Installation, Start-Up and Service Instructions

CONTENTS

SAFETY CONSIDERATIONS

Installing, starting up, and servicing air-conditioning equipment can be hazardous due to system pressures, electrical components and equipment location (roofs, elevated structures, etc.).

Only trained, qualified installers and service mechanics should install, start up, and service this equipment (Fig. 1).

Untrained personnel can perform basic maintenance functions such as cleaning coils. All other operations should be performed by trained service personnel.

When working on the equipment, observe precautions in the literature and on tags, stickers, and labels attached to the equipment.

Follow all safety codes. Wear safety glasses and work gloves. Keep quenching cloth and fire extinguisher nearby when brazing. Use care in handling, rigging, and setting bulky equipment.

ELECTRIC SHOCK HAZARD

Open all remote disconnects before servicing this equipment.

→ **⚠ WARNING**

DO NOT USE TORCH to remove any component. System contains oil and refrigerant under pressure.

To remove a component, wear protective gloves and goggles and proceed as follows:

a. Shut off electrical power to unit.
b. Recover refrigerant to relieve all pressure from system using both high-pressure and low pressure ports.
c. Traces of vapor should be displaced with nitrogen and the work area should be well ventilated. Refrigerant in contact with an open flame produces toxic gases.
d. Cut component connection tubing with tubing cutter and remove component from unit. Use a pan to catch any oil that may come out of the lines and as a gage for how much oil to add to the system.
e. Carefully unsweat remaining tubing stubs when necessary. Oil can ignite when exposed to torch flame.

Failure to follow these procedures may result in personal injury or death.

→ **⚠ CAUTION**

DO NOT re-use compressor oil or any oil that has been exposed to the atmosphere. Dispose of oil per local codes and regulations. DO NOT leave refrigerant system open to air any longer than the actual time required to service the equipment. Seal circuits being serviced and charge with dry nitrogen to prevent oil contamination when timely repairs cannot be completed. Failure to follow these procedures may result in damage to equipment.

INTRODUCTION

These instructions describe installation, start-up, and service of 09DK020-044 air-cooled condensers (Fig. 1). See Table 1 for general unit physical data.

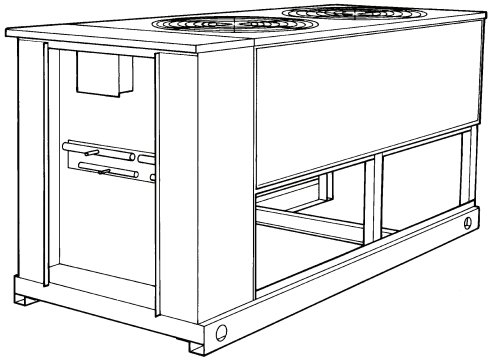


Fig. 1 — Model 09DK (Size 028 Shown)

INSTALLATION

Step 1 — Complete Pre-Installation Checks —

Examine for damage incurred during shipment. File claim immediately with transit company if damage is found. Verify that the nameplate electrical requirements match the available power supply. Check the shipment for completeness.

Step 2 — Locate and Rig Unit, Remove Shipping Skid

LOCATION — If roof installation is specified, make certain that roof structure can support the condenser weight. Refer to Table 1.

Locate condenser where an adequate supply of inlet outdoor air is available. Do not locate where the possibility of air recirculation exists, such as under a roof overhang.

Locate condenser in an area free from airborne dirt or other foreign material which could clog condenser coils.

RIGGING — Preferred method is with spreader bars from above the unit. Use 2-in. (50 mm) OD pipe or hooks in lifting holes. Rig with 4 cables and spreader bars. All panels must be in place when rigging. See rigging label on unit for details concerning shipping weights, distance between lifting holes, center of gravity, and spreader bar dimensions. Also see Fig. 2.

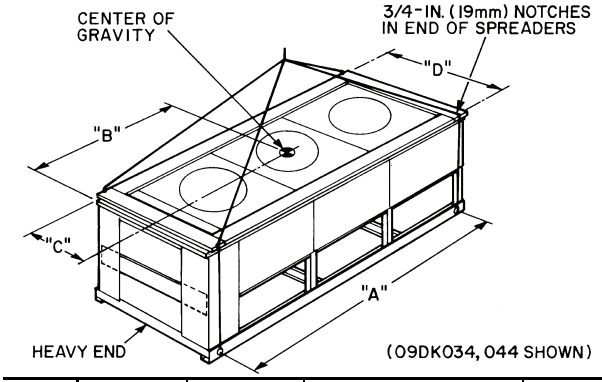
If overhead rigging is not possible, place unit on skid or pad for rolling or dragging. When rolling, use minimum of 3 rollers. When dragging, pull the pad. *Do not apply force to the unit.* When in final position, raise from above to lift unit off pad.

⚠ CAUTION

All panels must be in place when rigging. Do not forklift unit if no skid is supplied. If unit has skid, use forklift truck from sides only.

PLACING UNIT — There must be 4 ft (1.22 m) for service and for unrestricted airflow on all sides of unit, and a minimum of 8 ft (2.44 m) clean air space above units. See Fig. 3, 4, and 5. For multiple units, allow 8 ft (2.44 m) separation between units for airflow and service.

MOUNTING UNIT — When unit is in proper location, use mounting holes in base rails for securing unit to supporting structure. Fasteners for mounting unit must be field supplied. If unit is to be mounted on vibration isolators, drill mounting holes in bottom of base rail at support points 1-4 (shown in Fig. 3, 4, and 5) and locate isolators at those points.

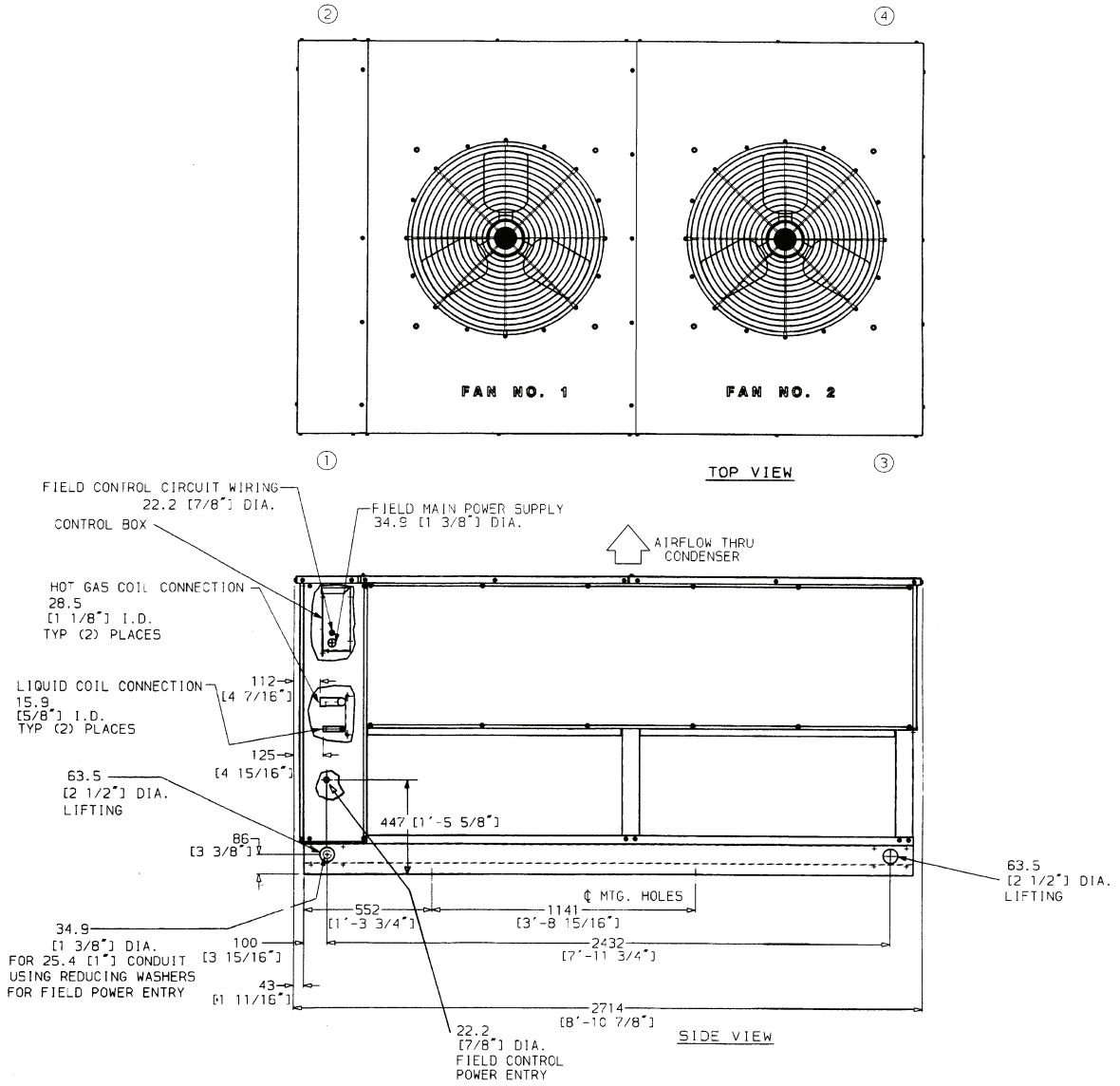


UNIT 09DK	MAX. SHIP WT		LIFTING HOLES		CENTER OF GRAVITY				D	
			A		B		C			
	lb	kg	in.	mm	in.	mm	in.	mm	in.	mm
020,024	989	449	95.7	2432	55.2	1403	24.7	628	49.5	1256
028	1209	548	95.7	2432	54.7	1391	36.7	933	73.5	1867
034	1835	832	142.0	3608	80.0	2032	36.7	933	73.5	1867
044	2017	915	142.0	3608	80.0	2032	36.7	933	73.5	1867

Fig. 2 — Rigging with Spreader Bars (Field Supplied)

Table 1 — Physical Data — 50 and 60 Hz

UNIT 09DK	020	024	028	034	044
OPERATING WEIGHT, lb (kg)					
Aluminum-Fin Units	797 (361.5)	797 (361.5)	983 (445.9)	1495 (678.1)	1676 (760.2)
Copper-Fin Units	921 (417.8)	921 (417.8)	1137 (515.7)	1700 (771.1)	1984 (900.0)
CONDENSER FANS, TYPE	Propeller Type, Direct Driven				
No.	2	2	2	3	3
Diam, in. (mm)	30 (762)				
Total Airflow cfm	10,600	13,500	15,700	21,100	23,700
L/s	5,000	6,370	7,400	9,950	11,200
Speed, Rpm (rps)	1140 (19), 60 Hz 950 (15.8), 50 Hz				
CONDENSER COIL, TYPE	Horizontal, Plate Fin				
Rows	3	3	2	2	3
Fins/in. (Fins/m)	17 (669)	17 (669)	19 (748)	17 (669)	17 (669)
Total Face Area, sq ft	23.5	23.5	39.2	58.4	58.4
sq m	2.18	2.18	3.64	5.43	5.43



DIMENSIONS — MM [FT-IN.]

