COBRA™ Energy Recovery Units 48/50HJ004-014 with 62AQ060-300 Single-Package Rooftop Units with Energy Recovery Capability

Installation, Start-Up, and Service Supplement

IMPORTANT: This is a supplemental instruction for the 48/50HJ Start-Up and Service Instructions. It is not intended to take the place of the instruction or to be a complete piece by itself.

IMPORTANT: Make sure supply voltage matches unit nameplate voltage.

CONTENTS

SAFETY CONSIDERATIONS

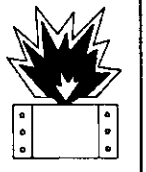
Installation and servicing of air-conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install, repair, or service air-conditioning equipment.

Untrained personnel can perform basic maintenance functions of cleaning coils and filters and replacing filters. All other operations should be performed by trained service personnel. When working on air-conditioning equipment, observe precautions in the literature, tags and labels attached to the unit, and other safety precautions that apply.

Verify that the power source supplied to the unit matches the voltages and amperages listed on the unit rating plate.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for unbrazing operations. Have fire extinguishers available for all brazing operations.

⚠ WARNING



Disconnect gas piping from unit when leak testing at pressure greater than $^1/_2$ psig. Pressures greater than $^1/_2$ psig will cause gas valve damage resulting in hazardous condition. If gas valve is subjected to pressure greater than $^1/_2$ psig, it *must* be replaced before use. When pressure testing field-supplied gas piping at pressures of $^1/_2$ psig or less, a unit connected to such piping must be isolated by manually closing the gas valve.

⚠ WARNING

Before performing service or maintenance operations on unit, turn off main power switch to unit and install a lockout tag. Electrical shock could cause personal injury.

GENERAL

Carrier's COBRA energy recovery units precondition ventilation air for the rooftop unit during winter and summer operation and recover energy from the building exhaust air. These units are designed to satisfy the higher ventilation requirements and other building codes while minimizing energy costs.

Factory installation of the 62AQ Energy$Recycler™ section provides the benefit of reduced field-installation time, single point power connections, and the assurance of a factory test for the complete COBRA energy recovery unit. The Energy$Recycler section requires less maintenance than other energy recovery systems and can be serviced by any qualified refrigeration technician.

NOTE: The COBRA unit nameplate has been moved to the opposite end of the rooftop section, on the upper, right-hand part of the panel due to the location of the 62AQ Energy$Recycler section.

Book 1 | 1 | 4 | 4 Tab 1a | 1b | 6a | 6b Catalog No. 534-80159 Printed in U.S.A. Form 48/50HJ,62AQ-3SIS Pg 1 4-06 Replaces: 48/50HJ,62AQ-2SIS

INSTALLATION

Step 1 — Inspect Shipment — File a claim with the shipping company if shipment is incomplete or damaged. See Fig. 1 for typical shipping packaging of a COBRA™ energy recovery unit.

Step 2 — Provide Unit Support — The COBRA energy recovery unit can use a full-perimeter roof curb or a standard roof curb for the rooftop section of the unit with a supplemental equipment support for the energy recovery section.

COBRA UNIT WITH A FULL-PERIMETER ROOF CURB — If the COBRA unit is installed on the full-perimeter curb, the supplemental equipment support is not required. If a full-perimeter curb is used, inspect the curb for the following REQUIRED details:

1. The ductwork must be attached to the curb.
2. The flashing must be sealed to all ensure no water can leak behind it, particularly around the 62AQ Energy$Recycler™ section of the curb.
3. The Energy$Recycler section of the full-perimeter curb must be watertight. See Fig. 2A and 2B.

⚠ CAUTION

DO NOT use the COBRA full-perimeter curb drawings to field fabricate a replacement curb! Significant problems can occur if a Carrier approved curb is not used.

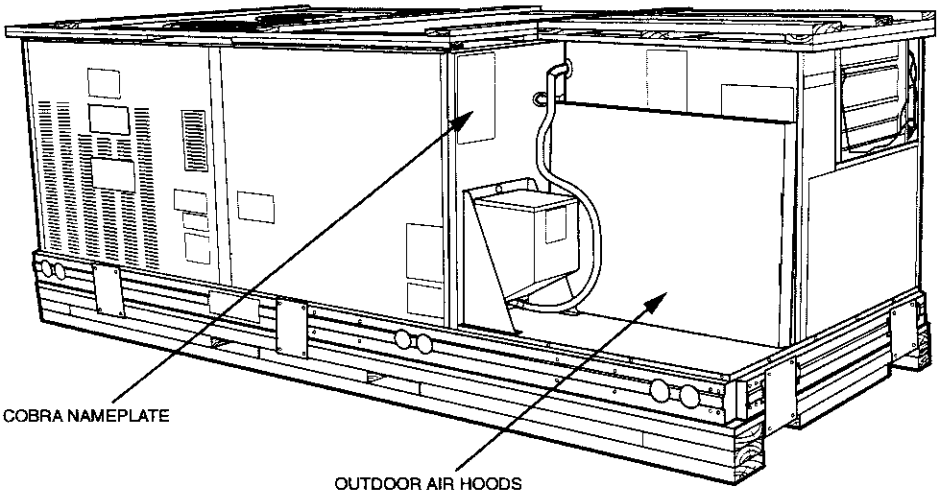


Fig. 1 — Shipping Packaging (48/50HJ004-006 Shown)

⚠ CAUTION

DO NOT USE THIS DRAWING TO FIELD-FABRICATE A CURB! SIGNIFICANT PROBLEMS CAN OCCUR IF A CARRIER APPROVED CURB IS NOT USED.

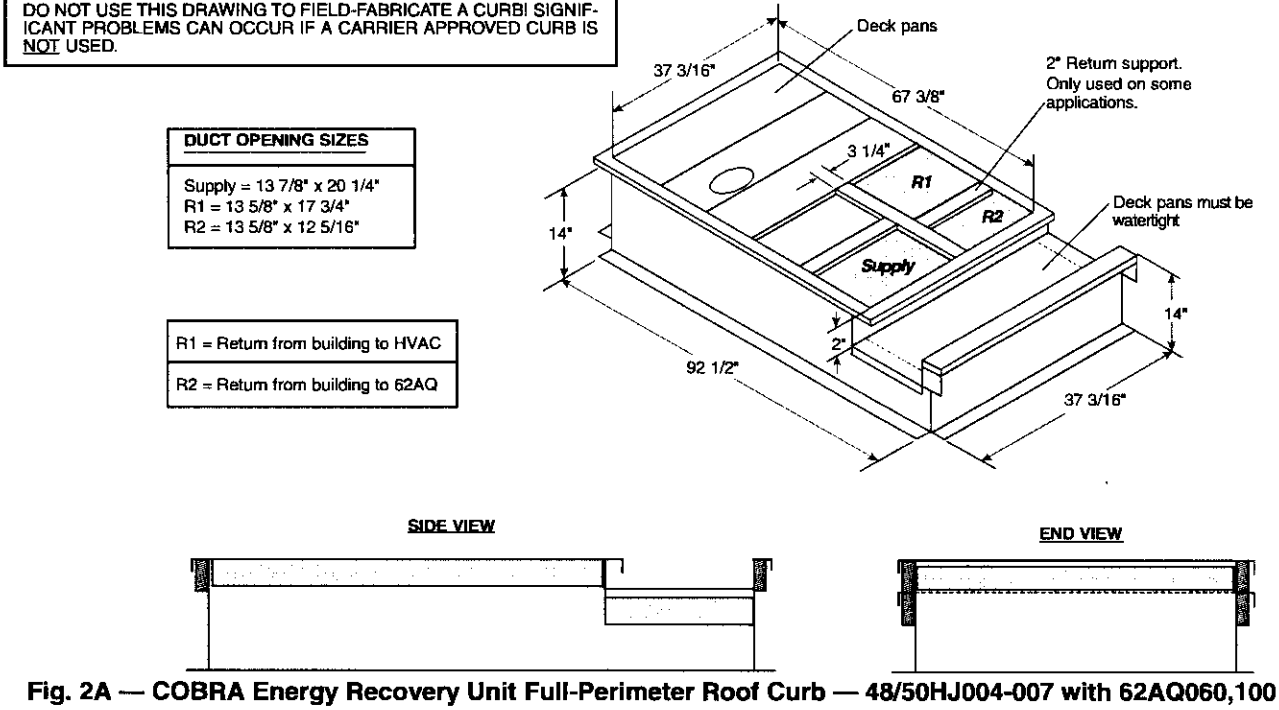


Fig. 2A — COBRA Energy Recovery Unit Full-Perimeter Roof Curb — 48/50HJ004-007 with 62AQ060,100

⚠ CAUTION

DO NOT USE THIS DRAWING TO FIELD-FABRICATE A CURB! SIGNIFICANT PROBLEMS CAN OCCUR IF A CARRIER APPROVED CURB IS NOT USED.

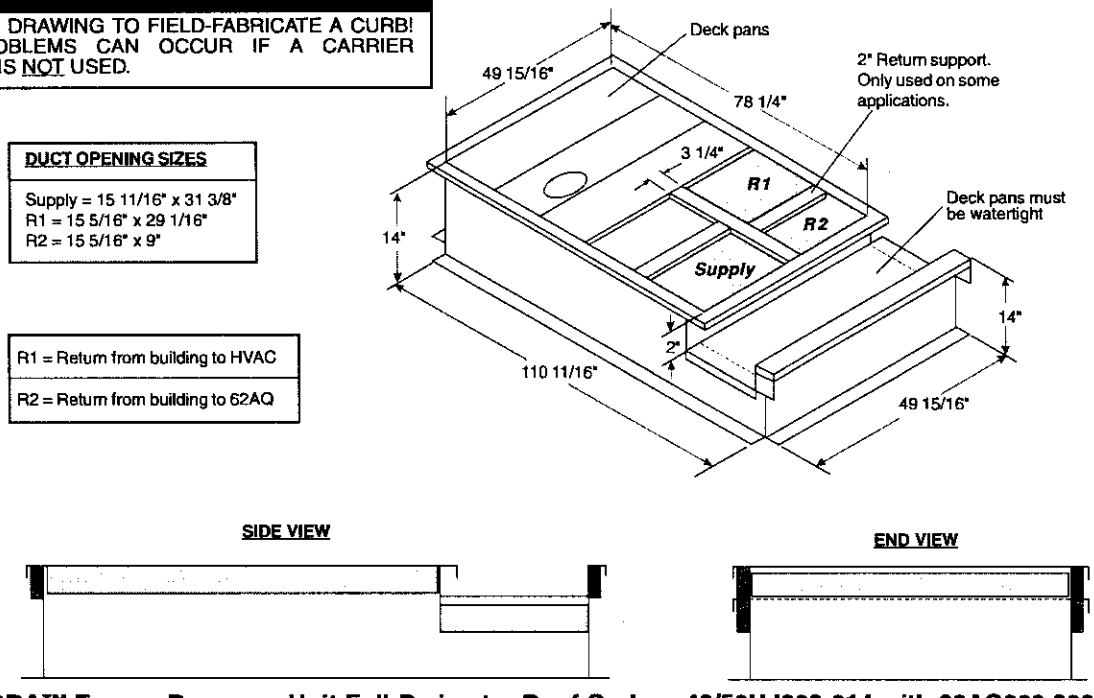


Fig. 2B — COBRA™ Energy Recovery Unit Full-Perimeter Roof Curb — 48/50HJ008-014 with 62AQ200,300

⚠ CAUTION

DO NOT use the standard COBRA full-perimeter curb in a sloped application! Contact your Carrier salesperson for a specific COBRA SLOPED full-perimeter curb.

COBRA UNIT WITH STANDARD ROOF CURB — If a standard rooftop curb is used (for new or retrofit applications), it is capable of supporting the rooftop unit section. An accessory support rail must be used to support the 62AQ Energy$Recycler™ section. Assemble and install accessory roof curb in accordance with instructions shipped with curb. See Fig. 3A, 3B and 4. Install insulation, cant strips, roofing felt, and counter flashing as shown.

Ductwork must be attached to curb, not to the unit. The accessory thru-the-bottom power and gas connection package must be installed before the unit is set on the roof curb.

If the combined COBRA unit roof curb is not being used, additional support is required under the Energy$Recycler section of the unit. An accessory support and pad for the energy recovery section or a field-fabricated and installed support can be used. See Fig. 4. Place the protective rubber pad on the roof so that the edge near the unit is located about 6 in. from the end of the 62AQ Energy$Recycler section. Measure the distance from the bottom of 62AQ Energy$Recycler rails to the pad. Adjust the energy recovery equipment support to match the measured distance and screw into place with the 4 screws provided. See Fig. 4. Place the support underneath the Energy$Recycler unit and on the protective rubber pad. This is done by lifting the end of the 62AQ Energy$Recycler section slightly above level and then sliding the support underneath the rails.

If electric control power or gas service is to be routed through the basepan, a field-installed accessory thru-the-bottom connection must be used. Attach the accessory to the basepan per the information in the accessory installation instructions. Thru-the-bottom connections must be installed before unit is set on the roof.

IMPORTANT: The gasketing of the unit to the roof curb is critical for a watertight seal. Install gasket supplied with the roof curb as shown in Fig. 3A and 3B. Improperly applied gasket can result in air leaks and poor unit performance.

Curb should be level. This is necessary for unit condensate drain to function properly. Refer to Roof Curb Accessory Installation Instructions for additional information as required.

Step 3 — Field Fabricate Ductwork — Secure all ducts to roof curb and building structure. *Do not connect ductwork to unit.* Insulate and weatherproof all external ductwork, joints, and roof openings with counter flashing and mastic in accordance with applicable codes. See Fig. 5A and 5B for duct dimensions.

Ducts passing through an unconditioned space must be insulated and covered with a vapor barrier. If a plenum return is used, the return should be ducted through the roof deck to comply with applicable fire codes.

A minimum clearance is not required around ductwork.

These units are designed for a minimum continuous heating return-air temperature of 50 F (dry bulb), or an intermittent operation down to 45 F (dry bulb), such as when used with a night setback thermostat. To operate at lower return-air temperatures, a field-supplied outdoor-air temperature control must be used to initiate both stages of heat when the temperature is below 45 F. Indoor comfort may be compromised when these lower air temperatures are used with insufficient heating temperature rise.

CONNECTOR PKG. ACCY.	B	C	D ALT DRAIN HOLE	GAS	POWER	CONTROL	ACCESSORY PWR
CRBTMPWR001A01	1′-9 11/16″ [551]	1′-4″ [406]	1 3/4″ [44.5]	3/4″ [19] NPT	3/4″ [19] NPT	1/2″ [12.7] NPT	1/2″ [12.7] NPT
CRBTMPWR002A01					1 1/4″ [31.7]		
CRBTMPWR003A01				1/2″ [12.7] NPT	3/4″ [19] NPT		
CRBTMPWR004A01				3/4″ [19] NPT	1 1/4″ [31.7]		

ROOF CURB ACCESSORY	A	UNIT SIZE
CRRFCURB001A01	1′-2″ [356]	004-007
CRRFCURB002A01	2′-0″ [610]	

NOTES:
1. Roof curb accessory is shipped disassembled.
2. Insulated panels.
3. Dimensions in [ ] are in millimeters.
4. Roof curb: galvanized steel.
5. Attach ductwork to curb (flanges of duct rest on curb).
6. Service clearance: 4 ft on each side.
7. Direction of airflow.
8. Connector packages CRBTMPWR001A01 and 2A01 are for thru-the-curb type gas. Packages CRBTMPWR003A01 and 4A01 are for thru-the-bottom type gas connections.

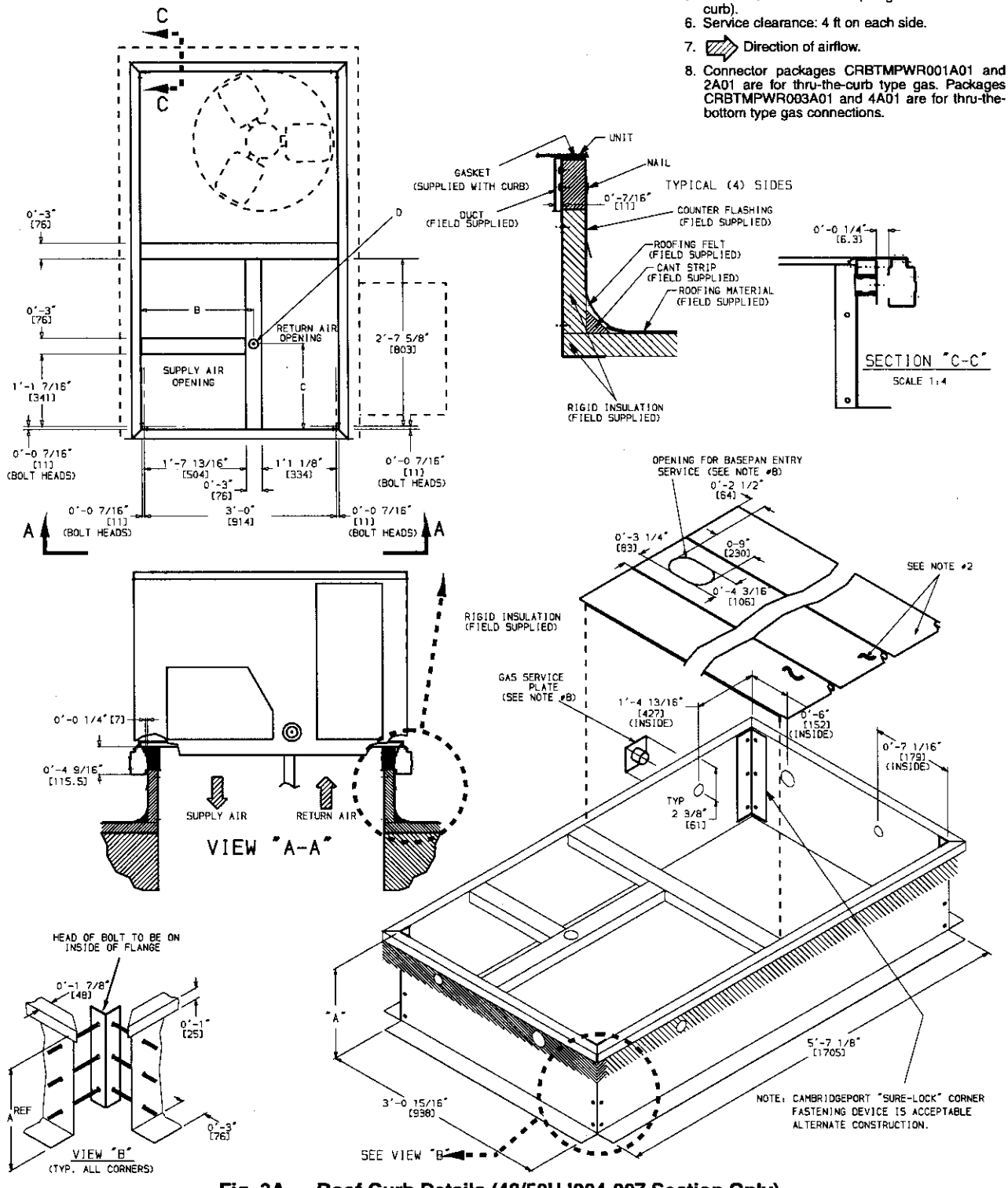


Fig. 3A — Roof Curb Details (48/50HJ004-007 Section Only)

CONNECTOR PKG. ACCY.	B	C	D ALT DRAIN HOLE	GAS	POWER	CONTROL	ACCESSORY PWR
CRBTMPWR001A01	2′-8 7/16″ [827]	1′-10 15/16″ [583]	1 3/4″ [44.5]	3/4″ [19] NPT	3/4″ [19] NPT	1/2″ [12.7] NPT	1/2″ [12.7] NPT
CRBTMPWR002A01					1 1/4″ [31.7]		
CRBTMPWR003A01				1/2″ [12.7] NPT	3/4″ [19] NPT		
CRBTMPWR004A01				3/4″ [19] NPT	1 1/4″ [31.7]		

ROOF CURB ACCESSORY	A	UNIT SIZE
CRRFCURB003A01	1′-2″ [356]	008-014
CRRFCURB004A01	2′-0″ [610]	

NOTES:
1. Roof curb accessory is shipped disassembled.
2. Insulated panels: 1-in. thick polyurethane foam, 1 3/4 lb density.
3. Dimensions in [ ] are in millimeters.
4. Roof curb: 16-gage steel.
5. Attach ductwork to curb (flanges of duct rest on curb).
6. Service clearance 4 ft on each side.
7. Direction of airflow.
8. Connector packages CRBTMPWR001A01 and 2A01 are for thru-the-curb gas type. Packages CRBTMPWR003A01 and 4A01 are for thru-the-bottom type gas connections.

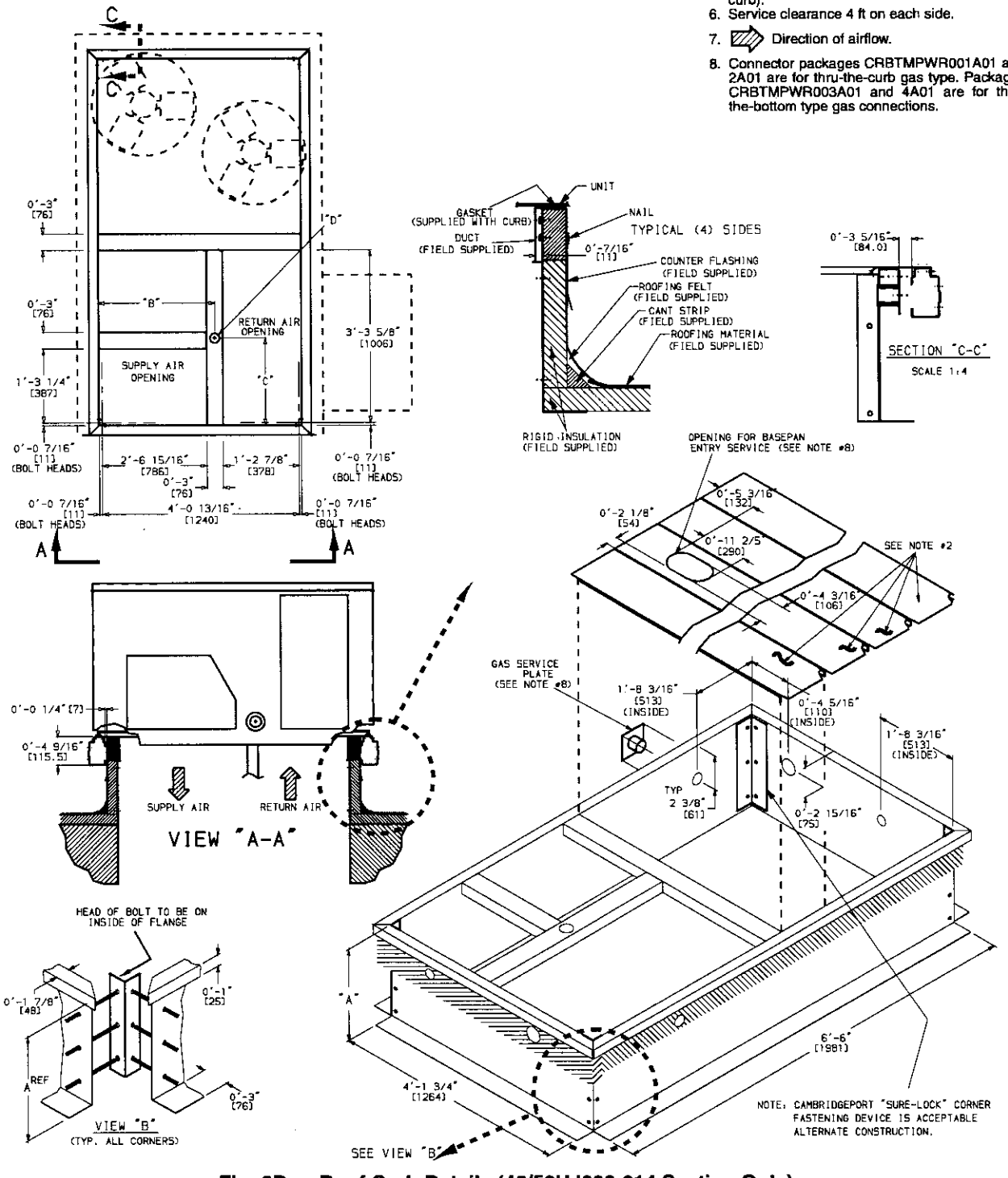
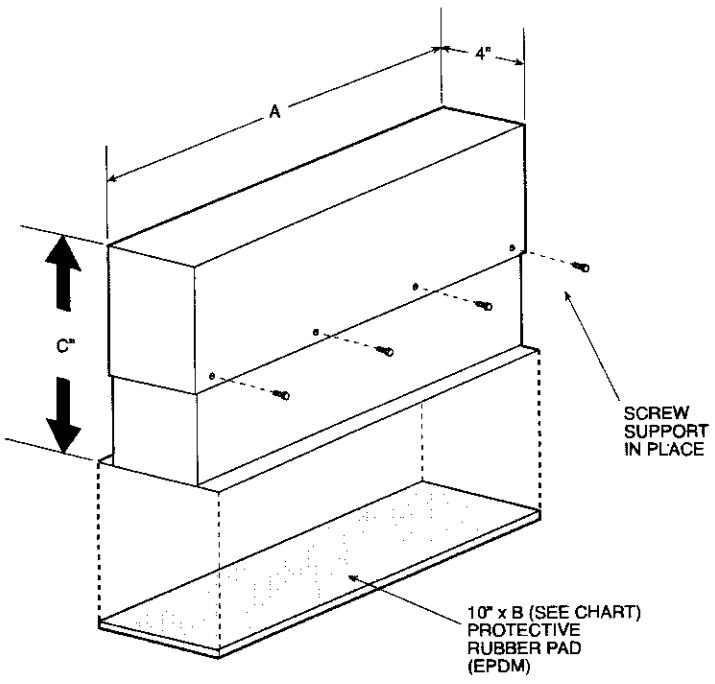


Fig. 3B — Roof Curb Details (48/50HJ008-014 Section Only)



UNIT SIZE	EQUIPMENT SUPPORT PART NUMBER	DIMENSIONS (in.)		
		A	B	C
3-6 Ton	CRAQSUPT001A00	36.9	40	8 to 14
	CRAQSUPT002A00	36.9	40	14 to 24
7½-12½ Ton	CRAQSUPT003A00	49.7	54	8 to 14
	CRAQSUPT004A00	49.7	54	14 to 24

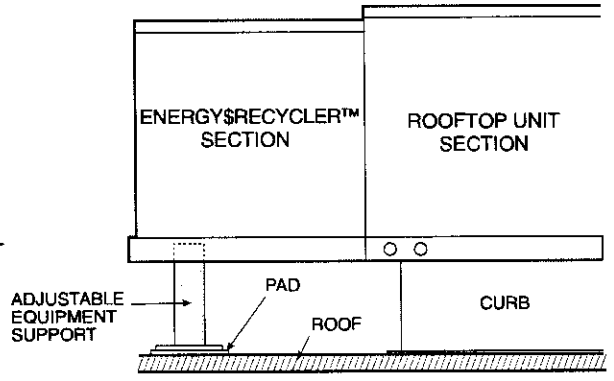


Fig. 4 — Supplemental Energy Recovery Section Equipment Support

Step 4 — Rig and Place Unit — Keep unit upright and do not drop. Spreader bars are not required if top crating is left on unit. Rollers may be used to move unit across a roof. Remove the bottom wooden skids that are under the unit by removing the wooden plates that hold the bottom wooden frame to the unit. Level by using unit frame as a reference. Lifting holes are provided in base rails as shown in Fig. 6A and 6B. Refer to rigging instructions on unit.

⚠ CAUTION

All panels must be in place when rigging.

POSITIONING — Maintain clearance around and above unit to provide minimum distance from combustible materials, proper airflow, and service access. A properly positioned unit will have the following clearances between unit and roof curb: 1/4-in. clearance between roof curb and base rails on each side and duct end of unit; 1/4-in. clearance between roof curb and condenser coil end of unit for size 004-007 units and a $3^{5}/_{16}$-in. clearance between roof curb and condenser coil end of unit for size 008-014 units.

Do not install unit in an indoor location. Do not locate unit air inlets near exhaust vents or other sources of contaminated air.

Be sure that unit is installed such that snow will not block the combustion intake or flue outlet.

Unit may be installed directly on wood flooring or on Class A, B, or C roof-covering material when roof curb is used.

Although unit is weatherproof, guard against water from higher level runoff and overhangs.

Flue vent discharge must have a minimum horizontal clearance of 4 ft from electric and gas meters, gas regulators, and gas relief equipment.

Minimum distance between unit and other electrically live parts is 48 inches.

Flue gas can deteriorate building materials. Orient unit such that flue gas will not affect building materials. Locate mechanical draft system flue assembly at least 48 in. from an adjacent building or combustible material.

Adequate combustion-air and ventilation-air space must be provided for proper operation of this equipment. Be sure that installation complies with all local codes and Section 5.3, Air for Combustion and Ventilation, NFGC (National Fuel Gas Code), and ANSI (American National Standards Institute) Z223.1, and NFPA (National Fire Protection Association) 54 TIA-54-84-1. In Canada, installation must be in accordance with the CAN1-B149 installation codes for gas burning appliances.

After unit is in position, remove rigging skids and shipping materials.

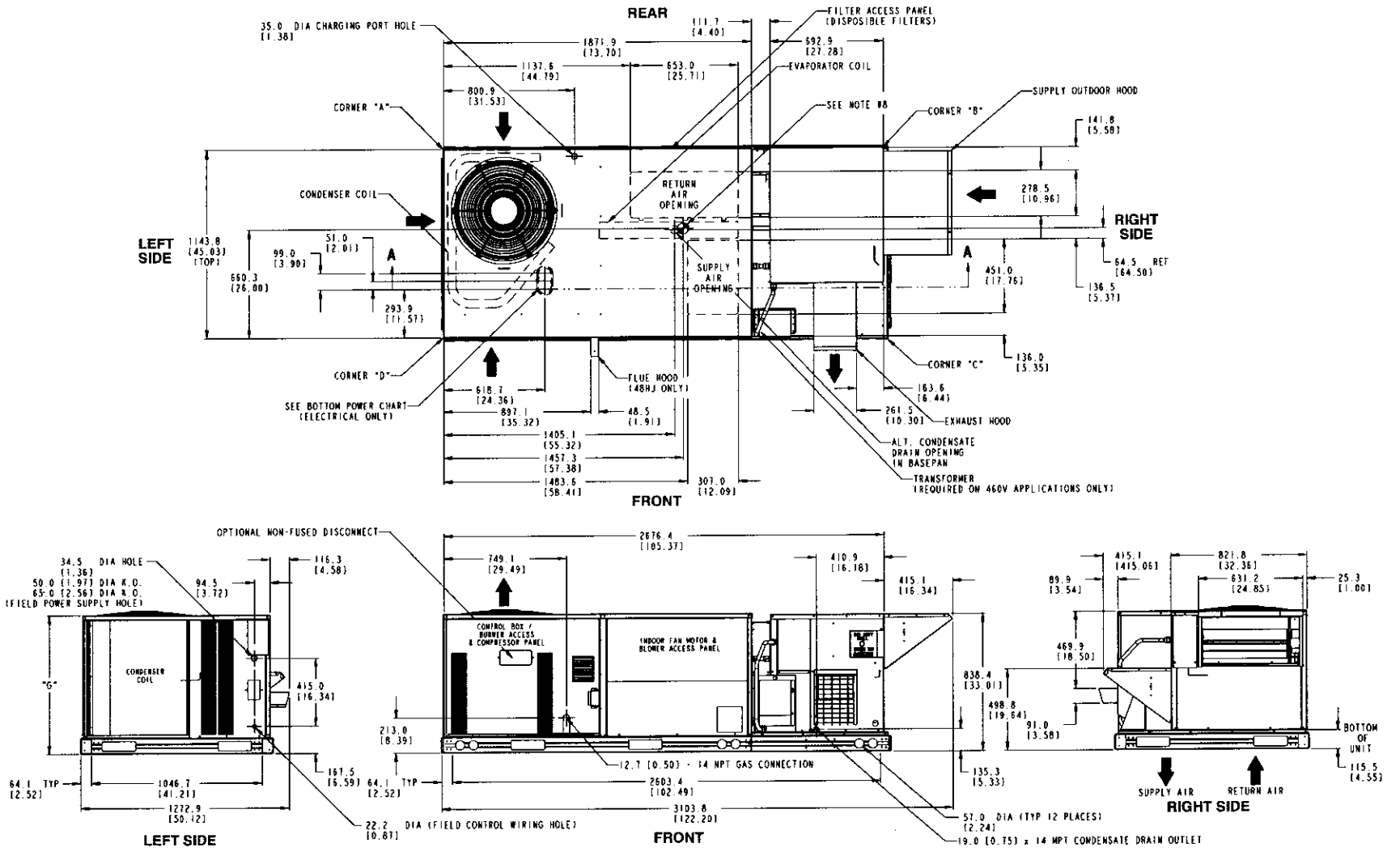


Fig. 5A — Base Unit Dimensions — COBRA™ Energy Recovery Unit — 48/50HJ004-007 with 62AQ060,100

SINGLE ZONE ELECTRIC COOLING WITH GAS HEAT													
UNIT	ELECTRICAL CHARACTERISTICS	UNIT WEIGHT		CORNER WEIGHT "A"		CORNER WEIGHT "B"		CORNER WEIGHT "C"		CORNER WEIGHT "D"		UNIT HEIGHT "G"	
		LB	KG	LB	KG	LB	KG	LB	KG	LB	KG	IN.	MM
48HJ*004 w/62AQ060	208/230-1-60, 208/230-3-60, 460-3-60	890	404	234	106	280	127	205	93	171	78	33.33	846.5
48HJ*004 w/62AQ100	208/230-1-60, 208/230-3-60, 460-3-60	905	411	238	108	284	129	208	94	174	79	33.33	846.5
48HJ*005 w/62AQ060	208/230-1-60, 208/230-3-60, 460-3-60	900	409	237	107	283	128	207	94	173	79	33.33	846.5
48HJ*005 w/62AQ100	208/230-1-60, 208/230-3-60, 460-3-60	915	415	241	109	288	130	211	96	176	80	33.33	846.5
48HJ*006 w/62AQ060	208/230-1-60, 208/230-3-60, 460-3-60	920	418	242	110	289	131	212	96	177	80	33.33	846.5
48HJ*006 w/62AQ100	208/230-1-60, 208/230-3-60, 460-3-60	935	425	246	112	294	133	215	98	180	82	33.33	846.5
48HJ*007 w/62AQ060	208/230-3-60, 460-3-60	995	452	262	119	313	142	229	104	192	87	41.24	1047.4
48HJ*007 w/62AQ100	208/230-3-60, 460-3-60	1010	459	266	120	317	144	232	105	194	88	41.24	1047.4

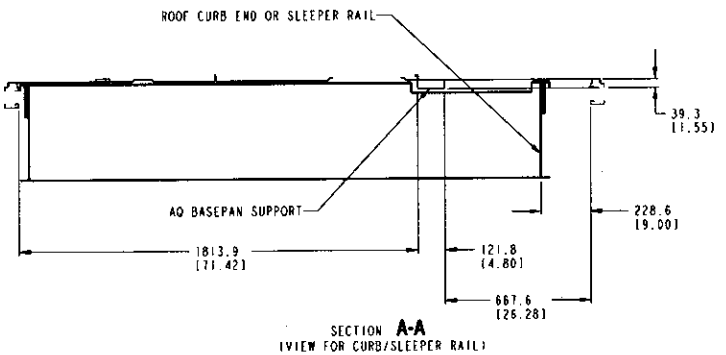
SINGLE ZONE ELECTRIC COOLING													
UNIT	ELECTRICAL CHARACTERISTICS	UNIT WEIGHT		CORNER WEIGHT "A"		CORNER WEIGHT "B"		CORNER WEIGHT "C"		CORNER WEIGHT "D"		UNIT HEIGHT "G"	
		LB	KG	LB	KG	LB	KG	LB	KG	LB	KG	IN.	MM
50HJ004 w/62AQ060	208/230-1-60, 208/230-3-60, 460-3-60	795	361	209	95	250	113	183	83	153	69	33.33	846.5
50HJ004 w/62AQ100	208/230-1-60, 208/230-3-60, 460-3-60	810	368	213	97	255	115	186	85	156	71	33.33	846.5
50HJ005 w/62AQ060	208/230-1-60, 208/230-3-60, 460-3-60	805	365	212	96	253	115	185	84	155	70	33.33	846.5
50HJ005 w/62AQ100	208/230-1-60, 208/230-3-60, 460-3-60	820	372	216	98	258	117	189	86	158	72	33.33	846.5
50HJ006 w/62AQ060	208/230-1-60, 208/230-3-60, 460-3-60	825	375	217	98	259	118	190	86	159	72	33.33	846.5
50HJ006 w/62AQ100	208/230-1-60, 208/230-3-60, 460-3-60	840	381	221	100	264	120	193	88	162	73	33.33	846.5
50HJ007 w/62AQ060	208/230-3-60, 460-3-60	880	400	231	105	277	125	203	92	169	77	41.24	1047.4
50HJ007 w/62AQ100	208/230-3-60, 460-3-60	895	407	235	107	281	128	206	93	172	78	41.24	1047.4

NOTES:
1. DIMENSIONS IN [ ] ARE IN INCHES.
2. ⊕ CENTER OF GRAVITY.
3. ➡ DIRECTION OF AIR FLOW.
4. DUCTWORK TO BE ATTACHED TO ACCESSORY ROOF CURB ONLY.
5. HJ - MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL):
   a. BETWEEN UNIT, FLUE SIDE AND COMBUSTIBLE SURFACES, 48 INCHES. 18 INCHES WHEN USING ACCESSORY FLUE DISCHARGE DEFLECTOR.
   b. BOTTOM OF UNIT TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) 1 INCH.
      BOTTOM OF BASE RAIL TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) 0 INCHES.
   c. CONDENSER COIL, FOR PROPER AIR FLOW, 36 INCHES ONE SIDE, 12 INCHES THE OTHER. THE SIDE GETTING THE GREATER CLEARANCE IS OPTIONAL.
   d. OVERHEAD, 60 INCHES TO ASSURE PROPER CONDENSER FAN OPERATION.
   e. BETWEEN UNITS, CONTROL BOX SIDE, 42 IN. PER NEC.
   f. BETWEEN UNIT AND UNGROUNDED SURFACES, CONTROL BOX SIDE, 36 IN. PER NEC.
   g. BETWEEN UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES, CONTROL BOX SIDE, 42 IN. PER NEC.
   h. HORIZONTAL SUPPLY AND RETURN END, 0 INCHES WHEN THE ALTERNATE CONDENSATE DRAIN IS USED.
   AQ - MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL):
   a. BETWEEN UNIT (CONTROL/EXHAUST SIDE) AND UNGROUNDED SURFACES, 36 INCHES AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES.
   b. FILTER ACCESS SIDE, 30 INCHES.
      SUPPLY AIR INTAKE, 36 INCHES.
      UNIT TOP, 0 INCHES.
      EXHAUST AIR SIDE 36 INCHES.
6. WITH THE EXCEPTION OF THE CLEARANCE FOR THE CONDENSER COIL AND COMBUSTION SIDE AS STATED IN NOTE #5a, b AND c, A REMOVABLE FENCE OR BARRICADE REQUIRES NO CLEARANCE.
7. UNITS MAY BE INSTALLED ON COMBUSTIBLE FLOORS MADE FROM WOOD OR CLASS A, B, OR C ROOF COVERING MATERIAL IF SET ON BASE RAIL.
8. THE VERTICAL CENTER OF GRAVITY IS 1'-6" [457] UP FROM THE BOTTOM OF THE BASE RAIL.

BOTTOM POWER CHART
THESE HOLES REQUIRED FOR USE
WITH ACCESSORY PACKAGES
CRBTMPWR001A01, 3A01 12.7 [0.50], 19.0 [0.75]
OR
CRBTMPWR002A01, 4A01 12.7 [0.50], 31.8 [1.25]

THREADED CONDUIT SIZE	WIRE SIZE	REQUIRED HOLE SIZES (MAX.)
12.7 [0.50]	ACCESSORY	22.2 [0.88]
12.7 [0.50]	24V	22.2 [0.88]
19.0 [0.75]	POWER*	28.4 [1.12]
31.7 [1.25]	POWER*	44.4 [1.75]
(003) 12.7 [0.50] FPT	GAS	31.8 [1.25]
(004) 19.0 [0.75] FPT	GAS	41.3 [1.62]

*SELECT EITHER 19.0 [0.75] OR 31.8 [1.25] FOR POWER, DEPENDING ON WIRE SIZE.



SECTION A-A
(VIEW FOR CURB/SLEEPER RAIL)

Fig. 5A — Base Unit Dimensions — COBRA™ Energy Recovery Unit — 48/50HJ004-007 with 62AQ060,100 (cont)

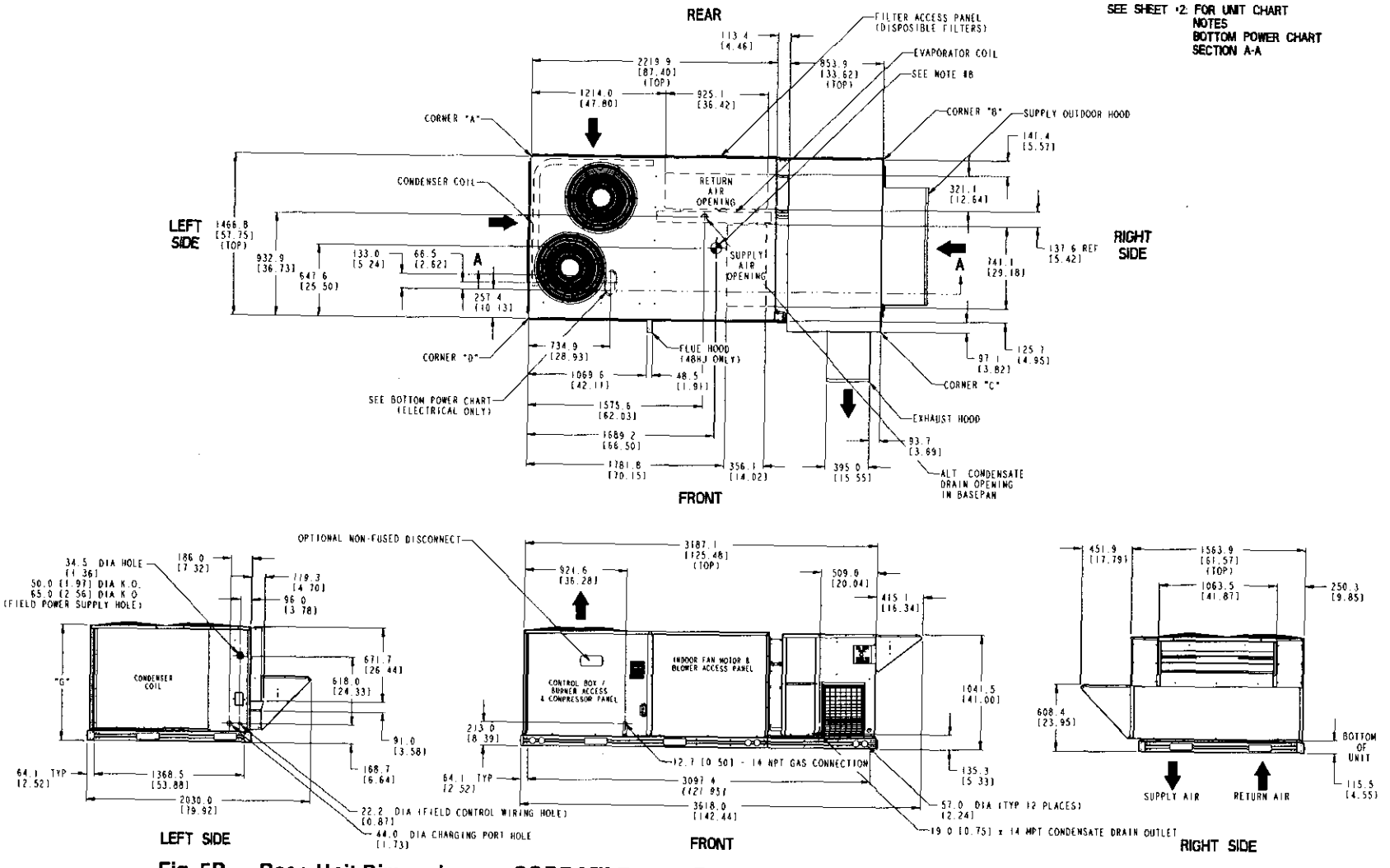


Fig. 5B — Base Unit Dimensions — COBRA™ Energy Recovery Unit — 48/50HJ008-014 with 62AQ200,300

SINGLE ZONE ELECTRIC COOLING WITH GAS HEAT													
UNIT	ELECTRICAL CHARACTERISTICS	UNIT WEIGHT		CORNER WEIGHT "A"		CORNER WEIGHT "B"		CORNER WEIGHT "C"		CORNER WEIGHT "D"		UNIT HEIGHT "G"	
		LB	KG	LB	KG	LB	KG	LB	KG	LB	KG	IN.	MM
48HJ*008 w/62AQ200	208/230-3-60, 460-3-60	1310	595	272	123	307	139	388	176	344	156	42.12	1070
48HJ*008 w/62AQ300	208/230-3-60, 460-3-60	1355	616	281	128	317	144	401	182	356	161	42.12	1070
48HJ*009 w/62AQ200	208/230-3-60, 460-3-60	1400	597	273	124	308	140	389	177	345	157	42.12	1070
48HJ*009 w/62AQ300	208/230-3-60, 460-3-60	1445	618	282	128	318	144	403	183	357	162	42.12	1070
48HJ*012 w/62AQ200	208/230-3-60, 460-3-60	1400	636	291	132	328	149	414	188	367	167	50.12	1273
48HJ*012 w/62AQ300	208/230-3-60, 460-3-60	1445	657	300	136	338	153	428	194	379	172	50.12	1273
48HJ*014 w/62AQ200	208/230-3-60, 460-3-60	1440	655	299	136	337	153	426	193	378	171	50.12	1273
48HJ*014 w/62AQ300	208/230-3-60, 460-3-60	1485	675	308	140	347	158	440	199	390	177	50.12	1273

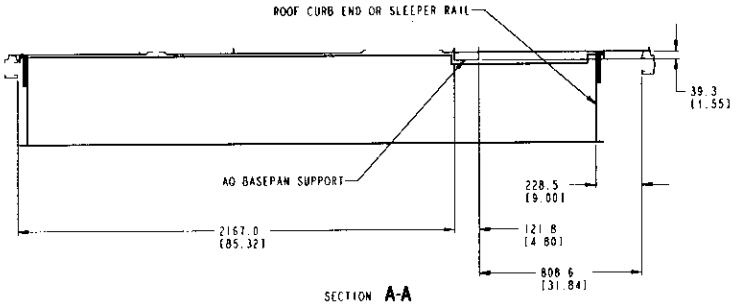
SINGLE ZONE ELECTRIC COOLING													
UNIT	ELECTRICAL CHARACTERISTICS	UNIT WEIGHT		CORNER WEIGHT "A"		CORNER WEIGHT "B"		CORNER WEIGHT "C"		CORNER WEIGHT "D"		UNIT HEIGHT "G"	
		LB	KG	LB	KG	LB	KG	LB	KG	LB	KG	IN.	MM
50HJ008 w/62AQ200	208/230-3-60, 460-3-60	1240	564	257	117	290	132	367	166	325	148	42.12	1070
50HJ008 w/62AQ300	208/230-3-60, 460-3-60	1285	584	267	121	301	136	380	173	337	153	42.12	1070
50HJ009 w/62AQ200	208/230-3-60, 460-3-60	1325	566	258	117	291	132	369	167	327	148	42.12	1070
50HJ009 w/62AQ300	208/230-3-60, 460-3-60	1370	586	268	121	302	137	382	173	339	154	42.12	1070
50HJ012 w/62AQ200	208/230-3-60, 460-3-60	1325	602	275	125	310	141	392	178	348	158	50.12	1273
50HJ012 w/62AQ300	208/230-3-60, 460-3-60	1370	623	284	129	321	145	406	184	360	163	50.12	1273
50HJ014 w/62AQ200	208/230-3-60, 460-3-60	1365	620	283	128	319	145	404	183	358	162	50.12	1273
50HJ014 w/62AQ300	208/230-3-60, 460-3-60	1410	641	293	133	330	150	417	189	370	168	50.12	1273

NOTES:
1. DIMENSIONS IN [ ] ARE IN INCHES.
2. ⊕ CENTER OF GRAVITY.
3. ➡ DIRECTION OF AIR FLOW.
4. DUCTWORK TO BE ATTACHED TO ACCESSORY ROOF CURB ONLY.
5. HJ - MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL):
   a. BETWEEN UNIT, FLUE SIDE AND COMBUSTIBLE SURFACES, 48 INCHES. 18 INCHES WHEN USING ACCESSORY FLUE DISCHARGE DEFLECTOR.
   b. BOTTOM OF UNIT TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) 1 INCH.
      BOTTOM OF BASE RAIL TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) 0 INCHES.
   c. CONDENSER COIL, FOR PROPER AIR FLOW, 36 INCHES ONE SIDE, 12 INCHES THE OTHER. THE SIDE GETTING THE GREATER CLEARANCE IS OPTIONAL.
   d. OVERHEAD, 60 INCHES TO ASSURE PROPER CONDENSER FAN OPERATION.
   e. BETWEEN UNITS, CONTROL BOX SIDE, 42 IN. PER NEC.
   f. BETWEEN UNIT AND UNGROUNDED SURFACES, CONTROL BOX SIDE, 36 IN. PER NEC.
   g. BETWEEN UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES, CONTROL BOX SIDE, 42 IN. PER NEC.
   h. HORIZONTAL SUPPLY AND RETURN END, 0 INCHES WHEN THE ALTERNATE CONDENSATE DRAIN IS USED.
   AQ - MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL):
   a. BETWEEN UNIT (CONTROL/EXHAUST SIDE) AND UNDGROUNDED SURFACES, 36 INCHES AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES.
   b. FILTER ACCESS SIDE, 30 INCHES.
      SUPPLY AIR INTAKE, 36 INCHES.
      UNIT TOP, 0 INCHES.
      EXHAUST AIR SIDE 36 INCHES.
6. WITH THE EXCEPTION OF THE CLEARANCE FOR THE CONDENSER COIL AND COMBUSTION SIDE AS STATED IN NOTE #5a, b AND c, A REMOVABLE FENCE OR BARRICADE REQUIRES NO CLEARANCE.
7. UNITS MAY BE INSTALLED ON COMBUSTIBLE FLOORS MADE FROM WOOD OR CLASS A, B, OR C ROOF COVERING MATERIAL IF SET ON BASE RAIL.
8. THE VERTICAL CENTER OF GRAVITY IS 1'-6" [457] UP FROM THE BOTTOM OF THE BASE RAIL.

BOTTOM POWER CHART
THESE HOLES REQUIRED FOR USE
WITH ACCESSORY PACKAGES
CRBTMPWR001A01, 3A01 12.7 [0.50], 19.0 [0.75]
OR
CRBTMPWR002A01, 4A01 12.7 [0.50], 31.8 [1.25]

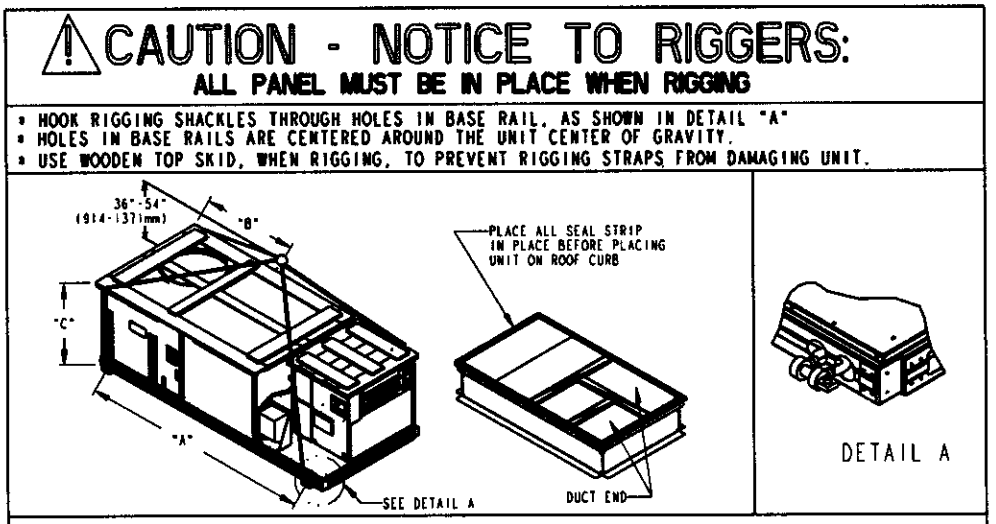
THREADED CONDUIT SIZE	WIRE SIZE	REQUIRED HOLE SIZES (MAX.)
12.7 [0.50]	ACCESSORY	22.2 [0.88]
12.7 [0.50]	24V	22.2 [0.88]
19.0 [0.75]	POWER*	28.4 [1.12]
31.7 [1.25]	POWER*	44.4 [1.75]
(003) 12.7 [0.50] FPT	GAS	31.8 [1.25]
(004) 19.0 [0.75] FPT	GAS	41.3 [1.62]

*SELECT EITHER 19.0 [0.75] OR 31.8 [1.25] FOR POWER, DEPENDING ON WIRE SIZE.



