. ***Field Installed Low-Ambient Kit*** is good for operation down to 32º F. This is accomplished by cycling the condenser fan on and off, which will in turn maintain a constant low side pressure and keep the air handler from frosting-up. ***Factory Built Low Ambient*** will allow continued cooling operation down to 0º F (consult factory for availability).

NOTE: *If this option is not specified and system runs under low-ambient conditions and experiences any failures (compressor, motor, etc.), warranty on these components may not be honored.*

ITEMS FOR CONSIDERATION

- Locate the unit as close to the indoor section as possible. (See Tubing Specifications chart on pape 8.)
- If C2C model is used for low ambient cooling down to 0°, this option must be specified to prevent system damage.
- Avoid high traffic areas and prevailing wind locations.
- Surface must be level.
- Mount unit above typical snow levels.

Ensure free flow of air through the unit. Air must not recirculate from discharge to intake. Air is drawn through the coil and side discharged through the fan grille. **A minimum 48" clearance is necessary for the condenser discharge. Rear intake (coil side) clearance is 12" minimum.** Consider how power will be run to the unit from the power source. Refrigerant piping must be a direct line to the indoor unit.

INSTALLATION INSTRUCTIONS

SITE PREPARATION

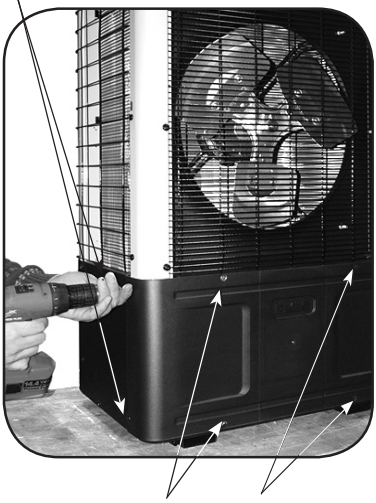
1. Place the unit on a flat concrete surface or pad if on the ground. Roof mounting should use a build up platform.
2. ***In areas of heavy snowfall, condensers should be set above the level of maximum anticipated snowfall (12" is usually adequate).***

INSTALLATION INSTRUCTIONS

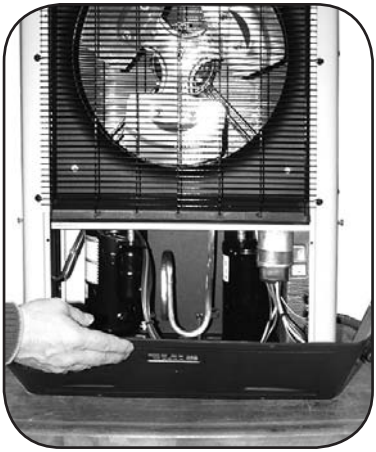
UNIT MOUNTING INSTRUCTIONS

The C2C allows for permanent mounting through the feet. ***This is highly recommended due to the vertical design of the unit***.

1. Loosen the screws on left and right sides of the front panel. (Do not remove these screws.)

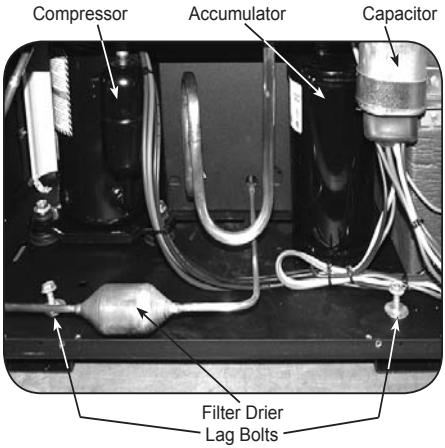


2. Remove the screws on the front of the panel.
3. To remove front panel:

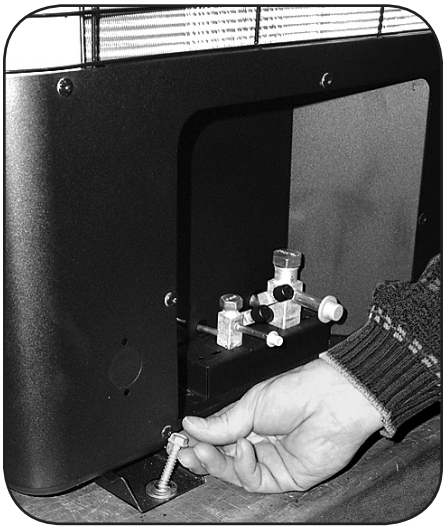


4. Slide front panel forward to clear side screws and remove.

UNIT MOUNTING INSTRUCTIONS *Continued*



5. Insert lag bolts through the holes in the bottom of the unit and tighten to secure.



6. Insert lag bolts through the holes in the feet on the back of the unit and tighten to secure.

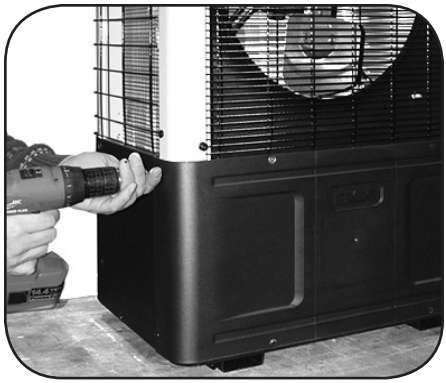
7. Replce the front panal, ***do not*** tighten the side screws at this time.

