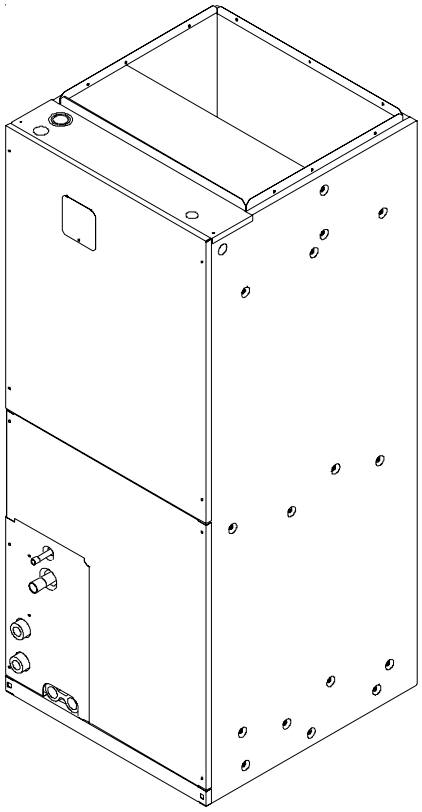
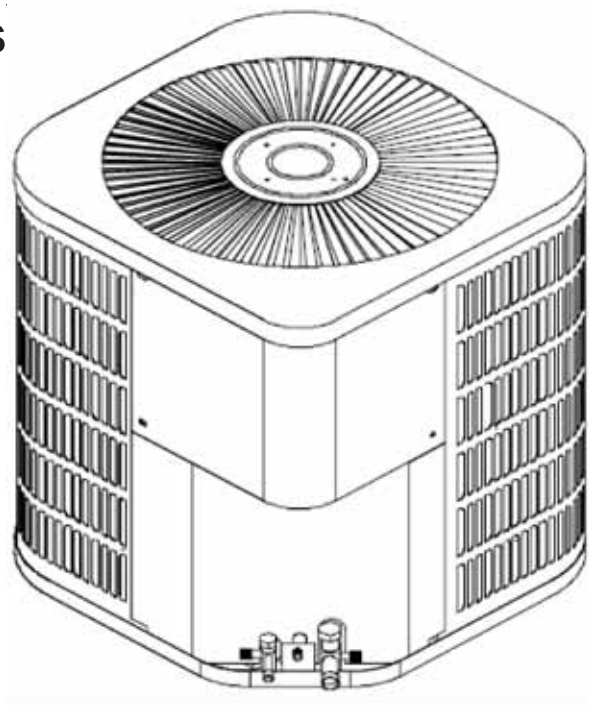
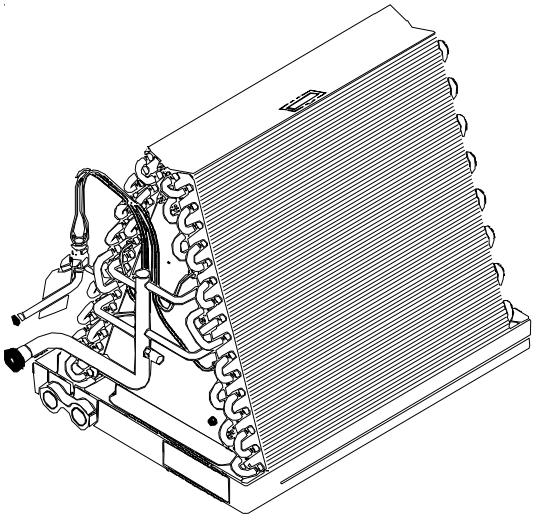
Service Instructions

CKL, CLJ, CRT, CLT, TWC, CLQ & HDC Split System Remote Coolers and CPLE, CPLJ, CPRT, CPLT & HDP Split System Remote Heat Pumps with R-22 Refrigerant Blowers, Coils, & Accessories







This manual is to be used by qualified, professionally trained HVAC technicians only. Goodman does not assume any responsibility for property damage or personal injury for improper service procedures or services performed by an unqualified person.

RS6200004
May 2006

INDEX

INDEX (Cont.)

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

IMPORTANT INFORMATION

Pride and workmanship go into every product to provide our customers with quality products. It is possible, however, that during its lifetime a product may require service. Products should be serviced only by a qualified service technician who is familiar with the safety procedures required in the repair and who is equipped with the proper tools, parts, testing instruments and the appropriate service manual. **REVIEW ALL SERVICE INFORMATION IN THE APPROPRIATE SERVICE MANUAL BEFORE BEGINNING REPAIRS.**

IMPORTANT NOTICES FOR CONSUMERS AND SERVICERS

RECOGNIZE SAFETY SYMBOLS, WORDS AND LABELS

WARNING

Hazards or unsafe practices which could result in property damage, product damage, personal injury or death.

WARNING

To prevent the risk of property damage, personal injury, or death, do not store combustible materials or use gasoline or other flammable liquids or vapors in the vicinity of this appliance.

WARNING

Do not connect to or use any device that is not design certified by Goodman for use with this unit. Serious property damage, personal injury, reduced unit performance and/or hazardous conditions may result from the use of such non-approved devices.

WARNING

ONLY individuals meeting the requirements of an "Entry Level Technician" as specified by the Air Conditioning and Refrigeration Institute (ARI) may use this information. Attempting to install or repair this unit without such background may result in product damage, personal injury, or death.

WARNING

Goodman will not be responsible for any injury or property damage arising from improper service or service procedures. If you install or perform service on this unit, you assume responsibility for any personal injury or property damage which may result. Many jurisdictions require a license to install or service heating and air conditioning equipment.

WARNING

The United States Environmental Protection Agency ("EPA") has issued various regulations regarding the introduction and disposal of refrigerants introduced into this unit. Failure to follow these regulations may harm the environment and can lead to the imposition of substantial fines. These regulations may vary by jurisdiction. A certified technician must perform the installation and service of this product. Should questions arise, contact your local EPA office. Violations of EPA regulations may result in fines or penalties.

To locate an authorized servicer, please consult your telephone book or the dealer from whom you purchased this product. For further assistance, please contact:

CONSUMER INFORMATION LINE
GOODMAN MANUFACTURING COMPANY, L.P. TOLL FREE
1-877-254-4729 (U.S. only)
email us at: customerservice@goodmanmfg.com
fax us at: (731) 856-1821
(Not a technical assistance line for dealers.)

Outside the U.S., call 1-713-861-2500. (Not a technical assistance line for dealers.)
Your telephone company will bill you for the call.

IMPORTANT INFORMATION

SAFE REFRIGERANT HANDLING

While these items will not cover every conceivable situation, they should serve as a useful guide.

WARNING

Refrigerants are heavier than air. They can "push out" the oxygen in your lungs or in any enclosed space.To avoid possible difficulty in breathing or death:

- **Never purge refrigerant into an enclosed room or space. By law, all refrigerants must be reclaimed.**
- **If an indoor leak is suspected, thoroughly ventilate the area before beginning work.**
- **Liquid refrigerant can be very cold. To avoid possible frostbite or blindness, avoid contact with refrigerant and wear gloves and goggles. If liquid refrigerant does contact your skin or eyes, seek medical help immediately.**
- **Always follow EPA regulations. Never burn refrigerant, as poisonous gas will be produced.**

WARNING

To avoid possible explosion:

- **Never apply flame or steam to a refrigerant cylinder. If you must heat a cylinder for faster charging, partially immerse it in warm water.**
- **Never fill a cylinder more than 80% full of liquid refrigerant.**
- **Never add anything other than R-22 to an R-22 cylinder or R-410A to an R-410A cylinder. The service equipment used must be listed or certified for the type of refrigerant used.**
- **Store cylinders in a cool, dry place. Never use a cylinder as a platform or a roller.**

WARNING

To avoid possible injury, explosion or death, practice safe handling of refrigerants.

WARNING

To avoid possible explosion, use only returnable (not disposable) service cylinders when removing refrigerant from a system.

- **Ensure the cylinder is free of damage which could lead to a leak or explosion.**
- **Ensure the hydrostatic test date does not exceed 5 years.**
- **Ensure the pressure rating meets or exceeds 400 lbs.**

When in doubt, do not use cylinder.

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

WARNING

System contaminants, improper service procedure and/or physical abuse affecting hermetic compressor electrical terminals may cause dangerous system venting.

The successful development of hermetically sealed refrigeration compressors has completely sealed the compressor's moving parts and electric motor inside a common housing, minimizing refrigerant leaks and the hazards sometimes associated with moving belts, pulleys or couplings.

Fundamental to the design of hermetic compressors is a method whereby electrical current is transmitted to the compressor motor through terminal conductors which pass through the compressor housing wall. These terminals are sealed in a dielectric material which insulates them from the housing and maintains the pressure tight integrity of the hermetic compressor. The terminals and their dielectric embedment are strongly constructed, but are vulnerable to careless compressor installation or maintenance procedures and equally vulnerable to internal electrical short circuits caused by excessive system contaminants.

In either of these instances, an electrical short between the terminal and the compressor housing may result in the loss of integrity between the terminal and its dielectric embedment. This loss may cause the terminals to be expelled, thereby venting the vaporous and liquid contents of the compressor housing and system.

A venting compressor terminal normally presents no danger to anyone, providing the terminal protective cover is properly in place.

If, however, the terminal protective cover is not properly in place, a venting terminal may discharge a combination of

(a) hot lubricating oil and refrigerant

(b) flammable mixture (if system is contaminated with air)

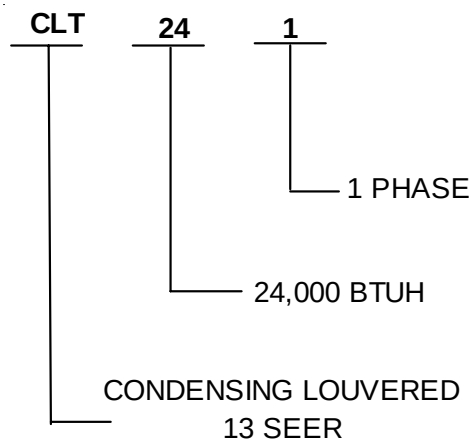
in a stream of spray which may be dangerous to anyone in the vicinity. Death or serious bodily injury could occur.

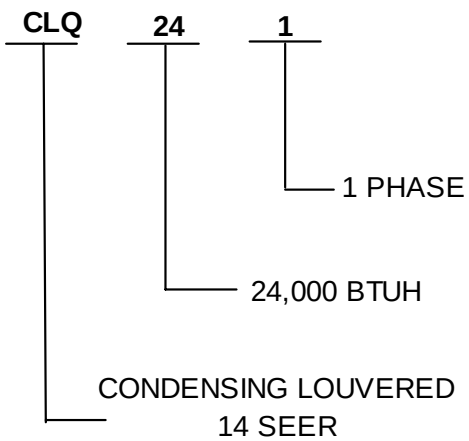
Under no circumstances is a hermetic compressor to be electrically energized and/or operated without having the terminal protective cover properly in place.

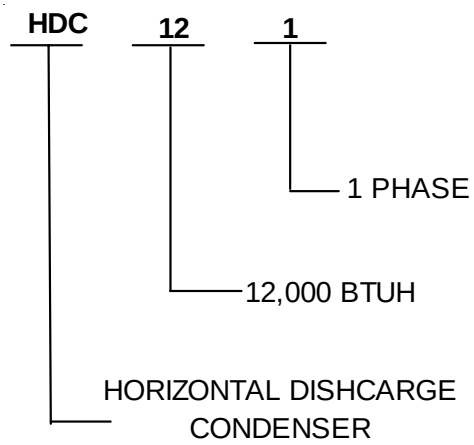
See Service Section S-17 for proper servicing.

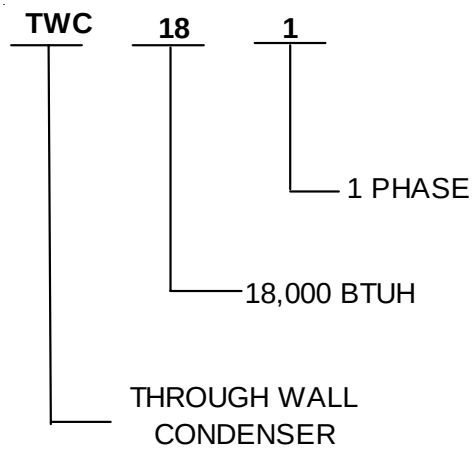
PRODUCT IDENTIFICATION

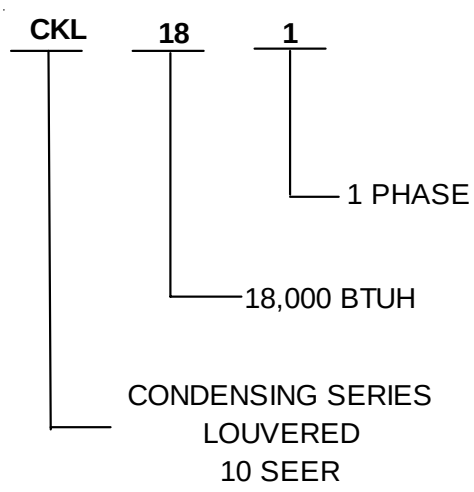
CONDENSING UNITS

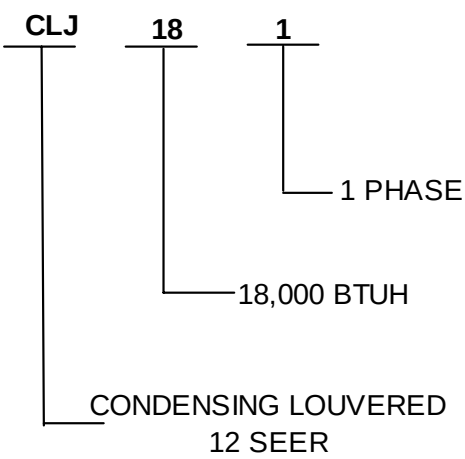


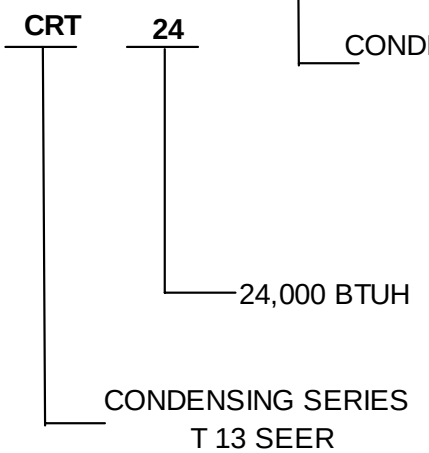






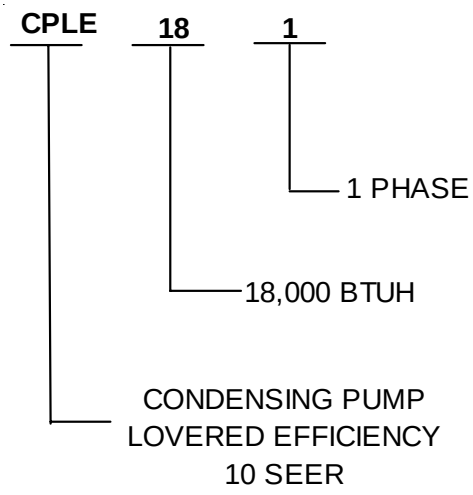


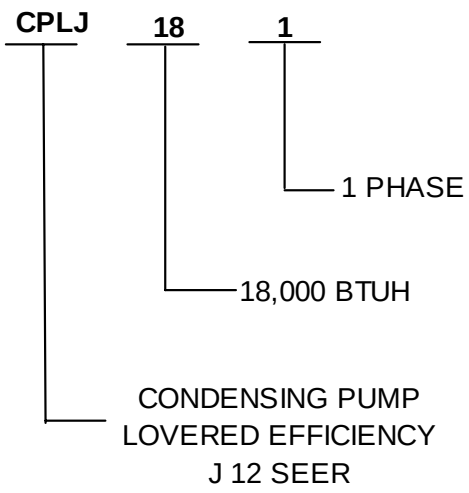


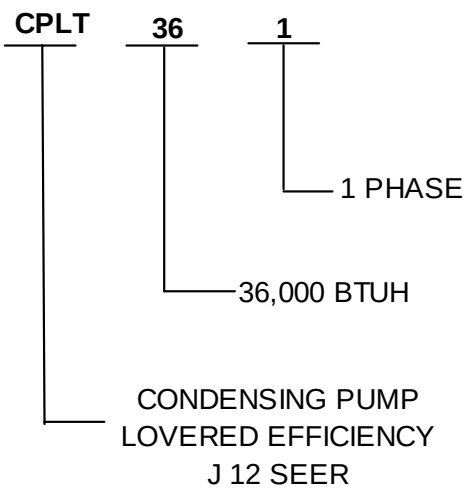


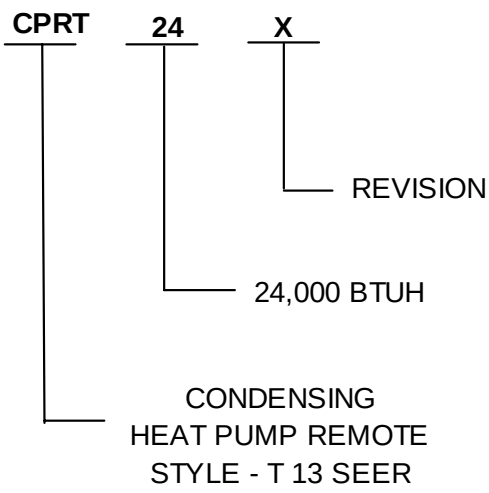
PRODUCT IDENTIFICATION

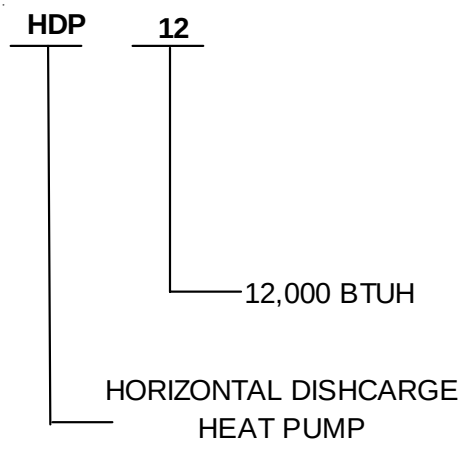
HEAT PUMPS











PRODUCT IDENTIFICATION

CONDENSING UNITS

Model	Description
CKL18-120	1.5 to 10 Ton 10 SEER Condensing Units
CLJ18-64	1.5 to 5 Ton 12 SEER Condensing Units
CRT24-60	2 to 5 Ton 13 SEER Condensing Units
CLT24-60	2 to 5 Ton 13 SEER Condensing Units
CLQ24-60	2 to 5 Ton 14 SEER Condensing Units
TWC18-30	2 to 5 Ton 10 SEER Condensing Units
HDC12-24-1A	Horizontal Discharge Air Cond. 1 thru 2 Ton

HEAT PUMPS

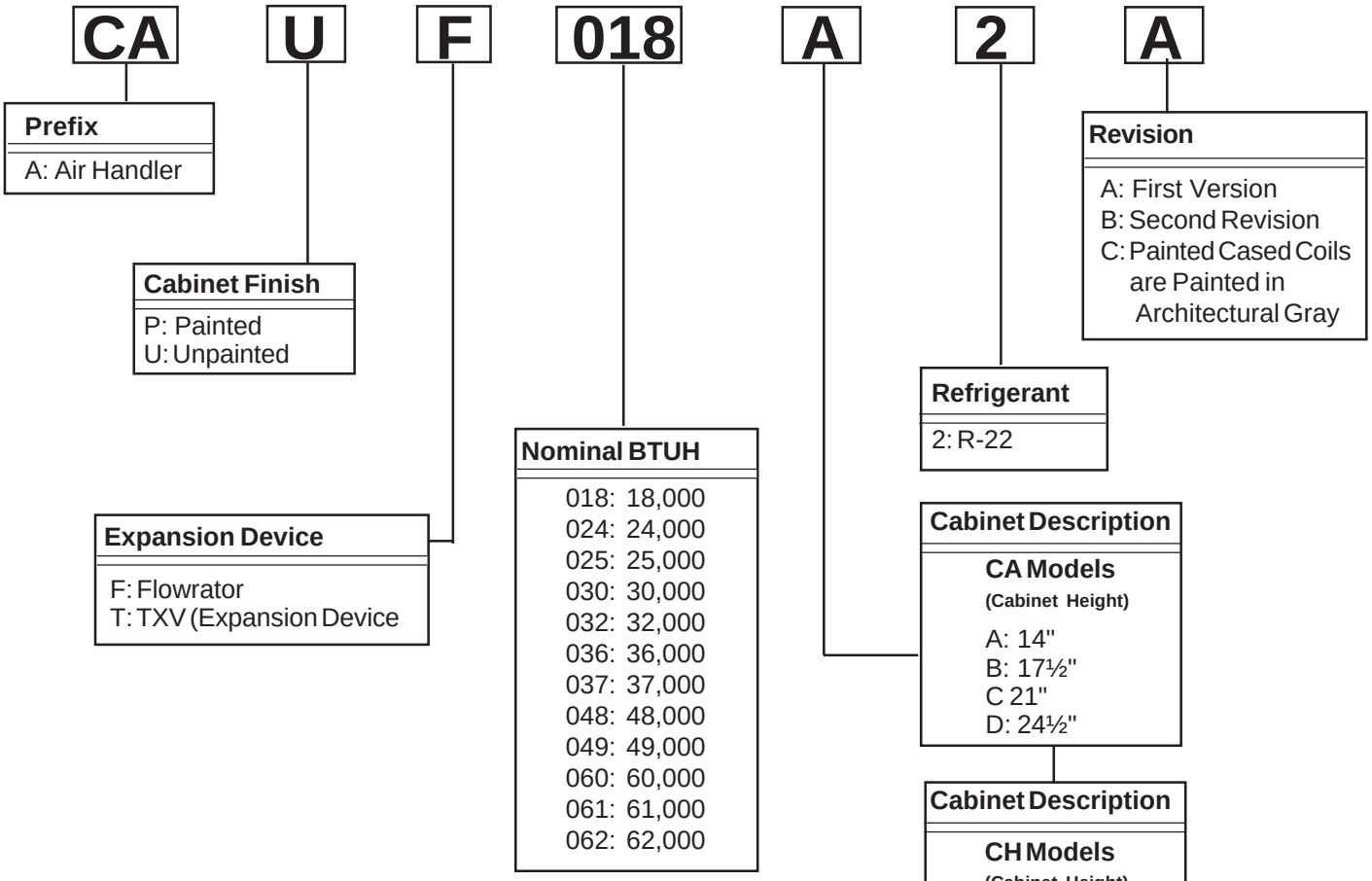
Model	Descripton
CPLE18-120	1.5 to 5 Ton 10 SEER Heat Pump Units
CPLJ18-60	1.5 to 5 Ton 12 SEER Heat Pump Units
CPRT24-60	2 to 5 Ton 13 SEER Heat Pump Units
CPLT24-60	2 to 5 Ton 13 SEER Heat Pump Units
HDP12-24-1A	Horizontal Discharge Heat Pump 1 thru 2 Ton

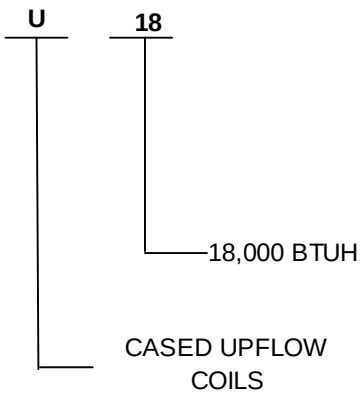
COILS

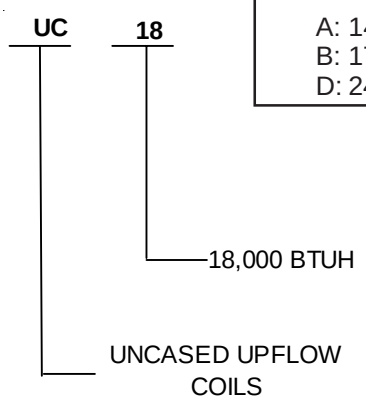
Model	Description
UC-18-62	Uncased Upflow Coil
U-18-62	Cased Upflow Coil
CAUF018-061	A Coil Upflow/Downflow Flowrator
CAPF018-060	A Coil Upflow/Downflow Painted Cased Flowrator
CAUX018-061	A Coil Upflow/Downflow w/ TXV
CAPX018-061	A Coil Upflow/Downflow Painted Cased w/ TXV
CHPF024-060	Horizontal A Coil Painted Cased w/ Flowrator
CHPX024-060	Horizontal A Coil Painted Cased w/ TXV
CACF018-061	Cased Upflow/Downflow Coil
H-24F-61F	Horizontal Evaporator Coil
HT-18-61	Horizontal "Butt-up" Evaporator Coil

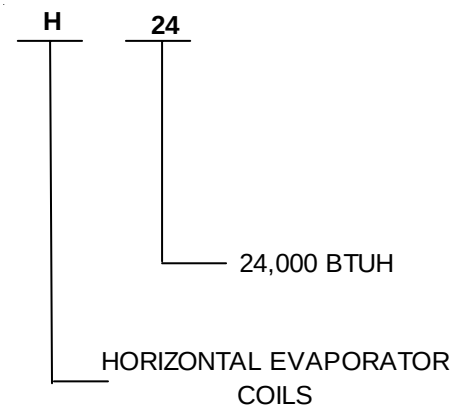
PRODUCT IDENTIFICATION

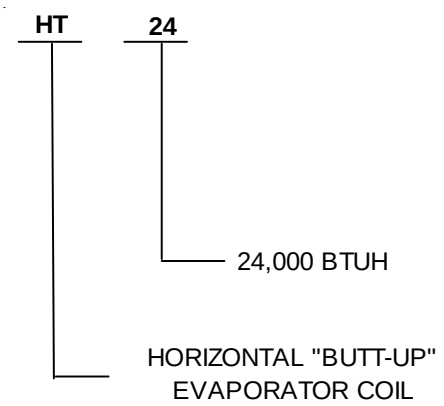
COILS



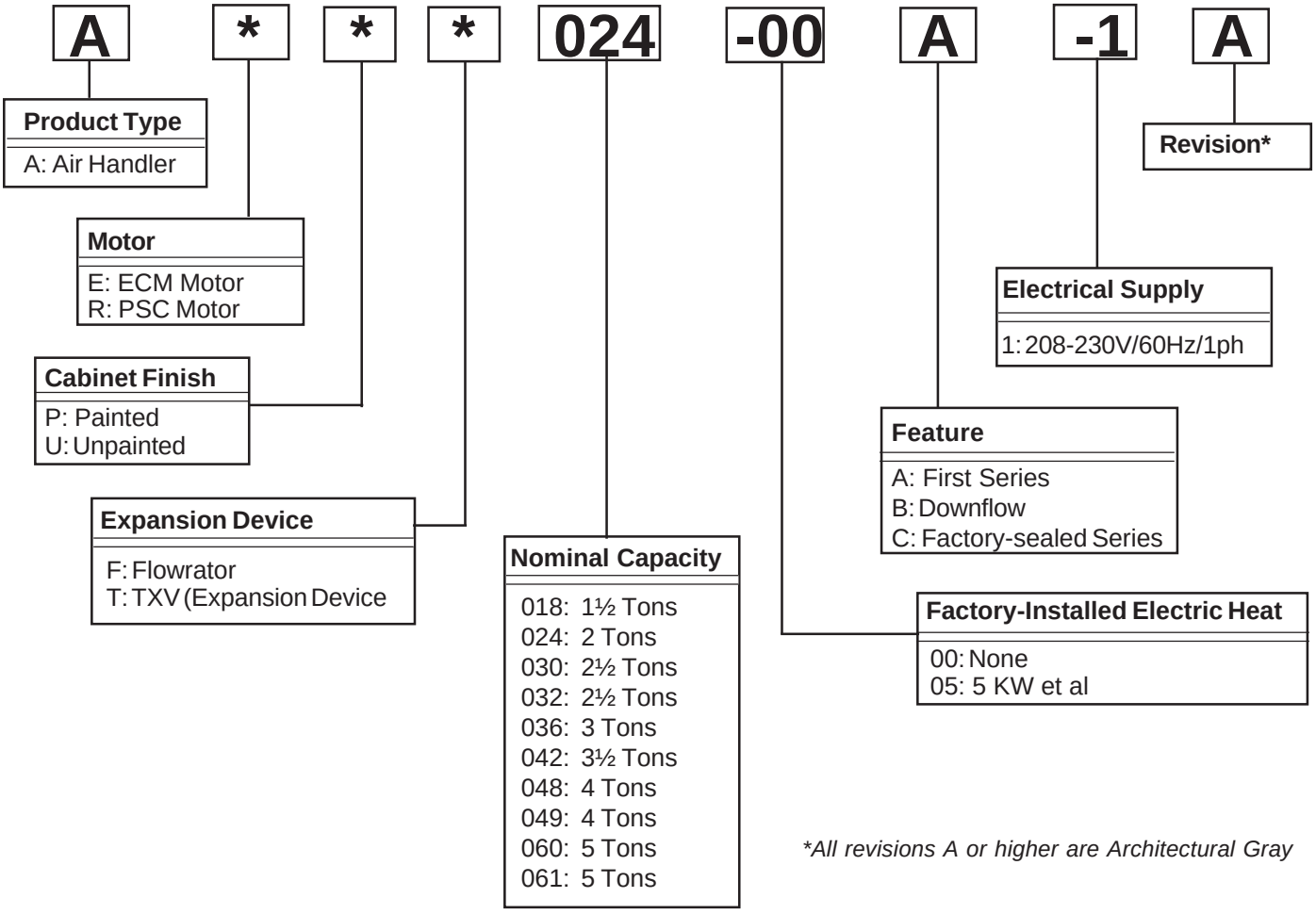








PRODUCT IDENTIFICATION
AIR HANDLERS



All revisions A or higher are Architectural Gray

AR 60

18- 18,000 BTUH
24- 24,000 BTUH
30, 32- 30,000 BTUH
36- 36,000 BTUH
42- 42,000 BTUH
48,49- 48,000 BTUH
60,61- 60,000 BTUH

AR-AIRHANDLER WITH COIL (2nd Generation)

All Airhandlers use **DIRECT DRIVE MOTORS**. Power supply is AC 208-230v, 60 hz, 1 phase.

PRODUCT IDENTIFICATION

AIR HANDLERS

A 24 00 2 RA

- **A** — **Air Handler w/Coil**
- **24** — **24 - 24,000 BTUH (7.0 KW)**
  36 - 36,000 BTUH (10.5 KW)
  48 - 48,000 BTUH (14.0 KW)
  60 - 60,000 BTUH (17.6 KW)
- **00** — **W/OPTION FOR HEATER KIT ***
- **2** — **50 HTZ MODEL**
- **RA** — **SECOND GENERATION**

AER 60

- 60 — AER-AIRHANDLER WITH COIL (2nd Generation)
- 24 - 24,000 BTUH
  30 - 30,000 BTUH
  36 - 36,000 BTUH
  48 - 48,000 BTUH
  60 - 60,000 BTUH

AWB 24 08 C

- **AWB** — AIR HANDLER WALL MOUNT B REVISION
- **24** — 24,000 BTUH
- **08** — KW OF HEAT
- **C** — CIRCUIT BREAKER

AC 24 05 D

- **AC** — AIR HANDLER CEILING MOUNT
- **24** — 24,000 BTUH
- **05** — KW OF HEAT
- **D** — CIRCUIT BREAKER

All Airhandlers use **DIRECT DRIVE MOTORS**. Power supply is AC 208-230v, 60 hz, 1 phase.

PRODUCT IDENTIFICATION
AIR HANDLERS

Model	Description
AR18-120	Elec. Cooling & Heat Pump Air Handler
AW 18-30	Vertical Wall Mount Air Handler
AER24-60	Multi-Position Variable Spd Air Handler
ACHP18-36	Hydronic Heat Air Handler
AH18-36	Hydronic Heat Air Handler
AC18-36	AC Electric Heat Air Handler
AWB18-36	Vertical Wall Mount Air Handler
ARUF018-061	Multi-Position Electric Heat Air Handler w/ Flowrator
ARPT024-060	Multi-Position Painted Electric Heat Air Handler w/ TXV
ARPF024-060	Multi-Position Painted Electric Heat Air Handler w/ Flowrator
AEPT030-060	Multi-Position Painted Variable Spd. Air Handler w/ TXV
WMC12-24-1A	Ductless Air Conditioning Indoor Section 1 thru 2 Ton
WMH12-24-1A	Ductless Heat Pump Indoor Section 1 thru 2 Ton

ACCESSORIES

SPLIT SYSTEM AIR CONDITIONING ACCESSORIES

Model	Description
LA-01	Low Ambient Kit
HLPK-01	High and Low Pressure Switch Kit
LPS-01	Low Pressure Kit
FP-01	Freeze Protection Kit for AC Air Handlers & Coils
ASC01A	Anti-Short Cycle Control Kit

SPLIT SYSTEM HEAT PUMP ACCESSORIES

Model	Description
AFE-18	All Fuel Kit
OT18-60	Outdoor Thermostat Kit
EH18-60	Emergency Heat Relay Kit
HPSK-01	Heat Pump Shut Off; for AC Air Handlers
FP-01	Freeze Protection Kit; for AC Air Handlers
ASC01A	Anti-Short Cycle Control Kit

COIL ACCESSORIES

Model	Description	Used With These Units
TX3N2	TXV Kit 1.5 to 3 Ton Air Cond. & Heat Pump	CAUF,CAPF CHPF
TX5N2	TXV Kit 3.5 to 5 Ton Air Cond. & Heat Pump	CAUF,CAPF CHPF
DFK	Downflow Kits	U- UC coils
DFKT	Downflow Kits	U-UC Coils

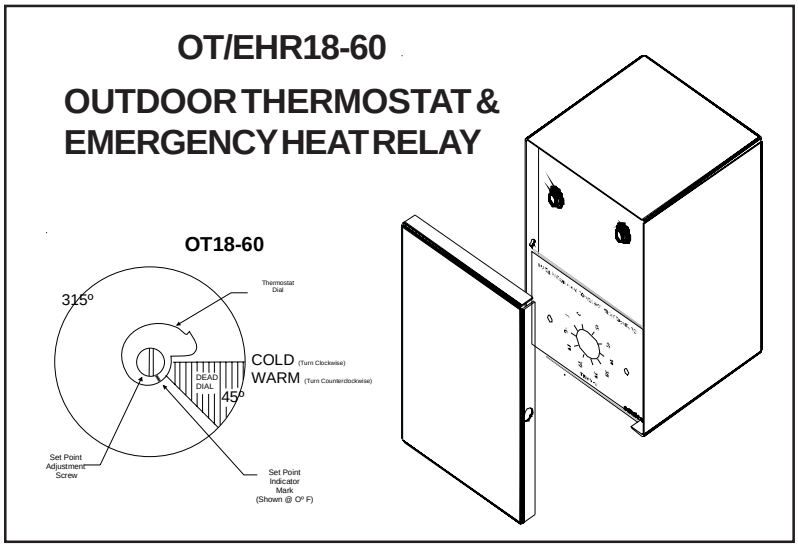
COIL INSULATION KIT FOR DOWNFLOW APPLICATIONS

Chassis Size	Insulation Kit
Small	DPI18-30/20
Medium	DPI36-42/20
Large	DPI48-60/20

NOTE: Each kit contains enough material to modify 20 coils.

ACCESSORIES
AIR HANDLER ACCESSORIES

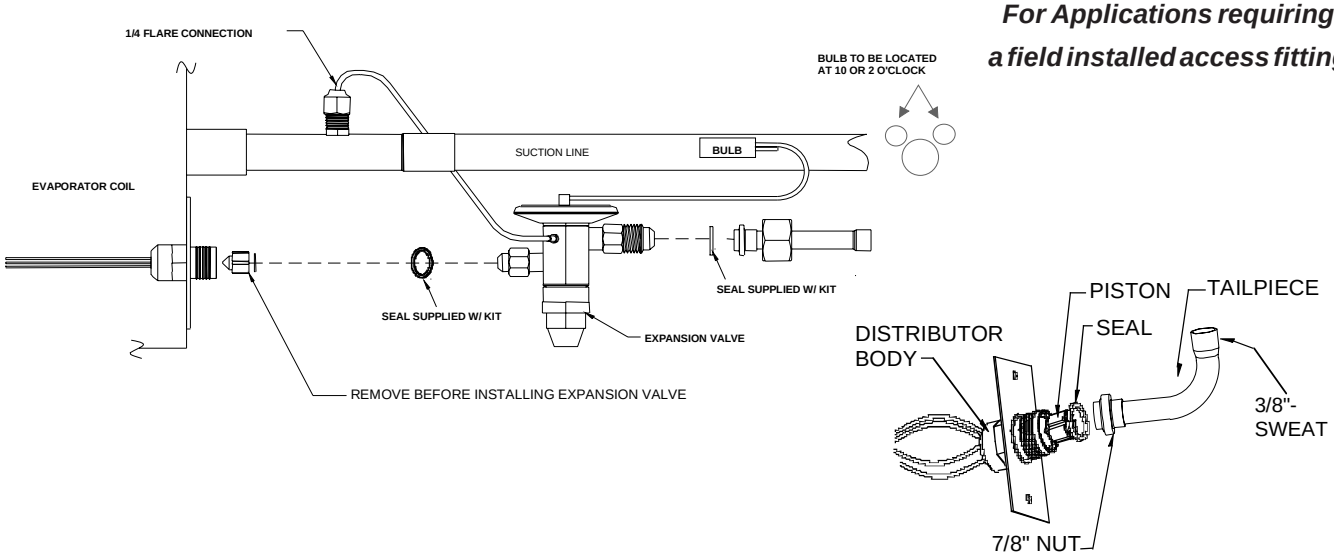
Model	Description	Used With These Units
WCK-01	Water Circulator Timer Kit	AH, ACHP
FIL18-32	Washable Air Filter	AR,AER,AEPT,ARPT,ARPF, ARUF
FIL36-42	Washable Air Filter	AR,AER,AEPT,ARPT,ARPF, ARUF
FIL48-61	Washable Air Filter	AR,AER,AEPT,ARPT,ARPF, ARUF
CAP-1	Ceiling Access Panels	AC,ACHP
CAP-2	Ceiling Access Panels	AC,ACHP
CAP-3	Ceiling Access Panels	AC,ACHP
CAP-1L	Ceiling Access Panels	AC,ACHP
CAP-2L	Ceiling Access Panels	AC,ACHP
CAP-3L	Ceiling Access Panels	AC,ACHP
WAD-1	Wall Access Door	AH,AWB
WAD-2	Wall Access Door	AH,AWB
XV18-36C	Expansion Valve Kit, Non-bleed	APRF/ARUF18-36
XV42-60C	Expansion Valve Kit, Non-bleed	ARPF/ARUF42-60
XVB18-36C	Expansion Valve Kit, 20% bleed	ARPF/ARUF18-36
XVB42-60C	Expansion Valve Kit, 20% bleed	ARPF/ARUF42-60
TX3N2	TXV Kit 1.5 to 3 Ton Air Cond. & Heat Pump	ARPF/ARUF18-36
TX5N2	TXV Kit 3.5 to 5 Ton Air Cond. & Heat Pump	AAPF/ARUF42-60
DPI18-30/20	Coil Insulation Kit; Small Chassis { Downflow}	AEPT,ARPT,ARUF
DPI36-42/20	Coil Insulation Kit; Medium Chassis { Downflow}	AEPT,ARPT,ARUF
DPI48-60/20	Coil Insulation Kit; Large Chassis { Downflow}	AEPT,ARPT,ARUF
FP-01	Freeze Protection Kit	All Models.



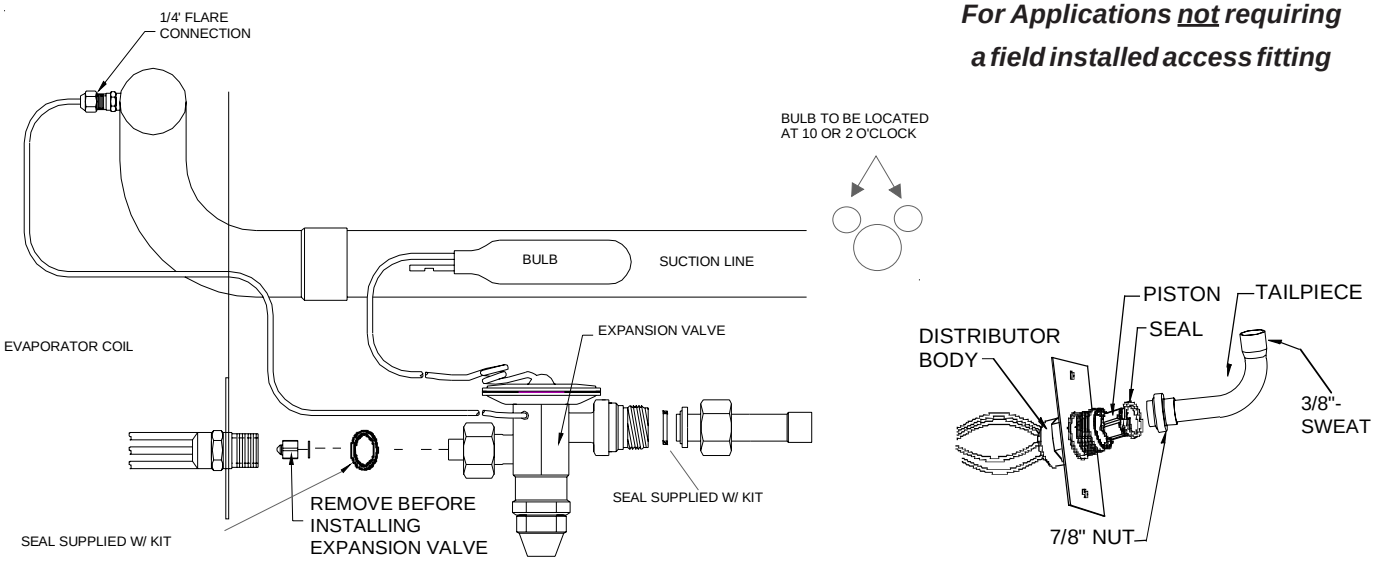
ACCESSORIES

EXPANSION VALVE KITS

For Applications requiring a field installed access fitting



For Applications <u>not</u> requiring a field installed access fitting



EXPANSION VALVE KITS FOR AIR CONDITIONING-ONLY APPLICATIONS

Kit Number	Use With	Description
XVB18-36C	ARUF018 to ARUF036	20% Bleed Valve
XVB42-60C	ARUF042 to ARUF060	20% Bleed Valve
XV18-36C	ARUF018 to ARUF 036	Non-Bleed Valve
XV42-60C	ARUF042 to ARUF061	Non-Bleed Valve

ACCESSORIES

PISTON KIT CHART

OUTDOOR UNIT	INDOOR UNIT BTU's	INDOOR PISTON SIZE	PISTON KIT PART NO.
CKL18-1*	18000	.052	(2)
	24000	.052	B1789852 (3)
	29000	.052	B1789852 (3)
	31000	.055	B1789855 (3)
	32000	.055	B1789855 (3)
	36000	.055	B1789855 (3)
	AH18	.049	(2)
	AE(R)24	.055	B1789855 (3)
CKL24-1*	24000	.059	(2)
	29000	.059	(2)
	30000	.059	B1789859 (3)
	31000	.062	B1789862 (3)
	32000	.062	B1789862 (3)
	36000	.062	B1789862 (3)
	AE(R)24	.062	(2)
CKL30-1*	24000	.065	(3)
	29000	.065	(4)
	30000	.065	(2)
	31000	.065	B1789865 (3)
	32000	.065	B1789865 (3)
	36000	.065	B1789865 (3)
	42000	.068	B1789868 (3)
	49000	.068	B1789868 (3)
	AE(R)30	.068	(2)
	AE(R)36	.068	B1789868 (3)
CKL36-1*	35000	.071	(2)
	36000	.071	(2)
	42000	.073	B1789873 (3)
	49000	.073	B1789873 (3)
	AE(R)36	.074	(2)
CKL42-1*	42000	.078	(2)
	47000	.078	B1789878 (3)
	48000	.078	B1789878 (3)
	49000	.078	B1789878 (3)
	60000	.078	B1789878 (3)
	AE(R)48	.082	(2)
CKL49-1*/3*	47000	.082	(2)
	48000	.082	(2)
	49000	.082	(2)
	59000	.082	B1789882 (1)
	60000	.082	B1789882 (1)
	61000	.082	B1789882 (1)
CKL60-1*/3*	60000	.090	(2)
	61000	.090	(2)
	62000	.090	(2)
	AE(R)60	.090	(2)
CKL62-1*	59000	.093	B1789893 (1)
	60000	.093	B1789893 (1)
	61000	.093	B1789893 (1)
	62000	.093	B1789893 (1)
	AE(R)60	.093	B1789893 (1)
CLJ18-1*	18000	.055	B1789855 (1)
	24000	.055	B1789855 (1)
	29000	.055	B1789855 (1)
	30000	.055	B1789855 (1)
	31000	.055	B1789855 (1)
	32000	.055	B1789855 (1)
	36000	.055	B1789855 (1)
	AH18	.052	B1789852 (3)
	AE(R)24	.055	B1789855 (1)
CLJ24-1*	24000	.057	B1789857 (1)
	29000	.057	B1789857 (1)
	30000	.057	B1789857 (1)
	31000	.057	B1789857 (1)
	32000	.057	B1789857 (1)
	36000	.057	B1789857 (1)
	AE(R)24	.057	B1789857 (1)
CLJ30-1*	30000	.065	(2)
	31000	.065	B1789865 (1)
	32000	.065	B1789865 (1)
	36000	.065	B1789865 (1)
	AE(R)30	.065	B1789865 (1)
	AE(R)36	.065	B1789865 (1)

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(1) PISTON SUPPLIED WITH THE OUTDOOR UNIT.
(2) PISTON SUPPLIED WITH THE INDOOR UNIT.
(3) PURCHASE PISTON KIT FROM DISTRIBUTOR.
(4) B1789865 PISTON PROVIDED IN THE INDOOR UNIT.
(5) PISTON PROVIDED IN THE OUTDOOR UNIT LIQUID LINE SERVICE VALVE.

OUTDOOR UNIT	INDOOR UNIT BTU's	INDOOR PISTON SIZE	PISTON KIT PART NO.
CLJ36-1*	36000	.071	(2)
	42000	.073	B1789873 (1)
	47000	.073	B1789873 (1)
	49000	.073	B1789873 (1)
	AE(R)36	.074	(2)
CLJ42-1*	42000	.078	(2)
	48000	.078	B1789878 (1)
	49000	.078	B1789878 (1)
	59000	.078	B1789878 (1)
	60000	.078	B1789878 (1)
	AE(R)48	.078	B1789878 (1)
CLJ48-1*	48000	.082	(2)
	49000	.082	(2)
	59000	.082	B1789882 (1)
	60000	.082	B1789882 (1)
	61000	.082	B1789882 (1)
	62000	.082	B1789882 (1)
	AE(R)48	.082	(2)
CLJ60-1*	59000	.093	B1789893 (1)
	60000	.093	B1789893 (1)
	61000	.093	B1789893 (1)
	62000	.093	B1789893 (1)
	AE(R)60	.093	B1789893 (1)
CLT24-1*/CRT24-1*	24000	.055	B1789855 (1)
	29000	.055	B1789855 (1)
	31000	.055	B1789855 (1)
	32000	.055	B1789855 (1)
	36000	.055	B1789855 (1)
	42000	.055	B1789855 (1)
	49000	.055	B1789855 (1)
	AE(R)24	.055	B1789855 (1)
CLT30-1*/CRT30-1*	30000	.065	(2)
	32000	.065	B1789865 (1)
	36000	.065	B1789865 (1)
	42000	.065	B1789865 (1)
	49000	.065	B1789865 (1)
	AE(R)36	.065	B1789865 (1)
CLT36-1*/CRT36-1*	47000	.074	B1789874 (1)
	48000	.074	B1789874 (1)
	49000	.074	B1789874 (1)
	60000	.074	B1789874 (1)
	AE(R)36	.074	(2)
CLT42-1*/CRT42-1*	42000	.078	(2)
	48000	.078	B1789878 (3)
	49000	.078	B1789878 (3)
	61000	.080	B1789880 (1)
	62000	.080	B1789880 (1)
	AE(R)48	.082	(2)
CLT48-1*/CRT48-1*	48000	.082	(2)
	49000	.082	(2)
	60000	.082	B1789882 (1)
	61000	.082	B1789882 (1)
	62000	.082	B1789882 (1)
	AE(R)48	.082	(2)
CLT60-1*/CRT60-1*	60000	.088	B1789888 (1)
	61000	.088	B1789888 (1)
	62000	.088	B1789888 (1)
	AE(R)60	.088	B1789888 (1)
CLQ24-1*	31000	.059	B1789859 (1)
	32000	.059	B1789859 (1)
	36000	.059	B1789859 (1)
	42000	.059	B1789859 (1)
	47000	.059	B1789859 (1)
	49000	.059	B1789859 (1)
	AE(R)24	.059	B1789859 (1)
CLQ30-1*	31000	.065	B1789865 (1)
	32000	.065	B1789865 (1)
	36000	.065	B1789865 (1)
	60000	.065	B1789865 (1)
	61000	.065	B1789865 (1)
	62000	.065	B1789865 (1)
	AE(R)36	.065	B1789865 (1)
CLQ36-1*	49000	.073	B1789873(1)
	60000	.073	B1789873(1)
	61000	.073	B1789873(1)
	62000	.073	B1789873(1)
	AE(R)36	.073	B1789873(1)
CLQ42-1*	49000	.080	B1789880 (1)
	60000	.080	B1789880 (1)
	61000	.080	B1789880 (1)
	62000	.080	B1789880 (1)
	AE(R)48	.080	B1789880 (1)
CLQ48-1*	49000	.082	(2)
	60000	.082	B1789882 (1)
	61000	.082	B1789882 (1)
	62000	.082	B1789882 (1)
	AE(R)48	.082	(2)
CLQ60-1*	60000	.090	(2)
	61000	.090	(2)
	62000	.090	(2)
	AE(R)60	.090	(2)

ACCESSORIES

OUTDOOR UNIT	INDOOR UNIT BTU's	INDOOR PISTON SIZE	PISTON KIT PART NO.
CPLE18-1*	18000	.052	(2)
	24000	.052	B1789852 (3)
	29000	.052	B1789852 (3)
	36000	.052	B1789852 (3)
CPLE24-1*	24000	.059	(2)
	29000	.059	(2)
	30000	.059	B1789859 (3)
	31000	.059	B1789859 (3)
	32000	.059	B1789859 (3)
	36000	.059	B1789859 (3)
CPLE30-1*	29000	.065	B1789865 (3)
	30000	.065	(2)
	31000	.068	(2)
	32000	.068	(2)
	36000	.068	B1789868 (3)
	48000	.068	B1789868 (3)
CPLE36-1*	35000	.073	B1789873 (1)
	36000	.073	B1789873 (1)
	42000	.073	B1789873 (1)
	47000	.073	B1789873 (1)
	48000	.073	B1789873 (1)
	49000	.073	B1789873 (1)
CPLE42-1*	42000	.078	(2)
	47000	.078	B1789878 (3)
	48000	.078	B1789878 (3)
	49000	.078	B1789878 (3)
CPLE48-1*	47000	.082	(2)
	49000	.082	(2)
	59000	.082	B1789882 (3)
	60000	.082	B1789882 (3)
	61000	.082	B1789882 (3)
	62000	.082	B1789882 (3)
CPLE60-1*/3*	61000	.092	B1789892 (1)
CPLJ18-1*	18000	.052	(2)
	24000	.055	B1789855 (1)
	32000	.055	B1789855 (1)
	36000	.055	B1789855 (1)
	AE(R)24	.055	B1789855 (1)
CPLJ24-1*	24000	.059	(2)
	30000	.059	B1789859 (1)
	31000	.059	B1789859 (1)
	32000	.059	B1789859 (1)
	36000	.059	B1789859 (1)
	42000	.059	B1789859 (1)
	AE(R)24	.059	B1789859 (1)
CPLJ30-1*	30000	.065	(2)
	32000	.068	(2)
	36000	.068	B1789868 (1)
	42000	.068	B1789868 (1)
	AE(R)30	.068	(2)
	AE(R)36	.068	B1789868 (1)
CPLJ36-1*	36000	.071	(2)
	42000	.074	B1789874 (1)
	49000	.074	B1789874 (1)
	AE(R)36	.074	(2)
CPLJ42-1*	42000	.078	(2)
	49000	.078	B1789878 (1)
	60000	.078	B1789878 (1)
	61000	.078	B1789878 (1)
	AE(R)48	.078	B1789878 (1)

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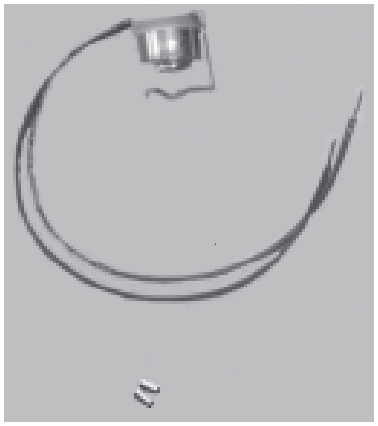
(3) PURCHASE PISTON KIT FROM DISTRIBUTOR.
(4) B1789865 PISTON PROVIDED IN THE INDOOR UNIT.
(5) PISTON PROVIDED IN THE OUTDOOR UNIT LIQUID LINE SERVICE VALVE.

OUTDOOR UNIT	INDOOR UNIT BTU's	INDOOR PISTON SIZE	PISTON KIT PART NO.
CPLJ48-1*	48000	.082	(2)
	49000	.084	B1789884 (1)
	60000	.084	B1789884 (1)
	61000	.084	B1789884 (1)
	AE(R)48	.084	B1789884 (1)
CPLJ60-1*	60000	.090	(2)
	61000	.090	(2)
	62000	.090	(2)
	AE(R)60	.090	(2)
CPLT24-1*/CPRT24-1*	32000	.062	B1789862 (1)
	36000	.062	B1789862 (1)
	42000	.062	B1789862 (1)
	AE(R)24	.062	(2)
CPLT30-1*/CPRT30-1*	32000	.071	B1789871 (1)
	36000	.071	(2)
	42000	.071	B1789871 (1)
	AE(R)30	.071	B1789871 (1)
	AE(R)36	.071	B1789871 (1)
CPLT36-1*/CPRT36-1*	48000	.073	B1789873 (1)
	49000	.073	B1789873 (1)
	60000	.073	B1789873 (1)
	AE(R)36	.073	B1789873 (1)
CPLT42-1*/CPRT42-1*	49000	.078	B1789878 (1)
	60000	.078	B1789878 (1)
	61000	.078	B1789878 (1)
	AE(R)48	.078	B1789878 (1)
CPLT48-1*/CPRT48-1*	61000	.084	B1789884 (1)
	AE(R)48	.084	B1789884 (1)
CPLT60-1*/CPRT60-1*	61000	.092	B1789892 (1)
	AE(R)60	.092	B1789892 (1)
EXPORT UNITS			
CKF36-2L*	36000	.067	(2)
CKF36-5L*	36000	.067	(2)
CKF48-5L*	48000	.076	(2)
CKF60-5L*	60000	.089	(2)
CKF70-5L*	60000	.089	(2)
CPKF24-2L*	24000	.059	(2)
CPKF36-2L*	36000	.067	(2)
CPKF36-5L*	36000	.067	(2)
CPKF36-2L*	48000	.067	B1789867 (3)
CPKF36-5L*	48000	.067	B1789867 (3)
CPKF42-5L*	48000	.073	B1789873 (3)
CPKF48-2L*	48000	.076	(2)
CPKF48-5L*	48000	.076	(2)
CPKF60-5L*	60000	.089	(2)
CPKF61-5L*	60000	.092	B1789892 (3)
MINI SPLIT UNITS			
HDC12-1*	12000	.045	(5)
	18000	.045	(5)
HDC18-1*	18000	.052	(5)
	24000	.052	(5)
HDC24-1*	24000	.055	(5)
HDP12-1*	12000	.045	(5)
	18000	.045	(5)
HDP18-1*	18000	.052	(5)
	24000	.052	(5)
HDP24-1*	24000	.055	(5)
THROUGH THE WALL UNITS			
TWC18-1*	18000	.052	(2)
TWC24-1*	24000	.059	(2)
	30000	.059	B1789859 (3)
TWCR30-1*	36000	.062	B1789862 (1)

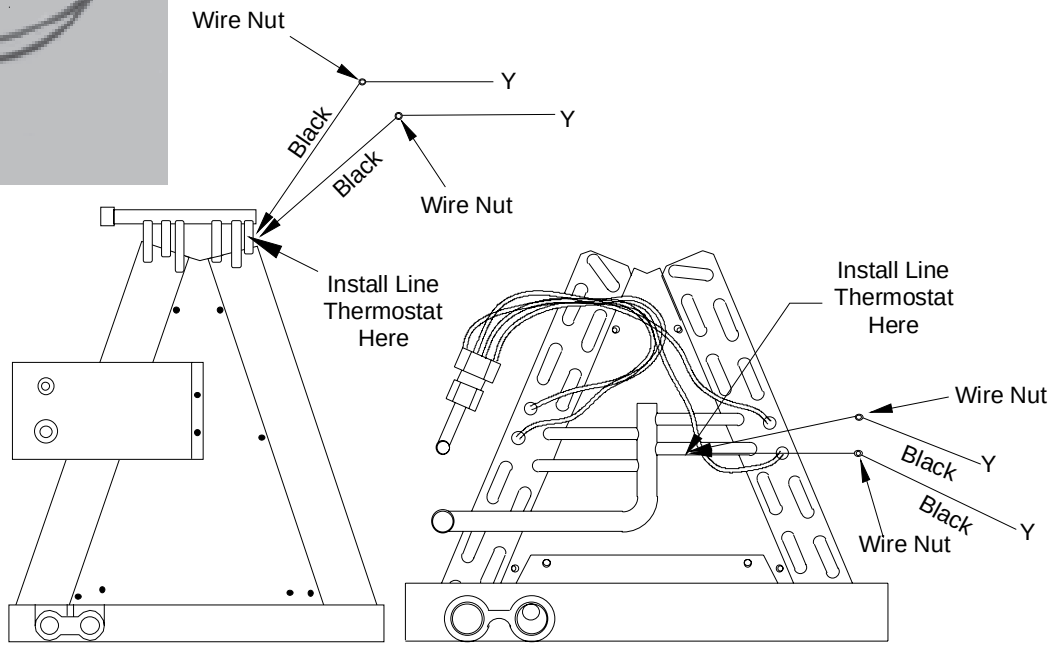
⚠ WARNING

It is essential that indoor and outdoor units be properly matched. Failure to follow these instructions or to properly match evaporators and condensors can result in unit damage, property damage and/or personal injury. No warranty will be honored for mix-matched systems that fail to adhere to these instructions.

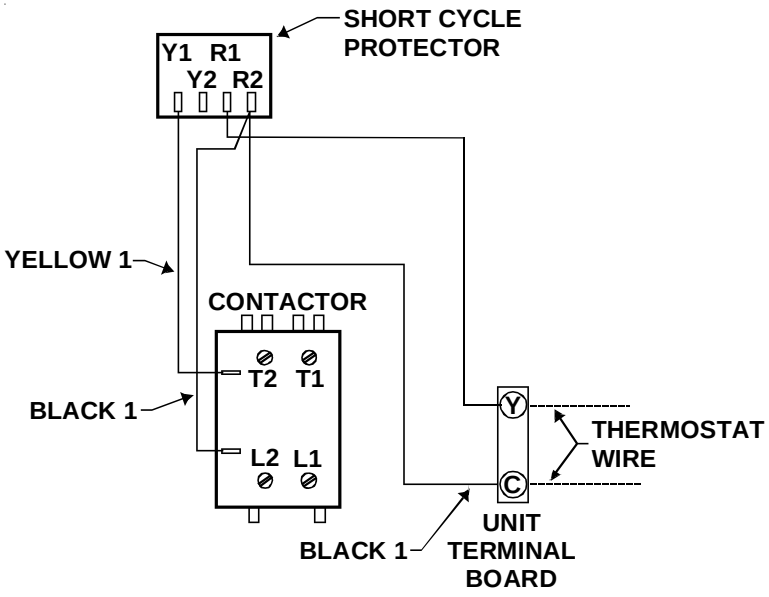
ACCESSORIES



FP-01
FREEZE THERMOSTAT KIT



ASC01A
ANTI-SHORT-CYCLE CONTROL KIT



ACCESSORIES
HEATER KIT APPLICATION OPTIONS

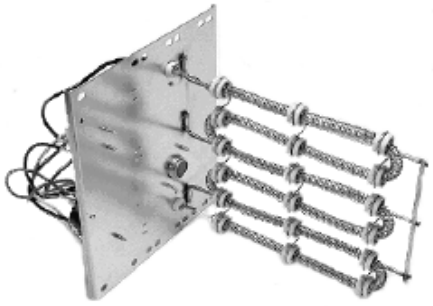
	AURF018-00A-1/-1A	AURF024-00A-1/-1A	AURF030-00A-1/-1A	AURF032-00A-1B/-1C	AURF036-00A-1/-1A	AURF042-00A-1/-1A	AURF042-00A-1B	AURF042-00A-1/-1A	AURF049-00A-1/-1A	AURF049-00A-1B	AURF060-00A-1/-1A	AURF061-00A-1/-1A	AURF061-00A-1B
HKR-03	X	X	X	X	X	X	X	X	X	X	X	X	X
HKR-05[C]	X	X	X	X	X	X	X	X	X	X	X	X	X
HKR-06	X	X	X	X	X	X	X	X	X	X	X	X	X
HKR-08[C]	X	X	X	X	X	X	X	X	X	X	X	X	X
HKR-10[C]		X	X	X[+]	X	X	X	X	X	X	X	X	X
HKR-15[C]			X	X[†]	X	X	X	X	X	X	X	X	X
HKR-20[C]					X	X	X[ƒ]	X	X	X	X	X	X
HKR-21[C]					X	X	X[ƒ]	X	X	X	X	X	X
HKR3-15[*]					X	X	X	X	X	X	X	X	X
HKR3-20[*]					X	X	X[ƒ]	X	X	X	X	X	X

[C] Circuit breakers optional.
[*] Heat Kit requires 3-phase power supply.
[+] When using a 10 kW heat kit, this air handler must either be in medium or high speed
[†] When using a 15 kW heat kit, this air handler must be on high speed.
[ƒ] When using a 20 kW heat kit, this air handler must be on high speed

HEATER KIT APPLICATION OPTIONS

	AER24-1	AER30-1	AER36-01	AER48-1	AER60-1
HKR-03					
HKR-05[C]	X	X			
HKR-06					
HKR-08[C]	X	X	X		
HKR-10[C]	X	X	X	X	X
HKR-15[C]			X	X	X
HKR-20[C]					X
HKR-21[C]					X

[C] Circuit Breakers optional.



HKR SERIES ELECTRIC HEAT KITS

Specifications

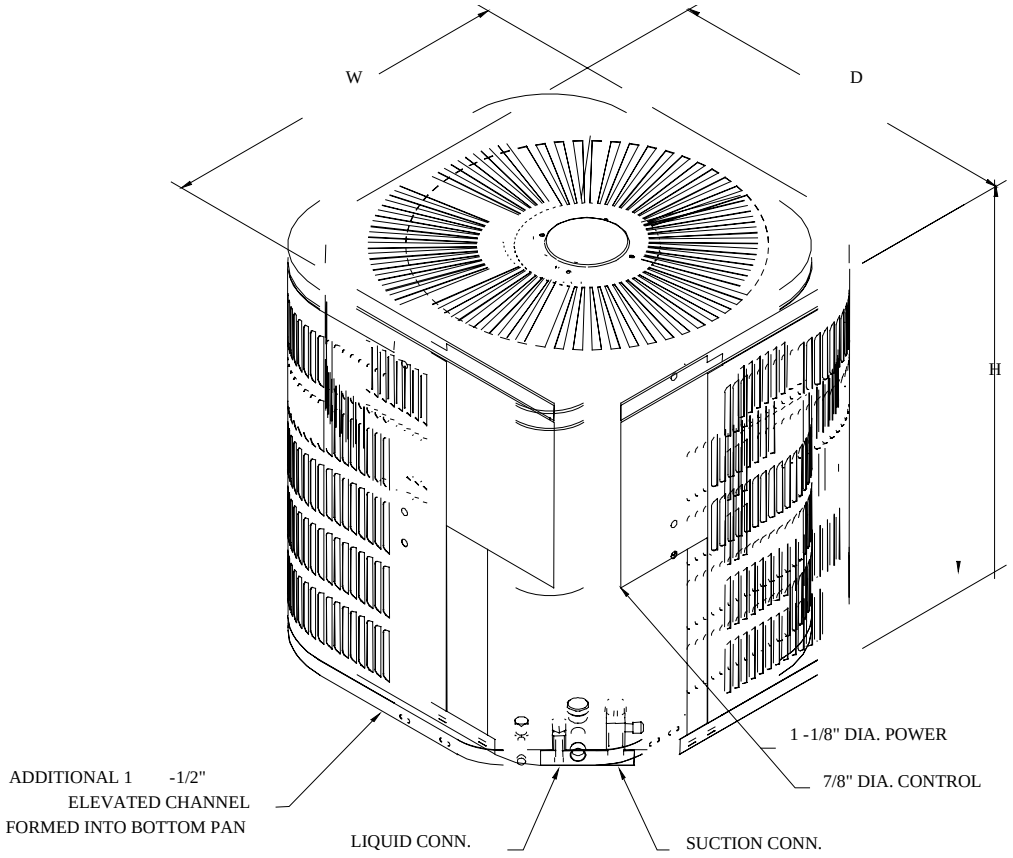
Model	Nominal Cooling Capacity (BTUH)	Service Valve			Compressor		Condenser Fan		Shipping Weight (pounds)
		Liquid	Suction	Connection Type	RLA	LRA	HP	FLA	
CKL18-1L	18,000	3/8”	3/4”	Sweat	8.5	49	1/6	1.3	125
CKL24-1L	24,000	3/8”	3/4”	Sweat	9.8	56	1/6	1.3	127
CKL24-1M	24,000	3/8”	3/4”	Sweat	12.1	57	1/6	1.3	127
CKL30-1L	29,000	3/8”	3/4”	Sweat	13.7	75	1/6	1.3	130
CKL36-1L	35,000	3/8”	3/4”	Sweat	17.2	96	1/6	1.3	152
CKL42-1L	41,000	3/8”	7/8”	Sweat	17.2	105	1/6	1.3	160
CKL49-1L	47,000	3/8”	7/8”	Sweat	18.3	102	1/4	1.8	176
CKL60-1L	57,000	3/8”	7/8”	Sweat	25	150	1/4	1.8	208
CKL62-1L	62,000	3/8”	7/8”	Sweat	27.1	144	1/3	2.3	258
CKL36-3L	35,000	3/8”	3/4”	Sweat	10.3	75	1/6	1.3	142
CKL49-3L	47,000	3/8”	7/8”	Sweat	12.6	91	1/4	1.8	176
CKL60-3L	57,000	3/8”	7/8”	Sweat	15.4	124	1/4	1.8	208
CKL60-4L	57,000	3/8”	7/8”	Sweat	7.4	59.6	1/4	0.8	208
CKL62-1L	62,000	3/8”	7/8”	Sweat	27.1	144	1/3	2.3	258

Electrical Data

Model	Minimum Circuit Ampacity	Maximum Overcurrent Protection	Voltage-Phase	Minimum Volts	Maximum Volts
CKL18-1L	11.9	20 amps	208/230-1	197	253
CKL24-1L	13.6	20 amps	208/230-1	197	253
CKL24-1M	16.4	20 amps	208/230-1	197	253
CKL30-1L	18.4	30 amps	208/230-1	197	253
CKL36-1L	22.8	40 amps	208/230-1	197	253
CKL42-1L	22.8	40 amps	208/230-1	197	253
CKL49-1L	24.7	40 amps	208/230-1	197	253
CKL60-1L	33.1	50 amps	208/230-1	197	253
CKL62-1L	36.1	60 amps	208/230-1	197	253
CKL36-3L	14.2	20 amps	208/230-3	197	253
CKL49-3L	17.6	30 amps	208/230-3	197	253
CKL60-3L	21.1	30 amps	208/230-3	197	253
CKL60-4L	10.1	15 amps	460-3	414	506
CKL62-1L	36.1	60 amps	208/230-1	197	253

1) Wire size should be determined in accordance with National Electrical Codes. Extensive wire runs will require larger wire sizes.
2) May use fuses or HACR type Circuit Breakers of the same size as noted.

Dimensions



Model	Width	Depth	Height
CKL18-1L	23”	23”	24”
CKL24-1L	23”	23”	24”
CKL24-1M	23”	23”	24”
CKL30-1L	23”	23”	24”
CKL36-1L	23”	23”	29”
CKL42-1L	23”	23”	31½”
CKL49-1L	29”	29”	29”
CKL60-1L	29”	29”	31½”
CKL62-1L	29”	29”	39”
CKL36-3L	23”	23”	26½”
CKL49-3L	29”	29”	29”
CKL60-3L	29”	29”	31½”
CKL60-4L	29”	29”	31½”

Performance Ratings

Condenser	Evaporator Model	Total BTUH	Sensible BTUH	SEER	EER	ARI Ref. #	Decibel
CKL18-1*	AC18-XX	17,000	12,410	10.00	9.00	467525	76
	ACHP1819-1	16,800	12,264	10.00	9.00	467533	76
	AEPT030-00*-1*	18,000	13,140	11.00	9.80	517544	76
	AH18	17,400	12,702	10.00	9.00	467531	76
	ARPF024-00B-1*	17,400	12,702	10.00	9.00	517514	76
	ARPT024-00*-1*	17,400	12,702	10.00	9.00	517529	76
	ARPT032-00*-1*	18,000	13,140	10.50	9.50	517511	76
	ARUF018-00*-1*	17,000	12,410	10.00	9.00	517512	76
	ARUF024-00*-1*	17,400	12,702	10.00	9.00	517498	76
	ARUF032-00*-1*	18,000	13,140	10.50	9.50	517497	76
	AWB18-XX	16,800	12,264	10.00	9.00	467564	76
	AWB24-XX	17,000	12,325	10.00	9.00	467560	76
	CA*F018*2*+EEP	17,000	12,325	10.00	9.00	503271	76
	CA*F024*2*+EEP	17,400	12,615	10.00	9.00	503272	76
	CA*F030*2*+EEP	18,000	13,050	10.50	9.50	503273	76
	CHPF024A2*+EEP	17,400	12,615	10.00	9.00	503276	76
	CHPF025B2*+EEP	17,400	12,615	10.00	9.00	530822	76
	CHPF030A2*+EEP	18,000	13,050	10.50	9.50	503277	76
	H24F+EEP	17,400	12,528	10.00	9.00	466994	76
	H36F+EEP	18,000	12,960	10.50	9.50	466980	76
CKL24-1*	AC24-XX	23,200	17,052	10.00	9.00	467561	75
	ACHP2423-1	23,200	17,052	10.00	9.00	467556	75
	AEPT030-00*-1*	24,000	17,640	11.00	9.80	517545	75
	AH24	23,200	17,052	10.00	9.00	467559	75
	ARPF024-00B-1*	23,000	16,905	10.00	9.00	517509	75
	ARPT024-00*-1*	23,000	16,905	10.00	9.00	517501	75
	ARPT032-00*-1*	24,000	17,640	10.50	9.50	517495	75
	ARUF024-00*-1*	23,000	16,905	10.00	9.00	517507	75
	ARUF032-00*-1*	24,000	17,640	10.50	9.50	517521	75
	AWB24-XX	23,200	17,052	10.00	9.00	467568	75
	CA*F024*2*+EEP	23,000	16,905	10.00	9.00	503280	75
	CA*F030*2*+EEP	24,000	17,640	10.50	9.50	503281	75
	CA*F036*2*+EEP	24,000	17,640	10.50	9.50	503282	75
	CHPF024A2*+EEP	23,000	16,790	10.00	9.00	503285	75
	CHPF025B2*+EEP	23,000	16,790	10.00	9.00	530824	75
	CHPF030A2*+EEP	24,000	17,520	10.50	9.50	503286	75
	H24F+EEP	23,000	16,675	10.00	9.00	467002	75
	H36F+EEP	24,000	17,400	10.50	9.50	467008	75

(1) Seasonal Energy Efficiency Ratio
(2) Energy Efficiency Ratio @ 80°F/67°F Inside - 95°F
(3) When matching the outdoor unit to the indoor unit, use the piston supplied with the outdoor unit or that specified on the piston kit chart supplied with the indoor unit.
(4) Note: XX of A Model Designate Electric Heat Quantity.
(5) EEP - Order from Service Dept. Part No. B13707-38 or new Solid State Board B13707-35S. Part No. B13707-38 is **not interchangeable** with B13707-35S.
The Goodman Gas Furnace contains the EEP cooling time delay.

Performance Ratings (cont.)

Condenser	Evaporator Model	Total BTUH	Sensible BTUH	SEER	EER	ARI Ref. #	Decibel
CKL30-1*	AC30-XX	28,400	20,590	10.00	9.00	467562	78
	AC36-XX	29,000	21,315	10.00	9.00	467555	78
	ACHP3028-1	28,000	20,580	10.00	9.00	467567	78
	AEPT030-00*-1*	28,000	20,580	10.50	9.50	517526	78
	AEPT036-00*-1*	29,000	21,315	11.00	9.80	517538	78
	AH30	28,000	20,580	10.00	9.00	467574	78
	AH36	29,000	21,315	10.00	9.00	467588	78
	ARPF036-00B-1*	29,000	21,315	10.50	9.50	517528	78
	ARPT032-00*-1*	29,000	21,315	10.50	9.50	517515	78
	ARPT036-00*-1*	28,000	20,580	10.00	9.00	517516	78
	ARUF030-00*-1*	27,200	19,992	10.00	9.00	517543	78
	ARUF032-00*-1*	29,000	21,315	10.50	9.50	517531	78
	ARUF036-00*-1*	28,000	20,580	10.00	9.00	517502	78
	AWB30-XX	27,000	19,845	10.00	9.00	467583	78
	AWB36-XX	28,000	20,580	10.00	9.00	467577	78
	CA*F030*2*+EEP	28,600	21,021	10.00	9.00	503289	78
	CA*F042*2*+EEP	29,000	21,315	10.50	9.50	503290	78
	CHPF024A2*+EEP	27,200	19,992	10.00	9.00	503293	78
	CHPF030A2*+EEP	28,600	21,021	10.00	9.00	503294	78
	CHPF036B2*+EEP	29,000	21,315	10.50	9.50	503295	78
	H36F+EEP	28,600	20,878	10.00	9.00	467013	78
	H49F+EEP	29,000	21,170	10.50	9.50	467010	78

Condenser	Evaporator Model	Total BTUH	Sensible BTUH	SEER	EER	ARI Ref. #	Decibel
CKL36-1*	AC36-XX	33,200	24,236	10.00	9.00	503315	80
	ACHP3632-1	32,000	23,360	10.00	9.00	503318	80
	AEPT036-00*-1*	35,000	25,550	11.00	9.80	517535	80
	AH36	34,400	25,112	10.00	9.00	503313	80
	ARPF036-00B-1*	33,200	24,236	10.00	9.00	517525	80
	ARPT036-00*-1*	34,000	24,820	10.00	9.00	517541	80
	ARPT042-00*-1*	35,000	25,550	10.50	9.50	517537	80
	ARUF036-00*-1*	34,000	24,820	10.00	9.00	517546	80
	ARUF042-00*-1*	35,000	25,550	10.50	9.50	517524	80
	AWB36-XX	34,000	24,820	10.00	9.00	503320	80
	CA*F036*2*+EEP	34,000	24,650	10.00	9.00	503301	80
	CA*F042*2*+EEP	35,000	25,375	10.50	9.50	503302	80
	CHPF030A2*+EEP	34,400	24,940	10.00	9.00	503307	80
	CHPF036B2*+EEP	34,000	24,650	10.00	9.00	503310	80
	CHPF042B2*+EEP	35,000	25,375	10.50	9.50	503304	80
	CHPF048C2*+EEP	35,000	25,375	10.50	9.50	530821	80
	H36F+EEP	34,000	24,650	10.00	9.00	503300	80
	H49F+EEP	35,000	25,375	10.50	9.50	503303	80

Performance Ratings (cont.)

Condenser	Evaporator Model	Total BTUH	Sensible BTUH	SEER	EER	ARI Ref. #	Decibel
CKL36-3*	AC36-XX	33,200	24,070	10.00	9.00	503345	80
	ACHP3632-1	32,000	23,200	10.00	9.00	503347	80
	AEPT036-00*-1*	35,000	25,375	11.00	9.80	517533	80
	AH36	34,400	24,940	10.00	9.00	503338	80
	ARPF036-00B-1*	33,200	24,070	10.00	9.00	517519	80
	ARPT036-00*-1*	34,000	24,650	10.00	9.00	517539	80
	ARPT042-00*-1*	35,000	25,375	10.50	9.50	517517	80
	ARUF036-00*-1*	34,000	24,820	10.00	9.00	517522	80
	ARUF042-00*-1*	35,000	25,375	10.50	9.50	517510	80
	AWB36-XX	34,000	24,820	10.00	9.00	503339	80
	CA*F036*2*+EEP	34,000	24,820	10.00	9.00	503325	80
	CA*F042*2*+EEP	35,000	25,550	10.50	9.50	503330	80
	CHPF030A2*+EEP	34,400	25,112	10.00	9.00	503334	80
	CHPF036B2*+EEP	34,000	24,650	10.00	9.00	503327	80
	CHPF042B2*+EEP	35,000	25,375	10.50	9.50	503337	80
	H36F+EEP	34,000	24,650	10.00	9.00	503333	80
	H49F+EEP	35,000	25,375	10.50	9.50	503332	80

Condenser	Evaporator Model	Total BTUH	Sensible BTUH	SEER	EER	ARI Ref. #	Decibel
CKL42-1*	AEPT060-00*-1*	41,000	30,400	11.00	9.80	517475	82
	ARPF048-00B-1*	41,000	30,400	10.50	9.50	517478	82
	ARPT042-00*-1*	40,000	28,000	10.00	9.00	517473	82
	ARPT049-00*-1*	41,000	30,400	10.50	9.50	517469	82
	ARUF042-00*-1*	40,000	28,000	10.00	9.00	517479	82
	ARUF048-00*-1*	40,000	28,000	10.00	9.00	517470	82
	ARUF049-00*-1*	41,000	30,400	10.50	9.50	517472	82
	CA*F042*2*+EEP	39,500	27,650	10.00	9.00	503352	82
	CA*F048*2*+EEP	40,500	29,160	10.00	9.00	503353	82
	CA*F060*2*+EEP	41,000	30,400	10.50	9.50	503354	82
	CHPF042B2*+EEP	40,000	28,000	10.00	9.00	503357	82
	CHPF048C2*+EEP	40,000	30,400	10.00	9.00	530820	82
	CHPF048D2*+EEP	41,000	28,000	10.50	9.50	503358	82
	H49F+EEP	40,000	30,400	10.00	9.00	467033	82
	H60F+EEP	41,000	34,200	10.50	9.50	467030	82

(1) Seasonal Energy Efficiency Ratio
(2) Energy Efficiency Ratio @ 80°F/67°F Inside - 95°F
(3) When matching the outdoor unit to the indoor unit, use the piston supplied with the outdoor unit or that specified on the piston kit chart supplied with the indoor unit.
(4) Note: XX of A Model Designate Electric Heat Quantity.
(5) EEP - Order from Service Dept. Part No. B13707-38 or new Solid State Board B13707-35S. Part No. B13707-38 is **not interchangeable** with B13707-35S.
The Goodman Gas Furnace contains the EEP cooling time delay.

Performance Ratings (cont.)

Condenser	Evaporator Model	Total BTUH	Sensible BTUH	SEER	EER	ARI Ref. #	Decibel
CKL49-1*	AEPT060-00*-1*	45,000	35,000	11.00	9.80	517486	80
	ARPF048-00B-1*	46,000	35,000	10.50	9.30	517477	80
	ARPT049-00*-1*	46,000	34,200	10.50	9.30	517480	80
	ARUF048-00*-1*	45,000	35,000	10.00	9.00	517482	80
	ARUF049-00*-1*	46,000	34,200	10.50	9.30	517487	80
	CA*F048*2*+EEP	45,000	35,000	10.00	9.00	503361	80
	CA*F060*2*+EEP	46,000	33,000	10.00	9.00	503362	80
	CHPF042B2*+EEP	44,000	33,000	10.00	9.00	503364	80
	CHPF048C2*+EEP	44,000	34,200	10.00	9.00	530823	80
	CHPF048D2*+EEP	45,000	36,000	10.00	9.00	503365	80
	CHPF060D2*+EEP	47,000	33,000	10.50	9.50	503366	80
	H49F+EEP	44,000	34,200	10.00	9.00	466757	80
	H60F+EEP	45,000	36,000	10.00	9.00	466759	80
	H61F+EEP	47,000	34,200	10.50	9.50	466770	80

Condenser	Evaporator Model	Total BTUH	Sensible BTUH	SEER	EER	ARI Ref. #	Decibel
CKL49-3*	AEPT060-00*-1*	45,000	35,000	11.00	9.80	517468	80
	ARPF048-00B-1*	46,000	35,000	10.50	9.50	517476	80
	ARPT049-00*-1*	46,000	34,200	10.50	9.50	517474	80
	ARUF048-00*-1*	45,000	35,000	10.00	9.00	517467	80
	ARUF049-00*-1*	46,000	34,200	10.50	9.50	517485	80
	CA*F048*2*+EEP	45,000	35,000	10.00	9.00	503369	80
	CA*F060*2*+EEP	46,000	33,000	10.00	9.00	503370	80
	CHPF042B2*+EEP	44,000	33,000	10.00	9.00	503372	80
	CHPF048D2*+EEP	45,000	34,200	10.00	9.00	503373	80
	CHPF060D2*+EEP	47,000	36,000	10.50	9.50	503374	80
	H49F+EEP	44,000	33,000	10.00	9.00	466763	80
	H60F+EEP	45,000	34,200	10.00	9.00	466765	80
	H61F+EEP	47,000	36,000	10.50	9.30	466767	80

(1) Seasonal Energy Efficiency Ratio
(2) Energy Efficiency Ratio @ 80°F/67°F Inside - 95°F
(3) When matching the outdoor unit to the indoor unit, use the piston supplied with the outdoor unit or that specified on the piston kit chart supplied with the indoor unit.
(4) Note: XX of A Model Designate Electric Heat Quantity.
(5) EEP - Order from Service Dept. Part No. B13707-38 or new Solid State Board B13707-35S. Part No. B13707-38 is **not interchangeable** with B13707-35S.
The Goodman Gas Furnace contains the EEP cooling time delay.

Performance Ratings (cont.)

Condenser	Evaporator Model	Total BTUH	Sensible BTUH	SEER	EER	ARI Ref. #	Decibel
CKL60-1*	AEPT060-00*-1*	57,000	42,000	10.50	9.50	517464	80
	ARPF060-00B-1*	57,000	42,000	10.50	9.50	517466	80
	ARPT061-00*-1*	57,000	42,000	10.50	9.50	517489	80
	ARUF060-00*-1*	56,000	40,300	10.00	9.00	517471	80
	ARUF061-00*-1*	57,000	42,000	10.50	9.50	517483	80
	CA*F060*2*+EEP	55,000	39,600	10.00	9.00	503382	80
	CA*F061*2*+EEP	56,000	40,300	10.50	9.50	503383	80
	CHPF048D2*+EEP	55,000	39,600	10.00	9.00	503386	80
	CHPF060D2*+EEP	56,000	40,300	10.50	9.50	503387	80
	H60F+EEP	55,000	39,600	10.00	9.00	504198	80
	H61F+EEP	56,000	40,300	10.50	9.50	504195	80
CKL60-3/4*	AEPT060-00*-1*	57,000	42,000	10.50	9.50	517488	80
	ARPF060-00B-1*	57,000	42,000	10.50	9.50	517481	80
	ARPT061-00*-1*	57,000	42,000	10.50	9.50	517484	80
	ARUF060-00*-1*	56,000	40,300	10.00	9.00	517548	80
	ARUF061-00*-1*	57,000	42,000	10.50	9.50	517536	80
	CA*F060*2*+EEP	55,000	39,600	10.00	9.00	503398	80
	CA*F061*2*+EEP	56,000	40,300	10.50	9.50	503399	80
	CHPF048D2*+EEP	55,000	39,600	10.00	9.00	503402	80
	CHPF060D2*+EEP	56,000	40,300	10.50	9.50	503403	80
	H60F+EEP	55,000	39,600	10.00	9.00	503405	80
	H61F+EEP	56,000	40,300	10.50	9.50	504197	80
CKL62-1*	AEPT060-00*-1*	61,000	45,000	10.50	9.50	517496	80
	ARPF060-00B-1*	61,000	45,000	10.00	9.00	517520	80
	ARPT061-00*-1*	62,000	45,000	10.00	9.00	517504	80
	ARUF060-00*-1*	58,000	42,000	10.00	9.00	517523	80
	ARUF061-00*-1*	62,000	45,000	10.00	9.00	517547	80
	CA*F060*2*+EEP	58,000	42,000	10.00	9.00	503417	80
	CA*F061*2*+EEP	60,000	43,000	10.00	9.00	503418	80
	CHPF048D2*+EEP	58,000	42,000	10.00	9.00	503421	80
	CHPF060D2*+EEP	60,000	43,000	10.00	9.00	503422	80
	H61F+EEP	60,000	43,000	10.00	9.00	503424	80

(1) Seasonal Energy Efficiency Ratio
(2) Energy Efficiency Ratio @ 80°F/67°F Inside - 95°F
(3) When matching the outdoor unit to the indoor unit, use the piston supplied with the outdoor unit or that specified on the piston kit chart supplied with the indoor unit.
(4) Note: XX of A Model Designate Electric Heat Quantity.
(5) EEP - Order from Service Dept. Part No. B13707-38 or new Solid State Board B13707-35S. Part No. B13707-38 is **not interchangeable** with B13707-35S.
The Goodman Gas Furnace contains the EEP cooling time delay.