SECTION A-A
SCALE 3:32
(VIEW FOR CURB/SLEEPER RAIL)

Fig. 5B — Base Unit Dimensions — COBRA™ Energy Recovery Unit — 48/50HJ008-014 with 62AQ200,300 (cont)



	MAX WEIGHT		A		B		C	
	lb	kg	in.	mm	in.	mm	in.	mm
48HJ004 w/62AQ060	890	404	95.6	2428.20	57.38	1457.30	33.35	847
48HJ004 w/62AQ100	905	411	95.6	2428.20	57.38	1457.30	33.35	847
48HJ005 w/62AQ060	900	409	95.6	2428.20	57.38	1457.30	33.35	847
48HJ005 w/62AQ100	915	415	95.6	2428.20	57.38	1457.30	33.35	847
48HJ006 w/62AQ060	920	418	95.6	2428.20	57.38	1457.30	33.35	847
48HJ006 w/62AQ100	935	425	95.6	2428.20	57.38	1457.30	33.35	847
48HJ007 w/62AQ060	995	452	95.6	2428.20	57.38	1457.30	42.12	1070
48HJ007 w/62AQ100	1010	459	95.6	2428.20	57.38	1457.30	42.12	1070
50HJ004 w/62AQ060	795	361	95.6	2428.20	57.38	1457.30	33.35	847
50HJ004 w/62AQ100	810	368	95.6	2428.20	57.38	1457.30	33.35	847
50HJ005 w/62AQ060	805	365	95.6	2428.20	57.38	1457.30	33.35	847
50HJ005 w/62AQ100	820	372	95.6	2428.20	57.38	1457.30	33.35	847
50HJ006 w/62AQ060	825	375	95.6	2428.20	57.38	1457.30	33.35	847
50HJ006 w/62AQ100	840	381	95.6	2428.20	57.38	1457.30	33.35	847
50HJ007 w/62AQ060	880	400	95.6	2428.20	57.38	1457.30	42.12	1070
50HJ007 w/62AQ100	895	407	95.6	2428.20	57.38	1457.30	42.12	1070

Fig. 6A — Rigging Label — COBRA™ Energy Recovery Unit — Sizes 48/50HJ004-007

Step 5 — Install Flue Hood (48HJ Rooftop Sections Only) — Refer to the 48HJ installation instructions for information on installing the flue hood.

Step 6 — Install Gas Piping (48HJ Rooftop Sections Only) — The gas supply for gas heat units (48HJ) can be run through the curb or through the bottom of the unit. See Fig. 7 and 8.

When installing the gas supply through the curb, the gas piping will exit out through the side of the roof curb and a hole in the base rail. The accessory thru-the-curb service connections (part numbers CRBTMPWR001A01 and CRBTMPWR002A01) are required. See Fig. 9. A field-supplied regulator is installed outside the unit and the piping is connected to the unit gas valve.

When installing gas supply through the bottom of the unit, the gas piping is routed through a knockout in the unit basepan and then connected to the unit gas valve. The accessory thru-the-bottom service connections (part numbers CRBTMPWR003A01 and CRBTMPWR004A01) are required. See Fig. 10 and 11. Refer to the 48HJ installation instructions for more information on installing the gas piping.

Step 7 — Install External Trap For Condensate Drain — The condensate from the rooftop unit along with condensate from the upper coil of the 62AQ Energy$Recycler™ section is internally piped to the condensate pan in the lower section of the 62AQ Energy$Recycler section. See Fig. 12. For this reason, the bottom drain on the rooftop unit CANNOT be used for a condensate drain. The 3/4-in. drain connection on the energy recovery section is located near the bottom left of the exhaust air section. See Fig. 5A and 5B. The Energy$Recycler section must have a field-fabricated, external, P-trap installed for condensate drainage. Trap must be at least 4 in. deep to protect against freeze-up. If the drain line is installed downstream from the external trap, pitch the line away from the unit at 1 in. per 10-ft of run. Do not use a pipe smaller than the connection (3/4-in.).

Step 8 — Make Electrical Connections

⚠ WARNING

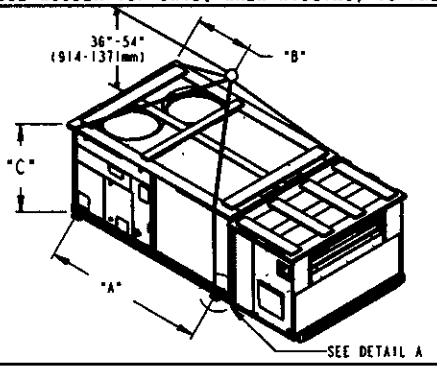
Unit cabinet must have an uninterrupted, unbroken electrical ground to minimize the possibility of personal injury if an electrical fault should occur. This ground may consist of electrical wire connected to unit ground lug in control compartment, or conduit approved for electrical ground when installed in accordance with NEC (National Electrical Code), ANSI/NFPA, latest edition, and local electrical codes. *Do not use gas piping as an electrical ground.* Failure to follow this warning could result in the installer being liable for personal injury of others.

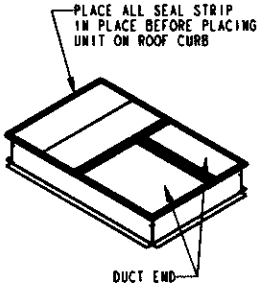
FIELD POWER SUPPLY — All units except 208/230-v units are factory-wired for the voltage shown on the nameplate.

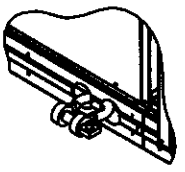
⚠ CAUTION - NOTICE TO RIGGERS:

ALL PANEL MUST BE IN PLACE WHEN RIGGING

- HOOK RIGGING SHACKLES THROUGH HOLES IN BASE RAIL, AS SHOWN IN DETAIL "A"
- HOLES IN BASE RAILS ARE CENTERED AROUND THE UNIT CENTER OF GRAVITY.
- USE WOODEN TOP SKID, WHEN RIGGING, TO PREVENT RIGGING STRAPS FROM DAMAGING UNIT.







DETAIL A

	MAX WEIGHT		A		B		C	
	lb	kg	in.	mm	in.	mm	in.	mm
48HJ008 w/62AQ200	1310	595	77.42	1966.5	66.50	1689.10	42.12	1070
48HJ008 w/62AQ300	1355	616	77.42	1966.5	66.50	1689.10	42.12	1070
48HJ009 w/62AQ200	1400	636	77.42	1966.5	66.50	1689.10	42.12	1070
48HJ009 w/62AQ300	1445	657	77.42	1966.5	66.50	1689.10	42.12	1070
48HJ012 w/62AQ200	1400	636	77.42	1966.5	66.50	1689.10	50.12	1273
48HJ012 w/62AQ300	1445	657	77.42	1966.5	66.50	1689.10	50.12	1273
48HJ014 w/62AQ200	1440	655	77.42	1966.5	66.50	1689.10	50.12	1273
48HJ014 w/62AQ300	1485	675	77.42	1966.5	66.50	1689.10	50.12	1273
50HJ008 w/62AQ200	1240	564	77.42	1966.5	66.50	1689.10	42.12	1070
50HJ008 w/62AQ300	1285	584	77.42	1966.5	66.50	1689.10	42.12	1070
50HJ009 w/62AQ200	1325	602	77.42	1966.5	66.50	1689.10	50.12	1273
50HJ009 w/62AQ300	1370	623	77.42	1966.5	66.50	1689.10	50.12	1273
50HJ012 w/62AQ200	1325	602	77.42	1966.5	66.50	1689.10	50.12	1273
50HJ012 w/62AQ300	1370	623	77.42	1966.5	66.50	1689.10	50.12	1273
50HJ014 w/62AQ200	1365	620	77.42	1966.5	66.50	1689.10	50.12	1273
50HJ014 w/62AQ300	1410	641	77.42	1966.5	66.50	1689.10	50.12	1273

Fig. 6B — Rigging Label — COBRA™ Energy Recovery Unit — Sizes 48/50HJ008-014

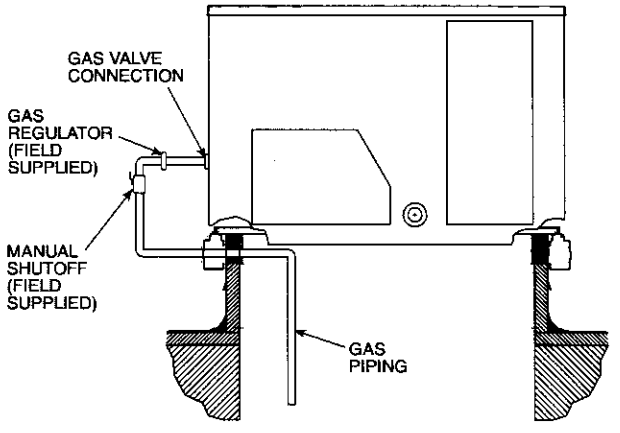


Fig. 7 — Thru-the-Curb Gas Connections

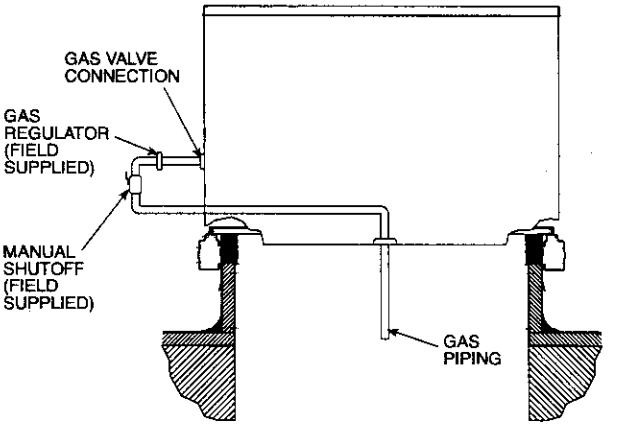


Fig. 8 — Thru-the-Bottom Gas Connections

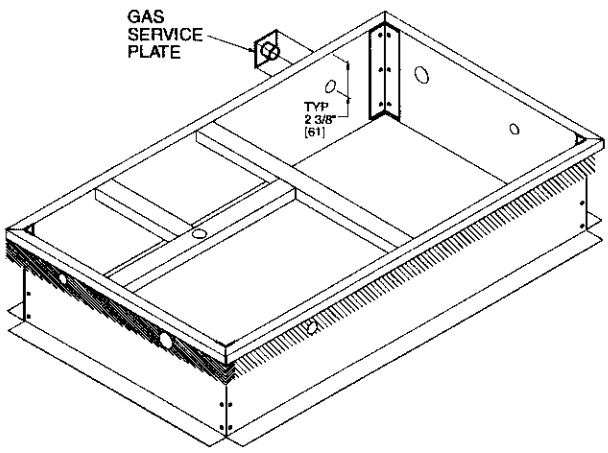


Fig. 9 — Thru-the-Curb Gas Connection (Accessory)

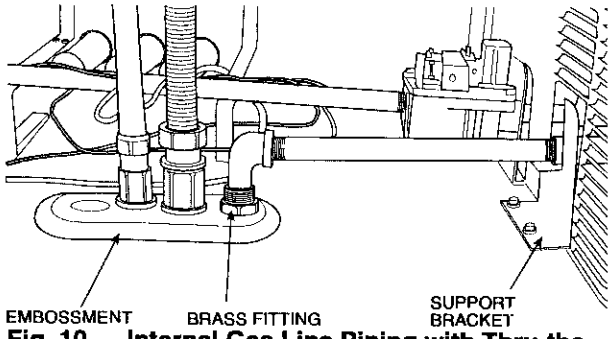


Fig. 10 — Internal Gas Line Piping with Thru-the-Bottom Connection (3 to 6 Ton Shown)

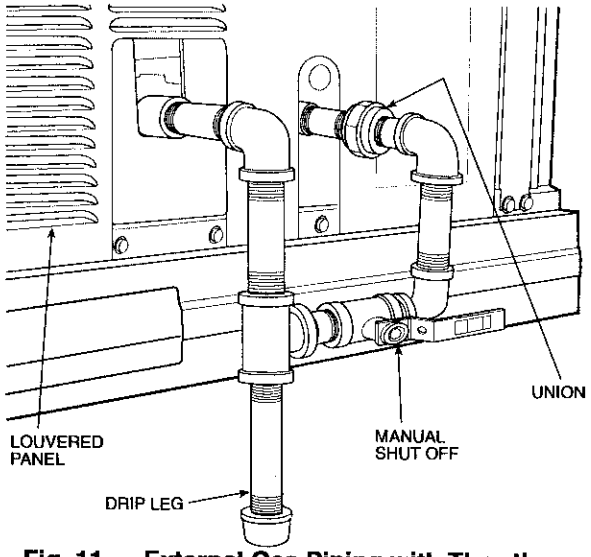


Fig. 11 — External Gas Piping with Thru-the-Bottom Connection (3 to 6 Ton Models Shown)

If the 208/230-v unit is to be connected to a 208-v power supply, the transformer must be rewired by moving the black wire with the 1/4-in. female space connector from the 230-volt connection and moving to the 200-volt 1/4-in. male terminal on the primary side of the transformer.

Refer to unit label diagram for additional information. Pigtails are provided for field wire connections. Use factory-supplied splices or UL (Underwriters Laboratories) approved copper/aluminum connector.

When installing units, provide a disconnect per the NEC.

All field wiring must comply with NEC and local requirements.

Install field wiring as follows:

1. Install conduit through side panel openings. Install conduit between disconnect and control box.
2. Install power lines to terminal connections as shown in Fig. 13-15.

Voltage to compressor terminals during operation must be within voltage range indicated on unit nameplate (see Tables 1A-1H). On 3-phase units, voltages between phases must be balanced within 2% and the current within 10%. Use the formula shown in the legend for Tables 1A-1H, Note 2 to determine the percent of voltage imbalance. Operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage to electrical components. Such operation would invalidate any applicable Carrier warranty.

FACTORY-SUPPLIED NON-FUSED DISCONNECT — The factory-supplied disconnect is capable of handling disconnect amps up to 80 A for a COBRA energy recovery unit. For disconnect amps greater than 80 A, a field-supplied disconnect is required.

FIELD-CONTROL WIRING — There are three required inputs to properly control COBRA™ units: temperature, humidity and an occupied/unoccupied schedule. The four recommended control combinations are:

- Thermidistat™ and electro-mechanical controls (Fig. 16)
- digital thermostat, humidistat and electro-mechanical controls (Fig. 17)
- humidistat, space temperature sensor and PremierLink™ controls (Fig. 18)
- Thermidistat and PremierLink controls (Fig. 19)

The most widely used combinations are the light commercial Thermidistat or PremierLink with thermostat and humidistat.

If the unit is equipped with the Humidi-MiZer™ or MoistureMi$er™ option, these systems also require a humidity input. The Energy$Recycler wiring accepts the sensed space humidity input and sends the appropriate signal to the rooftop unit. See Fig. 14-17.

NOTE: The humidity sensor device used with a COBRA or field-installed 62AQ unit with or without a Humidi-MiZer or MoistureMi$er dehumidification option must be a contact closure type device such as a humidistat or a light commercial Thermidistat device.

NOTE: For wire runs up to 50 ft, use No. 18 AWG (American Wire Gage) insulated wire (35 C minimum). For wire runs of 50 to 75 ft, use No. 16 AWG insulated wire (35 C minimum). For runs that require more than 75 ft, use No. 14 AWG insulated wire (35 C minimum). All wire larger than No. 18 AWG cannot be directly connected to the thermostat and will require a junction box and splice at the thermostat.

THERMIDISTAT DEVICE — The light commercial Thermidistat device is a 7-day programmable, wall-mounted, low voltage field-installed control. It combines temperature and humidity control in a single unit and provides separate set points for heating and cooling. The control adds a dehumidification control function with separate set points for up to 2 occupied and unoccupied periods per day.

If a Thermidistat device is used, install the Thermidistat assembly accessory according to installation instructions included with the accessory. Place the Thermidistat assembly on a solid wall in the conditioned space to sense average temperature in accordance with Thermidistat installation instruction on page 43. Connect Thermidistat wires to terminal board. Route Thermidistat cable or equivalent single leads of colored wire from subbase terminals through connector on unit to low-voltage connections (shown in Fig. 16). Thermidistat control wiring is routed to both the rooftop unit control box and the 62AQ Energy$Recycler control box.

PREMIERLINK™ CONTROLLER — The PremierLink digital controller is a Direct Digital Control (DDC) box that mounts in the rooftop unit under the main unit control box. It is designed to be connected to the Carrier Comfort Network® (CCN) system, where all the input and output points and control screens can be monitored for servicing and troubleshooting purposes. However, the PremierLink controller can also be connected and operated via thermostat. For details and additional information, refer to the Retrofit PremierLink Installation Instructions and Application Data.

The PremierLink controller is available factory-installed or as a field retrofit accessory. The PremierLink controller is designed to allow users the access and ability to change factory defined settings, thus expanding the function of the standard rooftop unit control. However, the PremierLink controller does not have an incorporated visual interface. It requires a CCN accessory such as a Navigator™ device, System Pilot™ unit or personal computer equipped with Carrier's proprietary ComfortWORKS® or ServiceTool software.

If a PremierLink controller is used, a Thermidistat device does not have to be used; a humidistat and separate room air sensor can also be used. Two extra terminal blocks (TB2 and TB3) are provided in the control box for all units with PremierLink controls. No wires should be directly connected to the PremierLink control. Wire sensors to TB2 or TB3. Humidistat is wired to TB1 and the Energy$Recycler section. See Fig. 17.

Pass the control wires through the hole provided in the corner post; then feed wires through the raceway build into the corner post to the 24-v barrier located on the left side of the control box. See Fig. 20A and 20B. The raceway provides the UL required clearance between high voltage and low voltage wiring.

The PremierLink controller does not support humidity control. A separate field-supplied humidity device that supports contact closure must be used. However, remote humidity sensing and control on a CCN system is possible using a PremierLink controller, a 3V™ universal controller and a 3V compatible humidity sensor. In this configuration, the universal controller provides 24 vdc power to the humidity sensor and accepts a 4 to 20 mA humidity signal from the humidity sensor. The universal controller provides an output relay contact that is connected to the HM terminal in the Energy$Recycler section's control box. The humidity sensor output does not connect directly to the COBRA unit. The universal controller is used to configure the humidity sensor's set point; when the sensed humidity level is reached, the controller sends a signal to the HM terminal.

The universal controller is also connected to the CCN bus wiring, therefore the humidity set point and sensed humidity value is displayed on the network. One universal controller can be used for up to eight (8) different COBRA units.

The PremierLink controller has two modes of sensor input: Temperature mode or Sensor mode. In Temperature mode, the PremierLink controller accepts input from a Carrier approved space thermostat. Input connections for this mode use terminal strip TB3 as shown in Fig. 21-23. Terminal strip TB3 connects to the J4 contacts on the PremierLink module. When the PremierLink controller is factory-installed, it is completely wired, except for the field-installed sensors. Currently, the only sensor that is included from the factory is the supply air temperature sensor. The following field-installed sensors are required for PremierLink controller operation:

- space temperature sensor — in sensor mode a space temperature sensor (SPT) is required, or for thermostat mode a thermostat is required, for all applications.
- outdoor-air temperature sensor (OAT) — required for all applications.
- supply-air temperature sensor (SAT) — required for all applications (included when PremierLink controller is factory-installed).
- indoor-air quality sensor (IAQ) — required for demand control ventilation.
- outdoor-air quality sensor (OAQ) — required for demand control ventilation.

HEAT ANTICIPATOR SETTINGS — Set heat anticipator settings at 0.14 amp for the first stage and 0.14 amp for second-stage heating, when available.

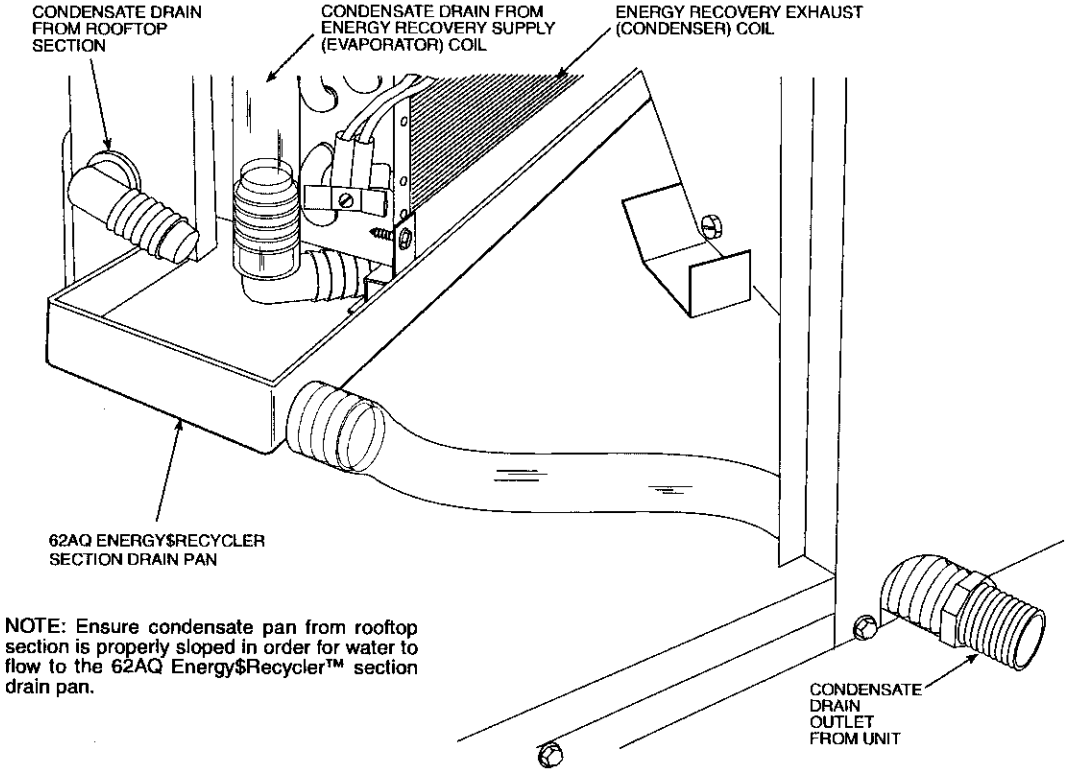
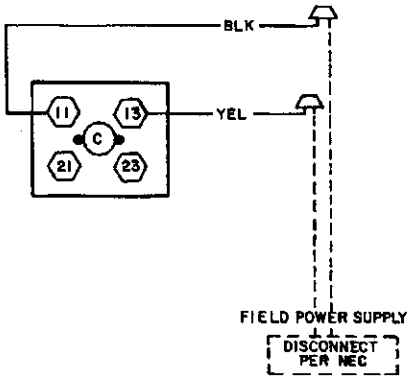
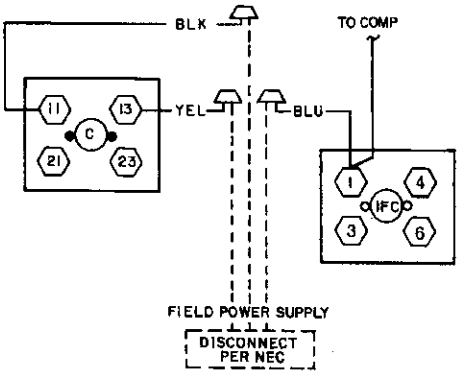


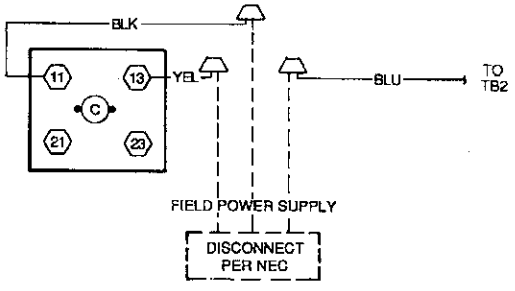
Fig. 12 — Condensate Drain Location



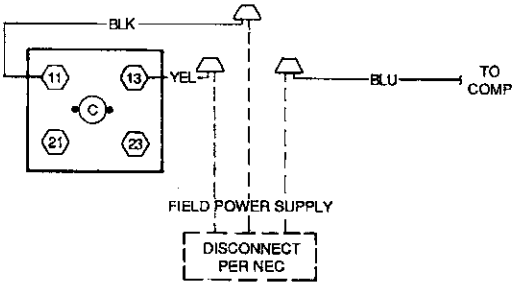
208/230-1-60



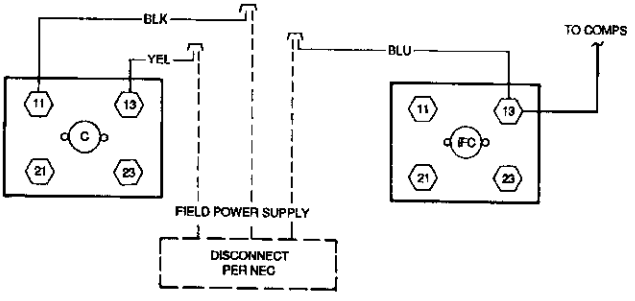
208/230-3-60
460-3-60
(SIZE 48/50HJ007 ONLY)



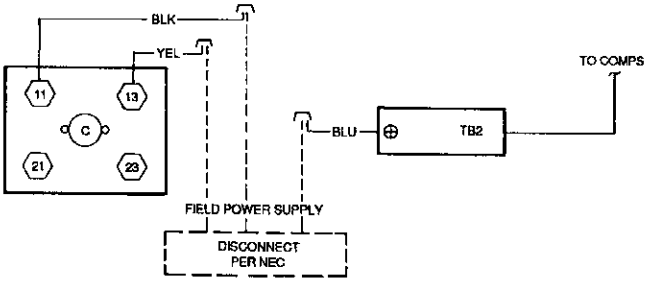
575-3-60
(SIZE 48/50HJ007 ONLY)



208/230-3-60
575-3-60, 460-3-60
(SIZES 48/50HJ004-006)



208/230-3-60 AND 460-3-60
(SIZES 48/50HJ008-014)



575-3-60
(SIZES 48/50HJ008-014)

LEGEND

C — Contactor
COMP — Compressor
IFC — Indoor-Fan Contactor
NEC — National Electrical Code
TB — Terminal Block

Fig. 13 — Power Wiring Connections

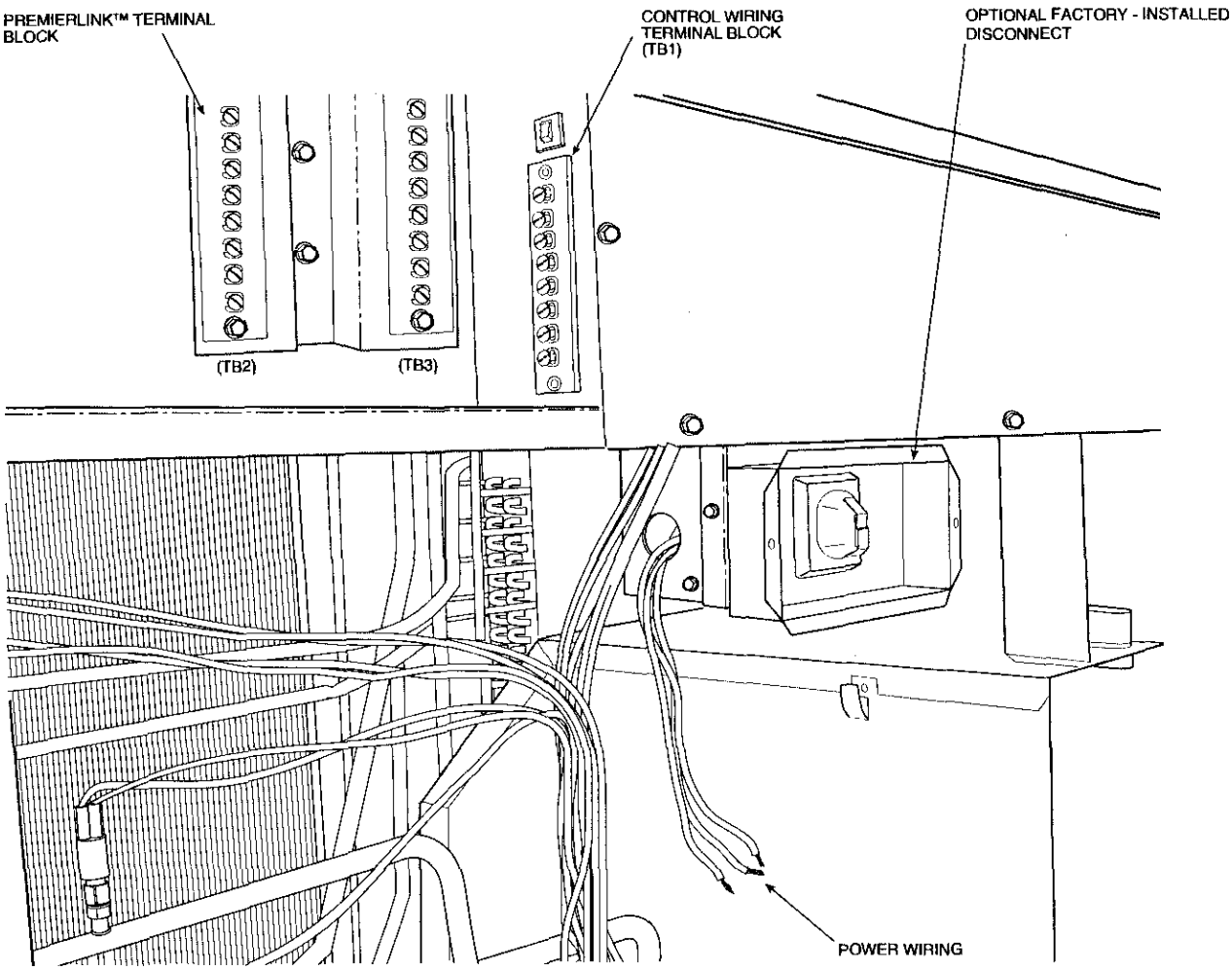


Fig. 14 — Field Wiring Connections (Terminal Blocks in Rooftop Unit Section)

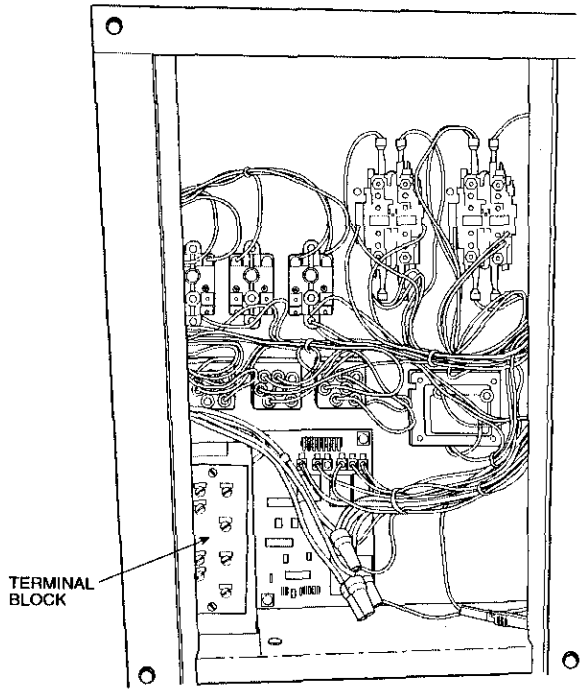


Fig. 15 — Field Wiring Connections (Terminal Block in Energy Recovery Section)

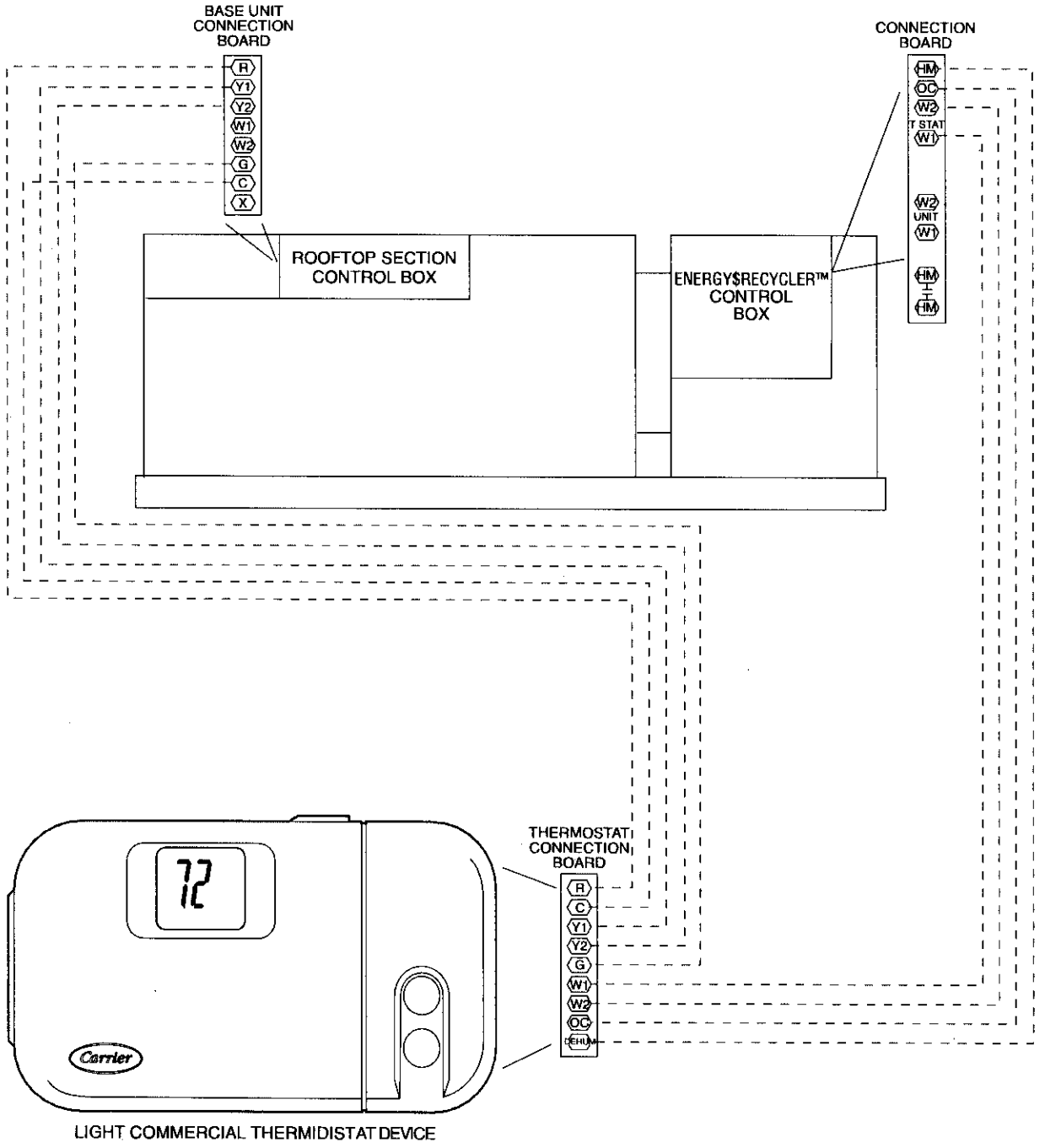


Fig. 16 — Control Wiring with Thermidistat™ Device and Electro-Mechanical Controls

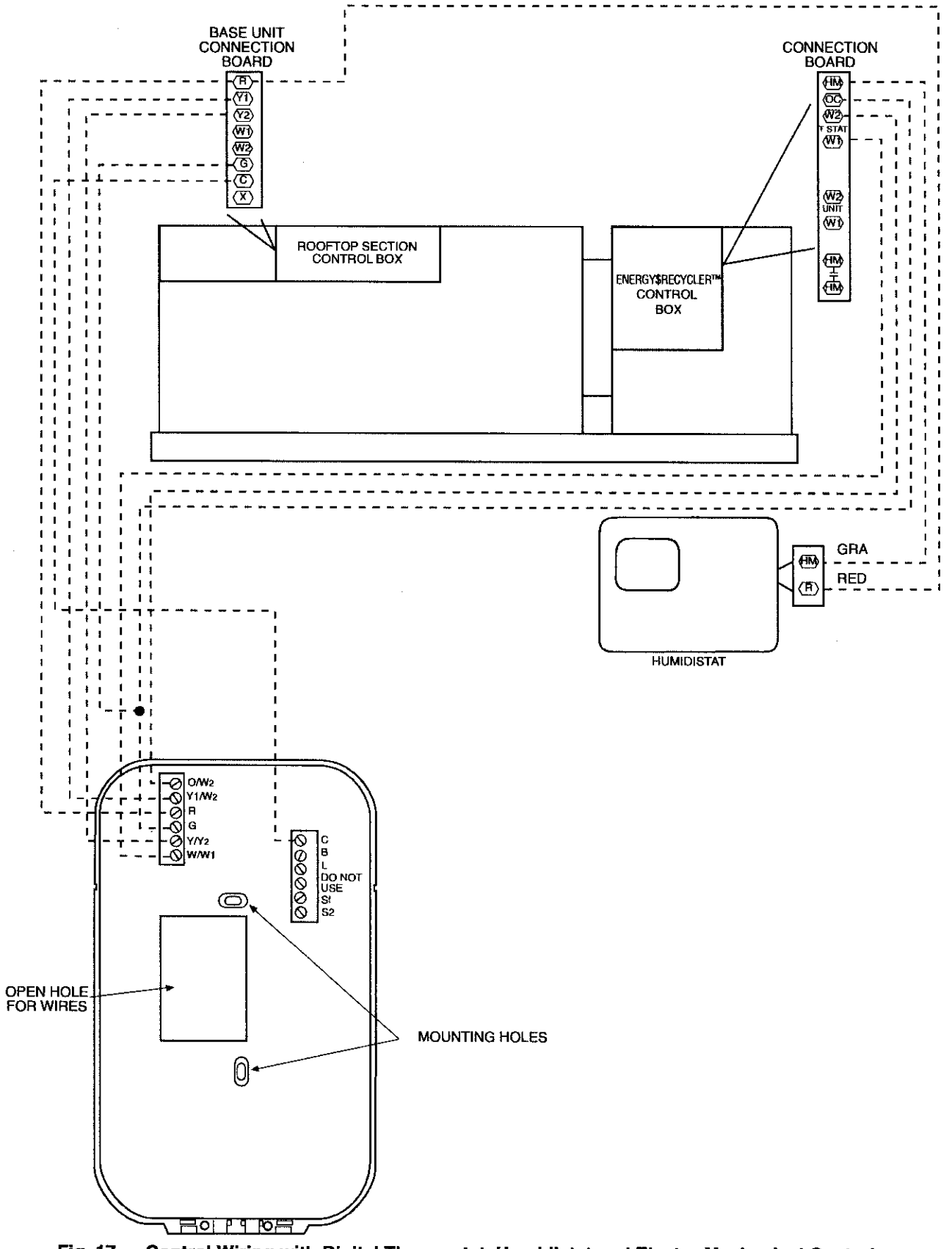


Fig. 17 — Control Wiring with Digital Thermostat, Humidistat and Electro-Mechanical Controls

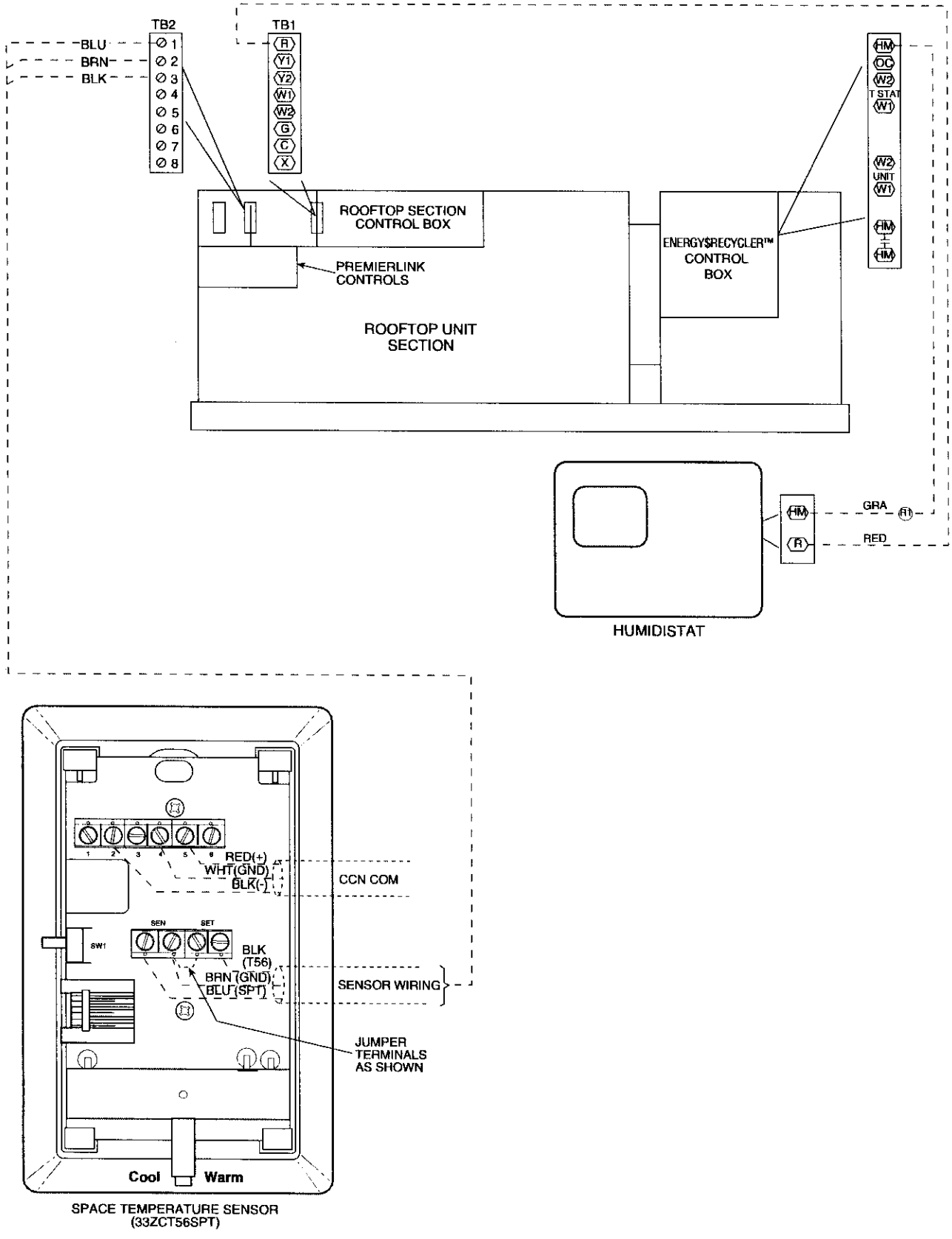
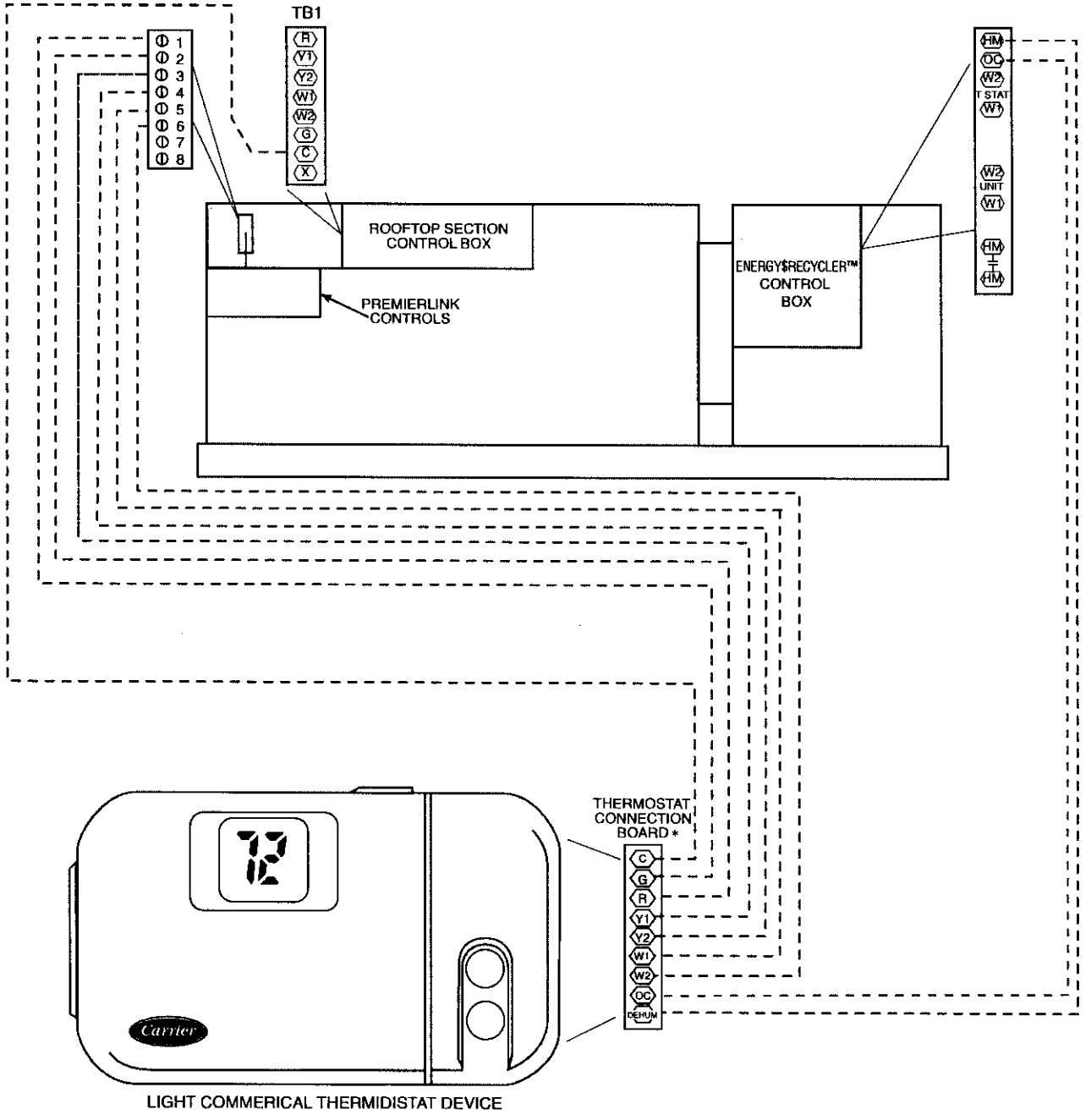


Fig. 18 — Control Wiring with Humidistat, Space Temperature Sensor, and PremierLink™ Controls



LIGHT COMMERICAL THERMIDISTAT DEVICE

NOTE: Thermidistat connection terminal arrangement for schematic purposes only.

Fig. 19 — Control Wiring with Thermidistat™ and PremierLink™ Controls

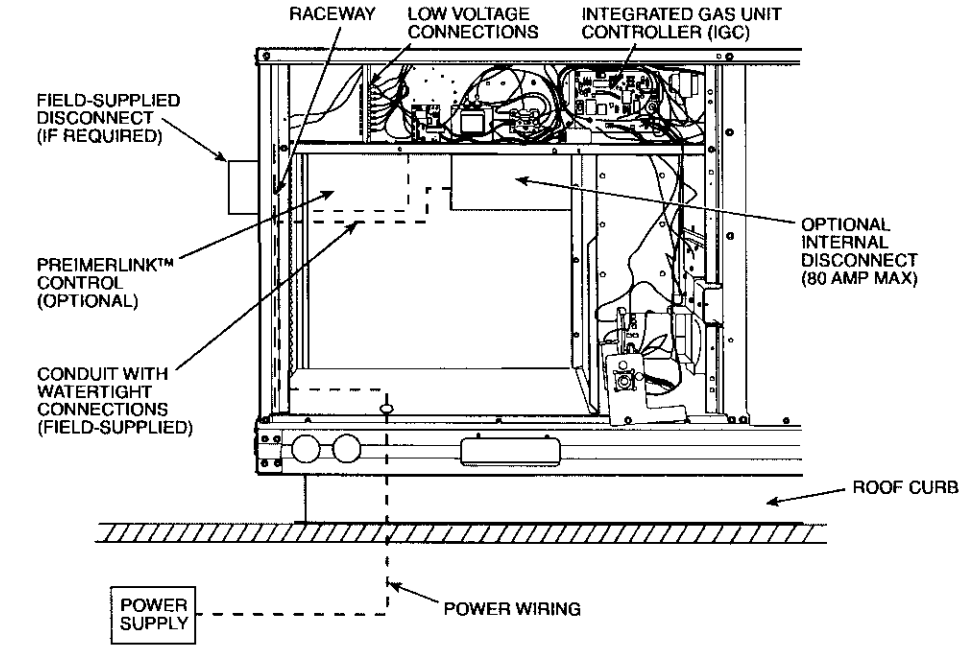


Fig. 20A — Power Wiring Routing with Thru-the-Bottom Accessory (Gas Unit Shown)

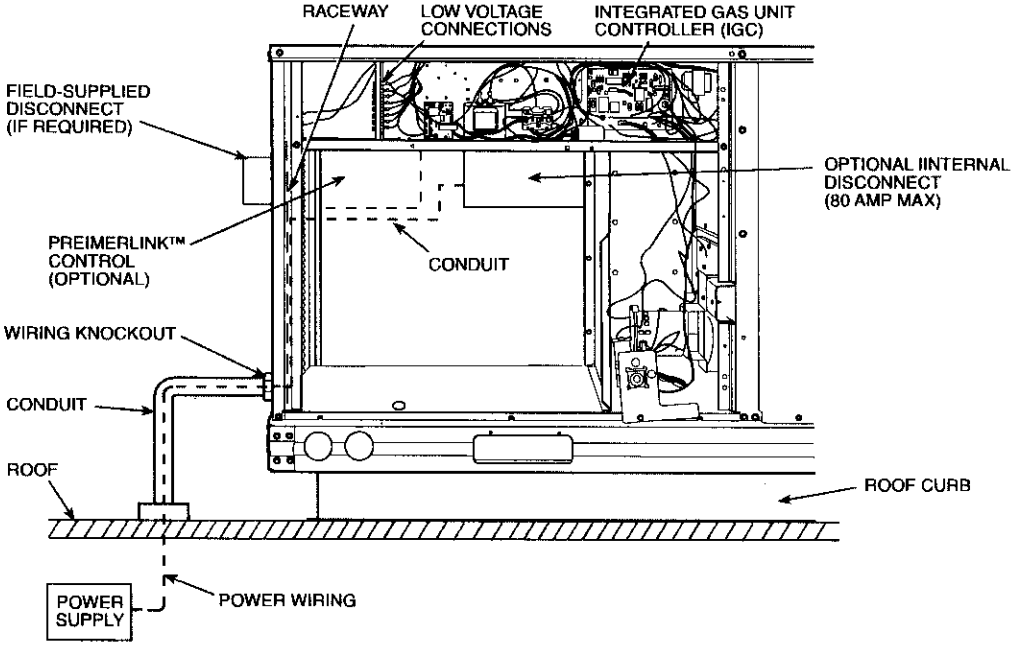
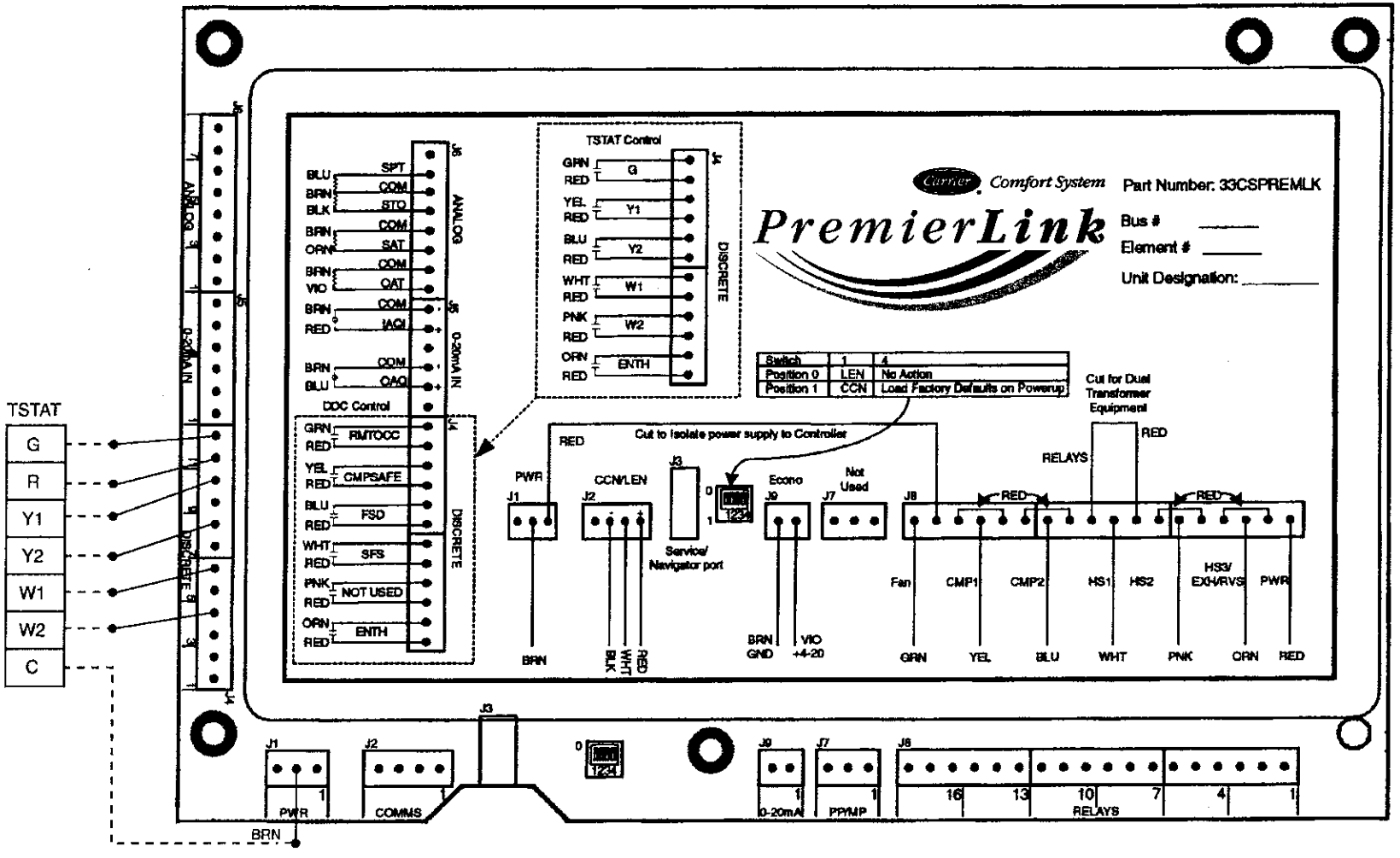
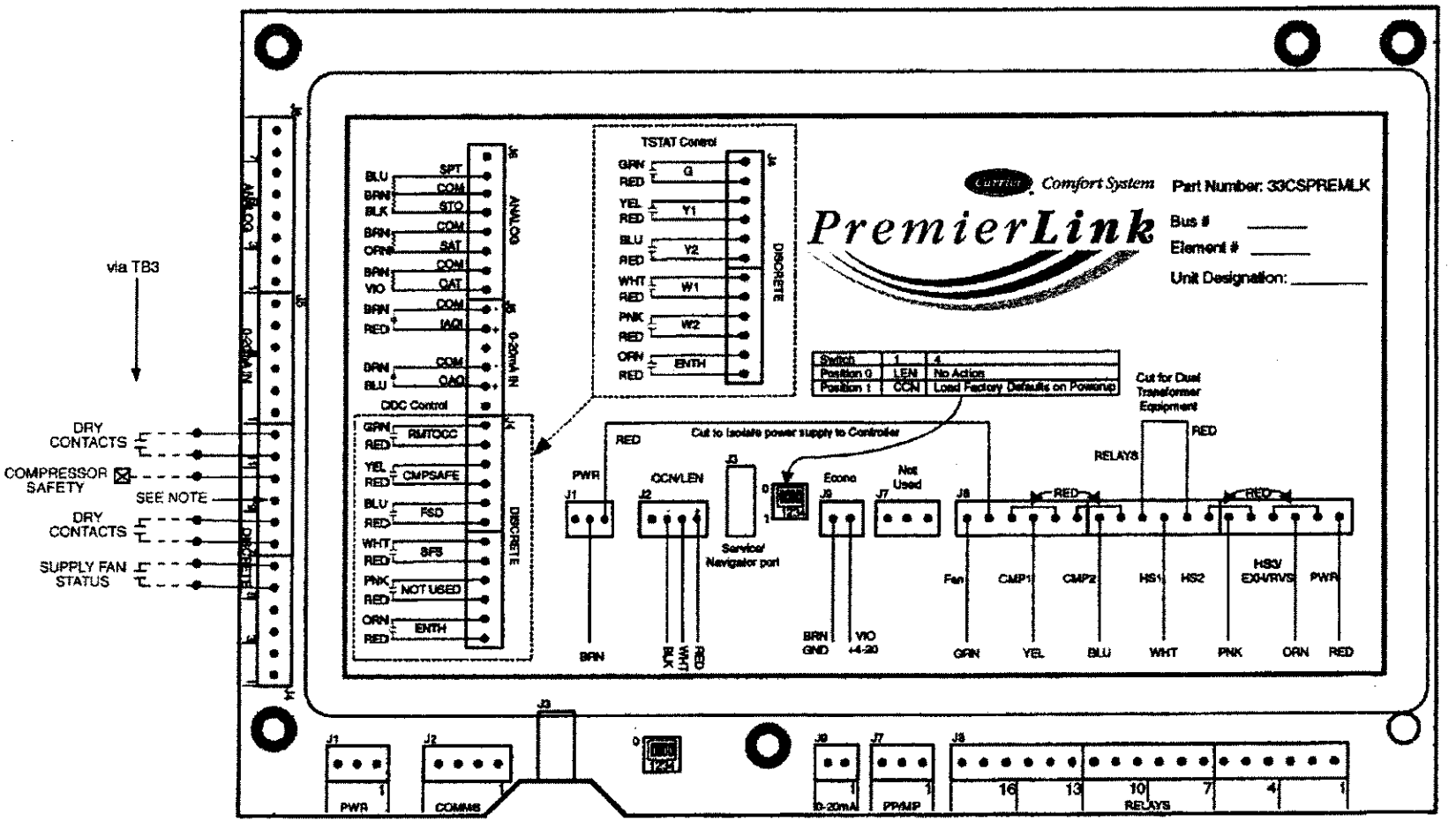


Fig. 20B — Power Wiring Routing from Outside of Unit (Gas Unit Shown)



NOTE: Remove all unused red wires from J4 connector to prevent 24 vac shorting other components or ground. Inputs on J4 are 24 vac; red leads are voltage source.

