

Installation and Start-Up Instructions

SAFETY CONSIDERATIONS

Installing and servicing air conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install or service air conditioning equipment.

Untrained personnel can perform basic maintenance, such as cleaning and replacing filters. All other operations should be performed by trained service personnel. When working on air conditioning equipment, observe precautions in literature and on tags and labels attached to unit.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available. Read these instructions *thoroughly*. Consult local building codes and NEC (National Electrical Code) for special installation requirements.

⚠ WARNING

Before installing or servicing system, always turn off main power to system. There may be more than one disconnect switch. Turn off accessory heater power if applicable. Electrical shock can cause personal injury

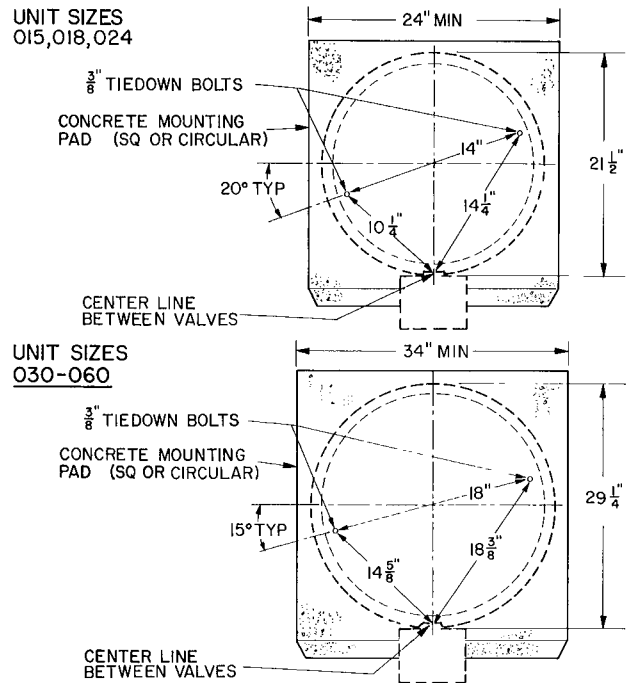
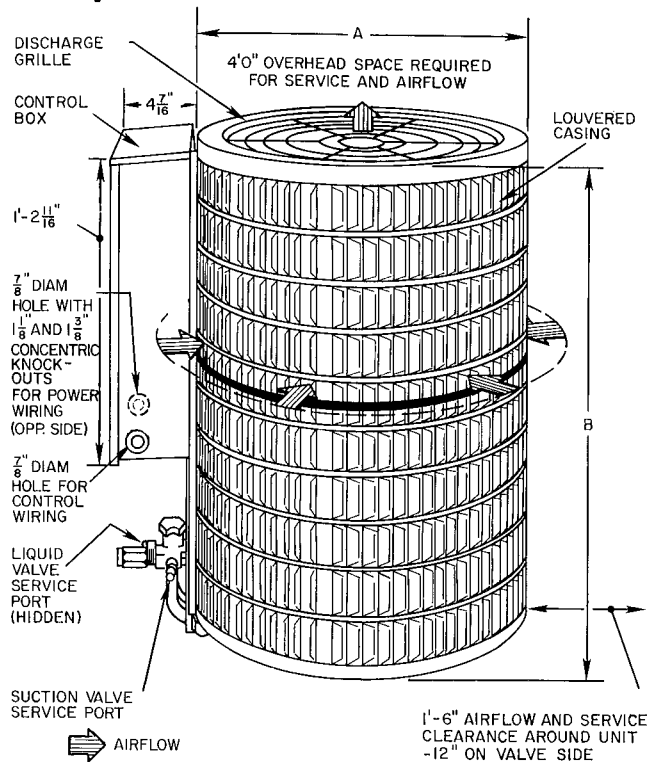
Step 1 — Install on a Solid, Level Mounting Pad — It is recommended that unit be attached to pad using tiedown bolts. Fasten unit to pad using holes provided in unit base. See Fig. 1

When installing, allow sufficient space for airflow clearance, wiring, refrigerant piping and service. Maintain a minimum of 4 ft clearance from obstructions above and 18 in around unit (12 in. on valve side). Maintain a distance of 24 in. between condensing units. Position so water or ice from roof or eaves cannot fall directly on unit.

