INSTALLATION MANUAL - 50 HZ

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See following pages for a complete Table of Contents.

NOTES, CAUTIONS AND WARNINGS

The installer should pay particular attention to the words: *NOTE*, *CAUTION*, and *WARNING*. Notes are intended to clarify or make the installation easier. Cautions are given to prevent equipment damage. Warnings are given to alert installer that personal injury and/or equipment damage may result if installation procedure is not handled properly.

CAUTION: READ ALL SAFETY GUIDES BEFORE YOU BEGIN TO INSTALL YOUR UNIT.

SAVE THIS MANUAL

CHAMPION® SERIES

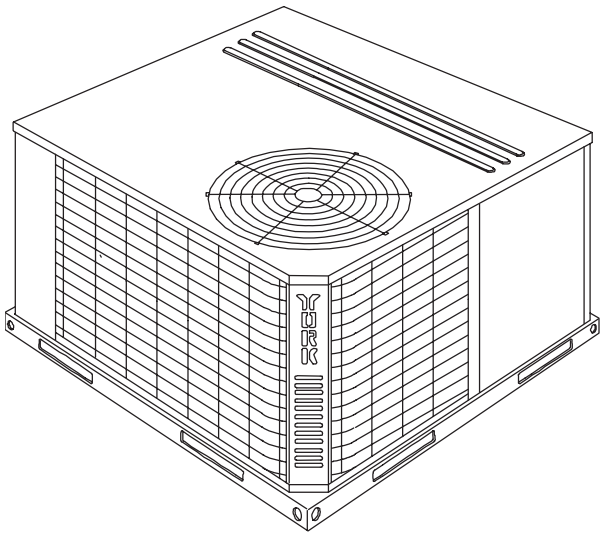
SINGLE PACKAGE AIR CONDITIONERS

ELECTRIC/ELECTRIC, AIR-COOLED

MODELS: D1EB036, 048 DIRECT DRIVE

D1EB060 BELT DRIVE

(WORLD 50 HZ)



Tested in accordance with:

ISO 9001
Certified Quality
Management System

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GENERAL

Model D1EB units are factory assembled cooling only air conditioners designed for outdoor installation on a rooftop or a slab.

The units are completely assembled on rigid, but easily removable base rails. All piping, refrigerant charge, and electrical wiring is factory installed and tested. The units require only electric power and duct connections at the point of installation.

INSPECTION

As soon as a unit is received, it should be inspected for possible damage during transit. If damage is evident, the extent of the damage should be noted on the carrier's freight bill. A separate request for inspection by the carrier's agent should be made in writing. Refer to Form 50.15-NM for additional information.

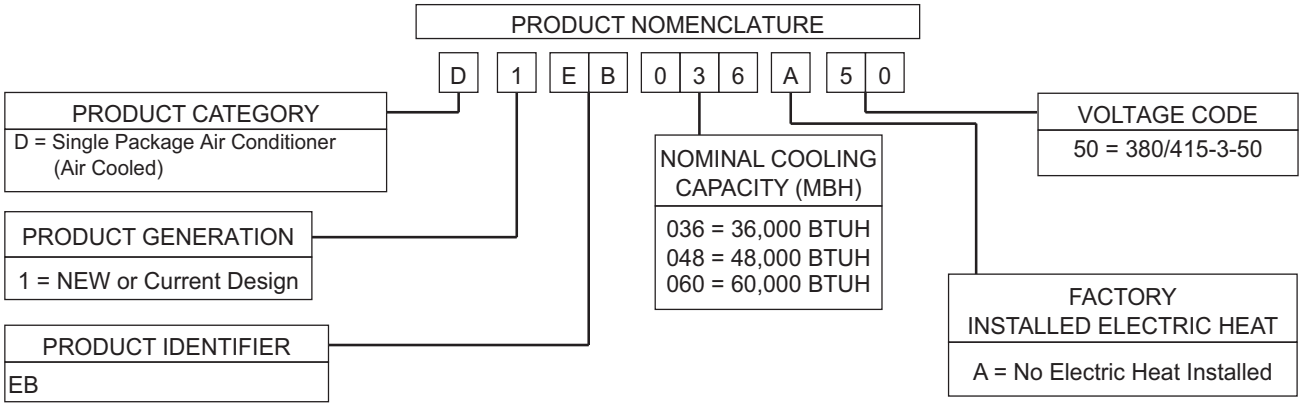
REFERENCE

Additional information on the design, installation, operation and service of this equipment is available in the following reference forms:

- 173858 - General Installation
- 036-21686-001 - Technical Guide

REPLACEMENT PARTS

Refer to Replacement Parts Manual for complete listing of replacement parts on this equipment.



INSTALLATION

LIMITATIONS

These units must be installed in accordance with the following national and local safety codes.

1. National Electrical Code ANSI/NFPS No. 70 or Canadian Electrical Code Part 1, C22.1 (latest editions).
2. Local plumbing and waste water codes and other applicable local codes.

Refer to Table 1 for unit application data.

If components are to be added to a unit to meet local codes, they are to be installed at the dealer's and/or the customer's expense.

Size of unit for proposed installation should be based on heat loss/heat gain calculations made in accordance with industry recognized procedures identified by the Air Conditioning Contractors of America.

TABLE 1: UNIT APPLICATION DATA

Wet Bulb Temperature (°C) of Air on Evaporator Coil, Min. / Max.	14 / 22
Dry Bulb Temperature (°C) of Air on Condenser Coil, Min.[1] / Max.	7 / 49

1. A low ambient accessory is available for operation down to 0°F.

LOCATION

Use the following guidelines to select a suitable location for these units.

1. Unit is designed for outdoor installation only.
2. Condenser must have an unlimited supply of air. Where a choice of location is possible, position unit on either north or east side of building.
3. For ground level installation, a level pad or slab should be used. The thickness and size of the pad or slab used

should meet local codes and unit weight. Do not tie the slab to the building foundation.

4. For roof top installation, be sure the structure will support the weight of the unit plus any field installed components. Unit must be installed on a level roof curb or appropriate angle iron frame providing adequate support under the compressor/condenser section.

5. Maintain level tolerance of unit to 1/8" maximum.

RIGGING OR HANDLING

Care must be exercised when moving the unit. Do not remove any packaging until the unit is near the place of installation. Rig unit with slings placed under the unit. Spreader bars of sufficient length should be used across the top of the unit.

BEFORE LIFTING A UNIT, MAKE SURE THAT ITS WEIGHT IS DISTRIBUTED EQUALLY ON THE CABLES SO THAT IT WILL LIFT EVENLY.

Units may also be moved or lifted with a fork-lift. Slotted openings in the skid are provided for this purpose. Forks must pass completely through the base.

