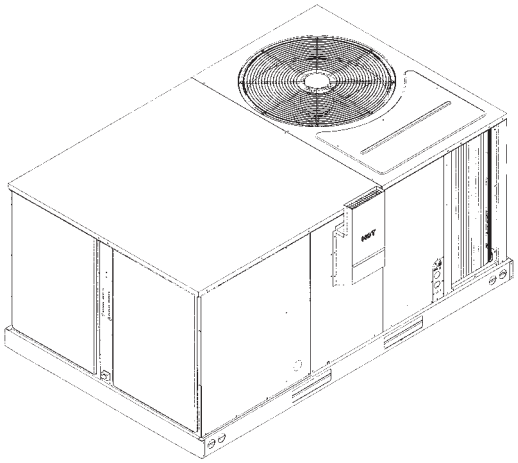
INSTALLATION INSTRUCTIONS

FOR COMBINATION HEATING AND COOLING ROOFTOP UNITS EQUIPPED WITH INTERMITTENT IGNITION

RKKA (3-6 TON) SERIES
3 PHASE MODELS ONLY



RECOGNIZE THIS SYMBOL AS AN INDICATION OF IMPORTANT SAFETY INFORMATION!

⚠WARNING

IF THE INFORMATION IN THESE INSTRUCTIONS IS NOT FOLLOWED EXACTLY, A FIRE OR EXPLOSION MAY RESULT, CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

⚠WARNING

THESE INSTRUCTIONS ARE INTENDED AS AN AID TO QUALIFIED SERVICE PERSONNEL FOR PROPER INSTALLATION, ADJUSTMENT AND OPERATION OF THIS UNIT. READ THESE INSTRUCTIONS THOROUGHLY BEFORE ATTEMPTING INSTALLATION OR OPERATION. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN IMPROPER INSTALLATION, ADJUSTMENT, SERVICE OR MAINTENANCE, POSSIBLY RESULTING IN FIRE, ELECTRICAL SHOCK, CARBON MONOXIDE POISONING, EXPLOSION, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

⚠WARNING

PROPOSITION 65 WARNING: THIS PRODUCT CONTAINS CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

⚠WARNING

— Do not store or use gasoline or other flammable vapors and liquids, or other combustible materials in the vicinity of this or any other appliance.

— WHAT TO DO IF YOU SMELL GAS
- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.
- Do not return to your home until authorized by the gas supplier or fire department.

— DO NOT RELY ON SMELL ALONE TO DETECT LEAKS. DUE TO VARIOUS FACTORS, YOU MAY NOT BE ABLE TO SMELL FUEL GASES.
- U.L. recognized fuel gas and CO (carbon monoxide) detectors are recommended in all applications, and their installation should be in accordance with the manufacturer's recommendations and/or local laws, rules, regulations, or customs.

— Improper installation, adjustment, alteration, service or maintenance can cause injury, property damage or death. Refer to this manual. Installation and service must be performed by a qualified installer, service agency or the gas supplier. In the commonwealth of Massachusetts, installation must be performed by a licensed plumber or gas fitter for appropriate fuel.

BA001-02

ARI PERFORMANCE CERTIFIED™
ARI Standard
210/240 UAC

c UL us
LISTED

Accredited by the RvA
ABS Quality Evaluations, Inc. Management System Certification
ANAB ACCREDITED
ISO 9001:2000
Certificate Number: 30164

DO NOT DESTROY THIS MANUAL. PLEASE READ CAREFULLY AND KEEP IN A SAFE PLACE FOR FUTURE REFERENCE BY A SERVICEMAN.

92-23577-42-12
SUPERSEDES 92-23577-42-11

TABLE OF CONTENTS

⚠ Recognize this symbol as an indication of Important Safety Information!

➤ Installation Instructions are updated on a regular basis. This is done as product changes occur or if new information becomes available. In this publication, an arrow (➤) denotes changes from the previous edition or additional new material.

INTRODUCTION

⚠ WARNING

THE MANUFACTURER'S WARRANTY DOES NOT COVER ANY DAMAGE OR DEFECT TO THE AIR CONDITIONER CAUSED BY THE ATTACHMENT OR USE OF ANY COMPONENTS, ACCESSORIES OR DEVICES (OTHER THAN THOSE AUTHORIZED BY THE MANUFACTURER) INTO, ONTO OR IN CONJUNCTION WITH THE AIR CONDITIONER. YOU SHOULD BE AWARE THAT THE USE OF UNAUTHORIZED COMPONENTS, ACCESSORIES OR DEVICES MAY ADVERSELY AFFECT THE OPERATION OF THE AIR CONDITIONER AND MAY ALSO ENDANGER LIFE AND PROPERTY. THE MANUFACTURER DISCLAIMS ANY RESPONSIBILITY FOR SUCH LOSS OR INJURY RESULTING FROM THE USE OF SUCH UNAUTHORIZED COMPONENTS, ACCESSORIES OR DEVICES.

This booklet contains the installation and operating instructions for your combination gas heating/electric cooling unit. There are some precautions that should be taken to derive maximum satisfaction from it. Improper installation can result in unsatisfactory operation or dangerous conditions.

Read this booklet and any instructions packaged with separate equipment required to make up the system prior to installation. Give this booklet to the owner and explain its provisions. The owner should retain this booklet for future reference.

CHECKING PRODUCT RECEIVED

Upon receiving the unit, inspect it for any damage from shipment. Claims for damage, either shipping or concealed, should be filed immediately with the shipping company. **IMPORTANT:** Check the unit model number, heating size, electrical characteristics, and accessories to determine if they are correct.

I. SPECIFICATIONS

A. GENERAL

The Combination Gas Heating/Electric Cooling Rooftop is available in 80,000, 100,000, 120,000 and 135,000 BTU/Hr. heating inputs and cooling capacities of 3, 3½, 4, 5 and 6 (10 seer only) nominal tons of cooling. Units are convertible from bottom supply and return to side supply and return by relocation of supply and return air access panels. See cover installation detail.

The units are weatherized for mounting outside of the building.

⚠ WARNING

UNITS ARE NOT DESIGN CERTIFIED TO BE INSTALLED INSIDE THE STRUCTURE. DOING SO CAN CAUSE INADEQUATE UNIT PERFORMANCE AS WELL AS PROPERTY DAMAGE AND CARBON MONOXIDE POISONING RESULTING IN PERSONAL INJURY OR DEATH.

The information on the rating plate is in compliance with the FTC and DOE rating for single phase units. The following information is for three phase units which **are not** covered under the DOE certification program.

1. The energy consumption of the ignition system used with this unit is 9 watts.
2. The efficiency rating of this unit is a product thermal efficiency rating determined under continuous operating conditions independent of any installed system.

B. MAJOR COMPONENTS

The unit includes a hermetically-sealed refrigerating system (consisting of a scroll compressor, condenser coil, evaporator coil with capillary tube assembly), a circulation air blower, a condenser fan, a heat exchanger assembly, gas burner and control assembly, combustion air motor and fan, and all necessary internal electrical wiring. The cooling system of these units is factory-evacuated, charged and performance tested. Refrigerant amount and type are indicated on rating plate.

SAFETY INFORMATION

⚠ WARNING

USE ONLY WITH TYPE OF GAS APPROVED FOR THIS UNIT. REFER TO THE UNIT RATING PLATE.

⚠ WARNING

INSTALL THIS UNIT ONLY IN A LOCATION AND POSITION AS SPECIFIED IN THE LOCATION REQUIREMENTS AND CONSIDERATIONS SECTION OF THESE INSTRUCTIONS. PROVIDE ADEQUATE COMBUSTION AND VENTILATION AIR TO THE UNIT SPACE AS SPECIFIED IN THE VENTING SECTION OF THESE INSTRUCTIONS.

⚠ WARNING

PROVIDE ADEQUATE COMBUSTION AND VENTILATION AIR TO THE UNIT SPACE AS SPECIFIED IN THE COMBUSTION AND VENTILATION AIR SECTION OF THESE INSTRUCTIONS.

⚠ WARNING

COMBUSTION PRODUCTS MUST BE DISCHARGED OUTDOORS. CONNECT THIS UNIT TO AN APPROVED VENT SYSTEM ONLY, AS SPECIFIED IN VENT PIPE INSTALLATION SECTION OF THESE INSTRUCTIONS.

⚠ WARNING

NEVER TEST FOR GAS LEAKS WITH AN OPEN FLAME. USE A COMMERCIALLY AVAILABLE SOAP SOLUTION MADE SPECIFICALLY FOR THE DETECTION OF LEAKS TO CHECK ALL CONNECTIONS, AS SPECIFIED IN GAS SUPPLY AND PIPING SECTION OF THESE INSTRUCTIONS.

⚠ WARNING

ALWAYS INSTALL UNIT TO OPERATE WITHIN THE UNIT'S INTENDED TEMPERATURE-RISE RANGE WITH A DUCT SYSTEM WHICH HAS AN EXTERNAL STATIC PRESSURE WITHIN THE ALLOWABLE RANGE, AS SPECIFIED IN DUCTING SECTION OF THESE INSTRUCTIONS. SEE ALSO UNIT RATING PLATE.

⚠ WARNING

WHEN A UNIT IS INSTALLED SO THAT SUPPLY DUCTS CARRY AIR CIRCULATED BY THE UNIT TO AREAS OUTSIDE THE SPACE CONTAINING THE UNIT, THE RETURN AIR SHALL ALSO BE HANDLED BY DUCT(S) SEALED TO THE UNIT CASING AND TERMINATING OUTSIDE THE SPACE CONTAINING THE UNIT.

⚠ WARNING

THIS UNIT MAY BE USED TO HEAT THE BUILDING OR STRUCTURE DURING CONSTRUCTION IF THE FOLLOWING INSTALLATION REQUIREMENTS ARE MET. INSTALLATION MUST COMPLY WITH ALL INSTALLATION INSTRUCTIONS INCLUDING:

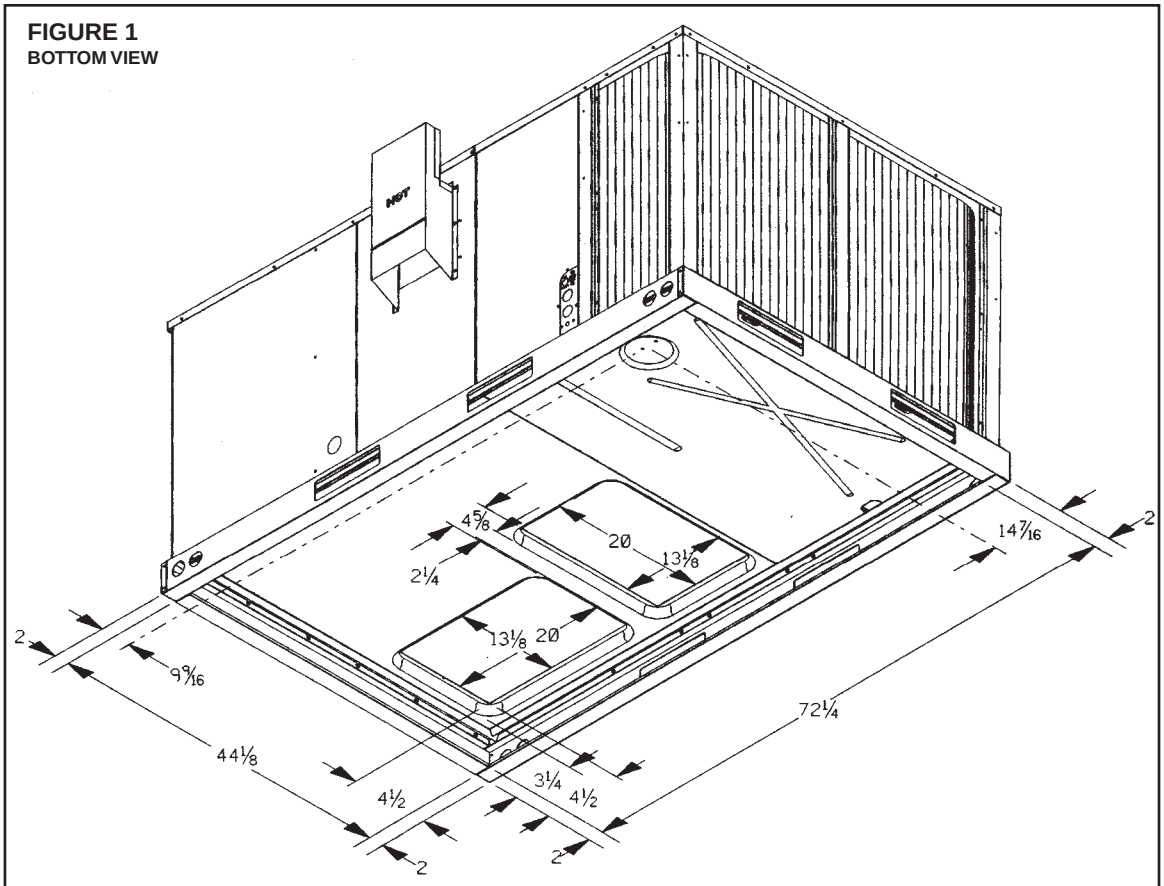
- **PROPER VENT INSTALLATION;**
- **FURNACE OPERATING UNDER THERMOSTATIC CONTROL;**
- **RETURN AIR DUCT SEALED TO THE FURNACE;**
- **AIR FILTERS IN PLACE;**
- **SET FURNACE INPUT RATE AND TEMPERATURE RISE PER RATING PLATE MARKING;**
- **MEANS OF PROVIDING OUTDOOR AIR REQUIRED FOR COMBUSTION;**
- **RETURN AIR TEMPERATURE MAINTAINED BETWEEN 55°F (13°C) AND 80°F (27°C); AND**
- **INSTALLATION OF EXHAUST AND COMBUSTION AIR INLET HOODS COMPLETED;**
- **CLEAN FURNACE, DUCT WORK AND COMPONENTS UPON SUBSTANTIAL COMPLETION OF THE CONSTRUCTION PROCESS, AND VERIFY FURNACE OPERATING CONDITIONS INCLUDING IGNITION, INPUT RATE, TEMPERATURE RISE AND VENTING, ACCORDING TO THE INSTRUCTIONS.**

Unit Dimensions

FOR CLEARANCES SEE PAGE 16, FIGURE 7.

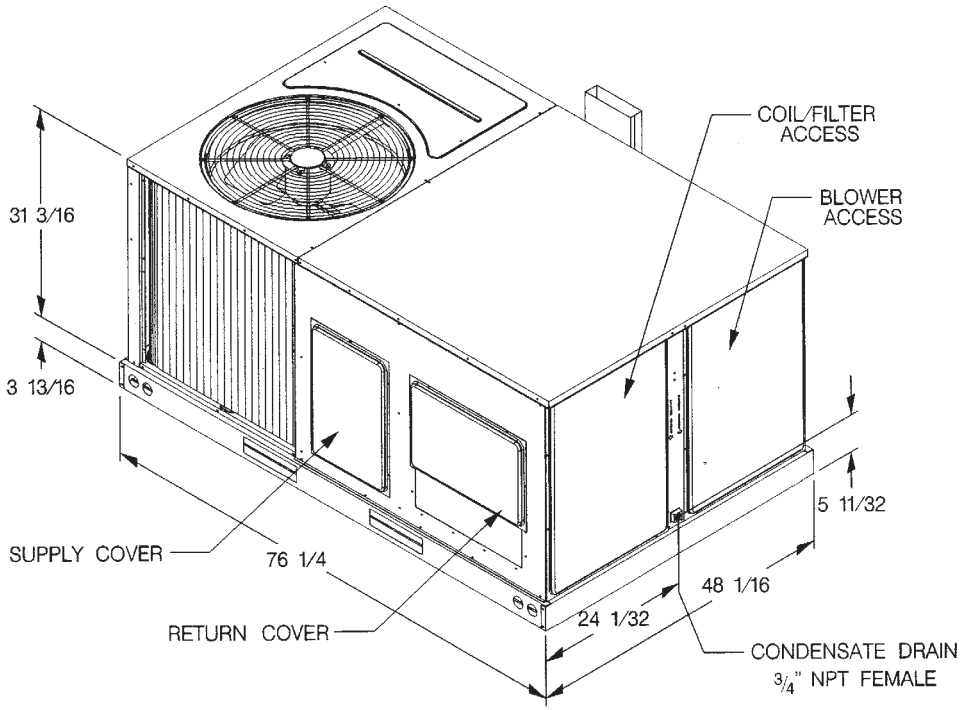
IMPORTANT: THIS UNIT MUST BE MOUNTED LEVEL IN BOTH DIRECTIONS TO ALLOW WATER TO DRAIN FROM THE CONDENSER SECTION AND CONDENSATE PAN.

FIGURE 1
BOTTOM VIEW



I316

FIGURE 2
CABINET DIMENSIONS AND ACCESS LOCATIONS



I281

FIGURE 3
CABINET DIMENSIONS AND ACCESS LOCATIONS

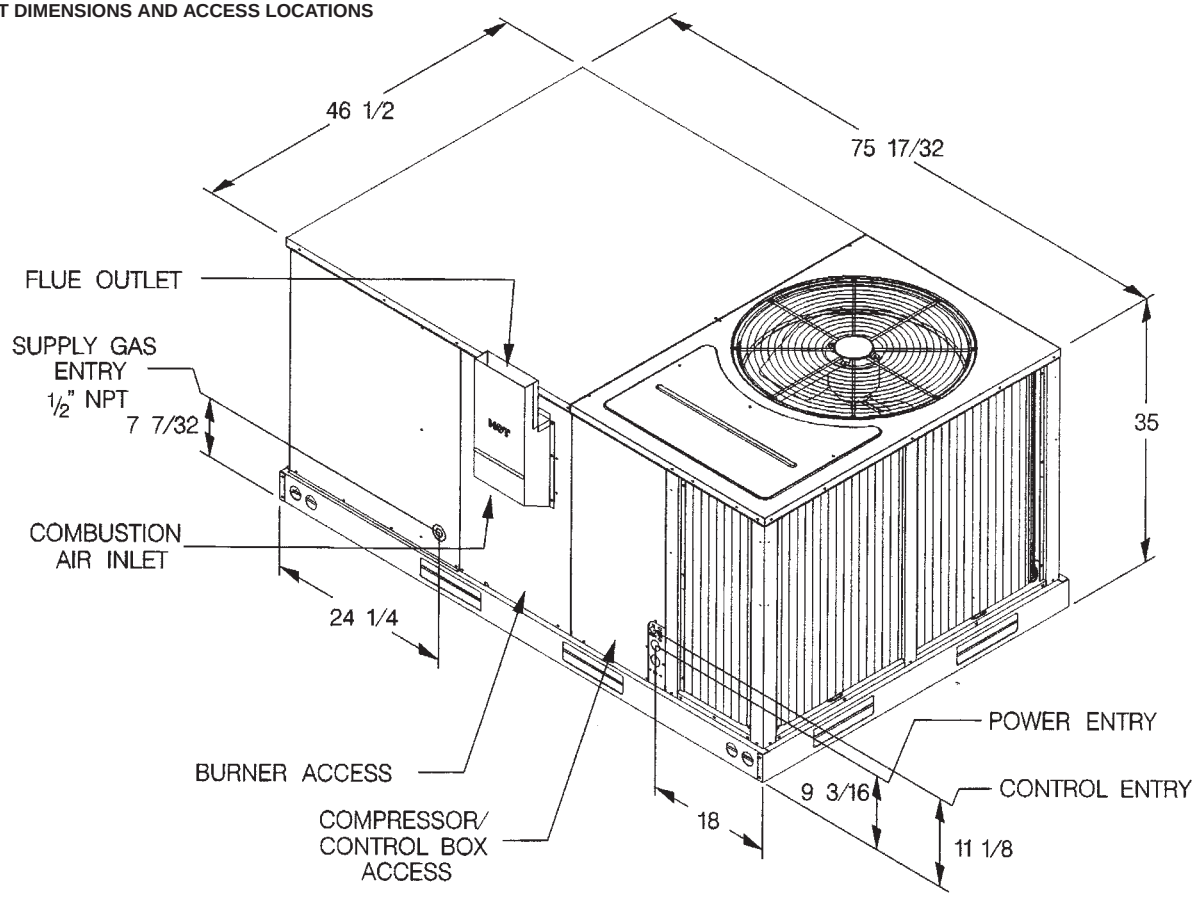


FIGURE 4
SUPPLY AND RETURN DIMENSIONS

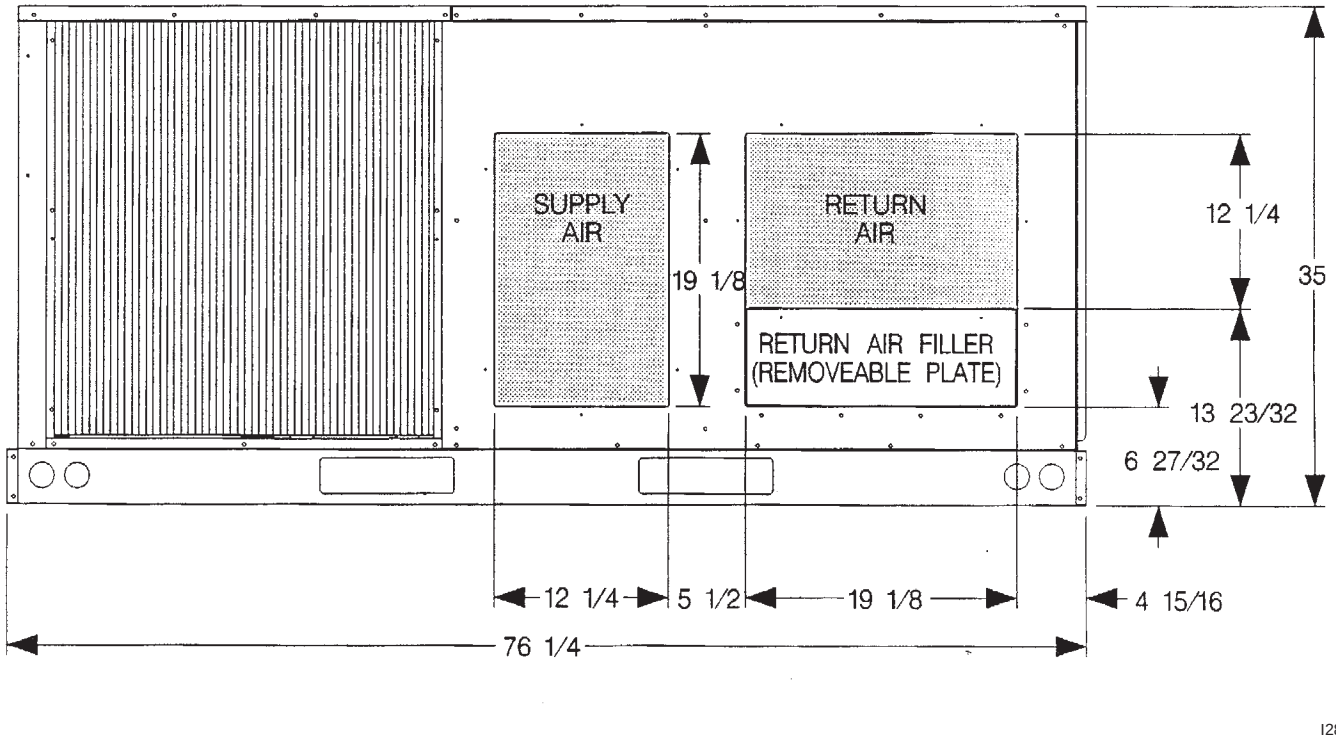


TABLE 1
3 TON - RKKA - ELECTRICAL & PHYSICAL DATA

UNIT MODEL	ELECTRICAL								PHYSICAL							
	PHASE HERTZ VOLTS	COMPRESSOR RLA	COMPR LRA	FULL LOAD AMPERES (FLA)		MINIMUM CIRCUIT AMPACITY AMPS	FUSE OR HACR CIRCUIT BREAKER		DRIVE TYPE	FILTER	OUTDOOR COIL				WEIGHT	
				FAN MTR	BLWR MTR		MIN. AMPS	MAX. AMPS		RECOMMENDED NO. AND SIZE [mm x mm x mm]	AREA SQ. FT. [M^2]	NO. ROWS	CFM [L/s]	R22 OZ. [g]	NET LBS. [kg]	SHIPPING LBS. [kg]
036CK08	3-60-208/230	12.4/12.4	88	2.0	3.0	21/21	25/25	30/30	DIR	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	72 [2041]	513 [232.71]	520 [235.9]
036CK12	3-60-208/230	12.4/12.4	88	2.0	3.0	21/21	25/25	30/30	DIR	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	72 [2041]	522 [236.8]	529 [240.0]
036DK08	3-60-460	6.1/6.1	44	1.0	2.0	11/11	15/15	15/15	DIR	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	72 [2041]	513 [232.71]	520 [235.9]
036DK12	3-60-460	6.1/6.1	44	1.0	2.0	11/11	15/15	15/15	DIR	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	72 [2041]	522 [236.8]	529 [240.0]
036CL08	3-60-208/230	12.4/12.4	88	2.0	2.8	21/21	25/25	30/30	BELT	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	72 [2041]	513 [232.71]	520 [235.9]
036CL12	3-60-208/230	12.4/12.4	88	2.0	2.8	21/21	25/25	30/30	BELT	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	72 [2041]	522 [236.8]	529 [240.0]
036DL08	3-60-460	6.1/6.1	44	1.0	1.4	11/11	15/15	15/15	BELT	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	72 [2041]	513 [232.71]	520 [235.9]
036DL12	3-60-460	6.1/6.1	44	1.0	1.4	11/11	15/15	15/15	BELT	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	72 [2041]	522 [236.8]	529 [240.0]
036DM12	3-60-460	6.1/6.1	44	1.0	1.4	11/11	15/15	15/15	BELT	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	72 [2041]	522 [236.8]	529 [240.0]
036DM12	3-60-460	6.1/6.1	44	1.0	1.4	11/11	15/15	15/15	BELT	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	72 [2041]	522 [236.8]	529 [240.0]
036YL08	3-60-575	4.8/4.8	35	.7	1.3	8/8	15/15	15/15	BELT	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	72 [2041]	513 [232.71]	520 [235.9]
036YL12	3-60-575	4.8/4.8	35	.7	1.3	8/8	15/15	15/15	BELT	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	72 [2041]	522 [236.8]	529 [240.0]
036YM12	3-60-575	4.8/4.8	35	.7	1.3	8/8	15/15	15/15	BELT	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	72 [2041]	522 [236.8]	529 [240.0]