Fig. 21 — PremierLink™ Controller Sensor Wiring — With Programmable or Non-Programmable Thermostat



NOTE: Remove red wire from J4-9 to prevent 24 vac shorting out other components or ground.

Fig. 22 — PremierLink™ Field-Installed Controller Sensor Mode Contacts

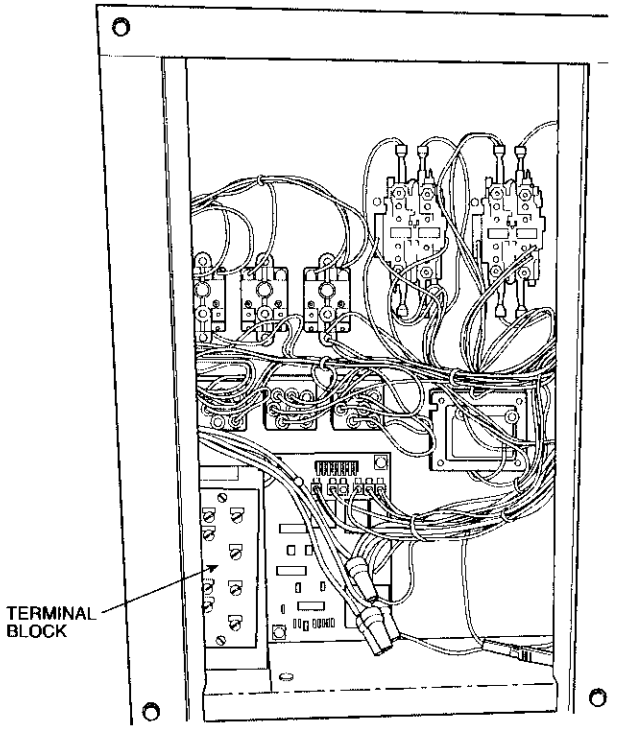


Fig. 23 — Field Wiring Connections (Terminal Block in Energy Recovery Section)

Table 1A — Electrical Data (COBRA™ Energy Recovery 48HJ004-007 Units with 62AQ060)

UNIT SIZE	NOMINAL V-PH-Hz	IFM TYPE	CONV OUTLET	62AQ FLA	POWER SUPPLY*		DISCONNECT SIZE	
					MCA	MOCP†	FLA	LRA
48HJ004	208/230-1-60	STD	NO	9.2	34.8/34.8	40/40	35/35	135/135
			YES	9.2	40.8/40.8	45/45	41/41	140/140
	208/230-3-60	STD	NO	9.2	27.7/27.7	35/35	29/29	124/124
			YES	9.2	33.7/33.7	40/40	34/34	129/129
		HIGH	NO	9.2	28.6/28.6	35/35	30/30	154/154
			YES	9.2	34.6/34.6	40/40	35/35	158/158
	460-3-60	STD	NO	9.2	13.6	15	14	63
			YES	9.2	16.3	20	17	65
		HIGH	NO	9.2	14.0	20	15	77
			YES	9.2	16.7	20	17	80
48HJ005	208/230-1-60	STD	NO	9.2	44.4/44.4	60/60	44/44	173/173
			YES	9.2	50.4/50.4	60/60	50/50	178/178
	208/230-3-60	STD	NO	9.2	31.7/31.7	40/40	33/33	140/140
			YES	9.2	37.7/37.7	40/40	38/38	145/145
		HIGH	NO	9.2	32.6/32.6	40/40	34/34	170/170
			YES	9.2	38.6/38.6	45/45	39/39	174/174
	460-3-60	STD	NO	9.2	15.2	20	16	71
			YES	9.2	17.9	20	18	73
		HIGH	NO	9.2	15.6	20	16	85
			YES	9.2	18.3	20	19	87
48HJ006	208/230-1-60	STD	NO	9.2	53.3/53.3	70/70	53/53	240/240
			YES	9.2	59.3/59.3	70/70	59/59	244/244
	208/230-3-60	STD	NO	9.2	38.1/38.1	45/45	39/39	202/202
			YES	9.2	44.1/44.1	50/50	44/44	207/207
		HIGH	NO	9.2	39.8/39.8	45/45	41/41	221/221
			YES	9.2	45.8/45.8	50/50	46/46	226/226
	460-3-60	STD	NO	9.2	19.3	25	20	101
			YES	9.2	22.0	25	22	104
		HIGH	NO	9.2	20.1	25	20	111
			YES	9.2	22.8	25	23	113
48HJ007	208/230-3-60	STD	NO	9.2	42.0/42.0	50/50	42/42	234/234
			YES	9.2	48.0/48.0	60/60	48/48	239/239
		HIGH	NO	9.2	43.7/43.7	50/50	44/44	253/253
			YES	9.2	49.7/49.7	60/60	50/50	258/258
	460-3-60	STD	NO	9.2	19.8	25	20	114
			YES	9.2	22.5	25	23	116
		HIGH	NO	9.2	20.6	25	21	124
			YES	9.2	23.3	30	23	126

LEGEND

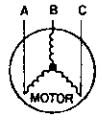
FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
UL — Underwriters Laboratories

*The values listed in this table do not include power exhaust. See Power Exhaust table for requirements.
†Fuse or HACR breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. UL, Canada units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

$$= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 460-3-60.



AB = 452 v
BC = 464 v
AC = 455 v

$$\text{Average Voltage} = \frac{452 + 464 + 455}{3}$$

$$= \frac{1371}{3}$$

$$= 457$$

Determine maximum deviation from average voltage.
(AB) 457 – 452 = 5 v
(BC) 464 – 457 = 7 v
(AC) 457 – 455 = 2 v
Maximum deviation is 7 v.
Determine percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{7}{457}$$

$$= 1.53\%$$

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

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

Table 1B — Electrical Data (COBRA™ Energy Recovery 50HJ004-007 Units with 62AQ060)

UNIT SIZE	NOMINAL V-PH-Hz	IFM TYPE	CONV OUTLET	62AQ FLA	HEATER MODEL NO. CRHEATER—A00	ELECTRIC HEAT		POWER SUPPLY*		DISCONNECT SIZE	
						Actual kW†	FLA	MCA	MOCP**	FLA	LRA
50HJ004	208/230-1-60	STD	NO	9.2	—	—/—	—/—	34.8/34.8	40/40	35/35	135
					001	3.3/ 4.0	15.9/18.3	35.7/38.8	40/45	35/37	135
					002	4.9/ 5.8	23.5/27.1	45.2/49.7	50/50	43/47	135
					003	6.5/ 8.0	31.4/36.3	55.1/61.2	60/70	52/58	135
					004	7.9/ 9.6	37.9/43.1	63.2/70.5	70/80	60/67	135
					002+002	9.8/11.6	46.9/54.2	74.5/83.6	80/90	70/79	135
			YES	9.2	—	—/—	—/—	40.8/40.8	45/45	41/41	140
					001	3.3/ 4.0	15.9/18.3	40.8/43.0	45/50	41/42	140
					002	4.9/ 5.8	23.5/27.1	50.0/53.9	60/60	49/52	140
					003	6.5/ 8.0	31.4/36.3	59.9/65.4	60/70	58/63	140
					004	7.9/ 9.6	37.9/43.1	68.0/74.7	70/80	65/71	140
					002+002	9.8/11.6	46.9/54.2	79.3/87.8	80/90	76/83	140
	208/230-3-60	STD	NO	9.2	—	—/—	—/—	27.7/27.7	35/35	29/29	124
					001	3.3/ 4.0	15.9/18.3	27.7/29.1	35/35	29/29	124
					002	4.9/ 5.8	23.5/27.1	32.8/35.4	40/40	32/34	124
					003	6.5/ 8.0	31.4/36.3	38.5/42.0	45/45	37/40	124
					004	7.9/ 9.6	37.9/43.1	43.2/47.4	45/50	41/45	124
					005	12.0/14.7	33.4/38.5	57.5/64.0	60/70	55/60	124
			YES	9.2	—	—/—	—/—	33.7/33.7	40/35	34/34	129
					001	3.3/ 4.0	15.9/18.3	33.7/33.7	40/40	34/34	129
					002	4.9/ 5.8	23.5/27.1	37.6/39.6	45/45	37/39	129
					003	6.5/ 8.0	31.4/36.3	43.3/46.2	50/50	43/45	129
					004	7.9/ 9.6	37.9/43.1	48.0/51.6	50/60	47/50	129
					005	12.0/14.7	33.4/38.5	62.3/68.2	70/70	60/65	129
		HIGH	NO	9.2	—	—/—	—/—	28.6/28.6	35/35	30/30	154
					001	3.3/ 4.0	15.9/18.3	28.6/30.0	35/35	30/30	154
					002	4.9/ 5.8	23.5/27.1	33.7/36.3	40/40	33/35	154
					003	6.5/ 8.0	31.4/36.3	39.4/42.9	45/45	38/41	154
					004	7.9/ 9.6	37.9/43.1	44.1/48.3	50/50	42/46	154
					005	12.0/14.7	33.4/38.5	58.4/64.9	60/70	56/62	154
			YES	9.2	—	—/—	—/—	34.6/34.6	40/40	35/35	158
					001	3.3/ 4.0	15.9/18.3	34.6/34.6	40/40	35/35	158
					002	4.9/ 5.8	23.5/27.1	38.5/40.5	45/45	38/40	158
					003	6.5/ 8.0	31.4/36.3	44.2/47.1	50/50	44/46	158
					004	7.9/ 9.6	37.9/43.1	48.9/52.5	60/60	48/51	158
					005	12.0/14.7	33.4/38.5	63.2/69.1	70/70	61/66	158
	460-3-60	STD	NO	9.2	—	—	—	13.6	20	14	63
					006	5.5	7.2	16.7	20	14	63
					007	8.1	13.8	20.9	25	15	63
					008	10.6	16.8	25.0	25	24	63
					009	12.9	27.7	28.7	30	27	63
			YES	9.2	—	—	—	16.3	20	20	67
					006	5.5	7.2	18.8	25	20	68
					007	8.1	13.8	23.0	25	20	68
					008	10.6	16.8	27.1	30	29	68
					009	12.9	27.7	30.8	35	32	68
		HIGH	NO	9.2	—	—	—	14.0	20	15	77
					006	5.5	7.2	17.1	20	15	77
					007	8.1	13.8	21.3	25	15	77
					008	10.6	16.8	25.4	30	24	77
					009	12.9	27.7	29.1	30	28	77
			YES	9.2	—	—	—	16.7	20	20	82
					006	5.5	7.2	19.2	25	20	82
					007	8.1	13.8	23.4	25	20	82
					008	10.6	16.8	27.5	30	29	82
					009	12.9	27.7	31.2	35	32	82
50HJ005	208/230-1-60	STD	NO	9.2	—	—/—	—/—	44.4/ 44.4	60/ 60	44/ 44	173
					001	3.3/ 4.0	15.9/18.3	44.4/ 44.4	60/ 60	44/ 44	173
					003	6.5/ 8.0	31.4/36.3	55.1/ 61.2	60/ 70	52/ 58	173
					002+002	9.8/11.6	46.9/54.2	74.5/ 83.6	80/ 90	70/ 79	173
					003+003	13.1/16.0	62.8/72.5	94.4/106.5	100/110	88/100	173
					004+004	16.0/19.3	75.8/87.5	110.6/125.2	125/150	103/117	173
			YES	9.2	—	—/—	—/—	50.4/ 50.4	60/ 60	50/ 50	178
					001	3.3/ 4.0	15.9/18.3	50.4/ 50.4	60/ 60	50/ 50	178
					003	6.5/ 8.0	31.4/36.3	59.9/ 65.4	60/ 70	58/ 63	178
					002+002	9.8/11.6	46.9/54.2	79.3/ 87.8	80/ 90	76/ 83	178
					003+003	13.1/16.0	62.8/72.5	99.2/110.7	100/125	94/104	178
					004+004	16.0/19.3	75.8/87.5	115.4/129.4	125/150	109/122	178
	208/230-3-60	STD	NO	9.2	—	—/—	—/—	31.7/31.7	40/40	33/33	140
					002	4.9/ 5.8	13.6/15.6	32.8/35.4	40/40	33/34	140
					003	6.5/ 8.0	18.1/20.9	38.5/42.0	45/45	37/40	140
					005	12/.014.7	33.4/38.5	57.5/64.0	60/70	55/60	140
					004+004	16.0/19.3	43.8/50.5	70.6/79.0	80/80	67/74	140
			YES	9.2	—	—/—	—/—	37.7/37.7	40/40	38/38	145
					002	4.9/ 5.8	13.6/15.6	37.7/39.6	45/45	38/39	145
					003	6.5/ 8.0	18.1/20.9	43.3/46.2	50/50	43/45	145
					005	12.0/14.7	33.4/38.5	62.3/68.2	70/70	60/65	145
					004+004	16.0/19.3	43.8/50.5	75.4/83.2	80/90	72/79	145
		HIGH	NO	9.2	—	—/—	—/—	32.6/32.6	40/40	34/34	170
					002	4.9/ 5.8	13.6/15.6	33.7/36.3	40/40	34/35	170
					003	6.5/ 8.0	18.1/20.9	39.4/42.9	45/45	38/41	170
					005	12.0/14.7	33.4/38.5	58.4/64.9	60/70	56/62	170
					004+004	16.0/19.3	43.8/50.5	71.5/79.9	80/80	68/75	170
			YES	9.2	—	—/—	—/—	38.6/38.6	45/45	39/39	174
					002	4.9/ 5.8	13.6/15.6	38.6/40.5	45/45	39/40	174
					003	6.5/ 8.0	18.1/20.9	44.2/47.1	50/50	44/46	174
					005	12.0/14.7	33.4/38.5	63.2/69.1	70/70	61/66	174
					004+004	16.0/19.3	43.8/50.5	76.3/84.1	80/90	73/80	174
	460-3-60	STD	NO	9.2	—	—	—	15.2	20	16	70
					006	7.2	7.2	16.7	20	16	71
					008	13.8	13.8	25.0	25	18	71
					009	16.8	16.8	28.7	30	27	71
					008+008	27.7	27.7	42.3	45	40	71
			YES	9.2	—	—	—	17.9	20	21	75
					006	7.2	7.2	18.8	25	21	75
					008	13.8	13.8	27.1	30	21	75
					009	16.8	16.8	30.8	35	32	75
					008+008	27.7	27.7	44.4	45	44	75

Table 1B — Electrical Data (COBRA™ Energy Recovery 50HJ004-007 Units with 62AQ060) (cont)

UNIT SIZE	NOMINAL V-PH-Hz	IFM TYPE	CONV OUTLET	62AQ FLA	HEATER MODEL NO. CRHEATER---A00	ELECTRIC HEAT		POWER SUPPLY*		DISCONNECT SIZE	
						Actual kW†	FLA	MCA	MOCP**	FLA	LRA
50HJ005 (cont)	460-3-60 (cont)	HIGH	NO	9.2	—	—	—	15.6	20	16	84
					006	7.2	7.2	17.1	20	16	85
					008	13.8	13.8	25.4	30	19	85
					009	16.8	16.8	29.1	30	28	85
					008+008	27.7	27.7	42.7	45	40	85
			YES	9.2	—	—	—	18.3	20	22	89
					006	7.2	7.2	19.2	25	22	90
					008	13.8	13.8	27.5	30	22	90
					009	16.8	16.8	31.2	35	32	90
					008+008	27.7	27.7	44.8	45	45	90
50HJ006	208/230-1-60	STD	NO	9.2	—	—/—	—/—	55.5/ 55.5	70/ 70	56/ 56	250
					002	4.9/ 5.8	23.5/27.1	55.5/ 55.5	70/ 70	56/ 56	250
					003	6.5/ 8.0	31.4/36.3	59.5/ 65.5	70/ 70	57/ 62	250
					002+002	8.7/11.6	46.9/54.2	78.9/ 87.9	80/ 90	75/ 83	250
					003+003	13.0/16.0	62.8/72.5	98.7/110.8	100/125	93/104	250
					004+004	15.8/19.3	75.8/87.5	115.0/129.6	125/150	108/121	250
			YES	9.2	—	—/—	—/—	61.5/ 61.5	70/ 70	61/ 61	255
					002	4.9/ 5.8	23.5/27.1	61.5/ 61.5	70/ 70	61/ 61	255
					003	6.5/ 8.0	31.4/36.3	64.3/ 69.7	70/ 70	62/ 67	255
					002+002	8.7/11.6	46.9/54.2	83.7/ 92.1	90/100	80/ 88	255
					003+003	13.0/16.0	62.8/72.5	103.5/115.0	110/125	98/109	255
					004+004	15.8/19.3	75.8/87.5	119.8/133.8	125/150	113/126	255
	208/230-3-60	STD	NO	9.2	—	—/—	—/—	38.1/38.1	45/ 45	39/39	202
					002	4.9/ 5.8	13.6/15.6	38.1/38.1	45/ 45	39/39	202
					004	7.9/ 9.6	21.9/25.3	44.1/48.3	50/ 50	42/46	202
					005	12.0/14.7	33.4/38.5	58.4/64.9	60/ 70	56/62	202
					004+004	15.8/19.3	43.8/50.5	71.5/79.9	80/ 80	68/75	202
					004+005	19.9/24.3	55.2/63.8	85.8/96.4	90/100	81/91	202
			YES	9.2	—	—/—	—/—	44.1/ 44.1	50/ 50	44/44	207
					002	4.9/ 5.8	13.6/15.6	44.1/ 44.1	50/ 50	44/44	207
					004	7.9/ 9.6	21.9/25.3	48.9/ 52.5	60/ 60	48/51	207
					005	12.0/14.7	33.4/38.5	63.2/ 69.1	70/ 70	61/66	207
					004+004	15.8/19.3	43.8/50.5	76.3/ 84.1	80/ 90	73/80	207
					004+005	19.9/24.3	55.2/63.8	90.6/100.6	100/110	86/95	207
		HIGH	NO	9.2	—	—/—	—/—	39.8/39.8	45/ 45	41/41	221
					002	4.9/ 5.8	13.6/15.6	39.8/39.8	45/ 45	41/41	221
					004	7.9/ 9.6	21.9/25.3	45.9/50.1	50/ 60	44/48	221
					005	12.0/14.7	33.4/38.5	60.3/66.7	70/ 70	58/63	221
					004+004	15.8/19.3	43.8/50.5	73.3/81.7	80/ 90	70/77	221
					004+005	19.9/24.3	55.2/63.8	87.6/98.3	90/100	83/93	221
			YES	9.2	—	—/—	—/—	45.8/ 45.8	50/ 50	46/46	226
					002	4.9/ 5.8	13.6/15.6	45.8/ 45.8	50/ 50	46/46	226
					004	7.9/ 9.6	21.9/25.3	50.7/ 54.3	60/ 60	50/53	226
					005	12.0/14.7	33.4/38.5	65.1/ 70.9	70/ 80	63/68	226
					004+004	15.8/19.3	43.8/50.5	78.1/ 85.9	80/ 90	75/82	226
					004+005	19.9/24.3	55.2/63.8	92.4/102.5	100/110	88/97	226
	460-3-60	STD	NO	9.2	—	—	—	19.3	25	20	101
					006	5.5	7.2	19.3	25	20	101
					008	10.6	13.8	25.4	30	20	101
					009	12.9	16.8	29.1	30	28	101
					008+008	21.1	27.7	42.7	45	40	101
					008+009	23.4	30.1	46.4	50	44	101
			YES	9.2	—	—	—	22.0	25	25	106
					006	5.5	7.2	22.0	25	25	106
					008	10.6	13.8	27.5	30	25	106
					009	12.9	16.8	31.2	35	32	106
					008+008	21.1	27.7	44.8	45	45	106
					008+009	23.4	30.1	48.5	50	48	106

LEGEND

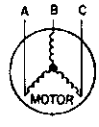
FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
UL — Underwriters' Laboratories

*The values listed in this table do not include power exhaust. See Power Exhaust table for requirements.
†Heater capacity (kW) is based on heater voltage of 240v or 480v. If power distribution voltage to unit varies from rated, heater kW will vary accordingly.
**Fuse or HACR breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. UL, Canada units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

$$= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 460-3-60.



AB = 452 v
BC = 464 v
AC = 455 v

$$\text{Average Voltage} = \frac{452 + 464 + 455}{3}$$

$$= \frac{1371}{3}$$

$$= 457$$

Determine maximum deviation from average voltage.
(AB) 457 – 452 = 5 v
(BC) 464 – 457 = 7 v
(AC) 457 – 455 = 2 v
Maximum deviation is 7 v.
Determine percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{7}{457}$$

$$= 1.53\%$$

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

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

Table 1B — Electrical Data (COBRA™ Energy Recovery 50HJ004-007 Units with 62AQ060) (cont)

UNIT SIZE	NOMINAL V-PH-Hz	IFM TYPE	CONV OUTLET	62AQ FLA	HEATER MODEL NO. CRHEATER—A00	ELECTRIC HEAT		POWER SUPPLY*		DISCONNECT SIZE	
						Actual kW†	FLA	MCA	MOCP**	FLA	LRA
50HJ006 (cont)	460-3-60 (cont)	HIGH	NO	9.2	—	—	—	20.1	25	20	110
					006	5.5	7.2	20.1	25	20	111
					008	10.6	13.8	26.2	30	20	111
					009	12.9	16.8	29.9	30	29	111
					008+008	21.1	27.7	43.5	45	41	111
					008+009	23.4	30.1	47.2	50	44	111
			YES	9.2	—	—	—	22.8	25	26	115
					006	5.5	7.2	22.8	25	26	116
					008	10.6	13.8	28.3	30	26	116
					009	12.9	16.8	32.0	35	33	116
					008+008	21.1	27.7	45.6	50	46	116
					008+009	23.4	30.1	49.3	50	49	116
50HJ007	208/230-3-60	STD	NO	9.2	—	—/—	—/—	42.0/42.0	50/ 50	42/42	234
					002	4.9/ 5.8	13.6/15.6	42.0/42.0	50/ 50	42/42	234
					004	7.9/ 9.6	21.9/25.3	44.1/48.3	50/ 50	42/46	234
					005	12.0/14.7	33.4/38.5	58.4/64.9	60/ 70	56/62	234
					004+004	15.8/19.3	43.8/50.5	71.5/79.9	80/ 80	68/75	234
					004+005	19.9/24.3	55.2/63.8	85.8/96.4	90/100	81/91	234
			YES	9.2	—	—/—	—/—	48.0/ 48.0	60/ 60	48/48	239
					002	4.9/ 5.8	13.6/15.6	48.0/ 48.0	60/ 60	48/48	239
					004	7.9/ 9.6	21.9/25.3	48.9/ 52.5	60/ 60	48/51	239
					005	12.0/14.7	33.4/38.5	63.2/ 69.1	70/ 70	61/66	239
					004+004	15.8/19.3	43.8/50.5	76.3/ 84.1	80/ 90	73/80	239
					004+005	19.9/24.3	55.2/63.8	90.6/100.6	100/110	86/95	239
	208/230-3-60	HIGH	NO	9.2	—	—/—	—/—	43.7/43.7	50/ 50	44/44	253
					002	4.9/ 5.8	13.6/15.6	43.7/43.7	50/ 50	44/44	253
					004	7.9/ 9.6	21.9/25.3	45.9/50.1	50/ 60	44/48	253
					005	12.0/14.7	33.4/38.5	60.3/66.7	70/ 70	58/63	253
					004+004	15.8/19.3	43.8/50.5	73.3/81.7	80/ 90	70/77	253
					004+005	19.9/24.3	55.2/63.8	87.6/98.3	90/100	83/93	253
			YES	9.2	—	—/—	—/—	49.7/ 49.7	60/ 60	50/50	258
					002	4.9/ 5.8	13.6/15.6	49.7/ 49.7	60/ 60	50/50	258
					004	7.9/ 9.6	21.9/25.3	50.7/ 54.3	60/ 60	50/53	258
					005	12.0/14.7	33.4/38.5	65.1/ 70.9	70/ 80	63/68	258
					004+004	15.8/19.3	43.8/50.5	78.1/ 85.9	80/ 90	75/82	258
					004+005	19.9/24.3	55.2/63.8	92.4/102.5	100/110	88/97	258
	460-3-60	STD	NO	9.2	—	—	—	19.8	25	20	114
					006	5.5	7.2	19.8	25	20	114
					008	10.6	13.8	25.4	30	20	114
					009	12.9	16.8	29.1	30	28	114
					008+008	21.1	27.7	42.7	45	40	114
					008+009	23.4	30.7	46.4	50	44	114
			YES	9.2	—	—	—	22.5	25	26	118
					006	5.5	7.2	22.5	25	26	119
					008	10.6	13.8	27.5	30	26	119
					009	12.9	16.8	31.2	35	32	119
					008+008	21.1	27.7	44.8	45	45	119
					008+009	23.4	30.7	48.5	50	48	119
		HIGH	NO	9.2	—	—	—	20.6	25	21	123
					006	5.5	7.2	20.6	25	21	124
					008	10.6	13.8	26.2	30	21	124
					009	12.9	16.8	29.9	30	29	124
					008+008	21.1	27.7	43.5	45	41	124
					008+009	23.4	30.7	47.2	50	44	124
			YES	9.2	—	—	—	23.3	30	26	128
					006	5.5	7.2	23.3	30	26	128
					008	10.6	13.8	28.3	30	26	128
					009	12.9	16.8	32.0	35	33	128
					008+008	21.1	27.7	45.6	50	46	128
					008+009	23.4	30.7	49.3	50	49	128

LEGEND

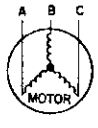
FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
UL — Underwriters' Laboratories

*The values listed in this table do not include power exhaust. See Power Exhaust table for requirements.
†Heater capacity (kW) is based on heater voltage of 240v or 480v. If power distribution voltage to unit varies from rated, heater kW will vary accordingly.
**Fuse or HACR breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. UL, Canada units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

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

Example: Supply voltage is 460-3-60.



AB = 452 v
BC = 464 v
AC = 455 v

$$\text{Average Voltage} = \frac{452 + 464 + 455}{3}$$

$$= \frac{1371}{3}$$

$$= 457$$

Determine maximum deviation from average voltage.
(AB) 457 – 452 = 5 v
(BC) 464 – 457 = 7 v
(AC) 457 – 455 = 2 v
Maximum deviation is 7 v.
Determine percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{7}{457}$$

$$= 1.53\%$$

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

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

Table 1C — Electrical Data (COBRA™ Energy Recovery 48HJ004-007 Units with 62AQ100)

UNIT SIZE	NOMINAL V-PH-Hz	IFM TYPE	CONV OUTLET	62AQ FLA	POWER SUPPLY*		DISCONNECT SIZE	
					MCA	MOCP†	FLA	LRA
48HJ004	208/230-1-60	STD	NO	15.1	40.7/40.7	45/45	42/42	161/161
			YES	15.1	46.7/46.7	50/50	48/48	166/166
	208/230-3-60	STD	NO	15.1	33.6/33.6	40/40	36/36	150/150
			YES	15.1	39.6/39.6	45/45	41/41	155/155
		HIGH	NO	15.1	34.5/34.5	40/40	37/37	180/180
			YES	15.1	40.5/40.5	45/45	42/42	184/184
	460-3-60	STD	NO	15.1	16.5	20	18	76
			YES	15.1	19.2	20	20	78
		HIGH	NO	15.1	16.9	20	18	90
			YES	15.1	19.6	25	20	93
48HJ005	208/230-1-60	STD	NO	15.1	50.3/50.3	60/60	51/51	199/199
			YES	15.1	56.3/56.3	70/70	57/57	204/204
	208/230-3-60	STD	NO	15.1	37.6/37.6	45/45	39/39	166/166
			YES	15.1	43.6/43.6	50/50	45/45	171/171
		HIGH	NO	15.1	38.5/38.5	45/45	40/40	196/196
			YES	15.1	44.5/44.5	50/50	46/46	200/200
	460-3-60	STD	NO	15.1	18.2	20	19	84
			YES	15.1	20.9	25	22	86
		HIGH	NO	15.1	18.6	25	19	98
			YES	15.1	21.3	25	22	100
48HJ006	208/230-1-60	STD	NO	15.1	59.2/59.2	70/70	60/60	266/266
			YES	15.1	65.2/65.2	80/80	65/65	270/270
	208/230-3-60	STD	NO	15.1	44.0/44.0	50/50	46/46	228/228
			YES	15.1	50.0/50.0	60/60	51/51	233/233
		HIGH	NO	15.1	45.7/45.7	60/60	48/48	247/247
			YES	15.1	51.7/51.7	60/60	53/53	252/252
	460-3-60	STD	NO	15.1	22.2	25	23	114
			YES	15.1	24.9	30	25	117
		HIGH	NO	15.1	23.0	30	24	124
			YES	15.1	25.7	30	26	126
48HJ007	208/230-3-60	STD	NO	15.1	47.9/47.9	60/60	49/49	260/260
			YES	15.1	53.9/53.9	60/60	55/55	265/265
		HIGH	NO	15.1	49.6/49.6	60/60	51/51	279/279
			YES	15.1	55.6/55.6	60/60	57/57	284/284
	460-3-60	STD	NO	15.1	22.8	30	23	127
			YES	15.1	25.5	30	26	129
		HIGH	NO	15.1	23.6	30	24	137
			YES	15.1	26.3	30	27	139

LEGEND

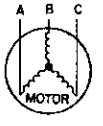
FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
UL — Underwriters Laboratories

*The values listed in this table do not include power exhaust. See Power Exhaust table for requirements.
†Fuse or HACR breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. UL, Canada units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

$$= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 460-3-60.



AB = 452 v
BC = 464 v
AC = 455 v

$$\text{Average Voltage} = \frac{452 + 464 + 455}{3}$$

$$= \frac{1371}{3}$$

$$= 457$$

Determine maximum deviation from average voltage.
(AB) 457 – 452 = 5 v
(BC) 464 – 457 = 7 v
(AC) 457 – 455 = 2 v
Maximum deviation is 7 v.
Determine percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{7}{457}$$

$$= 1.53\%$$

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

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

Table 1D — Electrical Data (COBRA™ Energy Recovery 50HJ004-007 Units with 62AQ100)

UNIT SIZE	NOMINAL V-PH-Hz	IFM TYPE	CONV OUTLET	62AQ FLA	HEATER MODEL NO. CRHEATER—A00	ELECTRIC HEAT		POWER SUPPLY*		DISCONNECT SIZE	
						Actual kW†	FLA	MCA	MOCP**	FLA	LRA
50HJ004	208/230-1-60	STD	NO	15.1	—	—/—	—/—	40.7/40.7	45/ 45	42/42	161
					001	3.3/ 4.0	15.9/18.3	42.5/45.5	50/ 60	42/44	161
					002	4.9/ 5.8	23.5/27.1	52.0/56.5	60/ 70	50/54	161
					003	6.5/ 8.0	31.4/36.3	61.9/67.9	70/ 70	59/65	161
					004	7.9/ 9.6	37.9/43.1	70.0/77.3	80/ 80	67/73	161
					002+002	9.8/11.6	46.9/54.2	81.3/90.3	90/100	77/85	161
			YES	15.1	—	—/—	—/—	46.7/46.7	50/ 50	48/48	166
					001	3.3/ 4.0	15.9/18.3	47.3/49.7	60/ 60	48/49	166
					002	4.9/ 5.8	23.5/27.1	56.8/60.7	70/ 70	56/59	166
					003	6.5/ 8.0	31.4/36.3	66.7/72.1	70/ 80	65/70	166
					004	7.9/ 9.6	37.9/43.1	74.8/81.5	80/ 90	72/78	166
					002+002	9.8/11.6	46.9/54.2	86.1/94.5	90/100	82/90	166
	208/230-3-60	STD	NO	15.1	—	—/—	—/—	33.6/33.6	40/40	36/36	150
					001	3.3/ 4.0	15.9/18.3	34.1/35.9	45/45	36/36	150
					002	4.9/ 5.8	23.5/27.1	39.6/42.2	50/50	39/41	150
					003	6.5/ 8.0	31.4/36.3	45.3/48.8	60/60	44/47	150
					004	7.9/ 9.6	37.9/43.1	50.0/54.2	60/60	48/52	150
					005	12.0/14.7	33.4/38.5	64.3/70.7	70/80	61/67	150
			YES	15.1	—	—/—	—/—	39.6/39.6	45/45	41/41	155
					001	3.3/ 4.0	15.9/18.3	39.6/40.1	50/50	41/41	155
					002	4.9/ 5.8	23.5/27.1	44.4/46.4	60/60	44/46	155
					003	6.5/ 8.0	31.4/36.3	50.1/53.0	60/60	49/52	155
					004	7.9/ 9.6	37.9/43.1	54.8/58.4	60/70	54/57	155
					005	12.0/14.7	33.4/38.5	69.1/74.9	80/80	67/72	155
		HIGH	NO	15.1	—	—/—	—/—	34.5/34.5	40/40	37/37	180
					001	3.3/ 4.0	15.9/18.3	35.0/36.8	45/45	37/37	180
					002	4.9/ 5.8	23.5/27.1	40.5/43.1	50/50	40/42	180
					003	6.5/ 8.0	31.4/36.3	46.2/49.7	60/60	45/48	180
					004	7.9/ 9.6	37.9/43.1	50.9/55.1	60/60	49/53	180
					005	12.0/14.7	33.4/38.5	65.2/71.6	70/80	62/68	180
			YES	15.1	—	—/—	—/—	40.5/40.5	45/45	42/42	184
					001	3.3/ 4.0	15.9/18.3	40.5/41.0	50/50	42/42	184
					002	4.9/ 5.8	23.5/27.1	45.3/47.3	60/60	45/47	184
					003	6.5/ 8.0	31.4/36.3	51.0/53.9	60/60	50/53	184
					004	7.9/ 9.6	37.9/43.1	55.7/59.3	70/70	55/58	184
					005	12.0/14.7	33.4/38.5	70.0/75.8	80/80	68/73	184
	460-3-60	STD	NO	15.1	—	—	—	16.5	20	18	76
					006	5.5	7.2	20.1	25	18	76
					007	8.1	13.8	24.3	30	18	77
					008	10.6	16.8	28.4	35	27	80
					009	12.9	27.7	32.1	35	31	83
			YES	15.1	—	—	—	19.2	20	23	80
					006	5.5	7.2	22.2	30	23	81
					007	8.1	13.8	26.4	30	23	81
					008	10.6	16.8	30.5	35	32	82
					009	12.9	27.7	34.2	40	35	85
		HIGH	NO	15.1	—	—	—	16.9	20	18	90
					006	5.5	7.2	20.5	25	18	90
					007	8.1	13.8	24.7	30	18	91
					008	10.6	16.8	28.8	35	28	94
					009	12.9	27.7	32.5	35	31	97
			YES	15.1	—	—	—	19.6	25	24	95
					006	5.5	7.2	22.6	30	24	95
					007	8.1	13.8	26.8	30	24	95
					008	10.6	16.8	30.9	35	32	96
					009	12.9	27.7	34.6	40	36	99
50HJ005	208/230-1-60	STD	NO	15.1	—	—/—	—/—	50.3/ 50.3	60/ 60	51/ 51	199
					001	3.3/ 4.0	15.9/18.3	50.3/ 50.3	60/ 60	51/ 51	199
					003	6.5/ 8.0	31.4/36.3	61.9/ 67.9	70/ 70	59/ 65	199
					002+002	9.8/11.6	46.9/54.2	81.3/ 90.3	90/100	77/ 85	199
					003+003	13.1/16.0	62.8/72.5	101.2/113.3	110/125	95/106	199
					004+004	16.0/19.3	75.8/87.5	117.4/132.0	125/150	110/124	199
			YES	15.1	—	—/—	—/—	56.3/ 56.3	70/ 70	57/ 57	204
					001	3.3/ 4.0	15.9/18.3	56.3/ 56.3	70/ 70	57/ 57	204
					003	6.5/ 8.0	31.4/36.3	66.7/ 72.1	70/ 80	65/ 70	204
					002+002	9.8/11.6	46.9/54.2	86.1/ 94.5	90/100	82/ 90	204
					003+003	13.1/16.0	62.8/72.5	106.0/117.5	110/125	101/111	204
					004+004	16.0/19.3	75.8/87.5	122.2/136.2	125/150	116/128	204
	208/230-3-60	STD	NO	15.1	—	—/—	—/—	37.6/37.6	45/45	39/39	166
					002	4.9/ 5.8	13.6/15.6	39.6/42.2	50/50	39/41	166
					003	6.5/ 8.0	18.1/20.9	45.3/48.8	60/60	44/47	166
					005	12.0/14.7	33.4/38.5	64.3/70.7	70/80	61/67	166
					004+004	16.0/19.3	43.8/50.5	77.3/85.8	80/90	73/81	166
			YES	15.1	—	—/—	—/—	43.6/43.6	50/50	45/45	171
					002	4.9/ 5.8	13.6/15.6	44.4/46.4	60/60	45/46	171
					003	6.5/ 8.0	18.1/20.9	50.1/53.0	60/60	49/52	171
					005	12.0/14.7	33.4/38.5	69.1/74.9	80/80	67/72	171
					004+004	16.0/19.3	43.8/50.5	82.1/90.0	90/90	79/86	171
		HIGH	NO	15.1	—	—/—	—/—	38.5/38.5	45/45	40/40	196
					002	4.9/ 5.8	13.6/15.6	40.5/43.1	50/50	40/42	196
					003	6.5/ 8.0	18.1/20.9	46.2/49.7	60/60	45/48	196
					005	12.0/14.7	33.4/38.5	65.2/71.6	70/80	62/68	196
					004+004	16.0/19.3	43.8/50.5	78.2/86.7	80/90	74/82	196
			YES	15.1	—	—/—	—/—	44.5/44.5	50/ 50	46/46	200
					002	4.9/ 5.8	13.6/15.6	45.3/47.3	60/ 60	46/47	200
					003	6.5/ 8.0	18.1/20.9	51.0/53.9	60/ 60	50/53	200
					005	12.0/14.7	33.4/38.5	70.0/75.8	80/ 80	68/73	200
					004+004	16.0/19.3	43.8/50.5	83.0/90.9	90/100	80/87	200
	460-3-60	STD	NO	15.1	—	—	—	18.2	20	19	83
					006	5.5	7.2	20.1	25	19	84
					008	10.6	13.8	28.4	35	19	84
					009	12.9	16.8	32.1	30	31	84
					008+008	21.1	27.7	45.6	50	43	94
			YES	15.1	—	—	—	20.9	25	25	88
					006	5.5	7.2	22.2	30	25	88
					008	10.6	13.8	30.5	35	25	88
					009	12.9	16.8	34.2	40	35	88
					008+008	21.1	27.7	47.7	50	48	96

Table 1D — Electrical Data (COBRA™ Energy Recovery 50HJ004-007 Units with 62AQ100) (cont)

UNIT SIZE	NOMINAL V-PH-Hz	IFM TYPE	CONV OUTLET	62AQ FLA	HEATER MODEL NO. CRHEATER—A00	ELECTRIC HEAT		POWER SUPPLY*		DISCONNECT SIZE	
						Actual kW†	FLA	MCA	MOCP**	FLA	LRA
50HJ005 (cont)	460-3-60 (cont)	HIGH	NO	15.1	—	—	—	18.6	25	19	97
					006	5.5	7.2	20.5	25	19	98
					008	10.6	13.8	28.8	35	19	98
					009	12.9	16.8	32.5	35	31	98
					008+008	21.1	27.7	46.0	50	43	108
			YES	15.1	—	—	—	21.3	25	25	102
					006	5.5	7.2	22.6	30	25	103
					008	10.6	13.8	30.9	35	25	103
					009	12.9	16.8	34.6	40	36	103
					008+008	21.1	27.7	48.1	50	48	110
50HJ006	208/230-1-60	STD	NO	15.1	—	—/—	—/—	61.4/ 61.4	70/ 70	62/ 62	276
					002	4.9 5.8	23.5/27.1	61.4/ 61.4	70/ 70	62/ 62	276
					003	6.5/ 8.0	31.4/36.3	65.8/ 71.8	70/ 80	64/ 69	276
					002+002	8.7/11.6	46.9/54.2	85.2/ 94.2	90/100	81/ 90	276
					003+003	13.0/16.0	62.8/72.5	105.1/117.2	110/125	100/111	276
					004+004	15.8/19.3	75.8/87.5	121.3/135.9	125/150	115/128	276
			YES	15.1	—	—/—	—/—	67.4/ 67.4	80/ 80	68/ 68	281
					002	4.9/ 5.8	23.5/27.1	67.4/ 67.4	80/ 80	68/ 68	281
					003	6.5 /8.0	31.4/36.3	70.6/ 76.0	80/ 80	69/ 74	281
					002+002	8.7/11.6	46.9/54.2	90.0/ 98.4	90/100	87/ 95	281
					003+003	13.0/16.0	62.8/72.5	109.9/121.4	110/125	105/116	281
					004+004	15.8/19.3	75.8/87.5	126.1/140.1	150/150	120/133	281
	208/230-3-60	STD	NO	15.1	—	—/—	—/—	44.0/ 44.0	50/ 50	46/46	228
					002	4.9/ 5.8	13.6/15.6	44.0/ 44.0	50/ 50	46/46	228
					004	7.9/ 9.6	21.9/25.3	50.9/ 55.1	60/ 60	49/53	228
					005	12.0/14.7	33.4/38.5	65.2/ 71.6	70/ 80	62/68	228
					004+004	15.8/19.3	43.8/50.5	78.2/ 86.7	80/ 90	74/82	228
					004+005	19.9/24.3	55.2/63.8	92.6/103.2	100/110	88/97	228
			YES	15.1	—	—/—	—/—	50.0/ 50.0	60/ 60	51/ 51	233
					002	4.9/ 5.8	13.6/15.6	50.0/ 50.0	60/ 60	51/ 51	233
					004	7.9/ 9.6	21.9/25.3	55.7/ 59.3	70/ 70	55/ 58	233
					005	12.0/14.7	33.4/38.5	70.0/ 75.8	80/ 80	68/ 73	233
					004+004	15.8/19.3	43.8/50.5	83.0/ 90.9	90/100	80/ 87	233
					004+005	19.9/24.3	55.2/63.8	97.4/107.4	100/110	93/102	233
		HIGH	NO	15.1	—	—/—	—/—	45.7/ 45.7	60/ 60	48/48	247
					002	4.9/ 5.8	13.6/15.6	45.7/ 45.7	60/ 60	48/48	247
					004	7.9/ 9.6	21.9/25.3	52.6/ 56.8	60/ 70	51/55	247
					005	12.0/14.7	33.4/38.5	66.9/ 73.3	70/ 80	64/70	247
					004+004	15.8/19.3	43.8/50.5	79.9/ 88.4	80/ 90	76/84	247
					004+005	19.9/24.3	55.2/63.8	94.3/104.9	100/110	90/99	247
			YES	15.1	—	—/—	—/—	51.7/ 51.7	60/ 60	53/ 53	252
					002	4.9/ 5.8	13.6/15.6	51.7/ 51.7	60/ 60	53/ 53	252
					004	7.9/ 9.6	21.9/25.3	57.4 61.0	70/ 70	57/ 60	252
					005	12.0/14.7	33.4/38.5	71.7/ 77.5	80/ 80	70/ 75	252
					004+004	15.8/19.3	43.8/50.5	84.7/ 92.6	90/100	82/ 89	252
					004+005	19.9/24.3	55.2/63.8	99.1/109.1	100/104	95/104	252
	460-3-60	STD	NO	15.1	—	—	—	22.2	25	23	114
					006	5.5	7.2	22.2	25	23	114
					008	10.6	13.8	28.8	35	23	114
					009	12.9	16.8	32.5	35	31	114
					008+008	21.1	27.7	46.0	50	43	114
					008+009	23.4	30.1	49.8	50	47	114
			YES	15.1	—	—	—	24.9	30	28	119
					006	5.5	7.2	24.9	30	28	119
					008	10.6	13.8	30.9	35	28	119
					009	12.9	16.8	34.6	40	36	119
					008+008	21.1	27.7	48.1	50	48	119
					008+009	23.4	30.1	51.9	60	52	119

LEGEND

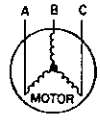
FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
UL — Underwriters' Laboratories

*The values listed in this table do not include power exhaust. See Power Exhaust table for requirements.
†Heater capacity (kW) is based on heater voltage of 240v or 480v. If power distribution voltage to unit varies from rated, heater kW will vary accordingly.
**Fuse or HACR breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. UL, Canada units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

$$= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 460-3-60.



AB = 452 v
BC = 464 v
AC = 455 v

$$\text{Average Voltage} = \frac{452 + 464 + 455}{3}$$

$$= \frac{1371}{3}$$

$$= 457$$

Determine maximum deviation from average voltage.
(AB) 457 – 452 = 5 v
(BC) 464 – 457 = 7 v
(AC) 457 – 455 = 2 v
Maximum deviation is 7 v.

Determine percent of voltage imbalance.

$$\text{\% Voltage Imbalance} = 100 \times \frac{7}{457}$$

$$= 1.53\%$$

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

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

Table 1D — Electrical Data (COBRA™ Energy Recovery 50HJ004-007 Units with 62AQ100) (cont)

UNIT SIZE	NOMINAL V-PH-Hz	IFM TYPE	CONV OUTLET	62AQ FLA	HEATER MODEL NO. CRHEATER—A00	ELECTRIC HEAT		POWER SUPPLY*		DISCONNECT SIZE	
						Actual kW†	FLA	MCA	MOCP**	FLA	LRA
50HJ006 (cont)	460-3-60 (cont)	HIGH	NO	15.1	—	—	—	23.0	30	24	123
					006	5.5	7.2	23.0	30	24	124
					008	10.6	13.8	29.6	35	24	124
					009	12.9	16.8	33.3	35	32	124
					008+008	21.1	27.7	46.8	50	44	124
					008+009	23.4	30.1	50.6	60	48	124
			YES	15.1	—	—	—	25.7	30	29	128
					006	5.5	7.2	25.7	30	29	129
					008	10.6	13.8	31.7	35	29	129
					009	12.9	16.8	35.4	40	37	129
					008+008	21.1	27.7	48.9	50	49	129
					008+009	23.4	30.1	52.7	60	53	129
50HJ007	208/230-3-60	STD	NO	15.1	—	—/—	—/—	47.9/ 47.9	60/ 60	49/49	260
					002	4.9/ 5.8	13.6/15.6	47.9/ 47.9	60/ 60	49/49	260
					004	7.9/ 9.6	21.9/25.3	50.9/ 55.1	60/ 60	49/53	260
					005	12.0/14.7	33.4/38.5	65.2/ 71.6	70/ 80	62/68	260
					004+004	15.8/19.3	43.8/50.5	78.2/ 86.7	80/ 90	74/82	260
					004+005	19.9/24.3	55.2/63.8	92.6/103.2	100/110	88/97	260
			YES	15.1	—	—/—	—/—	53.9/ 53.9	60/ 60	55/ 55	265
					002	4.9/ 5.8	13.6/15.6	53.9/ 53.9	60/ 60	55/ 55	265
					004	7.9/ 9.6	21.9/25.3	55.7/ 59.3	70/ 70	55/ 58	265
					005	12.0/14.7	33.4/38.5	70.0/ 75.8	80/ 80	68/ 73	265
					004+004	15.8/19.3	43.8/50.5	83.0/ 90.9	90/100	80/ 87	265
					004+005	19.9/24.3	55.2/63.8	97.4/107.4	100/110	93/102	265
		HIGH	NO	15.1	—	—/—	—/—	49.6/ 49.6	60/ 60	51/51	279
					002	4.9/ 5.8	13.6/15.6	49.6/ 49.6	60/ 60	51/51	279
					004	7.9/ 9.6	21.9/25.3	52.6/ 56.8	60/ 70	51/55	279
					005	12.0/14.7	33.4/38.5	66.9/ 73.3	70/ 80	64/70	279
					004+004	15.8/19.3	43.8/50.5	79.9/ 88.4	80/ 90	76/84	279
					004+005	19.9/24.3	55.2/63.8	94.3/104.9	100/110	90/99	279
			YES	15.1	—	—/—	—/—	55.6/ 55.6	60/ 60	57/ 57	284
					002	4.9/ 5.8	13.6/15.6	55.6/ 55.6	60/ 60	57/ 57	284
					004	7.9/ 9.6	21.9/25.3	57.4/ 61.0	70/ 70	57/ 60	284
					005	12.0/14.7	33.4/38.5	71.7/ 77.5	80/ 80	70/ 75	284
					004+004	15.8/19.3	43.8/50.5	84.7/ 92.6	90/100	82/ 89	284
					004+005	19.9/24.3	55.2/63.8	99.1/109.1	100/110	95/104	284
	460-3-60	STD	NO	15.1	—	—	—	22.8	30	23	127
					006	5.5	7.2	22.8	30	23	127
					008	10.6	13.8	28.8	35	23	127
					009	12.9	16.8	32.5	35	31	127
					008+008	21.1	27.7	46.0	50	43	127
					008+009	23.4	30.7	49.8	50	47	127
			YES	15.1	—	—	—	25.5	30	29	131
					006	5.5	7.2	25.5	30	29	132
					008	10.6	13.8	30.9	35	29	132
					009	12.9	16.8	34.6	40	36	132
					008+008	21.1	27.7	48.1	50	48	132
					008+009	23.4	30.7	51.9	60	52	132
		HIGH	NO	15.1	—	—	—	23.6	30	24	136
					006	5.5	7.2	23.6	30	24	137
					008	10.6	13.8	29.6	35	24	137
					009	12.9	16.8	33.3	35	32	137
					008+008	21.1	27.7	46.8	50	44	137
					008+009	23.4	30.7	50.6	60	48	137
			YES	15.1	—	—	—	26.3	30	30	141
					006	5.5	7.2	26.3	30	30	141
					008	10.6	13.8	31.7	35	30	141
					009	12.9	16.8	35.4	40	37	141
					008+008	21.1	27.7	48.9	50	49	141
					008+009	23.4	30.7	52.7	60	53	141

LEGEND

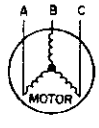
FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
UL — Underwriters' Laboratories

*The values listed in this table do not include power exhaust. See Power Exhaust table for requirements.
†Heater capacity (kW) is based on heater voltage of 240v or 480v. If power distribution voltage to unit varies from rated, heater kW will vary accordingly.
**Fuse or HACR breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. UL, Canada units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

$$= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 460-3-60.