Specifications

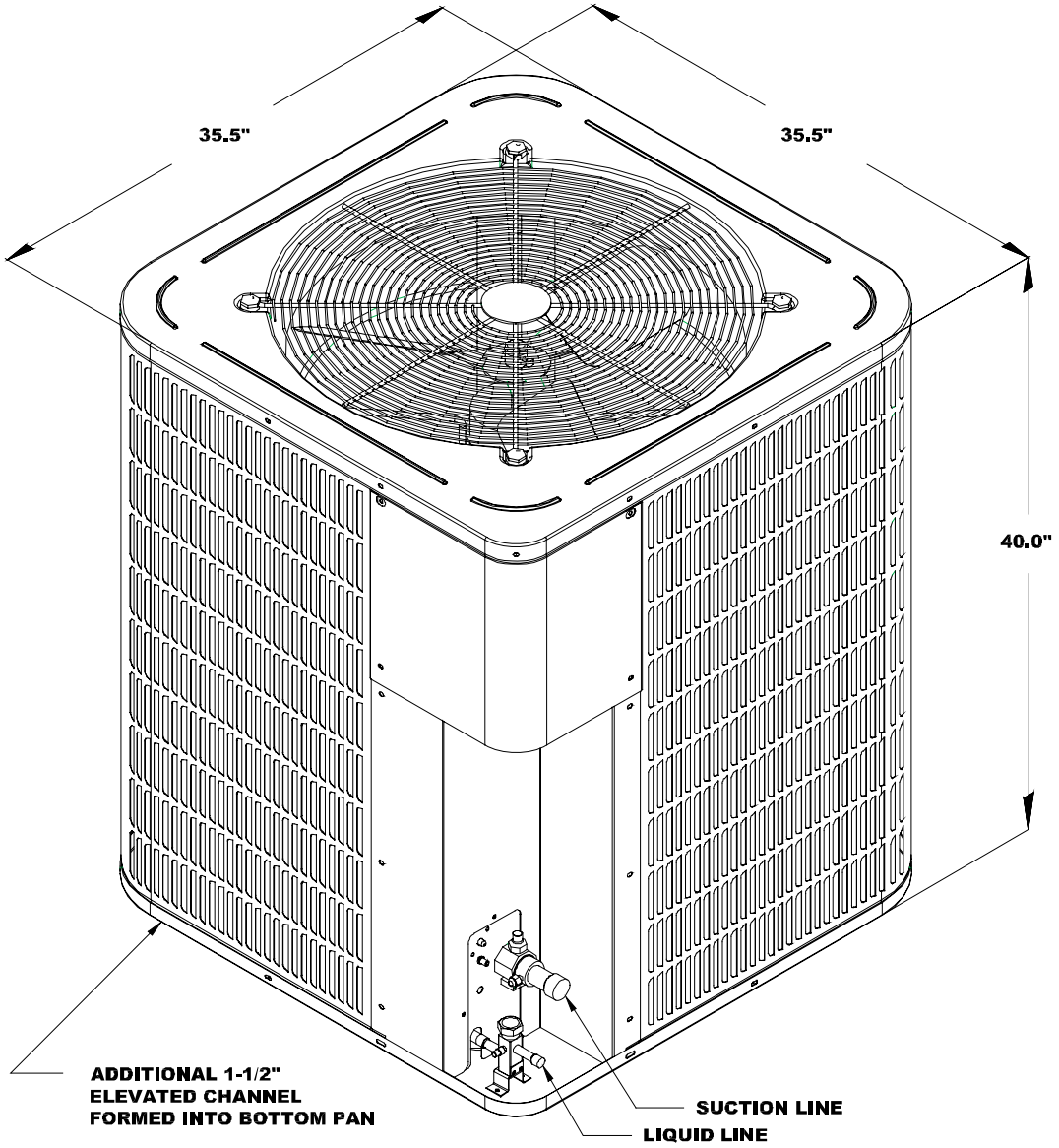
Model	Refrigerant Line Connection		Type	Approximate Shipping Weight (pounds)
	Liquid	Suction		
CKL090-3/-3L	5/8”	1⅜"	Sweat	370
CKL090-4/-4L	5/8”	1⅜"	Sweat	370
CKL120-3/-3L	5/8”	1⅜"	Sweat	420
CKL120-4/-4L	5/8”	1⅜"	Sweat	420

Electrical Data

Model	Volts	PH	Minimum Circuit Ampacity[1]	Maximum Overcurrent Protection[2]	Maximum Volts	Minimum Volts	Compressor		Condenser Fan	
							RLA	LRA	FLA	HP
CKL090-3/-3L	208/230	3	37.8	60	253	197	25.7	196	5.6	1
CKL090-4/-4L	460	3	18.8	30	506	414	12.8	100	2.8	1
CKL120-3/-3L	208/230	3	43.3	60	253	197	30.1	225	5.6	1
CKL120-4/-4L	460	3	22.2	35	506	414	15.5	114	2.8	1

1) Wire size should be determined in accordance with National Electrical Codes. Extensive wire runs will require larger wire sizes.
2) May use fuses or HACR type Circuit Breakers of the same size as noted.
3) The -3L and -4L models are painted Architectural Gray. All other models are painted Bahama Beige.

Dimensions



Performance Ratings

Model	Evaporator Model	Total BTUH @ 95 °F	Sensible BTUH @ 95 °F	EER[1]	Decibels
CKL090-3/-3L	AR090	88,000	63,400	10.3	8.4
CKL090-4/-4L	(2) U-60; (2) CA(U,P)X060D2A	90,000	64,800	10.3	8.4
CKL120-3/-3L	AR120	114,000	82,200	10.3	8.4
CKL120-4/-4L	(2) U-61; (2) CA(U,P)X061D2A	112,000	80,800	10.3	8.4

1) EER = Energy Efficiency Ratio = Capacity BTUH @ 95 °F/kW_I (kW_I = Compressor + Indoor Blower Motor + Outdoor Fan Motor)
2) For CKL**-3 models, reduce BTUH by 2,000 @ 208 volts.

Outdoor Unit CKL090-3/-4/-3L/-4L Indoor Unit AR090

Indoor Air		Condenser Air Temperature														
		75 °F			85 °F			95 °F			105 °F			115 °F		
SCFM	WB	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH
2493	72	102.1	47.6	8.03	97.7	45.6	8.46	92.4	43.7	8.80	87.1	41.8	9.23	81.8	39.9	9.65
	67	93.3	59.0	7.52	88.9	57.1	7.86	84.5	55.2	8.29	79.2	53.3	8.71	73.9	53.3	9.14
	62	86.2	69.7	7.01	81.8	67.8	7.43	79.6	65.9	7.86	77.4	64.0	8.29	73.0	61.5	8.63
	57	82.7	75.4	6.83	79.2	72.3	7.26	75.7	69.1	7.69	71.3	65.3	8.20	67.8	61.5	8.54
2933	72	106.5	52.6	8.29	101.2	50.7	8.63	95.9	48.8	9.06	90.6	47.6	9.48	84.5	45.0	9.91
	67	97.7	67.2	7.77	93.3	65.3	8.12	88.0	63.4	8.54	82.7	61.5	8.97	77.4	59.6	9.40
	62	90.6	80.5	7.35	86.2	78.0	7.69	81.8	74.8	8.12	78.3	71.0	8.54	73.9	67.2	9.06
	57	89.8	81.8	7.26	85.4	78.6	7.69	81.8	74.8	8.12	78.3	71.0	8.54	73.9	67.2	9.06
3373	72	109.1	57.1	8.46	103.8	55.2	8.80	98.6	53.3	9.23	92.4	51.4	9.65	87.1	50.1	10.08
	67	101.2	74.2	7.95	95.9	72.9	8.29	90.6	71.0	8.71	85.4	68.5	9.14	80.1	66.6	9.57
	62	95.0	86.9	7.60	91.5	83.1	8.03	86.2	79.3	8.46	82.7	75.4	8.89	77.4	71.0	9.40
	57	95.0	86.9	7.60	91.5	83.1	8.03	86.2	79.3	8.46	82.7	75.4	8.89	77.4	71.0	9.40

Sensible heat capacities shown are based on 80 °F DB entering air at the evaporator coil. For sensible heat capacities at other than 80 °F DB, deduct 84 BTUH per 100 CFM of evaporator coil air for each degree below 80 °F, or add 84 BTUH per 100 CFM of evaporator coil air per degree above 80 °F.
CAPACITIES AT 95 °F OUTDOOR, 75 °F DB AND 63 °F WB INDOOR
TOTAL MBTUH 83.1 SENSIBLE MBTUH 60.2 LATENT MBTUH 22.9

Outdoor Unit CKL090-3/-4/-3L/-4L Indoor Unit (2) U60

INDOOR AIR		CONDENSER AIR TEMPERATURE														
		75			85			95			105			115		
SCFM	WB	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH
2550	72	104.4	48.6	8.21	99.9	46.7	8.65	94.5	44.7	9.00	89.1	42.8	9.44	83.7	40.8	9.87
	67	95.4	60.3	7.69	90.9	58.3	8.04	86.4	56.4	8.48	81.0	54.4	8.91	75.6	54.4	9.35
	62	88.2	71.3	7.17	83.7	69.3	7.60	81.5	67.4	8.04	79.2	65.4	8.48	74.7	62.9	8.83
	57	84.6	77.1	6.99	81.0	73.9	7.43	77.4	70.6	7.86	72.9	66.7	8.39	69.3	62.9	8.74
3000	72	108.9	53.8	8.48	103.5	51.8	8.83	98.1	49.9	9.26	92.7	48.6	9.70	86.4	46.0	10.14
	67	99.9	68.7	7.95	95.4	66.7	8.30	90.0	64.8	8.74	84.6	62.9	9.17	79.2	60.9	9.61
	62	92.7	82.3	7.51	88.2	79.7	7.86	83.7	76.5	8.30	80.1	72.6	8.74	75.6	68.7	9.26
	57	91.8	83.6	7.43	87.3	80.4	7.86	83.7	76.5	8.30	80.1	72.6	8.74	75.6	68.7	9.26
3450	72	111.6	58.3	8.65	106.2	56.4	9.00	100.8	54.4	9.44	94.5	52.5	9.87	89.1	51.2	10.31
	67	103.5	75.8	8.13	98.1	74.5	8.48	92.7	72.6	8.91	87.3	70.0	9.35	81.9	68.0	9.79
	62	97.2	88.8	7.78	93.6	84.9	8.21	88.2	81.0	8.65	84.6	77.1	9.09	79.2	72.6	9.61
	57	97.2	88.8	7.78	93.6	84.9	8.21	88.2	81.0	8.65	84.6	77.1	9.09	79.2	72.6	9.61

Sensible heat capacities shown are based on 80 °F DB entering air at the evaporator coil. For sensible heat capacities at other than 80 °F DB, deduct 84 BTUH per 100 CFM of evaporator coil air for each degree below 80 °F, or add 84 BTUH per 100 CFM of evaporator coil air per degree above 80 °F.
CAPACITIES AT 95 °F OUTDOOR, 75 °F DB AND 63 °F WB INDOOR
TOTAL MBTUH 85.0 SENSIBLE MBTUH 61.5 LATENT MBTUH 23.4

Performance Ratings (cont.)

Outdoor Unit CKL120-3/-4/-3L/-4L Indoor Unit AR120

Indoor Air		Condenser Air Temperature														
		75 °F			85 °F			95 °F			105 °F			115 °F		
SCFM	WB	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH
3230	72	132.2	61.7	10.40	126.5	59.2	10.96	119.7	56.7	11.40	112.9	54.3	11.95	106.0	51.8	12.51
	67	120.8	76.4	9.74	115.1	74.0	10.18	109.4	71.5	10.74	102.6	69.0	11.29	95.8	69.0	11.84
	62	111.7	90.4	9.08	106.0	88.0	9.63	103.2	85.5	10.18	100.3	83.0	10.74	94.6	79.7	11.18
	57	107.2	97.8	8.85	102.6	93.7	9.41	98.0	89.6	9.96	92.3	84.7	10.63	87.8	79.7	11.07
3800	72	137.9	68.2	10.74	131.1	65.8	11.18	124.3	63.3	11.73	117.4	61.7	12.29	109.4	58.4	12.84
	67	126.5	87.1	10.07	120.8	84.7	10.51	114.0	82.2	11.07	107.2	79.7	11.62	100.3	77.3	12.17
	62	117.4	104.4	9.52	111.7	101.1	9.96	106.0	97.0	10.51	101.5	92.1	11.07	95.8	87.1	11.73
	57	116.3	106.0	9.41	110.6	101.9	9.96	106.0	97.0	10.51	101.5	92.1	11.07	95.8	87.1	11.73
4370	72	141.4	74.0	10.96	134.5	71.5	11.40	127.7	69.0	11.95	119.7	66.6	12.51	112.9	64.9	13.06
	67	131.1	96.2	10.29	124.3	94.5	10.74	117.4	92.1	11.29	110.6	88.8	11.84	103.7	86.3	12.40
	62	123.1	112.6	9.85	118.6	107.7	10.40	111.7	102.8	10.96	107.2	97.8	11.51	100.3	92.1	12.17
	57	123.1	112.6	9.85	118.6	107.7	10.40	111.7	102.8	10.96	107.2	97.8	11.51	100.3	92.1	12.17

Sensible heat capacities shown are based on 80 °F DB entering air at the evaporator coil. For sensible heat capacities at other than 80 °F DB, deduct 84 BTUH per 100 CFM of evaporator coil air for each degree below 80 °F, or add 84 BTUH PER 100 CFM of evaporator coil air per degree above 80 °F.
CAPACITIES AT 95 °F OUTDOOR, 75 °F DB AND 63 °F WB INDOOR
TOTAL MBTUH 107.6 SENSIBLE MBTUH 78.1 LATENT MBTUH 29.5

Outdoor Unit CKL120-3/-4/-3L/-4L Indoor Unit (2) U61

INDOOR AIR		CONDENSER AIR TEMPERATURE														
		75			85			95			105			115		
SCFM	WB	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH
3173	72	129.9	60.6	10.22	124.3	58.2	10.77	117.6	55.8	11.20	110.9	53.3	11.74	104.2	50.9	12.29
	67	118.7	75.1	9.57	113.1	72.7	10.00	107.5	70.3	10.55	100.8	67.9	11.09	94.1	67.9	11.63
	62	109.8	88.9	8.92	104.2	86.5	9.46	101.4	84.0	10.00	98.6	81.6	10.55	93.0	78.4	10.98
	57	105.3	96.2	8.70	100.8	92.1	9.24	96.3	88.1	9.79	90.7	83.2	10.44	86.2	78.4	10.87
3733	72	135.5	67.1	10.55	128.8	64.6	10.98	122.1	62.2	11.53	115.4	60.6	12.07	107.5	57.4	12.61
	67	124.3	85.6	9.90	118.7	83.2	10.33	112.0	80.8	10.87	105.3	78.4	11.42	98.6	76.0	11.96
	62	115.4	102.6	9.35	109.8	99.4	9.79	104.2	95.3	10.33	99.7	90.5	10.87	94.1	85.6	11.53
	57	114.2	104.2	9.24	108.6	100.2	9.79	104.2	95.3	10.33	99.7	90.5	10.87	94.1	85.6	11.53
4293	72	138.9	72.7	10.77	132.2	70.3	11.20	125.4	67.9	11.74	117.6	65.4	12.29	110.9	63.8	12.83
	67	128.8	94.5	10.11	122.1	92.9	10.55	115.4	90.5	11.09	108.6	87.3	11.63	101.9	84.8	12.18
	62	121.0	110.7	9.68	116.5	105.8	10.22	109.8	101.0	10.77	105.3	96.2	11.31	98.6	90.5	11.96
	57	121.0	110.7	9.68	116.5	105.8	10.22	109.8	101.0	10.77	105.3	96.2	11.31	98.6	90.5	11.96

Sensible heat capacities shown are based on 80 °F DB entering air at the evaporator coil. For sensible heat capacities at other than 80 °F DB, deduct 84 BTUH per 100 CFM of evaporator coil air for each degree below 80 °F, or add 84 BTUH per 100 CFM of evaporator coil air per degree above 80 °F.
CAPACITIES AT 95 °F OUTDOOR, 75 °F DB AND 63 °F WB INDOOR
TOTAL MBTUH 105.7 SENSIBLE MBTUH 76.8 LATENT MBTUH 29.0

Specifications

Model	Nominal Cooling Capacity (BTUH)	Service Valve			Compressor			Condenser Fan		Ship Wgt (lbs)
		Liquid	Suction	Connect Type	RLA	LRA	Type	HP	FLA	
CLJ18-1A	18,400	3/8”	3/4”	Sweat	8.6	49	Reciprocating	1/6	1.3	135
CLJ18-1C	18,400	3/8”	3/4”	Sweat	8.6	49	Reciprocating	1/6	1.3	135
CLJ24-1A	23,400	3/8”	3/4”	Sweat	9.4	49	Reciprocating	1/6	1.3	160
CLJ24-1C	23,400	3/8”	3/4”	Sweat	9.4	49	Reciprocating	1/6	1.3	160
CLJ24-1D	23,400	3/8”	3/4”	Sweat	9.2	43	Reciprocating	1/6	1	160
CLJ30-1A	30,000	3/8”	3/4”	Sweat	13	60	Reciprocating	1/6	0.9	173
CLJ30-1C	30,000	3/8”	3/4”	Sweat	13	60	Reciprocating	1/6	1.1	173
CLJ30-1D	30,000	3/8”	3/4”	Sweat	10.8	60	Reciprocating	1/6	0.9	174
CLJ36-1A/-1C	36,000	3/8”	3/4”	Sweat	14.4	82	Reciprocating	1/4	1.5	174
CLJ42-1B	41,000	3/8”	7/8”	Sweat	17.2	96	Reciprocating	1/4	1.6	175
CLJ42-1C	41,000	3/8”	7/8”	Sweat	14.9	96	Reciprocating	1/4	1.6	175
CLJ48-1A/-1C/-1D	47,000	3/8”	7/8”	Sweat	18.3	109	Scroll	1/4	1.8	208
CLJ60-1/-1C	56,000	3/8”	7/8”	Sweat	25	148	Scroll	1/4	1.8	270

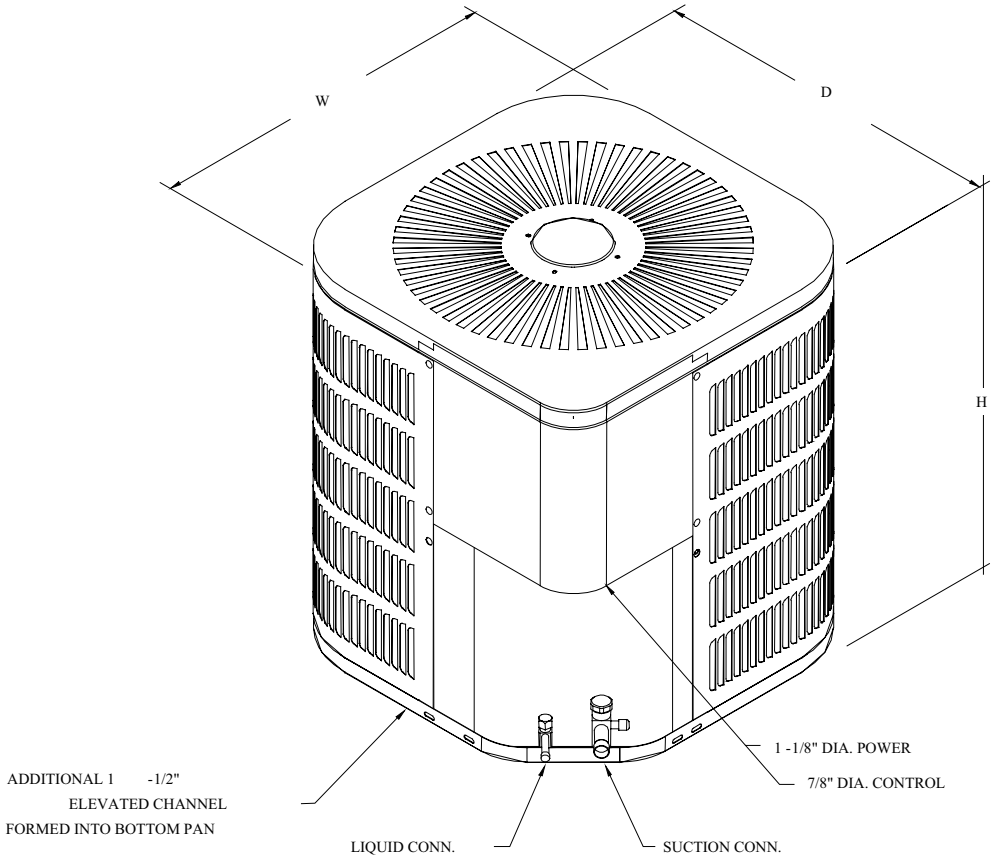
NOTE: The -*C models are painted in Architectural Gray. All other models are painted in Bahama Beige.

Electrical Data

Model	Minimum Circuit Ampacity	Maximum Overcurrent Protection (amps)	Voltage-Phase	Minimum Volts	Maximum Volts
CLJ18-1A	12.1	20	208/230-1	197	253
CLJ18-1C	12.1	20	208/230-1	197	253
CLJ24-1A	13.1	20	208/230-1	197	253
CLJ24-1C	13.1	20	208/230-1	197	253
CLJ24-1D	12.4	20	208/230-1	197	253
CLJ30-1A	17.2	30	208/230-1	197	253
CLJ30-1C	17.4	30	208/230-1	197	253
CLJ30-1D	14.3	30	208/230-1	197	253
CLJ36-1A/-1C	19.5	30	208/230-1	197	253
CLJ42-1B	23.1	40	208/230-1	197	253
CLJ42-1C	20.2	30	208/230-1	197	253
CLJ48-1A/-1C/-1D	24.7	40	208/230-1	197	253
CLJ60-1/-1C	33.1	60	208/230-1	197	253

1) Wire size should be determined in accordance with National Electrical Codes. Extensive wire runs will require larger wire sizes.
2) May use fuses or HACR type Circuit Breakers of the same size as noted.

Dimensions



Model	Width	Depth	Height
CLJ18-1A	23”	23”	26.5”
CLJ18-1C	23”	23”	26.5”
CLJ24-1A	23”	23”	31.5”
CLJ24-1C	23”	23”	31.5”
CLJ24-1D	23”	23”	31.5”
CLJ30-1A	29”	29”	26.5”
CLJ30-1C	29”	29”	26.5”
CLJ30-1D	29”	29”	29”
CLJ36-1A/-1C	29”	29”	29”
CLJ42-1B	29”	29”	31.5”
CLJ42-1C	29”	29”	31.5”

Performance Ratings

Condenser	Evaporator Model	Total BTUH	Sensible BTUH	EER	SEER	ARI Ref. #	Decibel
CLJ18-1*	AC18-XX	17,200	12,750	10.50	12.00	467428	77
	ACHP1819-1	17,200	12,750	10.50	12.00	467432	77
	AEPT030-00*-1*	18,400	13,600	11.50	13.00	517499	77
	AH18	17,000	12,900	10.00	11.20	467430	77
	AH30	17,400	12,600	10.50	12.00	467429	77
	ARPF024-00B-1*	16,800	12,400	10.10	11.50	517505	77
	ARPF036-00B-1*	18,000	13,200	10.50	12.00	517503	77
	ARPT024-00*-1*	16,800	12,400	10.10	11.50	517513	77
	ARPT032-00*-1*	18,000	13,200	10.50	12.00	517508	77
	ARUF018-00*-1*	16,000	11,800	10.00	11.30	517534	77
	ARUF024-00*-1*	16,800	12,400	10.10	11.50	517542	77
	ARUF032-00*-1*	18,000	13,200	10.50	12.00	517530	77
	AWB18-XX	16,000	11,800	10.00	11.30	467498	77
	AWB24-XX	17,200	12,750	10.50	12.00	467491	77
	CA*F018*2*+EEP	16,000	11,800	10.00	11.30	503429	77
	CA*F024*2*+EEP	16,800	12,400	10.10	11.50	505285	77
	CA*F030*2*+EEP	18,000	13,200	10.50	12.00	503432	77
	CA*F030*2*+G*V80703B**	18,000	13,200	11.50	13.00	520819	77
	CA*F042*2*+G*V80703B**	18,000	13,200	11.50	13.00	520833	77
	CA*F042*2*+G*V90704C**	18,000	13,200	11.50	13.00	503433	77
	CHPF024A2*+EEP	16,800	12,400	10.10	11.50	503438	77
	CHPF030A2*+EEP	18,000	13,200	10.50	12.00	503439	77
	CHPF030A2*+G*V80703B**	18,000	13,200	11.50	13.00	520822	77
	CHPF042B2*+G*V80703B**	18,000	13,200	11.50	13.00	520835	77
	CHPF042B2*+G*V90704C**	18,000	13,200	11.50	13.00	503442	77
	H36F+EEP	18,000	13,200	10.50	12.00	467040	77
	H36F+GV80703B**	18,000	13,200	11.50	13.00	527381	77
	H36F+GV90453B**	18,000	13,200	11.50	13.00	527364	77

NOTES:
1.) Seasonal Energy Efficiency Ratio
2.) Energy Efficiency Ratio @ 80 °F/67 °F Inside - 95 °F
3.) When matching the outdoor unit to the indoor unit, use the piston supplied with the outdoor unit or that specified on the piston kit chart supplied with the indoor unit.
4.) Note: XX of A Model Designate Electric Heat Quantity.
5.) EEP - Order from Service Dept. Part No. B13707-38 or new Solid State Board B13707-35S. Part No. B13707-38 is not interchangeable with B13707-35S. The Goodman Gas Furnace contains the EEP cooling time delay.

Performance Ratings (cont.)

Condenser	Evaporator Model	Total BTUH	Sensible BTUH	EER	SEER	ARI Ref. #	Decibel
CLJ24-1*	AC24-XX	21,200	15,700	10.00	11.50	467511	73
	AC30-XX	23,200	17,200	10.50	12.00	467521	73
	ACHP2423-1	21,200	15,700	10.00	11.50	467502	73
	ACHP3028-1	22,400	16,600	10.50	12.00	467516	73
	AEPT030-00*-1*	24,000	17,700	11.50	13.00	517500	73
	AH30	22,400	16,600	10.50	12.00	467515	73
	ARPF024-00B-1*	22,800	16,800	10.00	11.30	517532	73
	ARPF036-00B-1*	23,400	17,270	10.50	12.00	517518	73
	ARPT024-00*-1*	22,800	16,800	10.00	11.30	517506	73
	ARPT032-00*-1*	23,400	17,270	10.50	12.00	517527	73
	ARUF024-00*-1*	22,800	16,800	10.00	11.30	517540	73
	ARUF032-00*-1*	23,400	17,270	10.50	12.00	517583	73
	AWB24-XX	22,800	16,800	10.50	12.00	467513	73
	AWB30-XX	22,800	16,800	10.50	12.00	467510	73
	CA*F024*2*+EEP	22,600	16,800	10.00	11.30	505284	73
	CA*F030*2*+G*V80703B**	23,400	17,270	11.50	13.00	520840	73
	CA*F036*2*+EEP	23,000	17,000	10.50	12.00	503449	73
	CA*F037*2*+EEP	23,400	17,270	10.50	12.00	521423	73
	CA*F042*2*+G*V80703B**	23,400	17,270	11.50	13.00	520839	73
	CA*F042*2*+G*V90704C**	23,400	17,270	11.50	13.00	503450	73
	CHPF024A2*+EEP	22,600	16,800	10.00	11.30	503454	73
	CHPF030A2*+EEP	23,400	17,270	10.50	12.00	503455	73
	CHPF030A2*+G*V80703B**	23,400	17,270	11.50	13.00	520916	73
	CHPF042B2*+G*V80703B**	23,400	17,270	11.50	13.00	520915	73
	CHPF042B2*+G*V90704C**	23,400	17,270	11.50	13.00	503458	73
	H24F+EEP	22,600	16,800	10.00	11.30	467416	73
	H36F+EEP	23,400	17,270	10.50	12.00	467413	73
	H36F+GV80703B**	23,400	17,270	11.50	13.00	527379	73
	H36F+GV90453B**	23,400	17,270	11.50	13.00	527390	73

NOTES:
1.) Seasonal Energy Efficiency Ratio
2.) Energy Efficiency Ratio @ 80 °F/67 °F Inside - 95 °F
3.) When matching the outdoor unit to the indoor unit, use the piston supplied with the outdoor unit or that specified on the piston kit chart supplied with the indoor unit.
4.) Note: XX of A Model Designate Electric Heat Quantity.
5.) EEP - Order from Service Dept. Part No. B13707-38 or new Solid State Board B13707-35S. Part No. B13707-38 is not interchangeable with B13707-35S. The Goodman Gas Furnace contains the EEP cooling time delay.

Performance Ratings (cont.)

Condenser	Evaporator Model	Total BTUH	Sensible BTUH	EER	SEER	ARI Ref. #	Decibel
CLJ30-1*	AC30-XX	27,400	20,300	10.10	11.50	467575	73
	AC36-XX	28,000	20,750	10.50	12.00	467587	73
	ACHP3632-1	27,000	20,000	9.80	11.00	467578	73
	AEPT030-00*-1*	29,000	21,500	11.00	12.50	517557	73
	AEPT036-00*-1*	30,000	22,200	11.50	13.00	517605	73
	AH30	26,400	19,550	10.00	11.50	467585	73
	AH36	28,000	20,750	10.50	12.00	467673	73
	ARPF036-00B-1*	28,000	20,750	10.50	12.00	517601	73
	ARPT032-00*-1*	28,000	20,750	10.50	12.00	517617	73
	ARUF030-00*-1*	27,000	20,000	9.80	11.00	517612	73
	ARUF032-00*-1*	28,000	20,750	10.50	12.00	517597	73
	AWB30-XX	27,000	20,000	9.80	11.00	467666	73
	AWB36-XX	28,000	20,750	10.50	12.00	467672	73
	CA*F030*2*+EEP	27,000	20,000	10.10	11.20	503463	73
	CA*F030*2*+G*V80703B**	28,000	20,665	11.00	12.50	520923	73
	CA*F036*2*+EEP	28,000	20,750	10.50	12.00	503466	73
	CA*F037*2*+EEP	28,000	20,750	10.50	12.00	521424	73
	CA*F042*2*+G*V80703B**	28,000	20,750	11.50	13.00	520925	73
	CA*F042*2*+G*V90704C**	28,000	20,750	11.50	13.00	503467	73
	CHPF030A2*+EEP	28,000	20,750	10.50	12.00	503473	73
	CHPF030A2*+G*V80703B**	28,000	20,665	11.00	12.50	520926	73
	CHPF042B2*+G*V80703B**	28,000	20,750	11.50	13.00	520922	73
	CHPF042B2*+G*V90704C**	28,000	20,750	11.50	13.00	503476	73
	H36F+EEP	28,000	20,750	10.50	12.00	467425	73
	H36F+GV80703B**	28,000	20,750	11.00	12.50	527395	73
	H36F+GV90704C**	28,000	20,750	11.50	13.00	527376	73

NOTES:
1.) Seasonal Energy Efficiency Ratio
2.) Energy Efficiency Ratio @ 80 °F/67 °F Inside - 95 °F
3.) When matching the outdoor unit to the indoor unit, use the piston supplied with the outdoor unit or that specified on the piston kit chart supplied with the indoor unit.
4.) Note: XX of A Model Designate Electric Heat Quantity.
5.) EEP - Order from Service Dept. Part No. B13707-38 or new Solid State Board B13707-35S. Part No. B13707-38 is not interchangeable with B13707-35S. The Goodman Gas Furnace contains the EEP cooling time delay.

Performance Ratings (cont.)

Condenser	Evaporator Model	Total BTUH	Sensible BTUH	EER	SEER	ARI Ref. #	Decibel
CLJ36-1*	AC36-XX	33,600	24,900	9.80	11.00	503480	77
	ACHP3632-1	33,000	24,500	9.80	11.00	503481	77
	AEPT036-00*-1*	36,000	26,300	11.50	13.00	517571	77
	AH36	35,400	26,200	10.50	12.00	503483	77
	ARPF048-00B-1*	36,000	26,300	10.50	12.00	517580	77
	ARPT036-00*-1*	34,000	24,500	10.00	11.20	517592	77
	ARPT042-00*-1*	36,000	26,300	10.50	12.00	517611	77
	ARUF036-00*-1*	34,000	24,500	10.00	11.20	517584	77
	ARUF042-00*-1*	36,000	26,300	10.50	12.00	517553	77
	AWB36-XX	36,000	26,300	10.50	12.00	503489	77
	CA*F036*2*+EEP	34,000	24,500	10.00	11.20	503490	77
	CA*F042*2*+EEP	36,000	26,300	10.50	12.00	503491	77
	CA*F042*2*+G*V80703B**	36,000	26,300	11.00	12.50	520920	77
	CA*F042*2*+G*V80905C**	36,000	26,300	11.50	13.00	520935	77
	CA*F042*2*+G*V90704C**	36,000	26,300	11.00	12.50	503492	77
	CA*F042*2*+G*V90905D**	36,000	26,300	11.50	13.00	503493	77
	CA*F048*2*+EEP	36,000	26,300	10.50	12.00	503496	77
	CA*F048*2*+G*V81155C**	36,000	26,300	11.50	13.00	520941	77
	CA*F049*2*+G*V81155C**	36,000	26,300	11.50	13.00	520946	77
	CA*F049*2*+G*V90905D**	36,000	26,300	11.50	13.00	503497	77
	CA*F049*2*+G*V91155D**	36,000	26,300	11.50	13.00	503498	77
	CHPF030A2*+EEP	34,000	24,500	10.00	11.20	503505	77
	CHPF042B2*+G*V80703B**	36,000	26,300	11.00	12.50	520937	77
	CHPF042B2*+G*V90704C**	36,000	26,300	11.00	12.50	503507	77
	CHPF042B2A+EEP	36,000	26,300	10.50	12.00	503506	77
	CHPF048C2*+EEP	36,000	26,300	10.50	12.00	530825	77
	CHPF048D2*+G*V80905C**	36,000	26,300	11.50	13.00	520936	77
	CHPF048D2*+G*V81155C**	36,000	26,300	11.50	13.00	520942	77
	CHPF048D2*+G*V90905D**	36,000	26,300	11.50	13.00	503508	77
	CHPF048D2*+G*V91155D**	36,000	26,300	11.50	13.00	518830	77
	H36F+EEP	34,000	24,500	10.00	11.20	503515	77
	H49F+EEP	36,000	26,300	10.50	12.00	503516	77
	H49F+G*V80905C**	36,000	26,300	11.50	13.00	527392	77
	H49F+G*V90905D**	36,000	26,300	11.50	13.00	527384	77
CLJ42-1*	AEPT060-00*-1*	41,000	30,700	11.50	13.00	517550	77
	ARPF048-00B-1*	40,500	30,200	10.50	12.00	517606	77
	ARPT042-00*-1*	39,500	29,500	10.00	11.30	517556	77
	ARPT049-00*-1*	40,500	30,200	10.50	12.00	517608	77
	ARUF042-00*-1*	39,500	29,500	10.00	11.30	517570	77
	ARUF048-00*-1*	40,000	30,000	10.10	11.50	517573	77
	ARUF049-00*-1*	40,500	30,200	10.50	12.00	517559	77
	CA*F042*2*+EEP	39,000	29,200	10.00	11.30	503530	77
	CA*F060*2*+EEP	40,500	30,200	10.50	12.00	503531	77
	CA*F060*2*+G*V80905C**	40,000	30,000	11.50	13.00	520944	77
	CA*F060*2*+G*V90905D**	40,000	30,000	11.00	12.50	503532	77
	CA*F061*2*+G*V81155C**	41,000	30,700	11.50	13.00	520965	77
	CA*F061*2*+G*V91155D**	41,000	30,700	11.50	13.00	503533	77
	CHPF048D2*+EEP	40,000	30,000	10.50	12.00	503540	77
	CHPF048D2*+G*V80905C**	40,000	30,000	11.50	13.00	520960	77
	CHPF048D2*+G*V90905D**	40,000	30,000	11.00	12.50	503541	77
	CHPF060D2*+G*V81155C**	41,000	30,700	11.50	13.00	520969	77
	CHPF060D2*+G*V91155D**	41,000	30,700	11.50	13.00	503542	77
	H49F+EEP	39,000	29,200	10.00	11.30	468541	77
	H60F+EEP	40,500	30,200	10.50	12.00	468553	77
	H60F+G*V80905C**	41,000	30,700	11.50	13.00	527397	77
	H60F+G*V90905D**	41,000	30,700	11.50	13.00	527389	77

Performance Ratings (cont.)

Condenser	Evaporator Model	Total BTUH	Sensible BTUH	EER	SEER	ARI Ref. #	Decibel
CLJ48-1*	AEPT060-00*-1*	46,000	34,300	11.50	13.00	517561	80
	ARPF048-00B-1*	45,000	32,800	10.50	12.00	517599	80
	ARPT049-00*-1*	45,000	32,800	10.50	12.00	517577	80
	ARUF048-00*-1*	44,000	31,800	10.00	11.30	517595	80
	ARUF049-00*-1*	45,000	32,800	10.50	12.00	517602	80
	CA*F060*2*+EEP	45,000	32,800	10.50	12.00	503553	80
	CA*F061*2*+EEP	47,000	34,300	10.50	12.00	503555	80
	CA*F061*2*+G*V80905C**	47,000	34,300	11.00	12.50	520968	80
	CA*F061*2*+G*V81155C**	47,000	34,300	11.00	12.50	520971	80
	CA*F061*2*+G*V90905D**	47,000	34,300	11.00	12.50	503556	80
	CA*F061*2*+G*V91155D**	47,000	34,300	11.00	12.50	503557	80
	CHPF048D2*+EEP	45,000	32,800	10.50	12.00	503563	80
	CHPF060D2*+EEP	47,000	34,300	10.50	12.00	503564	80
	CHPF060D2*+G*V80905C**	47,000	34,300	11.00	12.50	520964	80
	CHPF060D2*+G*V81155C**	47,000	34,300	11.00	12.50	520962	80
	CHPF060D2*+G*V90905D**	47,000	34,300	11.00	12.50	503565	80
	CHPF060D2*+G*V91155D**	47,000	34,300	11.00	12.50	503566	80
	H60F+EEP	45,000	32,800	10.50	12.00	503573	80
	H61F+EEP	47,000	34,300	10.50	12.00	503574	80
	H61F+G*V80905C**	47,000	34,300	11.00	12.50	527382	80
	H61F+G*V90905D**	47,000	34,300	11.00	12.50	527367	80
CLJ60-1*	AEPT060-00*-1*	54,000	40,500	10.80	12.30	517614	80
	ARPF060-00B-1*	56,000	42,000	10.50	12.00	517575	80
	ARPT061-00*-1*	56,000	42,000	10.50	12.00	517582	80
	ARUF060-00*-1*	53,000	39,500	10.00	11.30	517560	80
	ARUF061-00*-1*	56,000	42,000	10.50	12.00	517563	80
	CA*F060*2*+EEP	53,000	39,500	10.00	11.30	503593	80
	CA*F061*2*+EEP	55,000	41,200	10.50	12.00	503594	80
	CA*F061*2*+G*V80905C**	55,000	40,150	10.80	12.30	520952	80
	CA*F061*2*+G*V81155C**	55,000	40,150	10.80	12.30	520970	80
	CA*F061*2*+G*V90905D**	55,000	40,150	10.80	12.20	520827	80
	CA*F061*2*+G*V91155D**	55,000	41,200	10.80	12.20	503595	80
	CHPF060D2*+EEP	55,000	41,200	10.50	12.00	503600	80
	CHPF060D2*+G*V80905C**	55,000	40,150	10.80	12.30	520949	80
	CHPF060D2*+G*V81155C**	55,000	40,150	10.80	12.30	520955	80
	CHPF060D2*+G*V90905D**	55,000	40,150	10.80	12.20	520829	80
	CHPF060D2*+G*V91155D**	55,000	41,200	10.80	12.20	503601	80
	H60F+EEP	53,000	39,500	10.00	11.30	503605	80
	H61F+EEP	55,000	41,200	10.50	12.00	503606	80
	H61F+G*V81155C**	55,000	40,150	10.80	12.30	527388	80
	H61F+G*V91155D**	55,000	40,150	10.80	12.30	527368	80

NOTES:

1.) Seasonal Energy Efficiency Ratio

2.) Energy Efficiency Ratio @ 80 °F/67 °F Inside - 95 °F

3.) When matching the outdoor unit to the indoor unit, use the piston supplied with the outdoor unit or that specified on the piston kit chart supplied with the indoor unit.

4.) Note: XX of A Model Designate Electric Heat Quantity.

5.) EEP - Order from Service Dept. Part No. B13707-38 or new Solid State Board B13707-35S. Part No. B13707-38 is **not interchangeable** with B13707-35S. The Goodman Gas Furnace contains the EEP cooling time delay.

Specifications

Model	Service Valve		Type	Approximate Shipping Weight (pounds)
	Liquid	Suction		
CLT24-1A/-1B	3/8”	3/4”	Sweat	173
CLT30-1A/-1B	3/8”	3/4”	Sweat	208
CLT36-1A/-1B	3/8”	3/4”	Sweat	209
CLT36-1C	3/8”	3/4”	Sweat	195
CLT42-1A/-1B	3/8”	7/8”	Sweat	258
CLT48-1A/-1B	3/8”	7/8”	Sweat	270
CLT60-1/-1B	3/8”	7/8”	Sweat	271

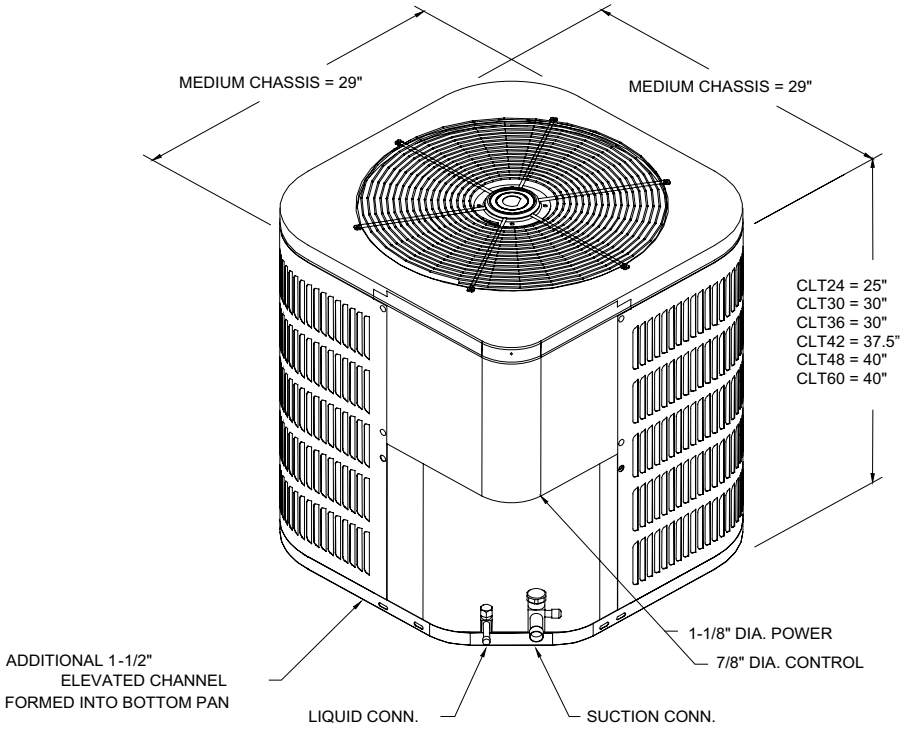
NOTE: The -*B models are painted in Architectural Gray. All other models are painted in Bahama Beige.

Electrical Data

Model	Volts	PH	Minimum Circuit Ampacity[1]	Maximum	Maximum Volts	Minimum Volts	Compressor		Condenser Fan	
							RLA	LRA	FLA	HP
CLT24-1A/-1B	208/230	1	12.9	20	253	197	9.6	45	0.9	1/6
CLT30-1A/-1B	208/230	1	16.4	20	253	197	12.2	63	1.1	1/6
CLT36-1A/-1B	208/230	1	20.1	30	253	197	14.8	83	1.6	¼
CLT36-1C	208/230	1	19.6	30	253	197	14.4	77	1.6	¼
CLT42-1A/-1B	208/230	1	22.4	30	253	197	16.6	95	1.6	¼
CLT48-1A/-1B	208/230	1	24.1	40	253	197	18.0	104	1.6	¼
CLT60-1/-1B	208/230	1	29.2	50	253	197	22.1	137	1.6	¼

1) Wire size should be determined in accordance with National Electrical Codes. Extensive wire runs will require larger wire sizes.
2) May use fuses or HACR type Circuit Breakers of the same size as noted.

Dimensions



Performance Ratings

Condenser	Evaporator Model	Total BTUH	Sensible BTUH	SEER	EER	ARI Ref. #	Decibel
CLT24-1*	AC24-XX	21,000	15,500	12	10.5	503821	74
	AWB24-XX	22,000	16,500	12	10.5	503827	
	AWB36-XX	22,000	16,500	13	11.5	503828	
	CA*F030*2*+EEP	21,000	15,500	12	10.5	503829	
	CA*F036*2*+EEP	22,000	16,500	13	11.5	503832	
	CA*F042*2*+G*V90704C**	22,400	16,800	14	12.5	503833	
	CA*F048*2*+EEP	22,400	16,800	13	11.5	503834	
	CHPF024A2*+EEP	21,000	15,500	12	10.5	503839	
	CHPF030A2*+EEP	22,000	16,500	13	11.5	503840	
	CHPF036B2*+EEP	22,400	16,800	13	11.5	503843	
	CHPF042B2*+G*V90704C**	22,400	16,800	14	12.5	503844	
	H24F+EEP	21,000	15,500	12	10.5	503850	
	H36F+EEP	22,000	16,500	13	11.5	503851	
	H49F+EEP	22,400	16,800	13	11.5	503853	
	ARUF024-00*-1*	21,000	15,500	12	10.5	517555	
	ARPT024-00*-1*	21,000	15,500	12	10.5	517558	
	ARUF032-00*-1*	22,000	16,500	13	11.5	517565	
	ARPT032-00*-1*	22,000	16,500	13	11.5	517566	
	AEPT030-00*-1*	22,400	16,800	14	12.5	517567	
	H36F+GV90453B**	22,000	16,500	14	12.5	527372	
	CA*F042*2*+G*V80704B**	22,400	16,800	14	12.5	551577	
	CHPF042B2*+G*V80704B**	22,400	16,800	14	12.5	551581	
	H36F+GV80704B**	22,000	16,500	14	12.5	551587	
	CA*F030*2*+G*V80704B**	22,000	16,500	14	12.5	551588	
	CHPF030A2*+G*V80704B**	22,000	16,500	14	12.5	551593	
CLT30-1*	AC30-XX	26,000	19,250	12.6	11	503863	74
	AWB30-XX	25,600	18,950	12	10.5	503870	
	AWB36-XX	26,000	19,250	12.5	11	503871	
	CA*F030*2*+EEP	26,600	20,100	13	11.5	503872	
	CA*F042*2*+EEP	27,000	20,250	13	11.5	503875	
	CA*F042*2*+G*V90704C**	27,000	20,250	14	12.5	503876	
	CHPF030A2*+EEP	26,600	20,100	13	11.5	503881	
	CHPF036B2*+EEP	27,000	20,250	13	11.5	503884	
	CHPF042B2*+G*V90704C**	27,000	20,250	14	12.5	503885	
	H36F+EEP	26,600	20,100	13	11.5	503890	
	H49F+EEP	28,400	21,300	13	11.5	503891	
	ARPT032-00*-1*	26,600	20,100	13	11.5	517564	
	AEPT036-00*-1*	28,000	21,000	14	12.5	517585	
	ARPT036-00*-1*	26,000	19,250	12.5	11	517588	
	ARUF030-00*-1*	25,600	18,950	12	10.5	517598	
	ARUF036-00*-1*	26,000	19,250	12.5	11	517600	
	ARUF032-00*-1*	26,600	20,100	13	11.5	517615	
	H49F+G*V90704C**	27,000	20,250	14	12.5	527370	
	CHPF042B2*+EEP	28,400	21,300	13	11.5	535499	
	H49F+G*V80704B**	27,000	20,250	14	12.5	551574	
	CHPF042B2*+G*V80704B**	27,000	20,250	14	12.5	551575	
	CA*F042*2*+G*V80704B**	27,000	20,250	14	12.5	551578	
	CA*F030*2*+G*V80704B**	27,000	20,250	14	12.5	551580	
	CHPF030A2*+G*V80704B**	27,000	20,250	14	12.5	551584	

NOTES:
1) Seasonal Energy Efficiency Ratio
2) Energy Efficiency Ratio @ 80 °F/67 °F Inside - 95 °F
3) When matching the outdoor unit to the indoor unit, use the piston supplied with the outdoor unit or that specified on the piston kit chart supplied with the indoor unit.
4) Note: XX of a model designates Electric Heat Quantity.
5) EEP - Order From Service Dept. Part No. B13707-38 or new Solid State Board B13707-35S. Part No. B13707-38 is **not interchangeable** with B13707-35S.

The Goodman Gas Furnace contains the EEP cooling time delay.

Performance Ratings (cont.)

Condenser	Evaporator Model	Total BTUH	Sensible BTUH	SEER	EER	ARI Ref. #	Decibel
CLT36-1*	AWB36-XX	34,000	23,800	12	11	503907	74
	CA*F036*2*+EEP	34,000	23,800	12	10.5	503908	
	CA*F042*2*+EEP	35,000	24,800	12.5	11	503909	
	CA*F048*2*+EEP	36,000	26,200	13	11.5	503910	
	CA*F048*2*+G*V90905D**	36,000	26,200	14	12.5	503911	
	CA*F048*2*+G*V91155D**	36,000	26,200	14	12.5	503912	
	CHPF036B2*+EEP	33,800	23,660	12.5	11	503919	
	CHPF048D2*+EEP	36,000	26,200	13	11.5	503920	
	CHPF048D2*+G*V90905D**	36,000	26,200	14	12.5	503921	
	CHPF048D2*+G*V91155D**	36,000	26,200	14	12.5	503922	
	H49F+EEP	35,000	24,800	12.5	11	503929	
	H60F+EEP	36,000	26,200	13	11.5	503930	
	H61F+EEP	36,000	26,200	13	11.5	503933	
	ARPT049-00*-1*	36,000	26,200	13	11.5	517549	
	ARUF042-00*-1*	35,000	24,800	12.5	11	517551	
	AEPT036-00*-1*	36,000	26,200	14	12.5	517576	
	ARUF048-00*-1*	36,000	26,200	13	11.5	517581	
	ARPT036-00*-1*	34,000	23,800	12	10.5	517591	
	ARUF036-00*-1*	34,000	23,800	12	10.5	517616	
	CHPF048D2*+G*V80905C**	36,000	26,200	14	12.5	521163	
	CA*F048*2*+G*V80905C**	36,000	26,200	14	12.5	521164	
	CHPF048D2*+G*V81155C**	36,000	26,200	14	12.5	521166	
	CA*F048*2*+G*V81155C**	36,000	26,200	14	12.5	521172	
	AC36-XX	33,800	23,660	12	10.5	521646	
	H60F+G*V90905D**	36,000	26,200	14	12.5	527385	
	H60F+G*V80905C**	36,000	26,200	14	12.5	527394	
CLT42-1*	CA*F042*2*+EEP	39,000	28,000	12	10.5	503950	74
	CA*F060*2*+EEP	40,000	29,000	12.5	11	503951	
	CA*F061*2*+EEP	41,000	30,000	13	11.5	503952	
	CA*F061*2*+G*V90905D**	41,000	30,000	14	12.5	503953	
	CA*F061*2*+G*V91155D**	41,000	30,000	14	12.5	503954	
	CHPF042B2A+EEP	39,000	28,000	12	10.5	503961	
	CHPF048D2*+EEP	40,000	29,000	12.5	11	503962	
	CHPF060D2*+EEP	41,000	30,000	13	11.5	503963	
	CHPF060D2*+G*V90905D**	41,000	30,000	14	12.5	503964	
	CHPF060D2*+G*V91155D**	41,000	30,000	14	12.5	503965	
	H49F+EEP	39,000	28,000	12	10.5	503973	
	H60F+EEP	40,000	29,000	12.5	11	503974	
	H61F+EEP	41,000	30,000	13	11.5	503975	
	AEPT060-00*-1*	41,000	30,000	14	12.5	517552	
	ARPT049-00*-1*	41,000	30,000	13	11.5	517618	
	ARUF048-00*-1*	40,000	29,000	12.5	11	517620	
	ARUF042-00*-1*	39,000	28,000	12	10.5	517623	
	ARPT042-00*-1*	39,000	29,000	12	10.5	517631	
	ARUF049-00*-1*	41,000	30,000	13	11.5	517633	
	CA*F061*2*+G*V80905C**	41,000	30,000	14	12.5	521173	
	CA*F061*2*+G*V81155C**	41,000	30,000	14	12.5	521183	
	CHPF060D2*+G*V80905C**	41,000	30,000	14	12.5	521192	
	CHPF060D2*+G*V81155C**	41,000	30,000	14	12.5	521194	

NOTES:
1) Seasonal Energy Efficiency Ratio
2) Energy Efficiency Ratio @ 80 °F/67 °F Inside - 95 °F
3) When matching the outdoor unit to the indoor unit, use the piston supplied with the outdoor unit or that specified on the piston kit chart supplied with the indoor unit.
4) Note: XX of a model designates Electric Heat Quantity.
5) EEP - Order From Service Dept. Part No. B13707-38 or new Solid State Board B13707-35S. Part No. B13707-38 is **not interchangeable** with B13707-35S.

The Goodman Gas Furnace contains the EEP cooling time delay.

Performance Ratings (cont.)

Condenser	Evaporator Model	Total BTUH	Sensible BTUH	SEER	EER	ARI Ref. #	Decibel
CLT48-1*	CA*F048*2*+EEP	43,000	31,000	12.5	11	503996	74
	CA*F060*2*+EEP	44,000	33,000	12.5	11	503997	
	CA*F061*2*+EEP	45,000	33,700	13	11.5	503998	
	CA*F061*2*+G*V90905D**	45,000	33,700	13.5	12	503999	
	CA*F061*2*+G*V91155D**	45,000	33,700	13.5	12	504000	
	CHPF048D2*+EEP	44,000	33,000	12.5	11	504007	
	CHPF060D2*+EEP	45,000	33,700	13	11.5	504008	
	CHPF060D2*+G*V90905D**	45,000	33,700	13.5	12	504009	
	CHPF060D2*+G*V91155D**	45,000	33,700	13.5	12	504010	
	H49F+EEP	43,000	31,000	12.5	11	504017	
	H60F+EEP	44,000	33,000	12.5	11	504018	
	H61F+EEP	45,000	33,700	13	11.5	504019	
	ARUF049-00*-1*	44,000	33,000	13	11.5	517622	
	ARUF048-00*-1*	43,500	32,000	12.5	11	517624	
	ARPT049-00*-1*	44,000	33,000	13	11.5	517628	
	AEPT060-00*-1*	44,500	33,400	13.5	12	517634	
	CHPF060D2*+G*V81155C**	45,000	33,700	13.5	12	521184	
	CHPF060D2*+G*V80905C**	45,000	33,700	13.5	12	521186	
	CA*F061*2*+G*V81155C**	45,000	33,700	13.5	12	521191	
	CA*F061*2*+G*V80905C**	45,000	33,700	13.5	12	521197	
	H61F+G*V91155D**	45,000	33,700	13.5	12	527374	
	H61F+G*V81155C**	45,000	33,700	13.5	12	527378	
CLT60-1*	CA*F061*2*+EEP	52,000	39,700	13	11.5	504037	74
	CA*F061*2*+G*V91155D**	53,000	40,200	13.3	11.8	504038	
	CHPF060D2*+EEP	52,000	39,700	13	11.5	504042	
	CHPF060D2*+G*V91155D**	53,000	40,200	13.3	11.8	504043	
	H61F+EEP	52,000	39,700	13	11.5	504047	
	AEPT060-00*-1*	53,000	40,200	13	11.8	517619	
	ARUF060-00*-1*	52,000	39,700	12	10.5	517629	
	ARPT061-00*-1*	53,000	40,200	12.5	11	517630	
	ARUF061-00*-1*	53,000	40,200	12.5	11	517632	
	CHPF060D2*+G*V90905D**	53,000	40,200	13.3	11.8	520816	
	CA*F061*2*+G*V90905D**	53,000	40,200	13.3	11.8	520826	
	CHPF060D2*+G*V80905C**	53,000	40,200	13.3	11.8	521175	
	CA*F061*2*+G*V81155C**	53,000	40,200	13.3	11.8	521178	
	CA*F061*2*+G*V80905C**	53,000	40,200	13.3	11.8	521179	
	CHPF060D2*+G*V81155C**	53,000	40,200	13.3	11.8	521189	
	H61F+G*V91155D**	53,000	40,200	13.3	11.8	527365	
	H61F+G*V81155C**	53,000	40,200	13.3	10.78	527377	

NOTES:
1) Seasonal Energy Efficiency Ratio
2) Energy Efficiency Ratio @ 80 °F/67 °F Inside - 95 °F
3) When matching the outdoor unit to the indoor unit, use the piston supplied with the outdoor unit or that specified on the piston kit chart supplied with the indoor unit.
4) Note: XX of a model designates Electric Heat Quantity.
5) EEP - Order From Service Dept. Part No. B13707-38 or new Solid State Board B13707-35S. Part No. B13707-38 is **not interchangeable** with B13707-35S.

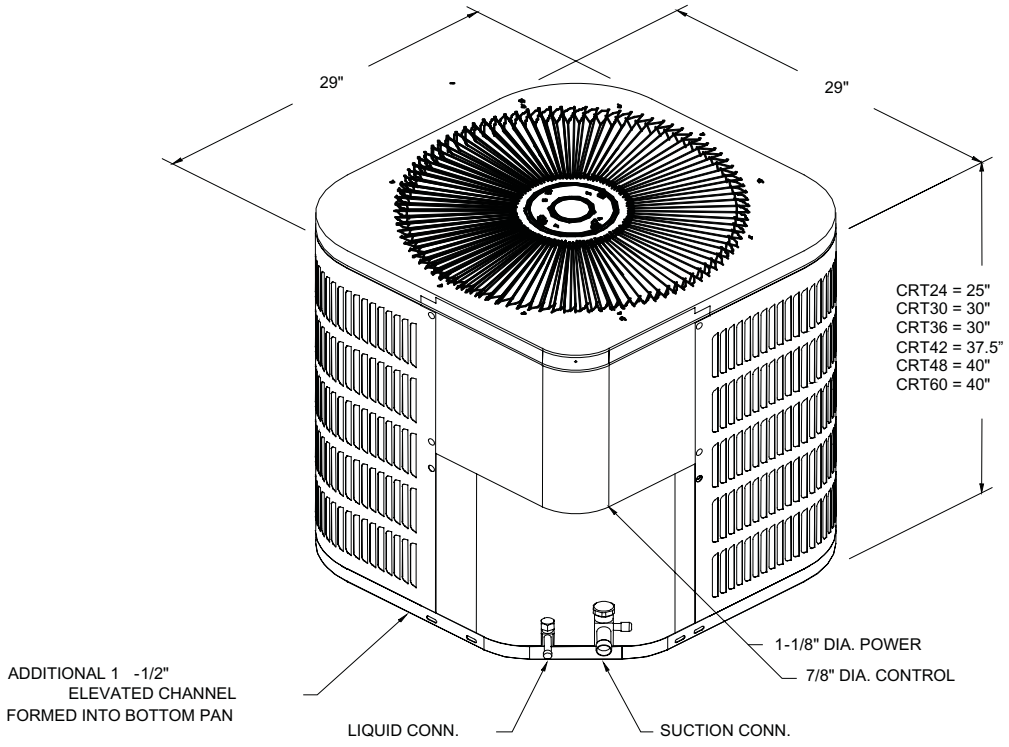
The Goodman Gas Furnace contains the EEP cooling time delay.

SPECIFICATIONS

	CRT18-1	CRT24-1	CRT24-1A	CRT30-1	CRT36-1	CRT36-1A	CRT42-1	CRT48-1	CRT60-1
Capacities									
Nominal Cooling (BTU/h)	19,000	22,400	23,000	28,000	36,000	36,000	41,000	45,000	53,000
SEER	13	13	13	13	13	13	13	13	13
Decibels	78	74	78	74	74	74	74	74	74
Compressor									
RLA	6.2	9.6	7.7	12.2	14.8	14.8	16.6	18	22.1
LRA	35	45	40	63	83	83	95	104	137
Condenser Fan Motor									
Horsepower	1/6	1/6	1/6	1/6	¼	¼	¼	¼	¼
FLA	1.5	0.9	1.5	1.1	1.6	1.6	1.6	1.6	1.6
Refrigeration System									
Liquid Valve Size (“O.D.)	⅜”	⅜”	⅜”	⅜”	⅜”	⅜”	⅜”	⅜”	⅜”
Suction Valve Size (“O.D.)	¾”	¾”	¾”	¾”	¾”	¾”	⅞”	⅞”	⅞”
Valve Type	Sweat	Sweat	Sweat	Sweat	Sweat	Sweat	Sweat	Sweat	Sweat
Refrigerant Charge	94	99	102	107	140.12	140.12	125	145	139.13
Shipped with Orifice Size	0.055	0.055	0.059	0.065	0.074	0.074	0.080	0.082	0.088
Electrical Data									
Voltage-Hz / Phase	208/230-1	208/230-1	208/230-1	208/230-1	208/230-1	208/230-1	208/230-1	208/230-1	208/230-1
Min. Circuit Ampacity[1]	9.3	12.9	11.2	16.4	20.1	20.1	22.4	24.1	29.2
MOD* (amps)[2]	15	20	15	20	30	30	30	40	50
Min / Max Volts	197/253	197/253	197/253	197/253	197/253	197/253	197/253	197/253	197/253
Power Supply Conduit Size	¾”	¾”	¾”	¾”	¾”	¾”	¾”	¾”	¾”
Ship Weight (lbs)	173	173	208	208	209	195	258	270	271

Notes:
[1] Wire size should be determined in accordance with National Electrical Codes. Extensive wire runs will require larger wire sizes.
[2] May use fuses or HACR-type circuit breakers of the same size as noted.
* Maximum Overcurrent Device

DIMENSIONS



Performance Ratings

Condenser	Indoor Model	Total BTU/h	Sensible BTU/h	SEER[1]	EER[2]	ARI Ref. #	dBs
CRT18-1*	AC18-XX / ACNF18XX1A*	18,000	13,500	13	11.5	798615	78
	AEPT030-00*-1*	19,000	14,250	14	12.2	798610	
	ARPF036-00B-1*	19,000	14,250	13	11.5	823883	
	ARPT032-00*-1*	19,000	14,250	13	11.5	823880	
	ARUF032-00*-1*	19,000	14,250	13	11.5	823885	
	AWB24-XX	18,000	13,500	13	11.5	798612	
	AWUF18XX1A*	18,000	13,500	13	11.5	798613	
	CA*F030*2*+EEP	19,000	14,250	13	11.5	823881	
	CA*F030*2*+G*V80704B**	19,000	14,250	14	12.2	798617	
	CA*F030*2*+G*V90704C**	19,000	14,250	14	12.2	798614	
	CHPF030A2*+EEP	19,000	14,250	13	11.5	823878	
	CHPF042B2*+G*V80704B**	19,600	14,700	14	12.2	798611	
	CHPF042B2*+G*V90704C**	19,600	14,700	14	12.2	823879	
	H36F+EEP	19,000	14,250	13	11.5	798616	
	H36F+G*V80704B**	19,000	14,250	14	12.2	823884	
	H36F+G*V90704C**	19,000	14,250	14	12.2	823882	
CRT24-1	AC24-XX	21,000	15,500	12	10.5	539687	76
	AEPT030-00*-1*	22,400	16,800	14	12.5	539795	
	ARPT024-00*-1*	21,000	15,500	12	10.5	539712	
	ARPT032-00*-1*	22,000	16,500	13	11.5	539710	
	ARUF024-00*-1*	21,000	15,500	12	10.5	539814	
	ARUF032-00*-1*	22,000	16,500	13	11.5	539784	
	AWB24-XX	22,000	16,500	12	10.5	539772	
	AWB36-XX	22,000	16,500	13	11.5	539794	
	CA*F030*2*+EEP	21,000	15,500	12	10.5	539323	
	CA*F030*2*+G*V80704B**	22,000	16,200	14	12.5	551600	
	CA*F037*2*+EEP	22,000	16,500	13	11.5	539334	
	CA*F042*2*+G*V80704B**	22,400	16,800	14	12.5	551586	
	CA*F042*2*+G*V90704C**	22,400	16,800	14	12.5	539819	
	CA*F048*2*+EEP	22,400	16,800	13	11.5	539332	
	CHPF024A2*+EEP	21,000	15,500	12	10.5	539322	
	CHPF030A2*+EEP	22,000	16,500	13	11.5	539327	
	CHPF030A2*+G*V80704B**	22,000	16,500	14	12.5	551602	
	CHPF036B2*+EEP	22,400	16,800	13	11.5	539335	
	CHPF042B2*+G*V80704B**	22,400	16,800	14	12.5	551576	
	CHPF042B2*+G*V90704C**	22,400	16,800	14	12.5	539703	
	H24F+EEP	21,000	15,500	12	10.5	539319	
	H36F+EEP	22,000	16,500	13	11.5	539321	
	H36F+G*V80704B**	22,000	16,500	14	12.5	551568	
	H36F+GV90453B**	22,000	16,500	14	12.5	539722	
	H49F+EEP	22,400	16,800	13	11.5	539325	

Performance Ratings (cont.)

Condenser	Indoor Model	Total BTU/h	Sensible BTU/h	SEER[1]	EER[2]	ARI Ref. #	dBs
CRT24-1*	AEPT030-00*-1*	23,600	17,700	14	12.2	830395	78
	ARPT032-00*-1*	23,000	17,250	13	11.5	830401	
	ARUF032-00*-1*	23,000	17,250	13	11.5	830400	
	AWB36-XX	23,000	17,250	13	11.5	830396	
	CA*F030*2*+EEP	23,000	17,250	13	11.5	830404	
	CA*F030*2*+G*V80704B**	23,000	17,250	14	12.2	830412	
	CA*F030*2*+G*V90704C**	23,000	17,250	14	12.2	830405	
	CA*F037*2*+EEP	23,400	17,550	13	11.5	830411	
	CA*F037*2*+G*V80704B**	23,400	17,550	14	12.2	830409	
	CA*F037*2*+G*V90704C**	23,400	17,550	14	12.2	830406	
	CA*F042*2*+EEP	23,600	17,700	13	11.5	830408	
	CHPF030A2*+EEP	23,000	17,250	13	11.5	830397	
	CHPF030A2*+G*V80704B**	23,000	17,250	14	12.2	830403	
	CHPF042B2*+G*V80704B**	23,400	17,550	14	12.2	830410	
	CHPF042B2*+G*V90704C**	23,400	17,550	14	12.2	830399	
	H36F+EEP	23,000	17,250	13	11.5	830398	
	H36F+G*V90704C**	23,000	17,250	14	12.2	830394	
	H36F+GV80704B**	23,000	17,250	14	12.2	830407	
	H49F+EEP	23,600	17,700	13	11.5	830402	
CRT30-1*	AC30-XX	26,000	19,250	12.6	11	539689	76
	AEPT036-00*-1*	28,000	21,000	14	12.5	539698	
	ARPT032-00*-1*	26,600	20,100	13	11.5	539756	
	ARPT036-00*-1*	26,000	19,250	12.5	11	539695	
	ARUF030-00*-1*	25,600	18,950	12	10.5	539783	
	ARUF032-00*-1*	26,600	20,100	13	11.5	539732	
	ARUF036-00*-1*	26,000	19,250	12.5	11	539734	
	AWB30-XX	25,600	18,950	12	10.5	539728	
	AWB36-XX	26,000	19,250	12.5	11	539770	
	CA*F030*2*+EEP	26,600	20,100	13	11.5	539337	
	CA*F030*2*+G*V80704B**	27,000	20,400	14	12.5	551567	
	CA*F042*2*+EEP	27,000	20,250	13	11.5	539330	
	CA*F042*2*+G*V80704B**	27,000	20,250	14	12.5	551598	
	CA*F042*2*+G*V90704C**	27,000	20,250	14	12.5	539705	
	CHPF030A2*+EEP	26,600	20,100	13	11.5	539333	
	CHPF030A2*+G*V80704B**	27,000	20,400	14	12.5	551579	
	CHPF036B2*+EEP	27,000	20,250	13	11.5	539320	
	CHPF042B2*+EEP	28,400	21,300	13	11.5	539329	
	CHPF042B2*+G*V80704B**	27,000	20,250	14	12.5	551592	
	CHPF042B2*+G*V90704C**	27,000	20,250	14	12.5	539803	
	H36F+EEP	26,600	20,100	13	11.5	539331	
	H49F+EEP	28,400	21,300	13	11.5	539326	
	H49F+G*V80704B**	27,000	20,250	14	12.5	551596	
	H49F+G*V90704C**	27,000	20,250	14	12.5	539740	

Performance Ratings (cont.)

Condenser	Indoor Model	Total BTU/h	Sensible BTU/h	SEER[1]	EER[2]	ARI Ref. #	dBs
CRT36-1*	AC36-XX	33,800	23,600	12	10.5	539749	76
	AEPT036-00*-1*	36,000	26,200	14	12.5	539684	
	ARPT036-00*-1*	34,000	23,800	12	10.5	539715	
	ARPT049-00*-1*	36,000	26,200	13	11.5	539796	
	ARUF036-00*-1*	34,000	23,800	12	10.5	539778	
	ARUF042-00*-1*	35,000	24,800	12.5	11	539729	
	ARUF048-00*-1*	36,000	26,200	13	11.5	539804	
	AWB36-XX	34,000	23,800	12	11	539713	
	CA*F036*2*+EEP	34,000	23,800	12	10.5	539336	
	CA*F042*2*+EEP	35,000	24,800	12.5	11	539324	
	CA*F048*2*+EEP	36,000	26,200	13	11.5	539760	
	CA*F048*2*+G*V80905C**	36,000	26,200	14	12.5	539686	
	CA*F048*2*+G*V81155C**	36,000	26,200	14	12.5	539747	
	CA*F048*2*+G*V90905D**	36,000	26,200	14	12.5	539725	
	CA*F048*2*+G*V91155D**	36,000	26,200	14	12.5	539748	
	CHPF036B2*+EEP	33,800	23,660	12.5	11	539328	
	CHPF048D2*+EEP	36,000	26,200	13	11.5	539721	
	CHPF048D2*+G*V80905C**	36,000	26,000	14	12.5	539706	
	CHPF048D2*+G*V91155D**	36,000	26,200	14	12.5	539818	
	H49F+EEP	35,000	24,800	12.5	11	539805	
	H60F+EEP	36,000	26,200	13	11.5	539766	
	H60F+G*V80905C**	36,000	26,200	14	12.5	539738	
	H60F+G*V90905D**	36,000	26,200	14	12.5	539812	
	H61F+EEP	36,000	26,200	13	11.5	539811	
CRT42-1*	AEPT060-00*-1*	41,000	30,000	14	12.5	539753	76
	ARPT042-00*-1*	39,000	28,000	12	10.5	539817	
	ARPT049-00*-1*	41,000	30,000	13	11.5	539759	
	ARUF042-00*-1*	39,000	28,000	12	10.5	539768	
	ARUF048-00*-1*	40,000	29,000	12.5	11	539755	
	ARUF049-00*-1*	41,000	30,000	13	11.5	539692	
	CA*F042*2*+EEP	39,000	28,000	12	10.5	539696	
	CA*F060*2*+EEP	40,000	29,000	12.5	11	539739	
	CA*F061*2*+EEP	41,000	30,000	13	11.5	539767	
	CA*F061*2*+G*V80905C**	41,000	30,000	14	12.5	539691	
	CA*F061*2*+G*V81155C**	41,000	30,000	14	12.5	539724	
	CA*F061*2*+G*V90905D**	41,000	30,000	14	12.5	539799	
	CA*F061*2*+G*V91155D**	41,000	30,000	14	12.5	539791	
	CHPF042B2A+EEP	39,000	28,000	12	10.5	539700	
	CHPF048D2*+EEP	40,000	29,000	12.5	11	539779	
	CHPF060D2*+EEP	41,000	30,000	13	11.5	539697	
	CHPF060D2*+G*V80905C**	41,000	30,000	14	12.5	539769	
	CHPF060D2*+G*V81155C**	41,000	30,000	14	12.5	539789	
	CHPF060D2*+G*V90905D**	41,000	30,000	14	12.5	539714	

Performance Ratings (cont.)

Condenser	Indoor Model	Total BTU/h	Sensible BTU/h	SEER[1]	EER[2]	ARI Ref. #	dBs
CRT42-1* (cont.)	CHPF060D2*+G*V91155D**	41,000	30,000	14	12.5	539781	76
	H49F+EEP	39,000	28,000	12	10.5	539777	
	H60F+EEP	40,000	29,000	12.5	11	539744	
	H61F+EEP	41,000	30,000	13	11.5	539816	
CRT48-1*	AEPT060-00*-1*	44,500	33,400	13.5	12	539785	76
	ARPT049-00*-1*	44,000	33,000	13	11.5	539730	
	ARUF048-00*-1*	43,500	32,000	12.5	11	539727	
	ARUF049-00*-1*	44,000	33,000	13	11.5	539720	
	CA*F048*2*+EEP	43,000	31,000	12.5	11	539774	
	CA*F060*2*+EEP	44,000	33,000	12.5	11	539718	
	CA*F061*2*+EEP	45,000	33,700	13	11.5	539737	
	CA*F061*2*+G*V80905C**	45,000	33,700	13.5	12	539733	
	CA*F061*2*+G*V81155C**	45,000	33,700	13.5	12	539702	
	CA*F061*2*+G*V90905D**	45,000	33,700	13.5	12	539764	
	CA*F061*2*+G*V91155D**	45,000	33,700	13.5	12	539754	
	CHPF048D2*+EEP	44,000	33,000	12.5	11	539797	
	CHPF060D2*+EEP	45,000	33,700	13	11.5	539788	
	CHPF060D2*+G*V80905C**	45,000	33,700	13.5	12	539731	
	CHPF060D2*+G*V81155C**	45,000	33,700	13.5	12	539763	
	CHPF060D2*+G*V90905D**	45,000	33,700	13.5	12	539782	
	CHPF060D2*+G*V91155D**	45,000	33,700	13.5	12	539741	
	H49F+EEP	43,000	31,000	12.5	11	539786	
	H60F+EEP	44,000	33,000	12.5	11	539716	
	H61F+EEP	45,000	33,700	13	11.5	539743	
	H61F+G*V81155C**	45,000	33,700	13.5	12	539773	
	H61F+G*V91155D**	45,000	33,700	13.5	12	539758	
CRT60-1*	AEPT060-00*-1*	53,000	40,200	13	11.8	531546	76
	ARPT061-00*-1*	53,000	40,200	12.5	11	531553	
	ARUF060-00*-1*	52,000	39,700	12	10.5	531539	
	ARUF061-00*-1*	53,000	40,200	12.5	11	532385	
	CA*F061*2*+EEP	52,000	39,700	13	11.5	531558	
	CA*F061*2*+G*V80905C**	53,000	40,200	13.3	11.8	531555	
	CA*F061*2*+G*V81155C**	53,000	40,200	13.3	11.8	531557	
	CA*F061*2*+G*V90905D**	53,000	40,200	13.3	11.8	531560	
	CA*F061*2*+G*V91155D**	53,000	40,200	13.3	11.8	531535	
	CHPF060D2*+EEP	52,000	39,700	13	11.5	531540	
	CHPF060D2*+G*V80905C**	53,000	40,200	13.3	11.8	531552	
	CHPF060D2*+G*V81155C**	53,000	40,200	13.3	11.8	531538	
	CHPF060D2*+G*V90905D**	53,000	40,200	13.3	11.8	531550	
	CHPF060D2*+G*V91155D**	53,000	40,200	13.3	11.8	531537	
	H61F+EEP	52,000	39,700	13	11.5	531534	
	H61F+G*V81155C**	53,000	40,200	13.3	11.8	531543	
	H61F+G*V91155D**	53,000	40,200	13.3	11.8	531561	

Physical Data

Model	Nominal Cooling Capacity (BTUH)	Service Valve			Compressor			Condenser Fan		Shipping Weight (pounds)
		Liquid	Suction	Connection Type	RLA	LRA	Type	HP	FLA	
TWC18-1A/-1B	18,000	3/8”	3/4”	Sweat	8.6	49	Reciprocating	1/4	1.2	185
TWC24-1/-1B	24,000	3/8”	3/4”	Sweat	11.85	59	Scroll	1/4	1.2	185
TWCR30-1/-1B	27,400	3/8”	3/4”	Sweat	13.6	67	Scroll	1/4	1.2	190

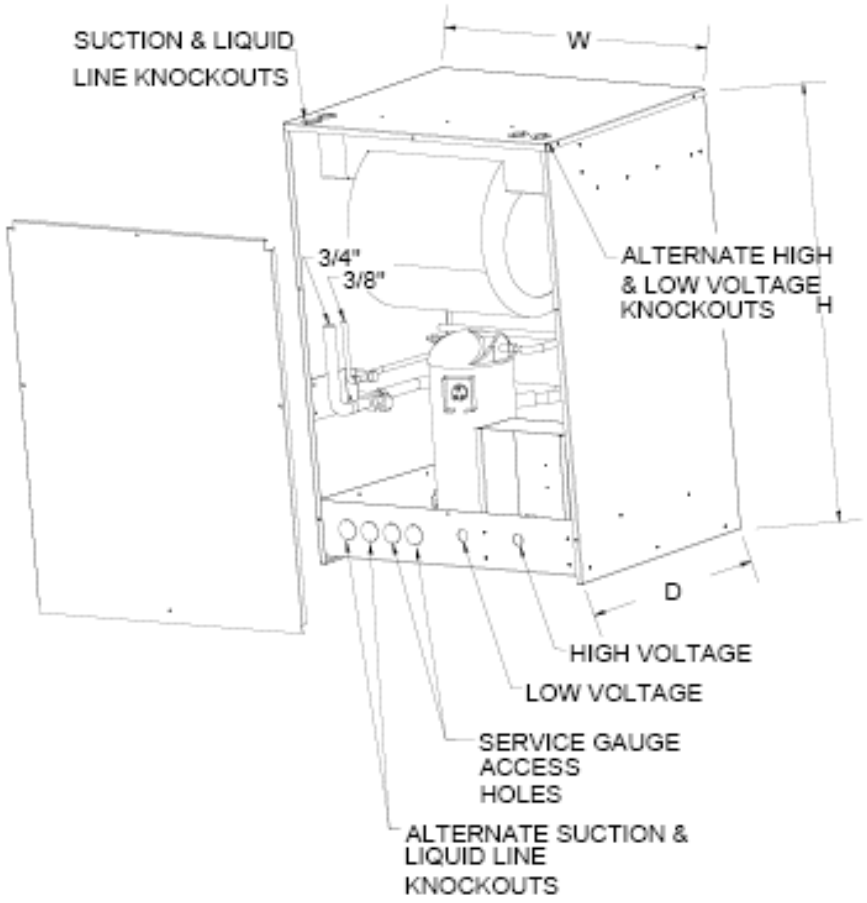
Electrical Data

Model	Minimum Circuit Ampacity	Maximum Overcurrent Protection (amps)	Voltage-Phase	Minimum Volts	Maximum Volts
TWC18-1A/-1B	12	20	208/230-1	197	253
TWC24-1/-1B	16	20	208/230-1	197	253
TWCR30-1/-1B	18.2	30	208/230-1	197	253

1) Wire size should be determined in accordance with National Electrical Codes. Extensive wire runs will require larger wire sizes.
2) May use fuses or HACR type Circuit Breakers of the same size as noted.
3) The -1B models are painted Architectural Gray. All other models are painted Bahama Beige.

Dimensions

Model	Width	Depth	Height
TWC18-1A/-1B	24”	18-3/4”	32”
TWC24-1/-1B	24”	18-3/4”	32”
TWCR30-1/-1B	24”	18-3/4”	32”



Performance Ratings

Condenser	Evaporator Model	Total BTUH	Sensible BTUH	SEER	EER	ARI Ref. #	Decibel
TWC18-1/-1B	AC18-XX	18,000	13,000	10.0	9.0	504163	75
	ACHP1819-1	17,400	12,400	10.0	9.0	504157	75
	AH2429-1	18,000	13,000	10.0	9.0	504162	75
	ARUF018-00A-1	17,000	12,300	10.0	9.0	504161	75
	AWB18-XX	17,400	12,400	10.0	9.0	233774	75
	CA*F018*2A+EEP	17,000	12,300	10.0	9.0	467684	75
TWC24-1/-1B	AC24-XX	23,400	17,000	10.0	9.0	233793	73
	AC30-XX	24,000	17,600	10.0	9.0	233795	73
	ACH30	23,400	17,000	10.0	9.0	233787	73
	ACHP3028-1	23,400	17,000	10.0	9.0	292095	73
	AH3043-1	23,400	17,000	10.0	9.0	233801	73
	ARUF024-00A-1	23,000	16,800	10.0	9.0	461471	73
	AWB24-XX	23,400	17,000	10.0	9.0	233788	73
	CA*F030*2A+EEP	24,000	17,600	10.0	9.0	467685	73
TWC30-1/-1B	AEPT030-00A-1	27,400	20,200	10.0	9.0	461474	73

1) Seasonal Energy Efficiency Ratio
2) Energy Efficiency Ratio @ 80 °F/67 °F Inside; 95 °F outside
3) When matching the outdoor unit to the indoor unit, refer to the piston kit chart for proper piston selection.
4) The XX of a model number designates electric heat quantity.

PRODUCT SPECIFICATIONS HDC

ELECTRICAL DATA

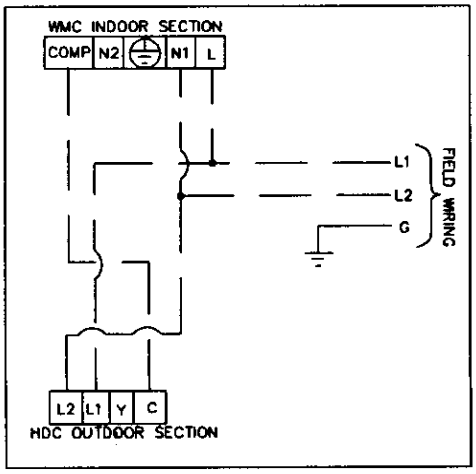
MODEL	POWER SUPPLY			+MINIMUM CIRCUIT AMPACITY	*MAXIMUM OVERCURRENT PROTECTION	MAXIMUM VOLTS	MINIMUM VOLTS	COMPRESSOR		COND. FAN MOTOR	
	VOLTS	PH	HZ					RLA	LRA	FLA	HP
HDC12-1A	208/240	1	60	8.0	15	253	197	5.9	29	.6	1/15
HDC18-1A	208/240	1	60	14.2	20	253	197	10.9	60	.6	1/15
HDC24-1A	208/240	1	60	16.6	30	253	197	12.8	61	.6	1/15

*May use fuses or HACR type Circuit Breakers of the same size as noted.
+Wire size should be determined in accordance with National Electrical Codes. Extensive wire runs will require larger wire sizes.

