

# EMI AMERICASERIES SINGLE-ZONE & MULTI-ZONE CONDENSING UNITS

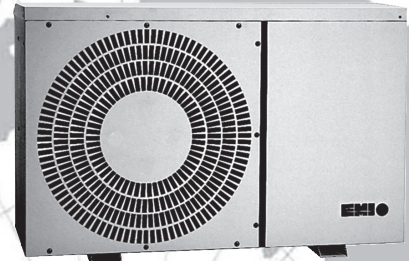
## STRAIGHT COOL/HEAT PUMPS

Nominal Capacities:

9,000, 12,000, 15,000, 18,000,  
24,000, 30,000, 36,000 Btuh

**EMI**  *AmericaSeries*

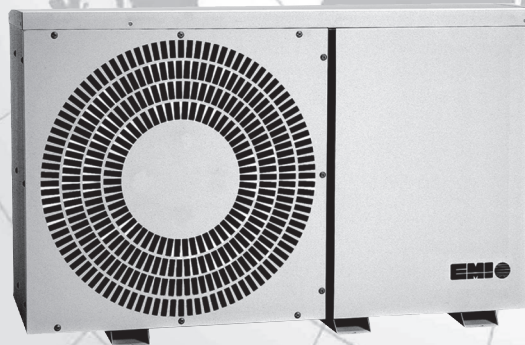
*Comfort Where It Counts.*



**SCC/SHC SINGLE-ZONE**



**MC4/MH4 MULTI-ZONE**



**MC2/MH2 DUAL-ZONE**

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An  **ECR International Brand**  
An ISO 9001-2000 Certified Company



P/N# 240004514, Rev. 1.5 [05/05]

# EMI AMERICASERIES CONDENSING UNIT CONDENSING UNITS

## INSTALLATION, OPERATION AND MAINTENANCE MANUAL

P/N# 240004514, Rev. 1.5 [05/05]

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

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This manual is intended as an aid to a qualified service personnel for proper installation, operation, and maintenance of these EMI AmericaSeries high efficiency condensing units. Read the instructions thoroughly and carefully 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.

### **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.**



**Recognize this symbol as an indication of important safety information**



### 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 an EMI unit, check our website @ [www.enviromaster.com](http://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 \_\_\_\_\_

### 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]*

## EMI AMERICASERIES CONDENSING UNIT - COMMON SECTION

### CONTROLS AND COMPONENTS (FACTORY INSTALLED OR SUPPLIED)

- Compressor and Fan Motor Contactor
- Capacitor
- Loss of Charge Switch (09 - 15 only)
- Defrost Control Board and Sensor (SHC only)
- Low Voltage Connections
- Large Capacity Suction Accumulator (09 - 15 only)
- High Pressure Control (SCC 18 - 36 and all Heat Pumps)
- Solid Core Filter Drier (09 - 15 only)
- Crankcase Heater (09-15K Heat Pump)

### SYSTEM OPTIONS

- Low Ambient Option (Specify this option if system will operate in cooling mode at outside temperatures below 60° F down to 0° F)
- Sea Coast Style Coated Coils
- 115V (09-12 only)
- 265V (all models)
- Hard Start - Straight Cool only (standard on Heat Pumps)

### INSTALLER SUPPLIED ITEMS

- Power wiring
- Low Volt wiring - 18 AWG minimum
- Secure mounting pad or foundation
- Refrigerant piping (if not supplied)
- Disconnect switch

### LOW AMBIENT OPTION

**MUST BE SPECIFIED IF:** The system will be asked to cool at outdoor temperatures below 60° F, this may cause damage to the compressor and coil, and could result in freezing that may void the warranty. We accomplish the low-ambient operation on our condensers by cycling the condenser fan. When in low-ambient operation the system high side pressure will cycle (fairly rapidly) between 275 psi and 210 psi. This will in turn maintain a constant low side pressure and keep the air handler from frosting-up.

**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. Maximum length allowed is 100'.
- 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 with side, or top discharged through the fan grille. **A minimum 48" clearance is necessary for the condenser discharge. 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.

Heat pump units produce condensate in the heat pump mode. Water will drain from the unit at the base. Place the unit so as not to create a hazard for pedestrians.

### SITE PREPARATION

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

### ELECTRICAL WIRING



The EMI AmericaSeries condensing unit must:

- Be connected to a properly grounded electrical supply with the proper voltage as stated on the rating plate.
- Have proper over current protection (i.e. time-delay fuse/HACR-Breaker) as listed on the Rating Plate.

**Failure to follow these instructions can result in a fire, explosion, or electrical shock causing property damage, personal injury, or death.**



Do not use the EMI AmericaSeries condensing unit with any electrical supply voltage other than the one listed on the rating plate.

Check the rating plate on the unit for the correct voltage rating. Failure to use the correct voltage may result in death, serious bodily injury or property damage. If you have any questions or doubts, consult the factory before installing this unit.

**Note: Refer to the units' wiring diagram for all wiring.**

All electrical wiring must be run according to NEC and local codes. Refer to the unit rating plate for voltage, ampacity and fuse size requirements. Use only HACR type breakers. Select the size wire according to the ampacity rating. Power should be run to a weather proof disconnect box usually within 3 feet of the unit. From the disconnect box, run the power through the 7/8" hole and into the electrical box and anchor with a strain relief fitting. Run wires to the high Volt L1 and L2 connections. Also run green wire to ground lug.

