

SERVICE FACTS

WCC036-SF-5A

Library	Service Literature
Product Section	Unitary
Product	Packaged Heat Pump
Model	WCC
Literature Type	Service Facts
Sequence	5A
Date	May 1997
File No.	SV-UN-PKGP-WCC036-SF-5A 5/97
Supersedes	New

IMPORTANT - This Document is customer property and is to remain with this unit. Please return to service information pack upon completion of work.

Model: WCC036F100B

Single Packaged Heat Pump - Convertible 3 Ton

⚠ WARNING: HAZARDOUS VOLTAGE - DISCONNECT POWER BEFORE SERVICING

PRODUCT SPECIFICATIONS

MODEL	WCC036F1	MODEL	WCC036F1
RATED Volts/Ph/Hz	208-230/1/60		
RATINGS (COOLING) ①		OUTDOOR FAN — TYPE	Propeller
BTUH	36000	No. Used/Dia. (in.)	1 / 18
Indoor Airflow (CFM)	1200	Type Drive/No. Speeds	Direct / 1
Power Input (KW)	3.79	CFM @ 0.0 in. w.g. ④	2450
EER/SEER (BTU/Watt-Hr.) ⑥	9.50/10.0	No. Motors—HP	1 — 1/5
Noise Rating No. ②	8.0	Motor Speed R.P.M.	1080
RATINGS (HEATING) ①		Volts/Ph/Hz	230/1/60
(High Temp.) BTUH	35400	F.L. Amps—L.R. Amps	1.6 — 3.3
Power Input (KW)	3.35	INDOOR FAN—TYPE	Centrifugal
(Low Temp.) BTUH	18800	Dia x Width (in.)	10 x 9
Power Input (KW)	2.76	No. Used	1
HSPF (BTU / Watt-Hr.) ⑥	6.80	Drive / Speeds (No.)	Direct / 2
POWER CONN.—V/Ph/Hz	208-230/1/60	CFM vs. in. w.g. ⑤	See Fan Perf. Table
Min. Brch. Cir. Ampacity ③	26	No. Motors—HP	1 — 1/3
Fuse Size—Max. (amps)	40	Motor Speed R.P.M.	1080
Fuse Size—Recmd. (Amps)	40	Volts/Ph/Hz	200-230/1/60
COMPRESSOR	Climatuff™	F.L. Amps—L.R. Amps	2.8/2.2 - 5.1
No. Used—No. Speeds	1 — 1	FILTER / FURNISHED?	No
Volts/Ph/Hz	200-230/1/60	Type Recommended	THROWAWAY
R.L. Amps—L.R. Amps	16.9 - 92	Min Face Area - Lo. Vel.	4.0 sq. ft.
Brch. Cir. Selec. Cur. Amps	14.6	REFRIGERANT	
OUTDOOR COIL—TYPE	Plate Fin	Charge (lbs of r-22)	8.2
Rows/F.P.I.	2/15	DIMENSIONS	H X W X D
Face Area (sq.ft.)	8.62	Crated (in.)	35-1/4 x 38 x 57
Tube Size (in.)	3/8 Copper	Uncrated	See Outline Drawing
Refrigerant Control	TXV Bleed	WEIGHT	
INDOOR COIL—TYPE	Plate Fin	Shipping (lbs.)	406
Rows/F.P.I.	3 / 15	Net (lbs.)	366
Face Area (sq.ft.)	3.96		
Tube Size (in.)	3/8 Copper		
Refrigerant Control	Orifice - .071		
Drain Conn. Size (in.)	3/4 FPT		
Duct Connections	See Outline Drawing		

- ① Rated in accordance with A.R.I. Standard 240.
- ② Calculated in accordance with A.R.I. Standard 270.
- ③ Calculated in accordance with currently prevailing Nat'l Electrical Code.
- ④ Standard Air — Dry Coil — Outdoor.
- ⑤ Standard Air — Wet Coil — Indoor.
- ⑥ Rated in accordance with D.O.E. test procedure.

⚠ WARNING

THIS INFORMATION IS FOR USE BY INDIVIDUALS HAVING ADEQUATE BACKGROUNDS OF ELECTRICAL AND MECHANICAL EXPERIENCE. ANY ATTEMPT TO REPAIR A CENTRAL AIR CONDITIONING PRODUCT MAY RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE. THE MANUFACTURER OR SELLER CANNOT BE RESPONSIBLE FOR THE INTERPRETATION OF THIS INFORMATION, NOR CAN IT ASSUME ANY LIABILITY IN CONNECTION WITH ITS USE.

⚠ CAUTION

**CONTAINS REFRIGERANT!
SYSTEM CONTAINS OIL AND REFRIGERANT UNDER HIGH PRESURE. RECOVER REFRIGERANT TO RELIEVE PRESSURE BEFORE OPENING SYSTEM. Failure to follow proper procedures can result in personal illness or injury or severe equipment damage.**

NOTICE: Since the manufacturer has a policy of continuous product improvement, it reserves the right to change specifications and design without notice.

⚠ CAUTION

RECONNECT ALL GROUNDING DEVICES.
All parts of this product that are capable of conducting electrical current are grounded. If grounding wires, screws, straps, clips, nuts, or washers used to complete a path to ground are removed for service, they must be returned to their original position and properly fastened.

