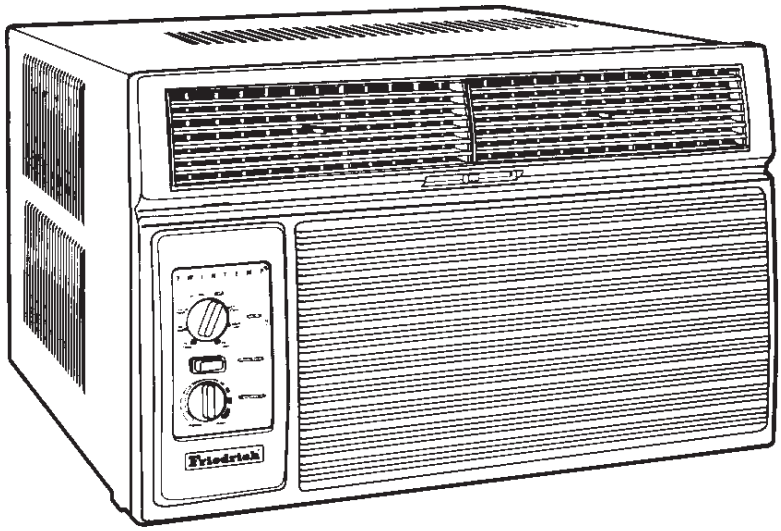
Friedrich

1997

TwinTemp® J Series



YS09J10
YS13J33
YM18J34A
YL24J35
ES12J33
ES15J33A
EM18J34A
EL24J35
EL33J35
EK12J33A
EK18J34A

Service & Parts Manual

AMERICA'S BEST AIR CONDITIONER

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TABLE OF CONTENTS (Cont.)

FRIEDRICH ROOM MODEL NUMBER CODE

E S 15 H 3 3 A

1st DIGIT - FUNCTION

S = Straight Cool, Value Series
C = Straight Cool, Budget Series
Y = Heat Pump
E = Electric Strip
K = Straight Cool, Challenger Series
W = Thru-The-Wall, WallMaster Series

2nd DIGIT - TYPE

C = Casement
P = PowerMiser “Portable”
Q = QStar
S = Small Chassis
M = Medium Chassis
L = Large Chassis
W = Built-In
H = Hazardgard

3rd & 4th DIGITS - APPROXIMATE BTU/HR (Cooling)

Heating BTU/HR capacity listed in Specifications/Performance Data Section

5th DIGIT - ALPHABETICAL MODIFIER

6th DIGIT - VOLTAGE

1 = 115 Volts
2 = 230 Volts
3 = 230-208 Volts

7th DIGIT

0 = Straight Cool & Heat Pump Models
ELECTRIC HEAT MODELS
1 = 1 KW Heat Strip, Nominal
3 = 3 KW Heat Strip, Nominal
4 = 4 KW Heat Strip, Nominal
5 = 5 KW Heat Strip, Nominal
8 = 8 KW Heat Strip, Nominal

8th DIGIT

Major Change

APPLICATION AND SIZING

In the application and sizing of room air conditioners for cooling, it is most important to give full consideration to all factors which may contribute to the heat loss or gain of the space to be conditioned. It is therefore necessary to make a survey of the space to be conditioned and calculate the load requirements before a selection of the size of the equipment needed can be made.

The load requirement may be determined very easily by simply using the standard “AHAM” Load Calculating Form, on Page 7. This form is very easy to use and is self explanatory throughout. It is necessary only to insert the proper measurements on the lines provided and multiply by the given factors, then add the result for the total load requirements.

Cooling load requirements are generally based on the cooling load for comfortable air conditioning which does not require specific conditions of inside temperature and humidity. The load calculation form is based on outside design temperature of 95° FDB and 75° FWB. It can be used for areas in the Continental United States having other outside design temperatures by applying a correction factor for the particular locality as determined from the map shown on Page 6.

When sizing a TwinTemp unit for cooling and heating, we must remember that the heating capacity of any given unit varies directly with the outdoor ambient temperature. Also, we must keep in mind the average low temperatures which might be experienced in the locality where the unit is to be installed. Therefore, when sizing a TwinTemp unit, both cooling and heating requirements must be calculated. Do not oversize, or undersize, one phase of the unit’s capacity at the expense of the other. In those cases where the unit will provide satisfactory cooling at all times but will be inadequate for those few times that the outdoor temperature is below the maximum low for the unit, additional auxiliary heating facilities must be provided to insure that adequate heat is available at all times.

INSTRUCTIONS FOR USING COOLING LOAD ESTIMATE FORM FOR ROOM AIR CONDITIONERS

(AHAM PUB. NO. RAC-1)

A. This cooling load estimate form is suitable for estimating the cooling load for comfort air conditioning installations which do not require specific conditions of inside temperature and humidity.

B. The form is based on an outside design temperature of 95°F dry bulb and 75°F wet bulb. It can be used for areas in the continental United States having other outside design temperatures by applying a correction factor for the particular locality as determined from the map.

C. The form includes "day" factors for calculating cooling loads in rooms where daytime comfort is desired (such as living rooms, offices, etc.)

D. The numbers of the following paragraphs refer to the corresponding numbered item on the form:

1. Multiply the square feet of window area for each exposure by the applicable factor. The window area is the area of the wall opening in which the window is installed. For windows shaded by inside shades or venetian blinds, use the factor for "Inside Shades." For windows shaded by outside awnings or by both outside awnings and inside shades (or venetian blinds), use the factor for "Outside Awnings." "Single Glass" includes all types of single thickness windows, and "Double Glass" includes sealed airspace types, storm windows, and glass block. Only one number should be entered in the right hand column for Item 1, and this number should represent **only the exposure with the largest load.**
2. Multiply the total square feet of **all** windows in the room by the applicable factor.

3a. Multiply the total length (linear feet) of all walls exposed to the outside by the applicable factor. Doors should be considered as being part of the wall. Outside walls facing due north should be calculated separately from outside walls facing other directions. Walls which are permanently shaded by adjacent structures should be considered "North Exposure." Do not consider trees and shrubbery as providing permanent shading. An un-insulated frame wall or a masonry wall 8 inches or less in thickness is considered "Light Construction." An insulated wall or masonry wall over 8 inches in thickness is considered "Heavy Construction."

3b. Multiply the total length (linear feet) of all inside walls between the space to be conditioned and any unconditioned spaces by the given factor. Do not include inside walls which separate other air conditioned rooms.

4. Multiply the total square feet of roof or ceiling area by the factor given for the type of construction most nearly describing the particular application (use one line only.)
5. Multiply the total square feet of floor area by the factor given. Disregard this item if the floor is directly on the ground or over a basement.
6. Multiply the number of people who normally occupy the space to be air conditioned by the factor given. Use a minimum of 2 people.
7. Determine the total number of watts for light and electrical equipment, except the air conditioner itself, that will be **in use** when the room air conditioning is operating. Multiply the total wattage by the factor given.
8. Multiply the total width (linear feet) of any doors or arches which are continually open to an unconditioned space by the applicable factor.

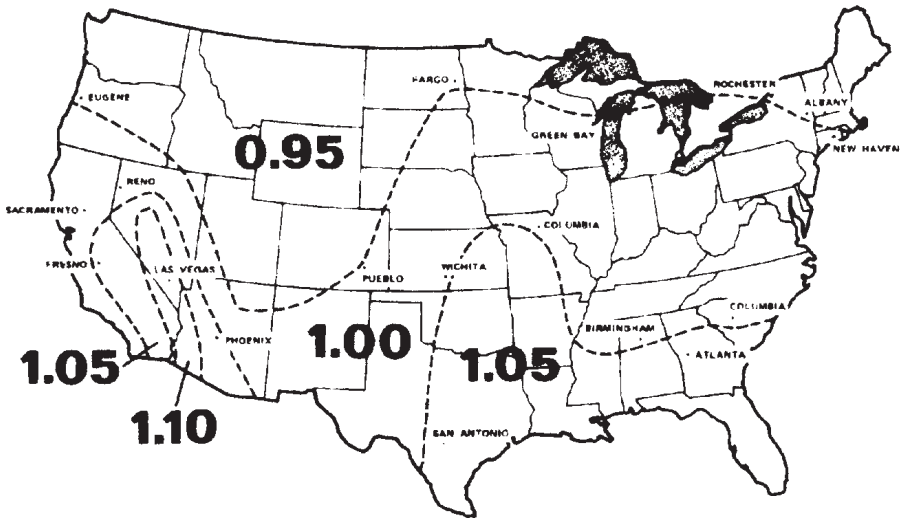
   NOTE: Where the width of the doors or arches is more than 5 feet, the actual load may exceed the calculated value. In such cases, both adjoining rooms should be considered as a single large room, and the room air conditioner unit or units should be selected according to a calculation made on this new basis.
9. Total the loads estimated for the foregoing 8 items.
10. Multiply the subtotal obtained in item 9 by the proper correction factor, selected from the map, for the particular locality. The result is the total estimated design cooling load in BTU per hour.

E. For best results, a room air conditioner unit or units having a cooling capacity rating (determined in accordance with the NEMA Standards Publication for Room Air Conditioners, CN 1-1960) as close as possible to the estimated load should be selected. In general, a greatly oversized unit which would operate intermittently will be much less satisfactory than one which is slightly undersized and which would operate more nearly continuously.

F. Intermittent loads such as kitchen and laundry equipment are not included in this form.

COOLING LOAD ESTIMATE FORM

HEAT GAIN FROM	QUANTITY	FACTORS				BTU/Hr. (Quantity x Factor)
		No Shades*	Inside Shades*	Outside Awnings*	(Area x Factor)	
1. WINDOWS: Heat gain from sun.						
Northeast	____ sq ft	60	25	20	Use	____
East	____ sq ft	80	40	25	only	____
Southeast	____ sq ft	75	30	20	the	____
South	____ sq ft	75	35	20	largest	____
Southwest	____ sq ft	110	45	30	load.	____
West	____ sq ft	150	65	45	Use	____
Northwest	____ sq ft	120	50	35	only	____
North	____ sq ft	0	0	0	one.	____
	* These factors are for single glass only. For glass block, multiply the above factors by 0.5; for double gass or storm windows, multiply the above factors by 0.8.					
2. Windows: Heat gain by conduction. (Total of all windows.)						
Single glass	____ sq ft			14		____
Double glass or glass block	____ sq ft			7		____
3. WALLS: (Based on linear feet of wall.)			Light Construction		Heavy Construction	
a. Outside walls						
North exposure	____ ft		30		20	____
Other than North exposure	____ ft		60		30	____
b. Inside Walls (between conditioned and unconditioned spaces only)	____ ft			30		____
4. ROOF OR CEILING: (Use one only.)						
a. Roof, uninsulated	____ sq ft			19		____
b. Roof, 1 inch or more insulation	____ sq ft			8		____
c. Ceiling, occupied space above.	____ sq ft			3		____
d. Ceiling, insulated with attic space above	____ sq ft			5		____
e. Ceiling, uninsulated, with attic space above	____ sq ft			12		____
5. FLOOR: (Disregard if floor is directly on ground or over basement	____ sq ft			3		____
6. NUMBER OF PEOPLE:	____			600		____
7. LIGHTS AND ELECTRICAL EQUIPMENT IN USE	____watts			3		____
8. DOORS AND ARCHES CONTINUOUSLY OPENED TO UNCONDITIONED SPACE: (Linear feet of width.)	____ ft			300		____
9. SUB-TOTAL	xxxxx			xxxxx		
10. TOTAL COOLING LOAD: (BTU per hour to be used for selection of room air conditioner(s).)	_____ (Item 9) x _____ (Factor from Map) =					_____



HEAT LOAD FORM

The heat load form, Page 9, may be used by servicing personnel to determine the heat loss of a conditioned space and the ambient winter design temperatures in which the unit will heat the calculated space.

The upper half of the form is for computing the heat loss of the space to be conditioned. It is necessary only to insert the proper measurements on the lines provided and multiply by the given factors, then add this result for the total heat loss in BTU/Hr./°F.

The BTU/Hr. per °F temperature difference is the 70°F inside winter designed temperature minus the lowest outdoor ambient winter temperature of the area where the unit is installed. This temperature difference is used as the multiplier when calculating the heat loss.

The graph shows the following:

Left Hand Scale	Unit capacity BTU/Hr. or heat loss BTU/Hr.
Bottom Scale	Outdoor ambient temperature, base point.
Heat Pump Model	BTU/Hr. capacity heat pump will deliver at outdoor temperatures.
Balance Point	Maximum BTU/Hr. heat pump will deliver at indicated ambient temperature.

Below is an example using the heat load form:

A space to be conditioned is part of a house geographically located in an area where the lowest outdoor ambient winter temperature is 40°F. The calculated heat loss is 184 BTU/Hr./°F.

Subtract 40°F (lowest outdoor ambient temperature for the geographical location) from 70°F (inside design temperature of the unit) for a difference of 30°F. Multiply 184 by 30 for a 5500 BTU/Hr. total heat loss for the calculated space.

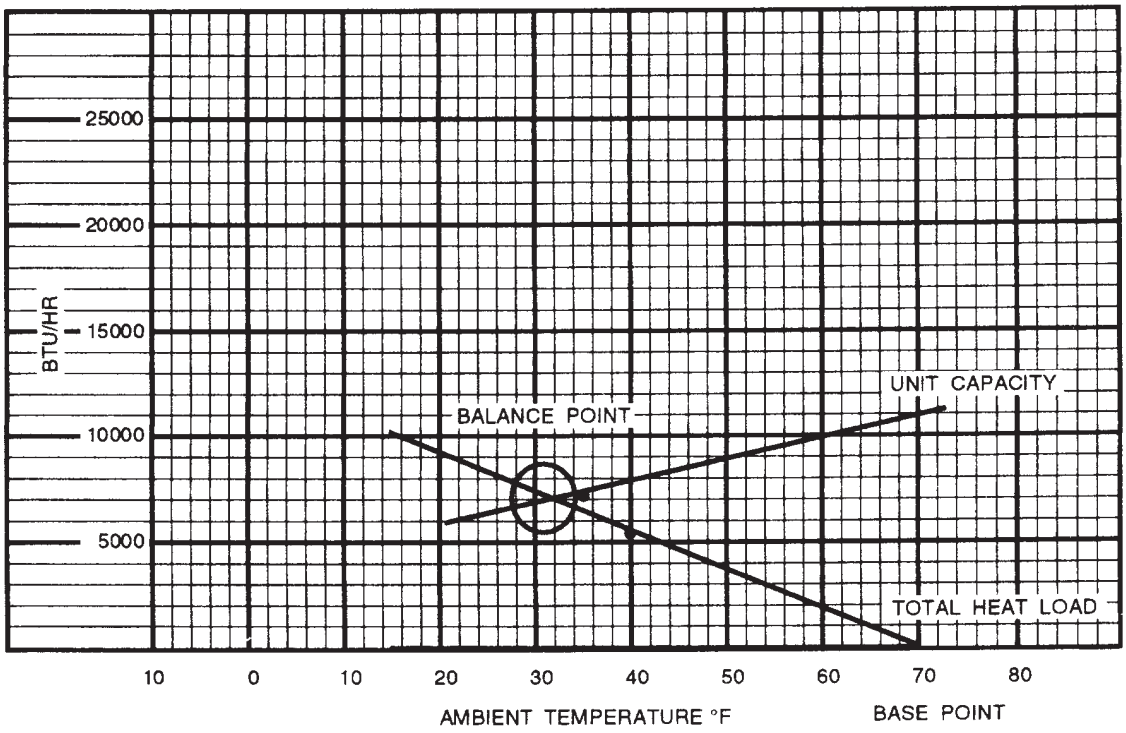
On the graph, plot the base point (70°) and a point on the 40°F line where it intersects with the 5500 BTU/Hr. line on the left scale. Draw a straight line from the base point 70 through the point plotted at 40°F. This is the total heat loss line.

Knowing that we have a 5500 BTU/Hr. heat loss, and we expect that our heat pump will maintain a 70°F inside temperature at 40°F outdoor ambient, we plot the selected unit capacity BTU/Hr. of the unit between 35° and 60° on the graph and draw a straight line between these points. Where the total heat loss line and the unit capacity line intersect, read down to the outdoor ambient temperature scale and find that this unit will deliver the required BTU/Hr. capacity to approximately 30°F.

HEATING LOAD FORM
FRIEDRICH ROOM UNIT HEAT PUMPS

		BTU/HR PER °F. TEMP. DIFFERENCE
WALLS: (Linear Feet)		
2" Insulation		Lin. Ft. x 1.6
Average		Lin. Ft. x 2.6
WINDOWS & DOORS: (Area, Sq. Ft.)		
Single Glass:		Sq. Ft. x 1.13
Double Glass:		Sq. Ft. x 0.61
INFILTRATION - WINDOWS & DOORS:	AVG.	Lin. Ft. x 1.0
	Loose	Lin. Ft. x 2.0
CEILING: (Area, Sq. Ft.)		
Insulated (6")		Sq. Ft. x 0.07
Insulated (2")		Sq. Ft. x 0.10
Built-up Roof (2" insulated)		Sq. Ft. x 0.10
Built-up Roof (½" insulated)		Sq. Ft. x 0.20
No Insulation		Sq. Ft. x 0.33
FLOOR: (Area, Sq. Ft.)		
Above Vented CrawlSpace		
Insulated (1")		Sq. Ft. x 0.20
Uninsulated		Sq. Ft. x 0.50
* Slab on Ground		Lin. Ft. x 1.70
1" Perimeter insulation		Lin. Ft. x 1.00
* Based on Linear Feet of outside wall		TOTAL HEAT LOSS PER °F BTU/HR/°F

Multiply total BTU/HR/°F x 30 and plot on graph below at 40°F. Draw straight line from 70 base point thru
point ploted at 40°F. Intersection of this heat loss line with unit capacity line represents the winter design



SPECIFICATIONS		YS09J10	YS13J33	YM18J34A	YL24J35
BTUH (Cooling)		9000	13000 13000	17500 17500	24000 23800
BTUH (Heating)		8300	12400 12300	16500 16300	23000 22800
E.E.R. (Cooling)		11.5	9.8 9.8	9.4 9.4	9.0 9.0
E.E.R. (Heating)		11.0	9.4 9.4	9.6 9.6	9.8 9.8
Volts		115	230 208	230 208	230 208
Amperes (Cooling)		7.2	6.0 6.5	8.3 9.1	12.0 13.0
Amperes (Heating)		6.7	6.0 6.5	7.6 8.3	10.4 11.5
Total Watts (Cooling)		780	1325 1325	1860 1860	2665 2645
Hertz		60	60	60	60
Fuse/Breaker Size		15	20	30	30
Resistance Heater	Amps		16.0 14.7	19.5 17.0	24.0 22.4
	Watts		3500 2900	4200 3500	5500 4650
	BTUH		10700 8900	13000 10600	17300 14300
Fan RPM		1110	1110	1120	1120
Evaporator Air CFM		300	325	425	600
Exhaust Air CFM		Yes	Yes	Yes	Yes
Dehumidification Pts/Hr		1.7	3.5	5.2	7.0
Width		25 15/16"	25 15/16"	25 15/16"	28"
Height		15 15/16"	15 15/16"	17 15/16"	20 3/16"
Depth		27 3/8"	27 3/8"	27 3/8"	33 5/8"
Minimum Ext. Into Room		3 1/16"	3 1/16"	3 1/16"	3 3/16"
Minimum Ext. to Outside		16 15/16"	16 15/16"	16 15/16"	18 15/16"
Net Weight		113	117	141	198
Shipping Weight		124	128	153	217

PERFORMANCE DATA* Cooling	EVAPORATOR AIR TEMP. °F.		OPERATING PRESSURES		ELECTRICAL RATINGS		R-22 REFRIG.	COMP. OIL
	DISCHARGE AIR	TEMP. DROP °F	SUCTION	DISCHARGE	AMPS	LOCKED ROTOR AMPS	CHARGE IN OZ.	CHARGE IN FLUID OZ.
YS09J10	59.0	21.0	87.0	241	7.2	39.2	28.0	11.8
YS13J33	56.0	24.0	75.0	280	6.0 6.5	29.0	30.0	11.8
YM18J34	53.0	27.0	74.0	277	8.7 9.3	42.0	54.0	30.0
YL24J35	55.0	25.0	77.0	272	12.0 13.0	61.0	69.0	32.0

* Rating Conditions: 80°F Room Air Temperature and 50% Relative Humidity with 95°F Outside Air Temperature at 40% Relative Humidity.

PERFORMANCE DATA (Heating)		*YS09J10	**YS13J33	**YM18J34	**YL24J35
AHAM	@ 70°F Inside 47°F Outside	8300	12400/12300	17200/17200	23000/22800
	@ 70°F Inside 35°F Outside		10700/8900	13000/10600	17300/14300
Evaporator Air Temperature Rise					
	@ 70°F Inside 47°F Outside	19.62	31.38	24.74	31.71
	@ 70°F Inside 35°F Outside		28.69/23.87	24.46/20.22	24.38/20.16
AMPS	@ 70°F Inside 47°F Outside	6.7	6.0/6.5	8.5/9.0	10.4/11.5
	@ 70°F Inside 35°F Outside		16.0/14.7	19.5/17.0	24.0/22.4
Watts	@ 70°F Inside 47°F Outside	760	1340/1300	1880/1820	2350/2340
	@ 70°F Inside 35°F Outside		3500/2900	5500/4650	5500/4650
Suction/Head PSIG					
	@ 70°F Inside 47°F Outside	53.5/222	52.5/251	53/225	54/236.5

* Do not operate below 37° ambient.
** Heating element comes on at 35°F outside ambient and compressor shuts off.