➤ TABLE 2

3.5 TON - RKKA - ELECTRICAL & PHYSICAL DATA

UNIT MODEL	ELECTRICAL								PHYSICAL							
	PHASE HERTZ VOLTS	COMPRESSOR RLA	COMPR LRA	FULL LOAD AMPERES (FLA)		MINIMUM CIRCUIT AMPACITY AMPS	FUSE OR HACR CIRCUIT BREAKER		DRIVE TYPE	FILTER	OUTDOOR COIL				WEIGHT	
				FAN MTR	BLWR MTR		MIN. AMPS	MAX. AMPS		RECOMMENDED NO. AND SIZE [mm x mm x mm]	AREA SQ. FT. [M^2]	NO. ROWS	CFM [L/s]	R22 OZ. [g]	NET LBS. [kg]	SHIPPING LBS. [kg]
042CK08	3-60-208-230	14.0/14.0	120	2.0	3.0	22/22	30/30	35/35	DIR	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	66 [1871]	529 [240.0]	536 [243.1]
042CK12	3-60-208-230	14.0/14.0	120	2.0	3.0	22/22	30/30	35/35	DIR	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	66 [1871]	538 [244.0]	545 [247.2]
042CL08	3-60-208-230	14.0/14.0	120	2.0	2.8	22/22	30/30	35/35	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	66 [1871]	529 [240.0]	536 [243.1]
042CL12	3-60-208-230	14.0/14.0	120	2.0	2.8	22/22	30/30	35/35	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	66 [1871]	538 [244.0]	545 [247.2]
042CM08	3-60-208-230	14.0/14.0	120	2.0	2.8	22/22	30/30	35/35	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	66 [1871]	529 [240.0]	536 [243.1]
042CM12	3-60-208-230	14.0/14.0	120	2.0	2.8	22/22	30/30	35/35	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	66 [1871]	529 [240.0]	536 [243.1]
042DK08	3-60-460	7.4	50	1.0	2.0	13	15	15	DIR	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	66 [1871]	529 [240.0]	536 [243.1]
042DK12	3-60-460	7.4	50	1.0	2.0	13	15	15	DIR	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	66 [1871]	538 [244.0]	545 [247.2]
042DL08	3-60-460	7.4	50	1.0	1.4	12	15	15	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	66 [1871]	529 [240.0]	536 [243.1]
042DL12	3-60-460	7.4	50	1.0	1.4	12	15	15	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	66 [1871]	538 [244.0]	545 [247.2]
042DM08	3-60-460	7.4	50	1.0	1.4	12	15	15	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	66 [1871]	529 [240.0]	536 [243.1]
042DM12	3-60-460	7.4	50	1.0	1.4	12	15	15	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	66 [1871]	539 [240.0]	536 [243.1]

➤ TABLE 2 - continued

3.5 TON - RKKA - ELECTRICAL & PHYSICAL DATA

UNIT MODEL	ELECTRICAL								PHYSICAL							
	PHASE HERTZ VOLTS	COMPRESSOR RLA	COMPR LRA	FULL LOAD AMPERES (FLA)		MINIMUM CIRCUIT AMPACITY AMPS	FUSE OR HACR CIRCUIT BREAKER		DRIVE TYPE	FILTER	OUTDOOR COIL				WEIGHT	
				FAN MTR	BLWR MTR		MIN. AMPS	MAX. AMPS		RECOMMENDED NO. AND SIZE [mm x mm x mm]	AREA SQ. FT. [M²]	NO. ROWS	CFM [L/s]	R22 OZ. [g]	NET LBS. [kg]	SHIPPING LBS. [kg]
042YL08	3-60-575	5.8	40	0.7	1.3	10	15	15	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	66 [1871]	529 [240.0]	536 [243.1]
042YL12	3-60-575	5.8	40	0.7	1.3	10	15	15	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	66 [1871]	538 [244.0]	545 [247.2]
042YM08	3-60-575	5.8	40	0.7	1.3	10	15	15	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	66 [1871]	529 [240.0]	536 [243.1]
042YM12	3-60-575	5.8	40	0.7	1.3	10	15	15	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	11.0 [1.022]	1.0	3600 [1699]	66 [1871]	529 [240.0]	536 [243.1]

➤ TABLE 3

4 TON - RKKA - ELECTRICAL & PHYSICAL DATA

UNIT MODEL	ELECTRICAL								PHYSICAL							
	PHASE HERTZ VOLTS	COMPRESSOR RLA	COMPR LRA	FULL LOAD AMPERES (FLA)		MINIMUM CIRCUIT AMPACITY AMPS	FUSE OR HACR CIRCUIT BREAKER		DRIVE TYPE	FILTER	OUTDOOR COIL				WEIGHT	
				FAN MTR	BLWR MTR		MIN. AMPS	MAX. AMPS		RECOMMENDED NO. AND SIZE [mm x mm x mm]	AREA SQ. FT. [M^2]	NO. ROWS	CFM [L/s]	R22 OZ. [g]	NET LBS. [kg]	SHIPPING LBS. [kg]
048CK08	3-60-208-230	13.5/13.5	99	2.0	3.0	22/22	30/30	35/35	DIR	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	573 [259.9]	580 [263.1]
048CK10	3-60-208-230	13.5/13.5	99	2.0	3.0	22/22	30/30	35/35	DIR	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	573 [259.9]	580 [263.1]
048CK13	3-60-208-230	13.5/13.5	99	2.0	3.0	22/22	30/30	35/35	DIR	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	578 [262.2]	585 [265.4]
048CL08	3-60-208-230	13.5/13.5	99	2.0	2.8	22/22	30/30	35/35	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	573 [259.9]	580 [263.1]
048CL10	3-60-208-230	13.5/13.5	99	2.0	2.8	22/22	30/30	35/35	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	573 [259.9]	580 [263.1]
048CL13	3-60-208-230	13.5/13.5	99	2.0	2.8	22/22	30/30	35/35	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	578 [262.2]	585 [265.4]
048CM08	3-60-208-230	13.5/13.5	99	2.0	3.4	23/23	30/30	35/35	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	573 [259.9]	580 [263.1]
048CM10	3-60-208-230	13.5/13.5	99	2.0	3.4	23/23	30/30	35/35	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	573 [259.9]	580 [263.1]
048CM13	3-60-208-230	13.5/13.5	99	2.0	3.4	23/23	30/30	35/35	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	573 [259.9]	580 [263.1]
048DK08	3-60-460	7.4	50	1.0	2.0	12	15	15	DIR	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	573 [259.9]	580 [263.1]
048DK10	3-60-460	7.4	50	1.0	2.0	12	15	15	DIR	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	573 [259.9]	580 [263.1]
048DK13	3-60-460	7.4	50	1.0	2.0	12	15	15	DIR	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	578 [262.2]	585 [265.4]
048DL08	3-60-460	7.4	50	1.0	1.4	12	15	15	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	573 [259.9]	580 [263.1]
048DL10	3-60-460	7.4	50	1.0	1.4	12	15	15	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	573 [259.9]	580 [263.1]
048DL13	3-60-460	7.4	50	1.0	1.4	12	15	15	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	578 [262.2]	585 [265.4]

➤ TABLE 3 - continued

4 TON - RKKA - ELECTRICAL & PHYSICAL DATA

UNIT MODEL	ELECTRICAL								PHYSICAL							
	PHASE HERTZ VOLTS	COMPRESSOR RLA	COMPR LRA	FULL LOAD AMPERES (FLA)		MINIMUM CIRCUIT AMPACITY AMPS	FUSE OR HACR CIRCUIT BREAKER		DRIVE TYPE	FILTER	OUTDOOR COIL				WEIGHT	
				FAN MTR	BLWR MTR		MIN. AMPS	MAX. AMPS		RECOMMENDED NO. AND SIZE [mm x mm x mm]	AREA SQ. FT. [M²]	NO. ROWS	CFM [L/s]	R22 OZ. [g]	NET LBS. [kg]	SHIPPING LBS. [kg]
048DM08	3-60-460	7.4	50	1.0	1.6	12	15	15	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	573 [259.9]	580 [263.1]
048DM10	3-60-460	7.4	50	1.0	1.6	12	15	15	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	573 [259.9]	580 [263.1]
048DM13	3-60-460	7.4	50	1.0	1.6	12	15	15	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	573 [259.9]	580 [263.1]
048YL08	3-60-575	5.8	40	0.7	1.3	10	15	15	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	573 [259.9]	580 [263.1]
048YL10	3-60-575	5.8	40	0.7	1.3	10	15	15	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	573 [259.9]	580 [263.1]
048YL13	3-60-575	5.8	40	0.7	1.3	10	15	15	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	578 [262.2]	585 [265.4]
048YM08	3-60-575	5.8	40	0.7	1.3	10	15	15	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	573 [259.9]	580 [263.1]
048YM10	3-60-575	5.8	40	0.7	1.3	10	15	15	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	573 [259.9]	580 [263.1]
048YM13	3-60-575	5.8	40	0.7	1.3	10	15	15	BELT	(1) 1″ X 16″ X 25″ [25 X 406 X 635]	16.9 [1.570]	1.0	4000 [1888]	93 [2636]	573 [259.9]	580 [263.1]

TABLE 4

5 TON - RKKA - ELECTRICAL & PHYSICAL DATA

UNIT MODEL	ELECTRICAL								PHYSICAL							
	PHASE HERTZ VOLTS	COMPRESSOR RLA	COMPR LRA	FULL LOAD AMPERES (FLA)		MINIMUM CIRCUIT AMPACITY AMPS	FUSE OR HACR CIRCUIT BREAKER		DRIVE TYPE	FILTER	OUTDOOR COIL				WEIGHT	
				FAN MTR	BLWR MTR		MIN. AMPS	MAX. AMPS		RECOMMENDED NO. AND SIZE [mm x mm x mm]	AREA SQ. FT. [M^2]	NO. ROWS	CFM [L/s]	R22 OZ. [g]	NET LBS. [kg]	SHIPPING LBS. [kg]
060CK10	3-60-208/230	17.3/17.3	123	2.0	5.4	30/30	35/35	40/40	DIR	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	16.6 [1.542]	1.5	3700 [1746]	131 [3714]	573 [259.9]	580 [263.1]
060CK13	3-60-208/230	17.3/17.3	123	2.0	5.4	30/30	35/35	40/40	DIR	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	16.6 [1.542]	1.5	3700 [1746]	131 [3714]	578 [262.2]	585 [265.4]
060CL10	3-60-208/230	17.3/17.3	123	2.0	5.4	30/30	35/35	40/40	BELT	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	16.6 [1.542]	1.5	3700 [1746]	131 [3714]	573 [259.9]	580 [263.1]
060CL13	3-60-208/230	17.3/17.3	123	2.0	5.4	30/30	35/35	40/40	BELT	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	16.6 [1.542]	1.5	3700 [1746]	131 [3714]	578 [262.2]	585 [265.4]
060DL10	3-60-460	9.0/9.0	62	1.0	1.3	14/14	20/20	20/20	BELT	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	16.6 [1.542]	1.5	3700 [1746]	131 [3714]	573 [259.9]	580 [263.1]
060DL13	3-60-460	9.0/9.0	62	1.0	1.3	14/14	20/20	20/20	BELT	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	16.6 [1.542]	1.5	3700 [1746]	131 [3714]	578 [262.2]	585 [265.4]
060DM13	3-60-460	9.0/9.0	62	1.0	1.9	15/15	20/20	20/20	BELT	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	16.6 [1.542]	1.5	3700 [1746]	131 [3714]	578 [262.2]	585 [265.4]
060YL10	3-60-575	7.1/7.1	50	.7	1.3	11/11	15/15	15/15	BELT	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	16.6 [1.542]	1.5	3700 [1746]	131 [3714]	573 [259.9]	580 [263.1]
060YL13	3-60-575	7.1/7.1	50	.7	1.3	11/11	15/15	15/15	BELT	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	16.6 [1.542]	1.5	3700 [1746]	131 [3714]	578 [262.2]	585 [265.4]
060YM13	3-60-575	7.1/7.1	50	.7	1.3	11/11	15/15	15/15	BELT	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	16.6 [1.542]	1.5	3700 [1746]	131 [3714]	578 [262.2]	585 [265.4]
060DM13	3-60-460	9.0/9.0	62	1.0	1.9	15/15	20/20	20/20	BELT	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	16.6 [1.542]	1.5	3700 [1746]	131 [3714]	578 [262.2]	585 [265.4]
060DK10	3-60-460	9.0/9.0	62	1.0	1.9	15/15	20/20	20/20	DIR	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	16.6 [1.542]	1.5	3700 [1746]	131 [3714]	573 [259.9]	580 [263.1]
060DK13	3-60-460	9.0/9.0	62	1.0	1.9	15/15	20/20	20/20	DIR	(2) 1″ X 16″ X 25″ [25 X 406 X 635]	16.6 [1.542]	1.5	3700 [1746]	131 [3714]	578 [262.2]	585 [265.4]

➤ TABLE 5

6 TON - RKKA - ELECTRICAL & PHYSICAL DATA

UNIT MODEL	ELECTRICAL								PHYSICAL								
	PHASE HERTZ VOLTS	COMPRESSOR RLA	COMPR LRA	FULL LOAD AMPERES (FLA)		MINIMUM CIRCUIT AMPACITY AMPS	FUSE OR HACR CIRCUIT BREAKER		DRIVE TYPE	FILTER	OUTDOOR COIL				WEIGHT	
				FAN MTR	BLWR MTR		MIN. AMPS	MAX. AMPS		RECOMMENDED NO. AND SIZE	AREA SQ. FT. (M^2)	NO. ROWS	CFM (L/s)	R22 OZ. (g)	NET LBS. (kg)	SHIPPING LBS. (kg)
073CL10	3-60-208/230	21.9/21.9	156	2.6	5.8	37/37	40/40	50/50	BELT	(2) 1" X 16" 25" [25 X 406 X 635]	16.6 [1.542]	2.0	4000 [1888]	176 [4990]	608 [275.8]	615 [279.0]
073CL13	3-60-208/230	21.9/21.9	156	2.6	5.8	37/37	40/40	50/50	BELT	(2) 1" X 16" 25" [25 X 406 X 635]	16.6 [1.542]	2.0	4000 [1888]	176 [4990]	614 [[278.5]	621 [281.7]
073DL10	3-60-460	10.9/10.9	70	1.2	2.8	19/19	20/20	25/25	BELT	(2) 1" X 16" 25" [25 X 406 X 635]	16.6 [1.542]	2.0	4000 [1888]	176 [4990]	608 [275.8]	615 [279.0]
073DL13	3-60-460	10.9/10.9	70	1.2	2.8	19/19	20/20	25/25	BELT	(2) 1" X 16" 25" [25 X 406 X 635]	16.6 [1.542]	2.0	4000 [1888]	176 [4990]	614 [[278.5]	621 [281.7]
073YL10	3-60-575	8.9/8.9	54	.9	2.1	15/15	15/15	20/20	BELT	(2) 1" X 16" 25" [25 X 406 X 635]	16.6 [1.542]	2.0	4000 [1888]	176 [4990]	608 [275.8]	615 [279.0]
073YL13	3-60-575	8.9/8.9	54	.9	2.1	15/15	15/15	20/20	BELT	(2) 1" X 16" 25" [25 X 406 X 635]	16.6 [1.542]	2.0	4000 [1888]	176 [4990]	614 [[278.5]	621 [281.7]

II. INSTALLATION

A. GENERAL

1. INSTALLATION — Install this unit in accordance with The American National Standard Z223.1-latest edition booklet entitled “National Fuel Gas Code,” and the requirements or codes of the local utility or other authority having jurisdiction.

   Additional helpful publications available from the “National Fire Protection Association” are: NFPA-90A - Installation of Air Conditioning and Ventilating Systems 1985 or latest edition. NFPA-90B - Warm Air Heating and Air Conditioning Systems 1984.

   These publications are available from:

   National Fire Protection Association, Inc.
   Batterymarch Park
   Quincy, MA 02269

2. PRE-INSTALLATION CHECK-POINTS — Before attempting any installation, carefully consider the following points:

   Structural strength of supporting members
   (Rooftop Installation)
   Clearances and provision for servicing
   Power supply and wiring
   Gas supply and piping
   Air duct connections and sizing
   Drain facilities and connections
   Location for minimum noise and vibration - away from bedroom windows

LOCATION CONSIDERATIONS

The metal parts of this unit may be subject to rust or deterioration in adverse environmental conditions. This oxidation could shorten the equipment’s useful life. Salt spray, fog or mist in seacoast areas, sulphur or chlorine from lawn watering systems, and various chemical contaminants from industries such as paper mills and petroleum refineries are especially corrosive.

If the unit is to be installed in an area where contaminants are likely to be a problem, give special attention to the equipment location and exposure.

1. Avoid having lawn sprinkler heads spray directly on the unit cabinet.
2. In coastal areas locate the unit on the side of the building away from the waterfront.
3. Shielding by a fence or shrubs may give some protection.

⚠ WARNING

DISCONNECT ALL POWER TO UNIT BEFORE STARTING MAINTENANCE. FAILURE TO DO SO CAN CAUSE ELECTRICAL SHOCK RESULTING IN PERSONAL INJURY OR DEATH. REGULAR MAINTENANCE WILL REDUCE THE BUILDUP OF CONTAMINANTS AND HELP TO PROTECT THE UNIT’S FINISH.

1. Frequent washing of the cabinet, fan blade and coil with fresh water will remove most of the salt or other contaminants that build up on the unit.
2. Regular cleaning and waxing of the cabinet with a good automobile polish will provide some protection.
3. A good liquid cleaner may be used several times a year to remove matter that will not wash off with water.

Several different types of protective coatings are offered in some areas. These coatings may provide some benefit, but the effectiveness of such coating materials cannot be verified by the equipment manufacturer.

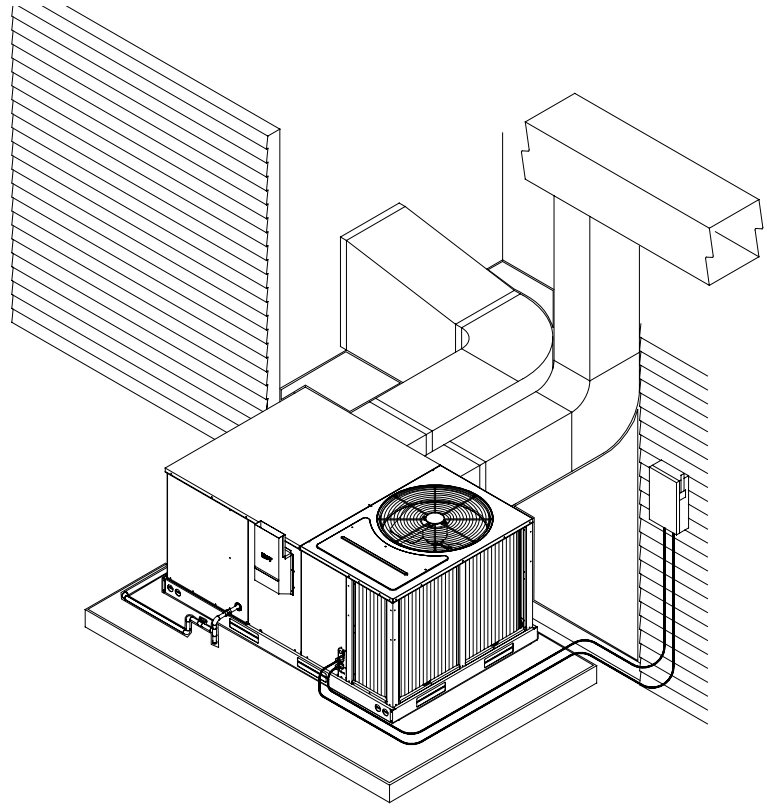
The best protection is frequent cleaning, maintenance and minimal exposure to contaminants.

B. OUTSIDE INSTALLATION

⚠ WARNING

THESE UNITS ARE DESIGNED CERTIFIED FOR OUTDOOR INSTALLATION ONLY. INSTALLATION INSIDE ANY PART OF A STRUCTURE CAN RESULT IN INADEQUATE UNIT

FIGURE 5
OUTSIDE SLAB INSTALLATION. CLOSET DISTRIBUTION SYSTEM. SLAB FLOOR CONSTRUCTION.



I298

PERFORMANCE AS WELL AS PROPERTY DAMAGE. INSTALLATION INSIDE CAN ALSO CAUSE RECIRCULATION OF FLUE PRODUCTS INTO THE CONDITIONED SPACE RESULTING IN PERSONAL INJURY OR DEATH.

(Typical outdoor slab installation is shown in Figure 5.)

1. Select a location where external water drainage cannot collect around unit.
2. Provide a level slab sufficiently high enough above grade to prevent surface water from entering the unit
3. The location of the unit should be such as to provide proper access for inspection and servicing as shown in Figure 7.
4. Locate unit where operating sounds will not disturb owner or neighbors.
5. Locate unit so roof runoff water does not pour directly on the unit. Provide gutter or other shielding at roof level. Do not locate unit in an area where excessive snow drifting may occur or accumulate.
6. Where snowfall is anticipated, the height of the unit above the ground level must be considered. Mount unit high enough to be above anticipated maximum area snowfall and to allow combustion air to enter the combustion air inlet.
7. Select an area which will keep the areas of the vent, air intake, and A/C condenser fins free and clear of obstructions such as weeds, shrubs, vines, snow, etc. Inform the user accordingly.

C. ATTACHING EXHAUST AND COMBUSTION AIR INLET HOODS

IMPORTANT: Do not operate this unit without the exhaust/combustion air inlet hood properly installed. This hood is shipped in a carton in the blower compartment inside the unit and must be attached when the unit is installed. See Figure 3.

To attach exhaust/combustion air inlet hood:

1. Remove screws securing blower access panel and remove access panel. For location of blower access panel, see Figure 2.
2. Remove exhaust/combustion air inlet hood from the carton, located inside the blower compartment.
3. Attach blower access panel.
4. Attach the combustion air inlet/exhaust hood with screws. Reference Figure 3 for proper location. Screws are in carton with the hood.
5. Vent the unit using the flue exhaust hood, as supplied from the factory, without alteration or addition.

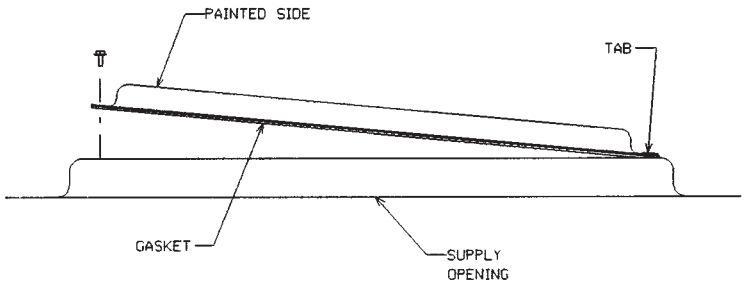
D. COVER PANEL INSTALLATION/ CONVERSION PROCEDURE

DOWNFLOW TO HORIZONTAL

1. Remove the screws and covers from the outside of the supply and return sections.
2. Install the covers in the bottom supply and return openings with the painted side up. See Figure 6. Use the existing gasket to seal the covers.
3. Secure the supply cover to the base of the unit with 1 screw, engaging prepunched tab in unit base.
4. Secure the return cover to the base of the unit with screws engaging prepunched holes in the unit base.

This unit is provided with 2 - 25″ X 16″ X 1″ disposable filters. When replacing filters, ensure they are inserted fully to the back to prevent bypass.

FIGURE 6
COVER GASKET DETAIL FOR UNITS SHIPPED FOR DOWNFLOW APPLICATION BEING CONVERTED TO HORIZONTAL



E. CLEARANCES

The following minimum clearances must be observed for proper unit performance and serviceability. Reference Figure 7.

Recommended Clearance	Location
48″	A - Front
18″	B - Condenser Coil
12″*	C - Duct Side
36″	D - Evaporator End
60″	E - Above
*Without Economizer. 57 With Economizer	

NOTE: Supply duct may be installed with “0’ inch clearance to combustible materials, provided 1″ minimum Fiberglass insulation is applied either inside or on the outside of the duct.