STATIC PRESSURE DROP THROUGH ELECTRIC HEATERS (INCHES OF WATER)

AIRFLOW CFM	Number of Heater Racks	
	1	2
600	.003	---
800	.004	---
1000	.005	.007
1200	.006	.008
1400	.007	.009
1600	.008	.01
2000	.01	.02

From Dwg. No. 21A730642

INDOOR BLOWER PERFORMANCE TCC036F, WCC036F

AIRFLOW CFM ③	HIGH SPEED ①			LOW SPEED		
	PRESS. IN.W.G.	PWR. WATTS	BHP	PRESS. IN.W.G.	PWR. WATTS	BHP
900	0.84	381	0.29	0.62	377	0.29
950	0.8	392	0.30	0.56	388	0.31
1000	0.76	404	0.31	0.49	400	0.32
1050	0.72	416	0.32	0.4	413	0.33
1100	0.68	427	0.34	0.29	427	0.35
1150	0.63	439	0.35	0.15	439	0.37
1200	0.58	450	0.36			
1250	0.52	462	0.37			
1300	0.46	473	0.38			
② 1350	0.38	485	0.40			
1400	0.3	496	0.41			
1450	0.19	507	0.42			
1500	0.07	518	0.43			

① FACTORY SETTING AT HI SPEED
 ② WATER BLOW-OFF LIMIT
 ③ WET COIL, NO FILTER, NO HEATER.
 SEE PRESSURE DROP TABLES FOR INSTALLED ELECTRIC HEATER.

From Dwg. No. 21A730242

Sequence of Operation

Heat Pump

General

Operation of the unit heating and cooling cycles is automatic for **HEAT** and **COOL** functions. (The optional automatic changeover thermostat, when in the **AUTO** position, automatically changes to heat or cool with sufficient room temperature change.) The fan switch can be placed in either the **ON** position, causing continuous evaporator (indoor) fan operation, or the **AUTO** position causing fan operation to coincide with heating or cooling run cycles.

Cooling Mode

(NOTE: TSH & TSC are contacts internal to the indoor thermostat.)

With the disconnect switch in the **ON** position, current is supplied to the compressor crankcase heater and control transformer. (The outdoor fan relay (ODF) relay is energized through normally closed contacts on the defrost timer control (DFC) on the 460V and 600V units only.) The cooling cycle is enabled through the low voltage side of the control transformer to the "R" terminal on the indoor thermostat. With the system switch in the **AUTO** position and TSC-1 contacts closed, power is supplied to the "O" terminal on the indoor thermostat to the switchover valve coil (SOV). This energizes the switch-over valve (SOV) and places it in the cooling position (it is in the heating position when not energized).

When the indoor temperature rises 1-1/2 degrees, TSC-2 contacts close, supplying power to the "Y" terminal on the indoor thermostat, and to the compressor contactor (CC). This starts the outdoor fan motor and compressor. The TSC-2 contacts also provide power to the "G" terminal which provides power to the fan relay (F) starting the indoor fan motor.

Heating Mode

With the disconnect switch in the "ON" position, current is supplied to the compressor crankcase heater and control transformer. (The outdoor fan relay (ODF) is energized through normally closed contacts on the defrost timer control (DFC) on the 460V and 600V units.) Starting at the "R" terminal on the indoor thermostat, current goes through the system switch (which is in "AUTO" position) to the TSH-1 contacts. When closed, these contacts supply power to terminal "Y" on the indoor thermostat as well as to the heating anticipator. The switch-over valve will not energize because of the high resistance of the heating anticipator in the thermostat. Power is provided from "Y" to the compressor contactor (CC) which starts the outdoor fan motor and compressor. The indoor thermostat contact TSH-1 also provides power to "G" terminal on the indoor thermostat energizing the fan relay (F), which starts the indoor fan motor.

Supplementary Heat

The **supplementary electric heat** is brought on when the indoor temperature drops 1-1/2 degrees below the thermostat setting. **TSH-2** contacts close providing power to the “**W**” terminal on the indoor thermostat and to the supplementary heater control circuit. **NOTE: The fan relay (F)** must have been energized. An outdoor thermostat may have been added to disallow the second stage (if provided) of electric heat above a selected outdoor temperature. If the outdoor temperature falls below the setting on the outdoor thermostat, this additional heater stage will come on. When the outdoor air temperature rises, and the outdoor T-stat setpoint is reached, the system will revert back to first stage electric heating.

When the indoor ambient is satisfied, **TSH-2** contacts will open and the unit will revert back to the compressor only heating mode and then off. For **emergency heat** (use of supplementary electric heat only), an emergency (EMERG) heat switch is provided within the thermostat. When placed in the emergency heat position, it will disable the compressor, bypass the outdoor thermostats, if provided, and engage the supplementary electric heaters and indoor fan.

Time-Temperature Defrost Operation

During the heating cycle, the outdoor coil may require a defrost cycle which is controlled by the defrost timer control (**DFC**). It is energized continuously allowing a defrost cycle every 50, 70 or 90 minutes depending on the setting of the time mode on the **DFC**. When the defrost thermostat (**DT**) closes at the appropriate line temperature setpoint, the defrost control (**DFC**) opens the circuit to the outdoor fan motor (**ODM**) and energizes the switch-over valve (**SOV**), placing the unit in the cooling mode. When the liquid line temperature reaches 50 Deg. F, or a ten minute time cycle expires, the (**DFC**) energizes the outdoor fan motor (**ODM**) and de-energizes the **SOV**, which returns the unit to the heating mode. Supplementary electric heat, if provided, is brought on to control indoor temperature during the defrost cycle.

TIME-TEMPERATURE DEFROST SYSTEM

DEFROST CONTROL

The electronic defrost board is a combination time/temperature device. It is designed to control the removal of frost and ice from the outdoor coil of a heat pump when coil temperatures are low.

