

Installation and Start-Up Instructions

SAFETY CONSIDERATIONS

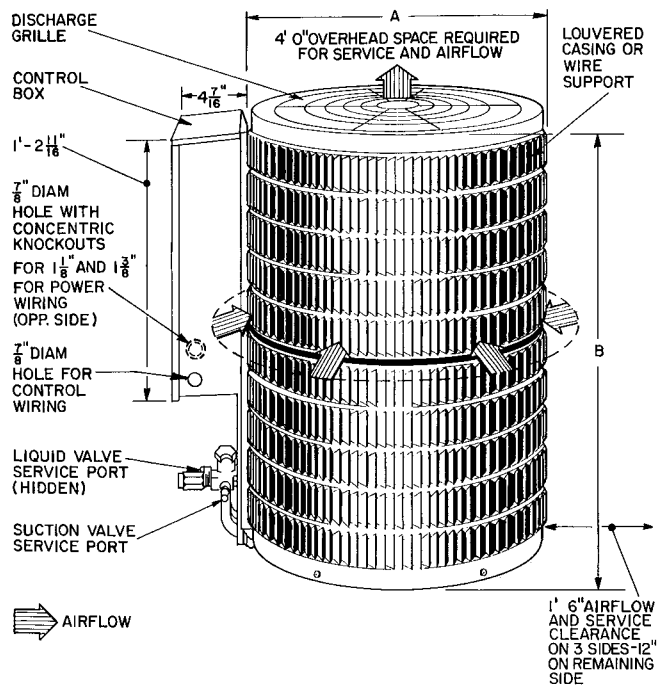
Installing and servicing air conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install or service air conditioning equipment.

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 National Electrical Code (NEC) 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 — Check Equipment and Jobsite** — Install on a solid, level mounting pad. It is not recommended that unit be attached to pad using tiedown bolts. Fasten unit to pad using holes provided in unit mounting feet. 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. on 3 sides of unit (12 in. on fourth side). Maintain a distance of 24 in. between condensing units. Position so water or ice from roof or eaves cannot fall directly on unit.

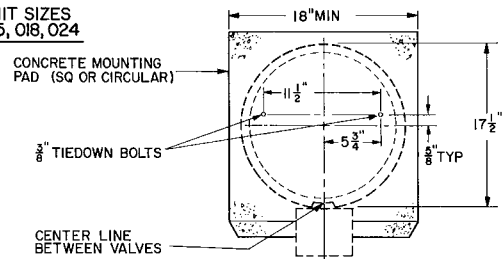
Step 2 — Replace Indoor AccuRater™ Piston, if required.

REPLACE ACCURATER REFRIGERANT CONTROL PISTON in the indoor coil, *if required*, before connecting refrigerant lines. Refer to Table 2 for proper piston size.

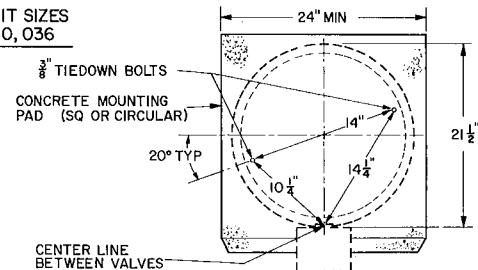
Step 3 — Make Piping Connections — Outdoor units may be connected to indoor sections using Carrier accessory tubing package (refer to Service Data) or field-supplied tubing of refrigerant grade, correct size (see Table 1) and condition. For tubing requirements beyond 50 ft, obtain information from your local 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, page 4 and Service Data).

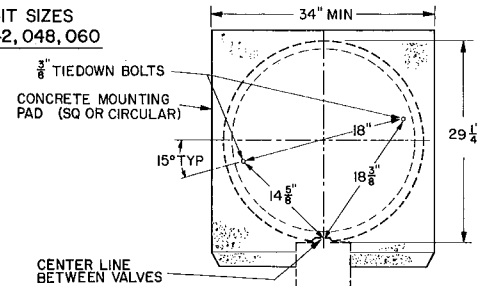
UNIT SIZES 015, 018, 024



UNIT SIZES 030, 036



UNIT SIZES 042, 048, 060



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 38EN	015	018	024	030	036	042	048	060
OPER WT (lb)*	94	111	111	142	146	182	200	228
REFRIGERANT Control	AccuRater™ (Installed in I.D. Coil)							
COND FAN	Propeller Type, Direct Drive Vertical							
Air Discharge	1950		2800		4800			
Air Qty (cfm)	1650		1100					
Motor Rpm (60 Hz)								
COND COIL (fins/in.)	20		16					
Tube Diam	3/8 in -		1/2 in, E-coil					
Rows	1		2					
Face Area (sq ft)	8 15		12 37		17 11		—	
Outer Row	—		—		—		17.11	
Inner Row								
DIMENSIONS (ft-in.)	1-5½		1-9½		2-5¼			
Diameter A	2-1		2-7					
Height B								
CONN (in. ODF)	Compatible Fitting (Suction and Liquid)							
Suction	3/8		3/8		3/8		3/8	
Liquid								
REFRIG LINES (in. ODF)	3/8		3/8		7/8		1½†	
Suction								
Liquid								