SPECIFICATIONS	ES12J33	ES15J33A	EM18J34	EL24J35	EL33J35	EK12J33A	EK18J34A
BTUH (Cooling)	12000 12000	15000 15000	18500 18300	24000 24000	33000 32500	12500 12500	18000 18000
BTUH (Heating)	10700 8900	10700 8900	13000 10600	17300 14300	17300 14300	10700 8900	13000 10600
E.E.R. (Cooling)	10.5 11.0	9.6 9.6	10.0 10.0	9.2 9.1	9.0 9.0	9.6 9.6	9.6 9.6
E.E.R. (Heating)							
Volts	230 208	230 208	230 208	230 208	230 208	230 208	230 208
Amperes (Cooling)	5.5 5.7	6.9 7.5	8.4 9.0	12.0 13.3	17.0 18.0	5.8 6.2	8.3 9.1
Amperes (Heating)	16.0 14.7	16.0 14.7	19.5 17.0	24.0 22.4	24.0 22.4	16.0 14.7	19.5 17.0
Total Watts (Cooling)	1140 1090	1665 1655	1850 1830	2610 2640	3670 3610	1250 1250	1875 1875
Hertz	60	60	60	60	60	60	60
Fuse/Breaker Size	20	20	30	30	30	20	30
Fan RPM	1120	1100	1120	1100	1100	1080	1120
Evaporator Air CFM	325	325	425	560	700	325	440
Fresh Air CFM	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Exhaust Air CFM	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dehumidification Pts/Hr	3.5	5.0	5.7	7.7	11.0	3.5	5.5
Width	25 15/16"	25 15/16"	25 15/16"	28"	28"	25 15/16"	25 15/16"
Height	15 15/16"	15 15/16"	17 15/16"	20 3/16"	20 3/16"	15 15/16"	17 15/16"
Depth	27 3/8"	27 3/8"	27 3/8"	33 5/8"	33 5/8"	27 3/8"	27 3/8"
Minimum Ext. Into Room	3 1/16"	3 1/16"	3 1/16"	3 3/16"	3 3/16"	3 1/16"	3 1/16"
Minimum Ext. to Outside	16 15/16"	16 15/16"	16 15/16"	18 15/16"	18 15/16"	16 15/16"	16 15/16"
Net Weight	110	121	135	191	215	108	133
Shipping Weight	121	132	147	210	234	119	145

PERFORMANCE DATA* Cooling	EVAPORATOR AIR TEMP. °F.		OPERATING PRESSURES		ELECTRICAL RATINGS		R-22 REFRIG.	COMP. OIL
	DISCHARGE AIR	TEMP. DROP °F	SUCTION	DISCHARGE	AMPS	LOCKED ROTOR AMPS	CHARGE IN OZ.	CHARGE IN FLUID OZ.
ES12J33	58.0	22.0	77.5	266	5.5 5.7	26.3	26.0	11.8
ES15J33A	53.0	27.0	77.0	260	7.4 8.2	42.0	49.0	30.0
EM18J34A	55.0	25.0	73.0	262	8.2 8.7	42.0	49.0	30.0
EL24J35	55.0	25.0	73.5	280	12.0 13.3	61.0	53.0	32.0
EL33J35	52.0	28.0	71.0	299	17.0 18.0	94.0	81.0	35.0
EK12J33A	57.0	23.0	79.0	293	5.8 6.2	26.3	26.0	11.8
EK18J33A	55.0	25.0	73.0	262	8.2 8.8	42.0	46.0	30.0

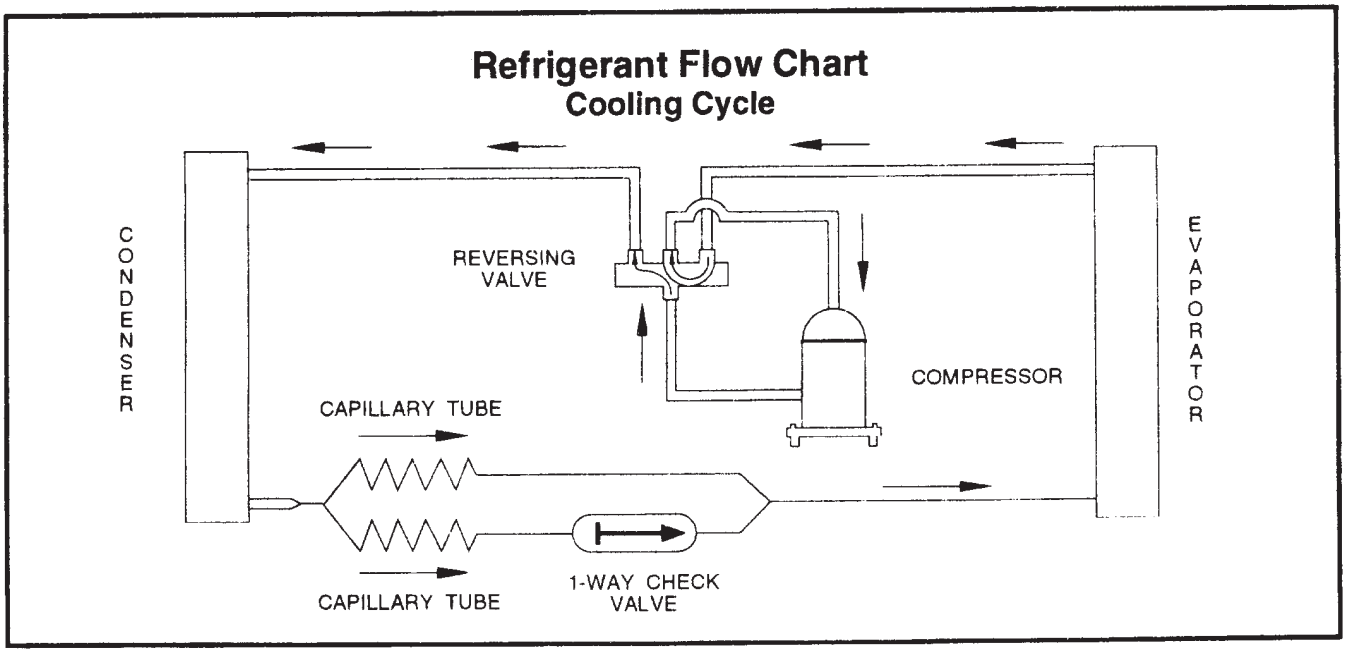
* Rating Conditions: 80°F Room Air Temperature and 50% Relative Humidity with 95°F Outside Air Temperature at 40% Relative Humidity.

PERFORMANCE DATA Heating	VOLTS	BTUH	CFM HIGH SPEED	HEAT RISE
ES12J33	230 208	10700 8900	1120	30.5
ES15J33A	230 208	10700 8900	1100	30.5
EM18J34A	230 208	13000 10600	1120	28.3
EL24J35	230 208	17300 14300	1100	28.6
EL33J35	230 208	17300 14300	1110	22.8
EK12J33A	230 208	10700 8900	1080	30.5
EK18J34A	230 208	13000 10600	1120	27.5

REFRIGERANT FLOW CHART — HEAT PUMP MODELS

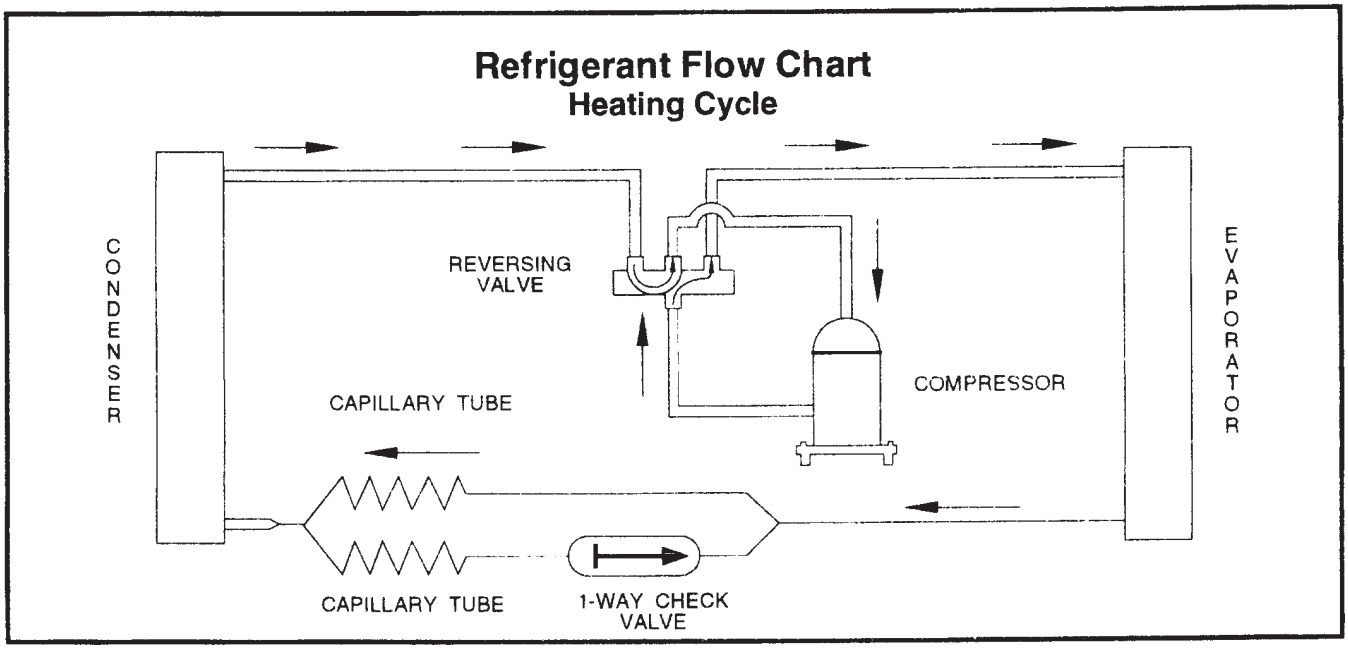
Cooling Cycle (Refer to Chart Below)

In the cooling cycle, both capillary tubes feed the evaporator coil.



Heating Cycle (Refer to Chart Below)

In the heating cycle, the one-way check is closed and the refrigerant flows through one capillary only to the condenser.



INSTALLATION INSTRUCTIONS
FOR DC-2 DRAIN KIT

STEP 1 Before sliding chassis into outer shell, turn chassis on its side and add drain hole by drilling ½" diameter hole as shown in Figure 1.

STEP 2 DC-2 mounts to the bottom of the outer shell as shown in Figure 2 on the right side as you face the unit. Use two (2) 10 - 24 x 3/8" long machine screws and 10 - 24 hex nuts provided.

STEP 3 SQ, KQ, YQ Models - Drill two ¼" holes in outer shell as shown in Figure 3. Also drill a 3/8" diameter hole in the base pan 3½" from the back and 3½" from right side.

STEP 4 Small and Medium Chassis Models - Mount in second and third holes from the rear of shell; See Figure 4.

STEP 5 Large Chassis Models - Mount in third and fourth holes from the rear of shell; see Figure 5.

STEP 6 Connect a suitable length of garden hose or other tubing to end of the drain tube to drain the condensate away.

FIGURE 1

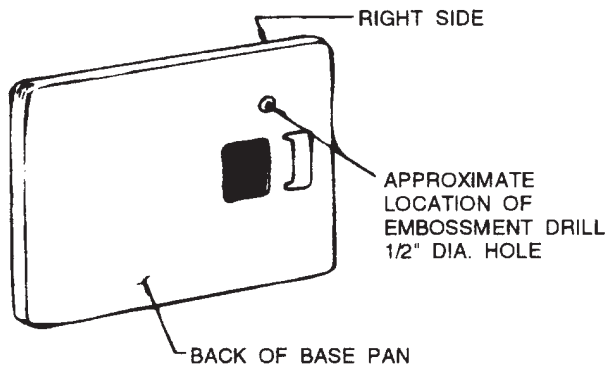


FIGURE 2

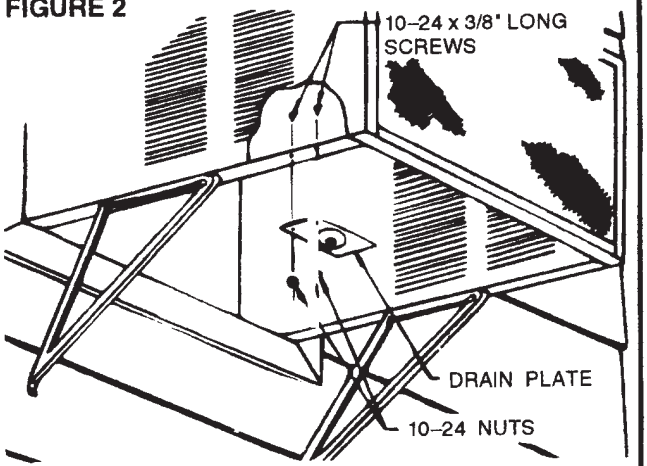
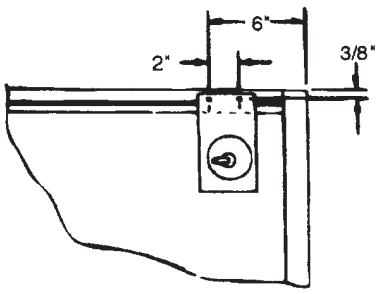
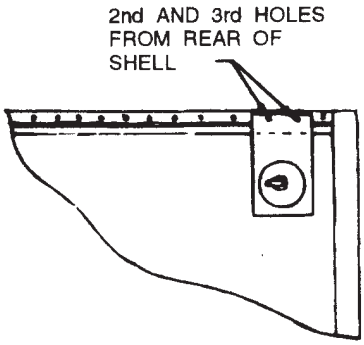


FIGURE 3



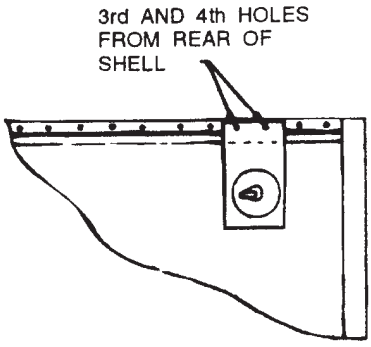
"SQ","KQ","YQ" MODELS
BOTTOM VIEW

FIGURE 4



SMALL AND MEDIUM
CHASSIS MODELS
BOTTOM VIEW

FIGURE 5



LARGE CHASSIS MODELS
BOTTOM VIEW

WARNING

DISCONNECT ELECTRICAL POWER TO UNIT BEFORE SERVICING OR TESTING

COMPRESSORS

Compressors are single phase, 115 or 230/208 volt, depending on the model unit. All compressor motors are permanent split capacitor type using only a running capacitor across the start and run terminal.

All compressors are internally spring mounted and externally mounted on rubber isolators.

COMPRESSOR WINDING TEST (See Figure 1)

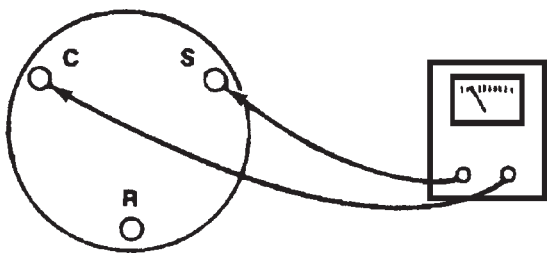
Remove compressor terminal box cover and disconnect wires from terminals. Using an ohmmeter, check continuity across the following:

1. Terminal "C" and "S" - no continuity - open winding - replace compressor.

2. Terminal "C" and "R" - no continuity - open winding - replace compressor.

3. Terminal "R" and "S" - no continuity - open winding - replace compressor.

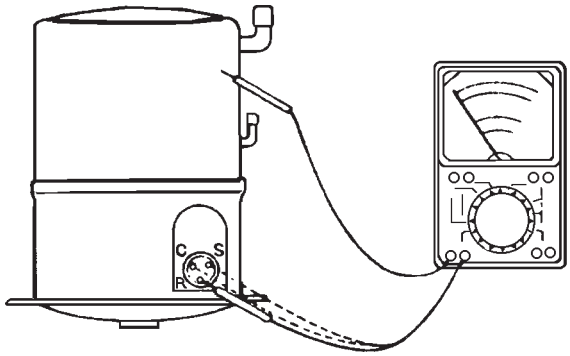
Figure 1: Compressor Winding Test



GROUND TEST

Use an ohmmeter set on its highest scale. Touch one lead to the compressor body (clean point of contact as a good connection is a must) and the other probe in turn to each compressor terminal (see Figure 2.) If a reading is obtained, the compressor is grounded and must be replaced.

Figure 2: Typical Ground Test



CHECKING COMPRESSOR EFFICIENCY

The reason for compressor inefficiency is normally due to broken or damaged suction and/or discharge valves, reducing the ability of the compressor to pump refrigerant gas.

This condition can be checked as follows:

1. Install a piercing valve on the suction and discharge or liquid process tube.

2. Attach gauges to the high and low sides of the system.

3. Start the system and run a "cooling or heating performance test."

   If test shows:

   A. **Below** normal high side pressure.

   B. **Above** normal low side pressure.

   C. **Low** temperature difference across coil.

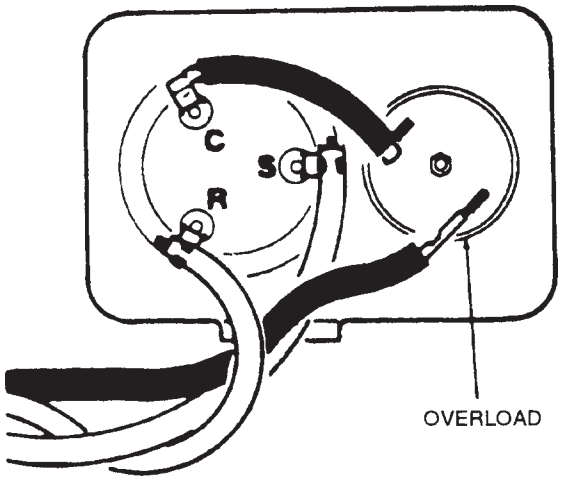
   The compressor valves are faulty - replace the compressor.

THERMAL OVERLOAD (External)

Some compressors are equipped with an external overload which is located in the compressor terminal box adjacent to the compressor body (see Figure 3.)

The overload is wired in series with the common motor terminal. The overload senses both major amperage and compressor temperature. High motor temperature or amperage heats the disc causing it to open and break the circuit to the common motor terminal.

Figure 3: External Overload



Heat generated within the compressor shell is usually due to:

1. High amperage.
2. Low refrigerant charge.
3. Frequent recycling.
4. Dirty condenser.

TERMINAL OVERLOAD - TEST
(Compressor - External Type)

1. Remove overload.
2. Allow time for overload to reset before attempting to test.
3. Apply ohmmeter probes to terminals on overload wires. There should be continuity through the overload.

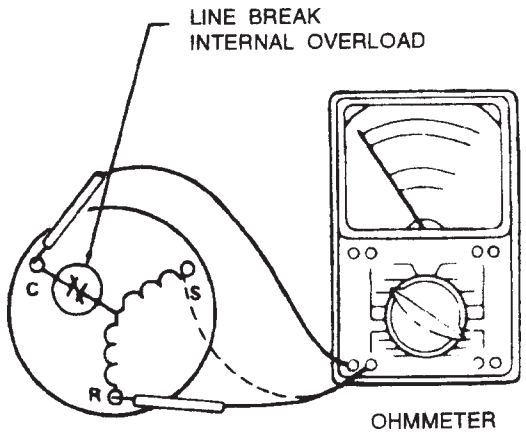
TERMINAL OVERLOAD (Internal)

Some model compressors are equipped with an internal overload. The overload is embedded in the motor windings to sense the winding temperature and/or current draw. The overload is connected in series with the common motor terminal.

Should the internal temperature and/or current draw become excessive, the contacts in the overload will open, turning off the compressor. The overload will automatically reset, but may require several hours before the heat is dissipated.

CHECKING THE INTERNAL OVERLOAD
(see Figure 4.)

Figure 4 INTERNAL OVERLOAD



1. With no power to unit, remove the leads from the compressor terminals.
2. Using an ohmmeter, test continuity between terminals C-S and C-R. If not continuous, the compressor overload is open and the compressor must be replaced.

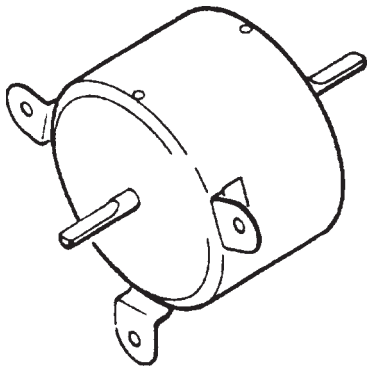
FAN MOTOR

A single phase permanent split capacitor motor is used to drive the evaporator blower and condenser fan. A self-resetting overload is located inside the motor to protect against high temperature and high amperage conditions.

FAN MOTOR - TEST

1. Determine that capacitor is serviceable.
2. Disconnect fan motor wires from fan speed switch or system switch.
3. Apply “live” test cord probes on black wire and common terminal of capacitor. Motor should run at high speed.

Figure 5: Fan Motor



4. Apply “live” test cord probes on red wire and common terminal of capacitor. Motor should run at low speed.

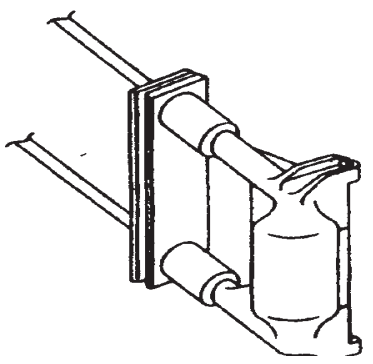
5. Apply “live” test cord probes on each of the remaining wires from the speed switch or system switch to test intermediate speeds.