FIGURE 7
CLEARANCES

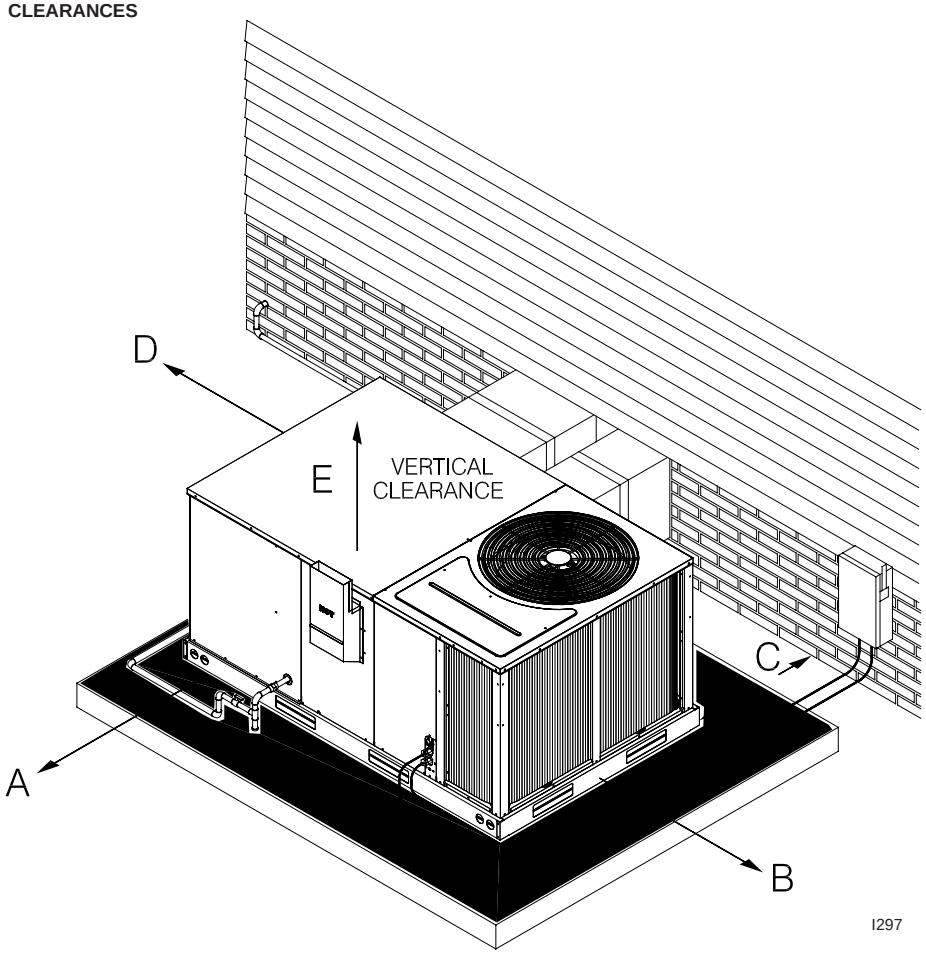
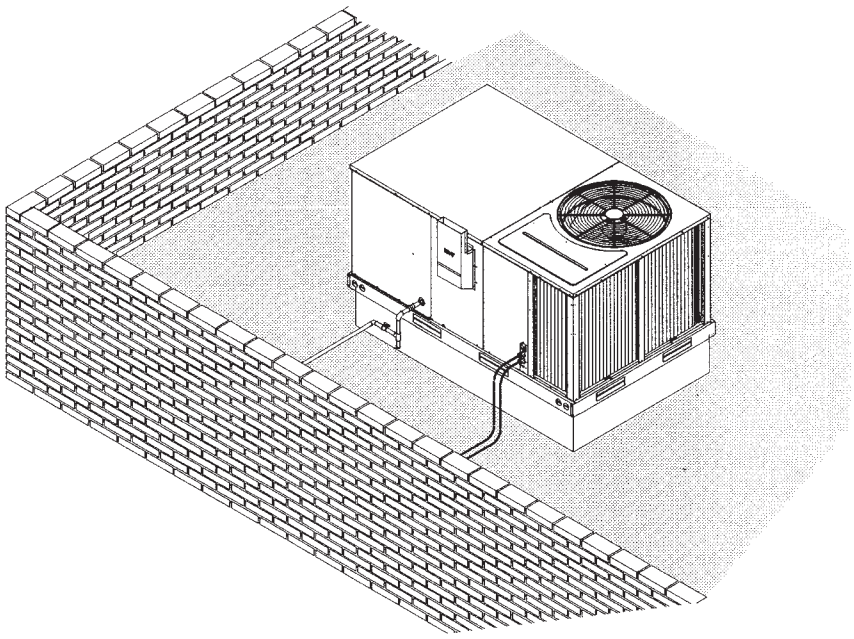


FIGURE 8
FLAT ROOFTOP INSTALLATION, ATTIC OR DROP CEILING DISTRIBUTING SYSTEM. MOUNTED ON ROOFCURB. CURB MUST BE LEVEL.



I299

G. ROOFTOP INSTALLATION

1. Before locating the unit on the roof, make sure that the roof structure is adequate to support the weight involved. (See Electrical & Physical Tables in this manual.) **THIS IS VERY IMPORTANT AND THE INSTALLER'S RESPONSIBILITY.**
2. For rigging and roofcurb details, see Figures 8, 9, 10 and 11.
3. The location of the unit on the roof should be such as to provide proper access for inspection and servicing.

IMPORTANT: *If unit will not be put into service immediately, block off supply and return air openings to prevent excessive condensation.*

H. DUCTING

The installing contractor should fabricate ductwork in accordance with local codes. Use industry manuals as a guide when sizing and designing the duct system. Contact Air Conditioning Contractors of America, 1513 16th St. N.W., Washington, D.C. 20036.

⚠ WARNING

DO NOT, UNDER ANY CIRCUMSTANCES, CONNECT RETURN DUCTWORK TO ANY OTHER HEAT PRODUCING DEVICE SUCH AS FIREPLACE INSERT, STOVE, ETC. UNAUTHORIZED USE OF SUCH DEVICES MAY RESULT IN FIRE, CARBON MONOXIDE POISONING, EXPLOSION, PERSONAL INJURY, PROPERTY DAMAGE OR DEATH.

Place the unit as close to the conditioned space as possible allowing clearances as indicated. Run ducts as directly as possible to supply and return outlets. Use of non-flammable weatherproof flexible connectors on both supply and return connections at unit to reduce noise transmission is recommended.

On ductwork exposed to outside temperature and humidity, use a minimum of 2″ of insulation and a vapor barrier. Distribution system in attic, furred space or crawl space should be insulated with at least 2″ of insulation. ½″ to 1″ thick insulation is usually sufficient for ductwork inside the air conditioned space.

Provide balancing dampers for each branch duct in the supply system. Properly support ductwork from the structure.

IMPORTANT: In the event that the return air ducts must be run through an "unconfined" space containing other fuel burning equipment, it is imperative that the user/homeowner must be informed against future changes in construction which might change this to a "confined space." Also, caution the user/homeowner against any future installation of additional equipment (such as power ventilators, clothes dryers, etc., within the existing unconfined and/or confined space which might create a negative pressure within the vicinity of other solid, liquid, or gas fueled appliances.

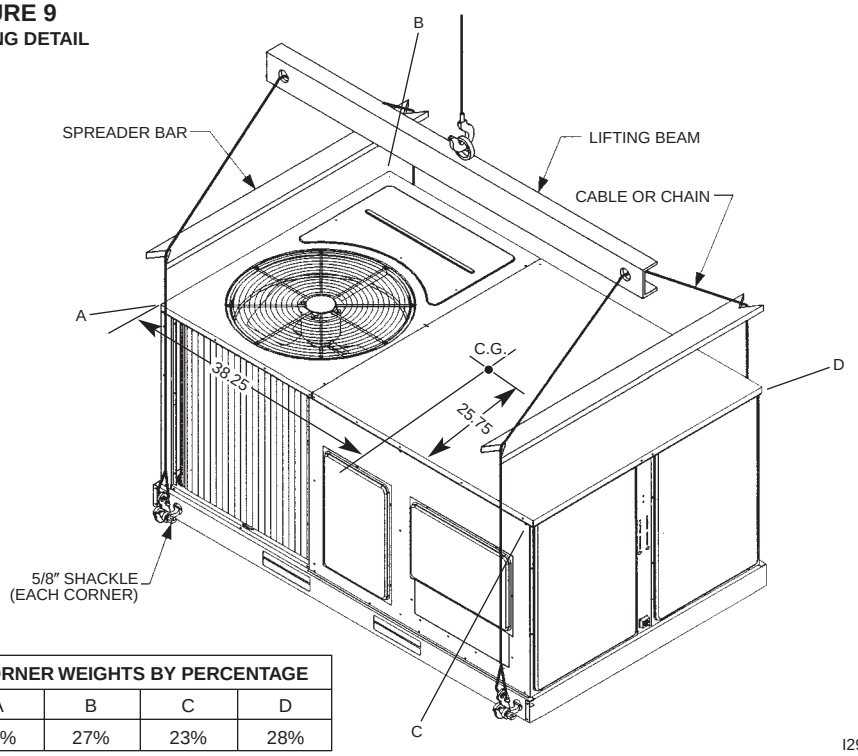
RETURN AIR

⚠ WARNING

NEVER ALLOW PRODUCTS OF COMBUSTION OR THE FLUE PRODUCTS TO ENTER THE RETURN AIR DUCTWORK, OR THE CIRCULATING AIR SUPPLY. ALL RETURN DUCTWORK MUST BE ADEQUATELY SEALED AND SECURED TO THE FURNACE WITH SHEET METAL SCREWS, AND JOINTS TAPED. ALL OTHER DUCT JOINTS MUST BE SECURED WITH APPROVED CONNECTIONS AND SEALED AIRTIGHT.

FAILURE TO PREVENT PRODUCTS OF COMBUSTION FROM BEING CIRCULATED INTO THE LIVING SPACE CAN CREATE POTENTIALLY HAZARDOUS CONDITIONS, INCLUDING CARBON MONOXIDE POISONING THAT COULD RESULT IN PERSONAL INJURY OR DEATH.

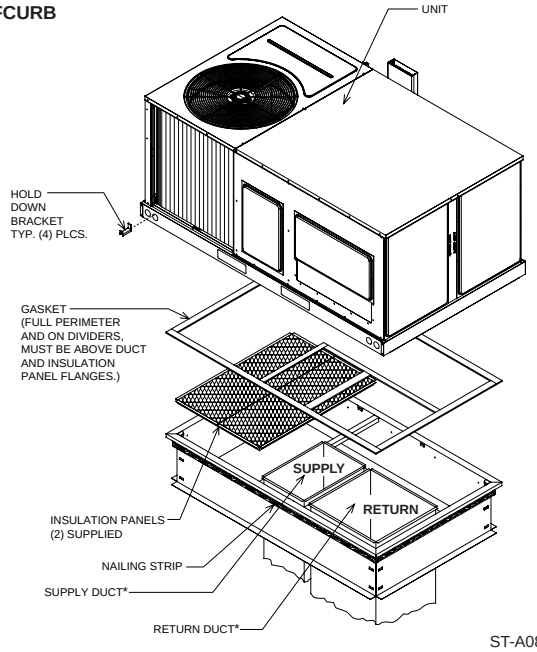
FIGURE 9
LIFTING DETAIL



CORNER WEIGHTS BY PERCENTAGE			
A	B	C	D
22%	27%	23%	28%

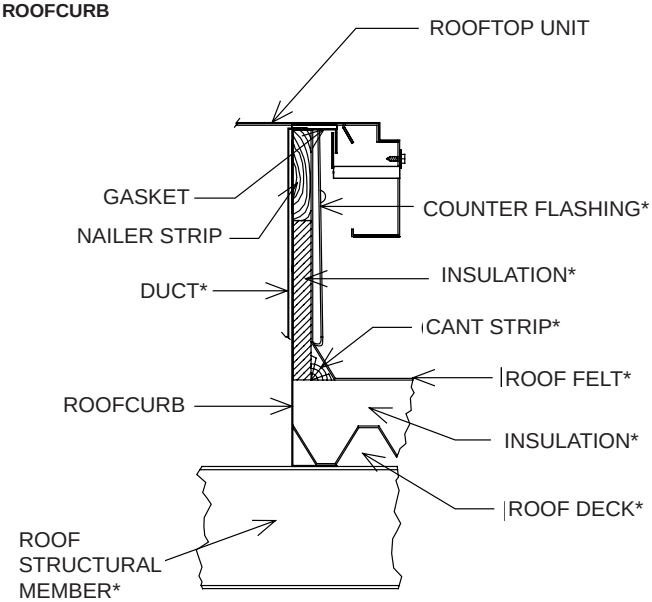
I296

FIGURE 10
ROOFCURB



ST-A0801-19-01

FIGURE 11
ROOFCURB



*BY CONTRACTOR

ST-A0801-19-01

III. GAS SUPPLY, CONDENSATE DRAIN AND PIPING

A. GAS CONNECTION

IMPORTANT: Connect this unit only to gas supplied by a commercial utility.

1. Install gas piping in accordance with local codes and regulations of the local utility company. In the absence of local codes, the installation must conform to the specifications of the National Fuel Gas Code, ANSI Z223.1 - latest edition.

   NOTE: The use of flexible gas connectors is not permitted.
2. Connect the gas line to the gas pipe inlet opening provided into the 1/2″ inlet valve. See Figure 5 or 8 for typical piping.
3. Size the gas line to the furnace adequate enough to prevent undue pressure drop and never less than 1/2″.
4. Install a drip leg or sediment trap in the gas supply line as close to the unit as possible.
5. Install an outside ground joint union to connect the gas supply to the control assembly at the burner tray.
6. Gas valves have been factory installed. Install a manual gas valve where local codes specify a shut-off valve outside the unit casing. (See Figure 12.)
7. Make sure piping is tight. **A pipe compound resistant to the action of liquefied petroleum gases must be used at all threaded pipe connections.**
8. IMPORTANT: any additions, changes or conversions required for the furnace to satisfactorily meet the application should be made by a qualified installer, service agency or the gas supplier, using factory-specified or approved parts. In the commonwealth of Massachusetts, installation must be performed by a licensed plumber or gas fitter for appropriate fuel.

IMPORTANT: *Disconnect the furnace and its individual shutoff valve from the gas supply piping during any pressure testing of that system at test pressures in excess of 1/2 pound per square inch gauge or isolate the system from the gas supply piping system by closing its individual manual shutoff valve during any pressure testing of this gas supply system at pressures equal to or less than 1/2 PSIG.*

TO CHECK FOR GAS LEAKS, USE A SOAP AND WATER SOLUTION OR OTHER APPROVED METHOD. DO NOT USE AN OPEN FLAME.

⚠ WARNING

DO NOT USE AN OPEN FLAME TO CHECK FOR LEAKS. THE USE OF AN OPEN FLAME CAN RESULT IN FIRE, EXPLOSION, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

IMPORTANT: *Check the rating plate to make certain the appliance is equipped to burn the type of gas supplied. Care should be taken after installation of this equipment that the gas control valve not be subjected to high gas supply line pressure.*

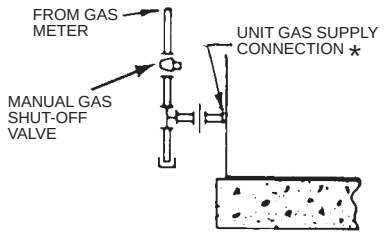
In making gas connections, avoid strains as they may cause noise and damage the controls. A backup wrench is required to be used on the valve to avoid damage.

TABLE 6
GAS PIPE CAPACITY TABLE (CU. FT./HR.)

Nominal Iron Pipe Size, Inches	Equivalent Length of Pipe, Feet							
	10	20	30	40	50	60	70	80
½	132	92	73	63	56	50	46	43
¾	278	190	152	130	115	105	96	90
1	520	350	285	245	215	195	180	170
1¼	1,050	730	590	500	440	400	370	350
1½	1,600	1,100	890	760	670	610	560	530

FIGURE 12
SUGGESTED GAS PIPING

ROOF OR GROUND LEVEL INSTALLATION



*Factory supplied grommet must be utilized.

The capacities of gas pipe of different diameters and lengths in cu. ft. per hr. with pressure drop of 0.3 in. and specific gravity of 0.60 (natural gas) are shown in Table 6.

After determining the pipe length, select the pipe size which will provide the minimum cubic feet per hour required for the gas input rating of the furnace. By formula:

$$\text{Cu. Ft. Per Hr. Required} = \frac{\text{Gas Input of Furnace (BTU/HR)}}{\text{Heating Value of Gas (BTU/FT}^3\text{)}}$$

The gas input of the furnace is marked on the furnace rating plate. The heating value of the gas (BTU/FT^3) may be determined by consulting the local natural gas utility or the L.P. gas supplier.

B. LP CONVERSION

⚠ WARNING

THIS UNIT IS EQUIPPED AT THE FACTORY FOR USE ON NATURAL GAS ONLY. CONVERSION TO LP GAS REQUIRES A SPECIAL KIT SUPPLIED BY THE DISTRIBUTOR OR MANUFACTURER. MAILING ADDRESSES ARE LISTED ON THE FURNACE RATING PLATE, PARTS LIST AND WARRANTY. FAILURE TO USE THE PROPER CONVERSION KIT CAN CAUSE FIRE, CARBON MONOXIDE POISONING, EXPLOSION, PERSONAL INJURY, PROPERTY DAMAGE OR DEATH.

Convert the valve to use liquefied petroleum (LP) gas by replacing the pressure regulator spring with the conversion kit spring. This LP kit spring allows the regulator to maintain the proper manifold pressure for LP gas. The correct burner LP orifices are included in the kit. See Figure 13.

IMPORTANT: To remove the gas valve, remove the four screws securing the manifold pipe to the burner tray. Remove the manifold pipe with gas valve attached. See Figure 14.

NOTE: Order the correct LP conversion kit from the furnace manufacturer. ***See Conversion Kit Index shipped with unit for proper LP kit number. Furnace conversion to LP gas must be performed by a qualified technician.***

NOx MODELS

When converting units equipped with NOx inserts to LP gas, the stainless steel screen mesh inserts in the entrance of the tubular exchangers are not required to meet SCAQMD NOx emission levels. These inserts and 1/8″ diameter retaining rod should be carefully removed before firing this furnace on LP gas. **IMPORTANT:** This furnace is not designed to operate on LP gas with the NOx inserts in place.

Step by step instructions on removing the NOx inserts and retaining rod are included in the Conversion Kit Installation Instructions.

TABLE 7
LP GAS PIPE CAPACITY TABLE (CU. FT./HR.)

Maximum capacity of pipe in thousands of BTU per hour of undiluted liquefied petroleum gases (at 11 inches water column inlet pressure).
(Based on a Pressure Drop of 0.5 Inch Water Column)

Nominal Iron Pipe Size, Inches	Length of Pipe, Feet											
	10	20	30	40	50	60	70	80	90	100	125	150
1/2	275	189	152	129	114	103	96	89	83	78	69	63
3/4	567	393	315	267	237	217	196	182	173	162	146	132
1	1,071	732	590	504	448	409	378	346	322	307	275	252
1-1/4	2,205	1,496	1,212	1,039	913	834	771	724	677	630	567	511
1-1/2	3,307	2,299	1,858	1,559	1,417	1,275	1,181	1,086	1,023	976	866	787
2	6,221	4,331	3,465	2,992	2,646	2,394	2,205	2,047	1,921	1,811	1,606	1,496

Example (LP): Input BTU requirement of unit, 150,000
Equivalent length of pipe, 60 ft. = 3/4″ IPS required.

C. ADJUSTING OR CHECKING FURNACE INPUT

– Natural Gas Line Pressure 5″ - 10.5″ W.C.
– LP Gas Line Pressure 11″ - 13″ W.C.

– Natural Gas Manifold Pressure 3.5″ W.C
– LP Gas Manifold Pressure - 10″ W.C.

Supply and manifold pressure taps are located on the gas valve body 1/8″ N.P.T. and on the manifold.

Use a properly calibrated manometer gauge for accurate gas pressure readings.

Only small variations in the gas flow should be made by means of the pressure regulator adjustment. Furnaces functioning on LP gas must be set by means of the tank or branch supply regulators. The furnace manifold pressure should be set at 10″ W.C. at the gas control valve.

To adjust the pressure regulator, remove the regulator cap and turn the adjustment screw clockwise to increase pressure or counterclockwise to decrease pressure. **Then replace the regulator cap securely.**

Any necessary major changes in the gas flow rate should be made by changing the size of the burner orifices. To change orifice spuds, shut off the manual main gas valve and remove the gas manifold.

For elevations up to 2,000 feet, rating plate input ratings apply. For high altitudes (elevations over 2,000 ft.), see conversion kit index 92-21519-XX for derating and orifice spud sizes.

Check of input is important to prevent over-firing of the furnace beyond its design-rated input. NEVER SET INPUT ABOVE THAT SHOWN ON THE RATING PLATE. Use the following table or formula to determine input rate.

Heating Value of Gas

FIGURE 13

FIGURE 14

MANIFOLD PIPE

TABLE 8

METER TIME IN MINUTES AND SECONDS FOR NORMAL INPUT RATING OF FURNACES EQUIPPED FOR NATURAL OR LP GAS											
INPUT BTU/HR	METER SIZE CU. FT.	HEATING VALUE OF GAS BTU PER CU. FT.									
		900		1000		1040		1100		2500	
		MIN.	SEC.	MIN.	SEC.	MIN.	SEC.	MIN.	SEC.	MIN.	SEC.
40,000	ONE	1	21	1	30	1	34	1	39	3	45
	TEN	13	30	15	0	15	36	16	30	37	30
60,000	ONE	0	54	1	0	1	3	1	6	2	30
	TEN	9	0	10	0	10	24	11	0	25	0
80,000	ONE	0	41	0	45	0	47	0	50	1	53
	TEN	6	45	7	30	7	48	8	15	18	45
100,000	ONE	0	33	0	36	0	38	0	40	1	30
	TEN	5	24	6	0	6	15	6	36	15	0

$$\text{Cu. Ft. Per Hr. Required} = \frac{\text{(BTU/Cu. Ft.) x 3600}}{\text{Time in Seconds (for 1 Cu. Ft.) of Gas}}$$

Start the furnace and measure the time required to burn one cubic foot of gas. Prior to checking the furnace input, make certain that all other gas appliances are shut off, with the exception of pilot burners. Time the meter with only the furnace in operation.

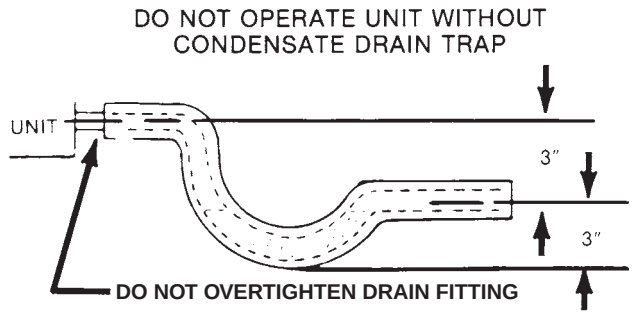
IMPORTANT NOTE FOR ALTITUDES ABOVE 2,000 FEET (610 METERS): The main burner orifices in your furnace and in these kits are sized for the nameplate input and intended for installations at elevations up to 2,000 feet in the USA or Canada, or for elevations of 2,000 - 4,500 feet (610 -1,373 meters) in Canada if the unit has been derated at the factory. For elevations above 2,000 feet (610 meters)

IN THE USA ONLY (see ANSI-Z223.1), the burner orifices must be sized to reduce the input 4% for each 1,000 feet (305 meters) above sea level.

NOTICE: DERATING OF THE HEATING INPUT FOR HIGH ALTITUDE IN THE FIELD IS UNLAWFUL IN CANADA (REFER TO CAN/CGA 2.17). UNITS INSTALLED IN ALTITUDES GREATER THAN 2,000 FEET (610 METERS) MUST BE SHIPPED FROM THE FACTORY OR FROM A FACTORY AUTHORIZED CONVERSION STATION WITH THE HEATING INPUT DERATED BY 10% SO AS TO OPERATE PROPERLY IN ALTITUDES FROM 2,000 - 4,500 FEET (610 - 1,373 METERS).

D. CONDENSATE DRAIN

FIGURE 15
CONDENSATE DRAIN



The condensate drain connection of the evaporator is threaded 3/4″ nominal P.V.C. pipe. **IMPORTANT:** Install a condensate trap to ensure proper condensate drainage. See Figure 15.

IV. WIRING

A. POWER SUPPLY

⚠ WARNING

TURN OFF THE MAIN ELECTRICAL POWER AT THE BRANCH CIRCUIT DISCONNECT CLOSEST TO THE UNIT BEFORE ATTEMPTING ANY WIRING. FAILURE TO DO SO CAN CAUSE ELECTRICAL SHOCK RESULTING IN PERSONAL INJURY OR DEATH.

1. **All wiring should be made in accordance with the National Electrical Code.** Consult the local power company to determine the availability of sufficient power to operate the unit. Check the voltage at power supply to make sure it corresponds to the unit's RATED VOLTAGE REQUIREMENT. Install a branch circuit disconnect near the rooftop, in accordance with the N.E.C., C.E.C. or local codes. A bracket is provided with the unit for mounting of the disconnect. See Figure 17.
2. It is important that proper electrical power is available at the unit. Voltage should not vary more than 10% from that stamped on the unit nameplate. On three phase units, phases must be balanced within 3%.
3. For branch circuit wiring (main power supply to unit disconnect), the minimum wire size for the length of run can be determined from Table 9 using the circuit ampacity found on the unit rating plate. Use the smallest wire size allowable in Table 9 from the unit disconnect to unit.

   NOTE: A bracket is provided with the unit for mounting the branch circuit disconnect to the unit. This is the recommended location for the disconnect. See Figure 16.
4. For through the base wiring entry reference **Figure 17.** All fittings and conduit are field supplied for this application. Reference the chart with **Figure 17** for proper hole and conduit size.

NOTES:

1. Wire size based on 60°C rated wire insulation and 30°C Ambient Temp. (86°F).
2. For more than 3 conductors in a raceway or cable, see the N.E.C. for derating the ampacity of each conductor.

   When installed, the unit must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code, **ANSI/NFPA 70,** if an external electrical source is utilized.

IMPORTANT: THIS UNIT IS APPROVED FOR USE WITH COPPER CONDUCTORS ONLY CONNECTED TO UNIT CONTACTOR.

WARRANTY MAY BE JEOPARDIZED IF ALUMINUM WIRE IS CONNECTED TO UNIT CONTACTOR.

Special instructions apply for power wiring with aluminum conductors: Warranty is void if connections are not made per instructions.

TABLE 10

AWG Copper Wire Size	AWG Aluminum Wire Size	Connector Type and Size (or equivalent)	
#12	#10	T & B Wire Nut	PT2
#10	# 8	T & B Wire Nut	PT3
# 8	# 6	Sherman Split Bolt	TSP6
# 6	# 4	Sherman Split Bolt	TSP4
# 4	# 2	Sherman Split Bolt	TSP2

Attach a length (6″ or more) of recommended size copper wire to the unit contactor terminals L1 and L3 for single phase, L1, L2 and L3 for three phase.

Select the equivalent aluminum wire size from the tabulation below:

Splice copper wire pigtails to aluminum wire with U.L. recognized connectors for copper-aluminum splices. Please exercise the following instructions very carefully to obtain a positive and lasting connection:

1. Strip insulation from aluminum conductor.
2. Coat the stripped end of the aluminum wire with the recommended inhibitor, and wire brush the aluminum surface through inhibitor. INHIBITORS: Brundy-Pentex "A"; Alcoa-No. 2EJC; T & B-KPOR Shield.
3. Clean and recoat aluminum conductor with inhibitor.
4. Make the splice using the above listed wire nuts or split bolt connectors.
5. Coat the entire connection with inhibitor and wrap with electrical insulating tape.