UNIT 09DK	A	B	C	D	E	F
020,024	1131 [3-8 1/2]	1007 [3-3 11/16]	240 [9 7/16]	432 [1-0]	228 [0-9]	559 [1-10]
028	1742 [5-8 5/8]	1619 [5-3 3/4]	496 [1-7 9/16]	914 [3-0]	445 [1-5 1/2]	762 [2-6]

NOTES:
1. There must be 1220 mm [4′-0″] for service and for unrestricted airflow on all sides of unit.
2. There must be minimum 2440 mm [8′-0″] clear air space above unit.
3. The approximate operating weight of the unit follows:

UNIT 09DK	TOTAL WEIGHT		OPERATING WT. AT SUPPORT POINTS			
			① & ②		③ & ④	
	Lb	Kg	Lb	Kg	Lb	Kg
020,024	797	361.5	186	84.4	212	96.2
020C,024C	921	417.8	215	97.5	245	111.1
028	983	445.9	229	103.9	262	118.8
028C	1137	515.7	268	121.6	300	136.1

C — Units with optional copper-fin coils

4. Dimensions are in millimeters. Dimensions in [ ] are in feet-inches.

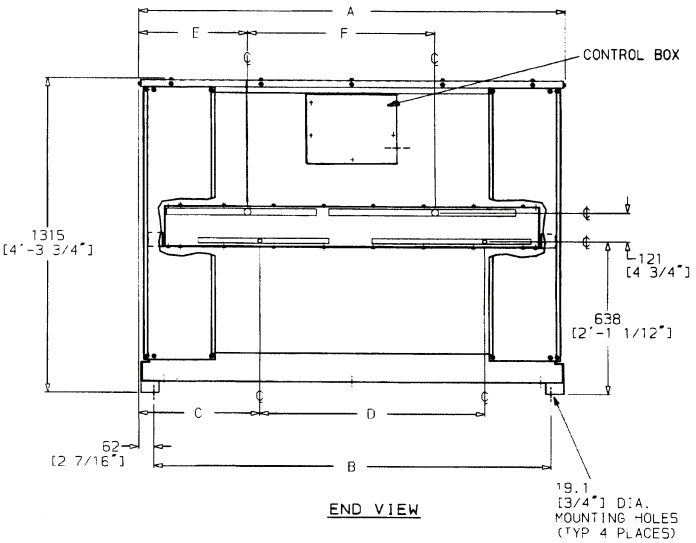
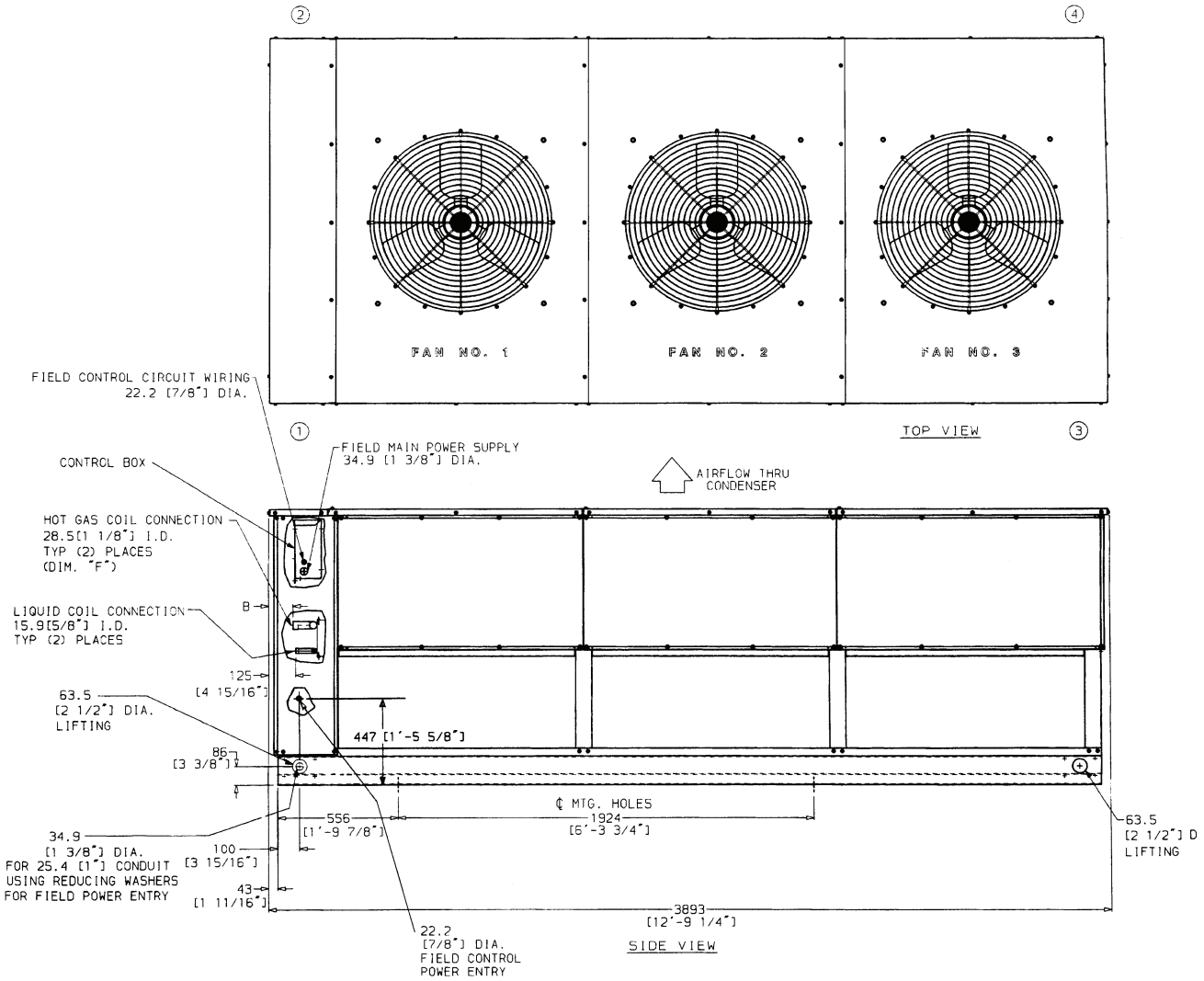
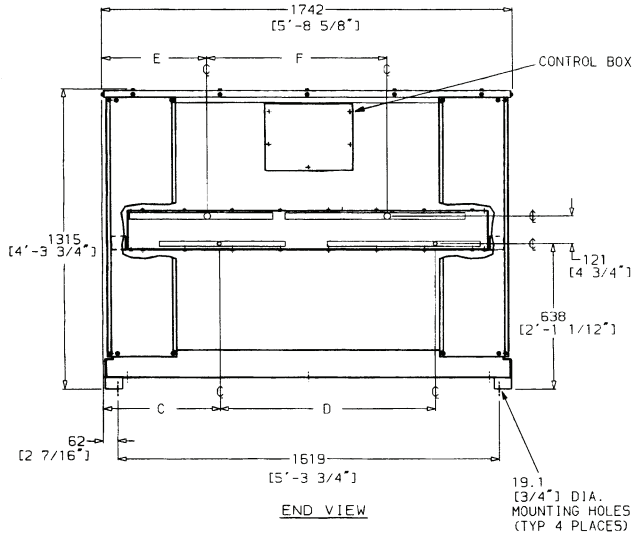


Fig. 3 — Dimensions, 09DK020-028





DIMENSIONS — MM [FT-IN.]

UNIT 09DK	B	C	D	E	F
034	112 [1-2 7/16]	496 [1-7 9/16]	914 [3-0]	445 [1-5 1/2]	762 [2-6]

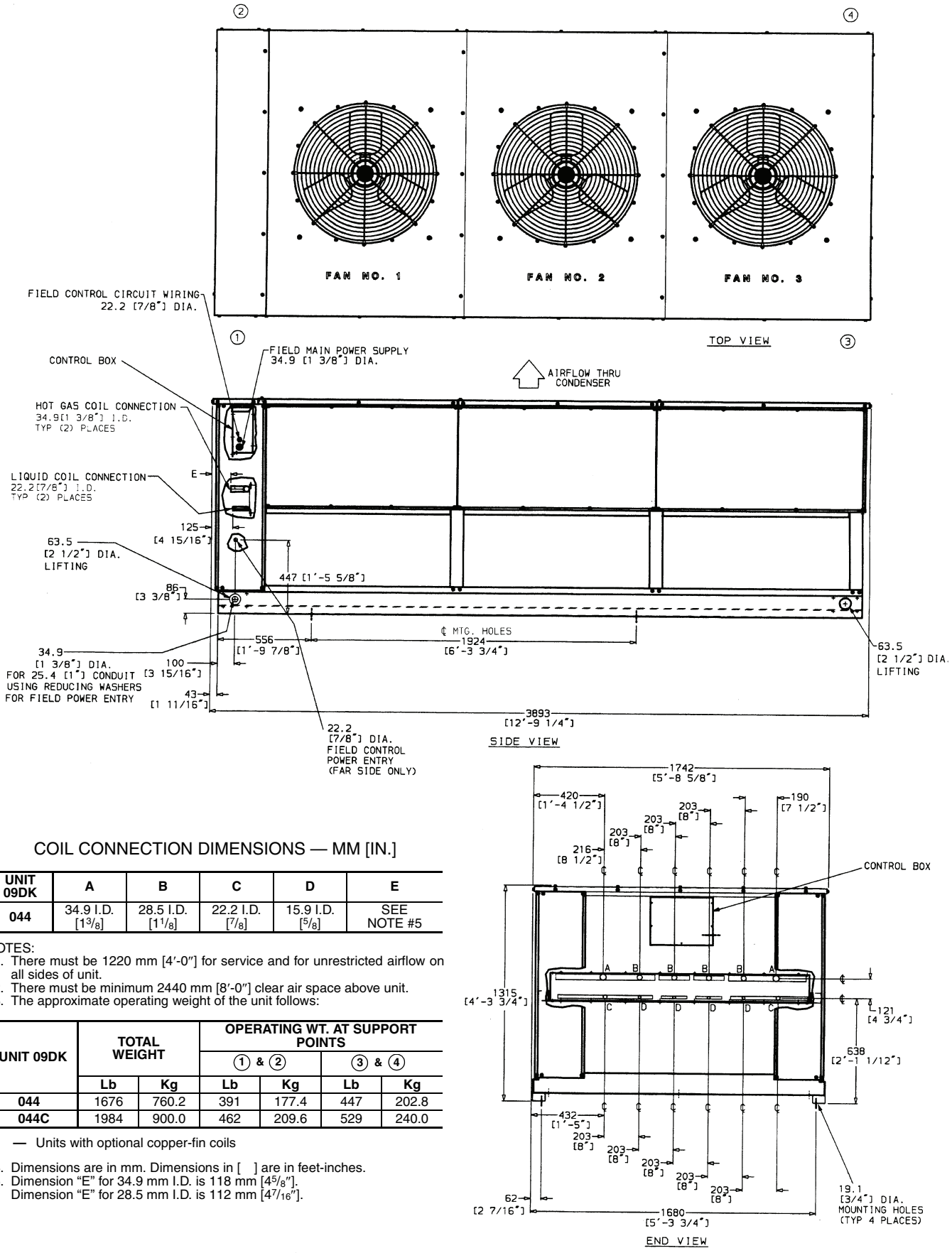
NOTES:
1. There must be 1220 mm [4′-0″] for service and for unrestricted airflow on all sides of unit.
2. There must be minimum 2440 mm [8′-0″] clear air space above unit.
3. The approximate operating weight of the unit follows:

UNIT 09DK	TOTAL WEIGHT		OPERATING WT. AT SUPPORT POINTS			
			① & ②		③ & ④	
	Lb	Kg	Lb	Kg	Lb	Kg
034	1495	678.1	349	158.3	399	181.0
034C	1700	771.1	396	179.6	454	205.9

C — Units with optional copper-fin coils

4. Dimensions are in millimeters. Dimensions in [ ] are in feet-inches.

Fig. 4 — Dimensions, 09DK034



COIL CONNECTION DIMENSIONS — MM [IN.]

UNIT 09DK	A	B	C	D	E
044	34.9 I.D. [1 3/8]	28.5 I.D. [1 1/8]	22.2 I.D. [7/8]	15.9 I.D. [5/8]	SEE NOTE #5

NOTES:
1. There must be 1220 mm [4′-0″] for service and for unrestricted airflow on all sides of unit.
2. There must be minimum 2440 mm [8′-0″] clear air space above unit.
3. The approximate operating weight of the unit follows:

UNIT 09DK	TOTAL WEIGHT		OPERATING WT. AT SUPPORT POINTS			
			① & ②		③ & ④	
	Lb	Kg	Lb	Kg	Lb	Kg
044	1676	760.2	391	177.4	447	202.8
044C	1984	900.0	462	209.6	529	240.0

C — Units with optional copper-fin coils

4. Dimensions are in mm. Dimensions in [ ] are in feet-inches.
5. Dimension “E” for 34.9 mm I.D. is 118 mm [4 5/8″].
   Dimension “E” for 28.5 mm I.D. is 112 mm [4 7/16″].

Fig. 5 — Dimensions, 09DK044

Step 3 — Complete Refrigerant Piping

GENERAL — All field leak and pressure testing should be in accordance with local code requirements. If no local code exists, follow American National Standards Institute (ANSI)/ American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Safety Standard 15, latest revision.

For leak testing procedures, refer to the Carrier Refrigerant Service Techniques Manual.

COIL CIRCUITING CONVERSION INSTRUCTIONS — See Table 2 for standard unit circuiting and for the circuiting available by installing the supplied parts kits. Note that for 044 size units, all circuiting must be field installed using field supplied parts. Field supplied and installed parts are also required for 100% circuiting of all 020-034 size units.

The following sections describe how to modify the standard unit circuiting (as shipped from the factory) for optional splits.

NOTE: All coils are purged with dry air and then capped prior to shipment. The coils **DO NOT** contain a refrigerant holding charge.

Table 2 — Coil Circuiting Options

UNIT 09DK	FACTORY CIRCUITING	FIELD-CONVERTED CIRCUITING
020	50/50%	67/33%*
024	50/50%	67/33%*
028	50/50%	60/40%* or 40/40/20%*
034	50/50%	60/40%* or 40/40/20%*
044	Uncircuited†	100% or 74/26% or 66/34% or 60/40% or 53/47% or 40/13/13/34%

*Parts kits for field circuiting conversions are supplied with the unit. Replacement parts kits are available as follows: For 020 and 024 size units, part no. 09DK400138; for 028 and 034 units, part no. 09DK400139. Replacement parts kits are not available for 044 units.

†The 044 unit is shipped from the factory uncircuited, with plastic caps on all connections. The unit must be field converted to the desired split with field supplied parts.

09DK020,024 67/33% Circuiting Modification — To convert the **09DK020** or **09DK024** coil from the **50/50%** to **67/33%** circuiting, perform the following steps:

1. Use a mini tubing cutter to remove specified parts:
   a. Both $^{3}/_{8}$-in. diam tube nipples connecting the left hot gas header to the coil. See Fig. 6, Item A.
   b. The $^{3}/_{8}$-in. diam tube nipple connecting the left liquid header to the coil. See Fig. 6, Item B.
   c. Caps, where 2 are located on the right gas header, and one is located on the right liquid header. See Fig. 6, Item C.
2. Attach following specified parts contained in the parts kit. Perform phos-copper brazing on all field-made connections while protecting adjacent joints from heat.
   a. Cap the open stub tubes on the left headers, where two are located on the gas header, and one on the liquid header. See Fig. 7, Item A.
   b. Insert both $3^{5}/_{8}$-in. length tube nipples into the open stub tubes located on the right side of the coil to connect the right gas header to the top row of the coil. See Fig. 7, Item B.
   c. Insert the $4^{11}/_{16}$-in. length tube nipple into the open stub tubes on the right side of the coil to connect the right liquid header to the bottom row. See Fig. 7, Item C.
3. Install or replace filter-drier(s). *Before charging the system, install or replace filter drier(s) connected to the liquid line near the indoor unit to prevent contamination in the system.*

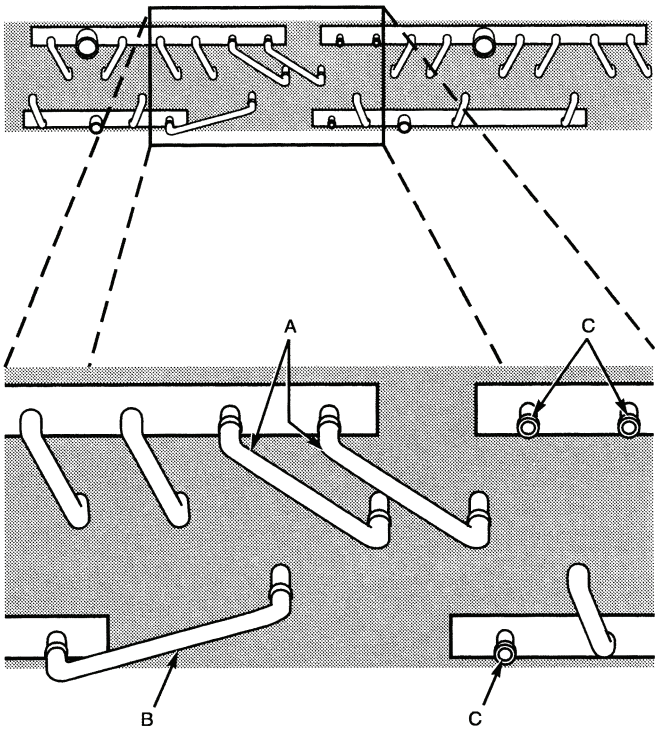


Fig. 6 — Parts Removed from 09DK020,024 (50/50%) Unit for 67/33% Circuiting

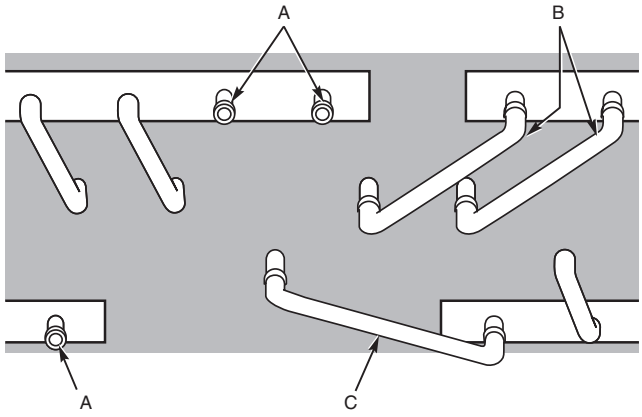


Fig. 7 — Parts Added to 09DK020,024 Unit (To Obtain 67/33% Circuiting)

09DK028,034 60/40% Circuiting Modification — To convert the **09DK028** or **09DK034** coil from the **50/50%** to **60/40%** circuiting, perform the following steps:

1. Use a mini tubing cutter to remove specified parts:
   a. Both $^{3}/_{8}$-in. diam tube nipples connecting the left hot gas header to the coil. See Fig. 8, Item A.
   b. The $^{3}/_{8}$-in. diam tube nipple connecting the left liquid header to the coil. See Fig. 8, Item B.
   c. Caps, where 2 are located on the right gas header, and one is located on the right liquid header. See Fig. 8, Item C.
2. Attach following specified parts contained in the parts kit. Perform phos-copper brazing on all field-made connections while protecting adjacent joints from heat.
   a. Cap the open stub tubes on the left headers, where two are located on the gas header, and one on the liquid header. See Fig. 9, Item A.
   b. Insert both $4^{1}/_{16}$-in. length tube nipples into the open stub tubes on the right side of the coil, connecting the gas header to the top row. See Fig. 9, Item B.
   c. Insert the $4^{11}/_{16}$-in. length tube nipple into the open stub tubes on the right side of the coil, connecting the liquid header to the bottom row. See Fig. 9, Item C.
3. Install or replace filter-drier(s). *Before charging the system, install or replace filter drier(s) connected to the liquid line near the indoor unit to prevent contamination in the system.*