COOLING PERFORMANCE RATING

MODEL		95F OD \ 80/67F ID BTUH				Sound Rating Bels
OUTDOOR	INDOOR	TOTAL	SENSIBLE	KWI	SEER	
HDC12-1A	WMC12-1A	11,400	8,600	1.22	10	7.4
	ARUF/AW18-XX	12,000	7,900	1.22		
HDC18-1A	WMC18-1A	16,800	13,200	1.80	10	7.4
	ARUF/AW18-XX	16,600	13,000	1.83		
	ARUF/AW24-XX	17,400	13,700	1.91		
HDC24-1A	WMC24-1A	20,000	15,720	2.15	10	7.4
	ARUF24-XX	22,000	17,000	2.39		
	AWM25F-KFAD	21,000	15,800	2.26		

SEER = SEASONAL ENERGY EFFICIENCY RATIO
KWI = COMPRESSOR + INDOOR BLOWER + OUTDOOR FAN WATTS
OD = OUTDOOR DRY BULB TEMPERATURE -DEGREE F
ID = INDOOR DRY BULB / WET BULB TEMPERATURE - DEGREE F

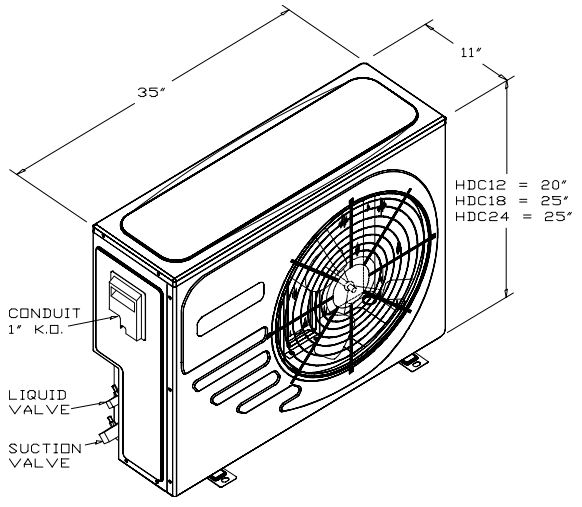


WIRING DIAGRAM - LINE VOLTAGE CONTROL CIRCUIT (TYPICAL WIRING FOR USE WITH DUCTLESS INDOOR SECTION)

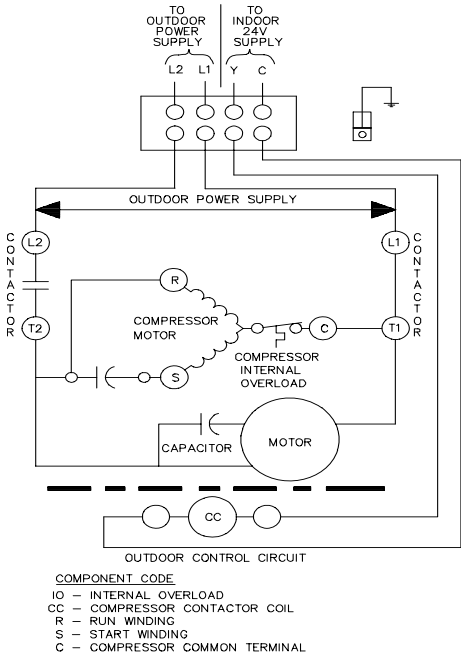
PHYSICAL DATA

ITEM	HDC12-1A	HDC18-1A	HDC24-1A
FAN			
DIAMETER	16”	18”	18”
RPM	950	950	950
COIL			
FACE AREA FT^2	4.9	6.1	6.5
TUBE DIAMETER	3/8”	3/8”	3/8”
NO. ROWS/FINS PER IN	19	19	19
NO. OF TUBES	16	20	20
FIN TYPE	RIPPLED	RIPPLED	RIPPLED
REFRIGERANT CONNECTION			
LIQUID DIAMETER	3/8”	3/8”	3/8”
SUCTION DIAMETER	5/8”	5/8”	5/8”
TYPE	FLARE	FLARE	FLARE
WEIGHT (pounds)	115	125	130

DIMENSIONAL DATA



WIRING DIAGRAM - LOW VOLTAGE CONTROL



CIRCUIT (TYPICAL WIRING FOR USE WITH DUCTED INDOOR SECTION
***NOTE 24 VOLT CONTACTOR IS FIELD SUPPLIED**

NOTE: SPECIFICATIONS AND PERFORMANCE DATA LISTED HEREIN ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Specifications

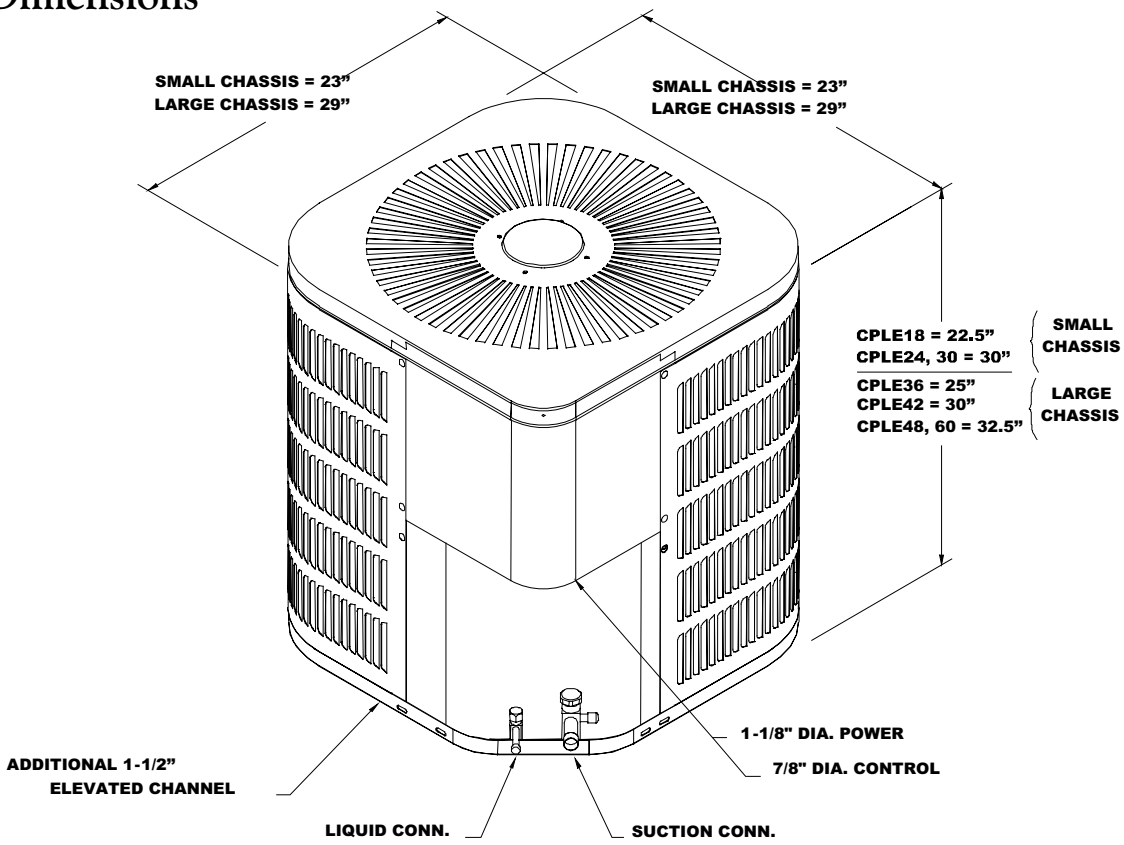
Model	Nominal Cooling Capacity (BTUH)	Nominal Heating Capacity (BTUH	Service Valve			Compressor		Condenser Fan		Shipping Weight (pounds)
			Liquid	Suction	Connection Type	RLA	LRA	HP	FLA	
CPLE18-1C	17,400	18,000	3/8”	3/4”	Sweat	9.4	49	1/6	1.3	127
CPLE24-1C	22,800	22,800	3/8”	3/4”	Sweat	13	56	1/6	1.3	137
CPLE30-1C	28,000	29,000	3/8”	3/4”	Sweat	13.7	75	1/6	1.3	140
CPLE36-1C	35,000	33,200	3/8”	3/4”	Sweat	16.2	96	1/4	1.8	152
CPLE42-1C	41,000	41,500	3/8”	7/8”	Sweat	17.1	105	1/4	1.8	162
CPLE48-1C	45,000	45,000	3/8”	7/8”	Sweat	18.3	102	1/4	1.8	178
CPLE48-3C	45,000	45,000	3/8”	7/8”	Sweat	12.6	91	1/4	1.8	178
CPLE60-1C	55,000	55,000	3/8”	7/8”	Sweat	25	150	1/4	1.8	210
CPLE60-3C	55,000	55,000	3/8”	7/8”	Sweat	15.4	124	1/4	1.8	210

Electrical Data

Model	Minimum Circuit Ampacity	Maximum Overcurrent Protection	Voltage-Phase	Minimum Volts	Maximum Volts
CPLE18-1C	13.1	20	208/230-1	197	253
CPLE24-1C	17.6	30	208/230-1	197	253
CPLE30-1C	18.4	30	208/230-1	197	253
CPLE36-1C	22.1	30	208/230-1	197	253
CPLE42-1C	23.2	40	208/230-1	197	253
CPLE48-1C	24.6	40	208/230-1	197	253
CPLE48-3C	17.6	30	208/230-3	197	253
CPLE60-1C	33.1	50	208/230-1	197	253
CPLE60-3C	21.1	30	208/230-3	197	253

1) Wire size should be determined in accordance with National Electrical Codes; extensive wire runs will require larger wire sizes
2) May use fuses or HACR type Circuit Breakers of the same size as noted
* With Crankcase Heat
**Uses Scroll Compressor

Dimensions



Model	Width	Depth	Height
CPLE18-1C	23”	23”	24”
CPLE24-1C	23”	23”	31.5”
CPLE30-1C	23”	23”	31.5”
CPLE36-1C	29”	29”	26.5”
CPLE42-1C	29”	29”	31.5”
CPLE48-1C	29”	29”	34”
CPLE48-3C	29”	29”	34”
CPLE60-1C	29”	29”	34”
CPLE60-3C	29”	29”	34”

Performance Ratings

Heat Pump	Coil or Air Handler	Total BTUH	Sensible BTUH	EER	SEER	47° F Heat Cap. (Btuh)	47°F Coeff. of Perf. (COP)	Region IV HSPF Rating	17°F Heat Cap. (Btuh)	17°F Coeff. of Perf. (COP)	ARI Ref. #	Decibels
CPLE18-1*	AC18-XX	16,200	11,400	9.0	10.0	16,000	3	6.8	9,200	2.2	467302	77
	AH18	16,200	11,400	9.0	10.0	16,000	3	6.8	10,200	2.2	467330	77
	AH24	17,400	13,000	9.5	10.5	18,000	3	7	11,000	2.2	467338	77
	ARPF024-00B-1*	17,400	13,000	9.5	10.5	17,000	3	7	11,000	2.22	517358	77
	ARPT024-00*-1*	17,400	13,000	9.5	10.5	18,000	3	7	11,000	2.22	517376	77
	ARUF018-00*-1*	17,000	11,700	9.0	10.0	17,400	3	6.8	10,600	2.22	517357	77
	ARUF024-00*-1*	17,400	13,000	9.5	10.5	18,000	3	7	11,000	2.22	517370	77
	AWB18-XX	16,200	11,400	9.0	10.0	17,000	3	6.8	10,200	2.2	467325	77
	AWB24-XX	17,000	12,600	9.0	10.5	17,600	3	6.8	10,600	2.2	467300	77
	CA*F018*2*+EEP	17,000	11,700	9.0	10.0	17,400	3	6.8	10,600	2.19	504120	77
	CA*F024*2*+EEP	17,400	13,000	9.5	10.5	18,000	3	7	11,000	2.19	504121	77
	CHPF024A2*+EEP	17,000	11,700	9.0	10.0	17,400	3	6.8	10,600	2.19	504123	77
	CHPF030A2*+EEP	17,400	13,000	9.5	10.5	18,000	3	7	11,000	2.19	504124	77
	H36F+EEP	17,400	13,000	9.5	10.5	18,000	3	7	11,000	2.2	467244	77
CPLE24-1*	AC24-XX	21,800	16,000	9.0	10.0	21,400	3	6.8	12,000	2	467344	77
	AC30-XX	22,800	17,400	9.5	10.5	22,800	3	7	13,000	2	467343	77
	AH24	21,800	16,000	9.0	10.0	21,400	3	7	12,400	2	467334	77
	AH30	22,400	17,000	9.0	10.0	22,400	3	7	13,000	2	467346	77
	ARPF024-00B-1*	22,000	16,400	9.0	10.0	21,000	3	7	12,800	2.01	517354	77
	ARPT024-00*-1*	22,000	16,400	9.0	10.0	21,000	3	7	12,800	2.01	517363	77
	ARPT032-00*-1*	22,800	17,400	9.5	10.5	22,800	3	7	13,000	2.01	517361	77
	ARUF024-00*-1*	22,000	16,400	9.0	10.0	22,000	3	7	12,800	2	517364	77
	ARUF030-00*-1*	22,400	17,000	9.0	10.0	22,400	3	7	13,000	2	517356	77
	AWB24-XX	21,800	16,000	9.0	10.0	21,800	3	7	12,400	2	467357	77
	AWB30-XX	22,400	17,000	9.0	10.0	22,400	3	7	13,000	2	467297	77
	AWB36-XX	22,800	17,400	9.5	10.5	22,800	3	7	13,000	2	467308	77
	CA*F024*2*+EEP	22,000	16,400	9.0	10.0	22,000	3	7	12,800	2.01	504239	77
	CA*F030*2*+EEP	22,800	17,400	9.5	10.5	22,800	3	7	13,000	2.01	504241	77
	CHPF024A2*+EEP	22,000	16,400	9.0	10.0	22,000	3	7	12,800	2.01	504288	77
	CHPF030A2*+EEP	22,800	17,400	9.5	10.5	22,800	3	7	13,000	2.01	504289	77
	H36F+EEP	22,800	17,400	9.5	10.5	22,800	3	7	13,000	2	467247	77
CPLE30-1*	AC30-XX	27,000	19,000	9.0	10.0	26,000	3	6.8	15,000	2	467296	77
	ARPF036-00B-1*	28,000	21,000	9.5	10.5	28,000	3	7	17,000	2.01	517360	77
	ARPT032-00*-1*	28,000	21,000	9.5	10.5	29,000	3	7	17,000	2.01	517373	77
	ARUF030-00*-1*	27,400	19,400	9.0	10.0	28,600	3	6.8	16,600	2	517362	77
	ARUF032-00*-1*	28,000	21,000	9.5	10.5	29,000	3	7	17,000	2	517372	77
	AWB30-XX	27,400	19,400	9.0	10.0	28,000	3	6.8	16,000	2	467351	77
	AWB36-XX	28,000	21,000	9.5	10.5	29,000	3	7	17,000	2	467311	77
	CA*F024*2*+EEP	27,000	19,000	9.0	10.0	27,000	3	6.8	16,000	2.01	504240	77
	CA*F030*2*+EEP	28,000	21,000	9.5	10.5	29,000	3	7	17,000	2.01	504242	77
	CHPF030A2*+EEP	27,000	19,000	9.0	10.0	27,000	3	6.8	16,000	2.01	504290	77
	CHPF042B2*+EEP	28,000	21,000	9.5	10.5	29,000	3	7	17,000	2.01	504296	77
	H36F+EEP	27,400	19,400	9.5	10.5	28,600	3	6.8	16,600	2	467278	77
	H48F+EEP	28,000	21,000	9.5	10.5	29,000	3	7	17,000	2	467279	77
CPLE36-1*	AC36-XX	32,600	22,900	9.0	10.0	31,000	2.8	6.8	17,000	2	467309	80
	ARPF036-00B-1*	32,600	22,900	9.0	10.0	31,000	2.82	6.8	17,000	2.01	517375	80
	ARPT036-00*-1*	33,000	23,400	9.0	10.0	33,000	3.09	7.3	18,600	2.1	517367	80
	ARPT042-00*-1*	35,000	26,200	9.5	10.5	34,200	3.21	7.5	18,800	2.1	517371	80
	ARUF036-00*-1*	33,000	23,400	9.0	10.0	33,000	3.08	7.3	18,600	2	517366	80
	ARUF042-00*-1*	35,000	26,200	9.5	10.5	34,200	3.2	7.5	18,800	2.1	517369	80
	AWB36-XX	33,000	23,400	9.0	10.0	33,000	3.1	7.3	18,600	2.1	467329	80
	CA*F036*2*+EEP	33,000	23,200	9.0	10.0	33,000	3.09	7.3	18,600	2.1	504238	80
	CA*F042*2*+EEP	35,000	26,200	9.5	10.5	33,200	3.18	7.5	18,800	2.1	504245	80
	CHPF030A2*+EEP	33,000	23,400	9.0	10.0	33,000	3.09	7.3	18,600	2.1	504291	80
	CHPF036B2*+EEP	32,000	22,500	9.0	10.0	33,000	3	7	17,600	2.01	504295	80
	CHPF042B2*+EEP	34,000	24,400	9.0	10.0	33,200	3.09	7.3	18,800	2.1	504297	80
	H49F+EEP	35,000	26,200	9.5	10.5	33,200	3.2	7.5	18,800	2.1	467277	80
CPLE42-1*	ARPF048-00B-1*	41,000	31,800	9.5	10.5	41,500	3.3	7.5	22,000	2.22	517359	80
	ARPT042-00*-1*	40,000	29,600	9.0	10.0	40,000	3.21	7.5	20,800	2.1	517365	80
	ARPT049-00*-1*	41,000	31,800	9.5	10.5	41,500	3.3	7.5	22,000	2.22	517355	80
	ARUF048-00*-1*	40,000	31,600	9.0	10.0	41,000	3.2	7.5	21,000	2.1	517368	80
	ARUF049-00*-1*	41,000	31,800	9.5	10.5	41,500	3.3	7.5	22,000	2.22	517390	80
	CA*F048*2*+EEP	40,000	29,600	9.0	10.0	41,000	3.18	7.5	21,000	2.1	504249	80
	CHPF042B2*+EEP	39,000	29,000	9.0	10.0	39,000	3	7.3	20,000	2.01	504298	80
	CHPF048D2*+EEP	41,000	31,600	9.5	10.5	41,000	3.18	7.5	21,000	2.1	504301	80
	H49F+EEP	41,000	31,600	9.5	10.5	41,000	3.2	7.5	21,000	2.1	467291	80

1) Certified per ARI 240 @ 80 °F/67 °F/95 °F
2) TVA Rating
3) Seasonal Energy Efficiency Ratio
4) Energy Efficiency Ratio @ 80 °F/67 °F/95 °F
5) HSPF = Heating Seasonal Performance Factor
6) Order the EEP from the Service Department using Part No. B13707-38 or new Solid State Board B13707-35S. Part No. B13707-38 is **not interchangeable** with B13707-35S.

When mix-matching outdoor and indoor units, the indoor unit check-flowrator must match the outdoor unit size.
See the AR series air handler for coil instructions.

Performance Ratings (cont.)

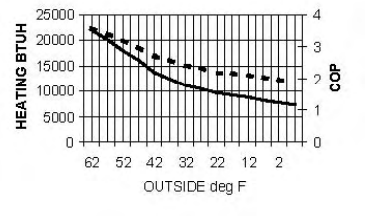
Heat Pump	Coil or Air Handler	Total BTUH	Sensible BTUH	EER	SEER	47° F Heat Cap. (Btuh)	47°F Coeff. of Perf. (COP)	Region IV HSPF Rating	17°F Heat Cap. (Btuh)	17°F Coeff. of Perf. (COP)	ARI Ref. #	Decibels
CPLE48-1*	ARPF048-00B-1*	44,000	34,600	9.0	10.0	43,000	3.12	7.5	25,400	2.1	517380	80
	ARPF060-00B-1*	45,000	35,000	9.0	10.0	44,000	3.18	7.5	26,000	2.16	517396	80
	ARPT049-00*-1*	44,000	34,600	9.0	10.0	43,000	3.12	7.5	25,400	2.1	517384	80
	ARPT061-00*-1*	45,000	35,000	9.0	10.0	44,000	3.12	7.5	26,000	2.16	517385	80
	ARUF049-00*-1*	44,000	34,600	9.0	10.0	43,000	3.12	7.5	25,400	2.1	517379	80
	ARUF061-00*-1*	45,000	35,000	9.0	10.0	44,000	3.12	7.5	26,000	2.16	517383	80
	CA*F060*2*+EEP	44,000	34,600	9.0	10.0	43,000	3.09	7.5	25,400	2.1	516556	80
	CA*F061*2*+EEP	45,000	35,000	9.0	10.0	44,000	3.15	7.5	26,000	2.13	516565	80
	CHPF048D2*+EEP	44,000	34,600	9.0	10.0	43,000	3.09	7.5	25,400	2.1	516552	80
	CHPF060D2*+EEP	45,000	35,000	9.0	10.0	44,000	3.15	7.5	26,000	2.13	516570	80
	H60F+EEP	44,000	34,600	9.0	10.0	43,000	3.03	7.5	25,400	2.1	516559	80
	H61F+EEP	45,000	35,000	9.0	10.0	44,000	3.03	7.5	26,000	2.16	516560	80
CPLE48-3*	ARPF048-00B-1*	44,000	34,600	9.0	10.0	43,000	3.12	7.5	25,400	2.1	517393	80
	ARPF060-00B-1*	45,000	35,000	9.0	10.0	44,000	3.12	7.5	26,000	2.13	517395	80
	ARPT049-00*-1*	44,000	34,600	9.0	10.0	43,000	3.12	7.5	25,400	2.1	517391	80
	ARPT061-00*-1*	45,000	35,000	9.0	10.0	44,000	3.12	7.5	26,000	2.13	517389	80
	ARUF049-00*-1*	44,000	34,600	9.0	10.0	43,000	3.12	7.5	25,400	2.1	517381	80
	ARUF061-00*-1*	45,000	35,000	9.0	10.0	44,000	3.12	7.5	26,000	2.1	517392	80
	CA*F060*2*+EEP	44,000	34,600	9.0	10.0	43,000	3.09	7.5	25,400	2.1	516568	80
	CA*F061*2*+EEP	45,000	35,000	9.0	10.0	44,000	3.15	7.5	26,000	2.13	516554	80
	CHPF048D2*+EEP	44,000	34,600	9.0	10.0	43,000	3.09	7.5	25,400	2.1	516558	80
	CHPF060D2*+EEP	45,000	35,000	9.0	10.0	44,000	3.15	7.5	26,000	2.13	516585	80
	H60F+EEP	44,000	34,600	9.0	10.0	43,000	3.09	7.5	25,400	2.1	516572	80
	H61F+EEP	45,000	35,000	9.0	10.0	44,000	3.18	7.5	26,000	2.16	516587	80
CPLE60-1*	ARPF060-00B-1*	55,000	39,900	9.0	10.0	55,000	3.3	8	32,000	2.31	517387	77
	ARPT061-00*-1*	55,000	39,900	9.0	10.0	55,000	3.3	8	32,000	2.31	517386	77
	ARUF061-00*-1*	55,000	39,900	9.0	10.0	55,000	3.3	8	32,000	2.3	517388	77
	CA*F061*2*+EEP	54,000	39,900	9.0	10.0	52,000	3.3	8	32,000	2.28	516597	77
	CHPF060D2*+EEP	54,000	39,900	9.0	10.0	52,000	3.3	8	32,000	2.28	516574	77
	H61F+EEP	55,000	39,900	9.0	10.0	55,000	3.3	8	32,000	2.31	516579	77
CPLE60-3*	ARPF060-00B-1*	55,000	39,900	9.0	10.0	55,000	3.3	8	32,000	2.31	517397	77
	ARPT061-00*-1*	55,000	39,900	9.0	10.0	55,000	3.3	8	32,000	2.31	517382	77
	ARUF061-00*-1*	55,000	39,900	9.0	10.0	55,000	3.3	8	32,000	2.3	517394	77
	CA*F061*2*+EEP	54,000	39,900	9.0	10.0	52,000	3.3	8	32,000	2.28	516592	77
	CHPF060D2*+EEP	54,000	39,900	9.0	10.0	52,000	3.3	8	32,000	2.28	516590	77
	H61F+EEP	55,000	39,900	9.0	10.0	55,000	3.3	8	32,000	2.31	516589	77

1) Certified per ARI 240 @ 80 °F/67 °F/95 °F
2) TVA Rating
3) Seasonal Energy Efficiency Ratio
4) Energy Efficiency Ratio @ 80 °F/67 °F/95 °F
5) HSPF = Heating Seasonal Performance Factor
6) Order the EEP from the Service Department using Part No. B13707-38 or new Solid State Board B13707-35S. Part No. B13707-38 is **not interchangeable** with B13707-35S.

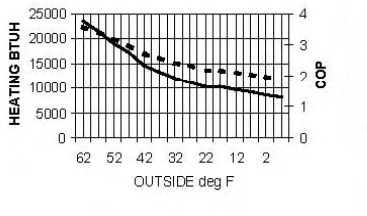
When mix-matching outdoor and indoor units, the indoor unit check-flowrator must match the outdoor unit size.
See the AR series air handler for coil instructions.

Heating Performance Expanded Ratings @ 70 °F Indoor Ambient

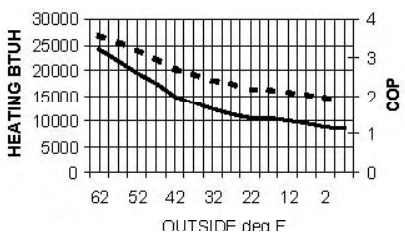
MODEL CPLE18-1* W: AC18-XX, AH18



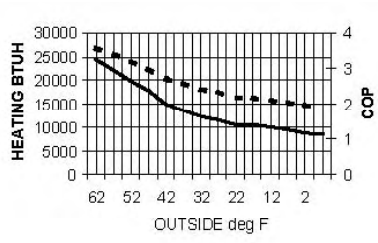
MODEL CPLE18-1* W: AWB18-XX



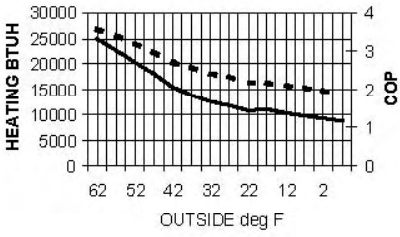
MODEL CPLE18-1* W: ARUF018



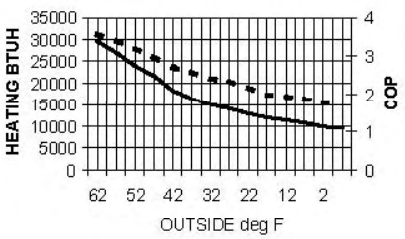
MODEL CPLE18-1* W: AWB24-XX



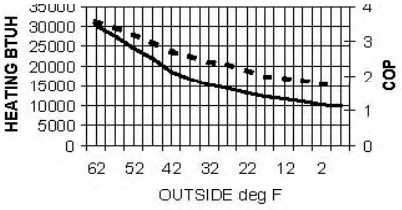
MODEL CPLE18-1* W: ARPF024/ARPT024, ARUF024, H36F+EEP



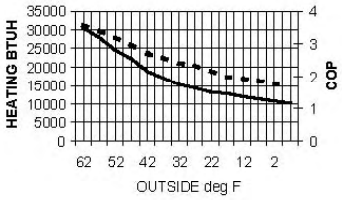
MODEL CPLE24-1* W: AC24-XX



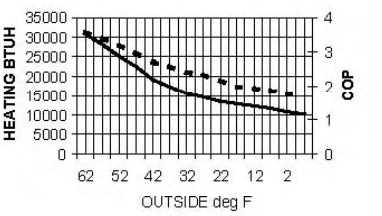
MODEL CPLE24-1* W: AWB24-XX



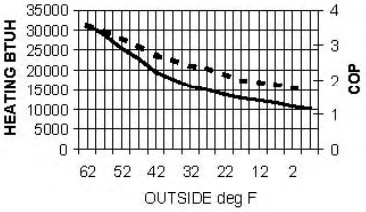
MODEL CPLE24-1* W: ARPF024, ARPT024, ARUF032, CA*F024*2*/CHPF024A2*+EEP



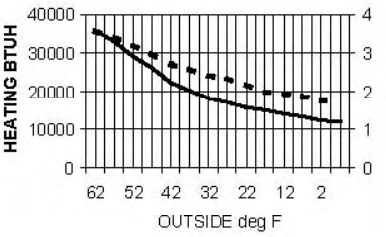
MODEL CPLE24-1* W: ARUF030, AWB30-XX



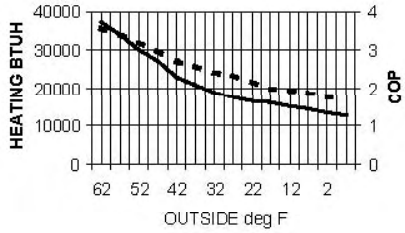
MODEL CPLE24-1* W: ARPF036/ARPT032, ARUF032, H36F+EEP, CA*F030*2*/CHPF030A2*+EEP



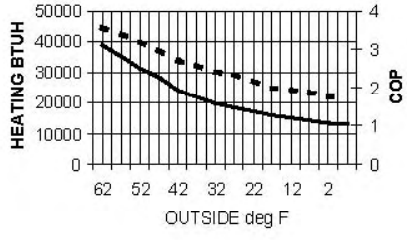
MODEL CPLE30-1* W: AC30-XX, AH30



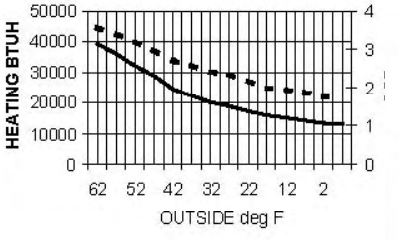
MODEL CPLE30-1* W: CA*F024*2*/CHPF030A2*+EEP



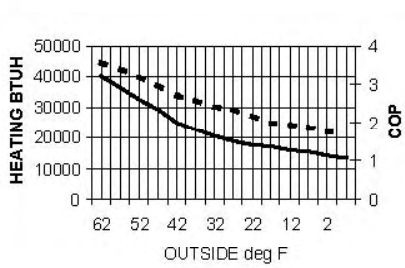
MODEL CPLE30-1* W: AWB30-XX



MODEL CPLE30-1* W: ARUF030, H36F+EEP

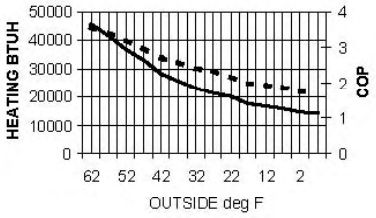


MODEL CPLE30-1* W: ARPF036/RPT032, ARUF032, 31+EEP, CA*F030*2*/CHPF030A2*+EEP

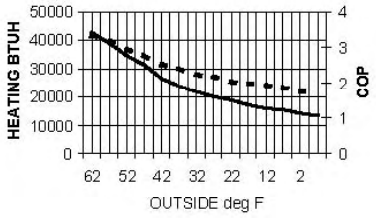


Heating Performance Expanded Ratings @ 70 °F Indoor Ambient (cont.)

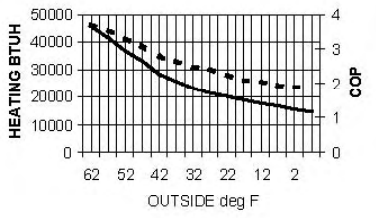
MODEL CPLE36-1* W: CHPF036B2*+EEP



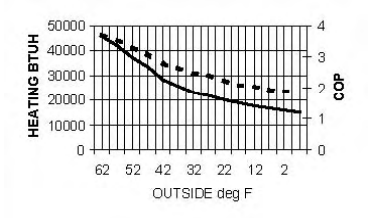
MODEL CPLE36-1* W: AC36-XX, AH36



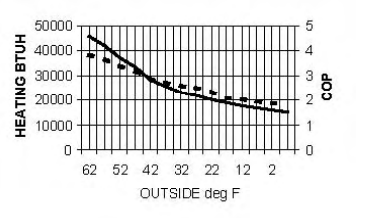
MODEL CPLE36-1* W: ARPT036/ARUF036, AWB36, CA*F036*2*/CHPF030A2*+EEP



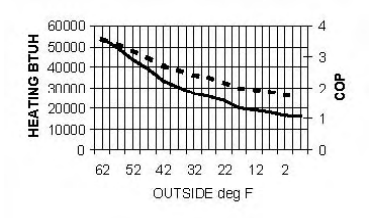
MODEL CPLE36-1* W: CHPF042B2*+EEP



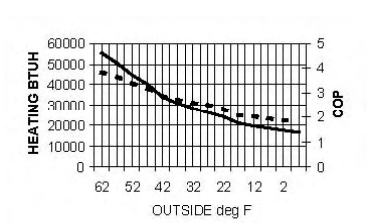
MODEL CPLE36-1* W: ARPT042/ARUF042, CA*F042*2*+EEP



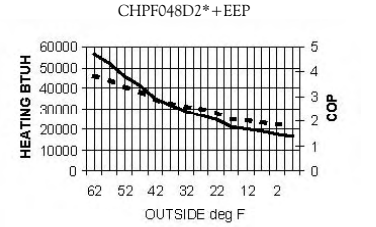
MODEL CPLE42-1* W: CHPF048D2*+EEP



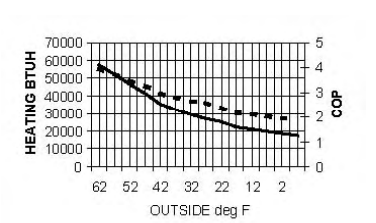
MODEL CPLE42-1* W: ARPT042/ARUF042



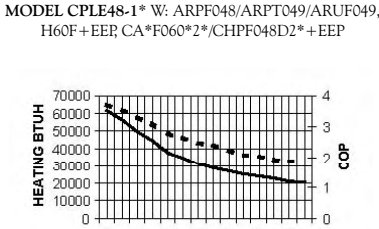
MODEL CPLE42-1* W: ARUF048, H49F+EEP, CA*F048*2*/CHPF048D2*+EEP



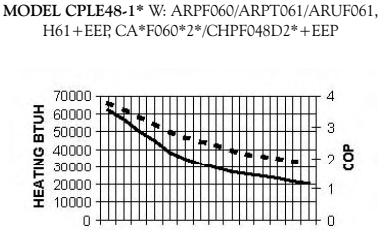
MODEL CPLE42-1* W: ARPF0498/ARPT049/ARUF049



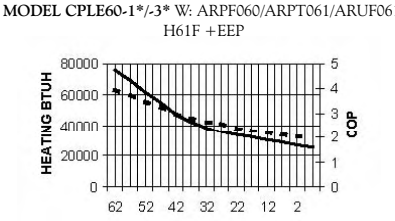
MODEL CPLE48-1* W: ARPF048/ARPT049/ARUF049, H60F+EEP, CA*F060*2*/CHPF048D2*+EEP



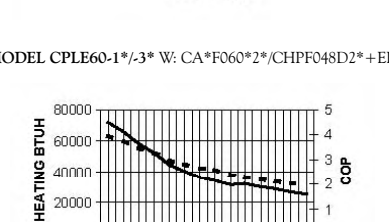
MODEL CPLE48-1* W: ARPF060/ARPT061/ARUF061, H61+EEP, CA*F060*2*/CHPF048D2*+EEP

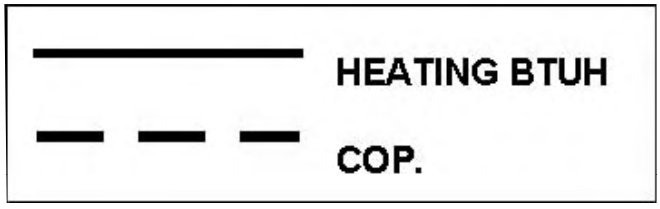


MODEL CPLE60-1*/-3* W: ARPF060/ARPT061/ARUF061, H61F +EEP



MODEL CPLE60-1*/-3* W: CA*F060*2*/CHPF048D2*+EEP





Specifications

Model	Service Valve		Type	Approximate Shipping Weight (pounds)
	Liquid	Suction		
CPLE090-3/-3C	5/8”	1-3/8”	Sweat	390
CPLE090-4/-4C	5/8”	1-3/8”	Sweat	390
CPLE120-3/-3C	5/8”	1-3/8”	Sweat	440
CPLE120-4/-4C	5/8”	1-3/8”	Sweat	440

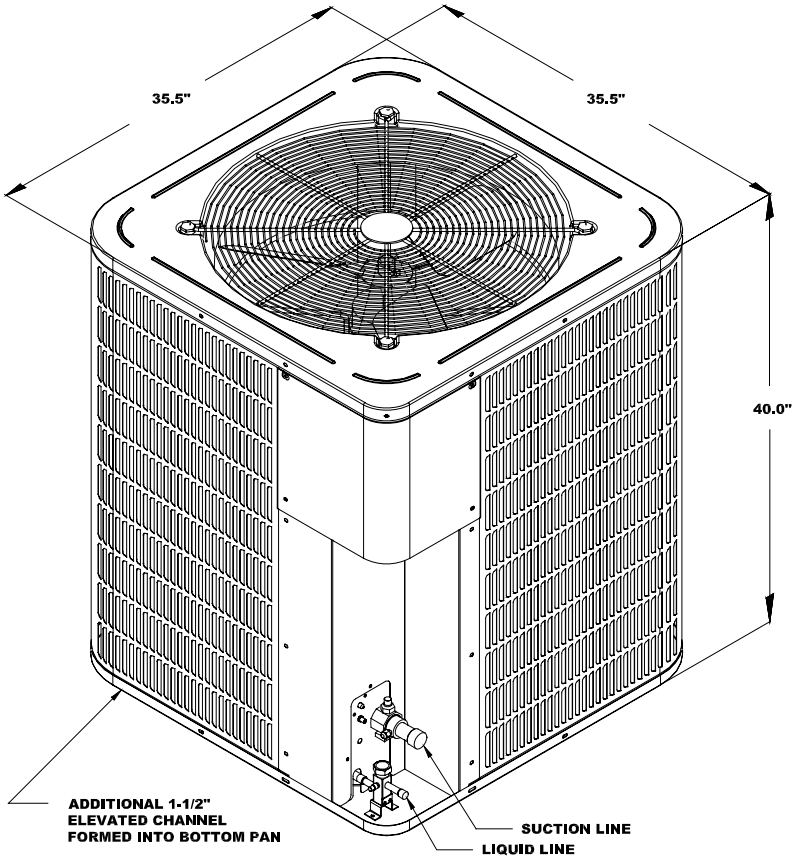
Model	Fan Diameter	Fan RPM	CFM	Tube Diameter	Face Area (Ft^2)	Rows Deep	Fins Per Inch	Fin Type	R-22 Holding Charge (pounds)
CPLE090-3/-4/-3C/-4C	26”	1,100	6,600	3/8”	30	1	19	Ripple	2
CPLE120-3/-4/-3C/-4C	26”	1,100	6,600	3/8”	30	2	16	Ripple	2

Electrical Data

Model	Volts	Ph	Hz	Minimum Circuit Amps[1]	Maximum Overcurrent Protection[2]	Minimum Volts	Maximum Volts	Compressor		Condenser Fan	
								RLA	LRA	FLA	HP
CPLE090-3/-3C	208/230	3	60	37.8	60	197	253	25.7	196	5.6	1
CPLE090-4/-4C	460	3	60	18.8	30	414	506	12.8	100	2.8	1
CPLE120-3/-3C	208/230	3	60	43.3	60	197	253	30.1	225	5.6	1
CPLE120-4/-4C	460	3	60	22.2	35	414	506	15.5	114	2.8	1

1) Wire size should be determined in accordance with National Electrical Codes; extensive wire runs will require larger wire sizes.
2) May use fuses or HACR type Circuit Breakers of the same size as noted.
3) The -3C and -4C models are painted Architectural Gray. All other models are painted Bahama Beige.

Dimensions



Performance Ratings at ARI Conditions

Model	Evaporator Model	Total Cooling BTUH @ 95 °F	Sensible Cooling BTUH @ 95 °F	EER[1]	Heating BTUH @ 47 °F	COP @ 47 °F	Heating BTUH @ 17 °F	COP @ 17 °F	SRN/ BELS
CPLE090-3/-4/-3C/-4C	AR090	87,000	63,500	10.1	82,000	3.2	53,000	2.2	8.4
CPLE120-3/-4/-3C/-4C	AR120	109,000	78,000	10.1	105,500	3.2	68,500	2.2	8.4

1) Energy Efficiency Ratio @ 80 °F/67 °F/95 °F = Capacity BTUH @95 F / kW_i
(kW_i = Compressor + Indoor Blower Motor + Outdoor Fan Motor
Note: For 3-models, reduce BTUH by 2,000 @ 208V

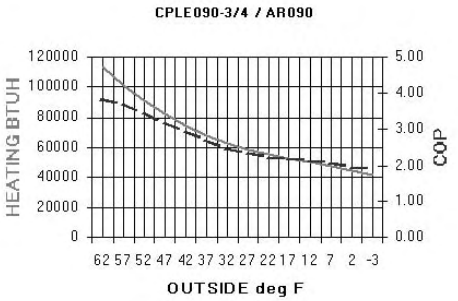
Expanded Ratings (Heating)

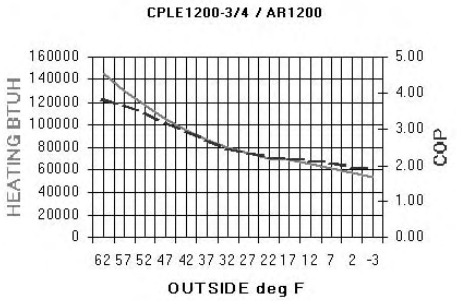
COP Plot CPLE090-3/-4/-3C/-4C

OD Temp	BTUH	COP	Watts
62	113,300	3.85	8.64
57	101,500	3.68	8.08
52	91,000	3.46	7.72
47	82,000	3.20	7.51
42	74,300	2.94	7.41
37	67,800	2.69	7.39
32	62,500	2.48	7.38
27	58,300	2.32	7.35
22	55,100	2.22	7.26
17	53,000	2.20	7.06
12	49,900	2.11	6.92
7	47,300	2.05	6.78
2	44,000	1.96	6.57
-3	41,900	1.91	6.43

COP Plot CPLE120-3/-4/-3C/-4C

OD Temp	BTUH	COP	Watts
62	145,800	3.85	11.0
57	130,800	3.68	10.4
52	117,400	3.46	9.96
47	105,500	3.20	9.66
42	95,200	2.94	9.50
37	86,500	2.69	9.43
32	79,500	2.48	9.40
27	74,100	2.32	9.37
22	70,400	2.22	9.29
17	68,500	2.20	9.13
12	64,500	2.11	8.94
7	61,200	2.05	8.76
2	56,900	1.97	8.49
-3	54,100	1.91	8.30





OUTDOOR UNIT CPLE090-3/-4/-3C/-4C INDOOR UNIT AR090

INDOOR		CONDENSER AIR TEMPERATURE														
AIR SCFM	WB	75°F			85°F			95°F			105°F			115°F		
		TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH
2465	72	100.9	47.6	8.10	96.6	45.7	8.53	91.4	43.8	8.87	86.1	41.9	9.30	80.9	40.0	9.73
	67	92.2	59.1	7.58	87.9	57.2	7.92	83.5	55.2	8.36	78.3	53.3	8.79	73.1	53.3	9.22
	62	85.3	69.9	7.06	80.9	67.9	7.49	78.7	66.0	7.92	76.6	64.1	8.36	72.2	61.6	8.70
	57	81.8	75.6	6.89	78.3	72.4	7.32	74.8	69.2	7.75	70.5	65.4	8.27	67.0	61.6	8.61
2900	72	105.3	52.7	8.36	100.1	50.8	8.70	94.8	48.9	9.13	89.6	47.6	9.56	83.5	45.1	9.99
	67	96.6	67.3	7.84	92.2	65.4	8.18	87.0	63.5	8.61	81.8	61.6	9.04	76.6	59.7	9.48
	62	89.6	80.6	7.41	85.3	78.1	7.75	80.9	74.9	8.18	77.4	71.1	8.61	73.1	67.3	9.13
	57	88.7	81.9	7.32	84.4	78.7	7.75	80.9	74.9	8.18	77.4	71.1	8.61	73.1	67.3	9.13
3335	72	107.9	57.2	8.53	102.7	55.2	8.87	97.4	53.3	9.30	91.4	51.4	9.73	86.1	50.2	10.16
	67	100.1	74.3	8.01	94.8	73.0	8.36	89.6	71.1	8.79	84.4	68.6	9.22	79.2	66.7	9.65
	62	94.0	87.0	7.67	90.5	83.2	8.10	85.3	79.4	8.53	81.8	75.6	8.96	76.6	71.1	9.48
	57	94.0	87.0	7.67	90.5	83.2	8.10	85.3	79.4	8.53	81.8	75.6	8.96	76.6	71.1	9.48

Sensible heat capacities shown are based on 80 °F DB entering air at the evaporator coil.
For sensible heat capacities at other than 80 °F DB, deduct 84 BTUH per 100 CFM of evaporator coil air for each degree below 80 °F, or add 84 BTUH per 100 CFM of evaporator coil air per degree above 80 °F.
Capacities at 95 °F OUTDOOR, 75 °F DB and 63 °F WB INDOOR
TOTAL MBTUH 82.1 SENSIBLE MBTUH 60.5 LATENT MBTUH 21.7

INDOOR UNIT CPLE120-3/-4/-3C/-4C INDOOR UNIT AR120

INDOOR		CONDENSER AIR TEMPERATURE														
AIR SCFM	WB	75°F			85°F			95°F			105°F			115°F		
		TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH	TOTAL MBTUH	SENS MBTUH	WATTS KWH
3230	72	126.4	58.9	10.14	121.0	56.5	10.68	114.5	54.2	11.12	107.9	51.8	11.66	101.4	49.5	12.20
	67	115.5	73.0	9.50	110.1	70.7	9.93	104.6	68.3	10.47	98.1	65.9	11.01	91.6	65.9	11.55
	62	106.8	86.4	8.85	101.4	84.0	9.39	98.6	81.6	9.93	95.9	79.3	10.47	90.5	76.1	10.90
	57	102.5	93.4	8.63	98.1	89.5	9.17	93.7	85.6	9.71	88.3	80.9	10.36	83.9	76.1	10.79
3800	72	131.9	65.2	10.47	125.4	62.8	10.90	118.8	60.4	11.44	112.3	58.9	11.98	104.6	55.7	12.52
	67	121.0	83.2	9.82	115.5	80.9	10.25	109.0	78.5	10.79	102.5	76.1	11.33	95.9	73.8	11.87
	62	112.3	99.7	9.28	106.8	96.6	9.71	101.4	92.6	10.25	97.0	87.9	10.79	91.6	83.2	11.44
	57	111.2	101.3	9.17	105.7	97.3	9.71	101.4	92.6	10.25	97.0	87.9	10.79	91.6	83.2	11.44
4370	72	135.2	70.7	10.68	128.6	68.3	11.12	122.1	65.9	11.66	114.5	63.6	12.20	107.9	62.0	12.73
	67	125.4	91.8	10.04	118.8	90.3	10.47	112.3	87.9	11.01	105.7	84.8	11.55	99.2	82.4	12.09
	62	117.7	107.5	9.60	113.4	102.8	10.14	106.8	98.1	10.68	102.5	93.4	11.22	95.9	87.9	11.87
	57	117.7	107.5	9.60	113.4	102.8	10.14	106.8	98.1	10.68	102.5	93.4	11.22	95.9	87.9	11.87

Sensible heat capacities shown are based on 80 °F DB entering air at the evaporator coil.
For sensible heat capacities at other than 80 °F DB, deduct 84 BTUH per 100 CFM of evaporator coil air for each degree below 80 °F, or add 84 BTUH PER 100 CFM of evaporator coil air per degree above 80 °F.
CAPACITIES AT 95 °F OUTDOOR, 75 °F DB AND 63 °F WB INDOOR
TOTAL MBTUH 102.9 SENSIBLE MBTUH 74.5 LATENT MBTUH 28.4

Specifications

Model	Nominal Cooling	Nominal Heating	Service Valve			Compressor					Ship Weight (lbs.)
			Liquid	Suction	Connect Type	RLA	LRA	Type	HP	FLA	
CPLJ18-1B	18,000	18,000	3/8”	3/4”	Sweat	8.6	49	Reciprocating	1/6	0.9	127
CPLJ24-1B	23,000	23,000	3/8”	3/4”	Sweat	9.8	56	Reciprocating	1/6	0.9	147
CPLJ30-1B	30,000	30,000	3/8”	3/4”	Sweat	13.5	72.5	Scroll	1/6	1.1	142
CPLJ36-1B	35,000	35,000	3/8”	3/4”	Sweat	14.7	83	Scroll	1/6	0.9	152
CPLJ42-1B	41,000	40,000	3/8”	7/8”	Sweat	18.4	95	Scroll	1/4	1.8	162
CPLJ48-1B	46,000	46,000	3/8”	7/8”	Sweat	18.3	109	Scroll	1/4	1.8	178
CPLJ60-1B	56,000	56,000	3/8”	7/8”	Sweat	25	148	Scroll	1/3	2.5	182

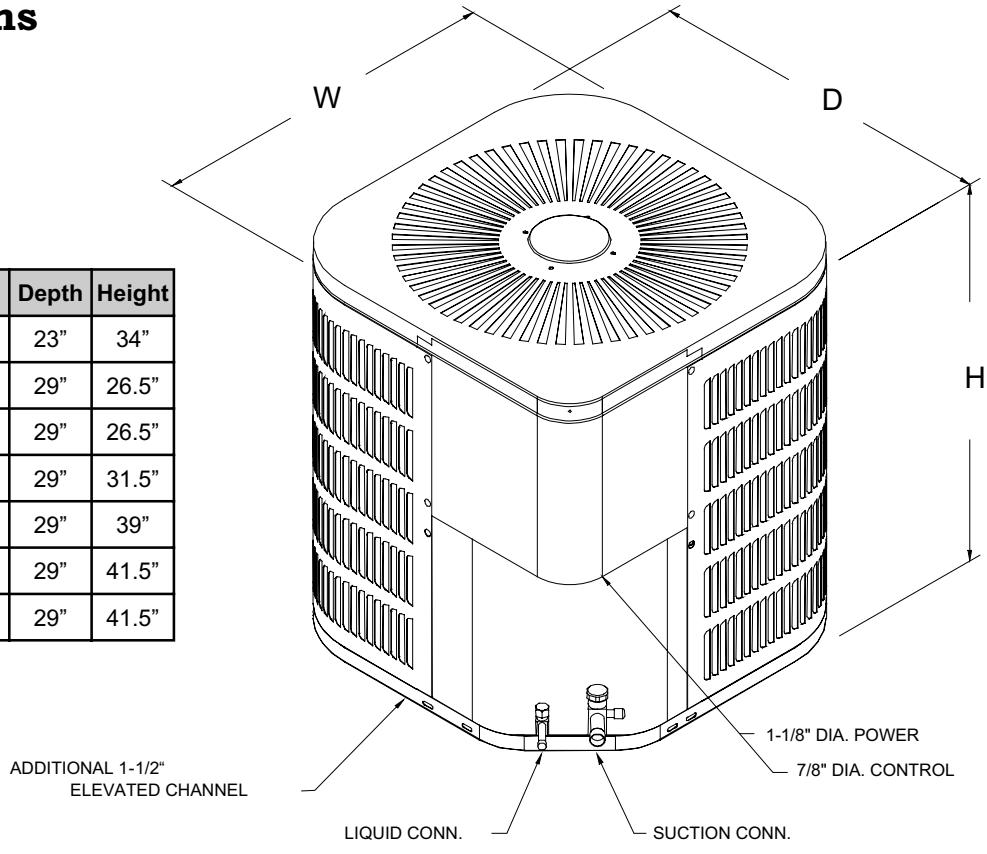
Electrical Data

Model	Minimum Circuit Ampacity	Maximum Overcurrent Protection	Voltage-Phase	Minimum Volts	Maximum Volts
CPLJ18-1B	11.7	20	208/230-1	197	253
CPLJ24-1B	13.2	20	208/230-1	197	253
CPLJ30-1B	18	30	208/230-1	197	253
CPLJ36-1B	19.3	30	208/230-1	197	253
CPLJ42-1B	24.8	40	208/230-1	197	253
CPLJ48-1B	24.7	40	208/230-1	197	253
CPLJ60-1B	33.8	50	208/230-1	197	253

1) Wire size should be determined in accordance with National Electrical Codes; extensive wire runs will require larger wire sizes
2) May use fuses or HACR type Circuit Breakers of the same size as noted

Dimensions

Model	Width	Depth	Height
CPLJ18-1B	23”	23”	34”
CPLJ24-1B	29”	29”	26.5”
CPLJ30-1B	29”	29”	26.5”
CPLJ36-1B	29”	29”	31.5”
CPLJ42-1B	29”	29”	39”
CPLJ48-1B	29”	29”	41.5”
CPLJ60-1B	29”	29”	41.5”



COOLING AND HEATING PERFORMANCE DATA

MODEL OUTDOOR SECTION	MODEL INDOOR SECTION	TOTAL COOLING BTUH (1)	SENSIBLE COOLING BTUH	(2) BTUH @ 75ºF/63ºF-95ºF TOTAL	(2) BTUH @ 75ºF/63ºF-95ºF SENS.	COOLING SEER(4)	COOLING EER (3)	HEATING BTUH 47°F	HEATING COP 47ºF	HEATING BTUH 17ºF	HEATING COP 17ºF	HEATING HSPF	SRN/ BELS
CPLJ18-1	AC18-XX	16400	12300	15500	11800	11.50	10.50	16000	2.80	9000	2.00	7.00	8.0
	AC24-XX	16800	12600	15800	12000	12.00	11.00	16400	3.00	9400	2.00	7.00	
	AR18-1/AW18-XX	17000	12700	16000	12200	11.00	10.00	17000	3.00	9400	2.00	7.00	
	AWB18-XX	17000	12700	16000	12200	11.00	10.00	17000	3.00	9400	2.00	7.00	
	AWB24/AW24-XX	17400	13100	16400	12600	12.00	11.00	17400	3.00	9600	2.00	7.00	
	U/UC32+EEP	18000	14200	17000	13700	12.00	11.00	18000	3.50	10000	2.20	7.30	
	HT3236/H36F+EEP	18000	14200	17000	13700	12.00	11.00	18000	3.50	10000	2.20	7.30	
	AR32-1	18000	14200	17000	13700	12.00	11.00	18000	3.50	10000	2.20	7.30	
	AE24-XX/AER24-1	18000	14200	17000	13700	13.00	12.00	18000	3.50	10000	2.20	7.50	
CPLJ24-1	AC24-XX	21200	15900	20000	15500	11.50	10.50	20200	2.80	11800	2.00	7.00	8.2
	AC30-XX	22000	16500	20700	16000	12.00	11.00	21000	2.80	12000	2.20	7.00	
	AWB24-XX	22400	16800	21100	16400	11.50	10.50	22000	3.00	12100	2.20	7.00	
	AR24-1/AW24-XX	22400	16800	21100	16400	11.50	10.50	22000	3.00	12100	2.20	7.00	
	U/UC32+EEP	23000	18000	21700	17400	12.00	11.00	23000	3.30	13600	2.60	7.50	
	U/UC42+EEP	23000	18000	21700	17400	12.00	11.00	23000	3.30	13600	2.60	7.50	
	HT3236/H36F+EEP	23000	18000	21700	17400	12.00	11.00	23000	3.30	13600	2.60	7.50	
	AWB36-XX	23000	18000	21700	17400	12.00	11.00	23000	3.30	13600	2.60	7.50	
	AR32-1/AR42-1	23000	18000	21700	17400	12.00	11.00	23000	3.30	13600	2.60	7.80	
	AE24-XX/AER24-1	23000	18000	21700	17400	13.00	12.00	23000	3.30	13600	2.60	8.00	
CPLJ30-1	AC30-XX	27000	20200	24600	18900	11.50	10.50	26000	2.80	14000	2.20	7.00	8.2
	AC36-XX	27400	20500	25000	19100	12.00	11.00	26400	2.80	14600	2.20	7.00	
	AWB30-XX	27200	20400	24800	19100	11.30	10.50	27000	3.00	14800	2.20	7.00	
	AR30-1/AW30-XX	27200	20400	24800	20700	11.30	10.50	27000	3.00	14800	2.20	7.00	
	HT3236/U/UC32+EEP	29000	21600	27400	20700	12.00	11.00	29400	3.30	17000	2.40	7.50	
	U/UC42+EEP	29000	21600	27400	20700	12.00	11.00	29400	3.30	17000	2.40	7.50	
	HT4248/H36F+EEP	29000	21600	27400	20700	12.00	11.00	29400	3.30	17000	2.40	7.50	
	AWB36-XX	29000	21600	27400	20700	12.00	11.00	29400	3.30	17000	2.40	7.50	
	AR32-1/AR42-1	29000	21600	27400	20700	12.00	11.00	29400	3.30	17000	2.40	7.80	
	AER30-1	29000	21600	26800	21200	12.50	11.50	29400	3.30	17000	2.40	7.80	
	AE36-XX/AER36-1	30000	22300	29300	19000	13.00	12.00	30000	3.50	18000	2.40	7.80	
CPLJ36-1	AC36-XX	32000	23000	30200	24000	11.00	10.00	31000	2.80	17000	2.00	7.00	8.2
	AWB36-XX/AR36-1	33000	23800	31150	24900	11.30	10.30	33000	3.20	19000	2.10	7.50	
	U/UC42+EEP	34000	24500	32100	23300	12.00	11.00	35000	3.50	20000	2.30	7.80	
	HT4248/H49F+EEP	34000	24500	32100	23300	12.00	11.00	35000	3.50	20000	2.30	7.80	
	AR42-1	34000	24500	32100	23300	12.00	11.00	35000	3.50	20000	2.30	7.80	
	AE36-XX/AER36-1	35000	25900	34000	24600	13.00	12.00	35000	3.50	20000	2.30	8.00	
CPLJ42-1	AR42-1	38500	27600	36200	29300	11.30	10.30	38500	3.30	21000	2.10	7.50	8.2
	U/UC60+EEP	40000	30400	37800	29300	12.00	11.00	40000	3.50	22400	2.30	8.00	
	HT61/H61F+EEP	40000	30400	37800	29000	12.00	11.00	40000	3.50	22400	2.30	8.00	
	AR49-1	40000	30400	37800	29300	12.00	11.00	40000	3.50	22400	2.30	8.00	
	AE48-XX/AER48-1	41000	31000	37800	29900	13.00	12.00	40000	3.50	23000	2.30	8.30	
CPLJ48-1	AR48-1	44000	32500	41500	31000	11.50	10.50	44000	3.30	24000	2.20	7.50	8.4
	AR49-1	44000	32500	41500	31000	12.00	11.00	45000	3.50	25000	2.30	8.00	
	U/UC60+EEP	44000	32500	41500	31000	12.00	11.00	45000	3.50	25000	2.30	8.00	
	HT61/H61F+EEP	44000	32500	41500	31000	12.00	11.00	45000	3.50	25000	2.30	8.00	
	AE48-XX/AER48-1	46000	35000	43400	33600	12.50	11.50	46000	3.60	27000	2.40	8.50	
	AR61-1	46000	35000	43400	33600	12.00	11.00	46000	3.60	27000	2.40	8.00	
CPLJ60-1A	AR60-1	55000	39600	51900	37000	11.30	10.30	55000	3.30	30000	2.10	7.50	8.4
	U/UC62+EEP	55000	39600	51900	37000	11.50	10.50	55000	3.20	30000	2.30	8.00	
	AR61-1	56000	40300	52600	37700	12.00	11.00	56000	3.30	31000	2.30	8.00	
	HT61/U/UC61+EEP	56000	40300	52600	37700	12.00	11.00	56000	3.30	31000	2.30	8.00	
	H61F+EEP	56000	40300	52600	37700	12.00	11.00	56000	3.30	31000	2.30	8.00	
	AE60-XX/AER60-1	56000	40300	52600	37700	12.00	11.00	56000	3.30	31000	2.30	8.50	

XX designates electric heat quantity.
HSPF = heating seasonal performance factor.
When mix matching outdoor and indoor units, the indoor unit check-flowrator must match the outdoor unit size.
See “AR” unit for coil instructions.
EEP - Order from service dept. part No. B13707-38 or new Solid State Board B13707-35S. Part No. B13707-38 is ***not interchangeable*** with B13707-35S.
T he Gas Furnace contains the EEP cooling time delay.
(1) Certified per ARI 240 @ 80ºF/67ºF -95ºF
(2) TVA Rating
(3) Energy Efficiency Ratio @ 80ºF/67ºF -95ºF
(4) Seasonal Energy Efficiency Ratio

PRODUCT SPECIFICATIONS CPLJ

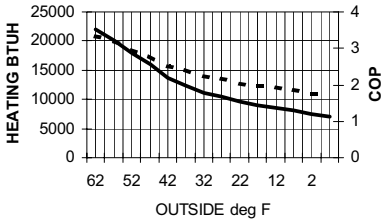
ELECTRICAL DATA

MODEL	VOLTS	PH	HZ	+MINIMUM CIRCUIT AMPS	*MAXIMUM OVERCURRENT PROTECTION	MINIMUM VOLTS	MAXIMUM VOLTS	COMPRESSOR		COND. FAN	
								RLA	LRA	FLA	HP
†CPLJ18-1	208/230	1	60	10.9	20	197	253	7.7	48.0	0.9	1/6
†CPLJ24-1	208/230	1	60	15.3	20	197	253	11.5	60.0	0.9	1/6
†CPLJ30-1	208/230	1	60	19.3	30	197	253	14.7	74.0	0.9	1/6
†CPLJ36-1	208/230	1	60	18.5	30	197	253	14.1	79.0	0.9	1/6
†CPLJ42-1	208/230	1	60	24.2	40	197	253	17.9	87.0	1.8	1/4
CPLJ48-1	208/230	1	60	24.7	40	197	253	18.3	109.0	1.8	1/4
**CPLJ60-1A	208/230	1	60	33.1	50	197	253	25.0	169.0	1.8	1/3

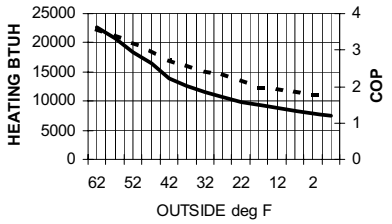
† With Crankcase Heat.
* May use fuses or HACR type Circuit Breakers of the same size as noted.
+ Wire size should be determined in accordance with National Electrical Codes. Extensive wire runs will require larger wire sizes.
**With Scroll Compressor

HEATING PERFORMANCE EXPANDED RATINGS @70ºF INDOOR AMBIENT

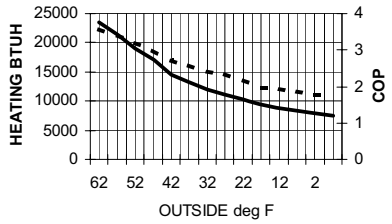
MODEL CPLJ18-1 W: AC18-XX



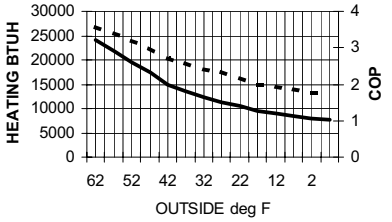
MODEL CPLJ18-1 W: AC24-XX



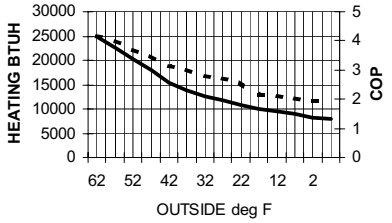
MODEL CPLJ18-1 W: AR18-1/AW/AWB18-XX



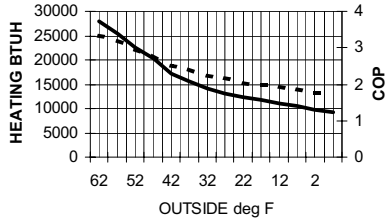
MODEL CPLJ18-1 W: AW/AWB24-XX



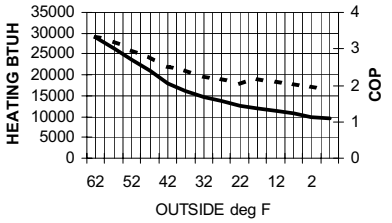
MODEL CPLJ18-1 W: U/UC32+EEP, HT3236/H36F+EEP, AR32-1, AE24-XX, AER24-1



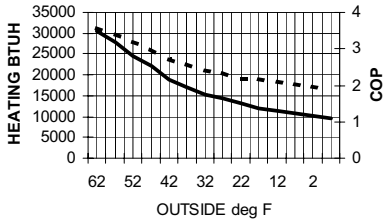
MODEL CPLJ24-1 W: AC24-XX



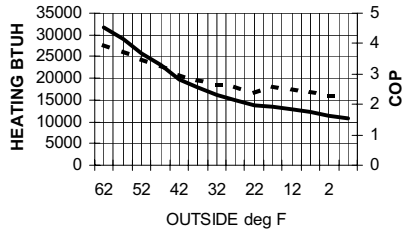
MODEL CPLJ24-1 W: AC30-XX



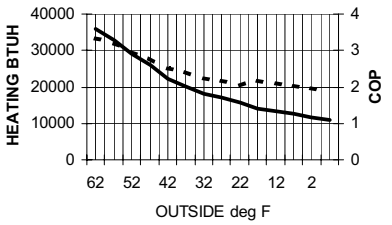
MODEL CPLJ24-1 W: AR24-1/AW/AWB24-XX



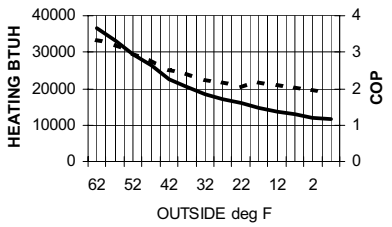
MODEL CPLJ24-1 W: U/UC32+EEP, U/UC42/+EEP, HT3236/H36F+EEP, AWB36-XX, AR32-1, AR 42-1, AE24-XX, AER24-1



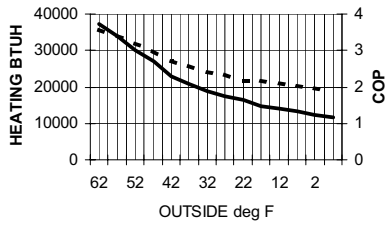
MODEL CPLJ30-1 W: AC30-XX



MODEL CPLJ30-1 W: AC36-XX

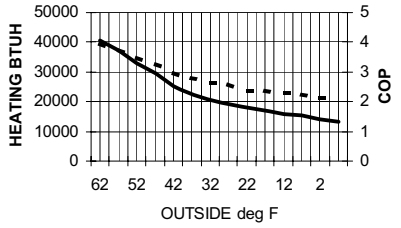


MODEL CPLJ30-1 W: AR30-1/AW/AWB30-XX

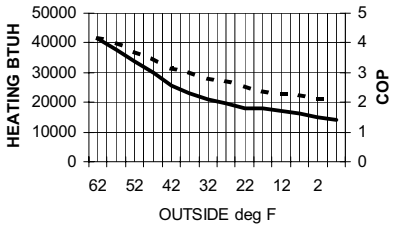


HEATING PERFORMANCE EXPANDED RATINGS @70ºF INDOOR AMBIENT

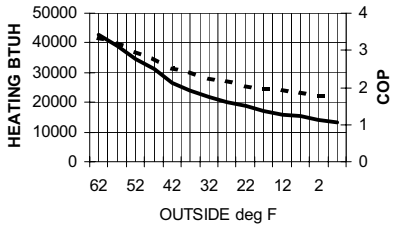
MODEL CPLJ30-1 W: HT3236/U/UC32+EEP, U/UC42 +EEP, HT4248/H36F+EEP, AR32-1, AR42-1, AER30-1,AWB36-XX



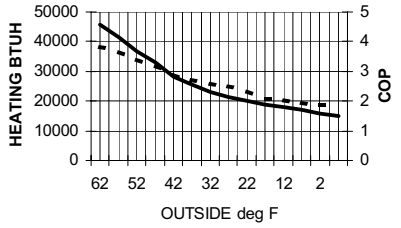
MODEL CPLJ30-1 W: AE36-XX/AER36-1



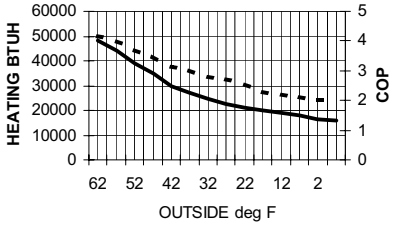
MODEL CPLJ36-1 W: AC36-XX



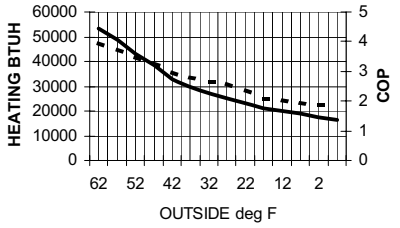
MODEL CPLJ36-1 W: AR36-1/AWB36-XX



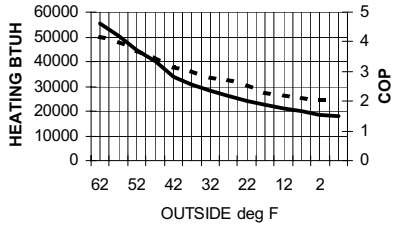
MODEL CPLJ36-1 W: U/UC42+EEP, HT4248/H49F+EEP, AR42-1, AE36-XX/AER36-1



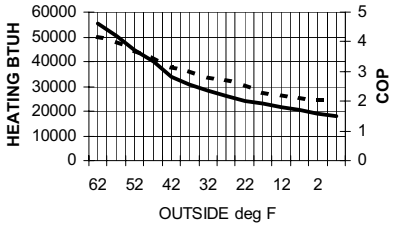
MODEL CPLJ42-1 W: AR42-1



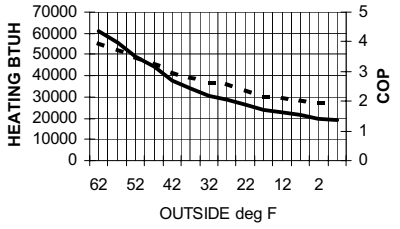
MODEL CPLJ42-1 W: U.UC60+EEP, HT61/H61F+EEP, AR49-1



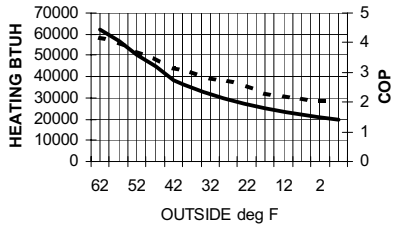
MODEL CPLJ42-1 W: AR48-XX/AER48-1



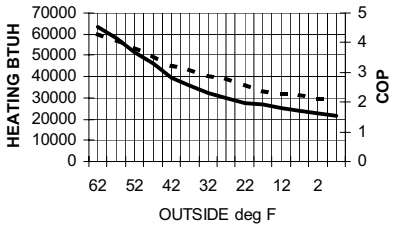
MODEL CPLJ48-1 W: AR48-1



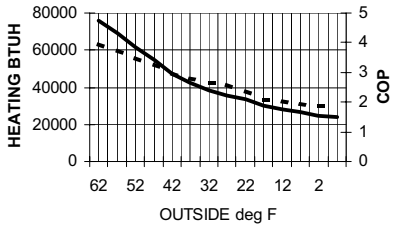
MODEL CPLJ48-1 W: AR49-1, U/UC60+EEP, HT61/HT61F+EEP



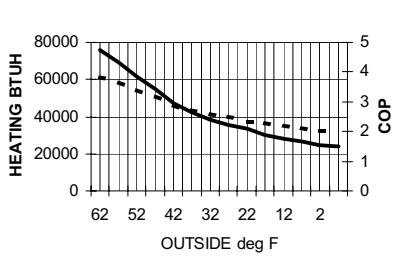
MODEL CPLJ48-1 W: AE48-XX/AER48-1, AR61-1



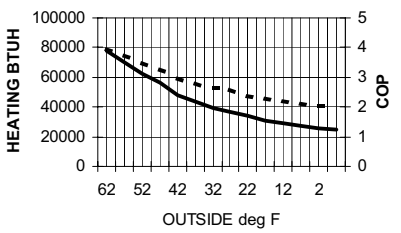
MODEL CPLJ60-1A W: AR60-1



MODEL CPLJ60-1A W: U/UC62+EEP



MODEL CPLJ60-1A W: AR61-1, U/UC61+EEP, HT61/H61F+EEP, AE60-XX/AER60-1



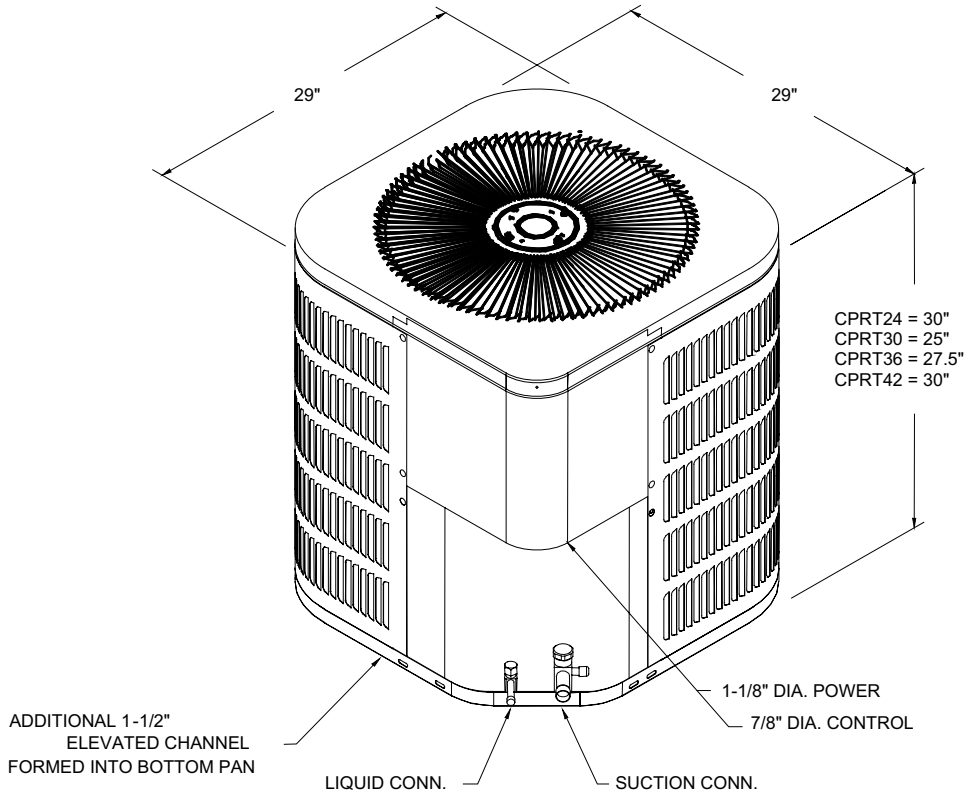
Specifications

	Model	CPRT24-1	CPRT30-1	CPRT36-1	CPRT42-1	CPRT48-1	CPRT60-1
Service Valve	Liquid	3/8”	3/8”	3/8”	3/8”	3/8”	3/8”
	Suction	3/4”	3/4”	7/8”	7/8”	7/8”	7/8”
	Type	Sweat	Sweat	Sweat	Sweat	Sweat	Sweat
Shipping Weight (lbs)		137	142	152	162	249	337
Electrical Data	Volts	208/230	208/230	208/230	208/230	208/230	208/230
	Phase	1	1	1	1	1	1
	Hz	60	60	60	60	60	60
	Minimum Circuit Amps[1]	14.5	17.8	20.1	23	24.6	29.2
	Maximum Overcurrent Protection[2]	20	30	30	40	40	50
	Minimum Volts	197	197	197	197	197	197
	Maximum Volts	253	253	253	253	253	253
Compressor	RLA	10.9	13.5	14.8	17.1	18.4	22.1
	LRA	54	72.5	83	95	109	137
Condenser Fan	FLA	0.9	0.9	1.6	1.6	1.6	1.6
	HP	1/6	1/6	1/6	1/6	1/6	1/6

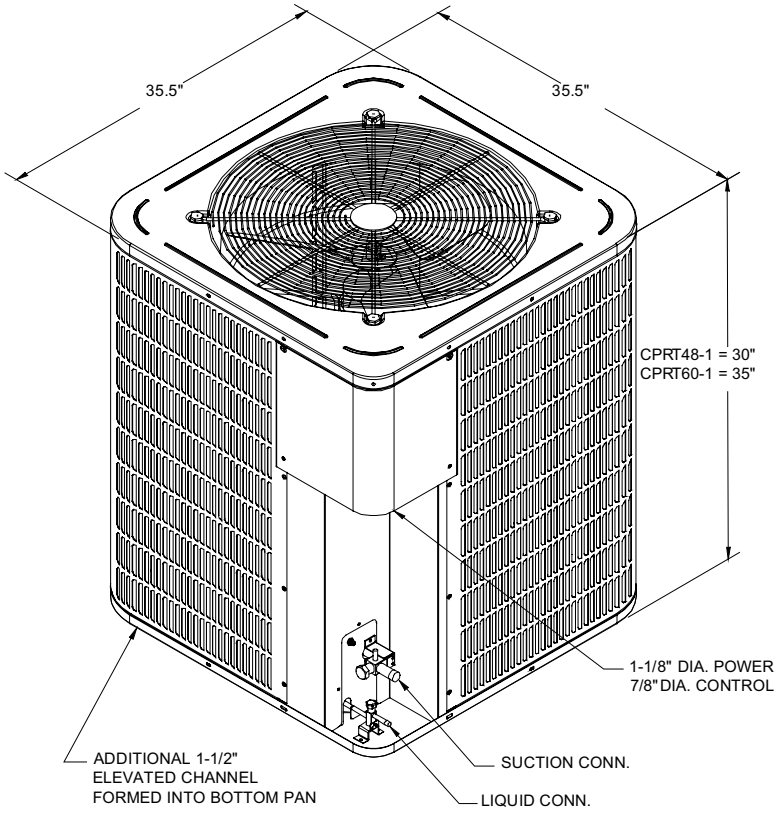
1) Wire size should be determined in accordance with National Electrical Codes; extensive wire runs will require larger wire sizes

2) May use fuses or HACR type Circuit Breakers of the same size as noted

Dimensions for CPRT24-42 Models



Dimensions for CPRT48-60 Models



Performance Ratings

Model	Coil / Air Handler	Cooling Capacity				Heating Capacity					ARI Ref. #	Decibels
		Total BTUH	Sensible BTUH	SEER	EER	47°F (BTUH)	47°F COP	HSPF	17°F (BTUH)	17°F COP		
CPRT24-1	AEPT030-00*-1*	22,800	17,000	14	12.6	23,000	3.5	7.5	11,500	2.5	539694	74
	ARPT032-00*-1*	22,800	17,000	13	11.6	23,000	3.3	7.7	11,500	2.3	539735	
	ARUF032-00*-1*	22,800	17,000	13	11.6	23,000	3.3	7.7	11,500	2.3	539765	
	CA*F030*2*+EEP	22,800	17,000	13	11.6	23,000	3.3	7.3	11,500	2.28	539685	
	CA*F042*2*+EEP	22,800	17,000	13	11.6	23,000	3.3	7.3	11,500	2.28	539746	
	CHPF030A2*+EEP	22,800	17,000	13	11.6	23,000	3.3	7.3	11,500	2.28	539717	
	CHPF042B2*+EEP	22,800	17,000	13	11.6	23,000	3.3	7.3	11,500	2.28	539808	
	H36F+EEP	22,800	17,000	13	11.6	23,000	3.3	7.5	11,500	2.3	539771	
CPRT30-1	AEPT030-00*-1*	29,000	22,300	13.5	12	30,000	3.42	8	18,000	2.52	539719	79
	AEPT036-00*-1*	30,000	26,000	14	12.5	31,000	3.5	8.5	19,000	2.6	539708	
	ARPT032-00*-1*	29,000	22,300	13	11.6	30,000	3.3	8	18,000	2.4	539801	
	ARUF032-00*-1*	29,000	22,300	13	11.6	30,000	3.3	8	18,000	2.4	539793	
	CA*F030*2*+EEP	30,000	23,000	13	11.6	30,000	3.3	7.8	18,000	2.4	539762	
	CA*F042*2*+EEP	30,000	23,000	13	11.6	30,000	3.3	7.8	18,000	2.4	539751	
	CHPF030A2*+EEP	30,000	22,300	13	11.6	30,000	3.3	7.8	18,000	2.4	539757	
	CHPF042B2*+EEP	30,000	22,300	13	11.6	30,000	3.3	7.8	18,000	2.4	539752	
	H36F+EEP	29,000	22,300	13	11.6	30,000	3.3	7.8	18,000	2.4	539761	
CPRT36-1	AEPT036-00*-1*	35,000	25,300	14	12.6	37,000	3.5	8.5	21,000	2.3	539780	79
	ARPT049-00*-1*	35,000	25,300	13	11.6	36,000	3.5	8	20,000	2.3	539787	
	ARUF048-00*-1*	35,000	25,300	13	11.6	36,000	3.5	8	20,000	2.3	539809	
	ARUF049-00*-1*	35,000	25,300	13	11.6	36,000	3.5	8	20,000	2.3	539775	
	CA*F048*2*+EEP	35,000	25,300	13	11.6	36,000	3.48	8	20,000	2.28	539807	
	CHPF048D2*+EEP	35,000	25,300	13	11.6	36,000	3.48	8	20,000	2.28	539736	
	H60F+EEP	35,000	25,300	13	11.6	36,000	3.5	8	20,000	2.3	539792	

1) Certified per ARI 210/240 @ 80 °F/67 °F/95 °F
2) TVA Rating
3) Seasonal Energy Efficiency Ratio
4) Energy Efficiency Ratio @ 80 °F/67 °F/95 °F
5) HSPF = Heating Seasonal Performance Factor
6) Order the EEP from the Service Department using Part No. B13707-38 or new Solid State Board B13707-35S. Part No. B13707-38 is **not interchangeable** with B13707-35S.

XX designates electric heat quantity

When mix-matching outdoor and indoor units, the indoor unit check-flowrator must match the outdoor unit size.

Performance Ratings

Model	Coil / Air Handler	Cooling Capacity				Heating Capacity					ARI Ref. #	Decibels
		Total BTUH	Sensible BTUH	SEER	EER	47°F (BTUH)	47°F COP	HSPF	17°F (BTUH)	17°F COP		
CPRT42-1	AEPT060-00*-1*	40,000	30,400	14	12.6	41,000	3.8	8.5	23,000	2.5	539742	79
	ARPT049-00*-1*	39,000	29,600	13	11.6	40,000	3.6	8.4	22,400	2.3	539709	
	ARUF049-00*-1*	39,000	29,600	13	11.6	40,000	3.6	8.4	22,400	2.3	539802	
	CA*F060*2*+EEP	39,000	29,600	13	11.6	40,000	3.6	8.4	22,400	2.28	539776	
	CHPF060D2*+EEP	39,000	29,600	13	11.6	40,000	3.6	8.4	22,400	2.28	539723	
	H61F+EEP	39,000	29,600	13	11.6	40,000	3.6	8.4	22,400	2.3	539806	
CPRT48-1	AEPT060-00*-1*	46,500	33,500	13.5	12	46,000	3.5	8.6	30,400	2.6	531554	79
	ARPT061-00*-1*	46,500	33,500	13	11.6	46,000	3.5	8.5	30,400	2.5	531549	
	ARUF061-00*-1*	46,500	33,500	13	11.6	46,000	3.5	8.5	30,400	2.5	531544	
	CA*F048*2*+EEP	42,500	30,600	12	10.6	42,000	3.48	8	28,000	2.28	531542	
	CA*F060*2*+EEP	43,500	31,400	12.5	11	43,000	3.48	8.2	28,000	2.28	531559	
	CA*F061*2*+EEP	46,000	33,000	13	11.6	45,000	3.48	8.4	30,000	2.28	532778	
	CHPF060D2*+EEP	46,000	33,000	13	11.6	45,000	3.48	8.4	33,000	2.28	531545	
	H61F+EEP	46,000	33,000	13	11.6	45,000	3.5	8.4	30,000	2.3	531536	
CPRT60-1	AEPT060-00*-1*	55,000	40,000	13	11.6	55,000	3.5	8.5	35,000	2.6	531533	79
	ARPT061-00*-1*	55,000	40,000	13	11.6	55,000	3.5	8.4	35,000	2.5	531532	
	ARUF061-00*-1*	55,000	40,000	13	11.6	55,000	3.5	8.4	35,000	2.5	531547	
	CA*F061*2*+EEP	54,000	39,400	13	11.6	54,000	3.4	8.4	34,000	2.4	531548	
	CHPF060D2*+EEP	54,000	39,400	13	11.6	54,000	3.48	8.4	34,000	2.4	531551	
	H61F+EEP	54,000	39,400	13	11.6	54,000	3.5	8.4	34,000	2.4	531541	

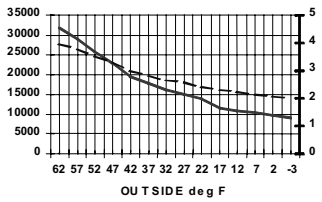
1) Certified per ARI 210/240 @ 80 °F/67 °F/95 °F
2) TVA Rating
3) Seasonal Energy Efficiency Ratio
4) Energy Efficiency Ratio @ 80 °F/67 °F/95 °F
5) HSPF = Heating Seasonal Performance Factor
6) Order the EEP from the Service Department using Part No. B13707-38 or new Solid State Board B13707-35S. Part No. B13707-38 is **not interchangeable** with B13707-35S.

XX designates electric heat quantity

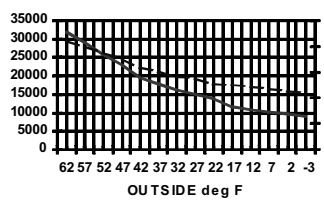
When mix-matching outdoor and indoor units, the indoor unit check-flowrator must match the outdoor unit size.

Heating Performance Expanded Ratings @ 70 °F Indoor Ambient

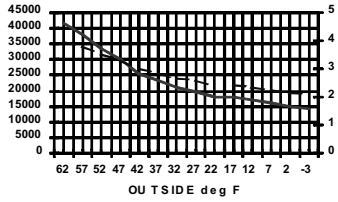
CP*T24-1 VS. U/UC32+EEP, U/UC42+EEP, H36F+EEP, ARPF036, A RPT032, ARUF032



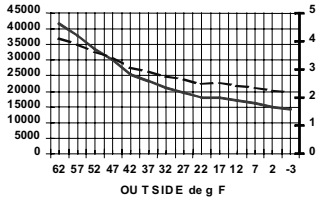
CP*T24-1 VS. AEPT024, AE24XX



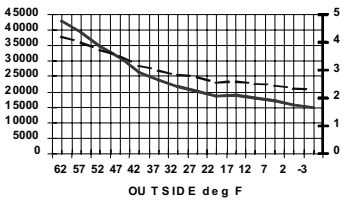
CP*T30-1 VS. U/UC32+EEP, U/UC42+EEP, H36F+EEP, ARPF036, AR PT032, ARUF032



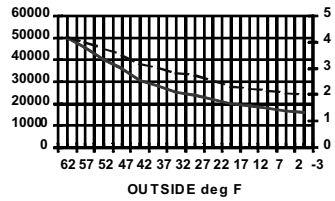
CP*T30-1 VS. AEPT030/AE30-XX



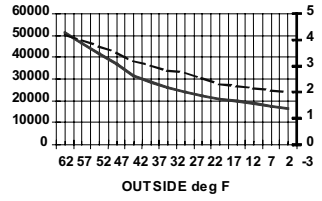
CP*T30-1 VS. AEPT036/AE36-XX



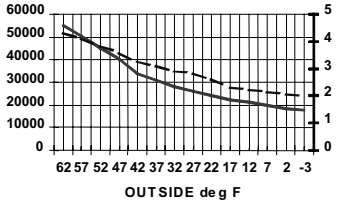
CP*T36-1 VS. U/UC49+EEP, H60F+EEP, ARUF048



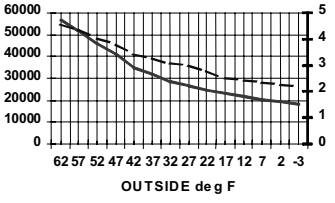
CP*T36-1 VS. AEPT036/AE36-XX



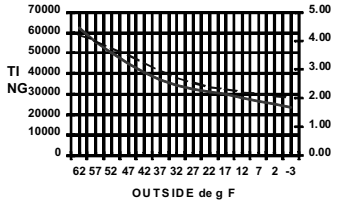
CP*T42-1 VS. U/UC60+EEP, H61F+EEP, ARPF048, ARPT049, ARUF049



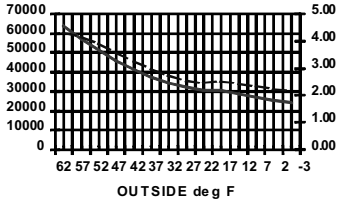
CP*T42-1 VS. AEPT048/AE48-XX



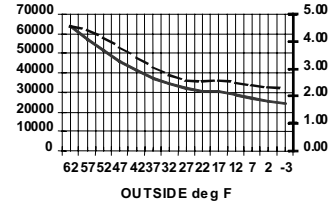
CP*T48-1 VS. U/UC61+EEP, H61F+EEP



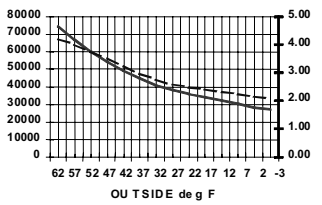
CP*T48-1 VS. ARPF060, ARPT061, ARUF061



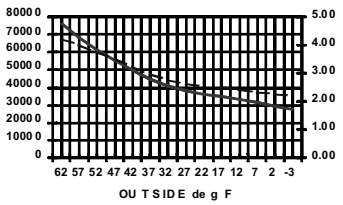
CP*T48-1 VS. AE/AEPT060



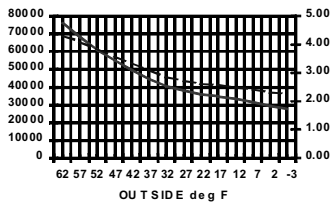
CP*T60-1 VS. U/UC61+EEP, H61F+EEP

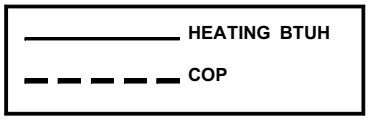


CP*T60-1 VS. ARPF060, ARPT061, ARUF061



CP*T60-1 VS. AE/AEPT060





Specifications

Model	Nominal Cooling Capacity (BTUH)	Nominal Heating Capacity (BTUH	Service Valve			Compressor			Condenser Fan		Ship Weight (lbs)
			Liquid	Suction	Connection Type	RLA	LRA	Type	HP	FLA	
CPLT24-1B	22,800	23,000	3/8”	3/4”	Sweat	10.9	54	Scroll	1/6	0.9	137
CPLT30-1B	30,000	31,000	3/8”	3/4”	Sweat	13.5	72.5	Scroll	1/6	0.9	142
CPLT36-1B	35,000	36,000	3/8”	7/8”	Sweat	14.8	83	Scroll	1/4	1.6	152
CPLT42-1B	40,000	40,000	3/8”	7/8”	Sweat	17.1	95	Scroll	1/4	1.6	162
CPLT48-1B	46,500	46,000	3/8”	7/8”	Sweat	18.4	109	Scroll	1/4	1.6	249
CPLT60-1B	55,000	55,000	3/8”	7/8”	Sweat	22.1	137	Scroll	1/4	1.6	337

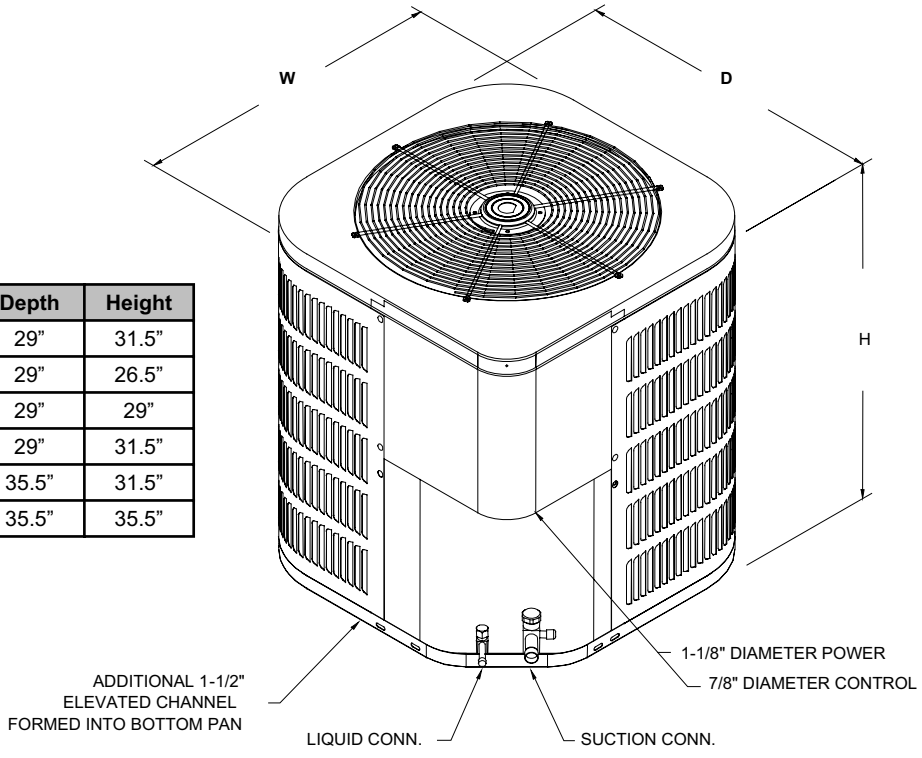
Electrical Data

Model	Minimum Circuit Ampacity	Maximum Overcurrent Protection	Voltage-Phase	Minimum Volts	Maximum Volts
CPLT24-1B	14.5	20	208/230-1	197	253
CPLT30-1B	17.8	30	208/230-1	197	253
CPLT36-1B	20.1	30	208/230-1	197	253
CPLT42-1B	23	40	208/230-1	197	253
CPLT48-1B	24.6	40	208/230-1	197	253
CPLT60-1B	29.2	50	208/230-1	197	253

1) Wire size should be determined in accordance with National Electrical Codes; extensive wire runs will require larger wire sizes.
2) May use fuses or HACR type Circuit Breakers of the same size as noted.