TABLE 9

BRANCH CIRCUIT COPPER WIRE SIZE (Based on 1% Voltage Drop)*

200	6	4	4	4	3	3	2	2
150	8	6	6	4	4	4	3	3
100	10	8	8	6	6	6	4	4
50	14	12	10	10	8	8	6	6
	15	20	25	30	35	40	45	50

BRANCH CIRCUIT AMPACITY

SUPPLY WIRE LENGTH-FEET

***Taken from National Electric Code**

FIGURE 16
RECOMMENDED BRANCH CIRCUIT DISCONNECT LOCATION

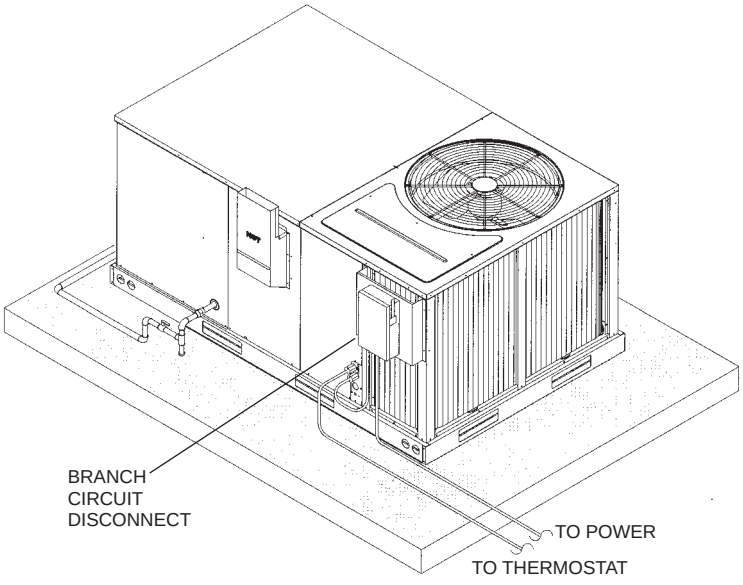


FIGURE 17

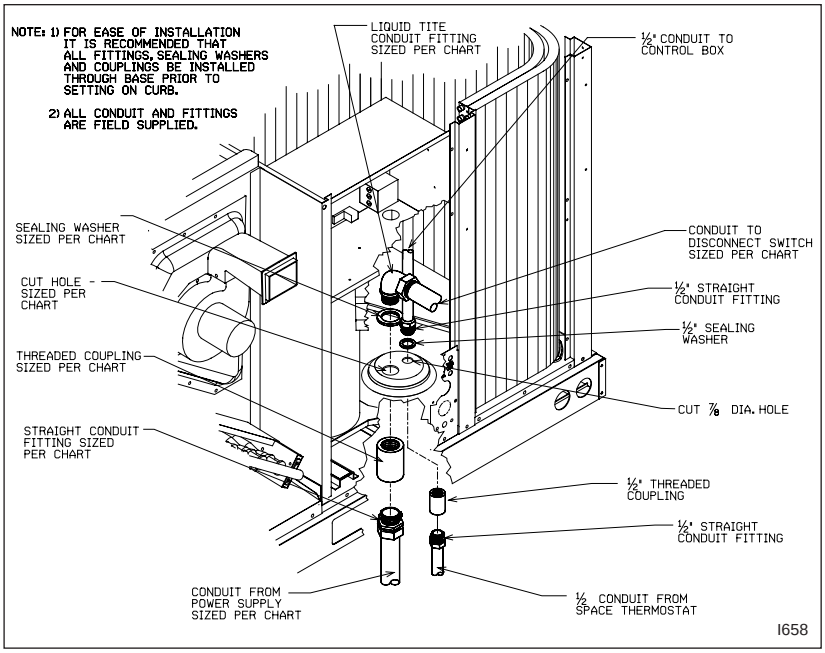
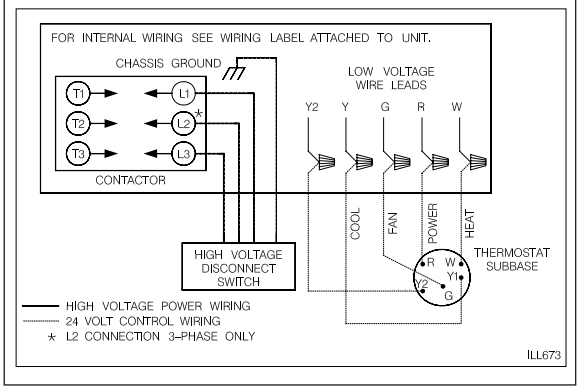


FIGURE 18
TYPICAL THERMOSTAT WIRING



	WIRE SIZE, AWG											
	14	**12**	**10**	**8**	**6**	**4**	**3**	**2**	**1**	**0**	**00**	**000**
CONDUIT SIZE	1/2″	1/2″	1/2″	3/4″	1″	1″	1-1/4″	1-1/4″	1-1/2″	1-1/2″	2″	2″
HOLE SIZE	7/8″	7/8″	7/8″	1-31/32″	1-23/64″	1-23/64″	1-23/32″	1-23/32″	1-31/32″	1-31/32″	2-15/32″	2-15/32″

NOTES: 1. DETERMINE REQUIRED WIRE SIZE FROM MINIMUM CIRCUIT AMPACITY SHOWN IN INSTALLATION & OPERATING INSTRUCTION.
2. BOTTOM POWER ENTRY WILL NOT ACCOMMODATE WIRE LARGER THAN #2 AWG (SHADED AREA).

B. HOOK-UP

To wire unit, refer to the following hook-up diagram.

Refer to Figures 3 and 17 for location of wiring entrances.

Wiring to be done in the field between the unit and devices not attached to the unit, or between separate devices which are field installed and located, shall conform with the temperature limitation for Type T wire [63°F rise (35°C)] when installed in accordance with the manufacturer's instructions.

C. INTERNAL WIRING

IMPORTANT: Some single phase units are equipped with a single pole contactor. Caution must be exercised when servicing as only one leg of the power supply is broken with the contactor.

A diagram of the internal wiring of this unit is located under the electrical box cover and this manual. If any of the original wire as supplied with the appliance must be replaced, the wire gauge and insulation must be same as original wiring.

Transformer is factory wired for 230 volts on 208/230 volt models and must be changed for 208 volt applications. See unit wiring diagram for 208 volt wiring.

D. THERMOSTAT

The room thermostat must be compatible with the spark ignition control on the unit. Generally, all thermostats that are not of the "current robbing" type are compatible with the integrated furnace control. The low voltage wiring should be sized as shown in Table 11.

Install the room thermostat in accordance with the instruction sheet packed in the box with the thermostat. Run the thermostat lead wires inside the blower compartment and connect to low voltage terminals as shown on the wiring diagram. Never install the thermostat on an outside wall or where it will be influenced by drafts, concealed hot or cold water pipes or ducts, lighting fixtures, radiation from fireplace, sun rays, lamps, televisions, radios or air streams from registers. Refer to instructions packed with the thermostat for "heater" selection or adjustment.

The following is a list of recommended thermostats to be used with or without an economizer:

Single Stage Cool W/O Economizer	Two Stage Cool W/Economizer
Maple Chase - Model #0970	Honeywell - Model #T7300-A1005
Honeywell - Model #T8602C	Honeywell - Model #T874D-1959
Maple Chase - Model #0960	
White Rodgers - Model #1F91-59	
Robertshaw - Model #CM64A-USAJ	

TABLE 11

FIELD WIRE SIZE FOR 24 VOLT THERMOSTAT CIRCUITS							
		SOLID COPPER WIRE - AWG.					
Thermostat Load - Amps	3.0	16	14	12	10	10	10
	2.5	16	14	12	12	12	10
	2.0	18	16	14	12	12	10
		50	100	150	200	250	300
		Length of Run – Feet (1)					

(1) The total wire length is the distance from the furnace to the thermostat and back to the furnace.

NOTE: DO NOT USE CONTROL WIRING SMALLER THAN NO. 18 AWG.

V. FURNACE SECTION CONTROLS AND IGNITION SYSTEM

NORMAL FURNACE OPERATING SEQUENCE

This unit is equipped with an integrated direct spark ignition control.

1. The thermostat calls for heat.
2. The control board will run a self check to verify that the limit control and manual reset overtemperature control are closed and that the pressure switch is open.
3. Upon closure of the pressure switch, the control board energizes the induced draft blower for a 15 second prepurge.
4. After the 15 second prepurge, the gas valve opens and the spark is initiated for 7 second trial for ignition.
5. Burners ignite and flame sensor proves all burners have lit.
6. The circulating air blower is energized after 30 seconds.
7. The control board enters a normal operation loop in which all safety controls are monitored continuously.
8. Thermostat is satisfied and opens.
9. The gas valve is de-energized and closes, shutting down the burner flame.
10. The control board will de-energize the inducer after a five second post purge.
11. The circulating air blower is de-energized after 90 seconds.

The integrated control is a three ignition system.

After a total of three cycles without sensing main burner flame, the system goes into a 100% lockout mode. After one hour, the ignition control repeats the prepurge and ignition cycles for 3 tries and then go into 100% lockout mode again. It continues this sequence of cycles and lockout each hour until ignition is successful or power is interrupted. During the lockout mode, neither the ignitor or gas valve will be energized until the system is reset by turning the thermostat to the “OFF” position or interrupting the electrical power to the unit for 3 seconds or longer. The induced draft blower and main burner will shut off when the thermostat is satisfied.

The circulating air blower will start and run on the heating speed if the thermostat fan switch is in the “ON” position.

The integrated furnace control is equipped with diagnostic LED. The LED is lit continuously when there is power to the control, with or without a call for heat. If the LED is not lit, there is either no power to the control or there is an internal component failure within the control, and the control should be replaced.

If the control detects the following failures, the LED will flash on for approximately 1/4 second, then off for 3/4 second for designated failure detections.

1 Flash: Failed to detect flame within the three tries for ignition.

2 Flash: Pressure switch or induced draft blower problem detected.

3 Flash: High limit or auxiliary limit open.

4 Flash: Flame sensed and gas valve not energized or flame sensed with no “W” signal.

5 Flash: Overtemperature switch open.

OPERATING INSTRUCTIONS

This appliance is equipped with integrated furnace control. This device lights the main burners each time the room thermostat (closes) calls for heat. See operating instructions on the back of the furnace/controls access panel.

⚠ WARNING

DO NOT ATTEMPT TO MANUALLY LIGHT THIS FURNACE WITH A MATCH OR ANY OPEN FLAME. ATTEMPTING TO DO SO CAN CAUSE AN EXPLOSION OR FIRE RESULTING IN PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

TO START THE FURNACE

1. STOP! Read the safety information on the Operating Instructions label located on this appliance.

⚠ WARNING

IF YOU DO NOT FOLLOW THESE INSTRUCTIONS EXACTLY, A FIRE OR EXPLOSION MAY RESULT CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR LOSS OF LIFE.

2. Set the thermostat to its lowest setting.
3. Turn off all electric power to the appliance.
4. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do NOT try to light the burner by hand.
5. Remove control door/access panel.
6. Move switch to the “OFF” position.
7. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP!
   - Do not try to light any appliance.
   - Do not touch any electric switch; do not use any phone in your building.
   - Immediately call your gas supplier from a neighbor’s phone. Follow the gas supplier’s instructions.
   - If you cannot reach your gas supplier, call the fire department.

   If you don’t smell gas, go to the next step.
8. Switch “OFF” position to “ON” position.
9. Replace the control door.
10. Turn on all electric power to the appliance.
11. Set the thermostat to the desired setting.
12. If the appliance will not operate, follow the instructions below on how to shut down the furnace.

⚠ WARNING

THE SPARK IGNITOR AND IGNITION LEAD FROM THE IGNITION CONTROL ARE HIGH VOLTAGE. KEEP HANDS OR TOOLS AWAY TO PREVENT ELECTRICAL SHOCK. SHUT OFF ELECTRICAL POWER BEFORE SERVICING ANY OF THE CONTROLS. FAILURE TO ADHERE TO THIS WARNING CAN RESULT IN PERSONAL INJURY OR DEATH.

The initial start-up on a new installation may require the control system to be energized for some time until air has bled through the system and fuel gas is available at the burners.

TO SHUT DOWN FURNACE

1. Set the thermostat to the lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Remove control door.
4. Move switch to the “OFF” position.
5. Replace control door.

⚠ WARNING

SHOULD OVERHEATING OCCUR OR THE GAS SUPPLY FAIL TO SHUT OFF, SHUT OFF THE MANUAL GAS VALVE TO THE APPLIANCE BEFORE SHUTTING OFF THE ELECTRICAL SUPPLY. FAILURE TO DO SO CAN RESULT IN AN EXPLOSION OR FIRE CAUSING PROPERTY DAMAGE, SEVERE PERSONAL INJURY OR DEATH!

BURNERS

Burners for these units have been designed so that field adjustment is not required. Burners are tray-mounted and accessible for easy cleaning when required.

MANUAL RESET OVERTEMPERATURE CONTROL

Two manual reset overtemperature controls (one on 80,000 BTUH) are located on the burner shield. These devices senses blockage in the heat exchanger or insufficient combustion air. This shuts off the main burners if excessive temperatures occur in the burner compartment.

Operation of this control indicates an abnormal condition. Therefore, the unit should be examined by a qualified installer, service agency, or the gas supplier before being placed back into operation.

⚠ WARNING

DO NOT JUMPER THIS DEVICE! DO NOT reset the overtemperature control without taking corrective action to assure that an adequate supply of combustion air is maintained under all conditions of operation. Failure to do so can result in carbon monoxide poisoning or death. Replace this control only with the identical replacement part.

PRESSURE SWITCH

This furnace has a pressure switch for sensing a blocked exhaust or a failed induced draft blower. It is normally open and closes when the induced draft blower starts, indicating air flow through the combustion chamber.

LIMIT CONTROL

The supply air high temperature limit cut-off is set at the factory and cannot be adjusted. It is calibrated to prevent the air temperature leaving the furnace from exceeding the maximum outlet air temperature.

⚠ WARNING

DO NOT JUMPER THIS DEVICE! DOING SO CAN CAUSE A FIRE OR EXPLOSION RESULTING IN PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

IMPORTANT: *Replace this control only with the identical replacement part.*

VI. SYSTEM OPERATING INFORMATION

ADVISE THE CUSTOMER

1. Change the air filters regularly. The heating system operates better, more efficiently and more economically.
2. Arrange the furniture and drapes so that the supply air registers and the return air grilles are unobstructed.
3. Close doors and windows. This reduces the heating and cooling load on the system.
4. Avoid excessive use of exhaust fans.
5. Do not permit the heat generated by television, lamps or radios to influence the thermostat operation.
6. Except for the mounting platform, keep all combustible articles three feet from the unit and exhaust system.
7. ***IMPORTANT:*** *Replace all blower doors and compartment cover after servicing the unit. Do not operate the unit without all panels and doors securely in place.*
8. Do not allow snow or other debris to accumulate in the vicinity of the appliance.

FURNACE SECTION MAINTENANCE

The unit's furnace should operate for many years without excessive scale build-up in flue passageways; however, it is recommended that a qualified installer, service agency, or the gas supplier annually inspect the flue passageways, the exhaust system and the burners for continued safe operation, paying particular attention to deterioration from corrosion or other sources.

If during inspection the flue passageways and exhaust system are determined to require cleaning, the following procedures should be followed **(by a qualified installer, service agency, or gas supplier):**

1. **Turn off the electrical power to the unit and set the thermostat to the lowest temperature.**
2. **Shut off the gas supply to the unit either at the meter or at manual valve in the supply piping.**

⚠ WARNING

LABEL ALL WIRES PRIOR TO DISCONNECTION WHEN SERVICING CONTROLS. WIRING ERRORS CAN CAUSE IMPROPER AND DANGEROUS OPERATION RESULTING IN FIRE, ELECTRICAL SHOCK, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

3. Remove the furnace controls access panel and the control box cover.
4. Disconnect the gas supply piping from the gas valve.
5. Disconnect the wiring to the induced draft blower motor, gas valve, flame sensor, and flame roll-out control, and ignitor cable. **Mark all wires disconnected for proper reconnection**.
6. Remove the screws (4) connecting the burner tray to the heat exchanger mounting panel.
7. Remove the burner tray and the manifold assembly from the unit.
8. Remove the screws (5) connecting the induced draft blower to the collector box and screws (18) connecting the collector box to the heat exchanger center panel. Remove the induced draft blower and the collector box from the unit.
9. Remove the screws (3) connecting the divider plate to the heat exchanger center panel.
10. Remove the turbulators from inside the heat exchangers by inserting the blade of a screwdriver under the locking tabs. Pop the tabs out of the expanded grooves of the heat exchanger. Slide the turbulators out of the heat exchangers.
11. Direct a water hose into the outlet of the heat exchanger top. Flush the inside of each heat exchanger tube with water. Blow out each tube with air to remove excessive moisture.
12. Reassemble (steps 1 through 10 in reverse order). **Be careful not to strip out the screw holes used to mount the collector box and inducer blower. Replace inducer blower gasket and collector box gasket with factory replacements if damaged.**

⚠ WARNING

HOLES IN THE EXHAUST TRANSITION OR HEAT EXCHANGER CAN CAUSE TOXIC FUMES TO ENTER THE HOME. THE EXHAUST TRANSITION OR HEAT EXCHANGER MUST BE REPLACED IF THEY HAVE HOLES OR CRACKS IN THEM. FAILURE TO DO SO CAN CAUSE CARBON MONOXIDE POISONING RESULTING IN PERSONAL INJURY OR DEATH.

The manufacturer recommends that a qualified installer, service agency or the gas supplier visually inspect the burner flames for the desired flame appearance at the beginning of the heating season and approximately midway in heating season.

The manufacturer also recommends that a qualified installer, service agency or the gas supplier clean the flame sensor with steel wool at the beginning of the heating season.

⚠ WARNING

DISCONNECT MAIN ELECTRICAL POWER TO THE UNIT BEFORE ATTEMPTING MAINTENANCE. FAILURE TO DO SO MAY RESULT IN ELECTRICAL SHOCK OR SEVERE PERSONAL INJURY OR DEATH.

LUBRICATION

IMPORTANT: DO NOT attempt to lubricate the bearings on the blower motor or the induced draft blower motor. Addition of lubricants can reduce the motor life and void the warranty.

The blower motor and induced draft blower motor are prelubricated by the manufacturer and do not require further attention.

A qualified installer, service agency or the gas supplier must periodically clean the motors to prevent the possibility of overheating due to an accumulation of dust and dirt on the windings or on the motor exterior. And, as suggested elsewhere in these instructions, the air filters should be kept clean because dirty filters can restrict air flow and the motor depends upon sufficient air flowing across and through it to prevent overheating.

COOLING SECTION MAINTENANCE

⚠ WARNING

DISCONNECT MAIN ELECTRICAL POWER TO THE UNIT BEFORE ATTEMPTING MAINTENANCE. FAILURE TO DO SO CAN CAUSE ELECTRICAL SHOCK RESULTING IN SEVERE PERSONAL INJURY OR DEATH.

It is recommended that at the beginning of each cooling season a qualified installer or service agency inspect and clean the cooling section of this unit. The following areas should be addressed: evaporator coil. condenser coil, condenser fan motor and venturi area.

To inspect the evaporator coil:

1. Remove the filter access panel and the blower/evaporator coil access panel. Remove the filters

⚠ WARNING

LABEL ALL WIRES PRIOR TO DISCONNECTION WHEN SERVICING THE UNIT. WIRING ERRORS CAN CAUSE IMPROPER AND DANGEROUS OPERATION RESULTING IN FIRE, ELECTRICAL SHOCK, PROPERTY DAMAGE, SEVERE PERSONAL INJURY OR DEATH.

2. Shine a flashlight on the evaporator coil (both sides) and inspect for accumulation of lint, insulation, etc.
3. If coil requires cleaning, follow the steps shown below.

Cleaning Evaporator Coil

1. The coil should be cleaned when it is dry. If the coil is coated with dirt or lint, vacuum it with a soft brush attachment. Be careful not to bend the coil fins.
2. If the coil is coated with oil or grease, clean it with a mild detergent-and-water solution. Rinse the coil thoroughly with water. **IMPORTANT: Do not** use excessive water pressure. Excessive water pressure can bend the fins and tubing of the coil and lead to inadequate unit performance. Be careful not to splash water excessively into unit.
3. Inspect the drain pan and condensate drain at the same time the evaporator coil is checked. Clean the drain pan by flushing with water and removing any matters of obstructions which may be present.
4. Go to next section for cleaning the condenser coil.

Cleaning Condenser Coil, Condenser Fan, Circulation Air Blower and Venturi

1. Remove the compressor access panel. Disconnect the wires to the condenser fan motor in the control box (see wiring diagram). Remove the wires from the opening in the bottom of the control box.
2. Remove the screws securing the condenser top panel and remove the panel with condenser fan motor and grille attached.
3. The coil should be cleaned when it is dry. If the coil is coated with dirt or lint, vacuum it with a soft brush attachment. Be careful not to bend the coil fins.
4. If the coil is coated with oil or grease, clean it with a mild detergent-and-water solution. Rinse the coil thoroughly with water. **IMPORTANT: Do not** use excessive water pressure. Excessive water pressure can bend the fins and tubing of the coil and lead to inadequate unit performance. Be careful not to splash water excessively into unit.
5. The venturi should also be inspected for items of obstruction such as collections of grass, dirt or spider webs. Remove any that are present.
6. Inspect the circulating air blower wheel and motor for accumulation of lint, dirt or other obstruction and clean it necessary. Inspect the blower motor mounts and the blower housing for loose mounts or other damage. Repair or replace if necessary.

Re-assembly

1. Place the condenser top panel back on the unit and replace all screws.
2. Run the fan motor wires through the hole in the bottom of the control box. Reconnect fan motor wires per the wiring diagram attached to the back of the cover.
3. Replace the filter and blower/evaporator coil access panels.
4. Replace the control box cover and controls access panel.
5. Restore electrical power to the unit and check for proper operation, especially the condenser fan motor.

REPLACEMENT PARTS

Contact your local distributor for a complete parts list.

TROUBLESHOOTING

Refer to Figures 23 and 24 for determining cause of unit problems.

WIRING DIAGRAMS

Figures 25, 26, 27, 28 and 29 are complete wiring diagrams for the unit and its power sources. Also located on back of compressor access panel.

CHARGING

See Figures 30 through 38 for proper charging information.

AIRFLOW PERFORMANCE DATA TABLES

TABLE 12 DIRECT DRIVE

MODEL NUMBER	3 TON — 10 SEER — 80,000 HEATING INPUT (1/2 H.P.)																							
OPERATION	HEATING												COOLING											
VOLTAGE	208						230						208						230					
MOTOR SPEED	LOW		MED.		HIGH		LOW		MED.		HIGH		LOW		MED.		HIGH		LOW		MED.		HIGH	
CFM/WATTS	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts
.10 E.S.P.	1210	405	—	—	—	—	1400	470	—	—	—	—	1210	405	—	—	—	—	1400	470	—	—	—	—
.20 E.S.P.	1193	400	—	—	—	—	1375	460	—	—	—	—	1195	400	—	—	—	—	1375	460	—	—	—	—
.30 E.S.P.	1175	395	—	—	—	—	1360	455	—	—	—	—	1175	395	—	—	—	—	1360	455	—	—	—	—
.40 E.S.P.	1155	385	—	—	—	—	1335	450	—	—	—	—	1155	385	—	—	—	—	1335	450	—	—	—	—
.50 E.S.P.	1125	380	—	—	—	—	1305	440	—	—	—	—	1125	380	—	—	—	—	1305	440	—	—	—	—
.60 E.S.P.	1075	375	—	—	—	—	1255	435	—	—	—	—	1075	375	—	—	—	—	1255	435	—	—	—	—
.70 E.S.P.	1015	370	1275	460	—	—	1210	425	—	—	—	—	1015	370	1275	460	—	—	1210	425	—	—	—	—
.80 E.S.P.	925	360	1180	445	1280	515	1100	410	1230	475	—	—	925	360	1180	445	1280	515	1100	410	1230	475	—	—

TABLE 13 DIRECT DRIVE

MODEL NUMBER	3 TON — 10 SEER — 120,000 HEATING INPUT (1/2 H.P.)																							
OPERATION	HEATING												COOLING											
VOLTAGE	208						230						208						230					
MOTOR SPEED	LOW		MED.		HIGH		LOW		MED.		HIGH		LOW		MED.		HIGH		LOW		MED.		HIGH	
CFM/WATTS	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts
.10 E.S.P.	—	—	—	—	1680	650	—	—	—	—	1870	780	1210	405	—	—	—	—	1400	470	—	—	—	—
.20 E.S.P.	—	—	—	—	1650	640	—	—	—	—	1830	760	1195	400	—	—	—	—	1375	460	—	—	—	—
.30 E.S.P.	—	—	—	—	1625	630	—	—	—	—	1790	740	1175	395	—	—	—	—	1360	455	—	—	—	—
.40 E.S.P.	—	—	—	—	1580	610	—	—	—	—	1730	700	1155	385	—	—	—	—	1335	450	—	—	—	—
.50 E.S.P.	—	—	—	—	1530	580	—	—	—	—	1660	660	1125	380	—	—	—	—	1305	440	—	—	—	—
.60 E.S.P.	—	—	—	—	1460	560	—	—	—	—	1580	635	1075	375	—	—	—	—	1255	435	—	—	—	—
.70 E.S.P.	—	—	—	—	1390	545	—	—	—	—	1500	600	1015	370	1275	460	—	—	1210	425	—	—	—	—
.80 E.S.P.	—	—	—	—	1280	515	—	—	—	—	1375	555	925	360	1180	445	1280	515	1100	410	1230	475	1375	555

NOTES: 1. Data shown is with dry coil conditions. See wet coil pressure drop.
2. Data includes 1″ filters.

AIRFLOW PERFORMANCE DATA TABLES

TABLE 14 DIRECT DRIVE

MODEL NUMBER	3 TON — 10 SEER — 80,000/120,000 HEATING INPUT (1/2 H.P.)											
OPERATION	HEATING						COOLING					
VOLTAGE	460 VOLT						460 VOLT					
MOTOR SPEED	LOW		MED.		HIGH		LOW		MED.		HIGH	
CFM/WATTS	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts
.10 E.S.P.	1400	470	—	—	—	—	1400	470	—	—	—	—
.20 E.S.P.	1375	460	—	—	—	—	1375	460	—	—	—	—
.30 E.S.P.	1360	455	—	—	—	—	1360	455	—	—	—	—
.40 E.S.P.	1335	450	—	—	—	—	1335	450	—	—	—	—
.50 E.S.P.	1305	440	—	—	—	—	1305	440	—	—	—	—
.60 E.S.P.	1255	435	—	—	—	—	1255	435	—	—	—	—
.70 E.S.P.	1210	425	—	—	—	—	1210	425	—	—	—	—
.80 E.S.P.	1100	410	—	—	—	—	1100	410	—	—	—	—

TABLE 15 DIRECT DRIVE

MODEL NUMBER	3-1/2 TON — 10 SEER — 80,000/120,000 HEATING INPUT (1/2 H.P.)											
OPERATION	HEATING						COOLING					
VOLTAGE	460 VOLT						460 VOLT					
MOTOR SPEED	LOW		MED.		HIGH		LOW		MED.		HIGH	
CFM/WATTS	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts
.10 E.S.P.	—	—	1685	635	—	—	—	—	1685	635	—	—
.20 E.S.P.	—	—	1620	600	—	—	—	—	1620	600	—	—
.30 E.S.P.	—	—	1580	580	—	—	—	—	1580	580	—	—
.40 E.S.P.	—	—	1550	570	—	—	—	—	1550	570	—	—
.50 E.S.P.	—	—	1500	550	—	—	—	—	1500	550	—	—
.60 E.S.P.	—	—	1430	535	—	—	—	—	1430	535	—	—
.70 E.S.P.	—	—	1350	505	—	—	—	—	1350	505	—	—
.80 E.S.P.	—	—	1230	475	—	—	—	—	1230	475	—	—

NOTE: 460 volt direct drive does not allow operation at separate speeds for heating and cooling. Any speed change must be made at the motor terminals and will be reflected in both heating and cooling operation.