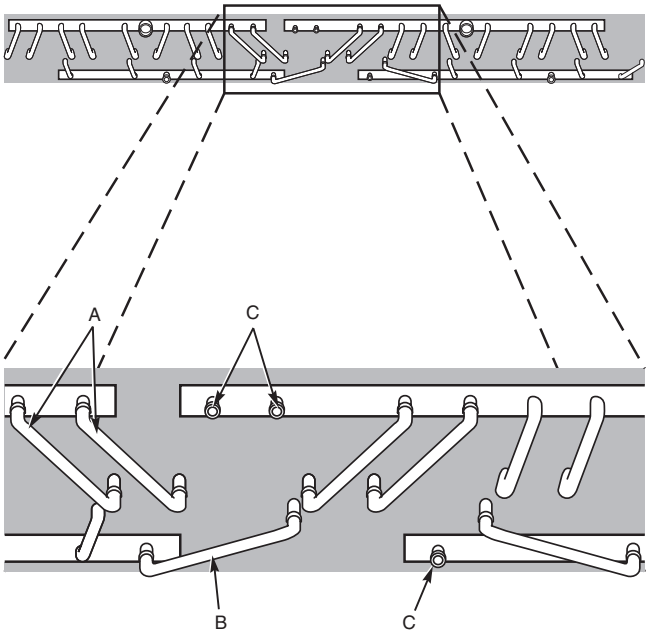


Fig. 8 — Parts Removed from 09DK028,034 (50/50%) Unit for 60/40% Circuiting

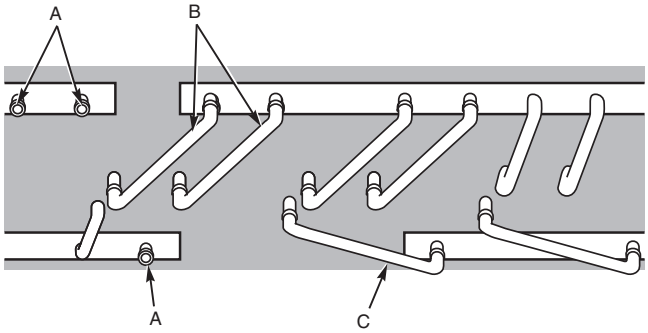


Fig. 9 — Parts Added to 09DK028,034 Unit (To Obtain 60/40% Circuiting)

09DK028,034 40/40/20% Circuiting Modification — To convert the **09DK028** or **09DK034** coil from the **50/50%** to **40/40/20%** circuiting, perform the following steps:

1. Use a mini tubing cutter to remove specified parts:
   a. Four 3/8-in. diam tube nipples connecting the hot gas headers to the coil. See Fig. 10, Item A.
   b. Both 3/8-in. diam tube nipples connecting the liquid headers to the coil. See Fig. 10, Item B.
2. Attach following specified parts contained in the parts kit. Perform phos-copper brazing on all field-made connections while protecting adjacent joints from heat.
   a. Cap the open stub tubes on the left and right gas and liquid headers with stub tube caps supplied in the parts kit. See Fig. 11, Item A.
   b. Insert the 7/8-in. diam header into the stub tubes located in the top row of the coil. See Fig. 11, Item B.
   c. Insert the 6-in. length U tube into the stub tubes located in the bottom row of the coil. See Fig. 11, Item C.
3. Install or replace filter-drier(s). *Before charging the system, install or replace filter drier(s) connected to the liquid line near the indoor unit to prevent contamination in the system.*

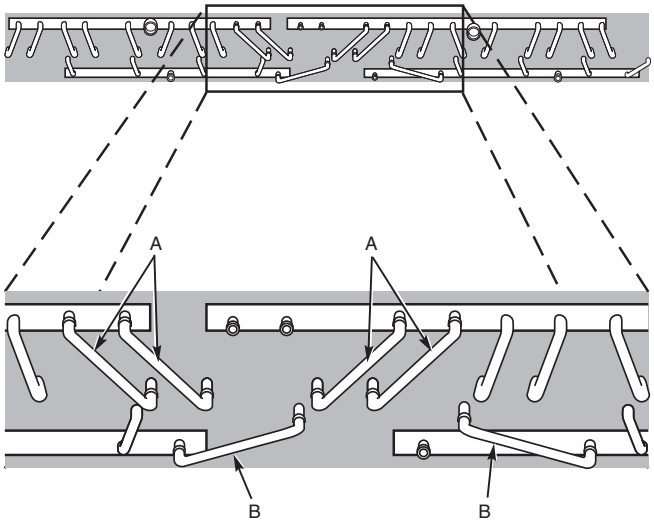


Fig. 10 — Parts Removed from 09DK028,034 (50/50%) Unit for 40/40/20% Circuiting

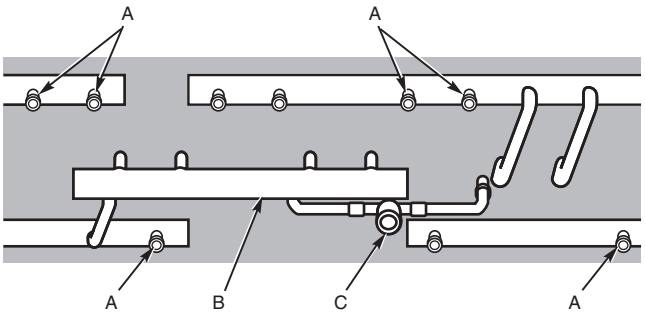
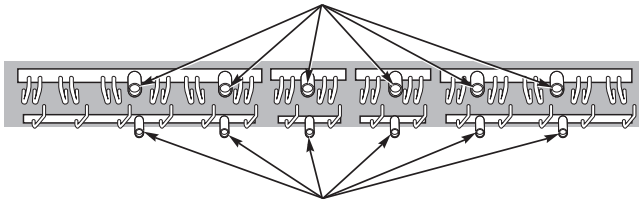


Fig. 11 — Parts Added to 09DK028,034 Unit (To Obtain 40/40/20% Circuiting)

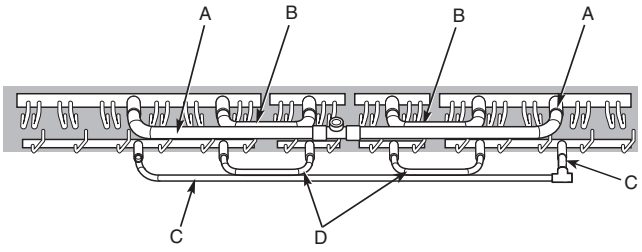
09DK044 100% Circuiting Modification — To configure the **09DK044** for a single **100%** refrigerant circuit using field supplied parts, perform the following steps:

1. Remove all plastic caps. Refer to Fig. 12.
2. Attach following parts as shown in Fig. 12. Perform phos-copper brazing on all field-made connections while protecting adjacent joints from heat.
   a. Construct one (1) gas tubing assembly (Item A), consisting of the following parts, and braze it into gas headers as shown:
      2 — $1^3/_8$-in. OD tubes
      2 — $1^3/_8$-in. 90° long-radius elbows
      1 — $1^3/_8$-in. tee (see note at right)
      2 — $1^3/_8$-in. OD nipples (cut to length as required)
   b. Construct 2 gas "U" tube assemblies (Item B), consisting of the following parts, and braze them into the gas headers as shown.
      1 — $1^1/_8$-in. OD tube
      2 — $1^1/_8$-in. 90° long-radius elbows
      2 — $1^1/_8$-in. OD nipples (cut to length as required)
   c. Construct one liquid tubing assembly (Item C), consisting of the following parts, and braze it into liquid headers as shown.
      2 — $^7/_8$-in. OD tubes
      1 — $^7/_8$-in. 90° long-radius elbow
      1 — $^7/_8$-in. tee (see note below)
      2 — $^7/_8$-in. OD nipples (cut to length as required)
   d. Construct 2 liquid "U" tube assemblies (Item D), consisting of the following parts, and braze them into the gas headers as shown.
      1 — $^5/_8$-in. OD tube
      2 — $^5/_8$-in. 90° long-radius elbows
      2 — $^5/_8$-in. OD nipples (cut to length as required)

      NOTE: Diameter of tee's interconnecting pipe opening is dependent upon interconnecting system piping diameter. Refer to Carrier System Design Manual, Part 3, for hot gas and liquid pipe sizing information.
3. Install or replace filter drier(s). *Before charging the system, install or replace filter drier(s) connected to the liquid line near the indoor unit to prevent contamination in the system.*



PLASTIC CAPS REMOVED FROM UNIT



FIELD-SUPPLIED PARTS ADDED TO UNIT

Fig. 12 — 09DK044 Unit with 100% Circuiting

09DK044 74/26% Circuiting Modification — To configure the **09DK044** for two refrigerant circuits (one with **74%** capacity and one with **26%** capacity) using field supplied parts, perform the following steps:

1. Remove all plastic caps. Refer to Fig. 13.
2. Attach following parts as shown in Fig. 13. Perform phos-copper brazing on all field-made connections while protecting adjacent joints from heat.
   a. Construct the 74% gas tubing assembly (Item A), consisting of the following parts, and braze it into gas headers as shown in Fig. 13, Item A:

      2 —1 3/8-in. OD tubes (cut to length as required)
      2 —1 3/8-in. 90° long-radius elbows
      1 —1 3/8-in. tee (see note at right)
      2 —1 3/8-in. OD nipples (cut to length as required)

   b. Construct the 26% gas tubing assembly (Item B), consisting of the following parts, and braze it into the gas headers as shown in Fig. 13, Item B:

      1 — 1 1/8-in. OD tube (cut to length as required)
      2 — 1 1/8-in. 90° long-radius elbows
      1 — 1 1/8-in. tee (see note at right)
      2 — 1 1/8-in. OD nipples (cut to length as required)

   c. Construct the 74% liquid tubing assembly (Item C), consisting of the following parts, and braze it into liquid headers as shown in Fig. 13, Item C:

      2 — 7/8-in. OD tubes (cut to length as required)
      2 — 7/8-in. 90° long-radius elbows
      1 — 7/8-in. tee (see note at right)
      2 — 7/8-in. OD nipples (cut to length as required)

   d. Construct the 26% liquid tube assembly (Item D), consisting of the following parts, and braze it into the gas headers as shown in Fig. 13, Item D:

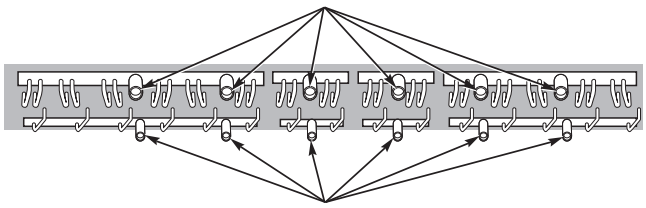
      1 — 5/8-in. OD tube
      2 — 5/8-in. 90° long-radius elbows
      1 — 5/8-in. tee (see note below)
      2 — 5/8-in. OD nipples (cut to length as required)

   e. Plug the two open 1 1/8-in. diameter stub tubes on the gas headers and the two open 5/8-in. diameter stub tubes on the liquid headers as shown in Fig. 13, Item E. Parts required:

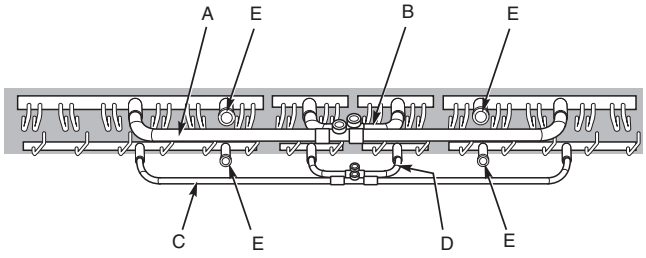
      2 —1 1/8-in. plug fittings
      2 — 5/8-in. plug fittings

      NOTE: Diameter of tee's interconnecting pipe opening is dependent upon interconnecting system piping diameter. Refer to Carrier System Design Manual, Part 3, for hot gas and liquid pipe sizing information.