Step 2 — Replace Indoor AccuRater™ Piston if Required — Check indoor coil piston to see if it matches the required piston listed in Table 2. If it does not match, replace indoor coil piston with piston shipped with this outdoor unit (located in plastic bag taped to valves). See Fig. 2.

Step 3 — Make Piping Connections — Outdoor units may be connected to indoor sections using Carrier accessory tubing package or field-supplied tubing of refrigerant grade, correct size (see Table 1) and condition. For tubing requirements beyond 50 ft, obtain information from Carrier distributor.

OUTDOOR UNITS CONNECTED TO CARRIER-APPROVED INDOOR UNITS — Outdoor units contain correct system refrigerant charge for operation with indoor unit of the same size when connected by 25 ft of field-supplied or Carrier accessory tubing. Check refrigerant charge for maximum efficiency (see Refrigerant Charging)



Certified dimension drawings available upon request

Fig. 1 — Dimensions, Connections and Mounting Pad (Refer to Table 1)

Table 1 — Physical Data (Refer to Fig. 1)

MODEL 38EH	015	018	024	030	036	042	048	060
OPER WT (lb)*	116	131	148	171	177	178	210	236
REFRIGERANT Control	22 AccuRater™ (Installed in I.D. Coil)							
COND FAN Air Discharge Air Qty (cfm) Motor Rpm (60 Hz) Motor Hp	Propeller Type, Direct Drive, 1-Speed Vertical 1850 3100 4000 830 850 1/10 1/8 1/2 1/3							
COND COIL (fins/in.) Tube Diam Rows Face Area (sq ft)	16 1/2 in., E-coil 1 2 12.37 17.11							
DIMENSIONS (ft-in.) Diameter Height	A 1-9 1/2 2-7 2-5 1/4 B							
CONN (in. ODF) Suction Liquid	Compatible Fitting (Suction and Liquid) 3/8 3/4							
REFRIG LINES (in. ODF) Suction Liquid	3/8 1/2 3/4 1 1/8 †							

*Weight increases slightly with addition of any accessories
 †38EH048,060 require a 1 1/8-in suction line for optimum performance. A 3/4- x 1 1/8-in connection adapter accessory (Carrier Part No. 28AU900061) is available. If a 3/8-in accessory tubing package is used, expect a 3% capacity loss

Table 2 — AccuRater™ Chart

COND UNIT 38EH (1- and 3-Ph)	ACCURATER PISTON NO.							
	Indoor Coil Size (28--) and Indoor Fan Coil Size (40--)							
	014/ 015	018	024	030	036	042	048	060/ 062
015	46	46	TXV	—	—	—	—	—
018	—	49	49	TXV	—	—	—	—
024	—	—	61	61	TXV	—	—	—
030	—	—	—	70	70	TXV	—	—
036	—	—	—	—	76	76	TXV	—
042	—	—	—	—	—	82	82	TXV
048	—	—	—	—	—	—	80	80
060	—	—	—	—	—	—	—	98

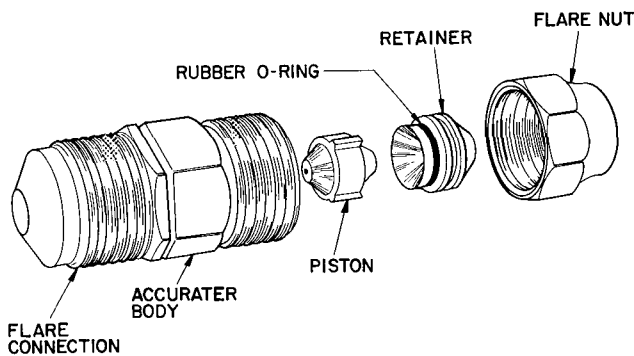


Fig. 2 — AccuRater™ (Bypass Type) Components

⚠ CAUTION

DO NOT BURY MORE THAN 3 FT OF REFRIGERANT TUBING IN GROUND. If any section of tubing is buried, there must be a 6-in. vertical rise to the valve connections on the outdoor unit. If more than the recommended length is buried, refrigerant may migrate to cooler buried section during extended periods of unit shutdown, causing refrigerant slugging and possibly compressor damage at start-up.