ELECTRICAL WIRING

1. All electrical wiring must be run according to NEC and local codes.
2. Refer to the unit rating plate for voltage, ampacity and over current protection requirements.

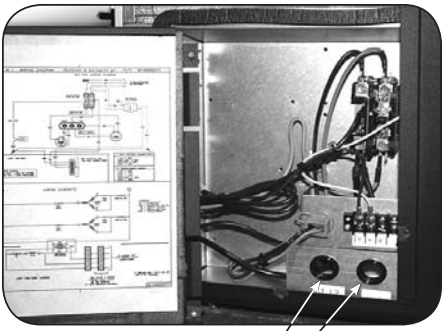
3. Use only HACR type breakers or time delay fuses. Select the wire size according to the ampacity rating.
4. To access electrical connections and wiring diagram:

   a) Remove the screws on the side panel adjacent to the back panel.



   b) The screws adjacent to the front panel should already be loose (don't remove them).

c. Slide the side panel out to access the high/low electrical connections and wire diagram.

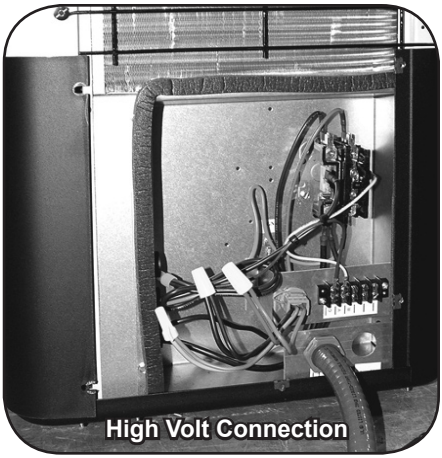


Plastic Edge Guards

Note: *Remove the plastic edge guards from the holes and replace with a water-tight strain relief fitting (High V) and a split grommet fitting (low V)*

5. Power should be run to a weather proof disconnect box usually within 3 feet of the unit.

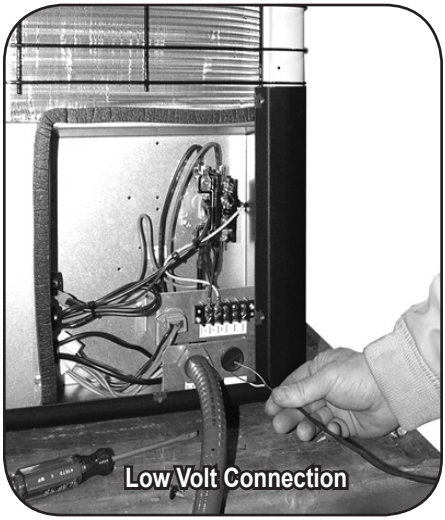
6. From the disconnect box, run the power through the 7/8" hole on the side of the unit and into the electrical box and anchor with the strain relief fitting.



High Volt Connection

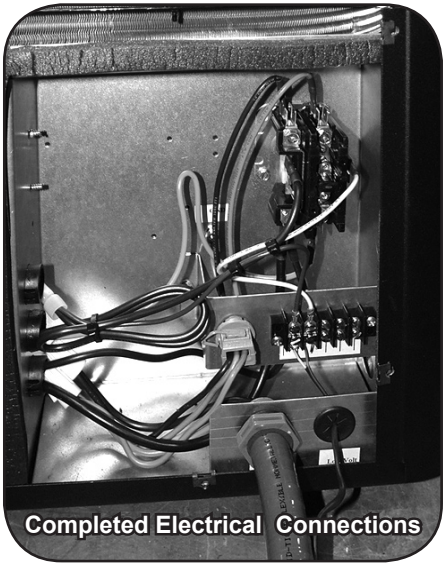
7. Run wires to the high Volt pigtail in the control box and attach L1 and L2 connections. Also run green wire to ground wire.

8. Check wiring diagram for the required number of low voltage wires to be run between indoor and outdoor sections.



Low Volt Connection

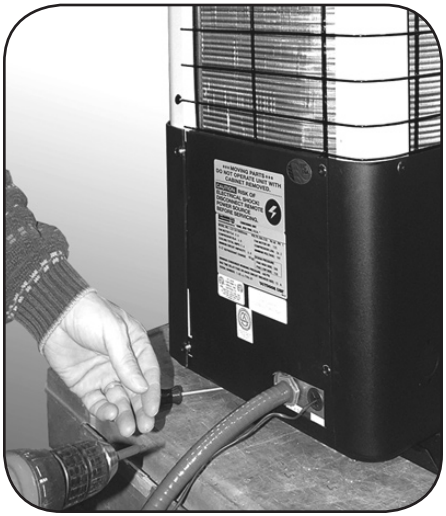
9. Connect the 24 Volt wiring matching color to color. Refer to the wiring diagram on the inside panel the unit for more details. Low Volt interconnect should be at least 18 awg.