Check wiring diagrams for the required number of low voltage wires to be run between indoor and outdoor sections. Connect the 24 Volt wiring matching color to color. Refer to the wiring diagram inside the unit for more details. **Low Volt interconnect should be at least 18 AWG.**

## EMI AMERICASERIES CONDENSING UNIT - COMMON SECTION

### REFRIGERANT PIPING

The standard system will support refrigerant runs to the inside unit of **100' equivalent feet with a 35' rise included.**

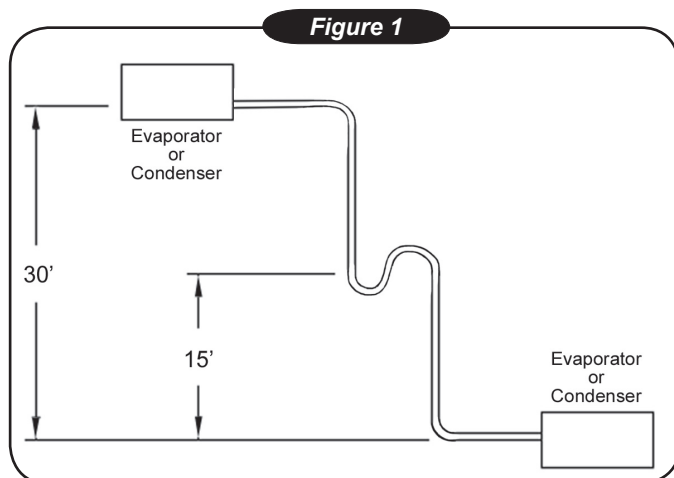
Units are furnished with sweat connections and are equipped with service valves and schrader fittings for charging and taking pressure readings. The following precautions should be made:

- 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 dryer be installed in liquid line, at the air handler.*

### 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 (1) 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 5 equivalent feet. One P-trap is equal to approximately 15 equivalent feet.
- Whether the outdoor unit is above or below the indoor unit a P-trap is recommended 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.

### REFRIGERANT PROCESSING

**WARNING!!** **It is illegal to discharge refrigerant into the atmosphere after July 1, 1992. Use proper reclaiming methods & equipment when installing or servicing this unit.**

The unit is delivered with precharged 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 interconnect pipping. Unit service valves are solid brass.

**IMPORTANT:** *All systems require field charge adjustments. Refer to the attached "Charge Adjustment Table" 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 (see page 6).*

**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.**

### 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.

## EMI AMERICASERIES CONDENSING UNIT - COMMON SECTION

### STARTING THE UNIT

- Before starting the unit in cool weather, power the system 24 hours before attempting to start if a crankcase heater is installed.
- Do a final system check using the superheat/subcooling method. Record results on Test Unit Data Sheet.
- 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 EMI AmericaSeries outdoor section is the compressor bearing unit of the system. It operates at the command of the indoor section or room thermostat. Therefore, the 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 collect 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.

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.

### GENERAL RECOMMENDATIONS

Do not charge the straight cool units on cold days unless weighing in the charge. The heat pump systems may be charged in heat cycle at any temperature. **These units uses a heat cycle TXV and cannot be charged to superheat; use weight or subcooling method only.**

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

**NOTE:** For more information, please visit our web-site at [www.enviromaster.com](http://www.enviromaster.com) or call 1-800-228-9364.

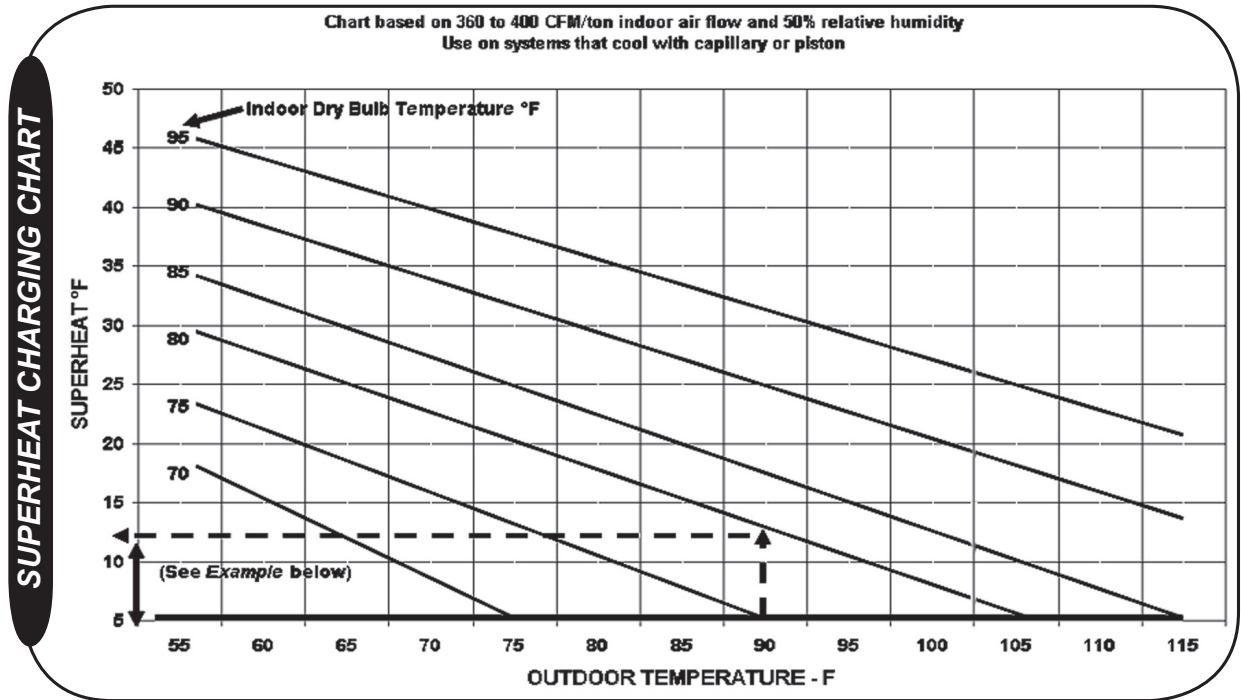
**See Field Charging on following page.**

## FIELD CHARGING

The use of the superheat method is highly recommended for field charging or checking the existing refrigerant charge in a system. Because each installation is different in terms of indoor air flow, refrigerant line length, etc., the factory charge may not be correct for every application. To assure the best performance from the air-conditioner, the refrigerant charge should be checked and adjusted, if need be, on each installation.