AB = 452 v
BC = 464 v
AC = 455 v

$$\text{Average Voltage} = \frac{452 + 464 + 455}{3}$$

$$= \frac{1371}{3}$$

$$= 457$$

Determine maximum deviation from average voltage.
(AB) 457 – 452 = 5 v
(BC) 464 – 457 = 7 v
(AC) 457 – 455 = 2 v
Maximum deviation is 7 v.
Determine percent of voltage imbalance.

$$\text{\% Voltage Imbalance} = 100 \times \frac{7}{457}$$

$$= 1.53\%$$

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

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

Table 1E — Electrical Data (COBRA™ Energy Recovery 48HJ008-014 Units with 62AQ200)

UNIT SIZE	NOMINAL V-PH-HZ	IFM TYPE	CONV OUTLET	62AQ FLA	POWER SUPPLY*		DISCONNECT SIZE	
					MCA	MOCP†	FLA	LRA
48HJ008	208/230-3-60	STD	NO	21.9	60.1	70	66	366
			YES	21.9	66.1	70	71	371
		HIGH	NO	21.9	63.2	70	69	391
			YES	21.9	69.2	80	75	395
	460-3-60	STD	NO	10.2	29.4	35	32	184
			YES	10.2	32.1	35	34	186
		HIGH	NO	10.2	30.8	35	34	197
			YES	10.2	33.5	35	36	199
48HJ009	208/230-3-60	STD	NO	21.9	62.1	70	68	400
			YES	21.9	68.1	70	73	405
		HIGH	NO	21.9	65.2	70	71	425
			YES	21.9	71.2	80	77	429
	460-3-60	STD	NO	10.2	31.7	35	34	206
			YES	10.2	34.4	40	37	208
		HIGH	NO	10.2	33.1	35	36	219
			YES	10.2	35.8	40	38	221
48HJ012	208/230-3-60	STD	NO	21.9	74.9	80	81	465
			YES	21.9	80.9	90	87	469
		HIGH	NO	21.9	79.3	90	86	488
			YES	21.9	85.3	90	92	493
	460-3-60	STD	NO	10.2	35.1	40	38	234
			YES	10.2	37.8	45	40	236
		HIGH	NO	10.2	37.7	40	41	245
			YES	10.2	40.4	45	43	247
48HJ014	208/230-3-60	STD	NO	21.9	82.5	90	89	550
			YES	21.9	88.5	100	95	555
	460-3-60	STD	NO	10.2	39.3	45	43	270
			YES	10.2	42.0	50	45	272

LEGEND

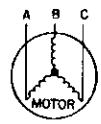
FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
UL — Underwriters' Laboratories

*The values listed in this table do not include power exhaust. See Power Exhaust table for requirements.
†Fuse or HACR breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. UL, Canada units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

$$= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 460-3-60.



AB = 452 v
BC = 464 v
AC = 455 v

$$\text{Average Voltage} = \frac{452 + 464 + 455}{3}$$

$$= \frac{1371}{3}$$

$$= 457$$

Determine maximum deviation from average voltage.
(AB) 457 – 452 = 5 v
(BC) 464 – 457 = 7 v
(AC) 457 – 455 = 2 v
Maximum deviation is 7 v.
Determine percent of voltage imbalance.

$$\text{\% Voltage Imbalance} = 100 \times \frac{7}{457}$$

$$= 1.53\%$$

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

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

Table 1F — Electrical Data (COBRA™ Energy Recovery 50HJ008-014 Units with 62AQ200)

UNIT SIZE	NOMINAL V-PH-Hz	IFM TYPE	CONV OUTLET	62AQ FLA	HEATER MODEL NO. CRHEATER—A00	ELECTRIC HEAT		POWER SUPPLY*		DISCONNECT SIZE	
						Actual kW†	FLA	MCA	MOCP**	FLA	LRA
50HJ008	208/230-3-60	STD	NO	21.9	—	—/—	—/—	60.1/ 60.1	70/ 70	66/ 66	366
					017	7.8/ 9.6	21.7/ 25.0	60.1/ 64.0	70/ 80	66/ 66	366
					010	12.0/14.7	33.4/ 38.5	74.5/ 80.9	80/ 90	72/ 78	366
					011	18.6/22.8	51.7/ 59.7	97.4/107.4	100/110	93/102	366
					012	24.0/29.4	66.7/ 77.0	116.2/129.0	125/150	111/122	366
					012+017	31.8/38.9	88.4/102.0	143.3/160.3	150/175	135/151	366
			YES	21.9	—	—/—	—/—	66.1/ 66.1	70/ 70	71/ 71	371
					017	7.8/ 9.6	21.7/ 25.0	66.1/ 68.2	80/ 80	71/ 71	371
					010	12.0/14.7	33.4/ 38.5	79.3/ 85.1	90/ 90	78/ 83	371
					011	18.6/22.8	51.7/ 59.7	102.2/111.6	110/125	99/107	371
					012	24.0/29.4	66.7/ 77.0	121.0/133.2	125/150	116/127	371
					012+017	31.8/38.9	88.4/102.0	148.1/164.5	150/175	141/156	371
		HIGH	NO	21.9	—	—/—	—/—	63.2/ 63.2	70/ 70	69/ 69	391
					017	7.8/ 9.6	21.7/ 25.0	63.2/ 67.1	80/ 80	69/ 69	391
					010	12.0/14.7	33.4/ 38.5	77.6/ 84.0	90/ 90	76/ 82	391
					011	18.6/22.8	51.7/ 59.7	100.5/110.5	110/125	97/106	391
					012	24.0/29.4	66.7/ 77.0	119.3/132.1	125/150	114/126	391
					012+017	31.8/38.9	88.4/102.0	146.4/163.4	150/175	139/155	391
			YES	21.9	—	—/—	—/—	69.2/ 69.2	80/ 80	75/ 75	395
					017	7.8/ 9.6	21.7/ 25.0	69.2/ 71.3	80/ 80	75/ 75	395
					010	12.0/14.7	33.4/ 38.5	82.4/ 88.2	90/100	81/ 86	395
					011	18.6/22.8	51.7/ 59.7	105.3/114.7	110/125	102/111	395
					012	24.0/29.4	66.7/ 77.0	124.1/136.3	125/150	120/131	395
					012+017	31.8/38.9	88.4/102.0	151.2/167.6	175/175	145/160	395
	460-3-60	STD	NO	21.9	—	—	—	29.4	35	32	184
					016	12.8	16.7	36.1	40	35	184
					013	15.2	19.8	40.0	45	38	184
					014	25.5	33.4	57.0	60	54	184
					015	30.3	39.7	64.8	70	61	184
					014+016	38.3	50.2	77.9	80	73	184
			YES	21.9	—	—	—	32.1	35	34	186
					016	12.8	16.7	38.2	45	37	186
					013	15.2	19.8	42.1	45	41	186
					014	25.5	33.4	59.1	60	57	186
					015	30.3	39.7	66.9	70	64	186
					014+016	38.3	50.2	80.0	80	76	186
		HIGH	NO	21.9	—	—	—	30.8	35	34	196
					016	12.8	16.7	37.5	40	36	197
					013	15.2	19.8	41.4	45	40	197
					014	25.5	33.4	58.4	60	56	197
					015	30.3	39.7	66.2	70	63	197
					014+016	38.3	50.2	79.3	80	75	197
			YES	21.9	—	—	—	33.5	35	36	198
					016	12.8	16.7	39.6	45	39	199
					013	15.2	19.8	43.5	45	42	199
					014	25.5	33.4	60.5	70	58	199
					015	30.3	39.7	68.3	70	65	199
					014+016	38.3	50.2	81.4	90	77	199
50HJ009	208/230-3-60	STD	NO	21.9	—	—/—	—/—	62.1/ 62.1	70/ 70	68/ 68	400
					017	7.8 /9.6	21.7/ 25.0	62.1/ 64.0	70/ 80	68/ 68	400
					010	12.0/14.7	33.4/ 38.5	74.5/ 80.9	80/ 90	72/ 78	400
					011	18.6/22.8	51.7/ 59.7	97.4/107.4	100/110	93/102	400
					012	24.0/29.4	66.7/ 77.0	116.2/129.0	125/150	111/122	400
					012+017	31.8/38.9	88.4/102.0	143.3/160.3	150/175	135/151	400
			YES	21.9	—	—/—	—/—	68.1/ 68.1	70/ 70	73/ 73	405
					017	7.8/ 9.6	21.7/ 25.0	68.1/ 68.2	80/ 80	73/ 73	405
					010	12.0/14.7	33.4/ 38.5	79.3/ 85.1	90/ 90	78/ 83	405
					011	18.6/22.8	51.7/ 59.7	102.2/111.6	110/125	99/107	405
					012	24.0/29.4	66.7/ 77.0	121.0/133.2	125/150	116/127	405
					012+017	31.8/38.9	88.4/102.0	148.1/164.5	150/175	141/156	405
		HIGH	NO	21.9	—	—/—	—/—	65.2/ 65.2	70/ 70	71/ 71	425
					017	7.8/ 9.6	21.7/ 25.0	65.2/ 67.1	80/ 80	71/ 71	425
					010	12.0/14.7	33.4/ 38.5	77.6/ 84.0	90/ 90	76/ 82	425
					011	18.6/22.8	51.7/ 59.7	100.5/110.5	110/125	97/106	425
					012	24.0/29.4	66.7/ 77.0	119.3/132.1	125/150	114/126	425
					012+017	31.8/38.9	88.4/102.0	146.4/163.4	150/175	139/155	425
			YES	21.9	—	—/—	—/—	71.2/ 71.2	80/ 80	77/ 77	429
					017	7.8/ 9.6	21.7/ 25.0	71.2/ 71.3	80/ 80	77/ 77	429
					010	12.0/14.7	33.4/ 38.5	82.4 / 88.2	90/100	81/ 86	429
					011	18.6/22.8	51.7/ 59.7	105.3/114.7	110/125	102/111	429
					012	24.0/29.4	66.7/ 77.0	124.1/136.3	125/150	120/131	429
					012+017	31.8/38.9	88.4/102.0	151.2/167.6	175/175	145/160	429
	460-3-60	STD	NO	21.9	—	—	—	31.7	35	34	206
					016	12.8	16.7	36.1	40	35	206
					013	15.2	19.8	40.0	45	38	206
					014	25.5	33.4	57.0	60	54	206
					015	30.3	39.7	64.8	70	61	206
					014+016	38.3	50.2	77.9	80	73	206
			YES	21.9	—	—	—	34.4	40	37	208
					016	12.8	16.7	38.2	45	37	208
					013	15.2	19.8	42.1	45	41	208
					014	25.5	33.4	59.1	60	57	208
					015	30.3	39.7	66.9	70	64	208
					014+016	38.3	50.2	80.0	80	76	208
		HIGH	NO	21.9	—	—	—	33.1	35	36	218
					016	12.8	16.7	37.5	40	36	219
					013	15.2	19.8	41.4	45	40	219
					014	25.5	33.4	58.4	60	56	219
					015	30.3	39.7	66.2	70	63	219
					014+016	38.3	50.2	79.3	80	75	219
			YES	21.9	—	—	—	35.8	40	38	220
					016	12.8	16.7	39.6	45	39	221
					013	15.2	19.8	43.5	45	42	221
					014	25.5	33.4	60.5	70	58	221
					015	30.3	39.7	68.3	70	65	221
					014+016	38.3	50.2	81.4	90	77	221

Table 1F — Electrical Data (COBRA™ Energy Recovery 50HJ008-014 Units with 62AQ200) (cont)

UNIT SIZE	NOMINAL V-PH-Hz	IFM TYPE	CONV OUTLET	62AQ FLA	HEATER MODEL NO. CRHEATER—A00	ELECTRIC HEAT		POWER SUPPLY*		DISCONNECT SIZE	
						Actual kW†	FLA	MCA	MOCP**	FLA	LRA
50HJ012	208/230-3-60	STD	NO	21.9	—	—/—	—/—	74.9/ 74.9	80/ 80	81/ 81	465
					017	7.8/ 9.6	21.7/ 25.0	74.9/ 74.9	80/ 80	81/ 81	465
					010	12.0/14.7	33.4/ 38.5	77.6/ 84.0	90/ 90	81/ 82	465
					012	24.0/29.4	66.7/ 77.0	119.3/132.1	125/150	114/126	465
					012+017	31.8/38.9	88.4/102.0	146.4/163.4	150/175	139/155	465
					010+012	37.5/45.9	104.2/104.2	166.2/156.2	175/175	157/176	465
			YES	21.9	—	—/—	—/—	80.9/ 80.9	90/ 90	87/ 87	469
					017	7.8/ 9.6	21.0/ 25.0	80.9/ 80.9	90/ 90	87/ 87	469
					010	12.0/14.7	33.4/ 38.5	82.4/ 88.2	90/100	87/ 87	469
					012	24.0/29.4	66.7/ 77.0	124.1/136.3	125/150	120/131	469
					012+017	31.8/38.9	88.4/102.0	151.2/167.6	175/175	145/160	469
					010+012	37.5/45.9	104.2/120.3	171.0/160.4	175/175	163/181	469
		HIGH	NO	21.9	—	—/—	—/—	79.3/ 79.3	90/ 90	86/ 86	488
					017	7.8/ 9.6	21.7/ 25.0	79.3/ 79.3	90/ 90	86/ 86	488
					010	12.0/14.7	33.4/ 38.5	82.3/ 88.8	90/100	86/ 87	488
					012	24.0/29.4	66.7/ 77.0	124.0/136.9	125/150	119/131	488
					012+017	31.8/38.9	88.4/102.0	151.1/168.2	175/175	144/160	488
					010+012	37.5/45.9	104.2/120.3	170.9/160.9	175/200	162/181	488
			YES	21.9	—	—/—	—/—	85.3/ 85.3	90/ 90	92/ 92	493
					017	7.8/ 9.6	21.0/ 25.0	85.3/ 85.3	90/ 90	92/ 92	493
					010	12.0/14.7	33.4/ 38.5	87.1/ 93.0	100/100	92/ 92	493
					012	24.0/29.4	66.7/ 77.0	128.8/141.1	150/150	125/136	493
					012+017	31.8/38.9	88.4/102.0	155.9/172.4	175/175	150/165	493
					010+012	37.5/45.9	104.2/120.3	175.7/165.1	200/200	168/186	493
	460-3-60	STD	NO	21.9	—	—	—	35.1	40	38	233
					016	12.8	16.7	37.5	40	38	234
					013	15.2	19.8	41.4	45	40	234
					015	30.3	39.7	66.2	70	63	234
					014+016	38.3	50.2	79.3	80	75	234
					013+015	45.9	60.1	76.7	90	86	234
			YES	21.9	—	—	—	37.8	40	40	235
					016	12.8	16.7	39.6	45	40	236
					013	15.2	19.8	43.5	45	42	236
					015	30.3	39.7	68.3	70	65	236
					014+016	38.3	50.2	81.4	90	77	236
					013+015	45.9	60.1	78.8	90	89	236
		HIGH	NO	21.9	—	—	—	37.7	40	41	245
					016	12.8	16.7	40.3	45	41	245
					013	15.2	19.8	44.3	50	43	245
					015	30.3	39.7	69.1	70	66	245
					014+016	38.3	50.2	82.1	90	78	245
					013+015	45.9	60.1	79.6	90	89	245
			YES	21.9	—	—	—	40.4	45	43	247
					016	12.8	16.7	42.4	50	43	247
					013	15.2	19.8	46.4	50	45	247
					015	30.3	39.7	71.2	80	68	247
					014+016	38.3	50.2	84.2	90	80	247
					013+015	45.9	60.1	81.7	90	92	247
50HJ014	208/230-3-60	STD	NO	21.9	—	—/—	—/—	82.5/ 82.5	90/ 90	89/ 89	550/550
					017	7.8/ 9.6	21.7/ 25.0	82.5/ 82.5	90/ 90	89/ 89	550/550
					010	12.0/14.7	33.4/ 38.5	82.3/ 88.8	90/100	89/ 89	550/550
					012	24.0/29.4	66.7/ 77.0	124.0/136.9	125/150	119/131	550/550
					012+017	31.8/38.9	88.4/102.0	151.1/168.2	175/175	144/160	550/550
					010+012	37.5/45.9	104.2/120.3	170.9/160.9	175/200	162/181	550/550
			YES	21.9	—	—/—	—/—	88.5/ 88.5	100/100	95/ 95	555/555
					017	7.8/ 9.6	21.7/ 25.0	88.5/ 88.5	100/100	95/ 95	555/555
					010	12.0/14.7	33.4/ 38.5	87.1/ 93.0	100/100	95/ 95	555/555
					012	24.0/29.4	66.7/ 77.0	128.8/141.1	150/150	125/136	555/555
					012+017	31.8/38.9	88.4/102.0	155.9/172.4	175/175	150/165	555/555
					010+012	37.5/45.9	104.2/120.3	175.7/165.1	200/200	168/186	555/555
	460-3-60	HIGH	NO	21.9	—	—	—	39.3	45	43	260
					016	9.6	16.7	40.3	45	43	260
					013	14.7	19.8	44.3	50	43	260
					015	29.4	39.7	69.1	70	66	260
					014+016	38.9	50.2	82.1	90	78	260
					013+015	45.9	60.1	79.6	90	89	260
			YES	21.9	—	—	—	42.0	45	45	262
					016	9.6	16.7	42.4	50	45	262
					013	14.7	19.8	46.4	50	45	262
					015	29.4	39.7	71.2	80	68	262
					014+016	38.9	50.2	84.2	90	80	262
					013+015	45.9	60.1	81.7	90	92	262

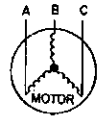
LEGEND

FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
UL — Underwriters' Laboratories

*The values listed in this table do not include power exhaust. See Power Exhaust table for requirements.
†Heater capacity (kW) is based on heater voltage of 240v or 480v. If power distribution voltage to unit varies from rated, heater kW will vary accordingly.
**Fuse or HACR breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. UL, Canada units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
Never operate a motor where a phase imbalance in supply voltage is greater than 2%.
Use the following formula to determine the percent of voltage imbalance.

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



Example: Supply voltage is 460-3-60.
AB = 452 v
BC = 464 v
AC = 455 v

$$\text{Average Voltage} = \frac{452 + 464 + 455}{3}$$

$$= \frac{1371}{3}$$

$$= 457$$

Determine maximum deviation from average voltage.
(AB) 457 – 452 = 5 v
(BC) 464 – 457 = 7 v
(AC) 457 – 455 = 2 v
Maximum deviation is 7 v.
Determine percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{7}{457}$$

$$= 1.53\%$$

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

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

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Table 1G — Electrical Data (COBRA™ Energy Recovery 48HJ008-014 Units with 62AQ300)

UNIT SIZE	NOMINAL V-PH-Hz	IFM TYPE	CONV OUTLET	62AQ FLA	POWER SUPPLY*		DISCONNECT SIZE	
					MCA	MOCP†	FLA	LRA
48HJ008	208/230-3-60	STD	NO	29.8	68.0	80	75	420
			YES	29.8	74.0	80	80	425
		HIGH	NO	29.8	71.1	80	78	445
			YES	29.8	77.1	80	84	449
	460-3-60	STD	NO	15.8	35.0	40	38	211
			YES	15.8	37.7	40	41	213
		HIGH	NO	15.8	36.4	40	40	224
			YES	15.8	39.1	45	43	226
48HJ009	208/230-3-60	STD	NO	29.8	70.0	80	77	454
			YES	29.8	76.0	80	82	459
		HIGH	NO	29.8	73.1	80	80	479
			YES	29.8	79.1	80	86	483
	460-3-60	STD	NO	15.8	37.3	40	41	233
			YES	15.8	40.0	45	43	235
		HIGH	NO	15.8	38.7	45	42	246
			YES	15.8	41.4	45	45	248
48HJ012	208/230-3-60	STD	NO	29.8	82.8	90	90	519
			YES	29.8	88.8	100	96	523
		HIGH	NO	29.8	87.2	100	95	542
			YES	29.8	93.2	100	101	547
	460-3-60	STD	NO	15.8	40.7	45	44	261
			YES	15.8	43.4	50	47	263
		HIGH	NO	15.8	43.3	50	47	272
			YES	15.8	46.0	50	50	274
48HJ014	208/230-3-60	STD	NO	29.8	90.4	100	98	604
			YES	29.8	96.4	100	104	609
	460-3-60	STD	NO	15.8	44.9	50	49	297
			YES	15.8	47.6	60	51	299

LEGEND

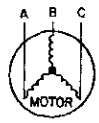
FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
UL — Underwriters Laboratories

*The values listed in this table do not include power exhaust. See Power Exhaust table for requirements.
†Fuse or HACR breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. UL, Canada units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

$$= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 460-3-60.



AB = 452 v
BC = 464 v
AC = 455 v

$$\text{Average Voltage} = \frac{452 + 464 + 455}{3}$$

$$= \frac{1371}{3}$$

$$= 457$$

Determine maximum deviation from average voltage.
(AB) 457 – 452 = 5 v
(BC) 464 – 457 = 7 v
(AC) 457 – 455 = 2 v
Maximum deviation is 7 v.
Determine percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{7}{457}$$

$$= 1.53\%$$

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

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

Table 1H — Electrical Data (COBRA™ Energy Recovery 50HJ008-014 Units with 62AQ300)

UNIT SIZE	NOMINAL V-PH-Hz	IFM TYP	CONV OUTLET	62AQ FLA	HEATER MODEL NO. CRHEATER---A00	ELECTRIC HEAT		POWER SUPPLY*		DISCONNECT SIZE	
						Actual kW†	FLA	MCA	MOCP**	FLA	LRA
50HJ008	208/230-3-60	STD	NO	21.9	—	—/—	—/—	68.0/ 68.0	80/ 80	75/ 75	420/420
					017	7.8/ 9.6	21.7/ 25.0	68.7/ 72.9	90/ 90	75/ 75	420/420
					010	12.0/14.7	33.4/ 38.5	83.3/ 89.7	100/100	81/ 87	420/420
					011	18.6/22.8	51.7/ 59.7	106.2/116.2	125/125	102/112	420/420
					012	24.0/29.4	66.7/ 77.0	125.0/137.8	150/150	120/131	420/420
					012+017	31.8/38.9	88.4/102.0	152.1/169.1	175/175	145/160	420/420
			YES	21.9	—	—/—	—/—	74.0/ 74.0	80/ 80	80/ 80	425/425
					017	7.8/ 9.6	21.7/ 25.0	74.0/ 77.1	90/ 90	80/ 80	425/425
					010	12.0/14.7	33.4/ 38.5	88.1/ 93.9	100/110	87/ 92	425/425
					011	18.6/22.8	51.7/ 59.7	111.0/120.4	125/125	108/116	425/425
					012	24.0/29.4	66.7/ 77.0	129.8/142.0	150/150	125/136	425/425
					012+017	31.8/38.9	88.4/102.0	156.9/173.3	175/175	150/165	425/425
		HIGH	NO	21.9	—	—/—	—/—	71.1/ 71.1	80/ 80	78/ 78	445/445
					017	7.8/ 9.6	21.7/ 25.0	71.8/ 76.0	90/ 90	78/ 78	445/445
					010	12.0/14.7	33.4/ 38.5	86.4/ 92.8	100/110	85/ 91	445/445
					011	18.6/22.8	51.7/ 59.7	109.3/119.3	125/125	106/115	445/445
					012	24.0/29.4	66.7/ 77.0	128.1/140.9	150/150	123/135	445/445
					012+017	31.8/38.9	88.4/102.0	155.2/172.2	175/175	148/164	445/445
			YES	21.9	—	—/—	—/—	77.1/ 77.1	80/ 80	84/ 84	449/449
					017	7.8/ 9.6	21.7/ 25.0	77.1/ 80.2	90/100	84/ 84	449/449
					010	12.0/14.7	33.4/ 38.5	91.2/ 97.0	110/110	90/ 96	449/449
					011	18.6/22.8	51.7/ 59.7	114.1/123.5	125/150	111/120	449/449
					012	24.0/29.4	66.7/ 77.0	132.9/145.1	150/150	129/140	449/449
					012+017	31.8/38.9	88.4/102.0	160.0/176.4	175/200	154/169	449/449
	460-3-60	STD	NO	21.9	—	—	—	35.0	40	38	211
					016	12.8	16.7	44.4	60	41	211
					013	15.2	19.8	48.3	60	45	211
					014	25.5	33.4	65.3	80	61	211
					015	30.3	39.7	73.1	90	68	211
					014+016	38.3	50.2	86.2	100	80	211
			YES	21.9	—	—	—	37.7	40	41	213
					016	12.8	16.7	46.5	60	44	213
					013	15.2	19.8	50.4	60	47	213
					014	25.5	33.4	67.4	80	63	213
					015	30.3	39.7	75.2	90	70	213
					014+016	38.3	50.2	88.3	100	82	213
		HIGH	NO	21.9	—	—	—	36.4	40	40	223
					016	12.8	16.7	45.8	60	43	224
					013	15.2	19.8	49.7	60	47	224
					014	25.5	33.4	66.7	80	62	224
					015	30.3	39.7	74.5	90	69	224
					014+016	38.3	50.2	87.6	100	81	224
			YES	21.9	—	—	—	39.1	45	43	225
					016	12.8	16.7	47.9	60	45	226
					013	15.2	19.8	51.8	60	49	226
					014	25.5	33.4	68.8	80	65	226
					015	30.3	39.7	76.6	90	72	226
					014+016	38.3	50.2	89.7	100	84	226
50HJ009	208/230-3-60	STD	NO	21.9	—	—/—	—	70.0/ 70.0	80/ 80	77/ 77	454/454
					017	7.8/ 9.6	16.4	70.0/ 72.9	90/ 90	77/ 77	454/454
					010	12.0/14.7	32.7	83.3/ 89.7	100/100	81/ 87	454/454
					011	18.6/22.8	—	106.2/116.2	125/125	102/112	454/454
					012	24.0/29.4	16.4	125.0/137.8	150/150	120/131	454/454
					012+017	31.8/38.9	32.7	152.1/169.1	175/175	145/160	454/454
			YES	21.9	—	—/—	—	76.0/ 76.0	80/ 80	82/ 82	459/459
					017	7.8/ 9.6	16.4	76.0/ 77.1	90/ 90	82/ 82	459/459
					010	12.0/14.7	32.7	88.1/ 93.9	100/110	87/ 92	459/459
					011	18.6/22.8	—	111.0/120.4	125/125	108/116	459/459
					012	24.0/29.4	16.4	129.8/142.0	150/150	125/136	459/459
					012+017	31.8/38.9	32.7	156.9/173.3	175/175	150/165	459/459
		HIGH	NO	21.9	—	—/—	—/—	73.1/ 73.1	80/ 80	80/ 80	479/479
					017	7.8/ 9.6	21.7/ 25.0	73.1/ 76.0	90/ 90	80/ 80	479/479
					010	12.0/14.7	33.4/ 38.5	86.4/ 92.8	100/110	85/ 91	479/479
					011	18.6/22.8	51.7/ 59.7	109.3/119.3	125/125	106/115	479/479
					012	24.0/29.4	66.7/ 77.0	128.1/140.9	150/150	123/135	479/479
					012+017	31.8/38.9	88.4/102.0	155.2/172.2	175/175	148/164	479/479
			YES	21.9	—	—/—	—/—	79.1/ 79.1	80/ 80	86/ 86	483/483
					017	7.8/ 9.6	21.7/ 25.0	79.1/ 80.2	90/100	86/ 86	483/483
					010	12.0/14.7	33.4/ 38.5	91.2/ 97.0	110/110	90/ 96	483/483
					011	18.6/22.8	51.7/ 59.7	114.1/123.5	125/150	111/120	483/483
					012	24.0/29.4	66.7/ 77.0	132.9/145.1	150/150	129/140	483/483
					012+017	31.8/38.9	88.4/102.0	160.0/176.4	175/200	154/169	483/483
	460-3-60	STD	NO	21.9	—	—	—	37.3	40	41	233
					016	12.8	16.7	44.4	60	41	233
					013	15.2	19.8	48.3	60	45	233
					014	25.5	33.4	65.3	80	61	233
					015	30.3	39.7	73.1	90	68	233
					014+016	38.3	50.2	86.2	100	80	233
			YES	21.9	—	—	—	40.0	45	43	235
					016	12.8	16.7	46.5	60	44	235
					013	15.2	19.8	50.4	60	47	235
					014	25.5	33.4	67.4	80	63	235
					015	30.3	39.7	75.2	90	70	235
					014+016	38.3	50.2	88.3	100	82	235
		HIGH	NO	21.9	—	—	—	38.7	45	42	245
					016	12.8	16.7	45.8	60	43	246
					013	15.2	19.8	49.7	60	47	246
					014	25.5	33.4	66.7	80	62	246
					015	30.3	39.7	74.5	90	69	246
					014+016	38.3	50.2	87.6	100	81	246
			YES	21.9	—	—	—	41.4	45	45	247
					016	12.8	16.7	47.9	60	45	248
					013	15.2	19.8	51.8	60	49	248
					014	25.5	33.4	68.8	80	65	248
					015	30.3	39.7	76.6	90	72	248
					014+016	38.3	50.2	89.7	100	84	248

Table 1H — Electrical Data (COBRA™ Energy Recovery 50HJ008-014 Units with 62AQ300) (cont)

UNIT SIZE	NOMINAL V-PH-Hz	IFM TYP	CONV OUTLET	62AQ FLA	HEATER MODEL NO. CRHEATER---A00	ELECTRIC HEAT		POWER SUPPLY*		DISCONNECT SIZE	
						Actual kW†	FLA	MCA	MOCP**	FLA	LRA
50HJ012	208/230-3-60	STD	NO	21.9	—	—/—	—/—	82.8/ 82.8	90/ 90	90/ 90	519
					017	7.8/ 9.6	21.7/ 25.0	82.8/ 82.8	90/ 90	90/ 90	519
					010	12.0/14.7	33.4/ 38.5	86.4/ 92.8	100/110	90/ 91	519
					012	24.0/29.4	66.7/ 77.0	128.1/140.9	150/150	123/135	519
					012+017	31.8/38.9	88.4/102.0	155.2/172.2	175/175	148/164	519
					012+010	37.5/45.9	104.2/104.2	175.0/165.0	175/200	166/185	519
			YES	21.9	—	—/—	—/—	88.8/ 88.8	100/100	96/ 96	523
					017	7.8/ 9.6	21.0/ 25.0	88.8/ 88.8	100/100	96/ 96	523
					010	12.0/14.7	33.4/ 38.5	91.2/ 97.0	110/110	96/ 96	523
					012	24.0/29.4	66.7/ 77.0	132.9/145.1	150/150	129/140	523
					012+017	31.8/38.9	88.4/102.0	160.0/176.4	175/200	154/169	523
					012+010	37.5/45.9	104.2/120.3	179.8/169.2	200/200	172/190	523
		HIGH	NO	21.9	—	—/—	—/—	87.2/ 87.2	100/100	95/ 95	542
					017	7.8/ 9.6	21.7/ 25.0	87.2/ 87.2	100/100	95/ 95	542
					010	12.0/14.7	33.4/ 38.5	90.8/ 97.2	100/110	95/ 96	542
					012	24.0/29.4	66.7/ 77.0	132.5/145.3	150/150	128/140	542
					012+017	31.8/38.9	88.4/102.0	159.6/176.6	175/200	153/169	542
					012+010	37.5/45.9	104.2/120.3	179.4/169.4	200/200	171/190	542
			YES	21.9	—	—/—	—/—	93.2/ 93.2	100/100	101/101	547
					017	7.8/ 9.6	21.0/ 25.0	93.2/ 93.2	100/100	101/101	547
					010	12.0/14.7	33.4/ 38.5	95.6/101.4	110/110	101/101	547
					012	24.0/29.4	66.7/ 77.0	137.3/149.5	150/150	134/145	547
					012+017	31.8/38.9	88.4/102.0	164.4/180.8	175/200	159/174	547
					012+010	37.5/45.9	104.2/120.3	184.2/173.6	200/200	177/195	547
	460-3-60	STD	NO	21.9	—	—	—	40.7	45	44	260
					016	12.8	16.7	45.8	60	44	261
					013	15.2	19.8	49.7	60	47	261
					015	30.3	39.7	66.7	80	62	261
					014+016	38.3	50.2	87.6	100	81	261
					015+013	45.9	60.1	85.0	110	93	261
			YES	21.9	—	—	—	43.4	45	47	262
					016	12.8	16.7	47.9	60	47	263
					013	15.2	19.8	51.8	60	49	263
					015	30.3	39.7	68.8	80	65	263
					014+016	38.3	50.2	89.7	100	84	263
					015+013	45.9	60.1	87.1	110	95	263
		HIGH	NO	21.9	—	—	—	43.3	50	47	272
					016	12.8	16.7	48.4	60	47	272
					013	15.2	19.8	52.3	60	50	272
					015	30.3	39.7	69.3	80	65	272
					014+016	38.3	50.2	90.2	100	84	272
					015+013	45.9	60.1	87.6	110	96	272
			YES	21.9	—	—	—	46.0	50	50	274
					016	12.8	16.7	50.5	60	50	274
					013	15.2	19.8	54.4	60	52	274
					015	30.3	39.7	71.4	90	68	274
					014+016	38.3	50.2	92.3	100	87	274
					015+013	45.9	60.1	89.7	110	98	274
50HJ014	208/230-3-60	STD	NO	21.9	—	—/—	—/—	90.4/ 90.4	100/100	98/ 98	604/604
					017	7.8/ 9.6	21.7/ 25.0	90.4/ 90.4	100/100	98/ 98	604/604
					010	12.0/14.7	33.4/ 38.5	90.8/ 97.2	100/110	98/ 98	604/604
					012	24.0/29.4	66.7/ 77.0	132.5/145.3	150/150	128/140	604/604
					012+017	31.8/38.9	88.4/102.0	159.6/176.6	175/200	153/169	604/604
					012+010	37.5/45.9	104.2/120.3	179.4/169.4	200/200	171/190	604/604
			YES	21.9	—	—/—	—/—	96.4/ 96.4	100/100	104/104	609/609
					016	7.8/ 9.6	21.7/ 25.0	96.4/ 96.4	100/100	104/104	609/609
					013	12.0/14.7	33.4/ 38.5	95.6/101.4	110/110	104/104	609/609
					015	24.0/29.4	66.7/ 77.0	137.3/149.5	150/150	134/145	609/609
					014+016	31.8/38.9	88.4/102.0	164.4/180.8	175/200	159/174	609/609
					015+013	37.5/45.9	104.2/120.3	184.2/173.6	200/200	177/195	609/609
	460-3-60	HIGH	NO	21.9	—	—	—	44.9	50	49	287
					016	12.8	16.7	48.4	60	49	287
					013	15.2	19.8	52.3	60	50	287
					015	30.3	39.7	48.4	70	49	287
					014+016	38.3	50.2	90.2	100	84	287
					015+013	45.9	60.1	87.6	110	96	287
			YES	21.9	—	—	—	47.6	50	51	289
					016	12.8	16.7	50.5	60	51	289
					013	15.2	19.8	54.4	60	52	289
					015	30.3	39.7	50.5	70	51	289
					014+016	38.3	50.2	92.3	100	87	289
					015+013	45.9	60.1	89.7	110	98	289

LEGEND

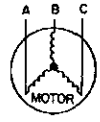
FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
UL — Underwriters' Laboratories

*The values listed in this table do not include power exhaust. See Power Exhaust table for requirements.
†Heater capacity (kW) is based on heater voltage of 240v or 480v. If power distribution voltage to unit varies from rated, heater kW will vary accordingly.
**Fuse or HACR breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. UL, Canada units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
Never operate a motor where a phase imbalance in supply voltage is greater than 2%.
Use the following formula to determine the percent of voltage imbalance.

$$= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 460-3-60.



AB = 452 v
BC = 464 v
AC = 455 v

$$\text{Average Voltage} = \frac{452 + 464 + 455}{3}$$

$$= \frac{1371}{3}$$

$$= 457$$

Determine maximum deviation from average voltage.
(AB) 457 – 452 = 5 v
(BC) 464 – 457 = 7 v
(AC) 457 – 455 = 2 v
Maximum deviation is 7 v.
Determine percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{7}{457}$$

$$= 1.53\%$$

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

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

INDOOR AIR QUALITY AND CO_2 SENSORS — If a space CO_2 sensor is desired, a field-installed 25% outdoor-air damper must be used for proper Demand Control Ventilation (DCV) operation. If not, the 62AQ Energy$Recycler unit outdoor-air dampers will remain shut unless the space CO_2 levels are above the CO_2 set point.

The 25% outdoor-air damper should be placed in the normal location on the base rooftop unit. See Fig. 24. This damper will allow additional outdoor air to be brought in if the CO_2 level is high, independent of 62AQ unit operation. In the occupied mode, the 62AQ unit will usually bring in enough fresh air to maintain CO_2 levels below the set point. If not, the 25% outdoor-air damper will open to allow additional fresh air to be brought in. See Fig. 25 and 26 for control wiring. The recommended CO_2 sensor is a 33ZCSENCO2 and the recommended 25% outdoor-air damper is a CRTWOPOS001A01 or a CRTWOPOS002A01 (dependent on rooftop unit size). See 33ZCSENC02 or 25% outdoor-air damper installation instructions for additional information.

Step 9 — Assemble and Mount Supply-Air Hood — The hood kit supplied with the 62AQ Energy$Recycler™ section is needed to complete this installation. See Fig. 27. The Energy$Recycler section supply air hood installs around its motorized damper inlet.

NOTE: Mount the hood sides to the Energy$Recycler section first, and then the hood top for easier installation. The thermostats are shipped factory-wired and taped behind the damper blade of the Energy$Recycler section. Knobs and screws are in hood package.

1. Assemble and mount supply air hood as shown in Fig. 27.
2. Discard the tape that holds the thermostats behind the damper plates. Mount thermostats to the hood sides of the energy recovery section unit into the holes provided, with thermostat terminals facing up. See Fig. 27. Mount outside cooling set point thermostat part number HH22HA060 (white label) on the left side of the hood. See Fig. 27.
3. Mount the outside heating thermostat part number HH22HA065 (red label) on the right side of the hood. See Fig. 27.
4. From the outside of the unit's side panels fasten the thermostat(s) with two mounting screws, with the quick connect terminals face up. See Fig. 27.
5. Install thermostat knobs (provided in kit). See Fig. 27.
6. Set supply air quantity (on units with optional factory-installed supply air fan [GA] or field-installed accessory supply air fan kit [CRFANKIT001-006A00]). Select the fan speed and damper position to obtain desired cfm. Relocate damper stops to the desired position on the damper support rail and adjust the fan speed by relocating the wire on the supply fan motor terminal block. Factory set position is 45 degrees for the damper position, and medium speed for the motor. Relocate stops to top hole for 30 degrees, bottom hole for 60 degrees, and remove stops for 90 degrees (see Fig. 27).
7. Install the aluminum filter screen and end cap with screws along the top, as shown in Fig. 27.

Step 10 — Mount the Barometric Relief Damper — The hood kit supplied with the energy recovery section is needed to complete this installation. The exhaust air hood (that includes the barometric relief damper) must be assembled and installed on the energy recovery section per the instructions below. See Fig. 28.

1. Install the barometric relief damper onto the energy recovery section by mounting the hinge with 2 screws then sliding in the hinge pin. See Fig. 28.
2. Install damper limiter for 30, 45, or 60 degree angles. Limiter pin not required for 90-degree setting (set to the desired position based on cfm requirements and fan speed). See Fig. 28. Fan speed is adjusted by relocating wires on fan terminal blocks.
3. Loosen compressor bolts and remove shipping blocks from under compressor on the 62AQ060 and 62AQ100 sizes only.
4. Install exhaust hood.
5. Install wire guard as shown in Fig. 28.

⚠ WARNING

Never operate the unit without the wire guard in place.

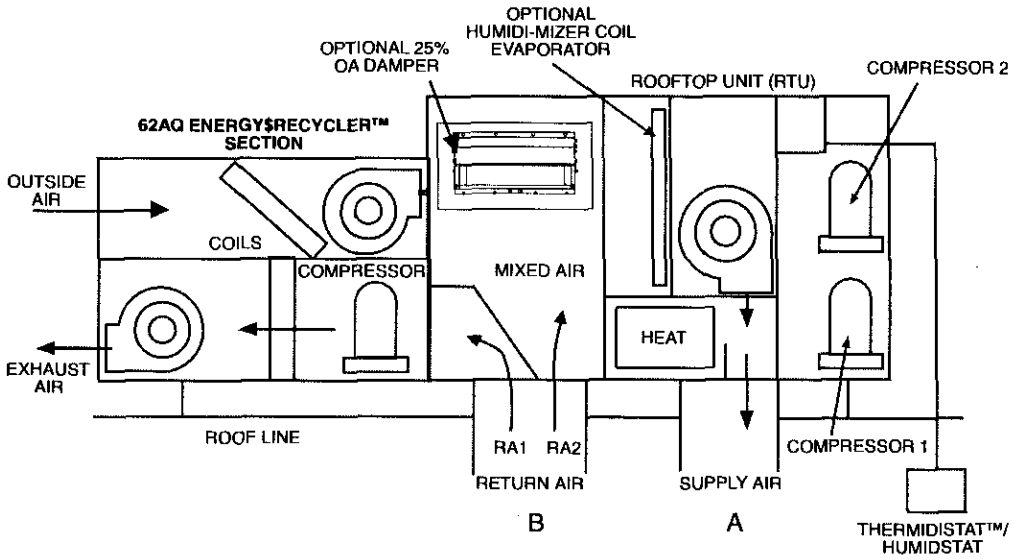
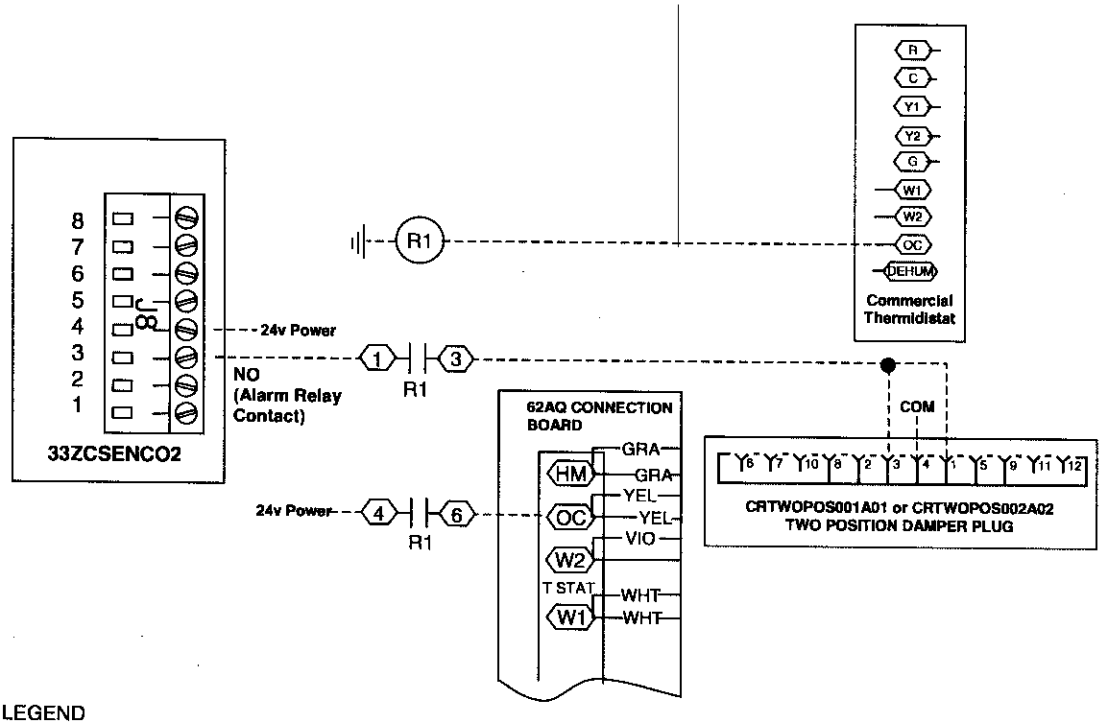


Fig. 24 — 25% Outdoor Air Damper Location

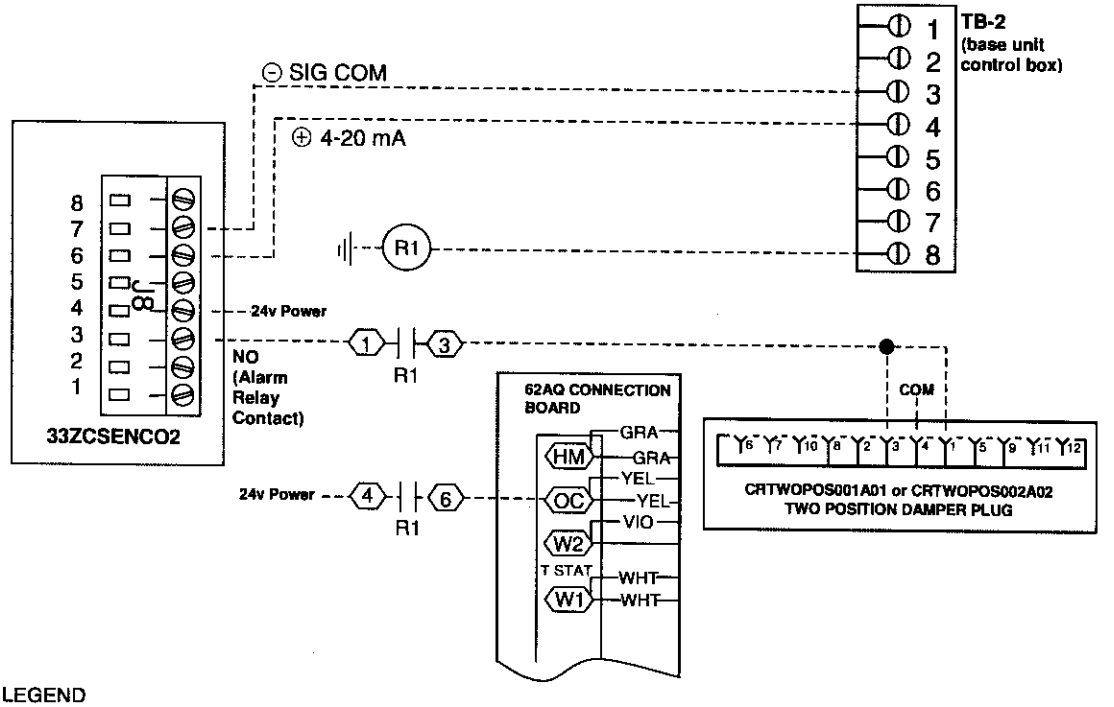


LEGEND

- - - - Field-Provided Wires

NOTES:
1. R1 is a 2-pole, normally open relay (recommended relay: HN61KK040).
2. The space CO_2 level and set point can be read and changed locally.

Fig. 25 — CO_2 Sensor Wiring with Electro-Mechanical Controls



LEGEND

- - - - Field-Provided Wires

NOTES:
1. R1 is a 2-pole, normally open relay (recommended relay: HN61KK040).
2. The space CO_2 level can be read on the Carrier Comfort Network® system; set point must be changed locally.

Fig. 26 — CO_2 Sensor Wiring with Factory-Installed PremierLink™ Direct Digital Control (DDC)

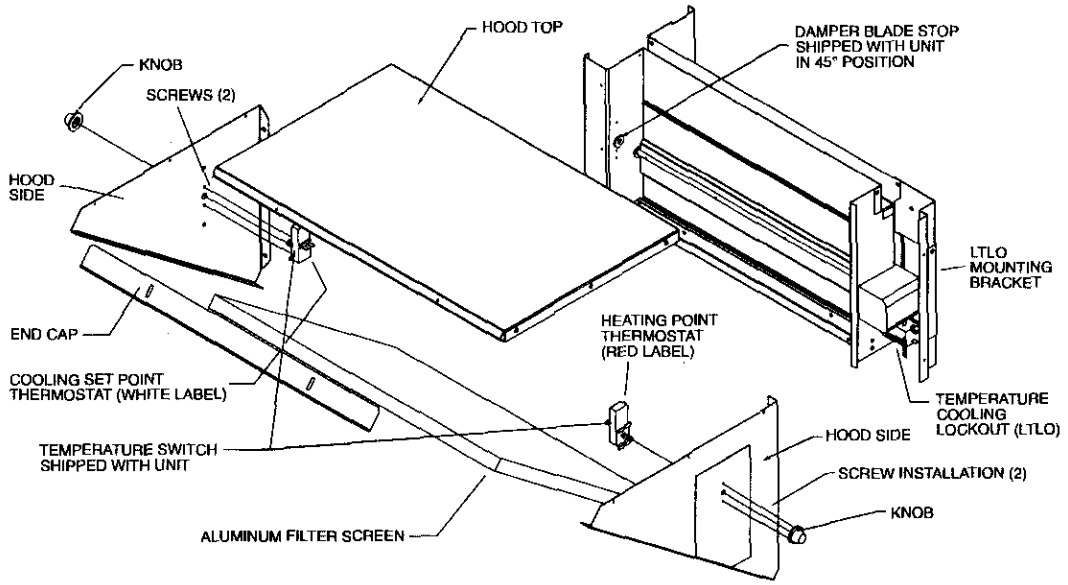


Fig. 27 — Energy Recovery Section Supply-Air Hood Assembly

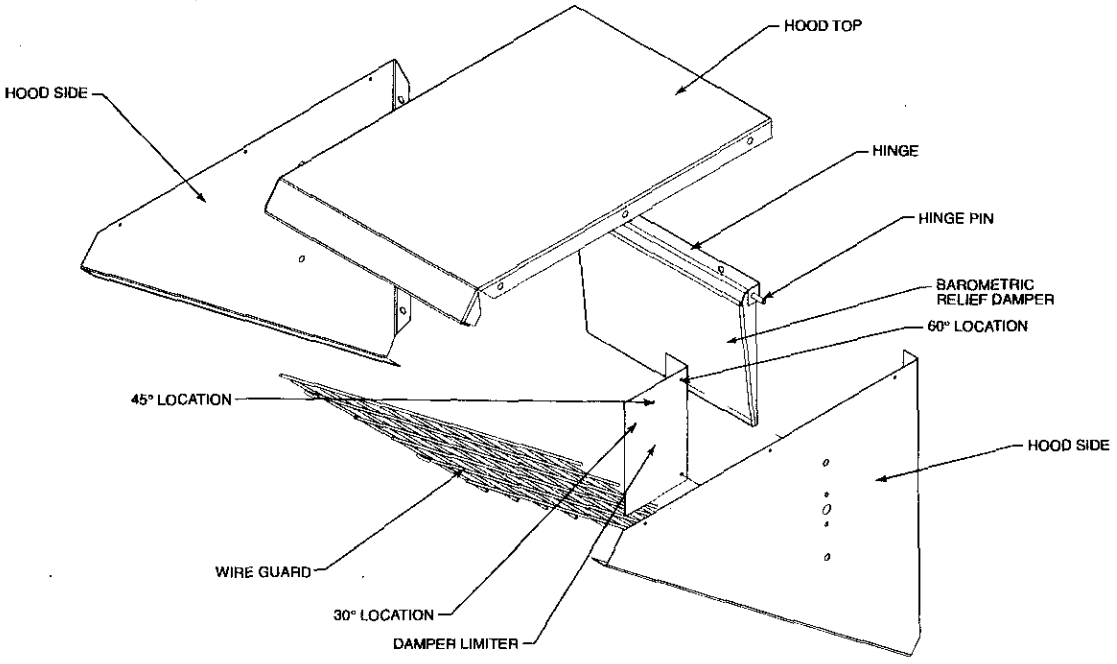


Fig. 28 — Energy Recovery Section Barometric Exhaust Air Hood Assembly

Step 11 — Set the Outdoor Cooling and Heating Thermostats

IMPORTANT: The 62AQ Energy$Recycler™ section is shipped with an outdoor thermostat set at 55 F which locks out mechanical cooling on the rooftop section and the Energy$Recycler section compressor. If this feature is not desirable, the rooftop unit's compressor can be allowed to run by relocating both gray wires to the same side of the low temperature lockout thermostat (LTLO) leaving the white wire on the opposite pole, locking out only the Energy$Recycler section compressor. The LTLO is also accessible by removing the filter access panel and the door of the damper mounting bracket.