Refer to Table 2 for unit weights and to Figure 1 for approximate center of gravity.

TABLE 2: UNIT WEIGHTS AND CENTERS OF GRAVITY

SIZE (Tons)	MODEL	UNIT WEIGHT kg (lb)		CENTER OF GRAVITY mm (in.)		4 POINT LOAD LOCATION kg (lb)			
		Shipping	Operating	X	Y	A	B	C	D
036 (3.0)	DEB	150 (330)	147 (325)	610 (24)	597 (23.5)	35 (77)	35 (78)	39 (85)	38 (84)
048 (4.0)	DEB	179 (395)	177 (390)	610 (24)	597 (23.5)	42 (93)	43 (94)	46 (102)	46 (101)
060 (5.0)	DEB	222 (490)	220 (485)	572 (22.5)	610 (24)	57 (125)	51 (112)	53 (117)	60 (131)

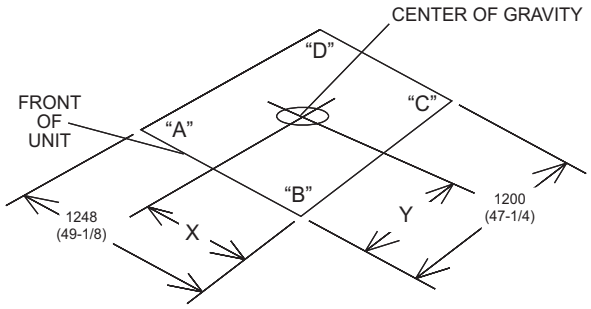


FIGURE 1 - CENTER OF GRAVITY

CLEARANCES

All units require certain clearances for proper operation and service. Refer to Figure 3 for the clearances required for combustion, construction, servicing and proper unit operation.

⚠WARNING

Do not permit overhanging structures or shrubs to obstruct the condenser air discharge outlet.

DUCT WORK

These units are adaptable to downflow use as well as rear supply and return air duct openings. To convert to downflow, use the following steps:

1. Remove the duct covers found in the bottom return and supply air duct openings. There are four (4) screws securing each duct cover (save these screws to use later).

2. Install the duct covers, removed in step one, to the rear supply and return air duct openings. Secure with the four (4) screws used in step one.

3. Seal the duct covers with silicone caulking.

Downflow units must have an L-shaped supply duct without any outlets or registers located directly below the supply outlet of the unit.

Duct work should be designed and sized according to the methods of the Air Conditioning Contractors of America (ACCA), as set forth in their Manual D.

A closed return duct system shall be used. This shall not preclude use of economizers or ventilation air intake. Flexible joints may be used in the supply and return duct work to minimize the transmission of noise.

⚠ CAUTION

When fastening duct work to the side duct flanges on the unit, insert the screws through the duct flanges only. DO NOT insert the screws through the casing. Outdoor duct work must be insulated and waterproofed.

NOTE: Be sure to note supply and return openings.

Refer to Figure 3 for information concerning rear and bottom supply and return air duct openings.

FILTERS

A filter rack and filters are standard on all units.

Filters must always be used and must be kept clean. When filters become dirt laden, insufficient air will be delivered by the blower, decreasing your units efficiency and increasing operating costs and wear-and-tear on the unit and controls.

Filters should be checked monthly especially since this unit may be used for both heating and cooling.

CONDENSATE DRAIN

A condensate trap is required to be installed in the condensate drain. The plumbing must conform to local codes. Use a sealing compound on male pipe threads. Install the condensate drain line (3/4“ NPTF) to spill into an open drain.

SERVICE ACCESS

Access to all serviceable components is provided by the following removable panels:

- Blower service access
- Electrical/filter access
- Compressor service access

Refer to Figure 3 for location of these access panels and minimum clearance.

THERMOSTAT

The room thermostat should be located on an inside wall approximately 56" above the floor where it will not be subject to drafts, sun exposure or heat from electrical fixtures or appliances. Follow manufacturer's instructions enclosed with the thermostat for general installation procedure. Four or five color coded insulated wires (minimum #18 AWG) should be used to connect thermostat to unit. See Figure 2.

TABLE 3: PHYSICAL DATA

COMPONENT	MODELS								
	DEB036			DEB048			DEB060		
NOMINAL TONNAGE	3.0			4.0			5.0		
COOLING PERFORMANCE									
RATING	T1	T2	T2	T1	T2	T3	T1	T2	T3
Indoor DB/WB °C	27 / 19	29 / 19	21 / 15	27 / 19	29 / 19	21 / 15	27 / 19	29 / 19	21 / 15
Outdoor DB/WB °C	35 / 24	46 / 24	27 / 19	35 / 24	46 / 24	27 / 19	35 / 24	46 / 24	27 / 19
Total Output (MBH)	36500	30550	34500	47000	40900	45000	58300	50800	54500
Total Output kW (MBH)	125 / 36.5	104 / 30.6	118 / 34.5	160 / 47	140 / 40.9	154 / 45	199 / 58.3	173 / 50.8	186 / 54.5
Total Input kW	4.25	4.72	3.75	5.07	6.14	4.40	6.00	7.25	5.20
COP[2]	2.52	1.90	2.70	2.72	1.95	3.00	2.85	2.05	3.07
Refrigerant charge kg (lb)	4.05 (8.94)			2.49 (5.5)			4.05 (8.94)		
Refrigerant type	R-22			R-22			R-22		
DIMENSIONS (inches)									
Length mm (in.)	1248 (49.13)			1248 (49.13)			1248 (49.13)		
Width mm (in.)	1200 (47.25)			1200 (47.25)			1200 (47.25)		
Height mm (in.)	851 (33.50)			1048 (41.25)			1048 (41.25)		
OPERATING WT. kg (lb)	147 (325)			177 (390)			220 (485)		
COMPRESSORS									
Type	Scroll 1-spd			Scroll 1-spd			Scroll 1-spd		
Quantity	1			1			1		
CONDENSER COIL DATA									
Face area m² (ft²)	0.77 (8.3)			1.47 (15.8)			1.47 (15.8)		
Rows	1			1			2		
Fins per cm (in.)	7.88 (20)			6.30 (16)			7.88 (20)		
Tube diameter mm (in.)	10 (0.375)			10 (0.375)			10 (0.375)		
Circuitry Type	Interlaced			Interlaced			Interlaced		
EVAPORATOR COIL DATA									
Face area m² (ft²)	0.41 (4.38)			0.52 (5.62)			0.52 (5.62)		
Rows	2			2			3		
Fins per cm (in.)	5.91 (15)			5.12 (13)			6.30 (16)		
Tube diameter mm (in.)	10 (0.375)			10 (0.375)			10 (0.375)		
Circuitry Type	Interlaced			Interlaced			Interlaced)		
Refrigerant control	Orifice			Orifice			Orifice		
CONDENSER FAN DATA									
Quantity	1			1			1		
Fan diameter mm (in.)	559 (22)			559 (22)			559 (22)		
Type	Axial			Axial			Axial		
Drive type	Direct			Direct			Direct		
No. speeds	1			1			1		
Number of motors	1			1			1		
Motor HP each	1/2			1/2			1/2		
RPM	900			900			900		
Nominal total m^3/s (cfm)	1.42 (3000)			1.42 (3000)			1.42 (3000)		
BLOWER DATA									
Quantity	1			1			1		
Centrifugal Blower Dia. x Wd. mm (in)	254 x 203 (10 x 8)			279 x 254 (11 x 10)			279 x 254) (11 x 10)		
Type	Centrifugal			Centrifugal			Centrifugal		
Motor HP each	3/4			1			1		
RPM	Variable			Variable			Variable		
Frame size	48			48			48		
FILTERS									
Quantity - Size mm (in)	2-559 x 356 x 25 2-(22 x 14 x 1)			2-559 x 356 x 25 2-(22 x 14 x 1)			2-559 x 356 x 25 2-(22 x 14 x 1)		