For proper superheat readings, a standard low-side refrigerant gauge and an accurate thermometer is

needed. A mercury or stem-type thermometer is not adequate for suction-line temperatures. We recommend electric thermocouple thermometers (available at most refrigeration wholesalers); however an accurate remote-bulb thermometer can be used. When measuring the line temperature, be sure the thermometer is well installed to assure accurate measurements. The chart below gives superheat values at various outdoor temperatures. Allow at least 5 minutes running time between charge adjustments for the unit to stabilize.



**Note: If operating superheat is more than 5° F above the chart value, add refrigerant. If below the chart value remove refrigerant. If below the limit line, remove refrigerant.**

### Example:

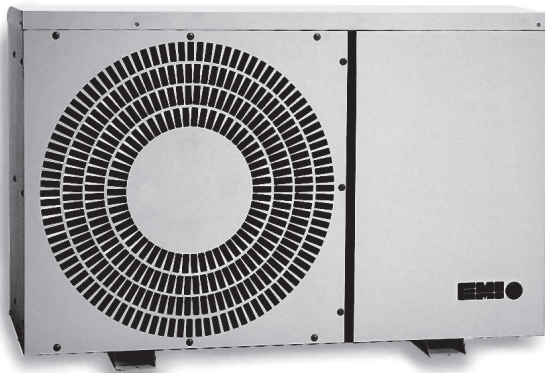
1. Suction pressure is 65 psi. which equals 38° F on **The R-22 Scale of the Low-Side Gauge.**
2. Suction line temperature taken at the unit is 70° F. 70° F minus 38° F equals 32° F superheat.
3. Outdoor temperature is 90° F; indoor temperature is 80° F.
4. Intersection of the indoor-temperature and outdoor-temperature lines occur on the 12° F superheat line.
5. Add charge to obtain 12° F superheat.

### Instructions:

1. Measure suction pressure and determine evaporator-refrigerant temperature on R-22 scale of low-side gauge.
2. Measure suction-line temperature on suction line of the unit.
3. Measure outdoor and indoor temperatures.
4. Determine from the table what the superheat should be for the indoor and outdoor temperatures. (Example indicates 12° F superheat.)
5. Adjust charge if needed. Be sure unit is running at stabilized condition.

# INSTALLATION OF SCC/SHC SINGLE-ZONE

## SCC/SHC SINGLE-ZONE High Efficiency Condensing Unit



### PRODUCT DESCRIPTION

The AmericaSeries SCC/SHC is an air cooled, high efficiency condensing unit, designed specifically to meet and/or exceed current standards for system energy efficiency ratings.

The SCC single zone condensing unit will provide cooling for a single AmericaSeries evaporator of any style from 9,000 through 36,000 capacity. Its compact, low profile design allows flexibility in the location and mounting of the unit. It is a very quiet operating unit and can be recommended for both commercial and residential applications. An advanced air flow design maximizes the heat transfer capability of the enhanced fin coil. Installation is simplified by the use of 24V control interconnection to the evaporator.

The SHC extended range single zone heat pump model contains a solid state electronic defrost control board in which system defrost is determined by a factory-set timer to initiate. Defrost termination is initiated by a "defrost" sensor attached to the condenser coil.

While in defrost, a backup resistance heater (if contained) is energized to offset the cooling effect, in the indoor unit.

This manual pertains to the outdoor section installation only. Please refer to the appropriate installation manual for your indoor product to complete the installation.

### SINGLE ZONE OPERATION CHARTS

#### COOLING - BASED ON 80/67°F I.D.

SUCTION IN PSI-G							
O.D. TEMP	SCC/SHC09	SCC/SHC12	SCC/SHC15	SCC/SHC18	SCC/SHC24	SCC/SHC30	SCC/SHC36
65°	73.5	60.0	69.0	68.5	56.5	67.5	65.0
70°	75.0	67.0	70.5	69.5	61.5	69.0	68.0
75°	76.5	69.0	72.0	71.0	65.5	70.5	69.0
80°	78.0	71.0	74.5	72.5	69.0	72.5	72.0
85°	79.5	72.5	76.0	73.5	72.5	74.0	74.0
90°	81.0	74.5	77.5	75.0	75.0	75.5	75.0
95°	82.5	76.5	79.0	76.0	77.0	77.0	76.0
100°	84.0	78.5	80.5	77.5	78.5	78.5	77.0
DISCHARGE IN PSI-G							
O.D. TEMP	SCC/SHC09	SCC/SHC12	SCC/SHC15	SCC/SHC18	SCC/SHC24	SCC/SHC30	SCC/SHC36
65°	194.5	177.0	190.0	166.5	168.5	177.0	190.0
70°	191.5	189.0	202.0	177.5	183.0	193.5	212.0
75°	193.0	201.5	220.0	190.0	197.5	210.0	221.0
80°	198.5	215.5	235.0	203.5	212.0	226.0	237.0
85°	208.5	230.5	252.0	218.0	227.0	242.5	253.0
90°	223.0	246.0	270.0	233.5	241.5	259.0	270.0
95°	241.5	263.0	285.0	250.5	256.0	275.5	285.0
100°	264.0	280.5	300.0	268.5	270.5	292.0	302.0
SUPERHEAT IN F° (SUCTION TEMP. TAKEN AT COMPRESSOR SUCTION CONNECTION)							
O.D. TEMP	SCC/SHC09	SCC/SHC12	SCC/SHC15	SCC/SHC18	SCC/SHC24	SCC/SHC30	SCC/SHC36
65°	24.0	32.0	23.0	22.5	43.5	32.5	30.0
70°	23.5	29.5	22.5	21.0	38.0	30.0	26.0
75°	22.5	27.0	22.0	20.0	32.0	27.5	23.0
80°	20.5	23.5	20.0	18.5	26.5	24.0	20.0
85°	17.5	20.0	15.0	17.0	21.0	19.5	16.0
90°	14.5	16.0	14.0	15.5	15.5	15.0	13.0
95°	10.5	11.5	10.0	14.0	10.0	9.5	10.0
100°	6.0	6.5	5.0	12.5	4.5	3.5	7.0
SUB-COOLING IN F°							
O.D. TEMP	SCC/SHC09	SCC/SHC12	SCC/SHC15	SCC/SHC18	SCC/SHC24	SCC/SHC30	SCC/SHC36
65°	34.5	28.5	21.0	19.5	24.5	22.0	23.0
70°	27.0	27.0	21.0	19.0	24.0	23.5	23.0
75°	21.5	26.0	21.0	19.0	24.0	24.0	22.0
80°	17.5	25.0	20.0	18.5	24.0	24.5	22.0
85°	15.5	25.0	20.0	18.0	24.0	24.0	21.0
90°	14.5	25.0	19.0	17.5	23.5	23.5	19.0
95°	15.5	25.5	18.5	17.0	23.5	22.5	17.0
100°	18.0	26.5	18.5	17.0	23.5	20.5	15.0

