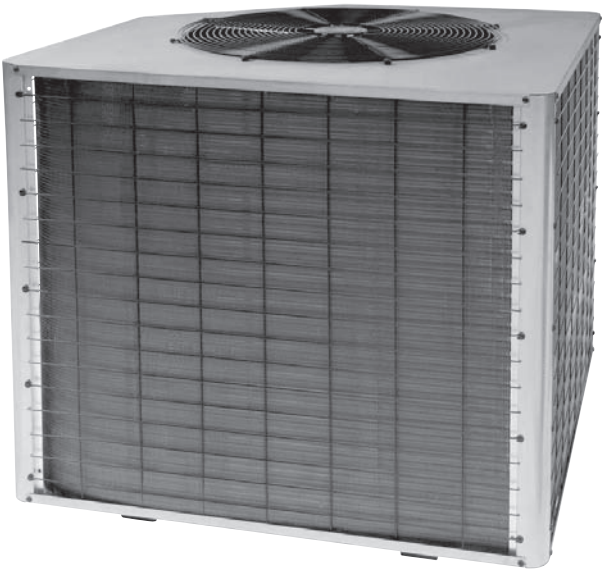
T2CG/T2HG, T3CG/T3HG, T4CG/T4HG Multi-Zone

Top-Discharge Ductless Split-System
Condensing Units for R410 Refrigerant

Capacities —Multi-Zone Applications				
T2CG/T2HG, T3CG/T3HG, T4CG/T4HG				Units
9,000	12,000	18,000	23,800	Btuh
2.6	3.5	5.3	8.3	kW

Installation, Operation and Maintenance Manual



T2CG/T2HG, T3CG/ T3HG, T4CG/T4HG

EMIO Ductless
Comfort Where It Counts.

ECR International Inc
2201 Dwyer Ave
Utica, NY 13501
www.enviromaster.com

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innovative living™
An ISO 9001-2008 Certified Company

P/N 240007755, Rev. D [6/20/2011]

Contents

NOTICE
Shipping Damage

Shipping damage MUST be reported to the carrier IMMEDIATELY. Examine the exterior. Remove cover and examine compressor and piping for signs of damage.

Inspect each component for damage. Concealed damage must be reported to the carrier within 15 days of the receipt of the shipment.

The carrier must make proper notation on the delivery receipt of all damage identified and complete a carrier inspection report.

The purchaser must notify ECR International's Customer Service Department of all damage and is responsible for filing any necessary claims with the carrier.

Customer Service : (800) 228-9364

To the Installer

Retain this manual and warranty for future reference. 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, contact your local representative. For a local representative listing, visit our web site:

www.enviromaster.com

For further assistance call:

1-800-228-9364

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

Model Number _____

Serial Number _____

Date of installation _____

NOTICE

The EMI series high efficiency condensing unit is backed by EMI and ECR International and is tested and rated in accordance with AHRI Standard 210/240-2008 and UL-1995. Due to ongoing product development, product designs and specifications may change without notice. Please contact the factory for more information.

Read Before Proceeding

Recognize this symbol as an indication of important safety information.

WARNING

Completely read all instructions prior to assembling, installing, operating, or repairing this product.

Inspect all parts for damage prior to installation and start-up. The EMI series high efficiency condensing unit must be installed ONLY by qualified installation personnel.

DANGER

Tampering with this unit is dangerous. Tampering voids all warranties. DO NOT attempt to modify or change this unit in any way.

DANGER

The EMI series 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.

Safety Instructions

This manual is intended as an aid to qualified service personnel for proper installation, operation, and maintenance of the EMI series high efficiency condensing unit. Read these 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.

Read all instructions before using this 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 unit before installation to make certain the voltage shown is the same as the electric supply to the unit. The rating plate is located on the front panel only.

This 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 unit.

Do not use the unit if it has damaged wiring, is not working properly, or has been damaged or dropped.

Verify unit before installing

Product description

The EMI Series T2CG/T2HG, T3CG/T3HG, T4CG/T4HG condensing units are air-cooled, vertically-arranged top-discharge, high-efficiency units designed specifically to meet or exceed a 13 SEER rating.

The T2CG/T2HG, T3CG/T3HG, T4CG/T4HG Models 09–24 condensing units will provide cooling and heating for a single air handler, as identified on page 26 and page 27.

The T2CG/T2HG, T3CG/T3HG, T4CG/T4HG are quiet units that can be recommended for both commercial and residential applications.

Features

- Installation of the T2CG/T2HG, T3CG/T3HG, T4CG/T4HG condensing units is simplified by a 24v control interconnection from the air handler.
- Multiple units can be lined up in close proximity to an exterior wall.
- Service valves are recessed to reduce tampering.
- All 9,000-12,000 Btuh zones are equipped with a Duratec Performance Package that includes an oversized suction accumulator with surge baffles and enhanced oil management and a factory-installed solid core filter drier.
- A factory-installed crankcase heater is standard on T2HG, T3HG, T4HG 09 &12 (thermostatically controlled) zones, and is available as optional equipment on T2CG, T3CG, T4CG_09&12 zones.
- All Heat Pump circuits include a Common Suction Port. It provides the most accurate Compressor Suction Saturation Pressure for a heat pump operating in either mode (Cooling or Heating).

Controls and components (Factory-installed or supplied)

- Compressor and fan motor contactor
- Run capacitor
- Low voltage terminal connections
- H.P.S. (High pressure switch) with manual external reset
- Heat pump hard start
- Cooling operation down to 32°F standard on all units
- Zones 09–12 only:
  - Large capacity suction accumulator
  - Solid-core filter drier
  - Thermostatically-controlled crankcase heater (heat pump only)

Thermostatically-controlled crankcase heater

- This feature energizes the crankcase heater only when needed, saving unnecessary power usage and increasing overall system efficiency.

Verify unit before installing *(continued)*

System options

- Corrosion-resistant coil options (sea coast and harsh environment usage):
  - Copper fin/copper tube condenser coil
  - Coated aluminum fin/copper tube condenser coil
- Low Ambient controls for cooling operation down to 0°F (standard equipment can operate down to 32°F)
  - Optional field-installed kit, when specified, for cooling operation down to 0°F — kit includes control, louvers and wind baffle plus installation instructions
- Low Ambient controls for operation down to 0°F (consult factory for availability)
- Models 09–12 only:
  - Field-installed thermostatically-controlled crankcase heater for straight cool units (T2CG, T3CG, T4CG) Recommended for operation below 60°F.

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
- Refrigerant for charging interconnect piping (see charge table on page 14)

NOTICE

Low Ambient controls are required when the system is asked to cool at outdoor temperatures below 32°F, this may cause damage to the compressor and coil, and may void the warranty. A field-installed low-ambient kit allows operation down to 0°F.

This is accomplished by cycling the condenser fan on and off. This will, in turn, maintain a constant low-side pressure, providing a steady cooling effect and keeping the air handler from frosting-up.

The optional kits include louvers/wind baffle, crankcase heater(09 & 12 zones), outdoor fan cycling switch, and installation instructions.

Site Preparation

Before installing, consider:

- Locate the unit as close to the indoor section as possible. (see page 10.)
- T2CG, T3CG, T4CG — If the unit is used for low ambient cooling down to 32°F, T2CG, T3CG, T4CG require CCH for 9 & 12 circuits.
- Avoid high traffic areas and prevailing wind locations.
- Surface must be flat and level.
- Mount unit above typical snow fall level. This is particularly important for heat pump applications (T2HG, T3HG, T4HG).

NOTICE

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

Site preparation

1. Place the unit on a flat concrete surface or pad if on the ground. Roof mounting should use a built up platform to avoid intake of hot air from the roof.
2. In areas of heavy snowfall, condensers should be set above the maximum anticipated snow line (12" is usually adequate for most locations).

Electrical Wiring

NOTICE

All electrical wiring must be run according to NEC and local codes.

1. Figure 1, Page 7 — Refer to the unit rating plate for voltage, minimum circuit ampacity and over current protection requirements.
2. Use only HACR type breakers or time delay fuses. Select the wire size according to the ampacity rating.
3. To access electrical connections and wiring diagram Figure 2, Page 7 —
   a. Remove the screw on the bottom of the control panel cover
   b. lift up and pull the bottom of the panel away from the unit
   c. Lower the panel out and away from under the top panel
4. Power should be run to a weather proof disconnect box usually within 3 feet of the unit.