Completed Electrical Connections

ELECTRICAL WIRING
Continued

10. To replace side panel slide the slotted holes of the panel onto the loosened screws of the front panel so that the edge of the front panel covers the edge of the side panel.



11. Fasten screws.

REFRIGERANT PIPING

INTERCONNECTING TUBING SPECIFICATIONS				
C2C Model	MAX. Length	Max. Lift	Liquid Line O.D.	Suction Line O.D.
* 09P	50’	25’	1/4"	1/2"
* 09T	100’	35’	1/4"	1/2"
12T	100’	35’	1/4"	1/2"
15T	100’	35’	3/8"	5/8"
18	100’	35’	3/8"	5/8"
24	100’	35’	3/8"	3/4"

**For 9000 Btuh applications requiring 50+' through 100' of interconnect tubing the suitable extended run tubing option must be requested.*

The system will support refrigerant runs to the inside unit of up to 100' equivalent feet with a 35' rise included. The 9K units come factory standard for 50' interconnect at the maximum. C2C units are furnished with sweat connections. The units are equipped with refrigerant valves and Schrader fittings for charging and taking pressure readings. The following precautions should be made:

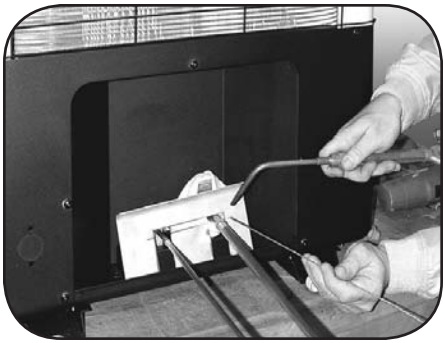
- Be certain no burrs remain on the fittings.
- Use only clean refrigeration tubing.
- Use tube benders to guard against kinking.
- Avoid piping on wet and rainy days and ***insulate suction line***. Be certain that plastic end caps remain in place when inserting through wall openings. Isolate tubing from transmitting vibration to the building or unit and avoid contact with sharp edges. **Refrigeration valves should be wrapped with a wet rag "heat sink" to protect valves while brazing.**

NOTE: *It is recommended that a Filter Drier be installed in liquid line, at the indoor unit.*

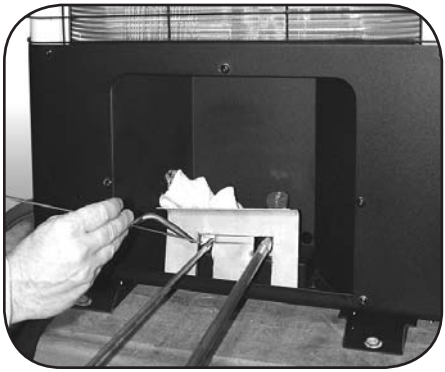
REFRIGERANT PIPING
Continued

1. Sand the ends of tubing and insert into fittings.

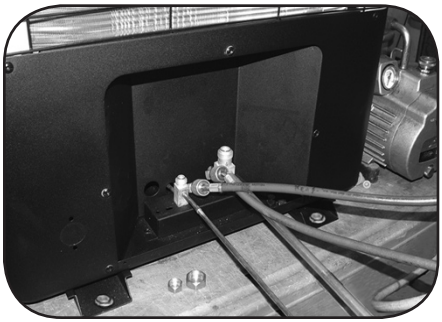
2. Protect the valves by wrapping with a wet rag "heat sink" before welding.



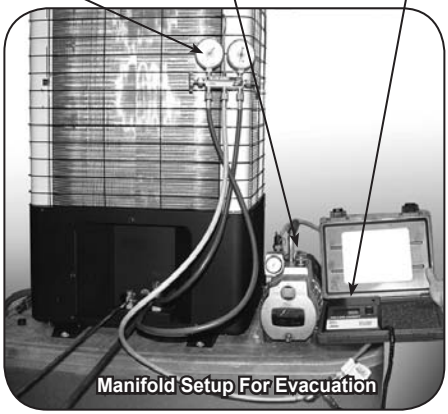
3. We recommend the use of a shield (can be made from some scrap metal) to protect the paint.



4. Weld tubing into fittings.

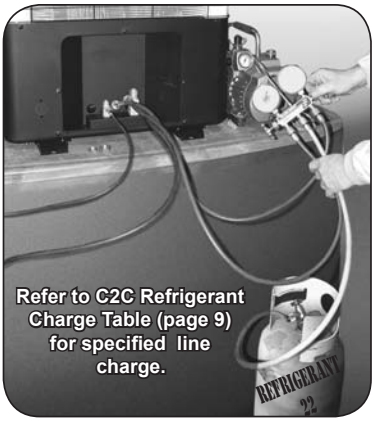


5. Attach manifold set.



Manifold Setup For Evacuation

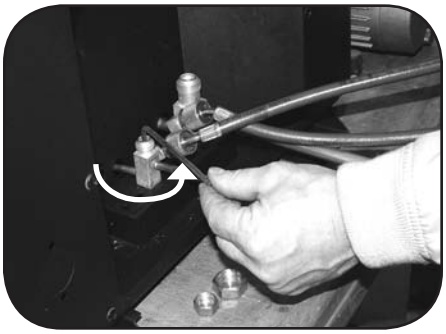
6. Evacuate line 300 to 500 microns.