#### HEATING - BASED ON 70°F I.D.

SUCTION IN PSI-G							
O.D. TEMP	SHC09	SHC12	SHC15	SHC18	SHC24	SHC30	SHC36
40°	52.0	50.5	47.0	51.0	48.0	49.5	52.0
45°	56.0	55.0	50.0	58.5	55.5	54.0	54.0
50°	61.0	60.0	54.0	63.5	62.0	58.5	55.5
55°	66.5	64.5	58.0	69.0	67.0	62.5	57.0
60°	73.0	69.0	63.0	73.0	71.0	67.0	62.0
65°	80.0	74.0	67.5	76.5	74.0	71.5	66.0
DISCHARGE IN PSI-G							
O.D. TEMP	SHC09	SHC12	SHC15	SHC18	SHC24	SHC30	SHC36
40°	203.5	239.5	202.0	206.5	230.5	213.5	235.0
45°	205.0	250.0	205.0	214.5	240.0	227.0	256.0
50°	210.5	260.5	212.0	222.5	250.5	239.0	262.0
55°	220.0	271.5	223.0	231.0	262.5	248.0	275.0
60°	233.5	282.0	235.0	239.0	276.0	255.0	283.0
65°	251.0	292.5	254.0	247.0	290.5	260.0	290.0
SUPERHEAT IN F° (SUCTION TEMP. TAKEN AT COMPRESSOR SUCTION CONNECTION)							
O.D. TEMP	SHC09	SHC12	SHC15	SHC18	SHC24	SHC30	SHC36
40°	15.0	12.0	15.0	17.0	13.5	8.0	15.0
45°	14.0	14.5	16.0	12.5	10.5	10.0	15.0
50°	13.5	16.5	17.0	10.5	9.5	12.0	16.0
55°	14.5	18.5	19.0	11.5	11.0	14.0	16.0
60°	16.0	21.0	20.0	15.0	14.0	16.0	16.0
65°	19.0	23.0	22.0	21.0	19.0	18.0	16.0
SUB-COOLING IN F°							
O.D. TEMP	SHC09	SHC12	SHC15	SHC18	SHC24	SHC30	SHC36
40°	23.0	22.0	13.0	17.0	23.5	13.0	5.0
45°	23.0	22.5	12.0	17.5	21.0	14.0	5.0
50°	23.0	22.5	12.0	17.5	20.0	14.5	5.0
55°	23.0	22.5	12.0	17.0	19.5	13.5	5.0
60°	23.0	22.0	11.0	15.0	19.5	12.0	5.0
65°	23.0	22.0	8.0	13.0	21.0	9.0	5.0

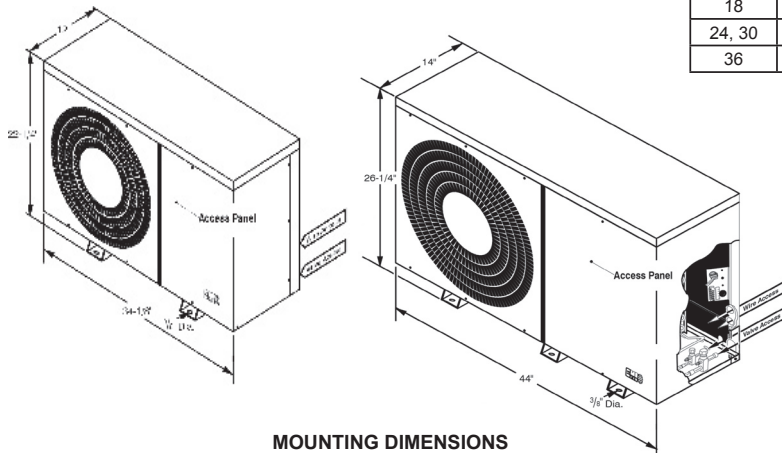
NOTE: I.D. = INDOOR - O.D. = OUTDOOR

# SCC/SHC DIMENSIONS & SPECIFICATIONS

NOTE: All EMI products are subject to ongoing development programs so design and specifications may change without notice.



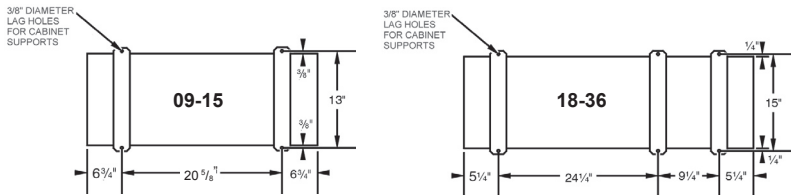
UNIT SIZE	WIDTH	HEIGHT	DEPTH	SHIPPING WT. (LBS.)	INTERCONNECTING REFRIGERANT LINE SIZES	
09, 12	34 1/8"	22 1/4"	12"	90	1/4"	1/2"
15	34 1/8"	22 1/4"	12"	90	1/4"	5/8"
18	44"	26 1/4"	14"	135	3/8"	5/8"
24, 30	44"	26 1/4"	14"	155	3/8"	3/4"
36	44"	26 1/4"	14"	155	3/8"	7/8"



MODEL	COOLING		HEATING	
	BTUH	SEER	BTUH	HSPF
09	9,500	10.5	9,000	7.1
12	12,000	10.0	11,200	7.0
15	15,800	10.3	14,100	7.1
18	18,600	10.3	18,000	7.0
24	24,000	10.6	21,500	7.3
30	28,400	10.2	26,200	7.9
36	33,000	10.0	31,000	6.8