Dimensions

Model	Width	Depth	Height
CPLT24-1B	29”	29”	31.5”
CPLT30-1B	29”	29”	26.5”
CPLT36-1B	29”	29”	29”
CPLT42-1B	29”	29”	31.5”
CPLT48-1B	35.5”	35.5”	31.5”
CPLT60-1B	35.5”	35.5”	35.5”



Performance Ratings

Heat Pump	Coil / Air Handler	Total BTUH	Sensible BTUH	SEER	EER	47° F Htg Cap (Btuh)	47°F (COP)	HSPF	17°F Htg Cap (Btuh)	17°F (COP)	ARI Ref. #	Decibels
CPLT24-1*	AEPT030-00*-1*	22,800	17,000	14.0	12.6	23,000	3.50	7.5	11,500	2.50	517455	72
	ARPT032-00*-1*	22,800	17,000	13.0	11.6	23,000	3.30	7.7	11,500	2.30	517453	
	ARUF032-00*-1*	22,800	17,000	13.0	11.6	23,000	3.30	7.7	11,500	2.30	517452	
	CA*F030*2*+EEP	22,800	17,000	13.0	11.6	23,000	3.30	7.3	11,500	2.28	516876	
	CA*F042*2*+EEP	22,800	17,000	13.0	11.6	23,000	3.30	7.3	11,500	2.28	516871	
	CHPF030A2*+EEP	22,800	17,000	13.0	11.6	23,000	3.30	7.3	11,500	2.28	516906	
	CHPF042B2*+EEP	22,800	17,000	13.0	11.6	23,000	3.30	7.3	11,500	2.28	516884	
	H36F+EEP	22,800	17,000	13.0	11.6	23,000	3.30	7.5	11,500	2.30	516899	
CPLT30-1*	AEPT030-00*-1*	29,000	21,200	13.5	12.0	30,000	3.42	8.0	18,000	2.52	517448	77
	AEPT036-00*-1*	30,000	22,300	14.0	12.5	31,000	3.50	8.5	19,000	2.60	517462	
	ARPT032-00*-1*	29,000	21,200	13.0	11.6	30,000	3.30	8.0	18,000	2.40	517463	
	ARUF032-00*-1*	29,000	21,200	13.0	11.6	30,000	3.30	8.0	18,000	2.40	517458	
	CA*F030*2*+EEP	30,000	22,300	13.0	11.6	30,000	3.30	7.8	18,000	2.40	516885	
	CA*F042*2*+EEP	30,000	22,300	13.0	11.6	30,000	3.30	7.8	18,000	2.40	516882	
	CHPF030A2*+EEP	30,000	22,300	13.0	11.6	30,000	3.30	7.8	18,000	2.40	516895	
	CHPF042B2*+EEP	30,000	22,300	13.0	11.6	30,000	3.30	7.8	18,000	2.40	516901	
	H36F+EEP	29,000	21,200	13.0	11.6	30,000	3.30	7.8	18,000	2.40	516905	
CPLT36-1*	AEPT036-00*-1*	35,000	26,000	14.0	12.6	37,000	3.50	8.5	21,000	2.30	517460	77
	ARPT049-00*-1*	35,000	25,300	13.0	11.6	36,000	3.50	8.0	20,000	2.30	517461	
	ARUF048-00*-1*	35,000	25,300	13.0	11.6	36,000	3.50	8.0	20,000	2.30	517447	
	ARUF049-00*-1*	35,000	25,300	13.0	11.6	36,000	3.50	8.0	20,000	2.30	531807	
	CA*F048*2*+EEP	35,000	25,300	13.0	11.6	36,000	3.48	8.0	20,000	2.28	516909	
	CHPF048D2*+EEP	35,000	25,300	13.0	11.6	36,000	3.48	8.0	20,000	2.28	516894	
	H60F+EEP	35,000	25,300	13.0	11.6	36,000	3.50	8.0	20,000	2.30	516910	
CPLT42-1*	AEPT060-00*-1*	40,000	30,400	14.0	12.6	41,000	3.80	8.5	23,000	2.50	517459	77
	ARPT049-00*-1*	39,000	29,600	13.0	11.6	40,000	3.60	8.4	22,400	2.30	517450	
	ARUF049-00*-1*	39,000	29,600	13.0	11.6	40,000	3.60	8.4	22,400	2.30	517457	
	CA*F060*2*+EEP	39,000	29,600	13.0	11.6	40,000	3.60	8.4	22,400	2.28	516929	
	CHPF060D2*+EEP	39,000	29,600	13.0	11.6	40,000	3.60	8.4	22,400	2.28	516913	
	H61F+EEP	39,000	29,600	13.0	11.6	40,000	3.60	8.4	22,400	2.30	516912	
CPLT48-1*	AEPT060-00*-1*	46,500	33,500	13.5	12.0	46,000	3.51	8.6	30,400	2.61	517451	77
	ARPT061-00*-1*	46,500	33,500	13.0	11.6	46,000	3.51	8.5	30,400	2.52	517449	
	ARUF061-00*-1*	46,500	33,500	13.0	11.6	46,000	3.50	8.5	30,400	2.52	517454	
	CA*F048*2*+EEP	42,500	30,600	12.0	10.6	42,000	3.48	8.0	28,000	2.28	516928	
	CA*F060*2*+EEP	43,500	31,400	12.5	11.0	43,000	3.48	8.2	28,000	2.28	516916	
	CHPF060D2*+EEP	46,000	33,000	13.0	11.6	45,000	3.48	8.4	33,000	2.28	516914	
	H61F+EEP	46,000	33,000	13.0	11.6	45,000	3.51	8.4	30,000	2.31	516923	
CPLT60-1*	AEPT060-00*-1*	55,000	40,000	13.0	11.6	55,000	3.51	8.5	35,000	2.61	517446	77
	ARPT061-00*-1*	55,000	40,000	13.0	11.6	55,000	3.50	8.4	35,000	2.52	518833	
	ARUF061-00*-1*	55,000	40,000	13.0	11.6	55,000	3.50	8.4	35,000	2.52	517445	
	CA*F061*2*+EEP	54,000	39,600	13.0	11.6	54,000	3.39	8.4	34,000	2.40	516921	
	CHPF060D2*+EEP	54,000	39,600	13.0	11.6	54,000	3.48	8.4	34,000	2.40	516925	
	H61F+EEP	54,000	39,600	13.0	11.6	54,000	3.51	8.4	34,000	2.40	516927	

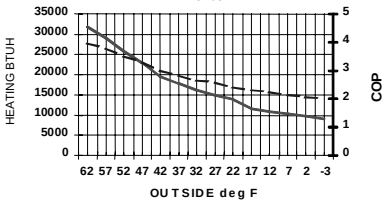
1) Certified per ARI 210/240 @ 80 °F/67 °F/95 °F
2) TVA Rating
3) Seasonal Energy Efficiency Ratio
4) Energy Efficiency Ratio @ 80 °F/67 °F/95 °F
5) HSPF = Heating Seasonal Performance Factor
6) Order the EEP from the Service Department using Part No. B13707-38 or new Solid State Board B13707-35S. Part No. B13707-38 is **not interchangeable** with B13707-35S.

XX designates electric heat quantity

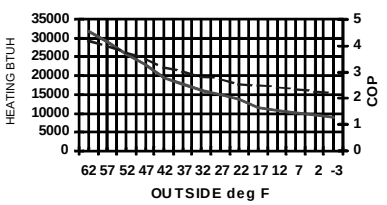
When mix-matching outdoor and indoor units, the indoor unit check-flowrator must match the outdoor unit size.

Heating Performance Expanded Ratings @ 70 °F Indoor Ambient

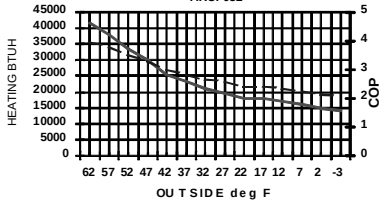
CPLT24-1* vs. H36F+EEP, ARPF036, ARPT032, ARUF032



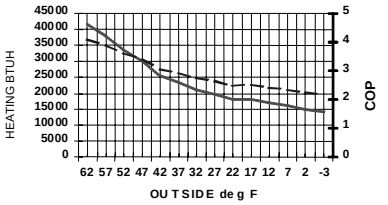
CPLT24-1* vs. AEPT024



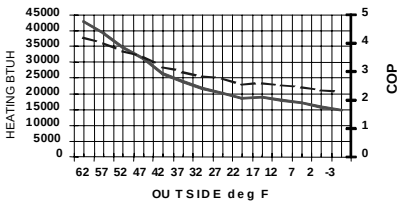
CPLT30-1* vs. H36F+EEP, ARPF036, ARPT032, ARUF032



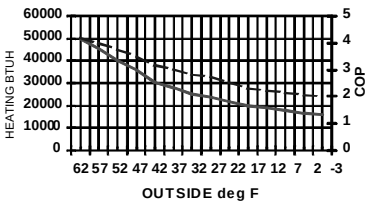
CPLT30-1* vs. AEPT030



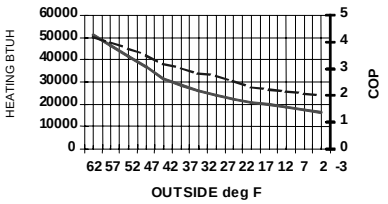
CPLT30-1* vs. AEPT036



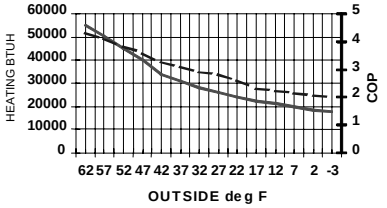
CPLT36-1* vs. H60F+EEP, ARUF048



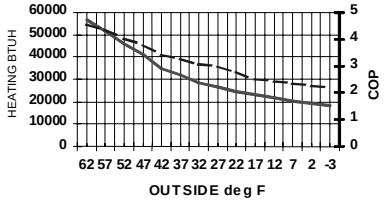
CPLT36-1* vs. AEPT036



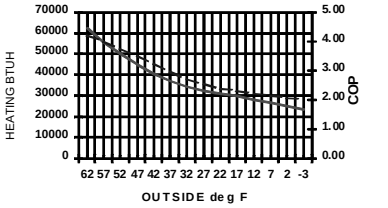
CPLT42-1* vs. H61F+EEP, ARPF048, ARPT049, ARUF049



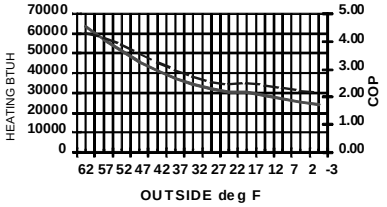
CPLT42-1* vs. AEPT048



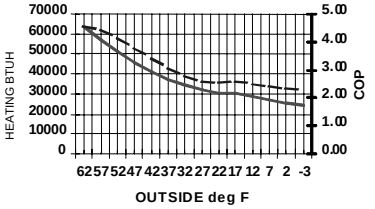
CPLT48-1* vs. H61F+EEP



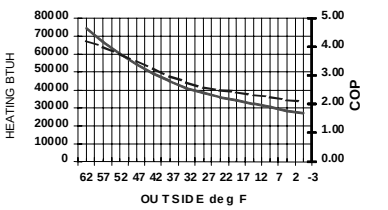
CPLT48-1* vs. ARPF060, ARPT061, ARUF061



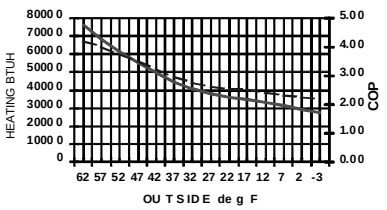
CPLT48-1* vs. AEPT060



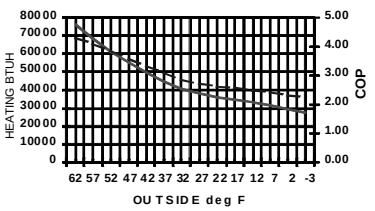
CPLT60-1* vs. H61F+EEP

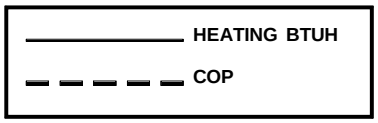


CPLT60-1* vs. ARPF060, ARPT061, ARUF061



CPLT60-1* vs. AEPT060





PRODUCT SPECIFICATIONS

HDP

ELECTRICAL DATA

MODEL	POWER SUPPLY			+MINIMUM CIRCUIT AMPACITY	*MAXIMUM OVERCURRENT PROTECTION	MAXIMUM VOLTS	MINIMUM VOLTS	COMPRESSOR		CONDENSER FAN MOTOR	
	VOLTS	PH	HZ					RLA	LRA	FLA	HP
HDP12-1A	208/240	1	60	8.0	15	253	197	5.9	29	.6	1/15
HDP18-1A	208/240	1	60	14.2	20	253	197	10.9	60	.6	1/15
HDP24-1A	208/240	1	60	16.6	30	253	197	12.8	61	.6	1/15

*May use fuses or HACR type Circuit Breakers of the same size as noted.
+Wire size should be determined in accordance with National Electrical Codes. Extensive wire runs will require larger wire sizes.

COOL AND HEAT PERFORMANCE DATA

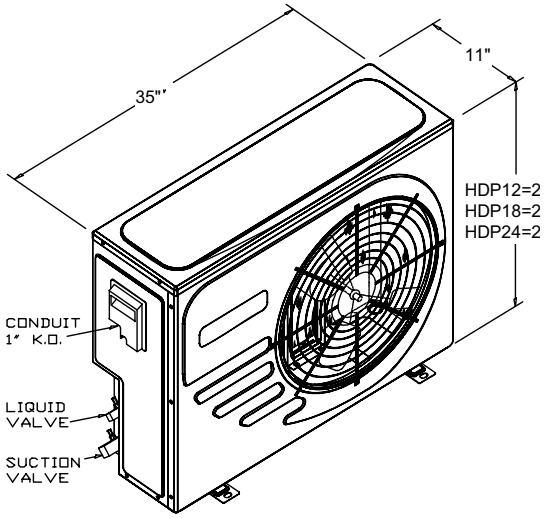
OUTDOOR SECTION	INDOOR SECTION	TOTAL COOLING BTUH (1)	SENS. COOLING BTUH	(2) BTUH @ 75°F/63°-95°F		COOLING SEER (4)	COOLING EER (3)	HEATING BTUH 47°F	HEATING COP 47°F	HEATING BTUH 17°F	HEATING COP 17°F	HEATING HSPF	SOUND RATING BELS
				TOTAL	SENS								
HDP12-1A	WMH12-1A	11000	6800	10600	6000	10.00	9.00	11400	2.80	6000	2.00	6.80	7.4
	WMH18-1A	12600	8800	12200	6950	10.00	9.00	12000	2.80	6500	2.00	6.80	
HDP18-1A	WMH18-1A	16800	10900	16300	9650	10.00	9.00	16000	2.80	9000	2.00	6.80	7.4
	WMH24-1A	17600	11500	17000	10000	10.00	9.00	17000	2.80	9400	2.00	6.80	
HDP24-1A	WMH24-1A	19000	13000	18300	10000	10.00	9.00	19000	2.80	10400	2.00	6.80	7.4

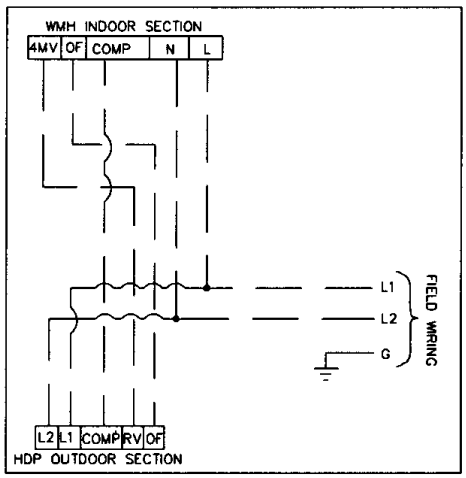
(1) Certified per ARI 210/240 @80°F/67°-95°F
(2) TVA Rating
(3) Energy Efficiency Ratio
(4) Seasonal Energy Efficiency Ratio
HSPF = Heating Seasonal Performance Factor

PHYSICAL DATA

FAN	
DIA. CM (IN)	(18)
RPM	950
COIL	
FACE AREA FT^2	6.10
TUBE DIA. - (IN)	3/8
NO. ROWS/FINS/IN	1R/19 FPI
FIN TYPE	RIPPLED
REFRIGERANT CON.	
LIQUID DIA - (IN)	3/8
SUCTION DIA - (IN)	5/8
TYPE	FLARE
WEIGHT (LBS).	130

DIMENSIONAL DATA





WIRING DIAGRAM - LINE VOLTAGE CONTROL CIRCUIT
(TYPICAL WIRING FOR USE WITH DUCTLESS INDOOR SECTION)

NOTE: SPECIFICATIONS AND PERFORMANCE DATA LISTED HEREIN ARE SUBJECT TO CHANGE WITHOUT NOTICE.

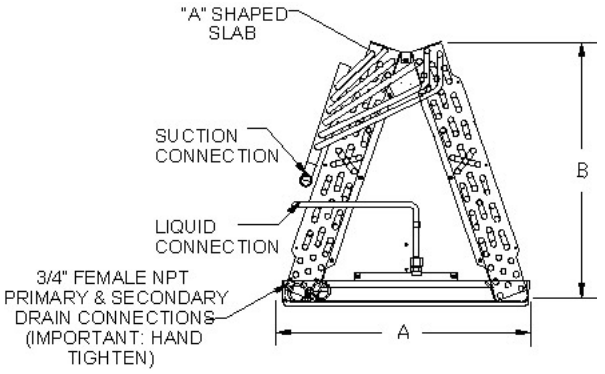
Uncased Upflow Evaporator Coils

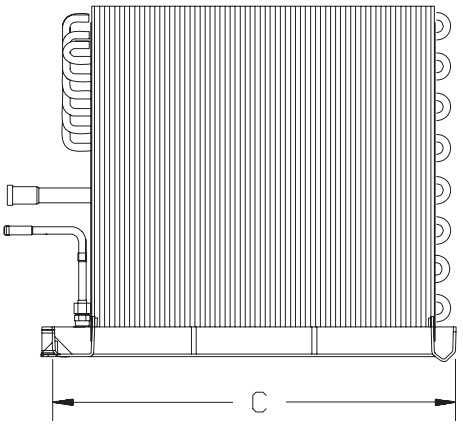
Model	Dimensions			Specifications						
	A	B	C	Nominal Tons	Nominal CFM	Static Pressure Wet Coil	No. Rows	Liquid Conn.	Suction Conn.	Ship Weight (pounds)
UC-18	13”	14¼”	20⅛”	1½	650	.20	2	⅜”	⅝”	14
UC-29	13”	14”	20⅛”	*2 - 2½	900	.20	2	⅜”	¾”	16
UC-32	13”	17⅞”	20⅛”	2½	1,000	.30	3	⅜”	¾”	24
UC-35	13”	18 ¼”	20⅛”	3	1,200	.30	2	⅜”	¾”	18
UC-36	17”	17½”	20⅛”	3	1,200	.25	2	⅜”	¾”	19
UC-42	17”	1¾”	20⅛”	3½	1,400	.30	3	⅜”	¾”	34
UC-47	17”	22⅛”	20⅛”	4	1,600	.30	3	⅜”	⅞”	31
UC-49	19¾”	21⅞”	20⅛”	4	1,600	.30	3	⅜”	⅞”	33
UC-59	19¾”	25⅞”	20⅛”	5	2,000	.30	3	⅜”	⅞”	36
UC-60	20¼”	21¼”	23”	5	2,000	.30	3	⅜”	⅞”	42
UC-61	20¼”	22”	23”	5	2,000	.30	4	⅜”	⅞”	44
UC-62	19¼”	26⅛”	20⅛”	5	2,000	.30	4	⅜”	⅞”	47

NOTES:

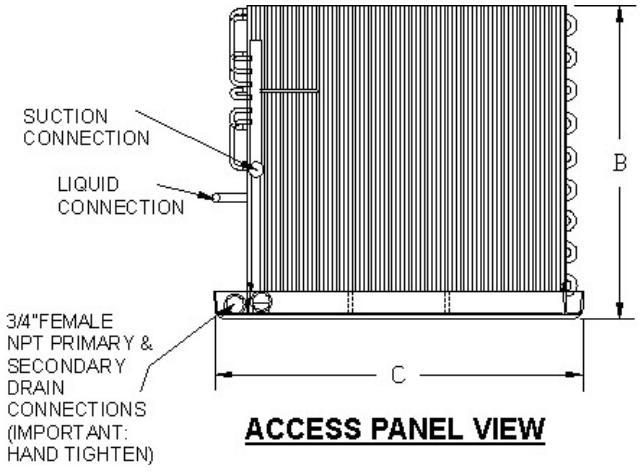
1) See Spec Sheet for installation tips.
2) Do not use this coil on oil furnaces or any applications where the temperature on drain pan may exceed 300°f. Use the following metal drain pans: 15236-18 (u-18 thru u-32), 15236-19 (u-36 thru u-47), 15236-20 (u/uc-60 thru u-61), and field fabricated metal pan for (u/uc-49, u/uc-59, and u/uc-62).
3) * Uc-29 comes with 2 ton flowrater b13134-59. If 2-1/2 ton matching is required, install provided piston kit b17898-65.

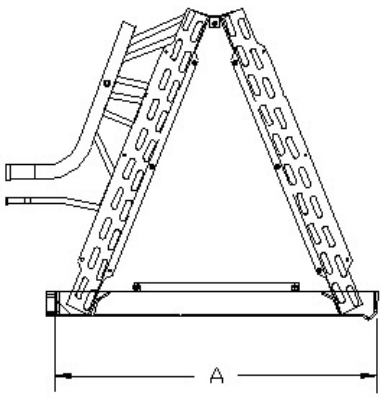
UC-18 thru UC-42, UC-47, UC-49, UC-59, & UC-62 Access Panel View





UC-60 & UC-61 Access Panel View



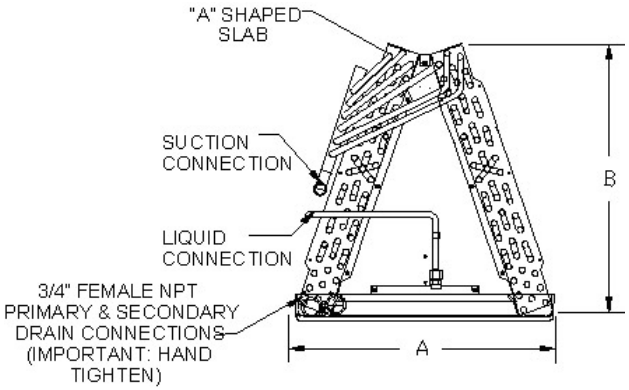


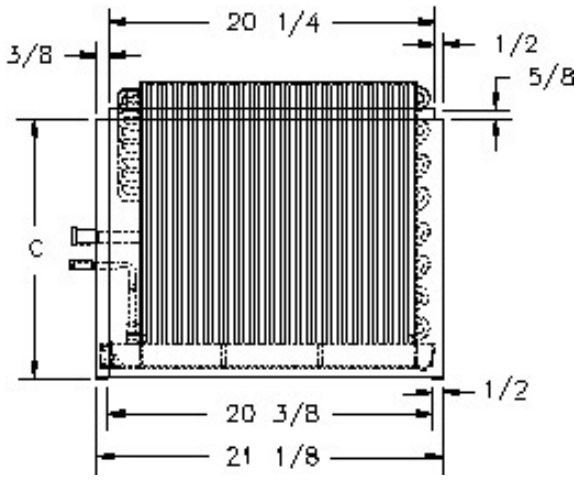
Cased Upflow Evaporator Coils

Model	Dimensions						Specifications						
	A	B	C	D	E	F	Nominal Tons	Nominal CFM	Static Pressure Wet Coil	No. Rows	Liquid Conn.	Suction Conn.	Ship Weight (pounds)
U-18	14¼"	12¾"	14"	½"	13¼"	-	1½	650	.20	2	⅜"	⅝"	24
U-29	14¼"	12¾"	14"	½"	13¼"	-	*2 - 2½	900	.20	2	⅜"	¾"	26
U-30	18¼"	17¼"	16"	½"	17¼"	-	2½	1,000	.30	2	⅜"	¾"	33
U-31	14¼"	12¾"	14"	½"	13¼"	-	2½	1,000	.30	3	⅜"	¾"	30
U-32	18¼"	17¼"	16"	½"	17¼"	2"	2½	1,000	.25	3	⅜"	¾"	41
U-35	14¼"	12¼"	14"	½"	13¼"	4⅛"	3	1,200	.30	2	⅜"	¾"	29
U-36	18¼"	17¼"	16"	½"	17¼"	1¾"	3	1,200	.30	2	⅜"	¾"	40
U-42	18¼"	17¼"	16"	½"	17¼"	2"	3½	1,400	.30	3	⅜"	¾"	48
U-47	18¼"	17¼"	16"	½"	17¼"	6"	4	1,600	.30	3	⅜"	⅞"	50
U-49	21⅛"	20⅛"	27"	½"	20"	-	4	1,600	.30	3	⅜"	⅞"	51
U-59	21⅛"	20⅛"	27"	½"	20"	-	5	2,000	.30	3	⅜"	⅞"	54
U-60	24¼"	23⅛"	20½"	½"	20⅛"	1"	5	2,000	.30	3	⅜"	⅞"	60
U-61	24¼"	23⅛"	20½"	½"	20⅛"	1⅝"	5	2,000	.30	4	⅜"	⅞"	62
U-62	21⅛"	20⅛"	27"	½"	20"	-	5	2,000	.30	4	⅜"	⅞"	68

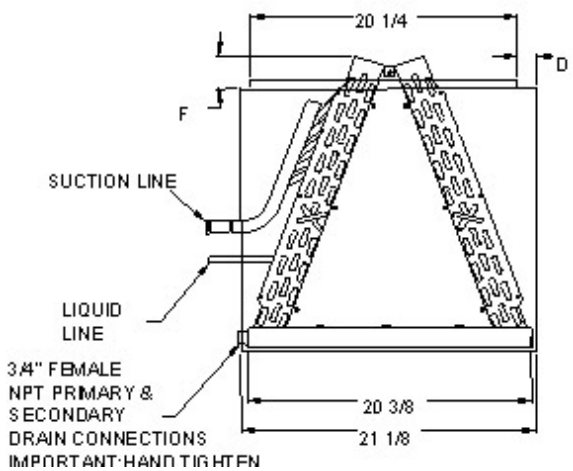
1.) * U-29 comes with 2 ton flowrator b13134-59. If 2 1/2 matching is required, install provided piston KIT B17898-65.

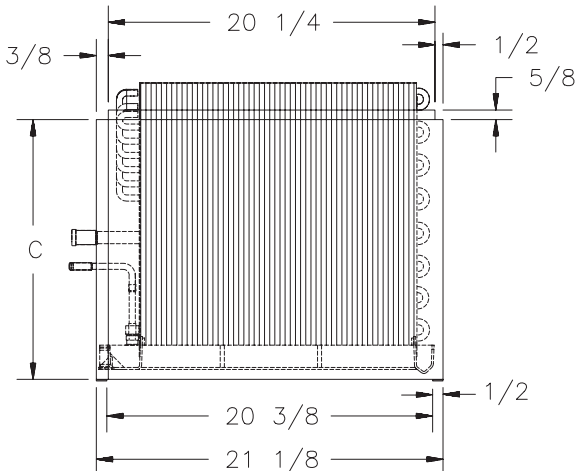
U-18 thru U-42, U-47, U-49, U-59, & U-62 Access Panel View





U-60 & U-61 Access Panel View

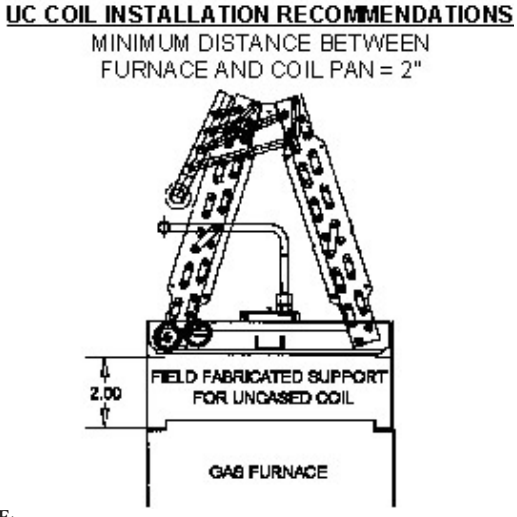


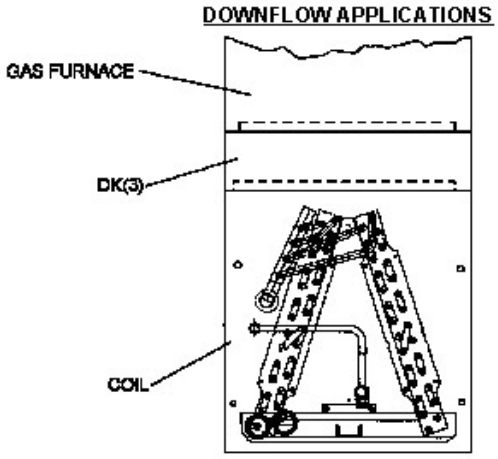


Cased (U) Coil Application Options

	Furnace Model No.	GMP050-3 GMP050-32(C) GMP075-3 GMP075-32(C) GMPH050-3 GMPN040-3 GMPN060-3 GMT045-3 (ND) GMT070-3 (ND) GMTH045-3 (ND) GSM060-3 (ND) GSMS060-3 (ND) GSU060-3 (*)	GDT045-3 GDT070-3 GMNT040-3 GMNT060-3 GPD050-3 GPD075-3	GMP075-3 GMP100-3 GMP100-4 GMP100-42(C) GMPE075-3 GMPH075-4 GMPN080-4 GMT070-4 (ND) GMT090-3 (ND) GMT090-4 (ND) GMTH070-4 (ND) GSM080-4 (ND) GSMS080-4 (ND) GSU080-4 (*)	GDT090-4 GMNT080-4 GPD100-4	GMP100-5 GMP125-4 GMP125-5 GMP125-52(C) GMPE100-4 GMPE125-5 GMPH080-5 GMPN100-4 GMT090-5 (ND) GMT115-5 (ND) GMTH115-5 (ND) GSM100-4 (ND) GSMS100-4 (ND) GSU100-4 (*)	GDT115-5 GMNT100-4 GPD125-4	GMP150-5 GMP150-52(C) GMPH120-5 GMPN120-5 GMT140-5 (ND)	GMNT120-5
COIL MODEL NO.	Nominal Furnace Width	14”	14”	17 ½”	17 ½”	21”	21”	24 ½”	24 ½”
	DFK Model No.(3)	DFK - 14	DFKT-14	DFK - 17	DFKT-17	DFK - 21	DFKT - 21	DFK - 24	DFKT - 24
	Nominal Coil Width								
U-18	14”	X	X						
U-29	14”	X	X						
U-30	17 ½”	X(1)	X(1)	X(2)	X(2)				
U-31	14”	X	X						
U-32	17 ½”	X(1)	X(1)	X(2)	X(2)				
U-35	14”	X	X						
U-36	17½”	X(1)	X(1)	X(2)	X(2)				
U-42	17½”	X(1)	X(1)	X(2)	X(2)				
U-47	17½”			X	X				
U-49	21”			X(1)	X(1)	X(2)	X(2)		
U-59	21”			X(1)	X(1)	X(2)	X(2)		
U-60	24 ½”					X(1)	X(1)	X(2)	X(2)
U-61	24 ½”					X(1)	X(1)	X(2)	X(2)
U-62	21”			X(1)	X(1)	X(2)	X(2)		

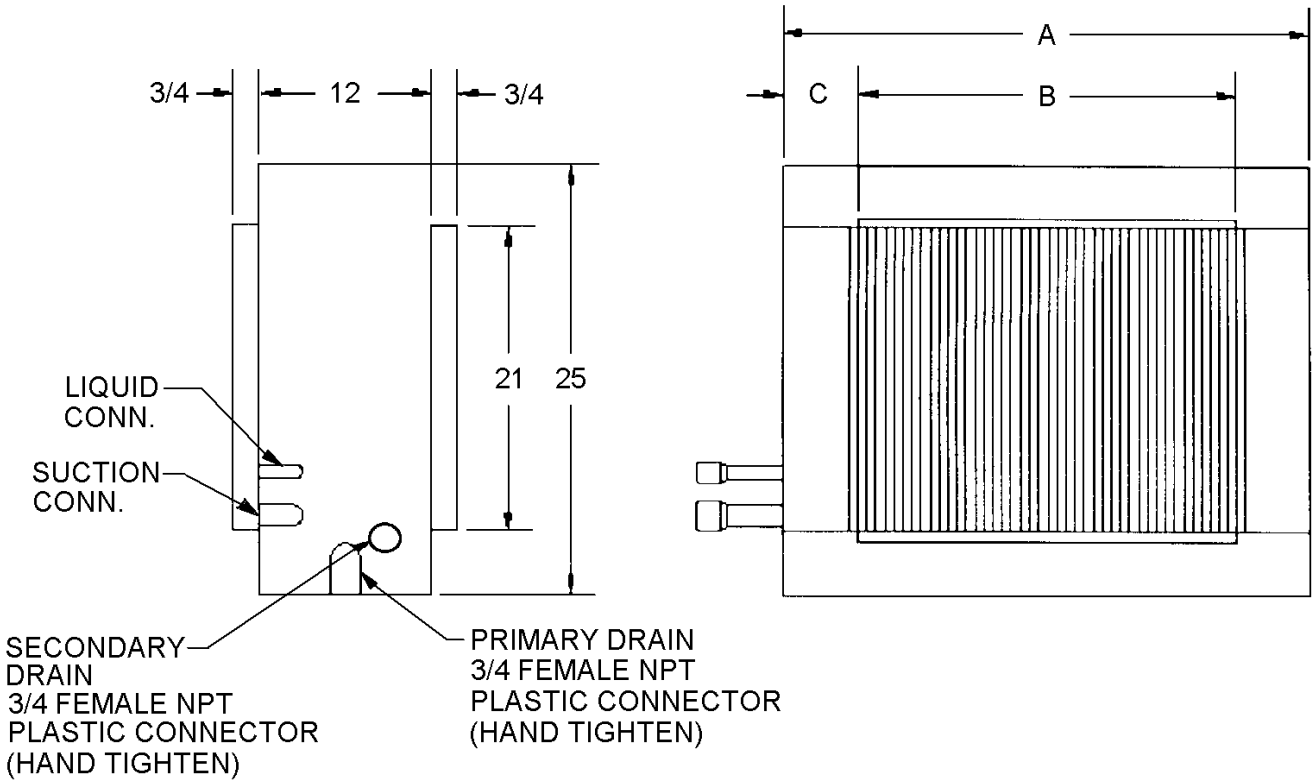
[1] Certified per ARI 210
[2] BTU/Watt @ 80/67 °F inside - 95 °F outside air
[3] M.C.A. (Minimum Circuit Ampacity)
[4] M.O.P. (Maximum Overcurrent Protection)





NOTE:
1. Do not use this coil on oil furnaces or any applications where the temperature on drain pan may exceed 300°F. Use the following metal drain pans: 15236-18 (U-18 thru U-32), 15236-19 (U-36 thru U-47), and 15236-20 (U/UC-60 thru U-61).
2. Due to the rating mix/match of various coils with outdoor units it is important to match the furnace air flow for the total system capacity. (Refer to the furnace sheet & spec. sheet & condenser/heat pump spec. sheet.)

HORIZONTAL EVAPORATOR COILS
2 THRU 5 TONS (WITH FLOWRATER)



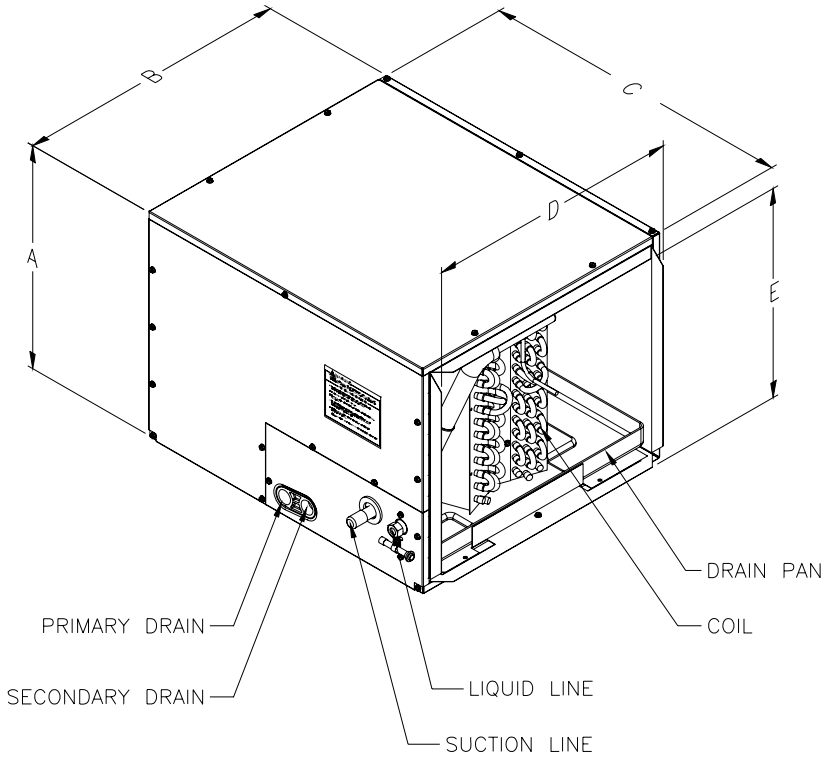
HORIZONTAL COILS

DIMENSIONS						SPECIFICATIONS				
COIL MODEL	NOMINAL TONS	A	B	C	NOMINAL CFM	STATIC PRESSURE WET COIL	NO. ROWS	LIQUID CONN	SUCTION CONN	SHIP WT.
H-24F	2	25-1/2	16	6	800	.07	2	3/8	3/4	26
H-36F	3	25-1/2	16	6	1200	.15	3	3/8	3/4	42
H-49F	4-1/2	33-1/2	24	6	1800	.20	3	3/8	7/8	53
H-60F	5	39-1/2	30	6	2150	.22	3	3/8	7/8	58
H-61F	5	39-1/2	30	6	2150	.24	4	3/8	7/8	65

*CONVERTIBLE TO EXPANSION -VALVE WITH THE ADDITION OF AN XV24-60 EXPANSION KIT.

NOTE: SPECIFICATIONS AND PERFORMANCE DATA LISTED HEREIN ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Specifications



DIMENSIONS

CABINET SIZE	HT COIL MODEL	A		B		C		D		E	
		IN	MM	IN	MM	IN	MM	IN	MM	IN	MM
SMALL	HT-1830	14.00	355.6	21.125	536.57	24.436	620.66	19.875	504.82	12.75	323.85
	HT-3236	14.00	355.6	21.125	536.57	24.436	620.66	19.875	504.82	12.75	323.85
MEDIUM	HT-36	17.50	444.5	21.125	536.57	24.436	620.66	19.875	504.82	16.25	412.75
	HT-4248	17.50	444.5	21.125	536.57	24.436	620.66	19.875	504.82	16.25	412.75
LARGE	HT-4860	21.00	533.4	24.00	609.6	27.882	708.20	22.75	577.85	19.75	501.65
	HT-61	21.00	533.4	24.00	609.6	27.882	708.20	22.75	577.85	19.75	501.65

* All air-opening flanges are 0.625” (15.62mm)

SPECIFICATIONS

MODEL	HT-1830	HT-3236	HT-36	HT-4248	HT-4860	HT-61
EVAPORATOR COIL						
FACE AREA (Sqft/Sqm.)	3.33 (.309)	3.33 (.309)	4.44 (.412)	4.44 (.412)	6.11 (.568)	6.11 (.568)
ROWS	2	3	2	3	3	4
FIN PER INCH	14	14	14	14	14	14
DRAINS CONNECTION						
PRIMARY AUXILLIARY (in/mm)	¾” (19.05)	¾” (19.05)	¾” (19.05)	¾” (19.05)	¾” (19.05)	¾” (19.05)
REFRIGERATION LINE CONNECTION						
VAPOR (in/mm)	¾” (19.05)	¾” (19.05)	¾” (19.05)	¾” (19.05)	7/8” (22.225)	7/8” (22.225)
LIQUID (in/mm)	3/8” (9.525)	3/8” (9.525)	3/8” (9.525)	3/8” (9.525)	3/8” (9.525)	3/8” (9.525)
SHIPPING WEIGHT (Lbs/Kg)	40 (18.143)	45 (20.412)	50 (22.680)	55 (24.948)	65 (29.484)	70 (31.751)

* Refer to outdoor unit Installation and Operations Manual for proper refrigeration line sizes. Installer may need to supply adapter.

HT AIR FLOW DATA

STATIC PRESSURE DROP ACROSS COIL; HORIZONTAL RIGHT APPLICATIONS

COIL MODEL		AIR QUANTITY (CFM) VS. PRESSURE DROP (IN/WC)				
		975	1075	1175	1250	1350
HT-1830	WET	0.14	0.17	0.21	0.26	0.31
	DRY	0.08	0.11	0.15	0.21	0.26
		950	1050	1150	1250	1350
HT-3236	WET	0.14	0.17	0.22	0.27	0.32
	DRY	0.08	0.11	0.15	0.20	0.25
		1175	1275	1375	1450	1550
HT-36	WET	0.14	0.17	0.21	0.25	0.31
	DRY	0.09	0.11	0.15	0.21	0.26
		1150	1250	1350	1450	1550
HT-4248	WET	0.14	0.17	0.21	0.26	0.32
	DRY	0.10	0.12	0.16	0.21	0.27
		1750	1850	1950	2050	2150
HT-4860	WET	0.21	0.26	0.31	0.37	0.44
	DRY	0.18	0.20	0.26	0.32	0.38
		1750	1850	1950	2050	2150
HT-61	WET	0.22	0.27	0.32	0.38	0.45
	DRY	0.19	0.21	0.27	0.33	0.39

NOTE: For horizontal left applications, reduce airflow to 3%.

***** Nominal CFM

CASE COIL / FURNACE APPLICATION OPTION

HT COIL	CABINET SIZE (MM)	14" FURNACE *GMNTE060-3 GMNT040-3 GMNT060-3 GMT045-3 GMT070-3 GMTH045-3*	17½" FURNACE *GMNTE080-4 GMNT080-4 GMT070-4 GMT090-3 GMT090-4 GMTH070-4*	21" FURNACE *GMNTE100-4 GMNT100-4*	21" FURNACE *GMT090-5 GMT115-5 GMTH090-5*
HT-1830	14" (355.6mm)	**X**	**X**[1]	**X**[1]	
HT-3236	14" (355.6mm)	**X**	**X**[1]	**X**[1]	**X**[1]
HT-36	17.5" (444.5mm)	**X**[1]	**X**	**X**[1]	**X**[1]
HT-4248	17.5" (444.5mm)		**X**	**X**[1]	**X**[1]
HT-4860	21" (533.4mm)			**X**	**X**
HT-61	21" (533.4mm)				**X**

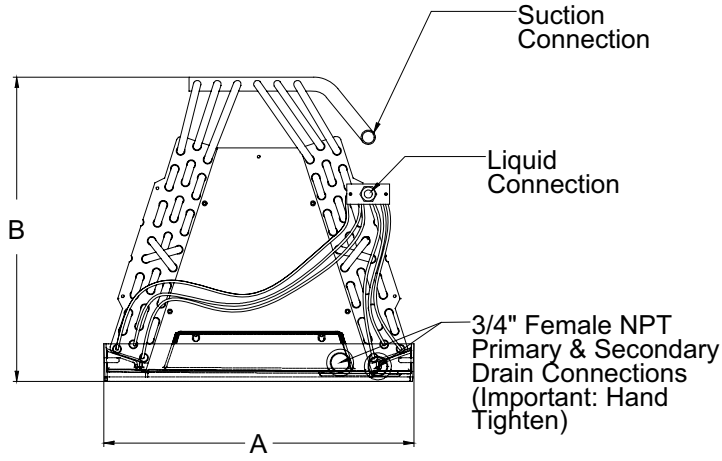
* Due to the rating mix/match of various coils with outdoor units, it is important to match the furnace airflow for the total system capacity. Refer to furnace specification sheets for air flow charts.

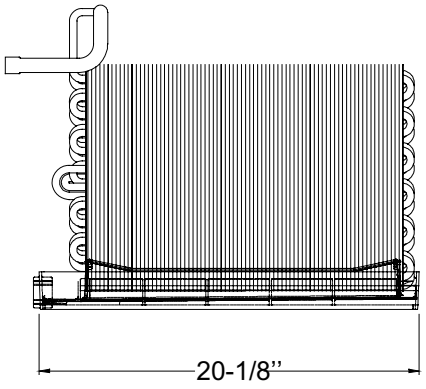
[1] Transition required.

CAUF—Uncased Upflow/Downflow Indoor Coils

Model	Dimensions		Specifications				Ship Weight (lbs)
	Width (A)	Height (B)	Nominal Tons	No. of Rows	Liquid Connection	Suction Connection	
CAUF018A2*	13”	16¼”	1½	2	3/8”	5/8”	18
CAUF024A2*	13”	16-1/8”	2	2	3/8”	3/4”	21
CAUF030A2*	13”	18-1/8”	2½	3	3/8”	3/4”	24
CAUF036A2A	13”	20”	3	3	3/8”	3/4”	31
CAUF036A2B	13”	20”	3	2	3/8”	3/4”	30
CAUF018B2*	16½”	16-1/8”	1½	2	3/8”	5/8”	18
CAUF025B2*	16½”	16¼”	2	3	3/8”	3/4”	21
CAUF030B2*	16½”	16-1/8”	2½	3	3/8”	3/4”	24
CAUF030C2*	20”		2½	3	3/8”	3/4”	31
CAUF030B4*	16½”	20”	2½	3	3/8”	3/4”	31
CAUF036B2A	16½”	20”	3	3	3/8”	3/4”	31
CAUF036B2B	16½”	20”	3	2	3/8”	3/4”	31
CAUF036B4*	16½”	19-15/16”	3	3	3/8”	3/4”	43
CAUF036C2*	20”	20”	3	2	3/8”	3/4”	34
CAUF037B2*	16½”	20”	3	3	3/8”	3/4”	31
CAUF037C2A	20”	18”	3	3	3/8”	3/4”	43
CAUF037D2*	23”		3	3	3/8”	3/4”	44
CAUF042B2*	16½”	19-15/16”	3½	3	3/8”	3/4”	43
CAUF048B2*	16½”	23-15/16”	4	3	3/8”	7/8”	44
CAUF042C2*	20”	21-7/16”	3½	3	3/8”	3/4”	43
CAUF042C4*	20”	23¾”	3½	3	3/8”	7/8”	44
CAUF048C2*	20”	23½”	4	3	3/8”	7/8”	44
CAUF048C4*	20”	23½”	4	3	3/8”	7/8”	44
CAUF049C2*	20”	23¾”	4	3	3/8”	7/8”	44
CAUF060C2*	20”	27-15/16”	5	3	3/8”	7/8”	55
CAUF061C2*	20”	27-15/16”	5	4	3/8”	7/8”	55
CAUF049D2*	23”	23¾”	4	3	3/8”	7/8”	44
CAUF057D4*	23”	28¼”	5	3	3/8”	7/8”	55
CAUF060D2*	23”	28¼”	5	3	3/8”	7/8”	55
CAUF060D4*	23”	27¾”	5	4	3/8”	7/8”	60
CAUF061D2*	23”	27¾”	5	4	3/8”	7/8”	60

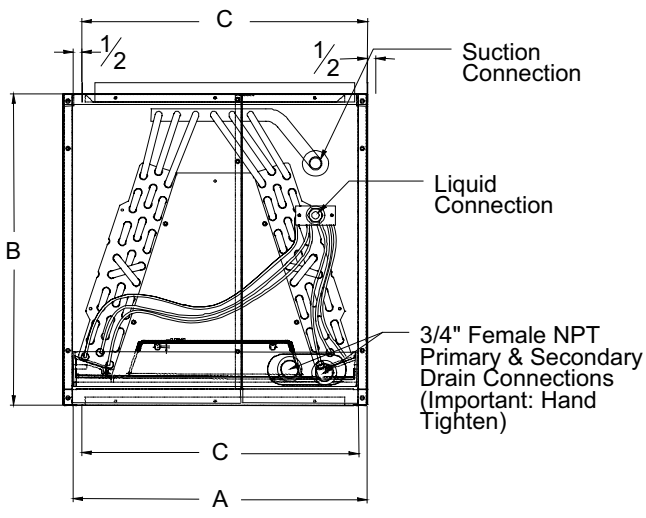
* Revision designator

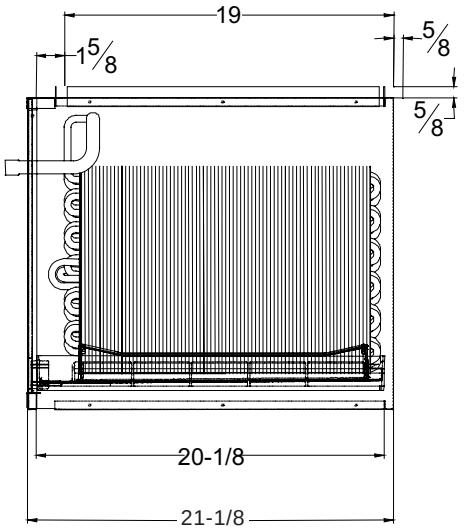




CAPF—Cased Upflow/Downflow Indoor Coils

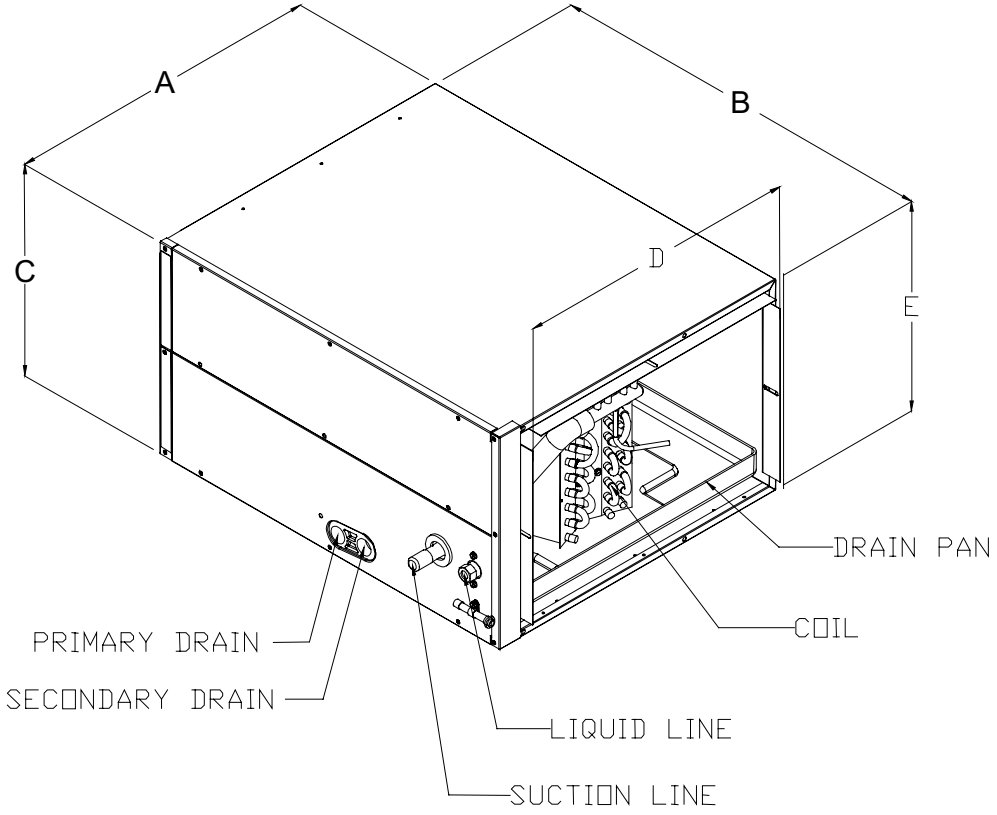
Model	Dimensions		Plenum Opening Width (C)	Specifications				Ship Weight (lbs)
	Width (A)	Height (B)		Nominal Tons	No. of Rows	Liquid Connection	Suction Connection	
CAPF018A2*	14”	18”	13”	1½	2	3/8”	5/8”	31
CAPF018B2*	17½”	18”	16½”	1½	2	3/8”	5/8”	33
CAPF024A2*	14”	18”	13”	2	2	3/8”	3/4”	33
CAPF025B2*	17½”	18”	16½”	2	3	3/8”	3/4”	35
CAPF030A2*	14”	18”	13”	2½	3	3/8”	3/4”	38
CAPF030B2*	17½”	18”	16½”	2½	3	3/8”	3/4”	42
CAPF030B4*	17½”	22”	16½”	2½	3	3/8”	3/4”	48
CAPF030C2*	21”	22”	20”	2½	3	3/8”	3/4”	48
CAPF036A2*	14”	22”	13”	3	2	3/8”	3/4”	38
CAPF036B2A	17½”	22”	16½”	3	3	3/8”	3/4”	48
CAPF036B2B/C	17½”	22”	16½”	3	2	3/8”	3/4”	48
CAPF036B4*	17½”	22”	16½”	3	3	3/8”	3/4”	60
CAPF036C2A	21”	26”	20	3	3	3/8”	3/4”	55
CAPF036C2B/C	21”	26”	20	3	2	3/8”	3/4”	55
CAPF036C2D	21”	22”	20	3	2	3/8”	3/4”	48
CAPF037B2*	17½”	22”	16½”	3	3	3/8”	3/4”	48
CAPF037C2A	21”	26’	20	3	3	3/8”	3/4”	55
CAPF037C2B	21”	22”	20	3	3	3/8”	3/4”	60
CAPF037D2*	24½”	22”	23½”	3	3	3/8”	3/4”	60
CAPF042B2*	17½”	22”	16½”	3½	3	3/8”	3/4”	60
CAPF042C2*	21”	26”	20	3½	3	3/8”	3/4”	65
CAPF042C2D	21”	22”	20”	3½	3	3/8”	3/4”	60
CAPF042C4*	21”	26”	20	3½	3	3/8”	7/8”	57
CAPF048B2*	17½”	22”	16½”	4	3	3/8”	7/8”	55
CAPF048C2A	21”	26”	20	4	3	3/8”	7/8”	65
CAPF048C4*	21”	26”	20	4	3	3/8”	7/8”	65
CAPF049C2*	21”	26”	20	4	3	3/8”	7/8”	57
CAPF049D2*	24½”	26”	23½”	4	3	3/8”	7/8”	58
CAPF057D4*	24½”	30”	23½”	5	3	3/8”	7/8”	68
CAPF060C2*	21”	30”	20	5	3	3/8”	7/8”	61
CAPF060D2*	24½”	30”	23½”	5	3	3/8”	7/8”	68
CAPF060D4*	24½”	30”	23½”	5	4	3/8”	7/8”	75
CAPF061C2*	21”	30”	20	5	4	3/8”	7/8”	68
CAPF061D2*	24½”	30”	23½”	5	4	3/8”	7/8”	75





CHPF—Cased Horizontal “A” Indoor Coil

Model	Dimensions			Plenum Opening		Evap Coil Face Area (ft2)	Specifications					Ship Weight (lbs)
	Width (A)	Depth (B)	Height (C)	Width (D)	Height (E)		No. of Rows	Fins / Inch	Primary Auxiliary Drain	Liquid Connection	Suction Connection	
CHPF024A2*	21-1/8”	26”	14”	19”	13”	3.33	2	14	3/4”	3/8”	¾”	40
CHPF025B2*	21-1/8”	26”	17½”	19”	16½”	3.56	2	14	3/4”	3/8”	¾”	48
CHPF030A2*	21-1/8”	26”	14”	19”	13”	3.33	3	14	3/4”	3/8”	¾”	45
CHPF030A4*	21-1/8”	26”	14”	19”	13”	3.33	3	14	3/4”	3/8”	¾”	45
CHPF036B2*	21-1/8”	26”	17½”	19”	16½”	4.44	2	14	3/4”	3/8”	¾”	50
CHPF036B4*	21-1/8”	26”	17½”	19”	16½”	4.44	3	14	3/4”	3/8”	¾”	55
CHPF042B2*	21-1/8”	26”	17½”	19”	16½”	4.44	3	14	3/4”	3/8”	¾”	55
CHPF048C2*	21-1/8”	26”	21”	19”	20”	4.88	3	14	3/4”	3/8”	7/8”	60
CHPF048D2*	21-1/8”	26”	24½”	19”	23½”	5.96	3	14	3/4”	3/8”	7/8”	65
CHPF048D4*	21-1/8”	26”	24½”	19”	23½”	5.96	3	14	3/4”	3/8”	7/8”	65
CHPF060D2*	21-1/8”	26”	24½”	19”	23½”	5.96	4	14	3/4”	3/8”	7/8”	70
CHPF060D4*	21-1/8”	26”	24½”	19”	23½”	5.96	4	14	3/4”	3/8”	7/8”	70



NOTE: All air opening flanges are 0.6250”.

Air Flow Data

Static Pressure Drop Across Coil, Upflow/Downflow Applications
Air Quantity (SCFM) Vs. Pressure Drop (In. WC)

CA**018A2*	SCFM	400	500	600	700	800	900	1000	1100	1200	
	WET	0.043	0.065	0.092	0.122	0.163	0.211	0.266	0.315	0.365	
	DRY	0.036	0.054	0.077	0.103	0.133	0.167	0.212	0.256	0.303	
CA**018B2*	SCFM	400	500	600	700	800	900	1000	1100	1200	
	WET	0.050	0.064	0.109	0.150	0.190	0.229	0.289	0.320	---	
	DRY	0.034	0.052	0.073	0.097	0.124	0.156	0.179	0.223	0.267	
CA**024A2*	SCFM	400	500	600	700	800	900	1000	1100	1200	
	WET	0.039	0.060	0.086	0.116	0.148	0.189	0.231	0.278	0.320	
	DRY	0.034	0.052	0.073	0.098	0.129	0.163	0.205	0.254	0.293	
CA**025B2*	SCFM	400	500	600	700	800	900	1000	1100	1200	
	WET	0.039	0.073	0.110	0.151	0.198	0.249	0.304	0.369	0.436	
	DRY	0.034	0.055	0.083	0.117	0.153	0.193	0.239	0.285	0.339	
CA**030A2*	SCFM	400	500	600	700	800	900	1000	1100	1200	
	WET	0.049	0.072	0.104	0.138	0.179	0.227	0.276	0.320	---	
	DRY	0.043	0.064	0.090	0.120	0.155	0.199	0.245	0.293	0.340	
CA**030B2*	SCFM	400	500	600	700	800	900	1000	1100	1200	
	WET	0.019	0.043	0.071	0.102	0.139	0.180	0.226	0.281	0.340	
	DRY	0.010	0.034	0.060	0.084	0.113	0.145	0.175	0.213	0.255	
CA**030C2*	SCFM	400	500	600	700	800	900	1000	1100	1200	
	WET	0.016	0.036	0.061	0.089	0.122	0.161	0.199	0.247	0.294	
	DRY	0.011	0.028	0.049	0.073	0.100	0.130	0.164	0.200	0.241	
CA**036A2*	SCFM	600	700	800	900	1000	1100	1200	1300	1400	
	WET	0.060	0.085	0.115	0.149	0.189	0.236	0.285	0.339	0.395	
	DRY	0.044	0.077	0.107	0.139	0.173	0.211	0.256	0.301	0.347	
CA**036B2*	SCFM	600	700	800	900	1000	1100	1200	1300	1400	
	WET	0.036	0.038	0.054	0.073	0.097	0.124	0.148	0.179	0.212	
	DRY	0.013	0.031	0.045	0.061	0.079	0.102	0.127	0.150	0.176	
CA**036C2*	SCFM	600	700	800	900	1000	1100	1200	1300	1400	1500
	WET	0.021	0.030	0.045	0.062	0.080	0.101	0.121	0.147	0.172	0.431
	DRY	0.015	0.026	0.038	0.052	0.069	0.089	0.108	0.128	0.150	0.346
CAP*037B2*	SCFM	600	700	800	900	1000	1100	1200	1300	1400	1500
	WET	0.050	0.083	0.112	0.146	0.184	0.225	0.276	0.323	0.375	0.322
	DRY	0.048	0.070	0.090	0.118	0.152	0.186	0.220	0.259	0.300	0.252
CAP*037C2*	SCFM	600	700	800	900	1000	1100	1200	1300	1400	1500
	WET	0.038	0.058	0.080	0.104	0.132	0.164	0.199	0.236	0.277	0.337
	DRY	0.028	0.045	0.065	0.086	0.111	0.137	0.164	0.187	0.216	0.264

* Revision designator

Air Flow Data (cont.)

Static Pressure Drop Across Coil, Upflow/Downflow Applications
Air Quantity (SCFM) Vs. Pressure Drop (In. WC)

CAP*037D2*	SCFM	600	700	800	900	1000	1100	1200	1300	1400	1500	1600				
	WET	0.039	0.060	0.090	0.108	0.136	0.168	0.206	0.244	0.288	0.381	0.436				
	DRY	0.030	0.047	0.068	0.089	0.114	0.149	0.167	0.197	0.230	0.285	0.323				
CAC*042B2*	SCFM	600	700	800	900	1000	1100	1200	1300	1400	1500	1600				
	WET	0.031	0.072	0.103	0.133	0.163	0.199	0.239	0.284	0.330	0.264	0.301				
	DRY	0.018	0.051	0.076	0.099	0.122	0.149	0.180	0.214	0.249	0.216	0.250				
CA**042C2*	SCFM	600	700	800	900	1000	1100	1200	1300	1400	1700	1800	1900			
	WET	0.036	0.048	0.065	0.085	0.106	0.132	0.159	0.190	0.226	0.410	0.460	0.510			
	DRY	0.026	0.038	0.053	0.072	0.092	0.114	0.138	0.161	0.184	0.350	0.390	0.430			
CA**048B2*	SCFM	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900			
	WET	0.077	0.104	0.126	0.154	0.184	0.224	0.263	0.307	0.347	0.267	0.301	0.341			
	DRY	0.067	0.087	0.108	0.133	0.162	0.190	0.226	0.264	0.304	0.232	0.260	0.291			
CA**048C2*	SCFM	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200
	WET	0.047	0.064	0.081	0.101	0.125	0.148	0.176	0.205	0.235	0.300	0.320	0.360	0.400	0.450	0.490
	DRY	0.042	0.057	0.074	0.091	0.110	0.133	0.156	0.180	0.205	0.230	0.250	0.280	0.310	0.340	0.370
CAP*049C2*	SCFM	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200
	WET	0.070	0.070	0.090	0.110	0.140	0.160	0.180	0.230	0.250	0.250	0.290	0.330	0.370	0.390	0.440
	DRY	0.055	0.060	0.070	0.090	0.110	0.130	0.160	0.180	0.200	0.190	0.210	0.240	0.260	0.290	0.320
CAP*049D2*	SCFM	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200
	WET	0.070	0.070	0.090	0.110	0.130	0.150	0.170	0.200	0.230	0.240	0.270	0.310	0.350	0.400	0.430
	DRY	0.050	0.050	0.070	0.090	0.100	0.120	0.130	0.150	0.170	0.220	0.240	0.270	0.300	0.330	0.370
CA**060C2*	SCFM	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200
	WET	0.062	0.070	0.090	0.100	0.120	0.140	0.160	0.190	0.220	0.190	0.210	0.240	0.270	0.290	0.310
	DRY	0.049	0.060	0.070	0.090	0.110	0.130	0.150	0.170	0.190	0.150	0.160	0.180	0.200	0.220	0.250
CA**060D2*	SCFM	800	900	1000	1100	1200	1300	1400	1500	1600	1900	2000	2100	2200		
	WET	0.055	0.060	0.070	0.080	0.100	0.110	0.120	0.150	0.170	0.390	0.430	0.470	0.510		
	DRY	0.030	0.040	0.050	0.060	0.070	0.090	0.100	0.110	0.130	0.330	0.370	0.410	0.440		
CA**061C2*	SCFM	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200		
	WET	0.110	0.130	0.150	0.180	0.210	0.240	0.280	0.310	0.340	0.270	0.310	0.340	0.380		
	DRY	0.100	0.120	0.140	0.160	0.190	0.220	0.240	0.270	0.310	0.230	0.250	0.280	0.300		
CA**061D2*	SCFM	1000	1100	1200	1300	1400	1500	1600	1700	1800						
	WET	0.070	0.090	0.110	0.120	0.150	0.170	0.190	0.220	0.240						
	DRY	0.060	0.080	0.090	0.110	0.120	0.140	0.160	0.180	0.210						

* Revision designator

Air Flow Data (cont.)

Static Pressure Drop Across Coil, Horizontal Right Applications
Air Quantity (SCFM) Vs. Pressure Drop (In. WC)

CHP*024A2*	SCFM	400	500	600	700	800	900	1000	1100	1175						
	WET	0.042	0.064	0.110	0.123	0.161	0.204	0.256	0.310	0.355						
	DRY	0.034	0.053	0.076	0.104	0.136	0.173	0.216	0.262	0.318						
CHP*025B2*	SCFM	400	500	600	700	800	900	1000	1100	1200						
	WET	0.008	0.023	0.042	0.065	0.092	0.120	0.154	0.186	0.224						
	DRY	0.001	0.016	0.034	0.055	0.080	0.108	0.137	0.172	0.208						
CHP*030A2*	SCFM	600	700	800	900	1000	1100	1200	1300	1400	1500	1600				
	WET	0.082	0.129	0.172	0.222	0.277	0.331	0.406	0.472	0.555	0.641	---				
	DRY	0.076	0.115	0.156	0.199	0.252	0.304	0.364	0.428	0.513	---	---				
CHP*036B2*	SCFM	600	700	800	900	1000	1100	1200	1300	1400	1500	1600				
	WET	0.024	0.041	0.061	0.082	0.104	0.130	0.159	0.191	0.225	0.262	---				
	DRY	0.024	0.041	0.058	0.078	0.102	0.125	0.154	0.186	0.219		---				
CHP*042B2*	SCFM	600	700	800	900	1000	1100	1200	1300	1400	1500	1600				
	WET	0.056	0.074	0.102	0.134	0.168	0.208	0.251	0.300	0.356	0.410	0.4643				
	DRY	0.051	0.072	0.095	0.124	0.159	0.197	0.238	0.283	0.331	0.378	0.4339				
CHP*048C2*	SCFM	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800				
	WET	0.083	0.103	0.126	0.151	0.178	0.208	0.240	0.274	0.310	0.346	0.383				
	DRY	0.073	0.096	0.120	0.144	0.169	0.196	0.224	0.254	0.286	0.319	0.354				
CHP*048D2*	SCFM	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200
	WET	0.046	0.050	0.060	0.070	0.090	0.110	0.130	0.160	0.180	0.210	0.240	0.260	0.300	0.320	0.350
	DRY	0.017	0.040	0.060	0.070	0.090	0.110	0.130	0.150	0.170	0.200	0.220	0.250	0.280	0.310	0.340
CHP*060D2*	SCFM	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	
	WET	0.060	0.080	0.090	0.120	0.140	0.160	0.190	0.220	0.250	0.280	0.320	0.350	0.390	0.430	
	DRY	0.060	0.080	0.100	0.120	0.140	0.160	0.180	0.210	0.240	0.270	0.300	0.330	0.370	0.400	

NOTE: For Horizontal Left Applications, Reduce Air Flow 3%

* Nominal CFM; Revision designator

PERFORMANCE RATINGS

Model No.	Capacity (TONS) Nominal (Cooling)	Capacity* BTUH 240V** (Heating)	Seasonal Efficiency AFUE%
A18-00	1 1/2	-	100.0
A18-05(C)	1 1/2	17000	100.0
A18-08(C)	1 1/2	24700	100.0
A24-00	2	-	100.0
A24-05(C)	2	17300	100.0
A24-08(C)	2	24900	100.0
A24-10(C)	2	33500	100.0
A30/32-00	2 1/2	-	100.0
A30/32-05	2 1/2	17600	100.0
A30/32-08(C)	2 1/2	25300	100.0
A30/32-10(C)	2 1/2	33800	100.0
A30/32-15	2 1/2	50100	100.0
A36-00	3	-	100.0
A36-05	3	17900	100.0
A36-06	3	22200	100.0
A36-08(C)	3	25600	100.0
A36-10(C)	3	34200	100.0
A36-15	3	50400	100.0
A36-20	3	66600	100.0
A42-00	3 1/2	-	100.0
A42-08(C)	3 1/2	25800	100.0
A42-10(C)	3 1/2	34300	100.0
A42-15	3 1/2	50600	100.0
A42-20	3 1/2	66800	100.0
A48/49-00	4	-	100.0
A49-08(C)	4	26000	100.0
A48/49-10	4	34500	100.0
A48/49-15	4	50700	100.0
A48/49-20	4	67000	100.0
A60/61-00	5	-	100.0
A60/61-10	5	35200	100.0
A60/61-15	5	51400	100.0
A60/61-20	5	67600	100.0

*Capacity and efficiency ratings in accordance with US Government standard tests.
**Capacity Correction Factors 208V = 0.75, 230V =0.92 (Heating)
+Refer to unit specifications for actual rating

BLOWER PERFORMANCE

Model	Speed	CFM Delivered Against External Static Pressure, inch WC				
		0.1	0.2	0.3	0.4	0.5
A18	HIGH	700	630	580	530	490
	LOW	620	560	500	420	360
A24	HIGH	960	930	890	840	780
	LOW	810	780	760	720	670
A30/32	HIGH	1150	1090	1040	980	910
	LOW	1060	1015	970	910	860
A36	HIGH	1450	1415	1360	1280	1200
	LOW	1260	1240	1200	1145	1060
A42	HIGH	1550	1520	1470	1410	1350
	LOW	1280	1250	1200	1200	1175
A48/49	HIGH	1670	1610	1500	1440	1370
	LOW	1310	1300	1290	1280	1260
A60/61	HIGH	2170	2080	2000	1920	1850
	LOW	1900	1810	1700	1590	1500

Dry coil with Filter in Place
SCFM Correction for Wet Coil - 4%

PHYSICAL DATA

Model No.	Blower Dia.	Blower Width	KW @230V (No. of Elements)	Coil Drain Conn FPT	Refrigerant Connection Liq.	Refrigerant Connection Suct.	Approx. Shipping Weight
A18-00	8	6	-	3/4	3/8	5/8	105
A18-05(C)	8	6	(1) 4.75	3/4	3/8	5/8	105
A18-08(C)	8	6	(2) 3.5	3/4	3/8	5/8	108
A24-00	9 1/2	6	-	3/4	3/8	3/4	106
A24-05(C)	9 1/2	6	(1) 4.75	3/4	3/8	3/4	109
A24-08(C)	9 1/2	6	(2) 3.5	3/4	3/8	3/4	109
A24-10(C)	9 1/2	6	(2) 4.75	3/4	3/8	3/4	109
A30-00	9 1/2	6	-	3/4	3/8	3/4	113
A30-05	9 1/2	6	(1) 4.75	3/4	3/8	3/4	116
A30-08(C)	9 1/2	6	(2) 3.5	3/4	3/8	3/4	116
A30-10(C)	9 1/2	6	(2) 4.75	3/4	3/8	3/4	116
A30-15	9 1/2	6	(3) 4.75	3/4	3/8	3/4	116
A32-00	9 1/2	6	-	3/4	3/8	3/4	120
A32-05	9 1/2	6	(1) 4.75	3/4	3/8	3/4	120
A32-08(C)	9 1/2	6	(2) 3.5	3/4	3/8	3/4	120
A32-10(C)	9 1/2	6	(2) 4.75	3/4	3/8	3/4	122
A32-15	9 1/2	6	(3) 4.75	3/4	3/8	3/4	125
A36-00	9 1/2	8	-	3/4	3/8	3/4	141
A36-05	9 1/2	8	(2) 4.75	3/4	3/8	3/4	144
A36-06	9 1/2	8	(2) 3.0	3/4	3/8	3/4	144
A36-08(C)	9 1/2	8	(2) 3.5	3/4	3/8	3/4	144
A36-10(C)	9 1/2	8	(2) 4.75	3/4	3/8	3/4	144
A36-15	9 1/2	8	(3) 4.75	3/4	3/8	3/4	145
A36-20	9 1/2	8	(4) 4.75	3/4	3/8	3/4	145
A42-00	9 1/2	8	-	3/4	3/8	3/4	144
A42-08(C)	9 1/2	8	(2) 3.5	3/4	3/8	3/4	147
A42-10	9 1/2	8	(2) 4.75	3/4	3/8	3/4	147
A42-15	9 1/2	8	(3) 4.75	3/4	3/8	3/4	147
A42-20	9 1/2	8	(4) 4.75	3/4	3/8	3/4	148
A48/49-00	9 1/2	8	-	3/4	3/8	7/8	173
A49-08(C)	9 1/2	8	(2) 3.5	3/4	3/8	7/8	176
A48.49-10	9 1/2	8	(2) 4.75	3/4	3/8	7/8	176
A48/49-15	9 1/2	8	(3) 4.75	3/4	3/8	7/8	176
A48/49-20	9 1/2	8	(4) 4.75	3/4	3/8	7/8	176
A60-00	10 5/8	10 5/8	-	3/4	3/8	7/8	192
A60-10	10 5/8	10 5/8	(2) 4.75	3/4	3/8	7/8	195
A60-15	10 5/8	10 5/8	(3) 4.75	3/4	3/8	7/8	195
A60-20	10 5/8	10 5/8	(3) 4.75	3/4	3/8	7/8	195
A61-00	10 5/8	10 5/8	-	3/4	3/8	7/8	192
A61-10	10 5/8	10 5/8	(2) 4.75	3/4	3/8	7/8	195
A61-15	10 5/8	10 5/8	(3) 4.75	3/4	3/8	7/8	195
A61-20	10 5/8	10 5/8	(4) 4.75	3/4	3/8	7/8	195

PRODUCT SPECIFICATIONS A18-61

PERFORMANCE RATINGS

Model No.	Capacity (TONS) Nominal (Cooling)	Capacity* BTUH 240V** (Heating)	Seasonal Efficiency AFUE%
A18-00	1 1/2	-	100.0
A18-05(C)	1 1/2	17000	100.0
A18-08(C)	1 1/2	24700	100.0
A24-00	2	-	100.0
A24-05(C)	2	17300	100.0
A24-08(C)	2	24900	100.0
A24-10(C)	2	33500	100.0
A30/32-00	2 1/2	-	100.0
A30/32-05	2 1/2	17600	100.0
A30/32-08(C)	2 1/2	25300	100.0
A30/32-10(C)	2 1/2	33800	100.0
A30/32-15	2 1/2	50100	100.0
A36-00	3	-	100.0
A36-05	3	17900	100.0
A36-06	3	22200	100.0
A36-08(C)	3	25600	100.0
A36-10(C)	3	34200	100.0
A36-15	3	50400	100.0
A36-20	3	66600	100.0
A42-00	3 1/2	-	100.0
A42-08(C)	3 1/2	25800	100.0
A42-10(C)	3 1/2	34300	100.0
A42-15	3 1/2	50600	100.0
A42-20	3 1/2	66800	100.0
A48/49-00	4	-	100.0
A49-08(C)	4	26000	100.0
A48/49-10	4	34500	100.0
A48/49-15	4	50700	100.0
A48/49-20	4	67000	100.0
A60/61-00	5	-	100.0
A60/61-10	5	35200	100.0
A60/61-15	5	51400	100.0
A60/61-20	5	67600	100.0

*Capacity and efficiency ratings in accordance with US Government standard tests.
**Capacity Correction Factors 208V = 0.75, 230V =0.92 (Heating)
+Refer to unit specifications for actual rating

BLOWER PERFORMANCE

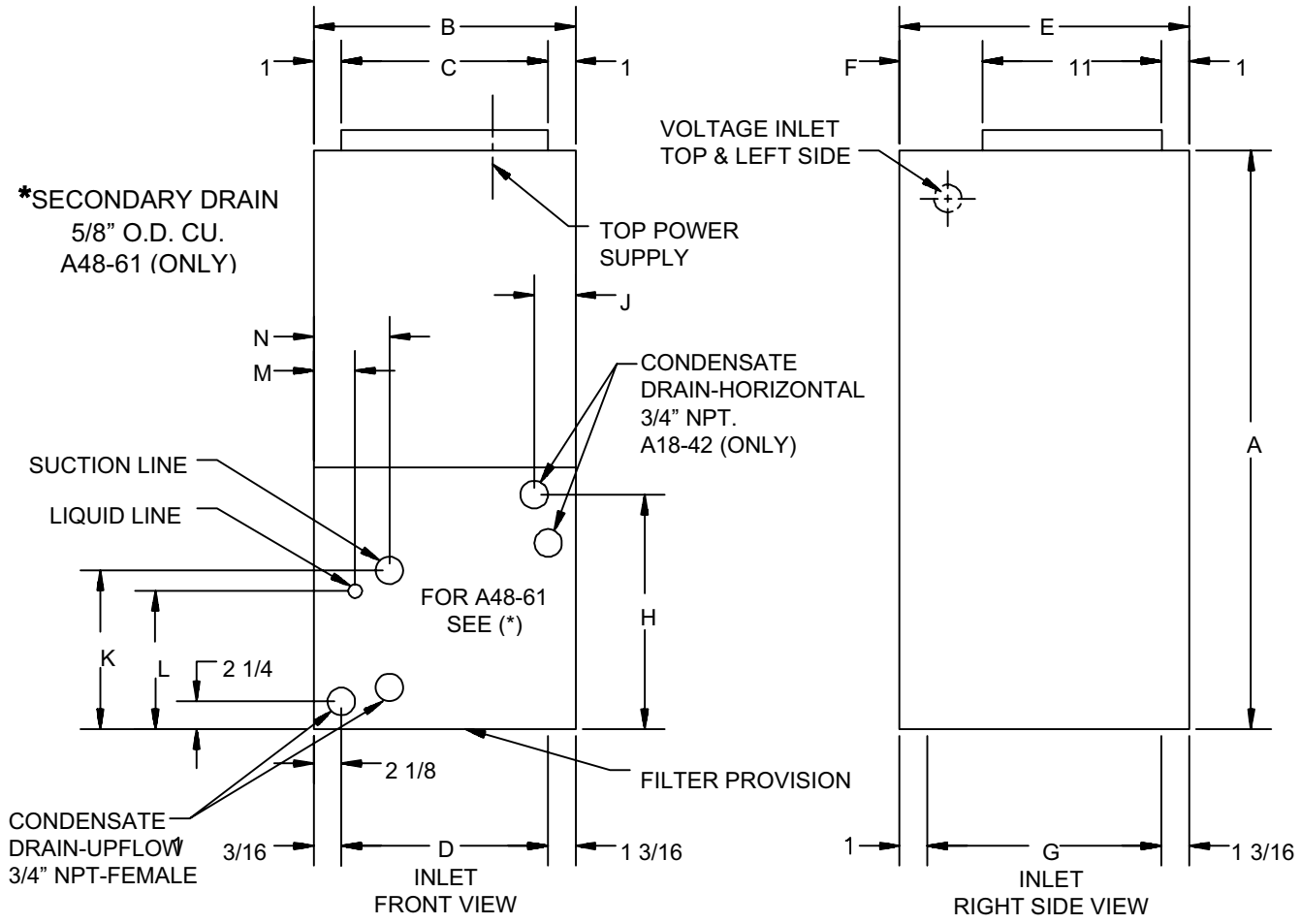
Model	Speed	CFM Delivered Against External Static Pressure, inch WG				
		0.1	0.2	0.3	0.4	0.5
A18	HIGH	700	630	580	530	490
	LOW	620	560	500	420	360
A24	HIGH	960	930	890	840	780
	LOW	810	780	760	720	670
A30/32	HIGH	1150	1090	1040	980	910
	LOW	1060	1015	970	910	860
A36	HIGH	1450	1415	1360	1280	1200
	LOW	1260	1240	1200	1145	1060
A42	HIGH	1550	1520	1470	1410	1350
	LOW	1280	1250	1200	1200	1175
A48/49	HIGH	1670	1610	1500	1440	1370
	LOW	1310	1300	1290	1280	1260
A60/61	HIGH	2170	2080	2000	1920	1850
	LOW	1900	1810	1700	1590	1500

Dry coil with Filter in Place
SCFM Correction for Wet Coil - 4%

PHYSICAL DATA

Model No.	Blower Dia.	Blower Width	KW @230V (No. of Elements)	Coil Drain Conn FPT	Refrigerant Connection Liq.	Refrigerant Connection Suct.	Approx. Shipping Weight
A18-00	8	6	-	3/4	3/8	5/8	105
A18-05(C)	8	6	(1) 4.75	3/4	3/8	5/8	105
A18-08(C)	8	6	(2) 3.5	3/4	3/8	5/8	108
A24-00	9 1/2	6	-	3/4	3/8	3/4	106
A24-05(C)	9 1/2	6	(1) 4.75	3/4	3/8	3/4	109
A24-08(C)	9 1/2	6	(2) 3.5	3/4	3/8	3/4	109
A24-10(C)	9 1/2	6	(2) 4.75	3/4	3/8	3/4	109
A30-00	9 1/2	6	-	3/4	3/8	3/4	113
A30-05	9 1/2	6	(1) 4.75	3/4	3/8	3/4	116
A30-08(C)	9 1/2	6	(2) 3.5	3/4	3/8	3/4	116
A30-10(C)	9 1/2	6	(2) 4.75	3/4	3/8	3/4	116
A30-15	9 1/2	6	(3) 4.75	3/4	3/8	3/4	116
A32-00	9 1/2	6	-	3/4	3/8	3/4	120
A32-05	9 1/2	6	(1) 4.75	3/4	3/8	3/4	120
A32-08(C)	9 1/2	6	(2) 3.5	3/4	3/8	3/4	120
A32-10(C)	9 1/2	6	(2) 4.75	3/4	3/8	3/4	122
A32-15	9 1/2	6	(3) 4.75	3/4	3/8	3/4	125
A36-00	9 1/2	8	-	3/4	3/8	3/4	141
A36-05	9 1/2	8	(2) 4.75	3/4	3/8	3/4	144
A36-06	9 1/2	8	(2) 3.0	3/4	3/8	3/4	144
A36-08(C)	9 1/2	8	(2) 3.5	3/4	3/8	3/4	144
A36-10(C)	9 1/2	8	(2) 4.75	3/4	3/8	3/4	144
A36-15	9 1/2	8	(3) 4.75	3/4	3/8	3/4	145
A36-20	9 1/2	8	(4) 4.75	3/4	3/8	3/4	145
A42-00	9 1/2	8	-	3/4	3/8	3/4	144
A42-08(C)	9 1/2	8	(2) 3.5	3/4	3/8	3/4	147
A42-10	9 1/2	8	(2) 4.75	3/4	3/8	3/4	147
A42-15	9 1/2	8	(3) 4.75	3/4	3/8	3/4	147
A42-20	9 1/2	8	(4) 4.75	3/4	3/8	3/4	148
A48/49-00	9 1/2	8	-	3/4	3/8	7/8	173
A49-08(C)	9 1/2	8	(2) 3.5	3/4	3/8	7/8	176
A48.49-10	9 1/2	8	(2) 4.75	3/4	3/8	7/8	176
A48/49-15	9 1/2	8	(3) 4.75	3/4	3/8	7/8	176
A48/49-20	9 1/2	8	(4) 4.75	3/4	3/8	7/8	176
A60-00	10 5/8	10 5/8	-	3/4	3/8	7/8	192
A60-10	10 5/8	10 5/8	(2) 4.75	3/4	3/8	7/8	195
A60-15	10 5/8	10 5/8	(3) 4.75	3/4	3/8	7/8	195
A60-20	10 5/8	10 5/8	(3) 4.75	3/4	3/8	7/8	195
A61-00	10 5/8	10 5/8	-	3/4	3/8	7/8	192
A61-10	10 5/8	10 5/8	(2) 4.75	3/4	3/8	7/8	195
A61-15	10 5/8	10 5/8	(3) 4.75	3/4	3/8	7/8	195
A61-20	10 5/8	10 5/8	(4) 4.75	3/4	3/8	7/8	195

Model: A1861



Model	A	B	C	D	E	F	G	H	J	K	L	M	N
A18, 24, 30, 32	41 1/8	15 1/2	13 1/2	13 1/8	22	10	19.812	14 3/4	1 3/4	9 7/8	8 1/4	2	2 3/4
A36, 42	46 3/4	19 1/2	17 1/2	17 1/8	22	10	19.812	14 3/4	1 3/4	9 7/8	8 1/4	2	2 3/4
A48, 49, 60, 61	53 1/4	22	20	19 5/8	24	12	21.812	20 3/4	1 5/8	10 1/2	8 1/8	1 3/16	3 1/2

* A48-61, Secondary Drain 5/8 O.D. Copper Tube

FILTER- PERMANENT WASHABLE

Model No.	Filter size (Actual Dimensions)
A18, 24, 30, 32	15" x 20" x 1"
A36, 42	19" x 22" x 1"
A48, 49, 60, 61	21 1/2" x 24" x 1"

Note: All filters above must be cut to size.
Filter will be field supplied.

NOTE: SPECIFICATIONS AND PERFORMANCE DATA LISTED HEREIN ARE SUBJECT TO CHANGE WITHOUT NOTICE

PRODUCT SPECIFICATIONS AR SERIES

ELECTRICAL DATA

Model No.	Single Supply Circuit		Min. VAC	Max VAC	Blower Motor	
	Minimum Circuit Ampacity @208/240V	Maximum Overcurrent Prot. Amps @208/240V			FLA	HP
AR18-1	1.2/1.2	15/15	197	253	0.96	1/5
AR24-1	1.9/1.9	15/15	197	253	1.5	1/5
AR30-1	2.4/2.4	15/15	197	253	1.95	1/3
AR32-1	2.4/2.4	15/15	197	253	1.95	1/3
AR36-1	2.7/2.7	15/15	197	253	2.15	1/3
AR42-1	2.8/2.8	15/15	197	253	2.2	1/2
AR48/49-1	3.3/3.3	15/15	197	253	2.6	1/2
AR60-1	4.9/4.9	15/15	197	253	3.9	3/4
AR61-1	4.9/4.9	15/15	197	253	3.9	3/4

PHYSICAL DATA

Blower		Coil Drain Conn	Refrigerant Connection		Approx. Shipping
Dia.	Width	FPT	Liq.	Suct.	Weight
8 [20.52 cm]	6 [15.24 cm]	3/4 [1.91 cm]	3/8 [.95 cm]	5/8 [1.59 cm]	105 [47.63 kg]
9 ½ [24.13 cm]	6 [15.24 cm]	3/4 [1.91 cm]	3/8 [.95 cm]	3/4 [1.91 cm]	106 [48.08 kg]
9 1/2 [24.13 cm]	6 [15.24 cm]	3/4 [1.91 cm]	3/8 [.95 cm]	3/4 [1.91 cm]	113 [51.26 kg]
9 1/2 [24.13 cm]	6 [15.24 cm]	3/4 [1.91 cm]	3/8 [.95 cm]	3/4 [1.91 cm]	120 [54.43 kg]
9 1/2 [24.13 cm]	8 [20.52 cm]	3/4 [1.91 cm]	3/8 [.95 cm]	3/4 [1.91 cm]	141 [63.96 kg]
9 1/2 [24.13 cm]	8 [20.52 cm]	3/4 [1.91 cm]	3/8 [.95 cm]	3/4 [1.91 cm]	144 [65.32 kg]
9 1/2 [24.13 cm]	8 [20.52 cm]	3/4 [1.91 cm]	3/8 [.95 cm]	7/8 [2.22 cm]	173 [78.47 kg]
10 5/8 [26.99 cm]	10 5/8 [26.99 cm]	3/4 [1.91 cm]	3/8 [.95 cm]	7/8 [2.22 cm]	192 [87.09 kg]
10 5/8 [26.99 cm]	10 5/8 [26.99 cm]	3/4 [1.91 cm]	3/8 [.95 cm]	7/8 [2.22 cm]	192 [87.09 kg]

[ ] DESIGNATES METRIC EQUIVALENTS IN CENTIMETERS AND KILOGRAMS

BLOWER PERFORMANCE

Model	Speed	CFM Delivered Against External Static Pressure, inch H_2O				
		0.1	0.2	0.3	0.4	0.5
AR18-1	HIGH	700	630	580	530	490
	LOW	674	600	545	493	375
AR24-1	HIGH	1056	1023	978	923	866
	LOW	935	914	881	847	788
AR30/32-1	HIGH	1150	1106	1040	980	915
	LOW	1060	1039	1982	914	863
AR36-1	HIGH	1549	1472	1418	1358	1285
	LOW	1322	1307	1277	1323	1154
AR42-1	HIGH	1586	1530	1471	1410	1350
	LOW	1524	1485	1423	1367	1175
AR48/49-1	HIGH	1670	1610	1531	1467	1393
	LOW	1580	1516	1465	1405	1343
AR60/61-1	HIGH	2170	2080	2000	1920	1850
	LOW	1900	1810	1780	1710	1630

Dry coil with Filter in Place
SCFM Correction for Wet Coil - 4%.