7. Charge line to proper weight charge (see page 10).

REFRIGERANT PIPING
Continued

8. Back-seat the valves (counter-clockwise)



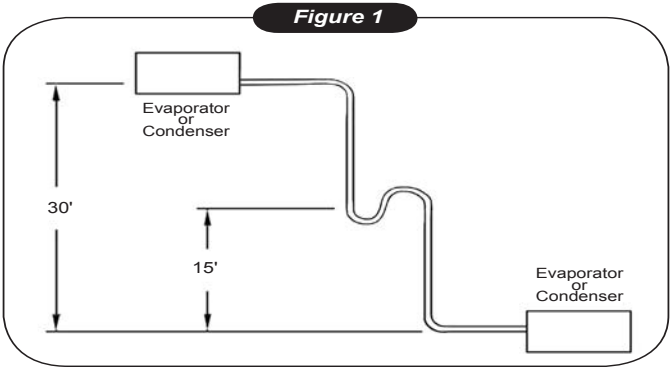
P-TRAP INSTALLATION

- A P-trap is recommended when the suction riser is equal to or greater than 20 feet in height.
- When the evaporator is installed above the compressor, the P-trap will prevent the flow of liquid back to the compressor in the off cycle.
- The placement of the P-trap should be at the halfway mark of the suction riser. For example if the suction riser is 30 feet tall then a P-trap is recommended at the 15 foot mark of the suction riser *(see Figure 1).*
- A P-trap may be fabricated using (2) street elbows and (2) regular elbow. A prefabricated trap may be purchased from a Wholesaler or Distributor however the trap should be shallow as the (3) elbow configuration. Each elbow is approximately 2 equivalent feet. One P-trap is equal to approximately 12 equivalent feet.
- Whether the outdoor unit is above or below the indoor unit a P-trap is required if the suction riser is 20 feet or higher.

NOTE: *Avoid excessive oil buildup. The P-trap should have a shallow depth and a short horizontal section.*

- P-traps are not required at the foot of the hot gas risers due to increased oil flow at higher temperatures.

Figure 1



COMPLETE PIPING CONNECTIONS

Pressure test all field installed piping with nitrogen. Using a suitable vacuum pump, evacuate the tubing and indoor unit to 300 microns, with service valves remaining front seated (closed).

Before releasing the refrigerant from the condenser, be sure the manifold gauge set is closed so as not to lose vacuum when shutting down the pump.

Release refrigerant from the condensing unit by back seating the service valve. Allen wrenches are used to open the valve. Replace valve caps. Be Careful to not back seat the valves past the snap flanges that hold the valve core in place.

REFRIGERANT PROCESSING

WARNING!! It is illegal to discharge refrigerant into the atmosphere. Use proper reclaiming methods & equipment when installing or servicing this unit.

The C2C is delivered precharged with refrigerant for the condenser coil and the evaporator. Charging of the field installed piping is required. Refer to the refrigerant charge table for the proper amount to be added for the applications interconect piping. Unit service valves are solid brass, for sweat connections.

IMPORTANT: All systems require field charge adjustments. Refer to the "Refrigerant Charge Table" below for proper weight charge and to the supplied "Operational Charts" for proper system pressures and temperature at different outdoor conditions. Superheat and subcooling method should be used for final system charge.

When charging and checking pressures/temperatures on system supplied with Low Ambient Option, the fan cycle switch should be jumped out of the circuit temporarily to obtain accurate data.

C2C REFRIGERANT CHARGE TABLE

CONDENSER CAPACITY	EVAPORATOR PAIRING	LINE CHG/FT	FACTORY CHARGE C2C
09	CHP 12	.25 oz.	37 oz.
	WHP 12		
	CAH 12		
12	CHP 12	.25 oz.	40 oz.
	WHP 12		
15	WHP 18	.56 oz.	48 oz.
18	CHP 24	.56 oz.	51 oz.
	WHP 18		
	CAH 24		
24	WHP 30	.56 oz.	65 oz.