Figure 1 Rating plate location

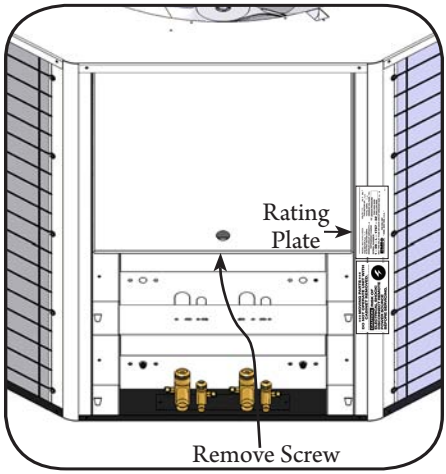
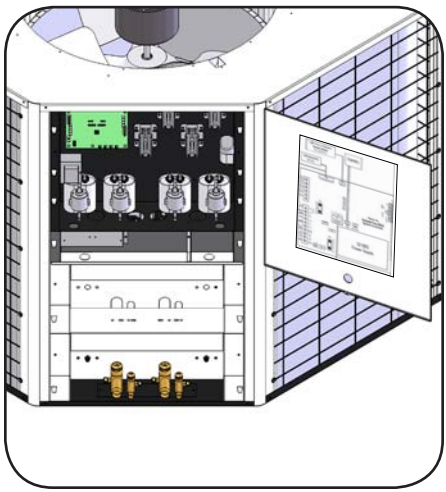


Figure 2 Remove side panel screws



Electrical Wiring *(continued)*

5. Figure 4, Page 8 — From the disconnect box, run the power through the 7/8" hole on the bottom of the control section and into the electrical box. Anchor with the strain relief fitting.
6. Run wires to the high volt pigtail in the control box and attach L1 and L2 connections. Also run green wire to ground lug.
7. Check wiring diagram for the required number of low voltage wires to be run between indoor and outdoor sections.
8. Figure 5, Page 8 — Connect the 24 volt wiring matching color to color. Refer to the wiring diagram on the inside panel of the condenser, and also refer to the wiring diagram on the indoor unit. Low volt interconnect should be at least 18 awg.
9. See Figure 6, Page 9 for completed wiring examples.
10. To replace control panel cover, slide the panel up and under the top panel, and slide back down in place.
11. Fasten all remaining loose screws.

Figure 3 Power entrances

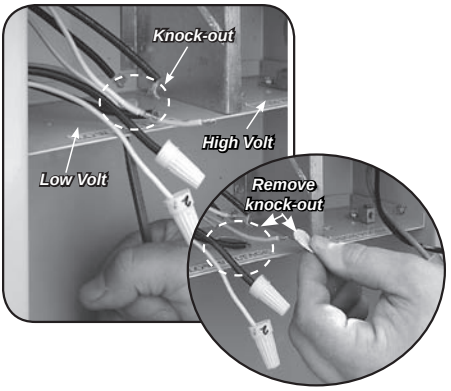


Figure 4 High voltage connections

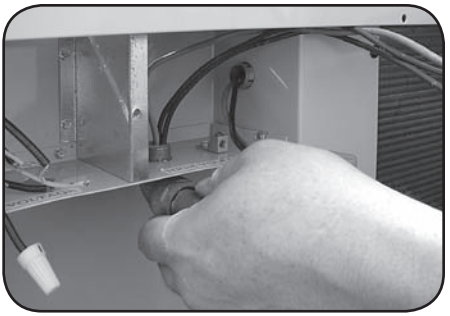
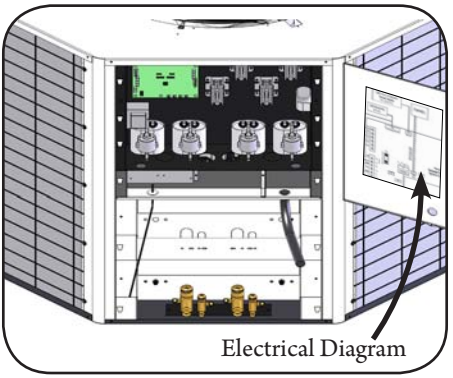


Figure 5 Low voltage connections



Electrical Wiring *(continued)*

Figure 6 Completed wiring, T4HG

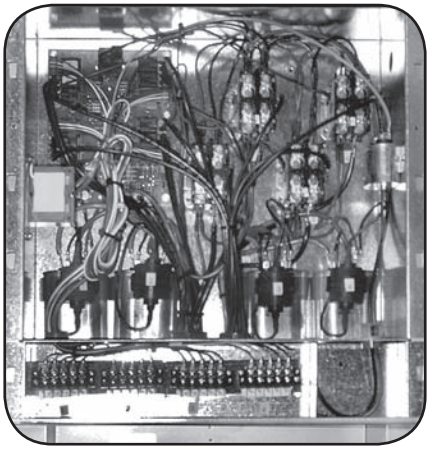
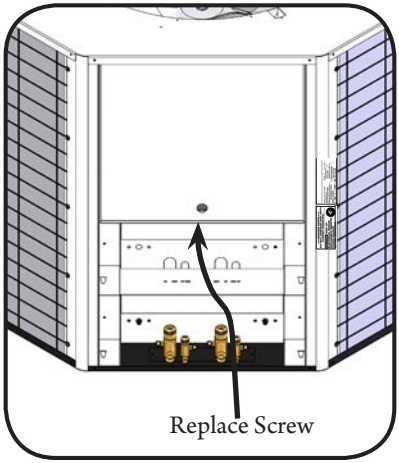


Figure 7 Control Panel Cover Installed



Refrigerant Piping

Tubing specifications

The system will support refrigerant runs to the inside unit as listed in Table 1, Page 10. The units are furnished with sweat connections and are equipped with refrigerant valves and Schrader fittings for charging and taking pressure readings.

⚠ CAUTION

It is recommended that a **filter drier** be installed in the liquid line, at the indoor unit on models without a factory-installed filter drier (i.e. 18K and 24K zones).

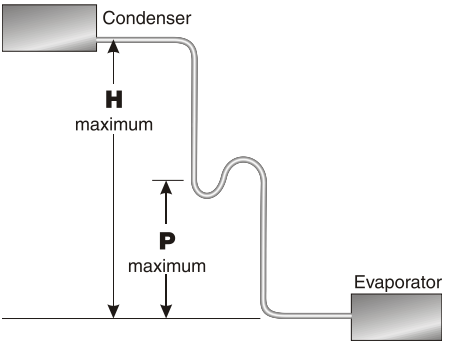
Table 1 Tubing specifications (see Table 10, Page 10)

Model	Max. Length Equivalent Feet	Max. Lift	Max. Trap Height	Liquid Line	Suction Line
		"H"	"P"	O.D.	O.D.
09	50′ (15 m)	20′ (6 m)	15′ (5 m)	1/4"	1/2"
12				1/4"	1/2"
18	100′ (30 m)	35′ (11 m)	20′ (6 m)	3/8"	5/8"
24				3/8"	3/4"

P-trap installation

- A P-trap is recommended when the suction riser is equal to or greater than show in Figure 10, Page 10 and Table 1, Page 10.
- When the condenser is installed above the air handler, the P-trap will help the return of oil back to the compressor.

Figure 10 P-trap placement (see Table 1, Page 10 for dimensions **H** & **P**)



- 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 with the (3) elbow configuration.
- Each elbow is approximately 2 equivalent feet.
- One P-trap is equal to approximately 12 equivalent feet.
- P-traps are not required at the foot of the hot gas risers due to increased oil flow at higher temperatures.

Refrigerant Piping *(continued)*

⚠ CAUTION

- Avoid piping on wet and rainy days.
- Use only clean, refrigeration-grade copper tubing.
- Use tubing benders to guard against kinking.
- Be certain no burrs remain on the fittings.
- Cap ends of lines until ready for connections.
- Be certain that plastic end caps remain in place when inserting through wall openings.
- Insulate the suction line.
- Isolate tubing from transmitting vibration to the building or unit and avoid contact with sharp edges.
- Wrap refrigeration valves with a wet rag "heat sink" to protect valves while brazing. (See Figure 12, Page 11.)

Refrigerant piping

1. Clean the ends of tubing and insert into fittings (Figure 11).
2. Protect valves by wrapping with a wet rag "heat sink" before brazing (Figure 12).
3. Use a shield to protect the paint as shown in Figure 13. (The shield can be made from scrap metal.)
4. Braze tubing into fittings.
5. Install all panels removed to this point. Panels are required for proper air flow.

Figure 11 Clean ends of tubing

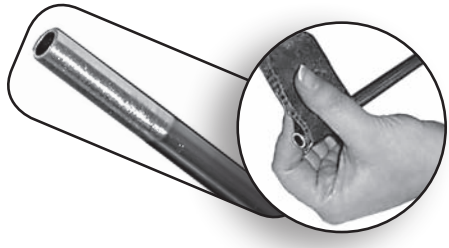


Figure 12 Wet rag "heat shield over valves

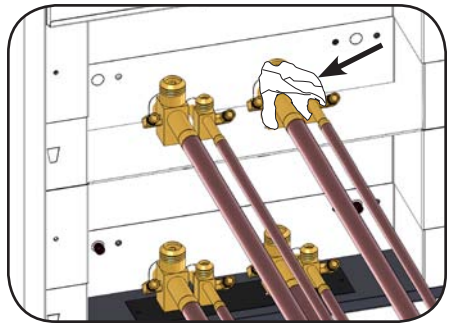
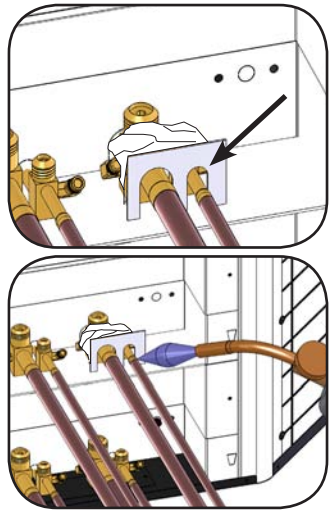


Figure 13 Make a shield to protect paint



Refrigerant Processing

Charging the unit

1. Attach manifold set, vacuum pump, & Micron Gauge. (Figure 14).
2. Evacuate line to 500 microns or less to ensure all moisture has been removed and there are no leaks (Figure 19).
3. Once certain of a good evacuation and leak free joints, back-seat the valves (counter-clockwise) to open and allow factory charge to fill lines and indoor unit (Figure 20, pg. 13).

NOTICE

Refer to refrigerant charge table for specified charge.