*Add 10 lbs for louvered casing (if so equipped) Weight increases slightly with addition of any accessories
 †38EN048,060 require a 1½-in suction line for optimum performance. A ¾- x 1½-in connection adapter accessory (Carrier Part No. 28AU900061) is available. If a ¾-in accessory tubing package is used, expect a 3% capacity loss

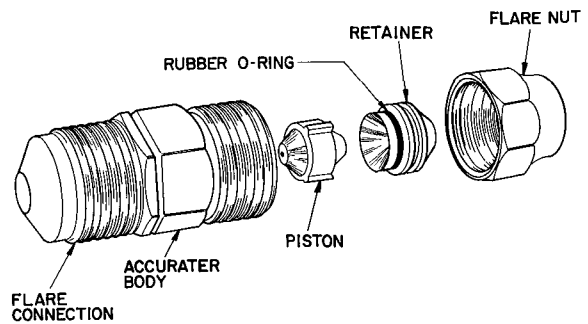


Fig. 2 — AccuRater (Bypass Type) Components

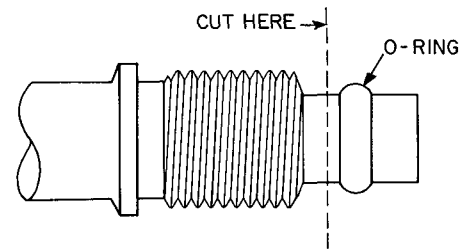


Fig. 3 — Repair of Mechanical Connection

⚠ 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.

Models 38EN048,060 — 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).

Table 2 — AccuRater™ Selection Chart

COND UNIT 38EN (1- and 3-Ph)	ACCURATER™ PISTON NO.								
	Evap Size (Coil or Fan Coil)								
	015	018	024	030	036	042	048	060	060
015-0	46	TXV	—	—	—	—	—	—	—
018-0	—	52	52	TXV	—	—	—	—	—
024-0	—	—	57	57	TXV	—	—	—	—
030-0	—	—	—	65	TXV	—	—	—	—
030-2	—	—	—	63	—	—	—	—	—
036-0	—	—	—	—	70	TXV	—	—	—
042-0	—	—	—	—	78	78	TXV	—	—
048-0	—	—	—	—	—	—	82	—	—
060-0	—	—	—	—	—	—	—	—	—
060-1	—	—	—	—	—	—	—	—	98

Factory-installed piston Obtain replacement pistons through local Carrier distributor

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

1. Loosen nut on Compatible Fitting one turn. Do not remove.
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.
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.

▲ 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, 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.

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 instructions, page 4.

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.

Table 3 — Electrical Data (60 Hz)

OUTDOOR UNIT 38EN	V/PH	OPER VOLTS*		COMPR		FAN	MCA	MAX FUSE† OR HACR TYPE CKT BKR AMPS
		Max	Min	LRA	RLA	FLA		
015-3	208-230/1	254	197	36.0	6.9	1.6	10.0	15
018-3				53.0	10.1	1.6	14.0	20
024-3				65.0	13.0	1.6	17.9	30
030-3				88.0	18.7	2.1	24.6	35
036-3				97.0	21.0	2.1	28.4	45
042-3				118.0	24.2	2.5	32.7	50
048-3	230/1	254	197	110.0	25.0	2.5	33.8	50
060-3				150.0	35.3	2.5	46.7	60
030-5	208-230/3‡	254	187	70.0	10.3	2.1	14.9	25
036-5				78.0	12.8	2.1	18.1	30
042-5				90.0	15.4	2.5	21.7	35
048-5				105.0	18.3	2.5	25.4	40
060-5				136.0	20.6	2.5	28.2	45
036-6				460/3‡	508	414	39.0	6.1
042-6	45.0	8.3	1.3				11.7	20
048-6	35.0	8.8	1.3				12.3	20
060-6	49.0	10.4	1.3				14.3	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

‡3-Phase available only with base unit and SM option unit

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

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 National Electrical Code (NEC).

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.

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-va minimum) supply for system as shown in Fig. 5, or use accessory transformer (refer to Service Data).

NOTE: Some 38EN units are equipped with a fan time delay. This permits indoor fan to continue to operate for 90 seconds, which provides additional cooling after compressor has cycled off. Refer to separate installation instructions packaged with fan time delay (shipped with unit).