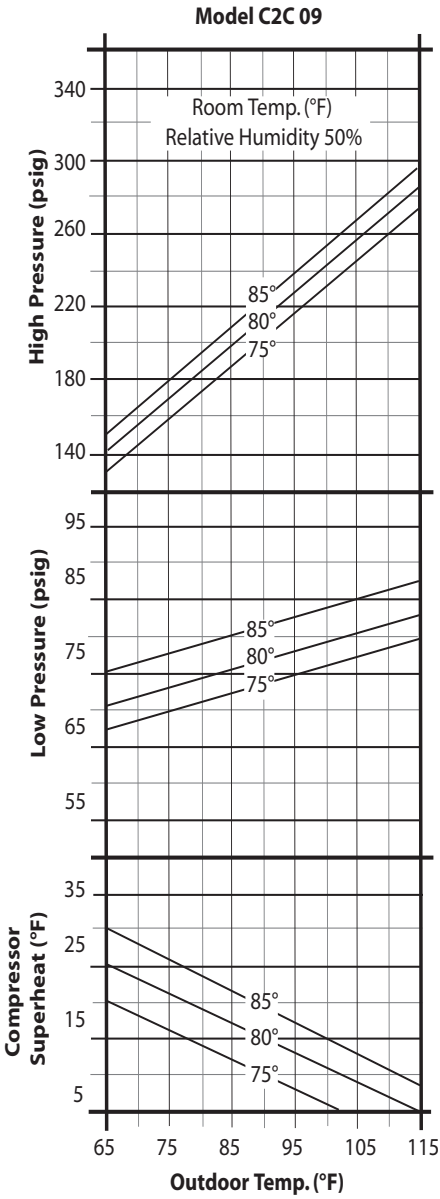
IMPORTANT NOTES:

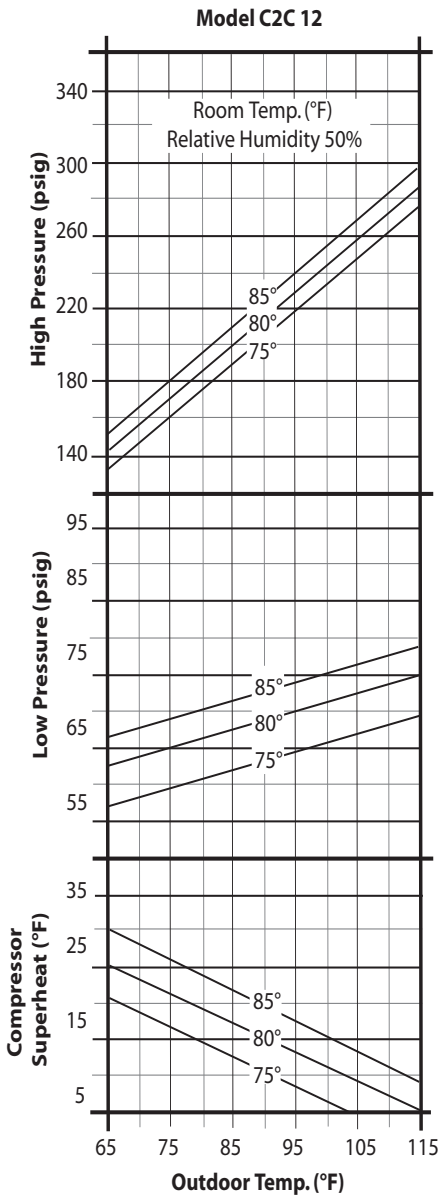
1. To find the charge adjustment and system charge for any evaporator and tubing length:

   Line Adjustment = (Line Charge/FT) x Line Length

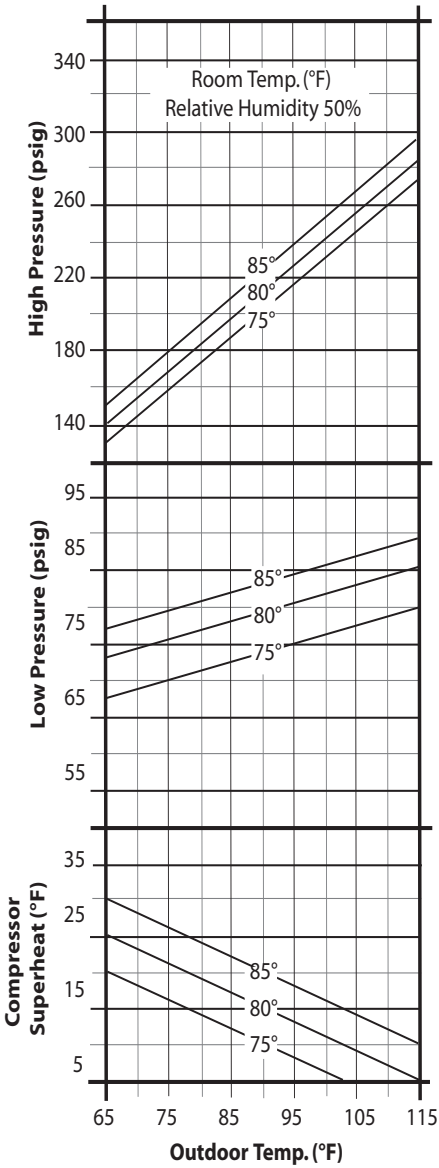
   System Total = Factory Charge + Line Adjustment