POWER AND CONTROL WIRING

Field wiring to the unit must conform to provisions of the current N.E.C. ANSI/NFPA No. 70 or C.E.C. and/or local ordinances. The unit must be electrically grounded in accordance with local codes or, in their absence, with the N.E.C./C.E.C. Voltage tolerances which must be maintained at the compressor terminals during starting and running conditions are indicated on the unit Rating Plate and Table 3.

The wiring entering the cabinet must be provided with mechanical strain relief.

A fused or HACR breaker disconnect switch should be field provided for the unit. If any of the wire supplied with the unit must be replaced, replacement wire must be of the type shown on the wiring diagram.

Electrical line must be sized properly to carry the load. Each unit must be wired with a separate branch circuit fed directly from the meter panel and properly fused.

Refer to Figure 2 for typical field wiring and to the appropriate unit wiring diagram for control circuit and power wiring information.

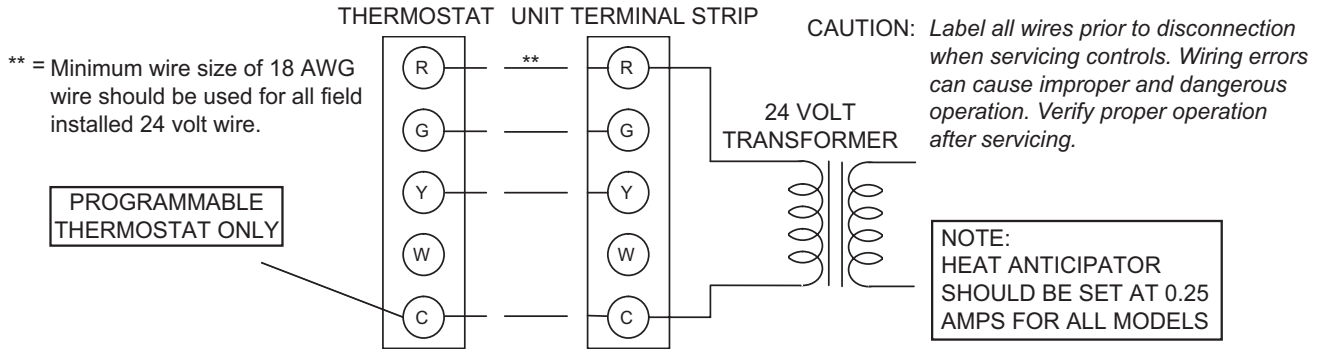
COMPRESSORS

Units are shipped with compressor mountings factory-adjusted for shipping.

⚠ CAUTION

Loosen compressor mounting bolts half turn before operating unit.

CONTROL WIRING



POWER WIRING

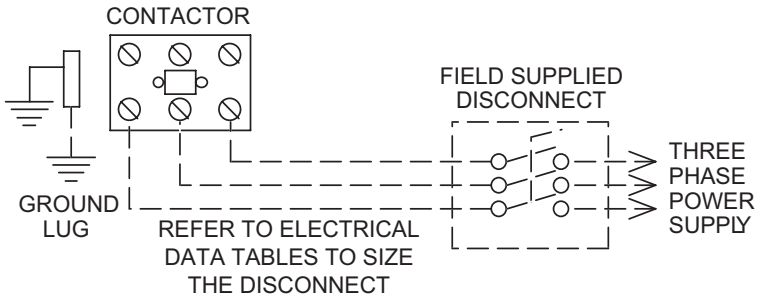


FIGURE 2 - TYPICAL FIELD WIRING DIAGRAM

TABLE 4: ELECTRICAL DATA

SIZE (TONS)	MODEL	POWER	COMPRESSOR (EACH)			OD FAN MOTORS (EACH)	SUPPLY BLOWER MOTOR	MCA[1] (AMPS)	MOCP[2] (AMPS)	MAX. FUSE[3] SIZE (AMPS)
			RLA	LRA	MCC					
036 (3.0)	DEB	380/415-3-50	6.7	39.0	9.5	1.0	1.8	11.2	15	15
048 (4.0)	DEB	380/415-3-50	8.7	66.5	12.5	1.0	3.2	15.1	20	20
060 (5.0)	DEB	380/415-3-50	10.4	73.0	13.0	1.0	2.7	15.7	25	25

1. Minimum Circuit Ampacity.
2. Maximum Over Current Protection per standard UL 1995.
3. Fuse or HACR circuit breaker size installed at factory or field installed.

CHECKING SUPPLY AIR CFM

To check the supply air CFM after the initial balancing has been completed:

1. Remove the two ¼ inch dot plugs in the duct panel.
2. Insert at least 8 inches of ¼ inch tubing into each of these holes for sufficient penetration into the airflow on both sides of the indoor coil.
3. Using an inclined manometer, determine the pressure drop across the evaporator coil.
4. Knowing the pressure drop across the coil, the actual CFM through the unit can be determined from Table 5.

⚠WARNING

Failure to properly adjust the total system air quantity can result in extensive system damage.

After readings have been obtained, remove the tubes and reinstall the two ¼ inch plugs removed in Step 1.

