

INSTALLATION & OPERATING INSTRUCTIONS

**HAVE YOU DISCUSSED WITH YOUR
INSTALLING CONTRACTOR THE
OPTIONAL \$400.00 2ND THROUGH 5TH
YEAR COMPRESSOR LABOR ALLOWANCE
PROGRAM?**

For The United States and Canada only

THROUGH THE WALL CONDENSING UNIT

**GOODMAN MANUFACTURING COMPANY, L.P.
2550 NORTH LOOP WEST, SUITE 400
HOUSTON, TEXAS 77092**

IMPORTANT MESSAGE TO OWNER/SERVICE PERSON

The United States Environmental Protection Agency (EPA) has issued various regulations regarding the introduction and disposal of refrigerants in this unit. Failure to follow these regulations may harm the environment and can lead to the imposition of substantial fines. Because these regulations may vary due to the passage of new laws we suggest that any work on this unit be done by a certified technician. Should you have any questions please contact the local office of the EPA.

IMPORTANT MESSAGE TO OWNER:

Instructions should be carefully read and kept near this product, for future reference. While these instructions are addressed primarily to the installer, useful maintenance information is included. Have your installing dealer acquaint you with the operating characteristics of the product and periodic maintenance requirements.

CODES AND REGULATIONS

This product is designed and manufactured to permit installation in accordance with National Codes. It is the installer's responsibility to install the product in accordance with National Codes and/or prevailing local codes and regulations.

The manufacturer assumes no responsibility for equipment installed in violation of any codes or regulations.

INSPECTION

This product has been inspected at the factory and released to the transportation agency without known damage. Inspect exterior of carton for evidence of rough handling in shipment. Unpack carefully, if damage is found, report immediately to the transportation agency.

REPLACEMENT PARTS

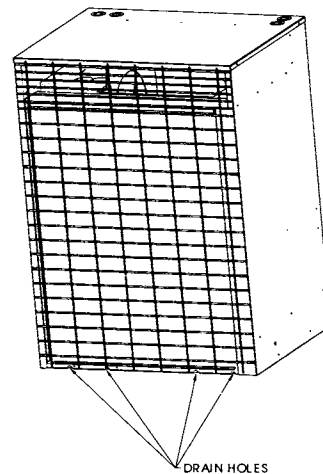
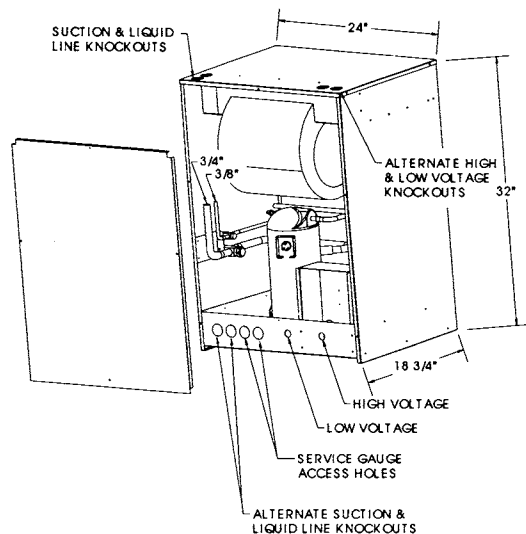
Order all replacement parts through your local distributor. When ordering parts, give complete model and serial number as shown on the unit rating plate.

INSTALLATION CONSIDERATIONS

This unit is designed to be mounted in a through the wall application. Location for mounting should be selected carefully.

The following items should be considered:

- 1) The rear of the unit (side w/ coil) should be completely unobstructed for proper air movement. If it is necessary to locate the unit in such a way that there is an obstruction, there should be a minimum of 60" clearance.
- 2) For service access to the compressor compartment allow a clearance of 28" min. from the front cover panel.
- 3) Location & sizing of electrical service and routing of low voltage wiring.
- 4) Routing of refrigeration lines from the evaporator. It will be necessary to provide suction line insulation.
- 5) Walls must be of adequate strength to support the weight of the unit to be installed. Walls with greater strength will be less likely to transmit sound and vibration. Masonry walls must have a lintel for wall support. The chassis of the unit must not be used for wall support.
- 6) Wall openings should be flashed across the top and bottom to prevent deterioration of construction materials if caulk seal should fail.
- 7) Location of the unit to living spaces should be considered. All condensing units contain a compressor and a means of moving air. While sound levels of this unit have been minimized it does produce some sound and vibration.