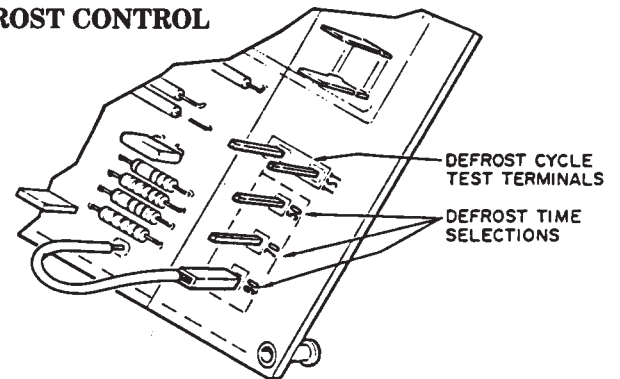
Defrosting of the coil is initiated at a pre-selected time interval, provided the outdoor coil is below the preset initiation temperature. One of three time intervals (50, 70 or 90 minutes) may be chosen, allowing the installer to adjust the time for his particular climate. In humid and northern climates, for example, the time interval may need to be shorter than in dry climates.

The electronic defrost board terminates the defrosting cycle when the outdoor coil temperature rises to the preset termination temperature or after a preset defrost time has passed, regardless of wind velocity. This helps ensure that the heat pump stays in defrost only as long as is necessary to remove the frost and ice from the outdoor coil.

OPERATION: Power to the defrost board is provided when the temperature sensing switch on the coil inlet tubing is closed. Defrost time intervals of 50, 70 and 90 minutes may be selected by connecting the selection wire to the terminals marked “50”, “70” and “90”, respectively. Most product is factory set at 50 minutes. In northern climates it is recommended that all units be set at 50 minutes. The accumulation of time starts and stops with the wall thermostat's call for heating. At the end of the chosen time interval, assuming the temperature sensing switch is closed, a defrost cycle is started. The defrost cycle is terminated when the tempera-

ture sensing switch opens or the 10 minute override interrupts the defrost period. On termination of the defrost cycle, the timing period is reset.

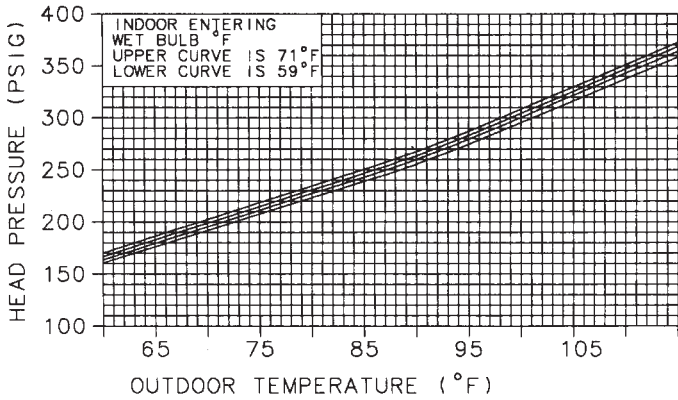
DEFROST CONTROL



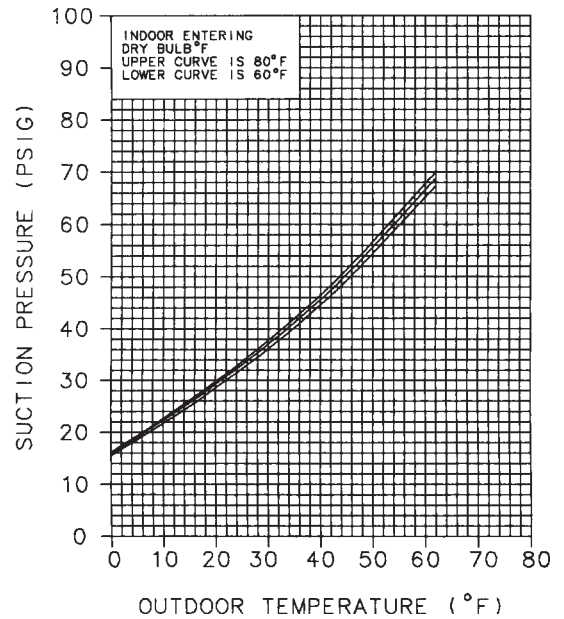
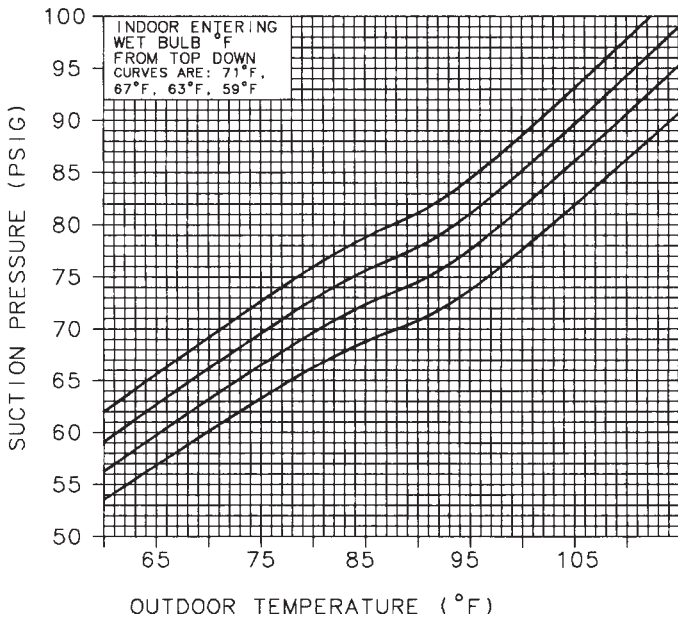
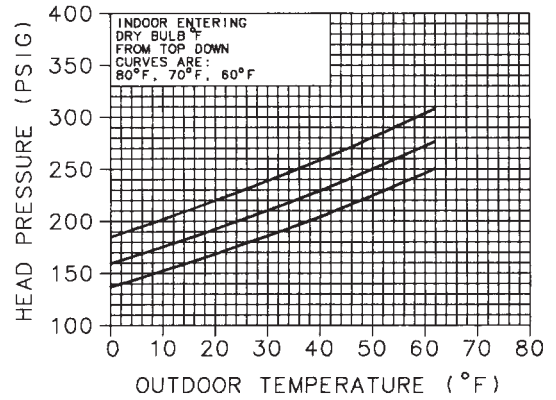
TEST FEATURE: The test feature is provided for use by the installer or serviceman to verify that the electronic defrost board is operating properly. To initiate a defrost cycle the two TST pins are shorted together until the cycle has been initiated. All timing functions are shortened to 11.7, 16.4, or 20.3 seconds for the 50, 70 and 90 minute time interval settings, respectively. After defrost initiation, the short across the two TST pins **MUST BE REMOVED IMMEDIATELY**, or the defrost period will last only 2.3 seconds. Defrost is terminated as described in the OPERATION section.