4. Charge to proper weight, charge based on feet of interconnect (see tables on page 14). **Only add/remove 410A in liquid form.**
5. Refer to charts beginning on page 15 to "fine tune" the refrigerant charge to meet your conditions.

⚠ CAUTION

All systems require field charge adjustments. Refer to the "Refrigerant Charge Tables" for proper weight charge and to the supplied "Single-zone Operation Charts" for proper system pressures and temperature at different outdoor conditions. Superheat should be used for final system charge.

⚠ CAUTION

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

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

Figure 14 Manifold set connections at unit

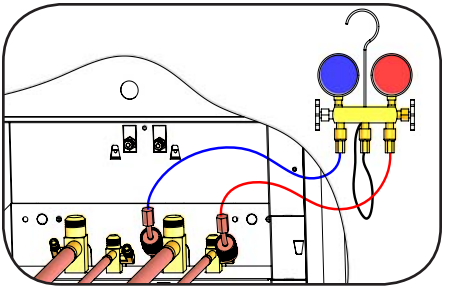
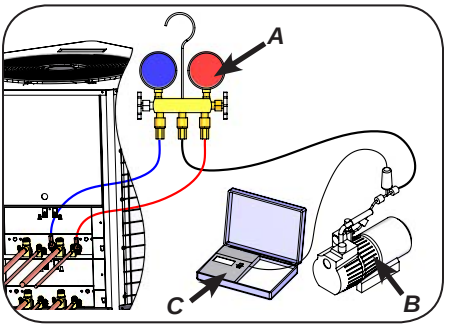
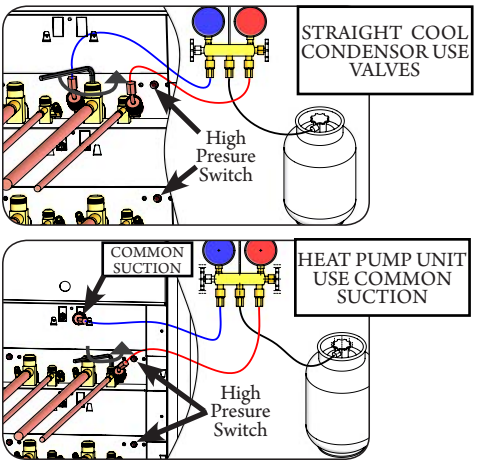


Figure 15 Manifold set up for evacuation



A Manifold
B Vacuum pump
C Micron gage

Figure 16 Manifold setup for Charging



Refrigerant Processing *(continued)*

⚠ WARNING

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

The units are delivered pre-charged with refrigerant for the condenser coil and the air handler. 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 piping. Unit service valves are solid brass, for sweat connections.

⚠ CAUTION

Pressure test all field installed piping with nitrogen. Using a suitable vacuum pump, evacuate the tubing and indoor unit to 500 microns or less, 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. DO NOT back seat the valves past the snap flanges that hold the valve core in place.

NOTICE

The following air handlers are equivalent in electrical specifications and system combinations.

WLH09	=	UNH09
WLH12	=	UNH12
WLH24	=	UNH24
WLC30	=	UNC30
WLC36	=	UNC36

Refrigerant Processing *(continued)*

NOTICE – *to find charge adjustment*

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

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

   System Total = Factory Charge + Line Adjustment

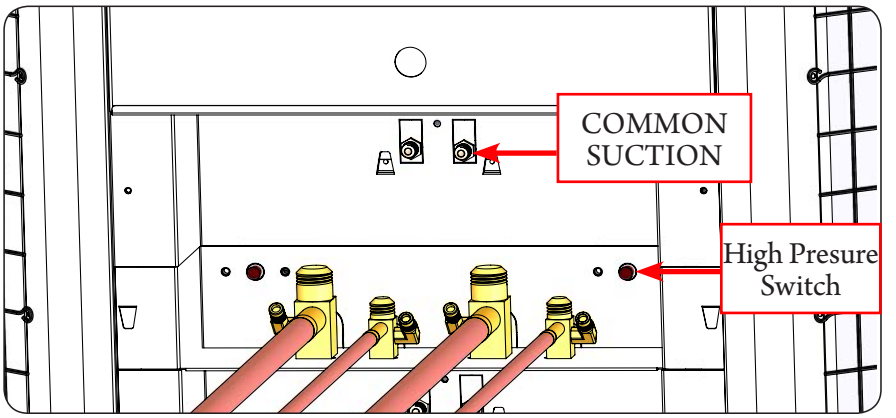
2. Round to the nearest ounce and allow for gauges and hoses.

Table 2 T2CG/T2HG, T3CG/T3HG, T4CG/T4HG refrigerant charge table

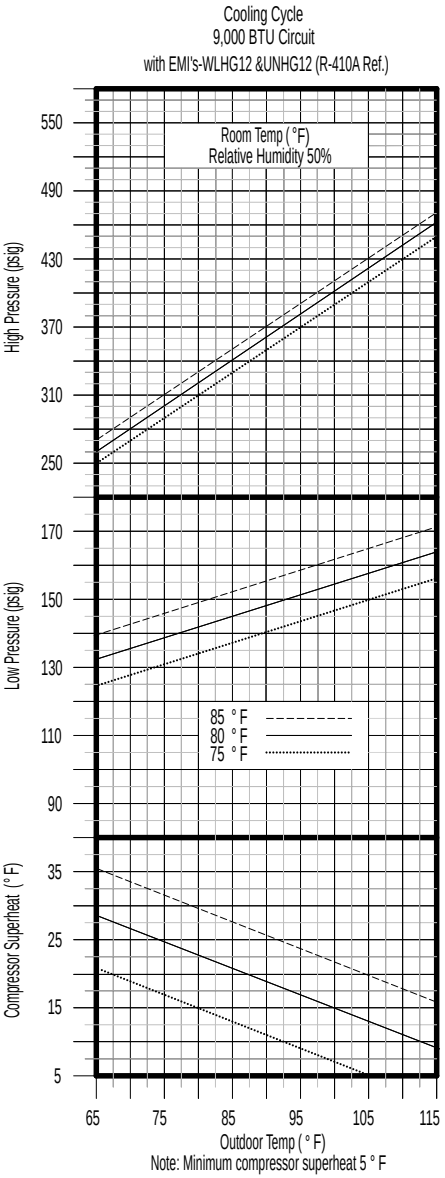
Condenser circuit capacity	Air handler pairing	Line charge per foot	Factory charge
9,000	WLH/UNH09	.25 oz/ft (23 g/m)	46.5oz
12,000	WLH/UNH12	.25 oz/ft (23 g/m)	45.25oz
18,000	WLH/UNH24	.64 oz/ft (59 g/m)	96.25oz
24,000	WLH/UNH24	.64 oz/ft (59 g/m)	78.50oz

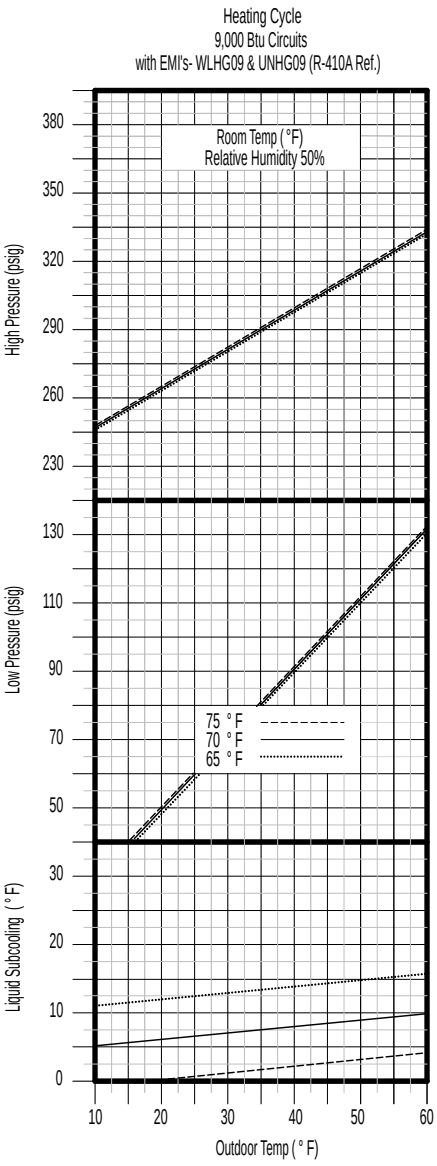
Figure 17 Common Suction & High Pressure Switch

All Heat Pump Saturated Suction Pressures should be measured at the "Common Suction Port" not the vapor Service Valve. The "Common Suction Port" includes the pressure drop and temperature increase through the reversing valve resulting in a more accurate and complete system charge. This port may also be used to charge the system in heating mode when both sides of the line set are at high system pressures or to determine the saturated evaporator pressure while in heating mode.