\* When paired with EMI's highest sales volume combinations

### MOUNTING DIMENSIONS



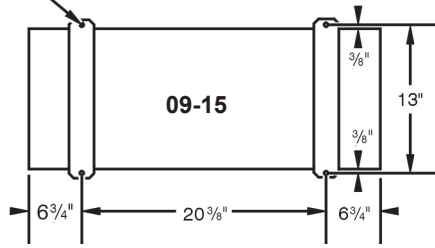
Model#	Volts/HZ/PH	Fan Motor		Compressor		Total AMPS	Min Volt	M.C.A.	HACR BRKR	
		AMPS	HP	RLA	LRA					
<b>115V 60Hz</b>										
09AA	115/60/1	1.6	0.125	7.4	44	9	104	10.9	15	
12AA		1.6	0.125	9.7	54	11.3	104	13.7	20	
<b>208/230V 60Hz</b>										
09DM	208/230/60/1	1	0.125	4.1	20	5.1	197	6.1	15	
12DM		1	0.125	5.1	28	6.1	197	7.4	15	
15DM		1	0.125	6.4	35	7.4	197	9.0	15	
18DF		1	0.125	7.4	48	8.4	197	10.3	15	
24DF		1	0.125	9.6	60	10.6	197	13.0	20	
30DF		1	0.125	11.8	73	12.8	197	15.8	25	
36DF		1.8	0.333	14.4	86	16.2	197	19.8	30	
<b>265/277V 60Hz</b>										
09EM	265/277/60/1	1	0.125	3.3	18	4.3	240	5.1	15	
12EM		1	0.125	4.2	28	5.2	240	6.3	15	
15EA		1	0.125	5.4	32	6.4	240	7.8	15	
18EF		1	0.125	6.5	44	7.5	240	9.1	15	
24EF		1	0.125	8.2	58	9.2	240	11.3	15	
30EF		1	0.125	10.4	72	11.4	240	14.0	20	
36EF		1.8	0.333	13	90	14.8	240	18.1	30	
<b>220/240 50 Hz</b>										
09FA	220/240/50/1	1	0.125	3	18.6	4	198	4.8	15	
12FA		1	0.125	4.1	28	5.1	198	6.1	15	
15FA		1	0.125	5.2	32	6.2	198	7.5	15	
18FF		1	0.125	6.7	42	7.7	198	9.4	15	
24FF		1	0.125	8.4	55	9.4	198	11.5	15	
30FF		1	0.125	10.7	70	11.7	198	14.4	25	
36FF		1.8	0.333	13.4	85	15.2	198	18.6	30	



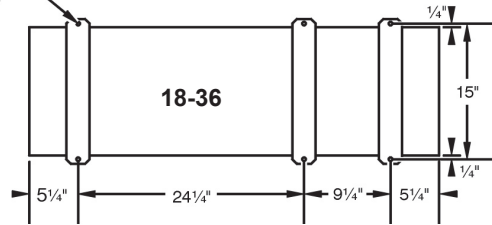
## SCC/SHC DIMENSIONS & SPECIFICATIONS

### MOUNTING DIMENSIONS

3/8" DIAMETER  
LAG HOLES  
FOR CABINET  
SUPPORTS



3/8" DIAMETER  
LAG HOLES  
FOR CABINET  
SUPPORTS



## REFRIGERANT CHARGE TABLE FOR SCC/SHC

CONDENSER CAPACITY	EVAPORATOR PAIRING	LINE CHG/FT	LINE LENGTH	LINE ADJUST	FACTORY CHARGE		SYSTEM TOTAL	
					SCC	SHC	SCC	SHC
09	CHP 12	.25 OZ.	10	3 OZ.	26.5 OZ.	44 OZ.	29 OZ.	47 OZ.
	FHP 12							
	WHP 12							
	TBH 12							
	CAH 12							
CNR 12								
12	CHP 12	.25 OZ.	10	3 OZ.	29.5 OZ.	42 OZ.	32 OZ.	45 OZ.
	FHP 12							
	WHP 12							
	TBH 12							
	CAH 12							
CNR 12								
15	CHP 15	.25 OZ.	10	3 OZ.	43.5 OZ.	52 OZ.	46.5 OZ.	55 OZ.
	FHP 15							
	WHP 18							
	CAH 24							
18	CHP 24	.56 OZ.	10	6 OZ.	35 OZ.	41 OZ.	41 OZ.	47 OZ.
	FHP 24							
	WHP 18							
	CAH 24							
24	CHP 24	.56 OZ.	10	6 OZ.	50 OZ.	44 OZ.	56 OZ.	50 OZ.
	FHP 24							
	WHP 30							
	CAH 24							
30	CHP 30	.56 OZ.	10	6 OZ.	64 oz.	68 oz.	70 OZ.	74 OZ.
	FHP 30							
	WHP 30							
	CAH 36							
36	CHP 36	.56 OZ.	10	6 OZ.	65 oz.	65 oz.	71 OZ.	71 OZ.
	FHP 36							
	WHP 36							
	CAH 36							

#### 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.

## INSTALLATION OF MC4/MH4 MULTI-ZONE

### MC4/MH4 MULTI-ZONE High Efficiency Condensing Unit Limited Range Heat Pump



### PRODUCT DESCRIPTION

The America Series high efficiency MC4 Multi-Zone Air Conditioners and MH4 Heat Pumps may contain 2, 3, or 4 compressors and low voltage wiring circuits for connection to 2, 3, or 4 indoor evaporators. Each zone is independent and no mixing of refrigerant is required. This manual pertains to the outdoor section installation of the MC4 air conditioner or MH4 heat pump with standard features. Check to be certain the included equipment is as ordered and that the voltage is correct for the power supply before attempting installation.