COOLING — During the unoccupied period, the economizer mode of operation is used as the first stage of cooling. When the outside air temperature is below the cooling thermostat set point, the outside air will be used for first stage cooling.

HEATING — The heating thermostat should be adjusted to the second stage balance point (heat output of the energy recovery section plus the heat output of the first stage on rooftop unit equals building load at this temperature). Above this setting, first stage heating will be the energy recovery section unit and second stage will be the first stage of the rooftop unit. Below this point, first stage heating will be the Energy$Recycler section plus first stage heating of the rooftop unit. The second stage will be the second stage of the rooftop unit.

LIGHT COMMERCIAL THERMIDISTAT™ ACCESSORY

General — A light commercial Thermidistat accessory (part number TSTATCCPLH01-B) or PremierLink™ controller with humidistat is required for field installation for each unit to control the Energy$Recycler section. See Fig. 29.

The light commercial Thermidistat is a 7-day programmable, wall-mounted, low-voltage control that combines temperature and humidity control in a single unit. It provides separate set points for heating and cooling, and adds dehumidification with separate set points for occupied and unoccupied periods. Different heating and cooling set points and times are programmable for up to 4 periods per day and 7 days per week. The dehumidification output provides direct control of the Energy$Recycler section, rooftop section fans, and the rooftop section compressor in response to the programmed time schedules and temperature settings. During power loss an internal memory stores programs and settings for unlimited time, and the clock continues to run for at least 8 hours. Batteries are not used.

Power — Note that this control does not require batteries and is not "power stealing." It does require 24 vac (R and C terminals) from the rooftop section's low-voltage transformer to be connected to it for proper operation. The control will not operate without these 2 connections. See Fig. 30.

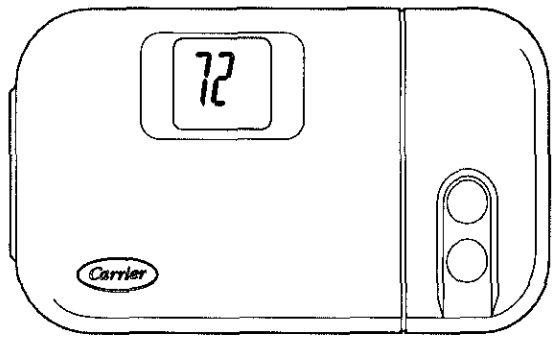
Dehumidification Equipment and Connections — The dehumidification output terminals on the light commercial Thermidistat device must be connected to the dehumidify input terminals on the Energy$Recycler section. Additionally, if the rooftop section is equipped with the optional Humidi-MiZer™ dehumidification accessory, a relay in the Energy$Recycler section energizes the Humidi-MiZer solenoid to activate the enhanced dehumidification mode.

Step 1 — Select Light Commercial Thermidistat Location — The light commercial Thermidistat should be mounted:

- Approximately 5 ft (1.5 m) from floor.
- Close to or in a frequently used room, preferably on an inside partitioning wall.
- On a section of wall without pipes or ductwork.

The light commercial Thermidistat device should NOT be mounted:

- Close to a window, on an outside wall, or next to a door leading to the outside.
- Exposed to direct light and heat from a lamp, sun, fireplace, or other temperature-radiating object that may cause a false reading.
- Close to or in direct airflow from supply registers and return-air registers.
- In areas with poor air circulation, such as behind a door or in an alcove.



HEIGHT (in.)	WIDTH (in.)	DEPTH (in.)
4 1/4	7 1/2	1 3/8

Fig. 29 — Light Commercial Thermidistat Accessory

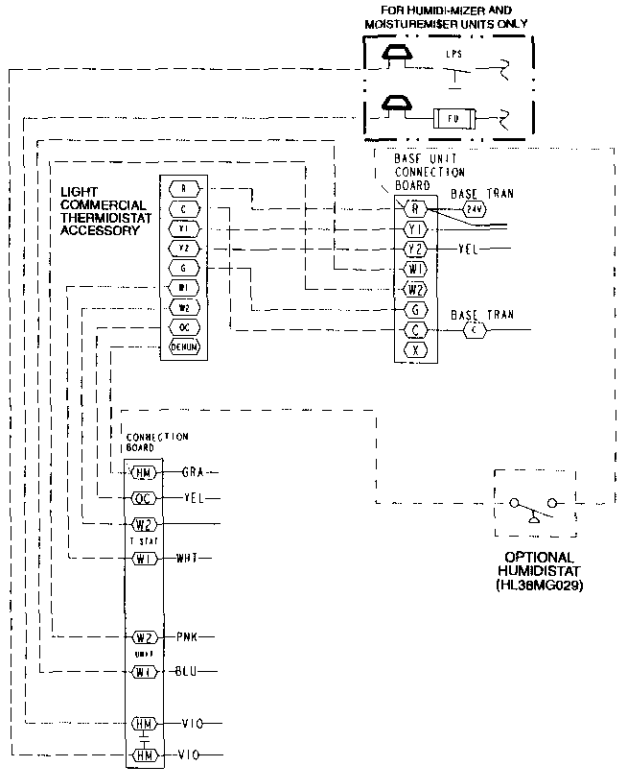


Fig. 30 — Light Commercial Thermidistat Accessory Low-Voltage Connections

Step 2 — Set DIP Switches — There is a 4-section DIP (Dual In-line Package) switch within the light commercial Thermidistat™ device which must be properly set by the installer. It is easiest to set these 4 switches before the light commercial Thermidistat device is mounted to the wall, so complete the following steps first:

1. Open hinged light commercial Thermidistat cover.
2. Remove cover completely by gently snapping it apart at the hinge.
3. Switches are located in upper right corner of circuit board. To change switch position, use corner of a small screwdriver to slide switch to opposite position.
4. After switches have been set, do not reassemble the 2 halves. The rear plastic will be first mounted to wall.

SWITCH 1 — Not used

SWITCH 2 — Not used

SWITCH 3 — SMART/CONVENTIONAL RECOVERY — Switch 3 selects between conventional or smart recovery from setback. Conventional recovery changes to new set point at preprogrammed time. Smart recovery, which is active in both heating and cooling, starts selected cycle 90 minutes earlier and smoothly adjusts set point so room will arrive at programmed temperature at programmed time.

NOTE: The occupied output is only energized at the preprogrammed time.

To Set:

OFF — for smart recovery. This is factory default.
ON — for conventional recovery.

SWITCH 4 — INSTALLER TEST OFF/ON — Switch 4 selects a special installer test mode that assists with checkout and troubleshooting. See Step 5 — Conduct Light Commercial Thermidistat Start-Up and Checkout.

To Set:

OFF — for normal operation. (Factory default setting.)
ON — for Installer Test mode.

Step 3 — Install Light Commercial Thermidistat Device

⚠ WARNING

Before installing light commercial Thermidistat device, turn off all power to COBRA™ energy recovery units. There may be more than one power disconnect. Electrical shock can cause personal injury or death. Install lockout tags on disconnects.

1. Turn off all power to equipment. Tag disconnect.
2. If an existing thermostat is being replaced:
   a. Remove existing thermostat from wall.
   b. Disconnect wires from existing thermostat, one at a time.
   c. As each wire is disconnected, record wire color and terminal marking.
   d. New or additional wire may be needed to accommodate added humidity outputs transformer common.
   e. Discard or recycle old thermostat.

⚠ WARNING

Mercury is a hazardous waste and MUST be disposed of properly.

3. Route wires through large hole in rear plastic. Level rear plastic (separated from front plastic in Step 2 — Set DIP Switches, on this page). Level rear plastic against wall (for aesthetic value only — light commercial Thermidistat device does not need to be leveled for proper operation) and mark wall through 2 mounting holes.
4. Drill two $^3/_{16}$-in. mounting holes in wall where marked.
5. Secure rear plastic to wall with 2 screws and anchors provided. Additional mounting holes are available for more secure mounting if needed. Make sure all wires extend through hole in mounting base.
6. Adjust length and routing of each wire to reach proper connector block and terminal on mounting base with $^1/_4$-in. extra length. Strip only $^1/_4$ in. of insulation from each wire to prevent adjacent wires from shorting together when connected.
7. Match and connect equipment wires to proper terminals of each connector block. Remember R and C must be connected for proper operation (see Fig. 30).

⚠ CAUTION

Improper wiring or installation may damage light commercial Thermidistat device. Check to make sure wiring is correct before proceeding with installation or turning on power. Refer to wiring schematic in the Troubleshooting section of this manual.

8. Push any excess wire into wall and against rear plastic. Seal hole in wall to prevent air leaks. Leaks can affect operation.
9. Reattach light commercial Thermidistat body to mounting base by first reattaching hinge.
10. Close light commercial Thermidistat assembly, making sure pins on back of circuit board align with sockets in connector.
11. Turn on power to equipment.

On power up, all display segments will light for 2 seconds. For the next 8 seconds, a 2-digit code appears on LED display that identifies light commercial Thermidistat configuration:

CP — Commercial Product

Step 4 — Set Light Commercial Thermidistat Configuration (Fig. 31 and 32) — Configuration options, like DIP switch settings, are intended to be selected at installation and normally are not modified by the owner. These options must be made as part of the installation. A special procedure allows entry into the Configuration mode. While in configuration mode, up to 10 selections can be made. A description of each selection and how to use the Configuration mode are as follows:

CONFIGURATION OPTIONS — SUMMARY

Option 1 — Anticipator adjustment
Option 2 — Clean filter timer adjustment
Option 3 — English/Metric selection
Option 4 — Fan (G) ON with W selection
Option 9 — Holiday heat set point
Option 10 — Holiday cool set point
Option 11 — Holiday humidity set point
Option 13 — Room temperature offset adjustment
Option 14 — Heat cool deadband adjustment
Option 21 — Keyboard lock

TO ENTER CONFIGURATION MODE — Press and hold FAN button for approximately 10 seconds until COOL set point display indicates a flashing "01". The light commercial Thermidistat device is now in Configuration mode. It will automatically exit this mode if no button is pressed for 3 minutes. Pressing HOLD End button will exit the Configuration mode immediately.

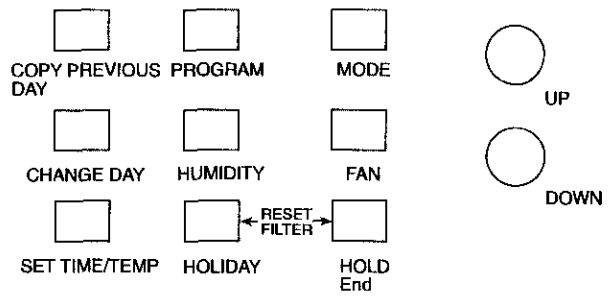


Fig. 31 — Light Commercial Thermidistat™ Keypad

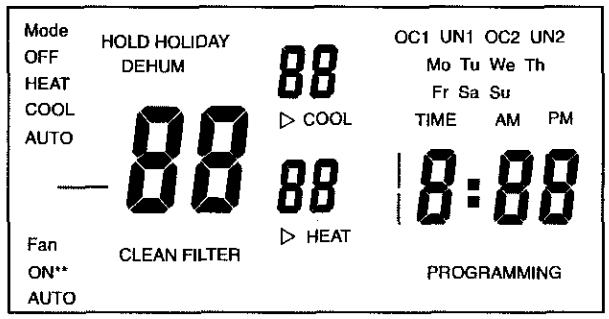


Fig. 32 — Light Commercial Thermidistat LCD on Power Up

WHILE IN CONFIGURATION MODE — The upper small (COOL set point) display indicates selected option number and large display indicates selection made within that option. One of these will be flashing. The up and down set point buttons are used, both to move between available options and to make selection for each option. When option number (small display) is flashing, the up and down set point buttons allows for scrolling through options moving between available option numbers. After desired option number has been selected, press SET TIME/TEMP button once. The large display will now flash, indicating that up and down set point buttons now control available choices within that option. Each press of SET TIME/TEMP button switches between available option (small display) and available selections within each option (large display).

Option 1 — Anticipator Adjustment — This adjustment controls sensitivity and cycle rate of light commercial Thermidistat device. Higher numbers decrease sensitivity and slow cycle rate. Lower numbers increase sensitivity and cycle rate. Anticipator values can range from 1 to 9. Factory default is 3. This default selection provides optimum performance in nearly all installations. Try it first; do not change setting unless there is evidence of need to do so.

Unlike conventional anticipators, this setting is not determined by current draw. There is no need to measure, know, or compensate for current draw. There is also no droop with this light commercial Thermidistat device. Regardless of setting and number of stages, both heating and cooling will control to their respective set points.

TO ADJUST:

1. Enter Configuration mode. The upper small (COOL set point) display will be flashing 01. If not, use up and down set point buttons to move it to 01.
2. Press SET TIME/TEMP button once to flash current selection of 1, 2, 3, 4, 5, 6, 7, 8, or 9 on large display. Factory default is 3.
3. Use up and down set point buttons to move to desired anticipator setting.
4. Press SET TIME/TEMP button again to flash small upper display for selection of another option, or press HOLD End to exit Configuration mode.

Option 2 — Clean Filter Timer — Select hours of blower operation (heating, cooling, or fan) before CLEAN FILTER icon is displayed. With OFF selected, icon will never come on, disabling this feature. Time selection can range from 400 to 3600 blower operation hours by selecting numbers 1 through 9. (Time is 400 times number selected.) Factory default is 2 (800 hr). Recommended blower operation hours selections are: disposable filter — 400 to 800 hr; media filter — 1200 to 1600 hr; electronic air cleaner — 1600 to 2400 hr.

TO SELECT OR ADJUST:

1. Enter Configuration mode. Use up and down set point buttons to make small display (now flashing) indicate 02.
2. Press SET TIME/TEMP button once to display current selection of 1, 2, 3, 4, 5, 6, 7, 8, or 9 on large display. Factory default is 2.
3. Use up and down set point buttons to move between available choices.
4. Press SET TIME/TEMP button again to flash small upper display for selection of another option, or press HOLD End to exit Configuration mode.

Option 3 — English/Metric — Select between Fahrenheit and Celsius operation. Factory default is Fahrenheit.

TO SELECT OR ADJUST:

1. Enter Configuration mode. Use up and down set point buttons to make small display (now flashing) indicate 03.
2. Press SET TIME/TEMP button once to flash current selection of F or C. Factory default is F.
3. Use up and down set point buttons to move between F and C on large display.
4. Press SET TIME/TEMP button again to flash small upper display for selection of another option, or press HOLD End to exit Configuration mode.

Option 4 — Fan (G) On With W — This selection determines whether fan (G) output is to be ON or OFF when any W (furnace or strip heat) output is ON. Most furnaces and fan coils manage their own blowers and do not require separate G signal. For these applications, select OFF. Some auxiliary heaters require separate G signal to turn on blower. In this case, select ON. Factory default is OFF.

TO SELECT:

1. Enter Configuration mode. Use up and down set point buttons to make small display (now flashing) indicate 04.
2. Press SET TIME/TEMP button once to flash large display.
3. Use up or down set point buttons to alternate between OFF and ON on large display.
4. Press SET TIME/TEMP button again to flash small upper display for selection of another option, or press HOLD End to exit Configuration mode.

Option 9 — Holiday Heat Set Point — This selection determines the heating set point (40 to 90 minus deadband F) when the HOLIDAY function is active.

TO SELECT:

1. Enter Configuration mode. Use up and down buttons to make small display (now flashing) indicate 09.
2. Press SET TIME/TEMP button once to flash large display.
3. Use up or down set point buttons to select desired temperature.
4. Press SET TIME/TEMP button again to flash small upper display for selection of another option, or press HOLD End to exit Configuration mode.

Option 10 — Holiday Cool Set Point — This selection determines the cooling set point (40 to 90 minus deadband F) when the HOLIDAY function is active.

TO SELECT:

1. Enter Configuration mode if not already there. Use up and down set point buttons to make small display (now flashing) indicate 10.
2. Press SET TIME/TEMP button once to flash large display.
3. Use up or down set point buttons to select desired temperature.
4. Press SET TIME/TEMP button again to flash small upper display for selection of another option, or press HOLD End to exit Configuration mode.

Option 11 — Holiday Humidity Set Point — This selection determines the humidity set point (50 to 90% rh [relative humidity]) when the HOLIDAY function is active.

NOTE: This value can only be changed in the installer software Configuration mode.

TO SELECT:

1. Enter Configuration mode. Use up and down set point buttons to make small display (now flashing) indicate 11.
2. Press SET TIME/TEMP button once to flash large display.
3. Use up or down buttons to select desired humidity.
4. Press SET TIME/TEMP button again to flash small upper display for selection of another option, or press HOLD End to exit Configuration mode.

Option 13 — Room Temperature Offset Adjust — This option allows calibration (or deliberate miscalibration) of room temperature sensor. There are various reasons why building owners may want to have displayed temperature adjusted to a higher or lower value. The selected number is number of degrees, plus or minus, which will be added to actual temperature. The numbers can range between –5 and +5. Factory default is 0. This adjusted value will be used as actual temperature for both display and control action. For example, if 2 is selected, 72 F actual will read 74 F. If set point is 72 F, the room will control to an actual temperature of 70 F which will be displayed and acted upon as if it were 72 F. The effect is that a positive number selection will make the room temperature lower and vice versa. The light commercial Thermidistat device is calibrated within an accuracy of ± 1° F when shipped from the factory, so this adjustment will provide the best accuracy when set to 0.

TO SELECT:

1. Enter Configuration mode. Use up and down set point buttons to make small display (now flashing) indicate 13.
2. Press SET TIME/TEMP button once to flash large display.
3. Use up or down set point buttons to move between –5, –4, –3, –2, –1, 0, 1, 2, 3, 4, or 5 on large display. Factory default is 0.
4. Press SET TIME/TEMP button again to flash small upper display for selection of another option, or press HOLD End to exit Configuration mode.

Option 14 — Heat/Cool Deadband Adjustment — This option selects the minimum difference between heating and cooling set points. A larger difference saves energy and a smaller difference decreases temperature difference between heating and cooling. Factory default is 2, which means cooling set point must be a minimum of 2 degrees above heating set point. An attempt to move them closer will result in one "pushing" the other to maintain the required difference.

Depending on set points, moving deadband closer than 2 degrees may result in regular cycling between heat and cool when AUTO mode is selected. However, this cycling cannot occur more often than 1 transition every 10 minutes. The system has a built-in requirement that it cannot switch between heat and cool without a 10-minute "off" time between the 2 operations. Specifically, to switch from one mode to the other, there must be no demand for the old mode and a demand for the new mode, and this must exist continually for 10 minutes before transition to the new mode will occur.

TO SELECT:

1. Enter Configuration mode if not already there. Use up and down set point buttons to make small display (now flashing) indicate 14.
2. Press SET TIME/TEMP button once to flash large display.
3. Use up or down set point buttons to move between 0, 1, 2, 3, 4, 5, or 6 on large display. Factory default is 2.
4. Press SET TIME/TEMP button again to flash small upper display for selection of another option, or press HOLD End to exit Configuration mode.

Option 21 — Keyboard Lock — This option allows the installer to disable the thermostat from being changed.

TO SELECT:

1. Enter Configuration mode. Use up and down set point buttons to make small display (now flashing) indicate 21.
2. Press SET TIME/TEMP button once to flash large display.
3. Use up and down set point buttons to move between OF and ON on large display. Factory default is OF, keyboard is active.

   NOTE: Once the keyboard is locked the building manager can momentarily unlock the keyboard by pressing the following keys sequentially, MODE, COPY PREVIOUS DAY, SET TIME/TEMP, and HOLD End. The sequence must be completed within a 5-second period, and the keypad will be unlocked. The keypad will return to lock once the keypad is idle for a 2-minute period or immediately if after exiting the Configuration mode.
4. Press SET TIME/TEMP button again to flash upper small display for selection of another option, or press HOLD End to exit Configuration mode.

Step 5 — Conduct Light Commercial Thermidistat Start-Up and Checkout — The light commercial Thermidistat device is designed with a built-in installer test capability. It allows easy operation of equipment without delays or set point adjustments to force heating or cooling. To enable Installer Test mode, move DIP switch no. 4 to ON position. To access this switch, open case as described in Step 2 — Set DIP Switches. Use the tip of a small screwdriver to slide switch no. 4 to ON position.

While in Installer Test mode, clock will display "InSt," FAN button will control fan, and MODE button will control heating and cooling.

TO TEST FAN:

NOTE: In the Installer Test mode the fan operation is not dependent on the occupied signal.

Fan button switches FAN icon between AUTO and ON. While ON is displayed, G output will be on, turning fan on. Allow up to 10 seconds after button is pressed for fan to turn on and off. On 3 through 12½ ton energy recovery units, the fan continues to operate for a minimum of 30 seconds after G signal is removed.

NOTE: In other than the Installer Test mode the fan will run continuously during the occupied periods. If auto fan is selected, the fan will come on with a heating or cooling call during the unoccupied periods and run continuously during the occupied periods. The fan icon AUTO will be lit if auto fan is selected and ON will be lit when the fan is on.

TO TEST COOLING AND DEHUMIDIFICATION:

Press MODE button until COOL icon turns on. Y1 cooling begins within 10 seconds and remains on for 4 minutes. Two minutes after Y1 comes on, the Y2 signal is energized for 2 minutes. At the end of 4-minute run, cooling stops and MODE reverts to OFF. At any time during 4-minute run time, cooling may be turned off by pressing MODE button until OFF appears. While cooling is on, successive presses of HUMIDITY button turns the dehumidify output on and off. While this output is active, the "DEHUM" icon will be energized.

TO TEST PRIMARY HEATING:

Press MODE button until HEAT icon turns on. W1 heating begins within 10 seconds and remains on for 4 minutes. This is the Recycling mode. If the outdoor temperature is below the balance point it will also include first stage furnace or electric heat in AC system. W1 will be on for 2 minutes followed by second stage W2 for 2 minutes. If the outdoor temperature is above the balance point, this second stage call will energize first stage furnace or electric heat in AC system. If the outdoor temperature is below the balance point, this second stage call will energize second stage furnace or electric heat in AC system. At the end of 4-minute run, heating stops, and MODE reverts back to OFF. At any time during 4-minute run time, heating may be turned off by pressing MODE button until OFF appears. While heating is on, successive presses of HUMIDITY button turn Occupied output on and off. While this output is active, "OC" appears in cool set point display.

Step 6 — Make Final Settings — Be sure to return DIP switch no. 4 back to OFF position to exit Installer Test mode. Assuming the system is to be left in operation after installation is complete, use MODE button to select between HEAT, COOL, or AUTO to provide desired operation of heating, cooling, or both.

The default set points and programmed schedule are (ONLY ONE PERIOD IS PROGRAMMED):

OCCUPIED 1 = OCCUPIED 2 = 7:00 AM;
COOL = 76 F; HEAT = 72 F
DISPLAY WILL READ OC2

UNOCCUPIED 1 = UNOCCUPIED 2 = 5:00 PM;
COOL = 85 F; HEAT = 65 F
DISPLAY WILL READ UN2

If programmed schedule is to be used, make sure the HOLD icon is off. The schedule is energized or deenergized by pushing the HOLD End button.

If fixed temperatures are desired, push HOLD End button to turn on HOLD icon. This will maintain set points, not allowing them to change with programmed schedule.

During unoccupied periods the FAN button may be used to select between AUTO (fan on only with equipment) and FAN (fan on continuously) fan modes. During occupied periods the fan is on continuously.

DEHUMIDIFICATION — Dehumidification is done only during cooling. A dehumidification set point is available to the owner in both occupied and unoccupied times. It can range from 50 to 90% relative humidity. When actual humidity is higher than set point, a dehumidification demand exists. In the occupied period, the light commercial Thermidistat™ device responds by activating its dehumidify output (DEHUM) turning on the compressor in the energy recovery section; and when a call for cooling exists, energizing the Humidi-MiZer™ solenoid in the 48/50HJ unit (if so equipped). The 62AQ Energy$Recycler™ compressor will be started in the Occupied mode even though a call for cooling does not exist; thus dehumidifying the outside air before it enters the building. In the unoccupied period the humidistat will only energize the Humidi-MiZer solenoid in the main unit.

However, if the humidity is below the set point in the unoccupied period, a "mini" economizer mode will be initiated, bringing in outside air to cool the space as the first stage of cooling, provided the outdoor air thermostat in the energy recovery section is below its set point.

HOLIDAY — A holiday selection is available specifically for times where the building will not be occupied for an extended period. For convenience, one button selects Holiday mode which is indicated by "HOLIDAY" icon on LED display. Holiday mode also has an automatic hold, meaning that set points are not affected by the programmed schedule. While in Holiday mode, the system provides temperature and humidity protection for the building in all seasons, but not comfort.

Holiday Set Points — The settings for HEAT, COOL, and DEHUM should have been done in the Configuration mode (Options 9,10, and 11).

OPERATIONAL INFORMATION

There are two different controls available: a light commercial Thermidistat device or a Humidstat in conjunction with a temperature sensor.

The light commercial Thermidistat device is a 7-day programmable, wall mounted, low voltage field-installed control. It combines temperature and humidity control in a single unit and provides separate set points for heating and cooling. The control adds a dehumidification control function with separate set points for up to 2 occupied and unoccupied periods per day.

Different heating and cooling set points and times are programmable for up to 4 periods per day 7 days per week. In case of a power loss an internal memory stores programs and settings for unlimited time, and the clock continues to run for at least 8 hours. Batteries are not used.

The light commercial Thermidistat device (or Humidistat and temperature sensor) provides direct control of the energy recovery section, rooftop unit fans, and rooftop unit compressor in response to the programmed time schedules and temperature settings. The dehumidification output signal controls the energy recovery compressor to cool and dehumidify the supply air via a relay.

Typical unit airflow is shown in Fig. 33. See Table 2A and 2B for operating information and system response.

Unoccupied Cooling Mode — During unoccupied periods the system fans and compression will cycle in response to the light commercial Thermidistat device's (or Humidistat and temperature sensor) temperature and humidity output signals to maintain space conditions at programmed set points. During mild weather, if the outdoor temperature is below the outside-air thermostat (OAT) set point, all compressor operation is locked off and the system operates in the economizer mode to provide free cooling.

If outdoor air is unsuitable (humidity or air quality), then the Energy$Recycler™ section will be off. If outdoor air is suitable, then both the Energy$Recycler section and the rooftop section will be used for cooling. First stage of cooling is the Energy$Recycler section in economizer mode. Second stage of cooling energizes the Energy$Recycler and rooftop compressors.

Occupied Cooling Mode — During occupied periods, the Energy$Recycler fans and the rooftop unit's fans run continuously to maintain proper airflow and ventilation rates. The compressors in the Energy$Recycler section and the rooftop unit cycle in response to the dehumidification and thermostat output signals from the control to maintain proper temperature and humidity levels.

Cooling Operation with the Humidi-MiZer™ Option (Units after October 2004) — Units equipped with the Humidi-MiZer dehumidification option are capable of increased humidity control by utilizing a common subcooling/ reheat dehumidification coil. This unique and innovative design provides the capability of the rooftop section to operate in both a subcooling mode and a hot gas reheat (HGRH) mode. A 48/50HJ rooftop unit equipped with the Humidi-MiZer system can be used with or without a 62AQ Energy$Recycler™ unit. See the Humidi-MiZer Application Data manual for additional details.

The incorporation of the Humidi-MiZer adaptive dehumidification system on a COBRA™ unit adds significant flexibility to the overall system. The response of the Humidi-MiZer system to varying space conditions is extremely dynamic. The COBRA energy recovery unit or 48/50HJ rooftop unit equipped with the Humidi-MiZer system will respond based on the temperature and humidity requirements as sensed in the space. Either a Carrier Thermidistat™ device (combined temperature and humidity sensing capability) or separate thermostat and humidistat can be used with the Humidi-MiZer system. See Tables 3A and 3B for sequence of operation of COBRA units equipped with the Humidi-MiZer dehumidification option.

Heating with Humidi-MiZer in Unoccupied Mode — In the unoccupied mode, the Energy$Recycler (E$R) unit is off and all compressors are locked off. First stage heat is rooftop section heat at 50%. Second stage heat is rooftop unit heat at 100%. See Table 3A.

Heating with Humidi-MiZer in Occupied Mode — In the occupied mode, when the E$R compressor runs in heat mode, it extracts heat from the exhaust air and rejects heat to the incoming outdoor air, returning energy to the building that, otherwise, would be wasted. The E$R and rooftop section fans run continuously. Rooftop section compressors are always off.

On a first stage call, the E$R compressor is on in heat mode. If the outdoor air is above the set point, rooftop section heat is off. Rooftop section heat is on at 50% if the outdoor air is below the set point. On a second stage call, the E$R compressor is on in heat mode. Rooftop section heat is on at 50% if the outdoor air is above the set point. Rooftop section heat is on at 100% if the outdoor air is below the set point. See Table 3B.

NOTE: If there is a thermostat call from the space for heating, all dehumidification (both subcooling mode and hot gas reheat mode) will not operate.

MOISTUREMI$ER™ OPTION (Units prior to October 2004) — Units equipped with the MoistureMi$er dehumidification option have an up to 40% increase in latent capacity in hot, humid climates. The MoistureMi$er dehumidification option increases humidity control and comfort in the occupied space by automatically lowering the evaporator coil temperature to optimum dehumidification levels while simultaneously reheating the leaving air to prevent overcooling. The MoistureMi$er capabilities have been incorporated into the Humidi-MiZer system; the MoistureMi$er is no longer an available option for units produced after October 2004.

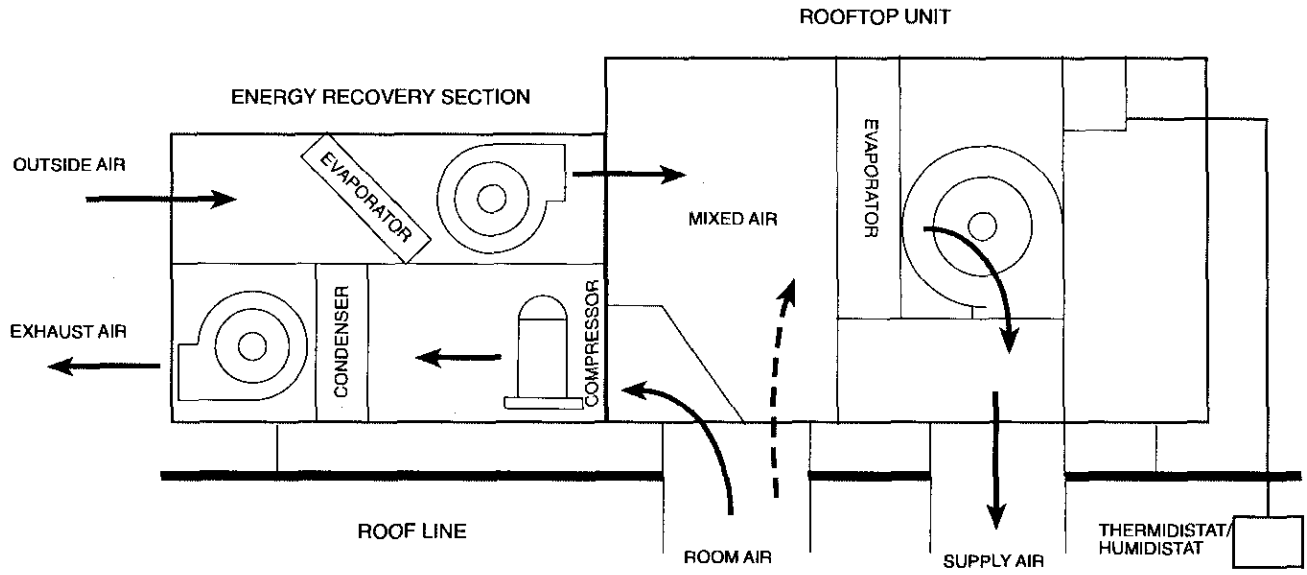


Fig. 33 — Typical Unit Airflow Diagram

Table 2A — COBRA™ Energy Recovery Unit Sequence of Operation — Unoccupied

UNOCCUPIED						
COOLING	**E$R Compressor**	**E$R Fans**	**RTU Compressor 1**	**RTU Compressor 2***	**RTU Fans**	**RTU Heat**
Indoor Temperature Above Y2*						
Humidity Low & OAT Low	On	On (cyc.)	On	Off	On (cyc.)	Off
Humidity Low & OAT High	Off	Off	On	On	On (cyc.)	Off
Humidity High & OAT Low	Off	Off	On	On	On (cyc.)	Off
Humidity High & OAT High	Off	Off	On	On	On (cyc.)	Off
Indoor Temperature Between Y1 & Y2*						
Humidity Low & OAT Low	Off	On (cyc.)	Off	Off	On (cyc.)	Off
Humidity Low & OAT High	Off	Off	On	Off	On (cyc.)	Off
Humidity High & OAT Low	Off	Off	On	On	On (cyc.)	Off
Humidity High & OAT High	Off	Off	On	On	On (cyc.)	Off
Indoor Temperature Below Y1						
Humidity Low	Off	Off	Off	Off	Off	Off
Humidity High	Off	Off	On	On	On (cyc.)	Off

NOTE: OAT < 55 F all compression off

HEATING	E$R Compressor	E$R Fans	RTU Compressor 1	RTU Compressor 2*	RTU Fans	RTU Heat†
Indoor Temperature Above W1	Off	Off	Off	Off	Off	Off
Indoor Temperature Between W1 & W2	Off	Off	Off	Off	On (cyc.)	On, 50%
Indoor Temperature Below W2	Off	Off	Off	Off	On (cyc.)	On, 100%

LEGEND

E$R — Energy$Recycler™ Unit
OAT — Outdoor Air Temperature
RTU — Rooftop Unit

*Second stage for Y2 call applicable on rooftop units with 2 circuits only.
†50% rooftop unit heat only applicable with 2-stage electric or gas heating units.

Table 2B — COBRA Energy Recovery Unit Sequence of Operation — Occupied

OCCUPIED						
COOLING	**E$R Compressor**	**E$R Fans**	**RTU Compressor 1**	**RTU Compressor 2***	**RTU Fans**	**RTU Heat**
Indoor Temperature Above Y2*						
Humidity Low & OAT Low	On	On	On	Off	On	Off
Humidity Low & OAT High	On	On	On	On	On	Off
Humidity High & OAT Low	On	On	On	On	On	Off
Humidity High & OAT High	On	On	On	On	On	Off
Indoor Temperature Between Y1 & Y2*						
Humidity Low & OAT Low	Off	On	Off	Off	On	Off
Humidity Low & OAT High	On	On	On	Off	On	Off
Humidity High & OAT Low	On	On	On	On	On	Off
Humidity High & OAT High	On	On	On	On	On	Off
Indoor Temperature Below Y1						
Humidity Low	Off	On	Off	Off	On	Off
Humidity High	On	On	Off	Off	On	Off

NOTE: OAT < 55 F all compression off

HEATING	E$R Compressor	E$R Fans	RTU Compressor 1	RTU Compressor 2	RTU Fans	RTU Heat†
Indoor Temperature Above W1	Off	On	Off	Off	On	Off
Indoor Temperature Between W1 & W2						
OAT >Set Pt (30 F)	On	On	Off	Off	On	Off
OAT <Set Pt (30 F)	On	On	Off	Off	On	On, 50%
Indoor Temperature Below W2						
OAT >Set Pt (30 F)	On	On	Off	Off	On	On, 50%
OAT <Set Pt (30 F)	On	On	Off	Off	On	On, 100%

LEGEND

E$R — Energy$Recycler Unit
OAT — Outdoor Air Temperature
RTU — Rooftop Unit

*Second stage for Y2 call applicable on rooftop units with 2 circuits only.
†50% rooftop unit heat only applicable with 2-stage electric or gas heating units.

Table 3A — Humidi-MiZer™ Adaptive Dehumidification System Rooftop with COBRA™ Energy Recovery Unit Sequence of Operation — Unoccupied

UNOCCUPIED						
COOLING	**E$R Compressor**	**E$R Fan**	**RTU Compressor 1**	**RTU Compressor 2**	**RTU Fans**	**RTU Heat**
Indoor Temperature Above Y2						
Humidity Low & OAT Low	On	On (cyc.)	On without SC	Off	On (cyc.)	Off
Humidity Low & OAT High	Off	Off	On without SC	On without SC	On (cyc.)	Off
Humidity High & OAT Low	Off	Off	On with SC	On with SC	On (cyc.)	Off
Humidity High & OAT High	Off	Off	On with SC	On with SC	On (cyc.)	Off
Indoor Temperature Between Y1 & Y2						
Humidity Low & OAT Low	Off	On (cyc.)	Off	Off	On (cyc.)	Off
Humidity Low & OAT High	Off	Off	On without SC	Off	On (cyc.)	Off
Humidity High & OAT Low	Off	Off	On with SC	On with HGRH	On (cyc.)	Off
Humidity High & OAT High	Off	Off	On with SC	On with HGRH	On (cyc.)	Off
Indoor Temperature Below Y1						
Humidity Low	Off	Off	Off	Off	Off	Off
Humidity High	Off	Off	On with HGRH	On with HGRH	On (cyc.)	Off

NOTE: OAT < 55 F all compression off

HEATING	E$R Compressor	E$R Fans	RTU Compressor 1	RTU Compressor 2	RTU Fans	RTU Heat
Indoor Temperature Above W1	Off	Off	Off	Off	Off	Off
Indoor Temperature Between W1 & W2	Off	Off	Off	Off	On (cyc.)	On, 50%
Indoor Temperature Below W2	Off	Off	Off	Off	On (cyc.)	On, 100%

LEGEND

E$R — Energy$Recycler™ Unit **RTU** — Rooftop Unit
HGRH— Hot Gas Reheat **SC** — Subcooling
OAT — Outdoor Air Temperature

Table 3B — Humidi-MiZer Adaptive Dehumidification System Rooftop with COBRA Energy Recovery Unit Sequence of Operation — Occupied

OCCUPIED						
COOLING	**E$R Compressor**	**E$R Fans**	**RTU Compressor 1**	**RTU Compressor 2**	**RTU Fans**	**RTU Heat**
Indoor Temperature Above Y2						
Humidity Low & OAT Low	On	On	On without SC	Off	On	Off
Humidity Low & OAT High	On	On	On without SC	On without SC	On	Off
Humidity High & OAT Low	On	On	On with SC	On with SC	On	Off
Humidity High & OAT High	On	On	On with SC	On with SC	On	Off
Indoor Temperature Between Y1 & Y2						
Humidity Low & OAT Low	Off	On	Off	Off	On	Off
Humidity Low & OAT High	On	On	On without SC	Off	On	Off
Humidity High & OAT Low	On	On	On with SC	On with HGRH	On	Off
Humidity High & OAT High	On	On	On with SC	On with HGRH	On	Off
Indoor Temperature Below Y1						
Humidity Low	Off	On	Off	Off	On	Off
Humidity High	On	On	On with HGRH	On with HGRH	On	Off

NOTE: OAT < 55 F all compression off

HEATING	E$R Compressor	E$R Fans	RTU Compressor 1	RTU Compressor 2	RTU Fans	RTU Heat
Indoor Temperature Above W1	Off	On	Off	Off	On	Off
Indoor Temperature Between W1 & W2						
OAT >Set Pt (30 F)	On	On	Off	Off	On	Off
OAT <Set Pt (30 F)	On	On	Off	Off	On	On, 50%
Indoor Temperature Below W2						
OAT >Set Pt (30 F)	On	On	Off	Off	On	On, 50%
OAT <Set Pt (30 F)	On	On	Off	Off	On	On, 100%

LEGEND

E$R — Energy$Recycler Unit **RTU** — Rooftop Unit
HGRH— Hot Gas Reheat **SC** — Subcooling
OAT — Outdoor Air Temperature

AIRFLOW CONSIDERATIONS — A COBRA™ unit is potentially capable of allowing up to 100% outdoor air (OA). This application depends specifically on the air conditions and the amount of airflow desired. For exact capabilities on specific COBRA applications, refer to the Packaged Rooftop Builder (PRB) selection software.

When configuring the COBRA unit, it is also important to select the correct ratio of outdoor air to exhaust air. When using the electronic selection software, the program will not allow unacceptable ratios. In general, the exhaust airflow determines the energy capacity available to condition the incoming outside air. Typically, the exhaust air cfm must be at least 50% the value of the OA cfm to satisfactorily precondition the OA. Conversely, the OA flow must be great enough to properly transfer energy from the OA coil.

Therefore, a minimum OA flow exists; the exhaust airflow cannot be greater than the incoming OA flow. Additionally, allowing the exhaust airflow to be greater than the incoming outdoor airflow could result in space pressurization problems.

See Table 4 for minimum and maximum airflow parameters.

Table 4 — Factory Supported Rooftop Unit with 62AQ Unit Combination and Allowable Airflows

48/50HJ UNIT SIZE	62AQ MODEL (E$R)	OUTDOOR AIR CFM RANGE (Min-Max)	EXHAUST CFM RANGE (Min-Max)
004-007	060	300 - 600	300 - 100% of OA Value
	100	500 - 1000	500 - 100% of OA Value
008-014	060*	300 - 600	300 - 100% of OA Value
	100*	500 - 1000	500 - 100% of OA Value
	200	1000 - 2000	1000 - 100% of OA Value
	300	1800 - 3000	1800 - 100% of OA Value

LEGEND

E$R — Energy$Recycler Unit
OA — Outdoor Air

*This unit combination is available only when the 62AQ is field-installed as an accessory.

Five-Minute Compressor Time Guard Device — This timer prevents compressor from starting unless it has been off for at least 5 minutes. It can be defeated for 1 cycle by simultaneously pressing FAN and UP buttons simultaneously.

Fifteen-Minute Staging Timer — In multistage heating or cooling, this timer prevents any higher stage from turning on until preceding stage has been on for 15 minutes. This timer is not in effect if temperature difference is greater than 5° F (usually due to a large change in desired temperature).

Three-Minute Minimum On Time — In normal operation, when a stage turns on, it will not turn off for a minimum of 3 minutes.

Heat/Cool Set Points (Desired Temperature) — A minimum difference of 2° F is enforced between heating and cooling desired temperatures. This is done by allowing one setting to "push" the other to maintain this difference. This difference is adjustable via Configuration Option 14.

Equipment On Indicators — When cooling equipment is on, a COOL icon preceded by a small triangle is displayed below cooling set point. While cooling equipment is delayed by the Time Guard timer, triangle will flash. The same is true for HEAT icon and its preceding triangle located under heating set point.

Dehumidify Output On Indicators — The DEHUM icon is on when the dehumidification output is energized.

Auto Changeover — When auto changeover mode is selected, a change from heat to cool (or vice versa) will not occur until an opposite mode demand has existed for 10 minutes. If set point is changed, the 10-minute requirement is deleted.

Power On Check — When AC power is first applied, all segments of display are turned on for a few seconds. Following this, temperature display indicates model/configuration via following 2-digit code: CP for commercial product. See Fig. 32.

Error Codes — If light commercial Thermidistat™ device cannot properly read room temperature, display will indicate two dashes (--) and all outputs (except fan, if on) will turn off.

E4 — If light commercial Thermidistat device's internal memory fails, "E4" will be displayed. Replace light commercial Thermidistat device.

E5 — If light commercial Thermidistat device cannot properly read humidity, "E5" will be displayed. Replace light commercial Thermidistat device.

Smart Recovery — With Smart Recovery selected (DIP SW1 is on), transition out of setback begins a fixed time period before selected recovery time and gradually adjusts room temperature so desired temperature will be achieved at selected recovery time. The fixed time period is 1.5 hours. It operates in both heating and cooling.

Outdoor-Air Dampers — The outdoor-air dampers of the energy recovery section are fully adjustable. See Fig. 34.

SUPPLY-AIR DAMPERS — The supply-air damper is a motorized, two-position (open/closed), spring-return type damper. There are 3 adjustable outdoor air intake stops (adjusts to 30, 45, 60, or 90 degrees open) to fix the amount of outdoor air intake in economizer mode. The factory set position is 45 degrees. The supply air fan motor is a 3-speed motor that is factory set for medium speed.

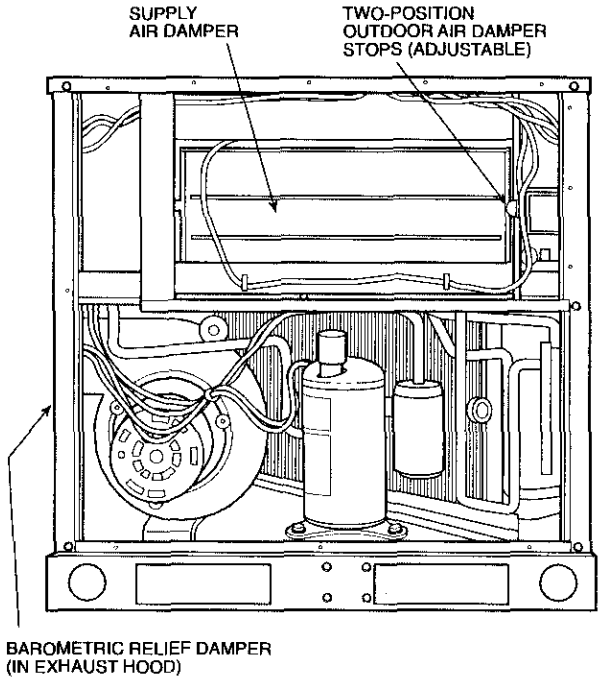


Fig. 34 — Outdoor-Air Dampers

BAROMETRIC RELIEF DAMPERS — The barometric relief damper is located in the exhaust fan section. The damper limiter can be set for 30, 45, or 60 degrees open (90 degrees open is not required) based on cfm and fan speed. The exhaust air fan motor is a 3-speed motor that is factory set for medium speed.

MULTIPLE STAGE COOLING CONTROL — Stage 1 is free cooling by opening the supply-air dampers and bringing in cool outside air. Stage 2 is efficient cooling with the energy recovery section as outdoor temperatures rise. Stage 3 is cooling operation of the rooftop section during peak outdoor conditions.

When installing a COBRA™ energy recovery unit, all fans and dampers must be balanced to achieve the proper unit airflow. In addition to the base unit's indoor fan, the 62AQ Energy$Recycler™ section has an exhaust damper, exhaust fan, supply damper and optional supply fan. The optional supply fan may be required if the return air static pressure is too low. See the 62AQ system fan curves (Fig. 35-70) or the Packaged RTU Builder selection software to determine if a supply fan is required for each application.

If proper setting for E$R supply fan and damper and exhaust fan and damper have not been determined, make the following adjustments using the appropriate 62AQ system fan curves.

After balancing the base rooftop unit (RTU) per the base unit installation instructions, make sure unit filters and all panels are in place.

1. Run RTU supply fan at specified rpm. Do NOT run the E$R fans.
2. Measure the return air static pressure at location B. See Fig. 24.
3. Once the RTU return air static pressure is determined:
   a. Plot the point on the appropriate exhaust fan curve, using the measured return static pressure and desired airflow.
   b. If the plotted point does not fall on an existing curve, adjust the position left or right until a curve is reached. Each curve corresponds to a damper position and fan speed. Follow the point vertically down to find the actual airflow (cfm). This will be the actual exhaust airflow of the 62AQ Energy$Recycler unit.

      NOTE: IF the E$R exhaust airflow is greater that the supply airflow, the return plenum static pressure will become more negative when the 62AQ fans are running. In this situation, the total static load on the rooftop unit's indoor ran motor is increased and will operate at a higher power input (watts).
   c. Adjust the exhaust fan speed and damper position according to the selected line from step (b).
4. Repeat Step 3 for the supply air fan and damper.

The supply fan is standard for COBRA units. If the supply fan is not required, it can be left secured, or completely removed to reduce supply static pressure.