TABLE 5: ADDITIONAL STATIC RESISTANCE

Size (Tons)	Model	Airflow m^3/s (cfm)	Wet Indoor Coil Pa (in.wc)	Economizer[1] Pa (in.wc)	Filter / Frame Kit Pa (in.wc)
036 (3.0)	DEB	0.42 (900)	12.45 (0.05)	2.49 (0.01)	4.98 (0.02)
		0.47 (1000)	14.95 (0.06)	2.49 (0.01)	4.98 (0.02)
		0.52 (1100)	17.44 (0.07)	4.98 (0.02)	7.47 (0.03)
		0.57 (1200)	17.44 (0.07)	4.98 (0.02)	7.47 (0.03)
		0.61 (1300)	19.93 (0.08)	7.47 (0.03)	7.47 (0.03)
		0.66 (1400)	22.42 (0.09)	9.96 (0.04)	9.96 (0.04)
		0.71 (1500)	24.91 (0.1)	12.45 (0.05)	9.96 (0.04)
048 (4.0)	DEB	0.57 (1200)	17.44 (0.07)	4.98 (0.02)	7.47 (0.03)
		0.61 (1300)	19.93 (0.08)	7.47 (0.03)	7.47 (0.03)
		0.66 (1400)	24.91 (0.1)	9.96 (0.04)	9.96 (0.04)
		0.71 (1500)	29.89 (0.12)	12.45 (0.05)	9.96 (0.04)
		0.76 (1600)	32.28 (0.13)	14.95 (0.06)	9.96 (0.04)
		0.80 (1700)	37.36 (0.15)	17.44 (0.07)	12.45 (0.05)
		0.85 (1800)	34.87 (0.14)	19.93 (0.08)	12.45 (0.05)
		0.90 (1900)	37.36 (0.15)	22.42 (0.09)	12.45 (0.05)
		0.94 (2000)	39.85 (0.16)	24.91 (0.1)	14.95 (0.06)
060 (5.0)	DEB	0.71 (1500)	65.39 (0.26)	12.45 (0.05)	9.96 (0.04)
		0.76 (1600)	69.75 (0.28)	14.95 (0.06)	9.96 (0.04)
		0.80 (1700)	74.10 (0.3)	17.44 (0.07)	12.45 (0.05)
		0.85 (1800)	78.46 (0.32)	19.93 (0.08)	12.45 (0.05)
		0.90 (1900)	82.82 (0.33)	22.42 (0.09)	12.45 (0.05)
		0.94 (2000)	87.18 (0.35)	24.91 (0.1)	14.95 (0.06)
		0.99 (2100)	91.54 (0.37)	29.89 (0.12)	14.95 (0.06)
		1.04 (2200)	95.90 (0.39)	32.38 (0.13)	14.95 (0.06)
		1.09 (2300)	100.26 (0.4)	34.87 (0.14)	17.44 (0.07)
		1.13 (2400)	104.62 (0.42)	39.85 (0.16)	17.44 (0.07)
		1.18 (2500)	108.98 (0.44)	44.84 (0.18)	19.93 (0.08)

1. The pressure drop through the economizer is greater than 100% outdoor air than for 100% return air. If the resistance of the return air duct is less than 0.25 IWG, the unit will deliver less CFM during full economizer operation.

TABLE 6: D1EB036 SUPERHEAT CHARGING (IMPERIAL)

OUTDOOR TEMPERATURE (°F)	SUPERHEAT AT COMPRESSOR SUCTION (°F) AIRFLOW = 1,300 CFM										
	INDOOR WB TEMPERATURE (°F)										
	55	57	59	61	63	65	67	69	71	73	75
65	21.1	21.6	22.1	22.7	23.2	23.8	24.3	25.3	26.4	26.9	27.4
70	19.5	20.0	20.6	21.1	21.7	22.2	22.8	24.0	25.1	25.7	26.3
75	17.9	18.5	19.0	19.6	20.2	20.7	21.3	22.6	23.9	24.6	25.2
80	16.3	16.9	17.5	18.0	18.6	19.2	19.8	21.2	22.7	23.4	24.1
85	14.7	15.3	15.9	16.5	17.1	17.7	18.3	19.9	21.4	22.2	23.0
90	13.1	13.8	14.4	15.1	15.8	16.4	17.1	18.7	20.3	21.2	22.0
95	11.5	12.2	12.9	13.7	14.4	15.2	15.9	17.6	19.3	20.1	20.9
100	9.1	9.6	10.2	10.7	11.2	11.8	12.3	15.0	17.6	18.9	20.2
105	6.7	7.1	7.4	7.7	8.1	8.4	8.8	12.4	16.0	17.8	19.6
110	-	-	-	-	-	5.0	5.2	9.7	14.3	16.6	18.9
115	-	-	-	-	-	-	-	7.1	12.6	15.4	18.2

TABLE 7: D1EB036 SUPERHEAT CHARGING (METRIC)

OUTDOOR TEMPERATURE (°C)	SUPERHEAT AT COMPRESSOR SUCTION (°C) AIRFLOW = 0.61 M^3/S										
	INDOOR WB TEMPERATURE (°C)										
	13	14	15	16	17	18	19	21	22	23	24
18	11.7	12.0	12.3	12.6	12.9	13.2	13.5	14.1	14.7	14.9	15.2
21	10.8	11.1	11.4	11.7	12.1	12.4	12.7	13.3	14.0	14.3	14.6
24	9.9	10.3	10.6	10.9	11.2	11.5	11.8	12.6	13.3	13.6	14.0
27	9.1	9.4	9.7	10.0	10.4	10.7	11.0	11.8	12.6	13.0	13.4
29	8.2	8.5	8.8	9.2	9.5	9.8	10.2	11.0	11.9	12.3	12.8
32	7.3	7.6	8.0	8.4	8.8	9.1	9.5	10.4	11.3	11.8	12.2
35	6.4	6.8	7.2	7.6	8.0	8.4	8.8	9.8	10.7	11.2	11.6
38	5.0	5.3	5.6	5.9	6.2	6.5	6.8	8.3	9.8	10.5	11.2
41	3.7	3.9	4.1	4.3	4.5	4.7	4.9	6.9	8.9	9.9	10.9
43	-	-	-	-	-	2.8	2.9	5.4	7.9	9.2	10.5
46	-	-	-	-	-	-	-	4.0	7.0	8.6	10.1

TABLE 8: D1EB048 SUPERHEAT CHARGING (IMPERIAL)