3. Install or replace filter drier(s). *Before charging the system, install or replace filter drier(s) connected to the liquid line near the indoor unit to prevent contamination in the system.*



PLASTIC CAPS REMOVED FROM UNIT



FIELD-SUPPLIED PARTS ADDED TO UNIT

Fig. 13 — 09DK044 Unit with 74/26% Circuiting

09DK044 66/34% Circuiting Modification — To configure the **09DK044** for two refrigerant circuits (one with **66%** capacity and one with **34%** capacity) using field supplied parts, perform the following steps:

1. Remove all plastic caps. Refer to Fig. 14.
2. Attach following parts as shown in Fig. 14. Perform phos-copper brazing on all field-made connections while protecting adjacent joints from heat.
   a. Construct the 66% gas tubing assembly (Item A), consisting of the following parts, and braze it into gas headers as shown in Fig. 14, Item A:

      2 — $1^1/_8$-in. OD tubes (cut to length as required)
      2 — $1^1/_8$-in. 90° long-radius elbows
      1 — $1^1/_8$-in. tee (see note at right)
      3 — $1^1/_8$-in. OD nipples (cut to length as required)

   b. Construct the 66% liquid tubing assembly (Item B), consisting of the following parts, and braze it into liquid headers as shown in Fig. 14, Item B:

      2 — $^5/_8$-in. OD tubes (cut to length as required)
      2 — $^5/_8$-in. 90° long-radius elbows
      1 — $^5/_8$-in. tee (see note at right)
      3 — $^5/_8$-in. OD nipples (cut to length as required)

   c. Plug the open $1^1/_8$-in. diameter stub tube on the right gas header and the open $^5/_8$-in. diameter stub tube on the right liquid header as shown in Fig. 14, Item C. Parts required:

      1 — $1^1/_8$-in. plug fitting
      1 — $^5/_8$-in. plug fitting

      NOTE: Diameter of tee's interconnecting pipe opening is dependent upon interconnecting system piping diameter. Refer to Carrier system Design Manual, Part 3 for hot gas and liquid pipe sizing information.

3. Install or replace filter drier(s). *Before charging the system, install or replace filter drier(s) connected to the liquid line near the indoor unit to prevent contamination in the system.*

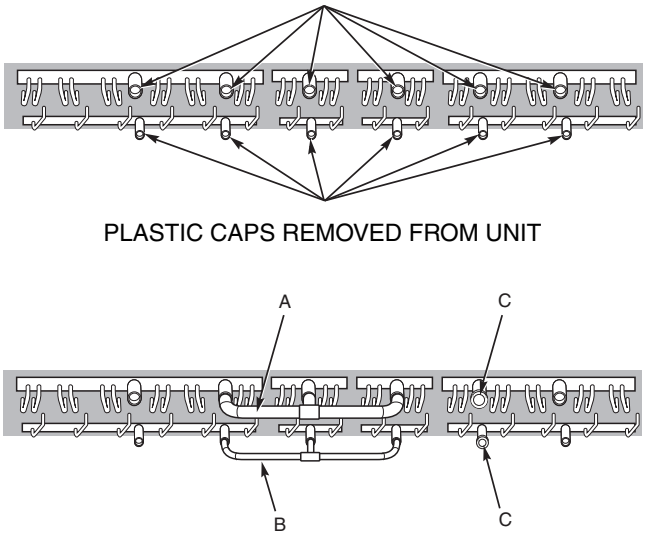


Fig. 14 — 09DK044 Unit with 66/34% Circuiting

09DK044 60/40% Circuiting Modification — To configure the **09DK044** for two refrigerant circuits (one with **60%** capacity and one with **40%** capacity) using field supplied parts, perform the following steps:

1. Remove all plastic caps. Refer to Fig. 15.
2. Attach following parts as shown in Fig. 15. Perform phos-copper brazing on all field-made connections while protecting adjacent joints from heat.
   a. Construct the 60% gas tubing assembly (Item A), consisting of the following parts, and braze it into gas headers as shown in Fig. 15, Item A:

      2 — $1^1/_8$-in. OD tubes (cut to length as required)
      2 — $1^1/_8$-in. 90° long-radius elbows
      1 — $1^1/_8$-in. tee (see note at right)
      3 — $1^1/_8$-in. OD nipples (cut to length as required)

   b. Construct the 60% liquid-tubing assembly (Item B) consisting of the following parts and braze it into liquid headers as shown in Fig. 15, Item B:

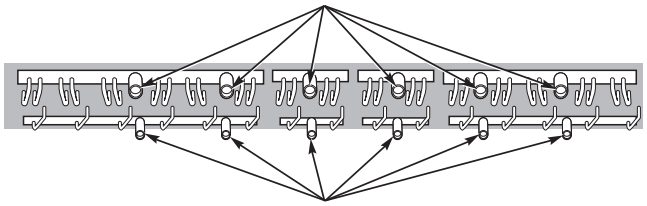
      2 — $^5/_8$-in. OD tubes (cut to length as required)
      2 — $^5/_8$-in. 90 long-radius elbows
      1 — $^5/_8$-in. tee (see note at right)
      3 — $^5/_8$-in. OD nipples (cut to length as required)

   c. Plug the open $1^1/_8$-in. diameter stub tube on the left gas header and the open $^5/_8$-in. diameter stub tube on the left liquid header as shown in Fig. 15, Item C. Parts required:

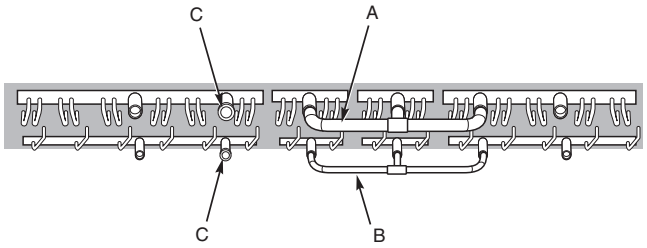
      1 — $1^1/_8$ in. plug fitting
      1 — $^5/_8$-in. plug fitting

      NOTE: Diameter of tee's interconnecting pipe opening is dependent upon interconnecting system piping diameter. Refer to Carrier System Design Manual, Part 3 for hot gas and liquid pipe sizing information.

3. Install or replace filter drier(s). *Before charging the system, install or replace filter drier(s) connected to the liquid line near the indoor unit to prevent contamination in the system.*



PLASTIC CAPS REMOVED FROM UNIT

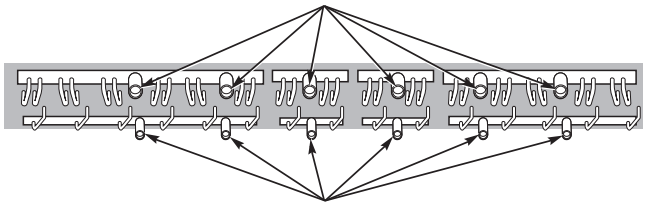


FIELD-SUPPLIED PARTS ADDED TO UNIT

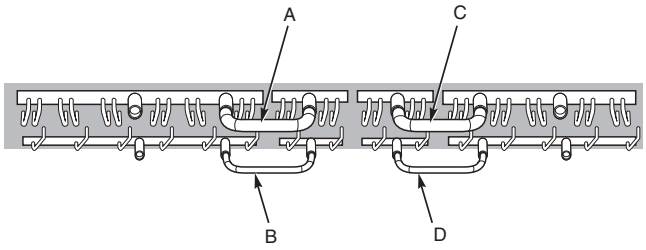
Fig. 15 — 09DK044 Unit with 60/40% Circuiting

09DK044 53/47% Circuiting Modification — To configure the **09DK044** for two refrigerant circuits (one with **53%** capacity and one with **47%** capacity) using field supplied parts, perform the following steps:

1. Remove all plastic caps. Refer to Fig. 16.
2. Attach following parts as shown in Fig. 16. Perform phos-copper brazing on all field-made connections while protecting adjacent joints from heat.
   a. Construct the 53% gas tubing assembly (Item A), consisting of the following parts, and braze it into gas headers as shown in Fig. 16, Item A:
      2 — $1^1/_8$-in. OD tubes (cut to length as required)
      2 — $1^1/_8$-in. 90° long-radius elbows
      2 — $1^1/_8$-in. OD nipples (cut to length as required)
   b. Construct the 53% liquid tubing assembly (Item B), consisting of the following parts, and braze it into liquid headers as shown in Fig. 16, Item B:
      2 — $^5/_8$-in. OD tubes (cut to length as required)
      2 — $^5/_8$-in. 90° long-radius elbows
      2 — $^5/_8$-in. OD nipples (cut to length as required)
   c. Construct the 47% gas tubing assembly (Item C), consisting of the following parts, and braze it into gas headers as shown in Fig. 16, Item C:
      2 — $1^1/_8$-in. OD tubes (cut to length as required)
      2 — $1^1/_8$-in. 90° long-radius elbows
      2 — $1^1/_8$-in. OD nipples (cut to length as required)
   d. Construct the 47% liquid tubing assembly (Item D), consisting of the following parts, and braze it into liquid headers as shown in Fig. 16, Item D:
      2 — $^5/_8$-in. OD tubes (cut to length as required)
      2 — $^5/_8$-in. 90 long-radius elbows
      2 — $^5/_8$-in. OD nipples (cut to length as required)
3. Install or replace filter drier(s). *Before charging the system, install or replace filter drier(s) connected to the liquid line near the indoor unit to prevent contamination in the system.*



PLASTIC CAPS REMOVED FROM UNIT



FIELD-SUPPLIED PARTS ADDED TO UNIT

Fig. 16 — 09DK044 Unit with 53/47% Circuiting

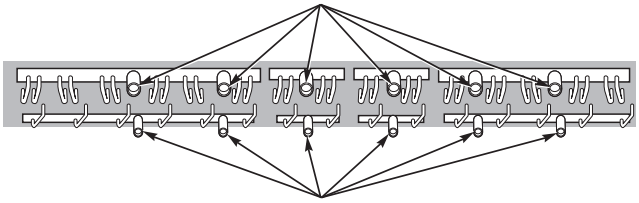
09DK044 40/13/13/34% Circuiting Modification — To configure the **09DK044** for four refrigerant circuits (one with **40%** capacity, two with **13%** capacity, and one with **30%** capacity) using field supplied parts, perform the following steps:

1. Remove all plastic caps. Refer to Fig. 17.
2. Attach following parts as shown in Fig. 17. Perform phos-copper brazing on all field-made connections while protecting adjacent joints from heat.
   a. Plug the open $1^1/_8$-in. stub tubes at the inside of each of the large gas headers as shown in Fig. 17, Item A. Parts required:

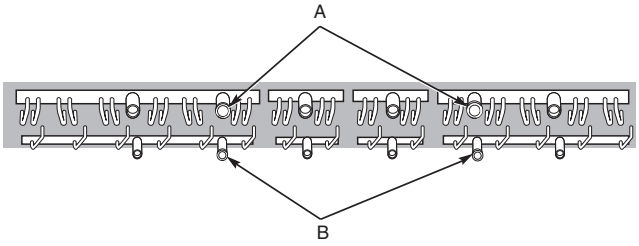
      2 — $1^1/_8$-in. plug fittings

   b. Plug the open $^5/_8$-in. stub tubes at the inside of each of the large gas headers as shown in Fig. 17, Item B. Parts required:

      2 — $^5/_8$-in. plug fittings
3. Install or replace filter drier(s). *Before charging the system, install or replace filter drier(s) connected to the liquid line near the indoor unit to prevent contamination in the system.*



PLASTIC CAPS REMOVED FROM UNIT



FIELD-SUPPLIED PARTS ADDED TO UNIT

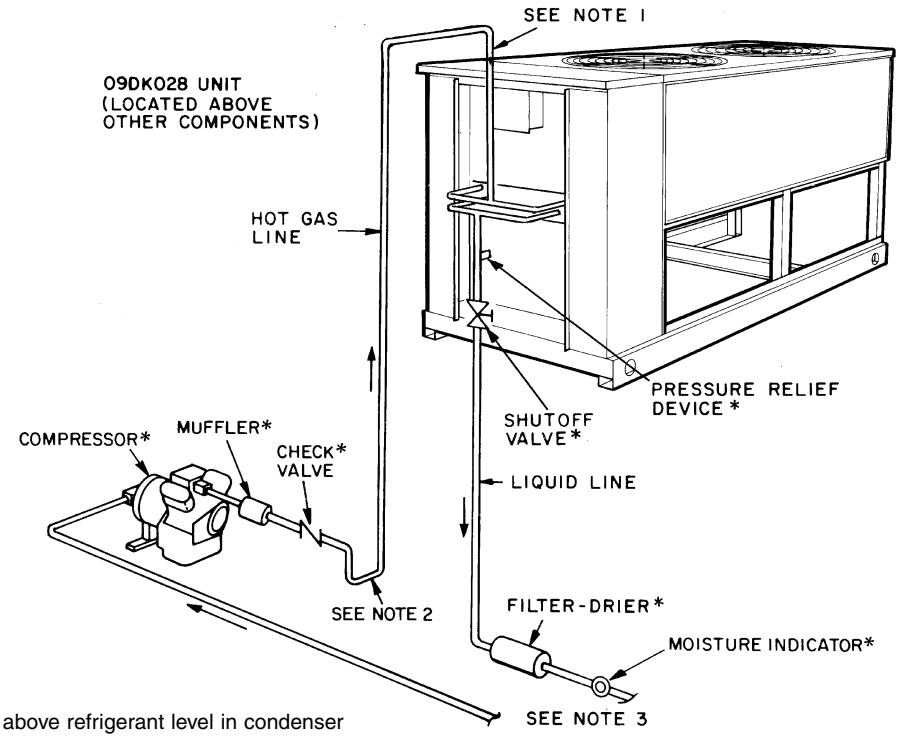
Fig. 17 — 09DK044 Unit with 40/13/13/34% Circuiting

REFRIGERANT LINE SIZING — Sizing depends on length of lines between various sections of the refrigerant system. Consider the amount of liquid lift and drop in the system as well as proper compressor oil return. Consult Carrier System Design Manual, Part 3, for proper piping sizes and design.

LIQUID SHUTOFF VALVE AND SIGHT GLASS — A shut-off valve is not supplied with 09DK condensers. It is strongly recommended that a full line size liquid shutoff valve (see Fig. 18 and 19) be field supplied near condenser to allow for servicing parts of the refrigerant circuit. A field-supplied moisture indicating sight glass is recommended for use in charging and servicing the system. Refer to Fig. 20.

PRESSURE RELIEF — The American National Standards Institute and American Society of Heating, Refrigeration, and Air Conditioning Engineers Safety Code for Mechanical Refrigeration (ANSI/ASHRAE) 15 states the following: "Every refrigerant system shall be protected by a pressure relief device unless so constructed that the pressure due to fire conditions will be safely relieved by some part of the system." Since 09DK condensers have no pressure relief device, one should be field supplied and installed just before the liquid line service valve. (See Fig. 18 and 19.) When the split coil is used with multiple systems, each system must have its own pressure relief.

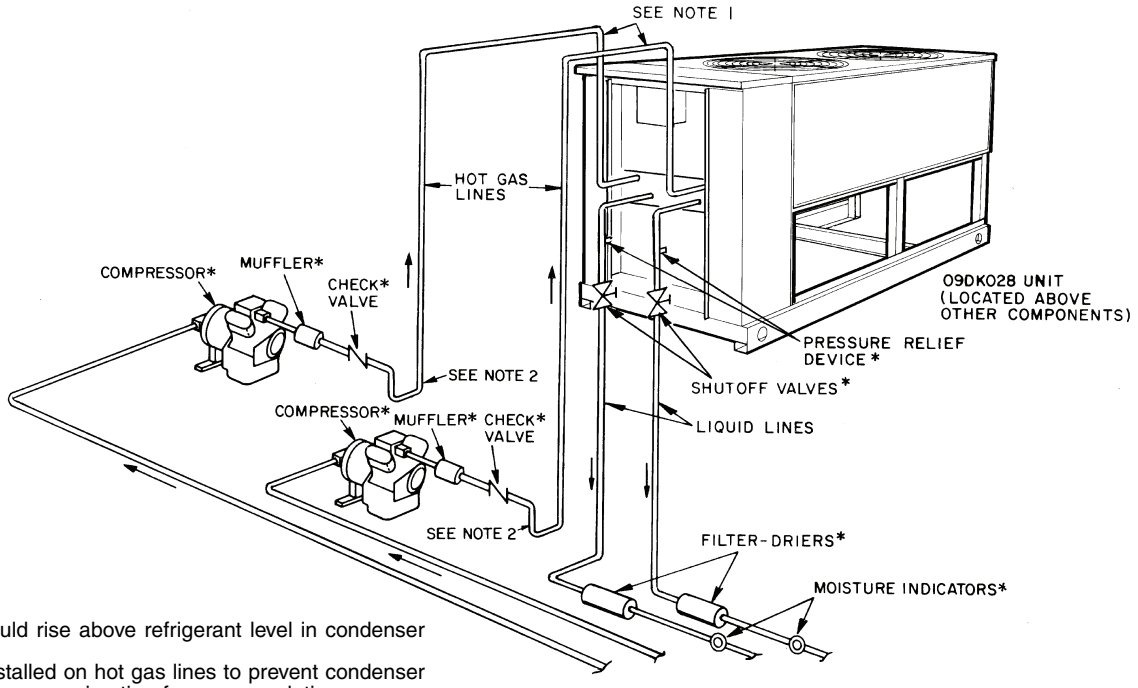
REFRIGERANT RECEIVER — A refrigerant receiver is not furnished with 09DK condensers and is *not* recommended for normal applications as its use will be detrimental to the desired effects of subcooling. However, if a particular application requires a receiver to increase refrigerant holding capacity of the condenser, a receiver can be used. When a receiver is to be used all year, it should be installed indoors. Carrier recommends the following installation in such a case (see Fig. 20). Locate valves on each side of the receiver so receiver may be isolated from system for normal operation.



*Field supplied.

NOTES:
1. Hot gas lines should rise above refrigerant level in condenser circuit.
2. Trap should be installed on hot gas lines to prevent condenser oil and refrigerant vapor migration from accumulating on compressor heads during off cycle.
3. Refer to Carrier System Design Manual, part 3 for proper piping sizes and design.
4. For piping lengths greater than 50 ft (15.2 m), provide support to liquid and gas lines near the connections to the coil.

Fig. 18 — Typical Piping for 09DK Condenser with a Single Compressor



*Field supplied.

NOTES:
1. Hot gas lines should rise above refrigerant level in condenser circuit.
2. Trap should be installed on hot gas lines to prevent condenser oil and refrigerant vapor migration from accumulating on compressor heads during off cycle.
3. Refer to Carrier System Design Manual, part 3 for proper piping sizes and design.
4. For piping lengths greater than 50 ft (15.2 m), provide support to liquid and gas lines near the connections to the coil.

Fig. 19 — Typical Piping for 09DK Condenser with a Dual Split System

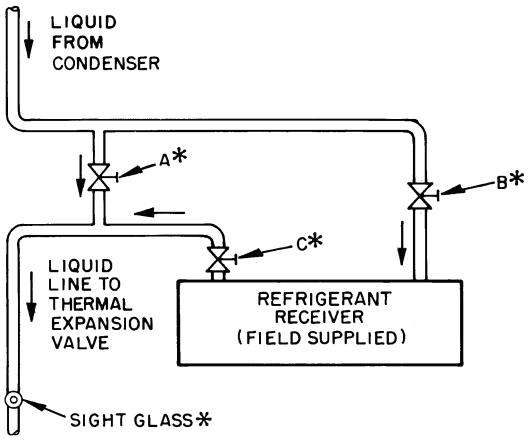
Procedure for Using the Refrigerant Receiver — See Fig. 20.

During normal operation — Valve A is open and valves B and C are closed. Receiver is isolated from the system.

For servicing — Valves A and C are closed and valve B is open. Run unit until all the refrigerant is in the receiver and then close valve B. Unit is now ready for servicing.

To resume operation — Leave valve A closed and open valves B and C. Run unit until the stored refrigerant is drawn into the system. To completely remove the refrigerant from the receiver, throttle valve B while noting condition of refrigerant in the liquid line sight glass; also monitor the suction pressure. A sudden surge of bubbles in the sight glass and a rapid decrease in suction pressure indicates that all the refrigerant has been withdrawn from the receiver. Immediately close valves B and C and then open valve A. The unit should now be ready for normal operation, with the receiver isolated from the system. *The system should be charged to a clear sight glass when under normal operation.*

COIL CONNECTIONS — See Fig. 3-5, 18, and 19 for the necessary connections.



*Field-supplied service valves.

A — Bypass valve
B — Receiver inlet valve
C — Receiver outlet valve

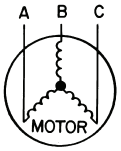
Fig. 20 — Piping for Optional Receiver

Step 4 — Complete Electrical Connections

GENERAL — Verify that nameplate electrical requirements match available power supply. Voltage at condenser must be within the minimum and maximum shown in Table 3 and phases must be balanced within 2%. Contact local power company for line voltage corrections. Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percentage of voltage imbalance:

$$\% \text{ Voltage Imbalance} = 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{Average voltage}}$$

Example: Supply voltage is 240-3-60.