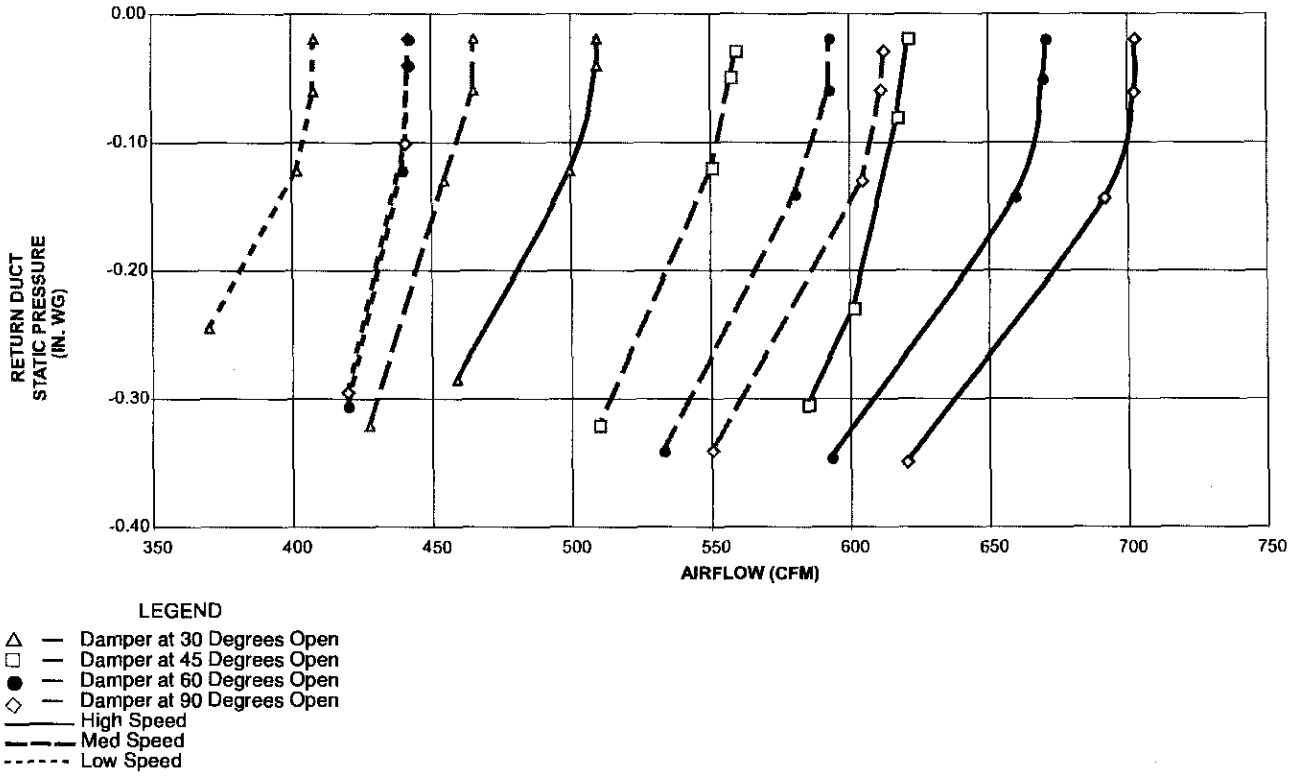


Fig. 35 — 62AQ060 Exhaust Fan Performance Curve (208v)

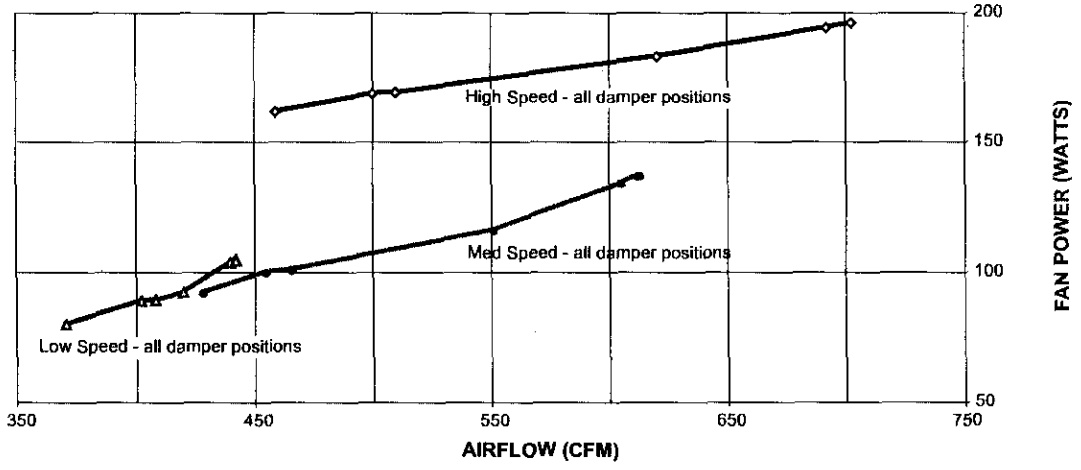


Fig. 36 — 62AQ060 Exhaust Fan Power Curve (208v)

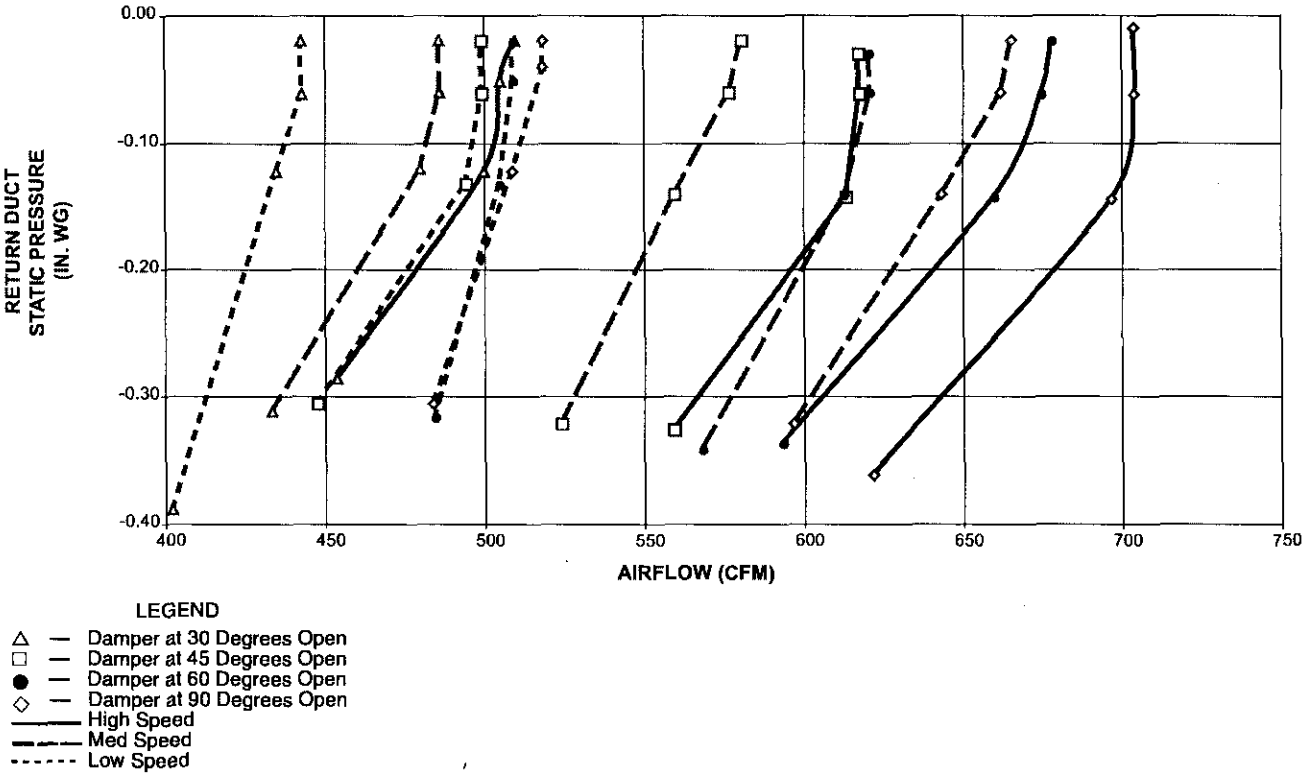


Fig. 37 — 62AQ060 Exhaust Fan Performance Curve (230v)

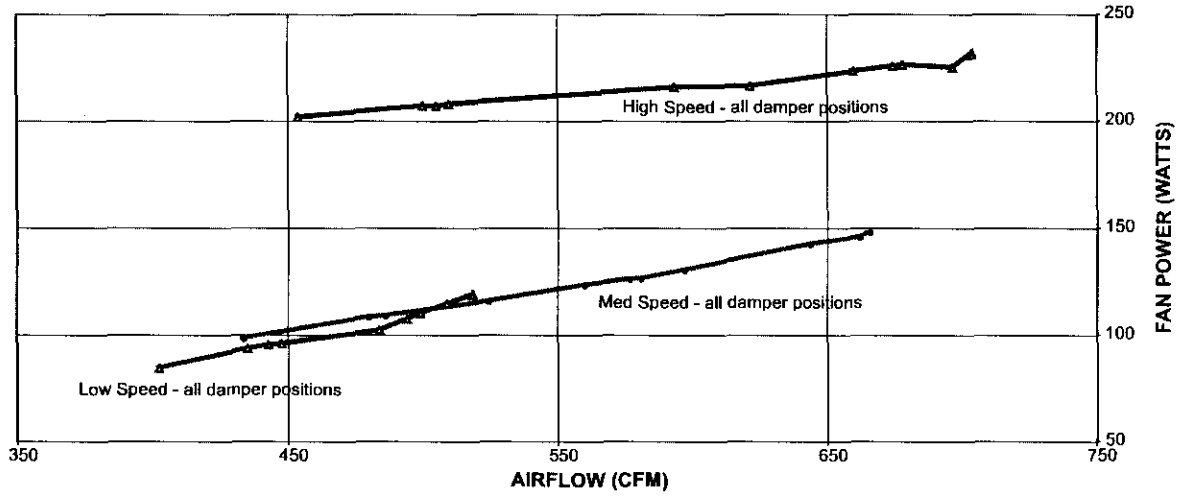


Fig. 38 — 62AQ060 Exhaust Fan Power Curve (230v)

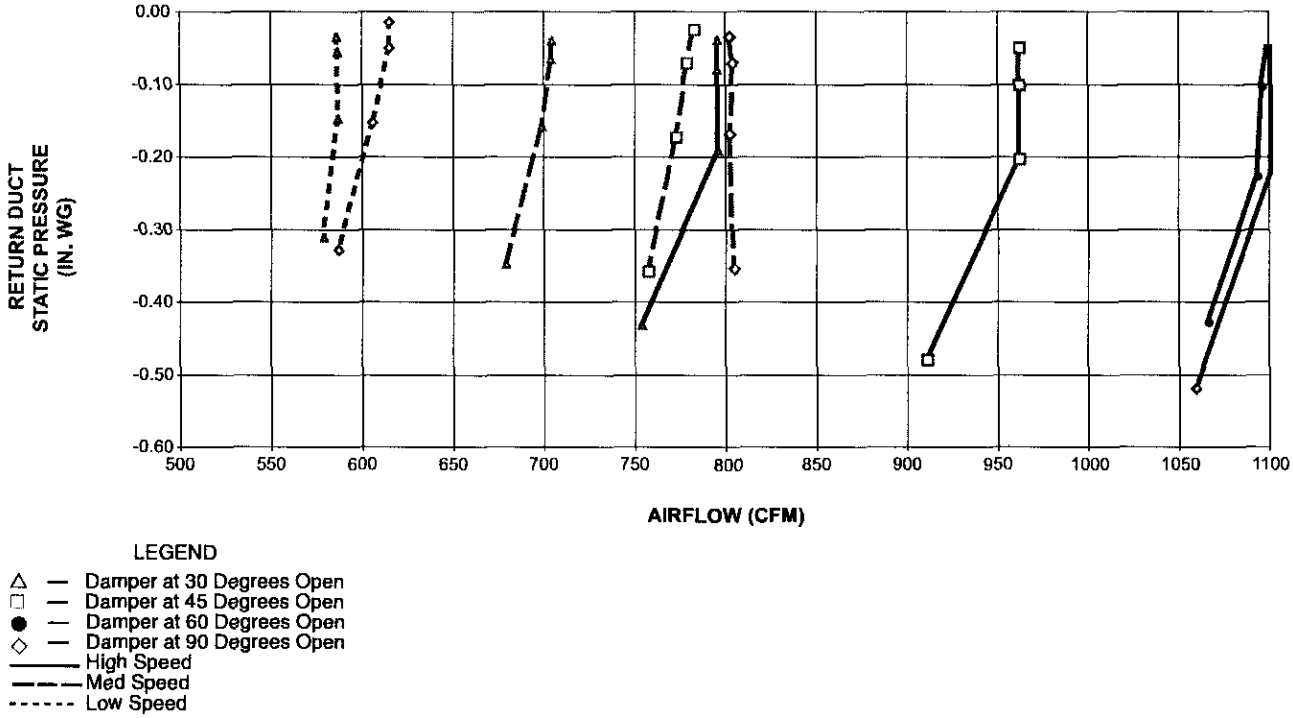


Fig. 39 — 62AQ100 Exhaust Fan Performance Curve (208v)

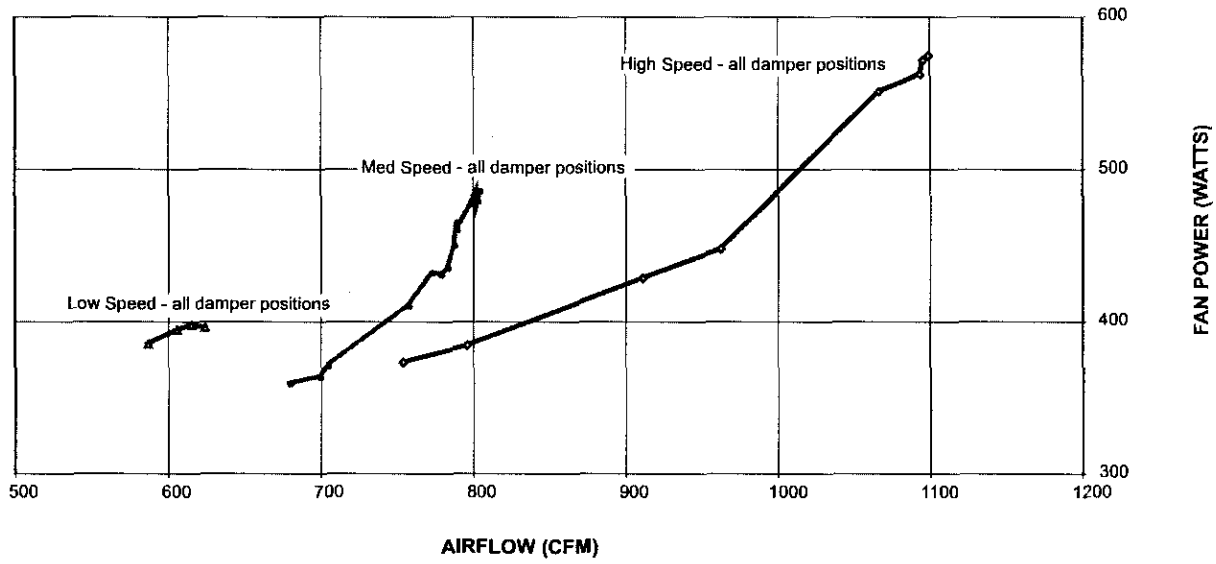
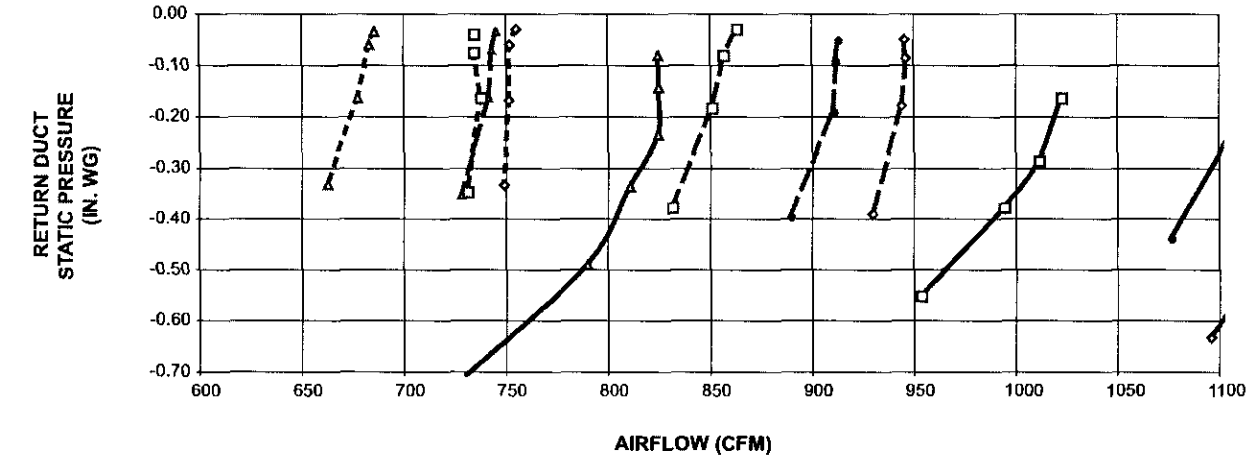


Fig. 40 — 62AQ100 Exhaust Fan Power Curve (208v)



LEGEND

△ — Damper at 30 Degrees Open
□ — Damper at 45 Degrees Open
● — Damper at 60 Degrees Open
◇ — Damper at 90 Degrees Open
——— High Speed
— — — Med Speed
------ Low Speed

Fig. 41 — 62AQ100 Exhaust Fan Performance Curve (230v)

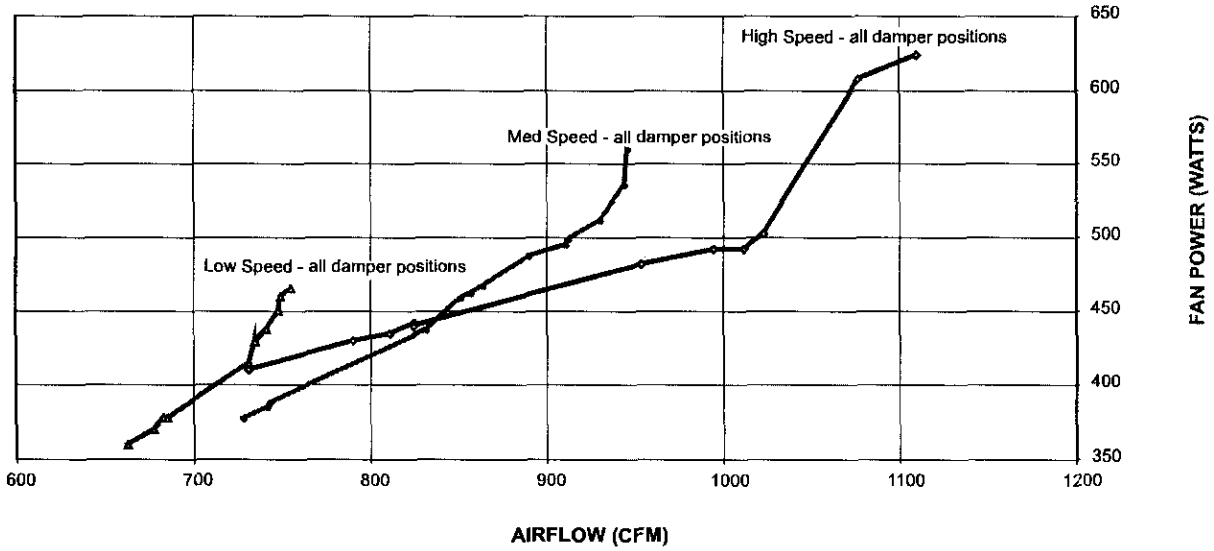


Fig. 42 — 62AQ100 Exhaust Fan Power Curve (230v)

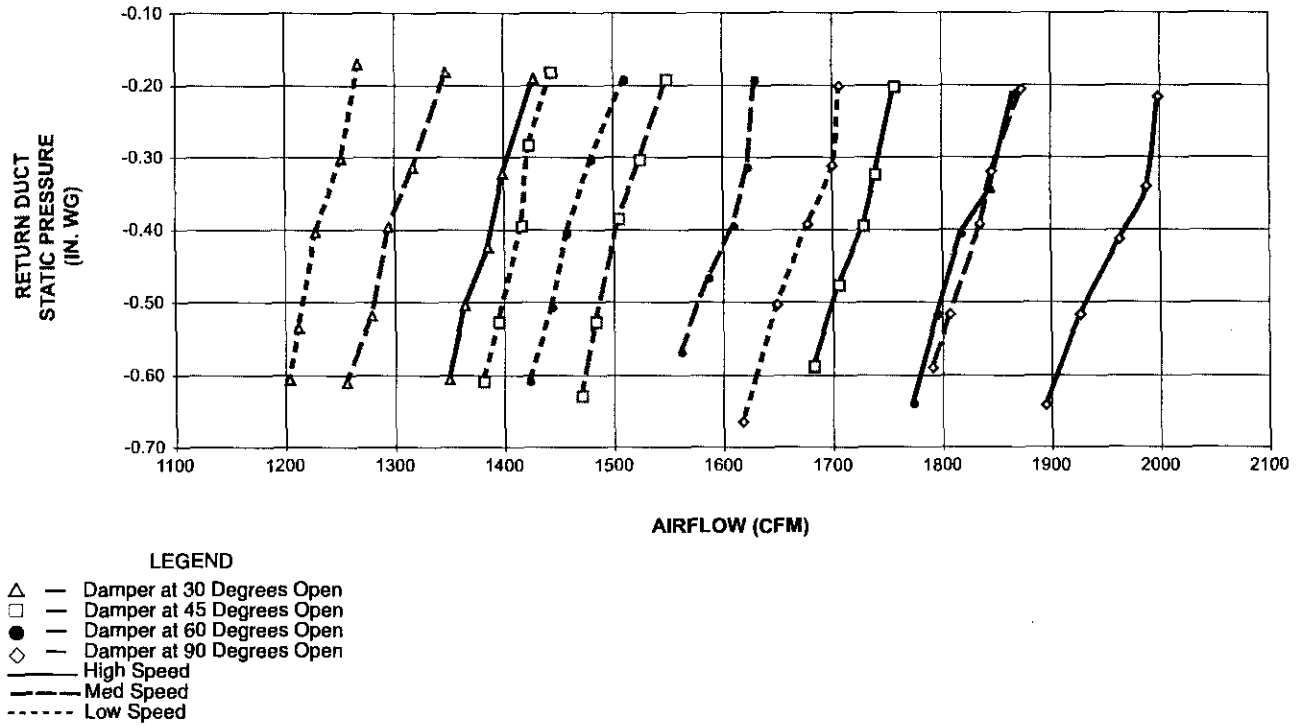


Fig. 43 — 62AQ200 Exhaust Fan Performance Curve (208v)

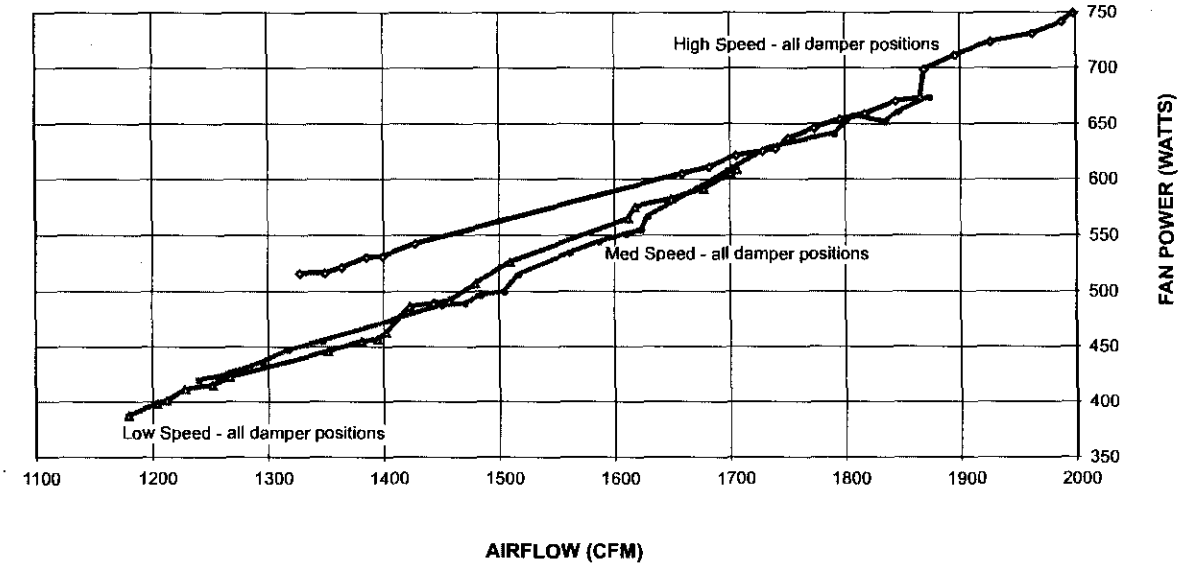


Fig. 44 — 62AQ200 Exhaust Fan Power Curve (208v)

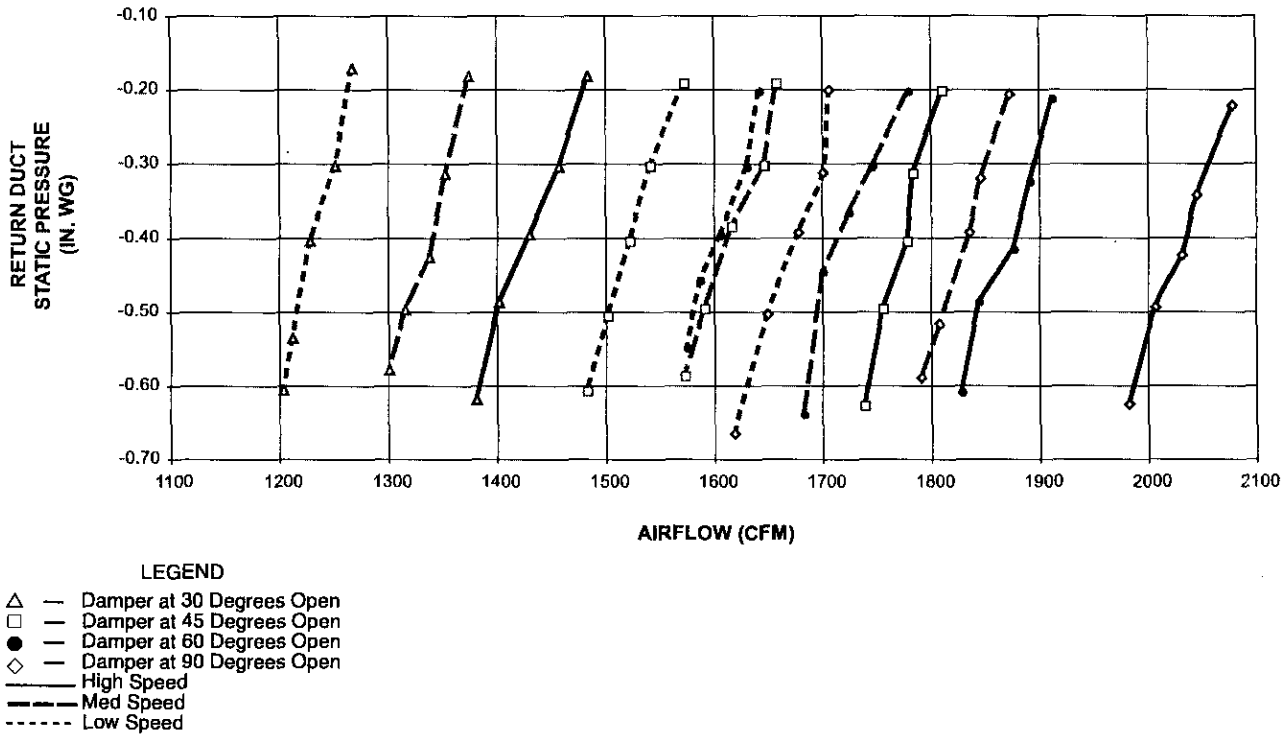


Fig. 45 — 62AQ200 Exhaust Fan Performance Curve (230v)

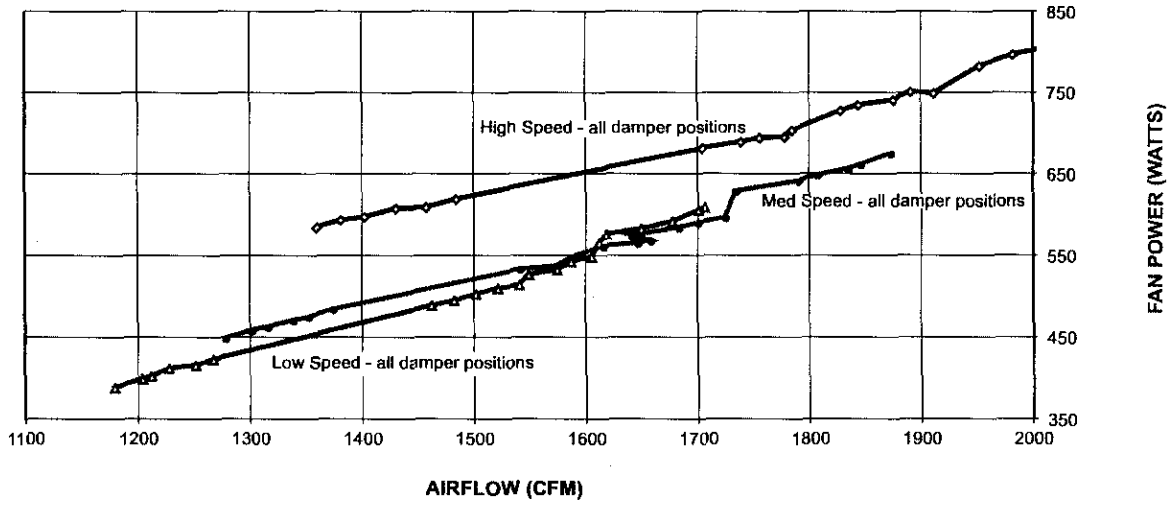


Fig. 46 — 62AQ200 Exhaust Fan Power Curve (230v)

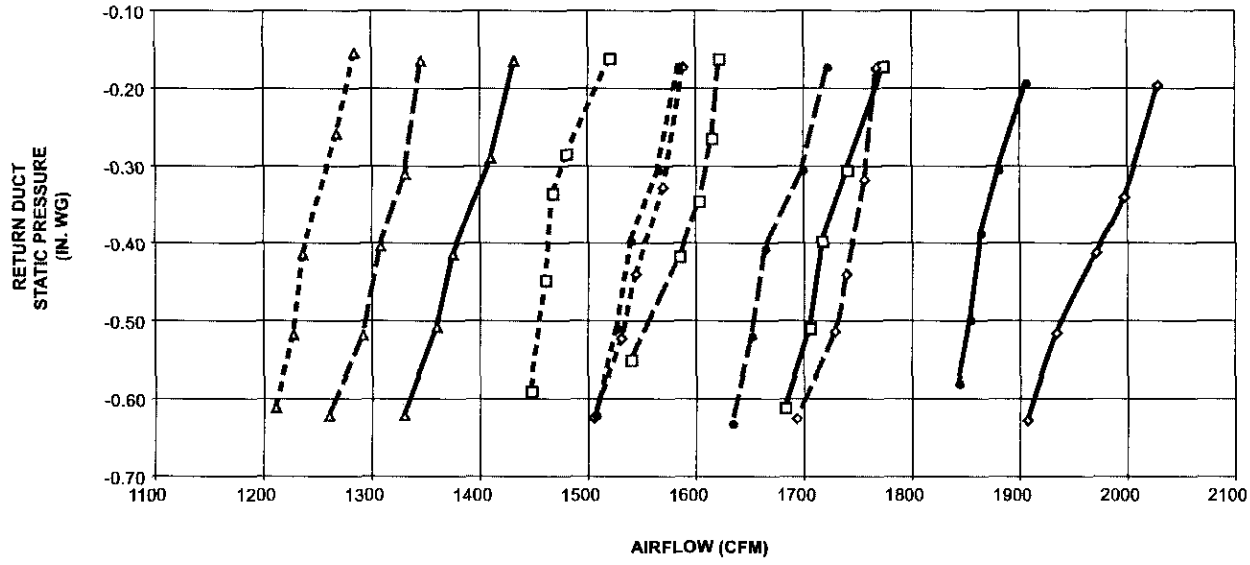


Fig. 47 — 62AQ200 Exhaust Fan Performance Curve (460v)

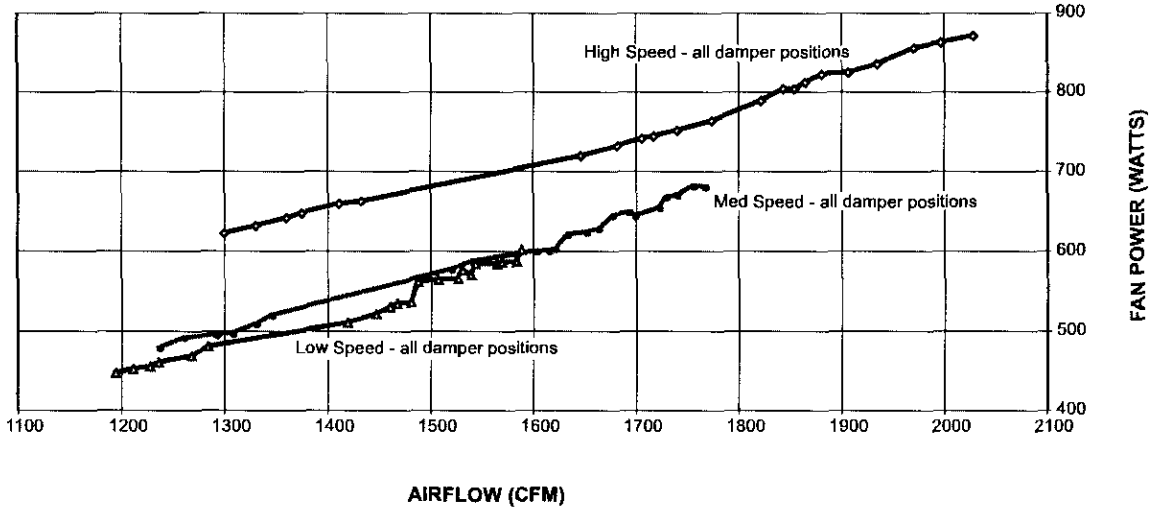


Fig. 48 — 62AQ200 Exhaust Fan Power Curve (460v)

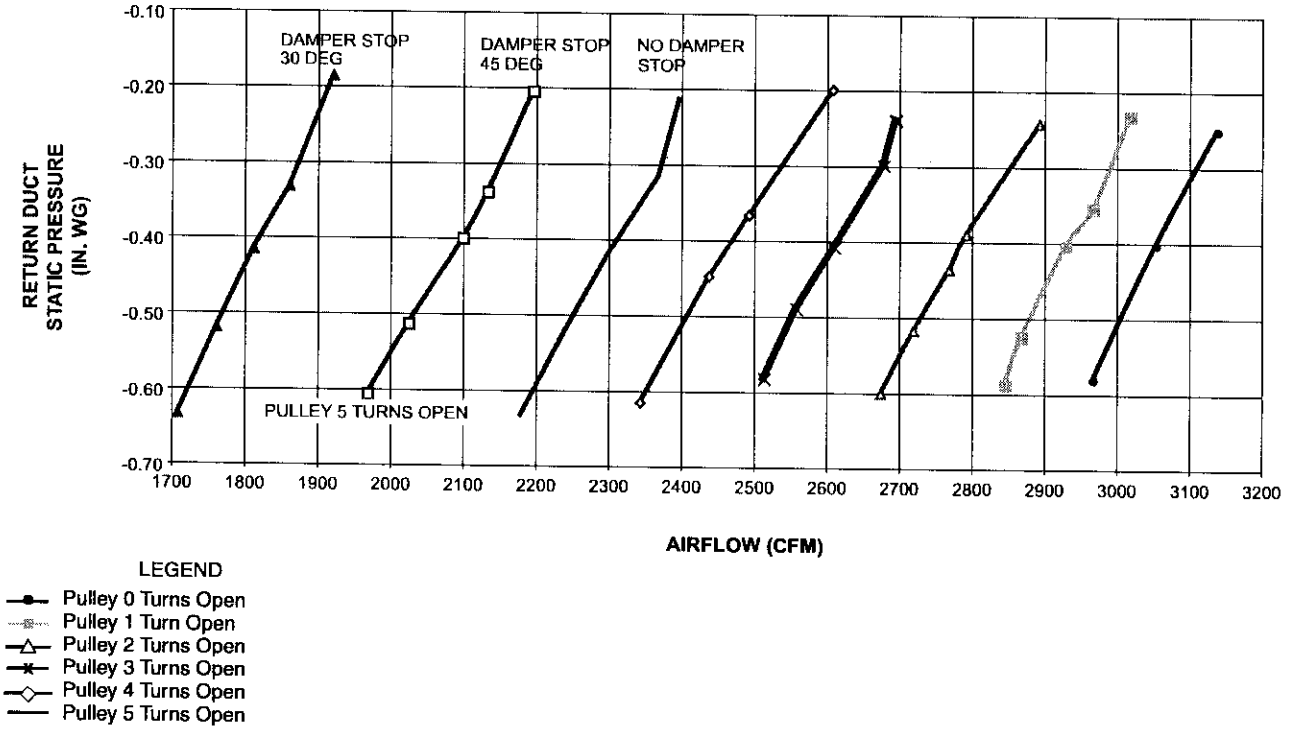


Fig. 49 — 62AQ300 Exhaust Fan Performance Curve (230v)

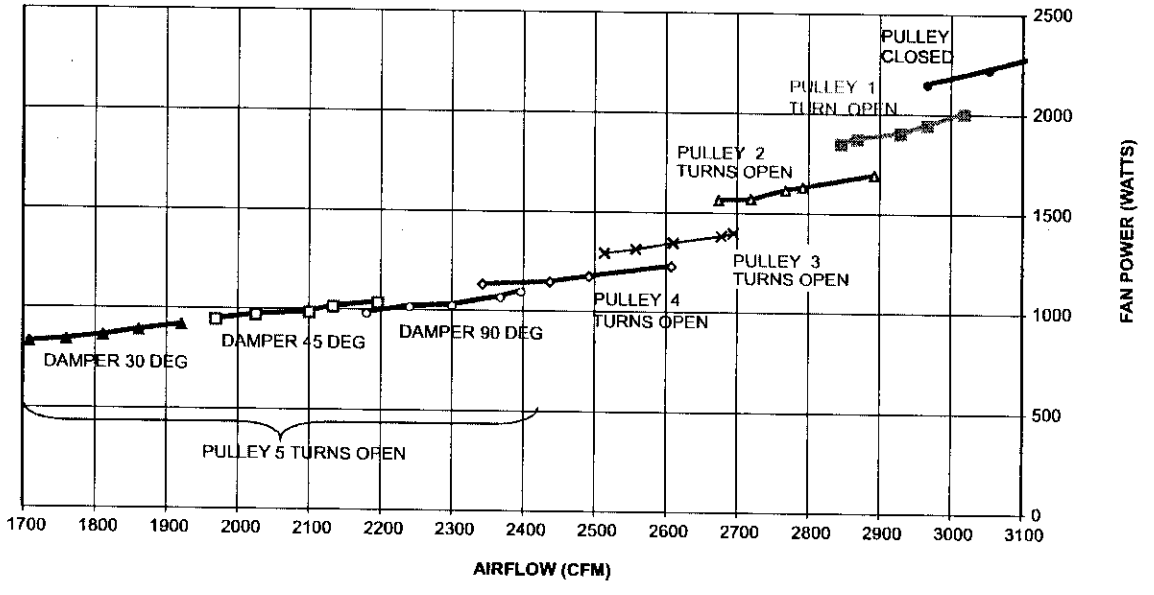
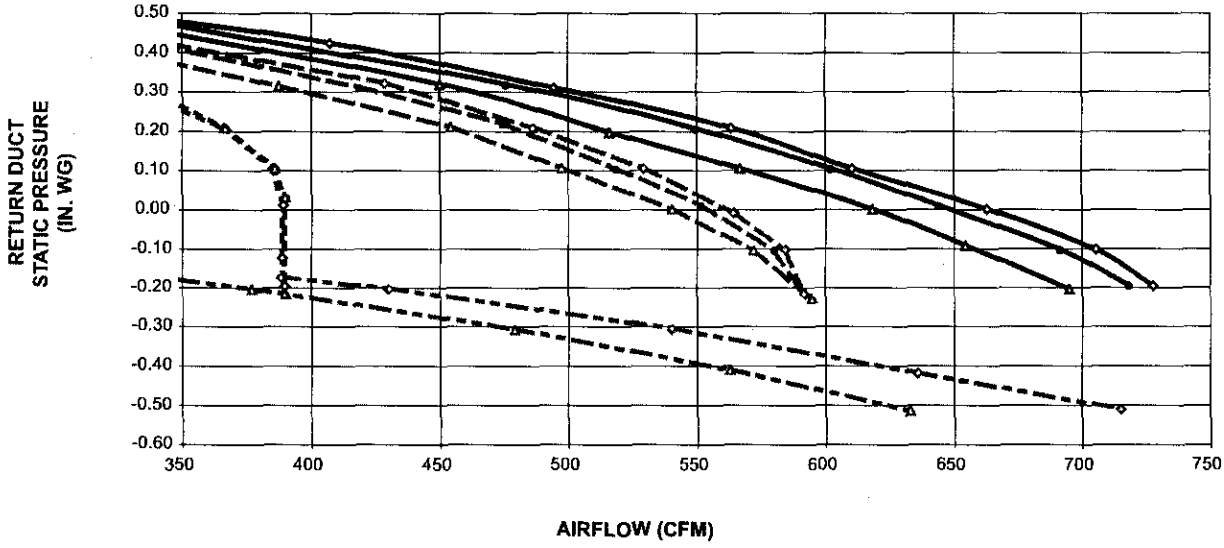


Fig. 50 — 62AQ300 Exhaust Fan Power Curve (230v)



LEGEND

△ — Damper at 30 Degrees Open
□ — Damper at 45 Degrees Open
● — Damper at 60 Degrees Open
◇ — Damper at 90 Degrees Open
— · · — No Fan
——— High Speed
— - — - — Med Speed
- - - - - - Low Speed

Fig. 51 — 62AQ060 Supply Fan Performance Curve (208v)

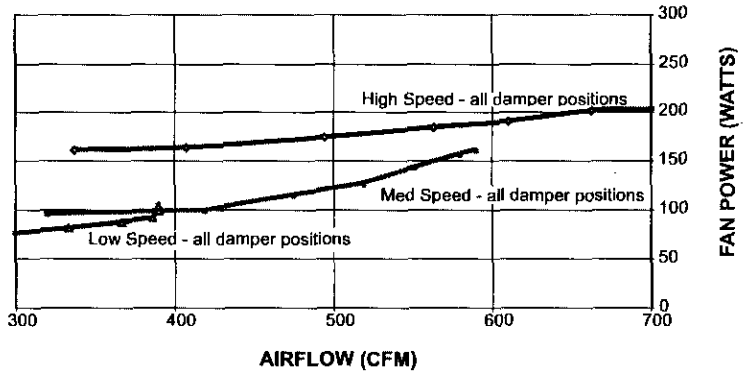
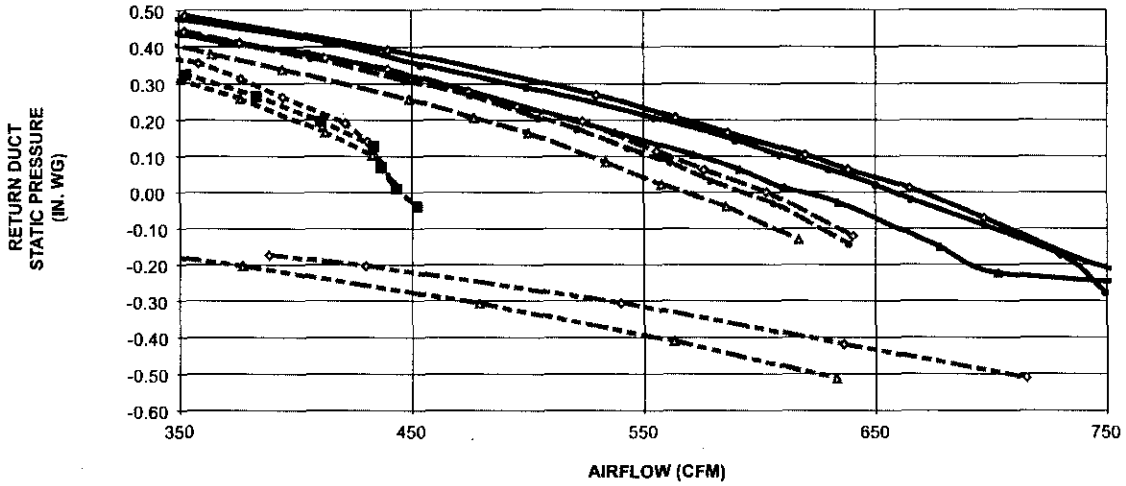


Fig. 52 — 62AQ060 Supply Fan Power Curve (208v)



LEGEND

△ — Damper at 30 Degrees Open
□ — Damper at 45 Degrees Open
● — Damper at 60 Degrees Open
◇ — Damper at 90 Degrees Open
— · · — No Fan
——— High Speed
— — — Med Speed
- - - - - - Low Speed

Fig. 53 — 62AQ060 Supply Fan Performance Curve (230v)

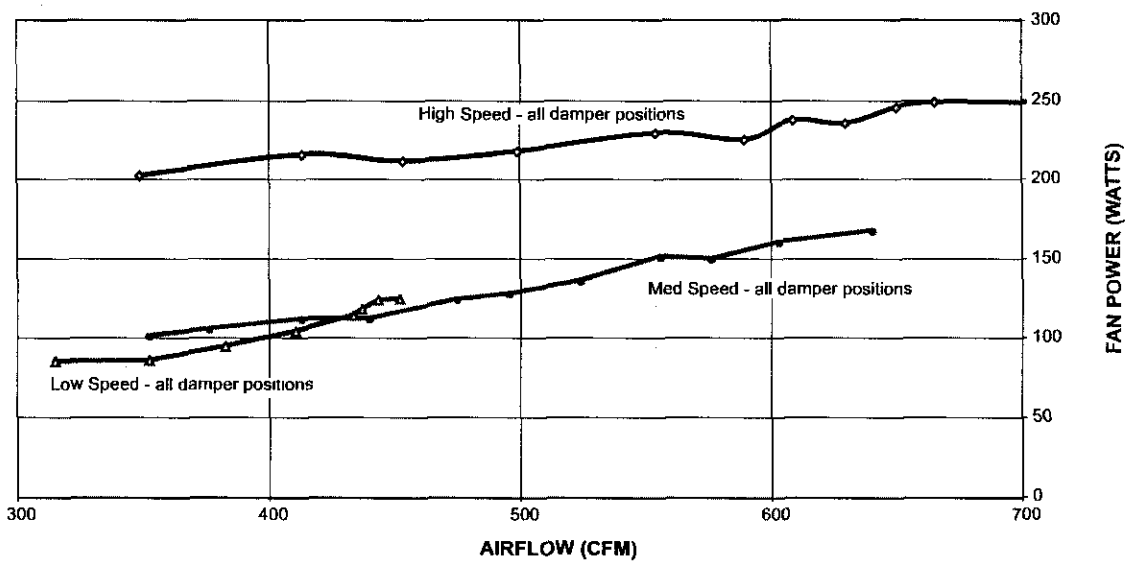
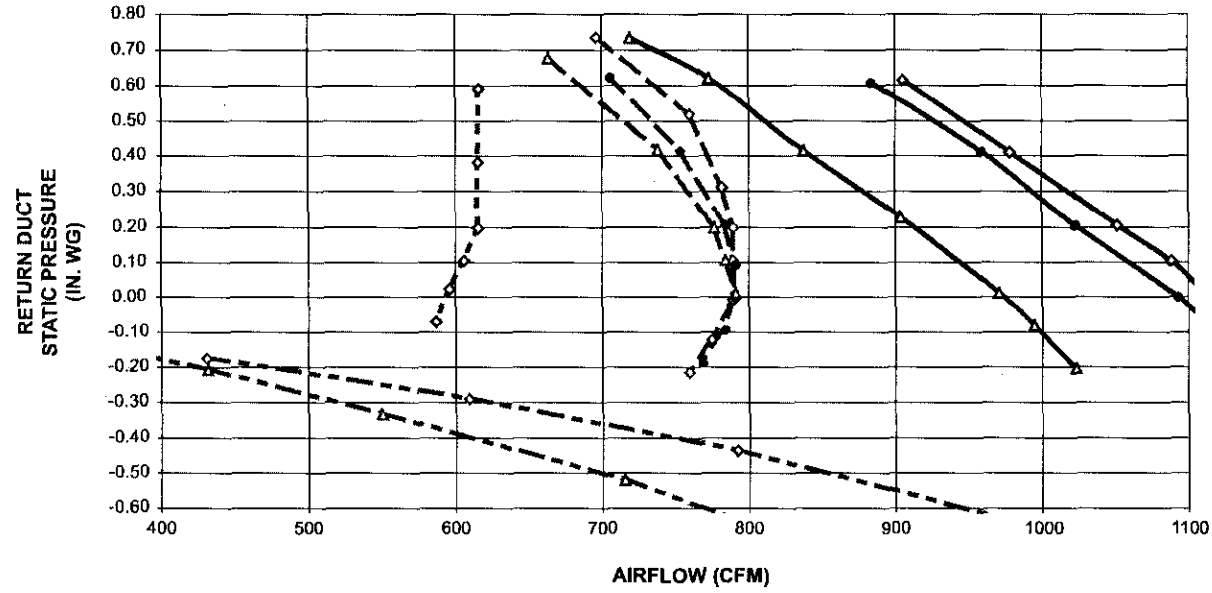


Fig. 54 — 62AQ060 Supply Fan Power Curve (230v)



LEGEND

△ — Damper at 30 Degrees Open
□ — Damper at 45 Degrees Open
● — Damper at 60 Degrees Open
◇ — Damper at 90 Degrees Open
— · · — No Fan
——— High Speed
— — — Med Speed
- - - - - - Low Speed

Fig. 55 — 62AQ100 Supply Fan Performance Curve (208v)

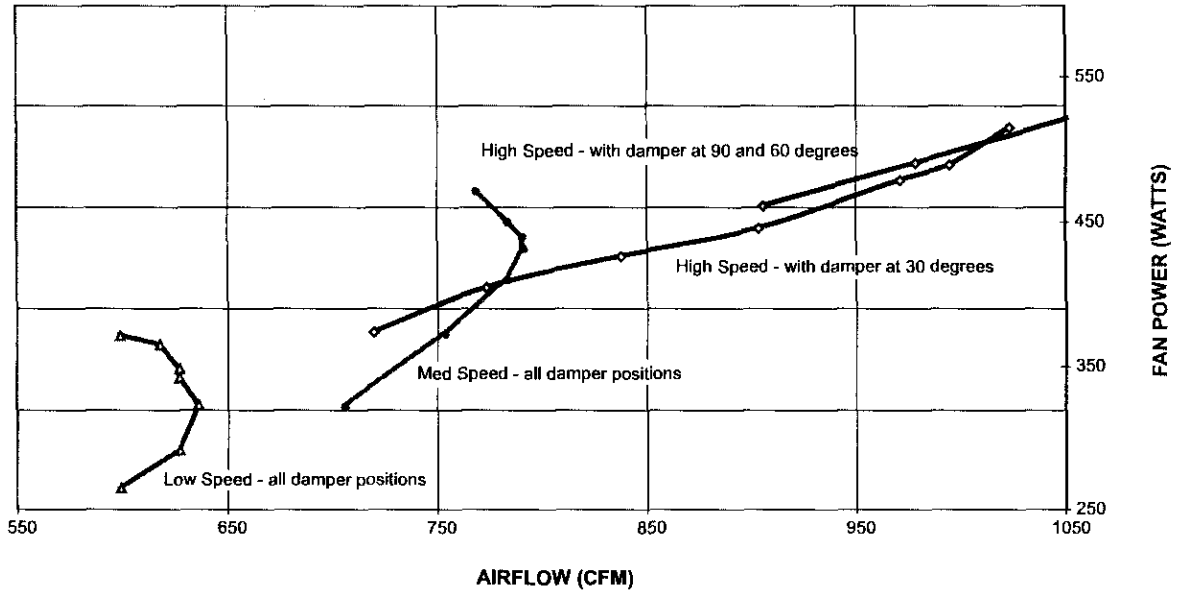
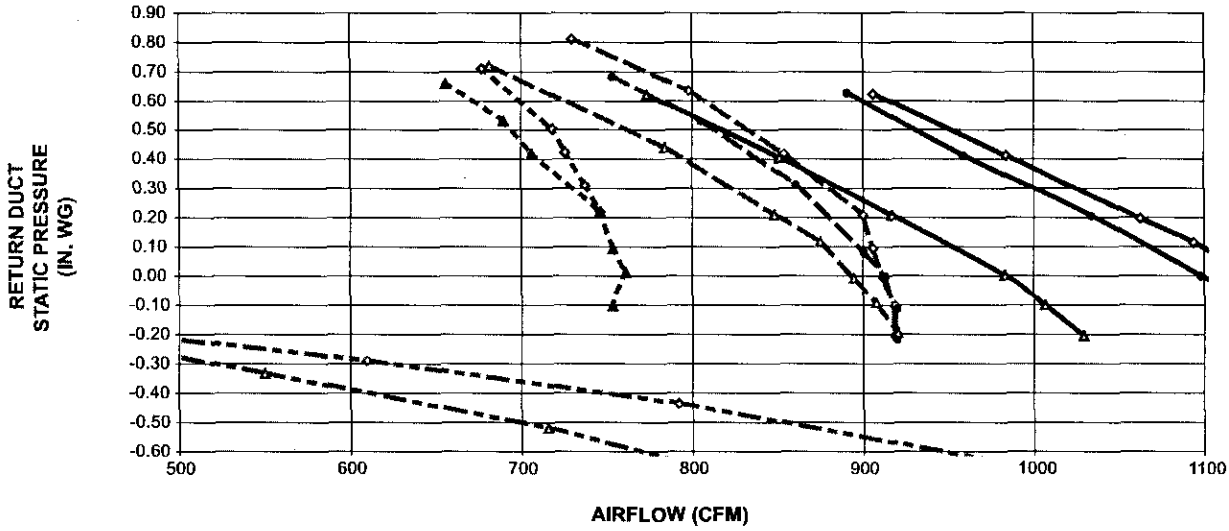


Fig. 56 — 62AQ100 Supply Fan Power Curve (208v)



LEGEND

△ — Damper at 30 Degrees Open
□ — Damper at 45 Degrees Open
● — Damper at 60 Degrees Open
◇ — Damper at 90 Degrees Open
— · · — No Fan
——— High Speed
— — — Med Speed
------ Low Speed

Fig. 57 — 62AQ100 Supply Fan Performance Curve (230v)

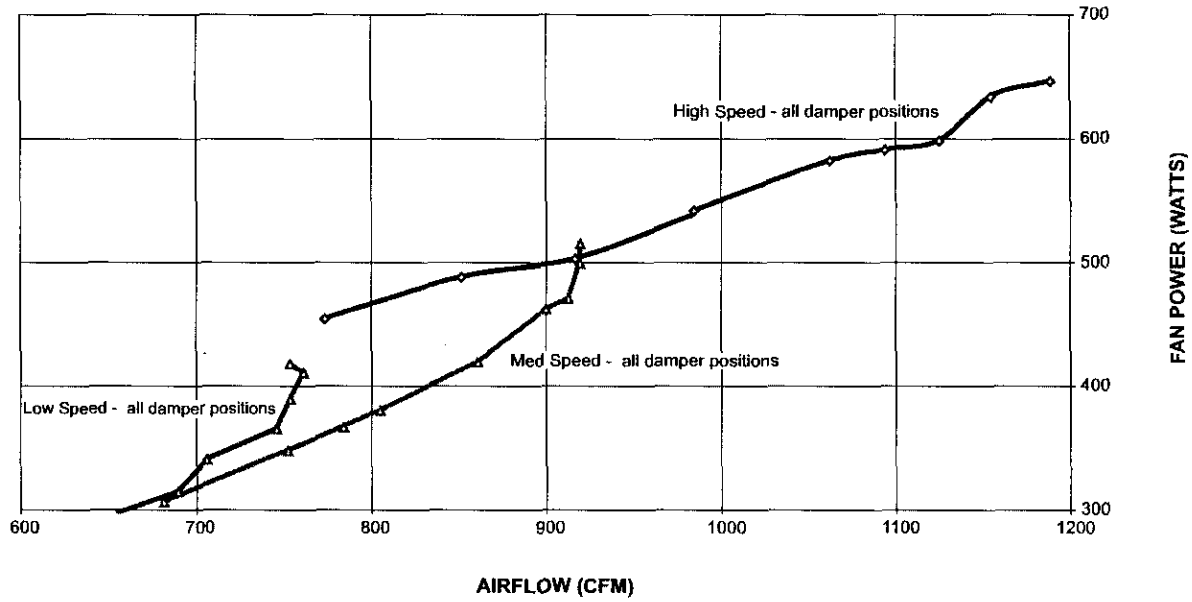
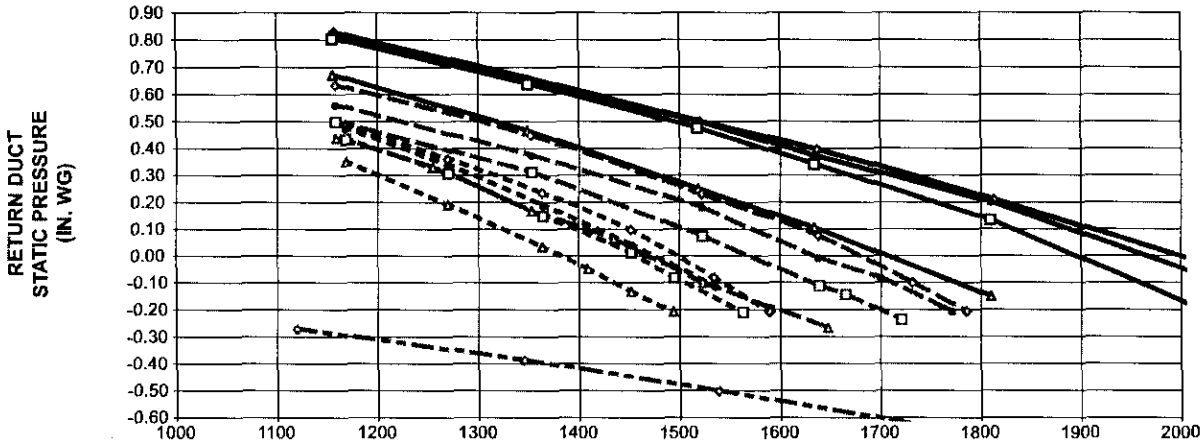