OUTDOOR TEMPERATURE (°F)	SUPERHEAT AT COMPRESSOR SUCTION (°F) AIRFLOW = 1,800 CFM										
	INDOOR WB TEMPERATURE (°F)										
	55	57	59	61	63	65	67	69	71	73	75
65	19.9	21.0	22.1	23.3	24.4	25.6	26.7	28.0	29.3	30.0	30.7
70	16.5	17.9	19.2	20.6	22.0	23.4	24.8	26.3	27.8	28.6	29.4
75	13.1	14.7	16.3	18.0	19.6	21.3	22.9	24.6	26.3	27.2	28.1
80	9.7	11.6	13.4	15.3	17.2	19.1	21.0	22.9	24.8	25.8	26.8
85	6.3	8.4	10.5	12.7	14.8	17.0	19.1	21.2	23.3	24.4	25.5
90	-	5.7	7.8	9.9	11.9	14.0	16.1	18.8	21.5	22.8	24.1
95	-	-	5.0	7.0	9.1	11.1	13.1	16.3	19.6	21.2	22.8
100	-	-	-	5.4	6.9	8.5	10.0	13.6	17.3	19.1	20.9
105	-	-	-	-	-	5.9	6.9	11.0	15.0	17.0	19.0
110	-	-	-	-	-	-	-	8.3	12.6	14.8	17.0
115	-	-	-	-	-	-	-	5.6	10.3	12.7	15.1

TABLE 9: D1EB048 SUPERHEAT CHARGING (METRIC)

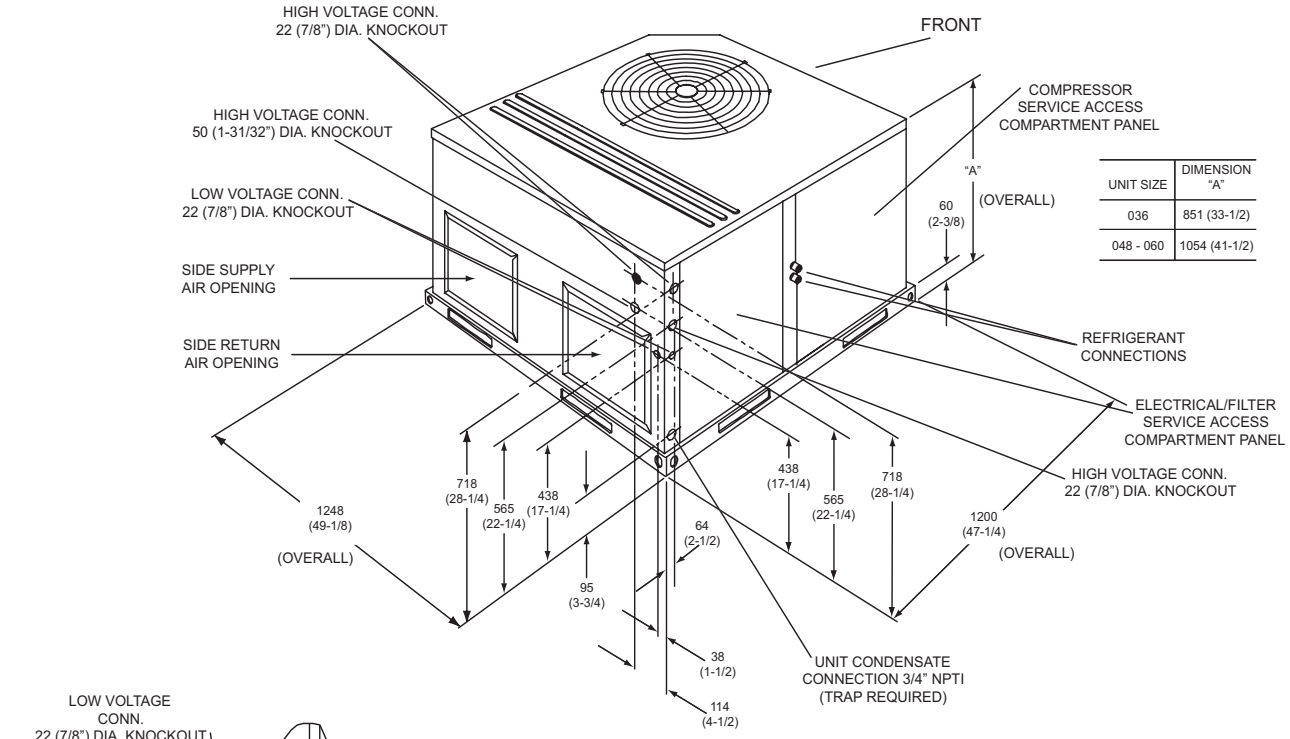
OUTDOOR TEMPERATURE (°C)	SUPERHEAT AT COMPRESSOR SUCTION (°C) AIRFLOW = 0.85 M^3/S										
	INDOOR WB TEMPERATURE (°C)										
	13	14	15	16	17	18	19	21	22	23	24
18	11.0	11.7	12.3	12.9	13.6	14.2	14.8	15.6	16.3	16.7	17.0
21	9.1	9.9	10.7	11.5	12.2	13.0	13.8	14.6	15.5	15.9	16.3
24	7.3	8.2	9.1	10.0	10.9	11.8	12.7	13.7	14.6	15.1	15.6
27	5.4	6.4	7.5	8.5	9.6	10.6	11.7	12.7	13.8	14.3	14.9
29	3.5	4.7	5.9	7.0	8.2	9.4	10.6	11.8	13.0	13.6	14.1
32	-	3.2	4.3	5.5	6.6	7.8	8.9	10.4	11.9	12.7	13.4
35	-	-	2.8	3.9	5.0	6.2	7.3	9.1	10.9	11.8	12.7
38	-	-	-	3.0	3.9	4.7	5.6	7.6	9.6	10.6	11.6
41	-	-	-	-	-	3.3	3.9	6.1	8.3	9.4	10.5
43	-	-	-	-	-	-	-	4.6	7.0	8.2	9.5
46	-	-	-	-	-	-	-	3.1	5.7	7.1	8.4

TABLE 10: D1EB060 SUPERHEAT CHARGING (IMPERIAL)