PERFORMANCE RATINGS

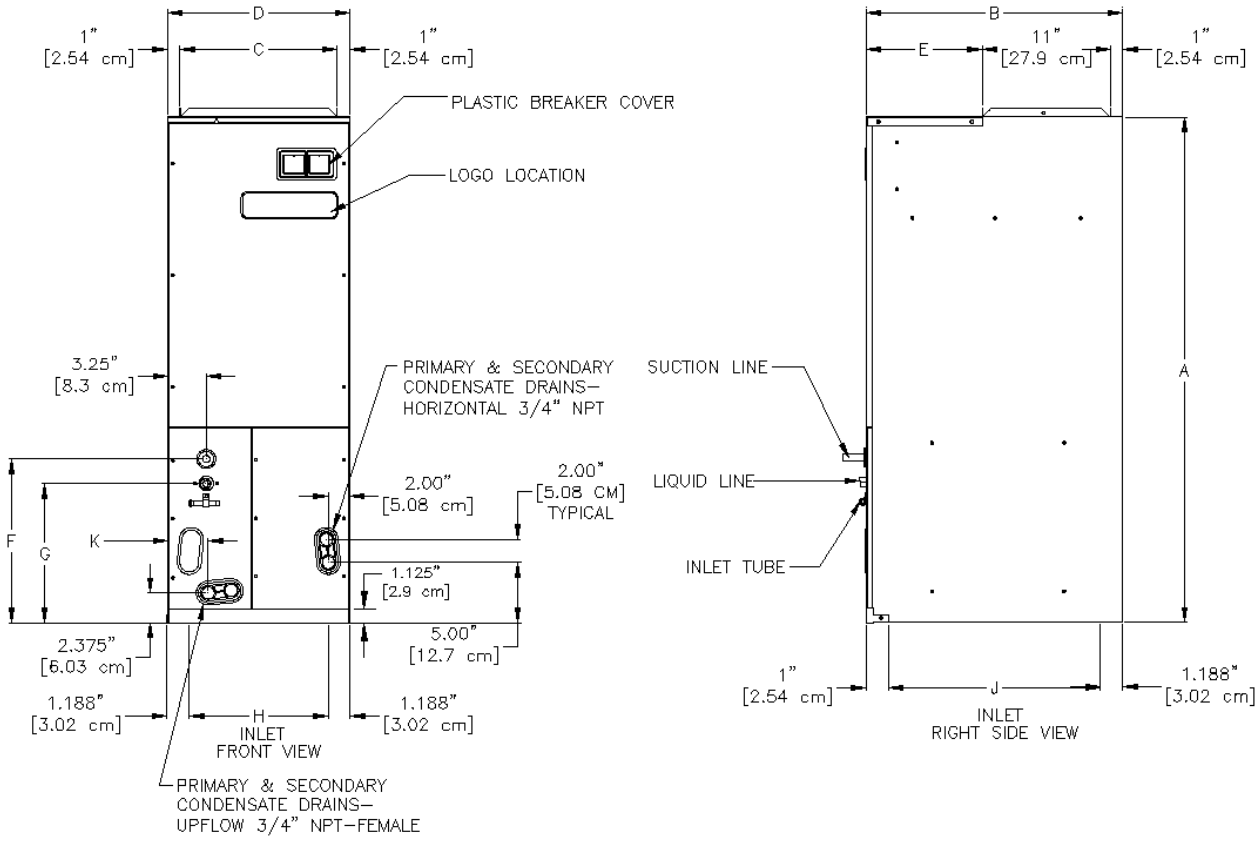
Model No.	Capacity (TONS) Nominal (Cooling)	Seasonal Efficiency AFUE%
AR18-1	1 1/2	100.0
AR24-1	2	100.0
AR30/32-1	2 1/2	100.0
AR36-1	3	100.0
AR42-1	3 1/2	100.0
AR48/49-1	4	100.0
AR60/61-1	5	100.0

HEATER KIT APPLICATION OPTIONS

	AR18-1	AR24-1	AR30-1	AR32-1	AR36-1	AR42-1	AR48/49-1	AR60-1	AR61-1
HKR-03	X	X	X	X	X	X	X	X	X
HKR-05(c)	X	X	X	X	X	X	X	X	X
HKR-06	X	X	X	X	X	X	X	X	X
HKR-08(c)	X	X	X	X	X	X	X	X	X
HKR-10(c)		X	X	X	X	X	X	X	X
HKR-15C			X	X	X	X	X	X	X
HKR-20C					X	X	X	X	X
HKR-21C					X	X	X	X	X
HKR3-15*					X	X	X	X	X
HKR3-20*					X	X	X	X	X

(c) circuit breakers optional
* - Heat Kit requires three phase power supply

PHYSICAL DIMENSIONS (See fig. Below)



Base Model #	A	B	C	D	E	F	G	H	J	K
AR18, 24, 30, 32	41.125 [107.0 cm]	22 [55.9 cm]	13.5 [34.3 cm]	15.5 [39.4 cm]	10 [25.4 cm]	13.375 [34.0 cm]	10.811 [27.5 cm]	13.125 [33.3 cm]	19.812 [50.3 cm]	3.563 [9.05cm]
AR36, 42	46.75 [118.7 cm]	22 [55.9 cm]	17.5 [44.5 cm]	19.5 [49.5 cm]	10 [25.4 cm]	13.375 [34.0 cm]	10.811 [27.5 cm]	17.125 [43.5 cm]	19.812 [50.3 cm]	3.563 [9.05cm]
AR48, 49, 60, 61	53.25 [135.3 cm]	24 [61.0 cm]	20 [50.8 cm]	22 [55.9 cm]	12 [30.5 cm]	14.5 [36.8 cm]	11.935 [30.3 cm]	19.625 [49.8 cm]	21.812 [55.4 cm]	3.343 [8.49cm]

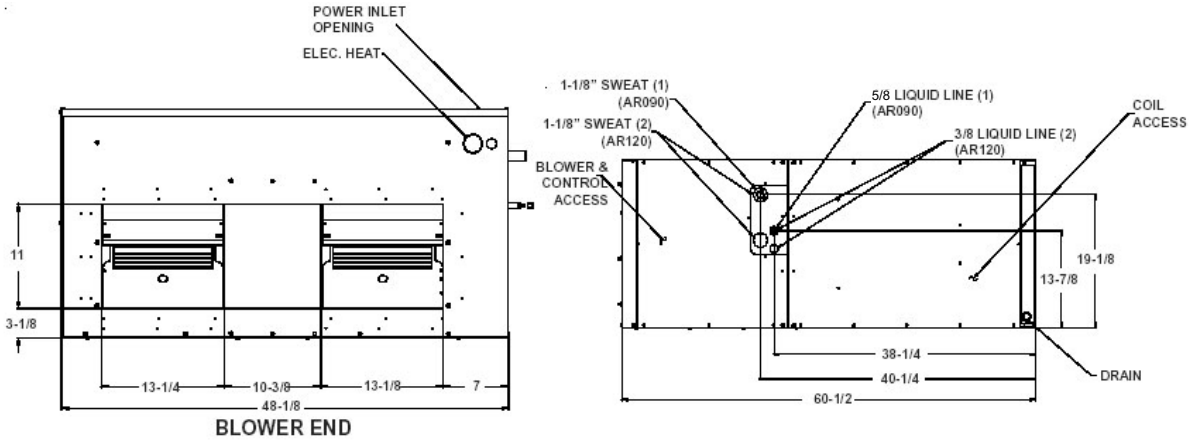
[ ] DESIGNATES METRIC EQUIVALENTS

NOTE: SPECIFICATIONS AND PERFORMANCE DATA LISTED HEREIN ARE SUBJECT TO CHANGE WITHOUT NOTICE.

SPECIFICATIONS

	AR090	AR120
Electrical		
Unit volts	208/240/460	208/240/460
Phase	3	3
Hertz	60	60
Voltage Range	187 - 253 / 414-506	187 - 253 / 414-506
FLA (Total)	5.2	6
Minimum Circuit Ampacity	6.5 / 3.3	7.5 / 3.8
Blower Motor Type		
Type	Belt Dive	Belt Dive
Horse Power	1½	2
Volts	208/230/460	208/230/460
Phase	3	3
Hertz	60	60
FLA	5.2	6
LRA	35	32
Blower & Controls		
Wheel Dia. & Width (Qty.)	11 x 10 (2)	11 x 10 (2)
Pulley Pitch Dia.	5.9	6.5
Bore	1	1
Motor Pulley Pitch Dia.	1.9 to 2.9	2.8 to 3.8
Bore	5/8	5/8
Belt Length & Width	39 x ½	41 x ½
Nominal Airflow (Ft./Min.)	3,000	4,000
Transformer (60 VAC.)	Standard	Standard
Blower Relay	Standard	Standard
Filter, Coil & Refrigerant		
Filter Size (Disposable) / Qty	16 x 20 x 2 (4)	16 x 20 x 2 (2) 20 x 20 x 2 (2)
Coil Area (sq. ft.)	9	10
FPI - Rows	14 - 4	14 - 4
Metering Device (Qty.)	Expansion Valve (1)	Expansion Valve (2)
Refrigerant	R-22	R-22
Liquid Connection (Qty.)	5/8	3/8 (2)
Suction Connection (Qty.)	1-1/8	1-1/8 (2)
Condensate Drain	¾ FPT	¾ FPT

DIMENSIONS

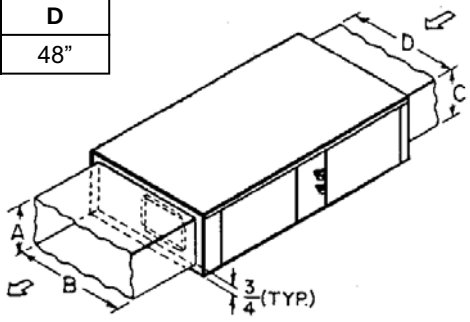


NOTE: AR090 (1) 5/8 Liquid Line AR120 (2) 3/8 Liquid Line

Duct Connection Sizing Without Electric Heaters

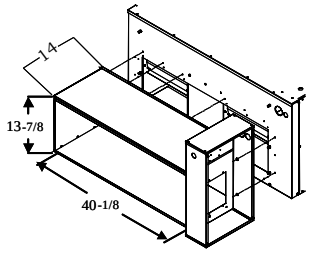
Minimum Supply and Return Duct Dimensions

Supply Duct		Return Duct	
A	B	C	D
13⅛"	40"	24"	48"



Dimensional Data for Electric Heater Kits

- 15, 20 & 30 kW Heater Kits
- Supply opening is 13⅞" x 40⅛"



Electric Heater Kits

AHKD Model Number	Nominal kW	Electrical Characteristics	Stages	Weight (lbs.)	Max. Overcurrent Protection
AHKD15-3	15	208-230/3/60	1	56	60
AHKD15-4	15	460/3/60	1	55	30
AHKD20-3	20	208-230/3/60	2	59	70
AHKD20-4	20	460/3/60	2	57	35
AHKD30-3	30	208-230/3/60	2	60	100
AHKD30-4	30	460/3/60	2	58	50

NOTES:

1) AR Series Air handlers do not have factory-installed electric heat. Purchased as an accessory, these are the ONLY heater kits that can be used with the AR Series.
2) The electrical characteristics of the air handler, electric heater kits, and building power supply must be compatible.

Temperature Rise (Degrees °F)

Model	Heat Kit kW	CFM	Supply Voltage		
			208	240	480
AR090	15	2,800	14	19	19
		2,900	14	18	18
		3,000	13	18	18
		3,100	13	17	17
		3,200	12	17	17
	20	2,800	19	25	25
		2,900	18	24	24
		3,000	18	24	24
		3,100	17	23	23
		3,200	17	22	22
	30	2,800	28	38	38
		2,900	27	37	37
		3,000	27	35	35
		3,100	26	34	34
		3,200	25	33	33

Model	Heat Kit kW	CFM	Supply Voltage		
			208	240	480
AR120	15	3,800	10	14	14
		3,900	10	14	14
		4,000	10	13	13
		4,100	10	13	13
		4,200	9	13	13
	20	3,800	14	19	19
		3,900	14	18	18
		4,000	13	18	18
		4,100	13	17	17
		4,200	13	17	17
	30	3,800	21	28	28
		3,900	20	27	27
		4,000	20	27	27
		4,100	19	26	26
		4,200	19	25	25

*Tables above are calculated with both stages of electric heat engaged (2-stage heat systems). Divide the temperature rise from the table by 2 for 1st stage operation for systems using staged electric heat.

AR090 Air Delivery*

Static Pressure	Motor Sheave Turns Open			
	1	2	3	4
0.1	4,264	3,930	3,633	3,273
0.2	3,996	3,705	3,235	2,998
0.3	6,731	3,379	3,002	2,517
0.4	6,445	3,066	2,613	
0.5	6,113	2,662		

* With dry coil and 2" air filter

NOTES:

Any adjustment made ot the blower should not cause the motor to draw more than the motor's rated RLA. Applications that exceed the above could require a larger motor.

AR120 Air Delivery*

Static Pressure	Motor Sheave Turns Open					
	0	1	2	3	4	5
0.1	5,193	5,037	4,790	4,529	4,097	4,097
0.2	5,012	4,873	4,603	4,315	3,842	3,842
0.3	4,852	4,675	4,393	4,091	3,589	3,589
0.4	4,687	4,484	4,172	3,853	3,295	3,073
0.5	4,501	4,268	3,939	3,561	2,922	2,610
0.6	4,293	4,041	3,673	3,223	2,642	
0.7	4,073	3,782	3,347	2,892		
0.8	3,807	3,485	2,962			
0.9	3,540	3,117				

* With dry coil and 2" air filter

NOTES:

Any adjustment made ot the blower should not cause the motor to draw more than the motor's rated RLA. Applications that exceed the above could require a larger motor.

Filters

Model	Filter Size
AR090	16” x 20” x 2”
AR120	16” x 20” x 2” 20” x 20” x 2”

Physical Data

Model	Blower		Refrigeration Connection		Water Connection		Drain Connection NPT	Approximate Shipping Weight (lb.)
	Diameter	Width	Liquid	Suction	In	Out		
AH1826-1/-1FP*	9”	6”	3/8”	5/8”	7/8”	7/8”	3/4”	95
AH2429-1/-1FP*	10”	6”	3/8”	5/8”	7/8”	7/8”	3/4”	100
AH3043-1FR/-1FRFP*	9”	8”	3/8”	3/4”	7/8”	7/8”	3/4”	135
AH3645-1FR/-1FRFP*	10”	8”	3/8”	3/4”	7/8”	7/8”	3/4”	140

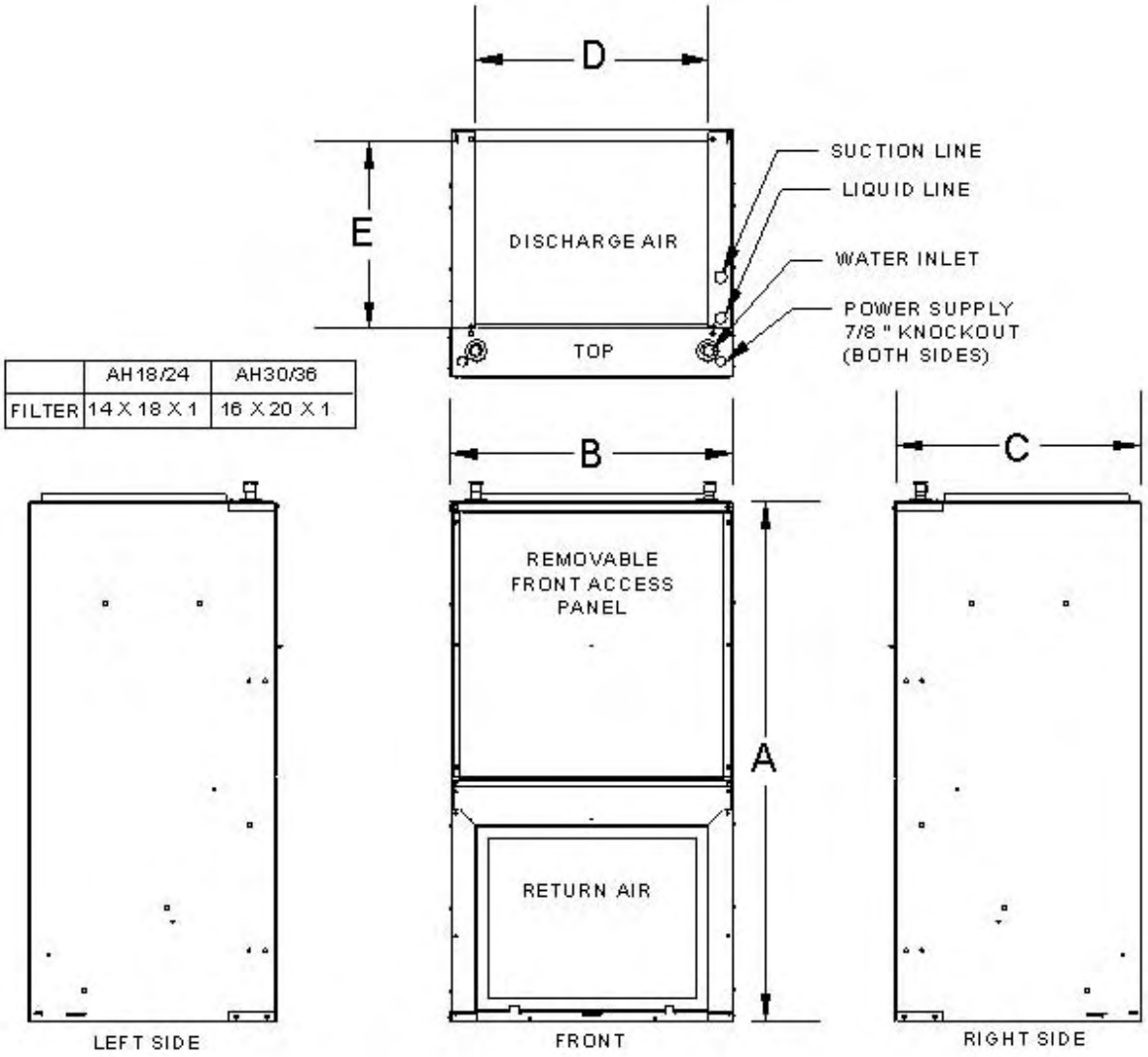
* -1FP designates models with a factory-installed freeze protection control

Dimensions

Model		A	B	C	D	E
AH1826-1/-1FP*	Small Chassis	39¾”	20 3/16”	16 1/8”	16”	11”
AH2429-1/-1FP*		39¾”	20 3/16”	16 1/8”	16”	11”
AH3043-1FR/-1FRFP*	Large Chassis	44¼”	24”	21”	19 7/8”	16”
AH3645-1FR/-1FRFP*		44¼”	24”	21”	19 7/8”	16”

* -1FP designates models with a factory-installed freeze protection control

Dimensional Data



	AH18/24	AH30/36
FILTER	14 X 18 X 1	16 X 20 X 1

Electrical Data

Model	Volt	Min Volt	Max Volt	Minimum Ampacity	Maximum Overcurrent Protection	Blower Motor		Circulator Motor FLA
						FLA	HP	
AH1826-1/-1FP*	115	103	126	7.2	15 A	5.2	1/3	0.74
AH2429-1/-1FP*	115	103	126	7.2	15 A	5.2	1/3	0.74
AH3043-1FR/-1FRFP*	115	103	126	7.2	15 A	5.2	1/3	0.74
AH3645-1FR/-1FRFP*	115	103	126	7.2	15 A	5.2	1/3	0.74

May use fuses or HACR type Circuit Breakers of the same size as noted.
+ Wire size should be determined in accordance with National Electrical Codes. Extensive wire runs will require larger wire sizes.
* -1FP designates models with a factory-installed freeze protection control

Performance Ratings

Model	Capacity Cooling Nominal BTUH	Capacity Heating ENT. Water Temp °F		
		120°	140°	180°
AH1826-1/-1FP*	18,000	18,400	26,000	40,500
AH2429-1/-1FP*	24,000	20,600	29,000	45,800
AH3043-1FR/-1FRFP*	30,000	30,500	43,000	67,000
AH3645-1FR/-1FRFP*	36,000	32,000	45,000	71,000

* -1FP designates models with a factory-installed freeze protection control

Blower Performance (Wet Coil)

Model	Motor Speed	CFM Delivered Against External Static Pressure				
		0.1	0.2	0.3	0.4	0.5
AH1826-1/-1FP*	Low	680	620	570	510	450
	Med	755	690	635	570	505
	High	800	730	675	600	535
AH2429-1/-1FP*	Low	720	675	640	595	540
	Med	810	760	720	670	610
	High	870	815	775	720	665
AH3043-1FR/-1FRFP*	Low	970	920	860	800	730
	Med	1080	1020	960	890	820
	High	1140	1080	1020	950	870
AH3645-1FR/-1FRFP*	Low	1020	995	945	905	835
	Med	1150	1120	1060	1010	940
	High	1310	1250	1190	1130	1060

Note: When matching the outdoor unit to the indoor unit, refer to the piston kit chart for proper piston selection
* -1FP designates models with a factory-installed freeze protection control

Specifications

Model	Heater KW		K-Capacity Max. BTUH		Heater Total Amps		Minimum Circuit Ampacity		Maximum Overcurrent Protection		Shipping Weight (pounds)
	230V	208V	230V	208V	230V	208V	230V	208V	230V	208V	
AC18-05D	4.8	3.9	16.4	13.4	20.9	18.9	29	27	30	30	59
AC18-06D	6.0	4.9	20.5	16.7	26.1	23.6	36	33	40	40	59
AC18-08D	7.3	6.0	24.9	20.5	31.7	28.7	43	39	45	40	59
AC24-05D	4.8	3.9	16.4	13.4	20.9	18.9	29	27	30	30	59
AC24-06D	6.0	4.9	20.5	16.7	26.1	23.6	36	33	40	40	59
AC24-08D	7.3	6.0	24.9	20.5	31.7	28.7	43	39	45	40	59
AC24-10D	9.8	8.0	33.4	27.3	42.6	38.5	56	51	60	60	59
AC30-05D	4.8	3.9	16.4	13.4	20.9	18.9	29	27	30	30	69
AC30-08D	7.3	6.0	24.9	20.5	31.7	28.7	43	39	45	40	69
AC30-10D	9.8	8.0	33.4	27.3	42.6	38.5	58	53	60	60	69
AC36-05D	-	-	-	-	-	-	-	-	-	-	76
AC36-08D	7.3	6.0	24.9	20.5	31.7	28.7	44	39	45	40	79
AC36-10D	9.8	8.0	33.4	27.3	42.6	38.5	59	54	60	60	79

NOTE:
When the room thermostat calls for second stage heat, the first stage (heat pump) operation must be locked out. When matching the "AC" unit that has electric heat with a heat pump, order "HEAT PUMP SHUT OFF KIT HPSK-01." The ACXX-00 units do not require this kit.

Heating Capacity/KW Correction Factor

Supply Voltage	240	230	220	210	208
Correction Factor	1.08	1.00	.92	.84	.82

(Multiply the 230-volt capacity by factors)

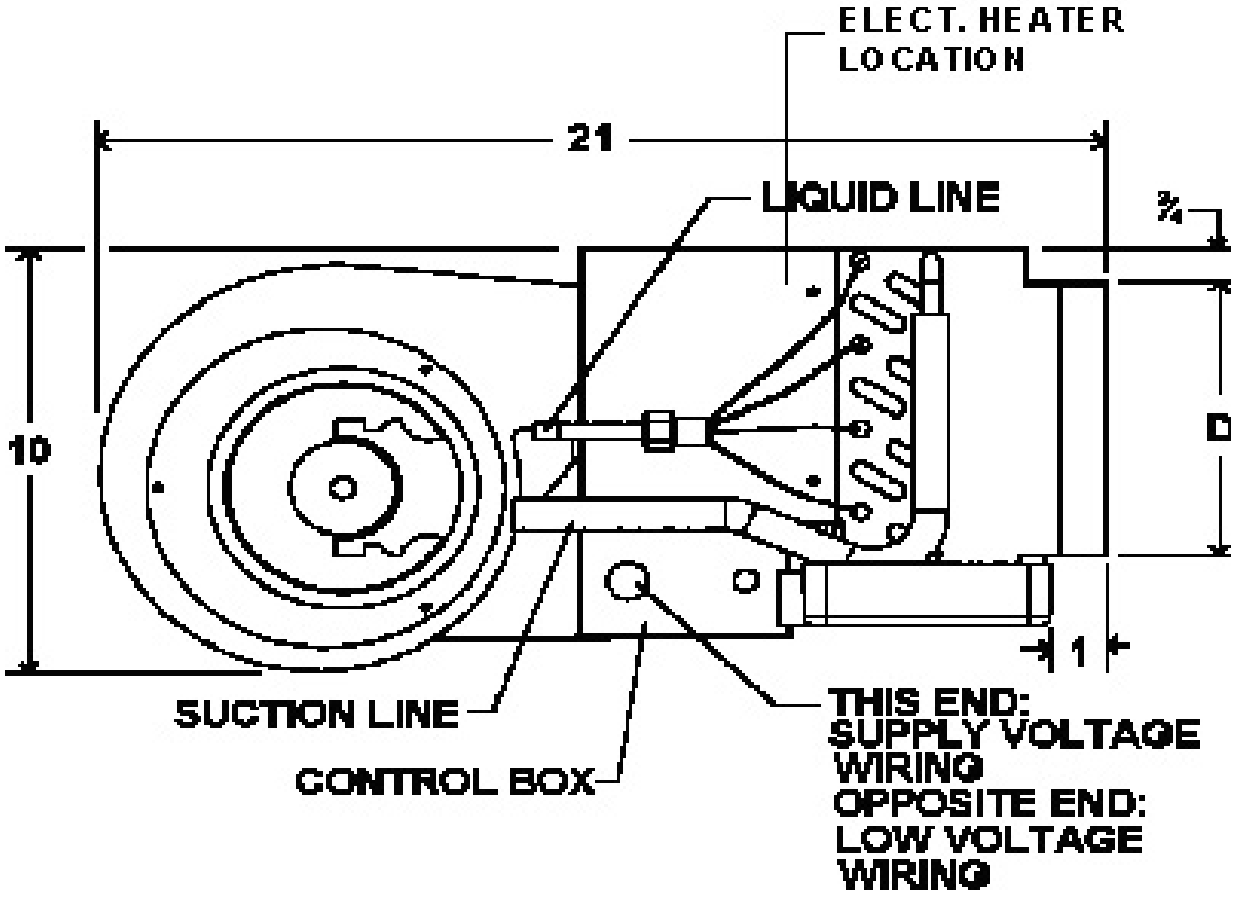
Blower Performance

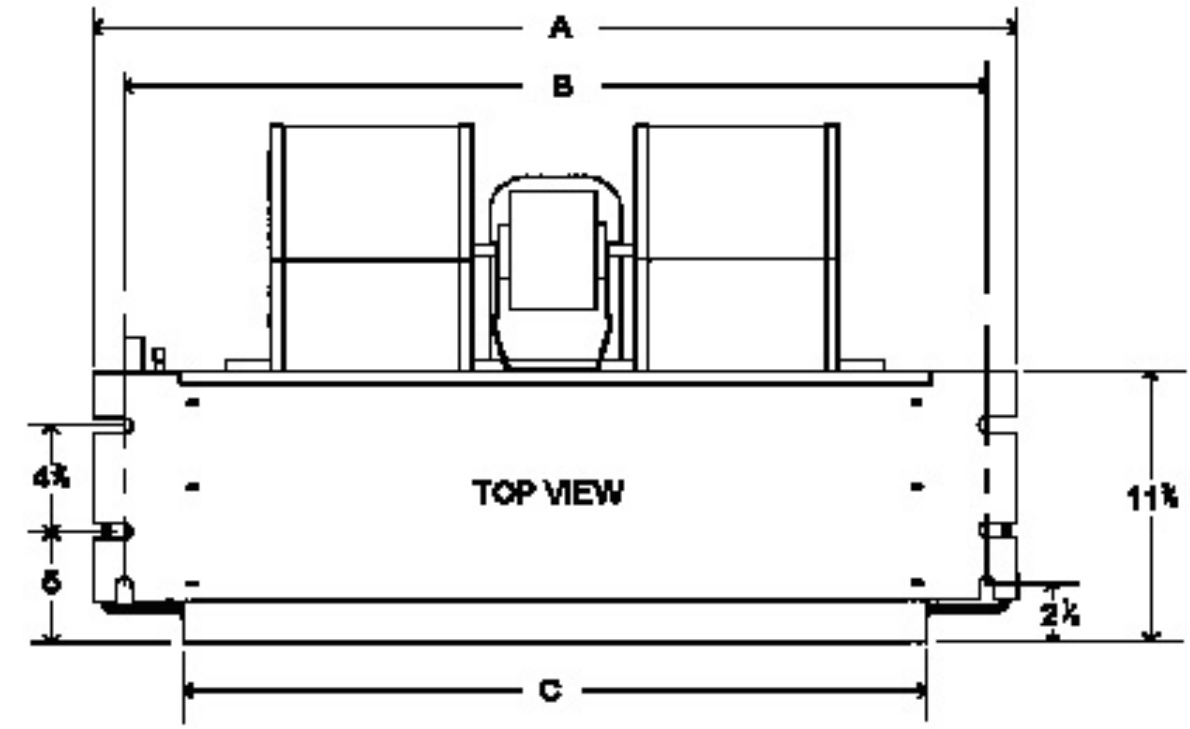
Model	Motor Speed	CFM Delivered Against External Static Pressure				
		0.1	0.2	0.3	0.4	0.5
AC18-05D AC18-06D AC18-08D	High	780	710	625	520	440
	Low	675	585	510	460	400
AC24-05D AC24-06D AC24-08D AC24-10D	High	935	880	810	735	675
	Low	720	680	630	565	490
AC30-05D AC30-08D AC30-10D	High	1,075	1,015	945	865	770
	Low	830	785	720	665	605
AC36-05D AC36-08D AC36-10D	High	1,200	1,150	1,090	1,025	945
	Low	920	880	830	770	710

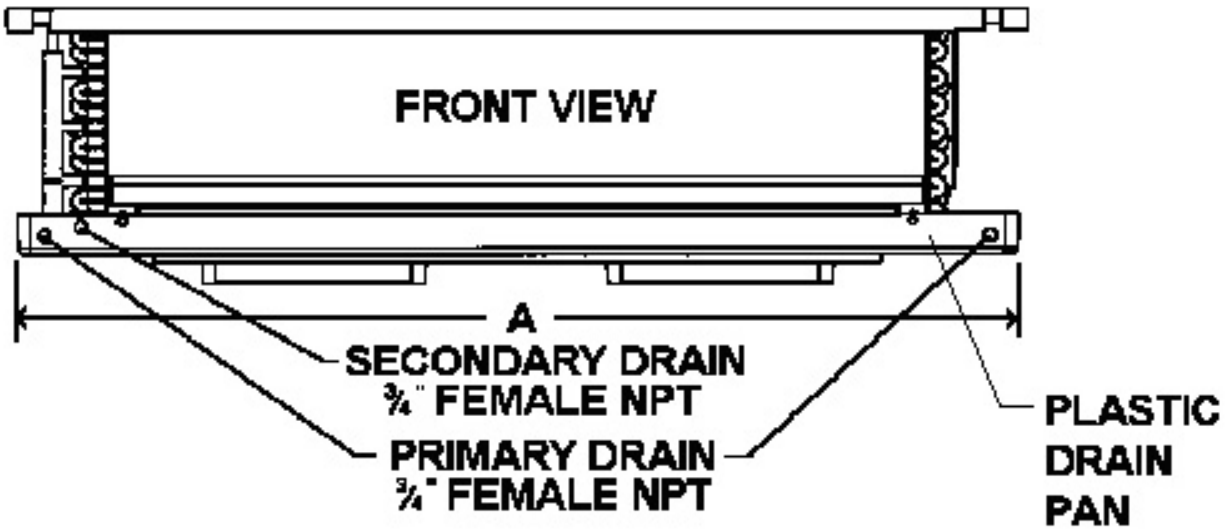
Dry coil with filter in place
208-volt operation x .96

Dimensions

Model	A	B	C	D
AC18-05D AC18-06D AC18-08D	37¼	34 11/16	30	6½
AC24-05D AC24-06D AC24-08D AC24-10D	37¼	34 11/16	30	6½
AC30-05D AC30-08D AC30-10D	43¼	40 11/16	36	6½
AC36-05D AC36-08D AC36-10D	49¼	46 11/16	42	6½




A
B
TOP VIEW
4¾
5
11⅛
2¼
C


FRONT VIEW
A
SECONDARY DRAIN
¾" FEMALE NPT
PRIMARY DRAIN
¾" FEMALE NPT
PLASTIC
DRAIN
PAN

Specifications

Model	Nominal Cooling Capacity (BTUH)	Heating Capacity Entering Water			Service Valve		Shipping Weight (pounds)
		120 °F	140 °F	180 °F	Liquid	Suction	
ACHP1819-1/-1FP*	18,000	13,150	18,400	28,500	3/8”	5/8”	65
ACHP2423-1/-1FP	24,000	16,450	23,000	35,600	3/8”	3/4”	65
ACHP3028-1/-1FP	30,000	19,500	27,300	42,300	3/8”	3/4”	75
ACHP3632-1/-1FP	36,000	23,000	32,000	49,600	3/8”	3/4”	105

* -1FP designates the models with a factory-installed freeze protection control

Electrical Data

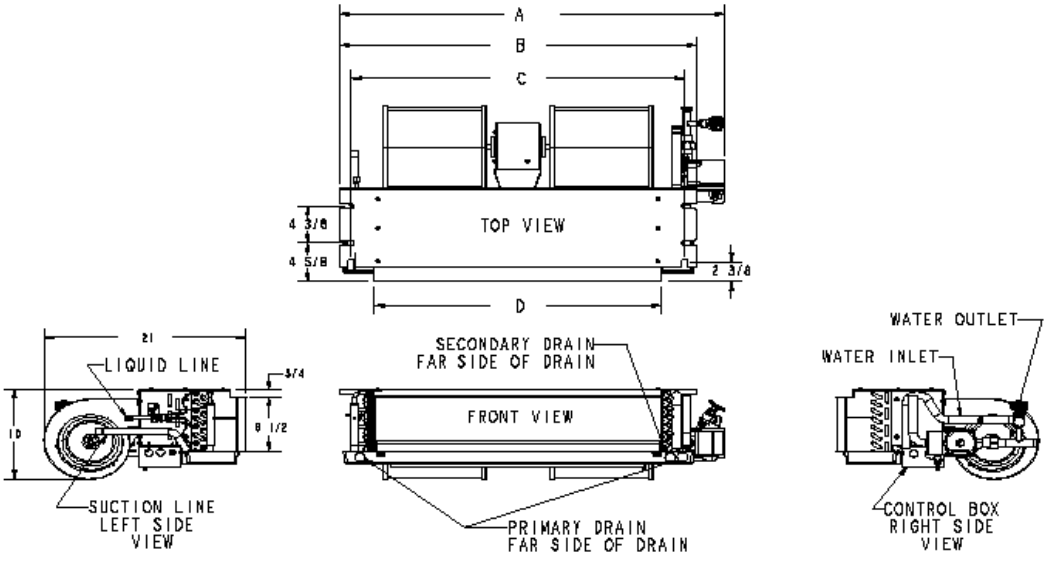
Model	Volt	Min Volt	Max Volt	Minimum Circuit Ampacity	Maximum Overcurrent Protection (amps)	Blower Motor		Circulator Motor	
						FLA	HP	FLA	HP
ACHP1819-1/-1FP*	115	103	126	2.68	15	1.55	1/8	0.74	1/25
ACHP2423-1/-1FP	115	103	126	8.24	15	6.0	1/3	0.74	1/25
ACHP3028-1/-1FP	115	103	126	8.24	15	6.0	1/3	0.74	1/25
ACHP3632-1/-1FP	115	103	126	5.62	15	3.9	1/2	0.74	1/25

Blower Performance (Wet Coil)

Model	Motor Speed	CFM Delivered Against External Static Pressure				
		0.1	0.2	0.3	0.4	0.5
ACHP1819-1/-1FP*	Low	610	570	510	450	390
	High	670	620	560	500	420
ACHP2423-1/-1FP	Low	760	710	650	600	530
	High	820	770	700	650	590
ACHP3028-1/-1FP	Low	1,000	940	880	810	750
	High	1,090	1,030	960	890	840
ACHP3632-1/-1FP	Low	970	930	880	820	760
	High	1,260	1,180	1,120	1,060	1,040

Dimensions

Model	A	B	C	D
ACHP1819-1/-1FP*	40¼”	37¼”	34-11/16”	30”
ACHP2423-1/-1FP	40¼”	37¼”	34-11/16”	30”
ACHP3028-1/-1FP	46¼”	43¼”	40-11/16”	36”
ACHP3632-1/-1FP	58”	55”	52½”	47¾”



Specifications

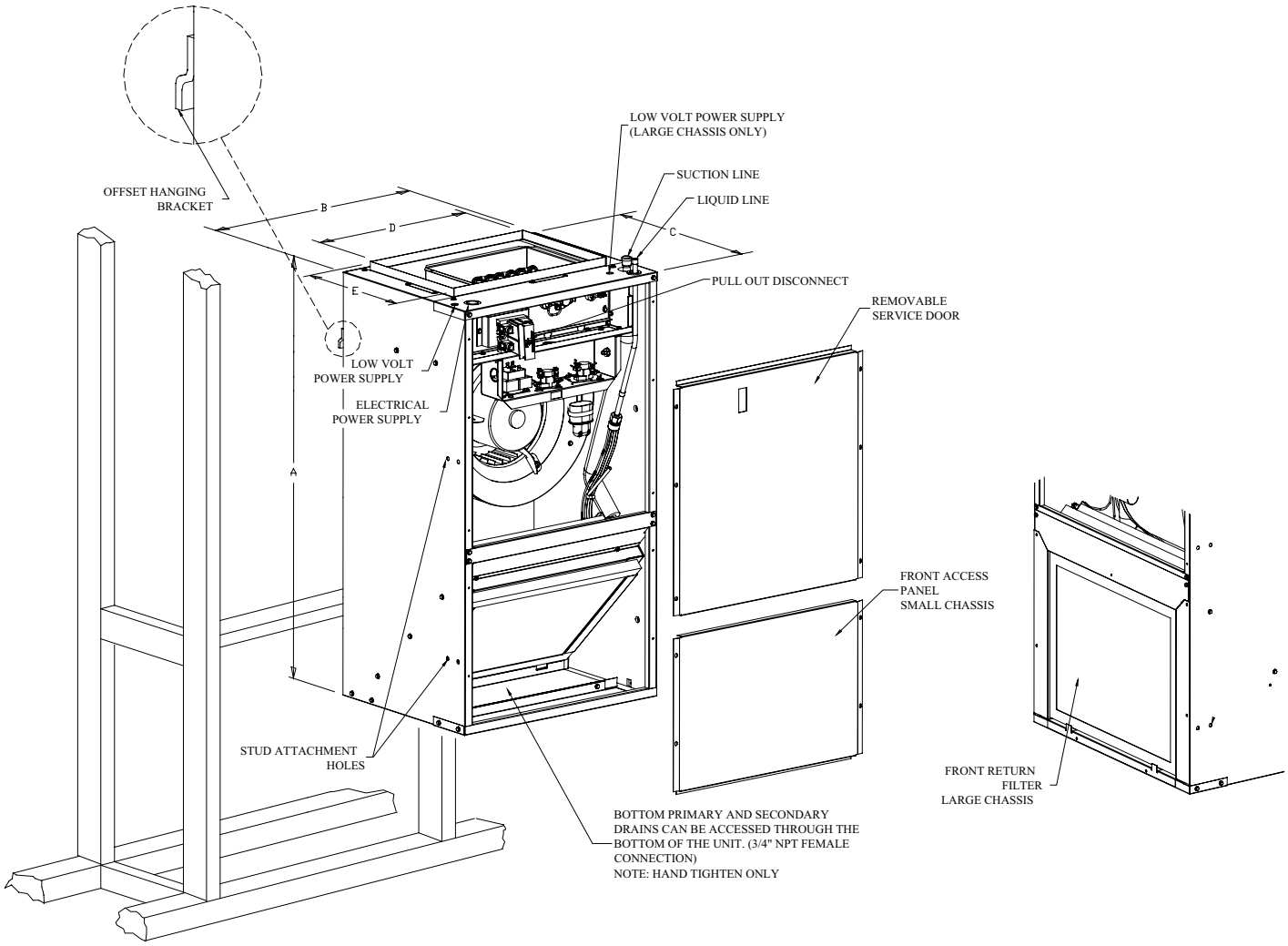
Model	Refrigerant Connection Line		Type	Shipping Weight (pounds)
	Liquid	Suction		
AWB18-05D	3/8”	5/8”	Sweat	81
AWB18-08D	3/8”	5/8”	Sweat	81
AWB24-05D	3/8”	5/8”	Sweat	84
AWB24-08D	3/8”	5/8”	Sweat	84
AWB24-10D	3/8”	5/8”	Sweat	84
AWB30-05D	3/8”	5/8”	Sweat	84
AWB30-08D	3/8”	5/8”	Sweat	84
AWB30-10D	3/8”	5/8”	Sweat	84
AWB36-05DFR	3/8”	3/4”	Sweat	96
AWB36-08DFR	3/8”	3/4”	Sweat	96
AWB36-10DFR	3/8”	3/4”	Sweat	96

Electrical Data

Model	Capacity Tons Cooling	Capacity BTUH Heating		Heater Total Amps		Minimum Circuit Ampacity		Maximum Overcurrent Protection	
	240V	240V	208V	240V	208V	240V	208V	240V	208V
AWB18-05D	1½	17,647	13,326	20.0	17.3	26.9	23.5	30	30
AWB18-08D	1½	26,177	19,468	30.4	26.0	40.0	34.3	40	40
AWB24-05D	2	17,647	13,326	20.0	17.3	26.9	23.5	30	30
AWB24-08D	2	26,177	19,468	30.4	26.0	40.0	34.3	40	40
AWB24-10D	2	34,707	25,951	40.8	35.1	53.0	45.7	60	50
AWB30-05D	2½	18,261	14,199	20.0	17.3	27.6	23.8	30	30
AWB30-08D	2½	26,791	20,341	30.4	26.0	40.6	34.6	50	40
AWB30-10D	2½	35,321	26,824	40.8	35.1	53.7	46.0	60	50
AWB36-05DFR	3	18,261	14,199	20.0	17.3	27.6	23.8	30	30
AWB36-08DFR	3	26,791	20,341	30.4	26.0	40.6	34.6	50	40
AWB36-10DFR	3	35,321	26,824	40.8	35.1	53.7	46.0	60	50

Dimensions

	A	B	C	D	E	Filter
Small Chassis (AWB18/24/30)	36”	20 3/16”	16⅛”	16”	11”	14” x 18” x 1”
Large Chassis (AWB36)	36”	24”	21”	19⅞”	15⅞”	16” x 20” x 1”



Blower Performance (1) (2)

Model	Motor Speed	CFM Delivered Against External Static Pressure				
		.1	.2	.3	.4	.5
AWB18	High	837	787	734	665	587
	Low	821	771	718	658	569
AWB24	High	908	870	833	790	734
	Low	877	840	799	752	692
AWB30	High	1,113	1,066	1,019	968	907
	Low	963	934	901	859	806
AWB36	High	1,278	1,191	1,107	1,012	931
	Low	1,171	1,102	1,028	949	887

Heating Capacity Correction Factor (3)

Supply Voltage	240	230	220	210	208
Correction Factor	1.00	.92	.84	.76	.74

(1) Dry coil with filter in place
(2) 208 volt operation x .96.
(3) Multiply 240 volt capacity by correction factor.

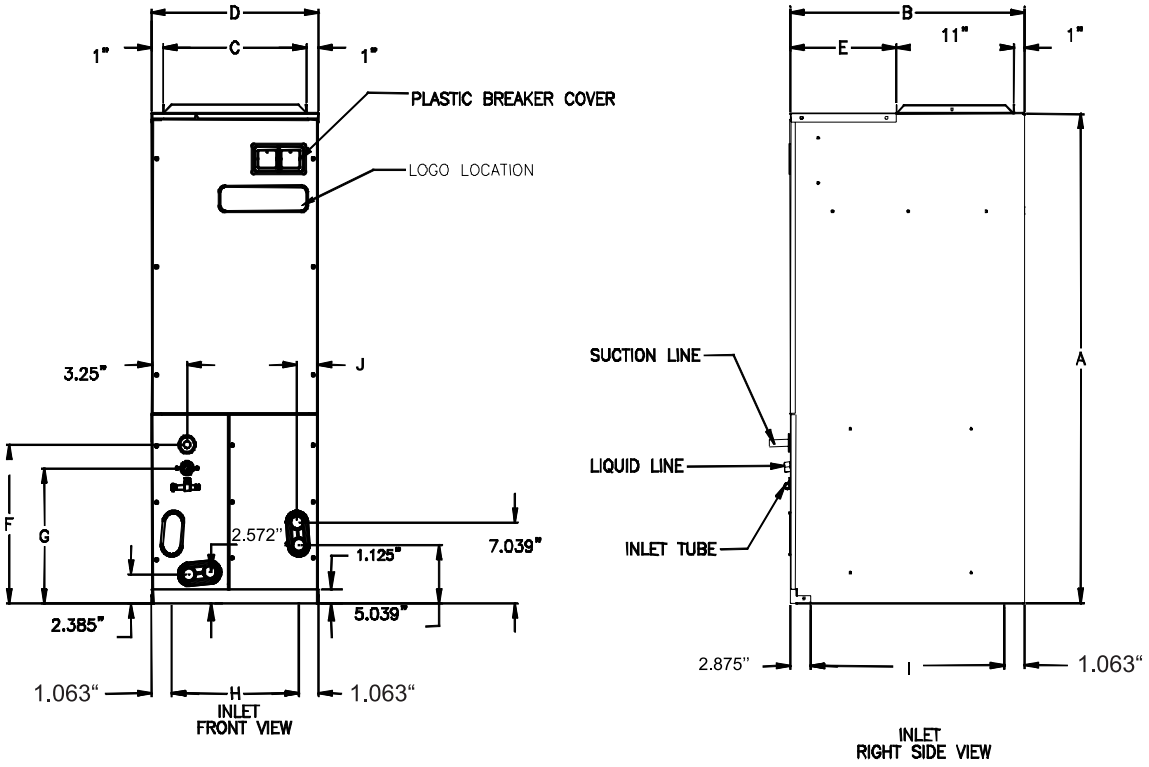
Specifications

Model	Blower Wheel		Coil Drain Connection FPT	Service Valve		Approximate Shipping Weight (pounds)
	Width	Depth		Liquid	Suction	
ARUF018-00A-1 /-1A	8”	6”	3/4”	3/8”	5/8”	105
ARUF024-00A-1 /-1A	9½”	6”	3/4”	3/8”	3/4”	106
ARUF030-00A-1 /-1A	9½”	6”	3/4”	3/8”	3/4”	113
ARUF032-00A-1 /-1A	9½”	6”	3/4”	3/8”	3/4”	120
ARUF032-00A-1B	9½”	8”	3/4”	3/8”	3/4”	120
ARUF036-00A-1 /-1A	9½”	8”	3/4”	3/8”	3/4”	141
ARUF042-00A-1 /-1A	9½”	8”	3/4”	3/8”	3/4”	144
ARUF042-00A-1B	9½”	8”	3/4”	3/8”	3/4”	144
ARUF048-00A-1 /-1A	9½”	8”	3/4”	3/8”	3/4”	173
ARUF049-00A-1 /-1A	9½”	8”	3/4”	3/8”	7/8”	173
ARUF049-00A-1B	10⅝”	8”	3/4”	3/8”	7/8”	173
ARUF060-00A-1 /-1A	10⅝”	10⅝”	3/4”	3/8”	7/8”	192
ARUF061-00A-1 /-1A	10⅝”	10⅝”	3/4”	3/8”	7/8”	192
ARUF061-00A-1B	10⅝”	10⅝”	3/4”	3/8”	7/8”	173

Electrical Data

Model	Single Supply Circuit		Minimum VAC	Maximum VAC	Blower Motor	
	Min. Circuit Ampacity @ 208/240V	Max. Overcurrent Protection @ 208/240V			HP	FLA
ARUF018-00A-1 /-1A	1.2/1.2	15/15	197	253	1/5	0.96
ARUF024-00A-1 /-1A	1.9/1.9	15/15	197	253	1/5	1.5
ARUF030-00A-1 /-1A	2.4/2.4	15/15	197	253	1/3	1.95
ARUF032-00A-1 /-1A	2.4/2.4	15/15	197	253	1/3	1.95
ARUF032-00A-1B	2.1/2.1	15/15	197	253	1/3	1.7
ARUF036-00A-1 /-1A	2.7/2.7	15/15	197	253	1/3	2.15
ARUF042-00A-1 /-1A	2.8/2.8	15/15	197	253	1/2	2.2
ARUF042-00A-1B	3.8/3.8	15/15	197	253	1/3	3.0
ARUF048-00A-1 /-1A	3.3/3.3	15/15	197	253	1/2	2.6
ARUF049-00A-1 /-1A	3.3/3.3	15/15	197	253	1/2	2.6
ARUF049-00A-1B	4.9/4.9	15/15	197	253	1/2	3.95
ARUF060-00A-1 /-1A	4.9/4.9	15/15	197	253	3/4	3.9
ARUF061-00A-1 /-1A	4.9/4.9	15/15	197	253	3/4	3.9
ARUF061-00A-1B	5.4/5.4	15/15	197	253	3/4	4.3

Dimensions



Model	A	B	C	D	E	F	G	H	I	J
ARUF018-00A-1A	42.125”	22”	13.5”	15.5”	10”	14.5”	11.935”	13.125”	17.938”	2.024”
ARUF024-00A-1A	42.125”	22”	13.5”	15.5”	10”	14.5”	11.935”	13.125”	17.938”	2.024”
ARUF030-00A-1A	42.125”	22”	13.5”	15.5”	10”	14.5”	11.935”	13.125”	17.938”	2.024”
ARUF032-00A-1B/-1C	42.125”	22”	13.5”	15.5”	10”	14.5”	11.935”	13.125”	17.938”	2.024”
ARUF036-00A-1A	46.75”	22”	17.5”	19.5”	10”	14.5”	11.935”	17.125”	17.938”	2.024”
ARUF042-00A-1A/-1B	46.75”	22”	17.5”	19.5”	10”	14.5”	11.935”	17.125”	17.938”	2.024”
ARUF048-00A-1A	53.25”	24”	20”	22”	12”	14.5”	11.935”	19.625”	19.938”	1.837”
ARUF049-00A-1A/-1B	53.25”	24”	20”	22”	12”	14.5”	11.935”	19.625”	19.938”	1.837”
ARUF060-00A-1A	53.25”	24”	20”	22”	12”	14.5”	11.935”	19.625”	19.938”	1.837”
ARUF061-00A-1A/-1B	53.25”	24”	20”	22”	12”	14.5”	11.935”	19.625”	19.938”	1.837”

Blower Performance

Model	Speed	CFM Delivered Against External Static Pressure (inches water)				
		0.1”	0.2”	0.3”	0.4”	0.5”
ARUF018-00A-1/-1A	High/Low	700/674	630/600	580/545	530/490	490/380
ARUF024-00A-1/-1A	High/Low	1,056/935	1,020/910	980/880	920/850	870/790
ARUF030-00A-1/-1A	High/Low	1,150/1,060	1,110/1,040	1,040/980	980/910	920/860
ARUF032-00A-1/-1A	High/Low	1,150/1,060	1,110/1,040	1,040/980	980/910	920/860
ARUF032-00A-1B	High/Medium/Low	1,150/870/640	1,090/830/610	1,020/790/570	950/750/530	900/710/490
ARUF036-00A-1/-1A	High/Low	1,549/1,322	1,470/1,310	1,420/1,280	1,360/1,320	1,290/1,150
ARUF042-00A-1/-1A	High/Low	1,586/1,524	1,530/1,490	1,470/1,420	1,410/1,370	1,350/1,175
ARUF042-00A-1B	High/Medium/Low	1,417/1,312/1,051	1,353/1,267/1,016	1,280/1,207/956	1,182/1,116/890	1,068/1,032/890
ARUF048-00A-1/-1A	High/Low	1,670/1,580	1,6310/1,520	1,530/1,470	1,470/1,410	1,390/1,340
ARUF049-00A-1/-1A	High/Low	1,670/1,580	1,6310/1,520	1,530/1,470	1,470/1,410	1,390/1,340
ARUF049-00A-1B	High/Medium/Low	1,706/1,499/1,346	1,676/1,477/1,318	1,644/1,437/1,276	1,609/1,379/1,231	1,534/1,323/1,147
ARUF060-00A-1/-1A	High/Low	2,170/1,900	2,080/1,810	2,000/1,780	1,920/1,710	1850/1,630
ARUF061-00A-1/-1A	High/Low	2,170/1,900	2,080/1,810	2,000/1,780	1,920/1,710	1850/1,630
ARUF061-00A-1B	High/Medium/Low	2,192/1,934/1,672	2,124/1,901/1,606	2,052/1,851/1,562	1,984/1,778/1,532	1,902/1,718/1,482

Dry coil with Filter in Place CFM Correction for Wet Coil - 4%

Heat Kit Applications

	ARUF018-00A-1/-1A	ARUF024-00A-1/-1A	ARUF030-00A-1/-1A	ARUF032-00A-1B/-1C	ARUF036-00A-1/-1A	ARUF042-00A-1/-1A	ARUF042-00A-1B	ARUF048-00A-1/-1A	ARUF049-00A-1/-1A	ARUF049-00A-1B	ARUF060-00A-1/-1A	ARUF061-00A-1/-1A	ARUF061-00A-1B
HKR-03	X	X	X	X	X	X	X	X	X	X	X	X	X
HKR-05(c)	X	X	X	X	X	X	X	X	X	X	X	X	X
HKR-06	X	X	X	X	X	X	X	X	X	X	X	X	X
HKR-08(c)	X	X	X	X	X	X	X	X	X	X	X	X	X
HKR-10(c)		X	X	X+	X	X	X	X	X	X	X	X	X
HKR-15(c)			X	X†	X	X	X	X	X	X	X	X	X
HKR-20(c)					X	X	X∫	X	X	X	X	X	X
HKR-21(c)					X	X	X∫	X	X	X	X	X	X
HKR3-15*					X	X	X	X	X	X	X	X	X
HKR3-20*					X	X	X∫	X	X	X	X	X	X

(c) Circuit breakers optional
* Heat Kit requires 3-phase power supply
+ When using a 10 kW heat kit, this air handler must either be in medium or high speed.
† When using a 15 kW heat kit, this air handler must be on high speed.
∫ When using a 20 kW or 21 kW heat kit, this air handler must be on high speed.

Expansion Valve Kits for Air Conditioning-only Applications

Kit Number	Used With	Description
XVB18-36C	ARUF018 to ARUF036	20% bleed valve
XVB42-60C	ARUF042 to ARUF060	20% bleed valve
XV18-36C	ARUF018 to ARUF036	Non-bleed valve
XV42-60C	ARUF042 to ARUF061	Non-bleed valve

Coil Insulation Kit For Downflow Applications

Chassis Size	Insulation Kit
Small	DPI18-30/20
Medium	DPI36-42/20
Large	DPI48-60/20

Note: Each kit contains enough material to modify 20 coils

Specifications

Model	Blower		Coil Drain Connection FPT	Connection		Shipping Weight (pounds)
	Diameter	Width		Liquid	Suction	
ARPF024-00B-1/-1A	9½"	6"	3/4"	3/8"	3/4"	106
ARPF036-00B-1/-1A	9½"	6"	3/4"	3/8"	3/4"	120
ARPF048-00B-1/-1A	9½"	8"	3/4"	3/8"	7/8"	173
ARPF060-00B-1/-1A	10⅝"	10⅝"	3/4"	3/8"	7/8"	192

Electrical Data

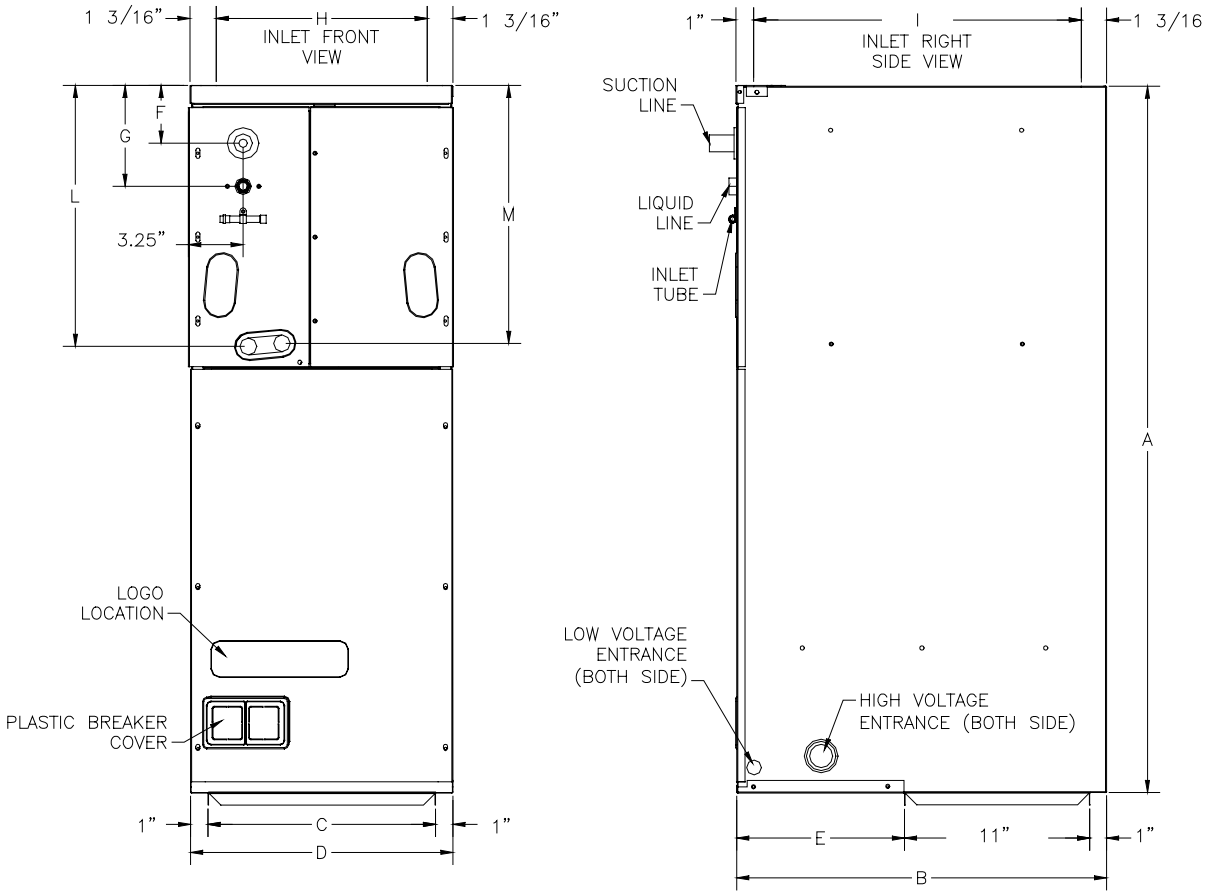
Model	Single Supply Circuit		Minimum VAC	Maximum VAC	Blower Motor	
	Minimum Circuit Ampacity @ 208/240V	Maximum Overcurrent Protection @ 208/240V (amps)			FLA	HP
ARPF024-00B-1/-1A	1.9/1.9	15/15	197	253	1.5	1/5
ARPF036-00B-1/-1A	2.4/2.4	15/15	197	253	1.95	1/3
ARPF048-00B-1/-1A	3.3/3.3	15/15	197	253	2.6	1/2
ARPF060-00B-1/-1A	4.9/4.9	15/15	197	253	3.9	3/4

Heat Kit Selection

	ARPF024-00B-1/-1A	ARPF036-00B-1/-1A	ARPF048-00B-1/-1A	ARPF060-00B-1/-1A
HKR-03A	X	X	X	X
HKR-05CA	X	X	X	X
HKR-06A	X	X	X	X
HKR-08CA	X	X	X	X
HKR-10CA	X	X	X	X
HKR-15CA		X	X	X
HKR-20CA			X	X
HKR-21CA			X	X
HKR3-15A*			X	X
HKR3-20A*			X	X

NOTE: The C indicates circuit breakers are optional.
* Heat Kit requires 3-phase power supply.

Dimensions



Model	A	B	C	D	E	F	G	H	I	L	M
ARPF024-00B-1/-1A	42.125"	22"	13.5"	15.5"	10"	3.5"	6"	13.125"	19.812"	15.5"	15.313"
ARPF036-00B-1/-1A	46.75"	22"	13.5"	19.5"	10"	3.5"	6"	13.125"	19.812"	15.5"	15.313"
ARPF048-00B-1/-1A	53.25"	24"	20"	22"	12"	9.25"	11.875"	19.625"	21.812"	21.438"	21.25"
ARPF060-00B-1/-1A	53.25"	24"	20"	22"	12"	9.25"	11.875"	19.625"	21.812"	21.438"	21.25"

Blower Performance

Model	Speed	CFM Delivered Against External Static Pressure (inches water)				
		0.1"	0.2"	0.3"	0.4"	0.5"
ARPF024-00B-1/-1A	High / Low	1,050 / 900	1,010 / 880	980 / 880	910 / 810	840 / 740
ARPF036-00B-1/-1A	High / Low	1,340 / 1,150	1,280 / 1,120	1,980 / 1,040	1,160 / 1,030	1,080 / 980
ARPF048-00B-1/-1A	High / Low	1,590 / 1,510	1,530 / 1,460	1,530 / 1,430	1,470 / 1,400	1,390 / 1,330
ARPF060-00B-1/-1A	High / Low	2,250 / 2,020	2,180 / 2,000	2,050 / 1,870	2,000 / 1,810	1,970 / 1,780

Dry coil with Filter in Place CFM Correction for Wet Coil - 4%

Specifications

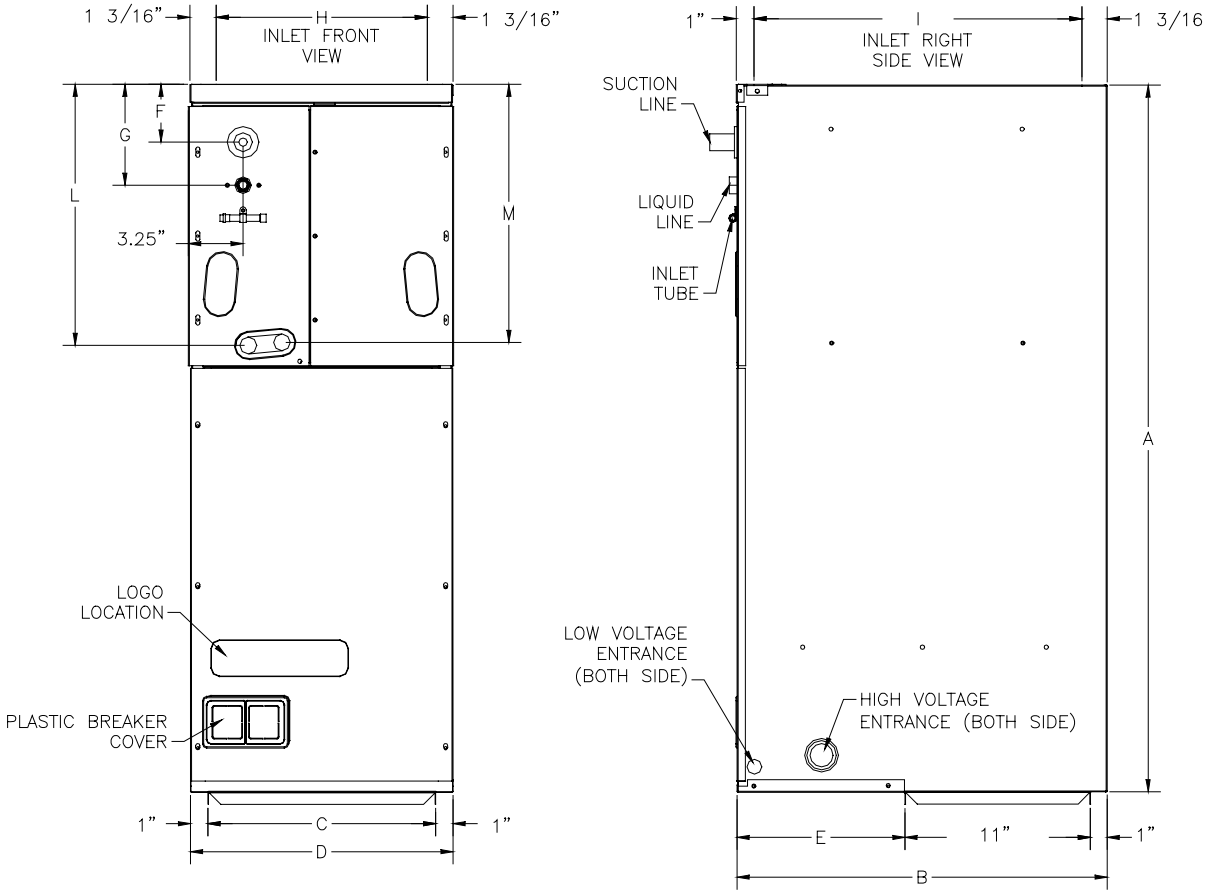
Model	Blower Wheel		Coil Drain Connection FPT	Service Valve		Approximate Shipping Weight (lbs)
	Diameter	Width		Liquid	Suction	
ARPT024-00C-1/00C-1A	9½"	6"	3/4"	3/8"	3/4"	106
ARPT032-00C-1/00C-1A	9½"	6"	3/4"	3/8"	3/4"	120
ARPT032-00C-1B	9½"	6"	3/4"	3/8"	3/4"	120
ARPT036-00C-1/00C-1A	9½"	8"	3/4"	3/8"	3/4"	141
ARPT042-00C-1/00C-1A	9½"	8"	3/4"	3/8"	3/4"	144
ARPT042-00C-1B	9½"	8"	3/4"	3/8"	3/4"	144
ARPT049-00C-1/00C-1A	9½"	8"	3/4"	3/8"	7/8"	173
ARPT049-00C-1B	10⅝"	8"	3/4"	3/8"	7/8"	173
ARPT061-00C-1/00C-1A	10⅝"	10⅝"	3/4"	3/8"	7/8"	192
ARPT061-00C-1B	10⅝"	10⅝"	3/4"	3/8"	7/8"	173

Electrical Data

Model	Single Supply Circuit		Minimum VAC	Maximum VAC	Blower Motor	
	Min. Circuit Ampacity*	Max. Overcurrent Protection			HP	FLA
ARPT024-00C-1/00C-1A	1.9/1.9	15/15	197	253	1/5	1.5
ARPT032-00C-1/00C-1A/00C-1B	2.4/2.4	15/15	197	253	1/3	1.95
ARPT032-00C-1B	2.4/2.4	15/15	197	253	1/3	1.95
ARPT036-00C-1/00C-1A	2.7/2.7	15/15	197	253	1/3	2.15
ARPT042-00C-1/00C-1A	2.8/2.8	15/15	197	253	1/2	2.2
ARPT042-00C-1B	3.8/3.8	15/15	197	253	1/3	3.0
ARPT049-00C-1/00C-1A	3.3/3.3	15/15	197	253	1/2	2.6
ARPT049-00C-1B	4.9/4.9	15/15	197	253	1/2	3.95
ARPT061-00C-1/00C-1A	4.9/4.9	15/15	197	253	3/4	3.9
ARPT061-00C-1B	5.4/5.4	15/15	197	253	3/4	4.3

* Minimum Circut Ampacity @ 208/ 240 V +Maximum Overcurrent Protection @ 208/ 240 V

Dimensions



Model	A	B	C	D	E	F	G	H	I	L	M
ARPF024-00B-1/-1A	42.125"	22"	13.5"	15.5"	10"	3.5"	6"	13.125"	19.812"	15.5"	15.313"
ARPF036-00B-1/-1A	46.75"	22"	13.5"	19.5"	10"	3.5"	6"	13.125"	19.812"	15.5"	15.313"
ARPF048-00B-1/-1A	53.25"	24"	20"	22"	12"	9.25"	11.875"	19.625"	21.812"	21.438"	21.25"
ARPF060-00B-1/-1A	53.25"	24"	20"	22"	12"	9.25"	11.875"	19.625"	21.812"	21.438"	21.25"

Blower Performance

Model	Speed	CFM Delivered Against External Static Pressure (inches water)				
		0.1"	0.2"	0.3"	0.4"	0.5"
ARPF024-00B-1/-1A	High / Low	1,050 / 900	1,010 / 880	980 / 880	910 / 810	840 / 740
ARPF036-00B-1/-1A	High / Low	1,340 / 1,150	1,280 / 1,120	1,980 / 1,040	1,160 / 1,030	1,080 / 980
ARPF048-00B-1/-1A	High / Low	1,590 / 1,510	1,530 / 1,460	1,530 / 1,430	1,470 / 1,400	1,390 / 1,330
ARPF060-00B-1/-1A	High / Low	2,250 / 2,020	2,180 / 2,000	2,050 / 1,870	2,000 / 1,810	1,970 / 1,780

Dry coil with Filter in Place

CFM Correction for Wet Coil - 4%

The AER Series Airhandlers represent the next generation of indoor air moving and conditioning equipment. Combining all of the advantages of our standard Airhandlers with the features and benefits of the new General Electric ECM™ Programmable Motor; the AER Series Airhandlers have been designed to provide the highest level of indoor comfort at the increased efficiency levels demanded today.

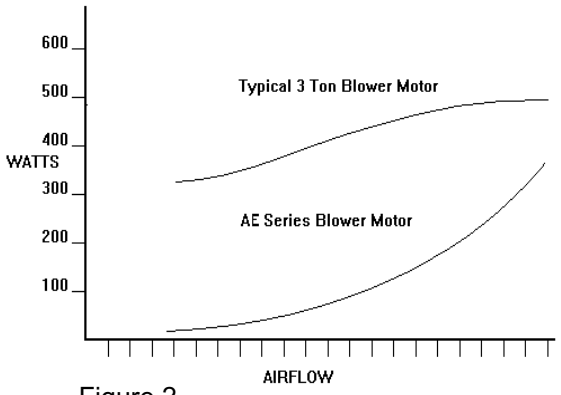
The AER Series Airhandlers do not require any special external electronic controls and can be operated with the same controls as our standard air handlers without any extensive or complicated connections.

WHAT DOES THE AER SERIES AIRHANDLER DO?

Efficiency

The ECM™ motors utilized in the AER Series Airhandlers are, at full load, over 20% more efficient than the motors utilized in the typical airhandler. And they maintain their efficiency throughout the entire load range in variable speed applications.

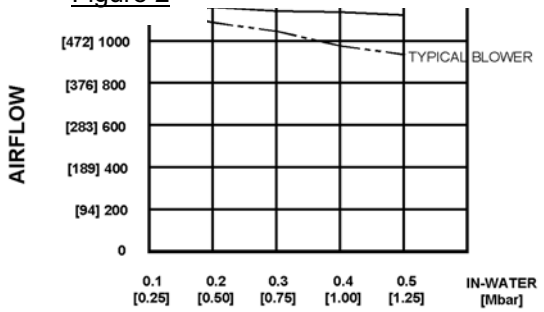
Figure 1



Constant CFM vs. Static Pressure (Figure 2)

The airflow delivered to a system by a typical airhandler is dependent upon the static pressure requiring careful attention to the design of the air distribution network. Often the system's airflow requirements in the cooling mode are different than they are in the heating mode making it necessary to design the air distribution network for the cooling or heating mode, or a compromise of the two. In such cases the system's capacity may be reduced resulting in higher operating costs and a lower

Figure 2



The AER Series Airhandlers delivers the optimum airflow for the system size whether in the heating or Cooling mode and regardless of the static pressure imposed by the air distrubution

Constant Fan

The airflow delivered to the system in constant fan operation by the typical airhandler is the full system require-ments. In most applications the constant fan operation is intended to provide air circulation throughout the condi-tioned space to prevent air stratification. In such applications the full system airflow is not required and results in a high background noise level and high operating cost. The AER Series airhandlers deliver to the system ap-proximately 30% of the full system airflow in constant fan operation. (60% or Y1 airflow can be field se-lected.) This results in lower background noise levels and lower operating cost.

Fan Only Mode

Fan Only Mode will select 30% of the Air Flow when dip switch #3 is OFF. FAN ONLY MODE will select 60% or Y1 cooling Air Flow when dip switch #3 is ON.

Humidity Control

The typical airhandler when matched with today's high efficiency outdoor sections operating under high humidity conditions may not remove sufficient moisture from the conditioned air to provide the desired comfort level. The AER Series Airhandlers provides further humidity control when operated with a standard 24V de-humidistat. When the de-humidistat detects a high humidity condition, the airflow delivered to the system is reduced allowing the indoor coil to remove more moisture from the conditioned air. When the de-humidistat detects normal humidity conditions the airflow delivered to the system is increased to the normal level.

Soft Start/Stop vs. Instant On/Off

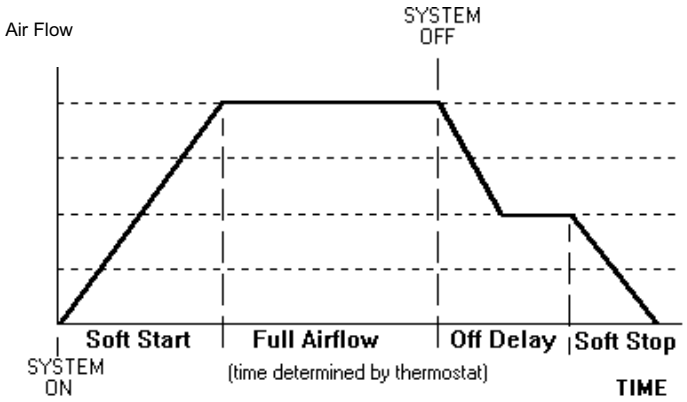
Upon a call for system operation the blower motor of a typical airhandler is energized at full speed. Because of the time lag between a call for system operation and the system operating at full capacity this often results in com-plaints of “warm air blasts" at start up in the cooling mode, and of "cold air blasts" at start up in the heating mode. There are also potential complaints of noise and distraction caused by the blower motor starting at full speed.

PRODUCT SPECIFICATIONS

Figure 3 represents the airflow delivered to the system by the AER Series Airhandlers for a typical cooling/ heating cycle.

Upon a call for system operation the AER's blower motor provides a soft start, i.e. the airflow delivered to the system "ramps" from zero to the system's full air flow requirements. Ramping the airflow during the system start up matches the airflow closer to the immediate system capacity to eliminate the complaints of "warm" or "cold air blasts". Ramping the airflow from zero to full system requirements also serves to eliminate the perceived noise and distraction which occurs on start up with the typical airhandler.

Figure 3



Upon a call to shut down system operation the AER's blower motor provides a soft stop, i.e. the airflow delivered to the system ramps down to approximately 50% of the full system requirements and remains there for a period of time and then ramps down to a full stop. The shut down air profile is intended to take the maximum advantage of the residual cooling or heating capacity of the indoor coil without "warm" or cold air blasts". Ramping the airflow from full system requirements to zero also eliminates the perceived noise and distraction which occurs on shut down with a typical airhandler.

Two Speed Application

The typical airhandlers blower motor when matched with a two speed outdoor section normally does not deliver the optimum airflow to the system for both high and low speed operation. This is due to design limitations inherent in the design of the standard induction motor. Because of this the typical two-speed application is designed to operate based upon the airflow delivered at either high or low speed and as a result the overall system efficiency and comfort level provided by the system is compromised. **The AER airhandler delivers the optimum airflow to the system for both high and low speed operations. As a result the overall system efficiency and comfort level provided by the system is not compromised.**

PERFORMANCE RATINGS

MODEL NO.	CAPACITY (TONS) NOMINAL COOLING+	SEASONAL EFFICIENCY AFUE
AER24-1	2	100
AER30-1	2-1/2	100
AER36-1	3	100
AER48-1	4	100
AER60-1	5	100

* Capacity and efficiency ratings in accordance with U.S. Government standard tests

** Capacity correction factors @ 208V = 0.75, 230V = 0.92 (Heating)

\+ Refer to outdoor sections specifications for actual rating

HEATER KIT APPLICATION OPTIONS

MODEL NO.	AER24-1	AER30-1	AER36-1	AER48-1	AER60-1
HKR-03					
HKR-05(c)	x	x			
HKR-06					
HKR-08(c)	x	x	x		
HKR-10(c)	x	x	x	x	x
HKR-15C			x	x	x
HKR-20C					x
HKR-21C					x

(c) circuit breakers optional

ELECTRICAL DATA

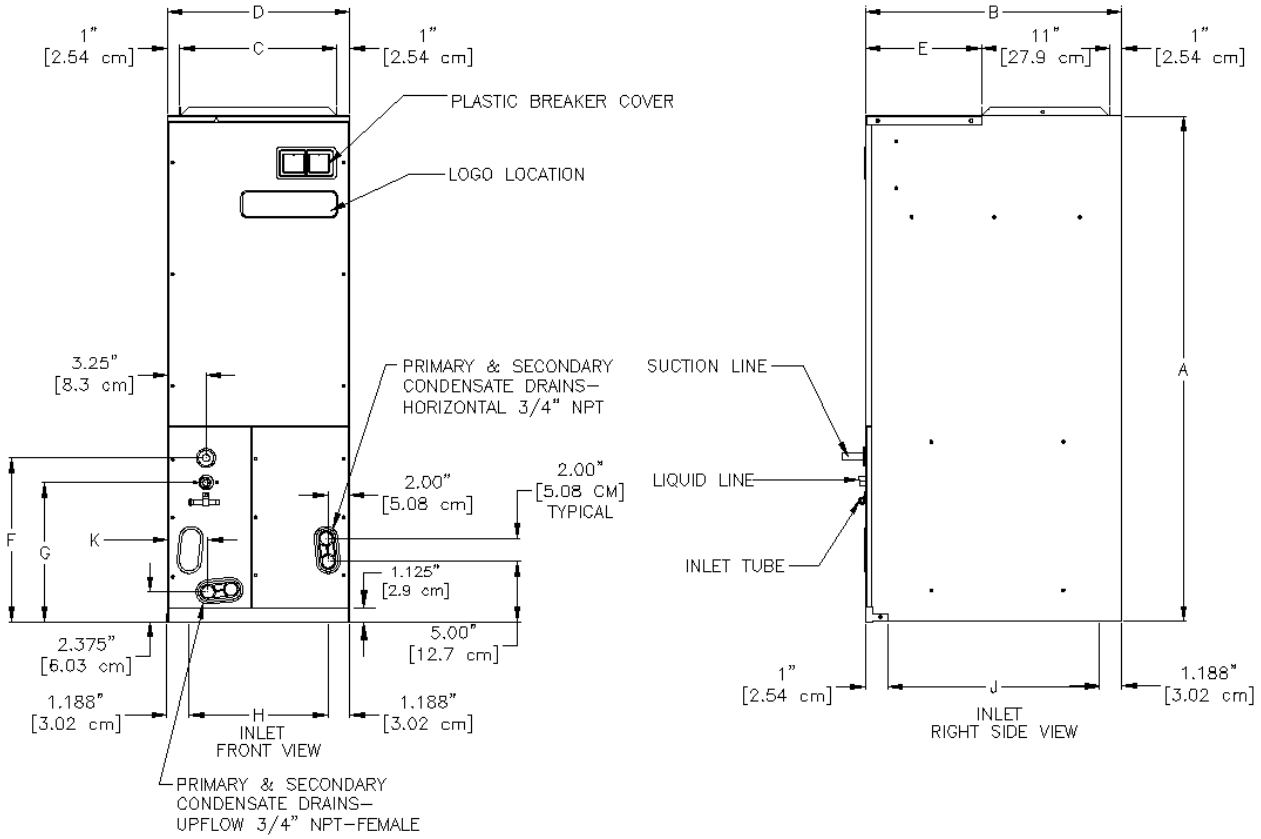
MODEL NO.	SINGLE SUPPLY CIRCUIT				MIN. VAC	MAX VAC	BLOWER MOTOR	
	MINIMUM AMPACITY		MAXIMUM OVERCURRENT PROTECTION				FLA	HP
	208V	240V	208V	240V				
AER24-1	2.5	2.5	15	15	197	253	2.0	1/2
AER30-1	2.5	2.5	15	15	197	253	2.0	1/2
AER36-1	3.1	3.1	15	15	197	253	2.5	3/4
AER48-1	6.1	6.1	15	15	197	253	4.9	3/4
AER60-1	7.8	7.8	15	15	197	253	6.2	3/4

PRODUCT SPECIFICATIONS

PHYSICAL DATA

Models	Blower		Coil Drain Conn. FPT	Refrigerant Connections		Approx. Shipping Weight	Filter Size (permanent washable)
	Dia.	Width		Liq.	Suct.		
AER24, 30	9.5 [24.1cm]	8 [20.3cm]	3/4	3/8 [1.0cm]	3/4 [1.9cm]	147 LBS [66.7 Kg]	19x21x1 [48.3 X 53.3 X 2.5 cm's]
AER36, 48, 60	10 [25.4cm]	10 [25.4cm]	3/4	3/8 [1.0cm]	7/8 [2.1cm]	195 LBS [88.5 Kg]	21-1/2x24x1 [54.6 X 61 X 2.5 cm's]

[ ] DESIGNATES METRIC EQUIVALENTS



Base Model #	A	B	C	D	E	F	G	H	J	K
AER24, 30	46.75 [118.7 cm]	22 [55.9 cm]	17.5 [44.5 cm]	19.5 [49.5 cm]	10 [25.4 cm]	13.375 [34.0 cm]	10.811 [27.5 cm]	17.125 [43.5 cm]	19.812 [50.3 cm]	3.563 [9.05cm]
AER36, 48, 60	53.25 [135.3 cm]	24 [61.0 cm]	20 [50.8 cm]	22 [55.9 cm]	12 [30.5 cm]	14.5 [36.8 cm]	11.935 [30.3 cm]	19.625 [49.8 cm]	21.812 [55.4 cm]	3.343 [8.49CM]

[ ] DESIGNATES METRIC EQUIVALENTS

NOTE: SPECIFICATIONS AND PERFORMANCE DATA LISTED HEREIN ARE SUBJECT TO CHANGE WITHOUT NOTICE

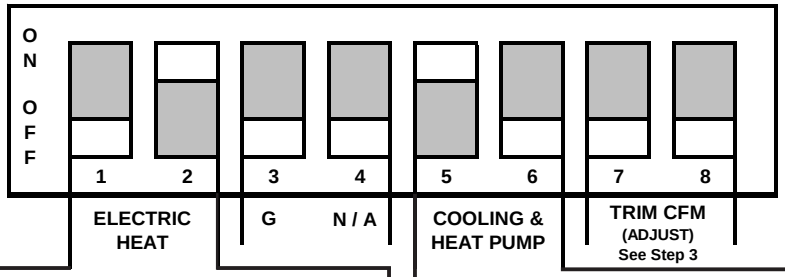
HOW IS THE AER SERIES AIRHANDLER'S AIRFLOW CHANGED?

WARNING

HIGH VOLTAGE! Disconnect ALL power sources before installing, servicing or setting up switches. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

IMPORTANT: Cooling, Heating and Backup Heat (Electric Heat) airflow must be set-up using dip-switch on terminal board, **IT IS NOT A FACTORY SET-UP.**

The AER Series Airhandlers blower motors have been preprogrammed for operation at 4 distinct airflow levels when operating in the Cooling, H.P. Heating, Backup Heating (Electric Heating), and Backup + H.P. Heating. Each mode has 4 levels to deliver different Air Flow CFM [L/s]. Simply flip the dip switch, and you can get different CFM combinations.



Follow these procedures to set up your Air Flow:

1. SET UP HEAT MODE (ELECTRIC HEAT MODE):

On dip switch channel 1 and 2 - It is recommended that you select the taps allowed in the tables below. CFM [L/s]

AER24-30

Heating Element KW	Switch Position	Emrgy. (Bkup)	HP w/ Bkup AirFlow
UP TO 10	OFF-OFF	1100 [519]	1210 [571]
UP TO 10	ON-OFF	850 [401]	935 [441]
5	OFF-ON	700 [330]	775 [354]

AER36-60

Heating Element KW	Switch Position	Emrgy. (Bkup)	HP w/ Bkup Air Flow
UP TO 20	OFF-OFF	2050 [967]	2150 [1015]
UP TO 20	ON-OFF	1750 [826]	1835 [866]
UP TO 15	OFF-ON	1600 [755]	1680 [793]
UP TO 10	ON-ON	1200 [566]	1260 [595]

2. SET UP COOL/HEAT PUMP MODE:

On dip switch channel 5 and 6 - Find the Air Flow for you application in the tables below. Set up motor by the outdoor unit capacity tons. CFM [L/s]

AER24-30

Outdoor Unit Tons	Switch Position	Indoor Air Flow	
		Cool	H.P.
2.5	OFF-OFF	1100 [519]	1100 [519]
2	ON-OFF	800 [378]	800 [378]
1.5	OFF-ON	600 [283]	600 [283]

AER36-60

Outdoor Unit Tons	Switch Position	Indoor Air Flow	
		Cool	H.P.
5	OFF-OFF	1800 [849]	1800 [849]
4	ON-OFF	1580 [746]	1580 [746]
3.5	OFF-ON	1480 [698]	1480 [698]
3	ON-ON	1200 [566]	1200 [566]

3. **SET UP ADJUST MODE:** You can increase or decrease your selected Air Flow to fit your requirement.
   On dip switch channel 7 and 8 - ON-OFF will increase selected COOL/HP Air Flow by 10%.
   - OFF-ON will decrease selected COOL/HP Air Flow by 15%.
   NOTE: Other settings have no effect on the set airflow.

4. **FAN ONLY MODE** will select 30% of the Air Flow when dip switch #3 is OFF, FAN ONLY MODE will select 60% or Y1 cooling Air Flow when dip switch #3 is ON.

5. When using a Humidistat (normally closed), cut jumper PJ6. The Humidistat will only effect cooling airflow by adjusting the Air Flow to 85%.