2. Round to the nearest ounce and allow for gauges and hoses.

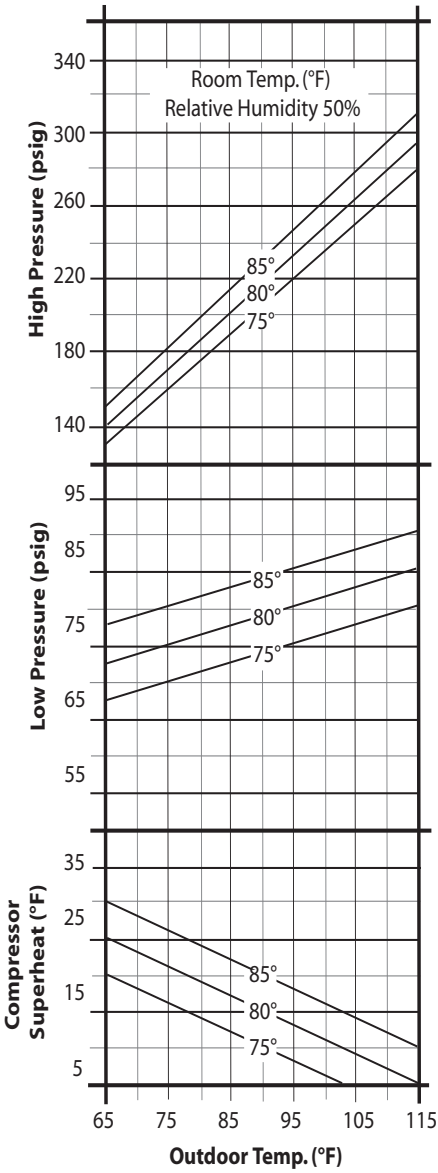

Model C2C 09
Room Temp. (°F)
Relative Humidity 50%
High Pressure (psig)
340
300
260
220
180
140
85°
80°
75°
Low Pressure (psig)
95
85
75
65
55
Compressor Superheat (°F)
35
25
15
5
65
75
85
95
105
115
Outdoor Temp. (°F)

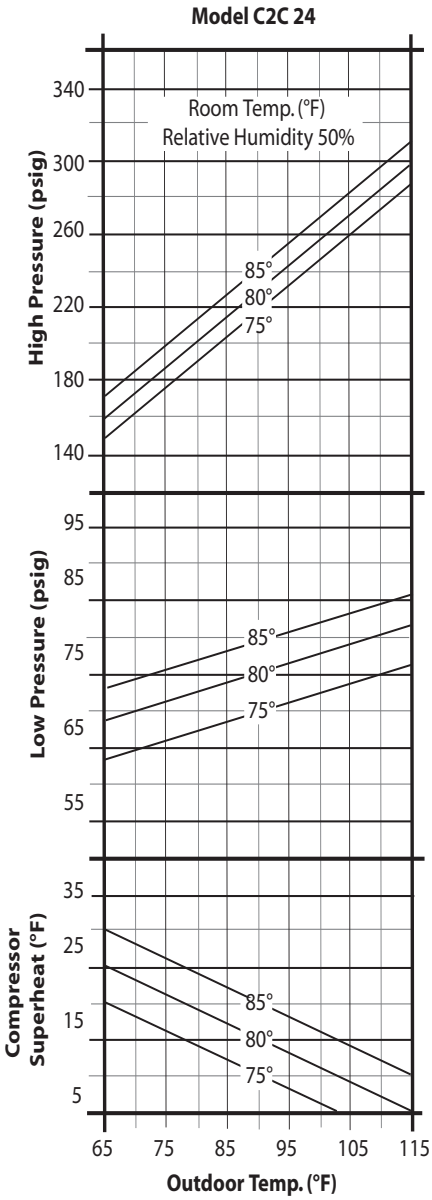

Model C2C 12
Room Temp. (°F)
Relative Humidity 50%
High Pressure (psig)
340
300
260
220
180
140
85°
80°
75°
Low Pressure (psig)
95
85
75
65
55
Compressor Superheat (°F)
35
25
15
5
65
75
85
95
105
115
Outdoor Temp. (°F)

Model C2C 15



Model C2C 18




Model C2C 24
Room Temp. (°F)
Relative Humidity 50%
High Pressure (psig)
340
300
260
220
180
140
85°
80°
75°
Low Pressure (psig)
95
85
75
65
55
85°
80°
75°
Compressor Superheat (°F)
35
25
15
5
85°
80°
75°
65
75
85
95
105
115
Outdoor Temp. (°F)

PREPERATION FOR START-UP

GENERAL RECOMMENDATION

Charging should be done with a dial-a-charge or weighed in with a scale.

STARTING THE UNIT

- In low ambient cooling 9-15 Btuh units, if a crankcase heater is installed, power the system 24 hours before attempting to start the unit in cool weather.
- Do a final system check using the Operation Charts (supplied on pages 10-12). Record results on Test Unit Data Sheet on page 15.
- Remove gauge set. Mount all access panels and make sure they are properly secured.
- Make final visual inspection and repair any deficiencies.