AIRFLOW PERFORMANCE DATA TABLES

TABLE 16 DIRECT DRIVE

MODEL NUMBER	4 TON — 10 SEER — 100,000/135,000 HEATING INPUT (1/2 H.P.)											
OPERATION	HEATING						COOLING					
VOLTAGE	460 VOLT						460 VOLT					
MOTOR SPEED	LOW		MED.		HIGH		LOW		MED.		HIGH	
CFM/WATTS	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts
.10 E.S.P.	—	—	—	—	1870	780	—	—	—	—	1870	780
.20 E.S.P.	—	—	—	—	1830	760	—	—	—	—	1830	760
.30 E.S.P.	—	—	—	—	1790	740	—	—	—	—	1790	740
.40 E.S.P.	—	—	—	—	1730	700	—	—	—	—	1730	700
.50 E.S.P.	—	—	—	—	1660	660	—	—	—	—	1660	660
.60 E.S.P.	—	—	—	—	1580	635	—	—	—	—	1580	635
.70 E.S.P.	—	—	—	—	1500	600	—	—	—	—	1500	600
.80 E.S.P.	—	—	—	—	1375	555	—	—	—	—	1375	555

TABLE 17 DIRECT DRIVE

MODEL NUMBER	5 TON — 10 SEER — 100,000/135,000 HEATING INPUT (3/4 H.P.)											
OPERATION	HEATING						COOLING					
VOLTAGE	460 VOLT						460 VOLT					
MOTOR SPEED	LOW		MED.		HIGH		LOW		MED.		HIGH	
CFM/WATTS	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts
.10 E.S.P.	—	—	—	—	2400	1080	—	—	—	—	2400	1080
.20 E.S.P.	—	—	—	—	2380	1070	—	—	—	—	2380	1070
.30 E.S.P.	—	—	—	—	2260	1030	—	—	—	—	2260	1030
.40 E.S.P.	—	—	—	—	2180	980	—	—	—	—	2180	980
.50 E.S.P.	—	—	—	—	2100	960	—	—	—	—	2100	960
.60 E.S.P.	—	—	—	—	2000	930	—	—	—	—	2000	930
.70 E.S.P.	—	—	—	—	1900	880	—	—	—	—	1900	880
.80 E.S.P.	—	—	—	—	1600	820	—	—	—	—	1600	820

NOTE: 460 volt direct drive does not allow operation at separate speeds for heating and cooling. Any speed change must be made at the motor terminals and will be reflected in both heating and cooling operation.

AIRFLOW PERFORMANCE DATA TABLES

TABLE 18 DIRECT DRIVE

MODEL NUMBER	3½ TON — 10 SEER — 80,000 HEATING INPUT (1/2 H.P.)																							
OPERATION	HEATING												COOLING											
VOLTAGE	208						230						208						230					
MOTOR SPEED	LOW		MED.		HIGH		LOW		MED.		HIGH		LOW		MED.		HIGH		LOW		MED.		HIGH	
CFM/WATTS	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts
.10 E.S.P.	1210	405	—	—	—	—	1400	470	—	—	—	—	1210	405	1515	525	—	—	1400	470	1685	635	—	—
.20 E.S.P.	1193	400	—	—	—	—	1375	460	—	—	—	—	1195	400	1500	515	—	—	1375	460	1620	600	—	—
.30 E.S.P.	1175	395	—	—	—	—	1360	455	—	—	—	—	—	—	1475	505	—	—	1360	455	1580	580	—	—
.40 E.S.P.	1155	385	—	—	—	—	1335	450	—	—	—	—	—	—	1450	500	—	—	—	—	1550	570	—	—
.50 E.S.P.	1125	380	—	—	—	—	1305	440	—	—	—	—	—	—	1405	490	1530	580	—	—	1500	550	—	—
.60 E.S.P.	1075	375	1350	475	—	—	1255	435	—	—	—	—	—	—	1350	475	1460	560	—	—	1430	535	1580	635
.70 E.S.P.	1015	370	1275	460	1390	545	1210	425	1350	505	—	—	—	—	1275	460	1390	545	—	—	1350	505	1500	600
.80 E.S.P.	925	360	1180	445	1280	515	1100	410	1230	475	1375	555	—	—	1180	445	1280	515	—	—	1230	475	1375	555

TABLE 19 DIRECT DRIVE

MODEL NUMBER	3½ TON — 10 SEER — 120,000 HEATING INPUT (1/2 H.P.)																							
OPERATION	HEATING												COOLING											
VOLTAGE	208						230						208						230					
MOTOR SPEED	LOW		MED.		HIGH		LOW		MED.		HIGH		LOW		MED.		HIGH		LOW		MED.		HIGH	
CFM/WATTS	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts
.10 E.S.P.	—	—	1515	525	1680	650	—	—	1685	635	1870	780	1210	405	1515	525	—	—	1400	470	1685	635	—	—
.20 E.S.P.	—	—	—	—	1650	640	—	—	1620	600	1830	760	1195	400	1500	515	—	—	1375	460	1620	600	—	—
.30 E.S.P.	—	—	—	—	1625	630	—	—	1580	580	1790	740	—	—	1475	505	—	—	1360	455	1580	580	—	—
.40 E.S.P.	—	—	—	—	1580	610	—	—	—	—	1730	700	—	—	1450	500	—	—	—	—	1550	570	—	—
.50 E.S.P.	—	—	—	—	1530	580	—	—	—	—	1660	660	—	—	1405	490	1530	580	—	—	1500	550	—	—
.60 E.S.P.	—	—	—	—	1460	560	—	—	—	—	1580	635	—	—	1350	475	1460	560	—	—	1430	535	1580	635
.70 E.S.P.	—	—	—	—	1390	545	—	—	—	—	1500	600	—	—	1275	460	1390	545	—	—	1350	505	1500	600
.80 E.S.P.	—	—	—	—	1280	515	—	—	—	—	1375	555	—	—	1180	445	1280	515	—	—	1230	475	1375	555

TABLE 20 DIRECT DRIVE

MODEL NUMBER	4 TON — 10 SEER — 100,000 HEATING INPUT (1/2 H.P.)																							
OPERATION	HEATING												COOLING											
VOLTAGE	208						230						208						230					
MOTOR SPEED	LOW		MED.		HIGH		LOW		MED.		HIGH		LOW		MED.		HIGH		LOW		MED.		HIGH	
CFM/WATTS	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts
.10 E.S.P.	—	—	1515	525	—	—	1400	470	1685	635	—	—	—	—	1515	525	1680	650	—	—	1685	635	1870	780
.20 E.S.P.	—	—	1500	515	—	—	1375	460	1620	600	—	—	—	—	1500	515	1650	640	—	—	1620	600	1830	760
.30 E.S.P.	—	—	1475	505	—	—	1360	455	1580	580	—	—	—	—	1475	505	1625	630	—	—	1580	580	1790	740
.40 E.S.P.	—	—	1450	500	—	—	—	—	1550	570	—	—	—	—	1450	500	1580	610	—	—	1550	570	1730	700
.50 E.S.P.	—	—	1405	490	—	—	—	—	1500	550	—	—	—	—	—	—	1530	580	—	—	—	—	1660	660
.60 E.S.P.	—	—	1350	475	1460	560	—	—	1430	535	1380	635	—	—	—	—	1460	560	—	—	—	—	1580	635
.70 E.S.P.	—	—	1275	460	1390	545	—	—	1350	505	1500	600	—	—	—	—	1390	545	—	—	—	—	1500	600
.80 E.S.P.	—	—	1180	445	1280	515	—	—	1230	475	1375	555	—	—	—	—	1280	515	—	—	—	—	1375	555

NOTES: 1. Data shown is with dry coil conditions. See wet coil pressure drop.
2. Data includes 1″ filters.

TABLE 21 DIRECT DRIVE

MODEL NUMBER	4 TON — 10 SEER — 135,000 HEATING INPUT (1/2 H.P.)																							
OPERATION	HEATING												COOLING											
VOLTAGE	208						230						208						230					
MOTOR SPEED	LOW		MED.		HIGH		LOW		MED.		HIGH		LOW		MED.		HIGH		LOW		MED.		HIGH	
CFM/WATTS	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts
.10 E.S.P.	—	—	—	—	1680	650	—	—	1685	635	1870	780	—	—	1515	525	1680	650	—	—	1685	635	1870	780
.20 E.S.P.	—	—	—	—	1650	640	—	—	1620	600	1830	760	—	—	1500	515	1630	640	—	—	1620	600	1830	760
.30 E.S.P.	—	—	—	—	1625	630	—	—	1580	580	1790	740	—	—	1475	505	1625	630	—	—	1580	580	1790	740
.40 E.S.P.	—	—	—	—	1580	610	—	—	1550	570	1730	700	—	—	1450	500	1580	610	—	—	1550	570	1730	700
.50 E.S.P.	—	—	—	—	1530	580	—	—	—	—	1660	660	—	—	—	—	1530	580	—	—	—	—	1660	660
.60 E.S.P.	—	—	—	—	1460	560	—	—	—	—	1580	635	—	—	—	—	1460	560	—	—	—	—	1580	635
.70 E.S.P.	—	—	—	—	1390	545	—	—	—	—	1500	600	—	—	—	—	1390	545	—	—	—	—	1500	600
.80 E.S.P.	—	—	—	—	1280	515	—	—	—	—	1375	555	—	—	—	—	1280	515	—	—	—	—	1375	555

TABLE 22 DIRECT DRIVE

MODEL NUMBER	5 TON — 10 SEER — 100,000 HEATING INPUT (3/4 H.P.)																							
OPERATION	HEATING												COOLING											
VOLTAGE	208						230						208						230					
MOTOR SPEED	LOW		MED.		HIGH		LOW		MED.		HIGH		LOW		MED.		HIGH		LOW		MED.		HIGH	
CFM/WATTS	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts
.10 E.S.P.	1450	605	—	—	—	—	1690	750	—	—	—	—	—	—	2050	830	2180	970	—	—	2175	980	2400	1080
.20 E.S.P.	1425	590	—	—	—	—	1660	740	—	—	—	—	—	—	1960	790	2150	940	—	—	2125	920	2380	1070
.30 E.S.P.	1405	580	—	—	—	—	1615	730	—	—	—	—	—	—	1890	760	2060	905	—	—	2040	880	2260	1030
.40 E.S.P.	1375	570	—	—	—	—	1570	710	—	—	—	—	—	—	1800	730	1950	860	—	—	1950	860	2180	980
.50 E.S.P.	1335	560	—	—	—	—	1310	680	—	—	—	—	—	—	—	—	1830	820	—	—	1825	825	2100	960
.60 E.S.P.	1300	550	—	—	—	—	1440	660	—	—	—	—	—	—	—	—	1680	770	—	—	—	—	2000	930
.70 E.S.P.	1260	540	—	—	1450	705	1375	645	—	—	—	—	—	—	—	—	1450	705	—	—	—	—	1900	880
.80 E.S.P.	1220	530	—	—	1340	670	1310	625	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1600	820

TABLE 23 DIRECT DRIVE

MODEL NUMBER	5 TON — 10 SEER — 135,000 HEATING INPUT (3/4 H.P.)																							
OPERATION	HEATING												COOLING											
VOLTAGE	208						230						208						230					
MOTOR SPEED	LOW		MED.		HIGH		LOW		MED.		HIGH		LOW		MED.		HIGH		LOW		MED.		HIGH	
CFM/WATTS	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts
.10 E.S.P.	—	—	2050	830	2180	970	—	—	2175	980	2400	1080	—	—	—	—	2180	970	—	—	2175	980	2400	1080
.20 E.S.P.	—	—	1960	790	2150	940	—	—	2123	920	2380	1070	—	—	—	—	2150	940	—	—	2125	920	2380	1070
.30 E.S.P.	—	—	1860	760	2060	905	—	—	2040	880	2260	1030	—	—	—	—	2060	905	—	—	2040	880	2260	1030
.40 E.S.P.	—	—	1800	730	1960	860	—	—	1950	860	2180	980	—	—	—	—	1960	860	—	—	1930	860	2180	980
.50 E.S.P.	—	—	—	—	1830	820	—	—	1825	825	2100	960	—	—	—	—	1830	820	—	—	1825	825	2100	960
.60 E.S.P.	—	—	—	—	1680	770	—	—	—	—	2000	930	—	—	—	—	1680	770	—	—	—	—	2000	930
.70 E.S.P.	—	—	—	—	1450	705	—	—	—	—	1900	880	—	—	—	—	1450	705	—	—	—	—	1900	880
.80 E.S.P.	—	—	—	—	—	—	—	—	—	—	1600	820	—	—	—	—	—	—	—	—	—	—	1600	820

NOTES: 1. Data shown is with dry coil conditions. See wet coil pressure drop.
2. Data includes 1″ filters.

AIR-FLOW PERFORMANCE – GAS HEAT MODELS
TABLE 24

AIR FLOW CFM	CAPACITY: 3 TON - 10 SEER VOLTAGE: 208/230 - 460 & 575 EXTERNAL STATIC PRESSURE																											
	0.1		0.2		0.3		0.4		0.5		0.6		0.7		0.8		0.9		1.0		1.10		1.20		1.30		1.40		1.50	
	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
900	—	—	—	—	650	230	715	260	780	290	845	340	905	400	960	455	1010	470	1055	490	1095	525	1140	555	1170	580	1215	625	1240	645
1000	—	—	615	225	670	255	740	280	800	320	860	375	925	425	980	470	1025	485	1075	515	1105	540	1155	575	1180	605	1225	650	1260	715
1100	—	—	630	255	700	275	760	310	820	345	885	390	940	435	995	485	1035	505	1085	540	1120	575	1170	615	1190	640	1235	690	1270	730
1200	605	250	655	270	720	305	775	340	835	370	900	415	955	475	1005	495	1045	540	1095	580	1130	605	1180	655	1210	690	1245	730	1290	780
1300	620	275	675	300	750	340	805	375	855	400	920	455	970	505	1025	530	1060	575	1115	610	1155	630	1195	680	1220	730	1255	780	1300	825
1400	640	305	710	340	775	375	825	395	880	440	940	480	990	520	1035	560	1080	590	1125	650	1170	705	1215	775	1230	810	1270	840	1320	880
1500	680	340	745	370	800	405	845	425	910	490	955	535	1005	565	1050	615	1090	660	1135	700	1185	760	1225	820	1240	850	1290	905	1330	940
						“L”														“M”								“N”		

DRIVE PACKAGE	“L”							“M”						
MOTOR H.P.	1/2							1/2						
BLOWER SHEAVE	6.9″ PITCH DIAMETER							6.4″ PITCH DIAMETER						
MOTOR SHEAVE	2.4″ - 3.4″ PITCH DIAMETER							3.6″ - 4.4″ PITCH DIAMETER						
TURNS OPEN	0	1	2	3	4	5	6	0	1	2	3	4	5	6
RPM	920	855	800	750	705	665	605	1230	1180	1130	1090	1045	1000	940

“N” DRIVE (FIELD SUPPLIED)
BLOWER SHEAVE – 5.7 PITCH DIAMETER
MOTOR SHEAVE– 3.4 - 4.4 PITCH DIAMETER
RANGE – 1030 - 1330
MOTOR – 1/2 H.P. - 1750 RPM

COMPONENT AIR RESISTANCE

COMPONENT	STANDARD INDOOR AIRFLOW - CFM									
	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800
	RESISTANCE - INCHES WATER									
WET COIL	.035	.040	.060	.070	.085	.100	.110	.120	.125	.130
DOWNFLOW	.055	.060	.066	.072	.080	.086	.093	.100	.107	.115
ECONOMIZER R. A. DAMPER	.05	.06	.07	.08	.09	.10	.11	.12	.13	.15

NOTES:
1. PERFORMANCE SHOWN WITH DRY COIL & STANDARD 1″ FILTERS
2. STANDARD CFM @ .075 LBS./CU. FT.
3. MOTOR EFFICIENCY = 80%
4. BHP = $\frac{\text{WATTS X MOTOR EFF.}}{746}$
5. ADD COMPONENT RESISTANCE TO DUCT STATIC TO DETERMINE TOTAL E.S.P.

AIR-FLOW PERFORMANCE – 3.5 TON BELT DRIVE
TABLE 25

AIR FLOW CFM	CAPACITY: 3.5 TON - 10 SEER VOLTAGE: 208/230 - 460 & 575 EXTERNAL STATIC PRESSURE																											
	0.1		0.2		0.3		0.4		0.5		0.6		0.7		0.8		0.9		1.0		1.10		1.20		1.30		1.40		1.50	
	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
1000	—	—	—	—	—	—	735	305	790	325	850	360	895	380	945	400	995	420	1060	455	1105	490	1145	520	1185	550	1220	590	1265	630
1100	—	—	—	—	—	—	750	320	810	355	870	380	915	400	965	415	1010	450	1075	500	1120	520	1160	560	1195	590	1240	640	1275	700
1200	—	—	—	—	725	335	770	350	835	380	885	410	935	440	985	450	1030	500	1090	540	1130	580	1170	600	1215	650	1255	710	1290	760
1300	—	—	—	—	745	360	800	395	860	415	905	445	955	465	1005	510	1050	550	1105	590	1140	610	1180	650	1230	710	1270	790	1305	815
1400	—	—	725	375	765	395	830	420	880	460	925	490	965	510	1015	560	1065	600	1120	640	1150	665	1190	710	1245	790	1290	850	1325	900
1500	—	—	740	410	795	440	855	480	905	495	950	540	1000	590	1030	610	1090	650	1135	690	1170	720	1205	765	1260	860	1310	920	1335	980
1600	725	410	765	445	820	470	875	510	825	540	975	570	1015	640	1055	660	1105	700	1145	745	1185	800	1225	860	1275	915	1325	1005	1350	1040
1700	740	460	795	495	850	520	900	550	945	600	1000	650	1020	690	1075	740	1125	760	1165	810	1205	865	1240	940	1290	1005	1340	—	—	—
1800	770	500	825	535	875	570	925	605	980	650	1010	710	1045	750	1100	790	1145	835	1185	900	1225	960	1270	1020	1315	1110	—	—	—	—
						"L"														"M"								"N"		

DRIVE PACKAGE	"L"							"M"						
MOTOR H.P.	1/2							1/2						
BLOWER SHEAVE	6.9″ PITCH DIAMETER							6.9″ PITCH DIAMETER						
MOTOR SHEAVE	2.8″ - 3.8″ PITCH DIAMETER							4.0″ - 5.0″ PITCH DIAMETER						
TURNS OPEN	0	1	2	3	4	5	6	0	1	2	3	4	5	6
RPM	958	945	905	865	820	770	725	1225	1185	1145	1100	1060	1020	1000

"N" DRIVE (FIELD SUPPLIED)
BLOWER SHEAVE – 6.4″ PITCH DIAMETER
MOTOR SHEAVE– 4.0″ - 5.0″ PITCH DIAMETER
RANGE – 1090 - 1365
MOTOR – 1/2 H.P. - 1750 RPM

COMPONENT AIR RESISTANCE

COMPONENT	STANDARD INDOOR AIRFLOW - CFM									
	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800
	RESISTANCE - INCHES WATER									
WET COIL	.035	.040	.060	.070	.065	.100	.110	.120	.125	.130
DOWNFLOW	.055	.060	.066	.072	.080	.086	.093	.100	.107	.115
ECONOMIZER R. A. DAMPER	.05	.06	.07	.08	.09	.10	.11	.12	.13	.15

NOTES:
1. PERFORMANCE SHOWN WITH DRY COIL & STANDARD 1″ FILTERS
2. STANDARD CFM @ .075 LBS./CU. FT.
3. MOTOR EFFICIENCY = 80%
4. BHP = $\frac{\text{WATTS X MOTOR EFF.}}{746}$
5. ADD COMPONENT RESISTANCE TO DUCT STATIC TO DETERMINE TOTAL E.S.P.

AIR-FLOW PERFORMANCE – 4 TON BELT DRIVE
TABLE 26

AIR FLOW CFM	CAPACITY: 4 TON - 10 SEER VOLTAGE: 208/230 - 460 & 575 EXTERNAL STATIC PRESSURE																													
	0.1		0.2		0.3		0.4		0.5		0.6		0.7		0.8		0.9		1.0		1.10		1.20		1.30		1.40		1.50	
	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
1200	—	—	—	—	—	—	780	360	835	390	885	410	935	440	975	475	1015	505	1070	550	1120	570	1170	600	1220	635	1265	655	1320	705
1300	—	—	—	—	—	—	805	390	855	410	910	450	950	470	990	510	1030	545	1085	590	1135	610	1185	640	1235	685	1285	730	1335	775
1400	—	—	—	—	770	385	825	425	870	445	925	480	960	510	1010	550	1050	600	1105	615	1155	650	1200	700	1245	730	1300	770	1345	825
1500	—	—	—	—	790	425	850	475	900	490	940	515	980	550	1025	600	1075	640	1125	670	1175	700	1220	745	1270	780	1315	825	1355	855
1600	—	—	775	425	815	455	870	495	920	530	960	580	1005	605	1050	660	1095	680	1145	710	1195	755	1235	800	1285	845	1330	890	1370	935
1700	—	—	795	470	850	505	900	540	940	560	980	605	1025	655	1075	715	1120	735	1165	770	1215	810	1270	870	1305	915	1350	940	1385	1000
1800	775	470	820	515	875	555	930	600	960	625	1010	680	1050	740	1100	760	1150	800	1190	840	1235	890	1280	930	1330	985	1365	1020	—	—
1900	800	525	855	560	910	610	955	650	995	700	1035	755	1075	800	1130	840	1175	870	1220	920	1260	955	1305	1010	1350	1070	1385	1115	—	—
2000	830	595	885	640	940	670	970	710	1020	790	1065	840	1115	860	1180	900	1200	950	1240	1010	1295	1060	1330	1105	1375	1160	—	—	—	—
						“L”														“M”								“N”		

DRIVE PACKAGE	“L”							“M”						
MOTOR H.P.	1/2							3/4						
BLOWER SHEAVE	6.4″ PITCH DIAMETER							5.7″ PITCH DIAMETER						
MOTOR SHEAVE	2.8″ - 3.8″ PITCH DIAMETER							3.4″ - 4.4″ PITCH DIAMETER						
TURNS OPEN	0	1	2	3	4	5	6	0	1	2	3	4	5	6
RPM	1060	1000	955	910	865	825	770	1385	1330	1280	1225	1175	1120	1060

COMPONENT AIR RESISTANCE

COMPONENT	STANDARD INDOOR AIRFLOW - CFM									
	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800
	RESISTANCE - INCHES WATER									
WET COIL	.035	.040	.060	.070	.085	.100	.110	.120	.125	.130
DOWNFLOW	.055	.060	.066	.072	.080	.086	.093	.100	.107	.115
ECONOMIZER R. A. DAMPER	.05	.06	.07	.08	.09	.10	.11	.12	.13	.15

NOTES:
1. PERFORMANCE SHOWN WITH DRY COIL & STANDARD 1″ FILTERS
2. STANDARD CFM @ .075 LBS./CU. FT.
3. MOTOR EFFICIENCY = 80%
4. BHP = $\frac{\text{WATTS X MOTOR EFF.}}{746}$
5. ADD COMPONENT RESISTANCE TO DUCT STATIC TO DETERMINE TOTAL E.S.P.

AIR-FLOW PERFORMANCE – 5 TON SINGLE PHASE BELT DRIVE
TABLE 27

AIR FLOW CFM	CAPACITY: 5 TON - 10 SEER VOLTAGE: 208/230 - 460 & 575 EXTERNAL STATIC PRESSURE													
	0.1		0.2		0.3		0.4		0.5		0.6		0.7	
	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
1400	—	—	765	360	830	380	890	400	950	420	990	435	1020	455
1500	—	—	795	395	855	425	925	460	960	480	1005	510	—	—
1600	770	410	835	440	880	460	940	490	980	500	1015	540	—	—
1700	825	460	860	490	925	520	955	540	1010	560	1035	590	—	—
1800	860	520	905	540	945	565	995	580	1030	630	1045	650	—	—
1900	905	565	945	600	980	640	1010	660	1040	710	—	—	—	—
2000	950	640	980	670	1010	710	1030	740	—	—	—	—	—	—
2100	990	730	1015	760	1040	800	—	—	—	—	—	—	—	—
2200	1030	825	1040	870	—	—	—	—	—	—	—	—	—	—
2300	—	—	—	—	—	—	—	—	—	—	—	—	—	—
"L" – 208 VOLT														

AIR FLOW CFM	EXTERNAL STATIC PRESSURE													
	0.1		0.2		0.3		0.4		0.5		0.6		0.7	
	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
1400	—	—	765	350	830	360	890	380	950	400	990	445	1030	450
1500	—	—	795	380	855	400	925	440	960	460	1005	475	1050	500
1600	770	400	835	425	880	445	940	475	980	490	1015	530	1065	560
1700	825	440	860	470	925	490	955	515	1010	540	1035	580	—	—
1800	860	500	805	525	945	540	995	570	1030	605	1045	640	—	—
1900	905	555	945	557	980	600	1010	650	1040	670	1065	710	—	—
2000	950	620	980	640	1010	700	1030	730	1065	750	—	—	—	—
2100	990	690	1015	720	1040	750	1065	790	—	—	—	—	—	—
2200	1030	760	1040	790	—	—	—	—	—	—	—	—	—	—
2300	1060	860	—	—	—	—	—	—	—	—	—	—	—	—
"L" – 230 VOLT														

DRIVE PACKAGE	"L" - 208 VOLT							"L" - 230 VOLT						
MOTOR H.P.	3/4 - 4 POLE - SINGLE PHASE							3/4 - 4 POLE - SINGLE PHASE						
BLOWER SHEAVE	6.4″ PITCH DIAMETER							6.4″ PITCH DIAMETER						
MOTOR SHEAVE	2.8″ - 3.8″ PITCH DIAMETER							2.8″ - 3.8″ PITCH DIAMETER						
TURNS OPEN	0	1	2	3	4	5	6	0	1	2	3	4	5	6
RPM	1045	1000	955	905	860	810	745	1065	1025	980	930	880	830	765

COMPONENT AIR RESISTANCE

COMPONENT	STANDARD INDOOR AIRFLOW - CFM									
	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800
	RESISTANCE - INCHES WATER									
WET COIL	.035	.040	.060	.070	.085	.100	.110	.120	.125	.130
DOWNFLOW	.055	.060	.066	.072	.080	.086	.093	.100	.107	.115
ECONOMIZER R. A. DAMPER	.05	.06	.07	.08	.09	.10	.11	.12	.13	.15

NOTES:
1. PERFORMANCE SHOWN WITH DRY COIL & STANDARD 1″ FILTERS
2. STANDARD CFM @ .075 LBS./CU. FT.
3. MOTOR EFFICIENCY = 80%
4. BHP = $\frac{\text{WATTS X MOTOR EFF.}}{746}$
5. ADD COMPONENT RESISTANCE TO DUCT STATIC TO DETERMINE TOTAL E.S.P.