Specifications

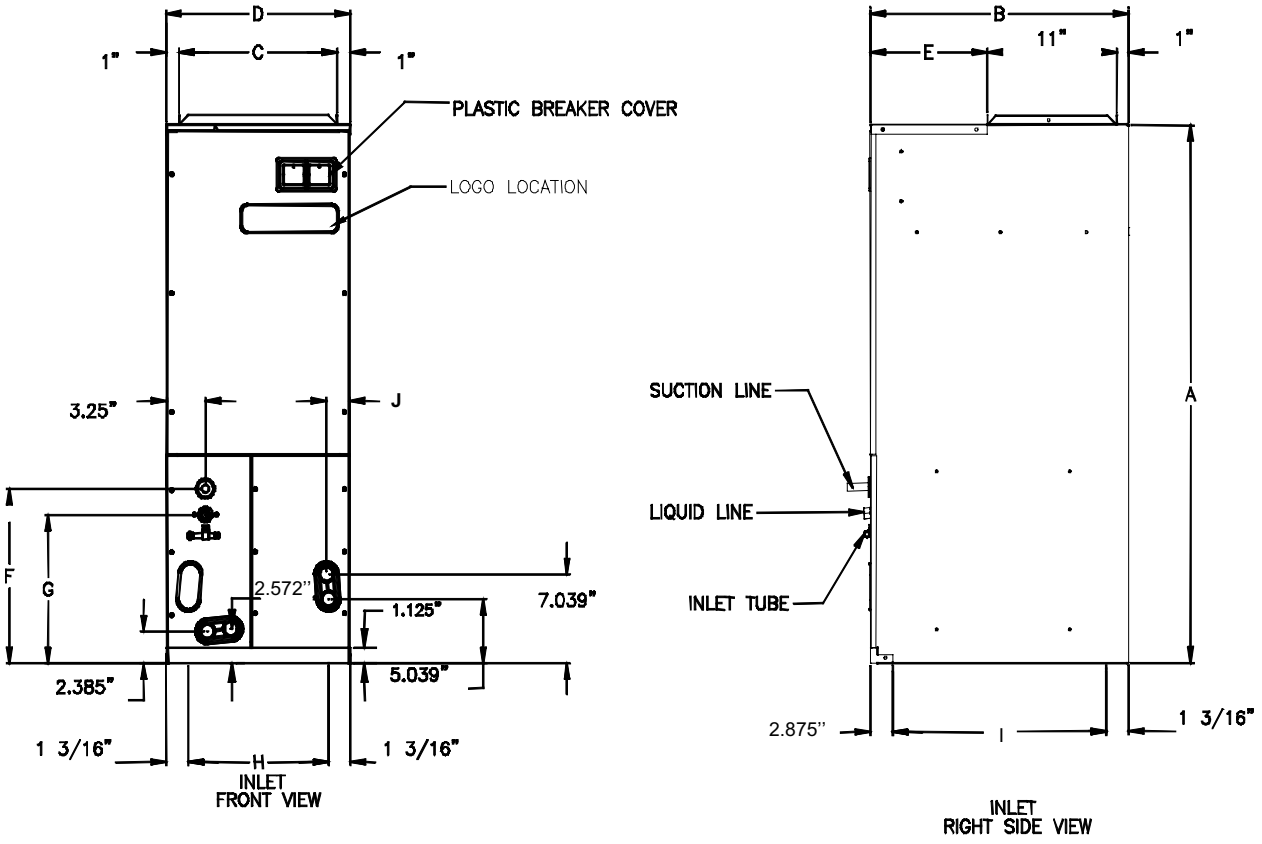
Model	Blower		Coil Drain Connection FPT	Liquid Connection	Suction Connection	Approximate Shipping Weight (pounds)
	Diameter	Width				
AEPT030-00C-1/00C-1A	9½"	8"	3/4"	3/8"	3/4"	147
AEPT036-00C-1/00C-1A	10⅝"	10⅝"	3/4"	3/8"	7/8"	176
AEPT060-00C-1/00C-1A	10⅝"	10⅝"	3/4"	3/8"	7/8"	195

Electrical Data

Model	Single Supply Circuit		Minimum VAC	Maximum VAC	Blower Motor	
	Minimum Circuit Ampacity	Max. Overcurrent Protection			FLA	HP
AEPT030-00C-1/00C-1A	2.5/2.5	15/15	197	253	2.0	1/2
AEPT036-00C-1/00C-1A	3.1/3.1	15/15	197	253	2.5	3/4
AEPT060-00C-1/00C-1A	7.8/7.8	15/15	197	253	6.2	3/4

* Minimum Circut Ampacity @ 208/ 240 V +Maximum Overcurrent Protection @ 208/ 240 V

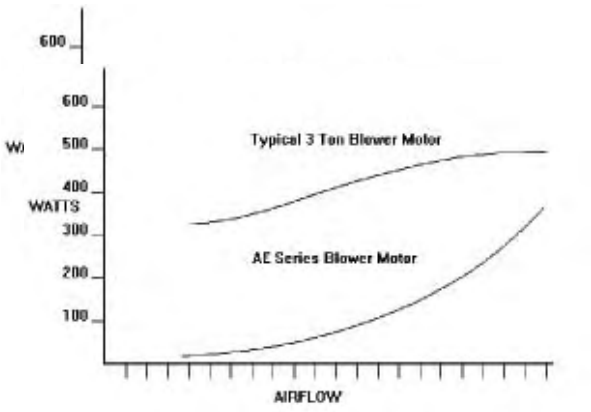
Dimensions



Model	A	B	C	D	E	F	G	H	I	J
AEPT030-00C-1/00C-1A	46¾"	22"	17½"	19½"	10"	14½"	11.935"	17⅛"	17.938"	2.024"
AEPT036-00C-1/00C-1A AEPT060-00C-1/00C-1A	53¼"	24"	20"	22"	12"	14½"	11.935"	19⅝"	17.938	1.837"

AEPT Overview

The AEPT air handler represents the next generation of indoor air moving and conditioning equipment. Combining all of the advantages of our standard air handlers with the features and benefits of a variable-speed DC programmable motor, the AEPT air handler has been designed to provide the highest level of indoor comfort at the increased efficiency levels demanded today.



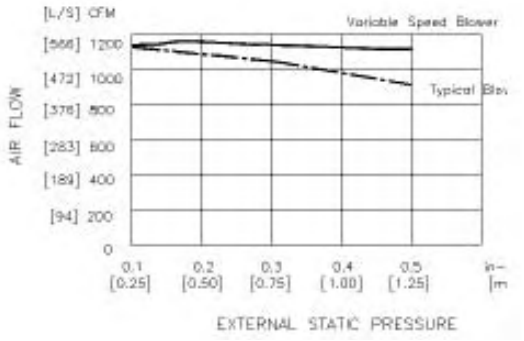
The AEPT air handlers do not require any special external electronic controls and can be operated with the same controls as our standard air handlers without any extensive or complicated connections.

Efficiency

The variable-speed DC motors utilized in the AEPT air handler are, at full load, over 20% more efficient than the motors utilized in the typical air handler. They also maintain their efficiency throughout the entire load range in variable-speed applications.

Constant CFM vs. Static Pressure

The air flow delivered to a system by a typical air handler is dependent upon the static pressure requiring careful attention to the design of the air distribution network. Often, the system's air flow requirements in the cooling mode are different from the heating mode, making it necessary to design the air distribution network for the cooling or heating mode, or a compromise of the two. In such cases, the system's capacity may be reduced, resulting in higher operating costs and a lower level of comfort.



The AEPT air handler delivers the optimum air flow for the system size, whether in heating or cooling mode, regardless of the static pressure imposed by the air distribution.

Constant Fan

The air flow delivered to the system in constant fan operation by the typical air handler is the full system requirement. In most applications, the constant fan operation is intended to provide air circulation throughout the conditioned space to prevent air stratification. In such applications, the full system air flow is not required and results in a high background noise level and high operating cost.

The AEPT air handler delivers to the system approximately 30% of the full system air flow in constant fan operation (60% or Y1 air flow can be field-selected). This results in lower background noise levels and lower operating cost.

Fan Only Mode

Fan Only Mode will select 30% of the Air Flow when dip switch #3 is OFF. FAN ONLY MODE will select 60% or Y1 cooling Air Flow when dip switch #3 is ON.

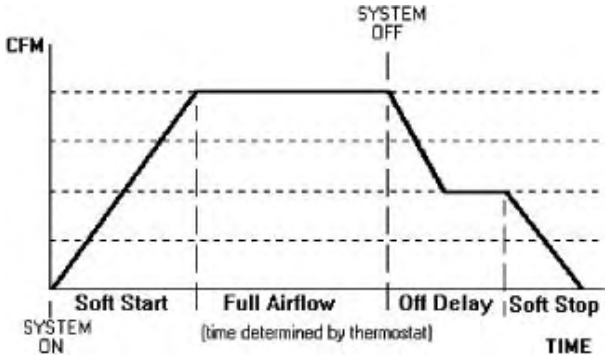
Humidity Control

When matched with today's high-efficiency outdoor sections, the typical air handler operating under high-humidity conditions may not remove sufficient moisture from the conditioned air to provide the desired comfort level.

The AEPT air handler provides further humidity control when operated with a standard 24V de-humidistat. When the de-humidistat detects a high-humidity condition, the air flow delivered to the system is reduced, allowing the indoor coil to remove more moisture from the conditioned air. When the de-humidistat detects normal humidity conditions, the air flow delivered to the system is increased to the normal level.

Soft Start/Stop vs. Instant On/Off

Upon a call for system operation, the blower motor of a typical air handler is energized at full speed. Because of the time lag between a call for system operation and the system operating at full capacity, this often results in complaints of blasts of warm air at start-up in the cooling mode, and of blasts of cold air at start-up in the heating mode. There are also potential complaints of noise and distraction caused by the blower motor starting at full speed.



Air flow delivered to the system by the AEPT air handler for a typical cooling/heating cycle.

Soft Start

Upon a call for system operation, the AEPT's blower motor provides a soft start. This means the air flow gradually increases from zero to the system's full air flow requirements. Ramping the air flow during the system start-up matches the air flow more closely to the immediate system capacity, eliminating blasts of warm or cold air. Ramping the air flow from zero to full system requirements also eliminates the perceived noise and distraction, which occurs on start-up with the typical air handler.

Soft Stop

Upon a call to shut down system operation, the AEPT's blower motor provides a soft stop. This means the air flow delivered to the system ramps down to approximately 50% of the full system requirements and remains there for a period of time and then ramps down to a full stop. The shut-down air profile is intended to take the maximum advantage of the residual cooling or heating capacity of the indoor coil without blasts of warm or cold air. Ramping the air flow from full system requirements to zero also eliminates the perceived noise and distraction, which occurs on shut-down with a typical air handler.

Two-Speed Application

The typical air handler blower motor, when matched with a 2-speed outdoor section, normally does not deliver the optimum air flow to the system for both high- and low-speed operation. This is due to design limitations inherent in the design of the standard induction motor. Because of this, the typical 2-speed application is designed to operate based upon the air flow delivered at either high or low speed. As a result, the overall system efficiency and comfort level provided by the system are compromised.

The AEPT air handler delivers the optimum air flow to the system for both high- and low-speed operations. As a result, the overall system efficiency and comfort level provided by the system are not compromised.

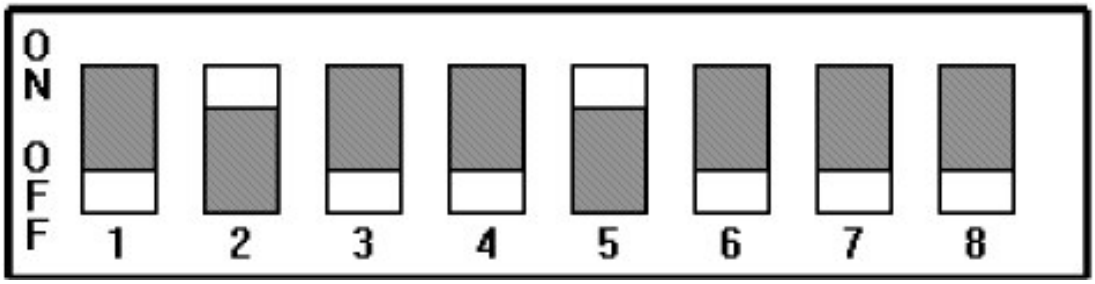
WARNING

HIGH VOLTAGE! Disconnect ALL power sources before installing, servicing or setting up switches. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

AEPT Dipswitches

The AEPT air handler blower motors have been pre-programmed for operation at four distinct air flow levels when operating in the Cooling, Heat Pump Heating, Backup Heating (Electric Heating) and Backup + Heat Pump Heating. Each mode has four levels to deliver different CFM. Simply flip the dipswitch, and you can get a different CFM combination.

Setting Up Your Motor



Dipswitch Number	Function	Instructions
1	Electric Heat Mode	Select the taps allowed in the tables (Dipswitch 1/2) below.
2	Electric Heat Mode	
3	N/A	N/A
4	Thermostat Mode	ON = The system operates with single-stage units using a single-stage cooling or heat pump thermostat. (factory default) OFF = The system operates with two-stage units with either a conventional two-stage cooling/heat pump thermostat or with an encoded two-stage thermostat for cooling operation. The encoded thermostats can be used with two-stage condensing units in retrofit applications where there aren't enough existing wires available for connections to the indoor thermostat and outdoor units.
5	Cooling/Heat Pump Mode	Find the air flow for your application in the tables (Dipswitch 5/6) below.
6	Cooling/Heat Pump Mode	Set up the motor based on the outdoor unit capacity tons.
7	Trim CFM Adjust Mode	Increase or decrease your selected air flow to fit your requirement. ON-OFF = Increases selected Cool/Heat Pump air flow by 10%. OFF-ON = Decreases selected Cool/Heat Pump air flow by 15% NOTE: Other settings have no effect on the set air flow.
8	Trim CFM Adjust Mode	

Dipswitch 1/2

AEPT30

Heating Element (kW)	Switch Position	Emergency Backup	Heat Pump with Backup
Up to 10	OFF-OFF	1,100	1,210
Up to 10	ON-OFF	850	935
5	OFF-ON	700	770

AEPT36/60

Heating Element (kW)	Switch Position	Emergency Backup	Heat Pump with Backup
Up to 20	OFF-OFF	2,050	2,150
Up to 20	ON-OFF	1,750	1,835
Up to 15	OFF-ON	1,600	1,680
Up to 10	ON-ON	1,200	1,260

Dipswitch 5/6

AEPT30

Outdoor Unit (Tons)	Switch Position	Indoor Air Flow	
		Cool	Heat Pump
2.5	OFF-OFF	1,100	1,100
2	ON-OFF	800	800
1.5	OFF-ON	600	600

AEPT36/60

Outdoor Unit (Tons)	Switch Position	Indoor Air Flow	
		Cool	Heat Pump
5	OFF-OFF	1,800	1,800
4	ON-OFF	1,580	1,580
3.5	OFF-ON	1,480	1,480
3	ON-ON	1,200	1,200

NOTE: When applying a humidistat (normally closed), refer to the installation and operating instructions. The humidistat can adjust the cooling air flow to 85%.

Heat Kit Selection

Model	AEPT030-00C-1/00C-1A	AEPT036-00C-1/00C-1A	AEPT060-00C-1/00C-1A
HKR-05C	X		
HKR-08C	X	X	
HKR-10C	X	X	X
HKR-15C		X	X
HKR-20C			X
HKR-21C			X

NOTE: The C indicates circuit breakers are optional

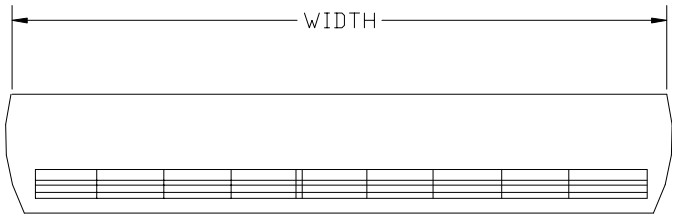
SPECIFICATIONS

RATINGS - RATINGS INDICATED ARE WITH MATCHING HDCX OUTDOOR SECTION

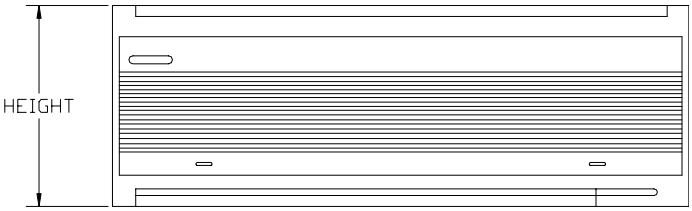
MODEL	WMC12-1A	WMC18-1A	WMC24-1A	AWM25F-KFAD (ACSON INTERNATIONAL)
CONTROL				
OPERATION	LCD MICRO COMPUTER REMOTE CONTROL			
DISCHARGE AIR	LOUVER (UP & DOWN) & GRILLE (LEFT & RIGHT)			
ROOM TEMPERATURE	ELECTRONIC THERMOSTAT			
RATINGS				
NOMINAL CAPACITY (KCALH / BTUH)	3,024 / 11,400	4,536 / 16,800	6,048 / 20,000	5,544 / 22,000
POWER SUPPLY (V / PH / HZ)	208 – 230 / 1 / 60			
WATTS (W)	1457	2040	2860	2716
MIN. CIRCUIT AMPACITY (A)	8.0	12.6	16.4	12.6
MAX. OVERCURRENT PROTECTION	15	20	30	30
AIRFLOW (cmm / cfm)	8.22 / 290	11.9 / 420	15.3 / 540	16,43 / 580
HIGH FAN (dBA)	43	48	52	47
MED. FAN (dBA)	41	44	48	44
LOW FAN (dBA)	39	39	45	42
BLOWER WHEEL	TANGENTIAL			
MOTOR				
NO. POLES	4	4	2	4
V / PH / HZ	208 – 230 /1 / 60			
INPUT WATTS (W)	32	40	110	81
RUNNING CURRENT (A)	0.16	0.19	0.51	0.38
OVERLOAD PROTECTION	INTERNAL THERMAL OVERLOAD RELAY			
REFRIGERANT COIL				
FACE AREA (M^2/FT^2)	0.179 / 1.927	0.224 / 2.411	0.224 / 2.411	0.254 / 2.733
NO. ROWS	2			
TUBES				
MATERIAL	COPPER (SEAMLESS INNER GROOVED TUBE)			
DIAMETER (mm / in)	7.00 / 0.276	9.52 / 3/8	9.52 / 3/8	7.0 / 9/32
THICKNESS (mm / in)	0.32 / 0.013	0.36 / 0.014	0.36 / 0.014	0.22 / 0.013
FIN				
MATERIAL	ALUMINUM (HYDROPHILIC COATED)			
FIN / in	20	14	14	18
AIR FILTER MEDIA	ANTI FUNGUS POLYPROPYLENE			
COND. DRAIN SIZE (mm / in)	16 / .063	20 / 5/64	20 / 5/64	20 / 5/64
DIMENSIONS				
HEIGHT (mm / in)	360 / 14.2	372 / 14.6	372 / 14.6	306 / 12
WIDTH (mm / in)	849 / 33.4	1,043 / 41.1	1,043 / 41.1	1062 / 41.8
DEPTH (mm / in)	152 / 6.0	189 / 7.4	189 / 7.4	202 / 8.0
SHIPPING WEIGHT (kg / lbs)	9.5 / 20.9	14.5 / 32.0	15.0 / 33.1	16 / 35.3

RATINGS – RATINGS INDICATED ARE WITH MATCHING HDC OUTDOOR SECTION

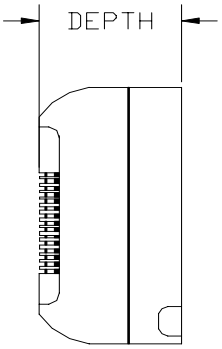
Wiring Diagram



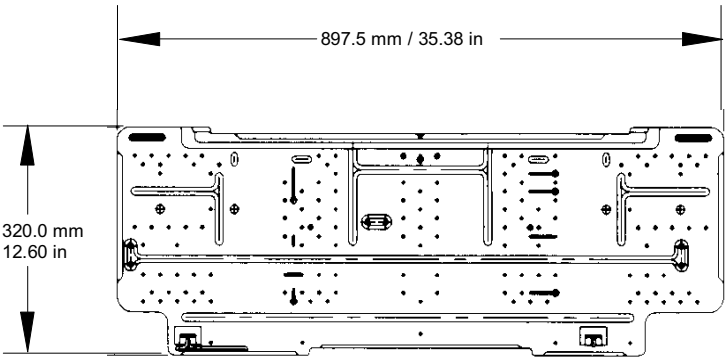
TOP VIEW

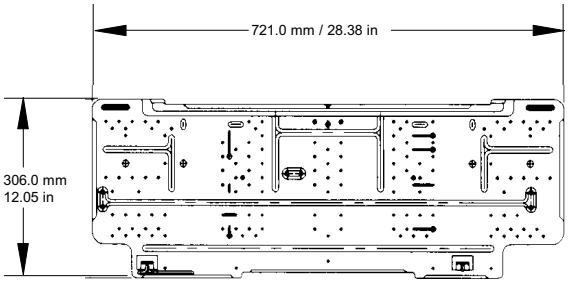


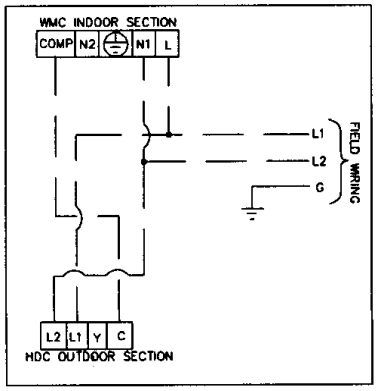
FRONT VIEW

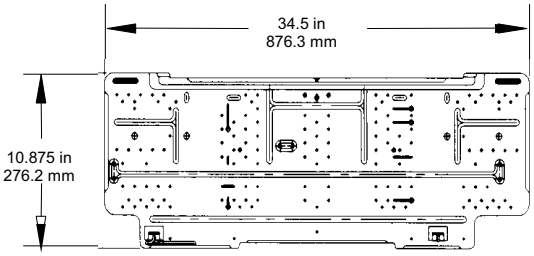


SIDE VIEW









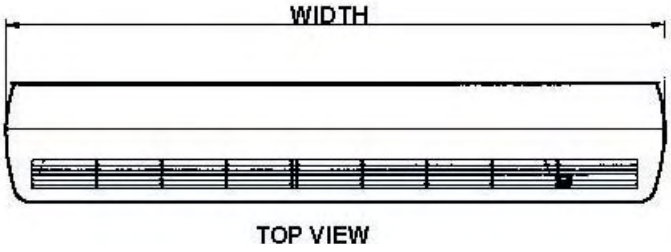
Installation Plate
AWM25F-KFAD

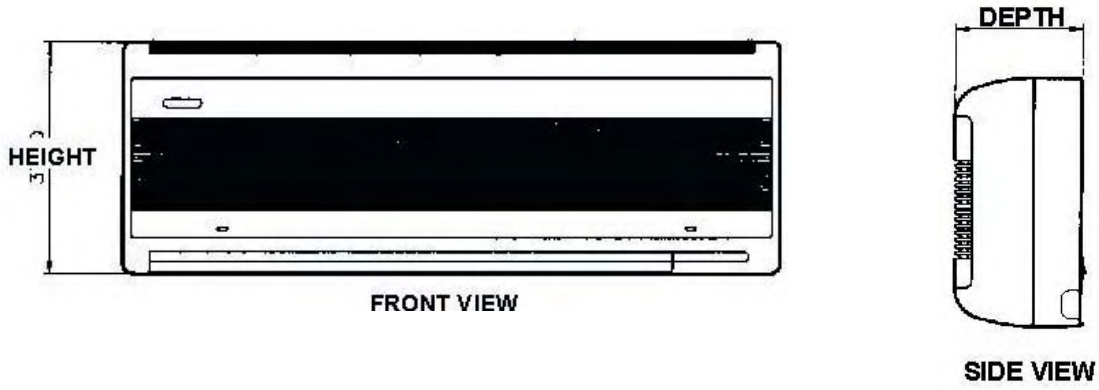
Specifications

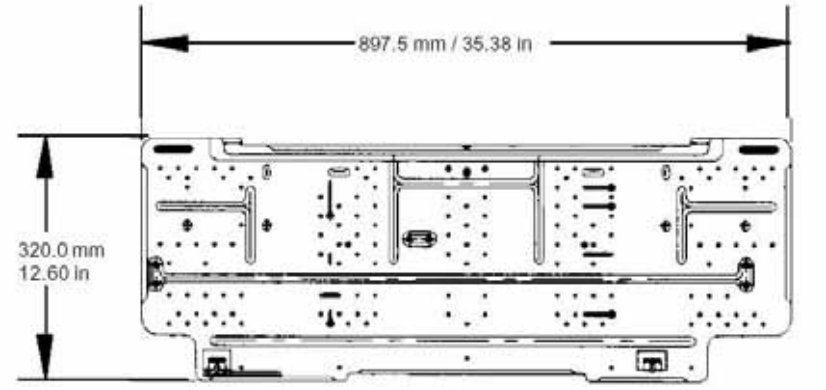
Model	WMH12-1A	WMH18-1A	WMH24-1A
Control			
Operation	LCD Micro Computer Remote Control		
Discharge Air	Louver (Up & Down) & Grille (Left & Right)		
Room Temperature	Electronic Thermostat		
Ratings			
Nominal Cooling Capacity (kcalh / btuh)	2772 / 11,000	4032 / 16,000	4662 / 18,500
Nominal Heating Capacity (kcalh / btuh)	2646 / 10,500	3906 / 15,000	4662 / 18,500
	208/230-1-60		
Seer / Cop (See Footnote 1) (Cooling / Heating)	10.0 / 2.50	10.0 / 2.75	10.0 / 2.72
Min. Circuit Ampacity (A) (See Footnote 1)	7.9	12.3	15.0
Max. Overcurrent Protection (A) (See Footnote 1)	15	25	30
Airflow (Cmm / Cfm)	8.22 / 290	11.9 / 420	15.3 / 540
Sound Pressure			
High Fan (dBA)	43	48	52
Med. Fan (dBA)	41	44	48
Low Fan (dBA)	39	39	45
Motor			
No. Poles	4	4	2
V-Ph-Hz	208/230-1-60		
Input Watts (W)	32	40	110
Running Current (A)	0.16	0.19	0.51
Overload Protection	INTERNAL THERMAL OVERLOAD RELAY		
Refrigerant Coil			
Face Area (M^2/ft^2)	0.179 / 1.927	0.224 / 2.411	0.224 / 2.411
No. Rows	2		
Refrigerant Coil Tubes			
Material	RIFLED COPPER TUBING		
Diameter (mm / in)	7.00 / 0.276	9.52 / 3/8	9.52 / 3/8
Thickness (mm / in)	0.32 / 0.013	0.36 / 0.014	0.36 / 0.014
Fin Material	ALUMINUM (HYDROPHILIC COATED)		
Fins per Inch	20	14	14
Dimensions			
Height (mm / in)	360 / 14.2	372 / 14.6	372 / 14.6
Width (mm / in)	849 / 33.4	1,043 / 41.1	1,043 / 41.1
Depth (mm / in)	152 / 6.0	189 / 7.4	189 / 7.4
Other Specifications			
Blower Wheel	TANGENTIAL		
Air Filter Media	ANTI FUNGUS POLYPROPYLENE HONEYCOMB		
Cond. Drain Size (Mm / In)	16 / .063	20 / 0.79	20 / 0.79
Shipping Weight (Kg / Lbs)	9.5 / 20.9	14.5 / 32.0	15.0 / 33.1

RATINGS - RATINGS INDICATED ARE WITH MATCHING HDP OUTDOOR SECTION

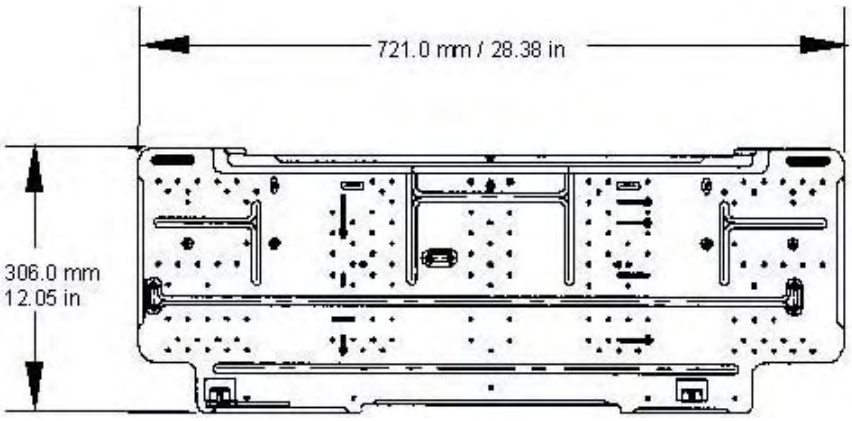
Dimensions







INSTALLATION PLATE WMH18-1A & WMH24-1A



INSTALLATION PLATE WMH12-1A

LOCATION & CLEARANCES

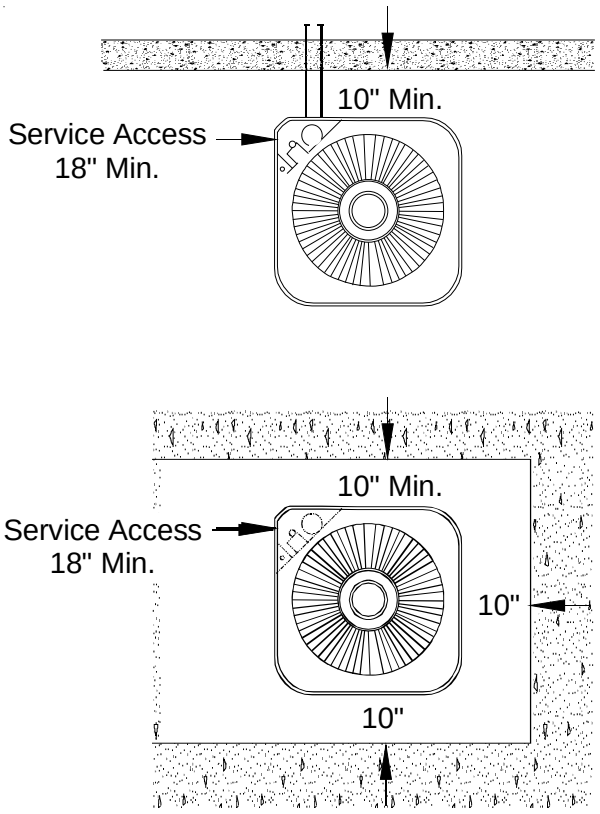
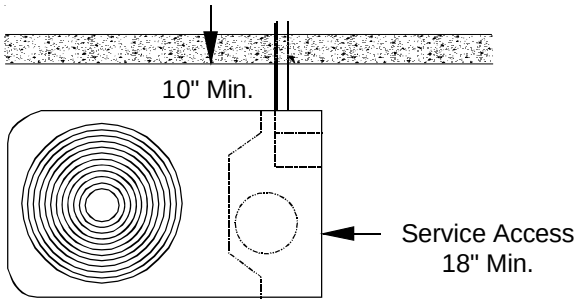


FIGURE 1



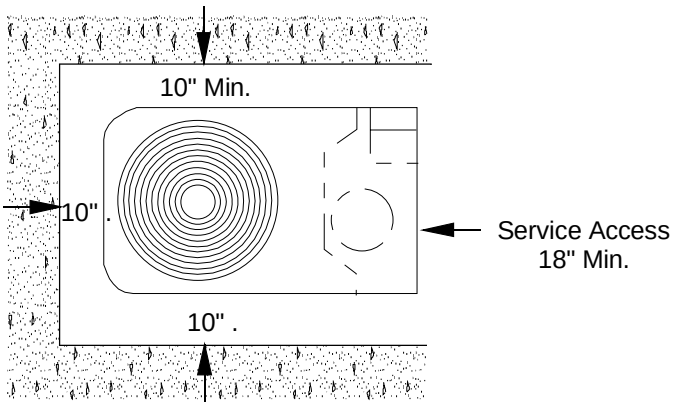


FIGURE 2

Close to the wall application assures free, unobstructed air to the other two sides. In more confined application spaces, such as corners, provide a minimum 10" clearance on all air inlet sides. Allow 18" minimum for service access to the compressor compartment and controls.

The top of the unit should be completely unobstructed. If units are to be located under an overhang, there should be a minimum of 36" clearance and provisions made to deflect the warm discharge air out from the overhang.

LOCATION

If unit is to be located under an overhang, there should be a minimum of 36" clearance and provisions made to deflect the warm discharge air out from the overhang. If the outdoor unit is mounted above the air handler, the maximum lift should not exceed 70' (suction line). If air handler is mounted above condensing unit, the lift should not exceed 50' (liquid line.). Refer to Figure 3 and Table 1 for maximum refrigerant line lengths.

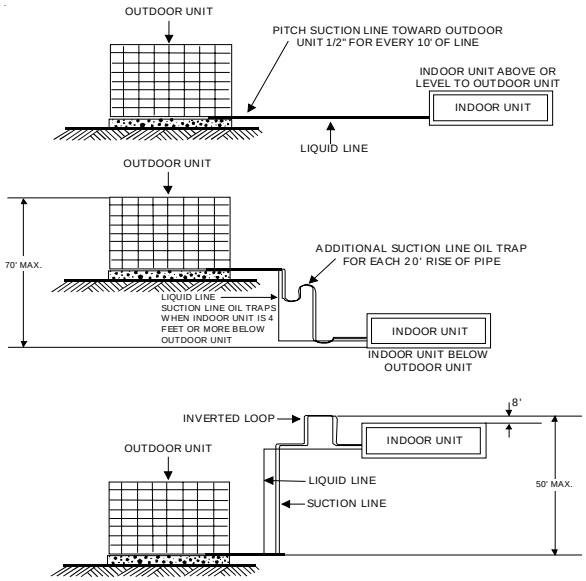


FIGURE 3

The condensing unit must be mounted on a solid, level foundation, i.e. pre-formed concrete slab or other suitable base. For rooftop application, make sure the building construction can support the weight and that proper consideration is given to the weather-tight integrity of the roof. The condensing unit contains moving components and can vibrate; therefore, sound is also a consideration in rooftop application. Since this unit discharges warm condenser air from the top with cooler air being drawn in three sides, plantings can be made in relatively close proximity to the unit. Owners should be advised to avoid lawn mower discharge toward the unit depositing debris on the fan coil surface reducing product efficiency.

PRODUCT DESIGN

This section gives a basic description of cooling unit operation, its various components and their basic operation. Ensure your system is properly sized for heat gain and loss according to methods of the Air Conditioning Contractors Association (ACCA) or equivalent.

CONDENSING UNIT

These units are designed for free air discharge. Condensed air is pulled through the condenser coil by a direct drive propeller fan and then discharged from the cabinet top. The unit requires no additional resistance (i.e. duct work) and should not be added.

The Goodman Remote Heat Pump condensing units are designed for 208-230 dual voltage single phase applications. The 3, 4, and 5 ton models are also available for 230V 3 phase applications. The 7.5 and 10 ton models are available in 230V and 460V 3 phase applications. The units range in size from 1.5 to 5-ton and have a rating of 10 through 13 SEER. SEER efficiency is dependent upon the unit and its components. Refer to the "Technical Information" manual of the unit you are servicing for further details.

The Goodman Remote Condensing Units range in size from 1.5 through 5 ton and have a rating of 10 through 14 SEER. Efficiency is dependent upon the unit and its components. Refer to the "Technical Information" manual of the unit you are servicing for further details.

Goodman Remote Condensing Units are designed for 208-240 volt single phase applications. The 3, 4, 5, 7.5 and 10 ton models are also available for 230V and 460V 3 phase applications.

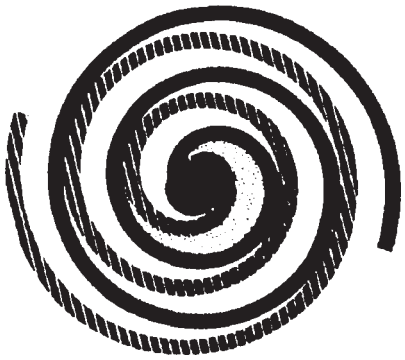
Suction and Liquid Line Connections

The suction and liquid line connections of the unit are set up for field piping with refrigerant-type copper. Front seating valves are factory-installed to accept the field-run copper. The total refrigerant charge needed for a normal operation is also factory-installed. For additional refrigerant line set information, refer to the "Technical Information" manual of the unit you are servicing.

Compressors

Goodman unit use a mix of reciprocating and scroll compressors. There are a number of design characteristics which differentiate the scroll compressor from the reciprocating compressor. One is the scroll. A scroll is an involute spiral which, when matched with a mating scroll form as shown, generates a series of crescent shaped gas pockets between the two members.

During compression, one scroll remains stationary (fixed scroll) while the other form (orbiting scroll) is allowed to orbit (but not rotate) around the first form.



As this motion occurs, the pockets between the two forms are slowly pushed to the center of the two scrolls while simultaneously being reduced in volume. When the pocket reaches the center of the scroll form, the gas, which is now at a high pressure, is discharged out of a port located at the center.

During compression, several pockets are being compressed simultaneously, resulting in a very smooth process. Both the suction process (outer portion of the scroll members) and the discharge process (inner portion) are continuous.

Some design characteristics of the Compliant Scroll compressor are:

- Compliant Scroll compressors are more tolerant of liquid refrigerant.

  NOTE: Even though the compressor section of a Scroll compressor is more tolerant of liquid refrigerant, continued floodback or flooded start conditions may wash oil from the bearing surfaces causing premature bearing failure.

- Compliant Scroll compressors use white oil which is compatible with 3GS. 3GS oil may be used if additional oil is required.

- Compliant scroll compressors perform "quiet" shutdowns that allow the compressor to restart immediately without the need for a time delay. This compressor will restart even if the system has not equalized.

  NOTE: Operating pressures and amp draws may differ from standard reciprocating compressors. This information can be found in the unit's Technical Information Manual.

PRODUCT DESIGN

WARNING

When installing or servicing this equipment, safety clothing, including hand and eye protection, is strongly advised. If installing this equipment in an area that has special safety requirements (hard hats etc.), observe these requirements. To protect the unit when welding close to the painted surfaces, the use of a quenching cloth is strongly advised to prevent scorching or marring of the equipment finish.

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

WARNING

The unit MUST have an uninterrupted, unbroken electrical ground to minimize the possibility of personal injury if an electrical fault should occur. The electrical ground circuit may consist of an appropriately sized electrical wire connecting the ground lug in the unit control box to the building electrical service panel. Other methods of grounding are permitted if performed in accordance with the "National Electric Code" (NEC)/"American National Standards Institute" (ANSI)/"National Fire Protection Association" (NFPA) 70 and local/state codes. In Canada, electrical grounding is to be in accordance with the Canadian Electric Code CSA C22.1. Failure to observe this warning can result in electrical shock that can cause personal injury or death.

WARNING

If this appliance is installed in an enclosed area such as a garage or utility room with any carbon monoxide (CO) producing appliance (i.e. automobile, furnace, water-heaters, etc.), ensure the area is properly ventilated.

WARNING

The United States Environmental Protection Agency ("EPA") has issued various regulations regarding the introduction and disposal of refrigerants introduced into this unit. Failure to follow these regulations may harm the environment and can lead to the imposition of substantial fines. These regulations may vary by jurisdiction. A certified technician must perform the installation and service of this product. Should questions arise, contact your local EPA office. Violation of EPA regulations may result in fines or penalties.

AIR HANDLERS

**See AirHandler Specification Sheet for Proper Combinations.*
SOME AIR HANDLERS USE DIRECT DRIVE MOTORS.
POWER SUPPLY IS 220-240 V, 50 HZ, 1 PHASE

INSTALLATION

Before installing this appliance insure that it is properly sized and adequate power is available.

This appliance can be installed in the vertical or right horizontal position without modification. The horizontal left and downflow positions require product modification.

This product is designed for zero centimeter (0 cm) clearance; however, adequate access for service or replacement must be considered without removing permanent structure. This unit can be installed on a platform when deemed necessary.

In an attic installation a secondary drain pan must be provided by the installer and placed under the entire unit with a separate drain line properly sloped and terminated in an area visible to the owner. This secondary drain pan is required in the event that there is a leak or main drain blockage. Closed cell insulation should be applied to the drain lines in unconditioned spaces where sweating may occur.

Appliances installed in garages, warehouses or other areas where they may be subjected to mechanical damage must be suitably guarded against such damage by installing behind protective barriers, being elevated or located out of the normal path of vehicles. When installed on a base, the base must also be protected by similar means.

Heating and cooling equipment located in garages, which may generate a glow, spark or flame capable of igniting flammable vapors, must be installed with the ignition source at least 18"[46cm] above the floor level.

When more than one appliance is installed in a building it shall be permanently identified as to the area or space serviced by the equipment.

When this product is installed in the vertical position in an unconditioned space, remove the horizontal drain pan and install the following insulation kit

Unit	Kit No.
A24-00-2RA	DPI18-30/20
A36-000-2RA	DPI36-42/20
A48-00-2RA A61-00-2RA	DPI48-61/20

This kit is used to prevent sweating on the vertical drain pan.

SYSTEM OPERATION

COOLING

The refrigerant used in the system is R-22. It is clear and colorless and the chemical formula is $CHCLF_2$. The boiling point, at atmospheric pressure is -41.4°F.

A few of the important principles that make the refrigeration cycle possible are: heat always flows from a warmer to a cooler body, under lower pressure a refrigerant will absorb heat and vaporize at a low temperature, the vapors may be drawn off and condensed at a higher pressure and temperature to be used again.

In the cooling mode, the indoor evaporator coil functions to cool and dehumidify the air conditioned spaces through the evaporative process taking place within the coil tubes.

NOTE: Actual temperatures and pressures are to be obtained from the "Cooling Performance Chart."

High temperature, high pressure vapor leaves the compressor through the discharge line, through the reversing valve on heat pump models, and enters the condenser coil. Air drawn through the condenser coil by the condenser fan causes the refrigerant to condense into a liquid by removing heat from the refrigerant. As the refrigerant is cooled below its condensing temperature it becomes subcooled.

The subcooled high pressure liquid refrigerant now leaves the condenser coil via the liquid line until it reaches the indoor expansion device.

As the refrigerant passes through the expansion device and into the evaporator coil a pressure drop is experienced causing the refrigerant to become a low pressure vapor. Low pressure saturated refrigerant enters the evaporator coil where heat is absorbed from the warm air drawn across the coil by the evaporator blower. As the refrigerant passes through the last tubes of the evaporator coil it becomes superheated, that is, it absorbs more heat than is necessary for the refrigerant to vaporize. Maintaining proper superheat assures that liquid refrigerant is not returning to the compressor which can lead to early compressor failure.

Low pressure superheated vapor leaves the evaporator coil and returns through the suction line, and on heat pump models through the reversing valve, to the compressor where the cycle begins again.

COOLING CYCLE

Cooling

When the contacts of the room thermostat close, R to Y and G in the unit are energized.

This energizes the compressor contactor, the condenser fan motor, and indoor blower motor.

When the thermostat is satisfied, it opens its contacts, breaking the low voltage circuit, causing the compressor contactor to open and indoor fan to stop after the fan off delay.

If the room thermostat fan selector switch should be set to the "on" position then the indoor blower would run continuous rather than cycling with the compressor.

HEATING CYCLE

Heat Pump Models

On heat pump units, when the room thermostat is set to the heating mode, the reversing valve is not energized. This is an indication to the defrost board that the unit is in the heating mode. As long as the thermostat is set for heating, the reversing valve will be in the de-energized position for heating except during a defrost cycle.

On a demand for first stage heat with heat pump units, the room thermostat energizes “Y” and “G”. This supplies 24Vac to terminal “Y” of the defrost board, the compressor contactor and the “G” terminal in the unit. The compressor starts in the heating mode and the indoor blower motor starts. When 24Vac is present at terminal “Y” of the defrost board during the heating mode, the board accumulates compressor run time.

When the first stage heat demand “Y” is satisfied, the room thermostat will remove the 24Vac from “Y” and “G”. The compressor turns off and the indoor blower will stop after the fan off delay. The defrost board will store the compressor’s accumulated run time in memory.

When auxiliary electric heaters are used, a two stage heating single stage cooling thermostat must be installed.

Should the second stage heating contacts in the room thermostat close, which would be wired to W1 at the unit low voltage connections, this would energize the coil(s) of the electric heat relay(s). Contacts within the relay(s) will close, bringing on the electric resistance heaters.

If auxiliary electric heaters should be used, they may be controlled by outdoor thermostats.

SYSTEM OPERATION

Emergency Heat Mode (Heat Pumps)

NOTE: The following only applies if the unit has an approved electric heat kit installed for auxiliary heating.

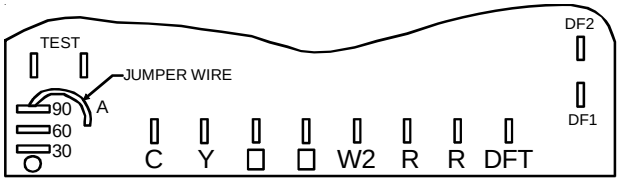
With the thermostat set to the emergency heat position and a call for 2nd stage heat, R to W1 will e energized. This will energize the electric heat sequencers. When the normally open contacts of the heat sequencers close, this will energize the electric resistance heat and also the indoor blower motor through the normally closed contacts of the EBTDR.

DEFROST CYCLE

The defrosting of the outdoor coil is jointly controlled by the defrost control board and the defrost thermostat.

Solid State Defrost Control

During operation the power to the circuit board is controlled by a temperature sensor, which is clamped to a return bend on the outdoor coil. Defrost timing periods of 30, 60, or 90 minutes may be selected by connecting the circuit board jumper to 30, 60, or 90 respectively. Accumulation of time for the timing period selected starts when the sensor closes (approximately 31° F), and when the room thermostat calls for heat. At the end of the timing period, the unit's defrost cycle will be initiated provided the sensor remains closed. When the sensor opens (approximately 75° F), the defrost cycle is terminated and the timing period is reset. If the defrost cycle is not terminated due to the sensor temperature, a ten minute override interrupts the unit's defrost period.



FAN OPERATION

Continuous Fan Mode (All Models)

If the thermostat calls for continuous fan, the indoor blower will be energized from the normally open contacts of the EBTDR after a 7 second delay on 2 thru 4 ton units, or through the normally open contacts of the blower relay on 5 ton units.

Anytime there is a call for continuous fan, the indoor blower will be energized through the normally open contacts of the EBTDR on 2 thru 4 ton units and from the "G" terminal from the thermostat on 5 ton units, regardless of a call for heat or cool.

If the thermostat is not calling for heat or cool, and the fan switch on the thermostat is returned to the automatic position, the fan will stop after a 65 second delay on all air handlers with multi-speed motors.

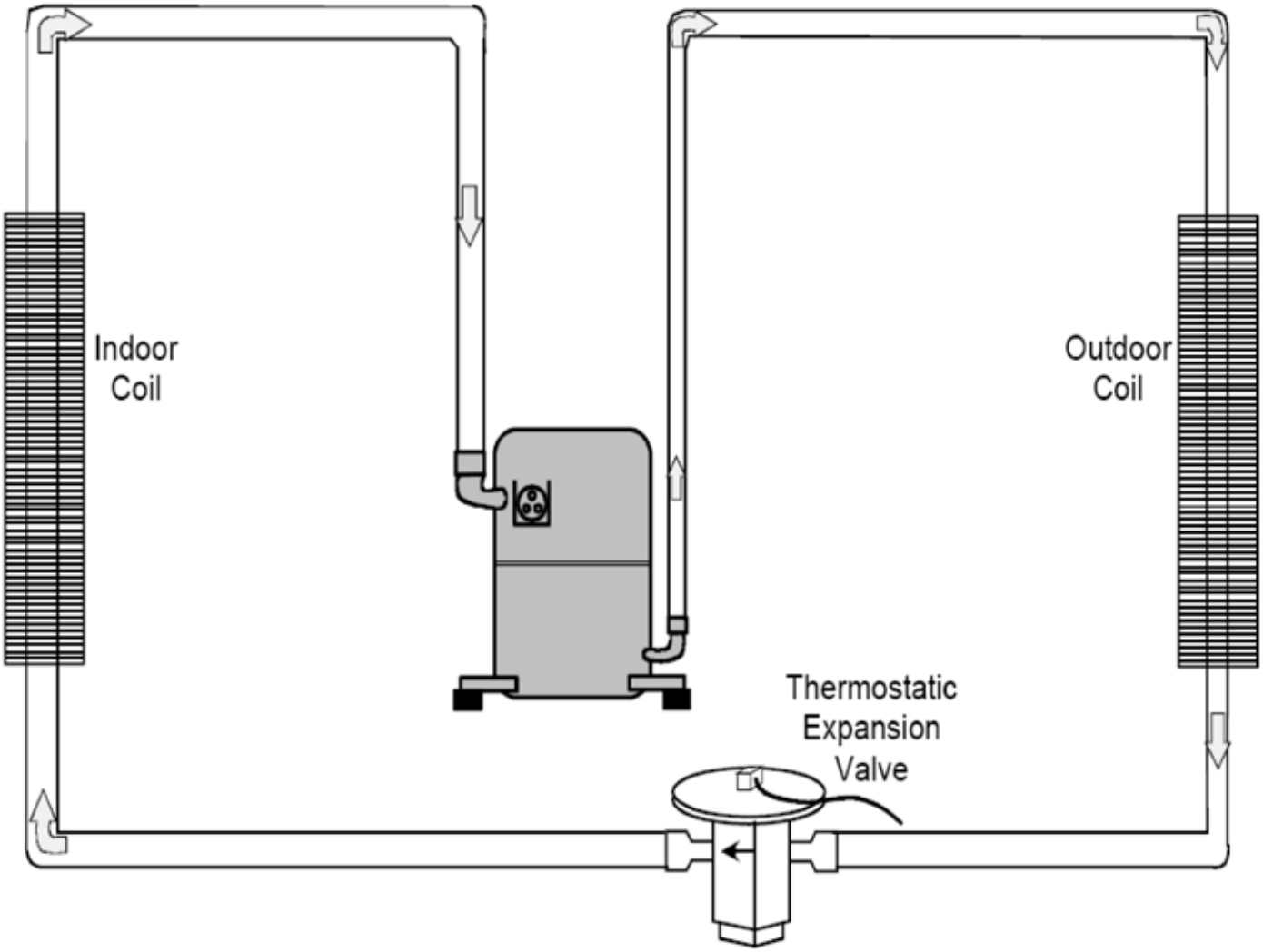
Soft Start (AER & AEPT)

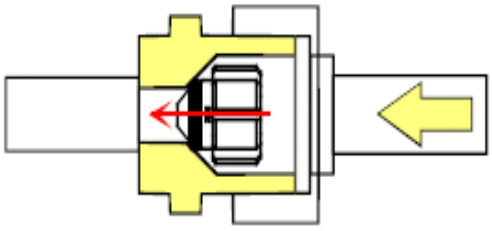
Upon a call for system operation, the blower motor provides a soft start, i.e. the airflow delivered to the system "ramps" from zero to the system's full air flow requirements. Ramping the airflow during the system start up matches the airflow closer to the immediate system capacity to eliminate the complaints of "warm" or "cold air blasts". Ramping the airflow from zero to full system requirements also serves to eliminate the perceived noise and distraction which occurs on start up with the typical airhandler.

Upon a call to shut down system operation, the blower motor provides a soft stop, i.e. the airflow delivered to the system ramps down to approximately 50% of the full system requirements and remains there for a period of time and then ramps down to a full stop. The shut down air profile is intended to take the maximum advantage of the residual cooling or heating capacity of the indoor coil without "warm" or cold air blasts". Ramping the airflow from full system requirements to zero also eliminates the perceived noise and distraction which occurs on shut down with a typical airhandler.

SYSTEM OPERATION

COOLING CYCLE

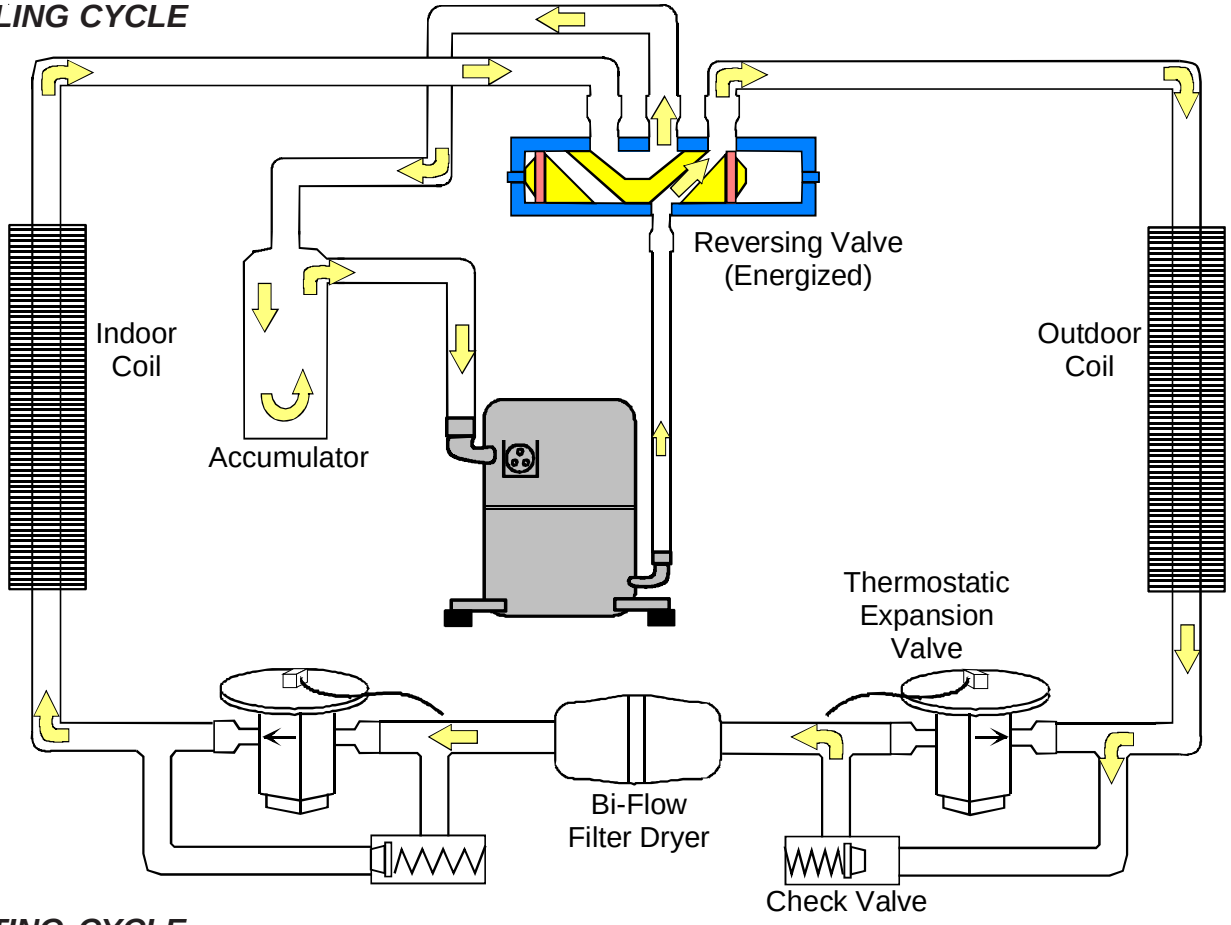




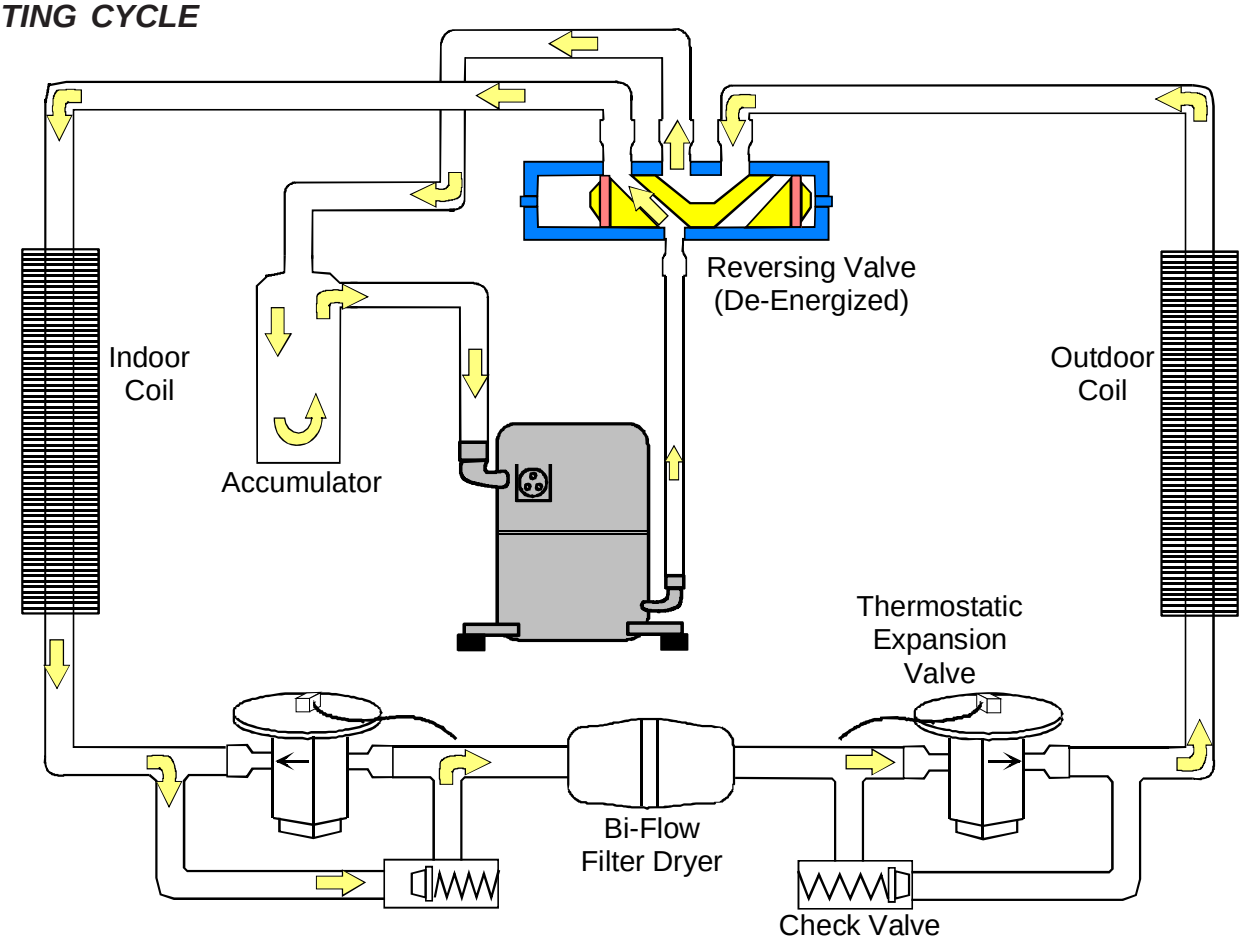
In the cooling mode, the orifice is pushed into its seat, forcing refrigerant to flow through the metered hole in the center of the orifice.

SYSTEM OPERATION

COOLING CYCLE

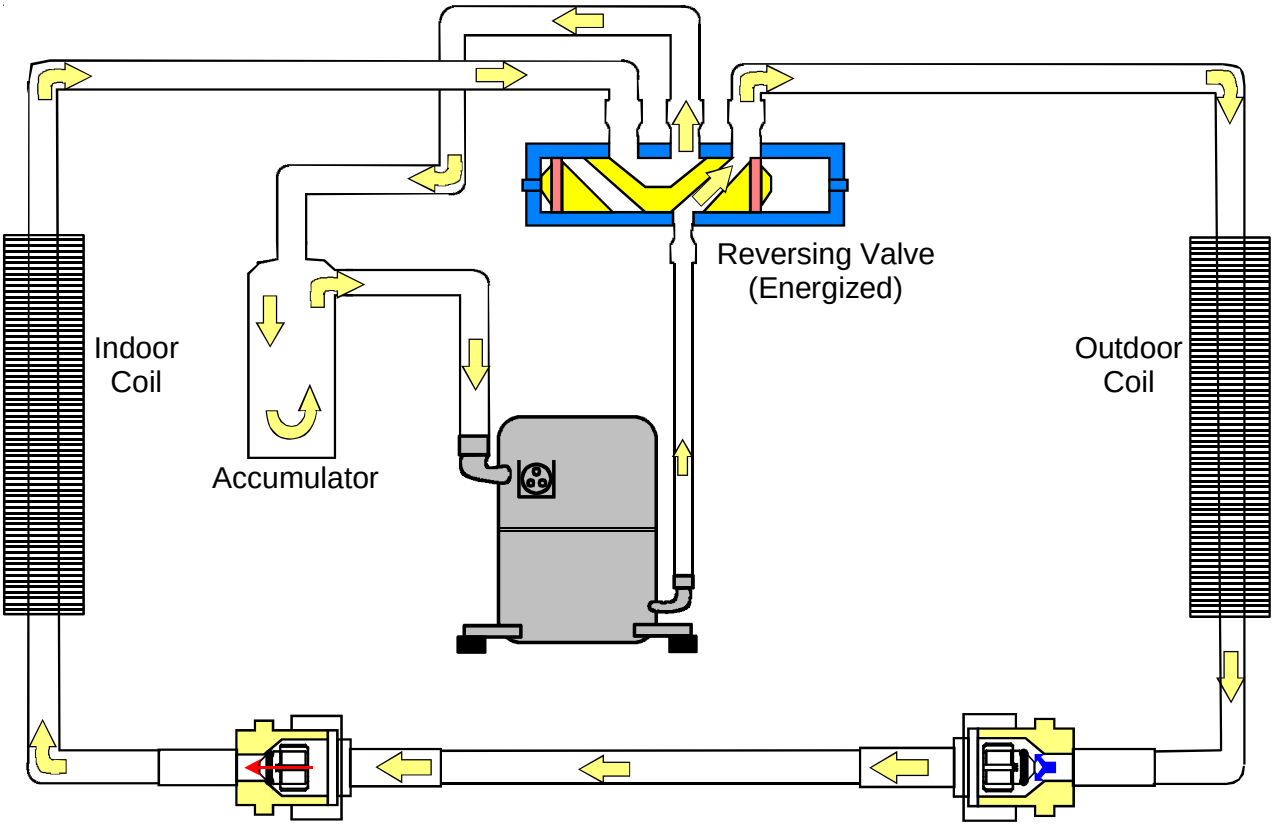


HEATING CYCLE

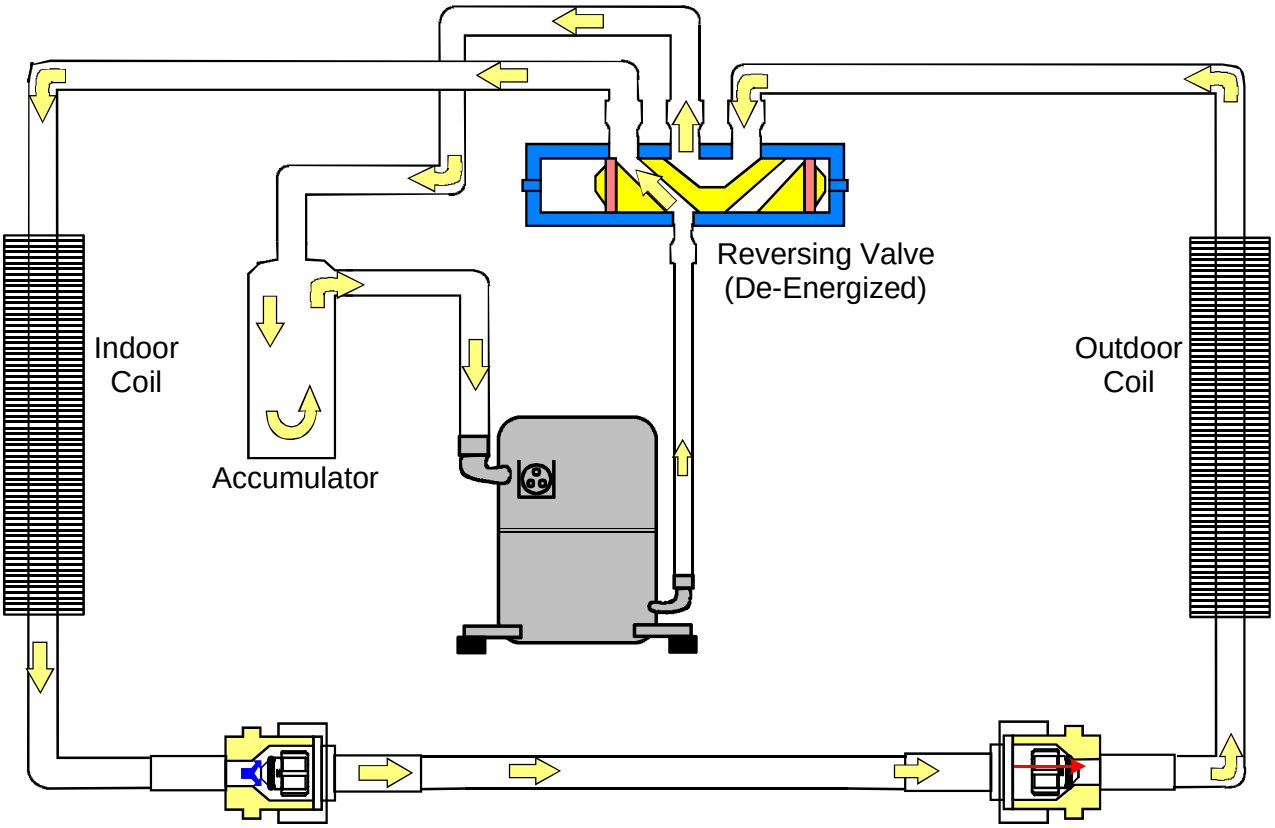


SYSTEM OPERATION

Typical Heat Pump System in Cooling

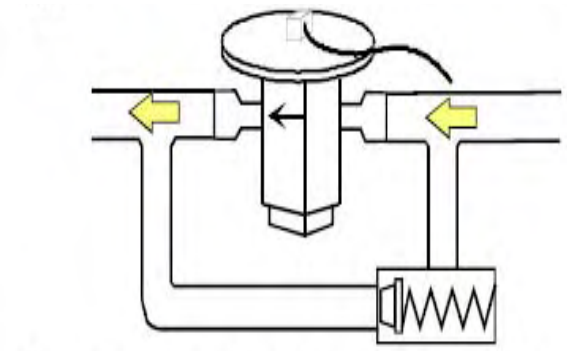


Typical Heat Pump System in Heating

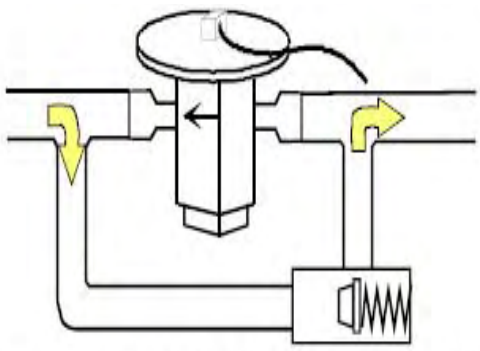


SYSTEM OPERATION

EXPANSION VALVE/CHECK VALVE ASSEMBLY IN COOLING OPERATION

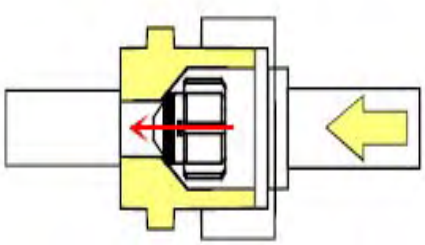


EXPANSION VALVE/CHECK VALVE ASSEMBLY IN HEATING OPERATION



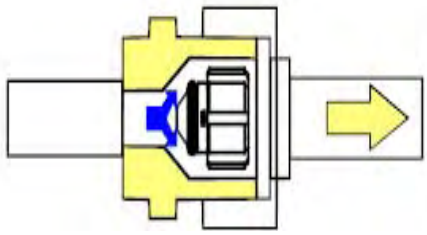
Most expansion valves used in current Goodman Brand Heat Pump products use an internally checked expansion valve.
This type of expansion valve does not require an external check valve as shown above.
However, the principle of operation is the same.

RESTRICTOR ORIFICE ASSEMBLY IN COOLING OPERATION



In the cooling mode, the orifice is pushed into its seat, forcing refrigerant to flow through the metered hole in the center of the orifice.

RESTRICTOR ORIFICE ASSEMBLY IN HEATING OPERATION



In the heating mode, the orifice moves back off its seat, allowing refrigerant to flow unmetered around the outside of the orifice.

SYSTEM OPERATION

AFE18-60 & AFE18-60A CONTROL BOARD

DESCRIPTION

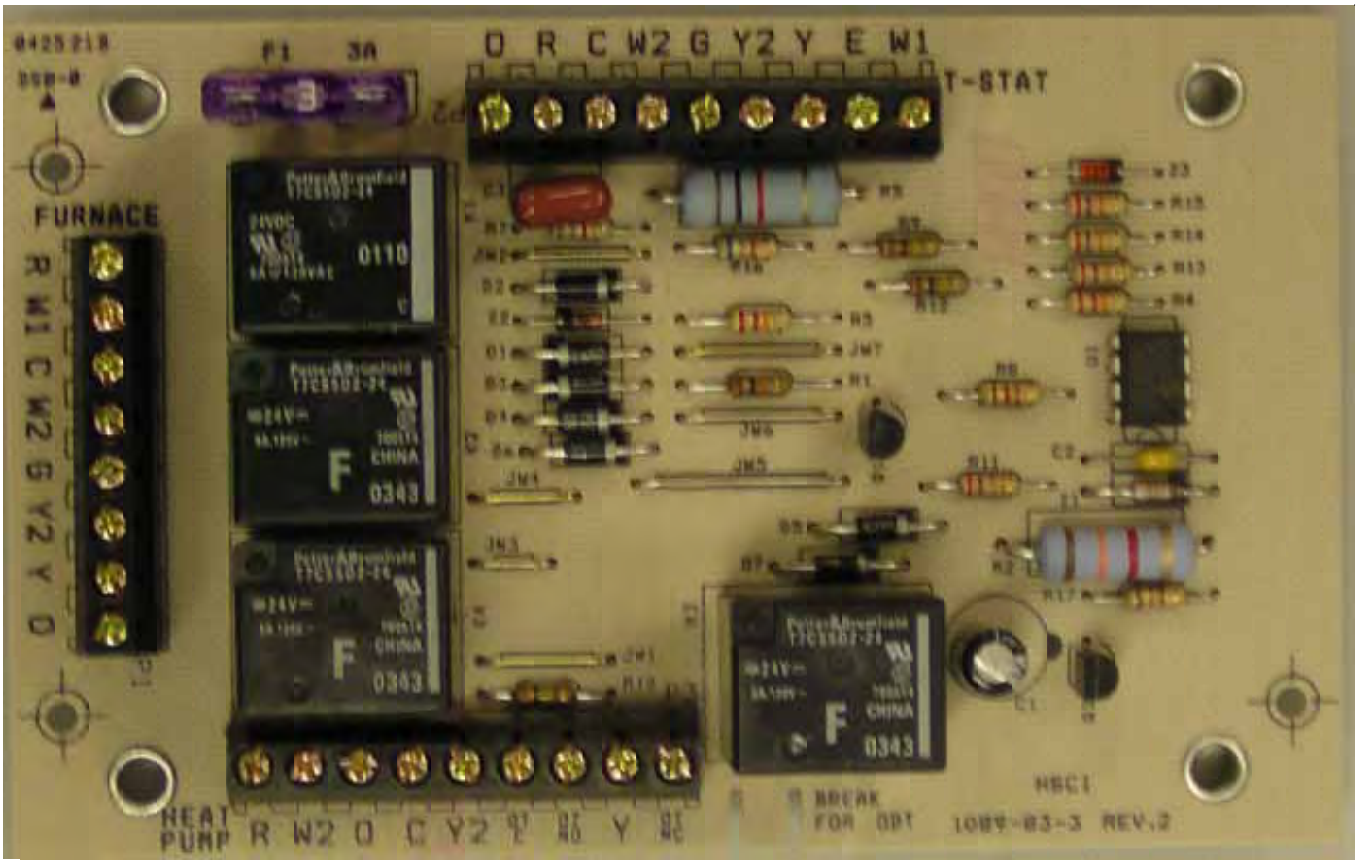
The AFE18 control is designed for use in heat pump applications where the indoor coil is located above/downstream of a gas or fossil fuel furnace. It will operate with single and two stage heat pumps and single and two stage furnaces. The AFE18 control will turn the heat pump unit off when the furnace is turned on. An anti-short cycle feature is also incorporated which initiates a 3 minute timed off delay when the compressor goes off. On initial power up or loss and restoration of power, this 3 minute timed off delay will be initiated. The compressor won't be allowed to restart until the 3 minute off delay has expired. Also included is a 5 second de-bounce feature on the "Y, E, W1 and O" thermostat inputs. These thermostat inputs must be present for 5 seconds before the AFE18 control will respond to it.

An optional outdoor thermostat, OT18-60A, can be used with the AFE18 to switch from heat pump operation to furnace operation below a specific ambient temperature setting, i.e. break even temperature during heating. When used in this manner, the "Y" heat demand is switched to the "W1" input to the furnace by the outdoor thermostat and the furnace is used to satisfy the first stage "Y" heat demand. On some controls, if the outdoor thermostat fails closed in this position during the heating season, it will turn on the furnace during the cooling season on a "Y" cooling demand. In this situation, the furnace produces heat and increases the indoor temperature thereby never satisfying the cooling demand. The furnace will continue to operate and can only be stopped by switching the thermostat to the off position or removing power to the unit and then replacing the outdoor thermostat. **When the AFE18 receives a "Y" and "O" input from the indoor thermostat**, it recognizes this as a cooling demand in the cooling mode. If the outdoor thermostat is stuck in the closed position switching the "Y" demand to the "W1" furnace input during the cooling mode as described above, the AFE18 won't allow the furnace to operate. The outdoor thermostat will have to be replaced to restore the unit to normal operation.

⚠ WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

AFE18-60A



SCHEDULED MAINTENANCE

The owner should be made aware of the fact, that, as with any mechanical equipment the remote air conditioner requires regularly scheduled maintenance to preserve high performance standards, prolong the service life of the equipment, and lessen the chances of costly failure.

In many instances the owner may be able to perform some of the maintenance; however, the advantage of a service contract, which places all maintenance in the hands of a trained serviceman, should be pointed out to the owner.

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

ONCE A MONTH

1. Inspect the return filters of the evaporator unit and clean or change if necessary.

NOTE: Depending on operation conditions, it may be necessary to clean the filters more often. If permanent type filters are used, they should be washed with warm water and dried.

2. When operating on the cooling cycle, inspect the condensate line piping from the evaporator coil. Make sure the piping is clear for proper condensate flow.

ONCE A YEAR

Qualified Service Personnel Only

1. Clean the indoor and outdoor coils.
2. Clean the casing of the outdoor unit inside and out .
3. Motors are permanently lubricated and do not require oiling. TO AVOID PREMATURE MOTOR FAILURE, DO NOT OIL.
4. Manually rotate the outdoor fan and indoor blower to be sure they run freely.
5. Inspect the control panel wiring, compressor connections, and all other component wiring to be sure all connections are tight. Inspect wire insulation to be certain that it is good.
6. Check the contacts of the compressor contactor. If they are burned or pitted, replace the contactor.
7. Using a halide or electronic leak detector, check all piping and etc. for refrigerant leaks.
8. Start the system and run both a Cooling & Heating Performance Test. If the results of the test are not satisfactory, see the "Service Problem Analysis" Chart of the possible cause.

TEST EQUIPMENT

Proper test equipment for accurate diagnosis is as essential as regular hand tools.

The following is a must for every service technician and service shop:

1. Thermocouple type temperature meter - measure dry bulb temperature.
2. Sling psychrometer- measure relative humidity and wet bulb temperature.
3. Amprobe - measure amperage and voltage.
4. Volt-Ohm Meter - testing continuity, capacitors, and motor windings.
5. Accurate Leak Detector - testing for refrigerant leaks.
6. High Vacuum Pump - evacuation.
7. Electric Vacuum Gauge, Manifold Gauges and high vacuum hoses - to measure and obtain proper vacuum.
8. Accurate Electronic Scale - measure proper refrigerant charge.
9. Inclined Manometer - measure static pressure and pressure drop across coils.

Other recording type instruments can be essential in solving abnormal problems, however, in many instances they may be rented from local sources.

Proper equipment promotes faster, more efficient service, and accurate repairs with less call backs.

COOLING PERFORMANCE TEST

All data based upon listed indoor dry bulb temperature. .00 inches external static pressure on coil of outdoor section. Indoor air cubic feet per minute (CFM) as listed in the Performance Data Sheets:

If conditions vary from this, results will change as follows:

1. As indoor dry bulb temperatures increase, a slight increase will occur in indoor air temperature drop (Delta T). Low and high side pressures and power will not change.
2. As indoor CFM decreases, a slight increase will occur in indoor temperature drop (Delta T). A slight decrease will occur in low and high side pressures and power.

A properly operating unit should be within plus or minus **3 degrees** of the typical (Delta T) value shown.

A properly operating unit should be within plus or minus **7 PSIG** of the **head pressure** shown.

A properly operating unit should be within plus or minus **3 PSIG** of the **suction pressure** shown.

A properly operating unit should be within plus or minus **3 Amps** of the typical value shown.

NOTE: Pressures are measured at the liquid and suction service valve ports.

TROUBLESHOOTING CHART

COOLING/HP ANALYSIS CHART

Complaint	No Cooling							Unsatisfactory Cooling/Heating								System Operating Pressures				Test Method Remedy	See Service Procedure Ref.
POSSIBLE CAUSE **DOTS IN ANALYSIS GUIDE INDICATE "POSSIBLE CAUSE"** **SYMPTOM**	System will not start	Compressor will not start - fan runs	Comp. and Cond. Fan will not start	Evaporator fan will not start	Condenser fan will not start	Compressor runs - goes off on overload	Compressor cycles on overload	System runs continuously - little cooling/htg	Too cool and then too warm	Not cool enough on warm days	Certain areas too cool, others too warm	Compressor is noisy	System runs - blows cold air in heating	Unit will not terminate defrost	Unit will not defrost	Low suction pressure	Low head pressure	High suction pressure	High head pressure		
Power Failure	●																			Test Voltage	S-1
Blown Fuse	●		●	●																Inspect Fuse Size & Type	S-1
Unbalanced Power, 3PH		●				●	●													Test Voltage	S-1
Loose Connection	●			●		●														Inspect Connection - Tighten	S-2, S-3
Shorted or Broken Wires	●	●	●	●	●	●														Test Circuits With Ohmmeter	S-2, S-3
Open Fan Overload				●	●															Test Continuity of Overload	S-17A
Faulty Thermostat	●		●	●					●											Test Continuity of Thermostat & Wiring	S-3
Faulty Transformer	●		●																	Check Control Circuit with Voltmeter	S-4
Shorted or Open Capacitor		●		●	●	●	●													Test Capacitor	S-15
Internal Compressor Overload Open		●											♦							Test Continuity of Overload	S-17A
Shorted or Grounded Compressor		●				●														Test Motor Windings	S-17B
Compressor Stuck		●				●	●						♦							Use Test Cord	S-17D
Faulty Compressor Contactor			●		●	●														Test Continuity of Coil & Contacts	S-7, S-8
Faulty Fan Relay				●																Test Continuity of Coil And Contacts	S-7
Open Control Circuit				●																Test Control Circuit with Voltmeter	S-4
Low Voltage		●				●	●													Test Voltage	S-1
Faulty Evap. Fan Motor				●												●			♦	Repair or Replace	S-16
Shorted or Grounded Fan Motor					●														●	Test Motor Windings	S-16
Improper Cooling Anticipator							●		●											Check Resistance of Anticipator	S-3B
Shortage of Refrigerant							●	●					♦			●	●			Test For Leaks, Add Refrigerant	S-101,103
Restricted Liquid Line							●	●								●	●		●	Remove Restriction, Replace Restricted Part	S-112
Open Element or Limit on Elec. Heater								♦					♦							Test Heater Element and Controls	S-26,S-27
Dirty Air Filter								●		●	●					●			♦	Inspect Filter-Clean or Replace	
Dirty Indoor Coil								●		●	●					●			♦	Inspect Coil - Clean	
Not enough air across Indoor Coil								●		●	●					●			♦	Check Blower Speed, Duct Static Press, Filter	S-200
Too much air across Indoor Coil																	♦	●		Reduce Blower Speed	S-200
Overcharge of Refrigerant						●	●					●	♦					●	●	Recover Part of Charge	S-113
Dirty Outdoor Coil						●	●			●						♦			●	Inspect Coil - Clean	
Noncondensibles							●			●			♦						●	Recover Charge, Evacuate, Recharge	S-114
Recirculation of Condensing Air							●			●									●	Remove Obstruction to Air Flow	
Infiltration of Outdoor Air								●		●	●									Check Windows, Doors, Vent Fans, Etc.	
Improperly Located Thermostat						●			●											Relocate Thermostat	
Air Flow Unbalanced									●		●									Readjust Air Volume Dampers	
System Undersized								●		●										Refigure Cooling Load	
Broken Internal Parts												●	♦							Replace Compressor	S-115
Broken Valves								●				●					●	●		Test Compressor Efficiency	S-104
Inefficient Compressor								●					♦				●	●		Test Compressor Efficiency	S-104
Wrong Type Expansion Valve						●	●	●		●						●	●		♦	Replace Valve	S-110
Expansion Device Restricted						●	●	●		●						●	●		●	Remove Restriction or Replace Expansion Device	S-110
Oversized Expansion Valve								●											●	Replace Valve	
Undersized Expansion Valve						●	●	●		●						●				Replace Valve	
Expansion Valve Bulb Loose												●						●		Tighten Bulb Bracket	S-105
Inoperative Expansion Valve						●		●								●				Check Valve Operation	S-110
Loose Hold-down Bolts												●								Tighten Bolts	
Faulty Reversing Valve						●							♦	♦	♦		♦	♦	♦	Replace Valve or Solenoid	S-21, 122
Faulty Defrost Control					●								♦	♦	♦	♦	♦		♦	Test Control	S-24
Faulty Defrost Thermostat													♦	♦	♦	♦	♦	♦	♦	Test Defrost Thermostat	S-25
Flowrator Not Seating Properly								●									●	●		Check Flowrator & Seat or Replace Flowrator	S-111

● **Cooling or Heating Cycle (Heat Pump)** ♦ **Heating Cycle Only (Heat Pump)**

Table of Contents

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

SERVICING

S-1 CHECKING VOLTAGE

1. Remove outer case, control panel cover, etc., from unit being tested.

With power ON:

WARNING

Line Voltage now present.

2. Using a voltmeter, measure the voltage across terminals L1 and L2 of the contactor for the condensing unit or at the field connections for the air handler or heaters.
3. No reading - indicates open wiring, open fuse(s) no power or etc., from unit to fused disconnect service. Repair as needed.
4. With ample voltage at line voltage connectors, energize the unit.
5. Measure the voltage with the unit starting and operating, and determine the unit Locked Rotor Voltage. **NOTE**: If checking heaters, be sure all heating elements are energized.

   Locked Rotor Voltage is the actual voltage available at the compressor during starting, locked rotor, or a stalled condition. Measured voltage should be above minimum listed in chart below.

   To measure Locked Rotor Voltage attach a voltmeter to the run "R" and common "C" terminals of the compressor, or to the T_1 and T_2 terminals of the contactor. Start the unit and allow the compressor to run for several seconds, then shut down the unit. Immediately attempt to restart the unit while measuring the Locked Rotor Voltage.
6. Lock rotor voltage should read within the voltage tabulation as shown. If the voltage falls below the minimum voltage, check the line wire size. Long runs of undersized wire can cause low voltage. If wire size is adequate, notify the local power company in regard to either low or high voltage.

Unit Supply Voltage		
Voltage	Min.	Max.
460	437	506
208/230	198	253

Three phase units require a balanced 3 phase power supply to operate. If the percentage of voltage imbalance exceeds 3% the unit must not be operated until the voltage condition is corrected.

$$\text{\% Voltage Imbalance} = \frac{\text{Max. Voltage Deviation From Average Voltage}}{\text{Average Voltage}} \times 100$$

To find the percentage of imbalance, measure the incoming power supply.

L1 - L2 = 240V
L1 - L3 = 232V
L2 - L3 = 238V
Total 710V

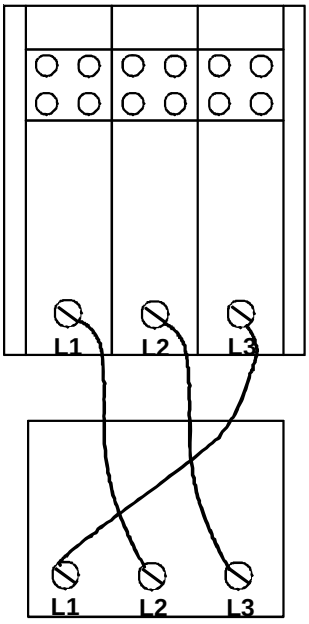
Avg. V = 710 / 3 = **236.7**

To find Max. deviation:
240 - 236.7 = +3.3
232 - 236.7 = **-4.7**
238 - 236.7 = +1.3

Max deviation was 4.7V

% Voltage Imbalance = 4.7 / 236.7 = **1.99%**

If the percentage of imbalance had exceeded 3%, it must be determined if the imbalance is in the incoming power supply or the equipment. To do this rotate the legs of the incoming power and retest voltage as shown below.



L1 - L2 = 240V
L1 - L3 = 227V
L2 - L3 = 238V

Rotate all 3 incoming legs as shown.

L1 - L2 = 227V
L1 - L3 = 238V
L2 - L3 = 240V

S-2 CHECKING WIRING

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

1. Check wiring visually for signs of overheating, damaged insulation and loose connections.
2. Use an ohmmeter to check continuity of any suspected open wires.
3. If any wires must be replaced, replace with comparable gauge and insulation thickness.

SERVICING

S-3 CHECKING THERMOSTAT, WIRING, AND ANTICIPATOR

THERMOSTAT WIRE SIZING CHART	
LENGTH OF RUN	MIN. COPPER WIRE GAUGE (AWG)
25 feet	18
50 feet	16
75 feet	14
100 feet	14
125 feet	12
150 feet	12

S-3A THERMOSTAT AND WIRING

WARNING

Line Voltage now present.

With power ON, thermostat calling for cooling

1. Use a voltmeter to check for 24 volts at thermostat wires C and Y in the condensing unit control panel.
2. No voltage indicates trouble in the thermostat, wiring or external transformer source.
3. Check the continuity of the thermostat and wiring. Repair or replace as necessary.

Indoor Blower Motor

With power ON:

WARNING

Line Voltage now present.

1. Set fan selector switch at thermostat to "ON" position.
2. With voltmeter, check for 24 volts at wires C and G.
3. No voltage indicates the trouble is in the thermostat or wiring.
4. Check the continuity of the thermostat and wiring. Repair or replace as necessary.

Resistance Heaters

1. Set room thermostat to a higher setting than room temperature so both stages call for heat.
2. With voltmeter, check for 24 volts at each heater relay.
3. No voltage indicates the trouble is in the thermostat or wiring.
4. Check the continuity of the thermostat and wiring. Repair or replace as necessary.

NOTE: Consideration must be given to how the heaters are wired (O.D.T. and etc.). Also safety devices must be checked for continuity.

S-3B COOLING ANTICIPATOR

The cooling anticipator is a small heater (resistor) in the thermostat. During the "off" cycle, it heats the bimetal element helping the thermostat call for the next cooling cycle. This prevents the room temperature from rising too high before the system is restarted. A properly sized anticipator should maintain room temperature within 1 1/2 to 2 degree range.

The anticipator is supplied in the thermostat and is not to be replaced. If the anticipator should fail for any reason, the thermostat must be changed.

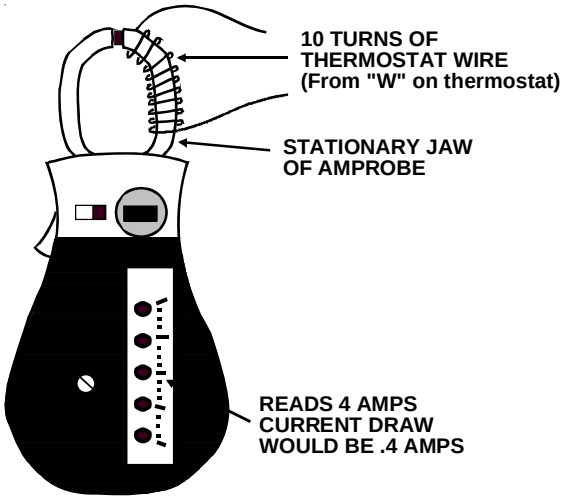
S-3C HEATING ANTICIPATOR

The heating anticipator is a wire wound adjustable heater which is energized during the "ON" cycle to help prevent overheating of the conditioned space.

The anticipator is a part of the thermostat and if it should fail for any reason, the thermostat must be replaced. See the following tables for recommended heater anticipator setting in accordance to the number of electric heaters installed.

To determine the proper setting, use an ammeter to measure the current on the "W" wire going to the thermostat.

Use an amprobe as shown below. Wrap 10 turns of thermostat wire around the stationary jaw of the amprobe and divide the reading by 10.

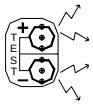


Checking Heat Anticipator Amp Draw

SERVICING

S-3D TROUBLESHOOTING ENCODED TWO STAGE COOLING THERMOSTATS OPTIONS

Troubleshooting Encoded Two Stage Cooling Thermostats Options



	TEST INDICATION	FUNCTION	SIGNAL OUT	SIGNAL FAN	
INPUT FROM THERMOSTAT	S1 +	LOW SPEED COOL	YCON +	Y1	
	* S1 - *	* LO SPEED COOL *	* YCON - *	* Y / Y2 HI *	* ERROR CONDITION (DIODE ON THERMOSTAT BACKWARDS)
	S1 + -	HI SPEED COOL	YCON + -	Y / Y2	
	S2 +	LO SPEED HEAT	W1 HEATER	W / W1	SEE NOTE 3
	S2 -	O	ED - (FUTURE USE)	O	
	S2 + -	LO SPEED HEAT HI SPEED HEAT	W1 HEATER W2 HEATER	W / W1 EM / W2	SEE NOTE 3
	S3 +	G	NONE	G	
	* S3 - *	N/A	N/A	N/A	* ERROR CONDITION (S3 CAN ONLY READ +)
	* S3 + - *	N/A	N/A	N/A	* ERROR CONDITION (S3 CAN ONLY READ +)
POWER TO THERMOSTAT	R + -	24 VAC	R TO T'STAT	R	
	COM	GND	COM TO T'STAT	C1 , C2	

NOTES:
1.) THE TEST SPADE CAN BE CONNECTED TO ANY OTHER TEST SPADE ON EITHER BOARD.