SYSTEM PRESSURE CURVES

COOLING



HEATING

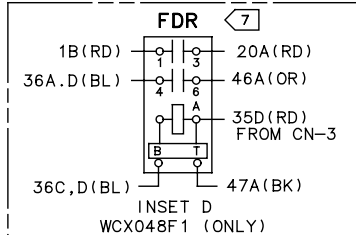
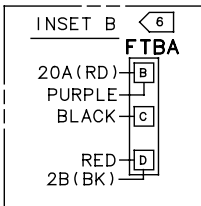
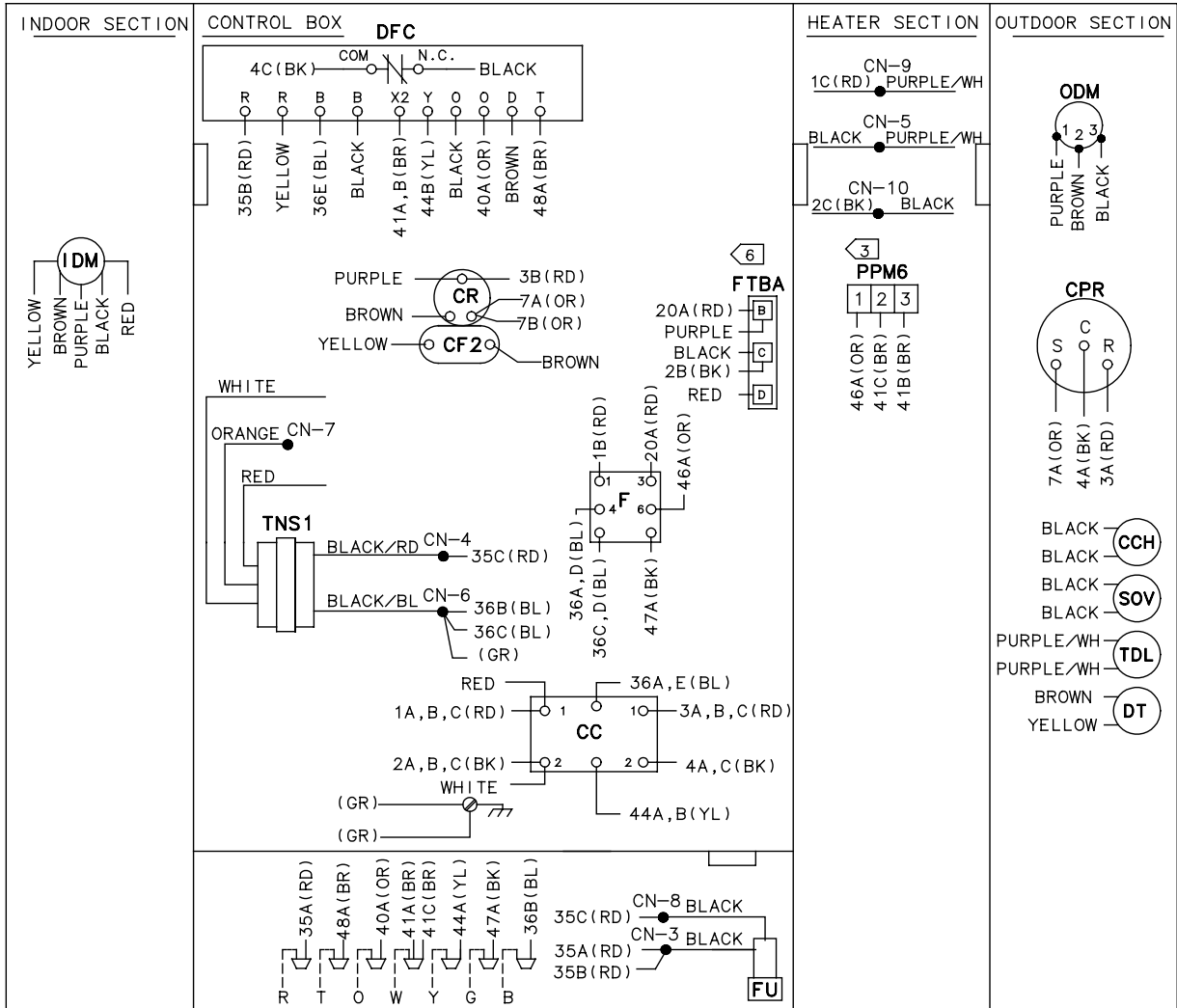