**Backup electric heat is highly recommended in the evaporator with heat pump application. The MH4 will operate in heating down to 35°F outdoor temperature, at which point it will shut down and initiate change-over to electric heat only.**

With cooling applications only, low ambient option should be specified for the unit to be supplied if the system will be asked to cool at outdoor temperature below 60°F. EMI accomplishes low-ambient operation on MC4/MH4 condensers by cycling the condenser fan. This will in turn maintain a constant low side pressure and keep

the air handler away from frost-up. Included in the low ambient option for the 9,000, 12,000 and 15,000 Btu circuits, is a crankcase heater. This will offer protection against cold start situations, thus prolonging the life of the compressor.

### REFRIGERANT CHARGE TABLE FOR MC4/MH4

CONDENSER CAPACITY	EVAPORATOR PAIRING	LINE CHG/FT	LINE LENGTH	LINE ADJUST	FACTORY CHARGE		SYSTEM TOTAL	
					MC4	MH4	MC4	MH4
09	CHP 12	.25 OZ.	10	3 OZ.	26.5 OZ.	44 OZ.	29 OZ.	47 OZ.
	FHP 12			6 OZ.			32 OZ.	50 OZ.
	WHP 12			13 OZ.			39 OZ.	57 OZ.
	TBH 12							
	CAH 12							
CNR 12								
12	CHP 12	.25 OZ.	10	3 OZ.	29.5 OZ.	42 OZ.	32 OZ.	45 OZ.
	FHP 12			6 OZ.			35 OZ.	48 OZ.
	WHP 12			13 OZ.			42 OZ.	55 OZ.
	TBH 12							
	CAH 12							
CNR 12								
15	CHP 15	.25 OZ.	10	3 OZ.	43.5 OZ.	52 OZ.	46.5 OZ.	55 OZ.
	FHP 15			6 OZ.			49.5 OZ.	58 OZ.
	WHP 18			13 OZ.			56.5 OZ.	65 OZ.
	CAH 24							
18	CHP 24	.56 OZ.	10	6 OZ.	35 OZ.	41 OZ.	41 OZ.	47 OZ.
	FHP 24			14 OZ.			49 OZ.	55 OZ.
	WHP 18			28 OZ.			63 OZ.	69 OZ.
	TBH 24							
	CAH 24							
24	CHP 24	.56 OZ.	10	6 OZ.	50 OZ.	44 OZ.	56 OZ.	50 OZ.
	FHP 24			14 OZ.			64 OZ.	58 OZ.
	WHP 30			28 OZ.			78 OZ.	72 OZ.
	TBH 24							
	CAH 24							
30	CHP 30	.56 OZ.	10	6 OZ.	64 oz.	68 oz.	70 OZ.	74 OZ.
	FHP 30			14 OZ.			78 OZ.	82 OZ.
	WHP 30			28 OZ.			92 OZ.	96 OZ.
	CAH 36							

**NOTE: The crankcase heater is installed when the low ambient control option is selected, and with 09-15K heat pumps.**

For installation of the indoor unit and start-up of the system, please refer to the appropriate installation manual for your indoor product to complete the installation.

#### IMPORTANT NOTES:

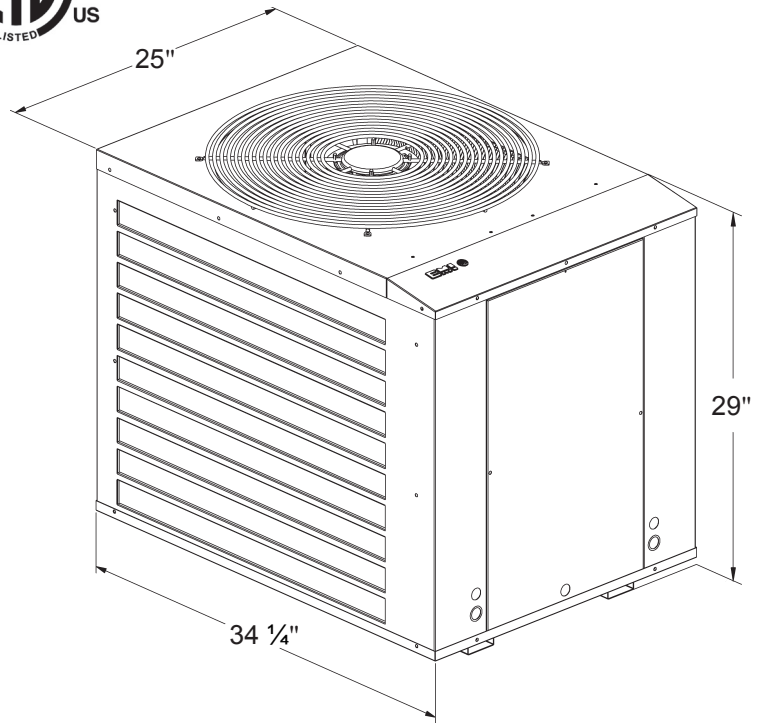
- To find the charge adjustment and system charge for any evaporator and tubing length:  

$$\text{Line Adjustment} = (\text{Line Charge/FT}) \times \text{Line Length}$$

$$\text{System Total} = \text{Factory Charge} + \text{Line Adjustment}$$
- Round to the nearest ounce and allow for gauges and hoses.

## MC4/MH4 DIMENSIONS AND SPECIFICATIONS

NOTE: Due to EMI's ongoing development programs, design and specifications may change without notice.



MC4/MH4 Piping Specification		
Ref. Line Size		
Model	Liquid	Suction
09, 12	1/4"	1/2" O.D.
15	1/4"	5/8" O.D.
18	3/8"	5/8" O.D.
24	3/8"	3/4" O.D.
30	3/8"	3/4" O.D.

Note: Do not upsize lines.