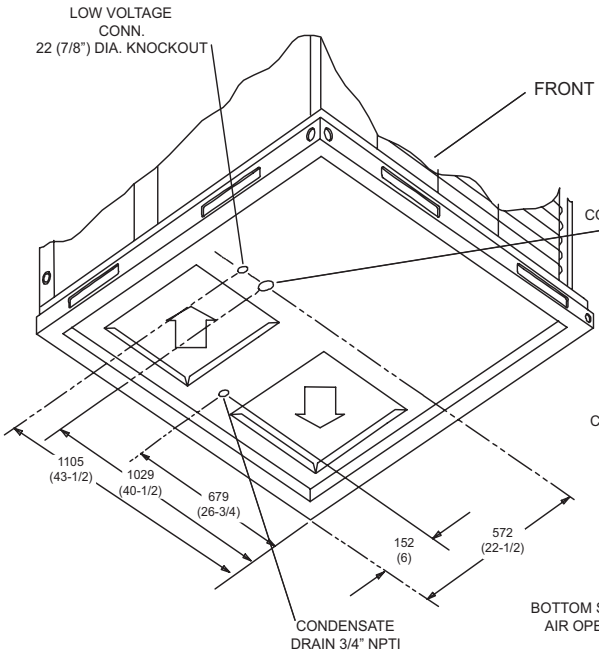
OUTDOOR TEMPERATURE (°F)	SUPERHEAT AT COMPRESSOR SUCTION (°F) AIRFLOW = 2,000 CFM										
	INDOOR WB TEMPERATURE (°F)										
	55	57	59	61	63	65	67	69	71	73	75
65	21.9	23.8	25.7	27.6	29.4	31.3	33.2	34.2	35.1	35.6	36.1
70	16.0	18.4	20.7	23.0	25.3	27.6	30.0	31.3	32.7	33.4	34.0
75	10.1	12.9	15.7	18.4	21.2	23.9	26.7	28.5	30.2	31.1	32.0
80	-	7.5	10.7	13.9	17.1	20.3	23.5	25.6	27.8	28.9	29.9
85	-	-	5.6	9.3	12.9	16.6	20.2	22.8	25.3	26.6	27.9
90	-	-	-	7.6	10.6	13.6	16.7	19.8	22.9	24.4	26.0
95	-	-	-	5.9	8.3	10.7	13.1	16.7	20.4	22.2	24.0
100	-	-	-	-	6.4	8.2	10.1	13.2	16.3	17.9	19.5
105	-	-	-	-	-	5.8	7.0	9.6	12.3	13.6	14.9
110	-	-	-	-	-	-	-	6.1	8.2	9.3	10.4
115	-	-	-	-	-	-	-	-	-	-	5.8

TABLE 11: D1EB060 SUPERHEAT CHARGING (METRIC)

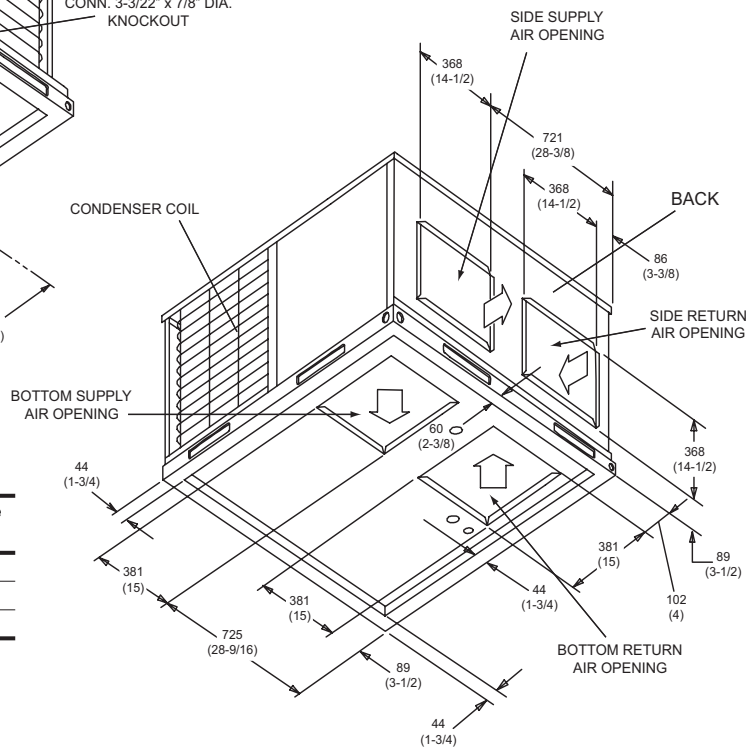
OUTDOOR TEMPERATURE (°C)	SUPERHEAT AT COMPRESSOR SUCTION (°C) AIRFLOW = 0.94 M^3/S										
	INDOOR WB TEMPERATURE (°C)										
	13	14	15	16	17	18	19	21	22	23	24
18	12.2	13.2	14.3	15.3	16.4	17.4	18.4	19.0	19.5	19.8	20.0
21	8.9	10.2	11.5	12.8	14.1	15.4	16.6	17.4	18.2	18.5	18.9
24	5.6	7.2	8.7	10.2	11.8	13.3	14.8	15.8	16.8	17.3	17.8
27	-	4.1	5.9	7.7	9.5	11.3	13.0	14.2	15.4	16.0	16.6
29	-	-	3.1	5.2	7.2	9.2	11.2	12.6	14.1	14.8	15.5
32	-	-	-	4.2	5.9	7.6	9.3	11.0	12.7	13.6	14.4
35	-	-	-	3.3	4.6	5.9	7.3	9.3	11.3	12.3	13.3
38	-	-	-	-	3.6	4.6	5.6	7.3	9.1	9.9	10.8
41	-	-	-	-	-	3.2	3.9	5.4	6.8	7.6	8.3
43	-	-	-	-	-	-	-	3.4	4.6	5.2	5.8
46	-	-	-	-	-	-	-	-	-	-	3.2



UNIT SIZE	DIMENSION "A"
036	851 (33-1/2)
048 - 060	1054 (41-1/2)



All dimensions are in inches. They are subject to change without notice. Certified dimensions will be provided upon request.



UNIT CLEARANCES

Direction	Distance mm (in.)	Direction	Distance mm (in.)
Top[1]	914 (36)	Right	610 (24)
Front	305 (12)	Left	610 (24)
Rear	0 (0)	Bottom[2]	0 (0)

1. Units must be installed outdoors. Over hanging structure or shrubs should not obscure condenser air discharge outlet.
2. Units may be installed on combustible floors made from wood or class A, B or C roof covering materials.

FIGURE 5 - UNIT DIMENSIONS

SEQUENCE OF OPERATION

COOLING

The following sequences of operation are based on using a standard single-stage cooling thermostat.

WITH POWER TO UNIT AND THERMOSTAT IN COOLING MODE

1. If the fan switch on the thermostat is in the “ON” position, the 24 volts at “G” will energize the “K1" relay on the fan control board, close the ”K1" relay contacts, and energize the indoor blower motor. If the fan switch is in the “AUTO” position, the blower will operate only when there is a call for cooling by the thermostat.
2. On a call for cooling, the thermostat will send 24 volts to “Y” on the fan control board. The 24 volt signal will energize contactor “M1", and power will be supplied to the compressor and outdoor fan motor. If the fan switch on the thermostat is on the ”AUTO" position, the thermostat will also send a 24 volt signal to “G” on the fan control board and the indoor blower will operate as indicated in step 1.
3. When the demand for cooling has been satisfied, the “M1" contactor will be de-energized when the 24 volt ”Y" signal is removed. If the fan switch on the thermostat is energized when the 24 volt “Y” signal is removed. If the fan switch on the thermostat is in the “ON” position, the indoor blower will continue to run. If the fan switch is in the “AUTO” position, the 24 volt “G” signal will be removed, and after a 60 second delay, the “K1" relay will open and de-energize the indoor blower motor.