COOLING PERFORMANCE CAN BE CHECKED WHEN THE OUTDOOR TEMP. IS ABOVE 75°. HEATING PERFORMANCE CAN BE CHECKED WHEN THE OUTDOOR TEMP. IS BELOW 60°F.
TO CHECK COOLING PERFORMANCE, ALLOW PRESSURES TO STABILIZE AND MEASURE INDOOR WET BULB TEMP.—OUTDOOR TEMP.—HEAD AND SUCTION PRESSURE. LOCATE OUTDOOR TEMP. ① LOCATE INDOOR WET BULB ② FIND INTERSECTION OF OD TEMP. & ID W.B. ③ READ HEAD OR SUCTION PRESSURE IN LEFT HAND COLUMN ④.

ACTUAL HEAD PRESSURE SHOULD BE ± 10 PSIG OF CHART
SUCTION PRESSURE SHOULD BE ± 3 PSIG OF CHART

From Dwg. No. 21C662074

CONNECTION DIAGRAM



WIRE COLOR DESIGNATION			
ABBR	COLOR	ABBR	COLOR
BK	BLACK	PR	PURPLE
BL	BLUE	RD	RED
BR	BROWN	WH	WHITE
GR	GREEN	YL	YELLOW
OR	ORANGE		

DEVICE	DESCRIPTION	LINE
AH, BH	CONTACTOR ELECTRIC HEAT	37, 38
CC	COMPRESSOR CONTACTOR COIL	40
CCH	CRANKCASE HEATER	21
CF1	OUTDOOR FAN CAPACITOR	19
CF2	INDOOR MOTOR CAPACITOR	21
CN	CONNECTOR OR WIRE NUT	
CPR	COMPRESSOR	14
CR	COMPRESSOR RUN CAPACITOR	15
CS	COMPRESSOR START CAPACITOR	10
CSR	COMPRESSOR START RELAY COIL	10
DFC	DEFROST CONTROL	33
DT	DEFROST TERMINATOR	30
F	INDOOR FAN RELAY COIL	43
FU	FUSE	29
FTB	FAN TERMINAL BLOCK	23-25
IDM	INDOOR FAN MOTOR	23
IOL	INTERNAL OVERLOAD	
ODM	OUTDOOR FAN MOTOR	18
PPM6	HEATER PLUG (FEMALE)	37, 38
SOV	SWITCHOVER VALVE	34
TNS1	CONTROL POWER TRANSFORMER	28
TDL	DISCHARGE LINE THERMOSTAT	21
FDR	INDOOR FAN DELAY RELAY	46
PCB	PRINTED CIRCUIT BOARD	46-49

NOTES:

- 1 CONNECTIONS SHOWN ARE FOR A TYPICAL THERMOSTAT. SEE SCHEMATIC SUPPLIED WITH THERMOSTAT FOR PROPER CONNECTIONS. LOW VOLTAGE WIRING TO UNIT MAY BE NEC CLASS 2 AND MUST BE A MIN. OF 18 A.W.G.
2. MAXIMUM ADDITIONAL EXTERNAL LOAD (PILOT DUTY) BETWEEN "B" AND "R" OF 0.5 AMPS, 24 VAC IS AVAILABLE WHEN A HEATER IS INSTALLED.
3. SEE WIRING DIAGRAM WITH HEATER FOR DETAILS OF HEATER WIRING.
4. FOR 208 VOLT OPERATION MAKE THE FOLLOWING WIRING CHANGES:
 A: AT IDM, MOVE 20A(RD) LEAD FROM FTBA-B TO YELLOW LEAD AT CF2.
 B: AT COMPRESSOR CONTACTOR REMOVE RED WIRE FROM TNS1 AND CONNECT TO ORANGE WIRE FROM TNS1. THE RED WIRE MUST BE RE-TERMINATED TO AVOID ACCIDENTLY SHORTING.
5. IF ANY OF THE ORIGINAL WIRE AS SUPPLIED IN THIS UNIT MUST BE REPLACED, REPLACE IT WITH APPLIANCE WIRING MATERIAL RATED AT 105° C.
6. INDOOR BLOWER MOTOR CONNECTIONS SHOWN ARE FOR THE WC*024F1, -036F1, -042F1, AND -060F1 UNIT. FOR INDOOR BLOWER MOTOR CONNECTIONS FOR THE WC*018F1, -030F1, AND -048F1 UNIT SEE INSET A AND B.
7. THE WCX048F1 HAS A FAN DELAY RELAY (FDR). SEE INSET C & D. UNIT IS FACTORY WIRED FOR FAN OFF DELAY. FOR INSTANT OFF OPERATION DISCONNECT 35D(RD) WIRE FROM FDR-A AND INSULATE. ADD JUMPER FROM PCB-T TO FDR-A.

D757238P04

SCHEMATIC

CAUTION-NOT SUITABLE FOR USE ON SYSTEMS EXCEEDING 150 VOLTS TO GROUND.
ATTENTION: NE CONVIENT PAS POUR LES INSTALLATIONS DE PLUS DE 150V. A TERRE.