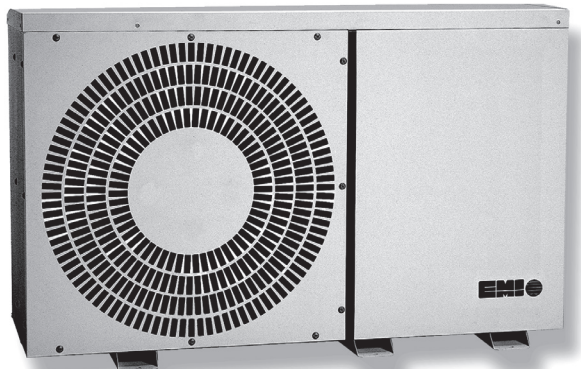
Reference Circuit Ratings (1)				
MC4/MH4 Model	Cooling		Heating	
	Btuh	SEER	Btuh	C.O.P.
09	9,400	10.5	8,000	3.1
12	10,800	10.5	10,000	3.1
15	14,200	10.0	13,600	3.0
18	17,100	10.0	16,000	3.2
24	22,000	10.0	20,800	3.0
30	28,600	10.0	26,500	3.0

(1) See Model Chart for proper System Capacities.

MC4/MH4 208/230V - 60 HERTZ 1 - PHASE														
CAPACITY	FAN MTR		COMPRESSOR								TOTAL AMPS	MCA	HACR BRKR	MIN VOLT
	AMPS	HP	CIRCUIT #1		CIRCUIT #2		CIRCUIT #3		CIRCUIT #4					
			RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA				
9990	1	0.125	3.8	20	3.8	20	3.8	20			12.4	13.4	15	197
2220	1	0.125	4.8	26.3	4.8	26.3	4.8	26.3			15.4	16.6	20	197
2550	1.8	0.33	4.8	26.3	6.7	48	6.7	48			20	21.7	25	197
9920	1	0.125	3.8	20	3.8	20	4.8	26.3			13.4	14.6	15	197
9908	1	0.125	3.8	20	3.8	20			7.4	48	16	17.9	25	197
9208	1	0.125	3.8	20	4.8	26.3			7.4	48	17	18.9	25	197
9904	1	0.125	3.8	20	3.8	20			9.6	60	18.2	20.6	30	197
9905	1.8	0.33	3.8	20	3.8	20			6.7	48	16.1	17.8	20	197
9504	1.8	0.33	3.8	20	6.7	48			9.6	60	21.9	24.3	30	197
9508	1.8	0.33	3.8	20	6.7	48			7.4	48	19.7	21.6	25	197
2208	1	0.125	4.8	26.3	4.8	26.3			7.4	48	18	19.9	25	197
2008	1	0.125	4.8	26.3					7.4	48	13.2	15.1	20	197
9999	1	0.125	3.8	20	3.8	20	3.8	20	3.8	20	16.2	17.2	20	197
2222	1	0.125	4.8	26.3	4.8	26.3	4.8	26.3	4.8	26.3	20.2	21.4	25	197
9922	1	0.125	3.8	20	3.8	20	4.8	26.3	4.8	26.3	18.2	19.4	20	197
0808	1	0.125			7.4	48			7.4	48	15.8	17.7	25	197
0404	1	0.125			9.6	60			9.6	60	20.2	22.6	30	197
0804	1	0.125			7.4	48			9.6	60	18	20.4	30	197
5555	1.8	0.33	6.7	48	6.7	48	6.7	48	6.7	48	28.6	30.3	35	197
0303	1.8	0.33			11.8	73			11.8	73	25.4	28.4	40	197

MC4/MH4 265/277V - 60 HERTZ 1 - PHASE														
CAPACITY	FAN MTR		COMPRESSOR								TOTAL AMPS	MCA	HACR BRKR	MIN VOLT
	AMPS	HP	CIRCUIT #1		CIRCUIT #2		CIRCUIT #3		CIRCUIT #4					
			RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA				
9990	1	0.125	3.3	18.6	3.3	18.6	3.3	18.6			10.9	11.8	15	240
2220	1	0.125	4.2	28	4.2	28	4.2	28			13.6	14.7	15	240

**MC2/MH2 DUAL-ZONE**  
High Efficiency Condensing Unit  
Limited Range Heat Pump



For installation of the indoor unit and start-up of the system, please refer to the appropriate installation manual for your indoor product to complete the installation.

**DESCRIPTION**

EMI offers the finest high capacity multiple zone outdoor units in the ductless split market, the MC2/MH2 High Capacity Condensing Unit. The MC2/MH2 allows the installation of two circuits from a single outside location when space or aesthetic requirements limit the use of locations. Valves are internal for tamper protection and each zone is independent so no mixing of refrigerant is required.

When specifying heat pump(s), it is recommended that the matching evaporator(s) be equipped with electric heat. The MH2 will operate down to 35°F outdoor temperature, at which point it will initiate change over to electric heat and shut down the condenser. All 9,000, 12,000, and 15,000 Btuh units are equipped with the Duratec Performance Package which include a large capacity suction accumulator with surge baffles and enhanced oil management, a factory installed solid core filter drier and loss of refrigerant charge protection.

**NOTE: The crankcase heater is installed with 9-15K Btu heat pumps and when the low ambient control option is selected.**

**REFRIGERANT CHARGE TABLE FOR MC2/MH2**

CONDENSER CAPACITY	EVAPORATOR PAIRING	LINE CHG/FT	LINE LENGTH	LINE ADJUST	FACTORY CHARGE		SYSTEM TOTAL	
					MC2	MH2	MC2	MH2
09	CHP 12	.25 OZ.	10	3 OZ.	26.5 OZ.	44 OZ.	29 OZ.	47 OZ.
	FHP 12							
	WHP 12							
	TBH 12							
	CAH 12							
CNR 12								
12	CHP 12	.25 OZ.	10	3 OZ.	29.5 OZ.	42 OZ.	32 OZ.	45 OZ.
	FHP 12							
	WHP 12							
	TBH 12							
	CAH 12							
CNR 12								
15	CHP 15	.25 OZ.	10	3 OZ.	43.5 OZ.	52 OZ.	46.5 OZ.	55 OZ.
	FHP 15							
	WHP 18							
	CAH 24							