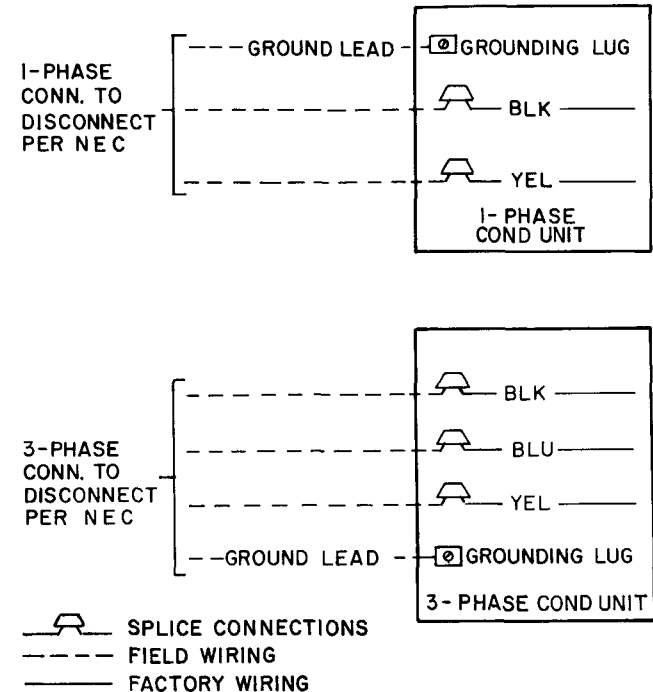
⚠ WARNING

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

Refrigerant Charging (Refer to Fig. 6 and Table 5)

⚠ CAUTION

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



Step 5 — Start-Up

1. Energize crankcase 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. Set thermostat selector switch at OFF.
4. Set room thermostat at desired temperature. Be sure set point is below indoor ambient temperature.
5. Close electrical disconnects to energize system.
6. 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.

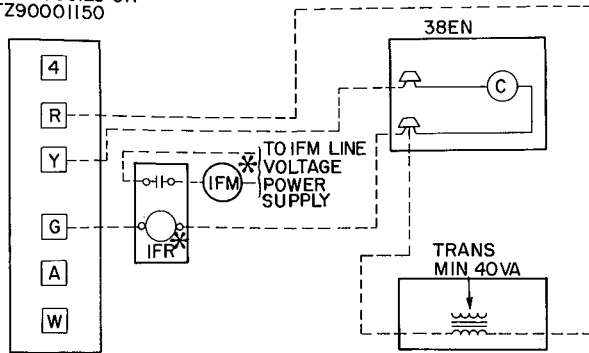
Motors and controls are designed to operate satisfactorily in the voltage range shown in Table 3. If necessary to use manifold gages for servicing, refer to Carrier Standard Service Techniques Manual, Chapter 1, Refrigerants, page 1-5, Fig. 8, for bypass method of returning charge to system. Removal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

→ **Table 4 — Service Data**

MODEL 38EN	COMPRESSOR	OIL CHARGE (oz)		R-22 CHG* (lb)	OUTDOOR FAN RPM
		Initial	Recharge		
015300	REK3-0125-PFV	24	20	3 60	1650
015310	AK8515E	17	15	3 20	
018300	H21B193ABCA	40	37	3 60	
018310	RES3-0175	24	20	3 70	
024300, 310	H21B243ABCA	40	37	3 80	
030300	H21A313ABCA	40	37	5 60	1100
030320	MD3215GG	46	44	6 70	
036300, 320	H21A373ABCA	50	47	5 80	
042300	H21A463ABCA	50	47	7 20	
048300	PC5316BD	76	62	7 60	
060300, 310	PC6716AG	76	62	9 60	
	PC6716AG	76	62	12.50	
030500	H21A313DBD	40	37	5 60	
036500	H21A373DBD	50	47	5 80	
042500	H21A463DBD	50	47	7 20	
048500	PY5316AD	76	62	7 60	
060500, 510	PY6716AF	76	62	9 60	
	PY6716AF	76	62	12.50	
036600	H21A373DBE	50	47	5 80	
042600	H21A463DBE	50	47	7 20	
048600	PH5316AD	76	62	7 60	
060600, 610	PH6716AF	76	62	9 60	
	PH6716AF	76	62	12 50	