NOTE: *A hard start kit may be required for units in low voltage/frequent cycle applications.*

OPERATION AND MAINTENANCE

The C2C outdoor section is the compressor bearing unit of the system. It operates at the command of the indoor section or room thermostat. Therefore, the system operation will be described in the manual pertaining to the indoor section.

EMI units are designed and constructed for reliability and long life with minimal maintenance. You can assure peak operating efficiency by regularly inspecting for free air passage into and through the coil. If debris collects on the air coil, it should be cleaned by "back-flushing" with a spray of water or vacuuming. ***TURN OFF POWER SUPPLY FIRST.*** Outdoor units may be cleaned or waxed if desired. Use a non-abrasive car wax (on metal surfaces only).

This unit is equipped with a permanently lubricated motor. Although oiling is not necessary, adding a few drops through the oiling ports twice yearly will extend the life of the motor. ***Do not over oil.***

Panels should remain on the unit at all times. Service should be performed by a QUALIFIED service agency only.

SPECIFIC CHANGES

All EMI products are subject to ongoing development programs so design and specifications may change without notice. Please consult the factory for more information.

APPLIES TO CHP 12/24 & WHP12/18/30 BUILT AFTER 4/05

NOTE: *Replace the existing piston (before installing the unit) with the piston supplied in Kit Bag when matching a:*

- *CHP12 with 9,000 Btuh Condenser*
- *CHP24 with 18,000 Btuh Condenser*
- *WHP12 with 9,000 Btuh Condenser*
- *WHP18 with 15,000 Btuh Condenser*
- *WHP30 with 24,000 Btuh Condenser*

(See charts below)

PROPER INSTALLATION OF PISTON/ORIFICE REPLACEMENT

CHP12/24 Piston/Orifice Installation Instruction

Model # Air Handler	Condenser Btuh	Factory Installed		Field Changeover	
		Part # Piston/Orifice	Piston/Orifice Size	Part # Piston/Orifice	Piston/Orifice Size
CHP12	9,000	240-4064	.044”	240-727	.041”
	12,000			*NO CHANGE*	
CHP24	18,000	240-728	.059”	240-1010	.049”
	24,000			*NO CHANGE*	

WHP12/18/30 Piston/Orifice Installation Instruction

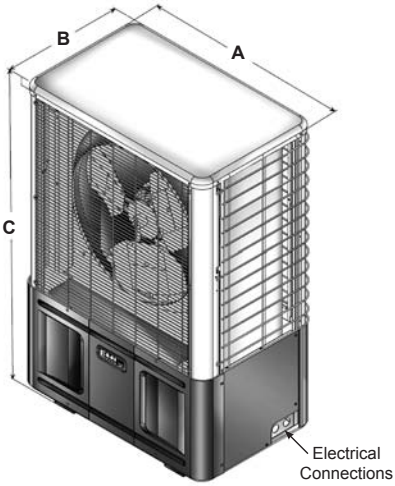
Model # Air Handler	Condenser Btuh	Factory Installed		Field Changeover	
		Part # Piston/Orifice	Piston/Orifice Size	Part # Piston/Orifice	Piston/Orifice Size
WHP12	9,000	240-4064	.044”	240-727	.041”
	12,000			*NO CHANGE*	
WHP18	15,000	240-4111	.053”	240-1010	.049”
	18,000			*NO CHANGE*	
WHP30	24,000	240-2089	.063”	240-3961	.059”
	30,000			*NO CHANGE*	

NOTE: *All EMI products are subject to ongoing development. Design and specifications may change without notice.*

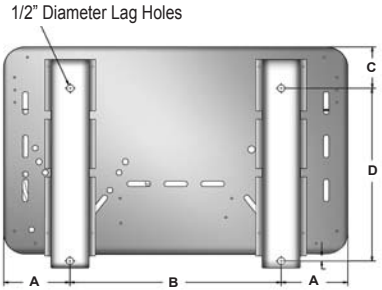
System Performance Data: Matched With EMI AmericaSeries Indoor Units

Physical Dimensions			
Model Size C2C	A	B	C
09, 12, 15	24"	15"	36"
18	32"	15"	36"
24	32"	15"	40"

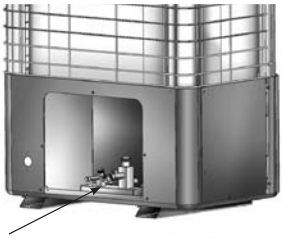
Cooling Systems Only			
C2C Model	Air Handler Model	Btuh	SEER
09	CAH12	9,000	13
09	CHP12	9,900	13
09	WHP12	9,000	13
12	CHP12	12,000	13
12	WHP12	12,000	13
15	WHP18	14,100	13
18	CAH 24	18,000	13
18	CHP24	19,000	13
18	WHP18	17,800	13
24	WHP30	24,000	13