CAPACITOR, RUN

A run capacitor is wired across the auxiliary and main winding of a single phase permanent split capacitor motor such as the compressor and fan motor. A single capacitor can be used for each motor or a dual rated capacitor can be used for both.

The capacitor's primary function is to reduce the line current while greatly improving the torque characteristics of a motor. The capacitor also reduces the line current to the motor by improving the power factor of the load. The line side of the capacitor is marked with a red dot and is wired to the line side of the circuit (see Figure 6.)

Figure 6: RUN CAPACITOR HOOK-UP



CAPACITOR - TEST

1. Remove capacitor from unit.

2. Check for visual damage such as bulges, cracks, or leaks.

3. For dual rated, apply an ohmmeter lead to common (C) terminal and the other probe to the compressor (HERM) terminal. A satisfactory capacitor will cause a deflection on the pointer, then gradually move back to infinity.

4. Reverse the leads of the probe and momentarily touch the capacitor terminals. The deflection of the pointer should be two times that of the first check if the capacitor is good.

5. Repeat steps 3 and 4 to check fan motor capacitor.

NOTE: A shorted capacitor will indicate a low resistance and the pointer will move to the "0" end of the scale and remain there as long as the probes are connected.

An open capacitor will show no movement of the pointer when placed across the terminals of the capacitor.

SYSTEM CONTROL SWITCH
(Heat Pump & Electric Heat Models)

An eight position control switch is used to regulate the operation of the fan motor and compressor. The compressor can be operated with the fan operating at low, medium or high speed in the cooling or heating mode. The fan motor can also be operated independently on medium speed. See switch section as indicated on decorative control panel (see Figure 7.)

1. "Off" Position - everything is off.

2. "Lo Cool" Position - fan operates on low speed, compressor is on.

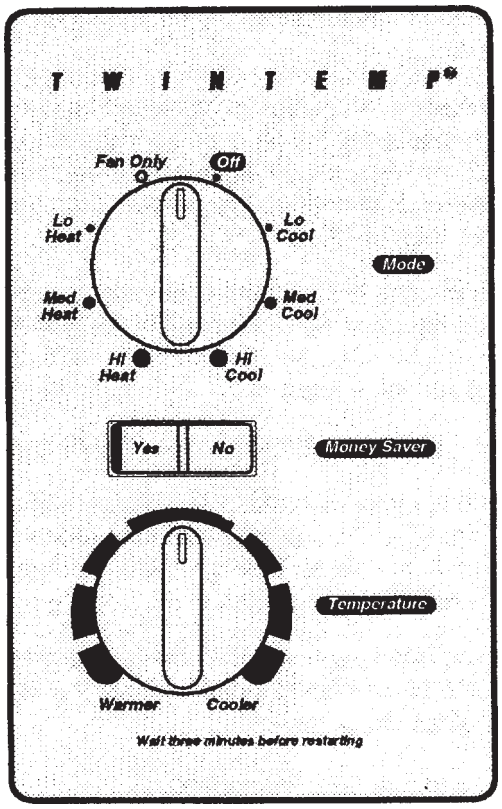
3. "Med Cool" Position - fan operates on medium speed, compressor is on.

4. "Hi Cool" Position - fan operates on high speed, compressor is on.

5. "Hi Heat" Position - fan operates on high speed, compressor or electric heater is on.

6. "Med Heat" Position - fan operates on medium speed, compressor or electric heater is on.

Figure 7: SYSTEM CONTROL PANEL
(Heat Pump & Electric Heat Models)

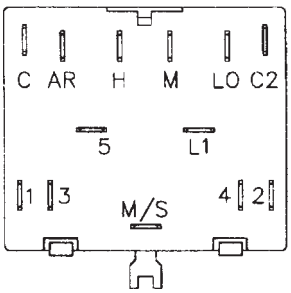


7. "Lo Heat" Position - fan operates on low speed, compressor or electric heater is on.

8. "Fan Only" Position - operates on medium speed.

NOTE: Heat pump models with electric heat - in the heat position, heating element only will be energized when outdoor temperature is below the operating range of the heat pump.

Figure 8: SYSTEM CONTROL SWITCH
(Heat Pump & Electric Heat Models)



SYSTEM CONTROL SWITCH - TEST

Disconnect leads from control switch. Turn control to position being tested (see Figure 8.) There must be continuity as follows:

1. "Off" Position - no continuity between terminals.

2. "Lo Cool" Position - between terminals "C" and "3", "C2" and "2", "LO" and "M/S", "AR" and "5".

3. "Med Cool" Position - between terminals "C" and "3", "C2" and "2", "M" and "M/S", "AR" and "5".

4. "Hi Cool" Position - between terminals "C" and "3", "C2" and "2", "H" and "M/S", "AR" and "5".

5. "Hi Heat" Position - between terminals "C" and "1", "C2" and "4", "H" and "M/S", "AR" and "5".

6. "Med Heat" Position - between terminals "C" and "1", "C2" and "4", "M" and "M/S", "AR" and "5".

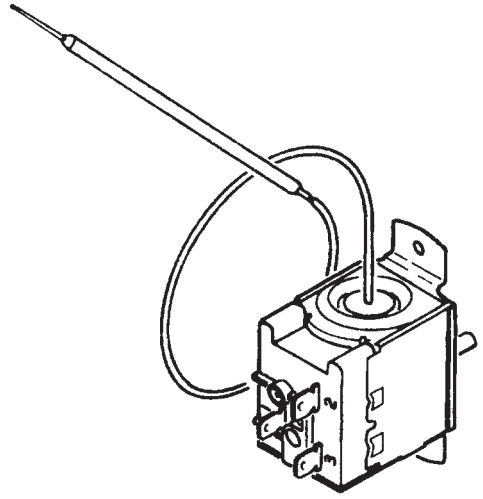
7. "Lo Cool" Position - between terminals "C" and "1", "C2" and "4", "LO" and "M/S", "AR" and "5".

8. "Fan Only" Position - between terminals "L1" and "M".

THERMOSTAT - (see Figure 9)

A cross ambient thermostat is used on all heat pump and electric heat units. In addition to cycling the unit in a heating or cooling operation, the thermostat will terminate the cooling cycle in the event ice forms on the evaporator coil, in this case the thermostat functions as a de-ice control. A resistor (anticipator) is positioned

Figure 9: THERMOSTAT



within a plastic block to supply a small amount of heat to the bulb area to prevent long "off cycles" in the "Cool-Fan Auto" (MoneySaver) position (see Figure 10.) A current feedback through the fan motor windings during "off cycle" completes the circuit to the resistor.

In the heating cycle, the heat anticipator is energized to supply a small amount of heat during the "on" cycle. This will open the contacts in the thermostat prematurely to maintain a closer differential between the "cut in" and "cut out" temperature. The heat anticipator is energized in the heating mode regardless of whether fan is placed in the automatic (MoneySaver) or constant run position.

RANGE: Cooling Model Thermostat
(Part No. 618-224-00)

60°F (±2°) to 92°F (±4°),

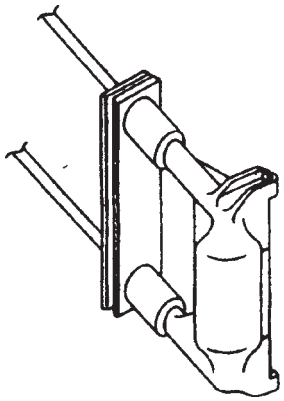
TEST:

Cooling/Heating Models: Remove wires from thermostat and check continuity between terminal "2" (common) and "3" for cooling. Check between terminals "2" (common) and "1" for heating. Also check that contacts in thermostat open after placing in either position. NOTE: Temperature must be within range listed to check thermostat. Refer to the troubleshooting section in this manual for additional information on thermostat testing.

THERMOSTAT ADJUSTMENT

No attempt should be made to adjust thermostat. Due to the sensitivity of the internal mechanism and the sophisticated equipment required to check the calibration, it is suggested that the thermostat be replaced rather than calibrated. Thermostat bulb must be straight to insure proper performance.

Figure 10: RESISTOR



RESISTOR (Heat Anticipator)

Failure of the resistor will cause prolonged "off" and "on" cycles of the unit. When replacing a resistor, be sure and use the exact replacement. Resistor ratings are as follows:

115 Volt - 5,000 ohms 3 watt
230 Volt - 20,000 ohms 3 watt

MONEYSAVER® SWITCH
(Rocker Switch) - See Figure 11

This rocker switch can be depressed to either **YES** or **NO**. In the **YES** position you will get the most economical operation. Both the fan and compressor will cycle on and off together, maintaining the selected temperature at a more constant level and reducing the humidity more efficiently in the cooling mode. This control will only operate when the unit is in a cooling or heating mode. In the **NO** position, the fan will run constantly as long as the unit is in the cooling or heating mode.

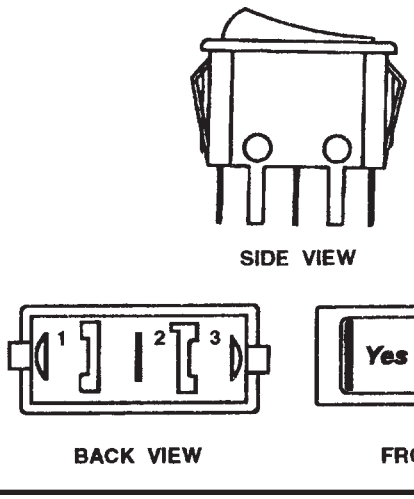
TEST:

Disconnect leads from switch. Depress switch to function being tested.

1. When **YES** is depressed, there should be continuity between terminals "1" and "2".

2. When **NO** is depressed, there should be continuity between terminals "2" and "3".

Figure 11: ROCKER SWITCH



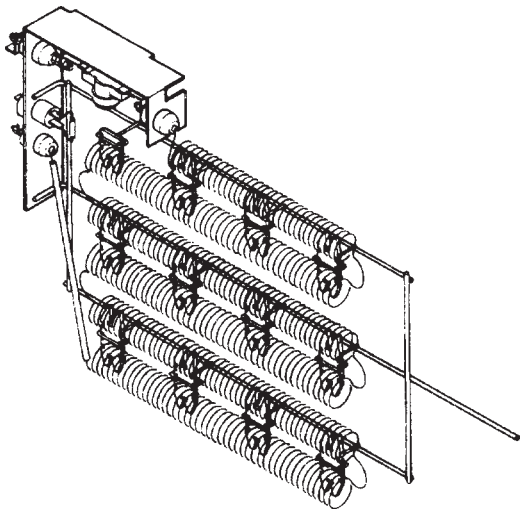
HEATING ELEMENT - See Figure 12

All heat pumps and electric heat models are equipped with a heating element with the exception of the YS09J10. The "YS", "ES" and "EK12" models are equipped with a 3.3 KW element. The "YM", "EM" and "EK18" models are equipped with a 4.0 KW element. The "YL" and "EL" models are equipped with a 5.2 KW element.

The heating element contains a fuse link and a heater limit switch. The fuse link is in series with the power supply and will open and interrupt the power when the temperature reaches 161.6°F, or a short circuit occurs in the heating element. Once the fuse link separates, a new fuse link must be installed. **NOTE: Always replace with the exact replacement.**

The heater element has a high limit control. This control is a bimetal thermostat mounted in the top of the heating element.

Figure 12: HEATING ELEMENT



Should the fan motor fail or filter become clogged, the high limit control will open and interrupt power to the heater before reaching an unsafe temperature condition.

The control is designed to open at 110°F ±6°F. Test continuity below 110°F and for open above 110°F.

The heating element for the "Y" model is energized by an outdoor thermostat. The outdoor thermostat is adjusted at a predetermined temperature to bring on the heating element and turn off the compressor. The room thermostat will then control the cycling of the element when the selected indoor temperature is reached.

Testing of the elements can be made with an ohmmeter across the terminals after the connecting wires have been removed. A cold resistance reading of approximately 14.5 ohms for the 3.3 KW heater, 11.9 ohms for the 4.0 KW heater and 9.15 ohms for the 5.2 KW heater should be registered.

DEFROST THERMOSTAT
(Heat Pump Models Only)

This thermostat (Figure 13) is single pole - double throw with contacts between terminals "2" and "3" closing on temperature rise and contacts between terminals "2" and "1" closing on temperature fall. When the contacts between terminals "2" and "1" make, power is supplied to the heater element.

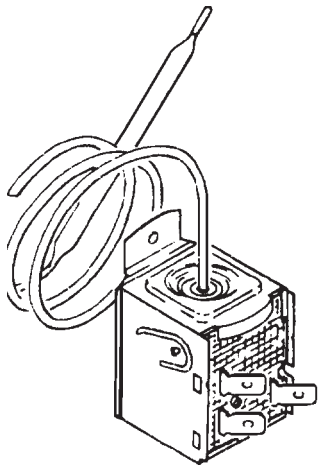
This control is dual purpose control that acts as an outdoor thermostat and defrost control.

When the sensing bulb, attached to the condenser coil, senses enough icing on the outdoor coil, it will interrupt power to the compressor and supply power to the heating element until the coil temperature reaches above 43°, then the heater will shut off and the unit will resume operating in the reverse cycle mode.

When the outdoor coil temperature drops below 20°, the unit will operate in electric heat mode continuously until the outdoor coil temperature rises above 43°.

The fan motor will not turn off when defrost occurs, and the 4-way valve will not reverse.

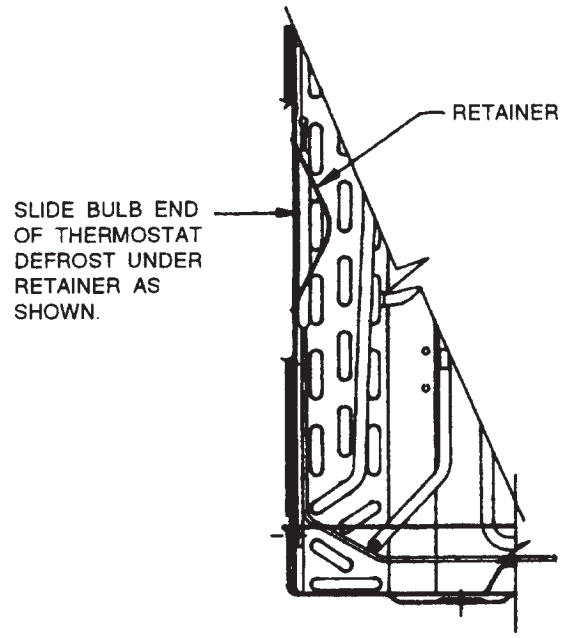
Figure 13: DEFROST THERMOSTAT (Heat Pump Models)



DEFROST BULB LOCATION
(Heat Pump Models Only)

The defrost control bulb must be mounted securely and in the correct location to operate properly (see Figure 14.)

Figure 14: DEFROST THERMOSTAT BULB LOCATION (All Heat Pump Models)



SOLENOID COIL
(Heat Pump Models Only)

The solenoid coil is an electromagnetic type coil mounted on the reversing valve and is energized during the operation of the compressor in the heating cycle.

Should the reversing valve fail to shift during the heating cycle, test the solenoid coil. Also, refer to Touch Test Chart on page 26.

TO TEST:

1. Disconnect power to unit.

2. Disconnect coil leads.

3. Attach probes of ana ohmmeter to each coil lead and check for continuity.

NOTE: Do not start unit with solenoid coil removed from valve, or do not remove coil after unit is in operation. This will cause the coil to burn out.

CHECK VALVE (Figure 15)
(Heat Pump Models Only)

A one-way check valve is installed in the capillary tube circuit to allow the flow of refrigerant through both tubes to the evaporator during the cooling mode.

In the heating mode, one capillary is closed by the check valve to allow flow through one capillary only to the condenser.

Figure 15: ONE-WAY CHECK VALVE (Heat Pump Models)

NOTE: The slide (check) inside the valve is made of teflon. Should it become necessary to replace the check valve, place a wet cloth around the valve to prevent overheating during the brazing operation. The flow arrow on the valve must point toward the evaporator.

VALVE, DRAIN PAN (see Figure 16)

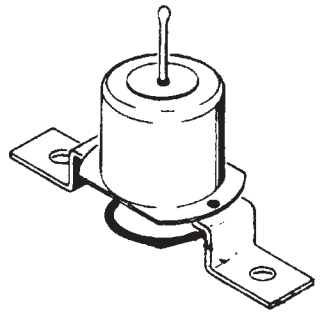
During the cooling mode of operation, condensate which collects in the drain pan is picked up by the condenser fan blade and sprayed onto the condenser coil. This assists in cooling the refrigerant plus evaporating the water.

During the heating mode of operation, it is necessary that water be removed to prevent it from freezing during cold outside temperatures. This could cause the condenser fan blade to freeze in the accumulated water and prevent it from turning.

To provide a means of draining this water, a bellows type drain valve is installed over a drain opening in the base pan.

This valve is temperature sensitive and will open when the outside temperature reaches 40°F. The valve will close gradually as the temperature rises above 40°F to fully close at 60°F.

Figure 16: DRAIN PAN VALVE



REVERSING VALVE
(Heat Pump Model Only)

A reversing valve is used to change the refrigerant flow within the system to permit heating or cooling (see Figure 17.)

The reversing valve consists of a main valve body which houses the slide and piston, plus a pivot valve which is activated by a solenoid.

There are three tubes connected to one side of the main valve body and one tube on the opposite side. The single tube is connected to the compressor discharge line. The center tube on the opposite side is the common suction line to the compressor. The outside tubes are connected to the indoor and outdoor coils.

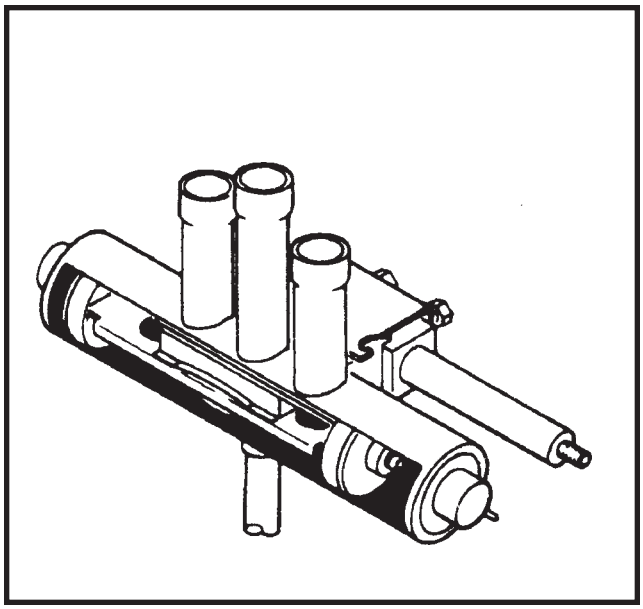


Figure 17: REVERSING VALVE

The pilot valve is responsible for directing the refrigerant flow to the indoor or outdoor coil. There are three small tubes connected to the pilot valve body. The center pilot tube is the common pilot tube and is connected to the center suction line. The outside tubes are connected to each end of the main valve body. The pilot valve consists of a needle valve and spring. When the solenoid is deenergized, the spring tension closes one pilot port while the others remain open. When the solenoid is energized, the opposite end is closed. The piston in the main valve is pressure operated and will always travel in the direction of the open pilot tube port which provides a path to the center tube. Pressure which will increase in the opposite end of the valve will escape through a bleed port located in each piston. When deenergized, the valve will be in the cooling position.

TESTING REVERSING VALVE

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

When stuck in the mid-position, part of the discharge gas from the compressor is directed back to the suction side, resulting in excessively high suction pressure.

Check the operation of the valve by starting the system and switching the operation from "cooling" to "heating" and then back to "cooling". Do not hammer on the valve.

If valve fails to change its position, test the voltage to the valve coil while the system is in the heating cycle. If voltage to coil is satisfactory, replace reversing valve.

Should the valve fail to shift from cooling to heating, block the air flow through the indoor coil and allow discharge pressure to build in the system. Then switch the system from cooling to heating.

If valve is stuck in the heating position, block the air flow through the indoor coil and allow discharge pressure to build in the system. Then switch the system from heating to cooling.

Should the valve fail to shift in either position after increasing the discharge pressure, replace the valve.

NOTE: When brazing a reverse valve into the system, it is of extreme importance that the temperature of the valve does not exceed 250°F at any time.

Wrap the reversing valve with a large rag saturated with water. "Re-wet" the rag and thoroughly cool the valve after brazing operation of the four joints involved.

The wet rag around the reversing valve will eliminate conduction of heat to the valve body when brazing the line connection.

IMPORTANT

ANY SEALED SYSTEM REPAIRS TO HEAT PUMP MODELS REQUIRES THE INSTALLATION OF A SUCTION LINE DRIER IN THE SUCTION LINE BETWEEN THE COMPRESSOR AND THE REVERSING VALVE. ELECTRIC HEAT MODELS REQUIRE A LIQUID LINE DRIER (SEE PARTS LIST FOR PART NUMBERS.)

SEALED REFRIGERATION SYSTEM REPAIRS

EQUIPMENT REQUIRED

1. Voltmeter
2. Ammeter
3. Ohmmeter
4. E.P.A. Approved Refrigerant Recovery System.
5. Vacuum Pump (capable of 200 microns or less vacuum.)
6. Acetylene Welder
7. Electronic Halogen Leak Detector (G.E. Type H-6 or equivalent.)
8. Accurate refrigerant charge measuring device such as:
   a. Balance Scales - 1/2 oz. accuracy
   b. Charging Board - 1/2 oz. accuracy
9. High Pressure Gauge - (0 - 400 lbs.)
10. Low Pressure Gauge - (30 - 150 lbs.)
11. Vacuum Gauge - (0 - 1000 microns)

EQUIPMENT MUST BE CAPABLE OF:

1. Recovery CFC's as low as 5%.
2. Evacuation from both the high side and low side of the system simultaneously.
3. Introducing refrigerant charge into high side of the system.
4. Accurately weighing the refrigerant charge actually introduced into the system.
5. Facilities for flowing nitrogen through refrigeration tubing during all brazing processes.