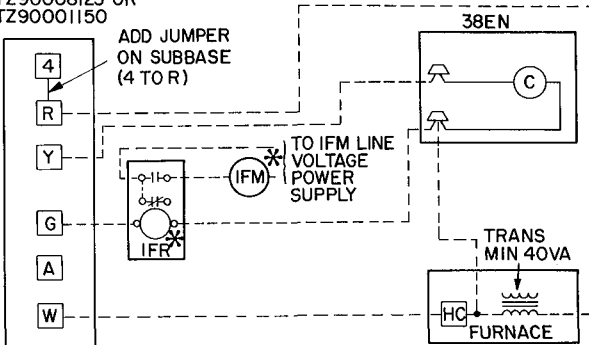
*Factory refrigerant charge is adequate when indoor unit and outdoor unit are the same size and are connected with 25 ft or less of field-supplied tubing of recommended size or Carrier accessory tubing

THERMOSTAT SUBBASE
99TZ90008125 OR
99TZ90001150



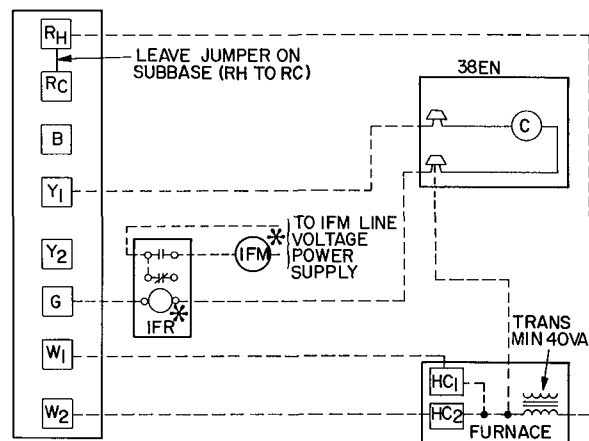
ARRANGEMENT A-(COOLING ONLY)

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)
- HC** — Heating Control
- IFM** — Indoor Fan Motor
- IFR** — Indoor Fan Relay
- Trans** — Transformer
- Field Splice
- Field Wiring
- Factory Wiring

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

Fig. 5 — Control Circuit Connections

Table 5 — 38EN Chargemaster® Charging Chart (AccuRater™ System)

OUTDOOR TEMP (F)	EVAPORATOR TEMPERATURE (F)										
	21	25	28	31	34	37	40	45	48		
	Suction Line Temperature (F)										
60	32	40	51								
62	30	38	39								
64	28	37	47	60							
66	27	35	45	57							
68		34	43	54	67						
70		32	41	52	64						
72		31	39	50	61	72					
74		30	37	48	58	69					
76		29	36	46	56	66					
78		27	35	44	54	63	75				
80		26	33	42	52	61	72				
82			32	40	50	59	68				
86			29	37	46	55	63	73	85		
88				35	44	53	61	70	81		
90				34	42	51	59	68	78	90	
92				33	41	49	57	65	75	86	
94					39	47	55	63	72	83	
96					38	45	53	61	70	80	
98					36	44	51	59	67	77	
100						42	49	57	65	75	
102						41	48	55	63	73	
104						39	46	53	61	70	
106							45	51	59	68	
108							43	49	57	65	
110							41	47	55	63	
112								46	53	61	
114									50	59	

Example

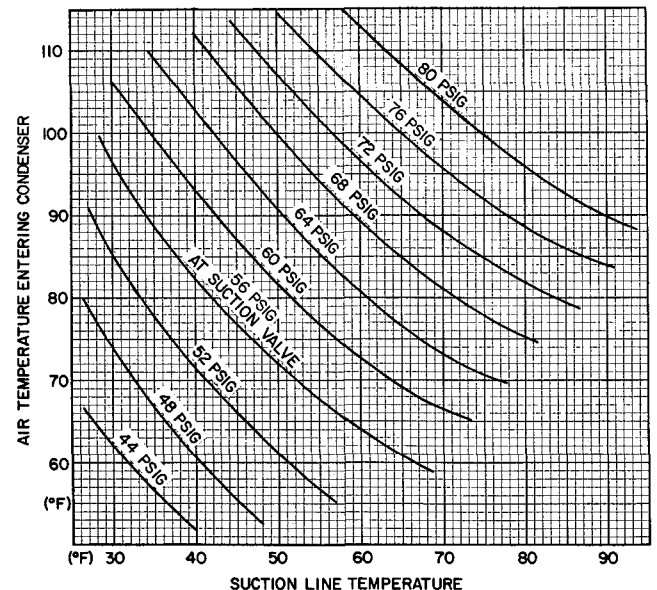


Fig. 6 — 38EN Charging Chart (AccuRater™ System)

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



38EN Air-Cooled Condensing Units

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Book 1 | 4
Tech 13a12a

PC 101

Catalog No 563-825

Printed in U S A

Form 38EN-3SI

Pg 6

485

12-84

Replaces: 38EN-2SI

For replacement items use Carrier Specified Parts