AIR-FLOW PERFORMANCE – 5 TON THREE PHASE BELT DRIVE
TABLE 28

AIR FLOW CFM	CAPACITY: 5 TON - 10 SEER VOLTAGE: 208/230 - 460 & 575-3 PHASE EXTERNAL STATIC PRESSURE																													
	0.1		0.2		0.3		0.4		0.5		0.6		0.7		0.8		0.9		1.0		1.10		1.20		1.30		1.40		1.50	
	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
1400	—	—	—	—	780	370	815	385	875	425	930	460	970	490	1030	540	1065	570	1105	595	1150	615	1195	645	1235	660	1300	705	1340	745
1500	—	—	—	—	795	405	840	415	895	440	945	500	995	540	1045	595	1080	615	1135	650	1165	675	1215	700	1255	735	1320	775	1355	805
1600	—	—	780	390	805	425	870	470	915	510	965	560	1015	600	1060	640	1105	680	1145	705	1180	730	1225	750	1275	790	1340	840	1365	880
1700	—	—	795	450	840	490	895	530	940	570	990	605	1035	640	1075	680	1120	725	1160	755	1200	790	1245	815	1300	855	1355	905	1375	940
1800	780	455	815	470	870	540	915	560	965	615	1010	660	1055	710	1100	760	1140	785	1175	810	1225	850	1260	880	1320	930	1365	985	1390	1020
1900	800	485	850	530	895	590	945	640	995	675	1035	720	1070	775	1120	810	1160	850	1200	890	1245	915	1290	960	1335	1000	1375	1050	1405	1100
2000	830	550	880	605	930	655	970	700	1015	730	1055	790	1105	830	1145	875	1180	910	1225	950	1260	980	1320	1035	1350	1075	1385	1120	—	—
2100	860	615	915	655	955	705	1005	760	1040	820	1090	870	1130	910	1170	950	1210	995	1250	1020	1290	1060	1335	1100	1370	1150	1400	1200	—	—
2200	895	680	945	735	995	780	1030	830	1060	880	1120	940	1155	980	1195	1020	1240	1055	1275	1100	1320	1140	1360	1180	1385	1225	—	—	—	—
2300	940	755	975	795	1015	830	1065	910	1100	965	1150	1050	1180	1050	1225	1095	1265	1125	1310	1175	1350	1230	1375	1260	1405	1320	—	—	—	—
2400	970	825	1015	880	1040	925	1100	1005	1145	1055	1175	1085	1225	1140	1260	1175	1300	1210	1340	1255	1370	1315	1400	1375	—	—	—	—	—	—
			"L"														"M"													

DRIVE PACKAGE	"L"							"M"						
MOTOR H.P.	3/4							1						
BLOWER SHEAVE	6.4" PITCH DIAMETER							6.4" PITCH DIAMETER						
MOTOR SHEAVE	2.8" - 3.8" PITCH DIAMETER - ADJ.							3.4" - 4.4" PITCH DIAMETER - ADJ.						
TURNS OPEN	0	1	2	3	4	5	6	0	1	2	3	4	5	6
RPM	1095	1040	995	940	890	835	780	1405	1360	1305	1250	1195	1145	1095

COMPONENT AIR RESISTANCE

COMPONENT	STANDARD INDOOR AIRFLOW - CFM									
	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800
	RESISTANCE - INCHES WATER									
WET COIL	.035	.040	.060	.070	.085	.100	.110	.120	.125	.130
DOWNFLOW	.055	.060	.066	.072	.080	.086	.093	.100	.107	.115
ECONOMIZER R. A. DAMPER	.05	.06	.07	.08	.09	.10	.11	.12	.13	.15

NOTES:
1. PERFORMANCE SHOWN WITH DRY COIL & STANDARD 1" FILTERS
2. STANDARD CFM @ .075 LBS./CU. FT.
3. MOTOR EFFICIENCY = 80%
4. BHP = $\frac{\text{WATTS X MOTOR EFF.}}{746}$
5. ADD COMPONENT RESISTANCE TO DUCT STATIC TO DETERMINE TOTAL E.S.P.

AIR-FLOW PERFORMANCE – 6 TON BELT DRIVE
TABLE 29

AIR FLOW CFM	CAPACITY: 6 TON VOLTAGE: 208/230 - 460 & 575 - 3 PHASE EXTERNAL STATIC PRESSURE																													
	0.1		0.2		0.3		0.4		0.5		0.6		0.7		0.8		0.9		1.0		1.10		1.20		1.30		1.40		1.50	
	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
1800	—	—	—	—	—	—	785	560	850	605	895	650	930	670	975	720	1010	760	1050	800	1090	850	1120	890	1150	940	1180	980	1210	1015
1900	—	—	—	—	785	580	830	615	875	660	915	700	955	740	990	770	1020	815	1070	855	1105	925	1135	960	1165	1015	1195	1075	1220	1115
2000	—	—	775	600	815	625	860	675	895	720	930	750	975	800	1015	840	1050	900	1065	940	1120	1000	1145	1035	1175	1090	1205	1150	1230	1205
2100	—	—	810	650	840	680	880	740	920	780	955	820	995	860	1030	920	1065	960	1100	1025	1130	1080	1160	1130	1190	1180	1220	1250	1240	1295
2200	780	660	825	700	865	750	910	810	945	850	980	880	1015	930	1050	1000	1080	1045	1120	1100	1145	1180	1180	1220	1205	1260	1230	1330	1255	1380
2300	815	720	855	760	890	830	930	870	960	910	1000	960	1035	1005	1065	1060	1100	1130	1135	1180	1160	1250	1200	1325	1220	1370	1240	1425	—	—
2400	845	780	880	835	920	900	950	945	990	990	1025	1050	1055	1110	1085	1155	1120	1215	1150	1335	1185	1355	1220	1430	1235	1470	1255	1525	—	—
2500	870	855	910	915	945	975	960	1020	1020	1085	1045	1140	1080	1200	1110	1260	1135	1300	1175	1390	1205	1450	1230	1530	1250	1580	1295	1630	—	—
2600	900	945	940	1005	975	1060	1005	1105	1040	1175	1065	1225	1100	1295	1135	1350	1165	1425	1200	1505	1225	1580	1240	1635	1270	1665	—	—	—	—
2700	930	1075	970	1100	1000	1145	1030	1200	1060	1260	1090	1335	1125	1395	1155	1470	1185	1540	1220	1615	1235	1875	1255	1730	—	—	—	—	—	—
						"L"																		"M"						

DRIVE PACKAGE	"L"							"M"						
MOTOR H.P.	1 1/2							11/2						
BLOWER SHEAVE	6.4" PITCH DIAMETER							6.4" PITCH DIAMETER						
MOTOR SHEAVE	2.8" - 3.8" PITCH DIAMETER							3.4" - 4.4" PITCH DIAMETER						
TURNS OPEN	0	1	2	3	4	5	6	0	1	2	3	4	5	6
RPM	1100	1050	1000	945	895	845	780	1295	1230	1195	1145	1100	1050	1000

COMPONENT AIR RESISTANCE

COMPONENT	STANDARD INDOOR AIRFLOW - CFM									
	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800
	RESISTANCE - INCHES WATER									
WET COIL	.035	.040	.060	.070	.085	.100	.110	.120	.125	.130
DOWNFLOW	.055	.060	.066	.072	.080	.086	.093	.100	.107	.115
ECONOMIZER R. A. DAMPER	.05	.06	.07	.08	.09	.10	.11	.12	.13	.15

NOTES:
1. PERFORMANCE SHOWN WITH DRY COIL & STANDARD 1" FILTERS
2. STANDARD CFM @ .075 LBS./CU. FT.
3. MOTOR EFFICIENCY = 80%
4. BHP = $\frac{\text{WATTS X MOTOR EFF.}}{746}$
5. ADD COMPONENT RESISTANCE TO DUCT STATIC TO DETERMINE TOTAL E.S.P.

BLOWER MOTOR SPEED TAPS

After determining necessary CFM and speed tap data from Tables 13-30, follow the steps below to change speeds.

1. Remove the blower access panel.
2. Reference Figure 19 for location of the speed tap block on the blower.
3. Remove the furnace control access panel.
4. Remove the control box cover. See Figure 20 for location of the integrated furnace control board.
5. Reference Figure 21 for the proper location of the red and black wires on the speed tap block and on the furnace integrated control board to obtain the speed tap you have chosen.
6. After adjusting the wires accordingly, attach the control box cover, furnace control access panel and the blower access panel to the unit.

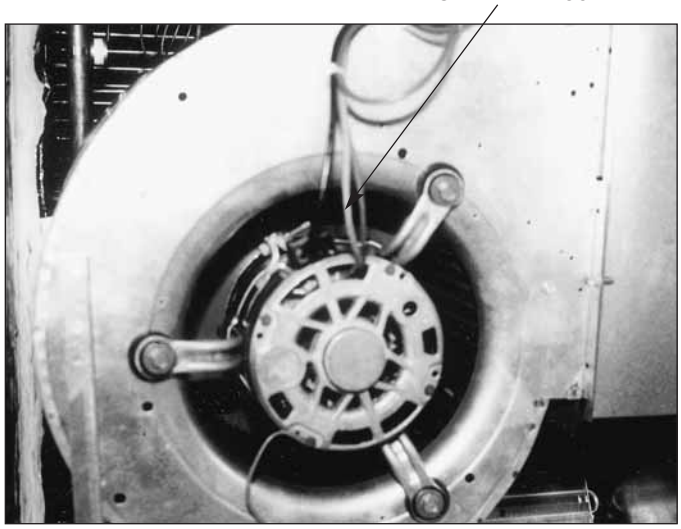


FIGURE 19

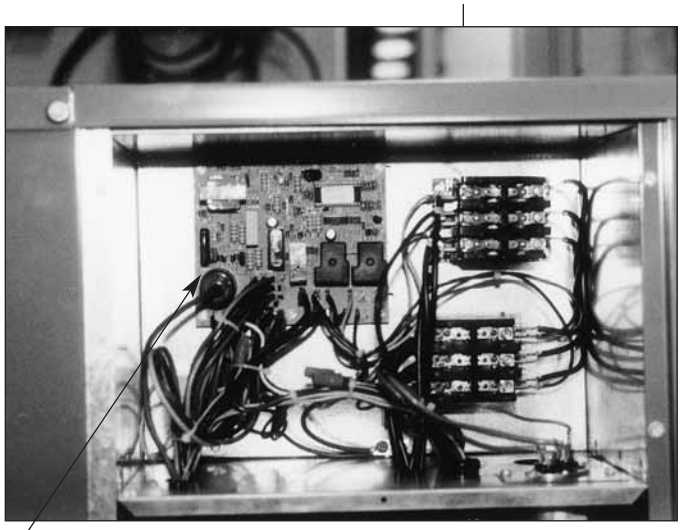
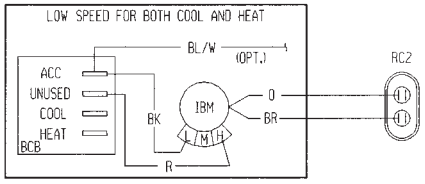


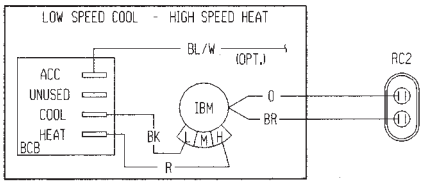
FIGURE 20

FIGURE 21

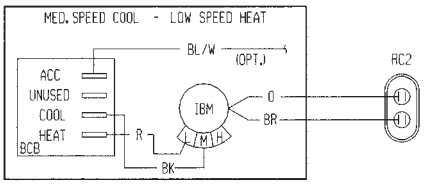
EXAMPLE 1



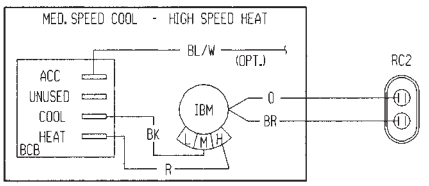
EXAMPLE 2



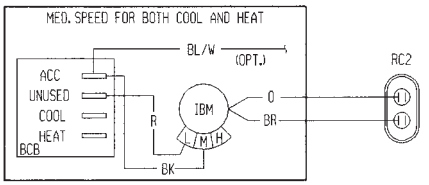
EXAMPLE 3



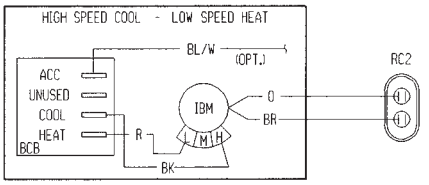
EXAMPLE 4



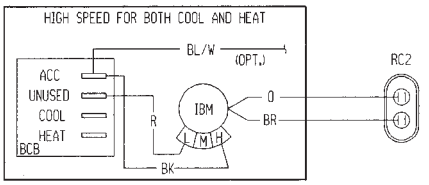
EXAMPLE 5



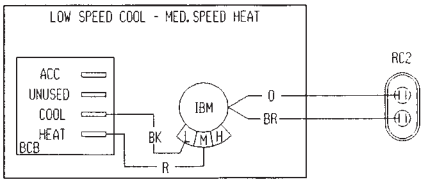
EXAMPLE 6



EXAMPLE 7



EXAMPLE 8



EXAMPLE 9

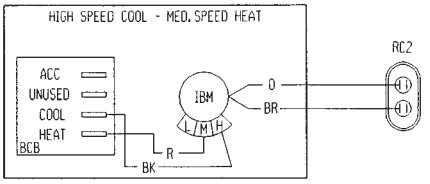


FIGURE 22
COOLING TROUBLE SHOOTING CHART

⚠ WARNING

DISCONNECT ALL POWER TO UNIT BEFORE SERVICING. CONTACTOR MAY BREAK ONLY ONE SIDE. FAILURE TO SHUT OFF POWER CAN CAUSE ELECTRICAL SHOCK RESULTING IN PERSONAL INJURY OR DEATH.

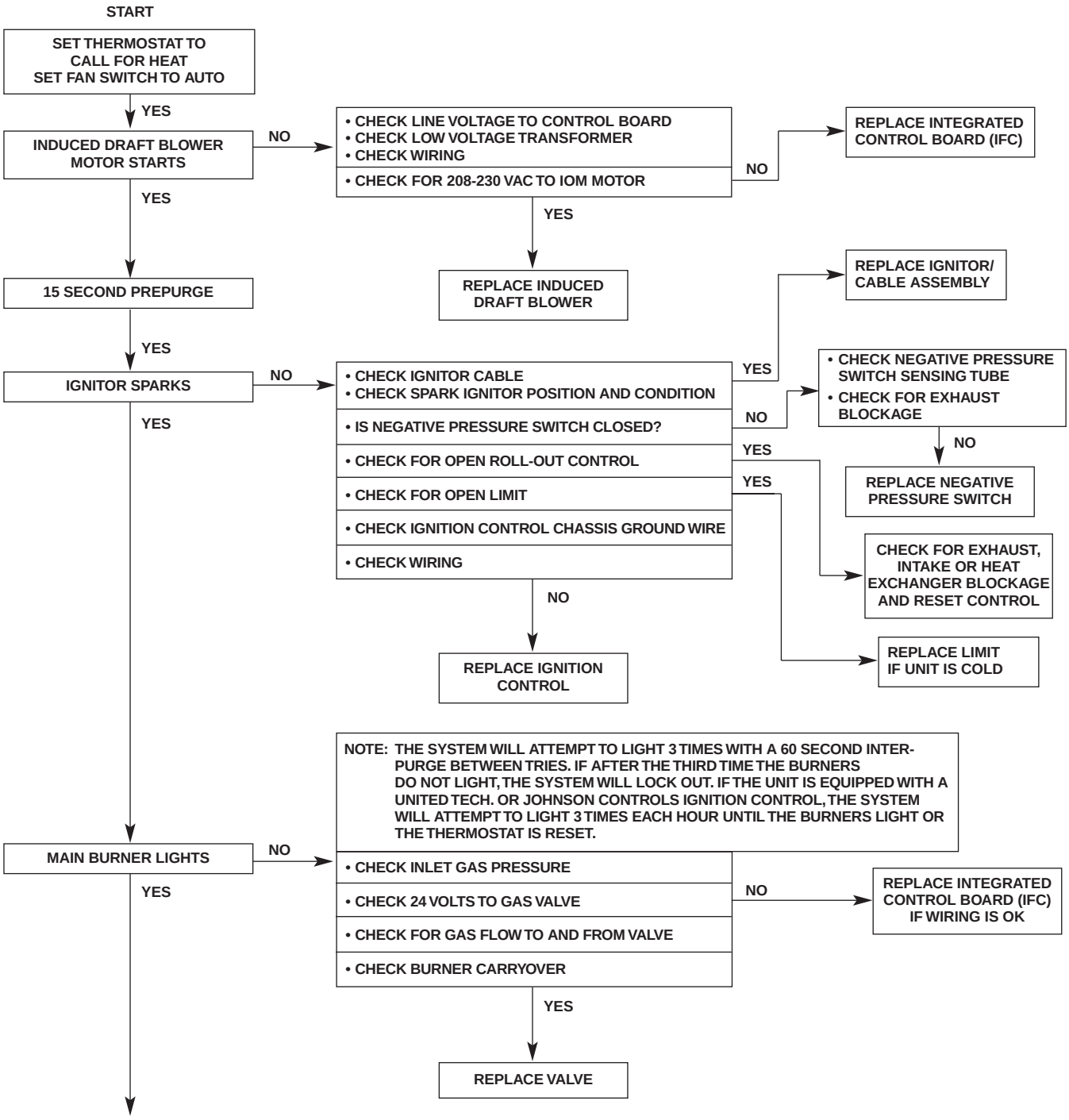
SYMPTOM	POSSIBLE CAUSE	REMEDY
Unit will not run	• Power off or loose electrical connection • Thermostat out of calibration-set too high • Failed contactor • Blown fuses • Transformer defective • High pressure control open (if provided) • Interconnecting low voltage wiring damaged	• Check for correct voltage at compressor contactor in control box • Reset • Check for 24 volts at contactor coil - replace if contacts are open • Replace fuses • Check wiring-replace transformer • Reset-also see high head pressure remedy-The high pressure control opens at 450 PSIG • Replace thermostat wiring
Condenser fan runs, compressor doesn't	• Run or start capacitor failed (single phase only) • Start relay defective 9single phase only) • Loose connection • Compressor stuck, grounded or open motor winding open internal overload. • Low voltage condition • Low voltage condition	• Replace • Replace • Check for correct voltage at compressor - check & tighten all connections • Wait at least 2 hours for overload to reset. If still open, replace the compressor. At compressor terminals, voltage must be within 10% of rating plate volts when unit is operating. • Add start kit components
Insufficient cooling	• Improperly sized unit • Improper airflow • Incorrect refrigerant charge • Air, non-condensibles or moisture in system • Incorrect voltage	• Recalculate load • Check - should be approximately 400 CFM per ton. • Charge per procedure attached to unit service panel. • Recover refrigerant, evacuate & recharge, add filter drier • At compressor terminals, voltage must be within 10% of rating plate volts when unit is operating.
Compressor short cycles	• Incorrect voltage • Defective overload protector • Refrigerant undercharge	• At compressor terminals, voltage must be ± 10% of nameplate marking when unit is operating. • Replace - check for correct voltage • Add refrigerant
Registers sweat	• Low evaporator airflow	• Increase speed of blower or reduce restriction - replace air filter
High head-low vapor pressures	• Restriction in liquid line, expansion device or filter drier • Flow check piston size too small • Incorrect capillary tubes • TXV does not open	• Remove or replace defective component • Change to correct size piston • Change coil assembly • Replace TXV
High head-high or normal vapor pressure - Cooling mode	• Dirty condenser coil • Refrigerant overcharge • Condenser fan not running • Air or non-condensibles in system	• Clean coil • Correct system charge • Repair or replace • Recover refrigerant, evacuate & recharge
Low head-high vapor pressures	• Defective Compressor valves • Incorrect capillary tubes	• Replace compressor • Replace coil assembly
Low vapor - cool compressor - iced evaporator coil	• Low evaporator airflow • Operating below 65°F outdoors • Moisture in system	• Increase speed of blower or reduce restriction - replace air filter • Add Low Ambient Kit • Recover refrigerant - evacuate & recharge - add filter drier
High vapor pressure	• Excessive load • Defective compressor	• Recheck load calculation • Replace
Fluctuating head & vapor pressures	• TXV hunting • Air or non-condensibles in system	• Check TXV bulb clamp - check air distribution on coil - replace TXV • Recover refrigerant, evacuate & recharge
Gurgle or pulsing noise at expansion device or liquid line	• Air or non-condensibles in system	• Recover refrigerant, evacuate & recharge
Circulating air blower & inducer run continuously, compressor will not start	• Manual reset overtemperature control • tripped • Wire loose in limit circuit	• Reset or replace • Check wiring

FIGURE 23
FURNACE TROUBLESHOOTING GUIDE
(COMBINATION HEATING AND COOLING UNITS WITH DIRECT SPARK IGNITION)

⚠ WARNING

HAZARDOUS VOLTAGE
LINE VOLTAGE
CONNECTIONS

DISCONNECT POWER BEFORE SERVICING.
SERVICE MUST BE BY A TRAINED, QUALIFIED SERVICE TECHNICIAN.



FLOW CHART CONTINUED ON NEXT PAGE

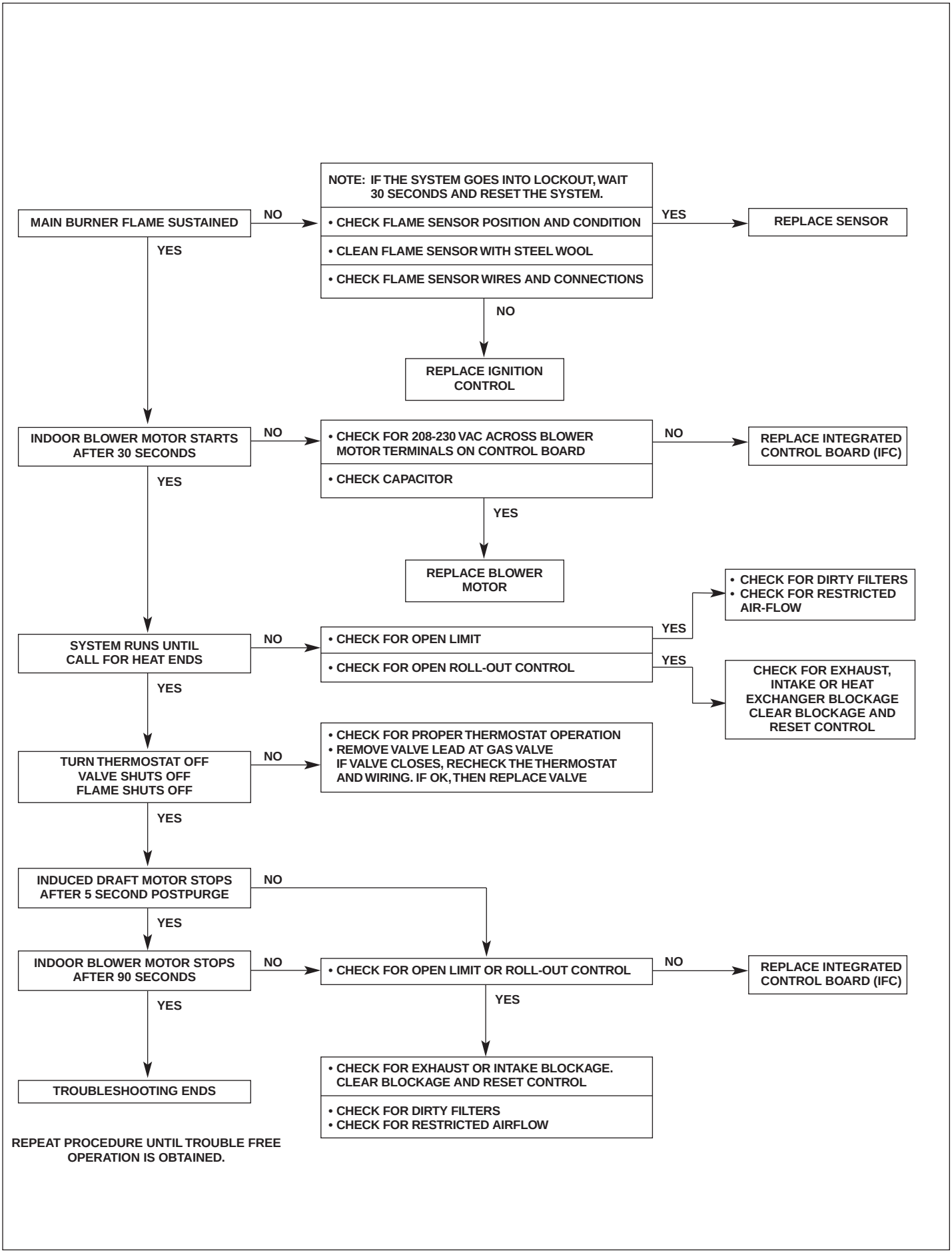

NOTE: IF THE SYSTEM GOES INTO LOCKOUT, WAIT 30 SECONDS AND RESET THE SYSTEM.
MAIN BURNER FLAME SUSTAINED
NO
• CHECK FLAME SENSOR POSITION AND CONDITION
• CLEAN FLAME SENSOR WITH STEEL WOOL
• CHECK FLAME SENSOR WIRES AND CONNECTIONS
YES
REPLACE SENSOR
YES
NO
REPLACE IGNITION CONTROL
INDOOR BLOWER MOTOR STARTS AFTER 30 SECONDS
NO
• CHECK FOR 208-230 VAC ACROSS BLOWER MOTOR TERMINALS ON CONTROL BOARD
• CHECK CAPACITOR
NO
REPLACE INTEGRATED CONTROL BOARD (IFC)
YES
YES
REPLACE BLOWER MOTOR
SYSTEM RUNS UNTIL CALL FOR HEAT ENDS
NO
• CHECK FOR OPEN LIMIT
• CHECK FOR OPEN ROLL-OUT CONTROL
YES
• CHECK FOR DIRTY FILTERS
• CHECK FOR RESTRICTED AIR-FLOW
YES
CHECK FOR EXHAUST, INTAKE OR HEAT EXCHANGER BLOCKAGE CLEAR BLOCKAGE AND RESET CONTROL
YES
TURN THERMOSTAT OFF VALVE SHUTS OFF FLAME SHUTS OFF
NO
• CHECK FOR PROPER THERMOSTAT OPERATION
• REMOVE VALVE LEAD AT GAS VALVE IF VALVE CLOSES, RECHECK THE THERMOSTAT AND WIRING. IF OK, THEN REPLACE VALVE
YES
INDUCED DRAFT MOTOR STOPS AFTER 5 SECOND POSTPURGE
NO
YES
INDOOR BLOWER MOTOR STOPS AFTER 90 SECONDS
NO
• CHECK FOR OPEN LIMIT OR ROLL-OUT CONTROL
NO
REPLACE INTEGRATED CONTROL BOARD (IFC)
YES
YES
• CHECK FOR EXHAUST OR INTAKE BLOCKAGE. CLEAR BLOCKAGE AND RESET CONTROL
• CHECK FOR DIRTY FILTERS
• CHECK FOR RESTRICTED AIRFLOW
TROUBLESHOOTING ENDS
REPEAT PROCEDURE UNTIL TROUBLE FREE OPERATION IS OBTAINED.