HERMETIC COMPONENT REPLACEMENT

The following procedure applies when replacing components in the sealed refrigeration circuit or repairing refrigerant leaks. (Compressor, condenser, evaporator, capillary tube, refrigerant leaks, etc.)

1. Recover the refrigerant from the system at the process tube located on the high side of the system by installing a line tap on the process tube. Apply gauge from process tube to EPA approved gauges from process tube to EPA approved recovery system. Recover CFCs in system to at least 5%.
2. Cut the process tube below pinch off on the suction side of the compressor.
3. Connect the line from the nitrogen tank to the suction process tube.
4. Drift dry nitrogen through the system and unsolder the more distant connection first. (Filter drier, high side process tube, etc.)
5. Replace inoperative component, and always install a new filter drier. Drift dry nitrogen through the system when making these connections.
6. Pressurize system to 30 PSIG with proper refrigerant and boost refrigerant pressure to 150 PSIG with dry nitrogen.
7. Leak test complete system with electric halogen leak detector, correcting any leaks found.
8. Reduce the system to zero gauge pressure.
9. Connect vacuum pump to high side and low side of system with deep vacuum hoses, or copper tubing. (Do not use regular hoses.)
10. Evacuate system to maximum absolute holding pressure of 200 microns or less. NOTE: This process can be speeded up by use of heat lamps, or by breaking the vacuum with refrigerant or dry nitrogen at 5,000 microns. Pressure system to 5 PSIG and leave in system a minimum of 10 minutes. Recover refrigerant, and proceed with evacuation of a pressure of 200 microns or a minimum of 10%.

11. Break vacuum by charging system from the high side with the correct amount of refrigerant specified. This will prevent boiling the oil out of the crankcase.

    NOTE: If the entire charge will not enter the high side, allow the remainder to enter the low side in small increments while operating the unit.

12. Restart unit several times after allowing pressures to stabilize. Pinch off process tubes, cut and solder the ends. Remove pinch off tool, and leak check the process tube ends.

SPECIAL PROCEDURE IN THE CASE OF MOTOR COMPRESSOR BURNOUT

1. Recover all refrigerant and oil from the system.

2. Remove compressor, capillary tube and filter drier from the system.

3. Flush evaporator condenser and all connecting tubing with dry nitrogen or equivalent, to remove all contamination from system. Inspect suction and discharge line for carbon deposits. Remove and clean if necessary.

4. Reassemble the system, including new drier strainer and capillary tube.

5. Proceed with processing as outlined under hermetic component replacement.

ROTARY COMPRESSOR SPECIAL TROUBLESHOOTING AND SERVICE

Basically, troubleshooting and servicing rotary compressors is the same as on the reciprocating compressor with only a few exceptions.

1. Because of the spinning motion of the rotary, the mounts are critical. If vibration is present, check the mounts carefully.

2. The electrical terminals on the rotary are in a different order than the reciprocating compressors. The terminal markings are on the cover gasket. Use your wiring diagram to insure correct connections.

REFRIGERANT CHARGE

1. The refrigerant charge is extremely critical. Measure charge carefully - as exact as possible to the nameplate charge.

2. The correct method for charging the rotary is to introduce liquid refrigerant into the high side of the system with the unit off. Then start compressor and enter the balance of the charge, gas only, into the low side.

   The introduction of liquid into the low side, without the use of a capillary tube, will cause damage to the discharge valve of the rotary compressor.

   NOTE: All inoperative compressors returned to Friedrich must have all lines properly plugged with the plugs from the replacement compressor.

TROUBLESHOOTING TOUCH TEST CHART
TO SERVICE REVERSING VALVES

VALVE OPERATING CONDITION	DISCHARGE TUBE from Compressor	SUCTION TUBE to Compressor	Tube to INSIDE COIL	Tube to OUTSIDE COIL	LEFT Pilot Capillary Tube	RIGHT Pilot Capillary Tube	NOTES: *Temperature of Valve Body. * *Warmer than Valve Body.	
	1	2	3	4	5	6	POSSIBLE CAUSES	CORRECTIONS
NORMAL FUNCTION OF VALVE								
Normal COOLING	Hot	Cool	Cool, as (2)	Hot, as (1)	*TVB	*TVB		
Normal HEATING	Hot	Cool	Hot, as (1)	Cool, as (2)	*TVB	*TVB		
MALFUNCTION OF VALVE								
Valve will not shift from cool to heat	Check electrical circuit and coil.						No voltage to coil.	Repair electrical circuit.
							Defective coil.	Replace coil.
	Check refrigeration charge.						Low charge.	Repair leak, recharge system.
							Pressure differential too high.	Recheck system.
	Hot	Cool	Cool, as (2)	Hot, as (1)	*TVB	Hot	Pilot valve okay. Dirt in one bleeder hole.	Deenergize solenoid, raise head pressure, reenergize solenoid to break dirt loose. If unsuccessful, remove valve, wash out. Check on air before installing. If no movement, replace valve, add strainer to discharge tube, mount valve horizontally.
							Piston cup leak.	Stop unit. After pressures equalize, restart with solenoid energized. If valve shifts, reattempt with compressor running. If still no shift, replace valve.
Valve will not shift from cool to heat	Hot	Cool	Cool, as (2)	Hot, as (1)	*TVB	*TVB	Clogged pilot tubes.	Raise head pressure, operate solenoid to free. If still no shift, replace valve.
	Hot	Cool	Cool, as (2)	Hot, as (1)	Hot	Hot	Both ports of pilot open. (Back seat port did not close).	Raise head pressure, operate solenoid to free partially clogged port. If still no shift, replace valve.
	Warm	Cool	Cool, as (2)	Warm, as (1)	*TVB	Warm	Defective compressor.	
Starts to shift but does not complete reversal	Hot	Warm	Warm	Hot	*TVB	Hot	Not enough pressure differential at start of stroke or not enough flow to maintain pressure differential.	Check unit for correct operating pressures and charge. Raise head pressure. If no shift, use valve with smaller port.
							Body damage.	Replace valve.
	Hot	Warm	Warm	Hot	Hot	Hot	Both ports of pilot open.	Raise head pressure, operate solenoid. If no shift, replace valve.
	Hot	Hot	Hot	Hot	*TVB	Hot	Body damage.	Replace valve.
							Valve hung up at mid-stroke. Pumping volume of compressor not sufficient to maintain reversal.	Raise head pressure, operate solenoid. If no shift, use valve with smaller ports.
	Hot	Hot	Hot	Hot	Hot	Hot	Both ports of pilot open.	Raise head pressure, operate solenoid. If no shift, replace valve.
Apparent leap in heating	Hot	Cool	Hot, as (1)	Cool, as (2)	*TVB	*TVB	Piston needle on end of slide leaking.	Operate valve several times, then recheck. If excessive leak, replace valve.
	Hot	Cool	Hot, as (1)	Cool, as (2)	** WVB	** WVB	Pilot needle and piston needle leaking.	Operate valve several times, then recheck. If excessive leak, replace valve.
Will not shift from heat to cool	Hot	Cool	Hot, as (1)	Cool, as (2)	*TVB	*TVB	Pressure differential too high.	Stop unit. Will reverse during equalization period. Recheck system.
							Clogged pilot tube.	Raise head pressure, operate solenoid to free dirt. If still no shift, replace valve.
	Hot	Cool	Hot, as (1)	Cool, as (2)	Hot	*TVB	Dirt in bleeder hole.	Raise head pressure, operate solenoid. Remove valve and wash out. Check on air before reinstalling, if no movement, replace valve. Add strainer to discharge tube. Mount valve horizontally.
	Hot	Cool	Hot, as (1)	Cool, as (2)	Hot	*TVB	Piston cup leak.	Stop unit, after pressures equalize, restart with solenoid deenergized. If valve shifts, reattempt with compressor running. If it still will not reverse while running, replace valve.
	Hot	Cool	Hot, as (1)	Cool, as (2)	Hot	Hot	Defective pilot.	Replace valve.
	Warm	Cool	Warm, as (1)	Cool, as (2)	Warm	*TVB	Defective compressor.	

Valve operated satisfactorily PRIOR to compressor motor burnout — caused by dirt and small geasy particles inside the valve. **TO CORRECT:** Remove valve, thoroughly wash it out. Check on air before reinstalling, or replace valve. Add strainer and filter-drier to discharge tube between valve and compressor.

Troubleshooting Cooling

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Compressor does not run.	Low voltage.	Check for voltage at compressor. 115 volt and 230 volt units will operate at 10% voltage variance.
	Thermostat not set cold enough or inoperative.	Set thermostat to coldest position. Test thermostat and replace if inoperative.
	Compressor hums but cuts off on overload.	Hard start compressor. Direct test compressor. If compressor starts, add starting components.
	Open or shorted compressor windings.	Check for continuity and resistance.
	Open overload.	Test overload protector and replace if inoperative.
	Open capacitor.	Test capacitor and replace if inoperative.
	Inoperative system switch.	Test for continuity in all positions. Replace if inoperative.
	Broken, loose or incorrect wiring.	Refer to appropriate wiring diagram to check wiring.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Fan motor does not run.	Inoperative system switch.	Test switch and replace if inoperative.
	Broken, loose or incorrect wiring.	Refer to applicable wiring diagram.
	Open capacitor.	Test capacitor and replace if inoperative.
	Fan speed switch open.	Test switch and replace if inoperative.
	Inoperative fan motor.	Test fan motor and replace if inoperative (be sure internal overload has had time to reset.)

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Does not cool, or cools only slightly.	Undersized unit.	Refer to Sizing Charts.
	Thermostat open or inoperative.	Set to coldest position. Test thermostat and replace if necessary.
	Dirty filter.	Clean as recommended in Owner's Manual.
	Dirty or plugged condenser or evaporator coil.	Use steam or detergents to clean.
	Poor air circulation in area being cooled.	Adjust discharge air louvers. Use high fan speed.
	Fresh air or exhaust air door open on applicable models.	Close doors. Instruct customer on use of this feature.
	Low capacity – undercharge.	Clean for leak and make repair.
	Compressor not pumping properly.	Check amperage draw against nameplate. If not conclusive, make pressure test.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Unit does not run.	Fuse blown or circuit tripped.	Replace fuse, reset breaker. If repeats, check fuse or breaker size. Check for shorts in unit wiring and components.
	Power cord not plugged in.	
	System switch in "Off" position.	Set switch correctly.
	Inoperative system switch.	Test for continuity in each switch position.
	Loose or disconnected wiring at switch or other components.	Check wiring and connections. Reconnect per wiring diagram.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Evaporator coil freezes up.	Dirty filter.	Clean as recommended in Owner's Manual.
	Restricted air flow.	,Check for dirty or obstructed coil – clean as required.
	Inoperative thermostat.	Test for shorted thermostat or stuck contacts.
	Short of refrigerant.	De-ice coil and check for leak.
	Inoperative fan motor.	Test fan motor and replace if inoperative.
	Partially restricted capillary.	De-ice coil. Check temperature differential across coil. Touch test coil return bends for same temperature. Test for low running current.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Compressor runs continually. Does not cycle off.	Excessive heat load.	Unit undersized. Test cooling performance of unit. Replace with larger unit.
	Restriction in line.	Check for partilally iced coil. Check temperature split across coil.
	Refrigerant leak.	Check for oil at silver soldered connections. Check for partially iced coil. Check split across coil. Check for low running amperage.
	Thermostat contacts stuck.	Check operation of thermostat. Replace if contacts remain closed
	Thermostat incorrectly wired.	Refer to appropriate wiring diagram.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Thermostat does not turn unit off.	Thermostat contacts stuck.	Replace thermostat.
	Thermostat set at coldest point.	Turn to higher temperature setting to see if unit cycles off.
	Incorrect wiring.	Refer to appropriate wiring diagram.
	Unit undersized for area to be cooled.	Refer to Sizing Chart.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Compressor attempts to start, or runs for short periods only. Cycles on overload.	Overload inoperative. Opens too soon.	Check operation of unit. Replace overload if system operation is satisfactory.
	Compressor attempts to start before system pressures are equalized.	Allow a minimum of two (2) minutes for pressures to equalize before attempting to restart. Instruct customer of waiting period.
	Low or fluctuating voltage.	Check voltage with unit operating. Check for other appliances on circuit. Air conditioner should be on separate circuit for proper voltage and fused separately.
	Incorrect wiring.	Refer to appropriate wiring diagram.
	Shorted or incorrect capacitor.	Check by substituting a known good capacitor of correct rating.
	Restricted or low air flow through condenser coil.	Check for proper fan speed or blocked condenser.
	Compressor running abnormally hot.	Check for kinked discharge line or restricted condenser. Check amperage.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Thermostat does not turn unit on.	Loss of charge in thermostat bulb.	Place jumper across thermostat terminals to check if unit operates. If unit operates, replace thermostat.
	Loose or broken parts in thermostat.	Check as above.
	Incorrect wiring.	Refer to appropriate wiring diagram.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Noisy operation.	Poorly installed unit.	Refer to Installation Instructions for proper installation.
	Fan blade striking chassis.	Reposition – adjust motor mount.
	Compressor vibrating.	Check that compressor grommets have not deteriorated. Check that compressor mounting parts are not missing.
	Improperly mounted or loose cabinet parts.	Check assembly and parts for looseness rubbing and rattling.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Water leaks into room.	Evaporator drain pan overflowing.	Clean obstructed drain trough.
	Condensation forming on base pan.	Evaporator drain pan broken or cracked. Reseal or replace.
	Poor installation resulting in rain entering room.	Check installation instructions. Reseal as required.
	Condensation on discharge grilles.	Dirty evaporator coil – clean. Very high humidity level.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Thermostat short cycles.	Thermostat differential too narrow.	Replace thermostat.
	Plenum gasket not sealing, allowing discharge air to short cycle thermostat.	Check gasket. Reposition or replace.
	Restricted coil or dirty filter.	Clean and advise customer of periodic cleaning of filter.
	Tubular insulation missing from top of thermostat bulb.	Replace tubular insulation on bulb. (Applicable models.)
	Thermostat bulb touching thermostat bulb support bracket.	Adjust bulb bracket. (Applicable models.)

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Prolonged off cycles (automatic operation).	Anticipator (resistor) wire disconnected at thermostat or system switch.	Refer to appropriate wiring diagram.
	Anticipator (resistor shorted or open). (Applicable models.)	Disconnect plug from outlet. Remove resistor from bracket. Insert plug and depress "Cool" and "Fan-Auto (MoneySaver)" buttons. Place thermostat to warmest setting. Feel resistor for temperature. If no heat, replace resistor.
	Partial loss of charge in thermostat bulb causing a wide differential.	Replace thermostat.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Switches from cooling to heating.	Thermostat sticking.	Change room thermostat.
	Incorrect wiring.	Refer to appropriate wiring diagram.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Outside water leaks.	Evaporator drain pan cracked or obstructed.	Repair, clean or replace as required.
	Water in compressor area.	Detach shroud from pan and coil. Clean and remove old sealer. Reseal, reinstall and check.
	Obstructed condenser coil.	Steam clean.
	Fan blade and slinger ring improperly positioned.	Adjust fan blade 3/16 to 1/4" from condenser shroud. Adjust fan motor mount to allow 3/16 to 1/4" clearance between condenser fan blade and base pan.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
High indoor humidity.	Insufficient air circulation in air conditioned area.	Adjust louvers for best possible air circulation.
	Oversized unit.	Operate in "Fan-Auto (MoneySaver)" position.
	Inadequate vapor barrier in building structure, particularly floors.	Advise customer.

Troubleshooting Heating

(Heat Pumps)

PROBLEM	POSSIBLE CAUSE	TO CORRECT
No heating – fan operates.	Thermostat setting.	Set thermostat to a warmer position.
	Defective thermostat.	Replace – do not attempt to adjust.
	Compressor not operating.	Check compressor wiring. Check for open internal or external overload. Check wiring.
	Defective system switch.	Test system switch.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Insufficient heating.	Restricted filter.	Clean as recommended in Owner's Manual.
	Outdoor thermostat. (Applicable models.)	Check if outdoor thermostat is energizing the heating element at its predetermined temperature setting.
	Fresh air or exhaust door open.	Check control setting.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Fan operates in "constant" position, but not in "automatic", (MoneySaver).	Inoperative system switch.	Check continuity of switch.
	Incorrect wiring.	Check applicable wiring diagram.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Temperature varies from comfortable to overly warm.	Defective thermostat.	Incorrect differential setting. Replace thermostat.
	Heat anticipator (resistor) shorted. (Applicable models.)	Check voltage to resistor. If voltage okay, remove resistor from thermostat bulb block. With current on, feel resistor for warmth. If no heat can be felt, replace anticipator.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Room temperature uneven. (Heating cycle)	Heat anticipator (resistor) shorted. (Applicable models.)	Disconnect power to unit. Remove resistor from thermostat bulb block. Plug in unit and allow to operate. Feel resistor for heat. If no heat is felt, replace resistor.
	Wide differential – partial loss of thermostat bulb charge.	Replace thermostat and check.
	Incorrect wiring.	Refer to appropriate wiring diagram. Resistor is energized during the "ON" cycle of compressor or fan.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Unit will not defrost.	Incorrect wiring.	Refer to appropriate wiring diagram.
	Defrost control timer motor not advancing.	Check for voltage at "TM" and "TM1" on timer. If voltage, replace control.
	Defrost control out of calibration.	If outside coil temperature is 25°F or below, and preselected time limit has elapsed, replace defrost control.
	Defrost control contacts stuck.	If contacts remain closed between terminals "2" and "3" of the defrost control after preselected time interval has passed, replace control.
	Defrost control bulb removed from coil, or not making good coil contact.	Reinstall and be assured that good bulb to coil contact is made.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Unit does not heat adequately.	Outdoor thermostat does not cut off compressor at the preselected temperature and bring on heating element.	Defective thermostat – replace.
	Fresh air or exhaust door open.	Check if operating properly. Instruct customer on proper use of control.
	Dirty filter.	Clean as recommended in Owner's Manual.
	Unit undersized.	Check heat rise across coil. Refer to performance data sheet on heat rise at various outdoor ambients. If heat rise is satisfactory, check if insulation can be added to attic or walls.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Unit cools when heat is called for.	Incorrect wiring.	Refer to applicable wiring diagram.
	Defective solenoid coil.	Check for continuity of coil.
	Reversing valve fails to shift.	Block condenser coil and switch unit to cooling. Allow pressure to build up in system, then switch to heating. If valve fails to shift, replace valve.
	Inoperative system switch.	Check for continuity of system switch.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Cooling adequate – heating insufficient.	Heating capillary tube partially restricted.	Check for partially starved outer coil. Replace heating capillary tube.
	Check valve leaking internally.	Switch unit several times from heating to cooling. Check temperature rise across coil. Refer to specification sheet for correct temperature rise.
	Reversing valve failing to shift completely – bypassing hot gas.	Deenergize solenoid coil, raise head pressure, energize solenoid to break loose. If valve fails to make complete shift, replace valve.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Compressor will not turn off and operate on heating element only during low outside ambients.	Outdoor thermostat. (Applicable models.)	Refer to the heating data on applicable models for the preselected temperature the compressor shuts off and the electric element is energized.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Compressor shuts off on outdoor thermostat but element does not heat.	Fuse link.	Check fuse link for continuity. If defective, replace.
	Heating element shorted.	Check amperage draw of element. If no amperage, replace.
	Incorrect wiring.	Check voltage to element. If voltage is okay, check wiring.
	Heat relay or heater contactor coil open.	Defective coil. Test coil for continuity.

Troubleshooting Heating

(Cooling/Electric Models

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Fan operates – heating element does not come on.	Heater relay or contactor coil open.	Check continuity of coil.
	Heater relay or contactor stuck open, pitted or burned.	Inspect, test continuity with ohmmeter.
	High limit control open.	Check continuity – if open, replace.
	Open thermal fuse.	Check continuity. Check reason for failure.
	Open or shorted element.	Check voltage across heater terminals. Check amperage draw of heater.
	Loose connections.	Tighten all terminals.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Heating inadequate.	Restricted filter.	Clean as recommended in Owner's Manual.
	Cycling high limit control.	Control is set to open at 155°F ± 5°F and close at 130°F ± 8°F. If cycling prematurely, replace control.
	Exhaust or fresh air door open.	Check position of fresh air door control slide. Adjust cable if door does not close properly.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Fan operates in "Constant" position, but not in "Automatic" (MoneySaver).	Fan relay contacts open.	Check continuity of fan relay. NOTE: Some models have the fan relay energized during the heating cycle while others do not.
	Inoperative system switch.	Check continuity between terminals "L2" and "3" of the system switch.
	Loose connection.	Check connections on system switch and fan relay.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Long "off" and "on" cycles.	Heat anticipator (resistor) shorted.	Disconnect power to unit. Remove resistor from thermostat bulb block. Plug in unit and allow to operate. Feel resistor for heat. If no heat is felt, replace resistor.
	Defective thermostat.	Replace thermostat and check operation.