- 8) If addition of an Architectural Grill is required request specification sheet for AG-1.

Figure 1

Figure 2

INSTALLATION

Due to the infinite number of exterior wall variations it is not expected that the following instructions will cover every possible installation. When variations exist common construction practices should be exercised. If proper construction methods can not be determined contact your distributor.

- 1) Walls must be of adequate strength to support the weight of the unit to be installed. If walls are not adequate, it will be necessary to make improvements before mounting unit in wall. Walls with greater strength will be less likely to transmit sound and vibration. Masonry walls must have a lintel for wall support. The chassis of the unit must not be used for wall support.
- 2) Wall openings should be flashed across the top and bottom to prevent deterioration of construction materials if caulk seal should fail.
- 3) Attach unit support brackets to the sides of the unit chassis. Supports should be located such that the unit has a 3/4' exposure outside the exterior wall. Use extreme caution when attaching support brackets to chassis, not to pierce a refrigerant tube or the condenser coil. After attaching support brackets review screw locations internally for interference with tubing, coils, wiring, etc. Correct as necessary.
- 4) Slide the chassis into the opening. Do not rack chassis to fit an out of square wall opening. This can lead to blower rubs and difficulty of servicing the unit in the future.
- 5) Check unit for level. Unit must be level side to side and front to back for proper drainage. Do not use the basepan as a level reference. Unit basepan is pitched to the back. Water collected in the chassis will be relieved through holes in the rear of the basepan. It is necessary to ensure drain holes in basepan are not plugged with construction materials.
- 6) Attach unit support brackets to wall framing using adequate fasteners.
- 7) Caulk around entire perimeter of the exterior of the chassis to prevent water from entering the structure. Do not fill basepan drain holes. See Figure 2
- 8) Remove knockouts from the right side of the top panel or the lower right of the basepan for high voltage and low voltage wire insertion. See Figure 1. See section titled Electrical Service for more details.
- 9) Remove knockouts from the left side of the top panel or the lower left of the basepan for refrigeration tube insertion. See Figure 1. See section titled Refrigerant Tubing for more details.

ELECTRICAL SERVICE

Electrical installation will consist of power supply wiring to the condensing unit as well as control wiring between thermostat, indoor unit and the condensing unit. All wiring must be in accordance with National Electrical Code and/or local codes that may apply. (See unit wiring diagram). The condenser's unit rating plate lists pertinent electrical data necessary for the selection of proper size electrical service and over-current protection. The owner should be made familiar with the location of the over-current protection, the proper size for this application and the proper procedure for disconnecting power service to the unit.

The condensing unit control wiring requires a 24 Volt minimum 25 VA service from the indoor transformer as shown on the wiring diagram. Low voltage wire entrance must be sealed air tight upon completion of wiring.

REFRIGERANT TUBING

Use only refrigerant grade (dehydrated and sealed) copper tubing of the size indicated in Table 1 to interconnect the condensing unit with the indoor evaporator. Take extreme care to keep the refrigerant tubing clean and dry prior to and during installation.

Do not remove plugs from ends of tubing until connection is ready to be made.

Suction line insulation is necessary to prevent condensation from forming on and dripping from suction line. Generally 3/8" wall thickness of *Armflex* or equivalent is satisfactory. In severe application (hot, high humidity areas) greater thickness may be required. Apply suction line insulation by sliding it on the sealed tubing before cutting and making connections.

Table 1

COND UNIT (TONS)	REFRIGERANT LINE LENGTH (ft)					
	0-24		25-49		50-74	
	Line Diameter (in. O.D.)					
	Suct	Liq	Suct	Liq	Suct	Liq
1-1/2	5/8	1/4	3/4	3/8	3/4	3/8
2	3/4	3/8	3/4	3/8	3/4	3/8
2-1/2	3/4	3/8	3/4*	3/8	7/8	1/2
3	3/4	3/8	7/8**	3/8	7/8**	1/2

* 7/8" required for full ratings

** 1-1/8" required for full ratings

FIELD CONNECTION TO SERVICE VALVES

- 1) Tubing should be cut square. Make sure it is round and free of burrs at the connecting ends. Clean the tubing to prevent contamination from entering the system.
- 2) Wrap a wet rag around the copper valve stub before brazing.
- 3) Braze or silver solder the joint.
- 4) After brazing quench with a wet rag to cool the joint.
- 5) Refrigerant tube cabinet penetrations must be sealed air tight upon completion of brazing.

EVAPORATOR COILS

CAUTION: Use extreme care in removing caps from the evaporators suction and liquid line fittings, as there is typically pressure present. Caps should be punctured prior to application of heat.

Complete suction and liquid line connections at the evaporator per manufacturer's instructions.

SYSTEM START UP

- 1) Condensing units are supplied with an R-22 charge sufficient for a typical matching evaporator and approximately 15' of interconnecting tubing. The condensing unit's liquid and suction valves are closed to contain the charge within the unit. The recommended procedures for processing and charge adjustment are as follows:
- 2) Remove and retain schrader caps from service valves. Connect vacuum pump to both service valves.
- 3) Evacuate tubing and evaporator thru liquid and suction service valves, to 500 microns or less for a minimum of 30 minutes. Close valve to pump and wait 15 minutes. Vacuum should not rise above 800 microns. If unable to obtain 500 microns, or vacuum rises above 800 microns over 15 minute period, discontinue evacuation, pressurize and check for leaks. Repair any leaks found and repeat step 2.
- 4) Close valve to vacuum pump and stop pump.
- 5) Remove valve cap. Keep the cap in a clean area to ensure proper seal when the cap is replaced.
- 6) Break vacuum by opening liquid and suction service valves. Fully open service valves and remove pump lines.
- 7) Replace the valve cap finger tight. Tighten with a wrench an additional 1/6 of a turn to ensure a seal.
- 8) Remove two basepan plugs at lower left front of unit. See Figure 1. Route service gage lines through openings. Connect service gages being sure to purge lines.
- 9) Replace front service cover. Do not operate unit with front service cover removed.
- 10) Set thermostat system switch to "cool" and temperature to highest setting. Close all disconnects.
- 11) Set thermostat temperature to call for cooling.
- 12) Check for operation of indoor and outdoor fans. Allow operation for at least 10 minutes.
- 13) Check charge and adjust if necessary.

**CHECKING CHARGE
CAPILLARY TUBE / FIXED ORIFICE SYSTEM**

- 1) Run system at least 10 minutes to allow pressure to stabilize.
- 2) Temporarily install thermometer on suction (large) line near condensing unit. Ensure good contact between thermometer and line. Wrap thermometer with insulating material to ensure accurate reading.
- 3) Refer to Table 4 for proper system superheat. Add charge to lower superheat. Recover charge to raise superheat.
- 4) For systems with more than 15' of interconnecting tubing see Table 3 for line charge allowance per ft.
- 5) **Remove gage lines carefully.** Escaping liquid refrigerant can cause burns. Replace service valve schrader caps finger tight. Replace basepan plugs.

**Table 2
Saturated Suction Temperature (R-22)**

Suction Pressure (PSIG)	Saturated Suction Temperature (°F)
50	26
53	28
55	30
58	32
61	34
63	36
66	38
69	40
72	42
75	44
78	46
81	48

**Table 3
Line Charge Allowance (R-22) oz./ft**

Line O.D. (in.)	Liquid	Suction
1/4	0.22	
3/8	0.58	
1/2	1.14	
5/8	1.86	0.04
3/4		0.06
7/8		0.08
1 1/8		0.15

**Table 4
System Superheat**

Ambient Condenser Inlet Temperature (°F Drybulb)	Return Air Temperature (°F Dry bulb)				
	65	70	75	80	85
100				5	5
95			5	5	5
90			7	12	18
85		5	10	17	20
80		5	12	21	26
75	5	10	17	25	29
70	5	14	20	28	32
65	13	19	26	32	35
60	17	25	30	33	37

SUPERHEAT CAN BE DETERMINED AS FOLLOWS

Read suction pressure. Using Table 2 determine saturated suction temperature.

Read suction line temperature.

Superheat = Suction Line Temp. - Sat. Suct. Temp.

PERIODIC MAINTENANCE

Every six months the interior of the unit should be cleaned. Pay particular attention to the basepan drain holes (See Figure 1) and to the blower weep holes. Blower weep holes are located at the lowest part of the blower housing.

Under normal conditions the condenser coil should be cleaned only as necessary. This can be done with a standard non-acid based coil cleaning solution. In coastal applications it will be necessary to clean the condenser coil more often.

Annually the caulk joint between the exterior wall and the chassis cabinet should be checked to maintain a leak free condition.

Annually check that seals created around the tubing and electrical entrances are leak free and repair as necessary.

As a Goodman policy of product improvement the specifications contained within this document may change without notice.