Multi-Zone Operation Charts



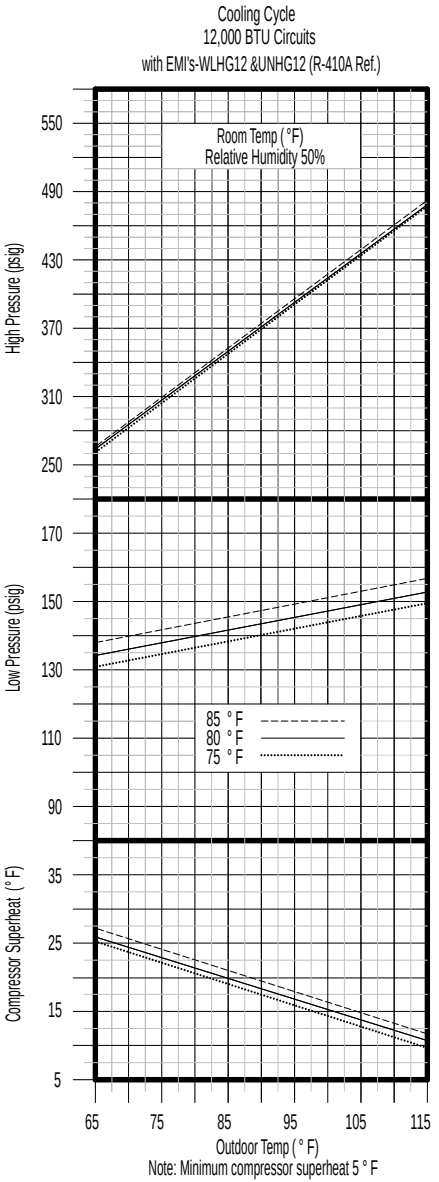


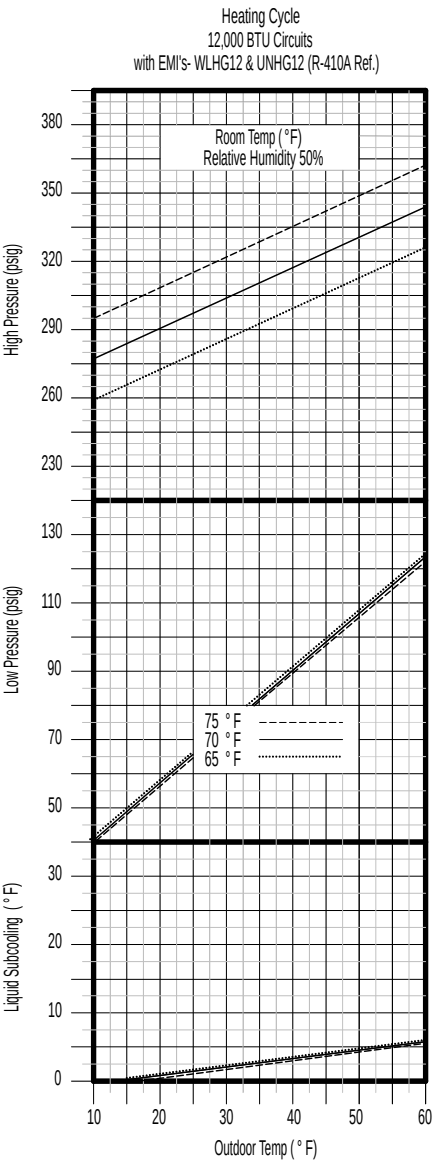
Heat Pump use Common Suction Port. A/C use vapor line Service Valve.

NOTICE

Performance data listed in this manual is subject to change without notice. For the most current unit/system performance data, please refer to the ECR International listing of certified products in the AHRI directory, at www.ahridirectory.org.

Multi-Zone Operation Charts





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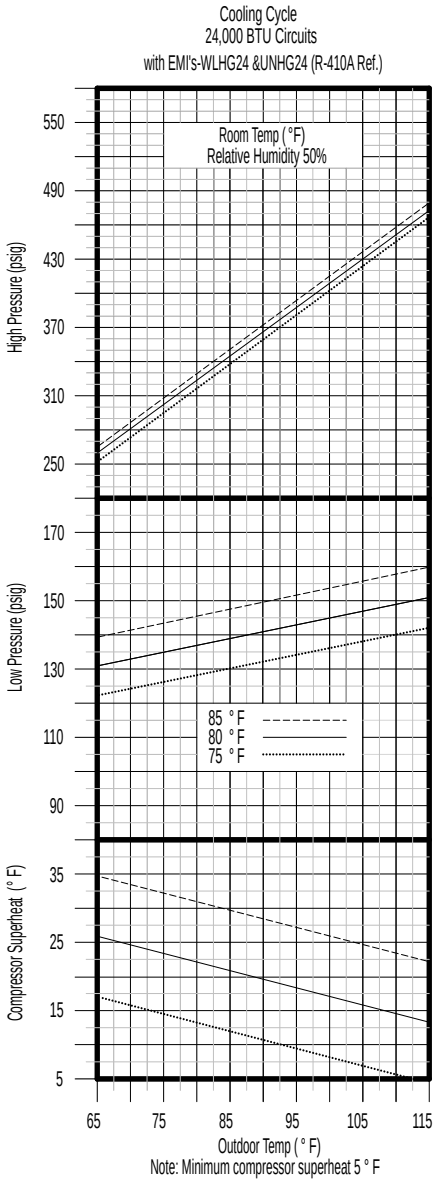

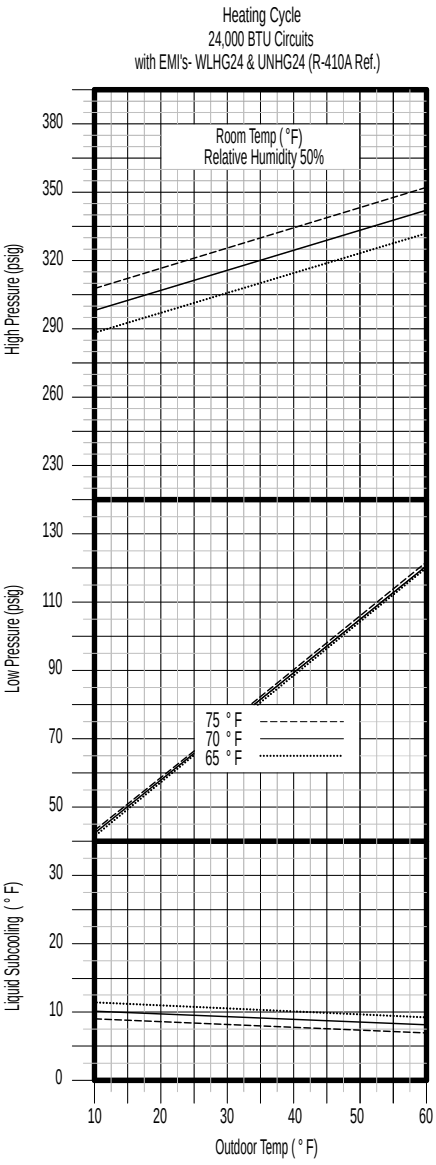

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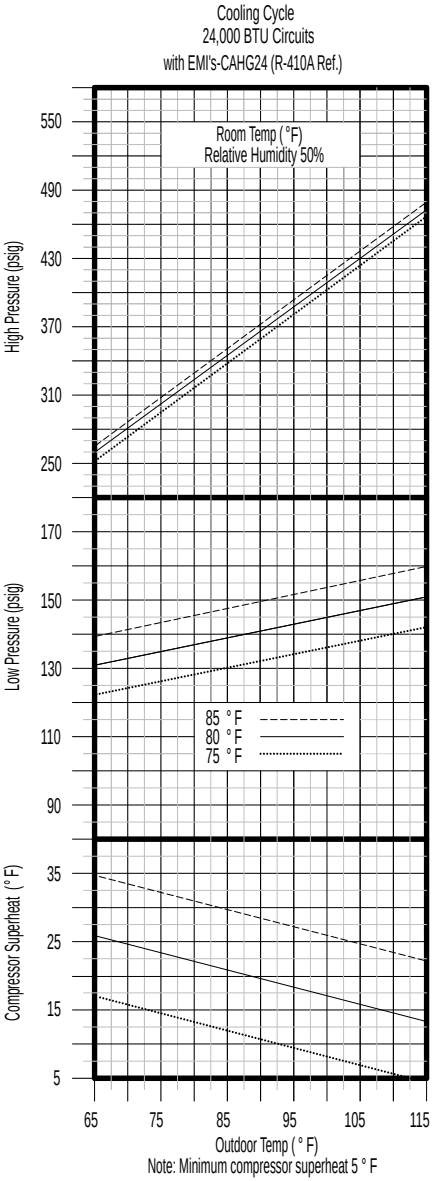
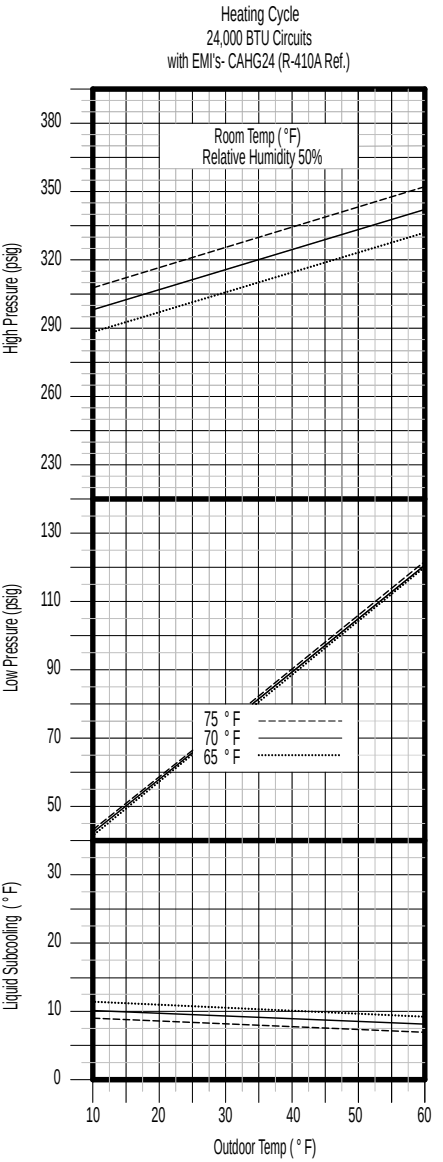
Multi-Zone Operation Charts