2.) THE + LED WILL BE RED AND WILL LIGHT TO INDICATE + HALF CYCLES.
THE - LED WILL BE GREEN AND WILL LIGHT TO INDICATE - HALF CYCLES.
BOTH RED AND GREEN ILLUMINATED WILL INDICATE FULL CYCLES DENOTED BY + - .

3.) SIGNAL OUT CONDITION FOR W1 , W2 HEATER WILL BE AFFECTED BY OT1 PJ4 AND OT2 PJ2 JUMPERS AND OUTDOOR THERMOSTATS ATTACHED. THE TABLE ABOVE ASSUMES OT1 PJ4 IS REMOVED AND OT2 PJ2 IS MADE WITH NO OUTDOOR THERMOSTATS ATTACHED.

The chart above provides troubleshooting for either version of the encoded thermostat option. This provides diagnostic information for the GMC CHET18-60 or a conventional two cool / two stage heat thermostat with IN4005 diodes added as called out in the above section.

A test lead or jumper wire can be added from the test terminal to any terminal on the B13682-74 or B13682-71 variable speed terminal board and provide information through the use of the LED lights on the B13682-71 VSTB control. Using this chart, a technician can determine if the proper input signal is being received by the encoded VSTB control and diagnose any problems that may be relayed to the output response of the B13682-74 VSTM control.

SERVICING

S-4 CHECKING TRANSFORMER AND CONTROL CIRCUIT

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

A step-down transformer (208/240 volt primary to 24 volt secondary) is provided with each indoor unit. This allows ample capacity for use with resistance heaters. The outdoor sections do not contain a transformer.

1. Remove control panel cover, or etc., to gain access to transformer.

With power ON:

WARNING

Line Voltage now present.

2. Using a voltmeter, check voltage across secondary voltage side of transformer (R to C).
3. No voltage indicates faulty transformer, bad wiring, or bad splices.
4. Check transformer primary voltage at incoming line voltage connections and/or splices.
5 If line voltage available at primary voltage side of transformer and wiring and splices good, transformer is inoperative. Replace.

S-5 CHECKING CYCLE PROTECTOR

Some models feature a solid state, delay-on make after break time delay relay installed in the low voltage circuit. This control is used to prevent short cycling of the compressor under certain operating conditions.

The component is normally closed (R_1 to Y_1). A power interruption will break circuit (R_1 to Y_1) for approximately three minutes before resetting.

1. Remove wire from Y_1 terminal.
2. Wait for approximately four (4) minutes if machine was running.

With power ON:

WARNING

Line Voltage now present.

1. Apply 24 VAC to terminals R_1 and R_2.
2. Should read 24 VAC at terminals Y_1 and Y_2.
3. Remove 24 VAC at terminals R_1 and R_2.
4. Should read 0 VAC at Y_1 and Y_2.
5. Reapply 24 VAC to R1 and R2 - within approximately three (3) to four (4) minutes should read 24 VAC at Y_1 and Y_2.

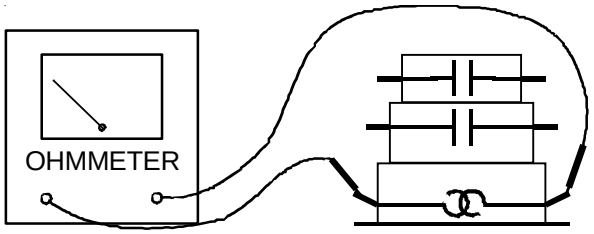
If not as above - replace relay.

S-6 CHECKING TIME DELAY RELAY

Time delay relays are used in some of the blower cabinets to improve efficiency by delaying the blower off time. Time delays are also used in electric heaters to sequence in multiple electric heaters.

1. Tag and disconnect all wires from male spade connections of relay.
2. Using an ohmmeter, measure the resistance across terminals H1 and H2. Should read approximately 150 ohms.
3. Using an ohmmeter, check for continuity across terminals 3 and 1, and 4 and 5.
4. Apply 24 volts to terminals H1 and H2. Check for continuity across other terminals - should test continuous. If not as above - replace.

NOTE: The time delay for the contacts to make will be approximately 20 to 50 seconds and to open after the coil is de-energized is approximately 40 to 90 seconds.



TESTING COIL CIRCUIT

SERVICING

S-7 CHECKING CONTACTOR AND/OR RELAYS

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

The compressor contactor and other relay holding coils are wired into the low or line voltage circuits. When the control circuit is energized, the coil pulls in the normally open contacts or opens the normally closed contacts. When the coil is de-energized, springs return the contacts to their normal position.

NOTE*: Most single phase contactors break only one side of the line (L1), leaving 115 volts to ground present at most internal components.*

1. Remove the leads from the holding coil.
2. Using an ohmmeter, test across the coil terminals.

If the coil does not test continuous, replace the relay or contactor.

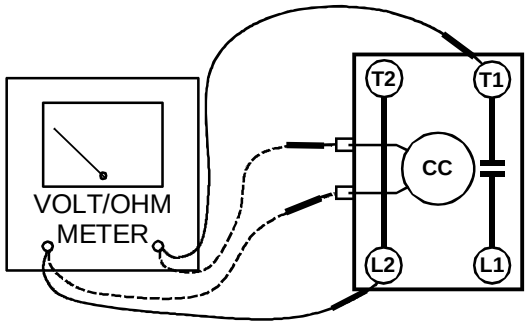
S-8 CHECKING CONTACTOR CONTACTS

SINGLE PHASE

1. Disconnect the wire leads from the terminal (T) side of the contactor.
2. With power ON, energize the contactor.

WARNING

Line Voltage now present.



TESTING COMPRESSOR CONTACTOR (Single Phase)

3. Using a voltmeter, test across terminals.
   A. L2 - T1 - No voltage indicates CC1 contacts open.

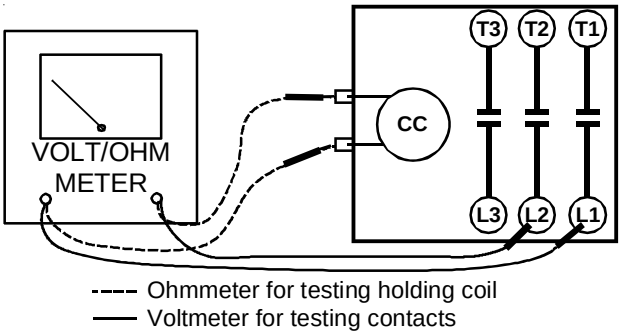
If a no voltage reading is obtained - replace the contactor.

THREE PHASE

Using a voltmeter, test across terminals.

A. L1-L2, L1-L3, and L2-L3 - If voltage is present, proceed to B. If voltage is not present, check breaker or fuses on main power supply..

B. T1-T2, T1-T3, and T2-T3 - If voltage readings are not the same as in "A", replace contactor.



TESTING COMPRESSOR CONTACTOR (ThreePhase)

S-9 CHECKING FAN RELAY CONTACTS

WARNING

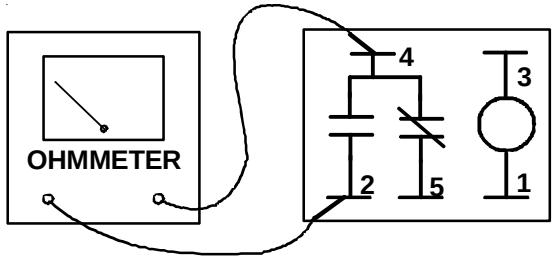
HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

1. Disconnect wires leads from terminals 2 and 4 of Fan Relay Cooling and 2 and 4, 5 and 6 of Fan Relay Heating.
2. Using an ohmmeter, test between 2 and 4 - should read open. Test between 5 and 6 - should read continuous.
3. With power ON, energize the relays.

WARNING

Line Voltage now present.

SERVICING



TESTING FAN RELAY

4. Using an ohmmeter, test between 2 and 4 - should read continuous . Test between 5 and 6 - should read open.
5. If not as above, replace the relay.

S-12 CHECKING HIGH PRESSURE CONTROL

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

The high pressure control capillary senses the pressure in the compressor discharge line. If abnormally high condensing pressures develop, the contacts of the control open, breaking the control circuit before the compressor motor overloads. This control is automatically reset.

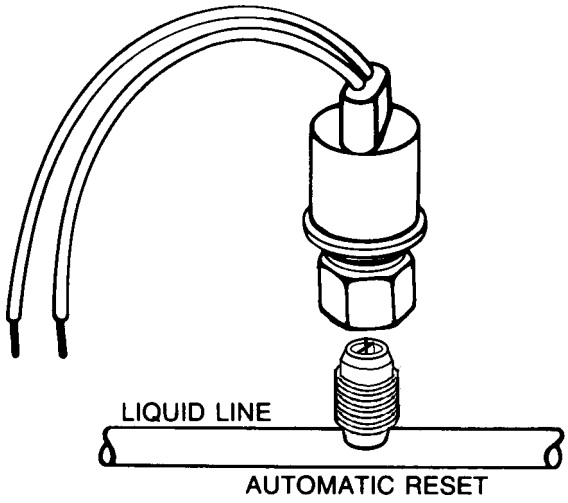
1. Using an ohmmeter, check across terminals of high pressure control, with wire removed. If not continuous, the contacts are open.
3. Attach a gauge to the dill valve port on the base valve.

With power ON:

WARNING

Line Voltage now present.

4. Start the system and place a piece of cardboard in front of the condenser coil, raising the condensing pressure.
5. Check pressure at which the high pressure control cuts-out.



If it cuts-out at 610 PSIG ± 10 PSIG, it is operating normally (See causes for high head pressure in Service Problem Analysis Guide). If it cuts out below this pressure range, replace the control.

S-13 CHECKING LOW PRESSURE CONTROL

The low pressure control senses the pressure in the suction line and will open its contacts on a drop in pressure. The low pressure control will automatically reset itself with a rise in pressure.

The low pressure control is designed to cut-out (open) at approximately 50 PSIG. It will automatically cut-in (close) at approximately 85 PSIG.

Test for continuity using a VOM and if not as above, replace the control.

S-15 CHECKING CAPACITOR

CAPACITOR, RUN

A run capacitor is wired across the auxiliary and main windings of a single phase permanent split capacitor motor. The capacitors primary function is to reduce the line current while greatly improving the torque characteristics of a motor. This is accomplished by using the 90° phase relationship between the capacitor current and voltage in conjunction with the motor windings, so that the motor will give two phase operation when connected to a single phase circuit. The capacitor also reduces the line current to the motor by improving the power factor.

The line side of this capacitor is marked with "COM" and is wired to the line side of the circuit.

SERVICING

CAPACITOR, START

SCROLL COMPRESSOR MODELS

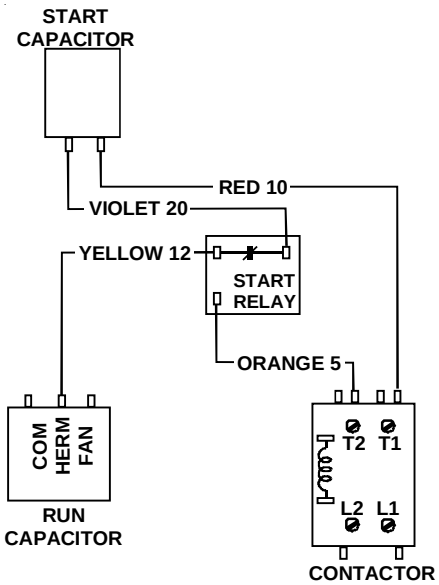
Hard start components are not required on Scroll compressor equipped units due to a non-replaceable check valve located in the discharge line of the compressor. However hard start kits are available and may improve low voltage starting characteristics.

This check valve closes off high side pressure to the compressor after shut down allowing equalization through the scroll flanks. Equalization requires only about one or two seconds during which time the compressor may turn backwards.

RELAY, START

A potential or voltage type relay is used to take the start capacitor out of the circuit once the motor comes up to speed. This type of relay is position sensitive. The normally closed contacts are wired in series with the start capacitor and the relay holding coil is wired parallel with the start winding. As the motor starts and comes up to speed, the increase in voltage across the start winding will energize the start relay holding coil and open the contacts to the start capacitor.

Two quick ways to test a capacitor are a resistance and a capacitance check.



HARD START KIT WIRING

S-15A RESISTANCE CHECK

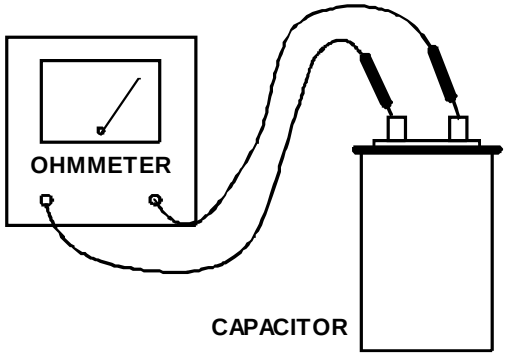
WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

1. Discharge capacitor and remove wire leads.

WARNING

Discharge capacitor through a 20 to 30 OHM resistor before handling.



TESTING CAPACITOR RESISTANCE

2. Set an ohmmeter on its highest ohm scale and connect the leads to the capacitor -

   A. Good Condition - indicator swings to zero and slowly returns to infinity. (Start capacitor with bleed resistor will not return to infinity. It will still read the resistance of the resistor).

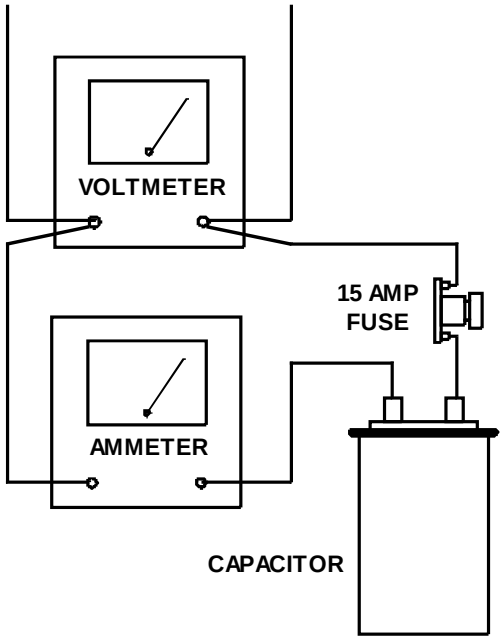
   B. Shorted - indicator swings to zero and stops there - replace.

   C. Open - no reading - replace. (Start capacitor would read resistor resistance.)

SERVICING

S-15B CAPACITANCE CHECK

Using a hookup as shown in the following drawing, take the amperage and voltage readings and use them in the formula:



TESTING CAPACITANCE

WARNING

Discharge capacitor through a 20 to 30 OHM resistor before handling.

Capacitance (MFD) = $\frac{2650 \times Amperage}{Voltage}$

S-16A CHECKING FAN AND BLOWER MOTOR WINDINGS (PSC MOTORS)

The auto reset fan motor overload is designed to protect the motor against high temperature and high amperage conditions by breaking the common circuit within the motor, similar to the compressor internal overload. However, heat generated within the motor is faster to dissipate than the compressor, allow at least 45 minutes for the overload to reset, then retest.

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

1. Remove the motor leads from its respective connection points and capacitor (if applicable).
2. Check the continuity between each of the motor leads.
3. Touch one probe of the ohmmeter to the motor frame (ground) and the other probe in turn to each lead.

If the windings do not test continuous or a reading is obtained from lead to ground, replace the motor.

S-16B CHECKING FAN AND BLOWER MOTOR (ECM MOTORS)

An ECM is an *Electronically Commutated Motor* which offers many significant advantages over PSC motors. The ECM has near zero rotor loss, synchronous machine operation, variable speed, low noise, and programmable air flow. Because of the sophisticated electronics within the ECM motor, some technicians are intimated by the ECM motor; however, these fears are unfounded. GE offers two ECM motor testers, and with a VOM meter, one can easily perform basic troubleshooting on ECM motors. An ECM motor requires power (line voltage) and a signal (24 volts) to operate. The ECM motor stator contains permanent magnet. As a result, the shaft feels "rough" when turned by hand. This is a characteristic of the motor, not an indication of defective bearings.

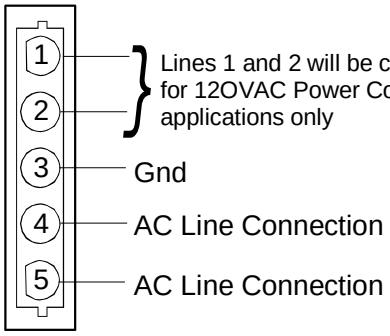
WARNING

Line Voltage now present.

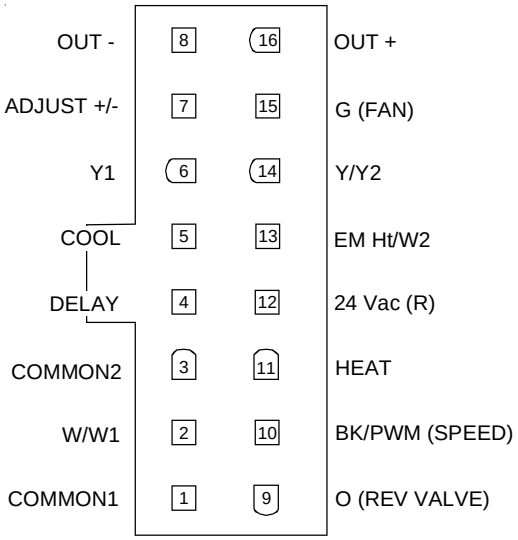
1. Disconnect the 5-pin connector from the motor.
2. Using a volt meter, check for line voltage at terminals #4 & #5 at the power connector. If no voltage is present:
3. Check the unit for incoming power See section S-1.
4. Check the control board, See section S-40.
5. If line voltage is present, reinsert the 5-pin connector and remove the 16-pin connector.
6. Check for signal (24 volts) at the transformer.
7. Check for signal (24 volts) from the thermostat to the "G" terminal at the 16-pin connector.
8. Using an ohmmeter, check for continuity from the #1 & #3 (common pins) to the transformer neutral or "C" thermostat terminal. If you do not have continuity, the motor may function erratically. Trace the common circuits, locate and repair the open neutral.
9. Set the thermostat to "Fan-On". Using a voltmeter, check for 24 volts between pin # 15 (G) and common.

SERVICING

10. Disconnect power to compressor. Set thermostat to call for cooling. Using a voltmeter, check for 24 volts at pin # 6 and/or #14.
11. Set the thermostat to a call for heating. Using a voltmeter, check for 24 volts at pin #2 and/or #11.



5 PIN CONNECTOR



16-PIN ECM HARNESS CONNECTOR

If you do not read voltage and continuity as described, the problem is in the control or interface board, but not the motor. If you register voltage as described , the ECM power head is defective and must be replaced.

ECM VARIABLE SPEED CIRCULATOR BLOWER MOTORS	
DO	**DON'T**
- Check-out motor, controls, wiring, and connections before replacing motor.	- Automatically assume the motor is bad.
- Orient connectors down to prevent water infiltration. - Install "drip loops".	- Locate connectors above 7 and 4 o'clock positions.
- Use authorized motor and control model #'s for replacement.	- Replace one motor or control model # with another (unless an authorized replacement).
- Keep static pressure to a minimum: - Recommend high efficiency, low static filters. - Recommend keeping filters clean. - Design ductwork for min. static, max comfort. - Look for and recommend ductwork improvement, where necessary, in replacement.	- Use high pressure drop filters - some have 1/2" H2O drop! - Use restricted returns.
- Size the equipment wisely.	- Oversize system then compensate with low airflow.
- Check orientation before inserting motor connectors.	- Plug in power connector backwards. - Force plugs.

Troubleshooting Chart for ECM Variable Speed Air Circulator Blower Motors

Symptom	Fault Description(s)	Possible Causes	Corrective Action	Cautions and Notes
- Motor rocks slightly when starting.	- This is normal start-up for variable speed motor.	----	----	----
- Motor won't start.	- No movement.	- Manual disconnect switch off or door switch open. - Blown fuse or circuit breaker. - 24 Vac wires miswired. - Unseated pins in wiring harness connectors. - Bad motor/control module. - Moisture present in motor or control module.	- Check 230 Vac power at motor. - Check low voltage (24 Vac R to C) at motor. - Check low voltage connections (G, Y, W, R, C) at motor. - Check for unseated pins in connectors on motor harness. - Test with a temporary jumper between R - G. - Check m	- Turn power OFF prior to repair. Wait 5 minutes after disconnecting power before opening motor. - Handle electronic motor/control with care.
	- Motor rocks, but won't start.	- Loose motor mount. - Blower wheel not tight on motor shaft. - Bad motor/control module.	- Check for loose motor mount. - Make sure blower wheel is tight on shaft. - Perform motor/control replacement check, ECM motors only.	- Turn power OFF prior to repair. Wait 5 minutes after disconnecting power before opening motor. - Handle electronic motor/control with care.
- Motor oscillates up & down while being tested off of blower.	- It is normal for motor to oscillate with no load on shaft.	----	----	----
- Motor starts, but runs erratically.	- Varies up and down or intermittent.	- Variation in 230 Vac to motor. - Unseated pins in wiring harness connectors. - Erratic CFM command from "BK" terminal. - Improper thermostat connection or setting. - Moisture present in motor/control module.	- Check line voltage for variation or "sag". - Check low voltage connections (G, Y, W, R, C) at motor, unseated pins in motor harness connectors. - Check-out system controls - Thermostat. - Perform Moisture Check.*	- Turn power OFF prior to repair.
	- "Hunts" or "puffs" at high CFM (speed).	- Incorrect or dirty filter(s). - Incorrect supply or return ductwork. - Incorrect blower speed setting.	- Does removing panel or filter reduce "puffing"? - Check/replace filter. - Check/correct duct restrictions. - Adjust to correct blower speed setting.	- Turn power OFF prior to repair.
	- Stays at low CFM despite system call for cool or heat CFM.	- 24 Vac wires miswired or loose. - "R" missing/not connected at motor. - Fan in delay mode.	- Check low voltage (Thermostat) wires and connections. - Verify fan is not in delay mode - wait until delay complete. - Perform motor/control replacement check, ECM motors only.	- Turn power OFF prior to repair. Wait 5 minutes after disconnecting power before opening motor. - Handle electronic motor/control with care.
	- Stays at high CFM.	- "R" missing/not connected at motor. - Fan in delay mode.	- Is fan in delay mode? - wait until delay time complete. - Perform motor/control replacement check, ECM motors only.	- Turn power OFF prior to repair. Wait 5 minutes after disconnecting power before opening motor. - Handle electronic motor/control with care.
	- Blower won't shut off.	- Current leakage from controls into G, Y, or W.	- Check for Triac switched t'stat or solid state relay.	- Turn power OFF prior to repair.
- Excessive noise.	- Air noise.	- High static creating high blower speed. - Incorrect supply or return ductwork. - Incorrect or dirty filter(s). - Incorrect blower speed setting.	- Check/replace filter. - Check/correct duct restrictions. - Adjust to correct blower speed setting.	- Turn power OFF prior to repair.
	- Noisy blower or cabinet.	- Loose blower housing, panels, etc. - High static creating high blower speed. - Air leaks in ductwork, cabinets, or panels.	- Check for loose blower housing, panels, etc. - Check for air whistling thru seams in ducts, cabinets or panels. - Check for cabinet/duct deformation.	- Turn power OFF prior to repair.
	- "Hunts" or "puffs" at high CFM (speed).	- High static creating high blower speed. - Incorrect or dirty filter(s). - Incorrect supply or return ductwork. - Incorrect blower speed setting.	- Does removing panel or filter reduce "puffing"? - Check/replace filter. - Check/correct duct restrictions. - Adjust to correct blower speed setting.	- Turn power OFF prior to repair.
- Evidence of Moisture.	- Motor failure or malfunction has occurred and moisture is present.	- Moisture in motor/control module.	- Replace motor and perform Moisture Check.*	- Turn power OFF prior to repair. Wait 5 minutes after disconnecting power before opening motor. - Handle electronic motor/control with care.

***Moisture Check**

- Connectors are oriented "down" (or as recommended by equipment manufacturer).
- Is condensate drain plugged?
- Check for undercharged condition.
- Arrange harnesses with "drip loop" under motor.
- Check for low airflow (too much latent capacity).
- Check and plug leaks in return ducts, cabinet.

Note: You must use the correct replacement control/motor module since they are factory programmed for specific operating modes. Even though they look alike, different modules may have completely different functionality. The ECM variable speed motors are c

Important Note: Using the wrong motor/control module voids all product warranties and may produce unexpected results.

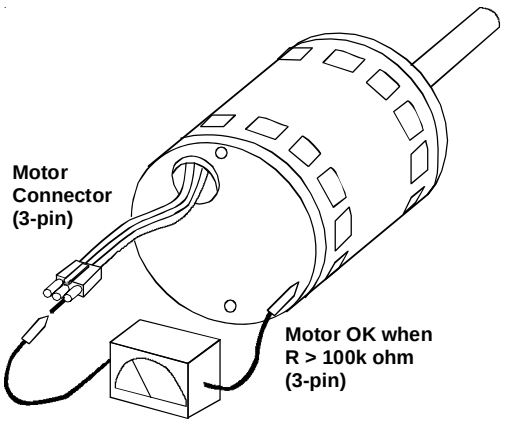
SERVICING

S-16C CHECKING ECM MOTOR WINDINGS

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

1. Disconnect the 5-pin and the 16-pin connectors from the ECM power head.
2. Remove the 2 screws securing the ECM power head and separate it from the motor.
3. Disconnect the 3-pin motor connector from the power head and lay it aside.
4. Using an ohmmeter, check the motor windings for continuity to ground (pins to motor shell). If the ohmmeter indicates continuity to ground, the motor is defective and must be replaced.
5. Using an ohmmeter, check the windings for continuity (pin to pin). If no continuity is indicated, the thermal limit (over load) device may be open. Allow motor to cool and retest.



WINDING TEST

S-16D ECM CFM ADJUSTMENTS

AER, AEPT MOTORS

This section references the operation characteristics of the AER and AEPT models motor only. The ECM control board is factory set with the dipswitch #4 in the “ON” position and all other dipswitches are factory set in the “OFF” position. When an AER or AEPT is used with 2-stage cooling units, dipswitch #4 should be in the "OFF" position.

For most applications, the settings are to be changed according to the electric heat size and the outdoor unit selection.

AER and AEPT products use a General Electric ECM™ motor. This motor provides many features not available on the traditional PSC motor. These features include:

- Improved Efficiency
- Constant CFM
- Soft Start and Stop
- Improved Humidity Control

MOTOR SPEED ADJUSTMENT

Each ECM™ blower motor has been preprogrammed for operation at 4 distinct airflow levels when operating in Cooling/Heat Pump mode or Electric Heat mode. These 4 distinct levels may also be adjusted slightly lower or higher if desired. The adjustment between levels and the trim adjustments are made by changing the dipswitch(s) either to an "OFF" or "ON" position.

DIPSWITCH FUNCTIONS

AER and AEPT air handler motors have an electronic control that contains an eight (8) position dip switch. The function of these dipswitches are shown in **Table 1.**

Dipswitch Number	Function
1	Electric Heat
2	
3	N/A
4	Indoor Thermostat
5	Cooling & Heat Pump CFM
6	
7	CFM Trim Adjust
8	

Table 1

CFM DELIVERY

Tables 2 and **3** show the CFM output for dipswitch combinations 1-2, and 5-6.

Electric Heat Operation

Model	Switch 1	Switch 2	CFM
AER30 AEPT30	OFF	OFF	1,100
	ON	OFF	850
	OFF	ON	700
AER36-60 AEPT36-60	OFF	OFF	2,050
	ON	OFF	1,750
	OFF	ON	1,600
	OFF	ON	1,200

Table 2

SERVICING

Cooling/Heat Pump Operation			
AER30 AEPT30	OFF	OFF	1,100
	ON	OFF	800
	OFF	ON	600
AER36-60 AEPT36-60	OFF	OFF	1,800
	ON	OFF	1,580
	OFF	ON	1,480
	ON	ON	1,200

Table 3

THERMOSTAT "FAN ONLY" MODE

During Fan Only Operations, the CFM output is 30% of the cooling setting.

CFM TRIM ADJUST

Minor adjustments can be made through the dip switch combination of 7-8. **Table 4** shows the switch position for this feature.

NOTE: The airflow will not make the decreasing adjustment in Electric Heat mode.

CFM	Switch 7	Switch 8
+10%	ON	OFF
-15%	OFF	ON

Table 4

HUMIDITY CONTROL

When using a Humidstat (normally closed), cut jumper PJ6 on the control board. The Humidstat will only affect cooling airflow by adjusting the Airflow to 85%.

TWO STAGE HEATING

When using staged electric heat, cut jumper PJ4 on the control board.

S-17 CHECKING COMPRESSOR

WARNING

Hermetic compressor electrical terminal venting can be dangerous. When insulating material which supports a hermetic compressor or electrical terminal suddenly disintegrates due to physical abuse or as a result of an electrical short between the terminal and the compressor housing, the terminal may be expelled, venting the vapor and liquid contents of the compressor housing and system.

If the compressor terminal PROTECTIVE COVER and gasket (if required) are not properly in place and secured, there is a remote possibility if a terminal vents, that the vaporous and liquid discharge can be ignited, spouting flames several feet, causing potentially severe or fatal injury to anyone in its path.

This discharge can be ignited external to the compressor if the terminal cover is not properly in place and if the discharge impinges on a sufficient heat source.

Ignition of the discharge can also occur at the venting terminal or inside the compressor, if there is sufficient contaminant air present in the system and an electrical arc occurs as the terminal vents.

Ignition cannot occur at the venting terminal without the presence of contaminant air, and cannot occur externally from the venting terminal without the presence of an external ignition source.

Therefore, proper evacuation of a hermetic system is essential at the time of manufacture and during servicing.

To reduce the possibility of external ignition, all open flame, electrical power, and other heat sources should be extinguished or turned off prior to servicing a system.

If the following test indicates shorted, grounded or open windings, see procedures S-19 for the next steps to be taken.

S-17A RESISTANCE TEST

Each compressor is equipped with an internal overload.

The line break internal overload senses both motor amperage and winding temperature. High motor temperature or amperage heats the disc causing it to open, breaking the common circuit within the compressor on single phase units.

Heat generated within the compressor shell, usually due to recycling of the motor, high amperage or insufficient gas to cool the motor, is slow to dissipate. Allow at least three to four hours for it to cool and reset, then retest.

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

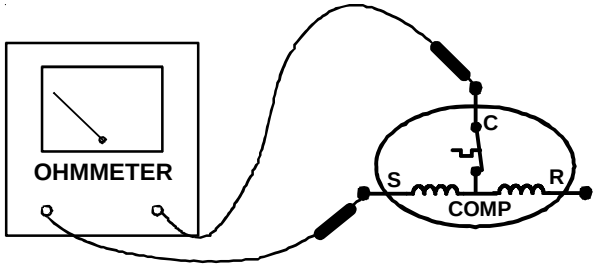
1. Remove the leads from the compressor terminals.

WARNING

See warnings S-17 before removing compressor terminal cover.

2. Using an ohmmeter, test continuity between terminals S-R, C-R, and C-S, on single phase units or terminals T2, T2 and T3, on 3 phase units.

SERVICING



TESTING COMPRESSOR WINDINGS

If either winding does not test continuous, replace the compressor.

NOTE: If an open compressor is indicated, allow ample time for the internal overload to reset before replacing compressor.

S-17B GROUND TEST

If fuse, circuit breaker, ground fault protective device, etc., has tripped, this is a strong indication that an electrical problem exists and must be found and corrected. The circuit protective device rating must be checked, and its maximum rating should coincide with that marked on the equipment nameplate.

With the terminal protective cover in place, it is acceptable to replace the fuse or reset the circuit breaker ONE TIME ONLY to see if it was just a nuisance opening. If it opens again, DO NOT continue to reset.

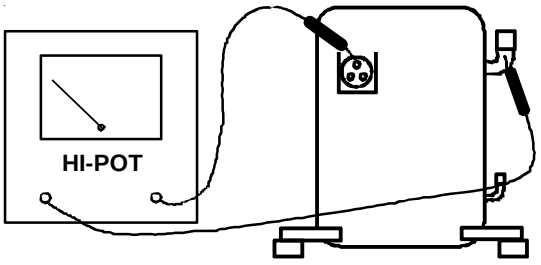
Disconnect all power to unit, making sure that **all** power legs are open.

1. DO NOT remove protective terminal cover. Disconnect the three leads going to the compressor terminals at the nearest point to the compressor.

WARNING

Damage can occur to the glass embedded terminals if the leads are not properly removed. This can result in terminal and hot oil discharging.

2. Identify the leads and using a Megger, Hi-Potential Ground Tester, or other suitable instrument which puts out a voltage between 300 and 1500 volts, check for a ground separately between each of the three leads and ground (such as an unpainted tube on the compressor). Do not use a low voltage output instrument such as a volt-ohmmeter.



COMPRESSOR GROUND TEST

3. If a ground is indicated, then carefully remove the compressor terminal protective cover and inspect for loose leads or insulation breaks in the lead wires.
4. If no visual problems indicated, carefully remove the leads at the compressor terminals.

Carefully retest for ground, directly between compressor terminals and ground.

5. If ground is indicated, replace the compressor.

S-17D OPERATION TEST

If the voltage, capacitor, overload and motor winding test fail to show the cause for failure:

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

1. Remove unit wiring from disconnect switch and wire a test cord to the disconnect switch.

NOTE: The wire size of the test cord must equal the line wire size and the fuse must be of the proper size and type.

2. With the protective terminal cover in place, use the three leads to the compressor terminals that were disconnected at the nearest point to the compressor and connect the common, start and run clips to the respective leads.
3. Connect good capacitors of the right MFD and voltage rating into the circuit as shown.
4. With power ON, close the switch.

WARNING

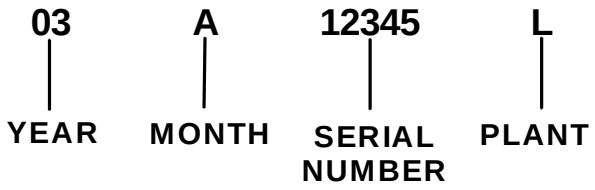
HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

A. If the compressor starts and continues to run, the cause for failure is somewhere else in the system.

B. If the compressor fails to start - replace.

SERVICING

COPELAND COMPRESSOR



S-18 TESTING CRANKCASE HEATER (OPTIONAL ITEM)

The crankcase heater must be energized a minimum of four (4) hours before the condensing unit is operated.

Crankcase heaters are used to prevent migration or accumulation of refrigerant in the compressor crankcase during the off cycles and prevents liquid slugging or oil pumping on start up.

A crankcase heater will not prevent compressor damage due to a floodback or over charge condition.

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

1. Disconnect the heater lead in wires.
2. Using an ohmmeter, check heater continuity - should test continuous. If not, replace.

S-20 CHECKING DEFROST RELAY CONTACTS

1. Remove the wire leads from the defrost relay contact terminals.
2. Using an ohmmeter, test continuity between terminals. Defrost contacts should read closed. If not as above, replace relay.

WARNING

Line Voltage now present.

3. Energize the relay by applying 24 volts to the relay coil.
4. With power on, retest with ohmmeter. Readings should be opposite those read in step 2, (N.O. contact should be closed, N.C. contacts should be open). If not as above, replace the relay.

S-21 CHECKING REVERSING VALVE AND SOLENOID

Occasionally the reversing valve may stick in the heating or cooling position or in the mid-position.

When stuck in the mid-position, part of the discharge gas from the compressor is directed back to the suction side, resulting in excessively high suction pressure. An increase in the suction line temperature through the reversing valve can also be measured. Check operation of the valve by starting the system and switching the operation from COOLING to HEATING cycle.

If the valve fails to change its position, test the voltage (24V) at the valve coil terminals, while the system is on the COOLING cycle.

If no voltage is registered at the coil terminals, check the operation of the thermostat an the continuity of the connecting wiring from the "O" terminal of the thermostat to the unit.

If voltage is registered at the coil, tap the valve body lightly while switching the system from HEATING to COOLING, etc. If this fails to cause the valve to switch positions, remove the coil connector cap and test the continuity of the reversing valve solenoid coil. If the coil does not test continuous - replace it.

If the coil test continuous and 24 volts is present at the coil terminals, the valve is inoperative - replace.

S-24 TESTING DEFROST TIMER BOARD

To check the defrost timer board for proper sequencing, proceed as follows: With power ON; unit running.

WARNING

Line Voltage now present.

TIME TEMPERATURE DEFROST CONTROL
Testing Defrost Initiation

1. Jumper defrost control (thermostat) by placing jumper wire from (R) wire of low voltage terminal board, to (DFT) terminal of defrost timer board.
2. Using a VOM, measure voltage between (DFT) terminal and (COM) terminal of defrost timer board - should read 24 VAC.
3. With VOM connected to the C and O terminials, meter should read 0 VAC. With the unit in operation, short or jumper the two TEST pins on board. (Test Terminals Jumpered - Count time speeds up - 90 minutes = approximately 21 seconds).
5. If not as above, replace control.

SERVICING

Testing Defrost Termination

With unit still running and defrost initiated:

1. Remove jumper from defrost control (thermostat) installed in Step 1 above.
2. Remove wire from Terminal (DFT) on defrost control board.
3. Unit should terminate defrost and resume normal heating operation.
4. If not as above, replace control.

S-25 TESTING DEFROST CONTROL

1. Install a thermocouple type temperature test lead on the tube adjacent to the defrost control (thermostat). Insulate the lead point of contact.
2. Check the temperature at which the control closes its contacts.
3. Raise the temperature of the control until it opens.
4. If not as above, replace control.

S-26 CHECKING HEATER LIMIT CONTROL(S)

(OPTIONAL ELECTRIC HEATERS)

Each individual heater element is protected wtih an automatic rest lmit control connected in series with each element to prevent overheating of components in case of low airflow. This limit control will open its circuit at approximately 150°F to 160°F and close at approximately 110°F.

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

1. Remove the wiring from the control terminals.
2. Using an ohmmeter test for continuity across the normally closed contacts. No readin gindicates the control is open - replace if necessary. Make sure the limits are cool before testing.

IF FOUND OPEN - REPLACE - DO NOT WIRE AROUND.

S-27 CHECKING HEATER ELEMENTS

Optional electric heaters may be added in the quantities shown in the spec sheet for each model unit, to provid electri resistance heating. Under no condition shall more heaters than the quantity shown be installed.

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

1. Disassemble and remove th heating element(s).
2. Visually inspect the heater assembly for any breaks in the wire or broken insulators.
3. Using an ohmmeter, test the element for continuity - no reading indicates the element is open. Replace as neccessary.

S-40 AR & AR*F ELECTRONIC BLOWERS TIME DELAY RELAY

The AR and AR*F contain an Electronic Blower Time Delay Relay board, B1370735. This board provides on/off time delays for the blower motor in cooling and heat pump heating demands when “G” is energized.

During a cooling or heat pump heating demand, 24Vac is supplied to terminal “G” of the EBTDR to turn on the blower motor. The EBTDR initiates a 7 second delay on and then energizes it’s onboard relay. The relay on the EBTDR board closes it’s normally open contacts and supplies power to the blower motor. When the “G” input is removed, the EBTDR initiates a 65 second delay off. When the 65 seconds delay expires the onboard relay is de-energized and it’s contacts open and remove power from the blower motor.

During an electric heat only demand, “W1” is energized but “G” is not. The blower motor is connected to the normally closed contacts of the relay on the EBTDR board. The other side of this set of contacts is connected to the heat sequencer on the heater assembly that provides power to the first heater element. When “W1” is energized, the sequencer will close it’s contacts within 10 to 20 seconds to supply power to the first heater element and to the blower motor through the normally closed contacts on the relay on the EBTDR. When the “W1” demand is removed, the sequencer opens it contacts within 30 to 70 seconds and removes power from the heater element and the blower motor.

The EBTDR also contains a speedup terminal to reduce the delays during troubleshooting of the unit. When this terminal is shorted to the common terminal, “C”, on the EBTDR board, the delay ON time is reduced to 3 seconds and the delay OFF time is reduced to 5 second.

Two additional terminals, M1 and M2, are on the EBTDR board. These terminals are used to connect the unused leads from the blower motor and have no affect on the board’s operation.

SERVICING

SEQUENCE OF OPERATION

This document covers the basic sequence of operation for a typical application with a mercury bulb thermostat. When a digital/electronic thermostat is used, the on/off staging of the auxiliary heat will vary. **Refer to the installation instructions and wiring diagrams provided with the MBR and AR*F for specific wiring connections and system configuration.**

AR & AR*F WITH SINGLE STAGE CONDENSERS

1.0 Cooling Operation

1.1 On a demand for cooling, the room thermostat energizes "G" and "Y" and 24Vac is supplied to "Y" at the condensing unit and the "G" terminal on the EBTDR board.

1.2 The compressor and condenser fan are turned on and after a 7 second on delay, the relay on the EBTDR board is energized and the blower motor starts.

1.3 When the cooling demand "Y" is satisfied, the room thermostat removes the 24Vac from "G" and "Y".

1.4 The compressor and condenser fan are turned off and after a 65 second delay off, the relay on the EBTDR board is de-energized and the blower is turned off.

2.0 Heating Operation

2.1 On a demand for heat, the room thermostat energizes "W1" and 24Vac is supplied to heat sequencer, HR1, on the heater assembly.

2.2 The contacts M1 and M2 will close within 10 to 20 seconds and turn on heater element #1. The normally closed contacts on the EBTDR are also connected to terminal M1. When M1 and M2 close, the blower motor will be energized thru the normally closed contacts on the EBTDR board. At the same time, if the heater assembly contains a second heater element, HR1 will contain a second set of contacts, M3 and M4, which will close to turn on heater element #2.

Note: If more than two heater elements are on the heater assembly, it will contain a second heat sequencer, HR2, which will control the 3rd and 4th heater elements if available. If the first stage heat demand, "W1" cannot be satisfied by the heat pump, the temperature indoors will continue to drop. The room thermostat will then energize "W2" and 24Vac will be supplied to HR2 on the heater assembly. When the "W2" demand is satisfied, the room thermostat will remove the 24Vac from HR2. The contacts on HR2 will open between 30 to 70 seconds and heater elements #3 and #4 will be turned off. **On most digital/electronic thermostats, "W2" will remain energized until the first stage demand "W1" is satisfied and then the "W1" and "W2" demands will be removed.**

2.3 When the "W1" heat demand is satisfied, the room thermostat will remove the 24Vac from HR1. Both set of contacts on the relay opens within 30 to 70 seconds and turn off the heater element(s) and the blower motor.

AR & AR*F WITH SINGLE STAGE HEAT PUMPS

3.0 Cooling Operation

On heat pump units, when the room thermostat set to the cooling mode, 24Vac is supplied to "O" which energizes the reversing valve. As long as the thermostat is set for cooling, the reversing valve will be in the energized position for cooling.

3.1 On a demand for cooling, the room thermostat energizes "G" and "Y" and 24Vac is supplied to "Y" at the heat pump and the "G" terminal on the EBTDR board.

3.2 The heat pump turned on in the cooling mode and after a 7 second on delay, the relay on the EBTDR board is energized and the blower motor starts.

3.3 When the cooling demand is satisfied, the room thermostat removes the 24Vac from "G" and "Y".

3.4 The heat pump is turned off and after a 65 second delay off, the relay on the EBTDR board is de-energized and the blower motor is turned off.

4.0 Heating Operation

On heat pump units, when the room thermostat set to the heating mode, the reversing valve is not energized. As long as the thermostat is set for heating, the reversing valve will be in the de-energized position for heating except during a defrost cycle. Some installations may use one or more outdoor thermostats to restrict the amount of electric heat that is available above a preset ambient temperature. Use of optional controls such as these can change the operation of the electric heaters during the heating mode. This sequence of operation does not cover those applications.

4.1 On a demand for first stage heat with heat pump units, the room thermostat energizes "G" and "Y" and 24Vac is supplied to "Y" at the heat pump unit and the "G" terminal on the EBTDR board. The heat pump is turned on in the heating mode and the blower motor starts after a 7 second on delay.

4.2 If the first stage heat demand cannot be satisfied by the heat pump, the temperature indoors will continue to drop. The room thermostat will then energize terminal "W2' for second stage heat and 24Vac will be supplied to heat sequencer HR1 on the heater assembly.

4.3 HR1 contacts M1 and M2 will close will close within 10 to 20 seconds and turn on heater element #1. At the same time, if the heater assembly contains a second heater element, HR1 will contain a second set of contacts, M3 and M4, which will close and turn on heater element #2. The blower motor is already on as a result of terminal "G" on the EBTDR board being energized for the first stage heat demand.

Note: If more than two heater elements are on the heater assembly, it will contain a second heat sequencer, HR2, which will control the 3rd and 4th heater elements if available. If the second stage heat demand, "W2" cannot be satisfied by the heat pump, the temperature indoors will continue to drop. The room thermostat will then energize "W3" and 24Vac will be supplied to HR2 on the heater assembly. When the "W3" demand is satisfied, the room thermostat will remove the 24Vac from HR2. The contacts on HR2 will open between 30 to 70 seconds and heater elements #3 and #4 will be turned off. **On most digital/electronic thermostats, "W3" will remain energized until the first stage heat demand "Y" is satisfied and then the "G", "Y", "W2" and "W3" demands will be removed.**

4.4 As the temperature indoors increase, it will reach a point where the second stage heat demand, "W2", is satisfied. When this happens, the room thermostat will remove the 24Vac from the coil of HR1. The contacts on HR1 will open between 30 to 70 seconds and turn off both heater element(s). The heat pump remains on along with the blower motor because the "Y" demand for first stage heat will still be present.

4.5 When the first stage heat demand "Y" is satisfied, the room thermostat will remove the 24Vac from "G" and "Y". The heat pump is turned off and the blower motor turns off after a 65 second off delay.

5.0 Defrost Operation

On heat pump units, when the room thermostat is set to the heating mode, the reversing valve is not energized. As long as the thermostat is set for heating, the reversing valve will be in the de-energized position for heating except during a defrost cycle.

5.1 The heat pump will be on and operating in the heating mode as described the Heating Operation in section 4.

5.2 The defrost control in the heat pump unit checks to see if a defrost is needed every 30, 60 or 90 minutes of heat pump operation depending on the selectable setting by monitoring the state of the defrost thermostat attached to the outdoor coil.

5.3 If the temperature of the outdoor coil is low enough to cause the defrost thermostat to be closed when the defrost board checks it, the board will initiate a defrost cycle.

5.4 When a defrost cycle is initiated, the contacts of the HVDR relay on the defrost board open and turns off the outdoor fan. The contacts of the LVDR relay on the defrost board closes and supplies 24Vac to "O" and "W2". The reversing valve is energized and the contacts on HR1 close and turns on the electric heater(s). The unit will continue to run in this mode until the defrost cycle is completed.

5.5 When the temperature of the outdoor coil rises high enough to causes the defrost thermostat to open, the defrost cycle will be terminated. If at the end of the programmed 10 minute override time the defrost thermostat is still closed, the defrost board will automatically terminate the defrost cycle.

5.6 When the defrost cycle is terminated, the contacts of the HVDR relay will close to start the outdoor fan and the contacts of the LVDR relay will open and turn off the reversing valve and electric heater(s). The unit will now be back in a normal heating mode with a heat pump demand for heating as described in the Heating Operation in section 4.

S-41 AER & AEPT WITH SINGLE STATE CONDENSERS

AER & AEPT ELECTRONIC BLOWER TIME DELAY RELAY

SEQUENCE OF OPERATION

This document covers the basic sequence of operation for a typical application with a mercury bulb thermostat. When a digital/electronic thermostat is used, the on/off staging of the auxiliary heat will vary. Refer to the installation instructions and wiring diagrams provided with the AER and AEPT for specific wiring connections, dip switch settings and system configuration.

AER & AEPT WITH SINGLE STAGE CONDENSERS

When used with a single stage condenser, dip switch #4 must be set to the on position on the VSTB inside the AER and AEPT. The "Y" output from the indoor thermostat must be connected to the yellow wire labeled "Y/Y2" inside the wire bundle marked "Thermostat" and the yellow wire labeled "Y/Y2" inside the wire bundle marked "Outdoor Unit" must be connected to "Y" at the condenser. The orange jumper wire from terminal "Y1" to terminal "O" on the VSTB inside the AEPT must remain connected.

1.0 Cooling Operation

1.1 On a demand for cooling, the room thermostat energizes "G" and "Y" and 24Vac is supplied to "G" and "Y/Y2" of the AER and AEPT unit. The VSTB inside the AER and AEPT will turn on the blower motor and the motor will ramp up to the speed programmed in the motor based on the settings for dip switch 5 and 6. The VSTB will supply 24Vac to "Y" at the condenser and the compressor and condenser are turned on.

1.2 When the cooling demand is satisfied, the room thermostat removes the 24Vac from "G" and "Y". The AEPT removes the 24Vac from "Y' at the condenser and the compressor and condenser fan are turned off. The blower motor will ramp down to a complete stop based on the time and rate programmed in the motor.

SERVICING

2.0 Heating Operation

2.1 On a demand for heat, the room thermostat energizes "W1" and 24Vac is supplied to terminal "E/W1" of the VSTB inside the AER and AEPT units. The VSTB will turn on the blower motor and the motor will ramp up to the speed programmed in the motor based on the settings for dip switch 1 and 2. The VSTB will supply 24Vac to heat sequencer HR1 on the electric heater assembly.

2.2 HR1 contacts M1 and M2 will close within 10 to 20 seconds and turn on heater element #1. At the same time, if the heater assembly contains a second heater element, HR1 will contain a second set of contacts, M3 and M4, which will close and turn on heater element #2.

5.0 Defrost Operation

On heat pump units, when the room thermostat is set to the heating mode, the reversing valve is not energized. As long as the thermostat is set for heating, the reversing valve will be in the de-energized position for heating except during a defrost cycle.

5.1 The heat pump will be on and operating in the heating mode as described the Heating Operation in section 4.

5.2 The defrost control in the heat pump unit checks to see if a defrost is needed every 30, 60 or 90 minutes of heat pump operation depending on the selectable setting by monitoring the state of the defrost thermostat attached to the outdoor coil.

5.3 If the temperature of the outdoor coil is low enough to cause the defrost thermostat to be closed when the defrost board checks it, the board will initiate a defrost cycle.

5.4 When a defrost cycle is initiated, the contacts of the HVDR relay on the defrost board open and turns off the outdoor fan. The contacts of the LVDR relay on the defrost board closes and supplies 24Vac to "O" and "W2". The reversing valve is energized and the contacts on HR1 close and turns on the electric heater(s). The unit will continue to run in this mode until the defrost cycle is completed.

5.5 When the temperature of the outdoor coil rises high enough to causes the defrost thermostat to open, the defrost cycle will be terminated. If at the end of the programmed 10 minute override time the defrost thermostat is still closed, the defrost board will automatically terminate the defrost cycle.

5.6 When the defrost cycle is terminated, the contacts of the HVDR relay on the defrost board will close to start the outdoor fan and the contacts of the LVDR relay will open and turn off the reversing valve and electric heater(s). The unit will now be back in a normal heating mode with a heat pump demand for heating as described in the Heating Operation in section 4.

S-60 ELECTRIC HEATER (OPTIONAL ITEM)

Optional electric heaters may be added, in the quantities shown in the specifications section, to provide electric resistance heating. Under no condition shall more heaters than the quantity shown be installed.

The low voltage circuit in the air handler is factory wired and terminates at the location provided for the electric heater(s). A minimum of field wiring is required to complete the installation.

Other components such as a Heating/Cooling Thermostat and Outdoor Thermostats are available to complete the installation.

The system CFM can be determined by measuring the static pressure external to the unit. The installation manual supplied with the blower coil, or the blower performance table in the service manual, shows the CFM for the static measured.

Alternately, the system CFM can be determined by operating the electric heaters and indoor blower WITHOUT having the compressor in operation. Measure the temperature rise as close to the blower inlet and outlet as possible.

If other than a 240V power supply is used, refer to the **BTUH CAPACITY CORRECTION FACTOR** chart below.

BTUH CAPACITY CORRECTION FACTOR				
SUPPLY VOLTAGE	250	230	220	208
MULTIPLICATION FACTOR	1.08	.92	.84	.75

EXAMPLE: Five (5) heaters provide 24.0 KW at the rated 240V. Our actual measured voltage is 220V, and our measured temperature rise is 42°F. Find the actual CFM:

Answer: 24.0KW, 42°F Rise, 240 V = 1800 CFM from the **TEMPERATURE RISE** CHART, Table 5.

Heating output at 220 V = 24.0KW x 3.413 x .84 = 68.8 MBH.

Actual CFM = 1800 x .84 Corr. Factor = 1400 CFM.

NOTE: The temperature rise table is for sea level installations. The temperature rise at a particular KW and CFM will be greater at high altitudes, while the external static pressure at a particular CFM will be less.

SERVICING

TEMPERATURE RISE (F°) @ 240V							
CFM	4.8 KW	7.2 KW	9.6 KW	14.4 KW	19.2 KW	24.0 KW	28.8 KW
600	25	38	51	-	-	-	-
700	22	33	43	-	-	-	-
800	19	29	38	57	-	-	-
900	17	26	34	51	-	-	-
1000	15	23	30	46	-	-	-
1100	14	21	27	41	55	-	-
1200	13	19	25	38	50	-	-
1300	12	18	23	35	46	-	-
1400	11	16	22	32	43	54	65
1500	10	15	20	30	40	50	60
1600	9	14	19	28	38	47	57
1700	9	14	18	27	36	44	53
1800	8	13	17	25	34	42	50
1900	8	12	16	24	32	40	48
2000	8	12	15	23	30	38	45
2100	7	11	14	22	29	36	43
2200	7	11	14	21	27	34	41
2300	7	10	13	20	26	33	39

Table 5

ELECTRIC HEATER CAPACITY BTUH								
HTR KW	3.0 KW	4.7 KW	6.0 KW	7.0 KW	9.5 KW	14.2 KW	19.5 KW	21.0 KW
BTUH	10200	16200	20400	23800	32400	48600	66500	71600

Table 6

FORMULAS:

Heating Output = KW x 3413 x Corr. Factor

Actual CFM = CFM (from table) x Corr. Factor

BTUH = KW x 3413

BTUH = CFM x 1.08 x Temperature Rise (T)

$$CFM = \frac{KW \times 3413}{1.08 \times T}$$

$$T = \frac{BTUH}{CFM \times 1.08}$$

S-61A CHECKING HEATER LIMIT CONTROL(S)

Each individual heater element is protected with a limit control device connected in series with each element to prevent overheating of components in case of low airflow. This limit control will open its circuit at approximately 150°F.

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

1. Remove the wiring from the control terminals.
2. Using an ohmmeter, test for continuity across the normally closed contacts. No reading indicates the control is open - replace if necessary.

IF FOUND OPEN - REPLACE - DO NOT WIRE AROUND.

S-61B CHECKING HEATER FUSE LINK (OPTIONAL ELECTRIC HEATERS)

Each individual heater element is protected with a one time fuse link which is connected in series with the element. The fuse link will open at approximately 333°.

1. Remove heater element assembly so as to expose fuse link.
2. Using an ohmmeter, test across the fuse link for continuity - no reading indicates the link is open. Replace as necessary.

NOTE: The link is designed to open at approximately 333°F. DO NOT WIRE AROUND - determine reason for failure.

S-62 CHECKING HEATER ELEMENTS

1. Disassemble and remove the heating element.
2. Visually inspect the heater assembly for any breaks in the wire or broken insulators.
3. Using an ohmmeter, test the element for continuity - no reading indicates the element is open. Replace as necessary.

SERVICING

S-100 REFRIGERATION REPAIR PRACTICE

DANGER

Always remove the refrigerant charge in a proper manner before applying heat to the system.

When repairing the refrigeration system:

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

1. Never open a system that is under vacuum. Air and moisture will be drawn in.
2. Plug or cap all openings.
3. Remove all burrs and clean the brazing surfaces of the tubing with sand cloth or paper. Brazing materials do not flow well on oxidized or oily surfaces.
4. Clean the inside of all new tubing to remove oils and pipe chips.
5. When brazing, sweep the tubing with dry nitrogen to prevent the formation of oxides on the inside surfaces.
6. Complete any repair by replacing the liquid line drier in the system, evacuate and charge.

BRAZING MATERIALS

Copper to Copper Joints - Sil-Fos used without flux (alloy of 15% silver, 80% copper, and 5% phosphorous). Recommended heat 1400°F.

Copper to Steel Joints - Silver Solder used without a flux (alloy of 30% silver, 38% copper, 32% zinc). Recommended heat - 1200°F.

S-101 LEAK TESTING (NITROGEN OR NITROGEN-TRACED)

WARNING

To avoid the risk of fire or explosion, never use oxygen, high pressure air or flammable gases for leak testing of a refrigeration system.

WARNING

To avoid possible explosion, the line from the nitrogen cylinder must include a pressure regulator and a pressure relief valve. The pressure relief valve must be set to open at no more than 150 psig.

Pressure test the system using dry nitrogen and soapy water to locate leaks. If you wish to use a leak detector, charge the system to 10 psi using the appropriate refrigerant then use nitrogen to finish charging the system to working pressure, then apply the detector to suspect areas. If leaks are found, repair them. After repair, repeat the pressure test. If no leaks exist, proceed to system evacuation.

S-102 EVACUATION

WARNING

REFRIGERANT UNDER PRESSURE!
Failure to follow proper procedures may cause property damage, personal injury or death.

This is the most important part of the entire service procedure. The life and efficiency of the equipment is dependent upon the thoroughness exercised by the serviceman when evacuating air (non-condensables) and moisture from the system.

Air in a system causes high condensing temperature and pressure, resulting in increased power input and reduced performance.

Moisture chemically reacts with the refrigerant oil to form corrosive acids. These acids attack motor windings and parts, causing breakdown.

The equipment required to thoroughly evacuate the system is a high vacuum pump, capable of producing a vacuum equivalent to 25 microns absolute and a thermocouple vacuum gauge to give a true reading of the vacuum in the system

NOTE: Never use the system compressor as a vacuum pump or run when under a high vacuum. Motor damage could occur.

WARNING

Do not front seat the service valve(s) with the compressor open, with the suction line of the comprssor closed or severely restricted.

WARNING

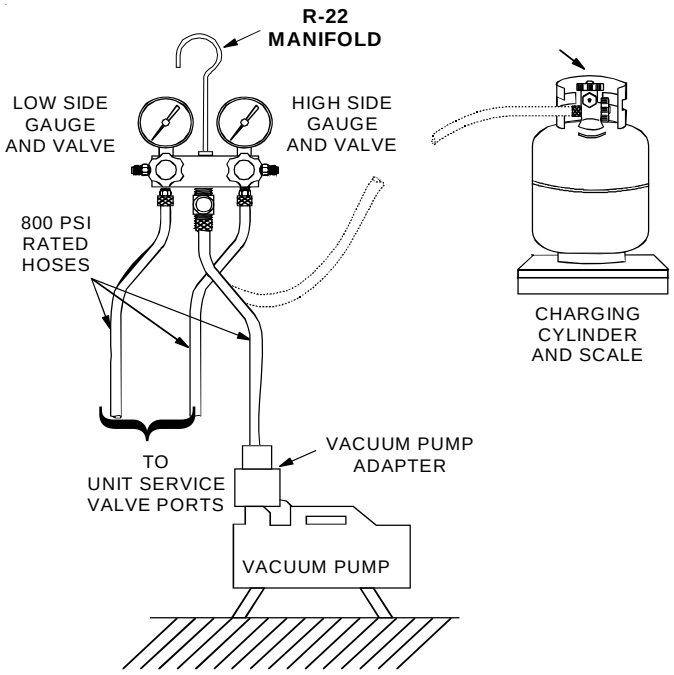
Operating the compressor with the suction valve closed will void the warranty and cause serious compressor damage.

WARNING

SCROLL COMPRESSOR. Do not front seat the service valve(s) with the compressor operating in an attempt to save refrigerant. With the suction line of the compressor closed or severely restricted, the scroll compressor can and will draw a deep vacuum very quickly. This vacuum can cause internal arcing of the fusite, resulting in a damaged or failed compressor.

SERVICING

1. Connect the vacuum pump, vacuum tight manifold set with high vacuum hoses, thermocouple vacuum gauge and charging cylinder as shown.
2. Start the vacuum pump and open the shut off valve to the high vacuum gauge manifold only. After the compound gauge (low side) has dropped to approximately 29 inches of vacuum, open the valve to the vacuum thermocouple gauge. See that the vacuum pump will blank-off to a maximum of 25 microns. A high vacuum pump can only produce a good vacuum if its oil is non-contaminated.



EVACUATION

3. If the vacuum pump is working properly, close the valve to the vacuum thermocouple gauge and open the high and low side valves to the high vacuum manifold set. With the valve on the charging cylinder closed, open the manifold valve to the cylinder.
4. Evacuate the system to at least 29 inches gauge before opening valve to thermocouple vacuum gauge.
5. Continue to evacuate to a maximum of 250 microns. Close valve to vacuum pump and watch rate of rise. If vacuum does not rise above 1500 microns in three to five minutes, system can be considered properly evacuated.
6. If thermocouple vacuum gauge continues to rise and levels off at about 5000 microns, moisture and non-condensables are still present. If gauge continues to rise a leak is present. Repair and re-evacuate.
7. Close valve to thermocouple vacuum gauge and vacuum pump. Shut off pump and prepare to charge.

S-103 CHARGING

WARNING

REFRIGERANT UNDER PRESSURE!
*** Do not overcharge system with refrigerant.**
*** Do not operate unit in a vacuum or at negative pressure.**
Failure to follow proper procedures may cause property damage, personal injury or death.

CAUTION

Use refrigerant certified to ARI standards. Used refrigerant may cause compressor damage and will void the warranty. Most portable machines cannot clean used refrigerant to meet ARI standards.

CAUTION

Operating the compressor with the suction valve closed will void the warranty and cause serious compressor damage.

Charge the system with the exact amount of refrigerant.

Refer to the specification section or check the unit nameplates for the correct refrigerant charge.

An inaccurately charged system will cause future problems.

1. When using an ambient compensated calibrated charging cylinder, allow liquid refrigerant only to enter the high side.
2. After the system will take all it will take, close the valve on the high side of the charging manifold.
3. Start the system and charge the balance of the refrigerant through the low side. DO NOT charge in a liquid form.
4. With the system still running, close the valve on the charging cylinder. At this time, you may still have some liquid refrigerant in the charging cylinder hose and will definitely have liquid in the liquid hose. Reseat the liquid line core. Slowly open the high side manifold valve and transfer the liquid refrigerant from the liquid line hose and charging cylinder hose into the suction service valve port. CAREFUL: Watch so that liquid refrigerant does not enter the compressor.
5. With the system still running, reseat the suction valve core, remove hose and reinstall both valve core caps.
6. Check system for leaks.

SERVICING

NOTE: This charging procedure can only be done in the cooling mode of operation. (Early production "a" models only.) All models with compressor process tube access valve can be processed in heating cycle if this valve is used.

When charging a remote condensing unit with a non-matching evaporator coil, or a system where the charge quantity is unknown, alternate charging methods must be used. These systems must be charged according to subcooling or superheat.

SYSTEM SUPERHEAT					
Ambient Condenser Inlet Temp. (°F Drybulb)	**Return Air Temperature (°F Drybulb)**				
	65	**70**	**75**	**80**	**85**
115					3
100				5	5
95			5	5	5
90			7	12	18
85		5	10	17	20
80		5	12	21	26
75	5	10	17	25	29
70	5	14	20	28	32
65	13	19	26	32	35
60	17	25	30	33	37

Coils having flow control restrictors should be charged to match the System Superheat chart above. Coils with thermostatic expansion valves (TXV's) should be charged by subcooling. See "Checking Subcooling and Superheat" sections in this manual.

Due to their design, Scroll compressors are inherently more tolerant of liquid refrigerant.

NOTE*: Even though the compressor section of a Scroll compressor is more tolerant of liquid refrigerant, continued floodback or flooded start conditions may wash oil from the bearing surfaces causing premature bearing failure.*

If a restriction is located, replace the restricted part, replace drier, evacuate and recharge.

S-104 CHECKING COMPRESSOR EFFICIENCY

The reason for compressor inefficiency is broken or damaged suction and/or discharge valves, or scroll flanks on Scroll compressors, reducing the ability of the compressor to pump refrigerant vapor.

The condition of the valves or scroll flanks is checked in the following manner.

1. Attach gauges to the high and low side of the system.
2. Start the system and run a "Cooling Performance Test.

If the test shows:

a. Below normal high side pressure.

b. Above normal low side pressure.

c. Low temperature difference across coil.

d. Low amp draw at compressor.

and the charge is correct. The compressor is faulty - replace the compressor. **NOTE:** THIS TEST CANNOT BE DONE IN THE HEATING MODE

Verification of proper rotation of Scroll Compressors is made as follows.

NOTE: The compressor may run backwards (noisy operation) for 1 or 2 seconds at shutdown. This is normal and does not harm the compressor.

1. Install gauges and verify that the suction pressure drops while the discharge pressure increases.
2. Listen for normal compressor sound levels. Reverse rotation results in elevated or unusual sound levels.
3. Reverse rotation will result in substantially reduced amp draw from tabulated values.

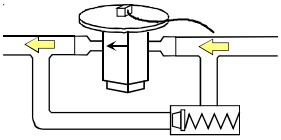
To correct improper rotation, switch any two power supply leads at the outdoor unit contactor.

The 3 phase Scroll Compressors are direction of rotation sensitive. They will rotate in either direction depending on the phasing of the power. There is no negative impact on durability caused by operating 3 phase compressors in reversed rotation. The compressors internal protector will trip, de-energizing the compressor. Continued operation of 3 phase scroll compressors with the rotation reversed will contribute to compressor failure. All 3 phase scroll compressors should be checked for correct phase rotation.

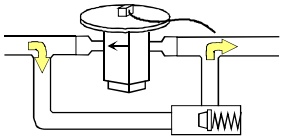
S-105B THERMOSTATIC EXPANSION VALVE

The expansion valve is designed to control the rate of liquid refrigerant flow into an evaporator coil in exact proportion to the rate of evaporation of the refrigerant in the coil. The amount of refrigerant entering the coil is regulated since the valve responds to temperature of the refrigerant gas leaving the coil (feeler bulb contact) and the pressure of the refrigerant in the coil. This regulation of the flow prevents the return of liquid refrigerant to the compressor.

The illustration below shows typical heat pump TXV/check valve operation in the heating and cooling modes.



COOLING



HEATING

THERMOSTATIC EXPANSION VALVES

Some TXV valves contain an internal check valve thus eliminating the need for an external check valve and bypass loop. The three forces which govern the operation of the valve are: (1) the pressure created in the power assembly by the feeler bulb, (2) evaporator pressure, and (3) the equivalent pressure of the superheat spring in the valve.

0% bleed type expansion valves are used on indoor and outdoor coils. The 0% bleed valve will not allow the system pressures (High and Low side) to equalize during the shut down period. The valve will shut off completely at approximately 100 PSIG.

30% bleed valves used on some other models will continue to allow some equalization even though the valve has shut-off completely because of the bleed holes within the valve. This type of valve should not be used as a replacement for a 0% bleed valve, due to the resulting drop in performance.

The bulb must be securely fastened with two straps to a clean straight section of the suction line. Application of the bulb to a horizontal run of line is preferred. If a vertical installation cannot be avoided, the bulb must be mounted so that the capillary tubing comes out at the top.

***THE VALVES PROVIDED BY GOODMAN ARE DESIGNED TO MEET THE SPECIFICATION REQUIREMENTS FOR OPTIMUM PRODUCT OPERATION*. DO NOT USE SUBSTITUTES.**

S-106 OVERFEEDING

Overfeeding by the expansion valve results in high suction pressure, cold suction line, and possible liquid slugging of the compressor.

If these symptoms are observed:

1. Check for an overcharged unit by referring to the cooling performance charts in the servicing section.
2. Check the operation of the power element in the valve as explained in S-110 Checking Expansion Valve Operation.
3. Check for restricted or plugged equalizer tube.

S-107 UNDERFEEDING

Underfeeding by the expansion valve results in low system capacity and low suction pressures.

If these symptoms are observed:

1. Check for a restricted liquid line or drier. A restriction will be indicated by a temperature drop across the drier.
2. Check the operation of the power element of the valve as described in S-110 Checking Expansion Valve Operation.

S-108 SUPERHEAT

The expansion valves are factory adjusted to maintain 12 to 18 degrees superheat of the suction gas. Before checking the superheat or replacing the valve, perform all the procedures outlined under Air Flow, Refrigerant Charge, Expansion Valve - Overfeeding, Underfeeding. These are the most common causes for evaporator malfunction.

CHECKING SUPERHEAT

Refrigerant gas is considered superheated when its temperature is higher than the saturation temperature corresponding to its pressure. The degree of superheat equals the degrees of temperature increase above the saturation temperature at existing pressure. See Temperature - Pressure Chart Table 7.

1. Attach an accurate thermometer or preferably a thermocouple type temperature tester to the suction line at a point at least 6" from the compressor.
2. Install a low side pressure gauge on the suction line service valve at the outdoor unit.
3. Record the gauge pressure and the temperature of the line.
4. Convert the suction pressure gauge reading to temperature by finding the gauge reading in Temperature - Pressure Chart and reading to the left, find the temperature in the °F. Column.
5. The difference between the thermometer reading and pressure to temperature conversion is the amount of superheat.

EXAMPLE:

a. Suction Pressure = 84

b. Corresponding Temp. °F. = 50

c. Thermometer on Suction Line = 63°F.

To obtain the degrees temperature of superheat subtract 50.0 from 63.0°F.

The difference is 13° Superheat. The 13° Superheat would fall in the ± range of allowable superheat.

SUPERHEAT ADJUSTMENT

The expansion valves used on Amana® coils are factory set and are not field adjustable. If the superheat setting becomes disturbed, replace the valve.

On systems using capillary tubes or flow control restrictors, superheat is adjusted in accordance with the "DESIRED SUPERHEAT vs. OUTDOOR TEMP" chart as explained in section S-103 CHARGING

SERVICING

Temp. °F.	Gauge Pressure (PSIG) Freon-22	Temp. °F.	Gauge Pressure (PSIG) Freon-22
-40	0.61	60	102.5
-38	1.42	62	106.3
-36	2.27	64	110.2
-34	3.15	65	114.2
-32	4.07	68	118.3
-30	5.02	70	122.5
-28	6.01	72	126.8
-26	7.03	74	131.2
-24	8.09	76	135.7
-22	9.18	78	140.5
-20	10.31	80	145.0
-18	11.48	82	149.5
-16	12.61	84	154.7
-14	13.94	86	159.8
-12	15.24	88	164.9
-10	16.59	90	170.1
-8	17.99	92	175.4
-6	19.44	94	180.9
-4	20.94	96	186.5
-2	22.49	96	192.1
0	24.09	100	197.9
2	25.73	102	203.8
4	27.44	104	209.9
6	29.21	106	216.0
8	31.04	108	222.3
10	32.93	110	228.7
12	34.88	112	235.2
14	36.89	114	241.9
16	38.96	116	248.7
18	41.09	118	255.6
20	43.28	120	262.6
22	45.53	122	269.7
24	47.85	124	276.9
26	50.24	126	284.1
28	52.70	128	291.4
30	55.23	130	298.8
32	57.83	132	306.3
34	60.51	134	314.0
36	63.27	136	321.9
38	66.11	136	329.9
40	69.02	140	338.0
42	71.99	142	346.3
44	75.04	144	355.0
46	78.18	146	364.3
48	81.40	158	374.1
50	84.70	150	384.3
52	88.10	152	392.3
54	91.5	154	401.3
56	95.1	156	411.3
58	98.8	158	421.8
		160	433.3

Table 7

S-109 CHECKING SUBCOOLING

Refrigerant liquid is considered subcooled when its temperature is lower than the saturation temperature corresponding to its pressure. The degree of subcooling equals the degrees of temperature decrease below the saturation temperature at the existing pressure.

1. Attach an accurate thermometer or preferably a thermocouple type temperature tester to the liquid line as it leaves the condensing unit.
2. Install a high side pressure gauge on the high side (liquid) service valve at the front of the unit.
3. Record the gauge pressure and the temperature of the line.
4. Convert the liquid line pressure gauge reading to temperature by finding the gauge reading in Temperature - Pressure Chart and reading to the left, find the temperature in the °F. Column.
5. The difference between the thermometer reading and pressure to temperature conversion is the amount of subcooling.

EXAMPLE:

a. Liquid Line Pressure = 260

b. Corresponding Temp. °F. = 120°

c. Thermometer on Liquid line = 109°F.

To obtain the amount of subcooling subtract 109°F from 120°F.

The difference is 11° subcooling. The normal subcooling range is 9° - 13° subcooling for heat pumps units, 14 to 18 for straight cool units.

S-110 CHECKING EXPANSION VALVE OPERATION

1. Remove the remote bulb of the expansion valve from the suction line.
2. Start the system and cool the bulb in a container of ice water, closing the valve. As you cool the bulb, the suction pressure should fall and the suction temperature will rise.
3. Next warm the bulb in your hand. As you warm the bulb, the suction pressure should rise and the suction temperature will fall.
4. If a temperature or pressure change is noticed, the expansion valve is operating. If no change is noticed, the valve is restricted, the power element is faulty, or the equalizer tube is plugged.
5. Capture the charge, replace the valve and drier, evacuate and recharge.

SERVICING

S-111 CAPILLARY TUBES/RESTRICTOR ORIFICES

The capillary tubes/restrictor orifices used in conjunction with the indoor and outdoor coil, are a predetermined length and bore (I.D.).

They are designed to control the rate of liquid refrigerant flow into an evaporator coil.

The amount of refrigerant that flows through the capillary tube/restrictor orifice is regulated by the pressure difference between the high and low sides of the system.

In the cooling cycle when the outdoor air temperature rises, the high side condensing pressure rises. At the same time, the cooling load on the indoor coil increases, causing the low side pressure to rise, but at a slower rate.

Since the high side pressure rises faster when the temperature increases, more refrigerant flows to the evaporator, increasing the cooling capacity of the system.

When the outdoor temperature falls, the reverse takes place. The condensing pressure falls, and the cooling loads on the indoor coil decrease, causing less refrigerant flow.

A strainer is placed on the entering side of the tubes to prevent any foreign material from becoming lodged inside the capillary tubes.

If a restriction should become evident, proceed as follows:

1. Capture the refrigerant charge.
2. Remove the capillary tubes/restrictor orifice or tube strainer assembly, and replace.
3. Replace liquid line drier, evacuate and recharge.

Capillary Tubes/Orifice Assembly

CHECKING EQUALIZATION TIME

During the "OFF" cycle, the high side pressure bleeds to the low side through the capillary tubes/restrictor orifices. Check equalization time as follows:

1. Attach a gauge manifold to the suction and liquid line dill valves.
2. Start the system and allow the pressures to stabilize.
3. Stop the system and check the time it takes for the high and low pressure gauge readings to equalize.

If it takes more than seven (7) minutes the capillary tubes/restrictor orifices are inoperative. Replace, install a liquid line drier, evacuate and recharge.

S-112 CHECKING RESTRICTED LIQUID LINE

When the system is operating, the liquid line is warm to the touch. If the liquid line is restricted, a definite temperature drop will be noticed at the point of restriction. In severe cases, frost will form at the restriction and extend down the line in the direction of the flow.

Discharge and suction pressures will be low, giving the appearance of an undercharged unit. However, the unit will have normal to high subcooling.

Locate the restriction, replace the restricted part, replace drier, evacuate and recharge.

S-113 OVERCHARGE OF REFRIGERANT

An overcharge of refrigerant is normally indicated by an excessively high head pressure.

An evaporator coil, using an expansion valve metering device, will basically modulate and control a flooded evaporator and prevent liquid return to the compressor.

An evaporator coil, using a capillary tube metering device, could allow refrigerant to return to the compressor under extreme overcharge conditions. Also with a capillary tube metering device, extreme cases of insufficient indoor air can cause icing of the indoor coil and liquid return to the compressor, but the head pressure would be lower.

There are other causes for high head pressure which may be found in the "Service Problem Analysis Guide."

If other causes check out normal, an overcharge or a system containing non-condensables would be indicated.

If this system is observed:

1. Start the system.
2. Remove and capture small quantities of gas from the suction line dill valve until the head pressure is reduced to normal.
3. Observe the system while running a cooling performance test. If a shortage of refrigerant is indicated, then the system contains non-condensables.

S-114 NON-CONDENSABLES

If non-condensables are suspected, shut down the system and allow the pressures to equalize. Wait at least 15 minutes. Compare the pressure to the temperature of the coldest coil since this is where most of the refrigerant will be. If the pressure indicates a higher temperature than that of the coil temperature, non-condensables are present.

Non-condensables are removed from the system by first removing the refrigerant charge, replacing and/or installing liquid line drier, evacuating and recharging.

SERVICING

S-115 COMPRESSOR BURNOUT

When a compressor burns out, high temperature develops causing the refrigerant, oil and motor insulation to decompose forming acids and sludge.

If a compressor is suspected of being burned-out, attach a refrigerant hose to the liquid line dill valve and properly remove and dispose of the refrigerant.

NOTICE

Violation of EPA regulations may result in fines or other penalties.

Now determine if a burn out has actually occurred. Confirm by analyzing an oil sample using a Sporlan Acid Test Kit, AK-3 or its equivalent.

Remove the compressor and obtain an oil sample from the suction stub. If the oil is not acidic, either a burnout has not occurred or the burnout is so mild that a complete clean-up is not necessary.

If acid level is unacceptable, the system must be cleaned by using the clean-up drier method.

CAUTION

Do not allow the sludge or oil to contact the skin. Severe burns may result.

NOTE: The Flushing Method using R-11 refrigerant is no longer approved by Goodman Company, L.P.

Suction Line Drier Clean-Up Method

Use AMANA® brand part number RF000127 suction line filter drier kit. This drier should be installed as close to the compressor suction fitting as possible. The filter must be accessible and be rechecked for a pressure drop after the system has operated for a time. It may be necessary to use new tubing and form as required.

NOTE: At least twelve (12) inches of the suction line immediately out of the compressor stub must be discarded due to burned residue and contaminates.

1. Remove compressor discharge line strainer.
2. Remove the liquid line drier and expansion valve.
3 Purge all remaining components with dry nitrogen or carbon dioxide until clean.
4. Install new components **including** liquid line drier.
5. Braze all joints, leak test, evacuate, and recharge system.
6. Start up the unit and record the pressure drop across the drier.
7. Continue to run the system for a minimum of twelve (12) hours and recheck the pressure drop across the drier. Pressure drop should not exceed 6 PSIG.
8. Continue to run the system for several days, repeatedly checking pressure drop across the suction line drier. If the pressure drop never exceeds the 6 PSIG, the drier has trapped the contaminants. Remove the suction line drier from the system.
9. If the pressure drop becomes greater, then it must be replaced and steps 5 through 9 repeated until it does not exceed 6 PSIG.

NOTICE: Regardless, the cause for burnout must be determined and corrected before the new compressor is started.

S-120 REFRIGERANT PIPING

The piping of a refrigeration system is very important in relation to system capacity, proper oil return to compressor, pumping rate of compressor and cooling performance of the evaporator.

This long line set application guideline applies to all ARI listed R22 air conditioner and heat pump split system matches of nominal capacity 18,000 to 60,000 Btuh. This guideline will cover installation requirements and additional accessories needed for split system installations where the line set exceeds 50 feet in actual length.

Additional Accessories:

1. **Crankcase Heater**- a long line set application can critically increase the charge level needed for a system. As a result, the system is very prone to refrigerant migration during its off-cycle and a crankcase heater will help minimize this risk. A crankcase heater is recommended for any long line application (50 watt minimum).
2. **Hard Start Assist**- increased charge level in long line applications can require extra work from the compressor at start-up. A hard start assist device may be required to overcome this.

Tube Sizing:

1. In long line applications, the "equivalent line length" is the sum of the straight length portions of the suction line plus losses (in equivalent length) from 45 and 90 degree bends. **Select the proper suction tube size based on equivalent length of the suction line (see Tables 8 & 9) and recalculated system capacity.**

Equivalent length = Length horizontal + Length vertical + Losses from bends (see Table 9)

2. **For any residential split system installed with a long line set, the liquid line size must never exceed 3/8".** Limiting the liquid line size to 3/8" is critical since an increased refrigerant charge level from having a larger liquid line could possibly shorten a compressor's lifespan.

SERVICING

3. **Single Stage Condensing Unit:** The maximum length of tubing must not exceed 150 feet.
   - **50 feet** is the maximum recommended vertical difference between the condenser and evaporator when the evaporator is above the condenser. Equivalent length is not to exceed 150 feet.
   - The vertical difference between the condenser and evaporator when the evaporator is below the condenser can approach 150 feet, as long as the equivalent length does not exceed 150 feet.
   - The distance between the condenser and evaporator in a completely horizontal installation in which the indoor and outdoor unit do not differ more than 10 feet in vertical distance from each other can approach 150 feet, as long as the equivalent length does not exceed 150 feet.
4. **Two-Stage Condensing Unit:** The maximum length of tubing must not exceed 75 feet where indoor coil is located above the outdoor unit.

NOTE: When the outdoor unit is located above the indoor coil, the maximum vertical rise must not exceed 25 feet. If the maximum vertical rise exceeds 25 feet, premature compressor failure will occur due to inadequate oil return.

5. **TXV Requirement:** All line set applications over 50 ft will require a TXV.
6. **Vibration and Noise:** In long line applications, refrigerant tubing is highly prone to transmit noise and vibration to the structure it is fastened to. Use adequate vibration-isolating hardware when mounting line set to adjacent structure.

Most refrigerant tubing kits are supplied with 3/8"-thick insulation on the vapor line. For long line installations over 50 feet, especially if the line set passes through a high ambient temperature, ½"-thick suction line insulation is recommended to reduce loss of capacity. The liquid line should be insulated if passing through an area of 120°F or greater. Do not attach the liquid line to any non-insulated portion of the suction line

Table 8 lists multiplier values to recalculate system-cooling capacity as a function of a system's equivalent line length (as calculated from the suction line) and the selected suction tube size. Table 2 lists the equivalent length gained from adding bends to the suction line. **Properly size the suction line to minimize capacity loss.**

REFRIGERANT LINE LENGTH (Ft)						
Cond Unit Tons	0-24		25-49		50-74***	
	Line Diameter (In. OD)					
	Suct	Liq	Suct	Liq	Suct	Liq
1 1/2	5/8	1/4	3/4	3/8	3/4	3/8
2	5/8	1/4	3/4	3/8	3/4	3/8
2 1/2	3/4	3/8	3/4*	3/8	7/8	3/8
3	3/4	3/8	3/4**	3/8	7/8**	3/8
3 1/2	3/4	3/8	7/8**	3/8	1 1/8	3/8
4	7/8	3/8	1 1/8	3/8	1 1/8	3/8
5	7/8	3/8	1 1/8	3/8	1 1/8	3/8

*7/8" required for full ratings

**1 1/8" required for full ratings

***Lines greater than 74 feet in length or vertical elevation changes more than 50 feet, refer to the long line set.

TABLE 8. CAPACITY MULTIPLIERS AS A FUNCTION OF SUCTION LINE SIZE & EQUIVALENT LENGTH

Nominal capacity Btuh	Vapor line diameter (in.)	EQUIVALENT LINE LENGTH (FT)				
		50	75	100	125	150
18,000	3/4	.99	.97	.96	.95	.95
24,000	3/4	1	.99	.99	.98	.97
30,000	3/4	.98	.97	.96	.95	.94
36,000	3/4	.93	.90	.86	.83	.79
	7/8	.98	.96	.94	.92	.90
42,000	3/4	.93	.90	.87	.83	.80
	7/8	.97	.96	.94	.93	.92
	1-1/8	1	1	.99	.99	.98
48,000	3/4	.90	.86	.82	.78	N/R
	7/8	.96	.94	.93	.91	.89
	1-1/8	1	1	.99	.99	.98
60,000	7/8	.93	.91	.89	.86	.84
	1-1/8	.99	.98	.98	.97	.97

Table 8

NOTE: For a condenser with a liquid valve tube connection less than 3/8" diameter, use 3/8" liquid line tubing for a line set greater than 25 feet.

TABLE 9. LOSSES FROM SUCTION LINE ELBOWS (EQUIVALENT LENGTH, FT.)

Type of elbow fitting	I.D. (in.)		
	3/4	7/8	1-1/8
90° short radius	1.7	2	2.3
90° long radius	1.5	1.7	1.6
45°	0.7	0.8	1

Table 9

Installation Requirements

1. In a completely horizontal installation with a long line set where the evaporator is at the same altitude as (or slightly below) the condenser, the line set should be sloped towards the evaporator. This helps reduce refrigerant migration to the condenser during a system's off-cycle.

2. For a system installation where the evaporator is above the condenser, an inverted vapor line trap should be installed on the suction line just before the inlet to the evaporator (see Fig 6). The top of the inverted loop must be slightly above the top of the evaporator coil and can be created simply by brazing two 90° long radius elbows together, if a bending tool is unavailable. Properly support and secure the inverted loop to the nearest point on the indoor unit or adjacent structure.

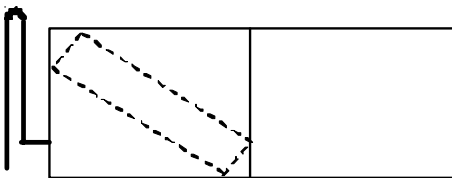


Fig 6. Evaporator unit with inverted vapor loop

3. **An oil trap is required at the evaporator only if the condenser is above the evaporator.** Preformed oil traps are available at most HVAC supply houses, or oil traps may be created by brazing tubing elbows together (see diagram below). Remember to add the equivalent length from oil traps to the equivalent length calculation of the suction line. For example, if you construct an oil trap using two 45° elbows, one short and one long 90° elbow in a ¾" diameter suction line, the additional equivalent length would be 0.7+ 0.7+1.7+1.5, which equals 4.6 feet (refer to table 9).

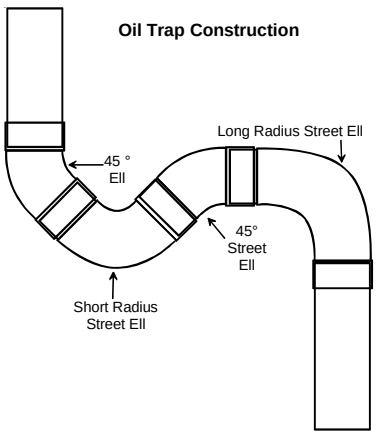


Fig 7. Oil Trap

4. **Low voltage wiring**. Verify low voltage wiring size is adequate for the length used since it will be increased in a long line application.

System Charging

R22 condensers are factory charged for 15 feet of line set. To calculate the amount of extra refrigerant (in ounces) needed for a line set over 15 feet, multiply the additional length of line set by 0.6 ounces. Note for the formula below, the linear feet of line set is the actual length of liquid line (or suction line, since both should be equal) used, not the equivalent length calculated for the suction line.

Extra refrigerant needed =

(Linear feet of line set – 15 ft) x **X** oz/ft.

Where **X** = **0.6** for 3/8" liquid tubing

Remember, for condensers with a liquid valve connection less than 3/8" diameter, 3/8" liquid tubing is required for a line set longer than 25 feet.

Follow the charging procedures in the outdoor unit I/O manual to ensure proper superheat and sub-cooling levels, especially on a system with a TXV installed in the indoor unit. Heat pumps should be checked in both heating and cooling mode for proper charge level. This guideline is meant to provide installation instructions based on most common long line set applications. Installation variables may affect system operation.

NO ADDITIONAL COMPRESSOR OIL IS NEEDED FOR LONG LINE SET APPLICATIONS

ON RESIDENTIAL SPLIT SYSTEMS.

S-122 REVERSING VALVE REPLACEMENT

Remove the refrigerant charge from the system.

When brazing a reversing valve into the system, it is of extreme importance that the temperature of the valve **does not exceed 250° F.** at any time.

Wrap the reversing valve with a large rag saturated with water. "Re-wet" the rag and thoroughly cool the valve after each brazing operation of the four joints involved. The wet rag around the reversing valve will eliminate conducting of heat to the valve body when brazing the line connection.

The use of a wet rag sometimes can be a nuisance. There are commercial grades of heat absorbing paste that may be substituted.

After the valve has been installed leak test, evacuate and recharge.

SERVICING

S-202 DUCT STATIC PRESSURES AND/OR STATIC PRESSURE DROP ACROSS COILS

This minimum and maximum allowable duct static pressure for the indoor sections are found in the specifications section.

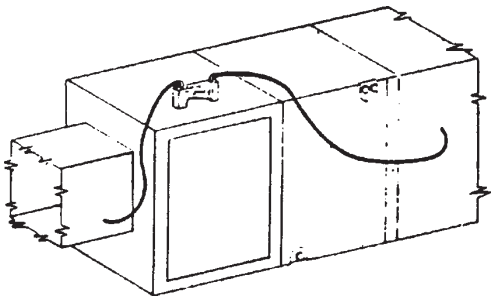
Tables are also provided for each coil, listing quantity of air (CFM) versus static pressure drop across the coil.

Too great an external static pressure will result in insufficient air that can cause icing of the coil. Too much air can cause poor humidity control and condensate to be pulled off the evaporator coil causing condensate leakage. Too much air can also cause motor overloading and in many cases this constitutes a poorly designed system.

S-203 AIR HANDLER EXTERNAL STATIC

To determine proper air movement, proceed as follows:

1. Using a draft gauge (inclined manometer), measure the static pressure of the return duct at the inlet of the unit, (Negative Pressure).
2. Measure the static pressure of the supply duct, (Positive Pressure).
3. Add the two readings together.

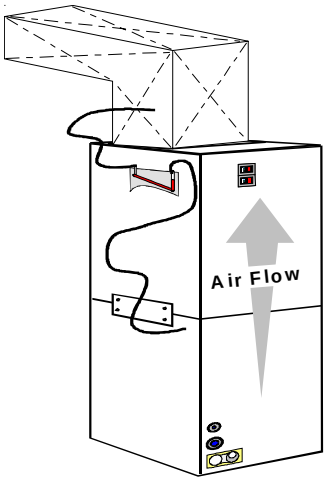


TOTAL EXTERNAL STATIC

NOTE: Both readings may be taken simultaneously and read directly on the manometer if so desired.

4. Consult proper table for quantity of air.

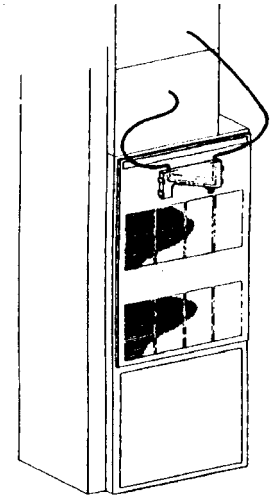
If external static pressure is being measured on a furnace to determine airflow, supply static must be taken between the "A" coil and the furnace.



TOTAL EXTERNAL STATIC

S-204 COIL STATIC PRESSURE DROP

1. Using a draft gauge (inclined manometer), connect the positive probe underneath the coil and the negative probe above the coil.
2. A direct reading can be taken of the static pressure drop across the coil.
3. Consult proper table for quantity of air.



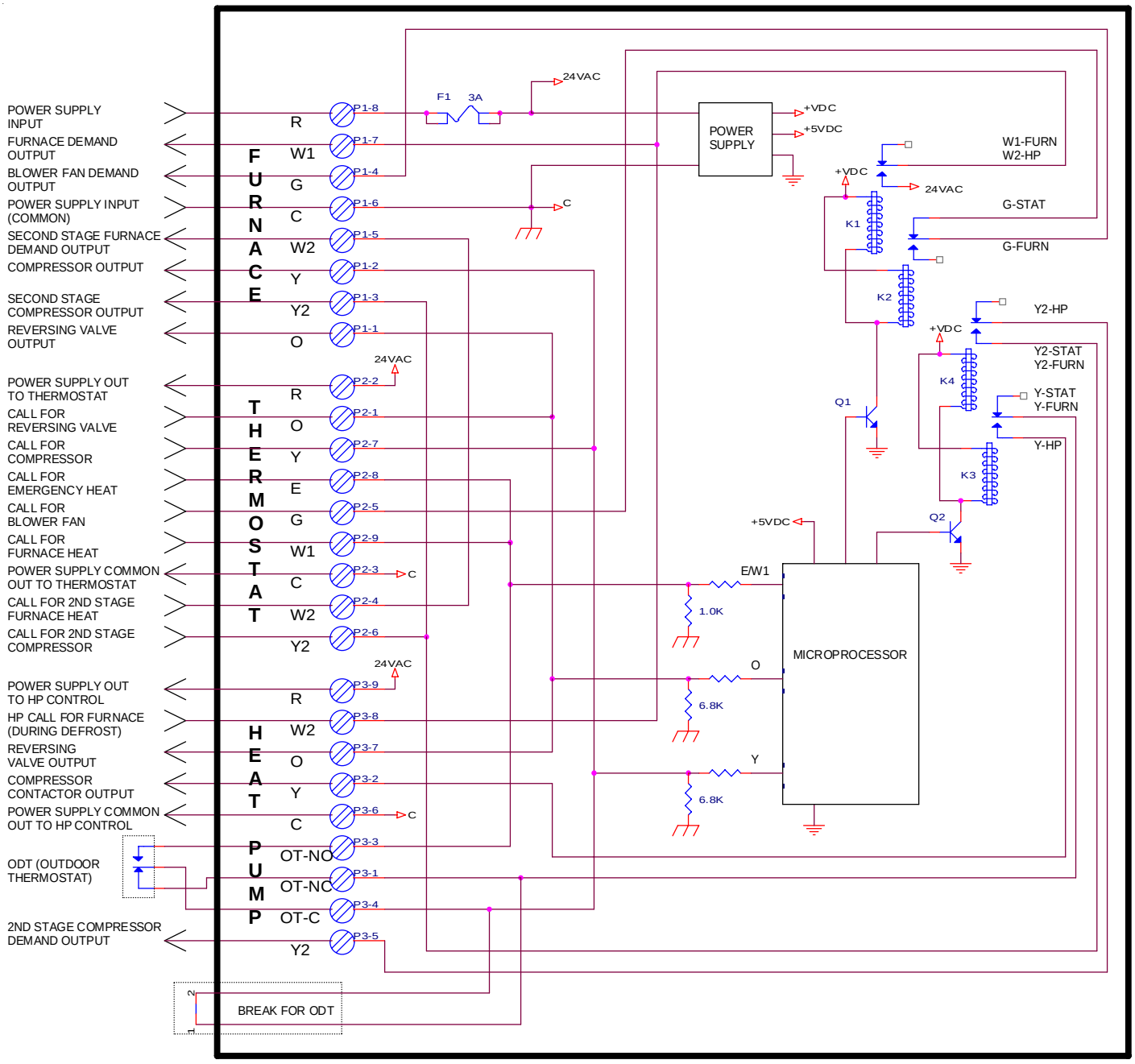
STATIC PRESSURE DROP

If the total external static pressure and/or static pressure drop exceeds the maximum or minimum allowable statics, check for closed dampers, dirty filters, undersized or poorly laid out duct work.

ACCESSORIES WIRING DIAGRAMS

WARNING **TO AVOID POSSIBLE ELECTRICAL SHOCK, PERSONAL INJURY, OR DEATH, DISCONNECT THE POWER BEFORE SERVICING.**

ALL FUEL SYSTEM AFE 18-60 & AFE18-60A CONTROL BOARD



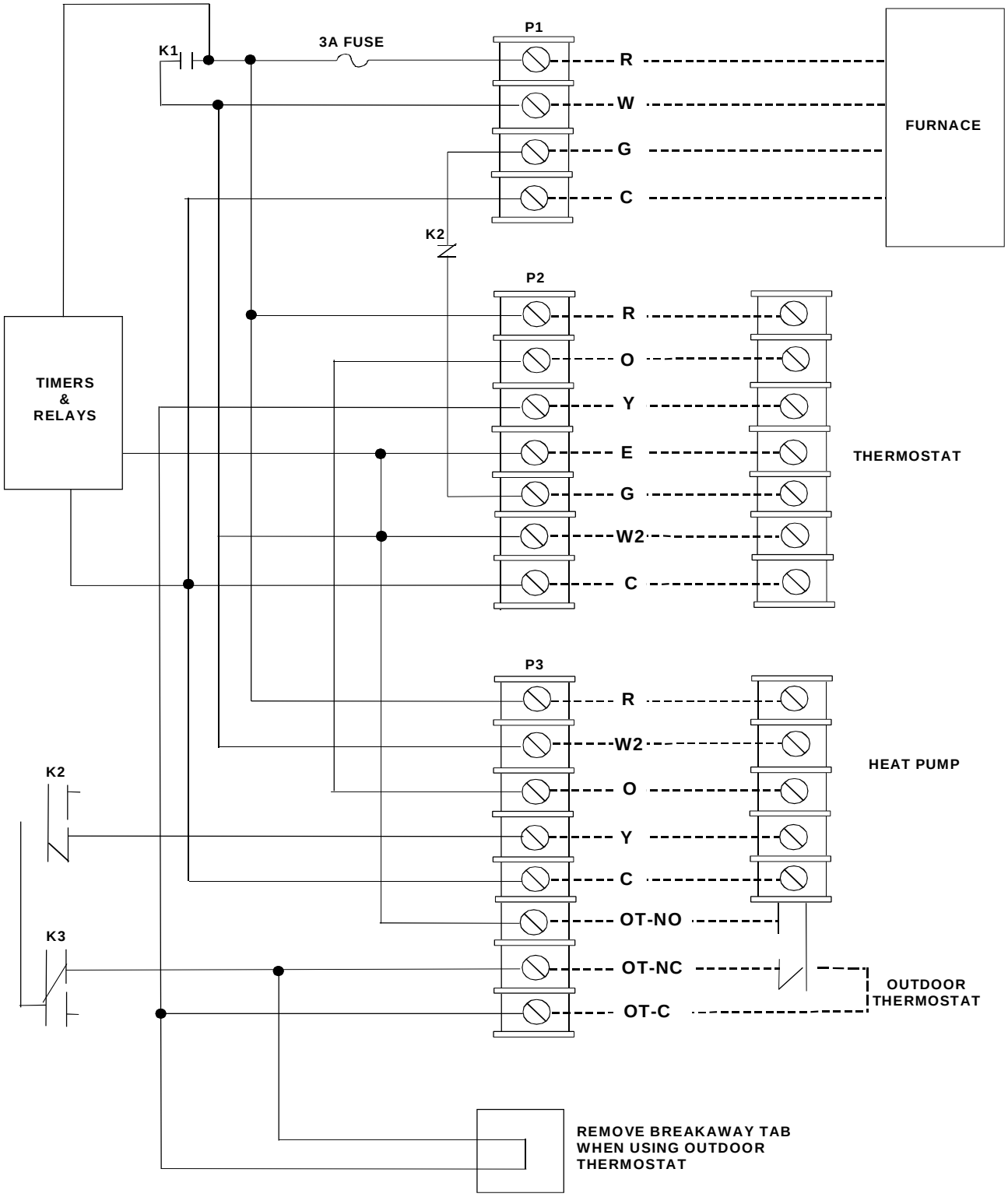
ALL FUEL CONTROL BOARD - AFE18-60 and AFE18-60A

This wiring diagram is for reference only. Not all wiring is as shown above.
Refer to the appropriate wiring diagram for the unit being serviced.
(For use with Heat Pumps in conjunction with 80% or 90% Single-Stage or Two-Stage Furnaces)

ACCESSORIES WIRING DIAGRAMS

WARNING TO AVOID POSSIBLE ELECTRICAL SHOCK, PERSONAL INJURY, OR DEATH, DISCONNECT THE POWER BEFORE SERVICING.

AFE 18-60



INTERNAL CONTROL TRACES

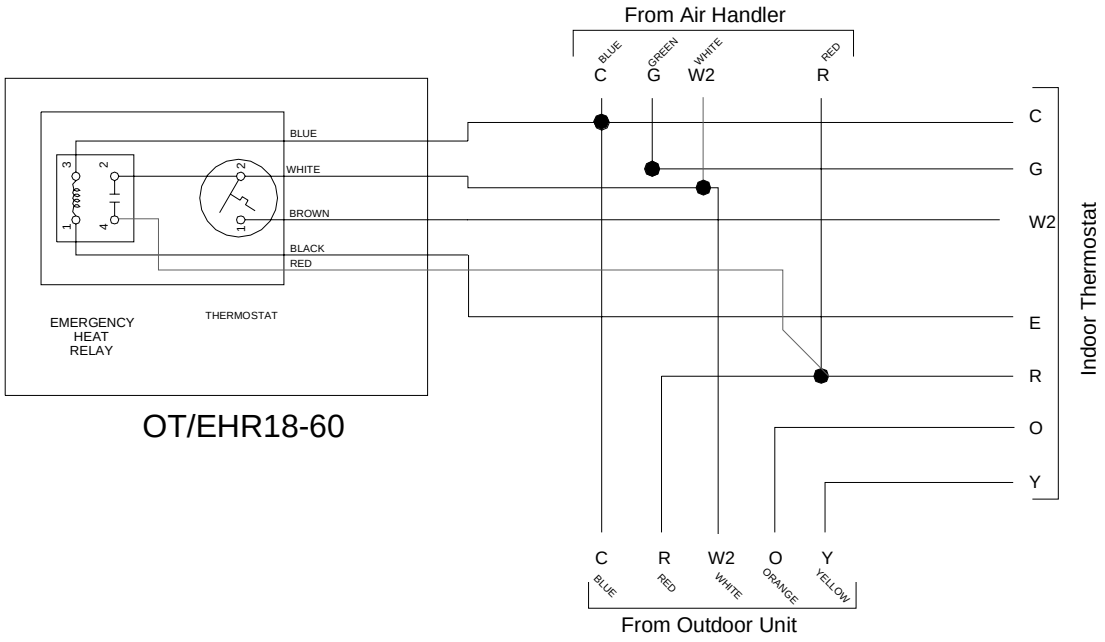
FIELD WIRING

*NOTE: K3 IS SHOWN WITH THE CONTROL POWERED. THE "Y" PATH TO THE HEAT PUMP WILL BE OPEN IF CONTROL IS NOT POWERED.

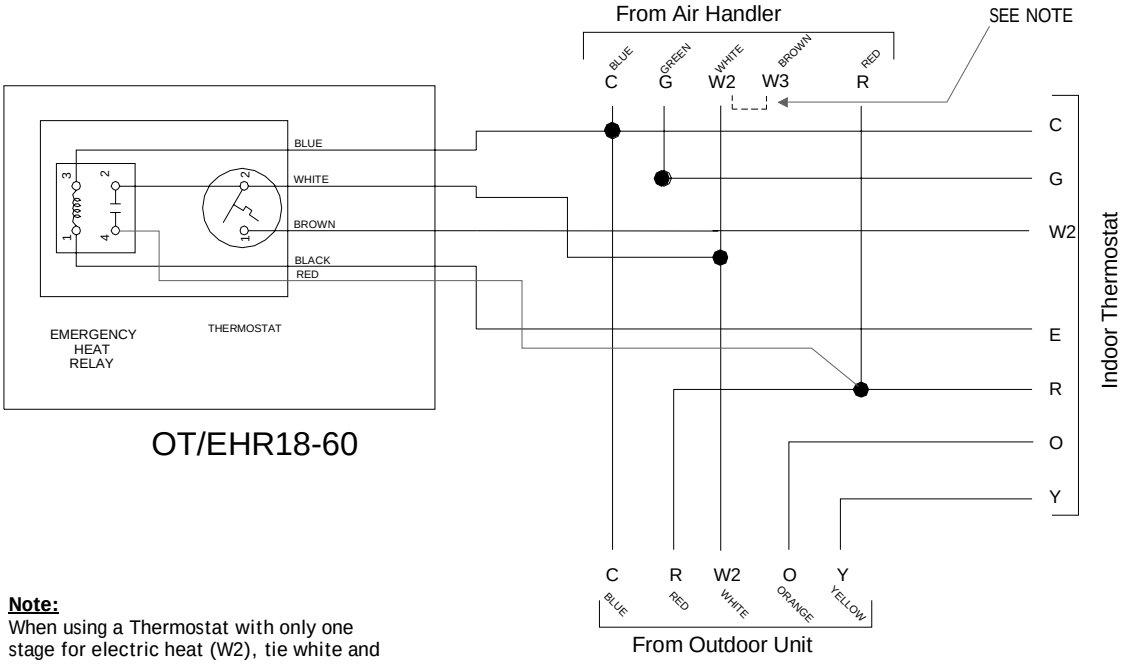
ACCESSORIES WIRING DIAGRAMS

WARNING **TO AVOID POSSIBLE ELECTRICAL SHOCK, PERSONAL INJURY, OR DEATH, DISCONNECT THE POWER BEFORE SERVICING.**

10kw and Below, One Stage Electric Heat



15kw and Above, Two Stage Electric Heat



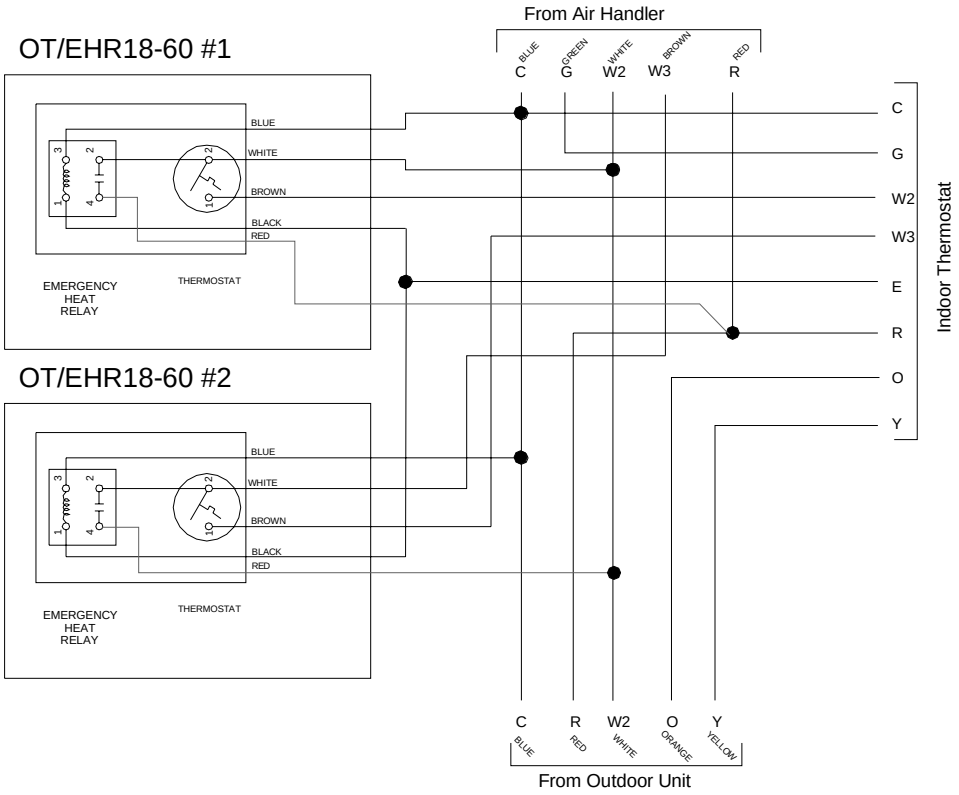
Note:
When using a Thermostat with only one stage for electric heat (W2), tie white and brown wires from air handler together.

Typical Wiring Schematics for OT/EHR18-60 (Outdoor Thermostat & Emergency Heat Relay).
This wiring diagram is for reference only. Not all wiring is as shown above.
Refer to the appropriate wiring diagram for the unit being serviced.

ACCESSORIES WIRING DIAGRAMS

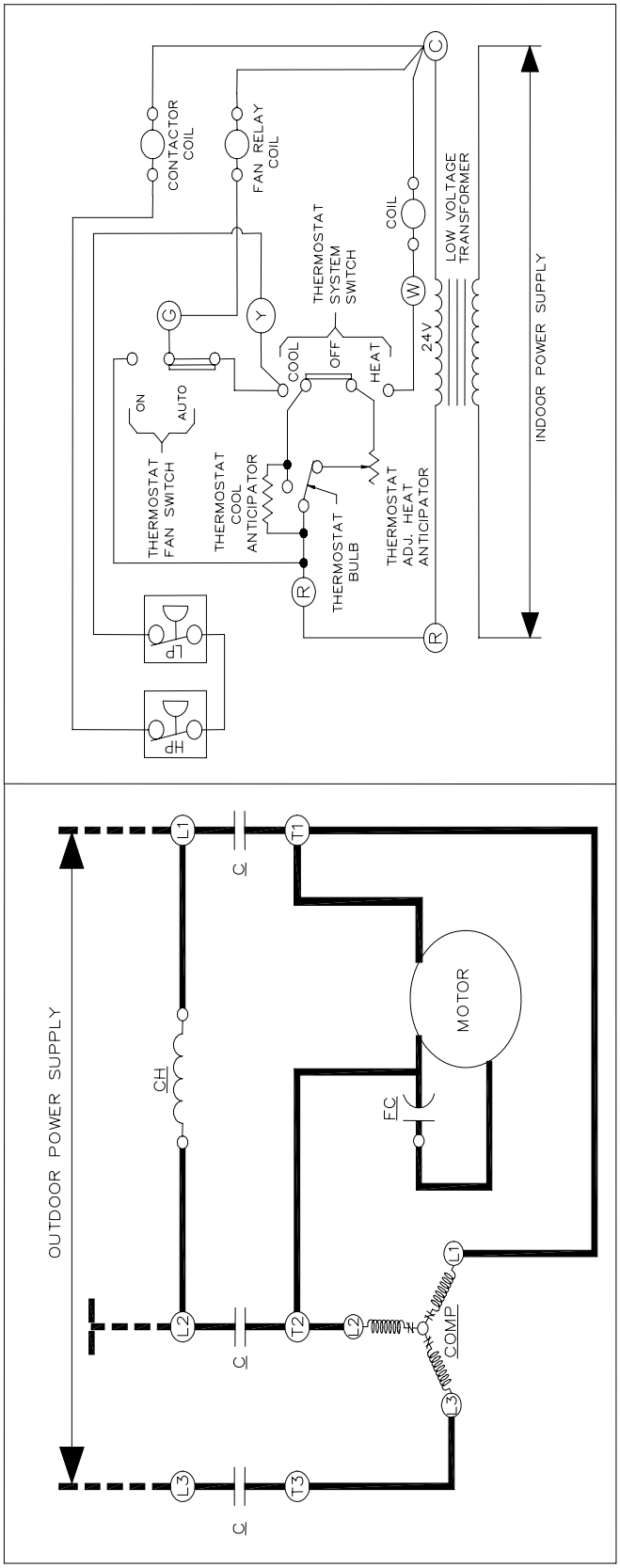
WARNING **TO AVOID POSSIBLE ELECTRICAL SHOCK, PERSONAL INJURY, OR DEATH, DISCONNECT THE POWER BEFORE SERVICING.**

15kw and Above with Two OT/EHR18-60's, Two Stage Electric Heat and Two Stage Thermostat

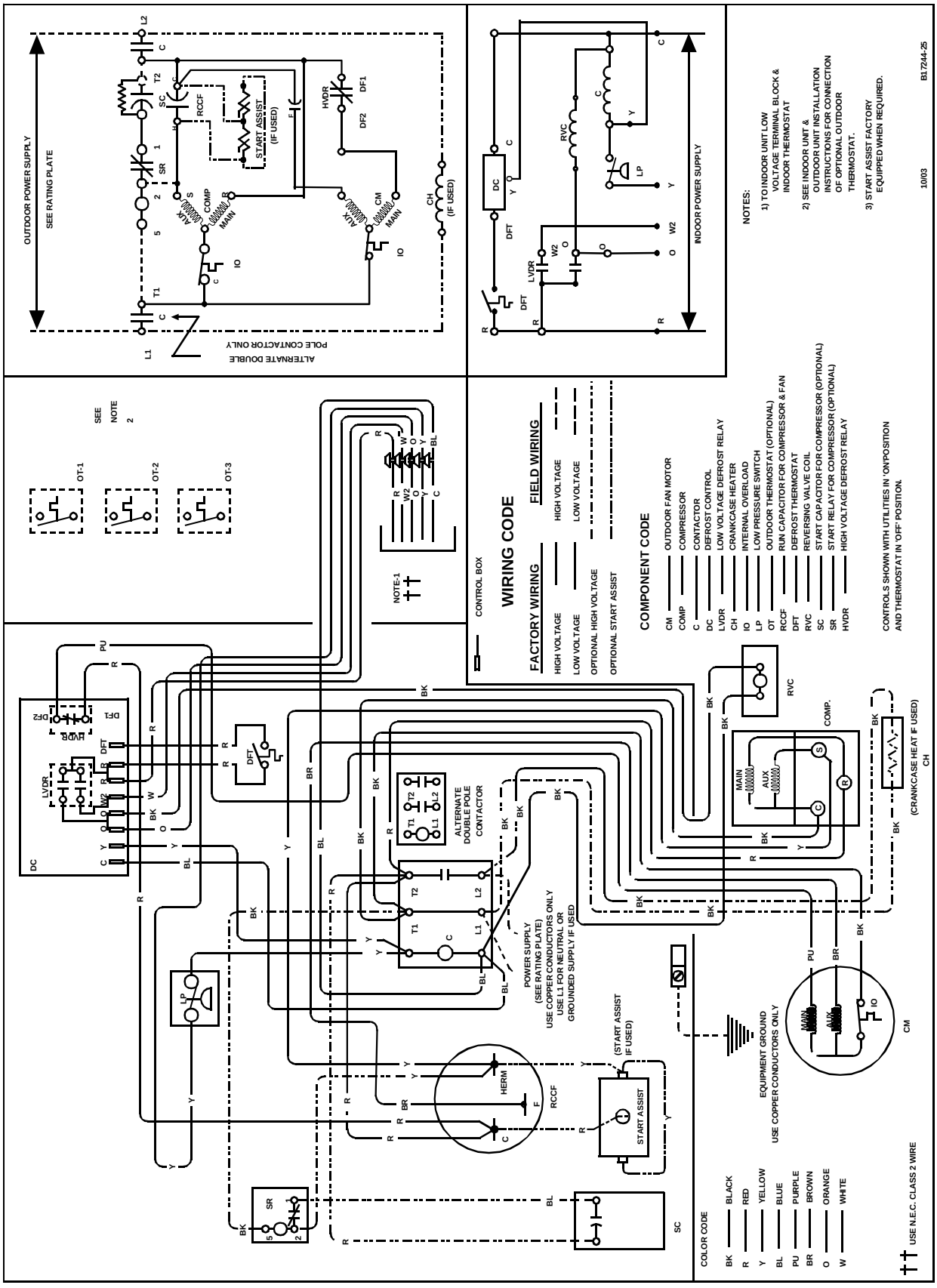


Typical Wiring Schematics for OT/EHR18-60 (Outdoor Thermostat & Emergency Heat Relay).
This wiring diagram is for reference only. Not all wiring is as shown above.
Refer to the appropriate wiring diagram for the unit being serviced.

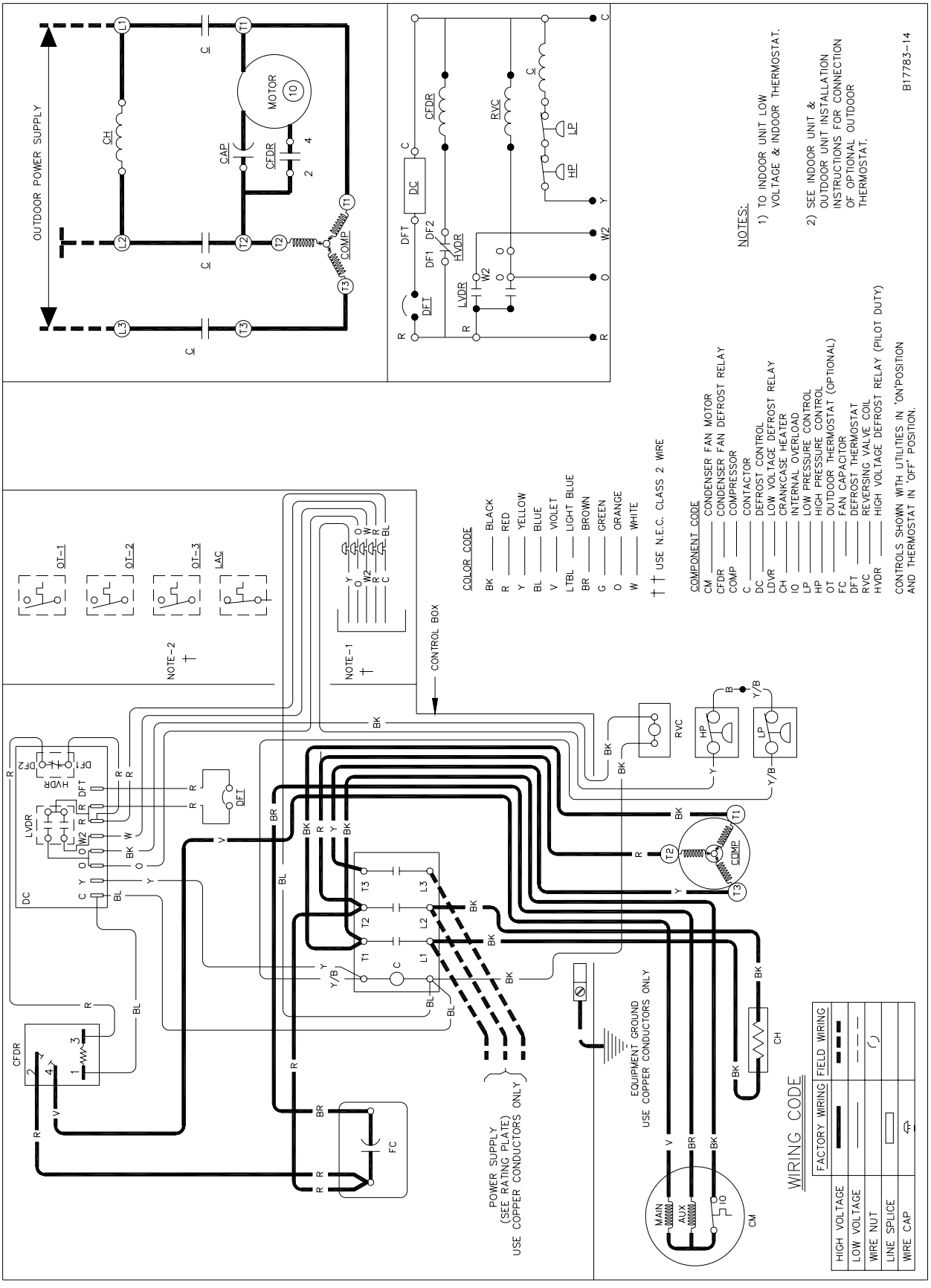
WARNING TO AVOID POSSIBLE ELECTRICAL SHOCK, PERSONAL INJURY, OR DEATH, DISCONNECT THE POWER BEFORE SERVICING.



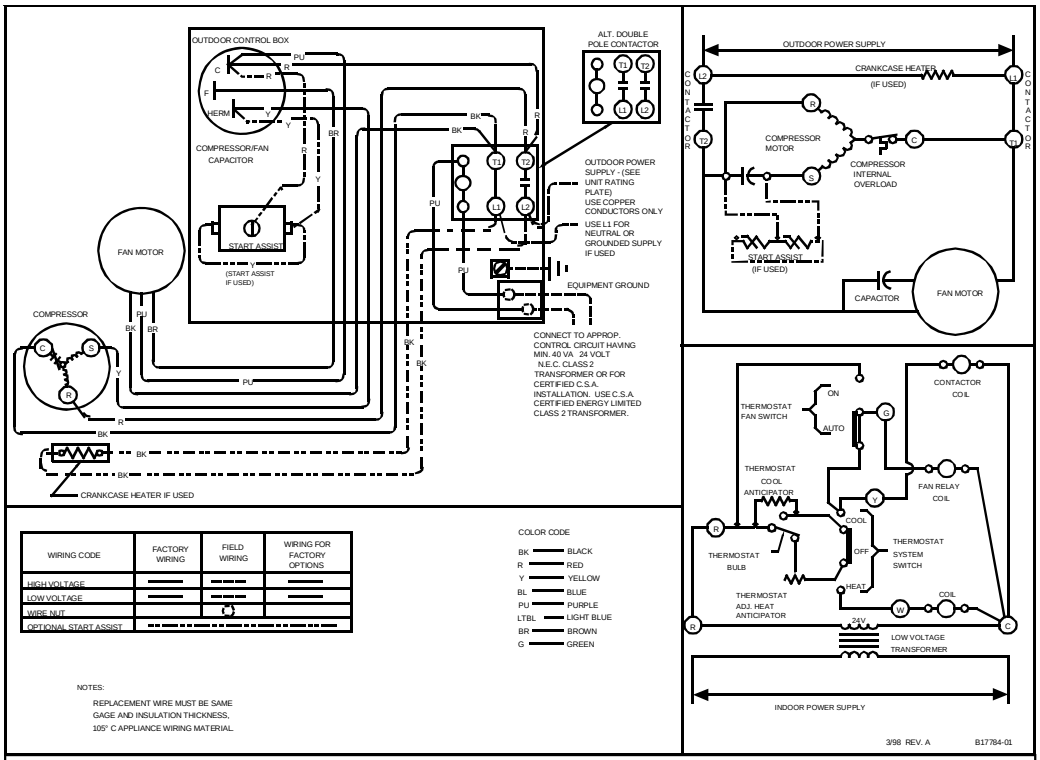
WARNING TO AVOID POSSIBLE ELECTRICAL SHOCK, PERSONAL INJURY, OR DEATH, DISCONNECT THE POWER BEFORE SERVICING.



WARNING TO AVOID POSSIBLE ELECTRICAL SHOCK, PERSONAL INJURY, OR DEATH, DISCONNECT THE POWER BEFORE SERVICING.



WARNING TO AVOID POSSIBLE ELECTRICAL SHOCK, PERSONAL INJURY, OR DEATH, DISCONNECT THE POWER BEFORE SERVICING.



WIRING CODE	FACTORY WIRING	FIELD WIRING	WIRING FOR FACTORY OPTIONS
HIGH VOLTAGE			
LOW VOLTAGE			
WIRE NUT			
OPTIONAL START ASSIST			

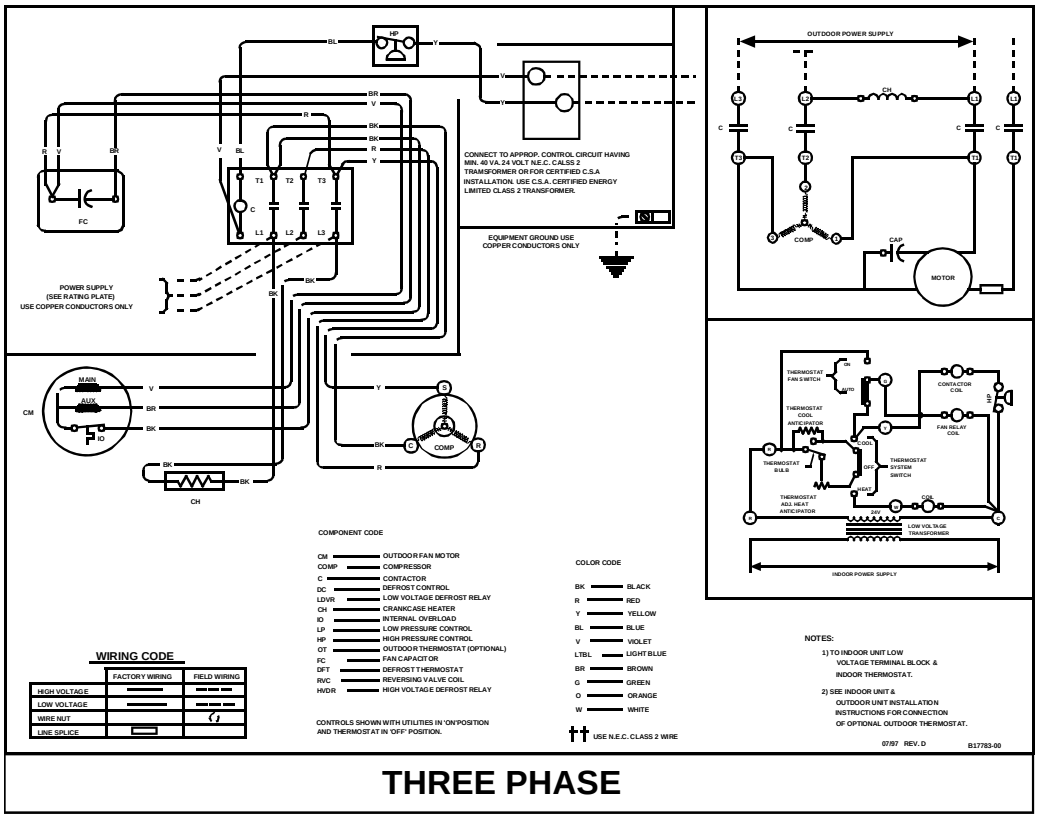
COLOR CODE

BK	BLACK
R	RED
Y	YELLOW
BL	BLUE
PU	PURPLE
LTBL	LIGHT BLUE
BR	BROWN
G	GREEN

NOTES:

REPLACEMENT WIRE MUST BE SAME GAGE AND INSULATION THICKNESS, 105° C APPLIANCE WIRING MATERIAL

SINGLE PHASE



WIRING CODE

	FACTORY WIRING	FIELD WIRING
HIGH VOLTAGE		
LOW VOLTAGE		
WIRE NUT		
LINE SPLICE		

COMPONENT CODE

CM	OUTDOOR FAN MOTOR
COMP	COMPRESSOR
C	CONTACTOR
DC	DEFROST CONTROL
LDVR	LOW VOLTAGE DEFROST RELAY
CH	CRANKCASE HEATER
IO	INTERNAL OVERLOAD
LP	LOW PRESSURE CONTROL
HP	HIGH PRESSURE CONTROL
OT	OUTDOOR THERMOSTAT (OPTIONAL)
FC	FAN CAPACITOR
DFT	DEFROST THERMOSTAT
RVC	REVERSING VALVE COIL
HVDR	HIGH VOLTAGE DEFROST RELAY

CONTROLS SHOWN WITH UTILITIES IN 'ON'POSITION AND THERMOSTAT IN 'OFF' POSITION.

COLOR CODE

BK	BLACK
R	RED
Y	YELLOW
BL	BLUE
V	VIOLET
LTBL	LIGHT BLUE
BR	BROWN
G	GREEN
O	ORANGE
W	WHITE

USE N.E.C. CLASS 2 WIRE

NOTES:

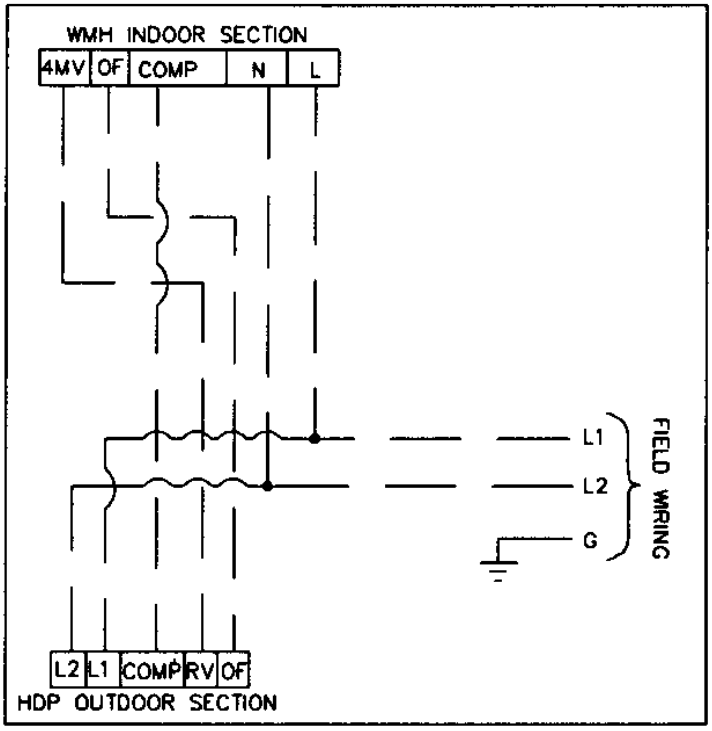
1) TO INDOOR UNIT LOW VOLTAGE TERMINAL BLOCK & INDOOR THERMOSTAT.

2) SEE INDOOR UNIT & OUTDOOR UNIT INSTALLATION INSTRUCTIONS FOR CONNECTION OF OPTIONAL OUTDOOR THERMOSTAT.

07/97 REV. D B17783-00

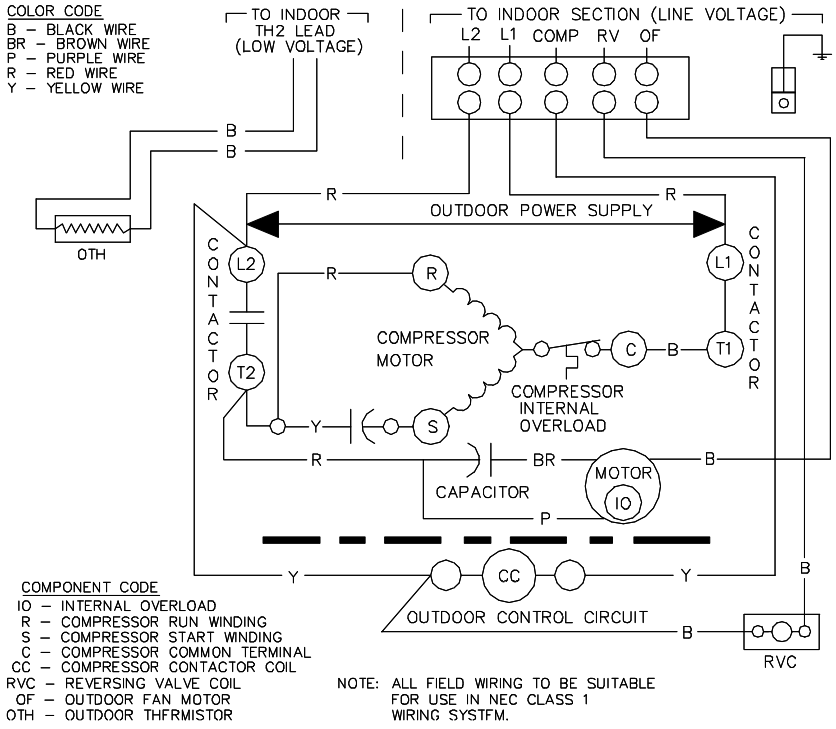
THREE PHASE

WARNING **TO AVOID POSSIBLE ELECTRICAL SHOCK, PERSONAL INJURY, OR DEATH, DISCONNECT THE POWER BEFORE SERVICING.**



Wiring Diagram - Line Voltage Control Circuit (Typical Wiring for use with Ductless Indoor Section)

Wiring Diagram - Line Voltage Control



Circuit (Typical Wring For Use With Ductled Indoor Section - ***Note: 24 Volt Contactor is Field Supplied.***

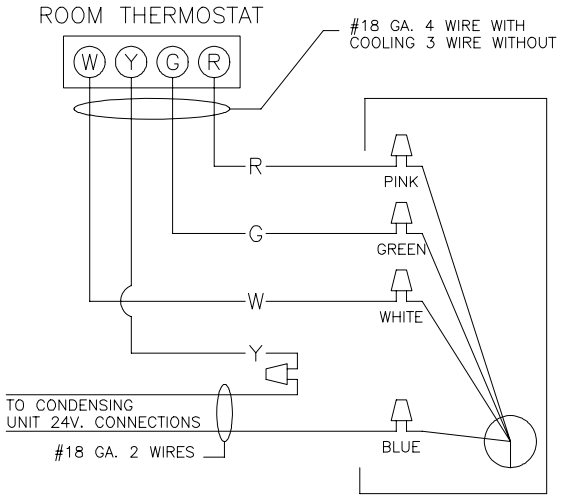
WARNING **TO AVOID POSSIBLE ELECTRICAL SHOCK, PERSONAL INJURY, OR DEATH, DISCONNECT THE POWER BEFORE SERVICING.**

THERMOSTAT WIRING

Thermostat Anticipator Setting for optional heat kits 10 KW and below

AIR HANDLER MODEL	THERMOSTAT HEAT ANTICIPATOR SETTING
AR18-61	.2

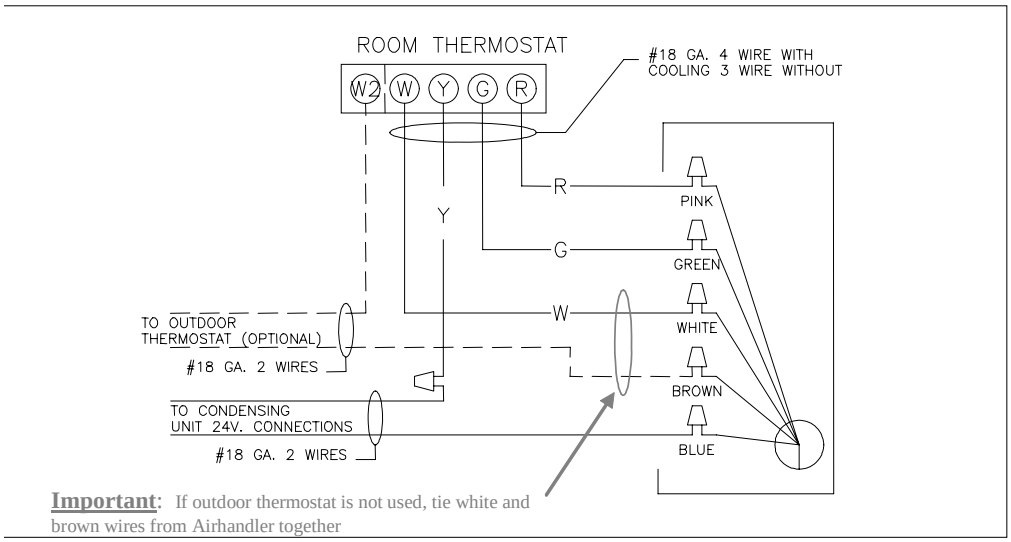
Low Voltage Wiring Diagram for Cooling Unit with optional heat kit 10 KW and below



Thermostat Anticipator Setting for optional heat kits 15 KW and above

AIR HANDLER MODEL	THERMOSTAT HEAT ANTICIPATOR SETTING			KW STAGES WHEN STAGING	
	1 STAGE T'STAT	2 STAGE T'STAT			
		STAGE 1	STAGE 2	STAGE 1	STAGE 2
AR18-32	.4	.2	.2	7.3 KW	4.8 KW
AR36-42	.4	.2	.2	9.8 KW	5.0 KW
AR48-61	.4	.2	.2	9.8 KW	9.8 KW

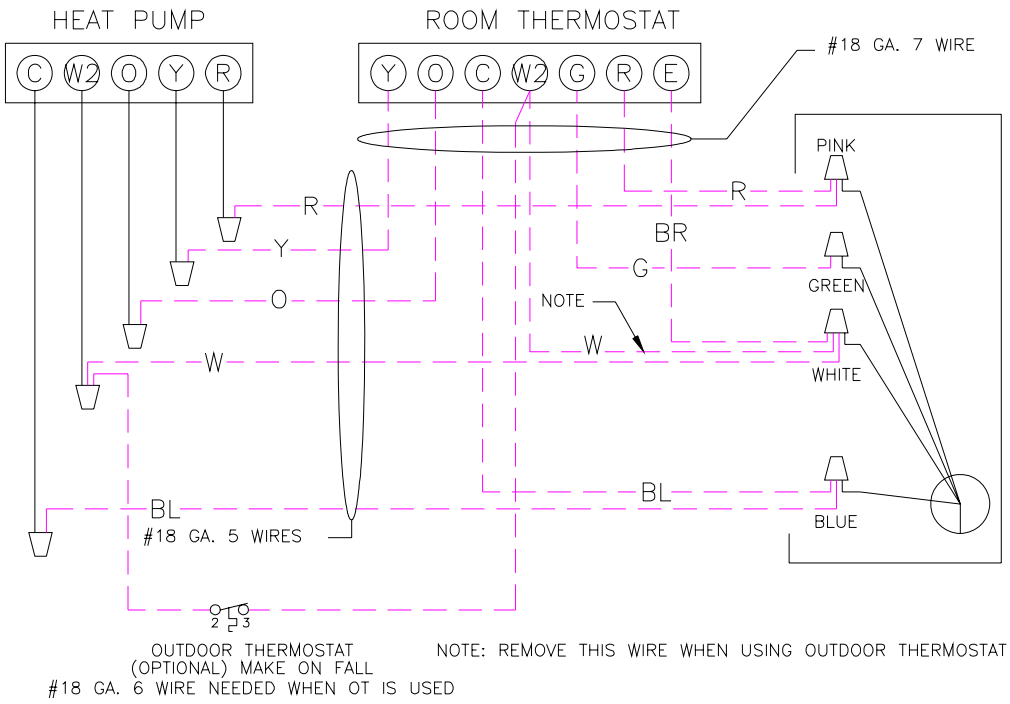
Low Voltage Wiring Diagram for Cooling Unit with optional heat kit 15 KW and above



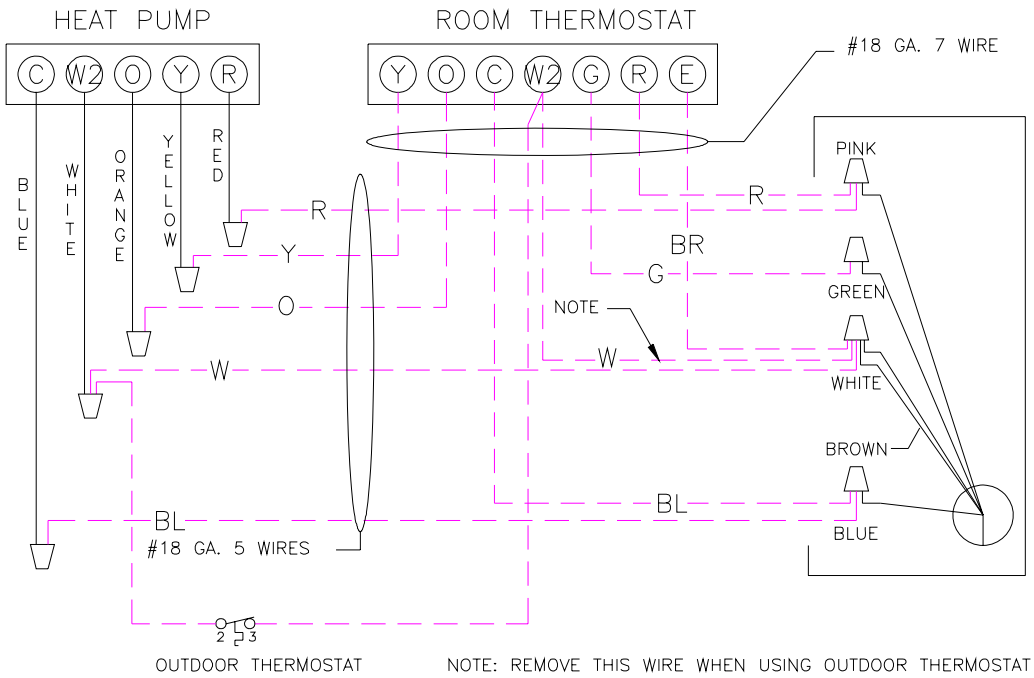
Important: If outdoor thermostat is not used, tie white and brown wires from Airhandler together

WARNING TO AVOID POSSIBLE ELECTRICAL SHOCK, PERSONAL INJURY, OR DEATH, DISCONNECT THE POWER BEFORE SERVICING.

Low Voltage Wiring Diagram for Heat Pump Unit with optional heat kit 10 KW and below

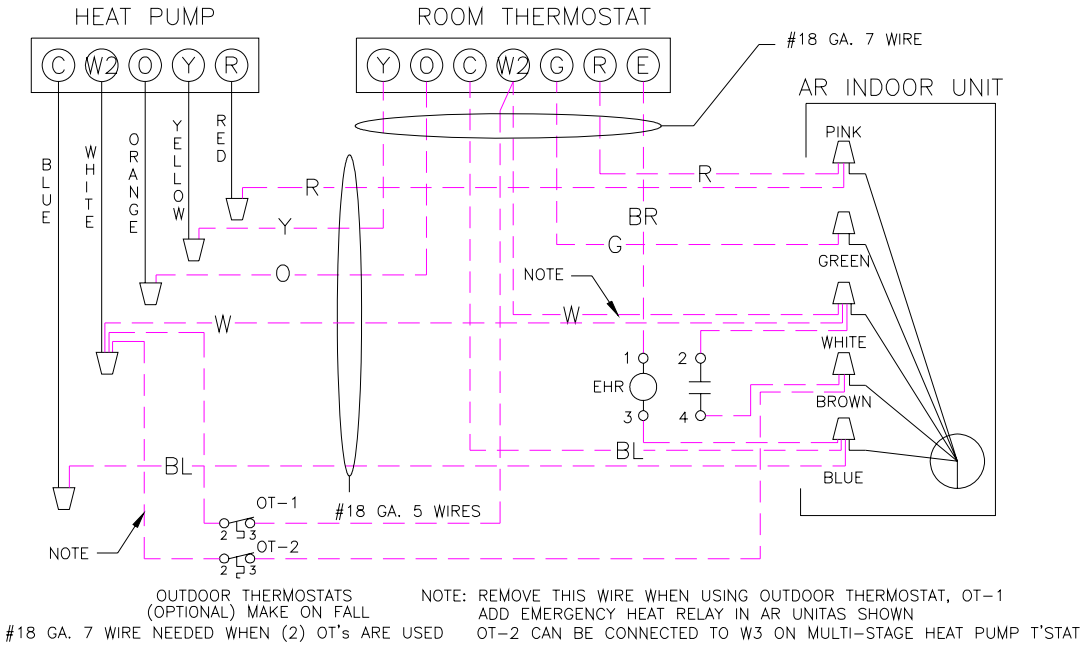


Low Voltage Wiring Diagram for Heat Pump Unit with optional heat kit 15 KW and above



WARNING TO AVOID POSSIBLE ELECTRICAL SHOCK, PERSONAL INJURY, OR DEATH, DISCONNECT THE POWER BEFORE SERVICING.

Low Voltage Wiring Diagram for Heat Pump Unit with optional heat kit 15 KW and above With Optional Outdoor Thermostats and Emergency Heat Relay



THERMOSTATS

Note: Second Stage heat can be accomplished by multi-stage heating thermostat or the addition of an outdoor thermostat as shown

Goodman Cooling and Heating thermostat part number is CHT18-60. This thermostat is single stage cool and single stage heat.

Goodman Heat Pump thermostat part number is HPT18-60. This thermostat is single stage cool, two stage heat, first stage is heat pump heating and second stage is optional electric heat.

If additional features are desired, such as digital or programmable thermostat other thermostats are commercially available that are compatible to this product line. Follow the thermostat manufacturer's instruction for installation.

WARNING **TO AVOID POSSIBLE ELECTRICAL SHOCK, PERSONAL INJURY, OR DEATH, DISCONNECT THE POWER BEFORE SERVICING.**

Thermostat Wiring

Use thermostat wiring diagram **Figures 10 thru 13** and those provided with the thermostat when making these connections.

NOTE: DO NOT USE THESE DIAGRAMS FOR AEPT MODELS. SEE SUPPLEMENTAL INSTALLATION AND OPERATING INSTRUCTIONS FOR AEPT MODELS.

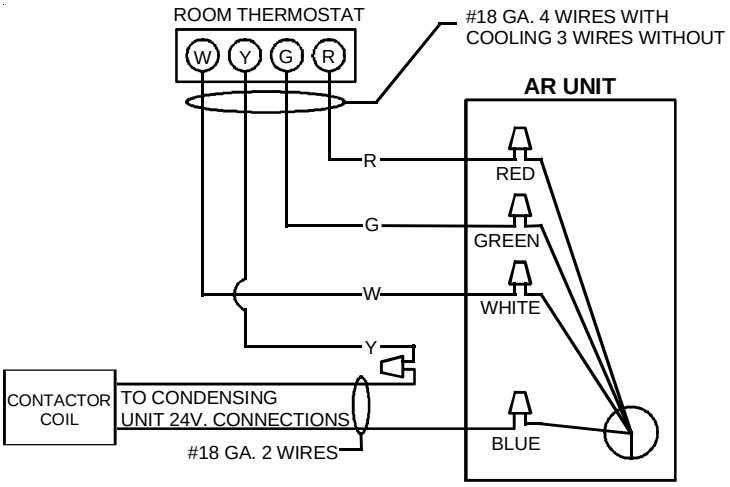


Figure 10 - Low Voltage Wiring Diagram for Cooling Unit with optional heat kit 10KW and below

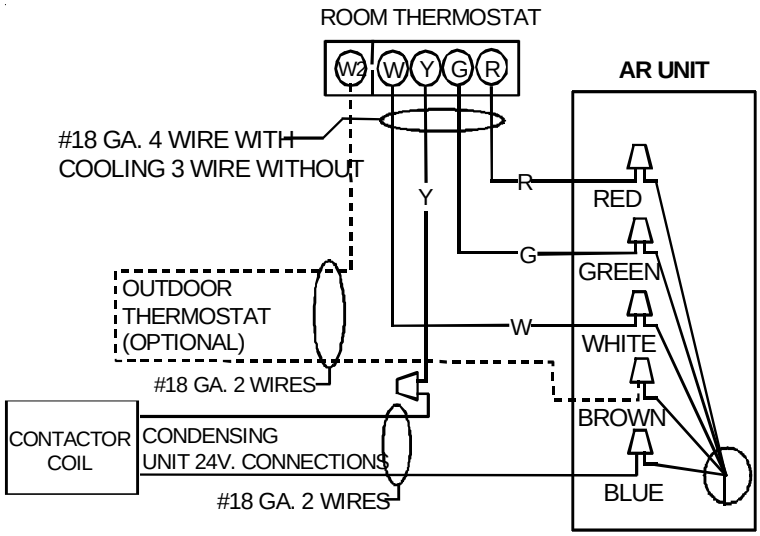
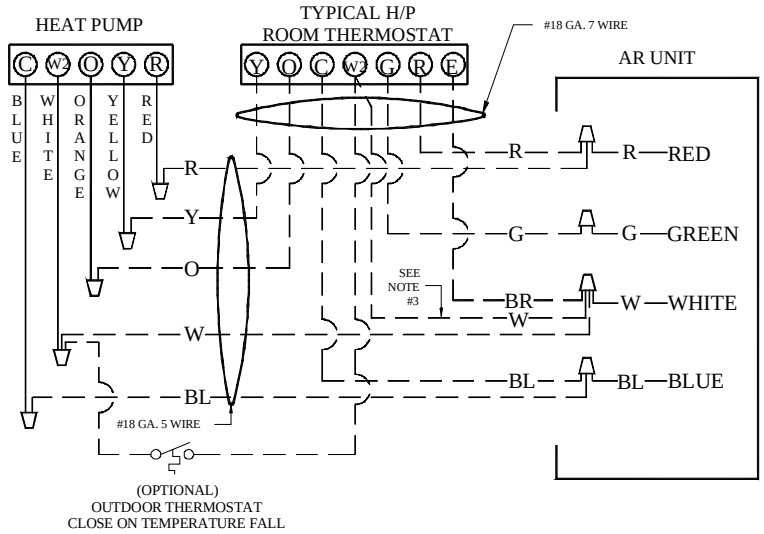


Figure 11 - Low Voltage Wiring Diagram for Cooling Unit with optional heat kit 15KW and above

WARNING **TO AVOID POSSIBLE ELECTRICAL SHOCK, PERSONAL INJURY, OR DEATH, DISCONNECT THE POWER BEFORE SERVICING.**

FIGURE 12

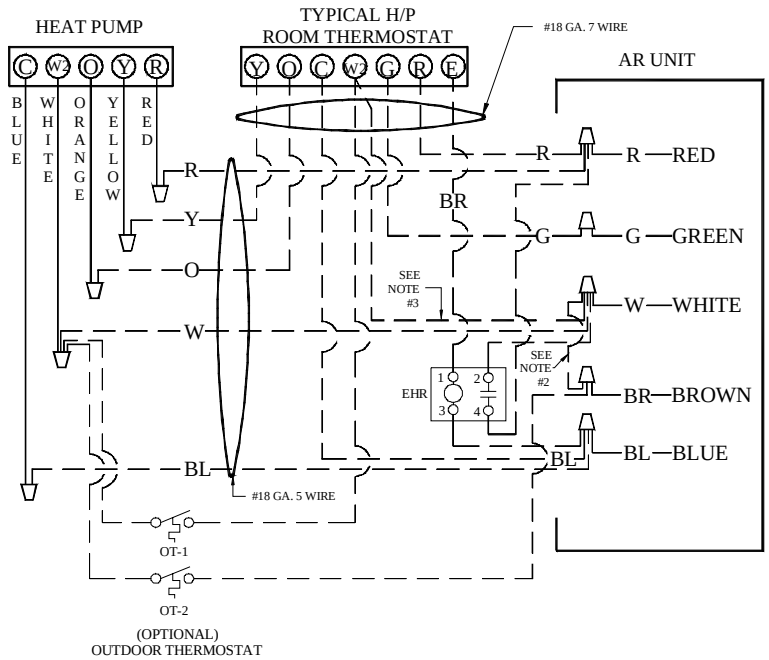
AR/ARUF/ARPF/ARPT
18-60
10 KW & BELOW



#18 GA. 6 WIRE NEEDED WHEN OT IS USED

FIGURE 13

AR/ARUF/ARPF/ARPT
18-60
ABOVE 10 KW



#18 GA. 7 WIRE NEEDED WHEN TWO OT'S ARE USED

NOTES:
1) OUTDOOR THERMOSTAT (OT-1) SHOULD BE THE FIRST TO CLOSE AND THE LAST TO OPEN.
2) CONNECT WHITE AND BROWN WIRES FROM AIR-HANDLER TOGETHER IF OT-2 IS NOT USED.
3) REMOVE WIRE WHEN USING OUTDOOR THERMOSTAT

NOMENCLATURE
OT ---OUTDOOR THERMOSTAT (OPTIONAL)
EHR -EMERGENCY HEAT RELAY (OPTIONAL)

COLOR CODES
R --RED
Y --YELLOW
BL-BLUE
BR-BROWN
O --ORANGE
W -WHITE
G --GREEN

Important: If outdoor thermostat is not used, tie white and brown wires from Air Handler together

AER / AEPT

INSTALLER

These instructions must be used in conjunction with the latest version of IO-230, which is shipped with the unit. It is important to follow both of these instructions and those in the latest version of IO-230 when installing the AER and AEPT series of air handlers.

THERMOSTAT CONNECTIONS

The following composite wiring diagrams detail various configurations in which the AEPT air handlers can be used. Examples include single-stage cooling and heat pump with single or two-stage electric heating. All these configurations can be applied with convenient connections to outdoor thermostat applications.

The following sections will be detailed:

- Single-Stage Cooling (GMC Thermostat Part #CHT18-60 or equivalent.)
- Heat Pump (GMC Thermostat Part #18-60 or equivalent)

Each diagram details the connections between room thermostat and AEPT air handlers, and the connections between the AEPT air handlers and the Condensing Unit (or Heat Pump) with optional connections to Outdoor Thermostats. For each configuration, refer to the explanation of the proper jumper(s) to remove for the corresponding blower speed that will result in the programmed ECM™ motor.

IMPORTANT:

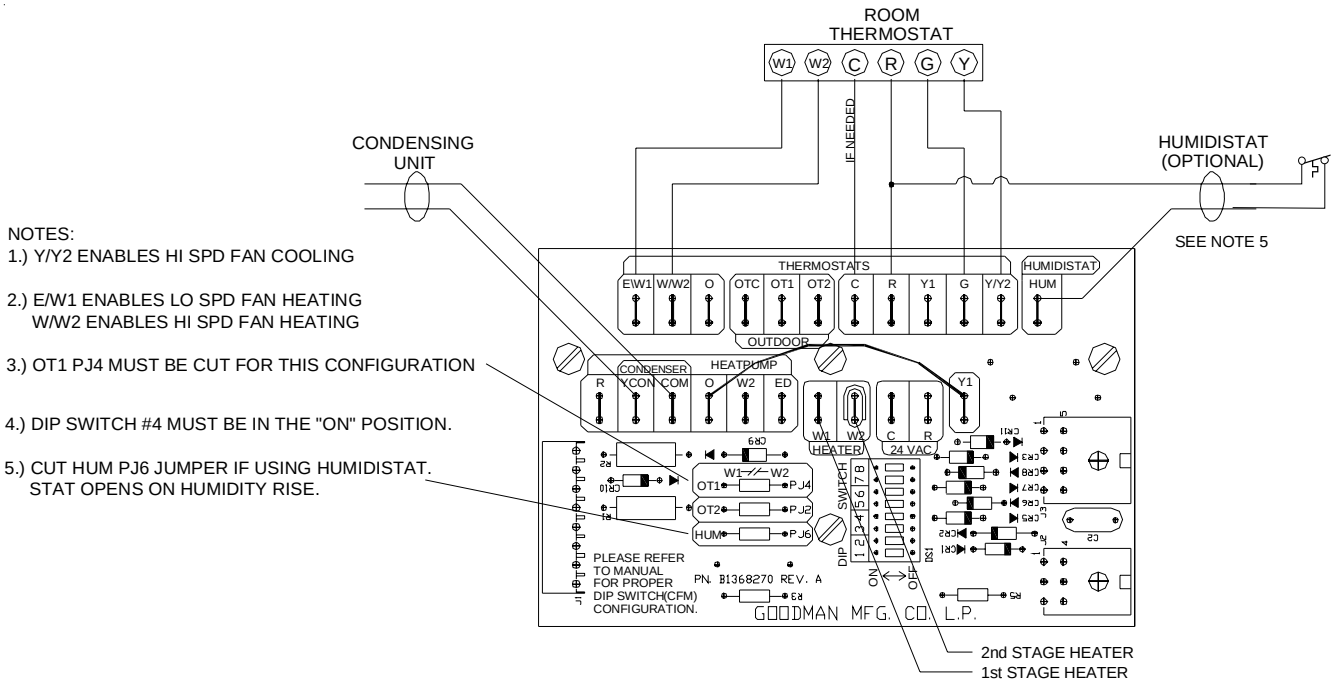
When matching the AEPT or AER Air Handlers to a Single Stage Cooling Unit or Heat Pump, remember to connect the "Y/Y2" thermostat connection on the variable speed board (VSTB) to the thermostat. Connecting the "Y1" will result in first stage cooling blower speed and may cause the contactor to chatter.

An equivalent thermostat can be used in place of the Goodman thermostat part number. The GMC thermostats that listed are mercury type thermostats.

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

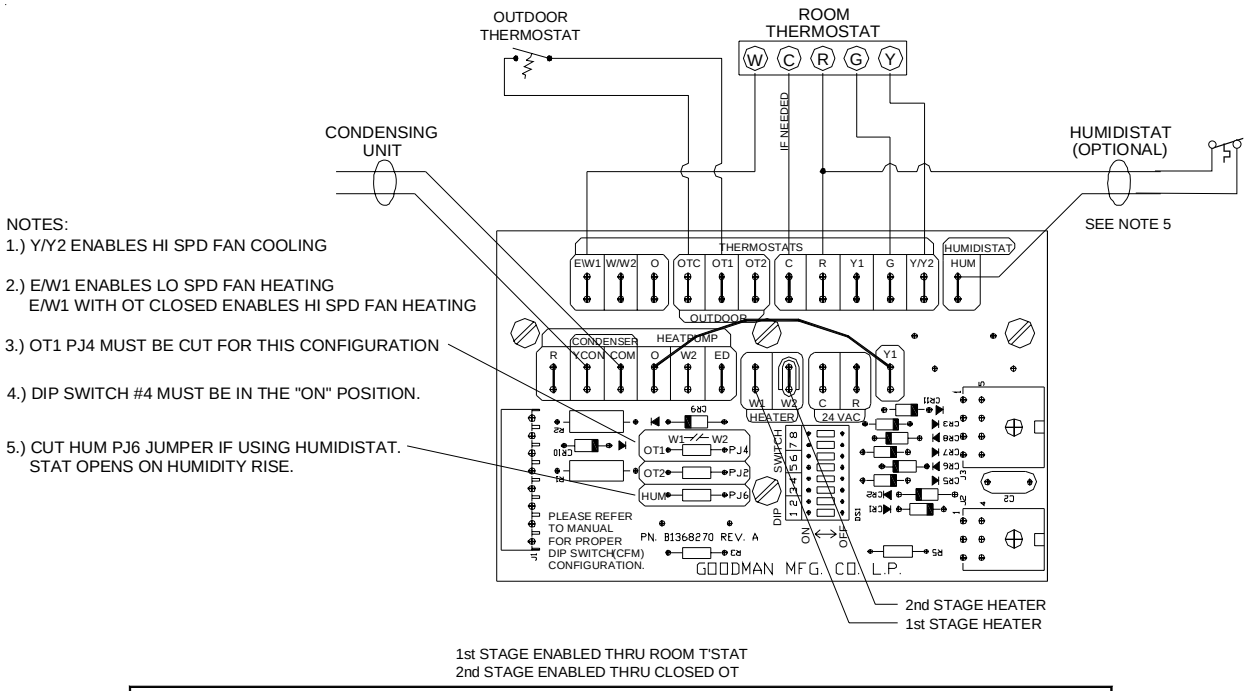
SINGLE STAGE COOLING WITH SINGLE OR TWO-STAGE HEATING



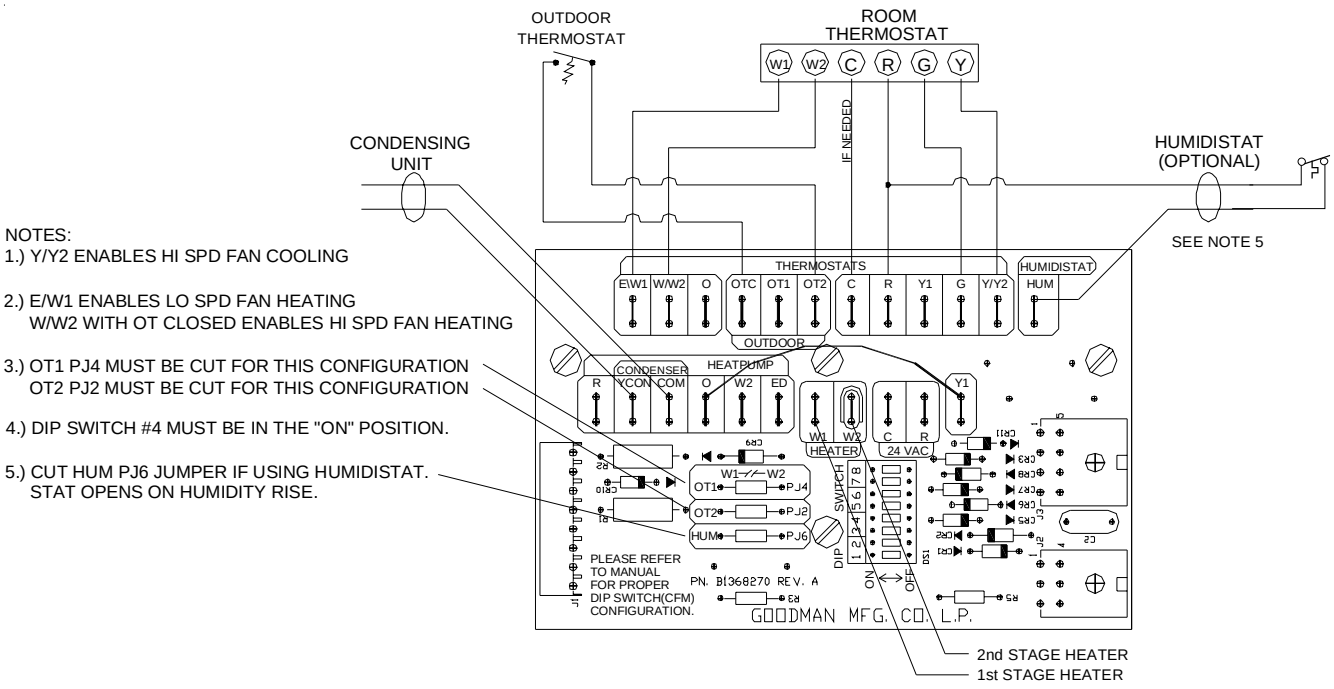
COOLING ONLY - 2 STAGE HEAT THERMOSTAT

AER / AEPT

WARNING **TO AVOID POSSIBLE ELECTRICAL SHOCK, PERSONAL INJURY, OR DEATH, DISCONNECT THE POWER BEFORE SERVICING.**



COOLING ONLY - 2 STAGE HEAT (1st ROOM T'STAT & 2nd OT)

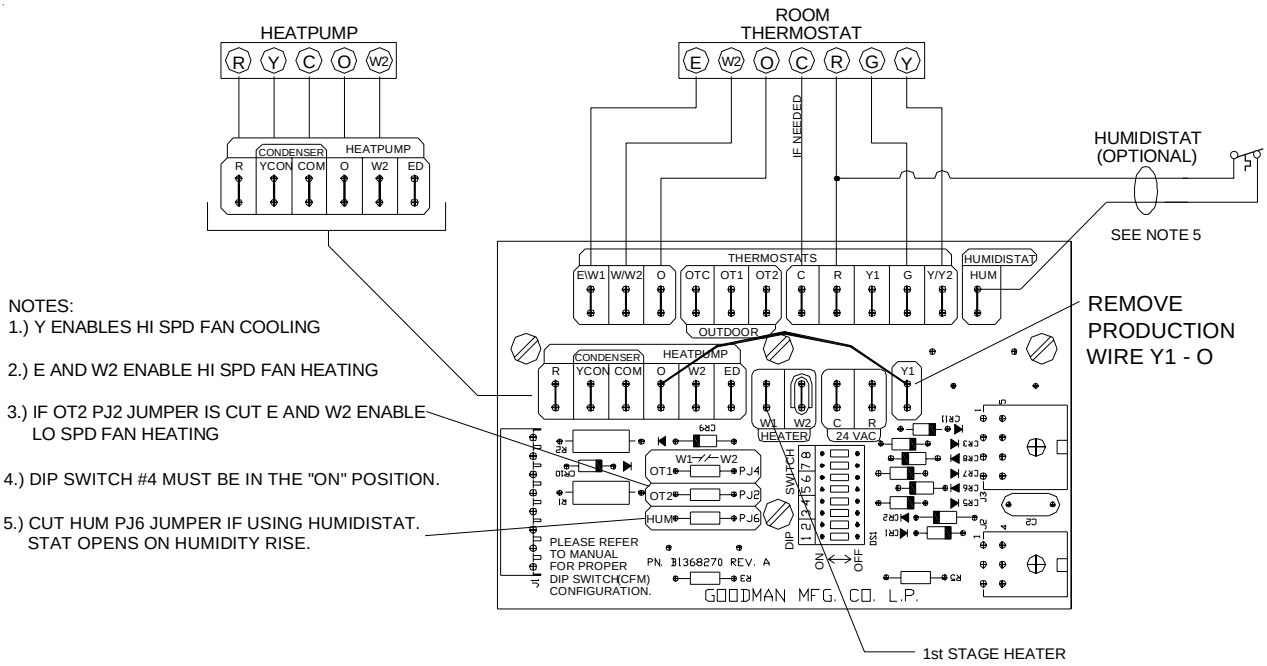


COOLING ONLY - 2 STAGE HEAT (T'STAT ENABLED OT)

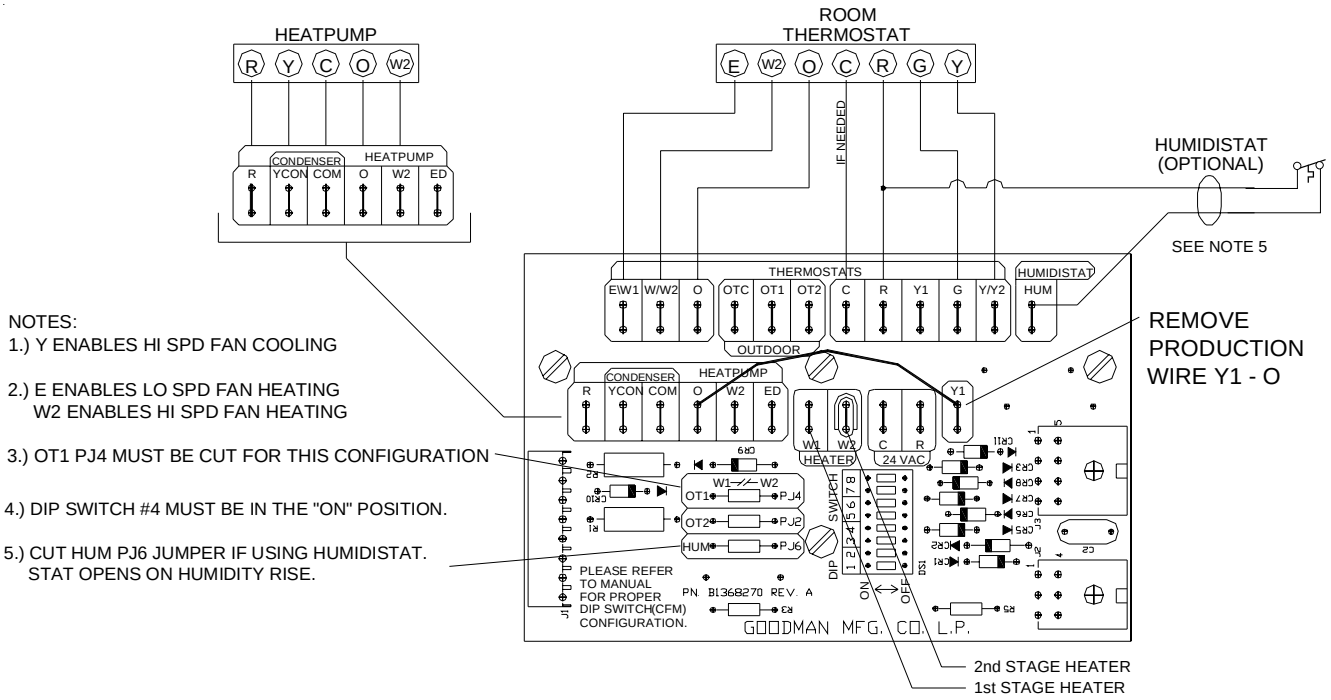
AER / AEPT

WARNING **TO AVOID POSSIBLE ELECTRICAL SHOCK, PERSONAL INJURY, OR DEATH, DISCONNECT THE POWER BEFORE SERVICING.**

HEAT PUMP WITH SINGLE OR TWO-STAGE HEATING (OPTIONS FOR EMERGENCY HEAT)



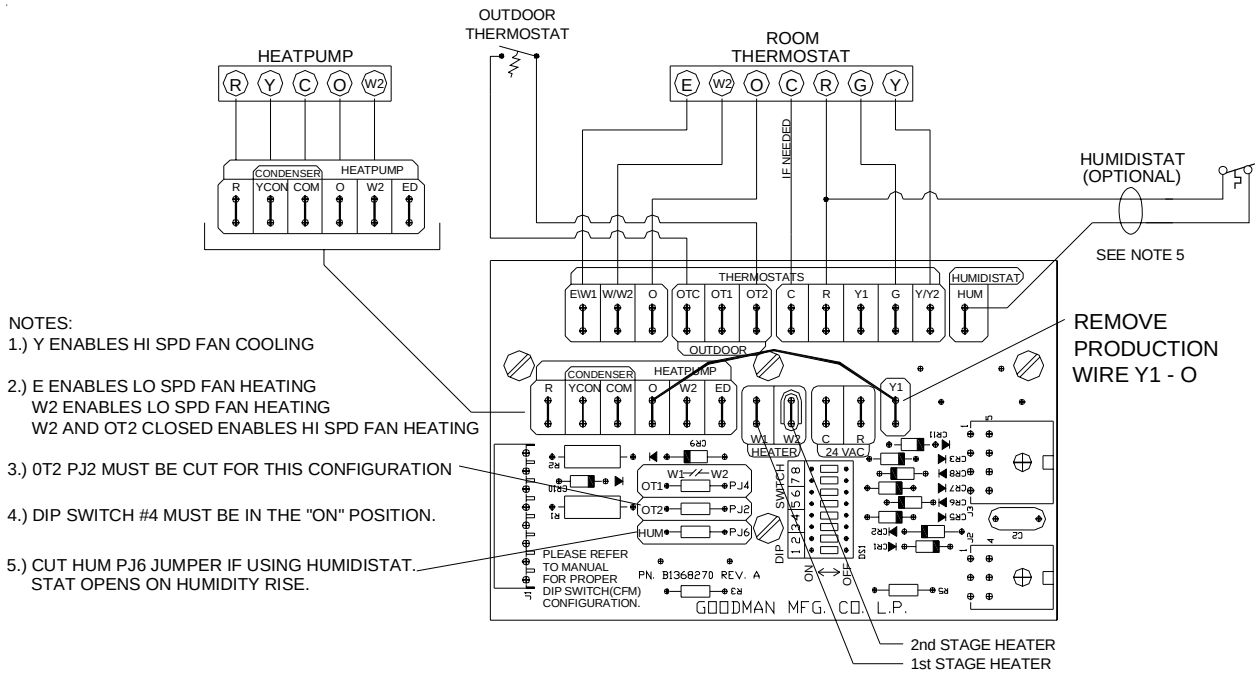
HEATPUMP - WITH 1 STG EMHT 1 STG AUX HEAT



HEATPUMP - 2 STG EMHT 1 STG AUX HEAT

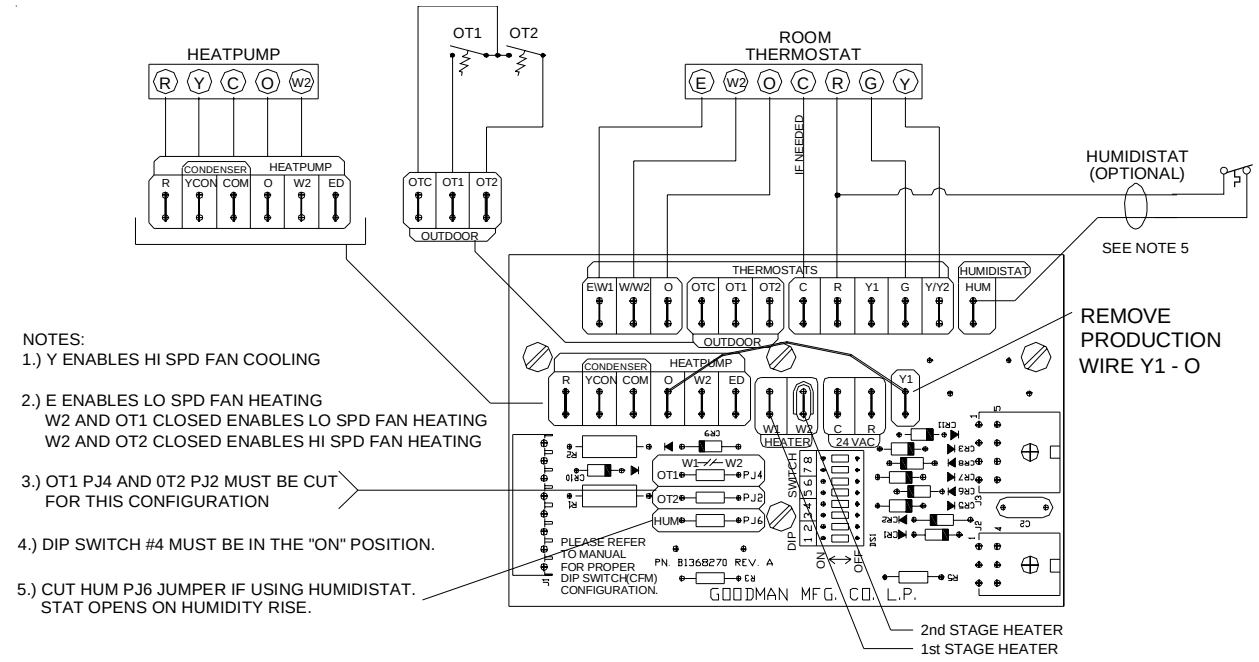
AER / AEPT

WARNING **TO AVOID POSSIBLE ELECTRICAL SHOCK, PERSONAL INJURY, OR DEATH, DISCONNECT THE POWER BEFORE SERVICING.**



1st STAGE AUX HEAT ENABLED BY ROOM T'STAT
2ND STAGE AUX ENABLED BY ROOM T'STAT AND OUTDOOR T'STAT

HEATPUMP - 2 STG EMHT 2 STG AUX - 1 OUTDOOR T'STAT

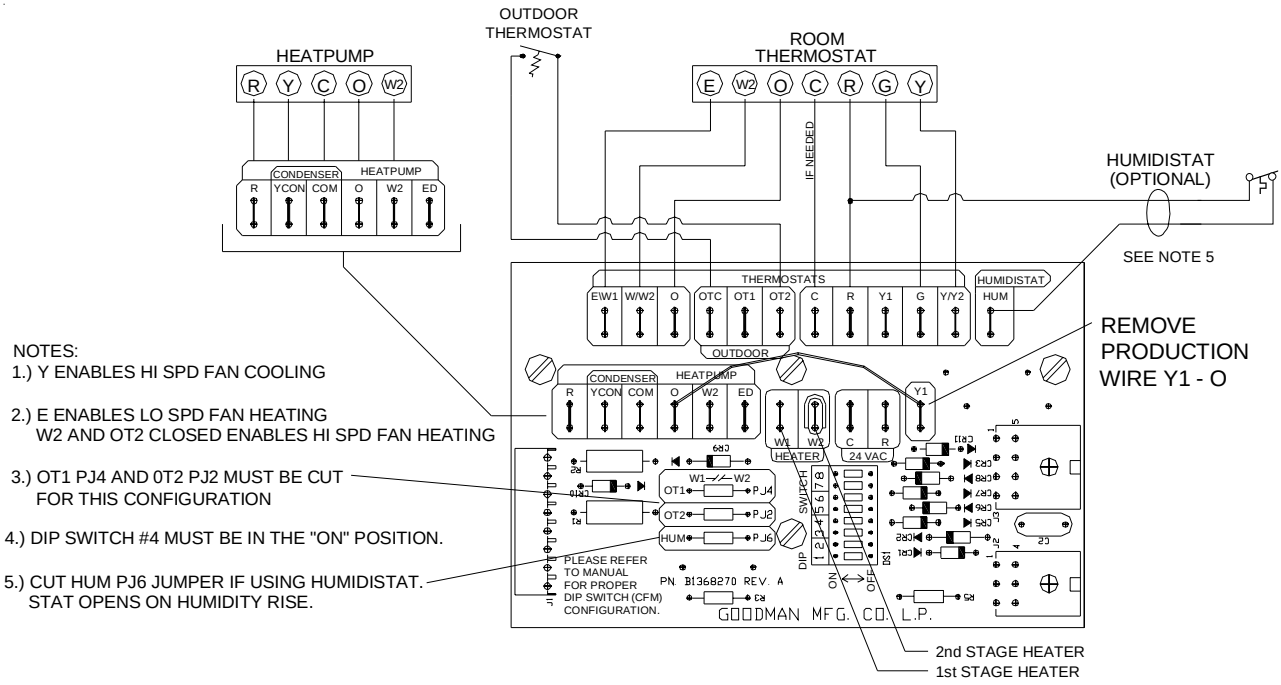


NO AUX HEAT IN HEATPUMP MODE UNTIL OUTDOOR T'STAT CLOSES

HEATPUMP - 2 STG EMHT 2 STG AUX - 2 OUTDOOR T'STATS

AER / AEPT

WARNING **TO AVOID POSSIBLE ELECTRICAL SHOCK, PERSONAL INJURY, OR DEATH, DISCONNECT THE POWER BEFORE SERVICING.**



NOTES:
1.) Y ENABLES HI SPD FAN COOLING

2.) E ENABLES LO SPD FAN HEATING
W2 AND OT2 CLOSED ENABLES HI SPD FAN HEATING

3.) OT1 PJ4 AND 0T2 PJ2 MUST BE CUT FOR THIS CONFIGURATION

4.) DIP SWITCH #4 MUST BE IN THE "ON" POSITION.

5.) CUT HUM PJ6 JUMPER IF USING HUMIDISTAT. STAT OPENS ON HUMIDITY RISE.

NO AUX HEAT IN HEATPUMP MODE UNTIL OUTDOOR T'STAT CLOSES

HEATPUMP - 2 STG EMHT 1 STG AUX - 1 OUTDOOR T'STAT

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