C2C Electrical Specifications									
Model #	Volts/HZ/PH	Fan Motor		Compressor		Total AMPS	Min Volt	M.C.A.	HACR BRKR
		AMPS	HP	RLA	LRA				
09AT	115/60/1	1.6	0.125	6.6	39.2	8.2	104	9.9	15
12AT	115/60/1	1.6	0.125	9.7	54.0	11.3	104	13.7	20
09DL	208/230/60/1	0.8	0.125	3.5	19.0	4.3	197	5.2	15
09DP	208/230/60/1	0.8	0.125	3.3	21.0	4.1	197	4.9	15
09DT	208/230/60/1	0.8	0.125	3.4	23.0	4.2	197	5.1	15
12DL	208/230/60/1	0.8	0.125	4.5	21.0	5.3	197	6.4	15
12DT	208/230/60/1	0.8	0.125	4.8	26.3	5.6	197	6.8	15
15DL	208/230/60/1	0.8	0.125	6.0	27.0	6.8	197	8.3	15
15DT	208/230/60/1	0.8	0.125	5.4	29.0	6.2	197	7.6	15
18DC	208/230/60/1	0.8	0.125	6.3	41.0	7.1	197	8.7	15
18DR	208/230/60/1	0.8	0.125	6.2	41.0	7.0	197	8.6	15
24DB	208/230/60/1	0.8	0.125	8.5	64.0	9.3	197	11.4	20
24DC	208/230/60/1	0.8	0.125	8.6	54.0	9.4	197	11.6	20
24DR	208/230/60/1	0.8	0.125	8.8	55.0	9.6	197	11.8	20



Sound Data	
Model #	dba
C2C09	61
C2C12	61
C2C15	62
C2C18	64
C2C24	65



Easy access interconnects on back of unit

MOUNTING DIMENSIONS				
Model Size	A	B	C	D
09, 12, 15	4 5/8"	14 11/16"	3"	12 7/16"
18, 24	4 5/8"	22 11/16"	3"	12 7/16"

TEST UNIT PERFORMANCE DATA SHEET

The Test Unit Performance Data sheet below is provided for use by a qualified service professional in the event that there is a problem with the unit. In order for our Technical Service Department to better serve you, please complete and have this information ready when calling. Make sure to include the Model Number, Serial Number, Date of Installation.

Call our Technical Support Department @ 1-800-228-9364.

Test Unit Performance Data			
		Date:	
Model Number		Technician:	
Serial Number		Mode:	Cooling
Indoor Section		Notes	
Evaporator Entering Air - DB			
Evaporator Entering Air - WB			
Evaporator Leaving Air - DB			
Evaporator Leaving Air - WB			
Outdoor Section			
Entering Air			
Leaving Air			
Temperature Split			
Operating Pressures			
Compressor Suction - PSIG			
Compressor Discharge - PSIG			
Power Input			
Compressor - Volts			
Compressor - Amps			
OD Fan Motor - Volts			
OD Fan Motor - Amps			
ID Fan Motor - Volts			
ID Fan Motor - Amps			
Total Volts			
Total Amps			
Temperatures - Degrees F°			
Compressor Suction			
Compressor Discharge			
Liquid Out Cond.			
Liquid before Expansion			
Suction out Evaporator			
Capacity Calculations			
DB - Temp Split at evap.			
Test Summary			
Compressor Superheat			
Sub Cooling			

ALL PRODUCT LIMITED WARRANTY

Enviromaster International LLC (EMI) warrants to the purchaser/owner that EMI products will be free from defects in material and workmanship under the normal use and maintenance for a period of twelve months for all components and sixty months on unit compressors from the date of original installation, or fifteen months for all components and sixty-three months on unit compressors from the date of manufacture, whichever comes first.

WHAT WE WILL COVER
EMI will replace any defective part returned to EMI's approved service organization with a new or rebuilt part at no charge. The replacement part assumes that unused portion of this warranty.

WHAT WE DON'T COVER
THIS WARRANTY DOES NOT INCLUDE LABOR or other costs incurred for repairing, removing, installing, shipping, servicing, or handling of either defective or replacement parts.

EMI IS NOT RESPONSIBLE FOR:
- Normal maintenance
- Damage or repairs required as a consequence of faulty installation or application by others.
- Failure to start due to voltage conditions, blown fuses, open circuit breakers, or other damages due to the inadequacy or interruption of electrical service.
- Damage or repairs needed as a consequence of any misapplication, abuse, improper servicing, unauthorized alteration, or improper operation.
- Damage as a result of floods, winds, fires, lightening, accidents, corrosive atmosphere, or other conditions beyond the control of EMI.
- Parts not supplied or designated by EMI.
- Products installed outside the United States or Canada.
- Any damages to person or property of whatever kind, direct or indirect, special or consequential, Whether resulting from use or loss of use of the product.

LIMITATION OF WARRANTIES
This warranty is exclusive and in lieu of any implied warranties of merchantability and fitness for a particular purpose and all other warranties express or implied. The remedies provided for in this warranty are exclusive and shall constitute the only liabilities on the part of EMI including any statements made by any individual which shall be of no effect.

FOR SERVICE OR REPAIR:
(1) Contact the Installer
(2) Call the nearest Distributor
(3) Call or write:

Comfort Where It Counts.

Enviromaster International LLC
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www.enviromaster.com