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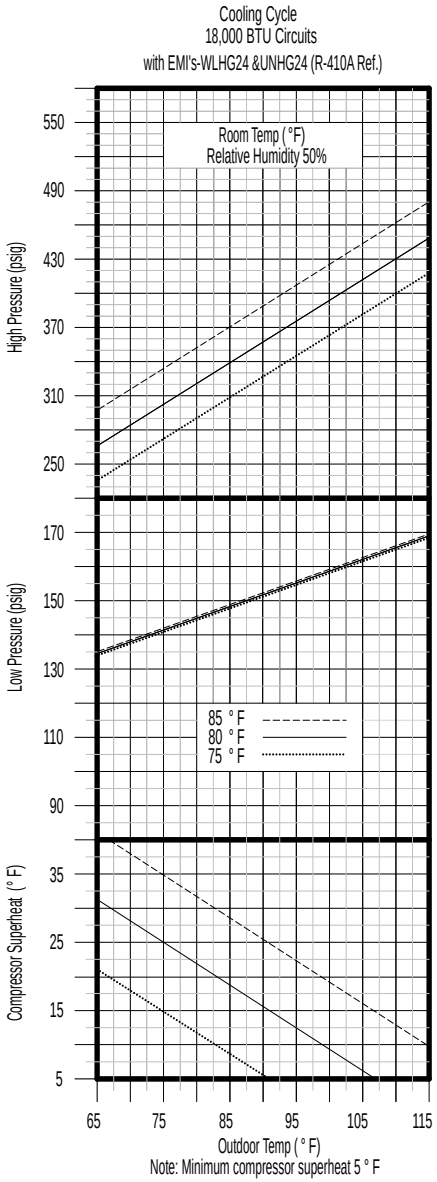
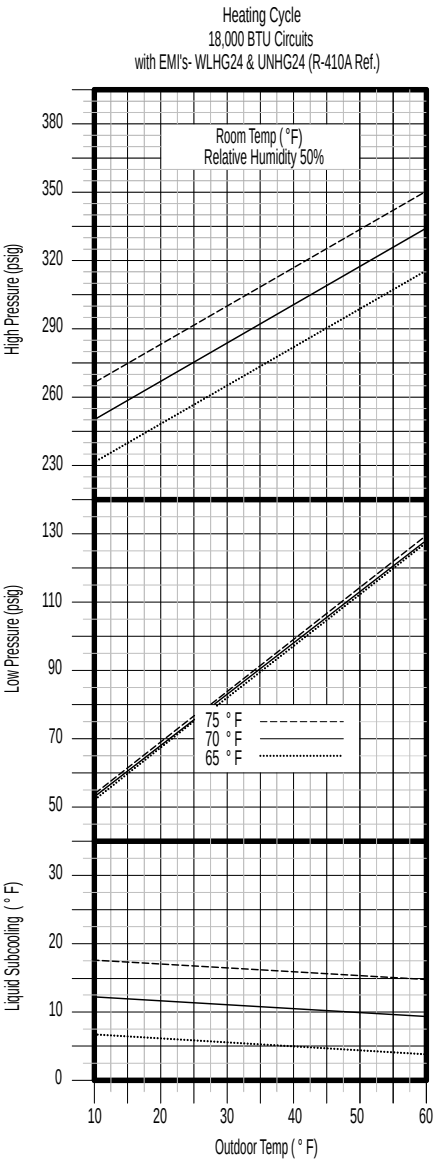
Multi-Zone Operation Charts



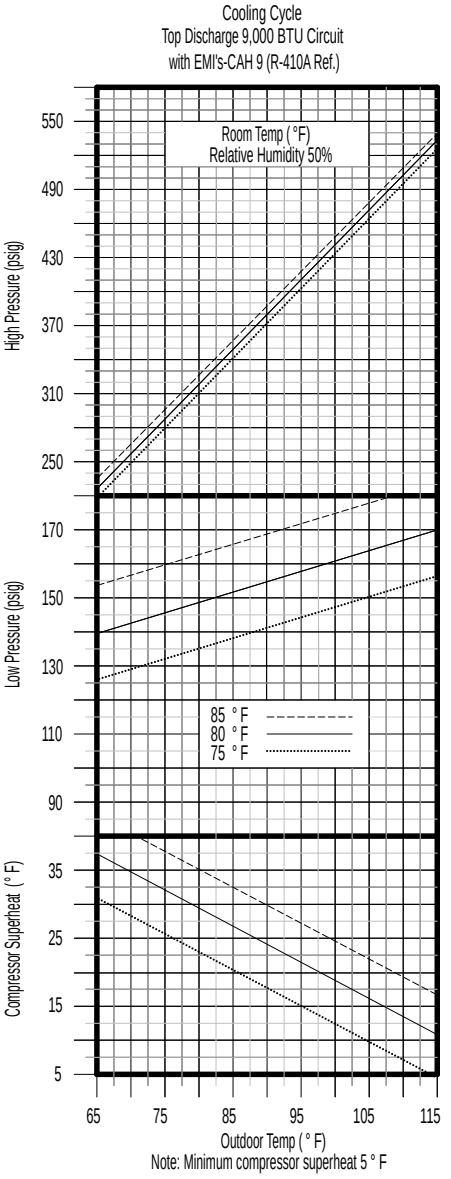


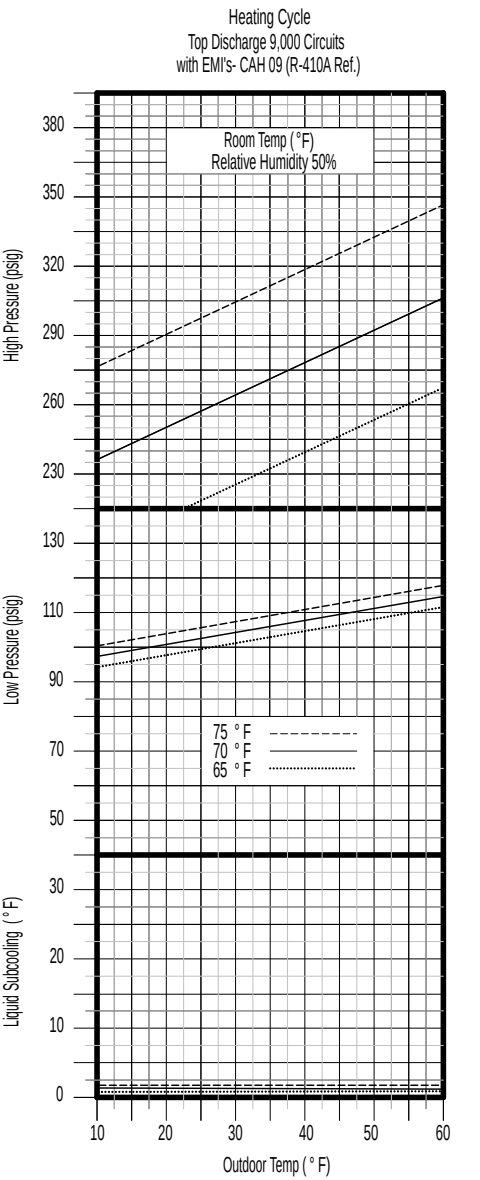
Heat Pump use Common Suction Port. A/C use vapor line Service Valve.

NOTICE

Performance data listed in this manual is subject to change without notice. For the most current unit/system performance data, please refer to the ECR International listing of certified products in the AHRI directory, at www.ahridirectory.org.

Multi-Zone Operation Charts (cont.)





Heat Pump use Common Suction Port. A/C use vapor line Service Valve.