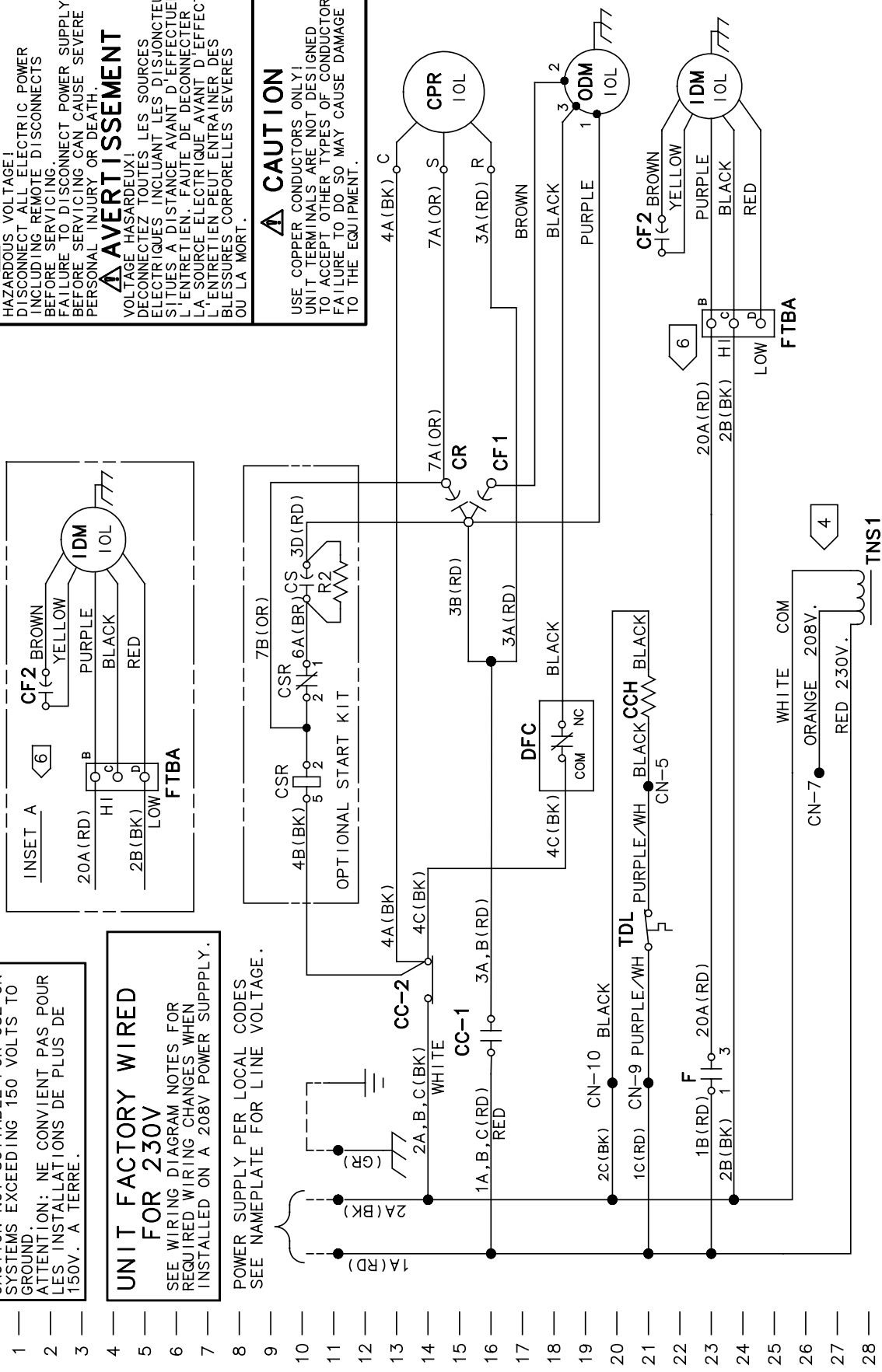
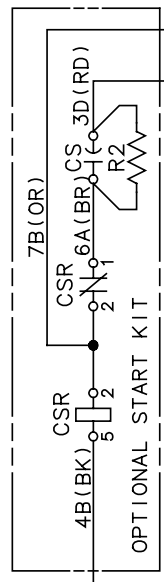
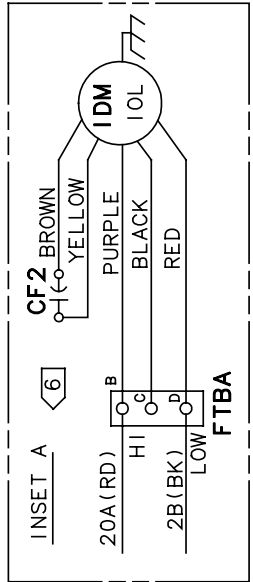
UNIT FACTORY WIRED FOR 230V
SEE WIRING DIAGRAM NOTES FOR REQUIRED WIRING CHANGES WHEN INSTALLED ON A 208V POWER SUPPLY.