TABLE 12: THERMOSTAT SIGNALS

SIGNAL	STATE	BOARD FUNCTION
“G”	ON	FAN INSTANT ON
	OFF	FAN INSTANT OFF
“G” “Y”	ON	FAN INSTANT ON COMPRESSOR AND OUTDOOR FAN INSTANT ON
	OFF	COMPRESSOR AND OUTDOOR FAN INSTANT OFF FAN 60 SECOND DELAY OFF

SECURE OWNER'S APPROVAL

When the system is functioning properly, secure the owner's approval. Show the owner the location of all disconnect switches and the thermostat. Teach the owner how to start and stop the unit and how to adjust temperature settings within the limitations of the system.

MAINTENANCE

NORMAL MAINTENANCE

⚠WARNING

Prior to any of the following maintenance procedures, shut off all power to the unit, to avoid personal injury.

Periodic maintenance consists of changing or cleaning filters and general cleaning of the outdoor coil.

FILTERS - Inspect once a month. Replace Disposable or clean Permanent Type as necessary. DO NOT replace Permanent Type with Disposable.

MOTORS - Indoor and outdoor fan motors are permanently lubricated and require no maintenance.

OUTDOOR COIL - Dirt should not be allowed to accumulate on the outdoor coil surface or other parts in the air circuit. Cleaning should be as often as necessary to keep the coil clean. Use a brush, vacuum cleaner attachment, or other suitable means. If water is used to clean the coil, be sure that the power to the unit is shut off prior to cleaning.

⚠ CAUTION

Exercise care when cleaning the coil so that the coil fins are not damaged.

Do not permit the hot condenser air discharge to be obstructed by overhanging structures or shrubs.

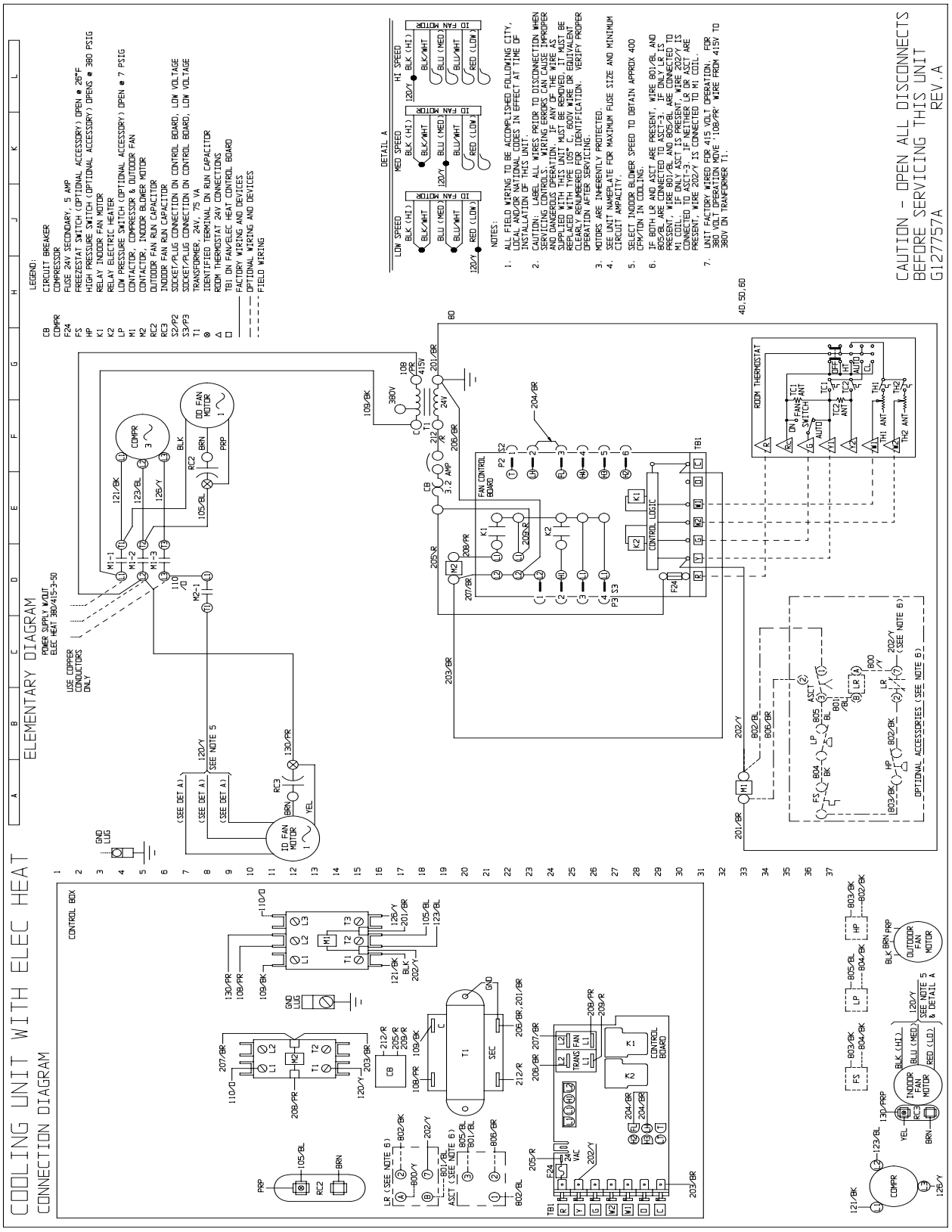


FIGURE 3 - TYPICAL WIRING DIAGRAM 3 & 4 TON (380/415-3-50 POWER SUPPLY)