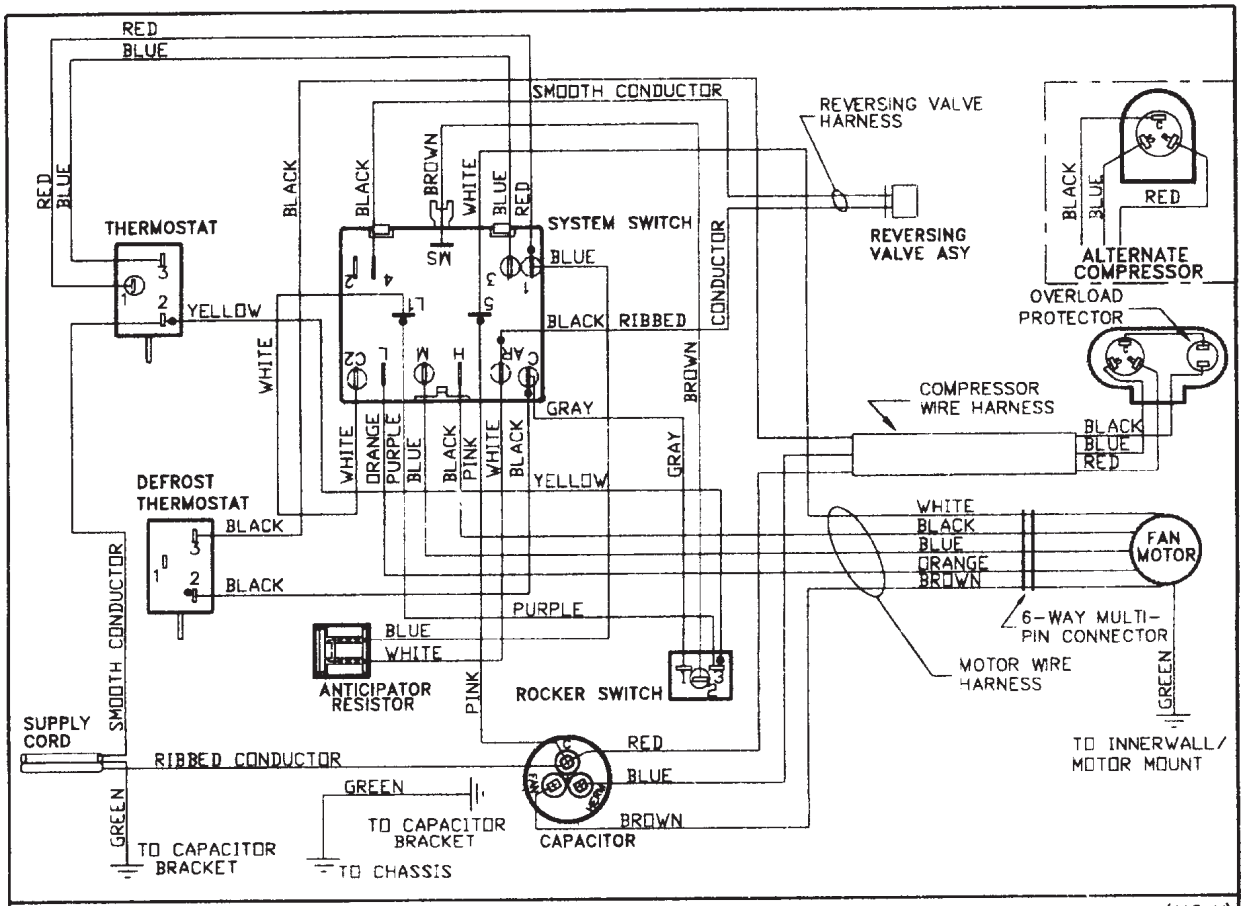
PROBLEM	POSSIBLE CAUSE	TO CORRECT
Fan motor does not operate in "Constant" or "MoneySaver" position.	Defective motor.	Check and replace.
	Open or shorted capacitor.	Replace capacitor and check.
	Condenser fan frozen to base pan.	Check if drain pan valve is open. If not, replace.
	Loose connections.	Check all connections. Check voltage to fan motor.

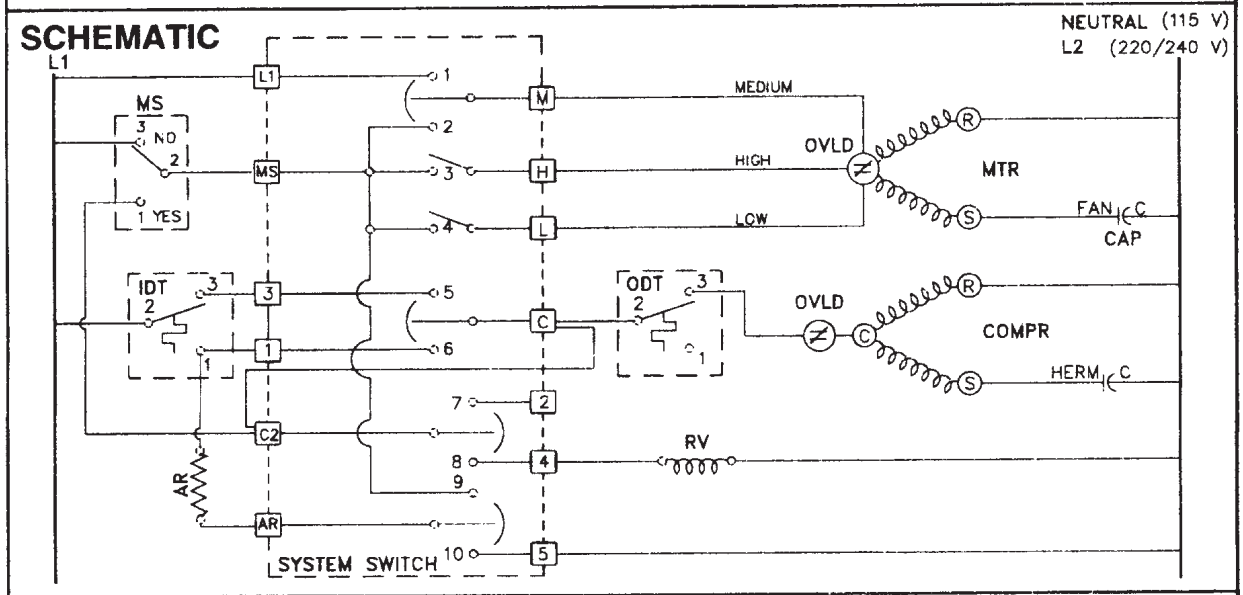
PROBLEM	POSSIBLE CAUSE	TO CORRECT
Cooling adequate heating insufficient.	Heating capillary tube partially restricted.	Check for partially starved outer coil. Replace heating capillary tube.
	Check valve leaking internally.	Switch unit several times from heating to cooling. Check temperature rise across coil. Refer to specification sheet for correct temperature rise.
	Reversing valve failing to shift completely – bypassing hot gas.	Deenergize solenoid coil, raise head pressure, energize solenoid to break loose. If valve fails to make complete shift, replace valve.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Compressor will not turn off and operate on heating element only during low outside ambients.	Outdoor thermostat. (Applicable models.)	Refer to the heating data on applicable models for the preselected temperature the compressor shuts off and the electric element is energized.

PROBLEM	POSSIBLE CAUSE	TO CORRECT
Compressor shuts off on outdoor thermostat but, element does not heat.	Fuse link.	Check fuse link for continuity. If defective, replace.
	Heating element shorted.	Check amperage draw of element. If no amperage, replace.
	Incorrect wiring.	Check voltage to element. If voltage is okay, check wiring.
	Heat relay or heater contactor coil open.	Defective coil. Test coil for continuity.

WIRING DIAGRAM FOR MODEL YS09J10





SWITCH LOGIC X = CLOSED, 0 = OPEN

SWITCH POSITION	CIRCUIT									
	1	2	3	4	5	6	7	8	9	10
OFF	0	0	0	0	0	0	0	0	0	0
LOW COOL	0	0	0	X	0	0	X	0	X	0
MEDIUM COOL	0	X	0	0	X	0	X	0	X	0
HIGH COOL	0	0	X	0	X	0	X	0	X	0
HIGH HEAT	0	0	X	0	0	X	0	X	0	X
MEDIUM HEAT	0	X	0	0	0	X	0	X	0	X
LOW HEAT	0	0	0	X	0	X	0	X	0	X
FAN ONLY	X	0	0	0	0	0	0	0	0	0

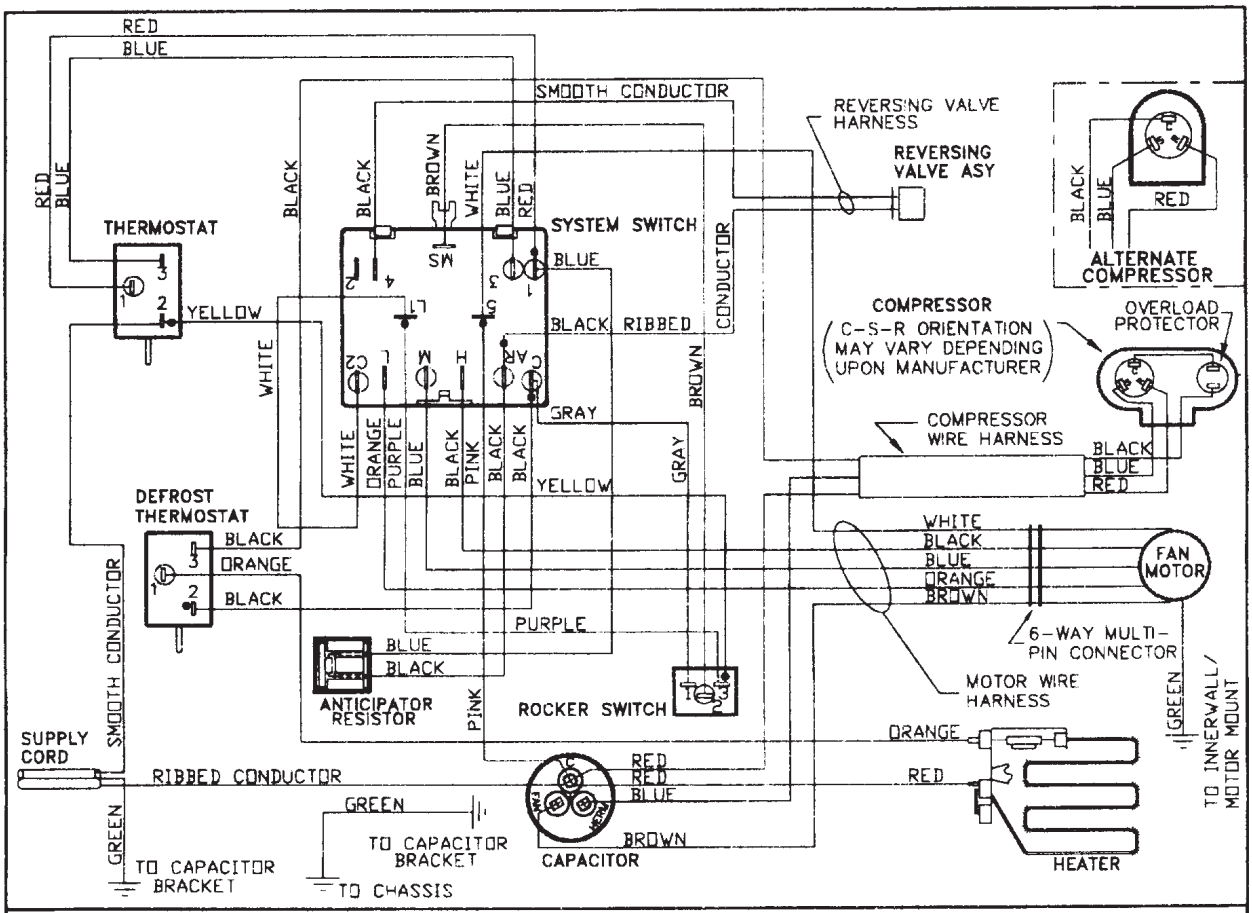
LEGEND

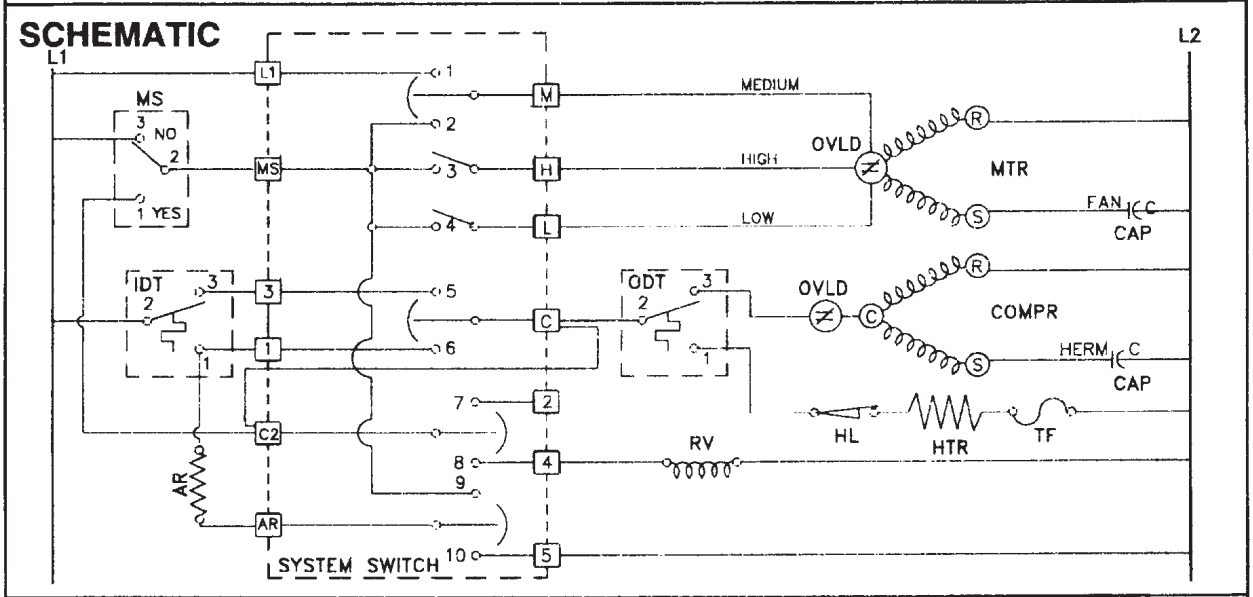
AR	–	ANTICIPATOR RESISTOR
MS	–	MONEY SAVER
CAP	–	CAPACITOR
COMPR	–	COMPRESSOR
MTR	–	FAN MOTOR
OVLD	–	OVERLOAD
RV	–	REVERSING VALVE
IDT	–	INDOOR THERMOSTAT
ODT	–	OUTDOOR THERMOSTAT

– GROUND LEAD
– COMBINATION TERMINAL
– PLASTIC INSULATOR

PART NO.	REV.
618-200-04	

WIRING DIAGRAM FOR MODELS YS13J33, YM18J34A & YL24J35





SWITCH LOGIC X = CLOSED, 0 = OPEN

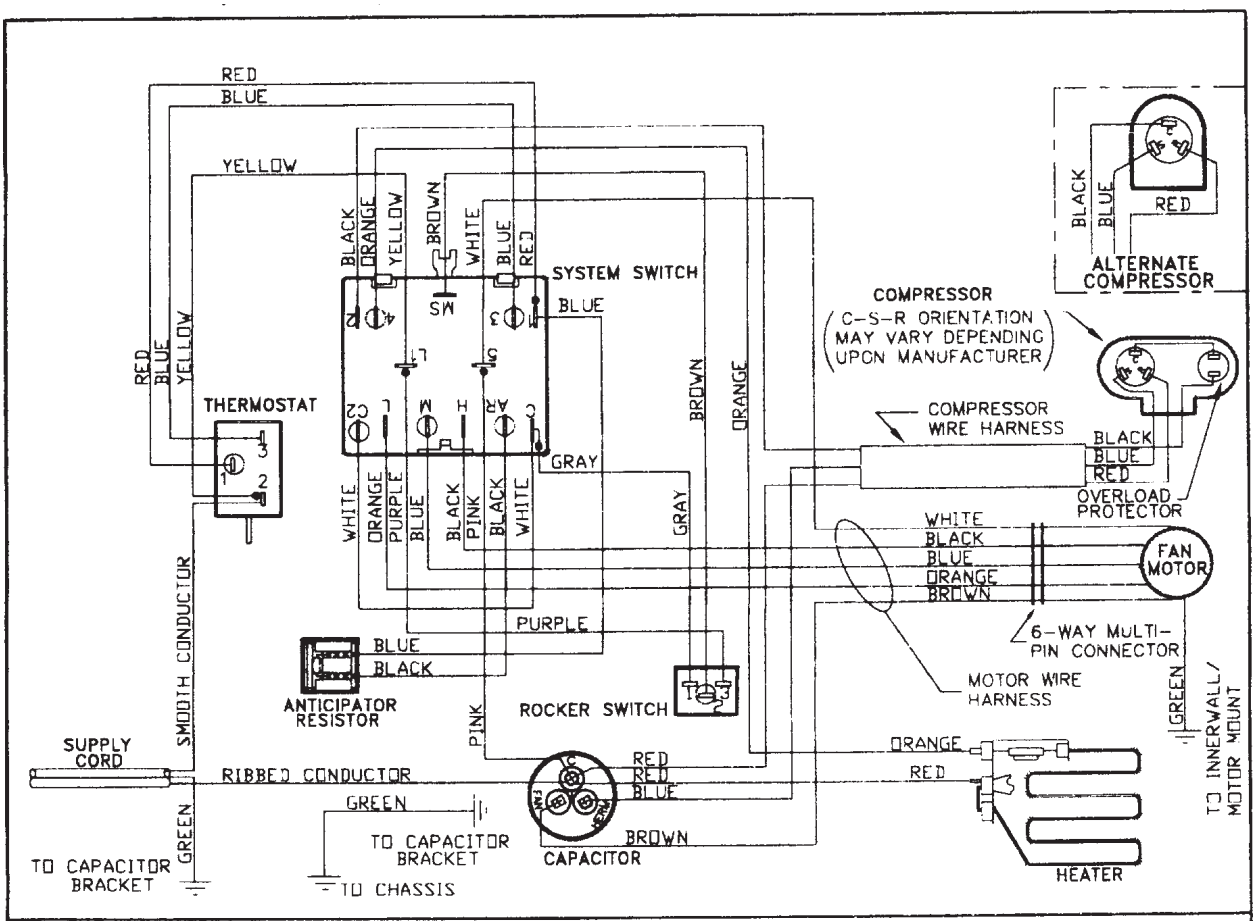
SWITCH POSITION	CIRCUIT 1	2	3	4	5	6	7	8	9	10
OFF	0	0	0	0	0	0	0	0	0	0
LOW COOL	0	0	0	X	X	0	X	0	X	0
MEDIUM COOL	0	X	0	0	X	0	X	0	X	0
HIGH COOL	0	0	X	0	X	0	X	0	X	0
HIGH HEAT	0	0	X	0	0	X	0	X	0	X
MEDIUM HEAT	0	X	0	0	0	X	0	X	0	X
LOW HEAT	0	0	0	X	0	X	0	X	0	X
FAN ONLY	X	0	0	0	0	0	0	0	0	0

LEGEND

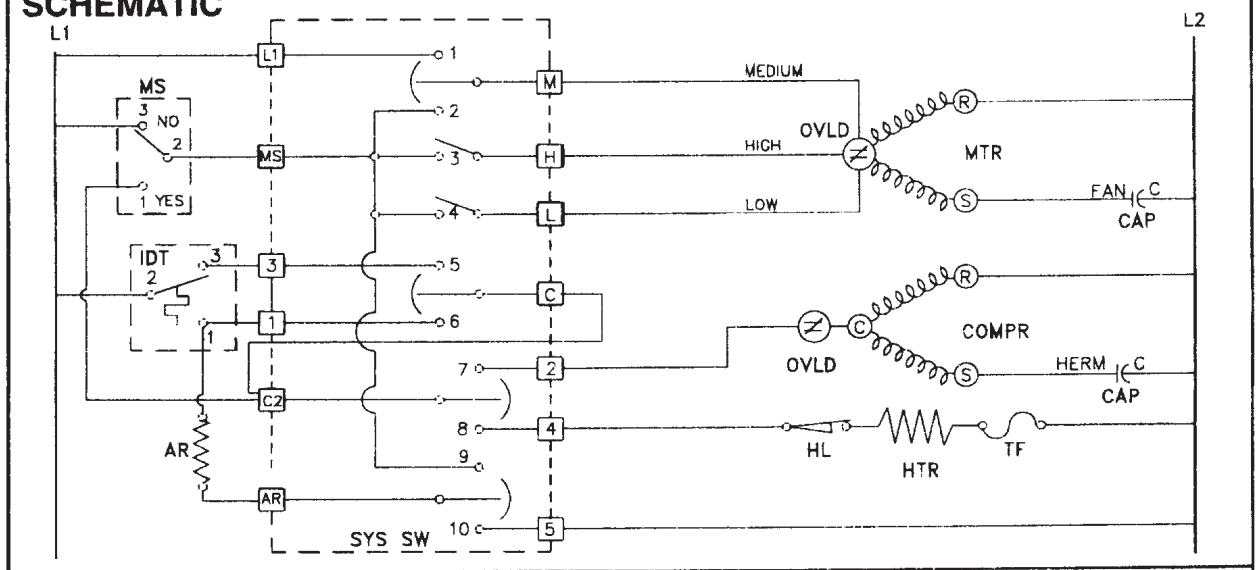
AR	– ANTICIPATOR RESISTOR	HTR	– HEATER
MS	– MONEY SAVER	HL	– HEATER LIMIT
CAP	– CAPACITOR	TF	– THERMAL FUSE
COMPR	– COMPRESSOR		– GROUND LEAD
MTR	– FAN MOTOR		– COMBINATION TERMINAL
OVLD	– OVERLOAD		– PLASTIC INSULATOR
RV	– REVERSING VALVE		
IDT	– INDOOR THERMOSTAT		
ODT	– OUTDOOR THERMOSTAT		

PART NO. 618-200-02 REV.

WIRING DIAGRAM FOR MODELS ES12J33, ES15J33A, EM18J34A EL24J35, EL33J35, EK12J33A & EK18J34A.