AB = 243 volts
BC = 236 volts
AC = 238 volts

$$\text{Average Voltage} = \frac{243 + 236 + 238}{3}$$

$$= \frac{717}{3}$$

$$= 239 \text{ volts}$$

Determine maximum deviation from average voltage:

(AB) 243 – 239 = 4 volts
(BC) 239 – 236 = 3 volts
(AC) 239 – 238 = 1 volt

Maximum deviation is then 4 volts. To determine the percentage of voltage imbalance:

$$\% \text{ Voltage Imbalance} = 100 \times \frac{4}{239}$$

$$= 1.7\%$$

This amount of phase imbalance is satisfactory since it is below the maximum allowable of 2%.

IMPORTANT: If supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

Condenser operation on improper line voltage or excessive phase imbalance may be considered abuse and any resulting damage may not be covered by Carrier warranty.

All wiring must be in accordance with NEC (National Electrical Code, U.S.A.) regulations or local codes.

CONNECTIONS — Refer to Table 3 and Fig. 21.

Install a field-supplied disconnect capable of being locked at OFF position.

POWER WIRING — Install field-supplied branch circuit fused disconnect(s) of a type that can be locked OFF or OPEN. Disconnect(s) must be within sight from and readily accessible from unit in compliance with NEC Article 440-14 (U.S.A.) or local code.

GENERAL WIRING NOTES

1. *The control circuit field supply disconnect should never be open except when unit is being serviced or is to be down for a prolonged period.*
2. Power entry is at one end only.
3. Terminals for field power supply are suitable for copper, copper-clad aluminum, or aluminum conductors. Insulation must be rated 60 C minimum.
4. Field power supply wires based on minimum 26 C ambient temperature air are 8 AWG (American Wire Gage) for Models 09DK034, 044 (208/230-3-60, 230-3-50), 12 AWG for all other models.
5. Connect field power wires to factory-supplied 8 AWG wire from contactor with factory-supplied nut.
6. Route field wiring through factory-supplied wire ties and base rail holes. See Fig. 3-5.
7. Control circuit power is as follows:

CONTROL CIRCUIT V-Hz	POWER SUPPLY V-Hz
220-60	380-60
230-50	230-50 400-50
115-60	208/230-60 460-60 575-60

NOTE: Use 14 AWG (American Wire Gage) copper conductors only for control circuit wiring.

Step 5 — Add Accessories as Needed — Accessories include fan cycling head-pressure control, winter start control, fan cycling, and electrical interlock. Refer to installation instructions furnished with each accessory.

START-UP

System Evacuation and Dehydration — Refer to GTAC II, Module 4, "Dehydration for Proper Evacuation and Dehydration techniques."

Charging Procedure — BEFORE CHARGING THE SYSTEM, INSTALL OR REPLACE THE FILTER-DRIER(S) CONNECTED TO THE LIQUID LINE WITHIN THE IN-DOOR UNIT(S) TO PREVENT CONTAMINATION WITHIN THE SYSTEM. Charge to a clear sight glass. Refer to GTAC II, Module 5 "Charging, Recovery, Recycling, and Reclamation" and Carrier Refrigerant Service Techniques manual for proper charging techniques. Add 10 lbs (4.5 kg) of R-22 over clear sight glass to flood subcooler sections of the condenser coils. See Table 4 for charging data.

Check Operation of Condenser Fan Motor Controls and Rotation of Fans — R*otation should be counterclockwise as viewed from top of unit.*

⚠ CAUTION

Before starting unit, be sure wire fan guards are secured in place over each fan.

Table 3 — 09DK Electrical Data

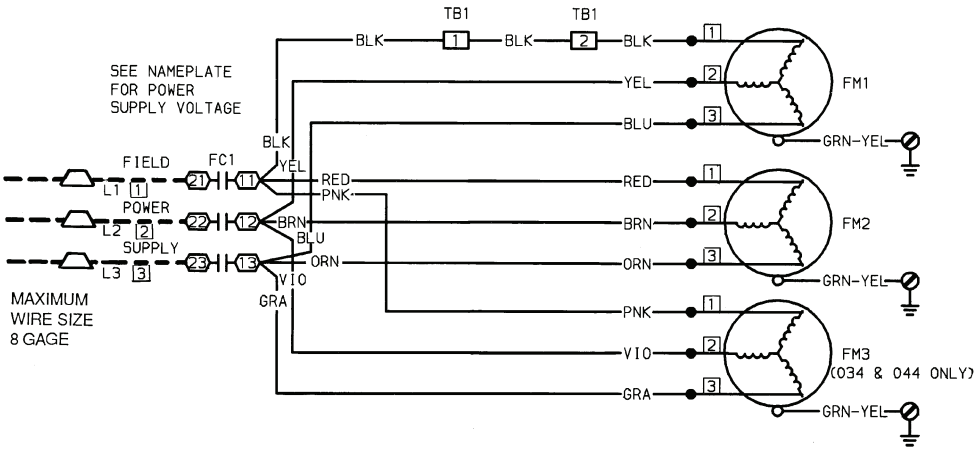
60 HERTZ

UNIT 09DK		UNIT					FAN MOTORS		CONTROL CIRCUIT	
		Volts -3 Ph	Supplied Volts		MCA	MOCP (Fuse)	No.	FLA (ea)	Volts -1 Ph	Amps
			Min	Max						
020	500	208/230	187	254	14.8	20	2	6.6	115	7
	200	380	342	418	8.8	15		3.9	220	
	600	460	414	508	7.4	15		3.3	115	
	100	575	518	632	7.6	15		3.4	115	
024	500	208/230	187	254	14.8	20		6.6	115	
	200	380	342	418	8.8	15		3.9	220	
	600	460	414	508	7.0	15		3.3	115	
	100	575	518	632	7.6	15		3.4	115	
028	500	208/230	187	254	13.9	20		6.6	115	
	200	380	342	418	8.8	15		3.9	220	
	600	460	414	508	7.4	15		3.3	115	
	100	575	518	632	7.6	15		3.4	115	
034	500	208/230	187	254	21.4	25	3	6.2	115	
	200	380	342	418	12.7	20		3.9	220	
	600	460	414	508	10.7	15		3.3	115	
	100	575	518	632	11.0	15		3.4	115	
044	500	208/230	187	254	20.1	25		6.6	115	
	200	380	342	418	12.7	20		3.9	220	
	600	460	414	508	10.1	15		3.4	115	
	100	575	518	632	11.0	15		3.4	115	

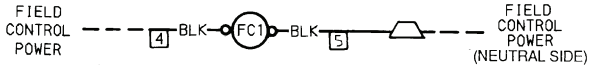
50 HERTZ

UNIT 09DK		UNIT					FAN MOTORS		CONTROL CIRCUIT	
		Volts -3 Ph	Supplied Volts		MCA	MOCP (Fuse)	No.	FLA (ea)	Volts -1 Ph	Amps
			Min	Max						
024	800	230	207	254	14.4	20	2	6.4	230	7
	900	400	342	440	6.7	15		3.0	230	
028	800	230	207	254	14.4	20		6.4	230	
	900	400	342	440	6.7	15		3.0	230	
034	800	230	207	254	20.8	30	3	6.4	230	
	900	400	342	440	9.7	15		3.0	230	
044	800	230	207	254	20.8	30		6.4	230	
	900	400	342	440	9.7	15		3.0	230	

FLA — Full Load Amps
MCA — Minimum Circuit Amps (for wire sizing). Complies with NEC (National Electrical Code, U.S.A.) Section 430-24.
MOCP — Maximum Overcurrent Protective Device (Amps).



CONTROL SCHEMATIC



LEGEND

FC — Fan Contactor
FM — Fan Motor
TB — Terminal Block Connection

Terminal Block Connection
Marked Terminal
Unmarked Terminal
Splice
Factory Wire
Field Control Wiring
Field Power Wiring

Fig. 21 — Wiring Diagram, Power Schematic; 09DK020-044

Table 4 — Refrigerant Circuit Data

UNIT 09DK		020, 024			028					034				
COIL														
No. of Ckts		2	1	1	2	1	1	2	1	2	1	1	2	1
Cap. (% Ckt)		50	67	33	50	60	40	40	20	50	60	40	40	20
REFRIGERANT														
Min. Operating Chg/Ckt*	**kg**	4.8	6.4	3.2	5.3	6.4	4.3	4.3	2.1	8.0	9.5	6.4	6.4	3.2
	lb	10.6	14.1	7.1	11.8	14.1	9.4	9.4	4.7	17.5	21.0	14.0	14.0	7.0
Optimum Operating Chg/Ckt†	**kg**	5.7	7.5	3.8	6.3	7.5	5.0	5.0	2.5	9.4	11.2	7.5	7.5	3.7
	lb	12.5	16.6	8.3	13.8	16.6	11.1	11.1	5.5	20.6	24.8	16.5	16.5	8.3
Vol/Ckt	**m^3**	0.008	0.01	0.006	0.009	0.01	0.007	0.007	0.004	0.014	0.017	0.011	0.011	0.006
	cu ft	0.30	0.40	0.20	0.33	0.40	0.26	0.26	0.14	0.49	0.59	0.39	0.39	0.20
STORAGE CAPACITY (Per Ckt)**														
R-12	**kg**	8.7	11.7	5.8	9.6	11.5	7.7	7.7	3.8	14.2	17.1	11.3	11.3	5.7
	lb	19.2	25.7	12.7	21.1	25.3	16.9	16.9	8.4	31.3	37.6	25.0	25.0	12.5
R-22	**kg**	7.9	10.6	5.3	8.8	10.5	7.0	7.0	3.5	13.0	15.6	10.4	10.4	5.2
	lb	17.5	23.3	11.7	19.3	23.2	15.4	15.4	7.7	28.7	34.4	23.0	23.0	11.5
R-500	**kg**	7.5	10.0	4.9	8.3	9.9	6.6	6.6	3.3	12.2	14.7	9.8	9.8	4.9
	lb	16.5	22.1	10.9	18.2	21.8	14.5	14.5	7.3	26.9	32.3	21.5	21.5	10.8
R-502	**kg**	8.3	11.1	5.5	9.2	11.0	7.3	7.3	3.7	13.6	16.3	10.8	10.8	5.4
	lb	18.3	24.5	12.1	20.2	24.2	16.1	16.1	8.1	29.9	35.9	23.9	23.9	12.0