NOTICE

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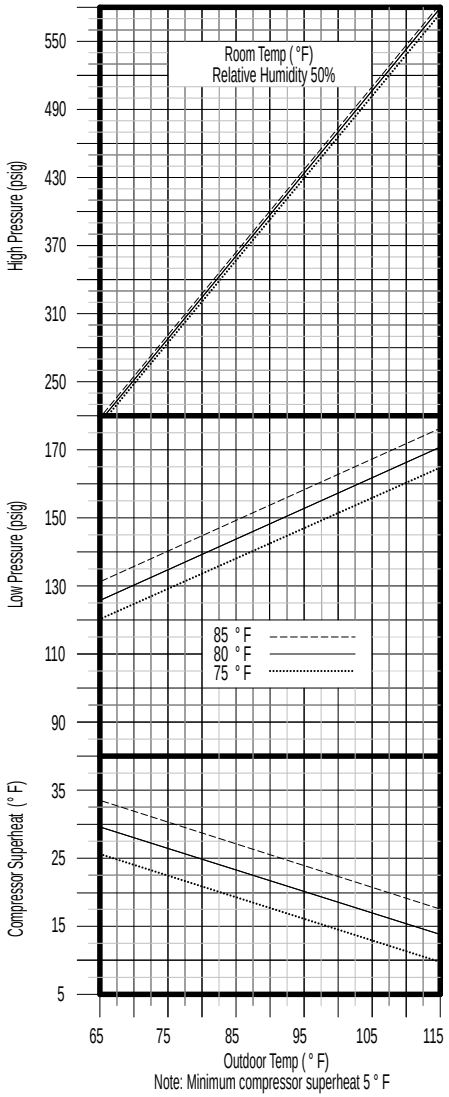
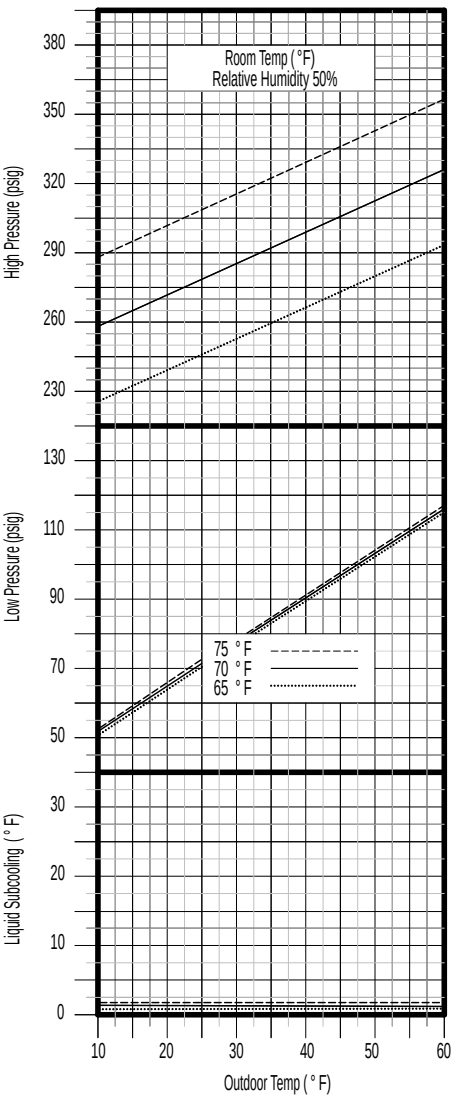
Multi-Zone Operation Charts (cont.)

Cooling Cycle
Top Discharge 12,000 BTU Circuit
with EMI's-CAH 12 (R-410A Ref.)



Note: Minimum compressor superheat 5 ° F

Heating Cycle
Top Discharge 12,000 Circuits
with EMI's- CAH 12 (R-410A Ref.)



Heat Pump use Common Suction Port. A/C use vapor line Service Valve.

NOTICE

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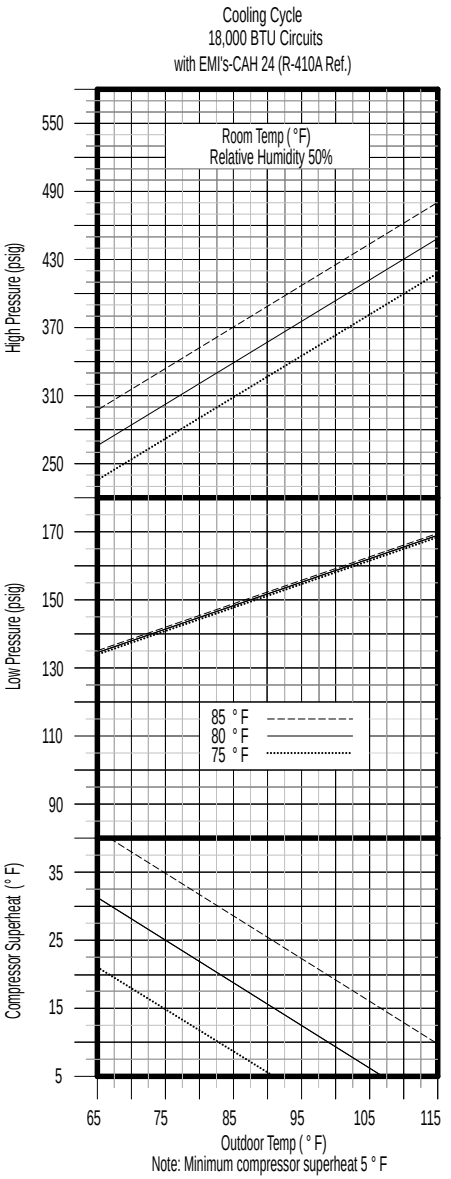
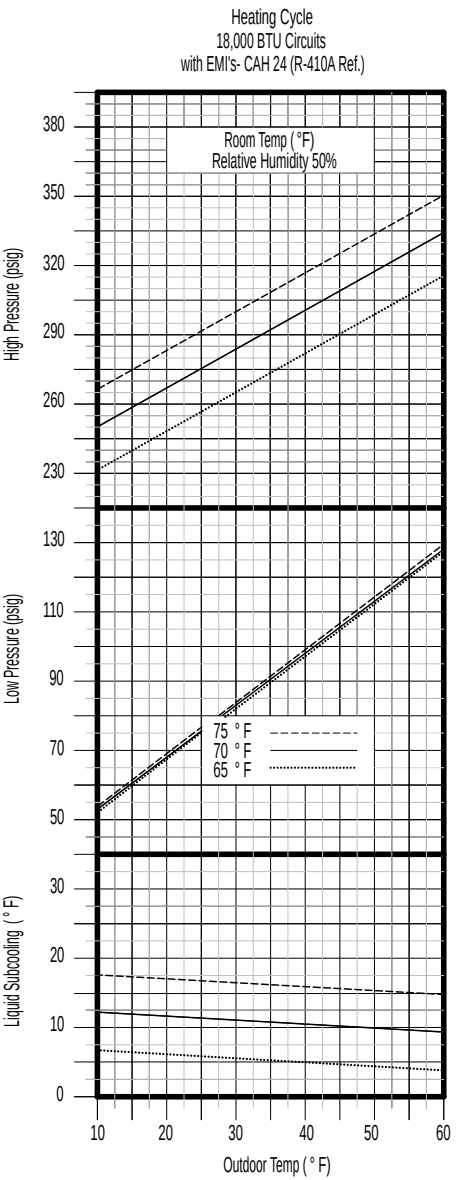
Multi-Zone Operation Charts (cont.)





Heat Pump use Common Suction Port. A/C use vapor line Service Valve.

NOTICE

Performance data listed in this manual is subject to change without notice. For the most current unit/system performance data, please refer to the ECR International listing of certified products in the AHRI directory, at www.ahridirectory.org.

Starting the Unit

9,000– 12,000 Btuh zones

In low ambient cooling, if a crankcase heater is installed, **power the system 24 hours before attempting to start** the unit in cool weather (below 60°F).

Test unit data sheet

After doing a final system check using the Operation Charts (supplied on previous pages).

Record results on Test Unit Data Sheet on page 32.

Before leaving

Remove gauge set, install caps. Mount all access panels and make sure they are properly secured.

Make final visual inspection and repair any deficiencies.

NOTICE

A hard start kit may be required for units in low voltage applications.

Operation and Maintenance

The 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.

Multi-zone Condenser Sequence of Operation

EMI Series condensers are designed to operate with EMI Series air handlers. Both the condenser (outdoor unit) and air handler (indoor unit) have a high volt service connection. Each is to be independently connected to the electrical service panel. (See the unit name plate for the correct breaker type and size). The outdoor and indoor units are also connected to each other through a low volt interconnect wiring. A 24v transformer located in the indoor unit provides the low volt power source.

Straight cool condensers are designed to operate as a single stage cooling unit. Heat pump condensers are designed to operate as a single stage cooling two stage heating unit. For proper operation the unit must be matched with an appropriate EMI indoor unit with unit mounted controls and/or wall mounted thermostat. For two-stage heating operation the indoor unit must be equipped with an electric strip heater.

NOTICE

For wall mounted thermostat operation be sure to select EMI p/n 240008209 or a suitable 24v, two stage heating, heat pump thermostat.

Condenser operation

The transformer located in the indoor unit provides 24v, low-volt control power to the condenser (outdoor unit). This can be measured across low-volt terminals "R" and "C".

Heat pump condensers utilize a reversing valve to provide reverse cycle operation. Therefore the outdoor unit will act as either a condenser or an air handler there-by providing comfort cooling or heating to the indoor space. The reversing valve is energized in cooling. Should the valve fail to actuate, the system will default to the heating mode of operation.

Cooling operation, single- and dual-zone

Cooling operation requires that the control (either unit mount or wall mount thermostat) make a connection between low-volt terminals "R" and "Y" along with "R" and "O" (heat pumps only). When the indoor control is placed in cooling mode, with the set point temperature below the room temperature, the reversing valve will energize (R & O heat pumps only) along with the compressor and outdoor fan (R & Y). When the indoor control is satisfied and the room temperature falls below the set temperature, the compressor and fan will de-energize. The anti-short cycle timer (ASCT) will prevent the compressor from re-starting for three minutes.

Heating operation

Heating operation requires that the control (either unit mount or wall mount, heat pump thermostat) make a connection between low-Volt terminals "R" and "Y" only. When the indoor control is placed in heating mode, with the set point temperature above room temperature, the compressor and outdoor fan (R & Y) will energize. When the indoor control is satisfied and the room temperature rises above the set temperature, the compressor and fan will de-energize. The anti-short cycle timer (ASCT) will prevent the compressor from re-starting for three minutes.

Defrost controls with short cycle protection (heat pumps only)

The outdoor unit is equipped with a logic control circuit designed to keep system operating at peek efficiency. The 24v circuit provides control to the indoor and outdoor systems including a three minute, anti-short cycle timer (ASCT) compressor protection.

The defrost control circuit is designed to keep the condenser coil free from frost and ice during heating mode. This is accomplished through the precise switching sequence of the outdoor fan, reversing valve and indoor auxiliary heater.