SCHEMATIC



SWITCH LOGIC X = CLOSED, 0 = OPEN

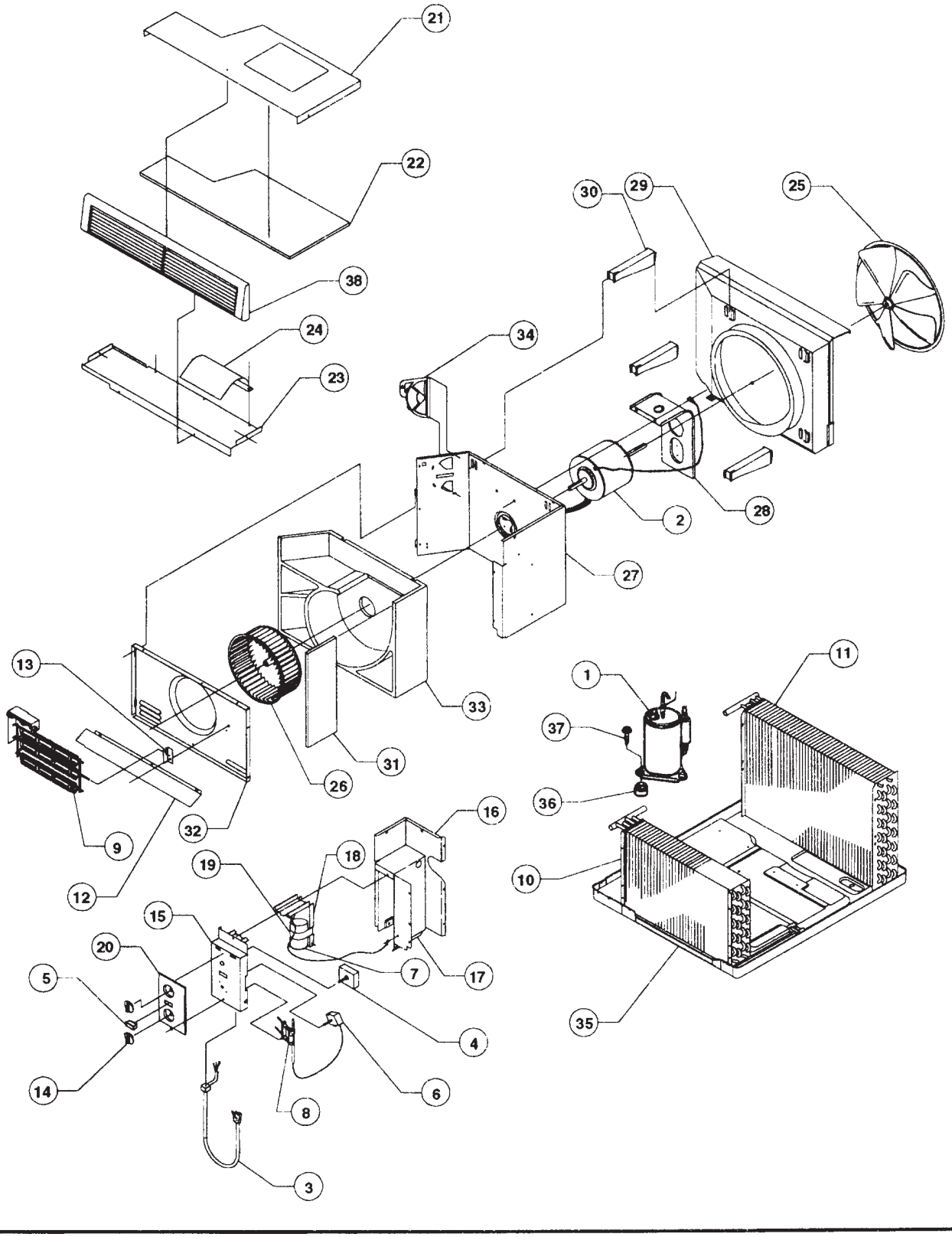
SWITCH POSITION	CIRCUIT 1	2	3	4	5	6	7	8	9	10
OFF	0	0	0	0	0	0	0	0	0	0
LOW COOL	0	0	0	X	X	0	X	0	X	0
MEDIUM COOL	0	X	0	0	X	0	X	0	X	0
HIGH COOL	0	0	X	0	X	0	X	0	X	0
HIGH HEAT	0	0	X	0	0	X	0	X	0	X
MEDIUM HEAT	0	X	0	0	0	X	0	X	0	X
LOW HEAT	0	0	0	X	0	X	0	X	0	X
FAN ONLY	X	0	0	0	0	0	0	0	0	0

LEGEND

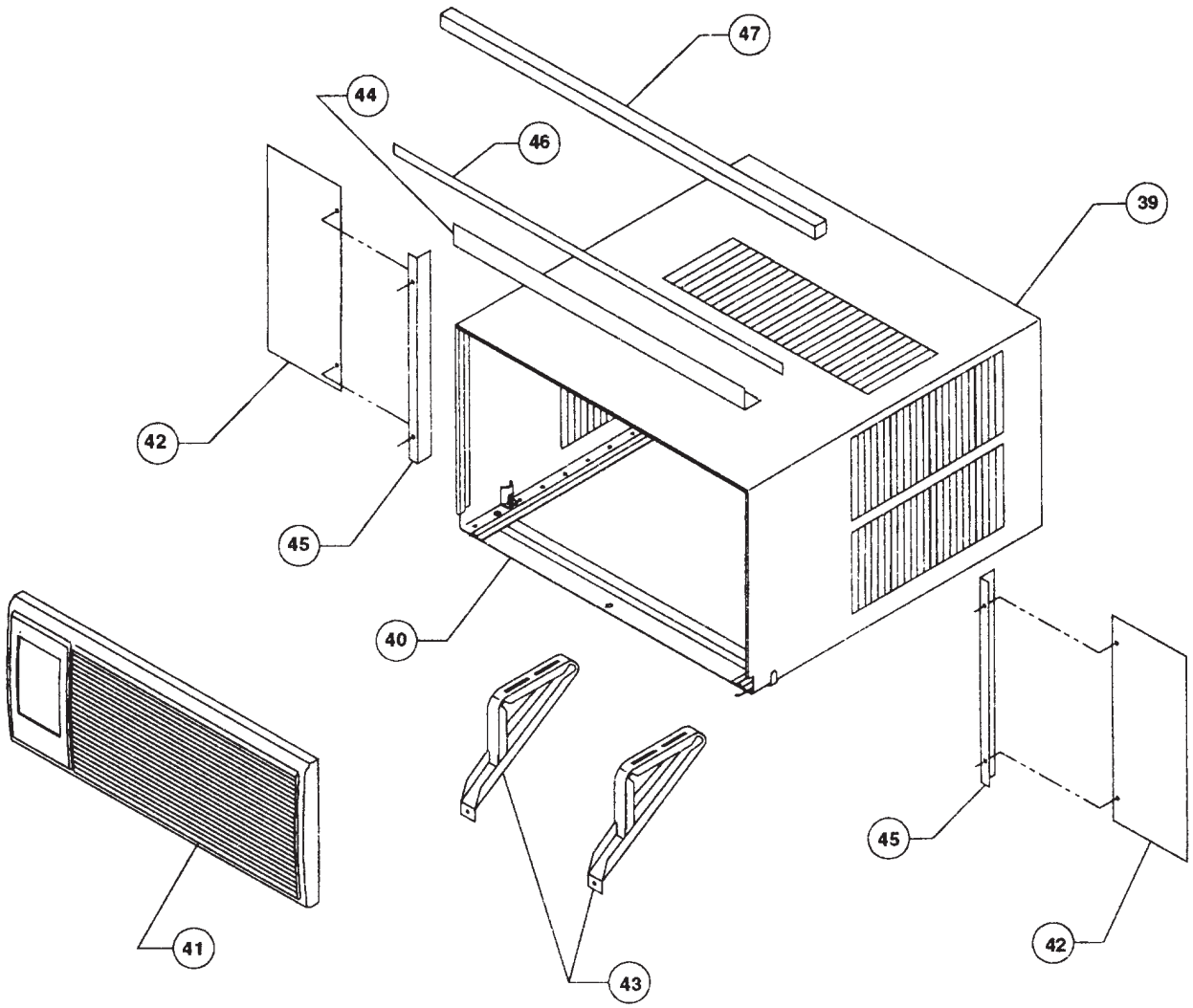
AR	– ANTICIPATOR RESISTOR	HTR	– HEATER
MS	– MONEY SAVER/ROCKER SWITCH	HL	– HEATER LIMIT
CAP	– CAPACITOR	TF	– THERMAL FUSE
COMPR	– COMPRESSOR		– GROUND LEAD
MTR	– FAN MOTOR		– COMBINATION TERMINAL
OVLD	– OVERLOAD PROTECTOR		– PLASTIC INSULATOR
SYS SW	– SYSTEM SWITCH		
IDT	– INDOOR THERMOSTAT		

PART NO. 618-200-01 | REV. 01

"YS" — "YM" — "YL" SERIES CHASSIS PARTS



"YS" — "YM" — "YL" SERIES CABINET & MOUNTING PARTS



"YS" - "YM" - "YL" SERIES PARTS LIST

REF.	PART NO.	DESCRIPTION	APPLICATION			
			YS09J10	YS13J33	YM18J34A	YL24J35
		ELECTRICAL PARTS				
1	615-628-07	Compressor, Tecumseh, 115 V, 60 Hz, 1 Ph, Model RK5480E	1			
1	615-628-05	Compressor, Tecumseh, 230/208 V, 60 Hz, 1 Ph, Model RK5513E		1		
1	617-187-01	Compressor, Bristol, 230/208 V, 60 Hz,1 Ph, Model H23B175ABCC			1	
1	611-935-12	Compressor, Tecumseh, 230/208 V, 60 Hz, 1 Ph, Model AW5524F				1
*	603-645-94	Overload, Compressor - MRA3793-114	1			
*	603-645-97	Overload, Compressor - MRA3795-114		1		
2	610-714-93	Motor, Fan	1			
2	610-714-94	Motor, Fan		1		
2	610-714-96	Motor, Fan			1	
2	610-714-85	Motor, Fan				1
3	605-000-54	Cord, Electric Supply - 15 Amp, 125 Volt	1			
3	605-000-49	Cord, Electric Supply - 20 Amp, 250 Volt		1		
3	605-000-48	Cord, Electric Supply - 30 Amp, 250 Volt			1	
3	605--000-55	Cord, Electric Supply - 30 Amp, 250 Volt				1
4	606-072-04	Switch, System - 8 Position	1	1	1	1
5	618-061-00	Switch, Rocker (Yes-No)	1	1	1	1
6	618-224-00	Thermostat (Cool & Heat)	1	1	1	1
*	613-503-13	Thermostat, Defrost	1	1	1	1
7	610-803-38	Capacitor - 25/10 MFD, 370 V	1			
7	610-803-37	Capacitor - 25/7.5 MFD, 370 V		1		
7	610-803-36	Capacitor - 30/7.5 MFD, 370 V			1	
7	610-803-34	Capacitor - 35/7.5 MFD, 370 V				1
*	618-208-00	Wire Harness, Fan Motor	1	1	1	1
*	618-213-00	Wire Harness, Compressor	1	1		
*	618-213-02	Wire Harness, Compressor			1	
*	618-214-00	Wire Harness, Compressor			1	
*	618-211-00	Wire Harness, Compressor				1
*	618-624-08	Wire Harness, Solenoid	1	1	1	1
8	618-080-00	Resistor Block - 115 Volt	1			
8	618-080-01	Resistor Block - 230 Volt		1	1	1
9	618-786-00	Heater Element - 3.3 KW		1		
9	618-786-01	Heater Element - 4.0 KW			1	
9	618-786-02	Heater Element - 5.2 KW				1
*	250-188-00	Solenoid - 120 Volt	1			
*	210-586-43	Solenoid - 230 Volt		1	1	1
*	615-963-01	Fuse Link		1	1	1
*	618-279-00	Heater Limit				
		REFRIGERATION SYSTEM COMPONENTS				
10	618-501-00	Coil, Evaporator	1	1		
10	618-500-01	Coil, Evaporator			1	

* Not Shown

"YS" - "YM" - "YL" SERIES PARTS LIST

REF.	PART NO.	DESCRIPTION	APPLICATION			
			YS090J100	YS133J333	YM18J34A	YL24J35
		REFRIGERATION SYSTEM COMPONENTS (Cont.)				
10	618-500-03	Coil, Evaporator				1
11	618-503-02	Coil, Condenser	1			
11	618-503-06	Coil, Condenser		1		
11	618-502-05	Coil, Condenser			1	
11	618-502-03	Coil, Condenser				1
*	250-182-00	Valve, Reversing	1			
*	250-183-00	Valve, Reversing		1		
*	250-187-00	Valve, Reversing			1	1
*	618-282-00	Suction Filter - 1/2" (Install during sealed system repair)	1	1		
*	618-282-01	Suction Filter - 5/8" (Install during sealed system repair)			1	1
*	618-244-00	Valve, Check	1	1	1	1
*	03760554	Capillary Tube (Cooling) - .031 I.D. x 20"-22" Long	1			
*	03760513	Capillary Tube (Heating & Cooling) - .049 I.D. x 28 3/4"-30" Long	1	1		
*	03760545	Capillary Tube (Cooling) - .042 I.D. x 20" Long		1		
*	03760555	Capillary Tube (Cooling) - .042 I.D. x 40"-42" Long			1	
*	03760473	Capillary Tube (Heating & Cooling) - .059 I.D. x 27½"-30" Long			1	
*	03760518	Capillary Tube (Cooling) - .054 I.D. x 27 3/8"-30" Long				1
*	01389985	Capillary Tube (Heating & Cooling) - .064 I.D. x 27 1/8"-30" Long				1
		CHASSIS PARTS				
12	618-129-00	Shield, Bottom		1		
12	618-129-01	Shield, Bottom			1	
12	618-135-01	Shield, Bottom				1
13	618-189-00	Bracket, Heater Mounting		1	1	1
*	618-218-00	Shield, Side		1		
*	618-218-01	Shield, Side			1	
*	618-219-00	Shield, Side				1
14	614-939-05	Knob, Control	2	2	2	2
15	618-072-00	Panel, Control Mounting	1	1		
15	618-110-00	Panel, Control Mounting			1	
15	618-069-00	Panel, Control Mounting				1
*	600-713-11	Bushing, Snap		1	1	1
*	600-713-12	Bushing, Snap	1	1	1	1
16	618-027-00	Panel, Left Side	1	1		
16	618-042-00	Panel, Left Side			1	
16	618-068-00	Panel, Left Side				1
17	618-028-00	Partition, Control Box	1			
17	618-028-01	Partition, Control Box		1		
17	618-043-01	Partition, Control Box			1	
17	618-070-01	Partition, Control Box				1
18	618-204-00	Bracket, Capacitor Mounting	1	1	1	1

* Not Shown

"YS" - "YM" - "YL" SERIES PARTS LIST

REF.	PART NO.	DESCRIPTION	APPLICATION			
			YS09J10	YS13J33	YM18J34A	YL24J35
		CHASSIS PARTS (Cont.)				
19	618-207-00	Strap, Capacitor	1	1	1	1
20	618-233-00	Decorative Panel	1	1	1	1
*	618-076-00	Grommet, Suction Line	1	1	1	1
*	618-148-00	Connector, Fresh Air & Exhaust	1	1	1	
*	618-148-01	Connector, Fresh Air & Exhaust				1
21	618-172-00	Cover, Top	1	1	1	
21	618-179-00	Cover, Top				1
22	618-167-00	Insulation, Top Cover	1	1	1	
22	618-182-00	Insulation, Top Cover				1
23	618-171-00	Deck	1	1	1	
23	618-180-00	Deck				1
*	608-658-08	Filter, Air	1	1		
*	608-658-09	Filter, Air			1	
*	608-658-10	Filter, Air				1
*	618-230-00	Holder, Filter	2	2	2	2
24	618-202-00	Airfoil	1	1	1	
24	618-202-01	Airfoil				1
*	618-206-00	Bracket, Resistor Block	1	1	1	1
*	915-003-02	Clamp, Supply Cord				
25	605-420-03	Fan Blade	1	1		
25	605-420-04	Fan Blade			1	
25	605-420-01	Fan Blade				1
26	606-106-03	Blower Wheel	1	1		
26	606-106-05	Blower Wheel			1	
26	606-106-02	Blower Wheel				1
27	618-033-00	Inner Wall	1	1		
27	618-047-00	Inner Wall			1	
27	618-066-00	Inner Wall				1
28	618-025-00	Mount, Motor	1	1		
28	618--041-00	Mount, Motor			1	
28	618-067-00	Mount, Motor				1
29	618-036-00	Shroud	1	1		
29	618-049-00	Shroud			1	
29	618-077-00	Shroud				1
30	618-026-00	Brace, Shroud	3	3	3	
30	618-100-00	Brace, Shroud				3
31	618-169-00	Insulation, Inner Wall	1	1		
31	618-169-01	Insulation, Inner Wall			1	
31	618-169-02	Insulation, Inner Wall				1
32	618-173-00	Blower Front	1			
32	618-173-01	Blower Front		1		
32	618-074-01	Blower Front			1	

* Not Shown

"YS" - "YM" - "YL" SERIES PARTS LIST

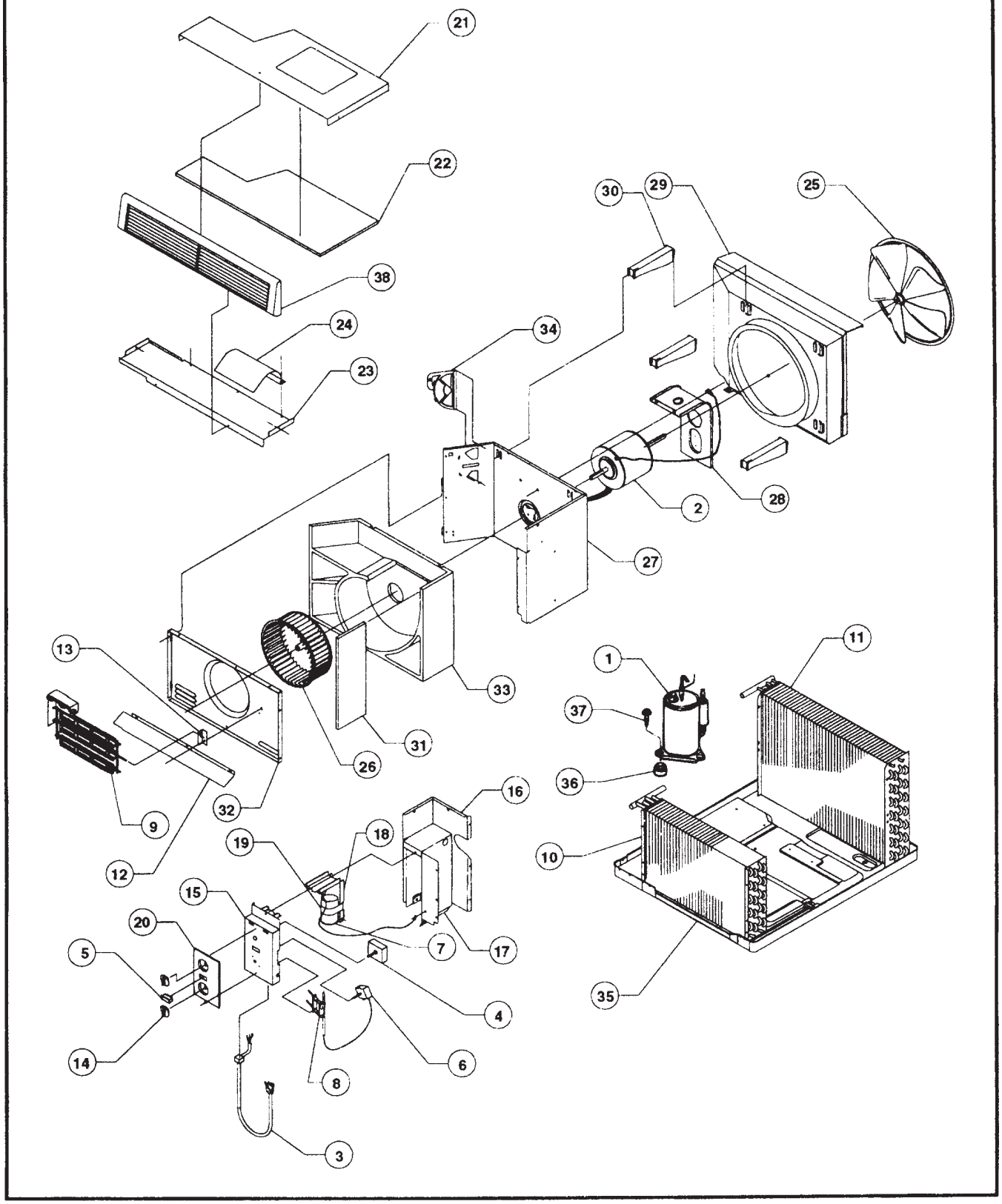
REF.	PART NO.	DESCRIPTION	APPLICATION			
			YS09J10	YS133J33	YM18J34A	YL24J35
		CHASSIS PARTS (Cont.)				
32	618-178-01	Blower Front				1
33	618-149-00	Scroll	1	1		
33	618-175-00	Scroll			1	
33	618-181-00	Scroll				1
34	618-215-00	Door, Slide Assembly	1	1	1	1
35	618-090-01	Base Pan	1	1		
35	618-090-09	Base Pan			1	
35	618-095-01	Base Pan				1
*	618-038-00	Drain Pan	1	1	1	
*	618-074-00	Drain Pan				1
*	601-799-00	Bellows, Drain Valve	1	1	1	1
*	618-188-00	Grille Assembly (Rear)	1	1		
*	618-188-01	Grille Assembly (Rear)			1	
*	618-188-02	Grille Assembly (Rear)				1
*	618-248-00	Thermostat Holder	1	1	1	1
36	610-289-00	Grommet, Compressor	3	3	3	
36	01150934	Grommet, Compressor				3
37	914-004-00	Screw, Compressor Mounting	3	3	3	3
38	618-102-00	Plenum Assembly	1	1	1	
38	618-105-00	Plenum Assembly				1
*	618-093-00	Knob, Fresh Air & Exhaust	1	1	1	1
*	618-062-00	Connector, Louver	2	2	2	
*	618-096-00	Connector, Louver				2
*	618-063-00	Louver	20	20	20	
*	618-097-00	Louver				20
*	618-063-01	Louver with Handle	2	2	2	
*	618-097-01	Louver with Handle				2
*	618-092-00	Lever, Fresh Air & Exhaust	1	1	1	1
39	618-257-00	Outer Shell Assembly	1	1		
39	618-257-01	Outer Shell Assembly			1	
39	618-257-02	Outer Shell Assembly				1
40	618-084-03	Sill Plate	1	1	1	
40	618-084-01	Sill Plate				1
41	618-089-00	Grille, Intake	1	1		
41	618-111-00	Grille, Intake			1	
41	618-104-00	Grille, Intake				1
*	618-199-00	Latch, Grille	2	2	2	2
42	602-944-08	Wingboard	1	1		
42	602-944-09	Wingboard			1	
42	602-944-10	Wingboard				1
*	611-050-04	Accessory Package	1	1		