FIGURE 24

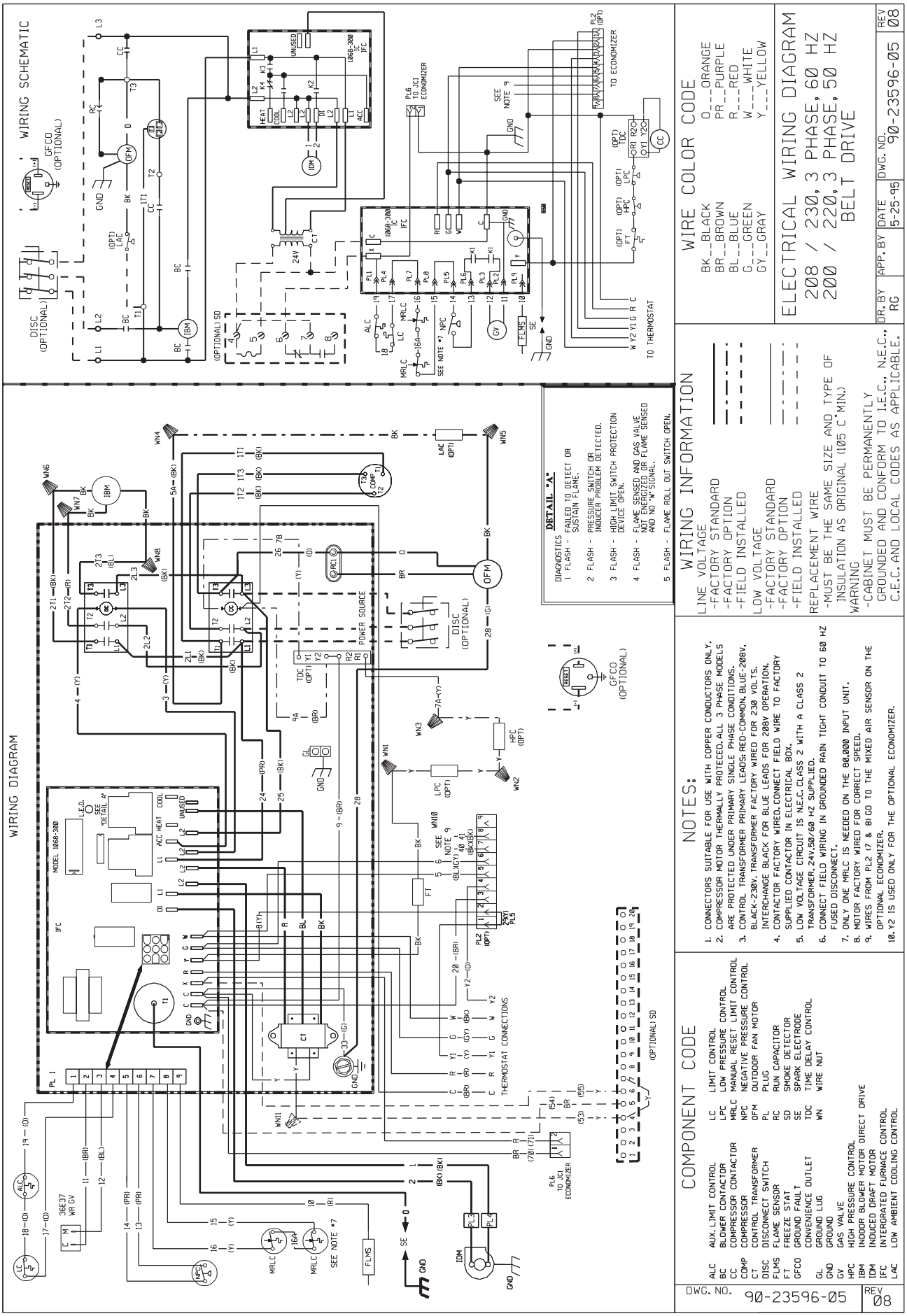

WIRING SCHEMATIC
WIRING DIAGRAM
NOTES:
1. CONNECTORS SUITABLE FOR USE WITH COPPER CONDUCTORS ONLY.
2. COMPRESSOR MOTOR THERMALLY PROTECED. ALL 3 PHASE MODELS ARE PROTECTED UNDER PRIMARY SINGLE PHASE CONDITIONS.
3. CONTROL TRANSFORMER PRIMARY LEADS: RED-COMMON, BLUE-208V, BLACK-230V. TRANSFORMER FACTORY WIRED FOR 230 VOLTS. INTERCHANGE BLACK FOR BLUE LEADS FOR 208V OPERATION.
4. CONTACTOR FACTORY WIRED. CONNECT FIELD WIRE TO FACTORY SUPPLIED CONTACTOR IN ELECTRICAL BOX.
5. LOW VOLTAGE CIRCUIT IS N.E.C. CLASS 2 WITH A CLASS 2 TRANSFORMER, 24V, 50/60 HZ SUPPLIED.
6. CONNECT FIELD WIRING IN GROUNDED RAIN TIGHT CONDUIT TO 60 HZ FUSED DISCONNECT.
7. ONLY ONE MRLC IS NEEDED ON THE 80,000 INPUT UNIT.
8. MOTOR FACTORY WIRED FOR CORRECT SPEED.
9. WIRES FROM PL2 (7 & 8) GO TO THE MIXED AIR SENSOR ON THE OPTIONAL ECONOMIZER.
10. Y2 IS USED ONLY FOR THE OPTIONAL ECONOMIZER.
COMPONENT CODE
ALC AUX. LIMIT CONTROL
BC BLOWER CONTACTOR
CC COMPRESSOR CONTACTOR
COMP COMPRESSOR
CT CONTROL TRANSFORMER
DISC DISCONNECT SWITCH
FLMS FLAME SENSOR
FT FREEZE STAT
GFCO GROUND FAULT
GL CONVENIENCE OUTLET
GND GROUND
GV GAS VALVE
HPC HIGH PRESSURE CONTROL
IBM INDOOR BLOWER MOTOR DIRECT DRIVE
IDM INDUCED DRAFT MOTOR
IFC INTERGRATED FURNANCE CONTROL
LAC LOW AMBIENT COOLING CONTROL
LC LIMIT CONTROL
LPC LOW PRESSURE CONTROL
MRLC MANUAL RESET LIMIT CONTROL
NPC NEGATIVE PRESSURE CONTROL
OFM OUTDOOR FAN MOTOR
PL PLUG
RC RUN CAPACITOR
SD SMOKE DETECTOR
SE SPARK ELECTRODE
TDC TIME DELAY CONTROL
WN WIRE NUT
DWG. NO. 90-23596-05 REV 08
WIRING INFORMATION
LINE VOLTAGE
-FACTORY STANDARD
-FACTORY OPTION
-FIELD INSTALLED
LOW VOLTAGE
-FACTORY STANDARD
-FACTORY OPTION
-FIELD INSTALLED
REPLACEMENT WIRE
-MUST BE THE SAME SIZE AND TYPE OF INSULATION AS ORIGINAL (105 C° MIN.)
WARNING
-CABINET MUST BE PERMANENTLY GROUNDED AND CONFORM TO I.E.C., N.E.C., C.E.C. AND LOCAL CODES AS APPLICABLE.
DIAGNOSTICS
1 FLASH - FAILED TO DETECT OR SUSTAIN FLAME.
2 FLASH - PRESSURE SWITCH OR INDUCER PROBLEM DETECTED.
3 FLASH - HIGH LIMIT SWITCH PROTECTION DEVICE OPEN.
4 FLASH - FLAME SENSED AND GAS VALVE NOT ENERGIZED OR FLAME SENSED AND NO "W" SIGNAL.
5 FLASH - FLAME ROLL OUT SWITCH OPEN.
DETAIL "A"
WIRE COLOR CODE
BK__BLACK O___ORANGE
BR__BROWN PR__PURPLE
BL__BLUE R___RED
G___GREEN W___WHITE
GY__GRAY Y___YELLOW
ELECTRICAL WIRING DIAGRAM
208 / 230, 3 PHASE, 60 HZ
200 / 220, 3 PHASE, 50 HZ
BELT DRIVE
DR. BY RG
APP. BY
DATE 5-25-95
DWG. NO. 90-23596-05
REV 08

FIGURE 25

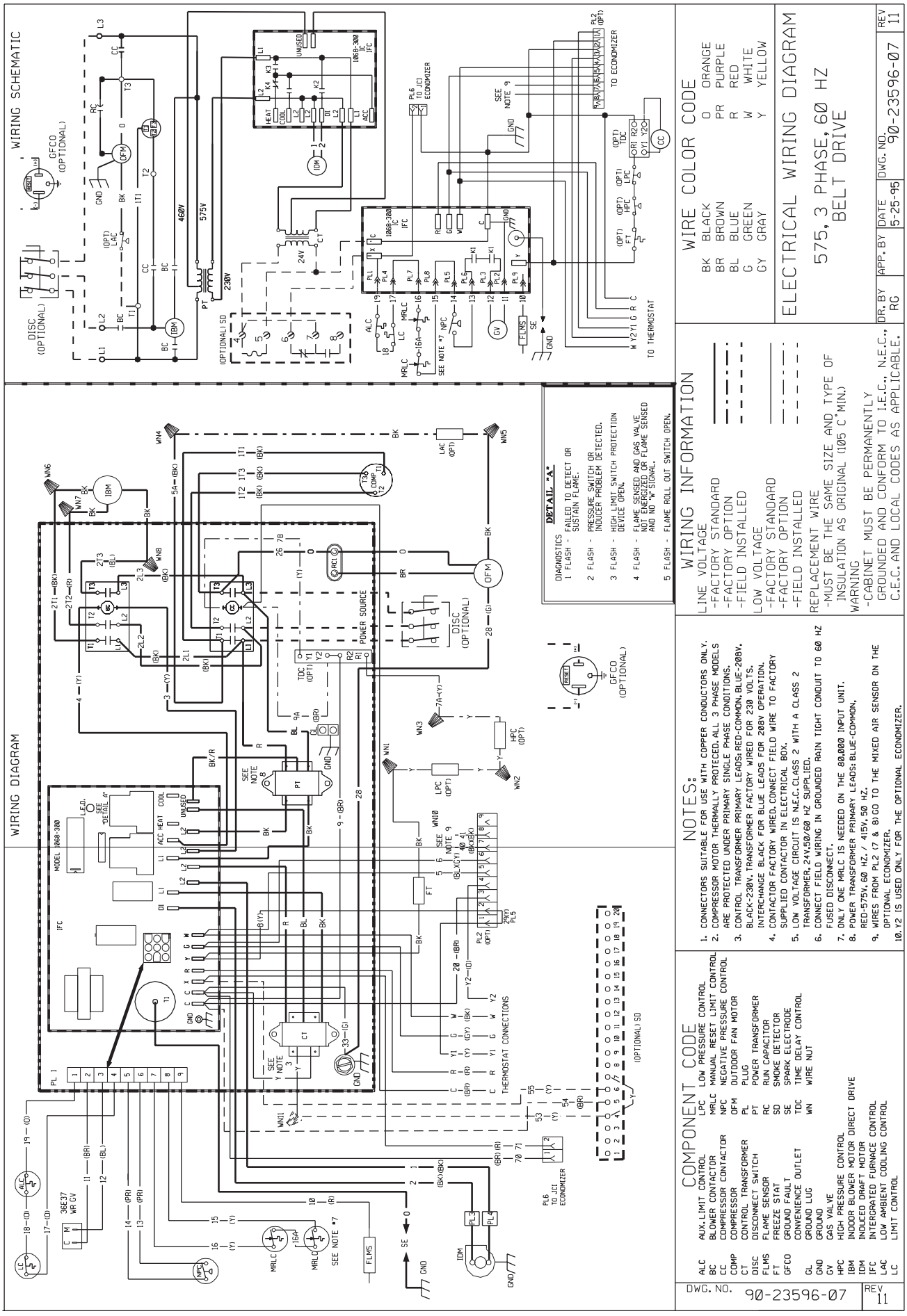
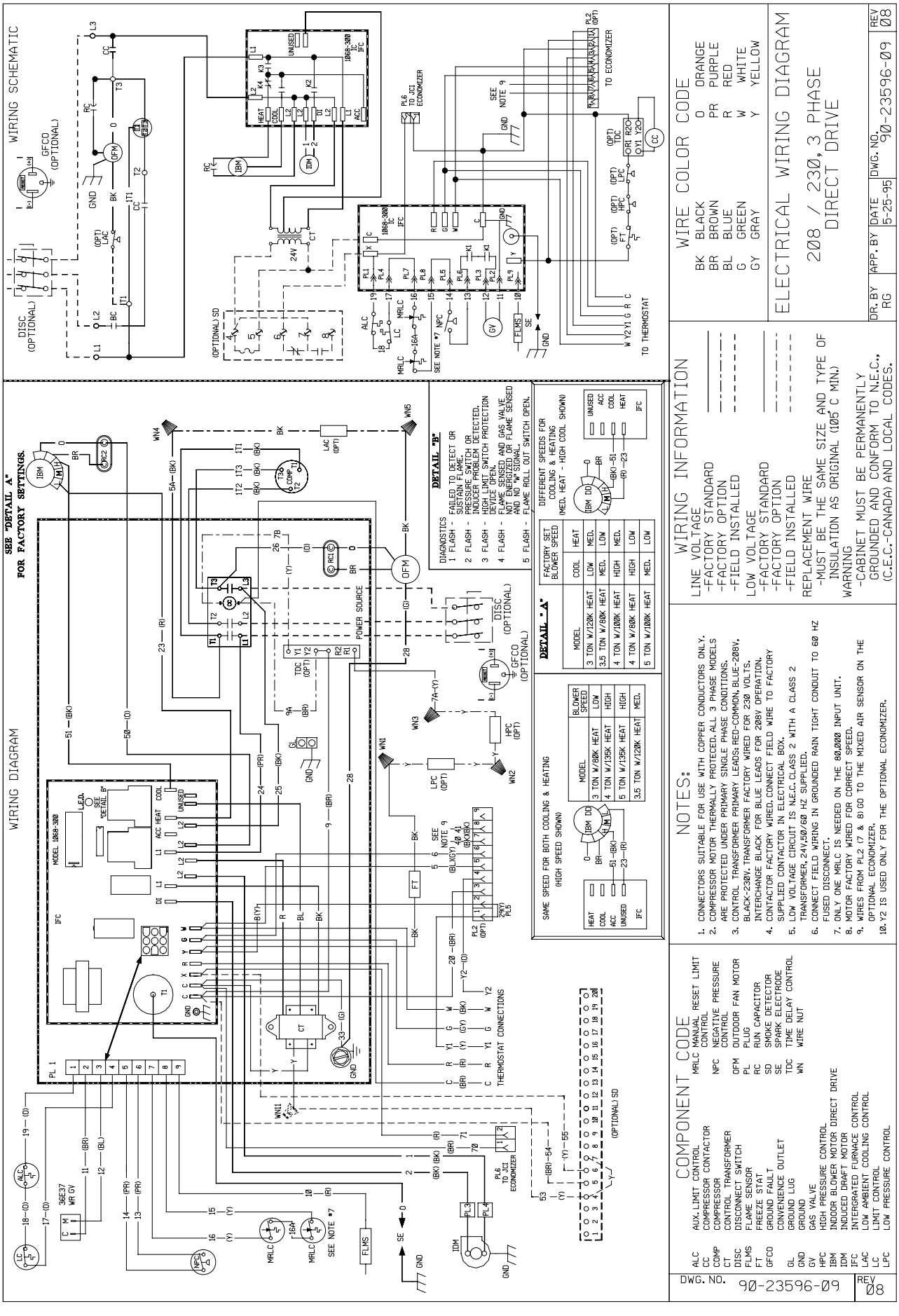

WIRING SCHEMATIC
WIRING DIAGRAM
ELECTRICAL WIRING DIAGRAM
575, 3 PHASE, 60 HZ
BELT DRIVE
WIRE COLOR CODE
BK BLACK
BR BROWN
BL BLUE
G GREEN
GY GRAY
O ORANGE
PR PURPLE
R RED
W WHITE
Y YELLOW
WIRING INFORMATION
LINE VOLTAGE
-FACTORY STANDARD
-FACTORY OPTION
-FIELD INSTALLED
LOW VOLTAGE
-FACTORY STANDARD
-FACTORY OPTION
-FIELD INSTALLED
REPLACEMENT WIRE
-MUST BE THE SAME SIZE AND TYPE OF INSULATION AS ORIGINAL (105 C°MIN.)
WARNING
-CABINET MUST BE PERMANENTLY GROUNDED AND CONFORM TO I.E.C., N.E.C., C.E.C. AND LOCAL CODES AS APPLICABLE.
NOTES:
1. CONNECTORS SUITABLE FOR USE WITH COPPER CONDUCTORS ONLY.
2. COMPRESSOR MOTOR THERMALLY PROTECED. ALL 3 PHASE MODELS ARE PROTECTED UNDER PRIMARY SINGLE PHASE CONDITIONS.
3. CONTROL TRANSFORMER PRIMARY LEADS: RED-COMMON, BLUE-208V, BLACK-230V. TRANSFORMER FACTORY WIRED FOR 230 VOLTS. INTERCHANGE BLACK FOR BLUE LEADS FOR 208V OPERATION.
4. CONTACTOR FACTORY WIRED. CONNECT FIELD WIRE TO FACTORY SUPPLIED CONTACTOR IN ELECTRICAL BOX.
5. LOW VOLTAGE CIRCUIT IS N.E.C. CLASS 2 WITH A CLASS 2 TRANSFORMER, 24V, 50/60 HZ SUPPLIED.
6. CONNECT FIELD WIRING IN GROUNDED RAIN TIGHT CONDUIT TO 60 HZ FUSED DISCONNECT.
7. ONLY ONE MRLC IS NEEDED ON THE 80,000 INPUT UNIT.
8. POWER TRANSFORMER PRIMARY LEADS: BLUE-COMMON, RED-575V, 60 HZ. / 415V, 50 HZ.
9. WIRES FROM PL2 (7 & 8) GO TO THE MIXED AIR SENSOR ON THE OPTIONAL ECONOMIZER.
10. Y2 IS USED ONLY FOR THE OPTIONAL ECONOMIZER.
COMPONENT CODE
ALC AUX.LIMIT CONTROL
BC BLOWER CONTACTOR
CC COMPRESSOR CONTACTOR
COMP COMPRESSOR
CT CONTROL TRANSFORMER
DISC DISCONNECT SWITCH
FLMS FLAME SENSOR
FT FREEZE STAT
GFCO GROUND FAULT CONVENIENCE OUTLET
GL GROUND LUG
GND GROUND
GV GAS VALVE
HPC HIGH PRESSURE CONTROL
IBM INDOOR BLOWER MOTOR
IDM INDUCED DRAFT MOTOR
IFC INTEGRATED FURNACE CONTROL
LAC LOW AMBIENT COOLING CONTROL
LC LIMIT CONTROL
LPC LOW PRESSURE CONTROL
MRLC MANUAL RESET LIMIT CONTROL
NPC NEGATIVE PRESSURE CONTROL
OFM OUTDOOR FAN MOTOR
PL PLUG
PT POWER TRANSFORMER
RC RUN CAPACITOR
SD SMOKE DETECTOR
SE SPARK ELECTRODE
TDC TIME DELAY CONTROL
WN WIRE NUT
DETAIL "A"
DIAGNOSTICS
1 FLASH - FAILED TO DETECT OR SUSTAIN FLAME.
2 FLASH - PRESSURE SWITCH OR INDUCER PROBLEM DETECTED.
3 FLASH - HIGH LIMIT SWITCH PROTECTION DEVICE OPEN.
4 FLASH - FLAME SENSED AND GAS VALVE NOT ENERGIZED OR FLAME SENSED AND NO "W" SIGNAL.
5 FLASH - FLAME ROLL OUT SWITCH OPEN.
DR. BY RG
APP. BY
DATE 5-25-95
DWG. NO. 90-23596-07
REV 11
DWG. NO. 90-23596-07
REV 11

FIGURE 26



NOTES:

1. CONNECTORS SUITABLE FOR USE WITH COPPER CONDUCTORS ONLY.
2. COMPRESSOR MOTOR THERMALLY PROTECED. ALL 3 PHASE MODELS ARE PROTECTED UNDER PRIMARY SINGLE PHASE CONDITIONS.
3. CONTROL TRANSFORMER PRIMARY LEADS: RED-COMMON, BLUE-208V, BLACK-230V. TRANSFORMER FACTORY WIRED FOR 230 VOLTS. INTERCHANGE BLACK FOR BLUE LEADS FOR 208V OPERATION.
4. CONTACTOR FACTORY WIRED. CONNECT FIELD WIRE TO FACTORY SUPPLIED CONTACTOR IN ELECTRICAL BOX.
5. LOW VOLTAGE CIRCUIT IS N.E.C. CLASS 2 WITH A CLASS 2 TRANSFORMER, 24V, 50/60 HZ SUPPLIED.
6. CONNECT FIELD WIRING IN GROUNDED RAIN TIGHT CONDUIT TO 60 HZ FUSED DISCONNECT.
7. ONLY ONE MRLC IS NEEDED ON THE 80,000 INPUT UNIT.
8. MOTOR FACTORY WIRED FOR CORRECT SPEED.
9. WIRES FROM PL2 (7 & 8) GO TO THE MIXED AIR SENSOR ON THE OPTIONAL ECONOMIZER.
10. Y2 IS USED ONLY FOR THE OPTIONAL ECONOMIZER.

COMPONENT CODE

ALC	AUX. LIMIT CONTROL	MRLC	MANUAL RESET LIMIT CONTROL
CC	COMPRESSOR CONTACTOR		
COMP	COMPRESSOR	NPC	NEGATIVE PRESSURE CONTROL
CT	CONTROL TRANSFORMER		
DISC	DISCONNECT SWITCH	OFM	OUTDOOR FAN MOTOR
FLMS	FLAME SENSOR	PL	PLUG
FT	FREEZE STAT	RC	RUN CAPACITOR
GFCO	GROUND FAULT CONVENIENCE OUTLET	SD	SMOKE DETECTOR
		SE	SPARK ELECTRODE
GL	GROUND LUG	TDC	TIME DELAY CONTROL
GND	GROUND	WN	WIRE NUT
GV	GAS VALVE		
HPC	HIGH PRESSURE CONTROL		
IBM	INDOOR BLOWER MOTOR		
IDM	DIRECT DRIVE INDUCED DRAFT MOTOR		
IFC	INTERGRATED FURNACE CONTROL		
LAC	LOW AMBIENT COOLING CONTROL		
LC	LIMIT CONTROL		
LPC	LOW PRESSURE CONTROL		

WIRING INFORMATION

LINE VOLTAGE
-FACTORY STANDARD
-FACTORY OPTION
-FIELD INSTALLED

LOW VOLTAGE
-FACTORY STANDARD
-FACTORY OPTION
-FIELD INSTALLED

REPLACEMENT WIRE
-MUST BE THE SAME SIZE AND TYPE OF INSULATION AS ORIGINAL (105° C MIN.)

WARNING
-CABINET MUST BE PERMANENTLY GROUNDED AND CONFORM TO N.E.C., (C.E.C.-CANADA) AND LOCAL CODES.