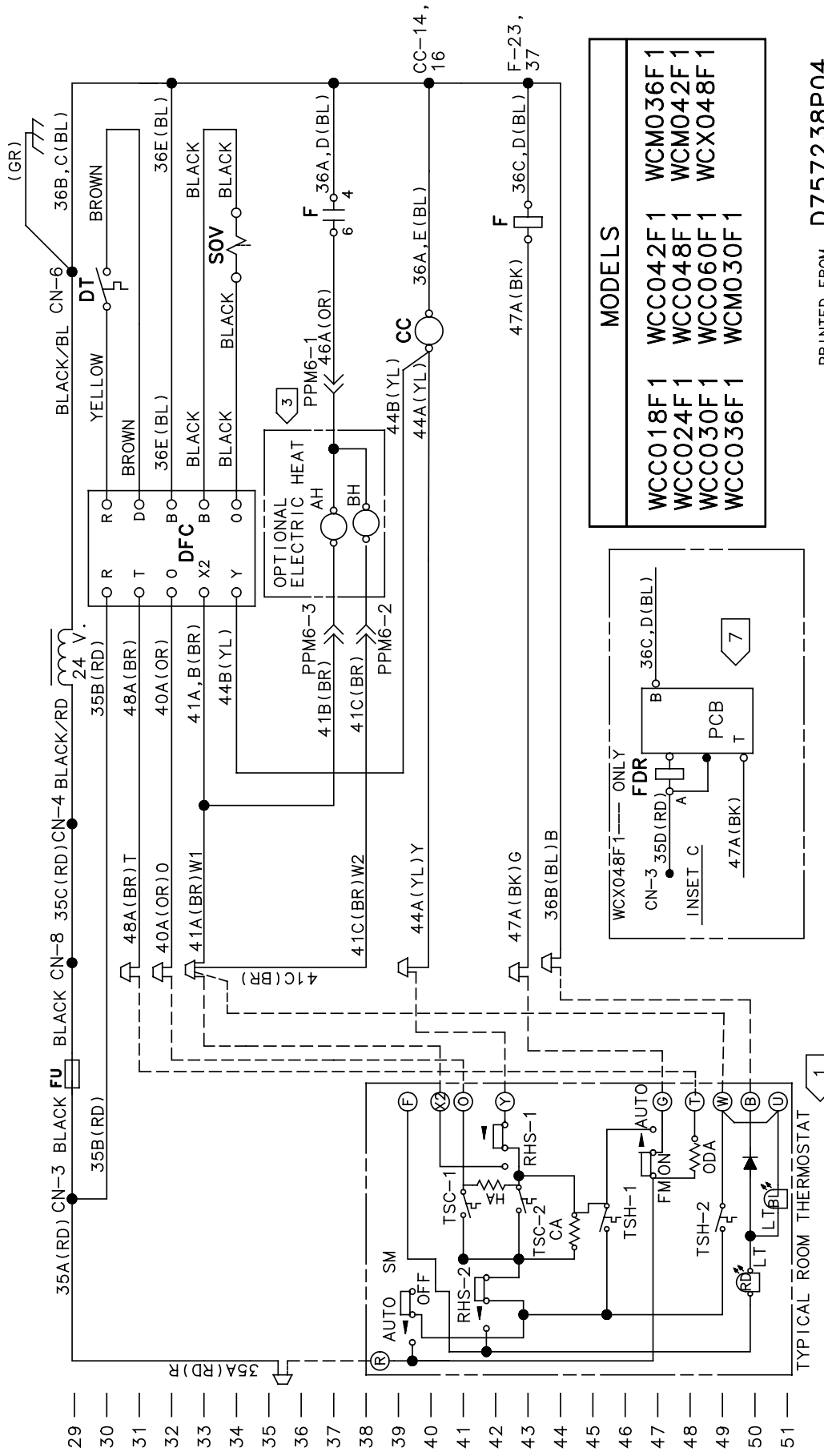
POWER SUPPLY PER LOCAL CODES
SEE NAMEPLATE FOR LINE VOLTAGE.

WARNING
HAZARDOUS VOLTAGE!
DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING.
FAILURE TO DISCONNECT POWER SUPPLY BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.

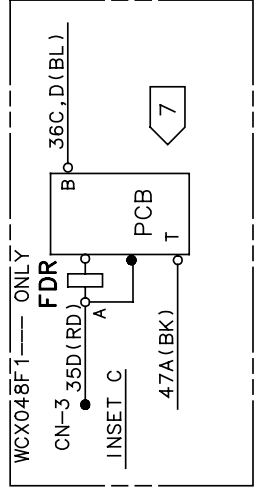
AVERTISSEMENT
VOLTAGE HASARDEUX!
DECONNECTEZ TOUTES LES SOURCES ELECTRIQUES INCLUANT LES DISJONCTEURS SITUES A DISTANCE AVANT D'EFFECTUER L'ENTRETIEN. FAUTE DE DECONNECTER LA SOURCE ELECTRIQUE AVANT D'EFFECTUER L'ENTRETIEN PEUT ENTRAÎNER DES BLESSURES CORPORELLES SEVERES OU LA MORT.

CAUTION
USE COPPER CONDUCTORS ONLY!
UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS. FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.



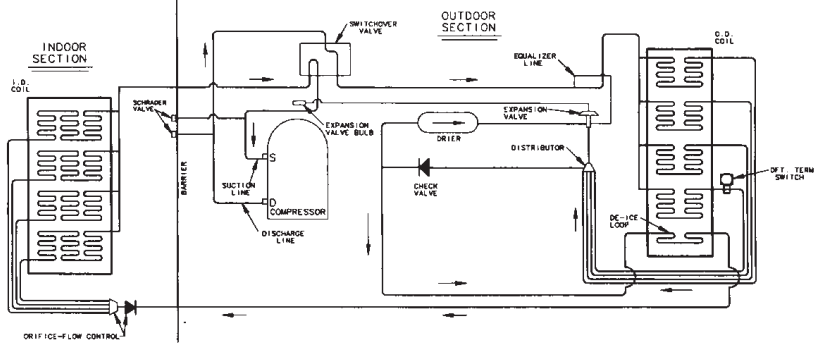


MODELS	
WCC018F1	WCC042F1
WCC024F1	WCC048F1
WCC030F1	WCC060F1
WCC036F1	WCC030F1
WCC036F1	WCC036F1
WCC042F1	WCC042F1
WCC048F1	WCC048F1
WCC060F1	WCC060F1
WCC030F1	WCC030F1