**IMPORTANT NOTES:**

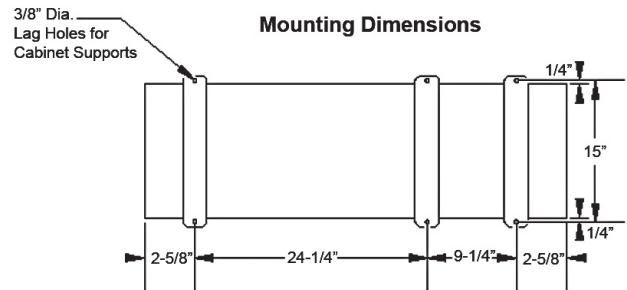
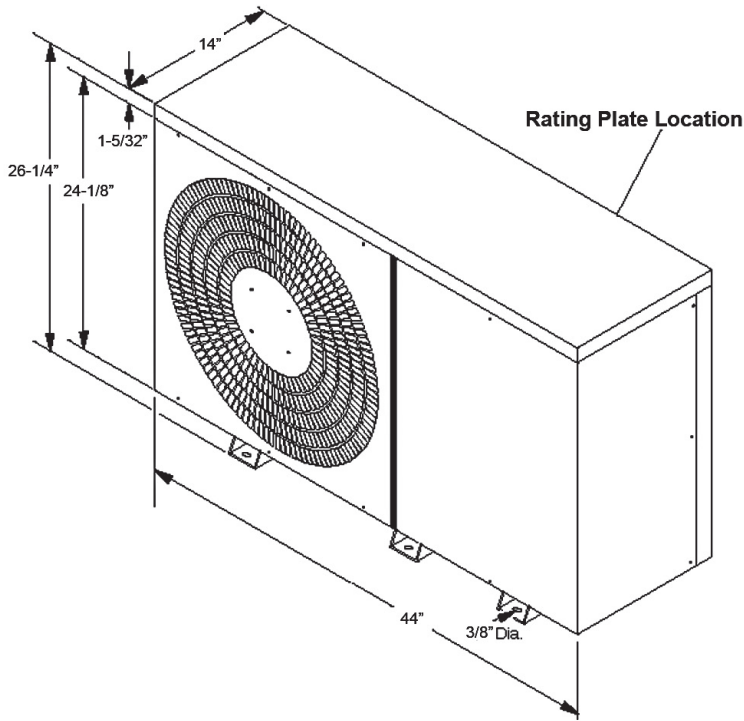
- To find the charge adjustment and system charge for any evaporator and tubing length:  

$$\text{Line Adjustment} = (\text{Line Charge/FT}) \times \text{Line Length}$$

$$\text{System Total} = \text{Factory Charge} + \text{Line Adjustment}$$
- Round to the nearest ounce and allow for gauges and hoses.

## MC2/MH2 DIMENSIONS AND SPECIFICATIONS

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



### MC2/MH2 ELECTRICAL SPECIFICATIONS

MODEL (1)	VOLTS/HZ/PHASE	FAN		COMPRESSOR 1		COMPRESSOR 2		TOTAL AMPS	MIN. CIR. AMPS (2)	HACR BRKR
		RLA	HP	RLA	LRA	RLA	LRA			
9900	208-230/60/1	1.0	0.125	4.1	20	4.1	20	9.2	10.3	15
2200	208-230/60/1	1.0	0.125	4.8	26.3	4.8	26.3	10.6	11.8	15
9200	208-230/60/1	1.0	0.125	3.8	20	4.8	26.3	9.6	10.8	15
5500	208-230/60/1	1.8	0.25	6.4	38	6.4	38	14.6	16.2	20

(1) Circuit Designators: 9 = 9,000 Btuh • 2 = 12,000 Btuh • 5 = 15,000 Btuh

ex. - Model 9200 consists of one 9,000 Btuh compressor and one 12,000 Btuh compressor

(2) Always refer to the rating plate for Minimum Circuit Ampacity on all multiple compressor units.

### MC2/MH2 PIPING SPECIFICATIONS

Model#	Line Sizes	
	Liquid	Suction
09, 12	1/4"	1/2"
15	1/4"	5/8"

### MC2/MH2 REFERENCE CIRCUIT RATINGS

MODEL	COOLING		HEATING	
	Btuh	SEER	Btuh	C.O.P.
09	9,500	10.5	8,800	3.3
12	11,300	10.0	10,500	3.1
15	14,200	10.0	13,400	3.1



## START-UP, MAINTENANCE AND TROUBLESHOOTING PROCEDURE

The Test Unit Performance Data sheet below is provided for use by a qualified service professional. 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: <input type="checkbox"/> Cooling
<b>Indoor Section</b>	<b>Notes</b>
Evaporator Entering Air - DB	NOTE: <i>Rotary compressors are critically charged systems, do not over charge. Refer to the Charge Table specific to you unit (SCC /SHC pg. 8, MC4/MH4 pg. 9, MC2/MH2 pg. 11) or call the factory. Anti-short cycle protection should be used on systems that use a conventional thermostat.</i>
Evaporator Entering Air - WB	
Evaporator Leaving Air - DB	
Evaporator Leaving Air - WB	
<b>Outdoor Section</b>	
Entering Air	
Leaving Air	
Temperature Split	
<b>Operating Pressures</b>	
Compressor Suction - PSIG	
Compressor Discharge - PSIG	
<b>Power Input</b>	
Compressor - Volts	
Compressor - Amps	
OD Fan Motor - Volts	
OD Fan Motor - Amps	
ID Fan Motor - Volts	
ID Fan Motor - Amps	
Total Volts	
Total Amps	
<b>Temperatures - Degrees F°</b>	
Compressor Suction	
Compressor Discharge	
Liquid Out Cond.	
Liquid before Expansion	
Suction out Evaporator	
<b>Capacity Calculations</b>	
DB - Temp Split at evap.	
<b>Test Summary</b>	
Compressor Superheat	
Sub Cooling	

**Save this information for future servicing.  
In the event there is a problem with the unit.  
Perform the test again (if possible) and have both sets of data  
ready when calling for assistance.**

## 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:



5780 Success Dr., Rome, NY 13440  
Phone: 1-800-228-9364  
FAX: 1-800-232-9364  
Email: [emi@enviromaster.com](mailto:emi@enviromaster.com)