"YS" - "YM" - "YL" SERIES PARTS LIST

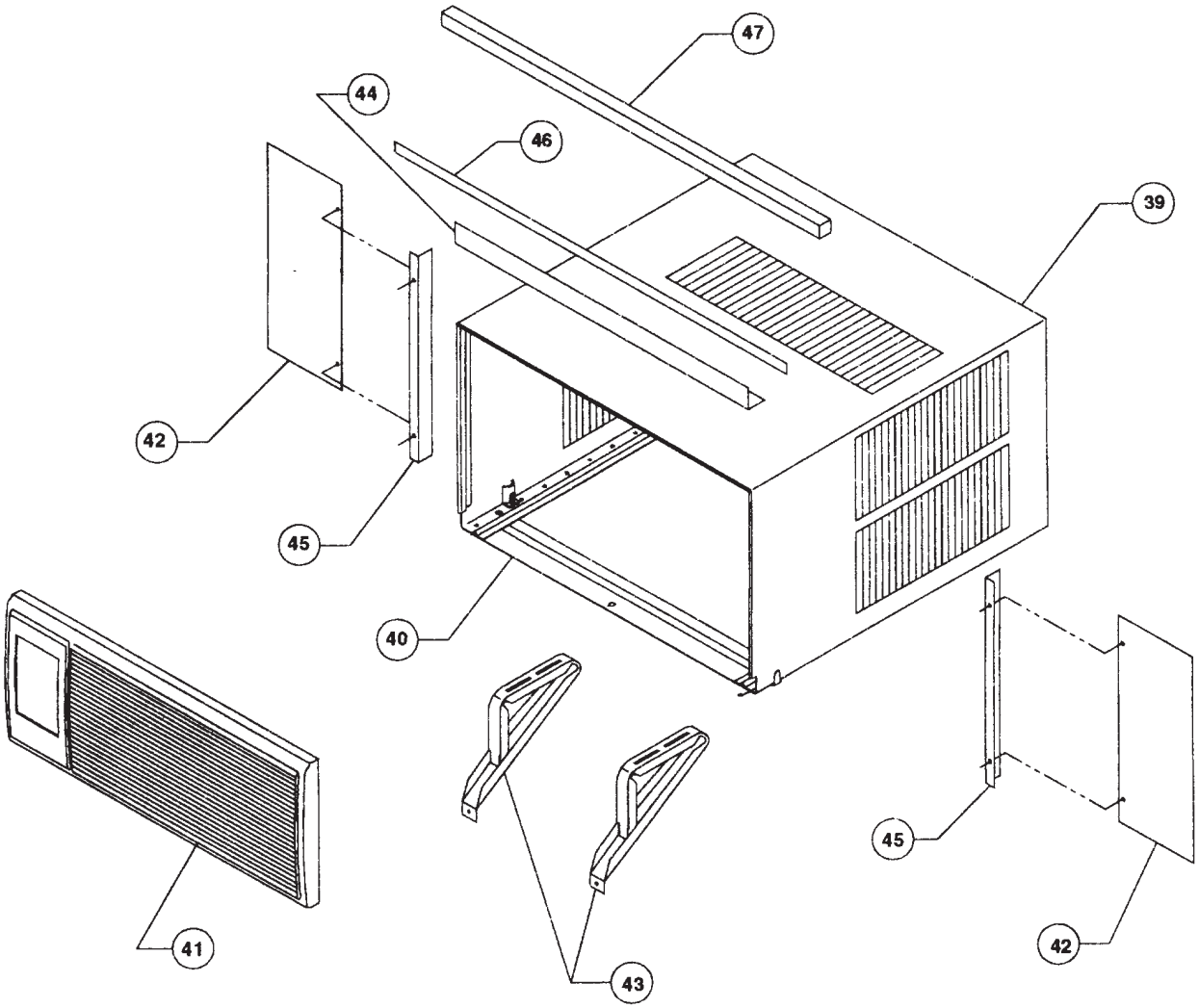
REF.	PART NO.	DESCRIPTION	APPLICATION			
			YS090J100	YS133J333	YM18J34A	YL24J35
		CHASSIS PARTS (Cont.)				
*	611-050-03	Accessory Package				1
43	611-095-03	Bracket, Support	2	2	2	2
44	618-197-01	Angle, Wingboard (Top)	1	1	1	
44	618-197-03	Angle, Wingboard (Top)				1
45	618-198-01	Angle, Wingboard (Side)	2	2		
45	618-198-03	Angle, Wingboard (Side)			2	
45	618-198-05	Angle, Wingboard (Side)				2
46	606-103-03	Gasket (Vinyl)	1	1	1	1
*	617-173-01	Gasket (Foam)	1	1	1	1
*	608-460-16	Bag Assembly (Hardware)	1	1	1	1
*	618-116-03	Carton (Shipping)	1	1		
*	618-116-04	Carton (Shipping)			1	
*	618-116-05	Carton (Shipping)				1
*	618-139-00	Pad, Shipping (Bottom)	1	1	1	
*	618-140-00	Pad, Shipping (Bottom)				1
*	618-141-01	Pad, Shipping (Top)	1	1	1	
*	618-141-00	Pad, Shipping (Top)				1
*	618-118-00	Tube, Shipping (Front & Rear)	2	2		
*	618-118-01	Tube, Shipping (Front & Rear)			2	
*	618-118-02	ube, Shipping (Front & Rear)				2
47	600-733-00	Gasket, Window (Foam)	1	1	1	1
		OPTIONAL ACCESSORIES				
*	01900-235	Drain - Condensate Connection Kit, DC-2	x	x	x	x
*	610-089-03	Start Kit, Capacitor/Relay (Pow-R-Pak)	x	x	x	x

* Not Shown

"ES" — "EM" SERIES CHASSIS PARTS



"ES" — "EM" SERIES CABINET & MOUNTING PARTS



"ES" - "EM" SERIES PARTS LIST

REF.	PART NO.	DESCRIPTION	APPLICATION		
			ES12J33	ES15J33A	EM18J34A
		ELECTRICAL PARTS			
1	615-628-04	Compressor, Tecumseh, 230 V, 60 Hz, 1 Ph, Model RK5512E	1		
1	615-628-28	Compressor, Tecumseh, 230 V, 60 Hz, 1 Ph, Model RK5515E		1	
1	617-187-01	Compressor, Bristol, 230 V, 60 Hz, 1 Ph, Model H23B175ABCC			1
*	603-645-96	Overload, Compressor - MRA3794-114	1		
*	617-645-06	Overload, Compressor - MRA4764-114		1	
2	610-714-94	Motor, Fan	1		
2	610-714-95	Motor, Fan		1	
2	610-714-96	Motor, Fan			1
3	605-000-49	Cord, Electric Supply - 20 Amp, 250 V	1	1	
3	605-000-48	Cord, Electric Supply - 30 Amp, 250 V			1
4	604-416-06	Switch, System - 8 Position	1	1	1
5	618-061-00	Switch, Rocker (Yes-No)	1	1	1
6	618-224-00	Thermostat (Cool & Heat)	1	1	1
7	610-803-37	Capacitor - 25/7.5 MFD, 370 V	1	1	
7	610-803-36	Capacitor - 30/7.5 MFD, 370 V			1
*	618-208-00	Wire Harness, Fan Motor	1	1	1
*	618-213-00	Wire Harness, Compressor	1		
*	618-214-00	Wire Harness, Compressor		1	
*	618-213-02	Wire Harness, Compressor			1
8	618-080-01	Resistor Block - 230 V	1	1	1
9	618-786-00	Heater Element - 3.3 KW	1	1	
9	618-786-01	Heater Element - 4.0 KW			1
*	618-963-01	Fuse Link	1	1	1
*	618-279-00	Heater Limit	1	1	1
		REFRIGERATION SYSTEM COMPONENTS			
10	618-501-00	Coil, Evaporator	1		
10	618-500-05	Coil, Evaporator		1	
10	618-500-01	Coil, Evaporator			1
11	618-503-02	Coil, Condenser	1	1	
11	618-502-00	Coil, Condenser			1
*	01390000	Capillary Tube - .064 I.D. x 40" Long	1		
*	03760512	Capillary Tube - .064 I.D. x 35" Long		1	
*	03760548	Capillary Tube - .054 I.D. x 37 1/4" - 40" Long			2
*	603-081-01	Filter Drier (Install during sealed system repair)	1	1	1
		CHASSIS PARTS			
12	618-129-00	Shield, Bottom	1	1	
12	618-129-01	Shield, Bottom			1
*	618-218-00	Shield, Side	1	1	
*	618-218-01	Shield, Side			1

* Not Shown

"ES" - "EM" SERIES PARTS LIST

REF.	PART NO.	DESCRIPTION	APPLICATION		
			ES12J333	ES15J333A	EM18J334A
		CHASSIS PARTS			
13	618-189-00	Bracket, Heater Mounting	1	1	1
14	614-939-05	Knob, Control	2	2	2
15	618-072-00	Panel, Control Mounting	1	1	
15	618-110-00	Panel, Control Mounting			1
*	600-713-11	Bushing, Snap	1	1	1
*	600-713-12	Bushing, Snap	1	1	1
*	618-170-00	Insulation, Left Side	1	1	
*	618-170-01	Insulation, Left Side			1
16	618-027-00	Panel, Left Side	1	1	
16	618-042-00	Panel, Left Side			1
17	618-028-01	Partition, Control Box	1	1	
17	618-043-01	Partition, Control Box			1
18	618-204-00	Bracket, Capacitor Mounting	1	1	1
19	618-207-00	Strap, Capacitor	1	1	1
20	618-233-00	Decorative Panel	1	1	1
*	618-076-00	Grommet, Suction Line	1	1	1
*	618-148-00	Connector, Fresh Air & Exhaust	1	1	1
21	618-172-00	Cover, Top	1	1	1
22	618-167-00	Insulation, Top Cover	1	1	1
*	618-168-00	Insulation, Left Side Deck	1	1	1
23	618-171-00	Deck	1	1	1
*	608-658-08	Filter, Air	1	1	
*	608-658-09	Filter, Air			1
*	618-230-00	Holder, Filter	2	2	2
24	618-202-00	Airfoil	1	1	1
*	618-206-00	Bracket, Resistor Block	1	1	1
*	915-003-02	Clamp, Supply Cord	1	1	1
25	605-420-03	Fan Blade	1	1	
25	605-420-04	Fan Blade			1
26	606-106-03	Blower Wheel	1		
26	606-106-01	Blower Wheel		1	
26	606-106-05	Blower Wheel			1
27	618-033-00	Inner Wall	1	1	
27	618-047-00	Inner Wall			1
28	618-025-00	Mount, Motor	1	1	
28	618-041-00	Mount, Motor			1
29	618-036-00	Shroud	1	1	
29	618-049-00	Shroud			1
30	618-026-00	Brace, Shroud	3	3	3
31	618-169-00	Insulation, Inner Wall	1	1	
31	618-169-01	Insulation, Inner Wall			1
32	618-173-00	Blower Front	1	1	
32	618-174-00	Blower Front			1

* Not Shown

"ES" - "EM" SERIES PARTS LIST

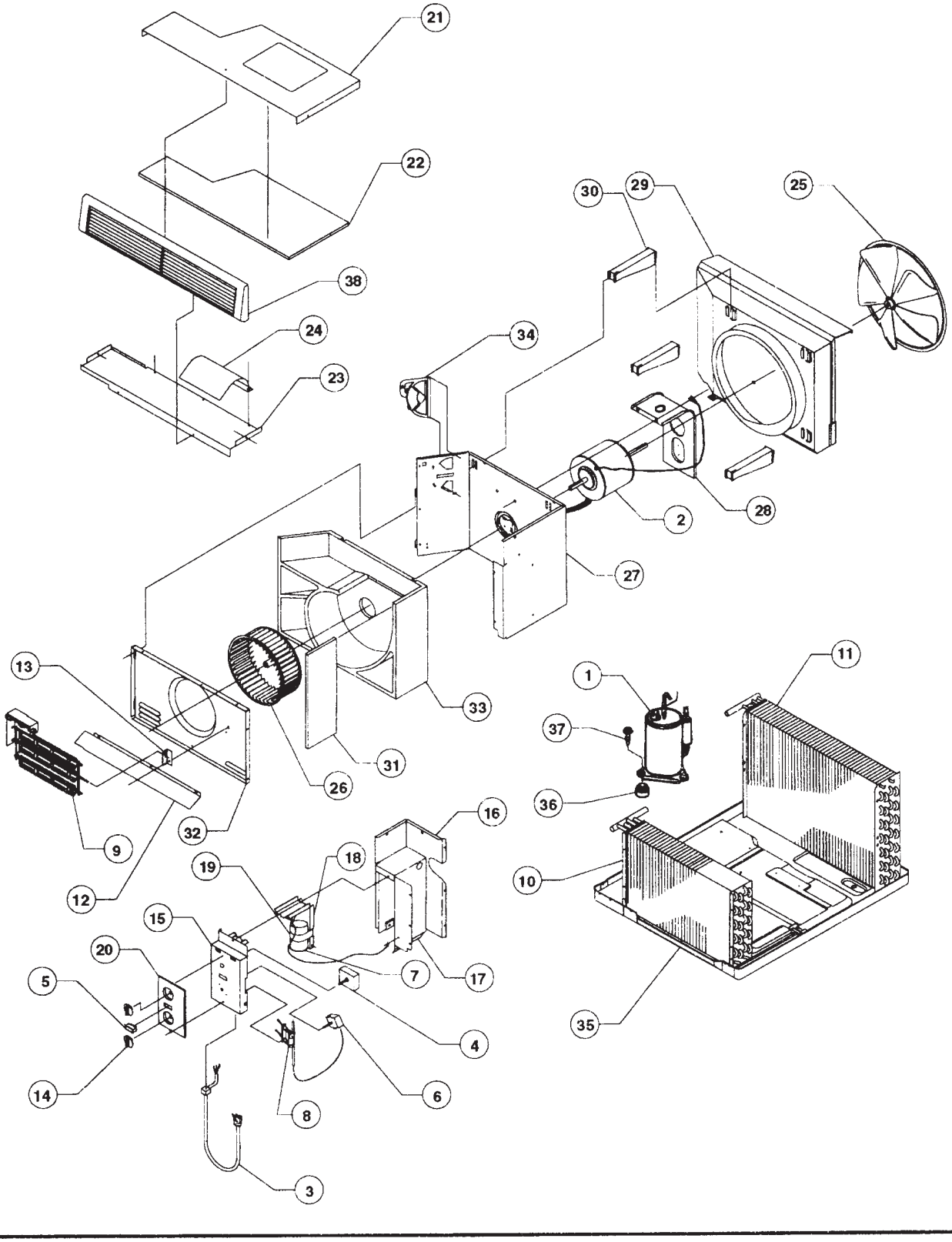
REF.	PART NO.	DESCRIPTION	APPLICATION		
			ES12J33	ES15J33A	EM18J34A
		CHASSIS PARTS (Cont.)			
33	618-149-00	Scroll	1	1	
33	618-175-00	Scroll			1
34	618-215-00	Door, Slide Assembly	1	1	1
35	618-090-01	Base Pan	1	1	
35	618-090-09	Base Pan			1
*	618-038-00	Drain Pan	1	1	1
*	601-799-00	Bellows, Drain Valve	1	1	1
*	618-188-00	Grille Assembly (Rear)	1	1	
*	618-188-01	Grille Assembly (Rear)			1
36	610-289-00	Grommet, Compressor	3	3	3
37	914-004-00	Bolt, Compressor Mounting	3	3	3
38	618-102-00	Plenum Assembly	1	1	1
*	618-093-00	Knob, Fresh Air & Exhaust	1	1	1
*	618-092-00	Lever, Fresh Air & Exhaust	1	1	1
*	618-062-00	Connector, Louver	2	2	2
*	618-063-00	Louver	20	20	20
*	618-063-01	Louver with Handle	2	2	2
39	618-257-00	Outer Shell (Carton with Sill Plate)	1	1	
39	618-257-01	Outer Shell (Carton with Sill Plate)			1
40	618-084-01	Sill Plate	1	1	1
*	618-196-00	Guide, Shell	2	2	2
41	618-089-00	Grille, Intake	1	1	
41	618-111-00	Grille, Intake			1
*	618-199-00	Latch, Intake Grille	2	2	2
42	602-944-08	Wingboard	1	1	
42	602-944-09	Wingboard			1
*	611-050-04	Accessory Package	1	1	
*	611-050-05	Accessory Package			1
43	611-095-03	Bracket, Support	2	2	2
44	618-197-01	Angle, Wingboard (Top)	1	1	1
45	618-198-01	Angle, Wingboard (Side)	2	2	
45	618-198-03	Angle, Wingboard (Side)			2
46	606-103-03	Gasket (Vinyl)	1	1	1
*	617-173-01	Gasket (Foam)	1	1	1
*	608-460-16	Bag Assembly (Hardware)	1	1	1
*	618-116-03	Carton (Shipping)	1	1	
*	618-116-04	Carton (Shipping)			1
*	618-139-00	Pad, Shipping (Bottom)	1	1	1
*	618-141-01	Pad, Shipping (Top)	1	1	1
*	618-118-00	Tube, Shipping (Front & Rear)	2	2	
*	618-118-01	Tube, Shipping (Front & Rear)			2
47	600-733-00	Gasket, Window (Foam)	1	1	1

* Not Shown

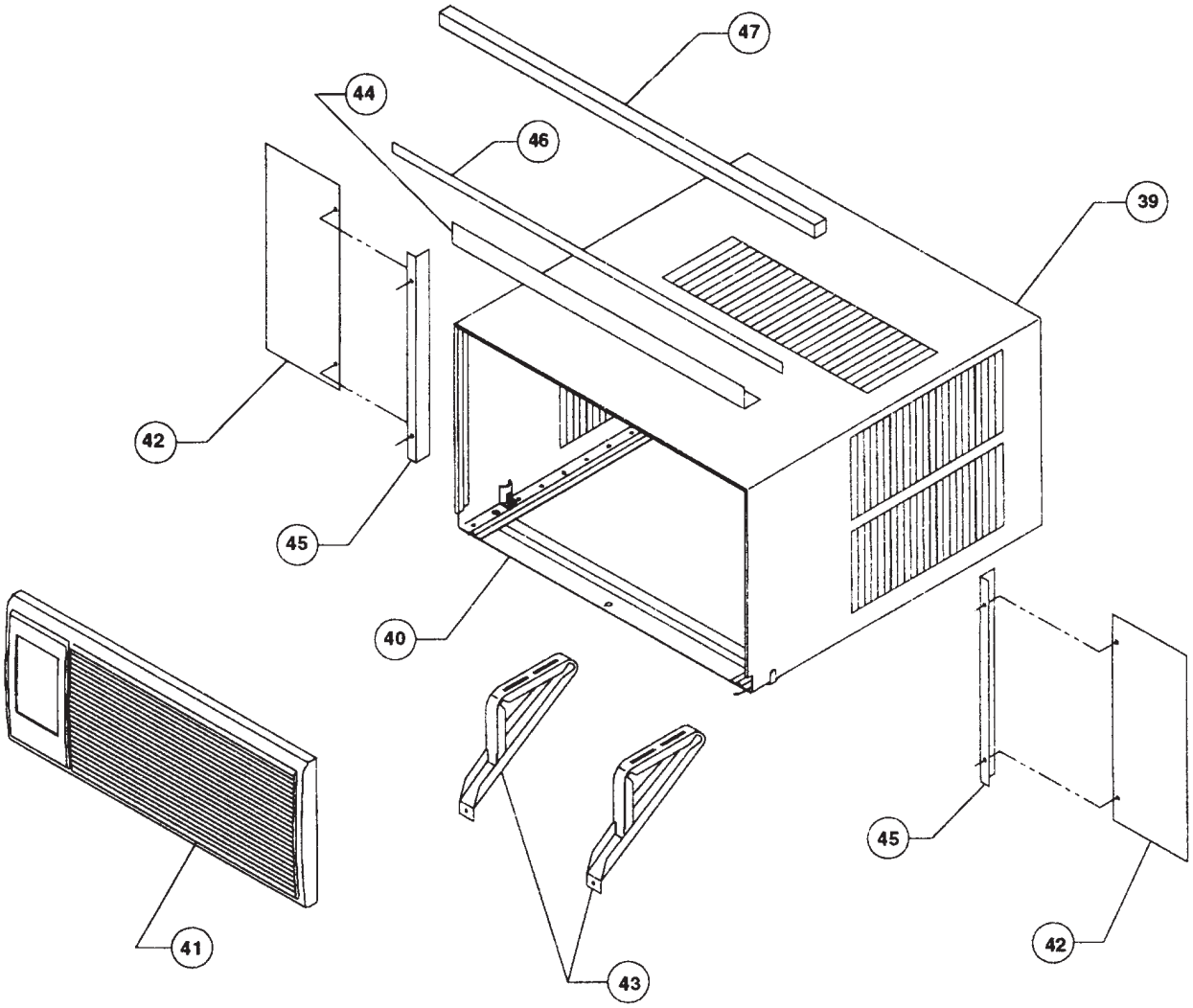
"ES" - "EM" SERIES PARTS LIST

REF.	PART NO.	DESCRIPTION	APPLICATION		
			ES12J33	ES15J33A	EM18J34A
		OPTIONAL ACCESSORIES			
*	01900-235	Drain - Condensate Connection Kit, DC-2	x	x	x
*	610-089-03	Start Kit, Capacitor/Relay (Pow-R-Pak)	x	x	x