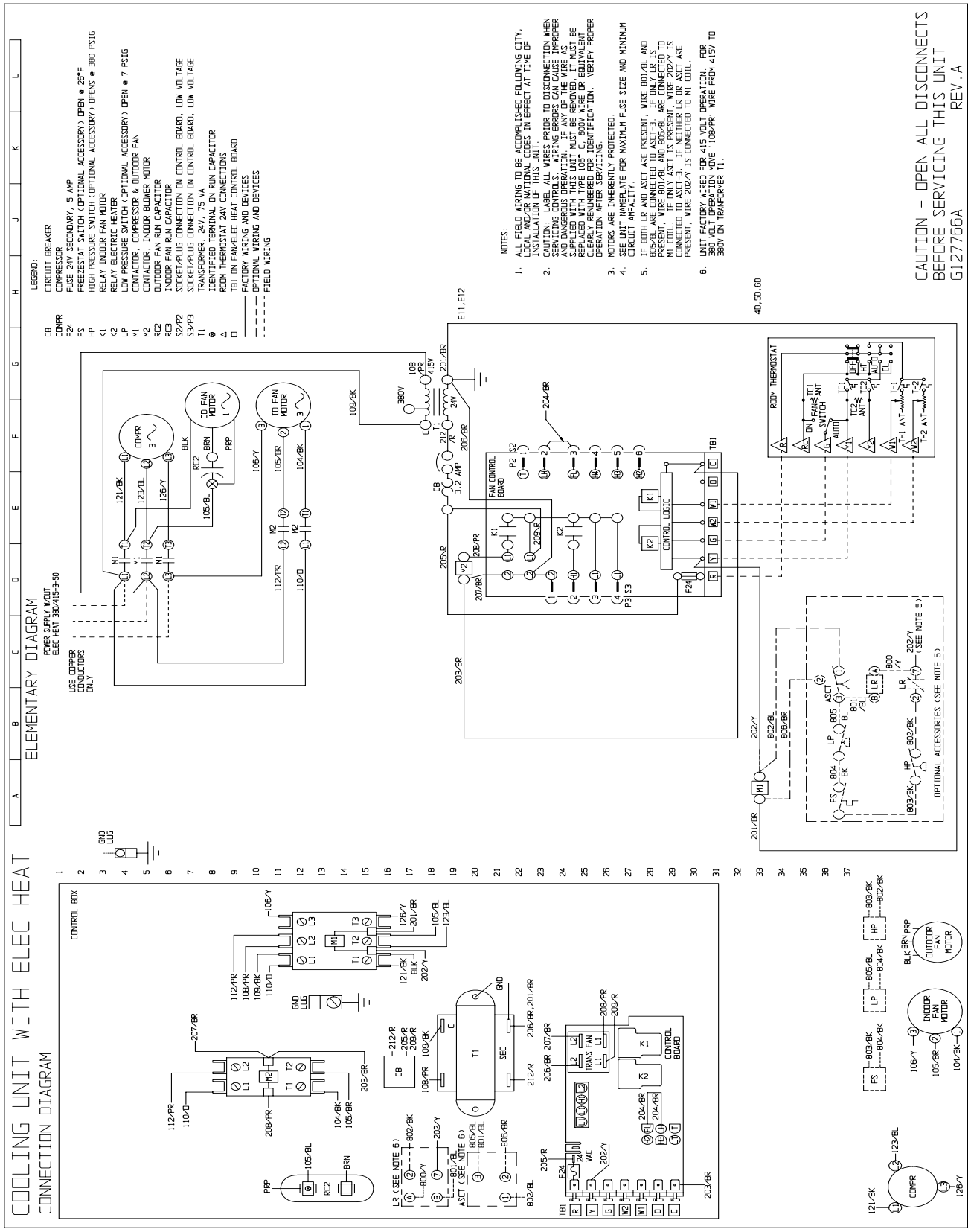


FIGURE 4 - TYPICAL WIRING DIAGRAM 5 TON (380/415-3-50 POWER SUPPLY)

CB	CIRCUIT BREAKER 24V, 3 AMP
COMPR	COMPRESSOR
F24	FUSE 24V SECONDARY, 5 AMP
FZ	FREEZESTAT SWITCH (OPTION ACCESSORY) OPEN @ 26°F
HP	HIGH PRESSURE SWITCH (OPTIONAL ACCESSORY) OPENS AT 380 PSIG
K1	RELAY INDOOR FAN MOTOR
K2	RELAY ELECTRIC HEATER
LP	LOW PRESSURE SWITCH (OPTIONAL ACCESSORY) OPEN @ 7 PSIG
M1	CONTACTOR, COMPRESSOR & OUTDOOR FAN
M2	CONTACTOR, ELECTRIC HEAT, 230V COIL
M3	CONTACTOR, ELECTRIC HEAT, 230V COIL
RC2	OUTDOOR FAN RUN CAPACITOR (ALTERNATE)
RC3	INDOOR FAN RUN CAPACITOR
S2/P2	SOCKET/PLUG CONNECTION ON FAN CONTROL BOARD, LOW VOLTAGE
S3/P3	SOCKET/PLUG CONNECTION ON FAN CONTROL BOARD, LINE VOLTAGE
S4/P4	SOCKET/PLUG CONNECTION ON ID FAN MOTOR, 24V
S3/P3	SOCKET/PLUG CONNECTION ON ID FAN MOTOR, 230V
T1	TRANSFORMER, 24V, 40 VA
⊗	IDENTIFIED TERMINAL ON RUN CAPACITOR
△	ROOM THERMOSTAT 24V CONNECTIONS
□	TB1 ON FAN/ELEC HEAT CONTROL BOARD
———	FACTORY WIRING AND DEVICES
—··—	OPTIONAL WIRING AND DEVICES
- - - -	FIELD WIRING

FIGURE 5 - TYPICAL WIRING DIAGRAM LEGEND

1. **ALL FIELD WIRING TO BE ACCOMPLISHED FOLLOWING CITY, LOCAL AND/OR NATIONAL CODES IN EFFECT AT TIME OF INSTALLATION OF THIS UNIT.**
2. **CAUTION: LABEL ALL WIRES PRIOR TO DISCONNECTION WHEN SERVICING CONTROLS. WIRING ERRORS CAN CAUSE IMPROPER AND DANGEROUS OPERATION. IF ANY OF THE WIRE AS SUPPLIED WITH THIS UNIT MUST BE REMOVED, IT MUST BE REPLACED WITH TYPE 105° C, 600V WIRE OR EQUIVALENT CLEARLY RENUMBERED FOR IDENTIFICATION. VERIFY PROPER OPERATION AFTER SERVICING.**
3. **MOTORS ARE INHERENTLY PROTECTED.**
4. **SEE UNIT NAMEPLATE FOR MAXIMUM FUSE SIZE AND MINIMUM CIRCUIT AMPACITY.**
5. **SELECT INDOOR BLOWER SPEED TO OBTAIN APPROX 400 CFM/TON IN COOLING.**
6. **IF BOTH LR AND ASCT ARE PRESENT, WIRE 801/BL AND 805/BL ARE CONNECTED TO ASCT-3. IF ONLY LR IS PRESENT, WIRE 801/BL AND 805/BL ARE CONNECTED TO M1 COIL. IF ONLY ASCT IS PRESENT, WIRE 202/Y IS CONNECTED TO ASCT-3. IF NEITHER LR OR ASCT IS PRESENT, WIRE 202/Y IS CONNECTED TO M1 COIL.**
7. **UNIT FACTORY WIRED FOR 415 VOLT OPERATION. FOR 380 VOLT OPERATION MOVE '108/PR' WIRE FROM 415V TO 380V ON TRANSFORMER T1.**

FIGURE 6 - TYPICAL WIRING DIAGRAM NOTES

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173858-YIM-A-0306
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