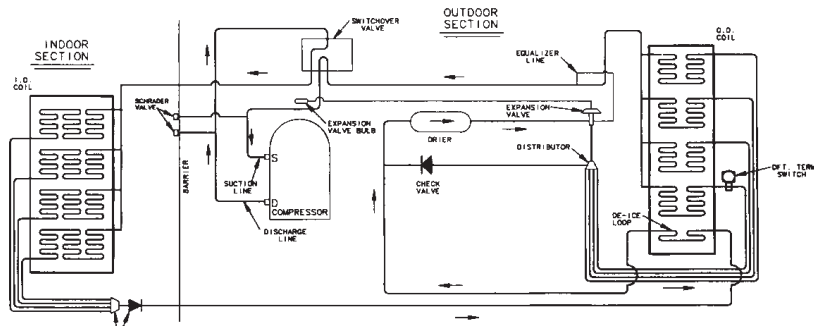


PRINTED FROM D757238P04

REFRIGERANT CIRCUIT



COOLING REFRIGERANT CYCLE

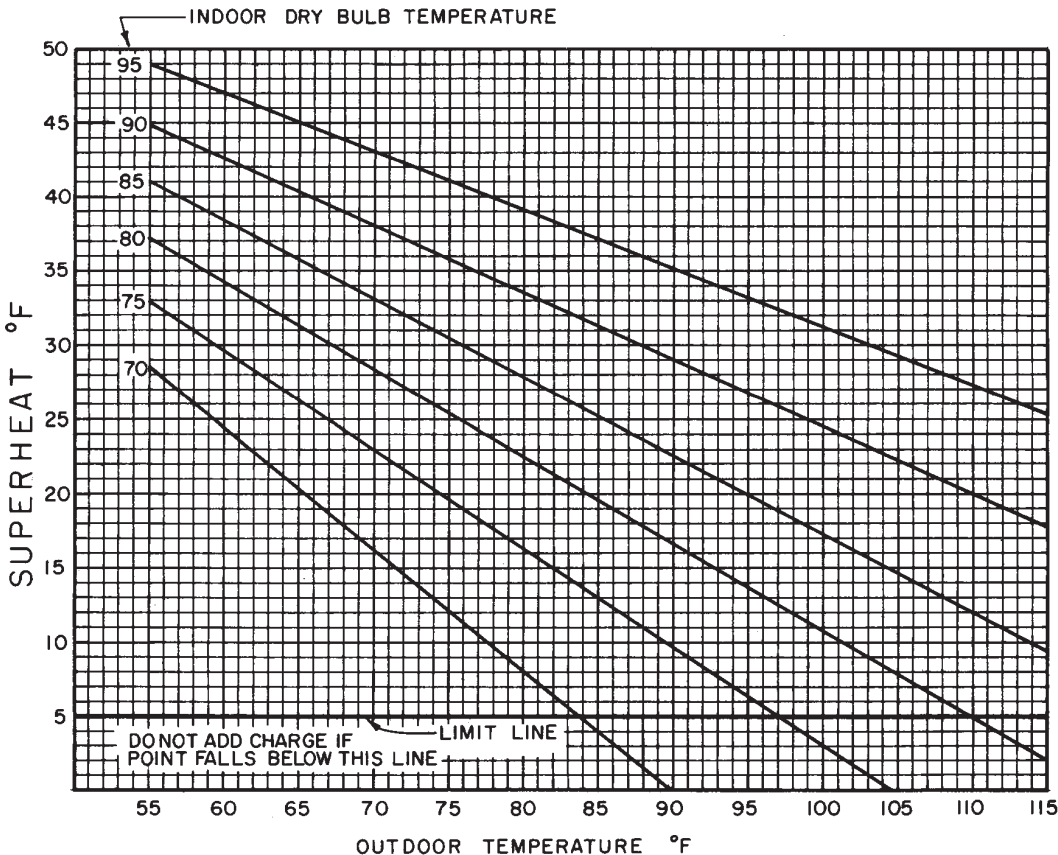


HEATING REFRIGERANT CYCLE

From Dwg. No. 21C729712

SUPERHEAT CHARGING CHART

CHART BASED ON 400CFM/TON INDOOR AIR FLOW AND 50% RELATIVE HUMIDITY.



NOTES:

1. MEASURE INDOOR DRY BULB TEMPERATURE.
2. MEASURE OUTDOOR DRY BULB TEMPERATURE.
3. MEASURE SUCTION PRESSURE AT PRESSURE TAP ON OUTDOOR UNIT.
4. MEASURE SUCTION TEMPERATURE NEAR PRESSURE TAP ON OUTDOOR UNIT.
5. DETERMINE DEGREES SUPERHEAT FROM TEMPERATURE PRESSURE CHART OR LOW SIDE MANIFOLD GAUGE.
6. FIND THE INTERSECTION WHERE THE OUTDOOR TEMPERATURE AND INDOOR TEMPERATURE MEET AND READ DEGREES SUPERHEAT. IF UNIT SUPERHEAT IS MORE THAN 5° ABOVE CHART VALUE, ADD R-22 UNTIL WITHIN 5°. IF UNIT SUPERHEAT IS MORE THAN 5° BELOW CHART VALUE, REMOVE R-22 UNTIL WITHIN 5°.
7. IF SUPERHEAT IS BELOW THE 5° LIMIT LINE, DO NOT ADD R-22.

From Dwg. No. 21B123511