"EL" SERIES CHASSIS PARTS



"EL" SERIES CABINET & MOUNTING PARTS



"EL" SERIES PARTS LIST

REF.	PART NO.	DESCRIPTION	APPLICATION	
			EL24J35	EL33J35
		ELECTRICAL PARTS		
1	611-935-12	Compressor, Tecumseh, 230V, 60 Hz, 1 Ph, Model AW5524F	1	
1	618-187-00	Compressor, Bristol, 230V, 60 Hz, 1 Ph, Model H25B355QABCC		1
2	610-714-85	Motor, Fan	1	
2	610-714-84	Motor, Fan		1
3	605-000-55	Cord, Electric Assembly - 30 Amp, 250 Volt	1	1
4	606-072-04	Switch, System - 8 Position	1	1
5	618-061-00	Switch, Rocker (Yes-No)	1	1
6	618-224-00	Thermostat (Cool & Heat)	1	1
7	610-803-34	Capacitor - 35/7.5 MFD, 370 V	1	
7	610-803-33	Capacitor - 45/7.5 MFD, 370 V		1
8	618-080-01	Resistor Block - 230 Volt	1	1
9	618-786-02	Heater Element - 5.5 KW	1	1
*	618-208-00	Wire Harness, Fan Motor	1	1
*	618-211-00	Wire Harness, Compressor	1	
*	618-210-00	Wire Harness, Compressor		1
*	615-963-01	Fuse Link	1	1
*	618-279-00	Heater Limit	1	1
		REFRIGERATION SYSTEM COMPONENTS		
10	618-500-03	Coil, Evaporator	1	
10	618-500-04	Coil, Evaporator		1
11	618-502-09	Coil, Condenser	1	
11	618-502-02	Coil, Condenser		1
*	03760473	Capillary Tube - .059 I.D. X 27½" - 30" Long	2	
*	03760545	Capillary Tube - .042 x 20" Long		5
*	614-813-01	Filter Drier (Install during sealed system repair)	1	1
		CHASSIS PARTS		
12	618-135-01	Shield, Bottom	1	
12	618-135-02	Shield, Bottom		1
*	618-219-00	Shield, Side	1	1
13	618-189-00	Bracket, Heater Mounting	1	1
14	614-939-05	Knob, Control	2	2
15	618-069-00	Panel, Control Mounting	1	1
*	600-713-11	Bushing, Snap	1	1
*	600-713-12	Bushing, Snap	1	1
16	618-176-00	Panel, Left Side	1	1
17	618-070-01	Partition, Control Box	1	1
18	618-204-00	Bracket, Capacitor Mounting	1	1
19	618-207-00	Strap, Capacitor	1	1
20	618-233-00	Decorative Panel	1	1
*	618-076-01	Grommet, Suction Line	1	1
*	618-148-01	Connector, Fresh Air & Exhaust	1	1

* Not Shown

"EL" SERIES PARTS LIST

REF.	PART NO.	DESCRIPTION	APPLICATION	
			EL24J35	EL33J35
		CHASSIS PARTS (Cont.)		
21	618-179-00	Cover, Top	1	1
22	618-182-00	Insulation, Top Cover	1	1
*	618-183-00	Insulation, Left Side Deck	1	1
23	618-180-00	Deck	1	1
*	608-658-10	Filter, Air	1	1
*	618-230-00	Holder, Filter	2	2
24	618-202-01	Airfoil	1	1
*	618-206-00	Bracket, Resistor Block	1	1
*	915-003-02	Clamp, Supply Cord	1	1
25	605-420-01	Fan Blade	1	1
26	606-106-05	Blower Wheel	1	
26	606-106-09	Blower Wheel		1
27	618-066-00	Inner Wall	1	1
28	618-067-00	Mount, Motor	1	1
29	918-077-00	Shroud	1	1
30	618-100-00	Brace, Shroud	3	3
31	618-169-02	Insulation, Inner Wall	1	1
32	618-178-00	Blower Front	1	1
33	618-181-00	Scroll	1	1
34	618-215-00	Door, Slide Assembly	1	1
35	618-095-01	Base Pan	1	1
*	618-074-00	Drain Pan	1	1
*	601-799-00	Bellows, Drain Valve	1	1
*	618-188-02	Grille Assembly (Rear)	1	1
36	01150934	Grommet, Compressor	3	3
37	914-004-00	Bolt, Compressor Mounting	3	3
38	618-105-00	Plenum Assembly	1	1
*	618-093-00	Knob, Fresh Air & Exhaust	1	1
*	618-096-00	Connector, Louver	2	2
*	618-097-00	Louver	20	20
*	618-097-01	Louver with Handle	2	2
*	618-092-00	Lever, Fresh Air & Exhaust	1	1
39	618-257-02	Outer Shell Assembly (Carton with Sill Plate)	1	1
40	618-084-01	Sill Plate	1	1
41	618-104-00	Grille, Intake	1	1
*	618-199-00	Latch, Intake Grille	2	2
42	602-944-10	Wingboard	1	1
*	611-050-03	Accessory Package	1	1
43	611-095-03	Bracket, Support	2	2
44	618-197-03	Angle, Wingboard (Top)	1	1
45	618-198-05	Angle, Wingboard (Side)	2	2
46	606-103-03	Gasket (Vinyl)	1	1
*	617-173-01	Gasket (Foam)	1	1
*	608-460-16	Bag Assembly (Hardware)	1	1

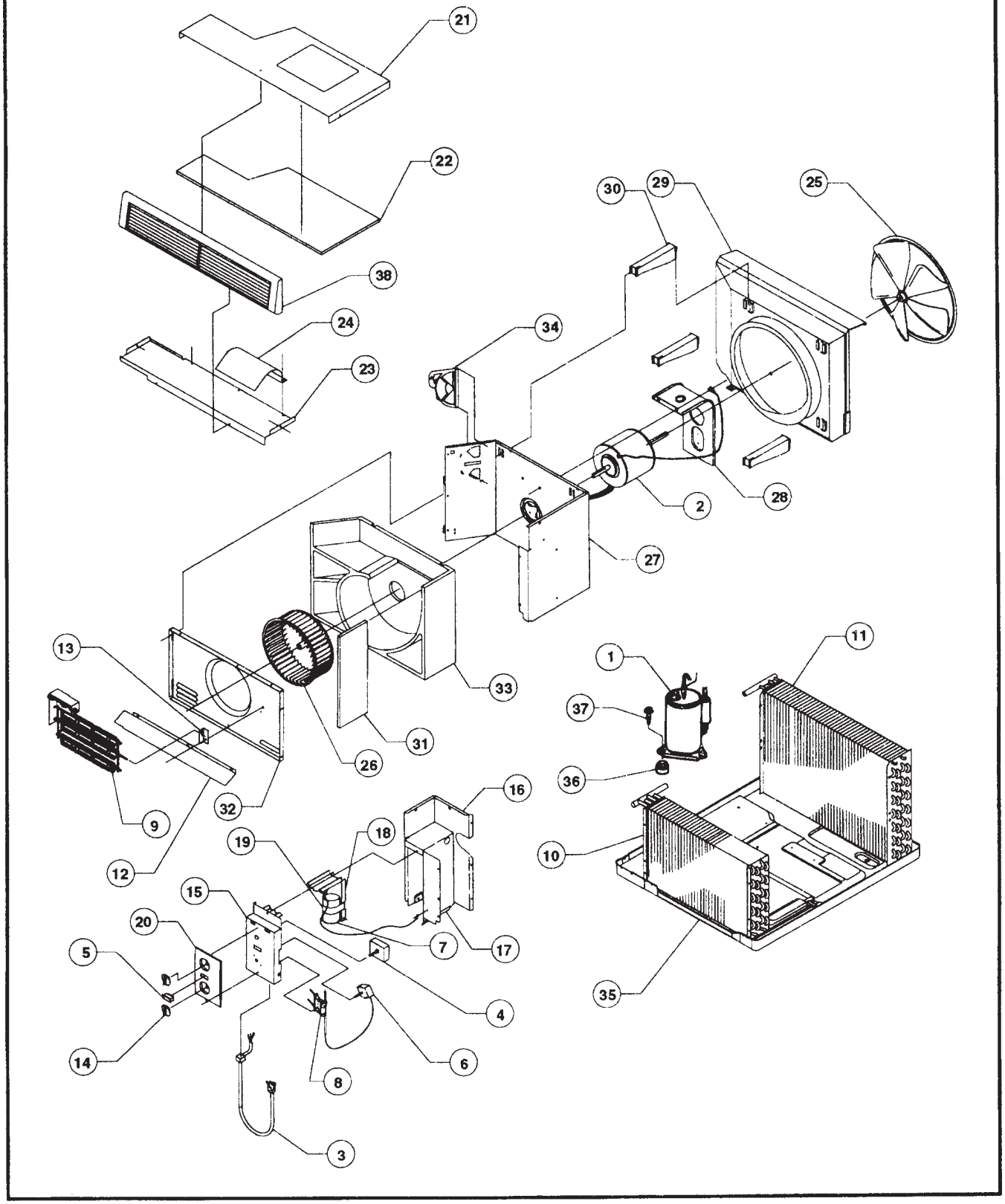
* Not Shown

"EL" SERIES PARTS LIST

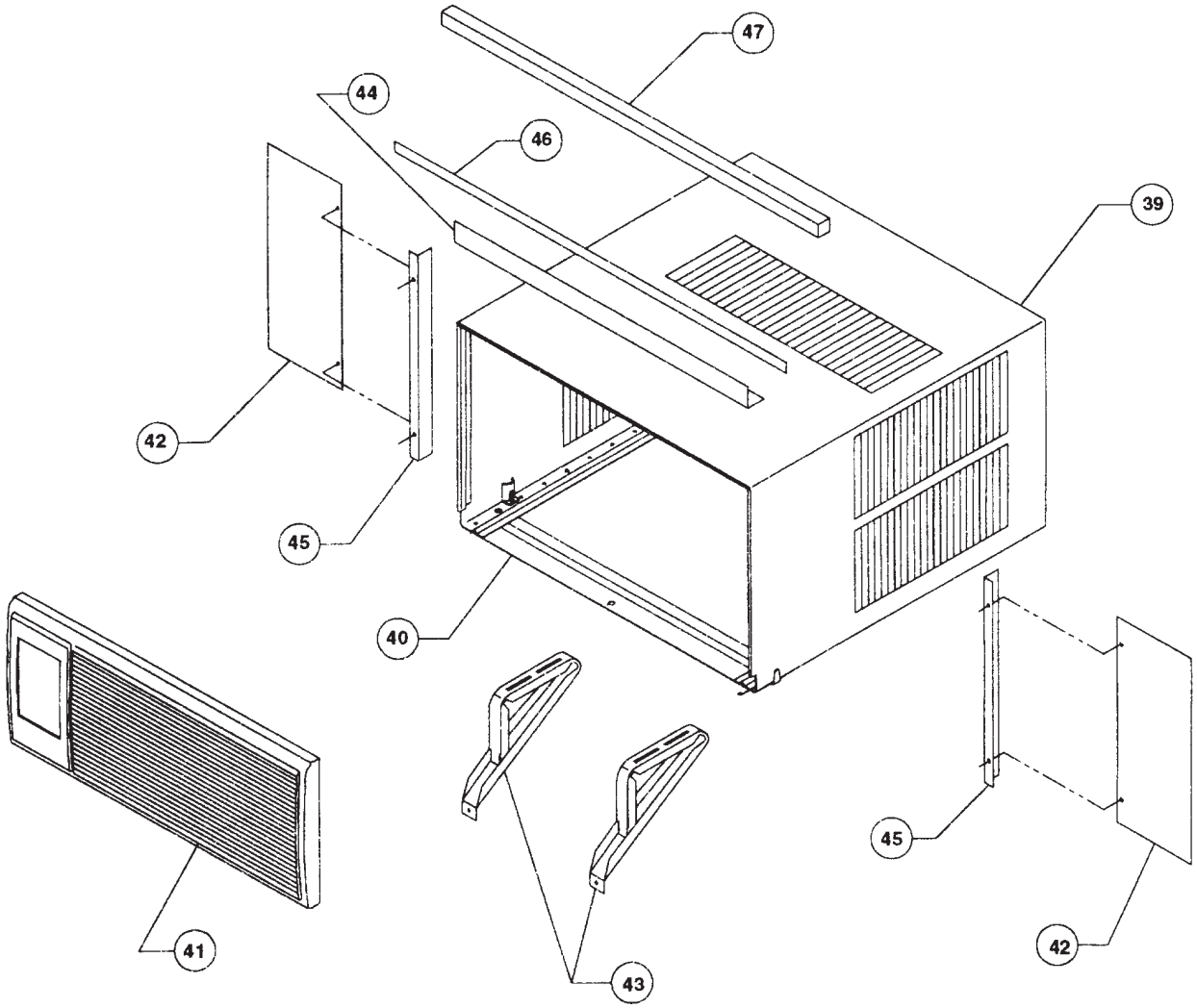
REF.	PART NO.	DESCRIPTION	APPLICATION	
			EL24J35	EL33J35
		CHASSIS PARTS (Cont.)		
*	618-116-05	Carton, Shipping	1	1
*	618-140-00	Pad, Shipping (Bottom)	1	1
*	618-141-00	Pad, Shipping (Top)	1	1
*	618-118-02	Tube, Shipping (Front & Rear)	2	2
*	618-196-00	Guide, Shell	2	2
47	600-733-00	Gasket, Window (Foam)	1	1
		OPTIONAL ACCESSORIES		
*	01900-235	Drain - Condensate Connection Kit, DC-2	x	x
*	610-089-03	Start Kit, Capacitor Relay (Pow-R-Pak)	x	x

* Not Shown

"EK" SERIES CHASSIS PARTS



"EK" SERIES CABINET & MOUNTING PARTS



"EK" SERIES PARTS LIST

REF.	PART NO.	DESCRIPTION	APPLICATION EK12J33A	APPLICATION EK18J34A
		ELECTRICAL PARTS		
1	615-628-04	Compressor, Tecumseh, 230 V, 60 Hz, 1Ph, Model RK5512E	1	
1	617-187-01	Compressor, Bristol, 230 V, 60 Hz, 1Ph, Model H23B175ABCC		1
*	603-645-96	Overload - MRA3794-114	1	
2	610-714-94	Motor, Fan	1	
2	610-714-96	Motor, Fan		1
3	605-000-49	Cord, Electric Supply - 20 Amp, 250 Volt	1	
3	605-000-48	Cord, Electric Supply - 30 Amp, 250 Volt		1
4	606-072-04	Switch, System - 8 Position	1	1
5	618-061-00	Switch, Rocker (Yes-No)	1	1
6	618-224-00	Thermostat (Cool & Heat)	1	1
7	610-803-37	Capacitor - 25/7.5 MFD, 370 V	1	
7	610-803-36	Capacitor - 30/7.5 MFD, 370 V		1
*	610-208-00	Wire Harness, Fan Motor	1	1
*	618-213-00	Wire Harness, Compressor	1	
*	618-213-02	Wire Harness, Compressor		1
8	618-080-01	Resistor Block - 230 Volt	1	1
9	618-786-00	Heater Element - 3.3 KW	1	
9	618-786-01	Heater Element - 4.0 KW		1
*	615-963-01	Fuse Link	1	1
*	618-279-00	Heater Limit	1	1
		REFRIGERATION SYSTEM COMPONENTS		
10	618-501-00	Coil, Evaporator	1	
10	618-500-02	Coil, Evaporator		1
11	618-503-03	Coil, Condenser	1	
11	618-502-00	Coil, Condenser		1
*	03760520	Capillary Tube - .059 I.D. x 31 5/8" - 35" Long	1	
*	03760545	Capillary Tube - .042 I.D. x 20" Long		3
*	603-081-01	Filter, Drier (Install during sealed system repair)	1	1
		CHASSIS PARTS		
12	618-129-00	Shield, Bottom	1	
12	618-129-01	Shield, Bottom		1
*	618-218-00	Shield, Side	1	
*	618-218-01	Shield, Side		1
13	618-189-00	Bracket, Heater Mounting	1	1
14	614-93-05	Knob, Control	2	2
15	618-072-00	Panel, Control Mounting	1	
15	618-111-00	Panel, Control Mounting		1
*	600-713-12	Bushing, Snap	1	1
*	600-713-11	Bushing, Snap	1	1

* Not Shown

"EK" SERIES PARTS LIST

REF.	PART NO.	DESCRIPTION	APPLICATION	
			EK12J33A	EK18J34A
		CHASSIS PARTS (Cont.)		
16	618-027-00	Panel, Left Side	1	
16	618-028-01	Panel, Left Side		1
17	618-028-01	Partition, Control Box	1	
17	618-043-01	Partition, Control Box		1
18	618-204-00	Bracket, Capacitor Mounting	1	1
19	618-207-00	Strap, Capacitor	1	1
20	618-233-00	Decorative Panel	1	1
*	618-076-00	Grommet, Suction Line	1	1
*	618-148-00	Connector, Fresh Air & Exhaust	1	1
21	618-172-00	Cover, Top	1	1
22	618-167-00	Insulation, Top Cover	1	1
23	618-171-00	Deck	1	1
*	618-168-00	Insulation, Left Side Deck	1	1
*	608-658-08	Filter, Air	1	
*	608-658-09	Filter, Air		1
*	618-230-00	Holder, Filter	2	2
24	618-202-00	Airfoil	1	1
*	618-168-00	Insulation, Left Side Deck	1	1
*	915-003-02	Clamp, Supply Cord	1	1
25	605-420-03	Fan Blade	1	
25	605-420-04	Fan Blade		1
26	606-106-01	Blower Wheel	1	1
27	618-033-00	Inner Wall	1	
27	618-047-00	Inner Wall		1
28	618-025-00	Mount, Motor	1	
28	618-041-00	Mount, Motor		1
29	618-036-00	Shroud	1	
29	618-049-00	Shroud		1
30	618-026-00	Brace, Shroud	3	3
31	618-169-00	Insulation, Inner Wall	1	
31	618-169-01	Insulation, Inner Wall		1
32	618-173-00	Blower Front	1	
32	618-174-00	Blower Front		1
33	618-149-00	Scroll	1	
33	618-175-00	Scroll		1
34	618-215-00	Door, Slide Assembly	1	1
35	618-090-01	Base Pan	1	
35	618-090-09	Base Pan		1
*	618-038-00	Drain Pan	1	1
*	601-799-00	Bellows, Drain Valve	1	1
*	618-188-00	Grille Assembly (Rear)	1	
*	618-188-01	Grille Assembly (Rear)		1

* Not Shown

"EK" SERIES PARTS LIST

REF.	PART NO.	DESCRIPTION	APPLICATION EK12J33A	APPLICATION EK18J34A
		CHASSIS PARTS (Cont.)		
36	610-289-00	Grommet, Compressor	3	3
37	914-004-00	Bolt, Compressor Mounting	3	3
38	618-102-00	Plenum Assembly	1	1
*	618-093-00	Knob, Fresh Air & Exhaust	1	1
*	618-092-00	Lever, Fresh Air & Exhaust	1	1
*	618-062-00	Connector, Louver	2	2
*	618-063-00	Louver, Discharge Grille	20	20
*	618-063-01	Louver with Handle	2	2
39	618-257-00	Outer Shell Assembly	1	
39	618-257-01	Outer Shell Assembly		1
40	618-084-03	Sill Plate	1	1
41	618-089-00	Grille, Intake	1	
41	618-111-00	Grille, Intake		1
*	618-199-00	Latch, Intake Grille	2	2
42	602-944-08	Wingboard	1	
42	602-944-09	Wingboard		1
*	611-050-04	Accessory Package	1	
*	611-050-05	Accessory Package		1
43	611-095-03	Bracket Support	2	2
44	618-197-01	Angle, Wingboard (Top)	1	1
45	618-198-01	Angle, Wingboard (Side)	2	
45	618-198-03	Angle, Wingboard (Side)		2
46	606-103-03	Gasket (Vinyl)	1	1
*	617-733-00	Gasket (Foam)	1	1
*	608-460-16	Plastic Bag (Hardware)	1	1
*	618-116-03	Carton (Shipping)	1	
*	618-116-04	Carton (Shipping)		1
*	618-139-00	Pad, Shipping (Bottom)	1	1
*	618-118-00	Tube, Shipping (Front & Rear)	2	
*	618-118-01	Tube, Shipping (Front & Rear)		2
*	618-141-01	Pad, Shipping (Top)	1	1
47	600-173-01	Gasket, Window (Foam)	1	1
		OPTIONAL ACCESSORIES		
*	01900-235	Drain - Condensate Connection Kit, DC-2	x	x
*	610-089-03	Start Kit, Capacitor/Relay (Pow-R-Pak)	x	x

* Not Shown

Use Factory Certified Parts . . .

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