WIRE COLOR CODE

BK	BLACK	O	ORANGE
BR	BROWN	PR	PURPLE
BL	BLUE	R	RED
G	GREEN	W	WHITE
GY	GRAY	Y	YELLOW

ELECTRICAL WIRING DIAGRAM

208 / 230, 3 PHASE DIRECT DRIVE

DR. BY	APP. BY	DATE	DWG. NO.	REV
RG		5-25-95	90-23596-09	08

DWG. NO. 90-23596-09 REV 08

FIGURE 27

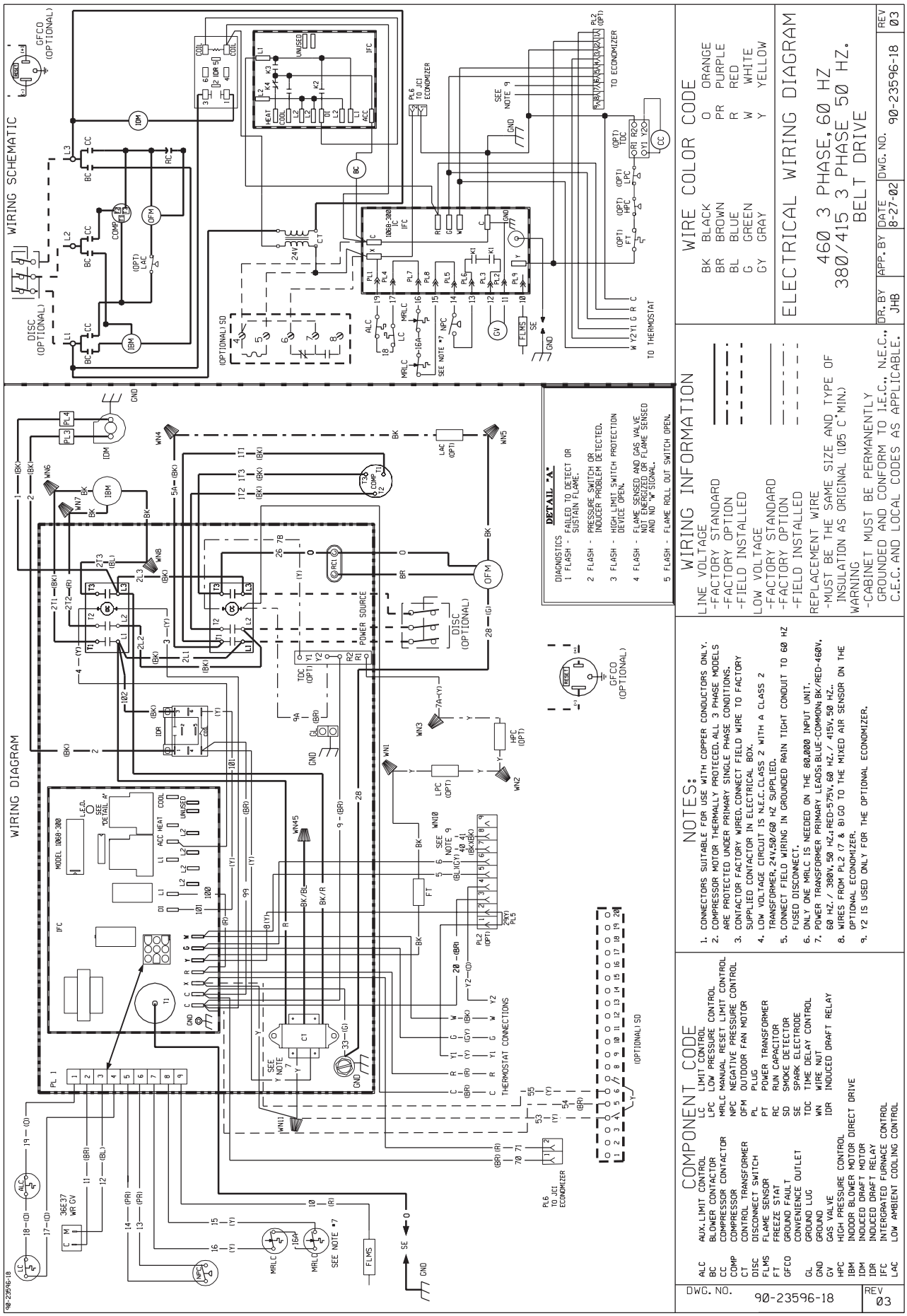
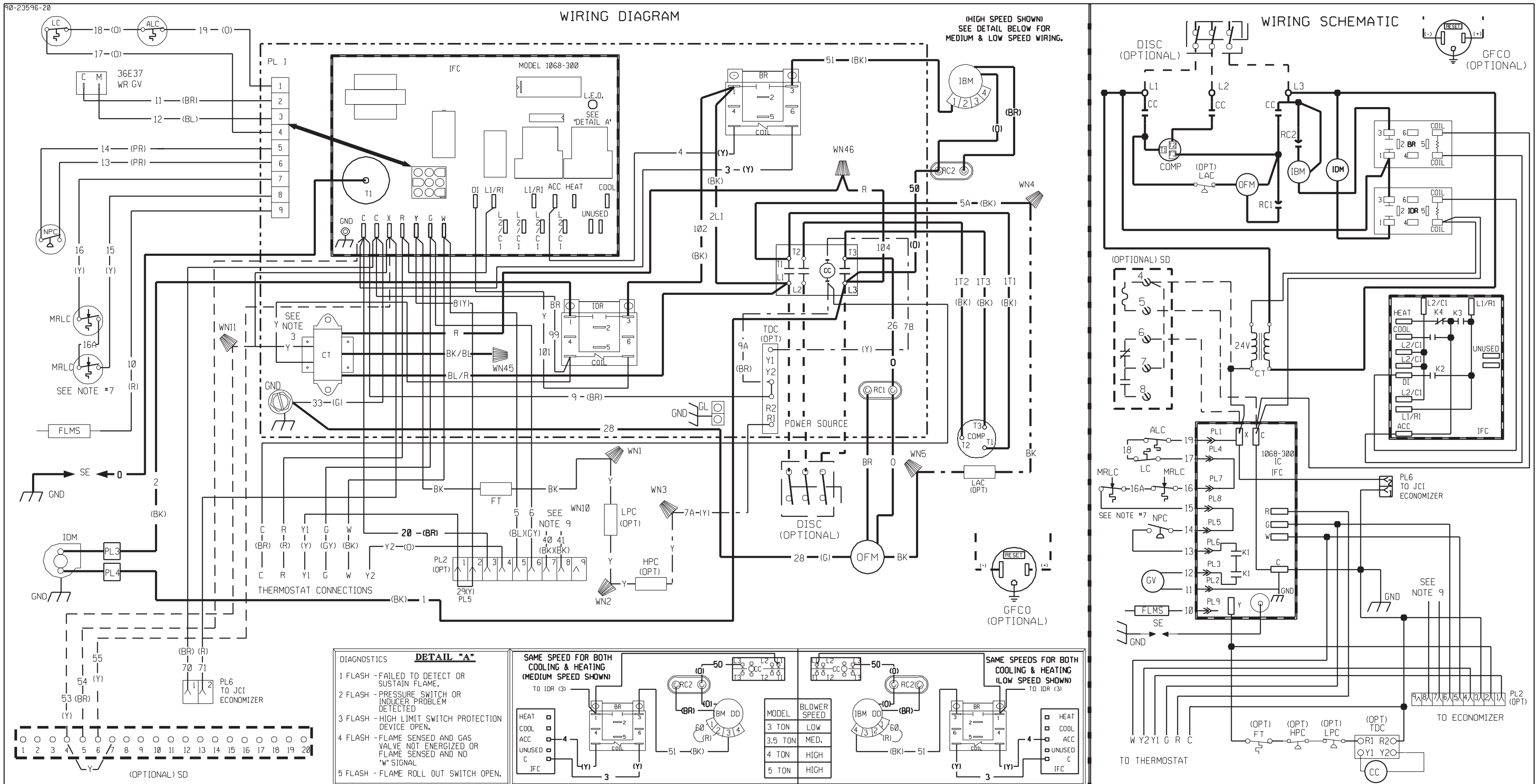

WIRING SCHEMATIC
WIRING DIAGRAM
ELECTRICAL WIRING DIAGRAM
460 3 PHASE, 60 HZ
380/415 3 PHASE 50 HZ.
BELT DRIVE
90-23596-18
REV 03
DR. BY JHB
APP. BY
DATE 8-27-02
DWG. NO. 90-23596-18
REV 03
WIRE COLOR CODE
BK BLACK
BR BROWN
BL BLUE
G GREEN
GY GRAY
O ORANGE
PR PURPLE
R RED
W WHITE
Y YELLOW
WIRING INFORMATION
LINE VOLTAGE
-FACTORY STANDARD
-FACTORY OPTION
-FIELD INSTALLED
LOW VOLTAGE
-FACTORY STANDARD
-FACTORY OPTION
-FIELD INSTALLED
REPLACEMENT WIRE
-MUST BE THE SAME SIZE AND TYPE OF INSULATION AS ORIGINAL (105 C°MIN.)
WARNING
-CABINET MUST BE PERMANENTLY GROUNDED AND CONFORM TO I.E.C., N.E.C., C.E.C. AND LOCAL CODES AS APPLICABLE.
NOTES:
1. CONNECTORS SUITABLE FOR USE WITH COPPER CONDUCTORS ONLY.
2. COMPRESSOR MOTOR THERMALLY PROTECED. ALL 3 PHASE MODELS ARE PROTECTED UNDER PRIMARY SINGLE PHASE CONDITIONS.
3. CONTACTOR FACTORY WIRED. CONNECT FIELD WIRE TO FACTORY SUPPLIED CONTACTOR IN ELECTRICAL BOX.
4. LOW VOLTAGE CIRCUIT IS N.E.C. CLASS 2 WITH A CLASS 2 TRANSFORMER, 24V,50/60 HZ SUPPLIED.
5. CONNECT FIELD WIRING IN GROUNDED RAIN TIGHT CONDUIT TO 60 HZ FUSED DISCONNECT.
6. ONLY ONE MRLC IS NEEDED ON THE 80,000 INPUT UNIT.
7. POWER TRANSFORMER PRIMARY LEADS: BLUE-COMMON; BK/RED-460V, 60 HZ. / 380V, 50 HZ.; RED-575V, 60 HZ. / 415V, 50 HZ..
8. WIRES FROM PL2 (7 & 8) GO TO THE MIXED AIR SENSOR ON THE OPTIONAL ECONOMIZER.
9. Y2 IS USED ONLY FOR THE OPTIONAL ECONOMIZER.
DETAIL "A"
DIAGNOSTICS
1 FLASH - FAILED TO DETECT OR SUSTAIN FLAME.
2 FLASH - PRESSURE SWITCH OR INDUCER PROBLEM DETECTED.
3 FLASH - HIGH LIMIT SWITCH PROTECTION DEVICE OPEN.
4 FLASH - FLAME SENSED AND GAS VALVE NOT ENERGIZED OR FLAME SENSED AND NO "W" SIGNAL.
5 FLASH - FLAME ROLL OUT SWITCH OPEN.
COMPONENT CODE
ALC AUX. LIMIT CONTROL
BC BLOWER CONTACTOR
CC COMPRESSOR CONTACTOR
COMP COMPRESSOR
CT CONTROL TRANSFORMER
DISC DISCONNECT SWITCH
FLMS FLAME SENSOR
FT FREEZE STAT
GFCO GROUND FAULT CONVENIENCE OUTLET
GL GROUND LUG
GND GROUND
GV GAS VALVE
HPC HIGH PRESSURE CONTROL
IBM INDOOR BLOWER MOTOR DIRECT DRIVE
IDM INDUCED DRAFT MOTOR
IDR INDUCED DRAFT RELAY
IFC INTERGRATED FURNACE CONTROL
LAC LOW AMBIENT COOLING CONTROL
LC LOW PRESSURE CONTROL
MRLC MANUAL RESET LIMIT CONTROL
NPC NEGATIVE PRESSURE CONTROL
OFM OUTDOOR FAN MOTOR
PL PLUG
PT POWER TRANSFORMER
RC RUN CAPACITOR
SD SMOKE DETECTOR
SE SPARK ELECTRODE
TDC TIME DELAY CONTROL
WN WIRE NUT
IDR INDUCED DRAFT RELAY
DWG. NO. 90-23596-18
REV 03

FIGURE 28



DWG. NO. 90-23596-20 REV 02

COMPONENT CODE

ALC	AUX. LIMIT CONTROL	LC	LIMIT CONTROL
BC	BLOWER CONTACTOR	LPC	LOW PRESSURE CONTROL
CC	COMPRESSOR CONTACTOR	MRLC	MANUAL RESET LIMIT CONTROL
COMP	COMPRESSOR	NPC	NEGATIVE PRESSURE CONTROL
CT	CONTROL TRANSFORMER	OFM	OUTDOOR FAN MOTOR
DISC	DISCONNECT SWITCH	PL	PLUG
FLMS	FLAME SENSOR	PT	POWER TRANSFORMER
FT	FREEZE STAT	RC	RUN CAPACITOR
GFCO	GROUND FAULT CONVENIENCE OUTLET	SD	SMOKE DETECTOR
		SE	SPARK ELECTRODE
GL	GROUND LUG	TDC	TIME DELAY CONTROL
GND	GROUND	WN	WIRE NUT
GV	GAS VALVE		
HPC	HIGH PRESSURE CONTROL		
IBM	INDOOR BLOWER MOTOR DIRECT DRIVE		
IDM	INDUCED DRAFT MOTOR		
IDR	INDUCER DRAFT RELAY		
IFC	INTERGRATED FURNACE CONTROL		
LAC	LOW AMBIENT COOLING CONTROL		

NOTES:

1. CONNECTORS SUITABLE FOR USE WITH COPPER CONDUCTORS ONLY.
2. COMPRESSOR MOTOR THERMALLY PROTECED. ALL 3 PHASE MODELS ARE PROTECTED UNDER PRIMARY SINGLE PHASE CONDITIONS.
3. POWER TRANSFORMER PRIMARY LEADS: BLUE-COMMON; BK/RED-460V, 60 HZ. / 380V, 50 HZ.; RED-575V, 60 HZ. / 415V, 50 HZ..
4. CONTACTOR FACTORY WIRED. CONNECT FIELD WIRE TO FACTORY SUPPLIED CONTACTOR IN ELECTRICAL BOX.
5. LOW VOLTAGE CIRCUIT IS N.E.C. CLASS 2 WITH A CLASS 2 TRANSFORMER, 24V, 50/60 HZ SUPPLIED.
6. CONNECT FIELD WIRING IN GROUNDED RAIN TIGHT CONDUIT TO 60 HZ FUSED DISCONNECT.
7. ONLY ONE MRLC IS NEEDED ON THE 80,000 INPUT UNIT. WIRES FROM PL2 (7 & 8) GO TO THE MIXED AIR SENSOR ON THE OPTIONAL ECONOMIZER.
8. Y2 IS USED ONLY FOR THE OPTIONAL ECONOMIZER.

WIRING INFORMATION

LINE VOLTAGE
- FACTORY STANDARD
- FACTORY OPTION
- FIELD INSTALLED

LOW VOLTAGE
- FACTORY STANDARD
- FACTORY OPTION
- FIELD INSTALLED

REPLACEMENT WIRE
- MUST BE THE SAME SIZE AND TYPE OF INSULATION AS ORIGINAL (105 C° MIN.)

WARNING
- CABINET MUST BE PERMANENTLY GROUNDED AND CONFORM TO I.E.C., N.E.C., C.E.C. AND LOCAL CODES AS APPLICABLE.

WIRE COLOR CODE

BK__BLACK	O___ORANGE
BR__BROWN	PR__PURPLE
BL__BLUE	R___RED
G___GREEN	W___WHITE
GY__GRAY	Y___YELLOW

ELECTRICAL WIRING DIAGRAM

460, 3 PHASE, 60 HZ
DIRECT DRIVE
ROOFTOP

DR. BY	APP. BY	DATE	DWG. NO.	REV
JHB		8-27-02	90-23596-20	02

SYSTEM CHARGE CHARTS

FIGURE 29
3 TON COOLING - 10 SEER

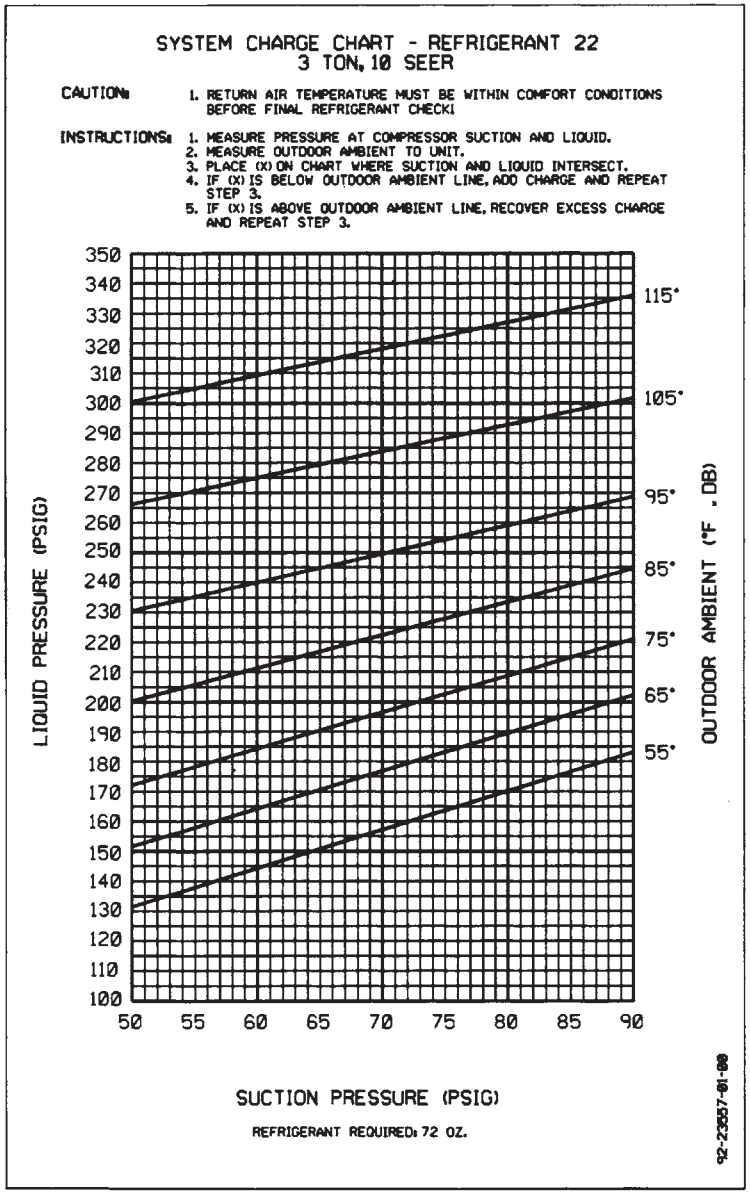
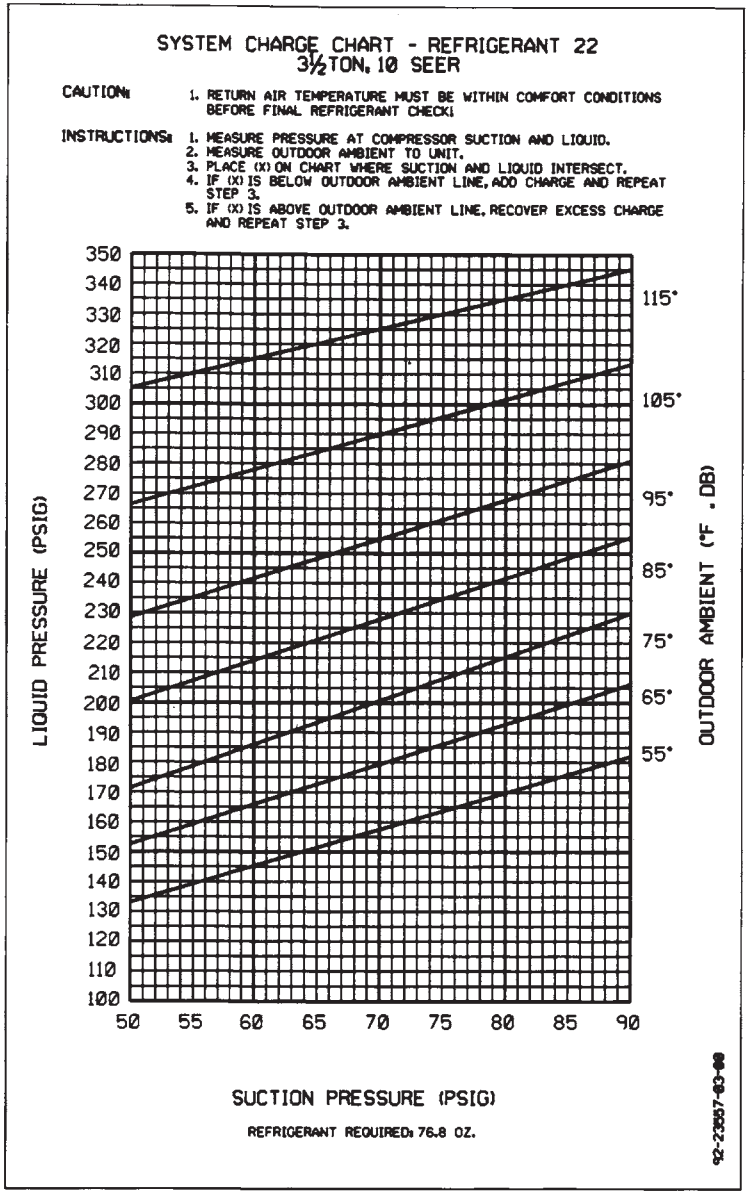


FIGURE 30
3 1/2 TON COOLING - 10 SEER



SYSTEM CHARGE CHARTS

FIGURE 31
4 TON COOLING - 10 SEER

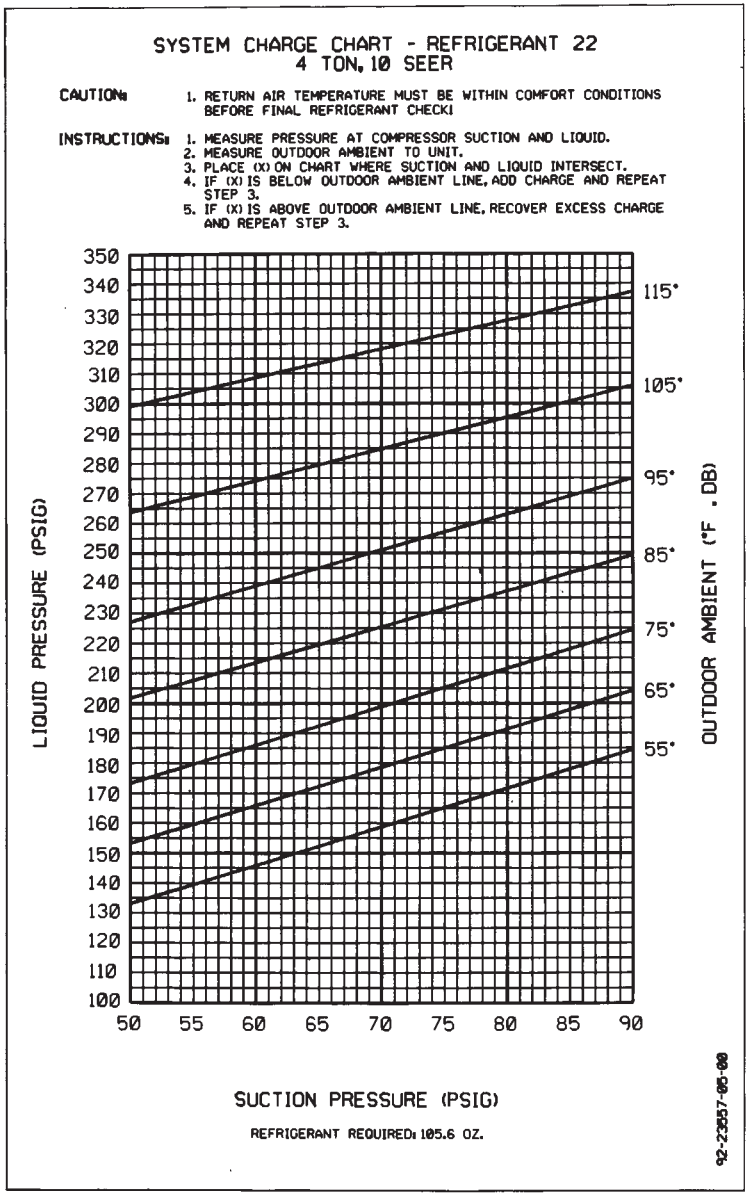
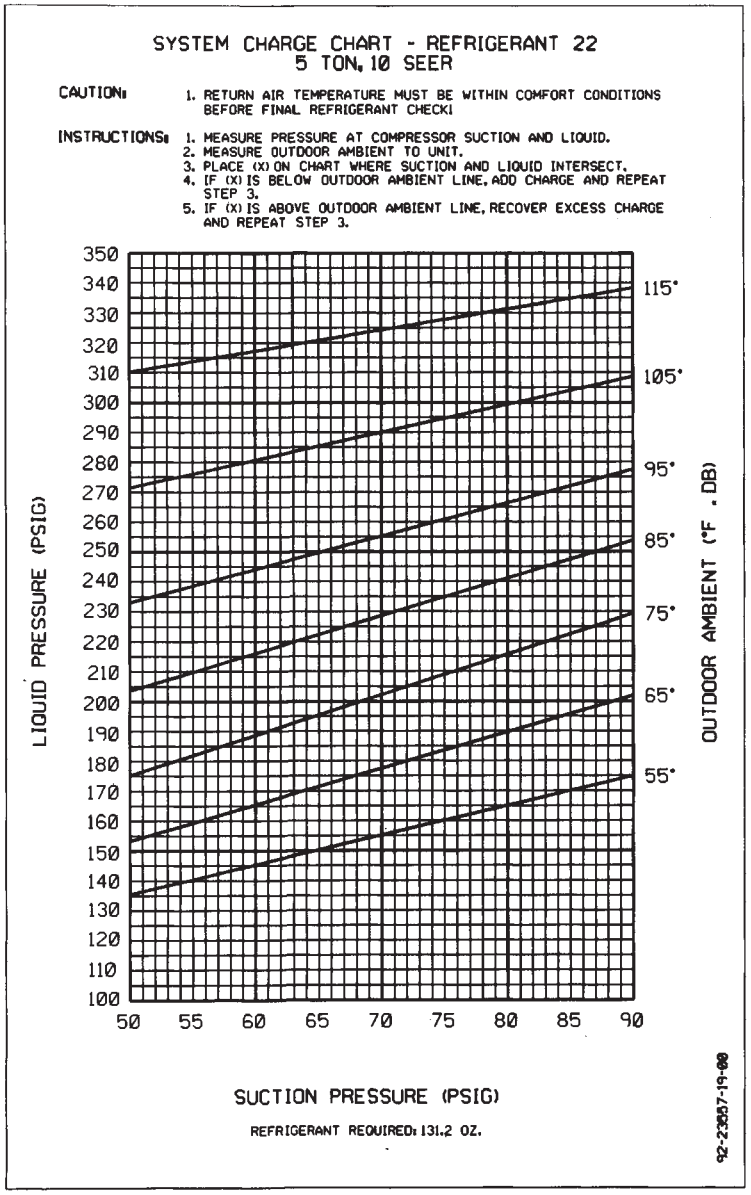


FIGURE 32
5 TON COOLING - 10 SEER



SYSTEM CHARGE CHARTS

➤ FIGURE 33
6 TON COOLING - 10 SEER