Defrost initiation

The defrost-sensor is located on either the end plate or the return bend of the condenser coil. A defrost cycle will initiate after the sensor closes (approx. 30°F) and remains closed for the length of time selected on the control board (either 30, 60 or 90 minutes)*.

*Factory settings 9–24k Btu = 90 minutes

At the start of the defrost cycle, the reversing valve will change from heating to cooling mode. The condenser fan will also switch off there-by allowing pressure and temperature

Single-zone and Dual-zone Condenser Sequence of Operation

Testing Defrost Operation Using Test Pins

to rise within the condenser coil to melt off any ice build-up. At the same time the unit will switch on the indoor electric strip heater to temper the cold air being discharged from the air handler. This will continue until either the defrost-sensor opens (approx. 60°F) or a 10-minute maximum cycle time has elapsed. Defrost times will vary depending on outdoor temperature and moisture conditions. When the defrost cycle is complete the unit will return to normal heating operation.

⚠ WARNING

Before removing the access panels to the unit make sure that all power is disconnected from the unit. Failure to do so could result in injury or electric shock.

Defrost operation can be initiated using the test pins located on the circuit board of the condensing unit. "Defrost test operation" will be a time compressed version of the actual defrost cycle.

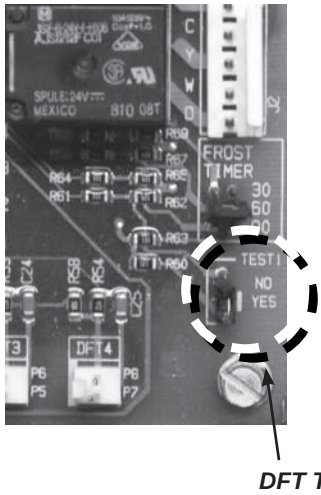
With the system "off", move the test jumper from the two pins for NO to the two pins for YES.

Defrost control board

Apply power to the indoor and outdoor units. Place the indoor unit in heating mode with the set point temperature well above room temperature. This is to ensure that the condenser will remain on during the entire defrost test operation.

The condenser will operate in heating for approximately 20 seconds. At that point the unit will enter defrost mode for approximately 2 seconds. During this time the condenser fan will switch off, the reversing valve will energize and the defrost board will energize the indoor electric heat relay through the "W" terminal. After the two second defrost cycle is complete, the unit will switch back to heating operation for another 20 seconds. This process will repeat until the test jumper is moved back to NO.

Figure 18 Defrost control board *(S1H shown)*



NOTICE

When testing is complete be sure to move the jumper back to NO. DO NOT leave the unit in test mode with jumper in YES.

Low ambient operation

If the unit is equipped with low ambient fan control for cooling, the fan will remain off (while in cooling mode) until the condenser pressure reaches 340 psi. The fan will then energize and run until the condenser pressure falls below 247 psi. This will happen only in the cooling mode (or when the reversing valve is energized). In heating (reversing valve not energized), the fan will run continuous so long as the connection is made between "R" and "Y".

Specification and Dimensions

NOTICE

Performance data listed in this manual is subject to change without notice. For the most current unit/system performance data, please refer to the ECR International listing of certified products in the AHRI directory, at www.ahridirectory.org.

Due to ongoing product development, designs, specifications, and performance are subject to change without notice. Please consult the factory for further information.

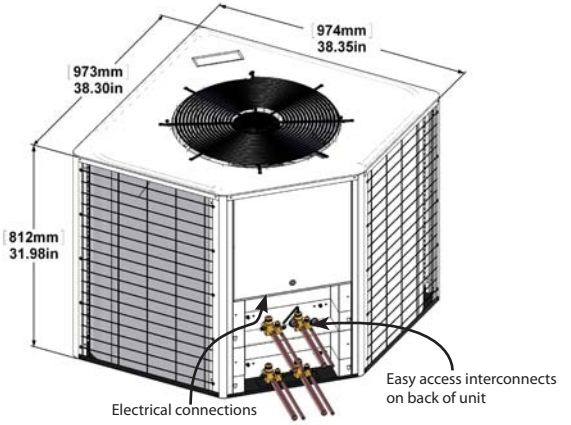


Table 3 Dimensional data, sound data and shipping weights

Model	Size	Sound level dBA (note 1)	Shipping weight Lbs (kg)
T2CG/T2HG	2400	70	325
T2CG/T2HG	4400	70	325
T2CG/T2HG	8800	70	325
T2CG/T2HG	9800	70	325
T3CG/T3HG	2240	70	325
T3CG/T3HG	9980	70	325
T3CG/T3HG	9990 2220 9920	70	325
T4CG/T4HG	2222 9922 9992 9999	70	325

Specification and Dimensions *(continued)* *(see NOTICE on page 26)*

Table 4 T2CG/T3CG/T4CG, T2HG/T3HG/T4HG electrical specifications

Model #	Fan Motor		Compressor Zone-1		Compressor Zone-2		Compressor Zone-3		Compressor Zone-4		Total amps	M.C.A.	HACR BRKR
	AMPS	HP	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA			
T2CG2400D	1.8	0.33	5.2	27	8.2	58.3					15.2	17.3	25
T2CG4400D	1.8	0.33	8.2	58.3	8.2	58.3					18.2	20.3	25
T2CG8800D	1.8	0.33	5.9	43	5.9	43					13.6	15.1	20
T2CG9800D	1.8	0.33	3.9	20	5.9	43					11.6	13.1	15
T3CG2220D	1.8	0.33	5.2	27	5.2	27	5.2	27			17.4	18.7	20
T3CG2240D	1.8	0.33	5.2	27	5.2	27	8.2	58.3			20.4	22.5	30
T3CG9920D	1.8	0.33	3.9	20	3.9	20	5.2	27			14.8	16.1	20
T3CG9990D	1.8	0.33	3.9	20	3.9	20	3.9	20			13.5	14.5	15
T3CG9980D	1.8	0.33	3.9	20	3.9	20	5.9	43			15.5	17	20
T4CG2222D	1.8	0.33	5.2	27	5.2	27	5.2	27	5.2	27	22.6	23.9	25
T4CG9922D	1.8	0.33	3.9	20	3.9	20	5.2	27	5.2	27	20	21.3	25
T4CG9992D	1.8	0.33	3.9	20	3.9	20	3.9	20	5.2	27	18.7	20	25
T4CG9999D	1.8	0.33	3.9	20	3.9	20	3.9	20	3.9	20	17.4	18.4	20
T2HG2400D	1.8	0.33	5.2	27	8.2	58.3					15.2	17.3	25
T2HG4400D	1.8	0.33	8.2	58.3	8.2	58.3					18.2	20.3	25
T2HG8800D	1.8	0.33	5.9	43	5.9	43					13.6	15.1	20
T2HG9800D	1.8	0.33	3.9	20	5.9	43					11.6	13.1	15
T3HG2220D	1.8	0.33	5.2	27	5.2	27	5.2	27			17.4	18.7	20
T3HG2240D	1.8	0.33	5.2	27	5.2	27	8.2	58.3			20.4	22.5	30
T3HG9920D	1.8	0.33	3.9	20	3.9	20	5.2	27			14.8	16.1	20
T3HG9980D	1.8	0.33	3.9	20	3.9	20	5.9	43			15.5	17	20
T3HG9990D	1.8	0.33	3.9	20	3.9	20	3.9	20			13.5	14.5	15
T4H2222D	1.8	0.33	5.2	27	5.2	27	5.2	27	5.2	27	22.6	23.9	25
T4H9922D	1.8	0.33	3.9	20	3.9	20	5.2	27	5.2	27	20	21.3	25
T4H9992D	1.8	0.33	3.9	20	3.9	20	3.9	20	5.2	27	18.7	20	25
T4H9999D	1.8	0.33	3.9	20	3.9	20	3.9	20	3.9	20	17.4	18.4	20

Note: All units are 208/230 volt, 60 Hz, single phase condensers, with a minimum voltage of 197V

AHRI CERTIFIED™ www.ahridirectory.org
Unitary Small AC
AHRI Standard 210/240
Certification applies only when the complete system is listed with AHRI.

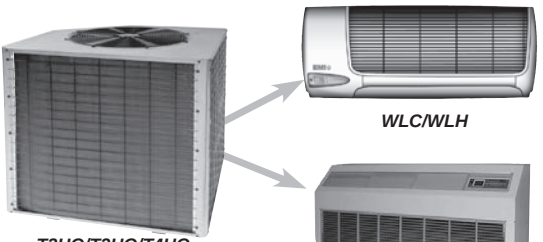
AHRI CERTIFIED™ www.ahridirectory.org
Unitary Small HP
AHRI Standard 210/240
Certification applies only when the complete system is listed with AHRI.