UNIT 09DK		044											
COIL													
No. of Ckts		1	1	2	1	1	1	1	1	1	1	1	1
Cap. (% Ckt)		40	34	13	74	26	66	34	60	40	53	47	100
REFRIGERANT													
Min. Operating Chg/Ckt*	**kg**	9.5	7.9	3.1	17.4	6.4	15.9	8.0	14.3	9.5	12.7	11.2	23.9
	lb	21.0	17.4	6.8	38.4	14.2	35.1	17.5	31.6	21.0	27.9	24.7	52.6
Optimum Operating Chg/Ckt†	**kg**	11.2	9.4	3.7	20.5	7.6	18.7	9.4	16.8	11.2	14.9	13.2	28.1
	lb	24.8	20.6	8.3	45.2	16.7	41.3	20.6	37.1	24.8	32.8	29.1	61.9
Vol/Ckt	**m^3**	0.016	0.014	0.005	0.031	0.011	0.028	0.014	0.025	0.017	0.022	0.02	0.042
	cu ft	0.60	0.52	0.19	1.09	0.40	1.0	0.49	0.89	0.60	0.79	0.70	1.49
STORAGE CAPACITY (Per Ckt)**													
R-12	**kg**	17.3	14.7	5.6	31.6	11.7	29.0	14.2	25.9	17.3	22.9	20.3	43.2
	lb	38.1	32.4	12.4	69.6	25.7	64.0	31.3	57.2	38.1	50.5	44.8	95.3
R-22	**kg**	15.8	13.4	5.1	28.8	10.7	26.4	13.2	23.7	15.8	21.0	18.6	39.6
	lb	34.8	29.6	11.3	63.6	23.5	58.1	29.0	52.3	34.8	46.2	40.9	87.1
R-500	**kg**	14.9	12.6	4.8	27.1	10.0	24.8	12.4	22.3	14.9	19.7	17.4	37.2
	lb	32.8	27.8	10.6	59.8	22.1	54.6	27.3	49.1	32.8	43.4	38.4	81.9
R-502	**kg**	16.5	14.1	5.4	30.2	11.2	23.1	13.7	24.8	16.5	21.9	19.4	41.3
	lb	36.4	31.0	11.8	66.5	24.6	51.0	30.1	54.7	36.4	48.3	42.8	91.1

LEGEND

Ckt — Circuit
Min. — Minimum
Vol — Volume

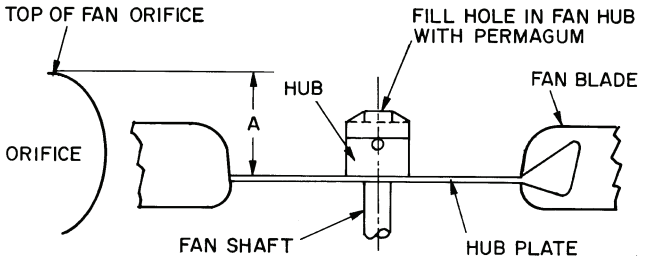
*Minimum operating charge based on 5° F (2.8° C) subcooling.
†Optimum operating charge based on 15° F (8.3° C) subcooling.
**Storage capacity calculated for 80% liquid and 20% vapor at 32.2 C (90 F).

SERVICE

Fan Guard Removal — On all sizes, remove eight 1/4 x 14 x 5/8-in. long self-tapping hex head screws per guard and remove guard.

Fan Adjustment

1. Make certain condenser power is off.
2. Remove fan guard.
3. Remove cap and setscrews on fan hub.
4. Adjust fan. See Fig. 22.
5. Tighten fan hub securely on motor shaft with setscrew which bears against the key.
6. Replace permagum and rubber cap over end of motor shaft to prevent moisture from causing fan to rust on shaft.



PROP LOCATION	"A" in. (mm)	
	Min	Max
60 Hz		
09DK020	3.12 (79.2)	3.38 (85.9)
09DK024,028,044	3.62 (91.9)	3.88 (98.6)
09DK034 Fan No. 1 and 3	3.62 (91.9)	3.88 (98.6)
Fan No. 2	3.12 (79.2)	3.38 (85.9)
50 Hz		
09DK024,028,044	1.56 (39.6)	1.68 (42.7)
09DK034 Fan No. 1 and 3	3.12 (79.2)	3.38 (85.9)
Fan No. 2	3.62 (91.9)	3.88 (98.6)

Fig. 22 — Location of Propeller on Motor Shaft from Outside of Orifice Ring

Lubrication — Fan motors have permanently lubricated bearings. No provisions are made for lubrication.

Cleaning Standard Coils — Clean standard coils with stiff brush, vacuum cleaner, or compressed air. Low-pressure water may be used to clean coils by removing fan guard and spraying coil from inside. *Condenser fan motors are drip-proof but not waterproof.* Routine cleaning of coil surfaces is essential to minimize contamination build-up and remove harmful residue. Inspect coils monthly and clean as required.

Cleaning and Maintaining E-Coated Coils — Routine cleaning of condenser coil surfaces is essential to maintain proper operation of the unit. Elimination of contamination and removal of harmful residue will greatly increase the life of the coil and extend the life of the unit. The following maintenance and cleaning procedures are recommended as part of the routine maintenance activities to extend the life of the coil.

REMOVE SURFACE LOADED FIBERS — Debris such as dirt and fibers on the surface of the coil should be removed with a vacuum cleaner. If a vacuum cleaner is not available, a soft brush may be used. The cleaning tool should be applied in the direction of the fins. Coil surfaces can be easily damaged (fin edges bent over) if the tool is applied across the fins.

NOTE: Use of a water stream, such as a garden hose, against a surface loaded coil will drive the fibers and dirt into the coil. This will make cleaning efforts more difficult. Surface debris must be completely removed prior to using low velocity clean water rinse.

PERIODIC CLEAN WATER RINSE — A periodic clean water rinse is very beneficial for coils that are applied in coastal or industrial environments. However, it is very important that the water rinse is made with very low velocity water stream to avoid damaging the fin edges. Monthly cleaning is recommended.

ROUTINE CLEANING OF E-COATED COIL SURFACES — Monthly cleaning with E-Coat Enzyme Coil Cleaner is essential to extend the life of coils. It is recommended that all coils including standard aluminum, pre-coated, copper/copper, or E-coated coils be cleaned with the E-Coat Enzyme Coil Cleaner as described below. Coil cleaning should be part of the regularly scheduled maintenance procedures of the unit to ensure long life of the coil. Failure to clean the coils may result in reduced durability in the environment.

E-Coat Enzyme Coil Cleaner is non-bacterial, biodegradable, and will not harm the coil or surrounding components such as electrical wiring, painted metal surfaces, or insulation. Use of non-recommended coil cleaners is strongly discouraged since coil and unit durability could be affected.

The following field-supplied equipment is required for coil cleaning:

- 2 1/2 gallon garden sprayer
- water rinse with low velocity spray nozzle

E-COAT ENZYME CLEANER APPLICATION INSTRUCTIONS — Perform the following procedure to clean the coil.

NOTE: Wear proper eye protection such as safety glasses during mixing and application.

1. Remove all surface debris and dirt from the coil with a vacuum cleaner.
2. Thoroughly wet finned surfaces with clean water and a low velocity garden hose, being careful not to bend fins.
3. Mix E-Coat Enzyme Cleaner in a $2^1/_2$ gallon garden sprayer according to the instructions included with the Enzyme Cleaner. The optimum solution temperature is 100 F.

⚠ CAUTION

DO NOT USE water in excess of 130 F. Enzymes in coil cleaner will be destroyed and coil cleaner will not be effective.

4. Thoroughly apply E-Coat Enzyme Cleaner solution to all coil surfaces including finned area, tube sheets and coil headers. Hold garden sprayer nozzle close to finned areas and apply cleaner with a vertical, up-and-down motion. Avoid spraying in horizontal pattern to minimize potential for fin damage. Ensure cleaner thoroughly penetrates deep into finned areas. Interior and exterior finned areas must be thoroughly cleaned.
5. Allow finned surfaces to remain wet with cleaning solution for 10 minutes. Ensure surfaces are not allowed to dry before rinsing. Reapply cleaner as needed to ensure 10-minute saturation is achieved.
6. Thoroughly rinse all surfaces with low velocity clean water using downward rinsing motion of water spray nozzle. Protect fins from damage from the spray nozzle

⚠ CAUTION

Do not use bleach, harsh chemicals, or acid cleaners on outdoor or indoor coils of any kind. These types of cleaners are difficult to rinse, and they promote rapid corrosion of the fin collar-copper tube connection. Only use the E-Coat Enzyme Coil Cleaner.

Never use high pressure air or liquids to clean coils. High pressures damage coils and increase the airside pressure drop. To promote unit integrity, follow cleaning and maintenance procedures in this document.

Fan Motor Removal

1. Make certain condenser power is off.
2. Remove fan guard and fan.
3. Loosen nut on motor holding clamp securing motor to motor support.
4. Lift motor upward. Remove wire connectors.

Head Pressure Control — This feature reduces condensing capacity under low ambient temperature conditions.

FAN CYCLING — Model 09DK units have accessory provision for fully automatic intermediate-season head pressure control through condenser fan cycling. Fan number 2 and 3 cycling (fan number 3 on 09DK034 and 044 only) is controlled by outdoor-air temperature through air temperature switches (ATS) 1 and 2.

The air temperature switches are located in the lower divider panel underneath the coil header. The sensing element is exposed to air entering the no. 1 fan compartment through a hole in the panel. Fan no. 1 is non-cycling. Table 5 shows operating settings of the air temperature switches.

Table 5 — Fan Cycling Controls

UNIT 09DK	020	024	028	034	044
No. 2 Fan					
Temp Close, F (C)	70 ± 3 (21.1 ± 1.7)			65 ± 3 (18.3 ± 1.7)	
Open, F (C)	60 ± 3 (15.6 ± 1.7)			55 ± 3 (12.8 ± 1.7)	
No. 3 Fan					
Temp Close, F (C)	—	—	—	80 ± 3 (26.7 ± 1.7)	
Open, F (C)	—	—	—	70 ± 3 (21.1 ± 1.7)	

SERVICE TRAINING

Packaged Service Training programs are an excellent way to increase your knowledge of the equipment discussed in this manual, including:

- Unit Familiarization
- Installation Overview
- Maintenance
- Operating Sequence

A large selection of product, theory, and skills programs are available, using popular video-based formats and materials. All include video and/or slides, plus companion book.

Classroom Service Training which includes "hands-on" experience with the products in our labs can mean increased confidence that really pays dividends in faster troubleshooting and fewer callbacks. Course descriptions and schedules are in our catalog.

CALL FOR FREE CATALOG 1-800-644-5544

[ ] Packaged Service Training [ ] Classroom Service Training

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

Catalog No. 530-917 Printed in U.S.A. Form 09DK-13SI Pg 24 612 11-99 Replaces: 09DK-11SI