Fig. 58 — 62AQ100 Supply Fan Power Curve (230v)



LEGEND

△ — Damper at 30 Degrees Open
□ — Damper at 45 Degrees Open
● — Damper at 60 Degrees Open
◇ — Damper at 90 Degrees Open
— · · — No Fan
——— High Speed
— — — Med Speed
- - - - - - Low Speed

Fig. 59 — 62AQ200 Supply Fan Performance Curve (208v)

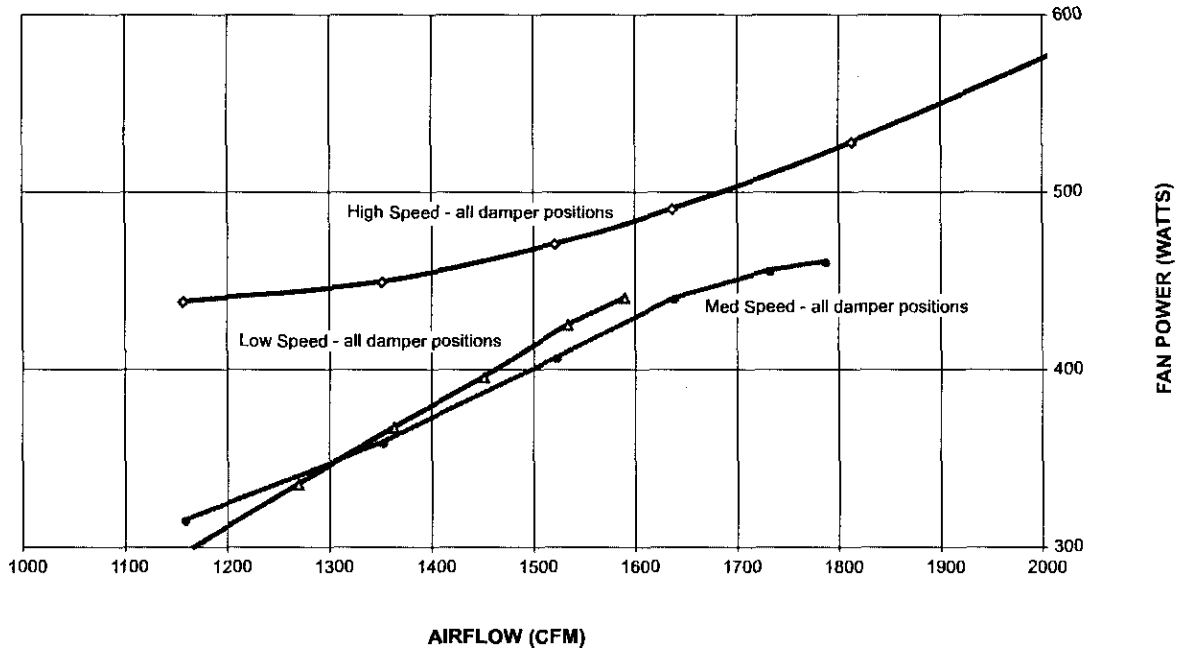
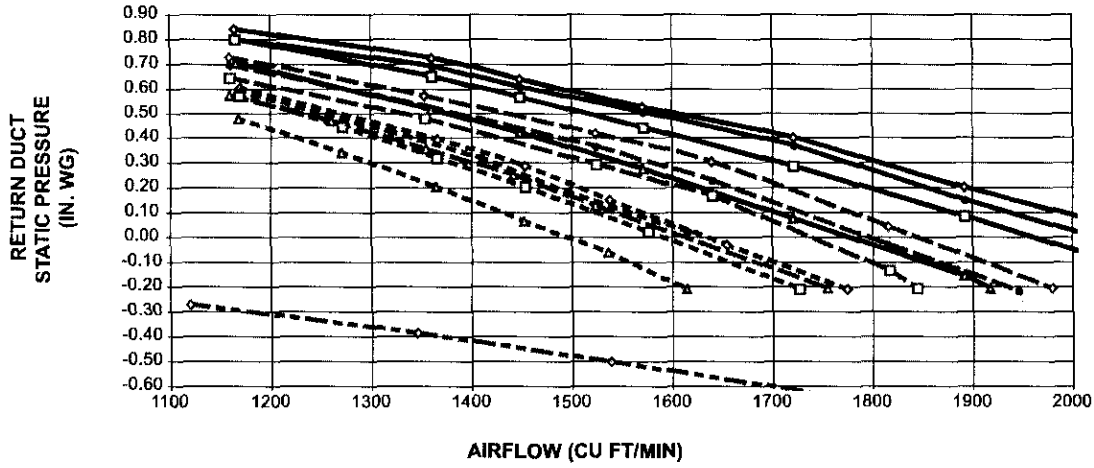


Fig. 60 — 62AQ200 Supply Fan Power Curve (208v)



LEGEND

△ — Damper at 30 Degrees Open
□ — Damper at 45 Degrees Open
● — Damper at 60 Degrees Open
◇ — Damper at 90 Degrees Open
— · · — No Fan
——— High Speed
— — — Med Speed
- - - - - - Low Speed

Fig. 61 — 62AQ200 Supply Fan Performance Curve (230v)

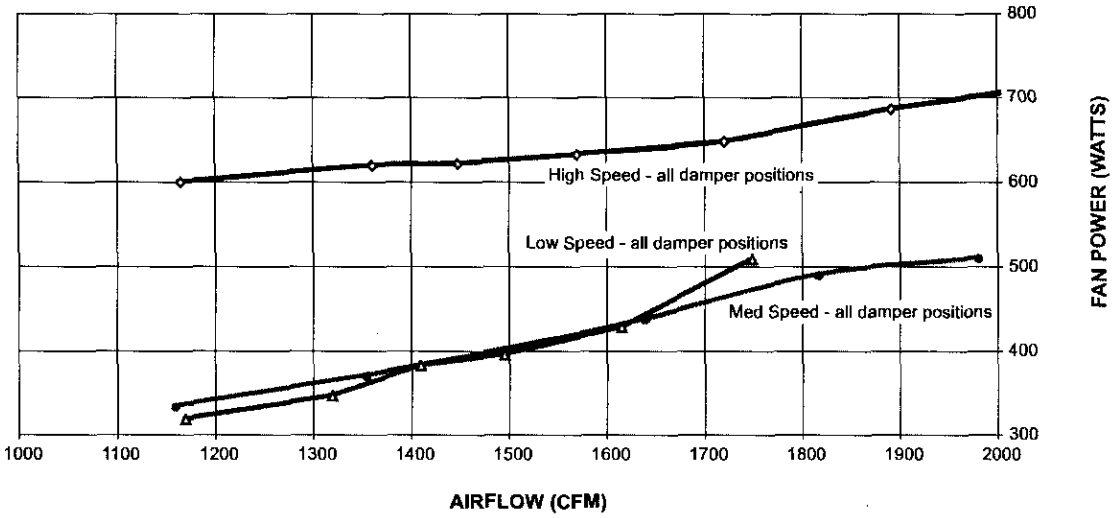


Fig. 62 — 62AQ200 Supply Fan Power Curve (230v)

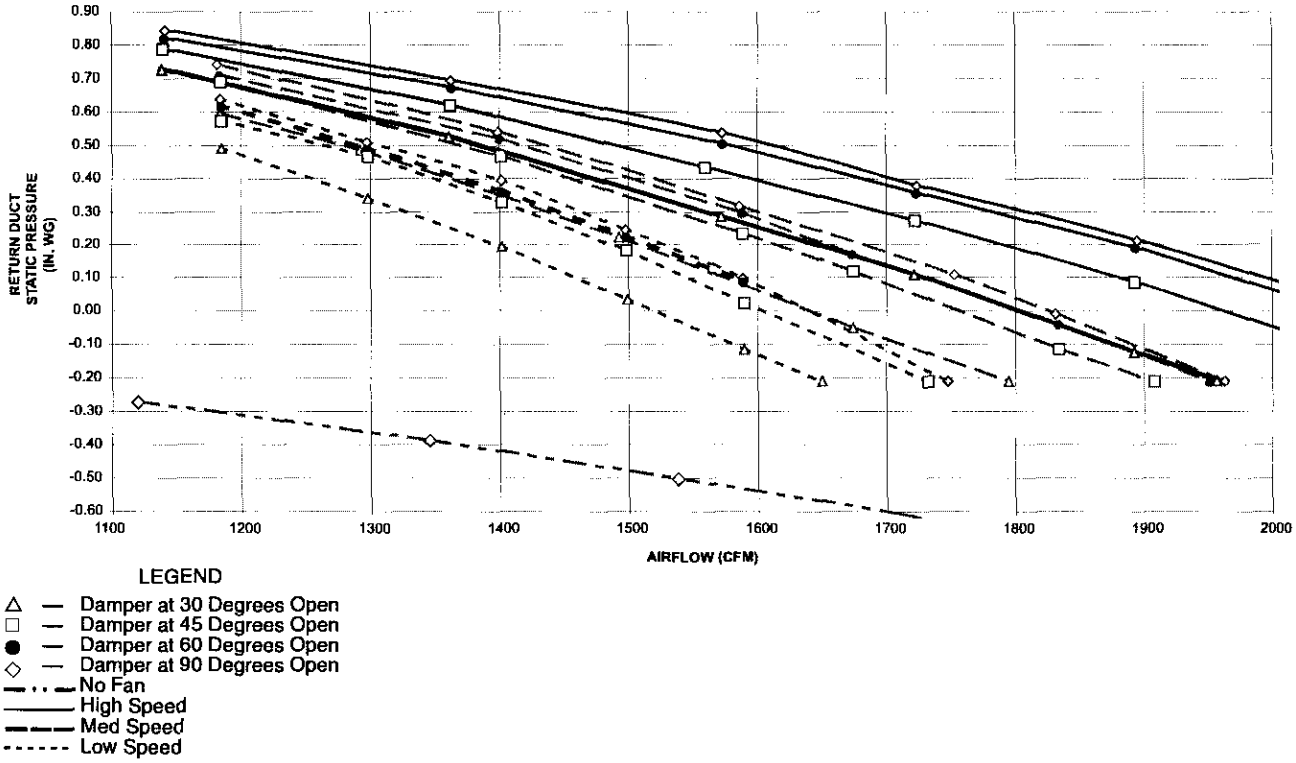


Fig. 63 — 62AQ200 Supply Fan Performance Curve (460v)

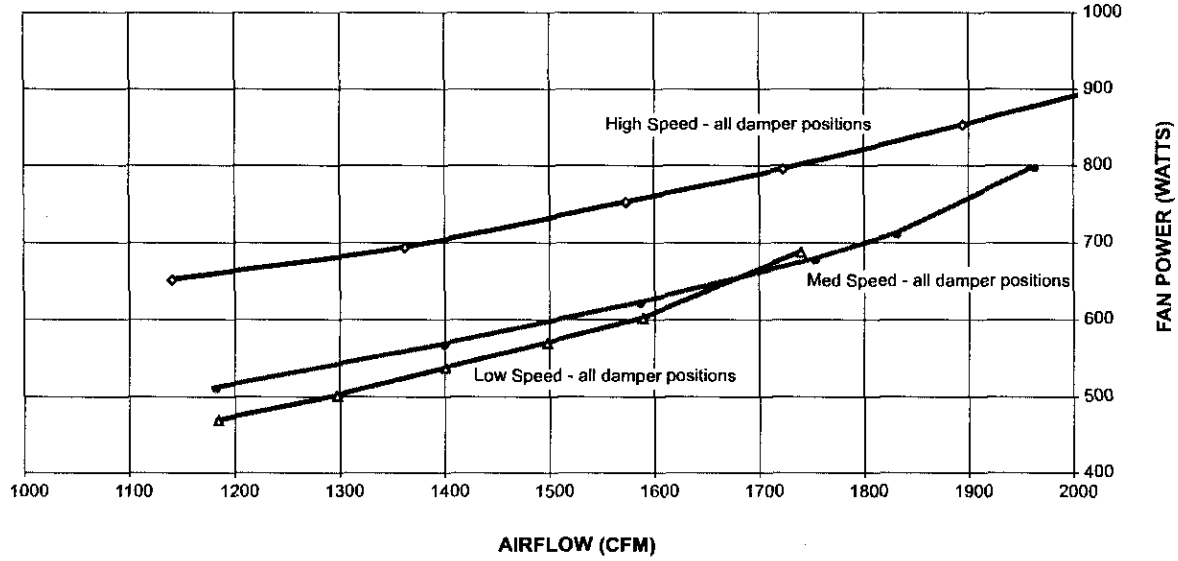


Fig. 64 — 62AQ200 Supply Fan Power Curve (460v)

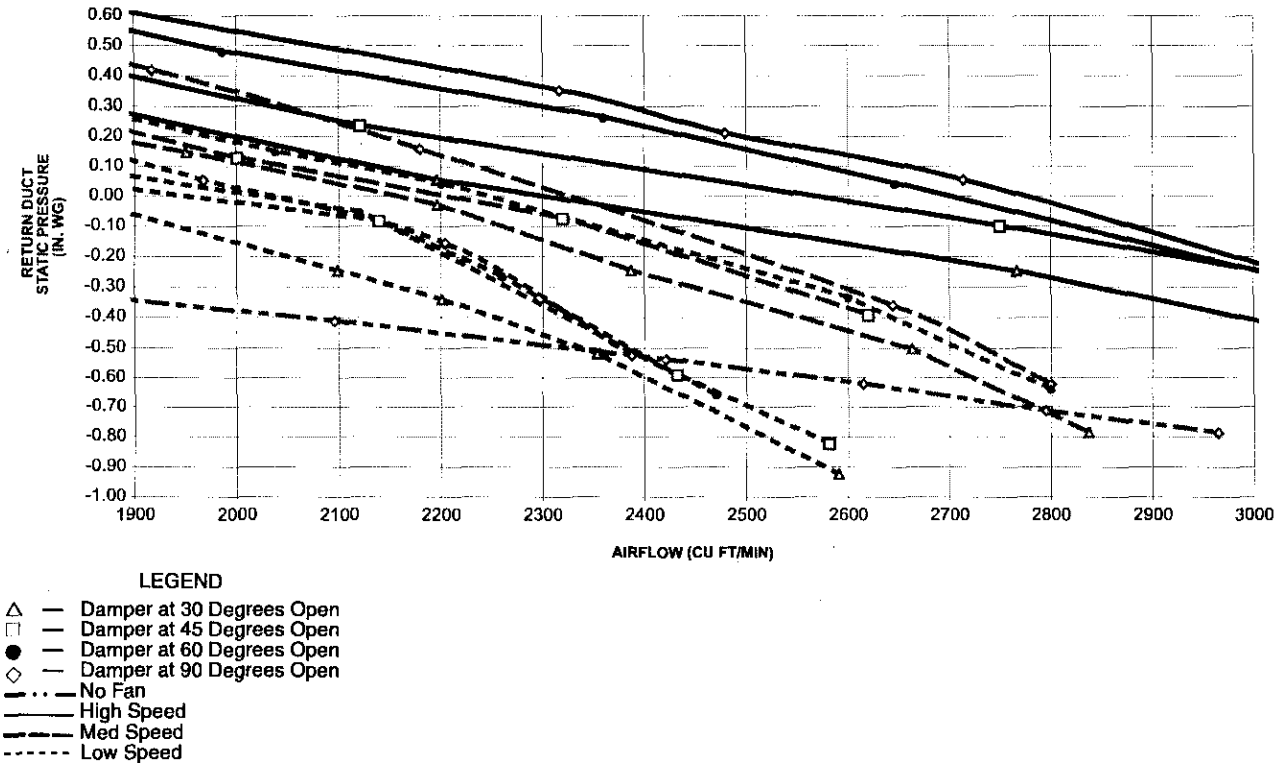


Fig. 65 — 62AQ300 Supply Fan Performance Curve (208v)

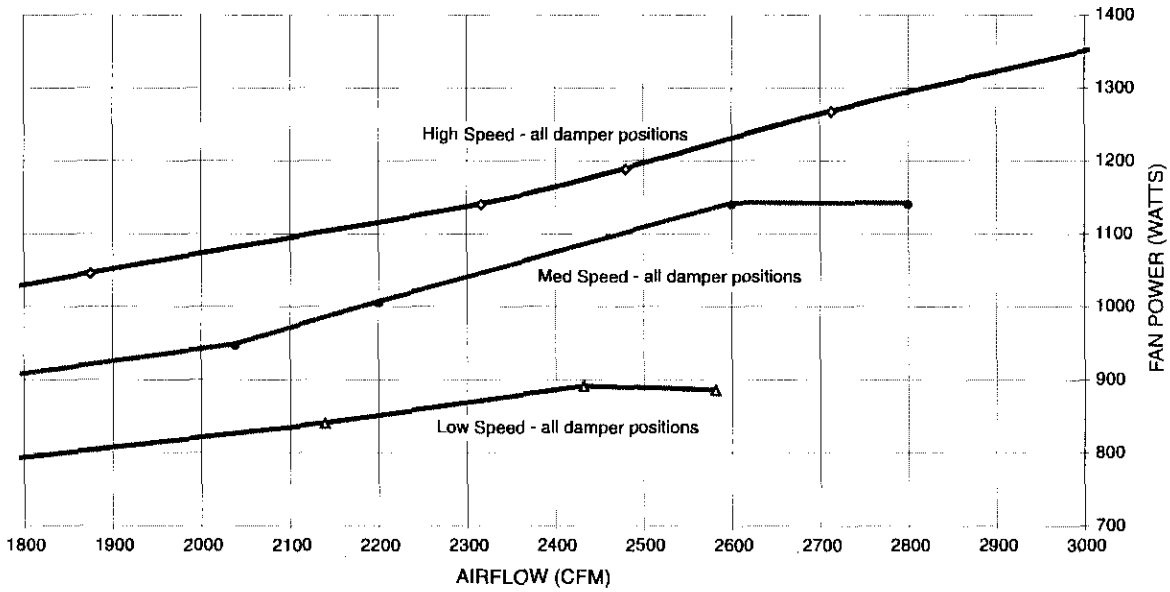
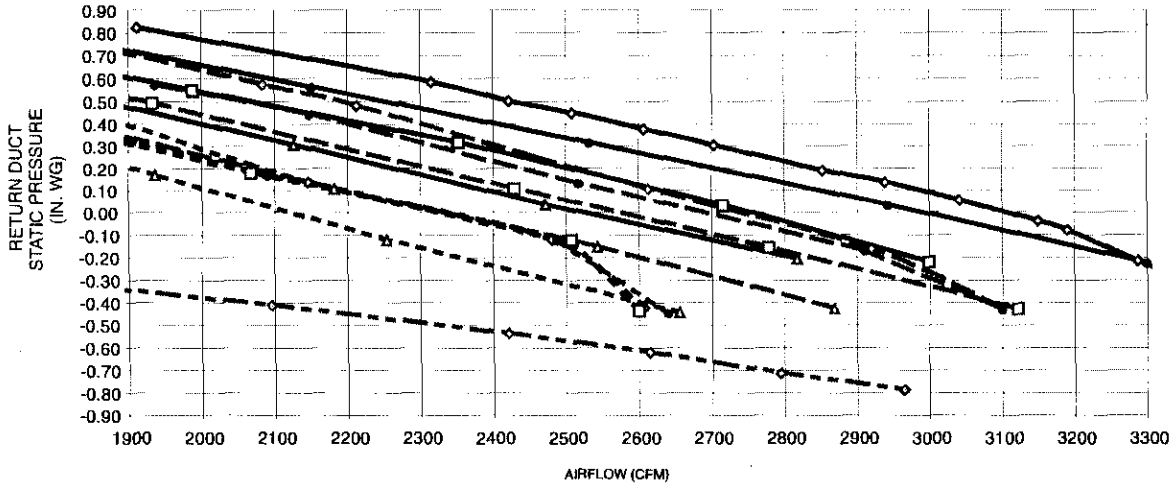


Fig. 66 — 62AQ300 Supply Fan Power Curve (208v)



LEGEND

△ — Damper at 30 Degrees Open
□ — Damper at 45 Degrees Open
● — Damper at 60 Degrees Open
◇ — Damper at 90 Degrees Open
— · · — No Fan
——— High Speed
— — — Med Speed
------ Low Speed

Fig. 67 — 62AQ300 Supply Fan Performance Curve (230v)

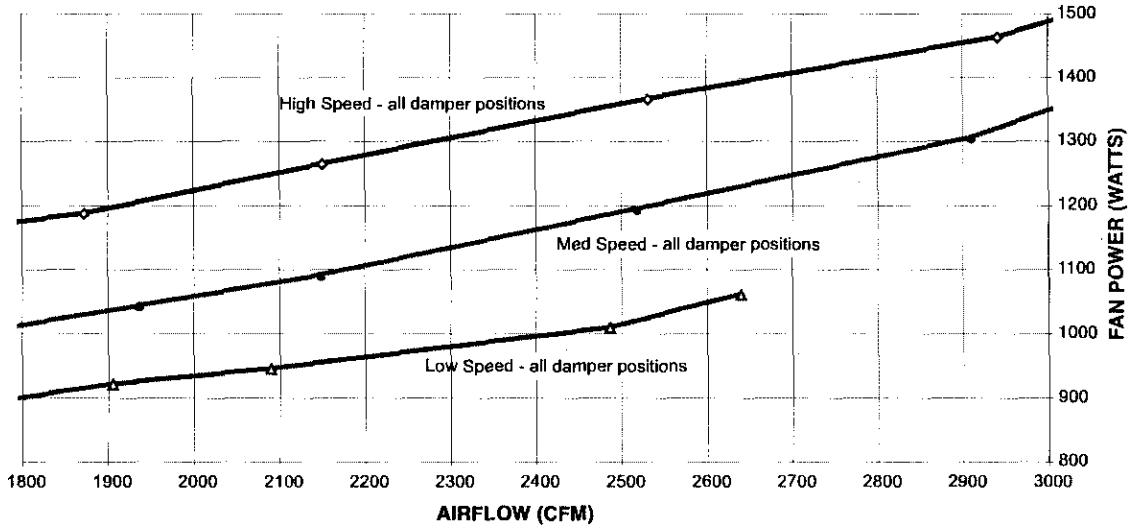
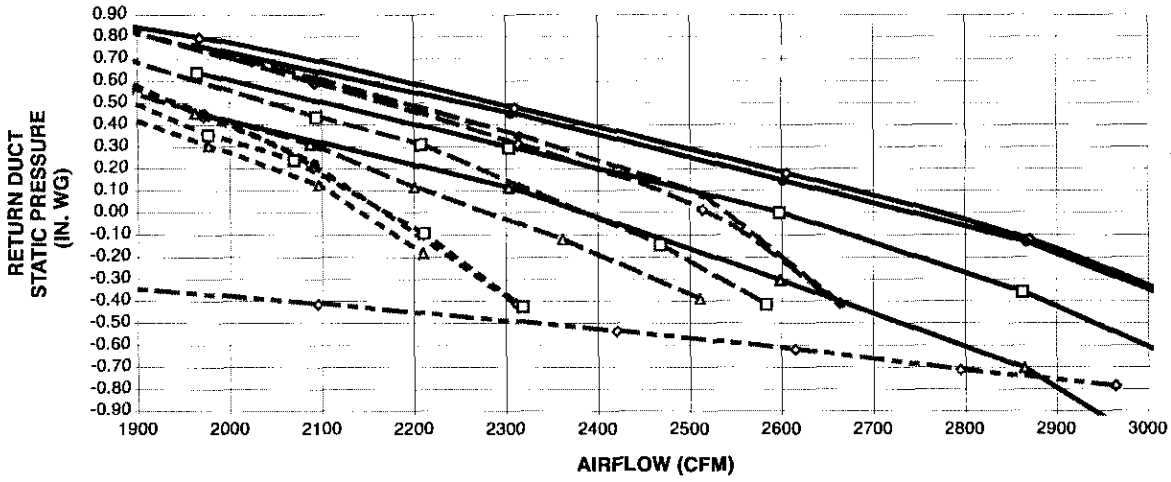


Fig. 68 — 62AQ300 Supply Fan Power Curve (230v)



LEGEND

△ — Damper at 30 Degrees Open
□ — Damper at 45 Degrees Open
● — Damper at 60 Degrees Open
◇ — Damper at 90 Degrees Open
—·—·— No Fan
——— High Speed
— — — Med Speed
------ Low Speed

Fig. 69 — 62AQ300 Supply Fan Performance Curve (460v)

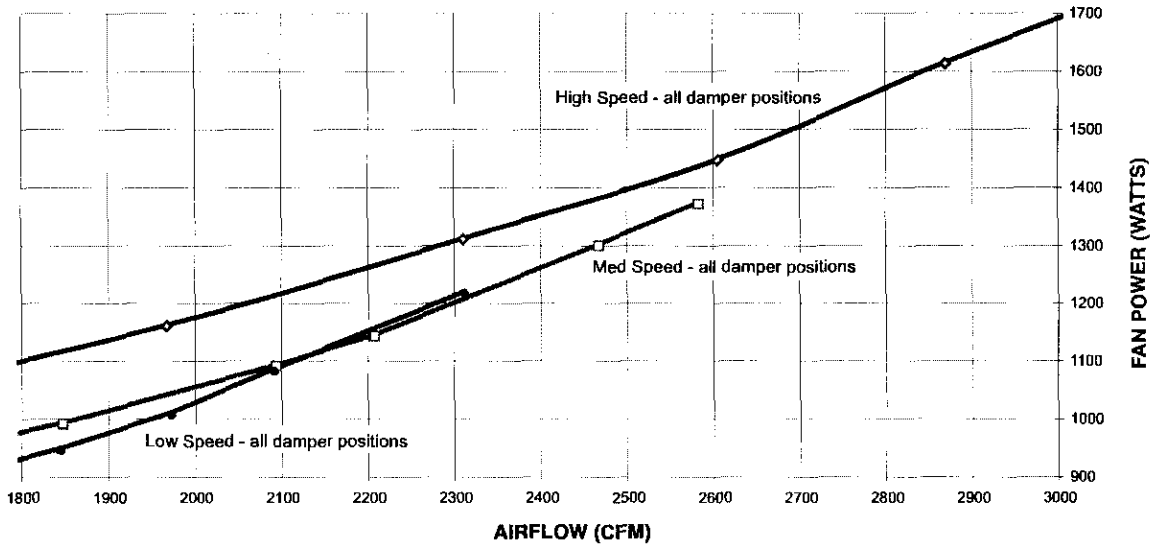


Fig. 70 — 62AQ300 Supply Fan Power Curve (460v)

PRE-START-UP

⚠ WARNING

Failure to observe the following warnings could result in serious personal injury.

1. Follow recognized safety practices and wear protective goggles and gloves when checking or servicing refrigerant system.
2. Do not operate compressor or provide any electric power to unit unless compressor terminal cover is in place and secured.
3. Do not remove compressor terminal cover until all electrical sources are disconnected and tagged accordingly.
4. Relieve all pressure from system before touching or disturbing any connections inside compressor terminal box. If refrigerant leak is suspected around compressor terminals, use accepted methods to recover refrigerant.
5. Never attempt to repair or solder any components while refrigerant system is under pressure.
6. Do not use torch to remove any component. System contains oil and refrigerant under pressure. To remove a component, wear protective goggles and gloves and proceed as follows:
   a. Shut off electrical power to unit and tag disconnect.
   b. Recover refrigerant to relieve all pressure from system, using both high-pressure and low-pressure ports.
   c. Cut component connection tubing with tubing cutter, and remove component from unit.
   d. Carefully unsweat remaining tubing stubs when necessary. Oil can ignite when exposed to torch flame.

Refer to 48/50HJ Installation Instructions for Pre-Start-Up information for the rooftop unit section. Proceed as follows to inspect and prepare the unit for initial start-up:

1. Remove filter access panel, blower access panel, and control panel access cover on the energy recovery section.
2. Read and follow instructions on all WARNING, CAUTION, and INFORMATION labels attached to (or shipped with) unit.
3. Make the following inspections:
   a. Inspect for shipping or handling damages such as broken lines, loose parts, or disconnected wires.
   b. Inspect for oil at all refrigerant tubing connections and on unit base. Detecting oil usually indicates a refrigerant leak. Leak-test all refrigerant tubing connections using an electronic leak detector, halide torch, or liquid-soap solution.
   c. Inspect all field and factory wiring connections Be sure that connections are completed and tight.
   d. Inspect upper (supply) and lower (exhaust) coils for damage and refrigerant leaks. If fin damage is noted, carefully straighten fins using a fin comb.
4. Tighten compressor holddown bolts to 5.5 to 6.5 ft-lb of torque.
5. Verify the following:
   a. If installed, ensure optional supply and exhaust blower wheel set screws are tight and wheels are centered within the blower housing.
   b. Make sure supply and exhaust air filters are in place.
   c. Make sure the condensate drain is of correct dimensions and primed with water to ensure proper drainage.
   d. Reinstall all access panels.
   e. Ensure all tools and miscellaneous parts have been removed.

START-UP

Refer to the 48/50HJ Installation Instructions for information on Start-Up for the rooftop unit section.

Unit Preparation — Make sure the unit has been installed in accordance with installation instructions and applicable codes.

Supply and Exhaust Filters — Make sure filters are correctly installed on unit. Do not operate without filters in place.

Outdoor-Air Inlet Screens — Outdoor-air inlet screen(s) must be in place before operating the unit.

Compressor Mounting — Compressors are internally spring-mounted. Ensure wooden shipping block has been removed from under the compressor and holddown bolts are in place.

Internal Wiring — Check all low and high voltage connections for proper locations. Ensure connections are tight.

Cooling — Set light commercial Thermidistat™ mode selection to Cooling and fan mode to Auto. Ensure thermostat has been adjusted to a setting below room temperature. Refer to Light Commercial Thermidistat Accessory section for correct unit operation.

Heating — Set light commercial Thermidistat mode selection to Heating and fan mode to Auto. Ensure thermostat has been adjusted to a setting below room temperature. Refer to Light Commercial Thermidistat Accessory section for correct unit operation.

Operating Sequence — Refer to Step 5 — Conduct Light Commercial Thermidistat Start-Up and Checkout on page 45, and Tables 2A and 2B for Energy$Recycler™ section operating sequences.

SERVICE

Refer to base unit installation instructions or 62AQ Installation Instruction for all service information.

Fuse Box (48HJ012,014 — 208/230-3-60 Units Only) — Certain 48HJ units contain fuses for the power supply. The fuse box is located in the compressor section in a single point box. See Fig. 71. Replacement fuses are cartridge type, non-renewable, time delay FRN type of the appropriate size and voltage. Refer to existing fuse size and voltage for replacement.

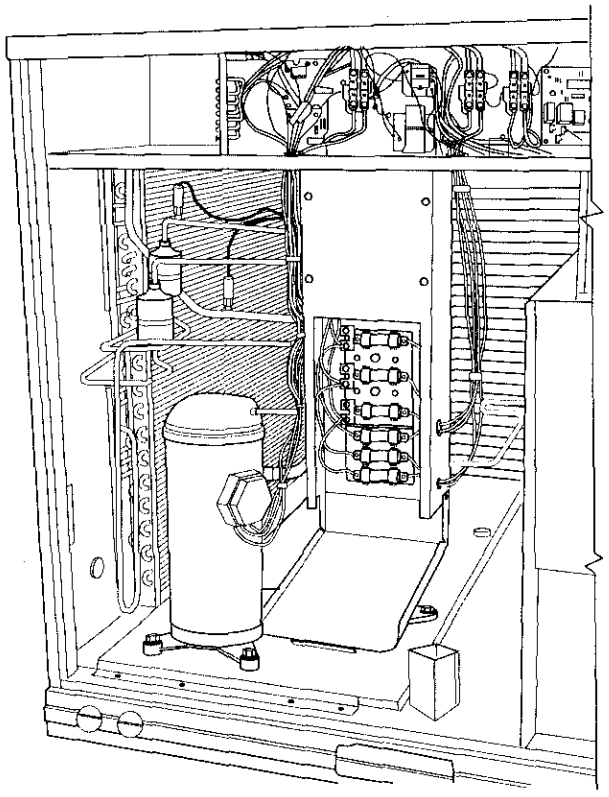


Fig. 71 — Fuse Box (48HJ012,014 — 208/230-3-60 Units Only)

TROUBLESHOOTING

Use Tables 5 and 6, and Fig. 72-79 when troubleshooting this unit.

NOTES:
1. If any of the original wire furnished must be replaced, it must be replaced with Type 90 C wire or its equivalent.
2. TRAN is wired for 230-v unit. If unit is to be run with 208-v power supply, disconnect BLK wire from 230-v tap (ORN) and connect to 208-v tap (RED). Insulate end of 230-v tap.
3. Use copper, copper clad aluminum conductor.

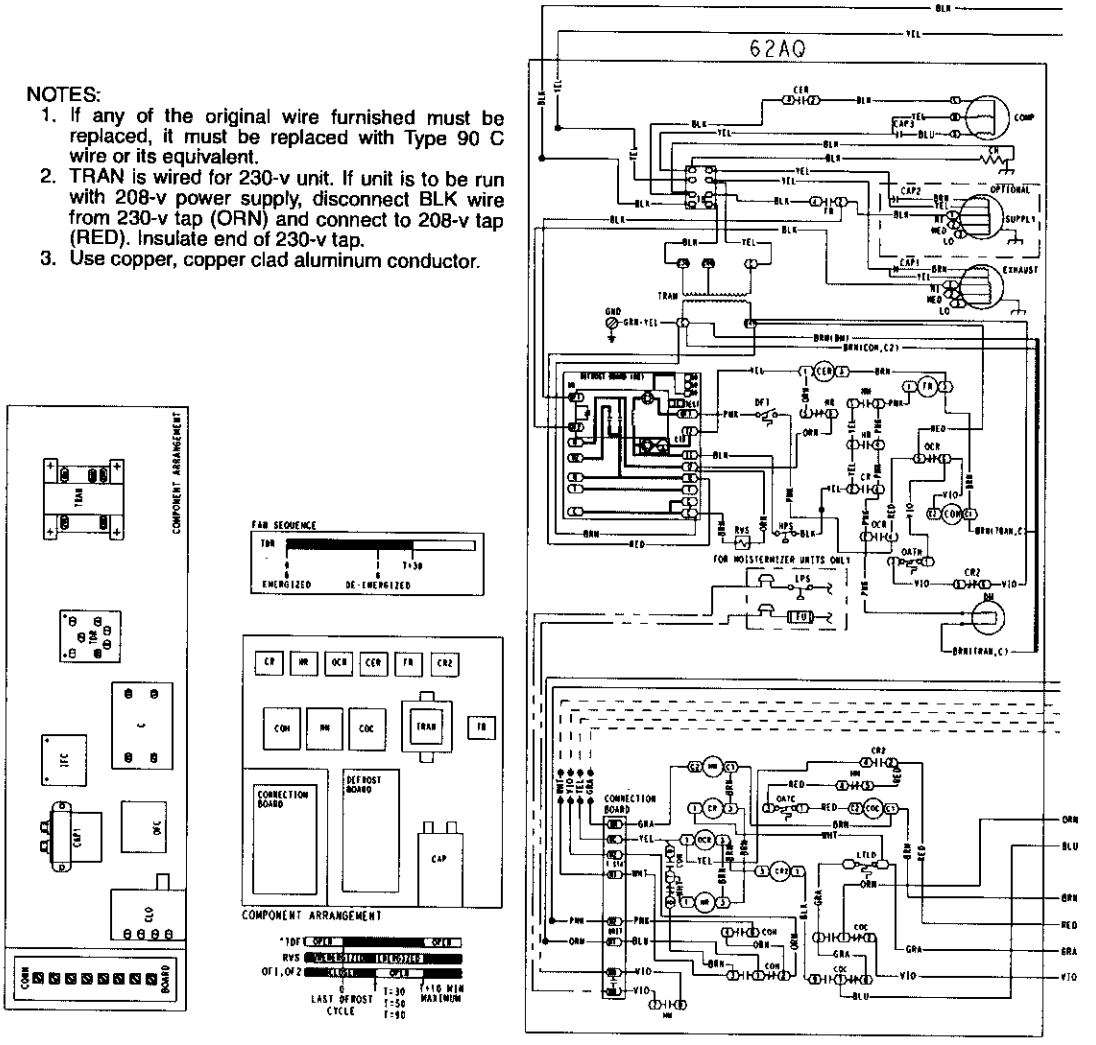


Fig. 72 — COBRA™ Unit Wiring Schematic (50HJ006 with 62AQ060/100, 208/230-3-60) with Electro-Mechanical Controls

LEGEND FOR FIG. 72-79

C	— Contactor	**HPS**	— High-Pressure Switch	**SEN**	— Sensor
CAP	— Capacitor	**HR**	— Heating Relay	**TB**	— Terminal Block
CB	— Circuit Breaker	**HS**	— Hall Effect Sensor	**TDR**	— Time Delay Relay
CC	— Compressor Contactor	**I**	— Ignitor	**TRAN**	— Transformer
CER	— Compressor Energy Recovery section	**IDM**	— Induced Draft Motor		Field Splice
CH	— Crankcase Heater	**IFC**	— Indoor Fan Contactor		Marked Wire
CLO	— Compressor Lockout	**IFM**	— Indoor Fan Motor		Terminal (Marked)
COC	— Cool Changeover Relay	**IGC**	— Integrated Gas Unit Control (48HJ only)		Terminal (Unmarked)
COH	— Heat Changeover Relay	**LTLO**	— Low Temp Cooling Lockout		Terminal Block
COMP	— Compressor Motor	**LPS**	— Low-Pressure Switch		Splice
CR	— Cooling Relay	**LS**	— Limit Switch		Splice (Marked)
CTD	— Compressor Time Delay	**LSM**	— Limit Switch (Manual)		Factory Wiring
DB	— Defrost Board	**MGV**	— Main Gas Valve		Field Control Wiring
DFT	— Defrost Thermostat	**OATC**	— Outdoor-Air Thermostat (Cool)		Field Power Wiring
DM	— Damper Motor	**OATH**	— Outdoor-Air Thermostat (Heat)		Accessory or Optional Wiring
DR	— Defrost Relay	**OCR**	— Occupied Relay		To indicate common potential only. Not to represent wiring.
EFC	— Exhaust Fan Contactor	**OFC**	— Outdoor Fan Contactor		
EQUIP	— Equipment	**OFM**	— Outdoor Fan Motor		
FC	— Supply Fan Contactor	**OLR**	— Overload Relay		
FPT	— Freeze-Up Protection Thermostat	**PL**	— Plug Assembly		
FR	— Fan Relay	**QT**	— Quadruple Terminal		
FU	— Fuse	**RS**	— Rollout Switch		
GND	— Ground	**RTU**	— Rooftop Unit		
GVR	— Gas Valve Relay	**RVS**	— Reversing Valve Solenoid		
HM	— Humidity Relay	**SAT**	— Supply Air Temperature		

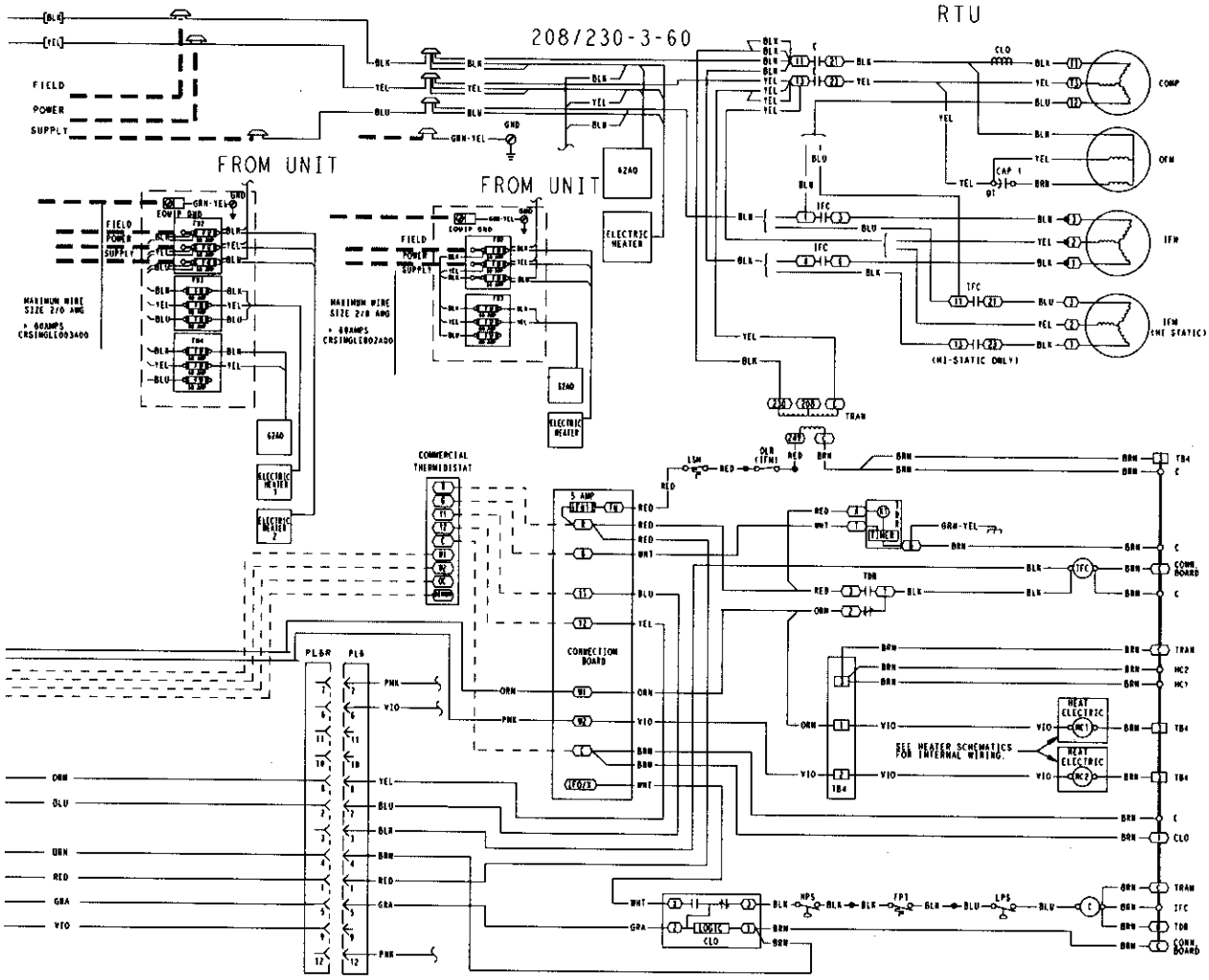


Fig. 72 — COBRA™ Unit Wiring Schematic (50HJ006 with 62AQ060/100, 208/230-3-60) with Electro-Mechanical Controls (cont)

NOTES:

1. If any of the original wire furnished must be replaced, it must be replaced with Type 90 C wire or its equivalent.
2. Three phase motors are protected under primary single phasing conditions.
3. TRAN is wired for 230v unit. If unit is to be run with 208v power supply, disconnect BLK wire from 230v tap (ORN) and connect to 200v tap.
4. IFMOVL not present with size 012 high static.
5. Use copper, copper clad aluminum or aluminum conductors.

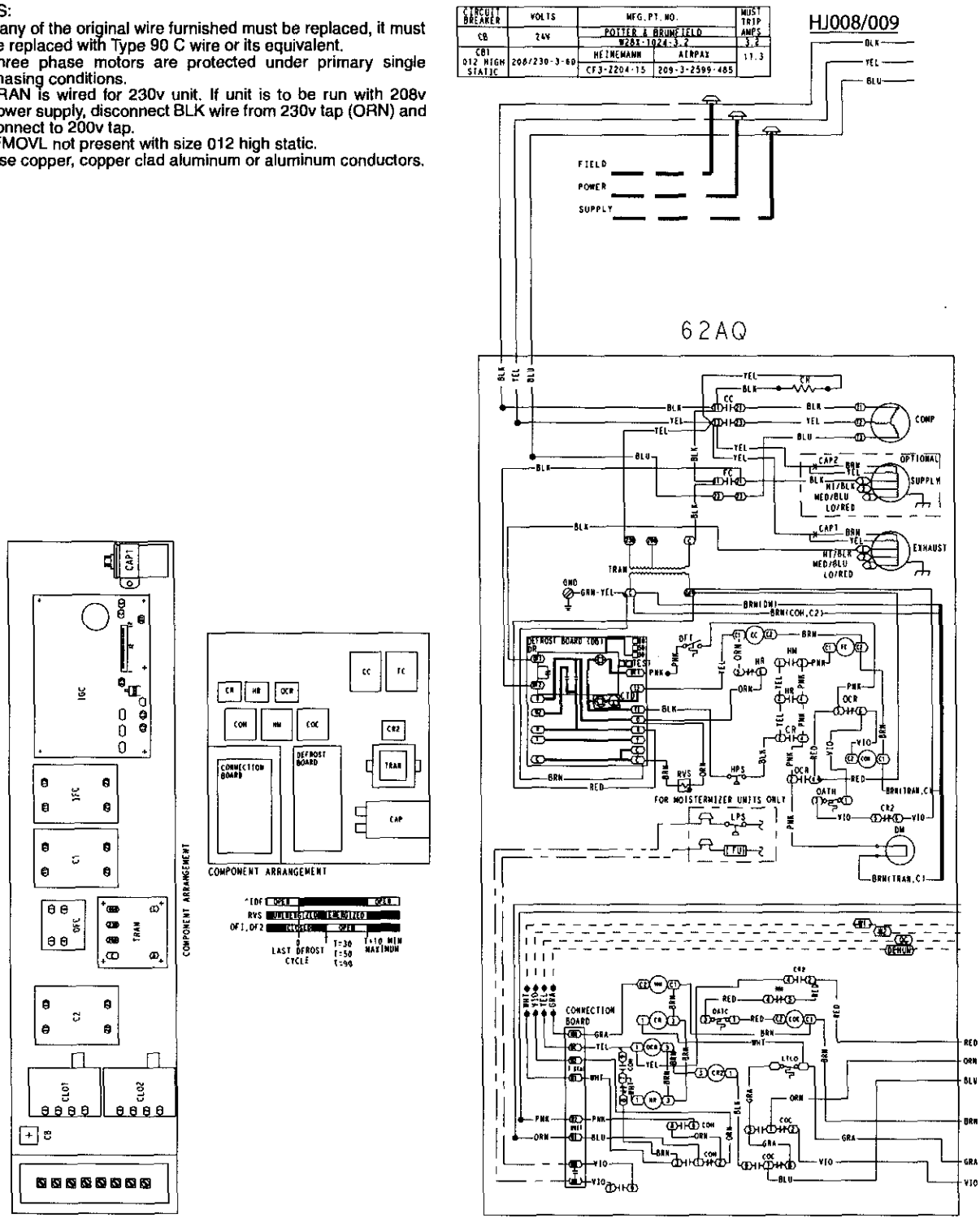


Fig. 73 — COBRA™ Unit Wiring Schematic (48HJ008-012 with 62AQ200, 208/230-3-60) with Electro-Mechanical Controls

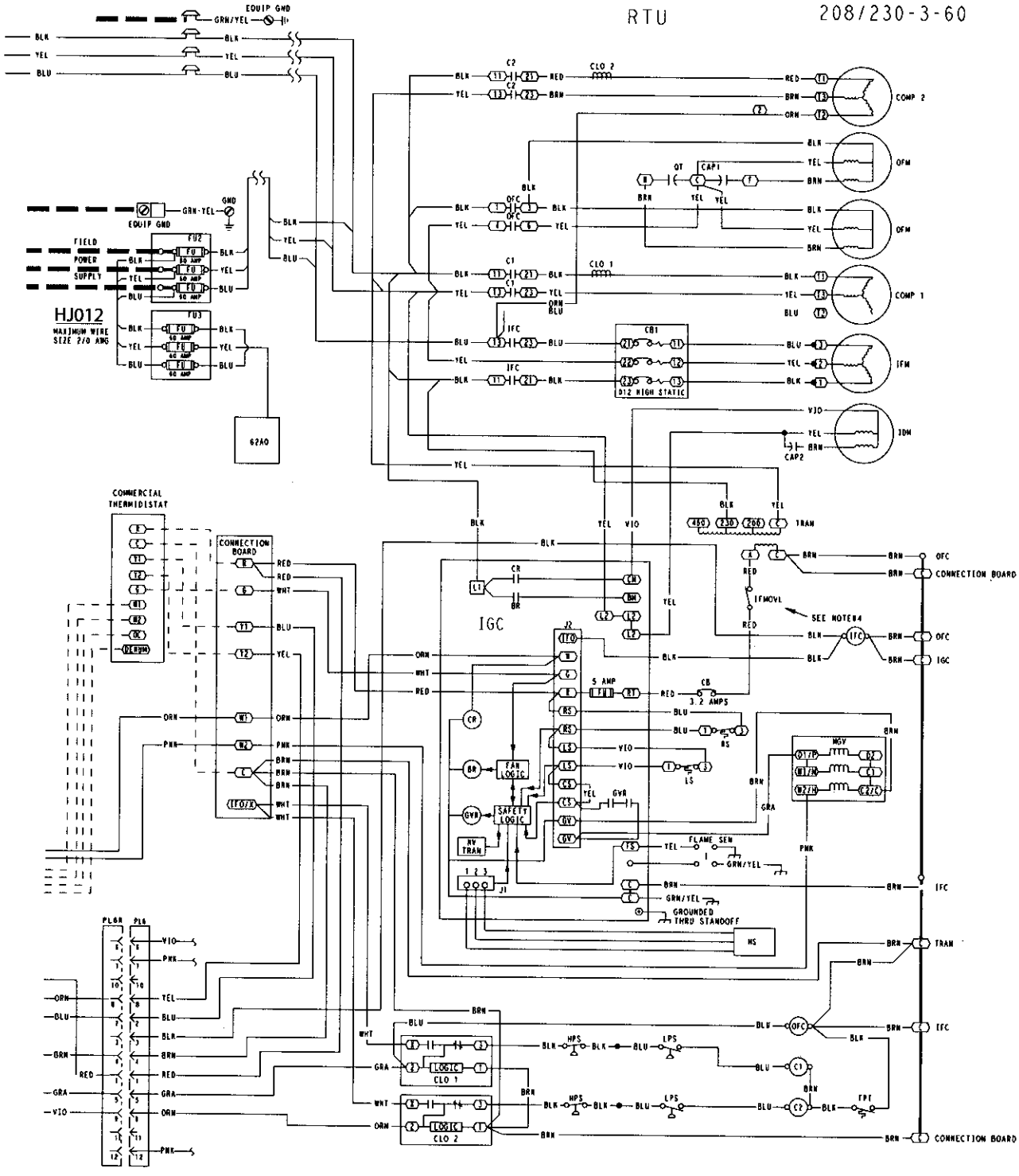


Fig. 73 — COBRA™ Unit Wiring Schematic (48HJ008-012 with 62AQ200, 208/230-3-60) with Electro-Mechanical Controls (cont)

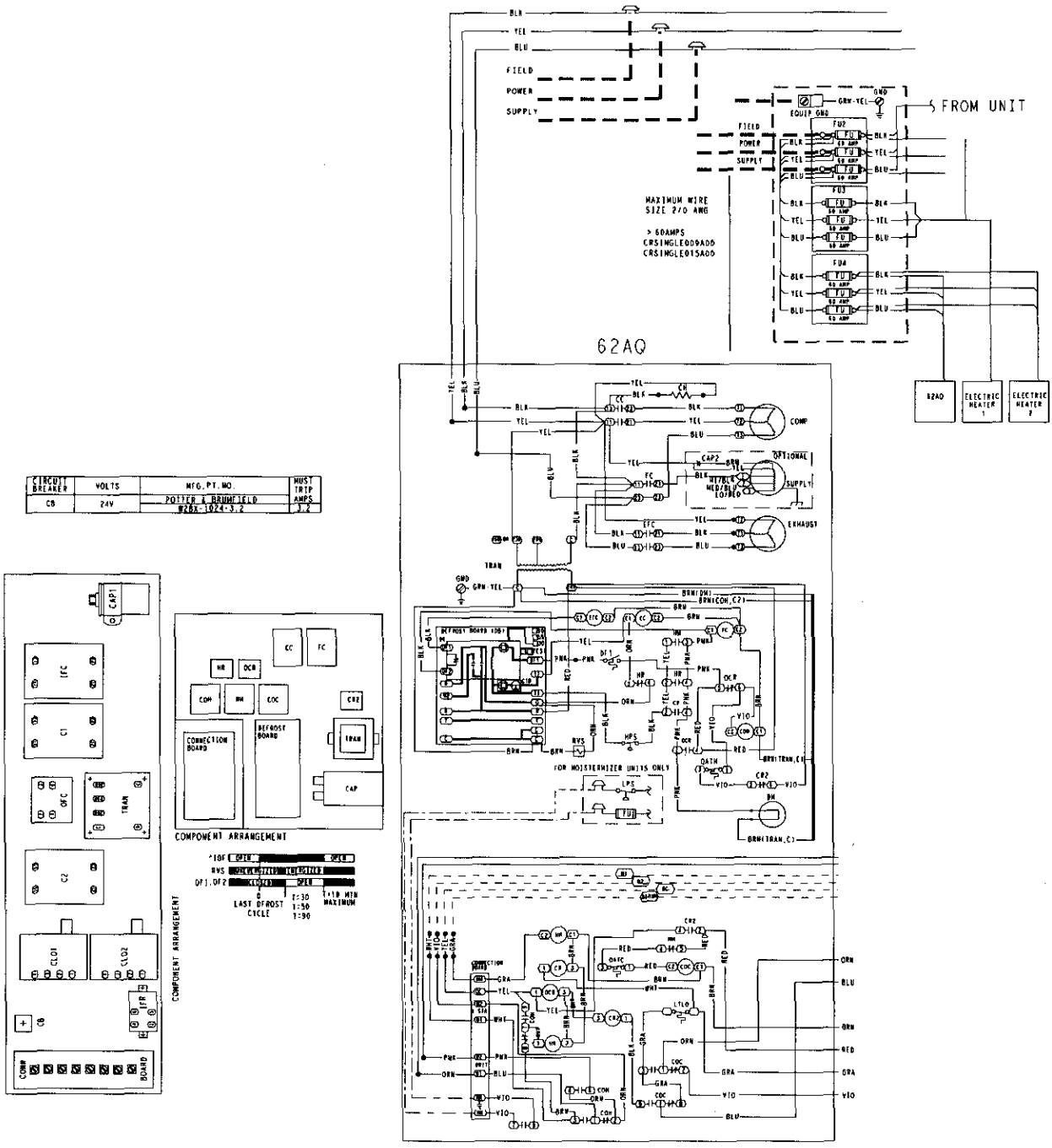


Fig. 74 — COBRA™ Unit Wiring Schematic (50HJ008/009 with 62AQ300, 208/230-3-60) with Electro-Mechanical Controls

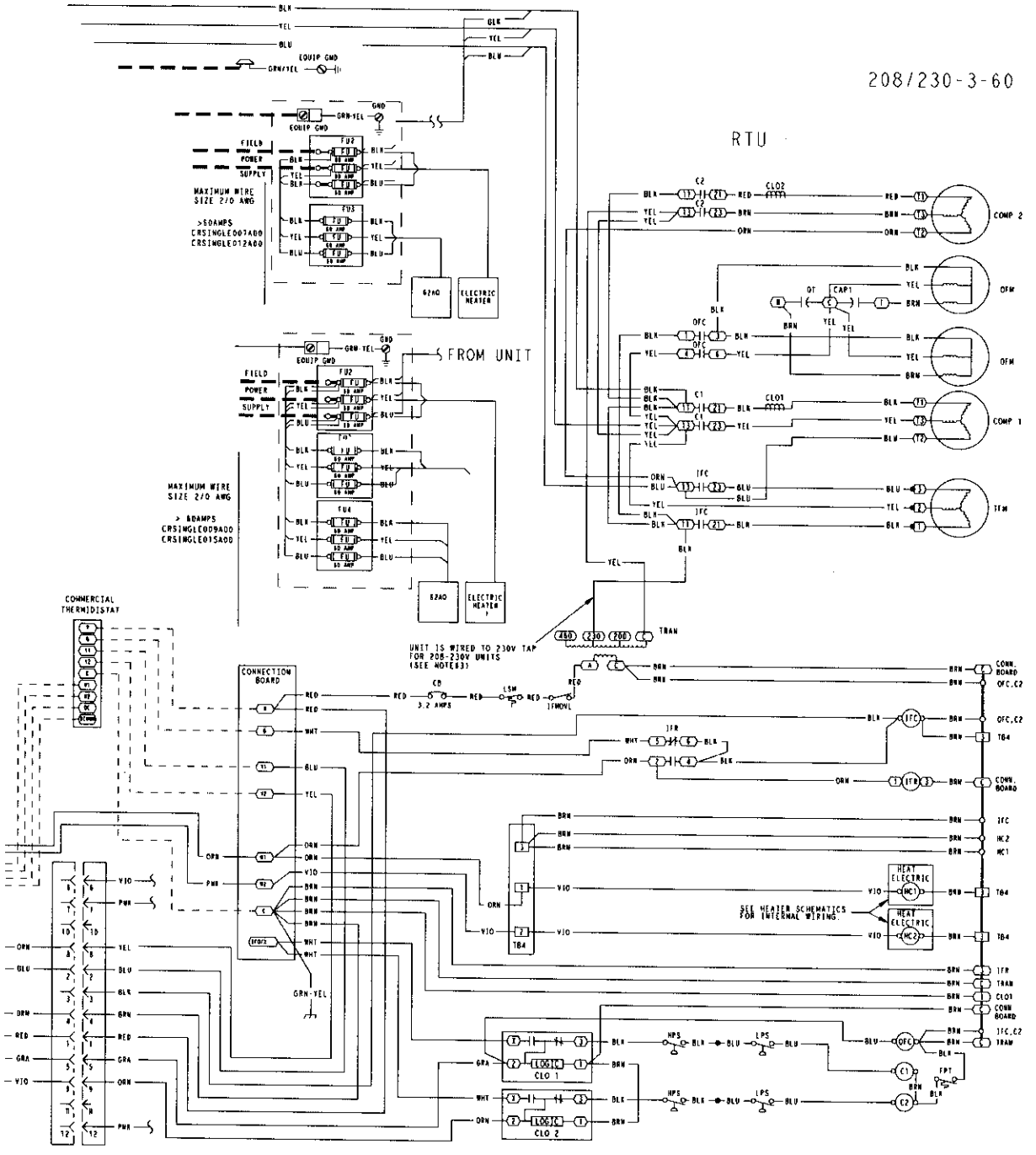


Fig. 74 — COBRA™ Unit Wiring Schematic (50HJ008/009 with 62AQ300, 208/230-3-60) with Electro-Mechanical Controls (cont)

NOTES:

1. If any of the original wire furnished must be replaced, it must be replaced with Type 90 C wire or its equivalent.
2. Three phase motors are protected under primary single phasing conditions.
3. IFMOVL not present with size 012 high static or 014 std. mtr.
4. Use copper, copper clad aluminum or aluminum conductors.