CONNECT REFRIGERANT LINES to fittings on outdoor unit suction and liquid service valves (Fig. 1). Unit Compatible Fittings permit mechanical (quick-connect) or sweat connections.

Compatible Fitting on outdoor section has aluminum plugs located beneath compatible nut — one plug each on suction and liquid valves. Plugs keep contaminants out of Compatible Fitting.

⚠ CAUTION

When removing compatible nut, be careful pressure build-up does not cause aluminum plug(s) to blow and cause personal injury. After tubing is hooked up, discard plug(s).

Models 38EH048,060 — When using 1-1/8 in. field-supplied refrigerant suction line, sweat-connect suction line to 1-1/8 in. end of required connection adapter. Be sure to provide a heat sink at the service valve to prevent damage during sweating operation. Connect 3/4-in. end of adapter to unit suction line Compatible Fitting. Connect liquid refrigerant line to unit. When a 7/8-in. field-supplied suction line is used, provide a field-supplied 3/4-in. to 7/8-in. suction line adapter (not necessary if 38LS accessory tubing is used).

Mechanical Connection — Mate one set of connections at a time.

1. Remove nut on Compatible Fitting.
 2. Remove plug and be sure O-ring is in the groove inside the Compatible Fitting.
 3. Cut tubing to correct length, deburr and size as necessary. Slide nut onto tube
 4. Insert tube into Compatible Fitting until it bottoms. *Tighten nut until it bottoms on shoulder of fitting or valve.* Keep tube bottomed in Compatible Fitting while tightening nut.
- NOTE: If using Carrier accessory tubing package, make connections within 2 minutes to avoid refrigerant loss.
5. If using field-supplied tubing evacuate or purge system using field-supplied refrigerant.

⚠ CAUTION

If undersized, damaged or elliptically-shaped tubing is used when making Compatible Fitting, leaks may result.

Sweat Connection — Use refrigerant grade tubing.

1. Remove locking nut, plug, rubber O-ring and Schrader core and cap from valve service port.
 2. Cut tubing to correct length, deburr and size as necessary.
 3. Insert tube in Compatible Fitting until it bottoms.
- NOTE: Wrap top and bottom of service valves in wet cloth to prevent damage by heat. Solder with low-temperature (430 F) silver alloy solder.
4. Replace Schrader core and cap.
 5. Evacuate or purge system using field-supplied refrigerant.

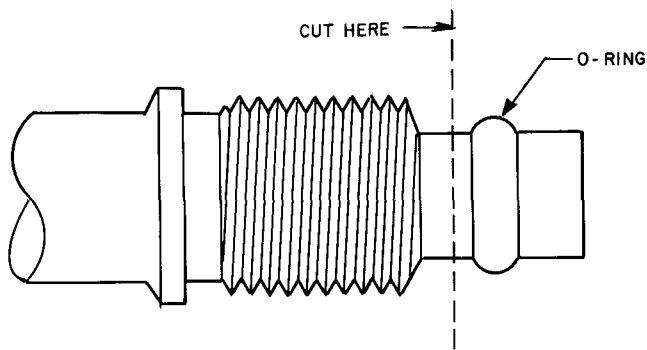


Fig. 3 — Repair of Mechanical Connection

Compatible Fitting Repair

MECHANICAL CONNECTION — Frontseat unit service valves. Relieve refrigerant pressure from tubing. Back off locknut from Compatible Fitting onto tube. Cut fitting between threads and O-ring. See Fig. 3. Remove tubing section remaining in threaded portion of fitting. Discard locknut.

Clean, flux and insert new tube end into remaining portion of Compatible Fitting. *Wrap valve in wet rag to prevent damaging factory-made joints.* Heat and apply low-temperature (430 F) solder.

SWEAT CONNECTION — Frontseat unit service valves. Relieve refrigerant pressure from tubing. Clean and flux area around leak. Repair, using low-temperature (430 F) solder

Evacuate or purge evaporator coil and tubing system. Add refrigerant charge. See Refrigerant Charging.

Step 4 — Make Electrical Connections — Be sure field wiring complies with local and national fire, safety and electrical codes, and voltage to system is within limits shown in Table 3. Contact local power company for correction of improper line voltage.

NOTE: Operation of unit on improper line voltage constitutes abuse and could affect Carrier warranty. See Table 3. *Do not* install unit in system where voltage may fluctuate above or below permissible limits.

See Table 3 for recommended fuse sizes. When making electric connections, provide clearance at unit for refrigerant piping connections.

INSTALL BRANCH CIRCUIT DISCONNECT PER NEC of adequate size to handle unit starting current. Locate disconnect within sight from and readily accessible from unit, per Section 440-14 of NEC (National Electrical Code).

ROUTE LINE POWER LEADS — Extend leads from disconnect through power wiring hole provided (see Fig. 1) and into unit splice area. Remove control box cover to gain access to unit wiring.

CONNECT GROUND LEAD AND POWER WIRING — Connect ground lead to ground connection in control box for safety. Then connect power wiring. See Fig. 4. Splice line power leads to yellow and black pigtails. Use wire nuts and tape at each connection. Connect unit wiring to *copper* power wiring only.

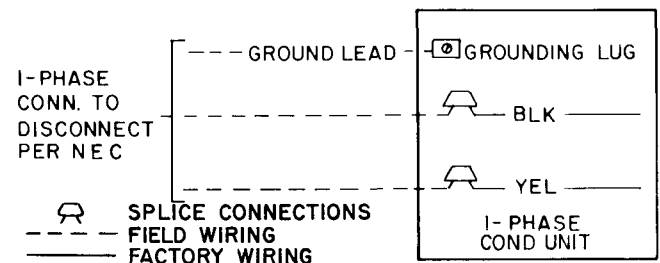


Fig. 4 — Line Power Connections

CONNECT CONTROL POWER WIRING — Route 24-v control wires through control wiring hole and connect to pigtails supplied with unit (Fig. 1). Splice control leads to brown and blue pigtails on all units. See Fig. 5.

Use furnace or fan coil transformer as 24-v (40-v minimum) supply for system as shown in Fig. 5, or use accessory transformer.

NOTE: Some 38EH units are equipped with a fan time delay. This permits indoor fan to continue to operate for

→ Table 3 — Electrical Data (60 Hz)

OUTDOOR UNIT 38EH	V/PH	OPER VOLTS*		COMPR		FAN FLA	MCA	MAX FUSE† OR HACR TYPE CKT BKR (Amps)
		Max	Min	LRA	RLA			
015	208-230/1	253	197	37.5	6.4	0.7	8.7	15
018				43.0	7.8	0.7	10.5	15
024				66.0	14.0	0.7	18.2	30
030				88.0	18.6	0.9	24.2	40
036				88.0	18.1	0.9	23.6	40
042				108.0	21.4	0.9	27.7	45
048				110.0	26.0	2.5	35.0	50
060	230/1	253	207	130.0	29.3	1.9	38.5	60
036-5	208-230/3	253	187	65.1	9.7	0.9	15.3	25
042-5				74.0	17.1	0.9	22.3	35
048-5				92.0	19.6	2.5	27.0	45
060-5				98.0	20.9	1.9	28.0	45
036-6	460/3	508	414	32.8	4.76	1.6	7.4	15
042-6				37.0	6.9	1.6	10.3	15
048-6				46.0	7.2	1.6	10.6	15
060-6				49.0	10.4	1.6	14.5	20

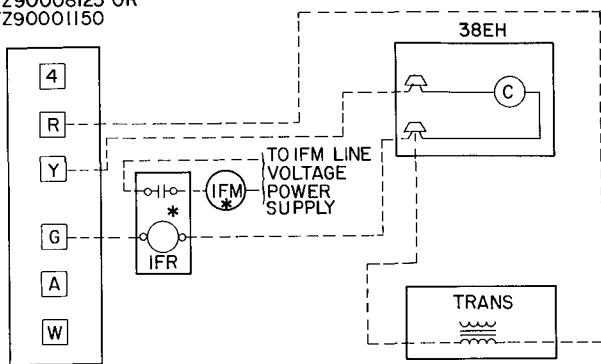
FLA — Full Load Amps
HACR — Heating, Air Conditioning, Refrigeration
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
RLA — Rated Load Amps

*Permissible limits of the voltage range at which unit will operate satisfactorily

†Time-delay fuse

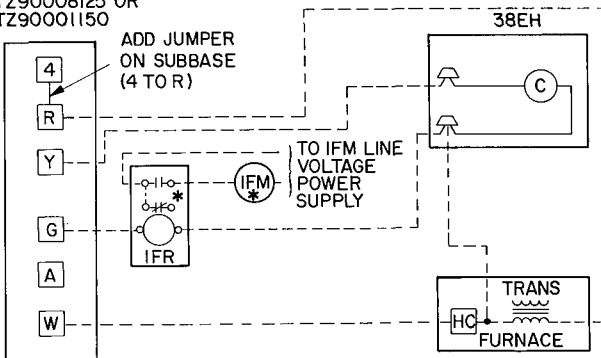
NOTE: Control circuit is 24 v on all units and requires external power source

THERMOSTAT SUBBASE
99TZ90008125 OR
99TZ90001150



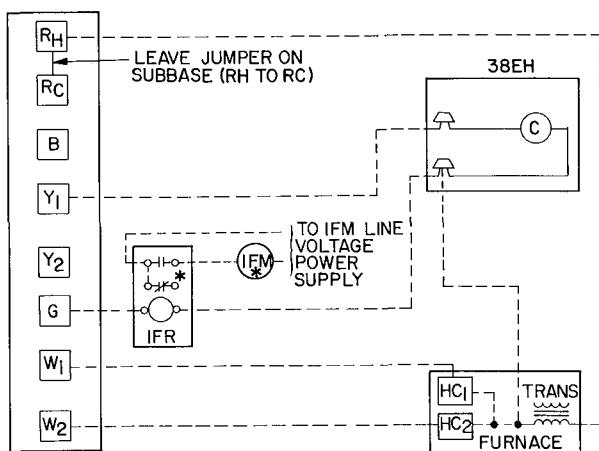
ARRANGEMENT A—(COOLING ONLY)

THERMOSTAT SUBBASE
99TZ90008125 OR
99TZ90001150



ARRANGEMENT B—ONE TRANSFORMER
(COOLING AND ONE-STAGE HEATING)

THERMOSTAT SUBBASE
99TZ90036120



ARRANGEMENT C—ONE TRANSFORMER
(COOLING AND TWO-STAGE HEATING)

*IFR and IFM are located in furnace on heating-cooling applications. If accessory IFR is required for cooling-only applications, locate (IFR) in fan coil.

C — Contactor (12-va) Field Splice
HC — Heating Control Field Wiring
IFM — Indoor Fan Motor Factory Wiring
IFR — Indoor Fan Relay
Trans — Transformer

NOTE: Refer to unit wiring label for wire colors C to G and C to Y connections.

Fig. 5 — Control Circuit Connections

90 seconds, which provides additional cooling after compressor has cycled off. Refer to separate installation instructions packaged with fan time delay (shipped with unit).

⚠ WARNING

To avoid personal injury, be sure indoor blower has stopped before attempting service or maintenance.

Step 5 — Start-Up

1. When equipped with a crankcase heater, energize heater a minimum of 24 hours before starting unit. To energize heater only, set thermostat at OFF position and close electrical disconnect to outdoor unit.
2. Backseat (open) liquid and suction line service valves.
3. Unit is shipped with valve stem(s) frontseated, and caps installed. Replace stem caps after system is opened to refrigerant flow (backseated). Replace caps finger tight and tighten additional 1/6 turn with wrench. See sticker on valve cap.



4. Set thermostat selector switch at OFF.
5. Set room thermostat at desired temperature. Be sure set point is below indoor ambient temperature.
6. Close electrical disconnects to energize system.
7. Set room thermostat at COOL and fan switch at FAN or AUTO, as desired. Operate unit for 15 minutes. Check system refrigerant charge. See Refrigerant Charging, below.

Motors and controls are designed to operate satisfactorily in the voltage range shown in Table 3. If necessary to use manifold gages for servicing, refer to Carrier Standard Service Techniques Manual, Chapter 1, Refrigerants, page 1-5, Fig. 8, for bypass method of returning charge to system. Removal of liquid line charging hose without following these precautions could result in some loss of charge.

Refrigerant Charging (Refer to Tables 4 and 5)

⚠ CAUTION

To prevent personal injury, wear safety glasses and gloves when handling refrigerant. Do not overcharge system. This can cause compressor flooding.

1. Operate unit a minimum of 10 minutes before checking charge.
2. Measure suction pressure by attaching a gage to suction valve service port.
3. Measure suction line temperature by attaching a service thermometer to unit suction line near suction valve. Insulate thermometer for accurate readings.
4. Measure outdoor coil inlet air dry-bulb temperature with a second thermometer.
5. Measure indoor coil inlet air wet-bulb temperature with a sling psychrometer.
6. Refer to Table 4. Find air temperature entering outdoor coil and wet-bulb temperature entering indoor coil. At this intersection note the superheat.
7. Refer to Table 5. Find superheat temperature and suction pressure, note suction line temperature.

8. If unit has higher suction line temperature than charted temperature, add refrigerant until charted temperature is reached.
9. If unit has lower suction line temperature than charted temperature, bleed refrigerant until charted temperature is reached.

10. If air temperature entering outdoor coil or pressure at suction valve changes, charge to new suction line temperature indicated on chart.
11. This procedure is valid, independent of indoor air quantity.

NOTE: For service data, refer to separate service manual for Models 38EH,EN,ES,QH,QN,QS.

**Table 4 — Superheat Charging Table
(Superheat Entering Suction Service Valve)**

OUTDOOR TEMP (F)	INDOOR COIL ENTERING AIR TEMP (F WB)													
	50	52	54	56	58	60	62	64	66	68	70	72	74	76
55	9	12	14	17	20	23	26	29	32	35	37	40	42	45
60	7	10	12	15	18	21	24	27	30	33	35	38	40	43
65	—	6	10	13	16	19	21	24	27	30	33	36	38	41
70	—	—	7	10	13	16	19	21	24	27	30	33	36	39
75	—	—	—	6	9	12	15	18	21	24	28	31	34	37
80	—	—	—	—	5	8	12	15	18	21	25	28	31	35
85	—	—	—	—	—	—	8	11	15	19	22	26	30	33
90	—	—	—	—	—	—	5	9	13	16	20	24	27	31
95	—	—	—	—	—	—	—	6	10	14	18	22	25	29
100	—	—	—	—	—	—	—	—	8	12	15	20	23	27
105	—	—	—	—	—	—	—	—	5	9	13	17	22	26
110	—	—	—	—	—	—	—	—	—	6	11	15	20	25
115	—	—	—	—	—	—	—	—	—	—	8	14	18	23

— Do not attempt to charge system under these conditions or refrigerant slugging may occur

**Table 5 — Required Suction-Tube Temperature (F)
(Entering Suction Service Valve)**

SUPERHEAT TEMP (F)	SUCTION PRESSURE AT SERVICE PORT (Psig)								
	61.5	64.2	67.1	70.0	73.0	76.0	79.2	82.4	85.7
0	35	37	39	41	43	45	47	49	51
2	37	39	41	43	45	47	49	51	53
4	39	41	43	45	47	49	51	53	55
6	41	43	45	47	49	51	53	55	57
8	43	45	47	49	51	53	55	57	59
10	45	47	49	51	53	55	57	59	61
12	47	49	51	53	55	57	59	61	63
14	49	51	53	55	57	59	61	63	65
16	51	53	55	57	59	61	63	65	67
18	53	55	57	59	61	63	65	67	69
20	55	57	59	61	63	65	67	69	71
22	57	59	61	63	65	67	69	71	73
24	59	61	63	65	67	69	71	73	75
26	61	63	65	67	69	71	73	75	77
28	63	65	67	69	71	73	75	77	79
30	65	67	69	71	73	75	77	79	81
32	67	69	71	73	75	77	79	81	83
34	69	71	73	75	77	79	81	83	85
36	71	73	75	77	79	81	83	85	87
38	73	75	77	79	81	83	85	87	89
40	75	77	79	81	83	85	87	89	91

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

Book 1 4
Tab 3a 2a

PC 101

Catalog No 533-813

Printed in U S A

Form 38EH-5SI

Pg 6

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1-86

Replaces: 38EH-3SI

For replacement items use Carrier Specified Parts.