Specification and Dimensions *(continued)* *(see NOTICE on page 26)*

T2HG/T3HG/T4HG performance data: Matched with EMI Series Indoor Units

Table 5 Heat pump systems with wall or universal units

Condenser	Wall unit	Cooling Btuh	Heating Btuh	SEER	HSPF	SHR	EER	COP	Ref.
T2HG2400	WLHG12/UNHG12 WLHG24/UNHG24	35,800	32,400	13.0	7.7	0.69	11.5	3.2	410A
T2HG4400	(2) WLHG24/UNHG24	47,500	44,000	13.0	7.7	0.67	11.5	3.1	410A
T2HG9800	WLHG09/UNHG09 WLHG24/UNHG24	27,000	25,000	13.0	7.7	0.76	11.5	3.4	410A
T2HG8800	(2)WLHG24/UNHG24	36,000	33,000	13.0	7.7	0.74	11.5	3.4	410A
T3HG2220	(3)WLHG12/UNHG12	36,000	31,200	13.0	7.7	0.72	11.5	3.1	410A
T3HG2240	(2) WLHG12/UNHG12 WLHG24/UNHG24	47,500	42,800	13.0	7.7	0.71	11.5	3.1	410A
T3HG9920	(2) WLHG09/UNHG09 WLHG12UNHG12	30,000	27,400	13.0	7.7	0.76	11.5	3.3	410A
T3HG9980	(2) WLHG09/UNHG09 WLHG24/UNHG24	36,000	33,500	13.0	7.7	0.76	11.5	3.4	410A
T3HG9990	(3)WLHG09/UNHG09	27,000	25,500	13.0	7.7	0.78	11.5	3.5	410A
T4HG2222	(4)WLHG12/UNHG12	48,000	41,500	13.0	7.7	0.72	11.5	3.1	410A
T4HG9922	(2)WLHG09/UNHG09 (2)WLHG12/UNHG12	42,000	37,800	13.0	7.7	0.74	11.5	3.2	410A
T4HG9992	(3)WLHG09/UNHG09 WLHG12/UNHG12	39,000	35,900	13.0	7.7	0.76	11.5	3.4	410A
T4HG9999	(4)WLHG09/UNHG09	36,000	34,000	13.0	7.7	0.78	11.5	3.5	410A



Specification and Dimensions *(continued)* *(see NOTICE on page 26)*

Table 6 Heat pump systems with cassette units (__ = G or H)

Condenser	Cassette	Cooling Btuh	Heating Btuh	SEER	HSPF	SHR	EER	COP	Ref.
T2HG2400	CAH_12/ CAH_24	35,800	30,200	13	7.7	0.70	11.5	3.1	410A
T2HG4400	(2) CAH_24	47,500	42,000	13	7.7	0.70	11.6	3.2	410A
T2HG9800	CAH_09/ CAH_24	27,000	24,600	13	7.7	0.74	11.6	3.2	410A
T2HG8800	(2)CAH_24	36,000	33,000	13	7.7	0.78	11.9	3.4	410A
T3HG2220	(3)CAH_12	36,000	27,600	13	7.7	0.70	11.5	3.0	410A
T3HG2240	(2) CAH_12/ CAH_24	47,500	39,400	13	7.7	0.70	11.5	3.0	410A
T3HG9920	(2) CAH_09/ CAH_12	30,000	25,200	13	7.7	0.75	11.5	3.0	410A
T3HG9980	(2) CAH_09/ CAH_24	36,000	32,500	13	7.7	0.77	11.5	3.3	410A
T3HG9990	(3)CAH_09	28,400	24,000	13	7.7	0.77	11.5	3.1	410A
T4HG2222	(4)CAH_12	48,000	36,800	13	7.7	0.70	11.5	3.0	410A
T4HG9922	(2)CAH_09/ (2)CAH_12	43,000	34,400	13	7.7	0.75	11.5	3.0	410A
T4HG9992	(3)CAH_09/ CAH_12	39,600	33,200	13	7.7	0.75	11.5	3.0	410A
T4HG9999	(4)CAH_09	36,000	32,000	13	7.7	0.77	11.5	3.1	410A

CAC/ CAH

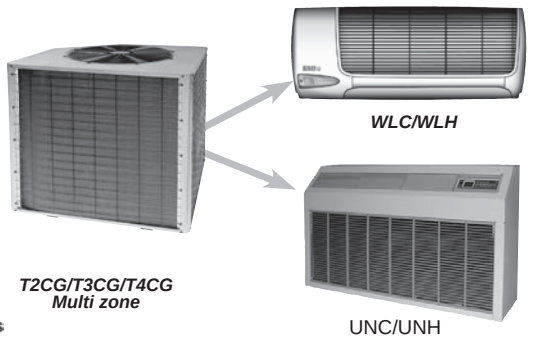
T2HG/T3HG/T4HG Multi zone

Specification and Dimensions *(continued)* *(see NOTICE on page 26)*

T2CG/T3CG/T4CG performance data: Matched with EMI Series Indoor Units

Table 7 Straight cool systems with wall or universal units

Condenser	Wall units	Btuh	SEER	SHR	EER	Ref.
T2CG2400	WLHG12/UNHG12 WLHG24/UNHG24	35,800	13.0	0.69	11.5	410A
T2CG4400	(2) WLHG24/UNHG24	47,500	13.0	0.67	11.5	410A
T2CG9800	WLHG09/UNHG09 WLHG24/UNHG24	27,000	13.0	0.76	11.5	410A
T2CG8800	(2)WLHG24/UNHG24	36,000	13.0	0.74	11.5	410A
T3CG2220	(3)WLHG12/UNHG12	36,000	13.0	0.72	11.5	410A
T3CG2240	(2) WLHG12/UNHG12 WLHG24/UNHG24	47,500	13.0	0.71	11.5	410A
T3CG9920	(2) WLHG09/UNHG09 WLHG12	30,000	13.0	0.76	11.5	410A
T3CG9980	(2) WLHG09/UNHG09 WLHG24/UNHG24	36,000	13.0	0.76	11.5	410A
T3CG9990	(3)WLHG09/UNHG09	27,000	13.0	0.78	11.5	410A
T4CG2222	(4)WLHG12/UNHG12	48,000	13.0	0.72	11.5	410A
T4CG9922	(2)WLHG09/UNHG09 (2)WLHG12/UNHG12	42,000	13.0	0.74	11.5	410A
T4CG9992	(3)WLHG09/UNHG09 WLHG12/UNHG12	39,000	13.0	0.76	11.5	410A
T4CG9999	(4)WLHG09/UNHG09	36,000	13.0	0.78	11.5	410A



Specification and Dimensions *(continued)* *(see NOTICE on page 26)*

T2CG/T3CG/T4CG performance data: Matched with EMI Series Indoor Units

Table 8 Straight cool systems with cassette units (__ = G or H)

Condenser	Cassette	Cooling Btuh	SEER	SHR	EER	Ref.
T2CG2400	CAH_12/CAH_24	35,800	13	0.70	11.5	410A
T2CG4400	(2) CAH_24	47,500	13	0.70	11.6	410A
T2CG9800	CAH_09/CAH_24	27,000	13	0.74	11.6	410A
T2CG8800	(2)CAH_24	36,000	13	0.78	11.9	410A
T3CG2220	(3)CAH_12	36,000	13	0.70	11.5	410A
T3CG2240	(2) CAH_12/CAH_24	47,500	13	0.70	11.5	410A
T3CG9920	(2) CAH_09/CAH_12	30,000	13	0.75	11.5	410A
T3CG9980	(2) CAH_09/CAH_24	36,000	13	0.77	11.5	410A
T3CG9990	(3)CAH_09	28,400	13	0.77	11.5	410A
T4CG2222	(4)CAH_12	48,000	13	0.70	11.5	410A
T4CG9922	(2)CAH_09/(2)CAH_12	43,000	13	0.75	11.5	410A
T4CG9992	(3)CAH_09/CAH_12	39,600	13	0.75	11.5	410A
T4CG9999	(4)CAH_09	36,000	13	0.77	11.5	410A

CAC/ CAH

T2CG/T3CG/T4CG Multi zone

Test Unit Performance Data Sheet

NOTICE

The Test Unit Performance Data sheet 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.

Have this information ready when calling. Make sure to include the Model Number, Serial Number, and Date of installation.

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

Model Number		Date:	
		Technician:	
Serial Number		Mode:	Cooling
Indoor Section		Notes	
Air handler Entering Air – DB			
Air handler Entering Air – WB			
Air handler Leaving Air – DB			
Air handler 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 Air handler			
Capacity Calculations			
DB – Temp Split at evap.			

Test Summary	
Compressor Superheat	
Sub Cooling	

NOTES

NOTES

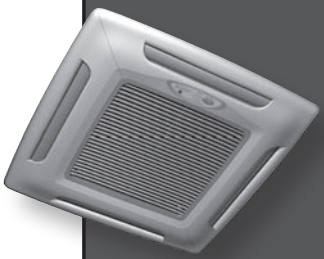
NOTES

EMI's Product Line

Indoor Units

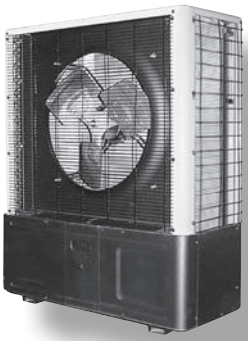
WLC/WLH
High Wall Air Handler

CAC/CAH
Cassette Air Handler

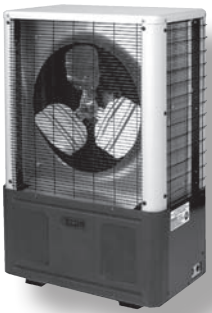


UNC/UNH
Universal Floor or Ceiling
Air Handler

Outdoor Units

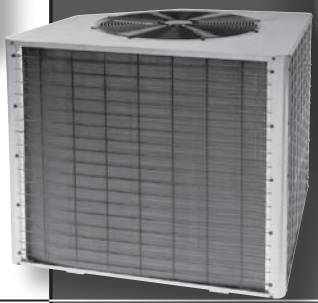


S2CG &S2HG
Dual Zone
Side Discharge



S1CG & S1HG
Single Zone
Side Discharge

T2C, T3C, T4C and
T2H, T3H, T4H; 2, 3 and 4
Zone Top Discharge



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EMI
Comfort Where It Counts

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