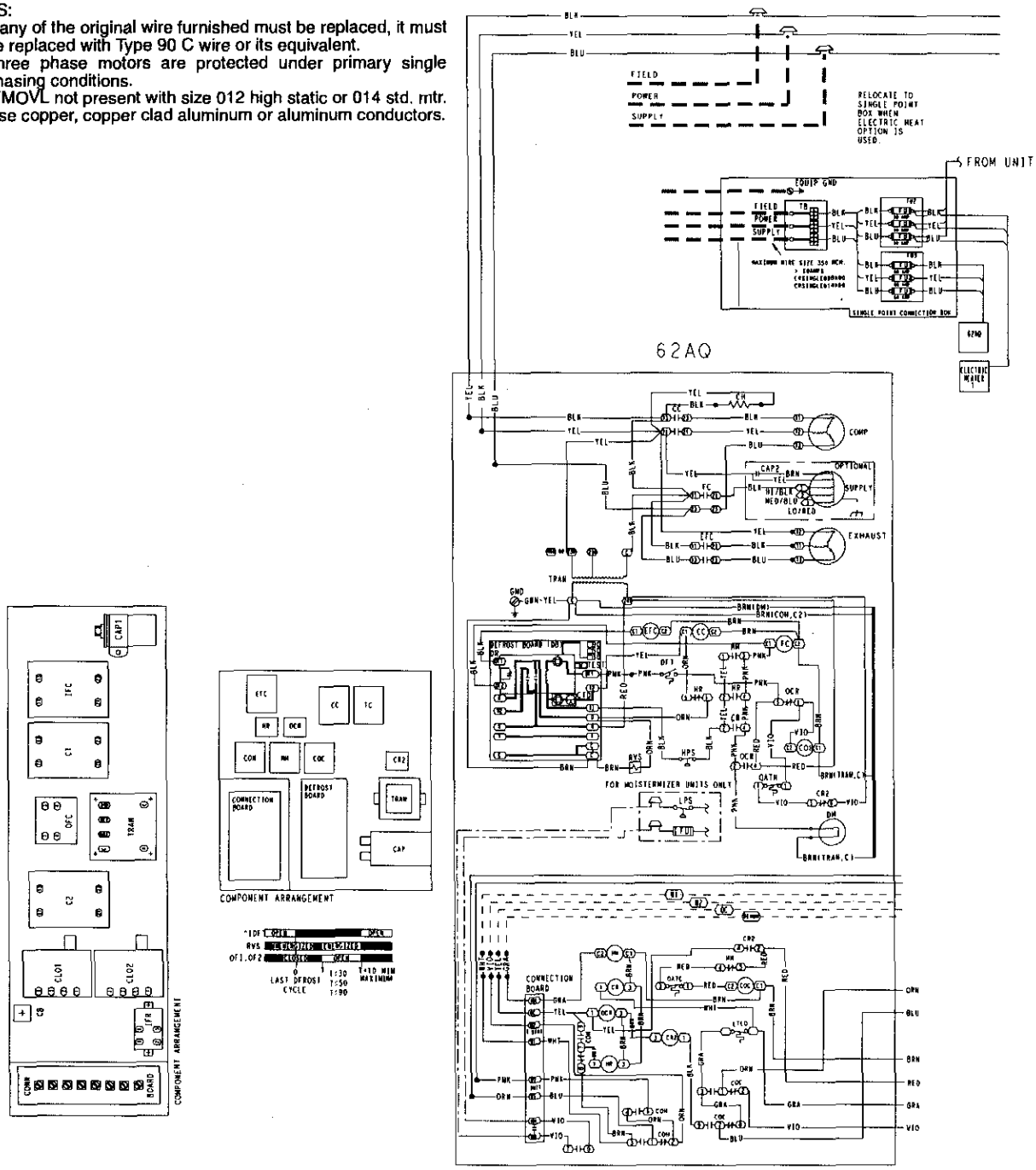


Fig. 75 — COBRA™ Unit Wiring Schematic (50HJ014 with 62AQ300, 460-3-60) with Electro-Mechanical Controls

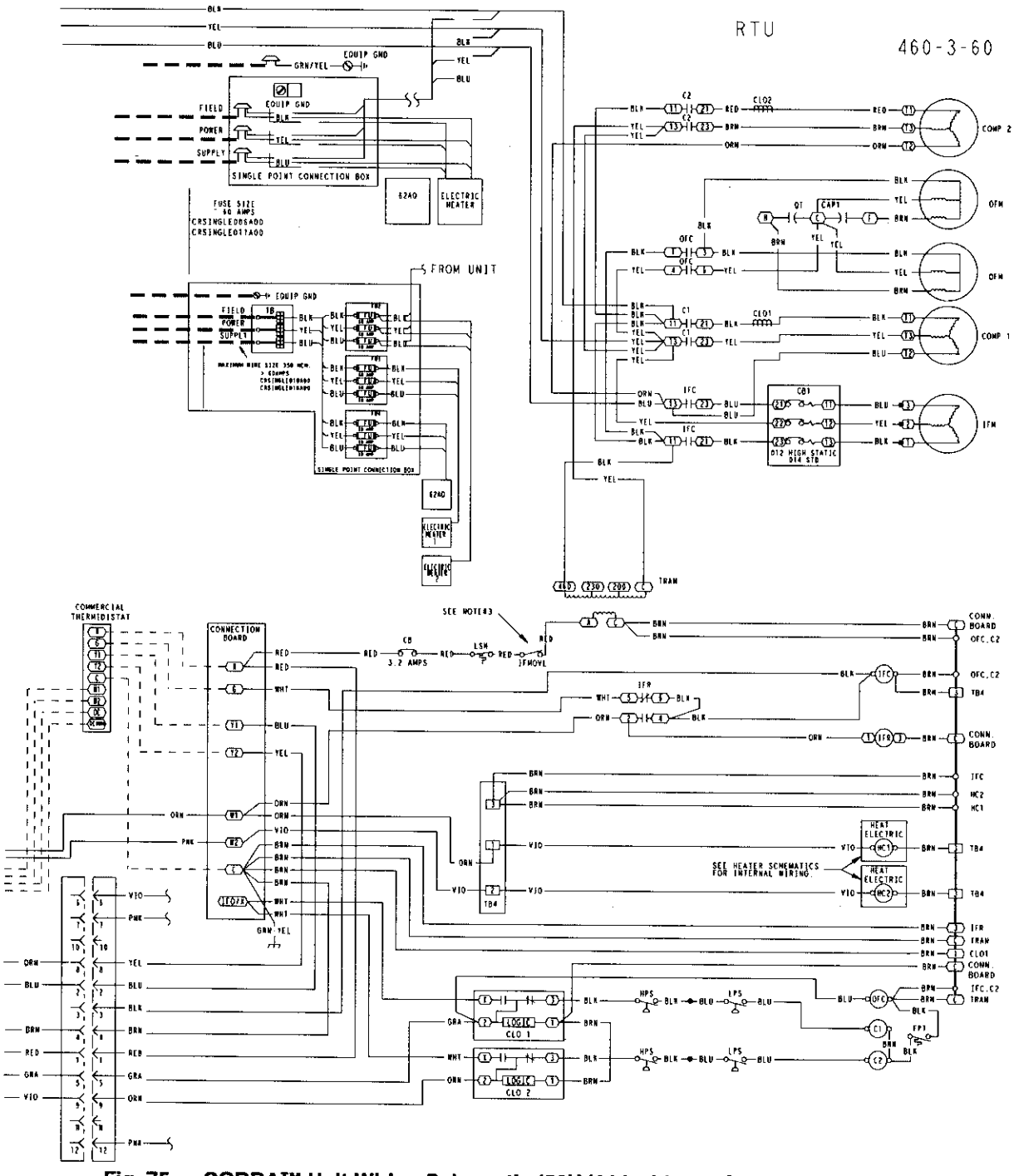
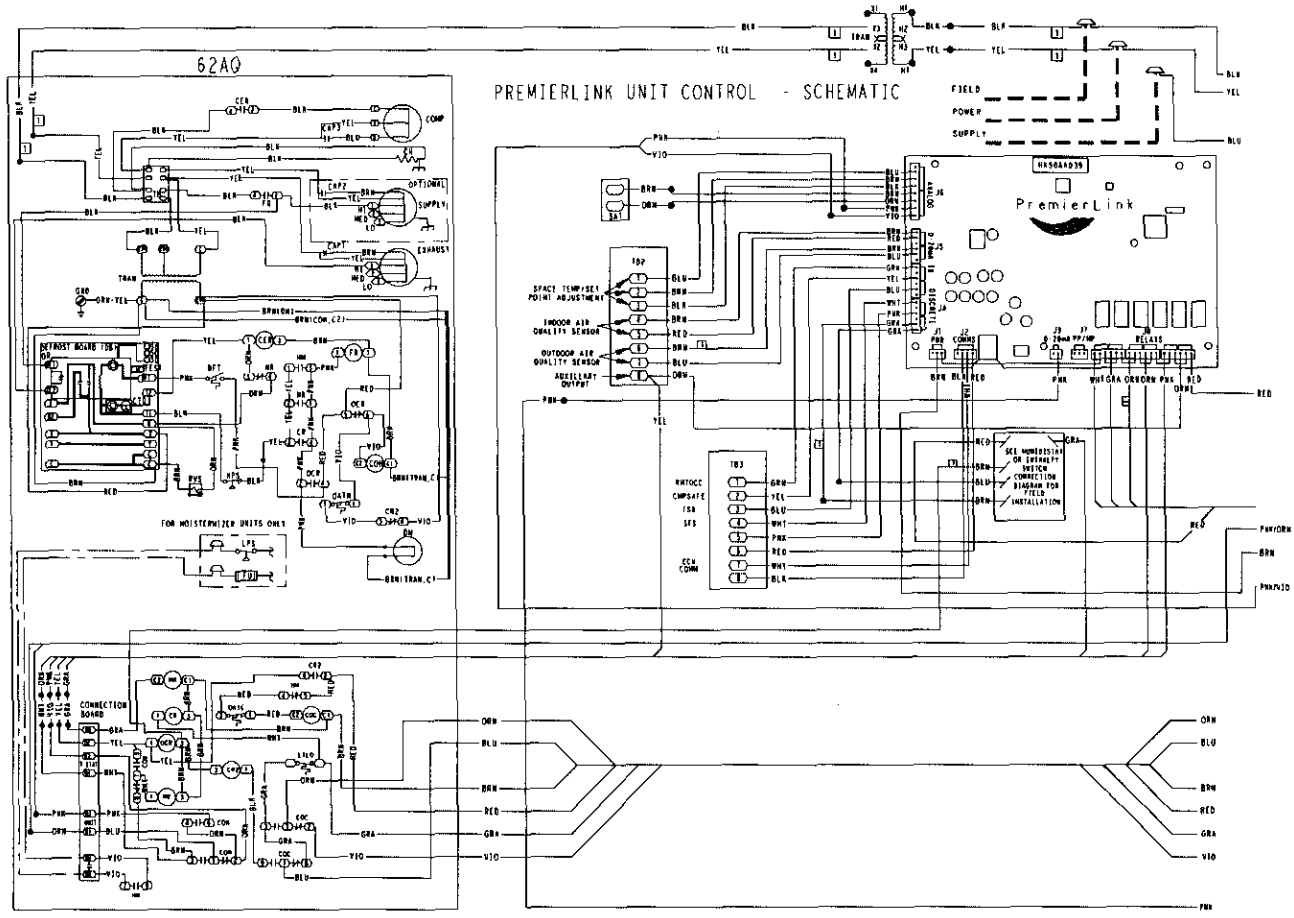


Fig. 75 — COBRA™ Unit Wiring Schematic (50HJ014 with 62AQ300, 460-3-60) with Electro-Mechanical Controls (cont)



NOTES:
1. If any of the original wire furnished must be replaced, it must be replaced with Type 90 C wire or its equivalent.
2. Three phase motors are protected under primary single phasing conditions.
3. Use copper conductors only.
4. To program PremierLink™:
   a. Aux output for Pin 3, J8 must be set on exhaust fan.
   b. In service configuration, set power exhaust to continuous.

Fig. 76 — COBRA™ Unit Wiring Schematic (48HJ006/007 with 62AQ060/100, 460-3-60) with Factory-Installed PremierLink™ Controller

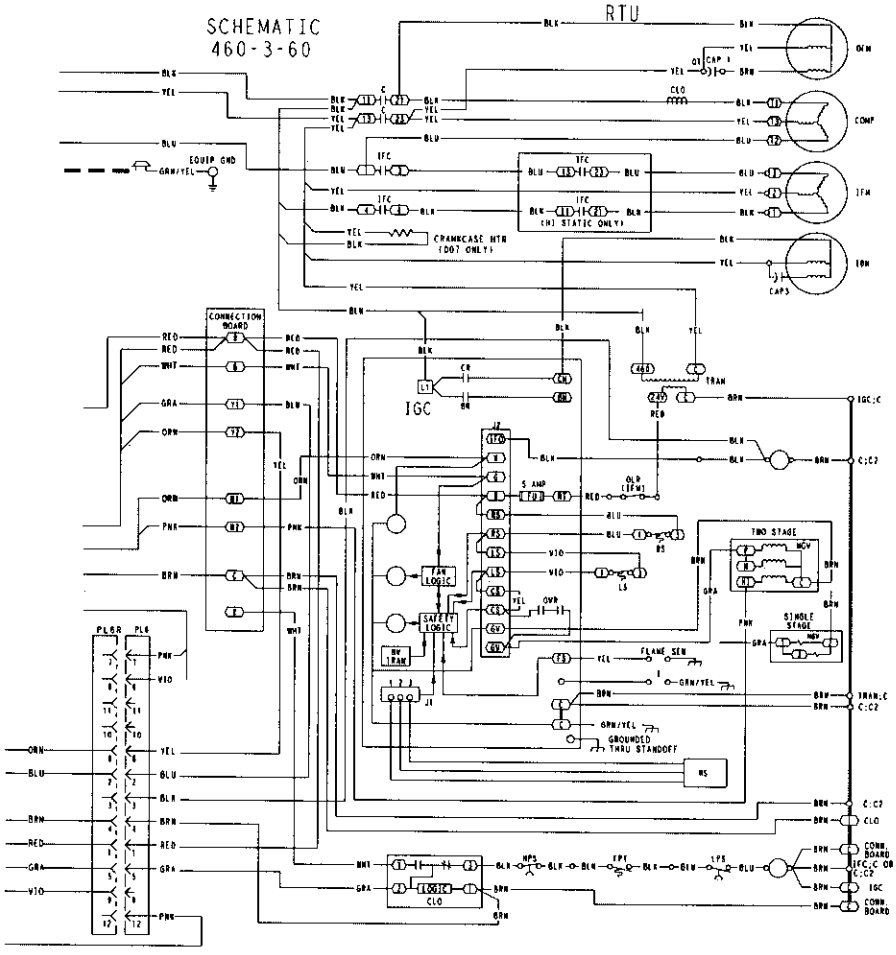
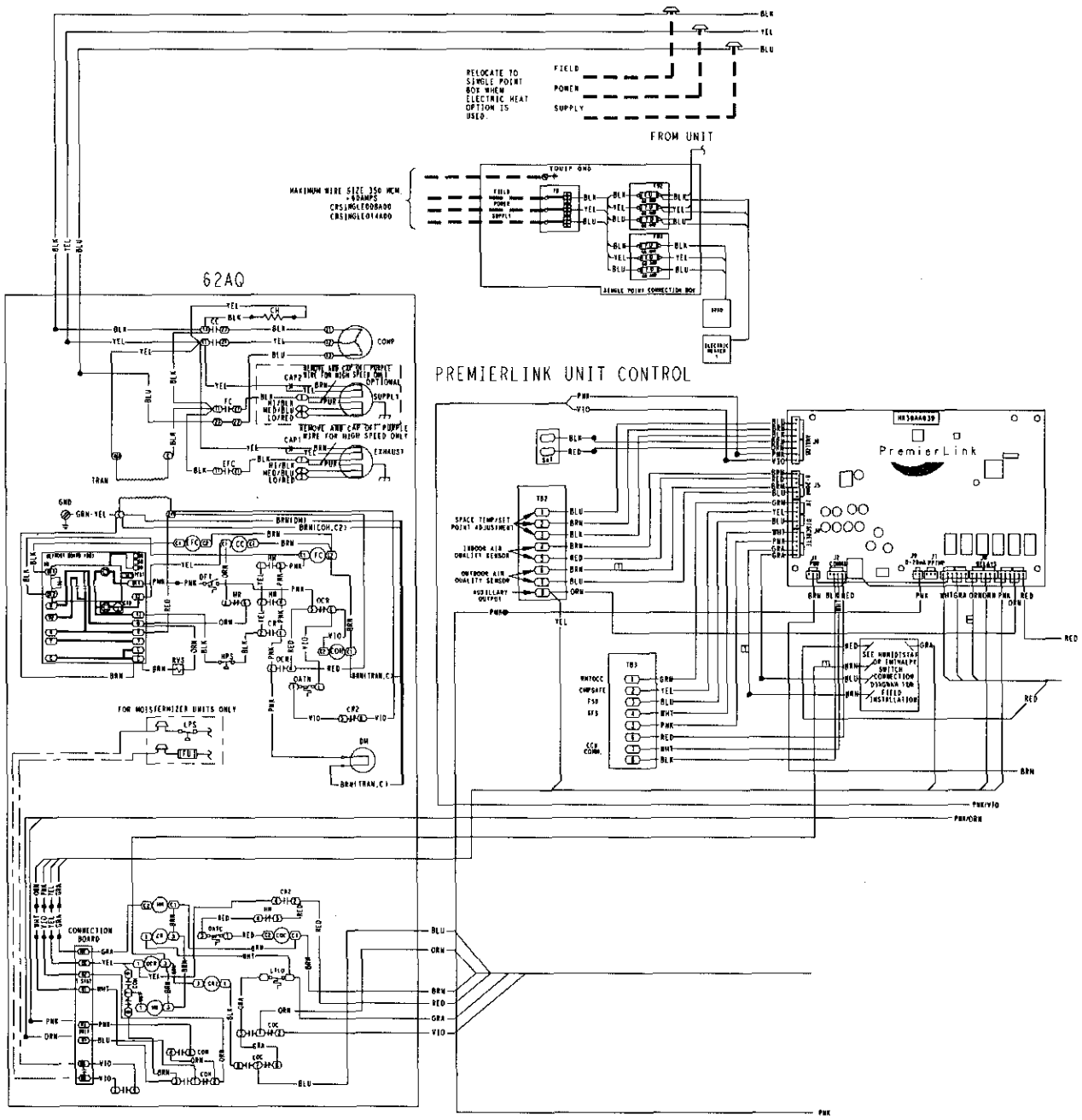


Fig. 76 — COBRA™ Unit Wiring Schematic (48HJ006/007 with 62AQ060/100, 460-3-60) with Factory-Installed PremierLink™ Controller (cont)



NOTES:
1. If any of the original wire furnished must be replaced, it must be replaced with Type 90 C wire or its equivalent.
2. Three phase motors are protected under primary single phasing conditions.
3. IFMOVL not present with size 012 high static.
4. Use copper conductors only.
5. To program PremierLink™:
   a. Aux output for Pin 3, J8 must be set on exhaust fan.
   b. In service configuration, set power exhaust to continuous.

Fig. 77 — COBRA™ Unit Wiring Schematic (50HJ008-014 with 62AQ200, 460-3-60) with Factory-Installed PremierLink™ Controller

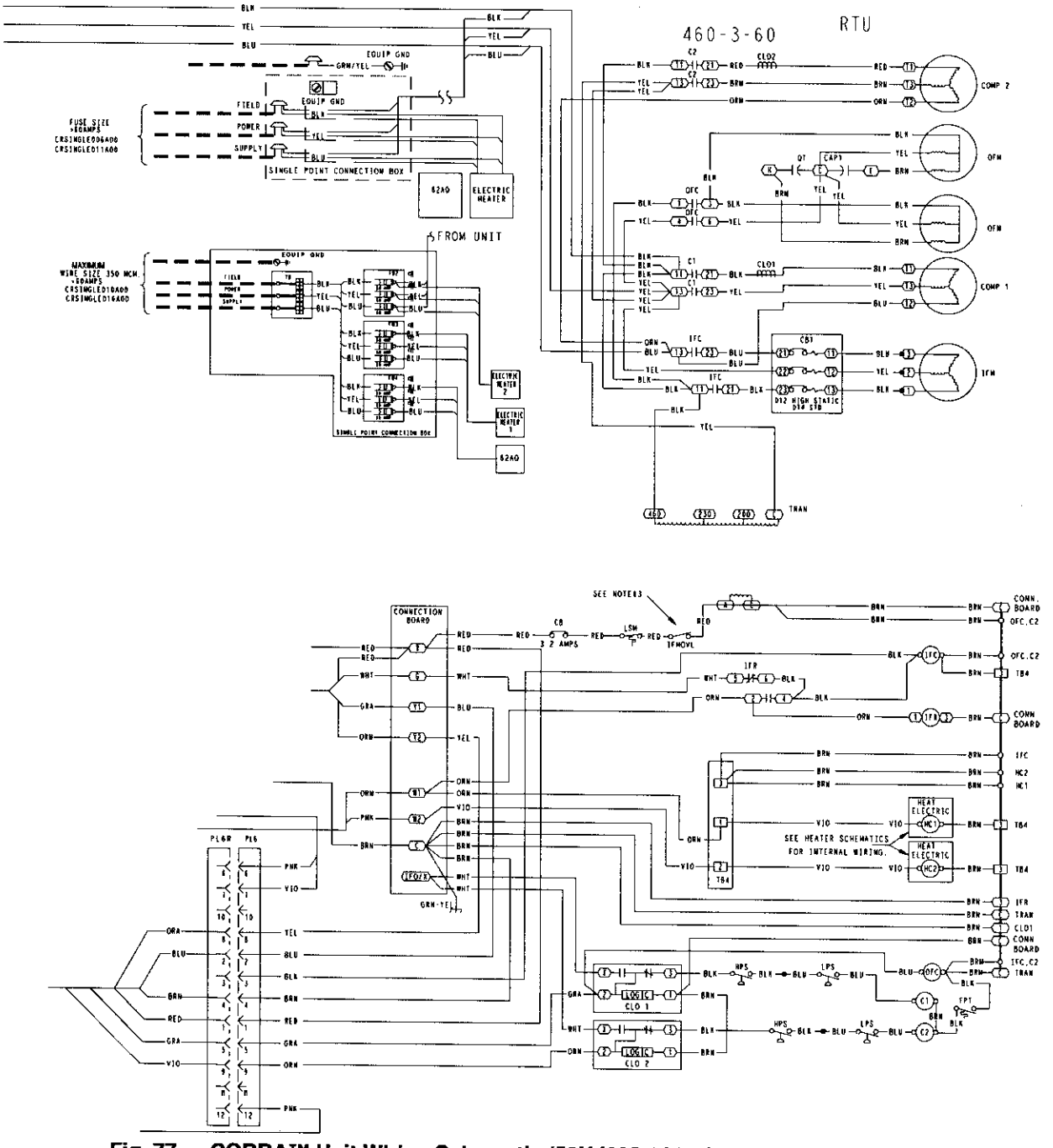
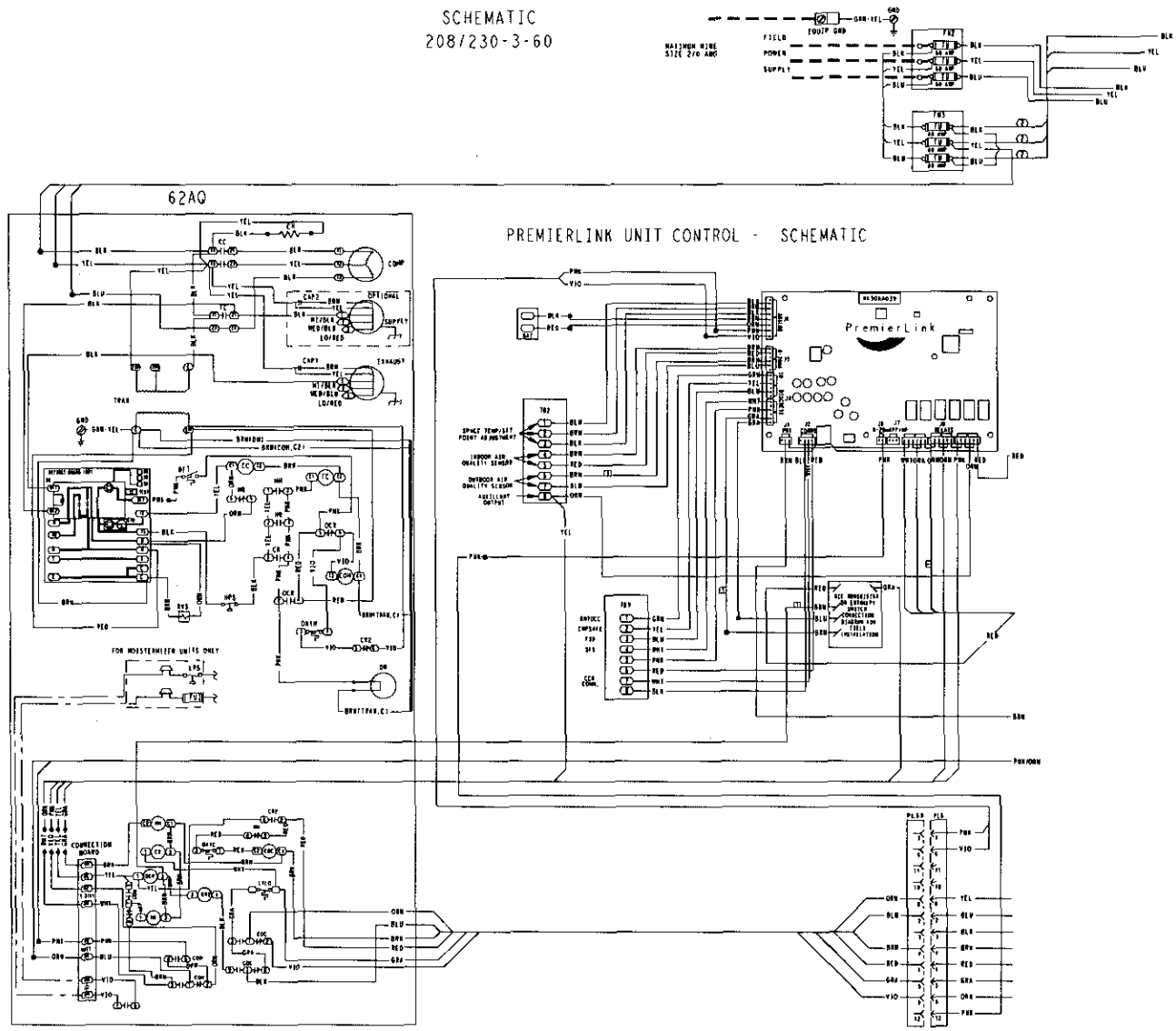


Fig. 77 — COBRA™ Unit Wiring Schematic (50HJ008-014 with 62AQ200, 460-3-60) with Factory-Installed PremierLink™ Controller (cont)

SCHEMATIC
208/230-3-60



NOTES:
1. If any of the original wire furnished must be replaced, it must be replaced with Type 90 C wire or its equivalent.
2. Three phase motors are protected under primary single phasing conditions.
3. TRAN is wired for 230v unit. If unit is to be run with 208v power supply, disconnect BLK wire from 230v tap (ORN) and connect to 200v tap.
4. Use copper, copper clad aluminum or aluminum conductors.
5. To program PremierLink™:
   a. Aux output for Pin 3, J8 must be set on exhaust fan.
   b. In service configuration, set power exhaust to continuous.

Fig. 78 — COBRA™ Unit Wiring Schematic (50HJ008/009 with 62AQ300, 208/230-3-60) with Factory-Installed PremierLink™ Controller

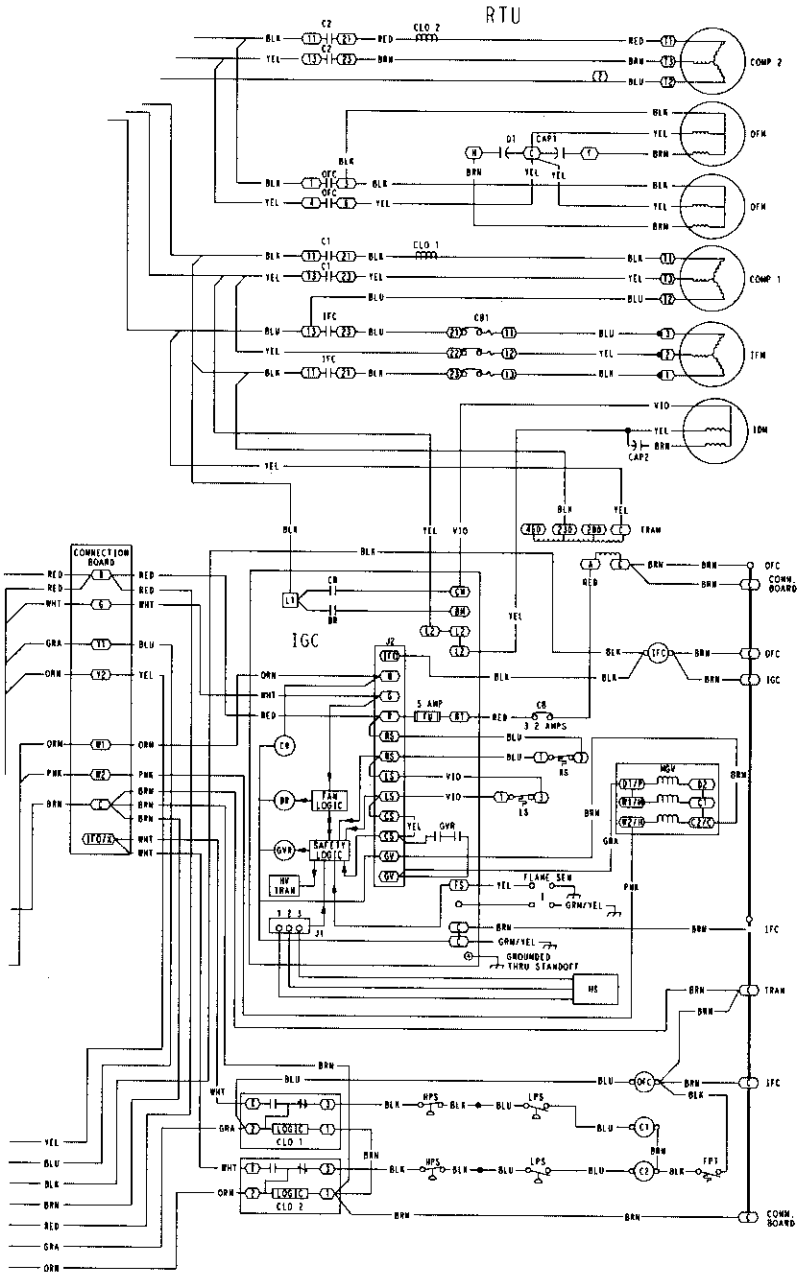
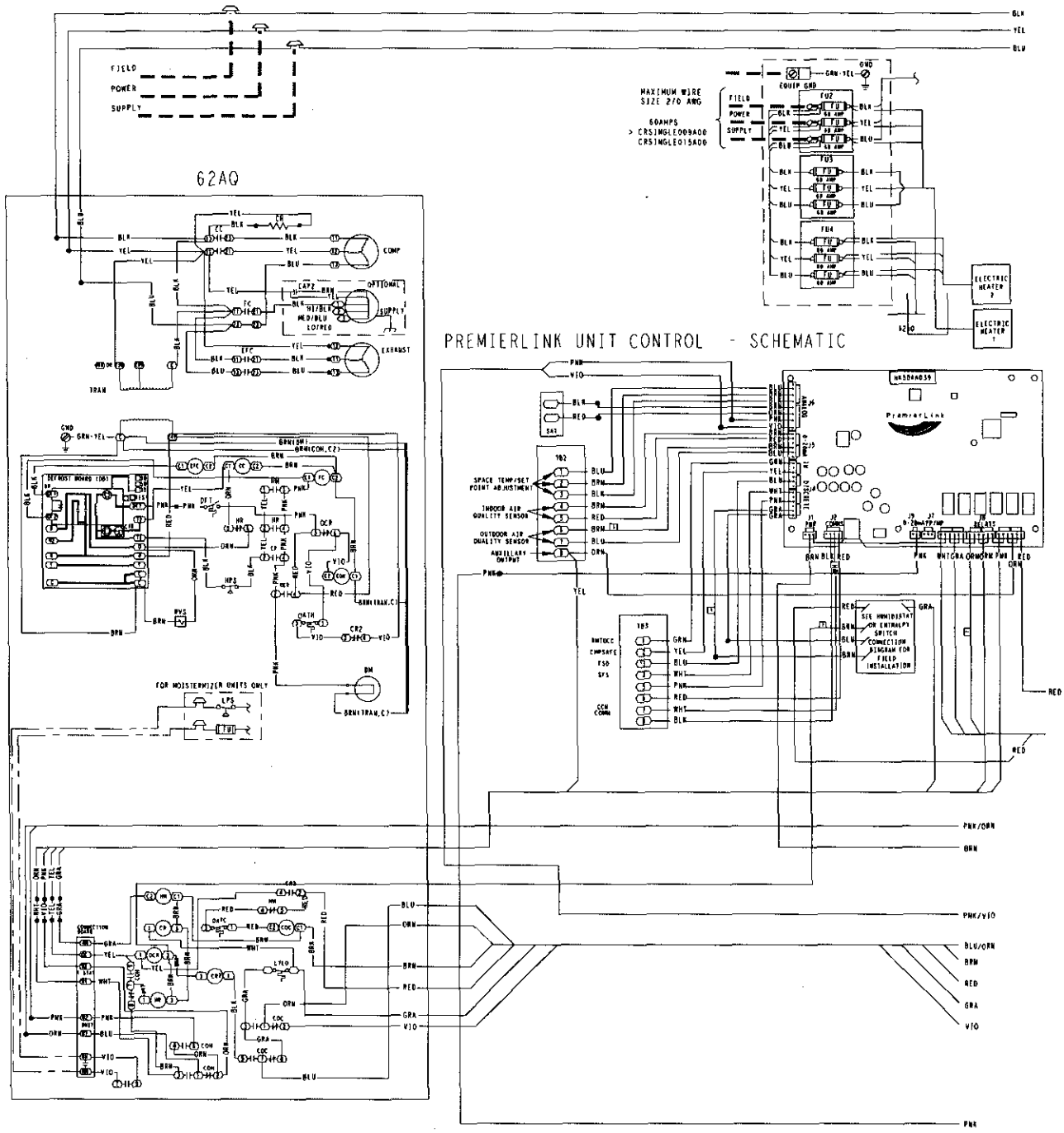
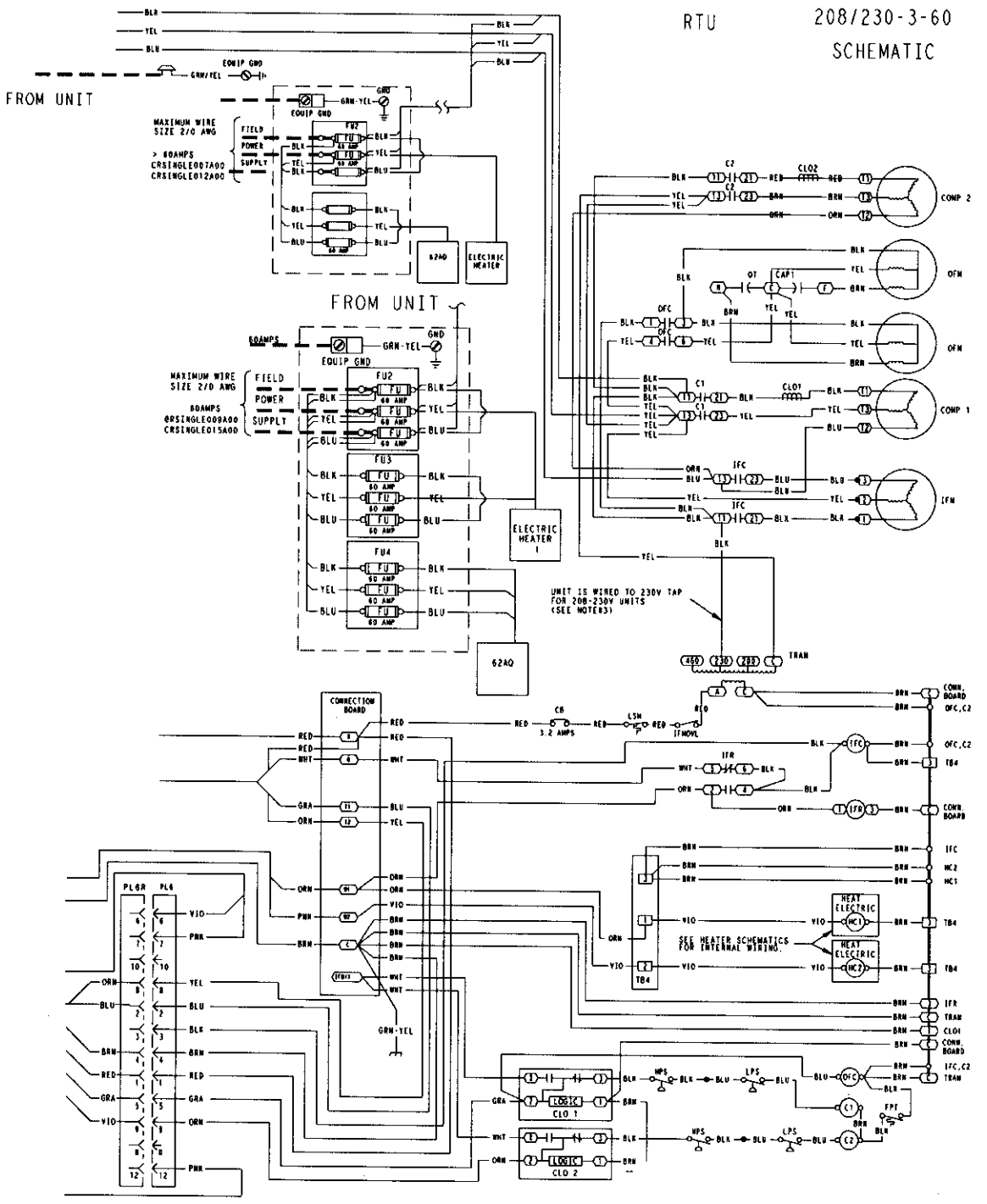


Fig. 78 — COBRA™ Unit Wiring Schematic (50HJ008/009 with 62AQ300, 208/230-3-60) with Factory-Installed PremierLink™ Controller (cont)



NOTES:
1. If any of the original wire furnished must be replaced, it must be replaced with Type 90 C wire or its equivalent.
2. Three phase motors are protected under primary single phasing conditions.
3. TRAN is wired for 230v unit. If unit is to be run with 208v power supply, disconnect BLK wire from 230v tap (ORN) and connect to 200v tap.
4. Use copper, copper clad aluminum or aluminum conductors only.
5. To program PremierLink™:
   a. Aux output for Pin 3, J8 must be set on exhaust fan.
   b. In service configuration, set power exhaust to continuous.

Fig. 79 — COBRA™ Unit Wiring Schematic (50HJ008/009 with 62AQ300, 208/230-3-60) with Factory-Installed PremierLink™ Controller



NOTES:

1. If any of the original wire furnished must be replaced, it must be replaced with Type 90 C wire or its equivalent.
2. Three phase motors are protected under primary single phasing conditions.
3. TRAN is wired for 230v unit. If unit is to be run with 208v power supply, disconnect BLK wire from 230v tap (ORN) and connect to 200v tap.
4. Use copper, copper clad aluminum or aluminum conductors only.
5. To program PremierLink™:
   a. Aux output for Pin 3, J8 must be set on exhaust fan.
   b. In service configuration, set power exhaust to continuous.

Fig. 79 — COBRA™ Unit Wiring Schematic (50HJ008/009 with 62AQ300, 208/230-3-60) with Factory-Installed PremierLink™ Controller (cont)

Table 5 — Heating and Cooling Troubleshooting

PROBLEM	CAUSE	REMEDY
Compressor and Outdoor Fan Will Not Start.	Power failure.	Call power company.
	Fuse blown or circuit breaker tripped.	Replace fuse or reset circuit breaker.
	Defective thermostat, contactor, transformer, control relay, or capacitor.	Replace component.
	Insufficient line voltage.	Determine cause and correct.
	Incorrect or faulty wiring.	Check wiring diagram and rewire correctly.
	Light Commercial Thermidistat™ program in UC1 or UC2 mode.	Check light commercial Thermidistat program. See Step 5 — Conduct Light Commercial Thermidistat Start-Up and Checkout on page 45.
	Defective fan motor.	Replace fan motor.
Compressor Will Not Start but Outdoor Fan Runs.	Faulty wiring or loose connection in compressor circuit.	Check wiring and repair or replace.
	Compressor motor burned out, seized, or internal overload open.	Determine cause. Replace compressor.
	Defective run/start capacitor, overload, start relay, Time Guard device.	Determine cause and replace.
	No DEHUM signal from light commercial Thermidistat device.	Check for DEHUM signal on light commercial Thermidistat LCD display.
	Time Guard device not timed out.	Allow time for Time Guard device to recycle unit.
Compressor Cycles (Other than Normally Satisfying Thermostat).	Refrigerant overcharge or undercharge.	Recover refrigerant, evacuate system, and recharge to nameplate.
	Defective compressor.	Replace and determine cause.
	Insufficient line voltage.	Determine cause and correct.
	Blocked outdoor coil or dirty air filter.	Determine cause and correct.
	Defective run/start capacitor, overload, or start relay.	Determine cause and replace.
	Faulty outdoor-fan (cooling) or indoor-fan (heating) motor or capacitor.	Replace.
	Restriction in refrigerant system.	Locate restriction and remove.
Suction Pressure Greater than 100 psig in Cooling Mode.	Defective TXV.	Replace TXV.
Excessive Head Pressure.*	Dirty air filters.	Replace filters.
	Dirty coils.	Clean coils.
	Refrigerant overcharged.	Recover excess refrigerant.
	Air in system.	Recover refrigerant, evacuate system, and recharge.
	Condensing air restricted or air short-cycling.	Determine cause and correct.
Head Pressure too Low.*	Low refrigerant charge.	Check for leaks; repair and recharge.
	Compressor valves leaking.	Replace compressor.
	Restriction in liquid tube.	Remove restriction.
Excessive Suction Pressure.*	High heat load.	Check for source and eliminate.
	Compressor valves leaking.	Replace compressor.
	Refrigerant overcharged.	Recover excess refrigerant.
Suction Pressure too Low.*	Dirty air filters or coils.	Replace filter, clean coils.
	Low refrigerant charge.	Check for leaks; repair and recharge.
	Metering device or low side restricted.	Remove source of restriction.
	Insufficient indoor airflow.	Increase air quantity. Check filter and replace if necessary.

LEGEND

TXV — Thermostatic Expansion Valve

*62AQ Energy$Recycler™ section uses TXVs with a 100 psig maximum operating pressure (MOP) feature to limit suction pressure in Cooling mode at high temperatures. Always consult charging chart for correct operating pressures.

Table 6 — Supply-Air Damper Troubleshooting

PROBLEM	CAUSE	REMEDY
Damper Does Not Open; Fan(s) Off.	OCR not energized (thermostat in Unoccupied mode).	Check light commercial Thermidistat program settings (see Step 5 — Light Commercial Thermidistat Start-Up and Checkout section, page 45).
	OCR defective.	Replace OCR.
	Damper jammed.	Free damper.
	Damper motor defective.	Replace damper motor.
	Loose wiring.	Check wiring and correct.
Damper Will Not Close.	Damper jammed.	Free damper.
	Motor return spring broken.	Replace motor.

LEGEND

OCR — Occupied Relay

ROOFTOP SECTION AND ENERGY$RECYCLER SECTION (62AQ) START-UP CHECKLIST

(Remove and Store in Job File)

I. PRELIMINARY INFORMATION

RTU **62AQ**

COBRA™ ENERGY RECOVERY UNIT MODEL NO.: _____ SERIAL NO.: _____/_____

DATE: _____ TECHNICIAN: _____/_____

II. PRE-START-UP (insert checkmark in box as each item is completed)

☐ VERIFY THAT CONDENSATE CONNECTION IS INSTALLED PER INSTALLATION INSTRUCTIONS

☐ CHECK ALL ELECTRICAL CONNECTIONS AND TERMINALS FOR TIGHTNESS

☐ CHECK THAT SUPPLY AND EXHAUST HOODS ARE INSTALLED AND AIR FILTER(S) ARE CLEAN AND IN PLACE

☐ CHECK FAN WHEEL AND PROPELLER FOR LOCATION IN HOUSING/ORIFICE AND SETSCREW TIGHTNESS

☐ CHECK PULLEY ALIGNMENT AND BELT TENSION PER INSTALLATION INSTRUCTIONS (62AQ300 BELT DRIVE EXHAUST FAN AND SUPPLY FAN)

III. START-UP

COMBINED ELECTRICAL (COBRA ENERGY RECOVERY UNIT)

SUPPLY VOLTAGE	L1-L2	_____	L2-L3	_____	L3-L1	_____
COMPRESSOR AMPS	L1	_____	L2	_____	L3	_____
INDOOR FAN AMPS	L1	_____	L2	_____	L3	_____

TEMPERATURES

OUTDOOR-AIR TEMPERATURE	_____	DB	_____	WB
RETURN-AIR TEMPERATURE	_____	DB	_____	WB
ENTERING SUPPLY-AIR (RTU)	_____	DB	_____	WB
LEAVING AIR TEMPERATURE (RTU)	_____	DB	_____	WB

PRESSURES (IN COOLING MODE)

ROOFTOP SECTION

REFRIGERANT SUCTION	_____	PSIG	TEMP AT COMPRESSOR	_____	F
REFRIGERANT DISCHARGE	_____	PSIG	TEMP AT COMPRESSOR	_____	F

☐ VERIFY REFRIGERANT CHARGE USING CHARGING CHART LABEL ON UNIT.

62AQ

REFRIGERANT SUCTION	_____	PSIG	TEMP AT COMPRESSOR	_____	F
REFRIGERANT DISCHARGE	_____	PSIG	TEMP AT COMPRESSOR	_____	F

☐ VERIFY REFRIGERANT CHARGE USING CHARGING CHART LABEL ON UNIT.

III. START-UP (cont)

AIRFLOWS (62AQ)

SUPPLY AIR _____ CFM

MOTOR SPEED (Circle One) LOW MEDIUM HIGH

DAMPER SETTING (°) (Circle One) 30 45 60 90

EXHAUST AIR _____ CFM

MOTOR SPEED (Circle One) LOW MEDIUM HIGH

DAMPER SETTING (°) (Circle One) 30 45 60 90

IV. LIGHT COMMERCIAL THERMIDISTAT™ ACCESSORY

NOTE: To disable Keyboard Lock, press MODE, COPY PREVIOUS DAY, SET TIME/TEMP, and HOLD End buttons in sequence within 5 seconds.

PROGRAMMED	_____ Yes	_____ No
KEYBOARD LOCK	_____ Yes	_____ No

OCCUPIED SETTINGS:

ROOM TEMP	_____ F
ROOM RH	_____ %

TIMES:	ON	OFF
OC1	_____	_____
OC2	_____	_____

TIMES:	ON	OFF
UC1	_____	_____
UC2	_____	_____

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE