

# SERVICE UNIT INFORMATION HS14

**LENNOX Industries Inc.** Corp. 815-L5 Litho U.S.A.

## HS14 SERIES UNITS WITH "L7" TWO SPEED COMPRESSOR

### I - INTRODUCTION

The HS14 features the Lennox two speed compressor which shifts speeds to match load requirements. At low speed it cuts energy consumption by nearly 50% over a single speed compressor. Figure 1 shows a cutaway of the unit. In addition, the HS14 can be applied to cooling loads in which the unit is wired for low speed only. The heat transfer surfaces become oversized causing increased capacity and efficiency. The following table lists the unit nominal tonnages at low and high speed.

Unit	Tonnage At Low Speed	Tonnage At High Speed
HS14-410V	2	3
HS14-510V	2-1/2	4
HS14-650V	3	5

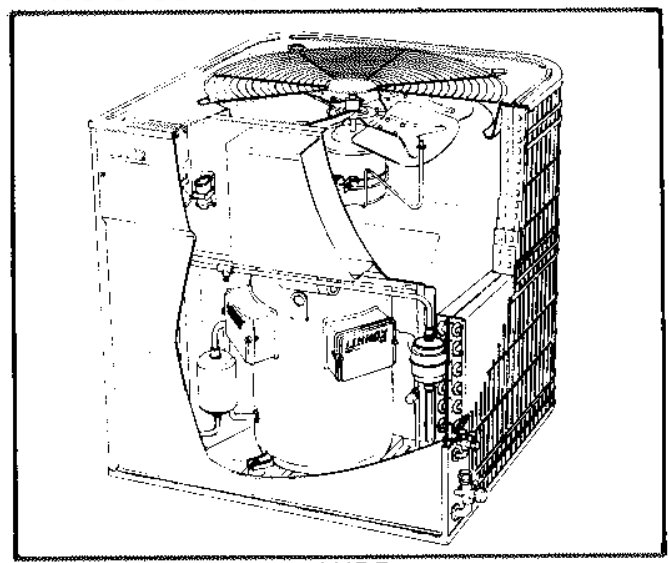


FIGURE 1

### II - UNIT INFORMATION

#### A - Specifications

Model No.			HS14-411V-413V	HS14-511V-513V	HS14-651V-653V
Condenser	Net face area (sq. ft.)	Outer coil	18.51	18.51	21.36
		Inner coil	17.65	17.65	20.36
	Coil	Tube diameter (in.) & No. of rows		3/8 — 2	3/8 — 2
	Fins per inch		20	20	20
Condenser Fan	Diameter (in.) & No. of blades		24 — 3	24 — 3	24 — 4
	Motor hp		1/10	1/6	1/4
	Cfm (factory setting)		2800	3200	4200
	Rpm (factory setting)		830	830	815
	Watts (factory setting)		150	210	310
**Refrigerant — 22 charge furnished			10 lbs. 4 oz.	10 lbs. 0 oz.	14 lbs. 0 oz.
Liquid line (o.d. in.) connection			3/8 (compression)	3/8 (compression)	3/8 (compression)
Suction line (o.d. in.) connection			7/8 (compression)	1-1/8 (sweat)	1-1/8 (sweat)
Shipping weight (lbs.)			314	322	356
Number of packages in shipment			1	1	1

\*\*Refrigerant charge is sufficient for 25 ft. length line set.

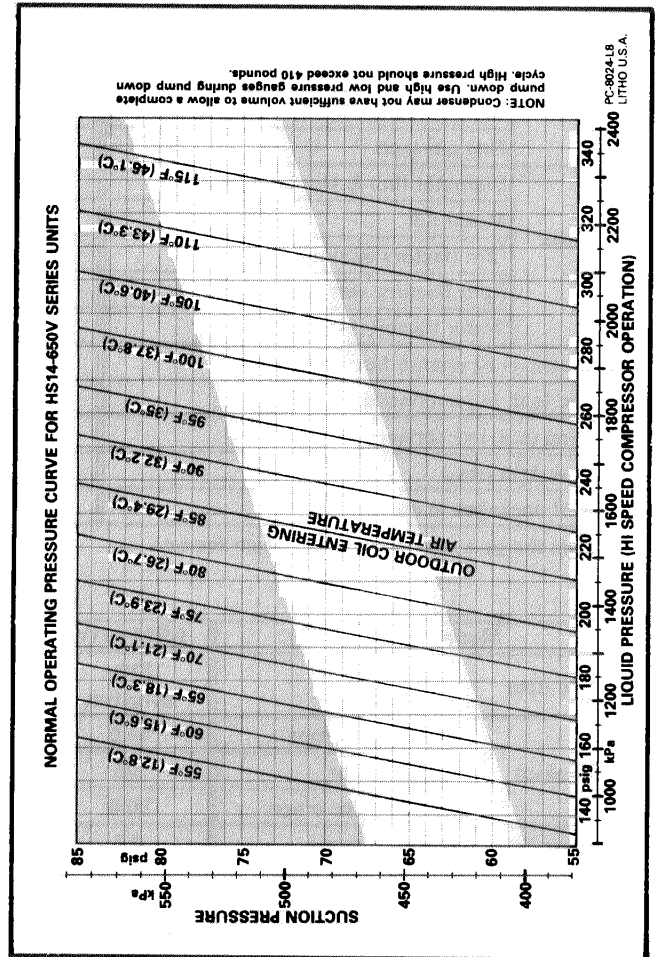
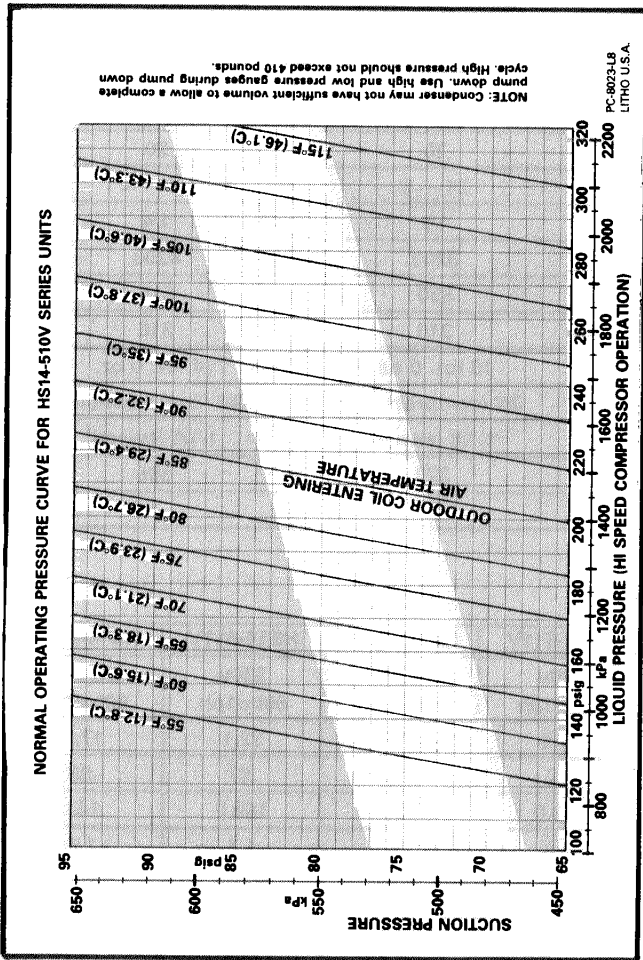
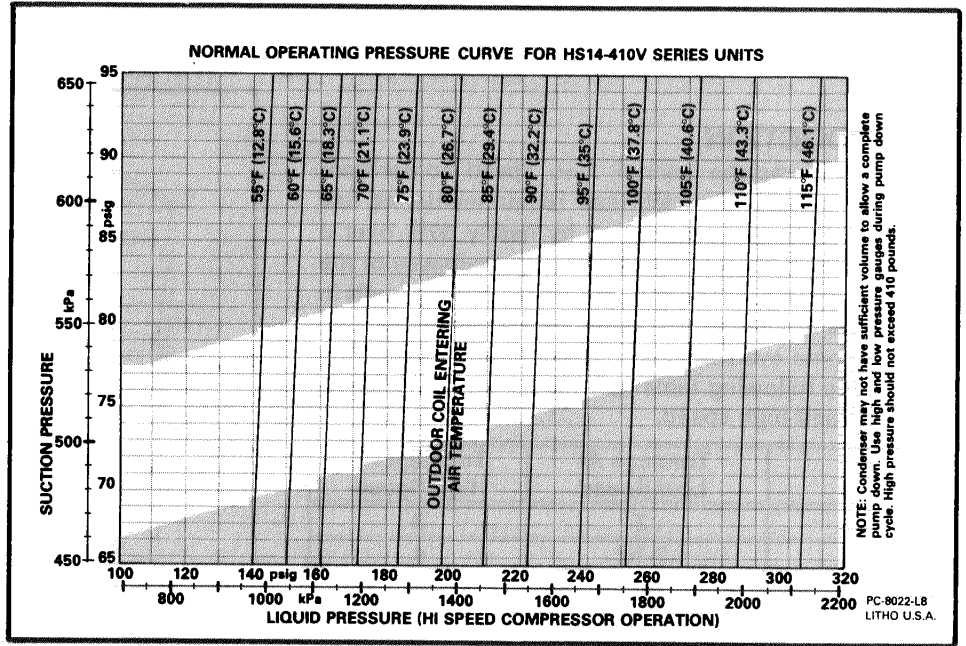
#### B - Electrical Data

Model No.		HS14-411V	HS14-413V	HS14-511V	HS14-513V	HS14-651V	HS14-653V
Line voltage data		230v 60hz/1ph	208/230v 60hz/3ph	230v 60hz/1ph	208/230v 60hz/3ph	230v 60hz/1ph	208/230v 60hz/3ph
Compressor	Rated load amps	14.8	11.1	21.6	15.7	32.1	17.2
	Power factor	.98	.88	.97	.88	.97	.88
	Locked rotor amps	90.0	83.0	133.0	125	163.0	144
Condenser Coil	Full load amps	0.7	0.7	1.0	1.0	1.7	1.7
Fan Motor	Locked rotor amps	1.2	1.2	1.9	1.9	2.9	2.9
Recommended maximum fuse size (amps)		30	25	45	35	60	40
Minimum circuit ampacity		19.2	14.6	28.0	20.6	41.8	23.2

\*Refer to National Electrical Code manual to determine wire, fuse and disconnect size requirements.  
NOTE — Extremes of operating range are plus and minus 10% of line voltage.

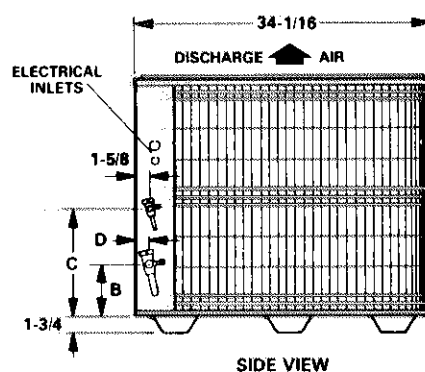
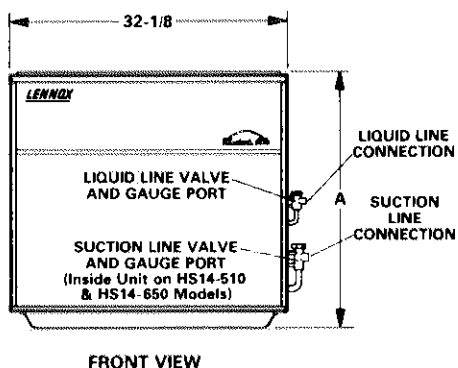
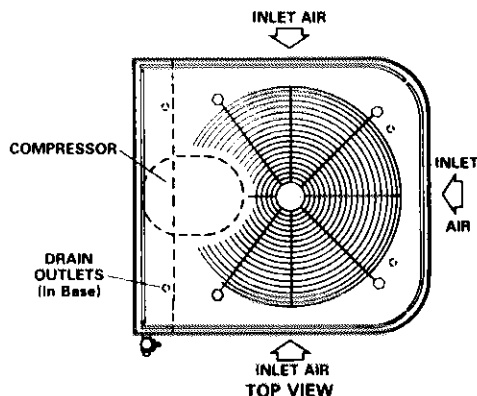
## C - Pressure Curves

Each unit is furnished with a normal operating pressure curve. The curve uses suction pressure, liquid pressure and outdoor temperature comparison. To use the chart, first check suction pressure, then move over to the outdoor temperature and finally down to the liquid pressure. If the liquid pressure is within five pounds of this reading, the unit is properly charged, providing the three conditions meet in the unshaded area of the chart. If they meet in the shaded area, there is something wrong with the system and further checks are needed.



## D - Dimensions

Model No.	A	B	C	D
HS14-411V	34-1/2	4-1/2	11-1/4	1-1/2
HS14-413V	34-1/2	4-1/2	11-1/4	1-1/2
HS14-511V	34-1/2	5-7/8	12	2-1/16
HS14-513V	34-1/2	5-7/8	12	2-1/16
HS14-651V	39-1/2	5-7/8	12	2-1/16
HS14-653V	39-1/2	5-7/8	12	2-1/16



## E - Approved Match-Ups

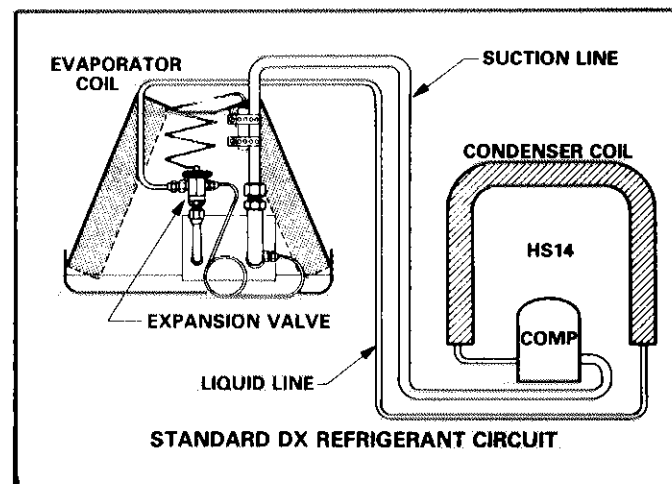
The HS14 is for use with single circuit coils and expansion valve systems only. The 3, 4 & 5 ton expansion valves use equalizer lines.

Refer to the Lennox Engineering Handbook for approved system match-ups and the correct expansion valve kit. The following table lists the line sets for the HS14.

Condensing Unit Model No.	Line Set Model No.	Length Suc. & Liq. Lines (ft.)	Liquid Line (o.d. in.)	Suction Line (o.d. in.)
HS14-410V	L10-65-30	30	3/8	7/8
	L10-65-40	40		
	L10-65-50	50		
HS14-510V	field fabricate	---	3/8	1-1/8
HS14-650V	field fabricate	---	3/8	1-1/8

The 410 units use compression connections at the unit. The 510 and 650 units use a compression connection for the liquid line and a sweat connection for the suction line.

The HS14 is applicable to the ZoneMaster system. This is a direct expansion valve refrigerant system using multiple evaporators. The HS14 unit and RTM1-65 Tank Module are used to couple the system together. Refer to the ZoneMaster literature for further details.



## F - Typical Field Wiring Diagram (Figure 2)

High voltage pigtail leads are provided in the make-up area of control box for connection to power supply. A ground lug is also provided.

**Note on unit wire sizing & fuse selection** - Minimum circuit ampacity and maximum fuse size are listed on the unit nameplate (also on pg. 1 under 'Electrical Data' of this manual and in the Engineering Handbook). The unit supply wire size must be obtained from the appropriate Table 310 of the National Electric Code. Sometimes nuisance trippouts occur

to circuit breakers that may be in the branch circuit. This condition is usually encountered when the circuit breaker is sized to the equipment's minimum circuit ampacity (MCA) instead of the maximum fuse size. Lennox recommends using the maximum fuse size listed on the unit nameplate to assure maximum current-carrying capacity. A circuit breaker size from MCA is normally one or two sizes smaller than the maximum fuse size and is often marginal in carrying the normal starting current.

Low voltage connections are made just below the control box.

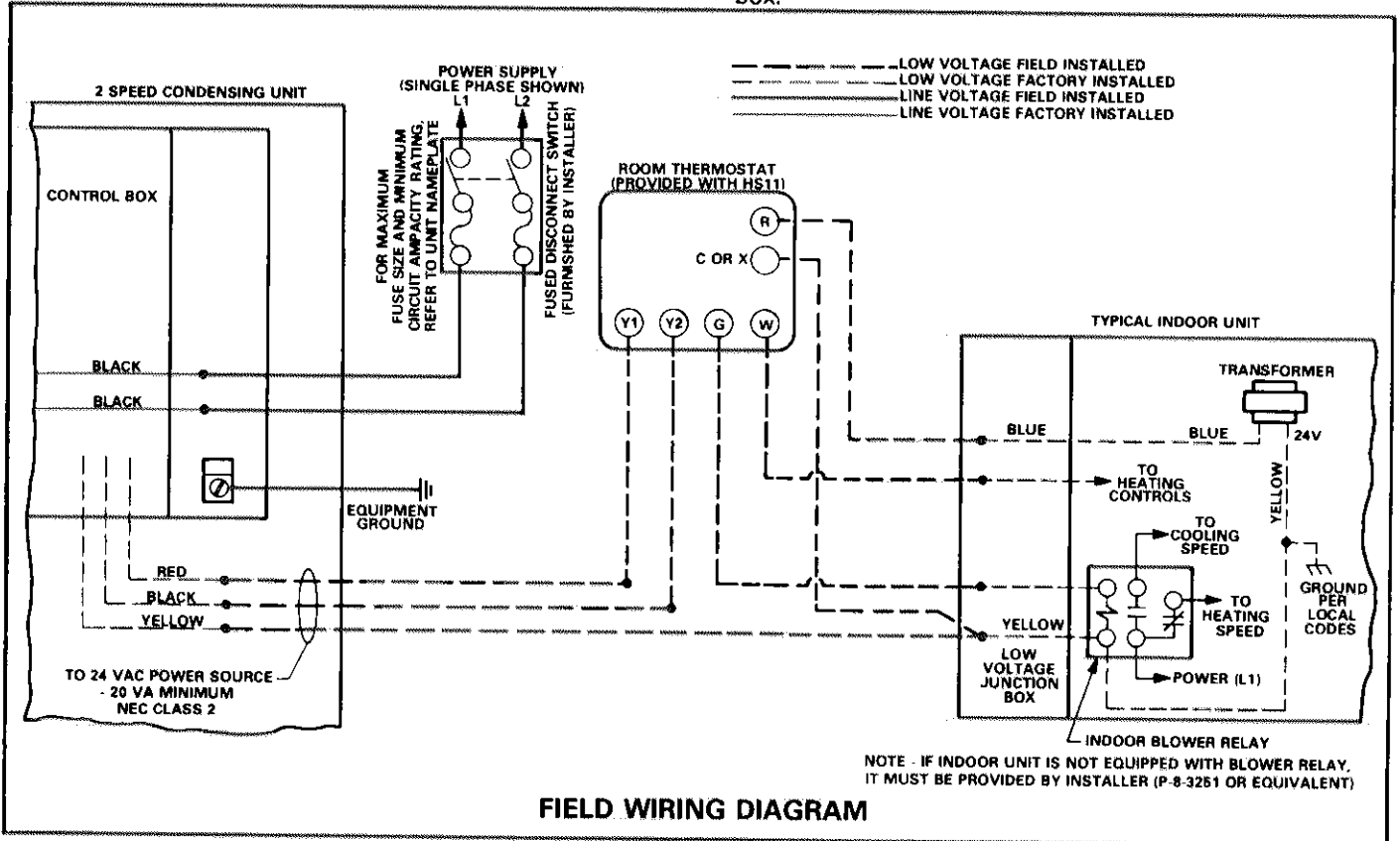


FIGURE 2

## G - Optional Latent Load Discriminator (LB-34857BA)

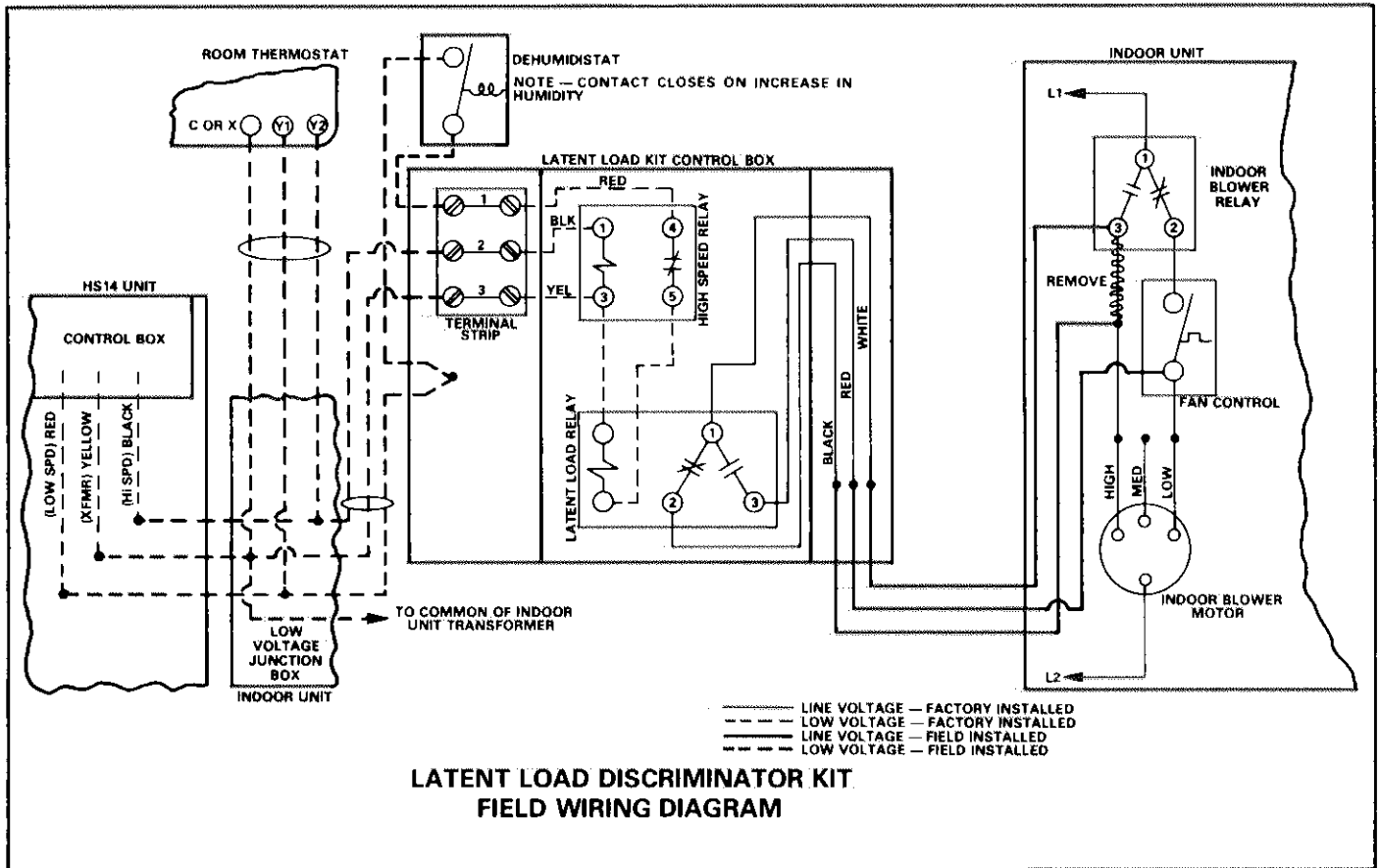
The optional Latent Load Discriminator Kit controls the speed of the indoor blower motor to obtain maximum dehumidification during low speed compressor operation. The kit has a dehumidistat which switches blower to low speed at high humidity conditions for latent cooling. During low humidity conditions, blower operates at high speed for maximum sensible cooling. The indoor blower motor automatically runs at high speed whenever compressor operates at high speed. Figure 3 shows the field wiring for the Latent Load Discriminator.

The dehumidistat mounts in the conditioned space. It is adjustable. The recommended setting is 50%.

With dehumidistat contacts closed (high humidity), the Latent Load Relay is energized through the N.C. contacts of the High Speed Relay. The blower motor runs at low speed.

With dehumidistat contacts open (low humidity), the Latent Load Relay is de-energized and the blower motor runs at high speed.

A high speed demand will energize the High Speed Relay to consequently de-energize the Latent Load Relay and run the blower motor at high speed.



**FIGURE 3**

### III - REFRIGERANT SYSTEM

The 410, 510 & 650 liquid line service valves and the 410 suction line valve are located outside the unit cabinet. They have side gauge ports. The liquid line valves require a 3/16 in. allen wrench and the suction line valves require a 5/16 in. allen wrench. The side gauge port is not shut off when the valve is backseated.

The suction line service valve on the 510 & 650 units is located inside the unit cabinet. A 3/16 in. hex socket wrench is

required for the valve. This valve closes gauge port when backseated.

A port for the addition of a pressure switch is provided in the liquid line between the condenser coil and filter drier for a low ambient kit if needed. This port may also be used to monitor high pressure during a system pumpdown for repairs on low side. The high pressure during pumpdown must not exceed 410 psig.

## IV - COMPONENTS

### A - Control Box (Figure 4)

#### 1 - Protection Module

The module connects to sensors within the compressor motor windings through S1 and S2. The module is supplied with 24 VAC at terminals P1 & P2. The compressor control circuit is connected to K1 & K2. If the sensors detect excessive winding temperatures, the module breaks power to the compressor control circuit.

#### 2 - Current Limiting Device - RT (Single phase units only)

The current limiting device (RT) is a NTC thermistor (negative temperature coefficient - increase in temperature equals decrease in resistance). Resistance at 77°F = 5 ohms ± 10%.

When the compressor is shut off the potential relay drops out immediately. RT absorbs the current surge created when the potential relay contacts close and discharge the run capacitor(s). This prevents the relay contacts from welding.

#### 3 - Transformer

208/230V primary/24V secondary - 70VA  
3.2 Amp (type C) fuse on secondary

#### 4 - Compressor Interlock

Prevents compressor fast cycling. The interlock provides a nominal 71 second time delay between cycles. Delay time may range from 60 to 96 seconds. The voltage input is 20 VAC min. to 30 VAC max. Reset time is 0.016 second max.

#### 5 - Control Relays (K1 & K2)

Used in 24 volt control circuit for low and high speed compressor operation.

#### 6 - Fan Relay (K3)

Used to control fan motor and crankcase heater. The relay energizes the heater when the unit is not operating.

#### 7 - Compressor Contactor - Combination K4 (Low Speed) & K5 (High Speed)

The HS14 uses a special combination contactor with two coils: K5 with 5 poles and K4 with 3 poles. Two normally closed (N.C.) auxiliary switches are integral to the contactor, one on the K4 side & one on the K5 side. The K4 & K5 sections are mounted on a common base plate and mechanically interlocked to prevent simultaneous operation.

The auxiliary switches are used to electrically interlock the contactor coils also preventing simultaneous operation.

The electrical and mechanical interlocks protect against any condition that could attempt to energize both K4 & K5 together. This condition would result in a direct short across the line causing definite contactor and fuse or circuit breaker damage. In addition, power surges could be created possibly damaging the compressor motor windings.

#### 8 - Time Delay (K7)

Provides time delay between compressor speeds to allow compressor to completely stop. The on time is 20 to 40 seconds and the off time is 30 to 50 seconds.

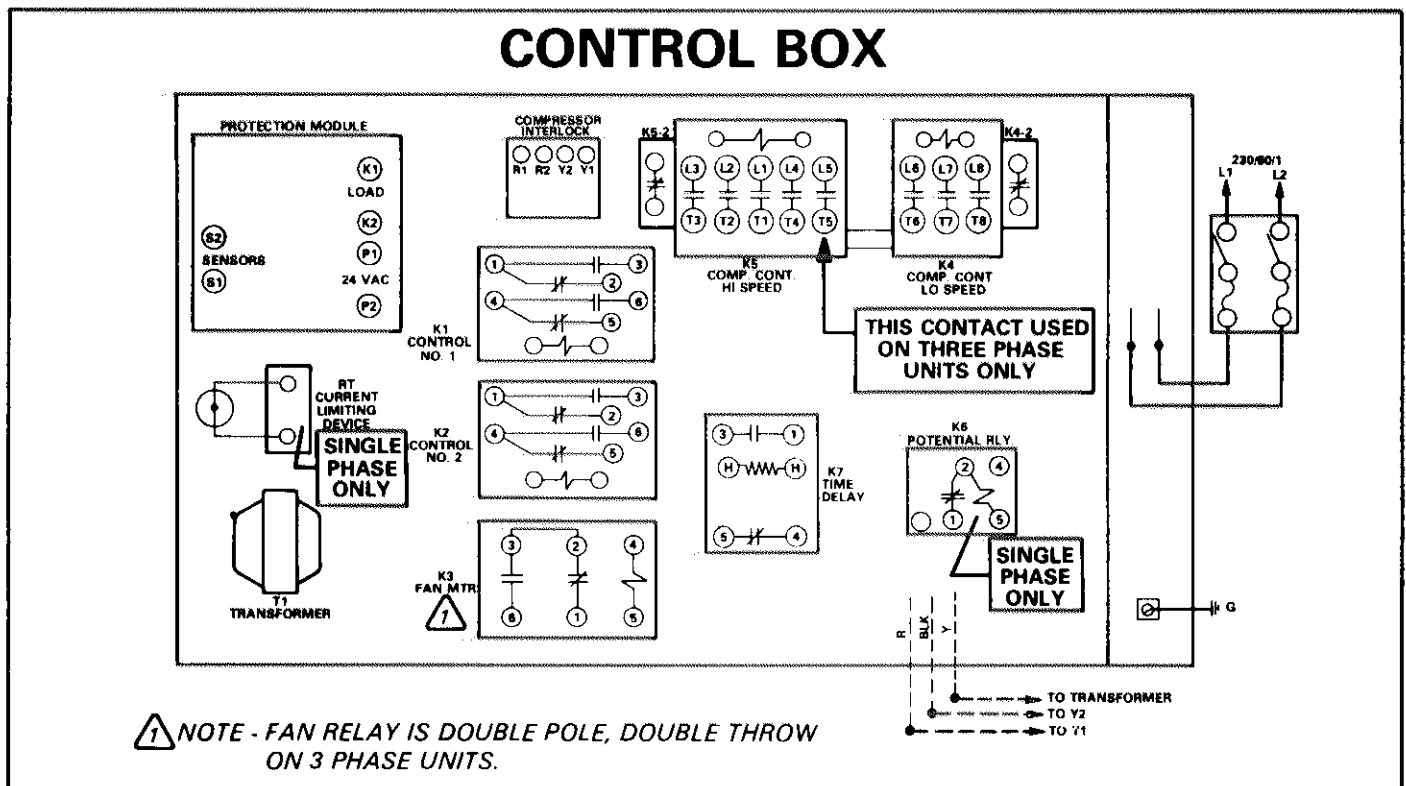


FIGURE 4

## 9 - Potential Relay (K3) (Single phase units only)

Used to disconnect the start capacitor from the circuit when the compressor reaches operating speed. The potential relays are matched specifically to each compressor size. See table for operating voltage.

HS14 Unit	Cold Coil Operating Voltages (VAC)			
	Min. Pickup	Max. Pickup	Min. Dropout	Max. Dropout
411V	260	290	60	121
511V	239	268	80	130
651V	258	287	60	135

## B - Compressor Compartment (Figure 5)

### 1 - High Pressure Switch (S1)

Switch is mounted in discharge line. This switch has a cutout pressure of 410 psig; reset 180 psig - Manual Reset.

### 2 - Low Pressure Switch (S2)

Switch is mounted in suction line. It has a cutout pressure of 25 psi  $\pm$  5 and an automatic cut in pressure of 55 psi  $\pm$  5.

### 3 - Crankcase Heater Thermostat (S6)

Thermostat opens at 101°F and closes at 81°F. De-energizes crankcase heater at temperatures above set-point.

## 4 - Fan Motor Capacitor (C1)

Condenser fan motor capacitors:

**410 series** - 3.75 mfd, 370 VAC

**510 series** - 5.0 mfd, 370 VAC

**650 series** - 10.0 mfd, 370 VAC

## 5 - Compressor Start Capacitor (C2) & Run Capacitor(s) (C3)

The start and run capacitors are matched specifically for each single phase compressor motor. During starting the start and run capacitors are in parallel for increased capacity. Values are as follows:

### 411 Series:

Start - 145 - 175 mfd (330 VAC)

Run - 35 mfd (440 VAC)

Parallel Capacity - 180 - 210 mfd (330 VAC)

### 511 Series:

Start - 145 - 175 mfd (330 VAC)

Run - 45 mfd (440 VAC)

Parallel Capacity - 190 - 220 mfd (330 VAC)

### 651 Series:

Start - 176 - 216 mfd (320 VAC)

Run - 30 mfd (440 VAC)

Run - 25 mfd (440 VAC)

Parallel Capacity - 231 - 271 mfd (320 VAC)

Note - The 651 uses 2 run capacitors in parallel totaling 55 mfd.

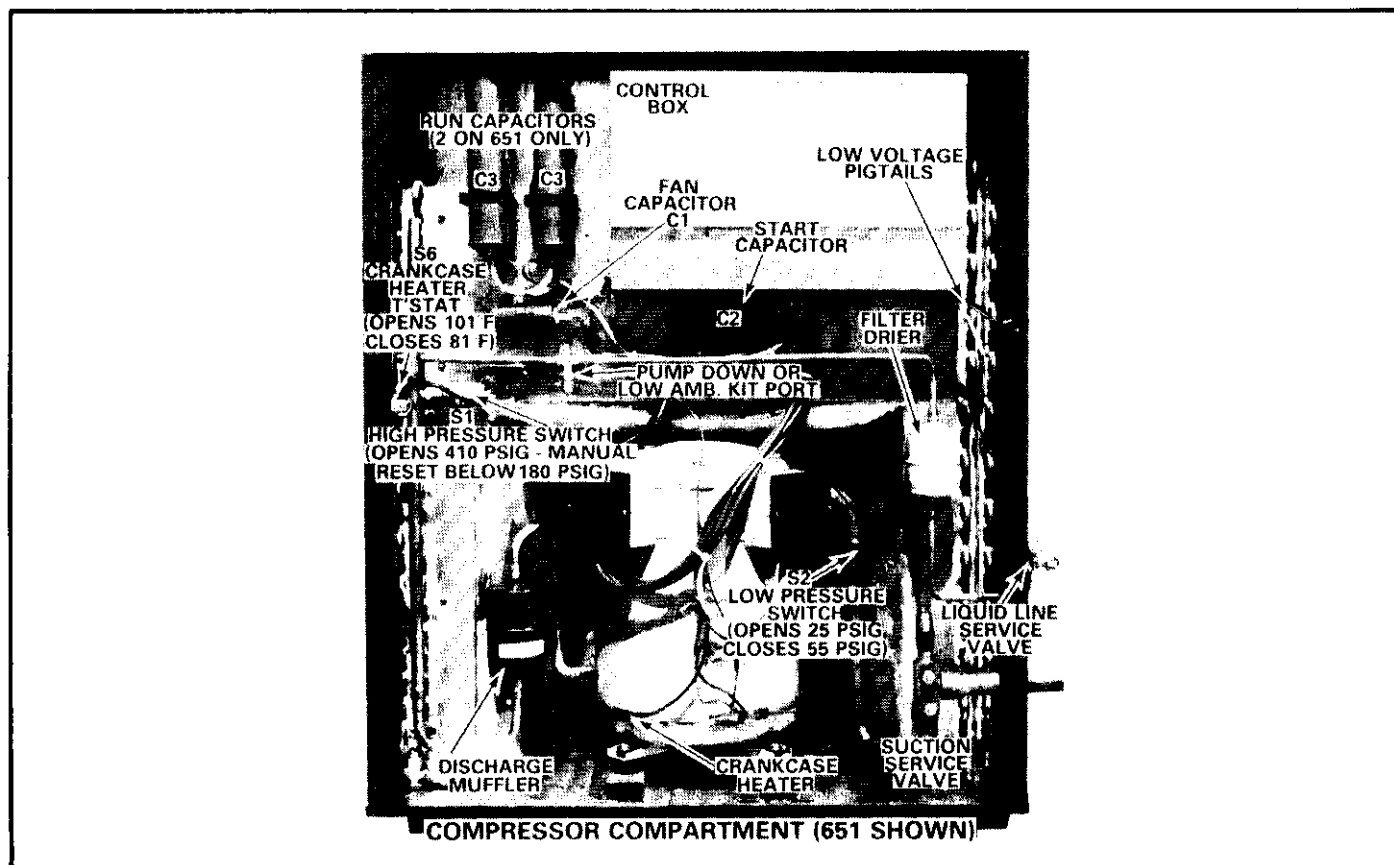


FIGURE 5

### C - Room Thermostat (Figure 6)

HS14 units use a two stage cooling - single stage heating thermostat. Mode of operation indicator lights give visual readout of "Low" and "High" speed compressor operation. The green light comes on during low speed and the amber light comes on during high speed. Thermostat is equipped with a temperature setting dial, system selector switch (Off - Heat - Auto - Cool) and fan control switch (Auto - On). One additional wire is required for common side of indoor unit transformer to terminal C on thermostat for operation of the indicator lights.

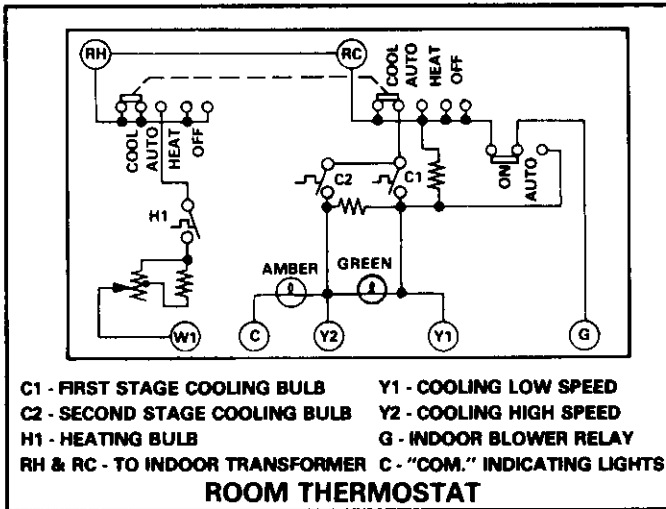


FIGURE 6

### D - Two Speed Compressor (Figure 7)

The Lennox two speed compressor has two electrical makeup boxes for connection to the motor winding terminals. One makeup box also contains the two terminals S1 & S2 for connection of the internal winding sensors to the protection module.

Each compressor has an external crankcase heater. The heater output is 50 watts at 240V with a resistance of 1150 ohms  $\pm$  10%.

#### Compressor Oil -

Texaco # WF68

Suniso #4-GSD (Sun Oil Co.)

Amount: 3, 4 & 5 ton - 75 ounces.

#### 1 - Single Phase Compressor (Figure 8)

The single phase compressor has a two speed, capacitor start-capacitor run motor. For starting, the start and run capacitors are in parallel to provide the proper starting torque. The start capacitor is disconnected by the potential relay when the motor comes up to speed. The run capacitor remains connected to the start winding and the motor runs as a 2 phase induction motor with improved power factor and torque characteristics.

**Low speed** compressor motor operation is provided by powering the run windings (internally connected in series) from terminals 1 (common) & 7. The windings form a four pole motor operating at 1800 RPM. The four

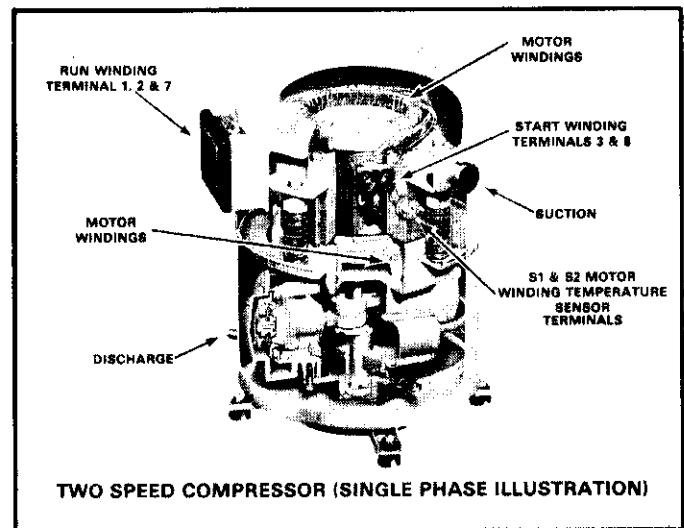


FIGURE 7

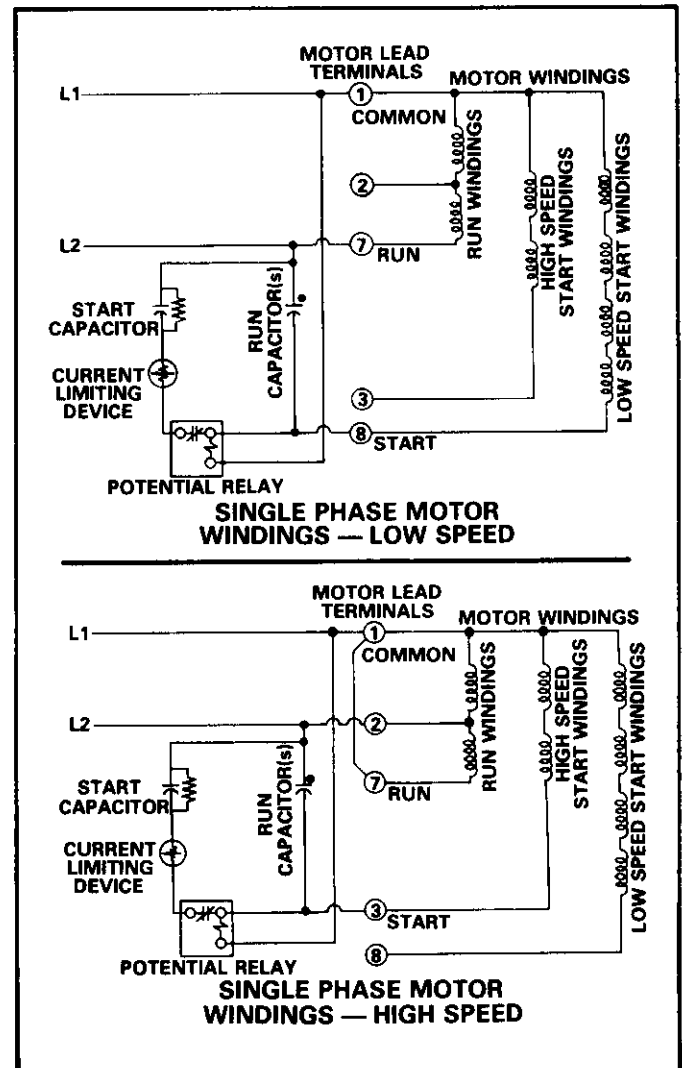


FIGURE 8



low speed start windings are in series and connected to terminals 1 (common) & 8. They are used with the start & run capacitors and potential relay to start and bring the motor up to speed.

**High speed** compressor motor operation is provided when the run windings are connected in **parallel**; terminals 1 (common) & 7 to L1 and terminal 2 to L2. The windings form a 2 pole motor operating at 3600 RPM. The two high speed start windings are in series and connected to terminals 1 (common) & 3.

## 2 - Three Phase Compressor (Figure 9)

This compressor has a two speed, 3 phase induction motor.

**Low speed** operation is provided when the motor windings are connected in a **series "Y"** circuit. This forms a four pole motor operating at 1800 RPM.

**High speed** operation is provided when the motor windings are connected in a **parallel "Y"** circuit. This forms a two pole motor operating at 3600 RPM.

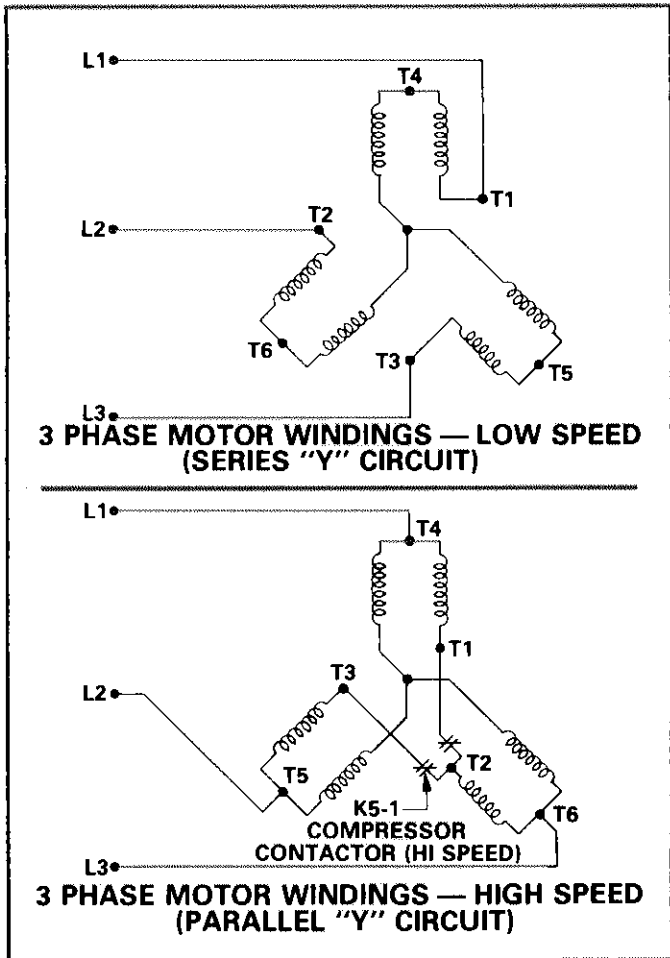


FIGURE 9

## V - CHECKING TWO SPEED COMPRESSOR WINDINGS

Turn off power to unit and remove all wiring from compressor terminals. Using an ohm meter set on scale R x 10K, check windings for grounds and open circuits. Refer to Figures 10 and 11.

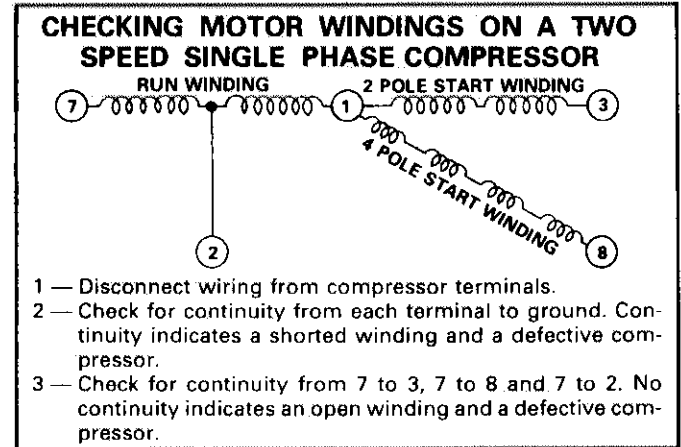


FIGURE 10

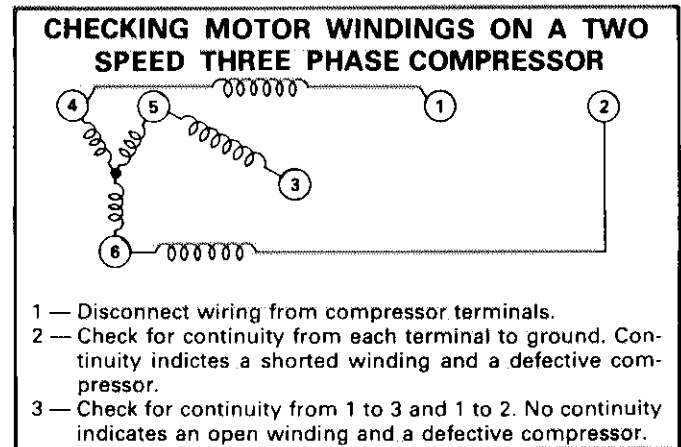
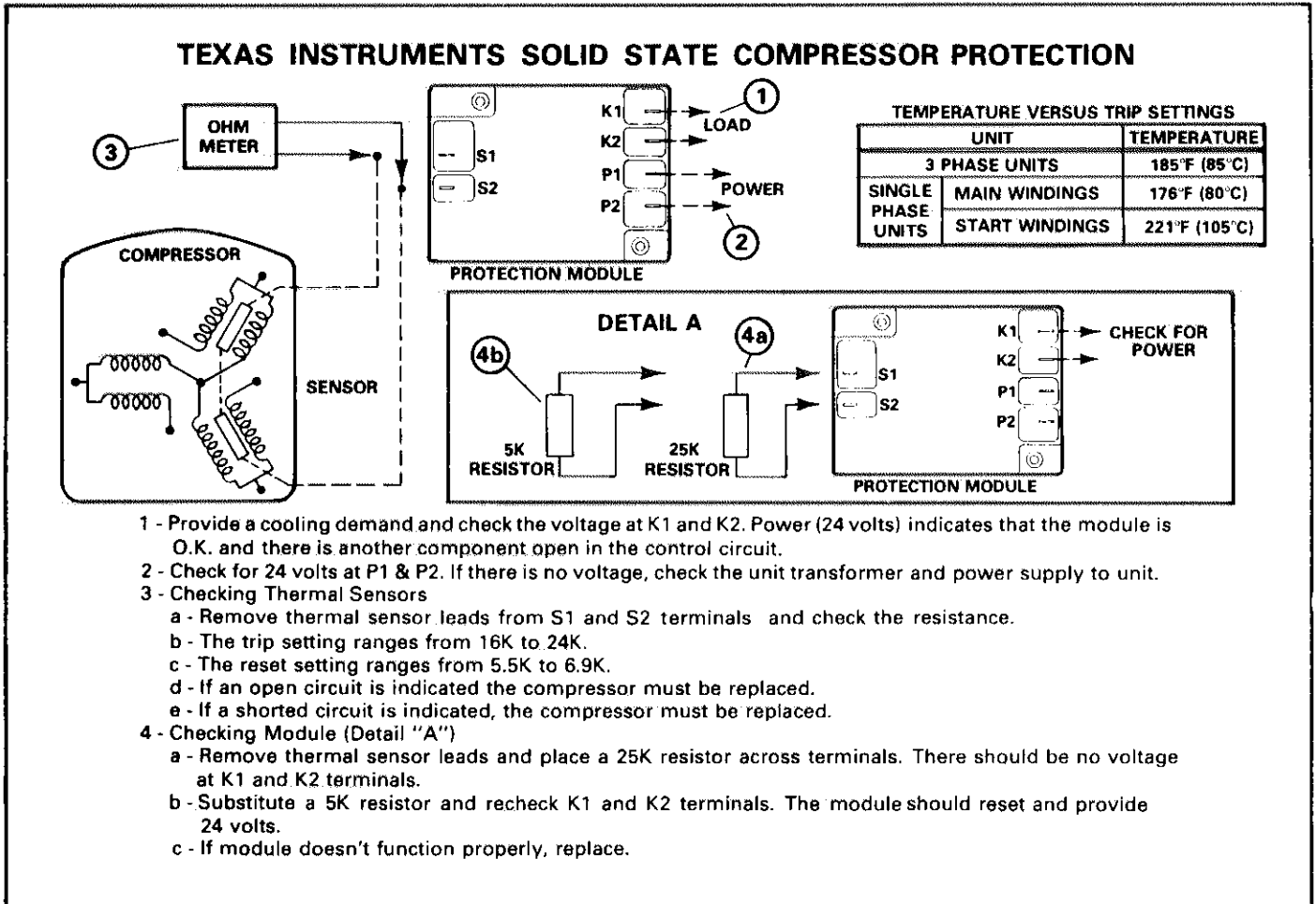


FIGURE 11

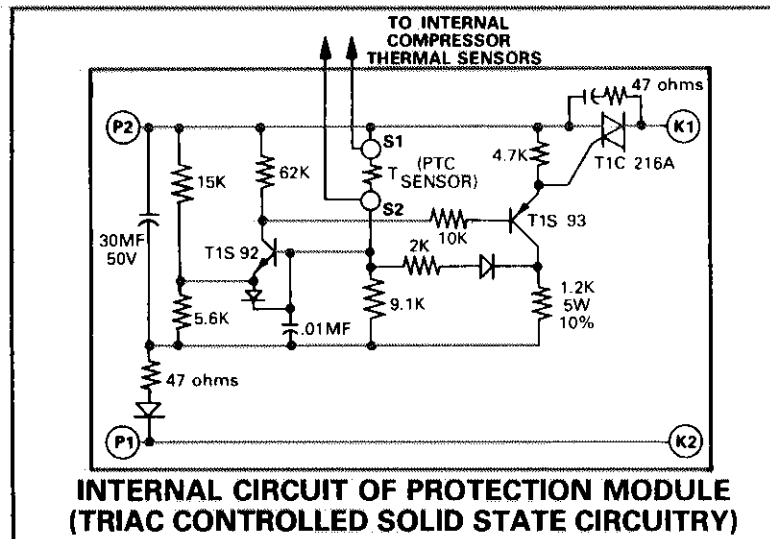
## VI - COMPRESSOR PROTECTION MODULE CHECKOUT

Thermal sensors embedded within the compressor windings change resistance in direct relationship to temperature change. The trip setting ranges from 16K to 24K while reset setting ranges from 5.5K to 6.9K.

Provide a cooling demand and check K1 and K2. Power indicates another component is open. Check power to module. Remove thermal sensor leads and check their resistance. Use resistors to check module operation. Refer to Figure 12.



**FIGURE 12**



## VII - SCHEMATIC WIRING DIAGRAM OPERATING SEQUENCE

Each of the following steps within this section are labeled in the corresponding diagram.

The breakdown of operation is as follows:

### SINGLE PHASE LOW SPEED

- A - 24 Volt Control Circuit (Figure 13)
- B - Compressor Starting Circuit (Figure 14)
- C - Compressor Run Circuit (Figure 15)
- D - Current Limiting Device Function (Figure 16)

### SINGLE PHASE HIGH SPEED

- A - 24 Volt Control Circuit (Figure 17)
- B - Compressor Starting Circuit (Figure 18)
- C - Compressor Run Circuit (Figure 19)

### THREE PHASE OPERATION

- A - Compressor Circuit - Low Speed (Figure 20)
- B - Compressor Circuit - High Speed (Figure 21)

### LOW & HIGH SPEED INDICATOR LIGHTS OPERATION (Figure 22)

### ACCESSORY SEQUENCE

- A - Latent Load Discriminator Kit (Figure 23)

### SINGLE PHASE LOW SPEED

#### A - 24 Volt Control Circuit (Figure 13)

- 1 - Thermostat demand on first stage (Y1) energizes K1 control relay No. 1 thru K7-2 N.C. time delay relay contacts.

- 2 - Thru:

- Protection Module N.C. Circuit - P2 to K1
- S1 - High Pressure Switch
- S2 - Low Pressure Switch
- K2-1 - Control Rly No. 2 N.C. Contacts
- K5-2 - High spd Contactor N.C. Auxiliary Contacts
- K1-1 - Control Rly No. 1 N.O. Contacts (Now Closed)

The fan motor relay K3 is energized. Also thru the compressor interlock and K2-2 N.C. Control relay No. 2 contacts, K4 low speed compressor contactor is energized.

If there is any power interruption to the compressor interlock, it will lockout the compressor contactor K4 for a nominal 71 seconds to prevent fast cycling.

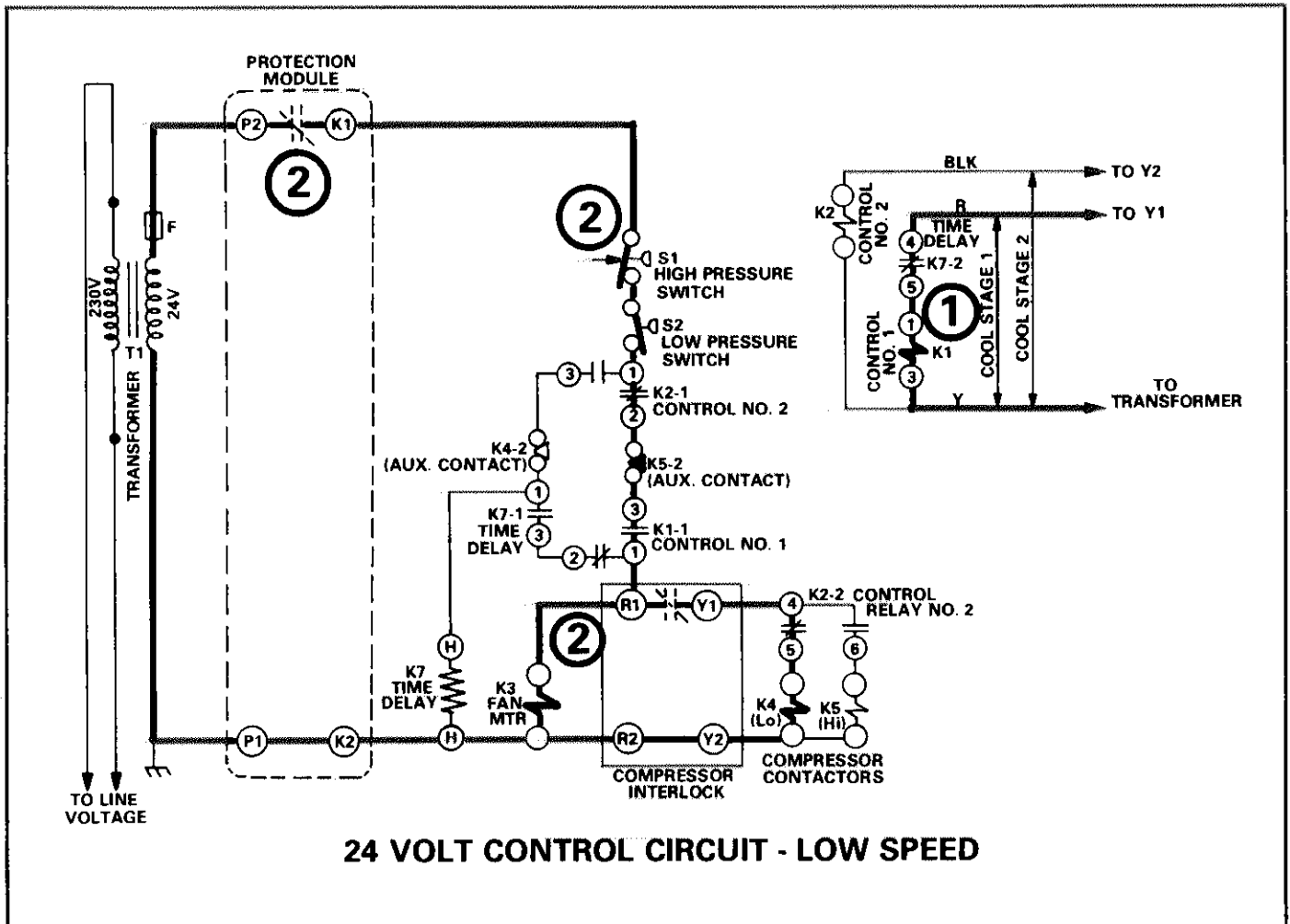


FIGURE 13

**B - Compressor Starting Circuit (Figure 14)**

1 - To energize the start windings with the proper torque the start and run capacitors are in parallel for maximum capacitance value.

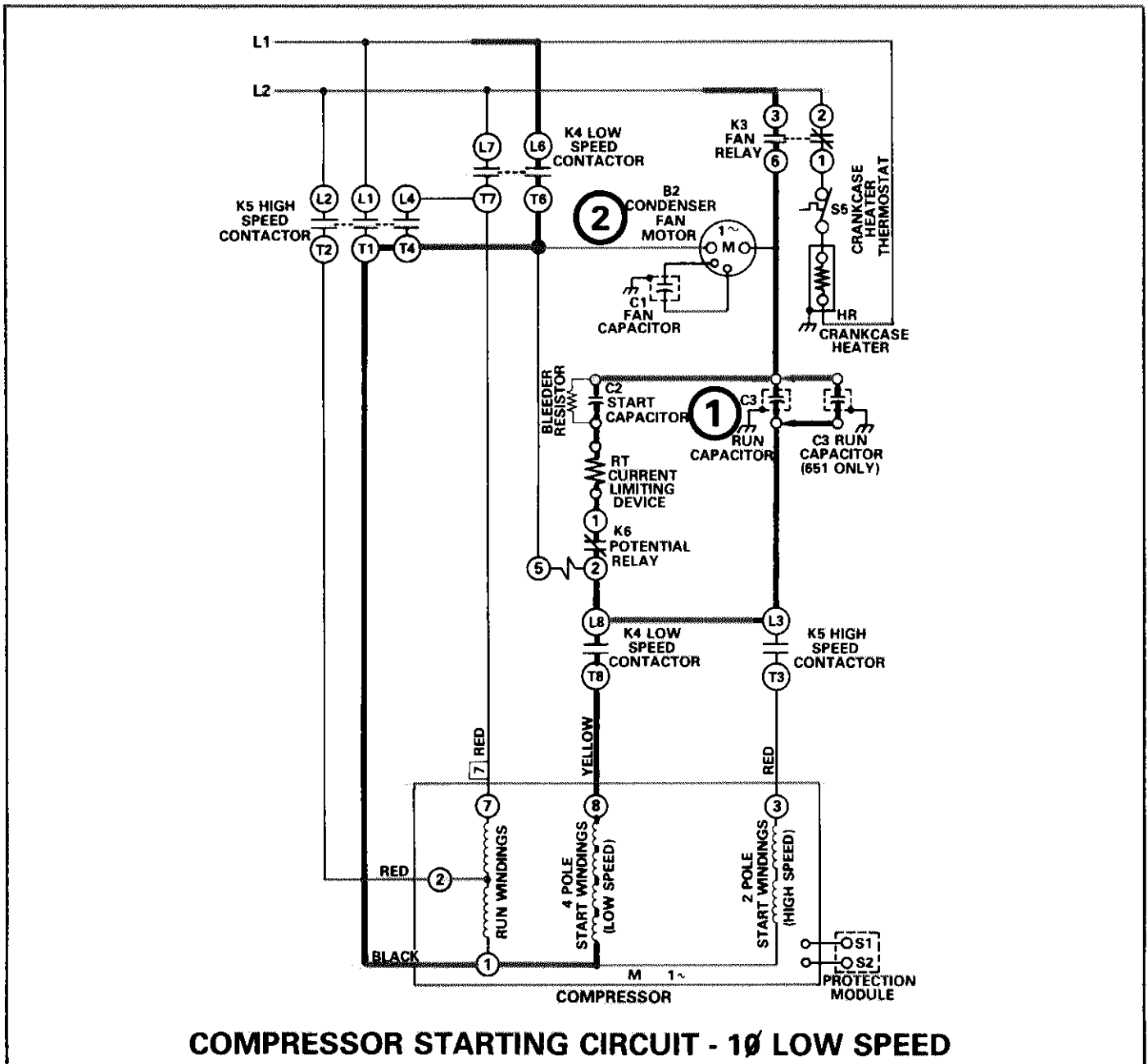
- L2 Thru: K3 - Fan Relay N.O. Contacts
- C2 - Start Capacitor
- C3 - Run Capacitor(s)
- RT - Current Limiting Device
- K6 - Potential Relay N.C. Contacts
- K4 - Low Speed Contactor L8-T8 Contacts

The low speed start windings are energized at terminal 8.

The start winding connects to common terminal 1 and

completes the circuit to L1 thru K4 low speed contactor L6-T6 contacts.

2 - The fan motor is also energized thru K3 fan relay contacts when K4 compressor contactor contacts close.



**FIGURE 14**

## C - Compressor Run Circuit (Figure 15)

1 - At the same time the start windings are energized the compressor run windings (in series) are powered thru K4 low speed contactor (contacts L6-T6 & L7-T7).

2 - As the compressor comes up to speed K6 potential relay coil is energized by the voltage from the motor windings thru K4 contacts L8-T8. This voltage will usually be in the range or above the pickup voltage of the potential relay. It varies with each compressor.

K6-N.C. contacts open taking the start capacitor out of the circuit.

3 - The run capacitor(s) remain connected to the start windings thru K3 fan relay and K4 contacts L8-T8. The run capacitors create the proper amount of voltage phase shift to improve the power factor and increase torque.

Note - If the run capacitor(s) fail the compressor may not start and if it does it will run with a very poor power factor creating high electric bills. The run capacitor(s) provide 2 functions:

- 1 - Increasing starting capacitance when in parallel with start capacitor.
- 2 - Improving power factor and torque characteristics during run.

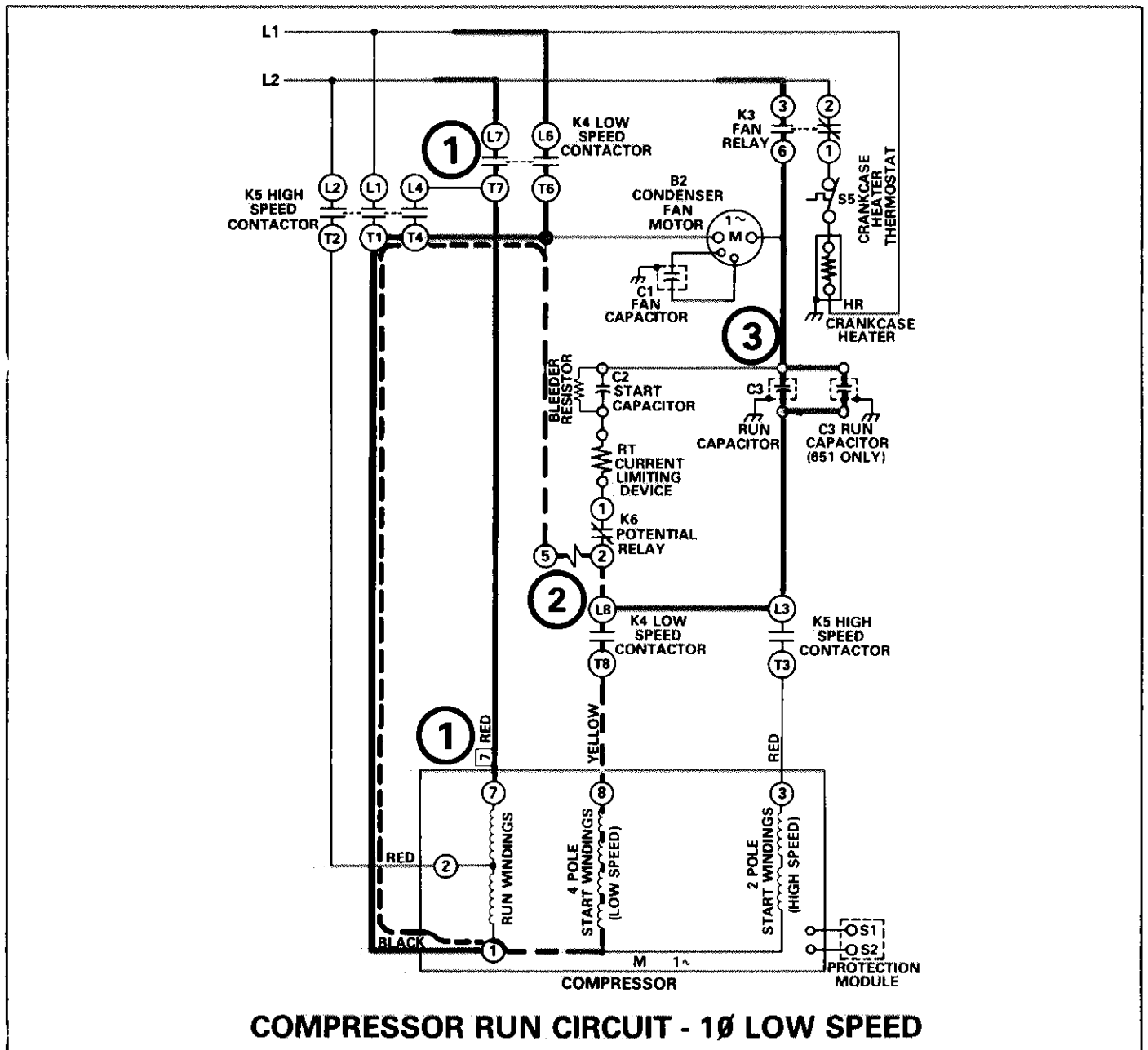


FIGURE 15

**D - Current Limiting Device Function (Figure 16)**

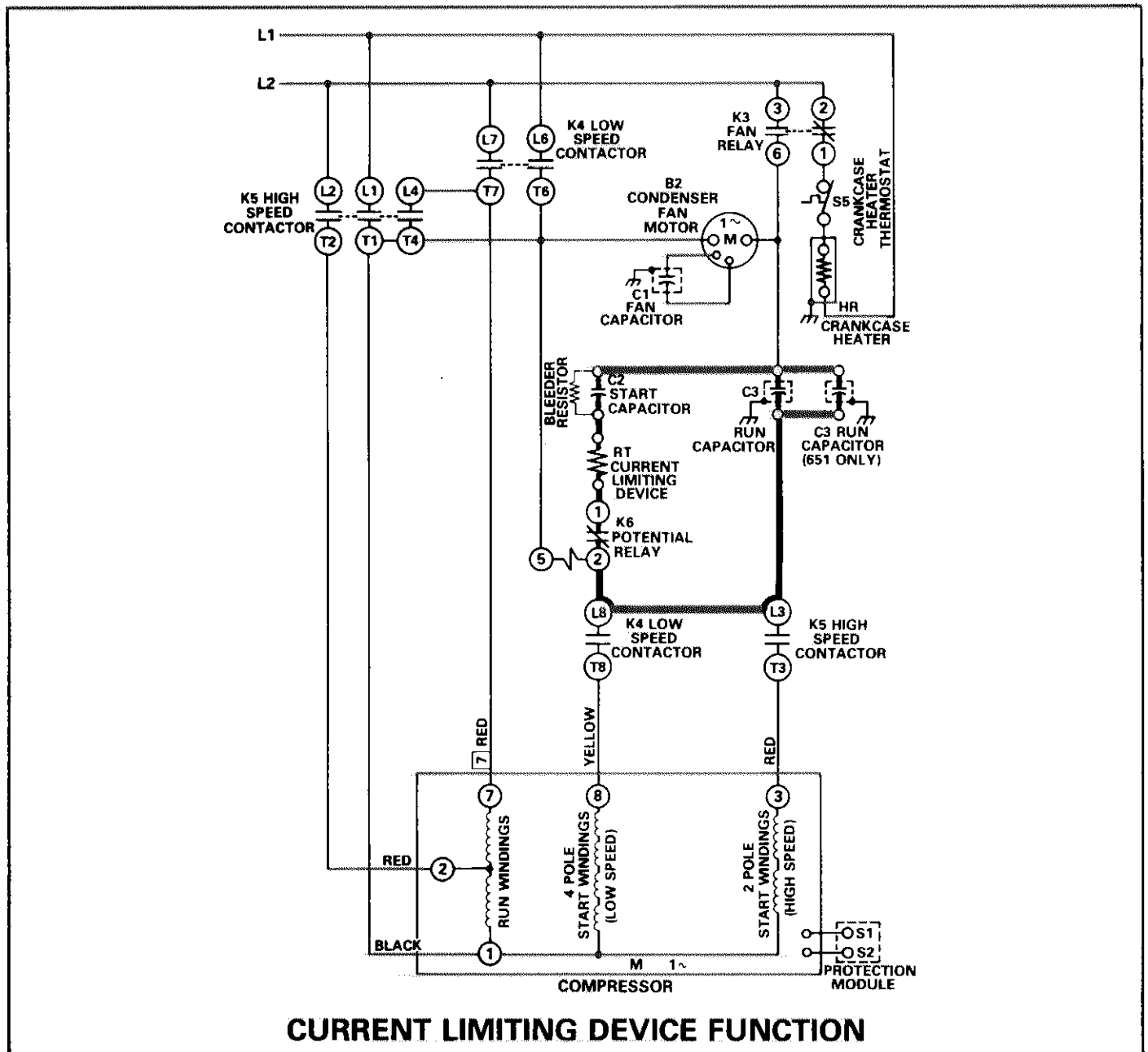
The current limiting device (RT) is a NTC thermistor (increase in temperature equals decrease in resistance).

It is used in the compressor starting circuit in series between the potential relay contacts and the start capacitor.

- 1 - As the compressor is started RT heats fast lowering its resistance due to the high initial starting current.
- 2 - When the compressor is up to speed, K6 potential relay contacts open breaking the circuit to RT (& the start capacitor). RT cools down during the compressor run cycle - increasing its resistance again. The start capacitor is discharged by the bleeder resistor across it.

- 3 - When the compressor is cycled off and K4 contactor opens, the potential relay K6 drops out immediately. This is when RT provides its function.
- 4 - When the potential relay contacts close, RT is in series with the contacts, start capacitor and the fully charged run capacitor(s). The resistance of RT absorbs the current surge created as the run capacitor(s) are discharged, dissipating it as heat.

This protects the potential relay contacts from welding when they close and discharge the run capacitor(s).



**FIGURE 16**

## SINGLE PHASE HIGH SPEED

### 1 - 24 Volt Control Circuit (Figure 17)

- 1 - Thermostat demand on second stage (Y2) energizes K2 control relay No. 2.
- 2 - Thru:
  - Protection Module N.C. Circuit - P2 to K1
  - S1 - High Pressure Switch
  - S2 - Low Pressure Switch
  - K2-1 - Control Rly No. 2 N.O. Contacts
  - K4-2 - Low Spd Contactor N.C. Contacts (Now Closed)
- 3 - After a delay of 20 to 40 seconds, K7-2 N.C. time delay contacts open to de-energize K1 control relay No. 1.
- 4 - At the same time K7-1 contacts close to energize K3 fan motor relay. Also thru the compressor interlock and K2-2 control relay No. 2 N.O. contacts - K5 high speed compressor contactor is energized.

Any power interruption to the compressor interlock will lockout the compressor contactor K5 for a nominal 71 seconds to prevent fast cycling.

**IMPORTANT** - The K7 time delay and compressor interlock give the following timing sequences:

- INITIAL DEMAND FIRST STAGE - No delay.
- INITIAL DEMAND SECOND STAGE - There is a 20 to 40 second (time on) delay thru K7 providing over nominal 71 seconds (interlock timing) have expired from end of last cycle.
- CHANGING FROM FIRST TO SECOND STAGE - There is a 20 to 40 second (time on) delay at K7 plus 30 to 50 second remainder at compressor interlock. Compressor and fan will stop. (Fan only starts at end of K7 timing.)
- CHANGING FROM SECOND TO FIRST STAGE - There is a 30 to 50 second (time off) delay at K7 plus 20 to 40 second remainder at compressor interlock. Compressor and fan will stop. (Fan only starts at end of K7 timing.)

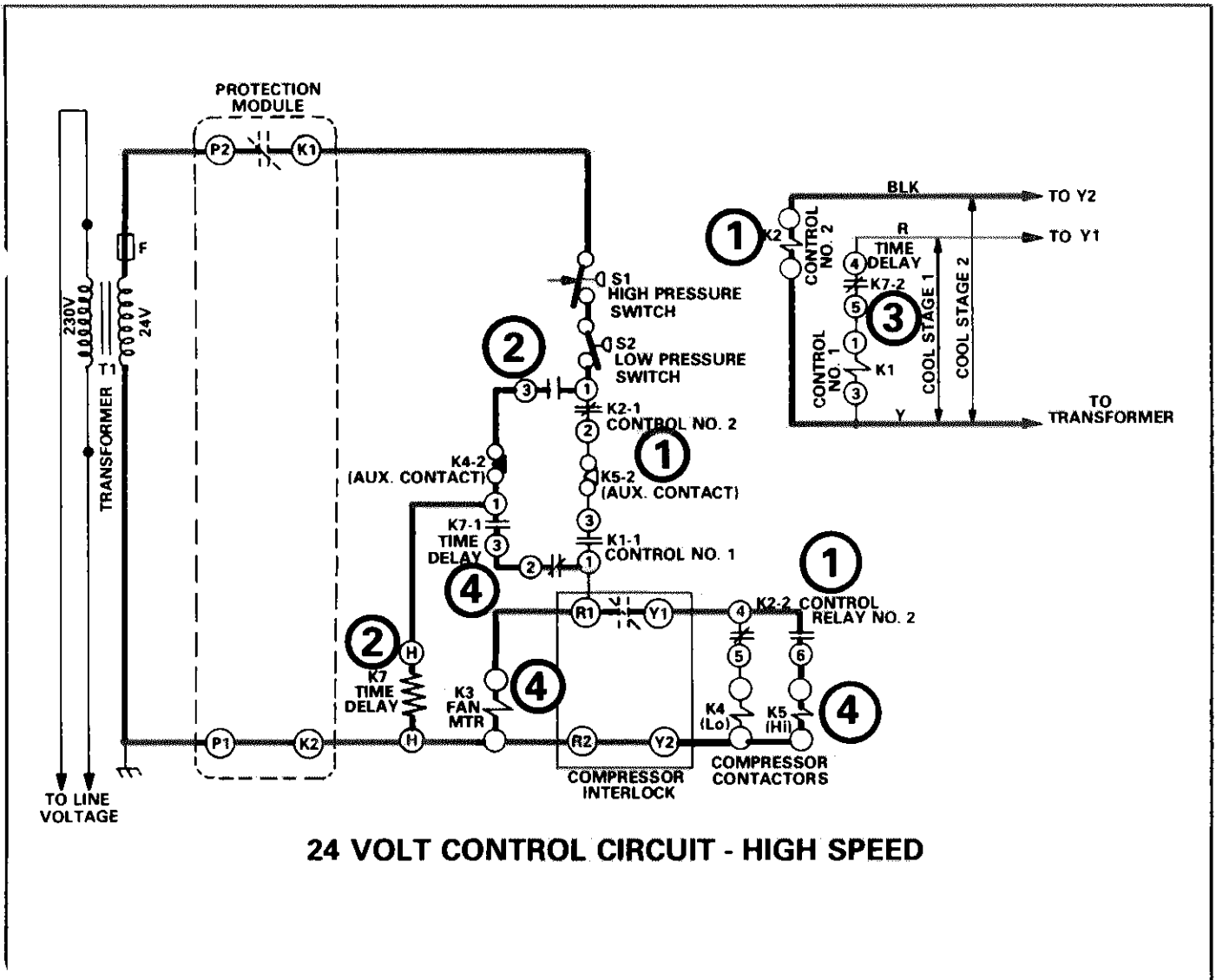


FIGURE 17

**B - Compressor Starting Circuit (Figure 18)**

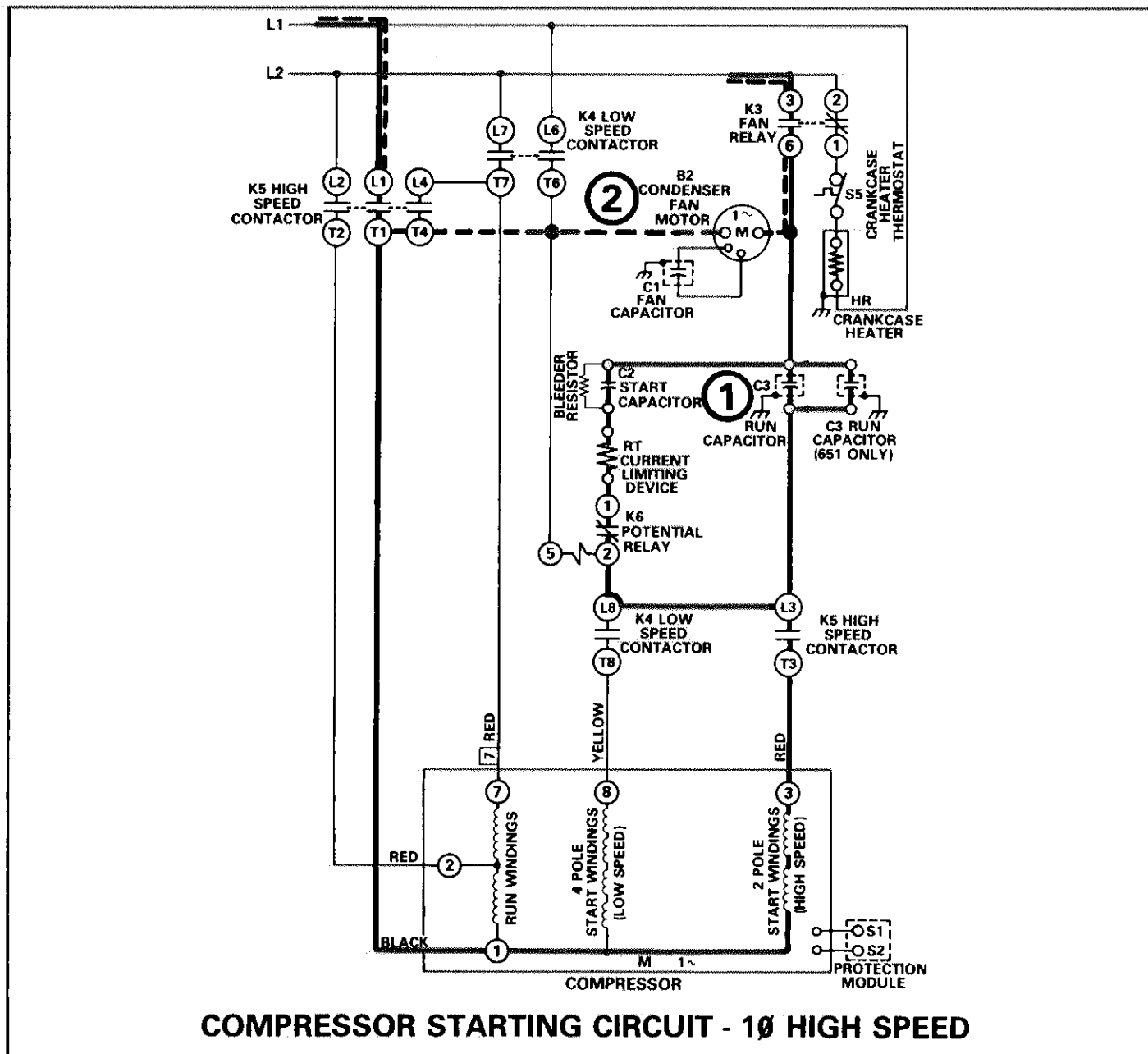
1 - L2 Thru:

- K3 - Fan Relay N.O. Contacts
- C2 - Start Capacitor
- C3 - Run Capacitor(s)
- RT - Current Limiting Device
- K6 - Potential Relay N.C. Contacts
- K5 - High Speed Contactor L3-T3 Contacts

The high speed windings are energized at terminal 3.

The start winding connects to common terminal 1 and completes the circuit to L1 thru K5 high speed contactor L1-T1 contacts.

2 - The fan motor is also energized thru K3 fan relay contacts when K5 compressor contactor contacts close.



**FIGURE 18**



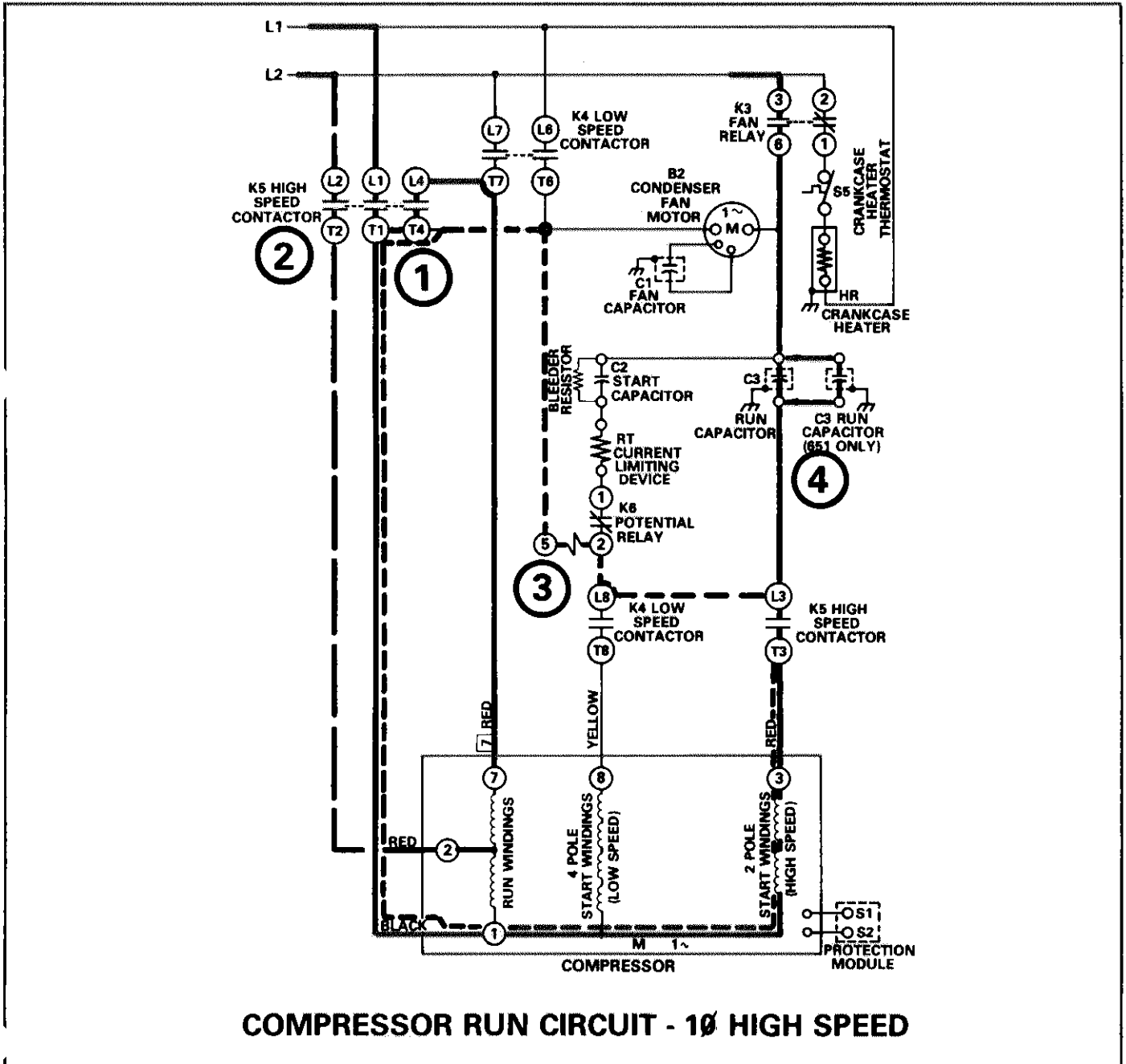
## C - Compressor Run Circuit (Figure 19)

At the same time the start windings are energized the compressor run windings (in parallel) are powered thru K5 high speed contactor as follows:

- 1 - L1 Power thru K5 contacts L1-T1 & L4-T4 to compressor terminals 1 & 7.
- 2 - L2 Power thru K5 contacts L2-T2 to compressor terminal 2.
- 3 - As the compressor comes up to speed, K6 potential relay coil is energized by the voltage from the motor windings thru K5 contacts L3-T3.

K6 contacts open taking the start capacitor out of the circuit.

- 4 - The run capacitor(s) remain connected to the start windings thru K3 fan relay and K5 contacts L3-T3.



**COMPRESSOR RUN CIRCUIT - 10 HIGH SPEED**

**FIGURE 19**

### THREE PHASE OPERATION

The 3 $\phi$  low voltage circuits operate the same as the 1 $\phi$  low voltage circuits. (Refer to figures 13 & 17)

No starting components or run capacitors are required on 3 $\phi$  motors.

### A - Compressor Circuit - Low Speed (Figure 20)

- 1 - K4-1 low speed compressor contactor and K3-2 fan relay are energized by low voltage circuit.
- 2 - Fan is energized, crankcase heater is de-energized by K3-2 fan relay contacts.
- 3 - Compressor terminals 1, 2 & 3 energized thru K4-1 contacts L6-T6, L7-T7, L8-T8 to form a series Y connection to the motor windings for low speed.

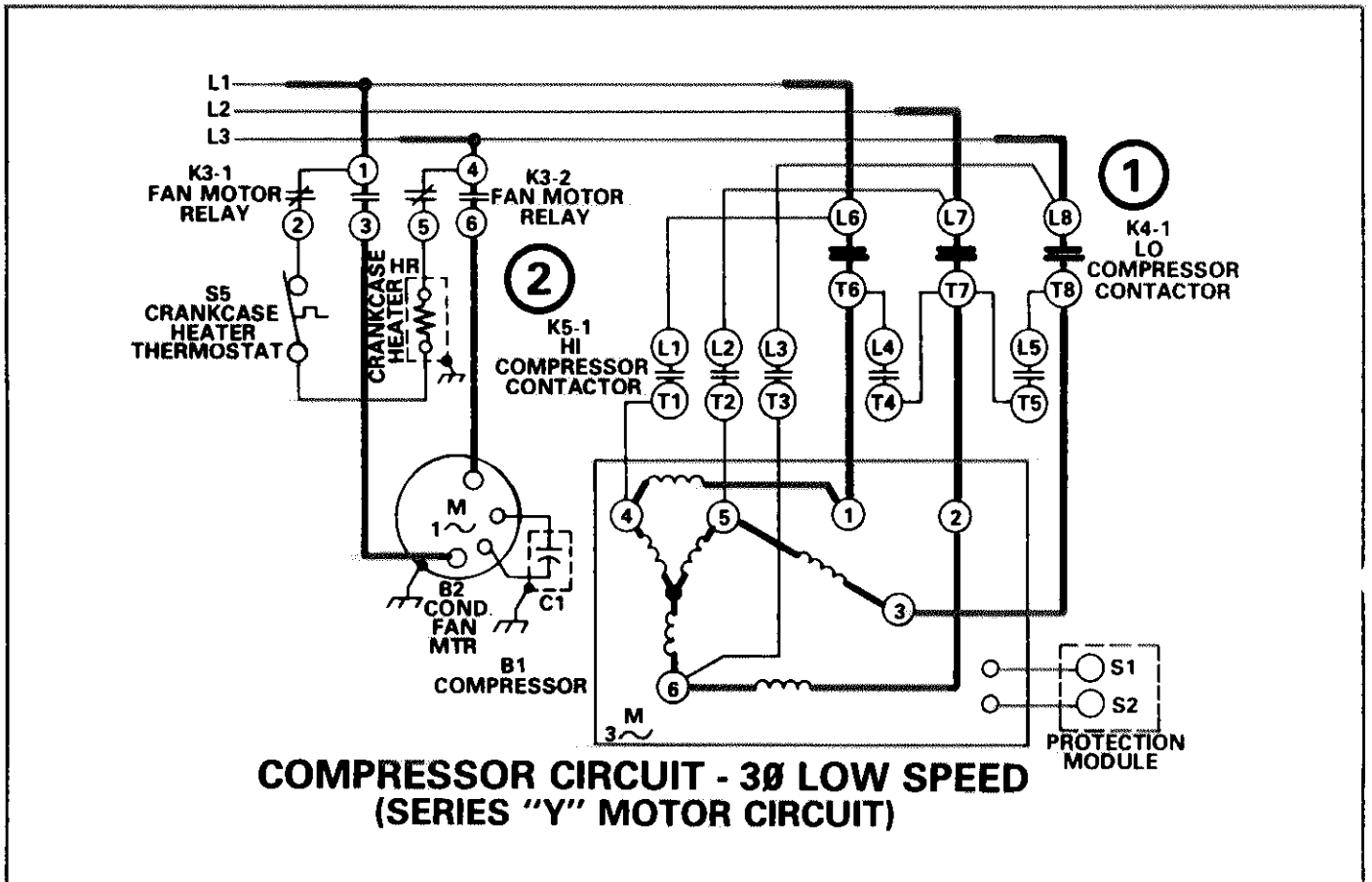


FIGURE 20

## B - Compressor Circuit - High Speed (Figure 21)

- 1 - K5-1 high speed compressor contactor and K3-2 fan relay are energized by low voltage circuit.
- 2 - Fan is energized, crankcase heater is de-energized by K3-2 fan relay contacts.

- 3 - Compressor terminals 4, 5, & 6 are energized thru K5-1 contacts L1-T1, L2-T2 & L3-T3. And compressor winding terminals 1, 2 & 3 are connected together by K5-1 contacts L4-T4 & L5-T5 to complete the parallel Y connection to the motor for high speed.

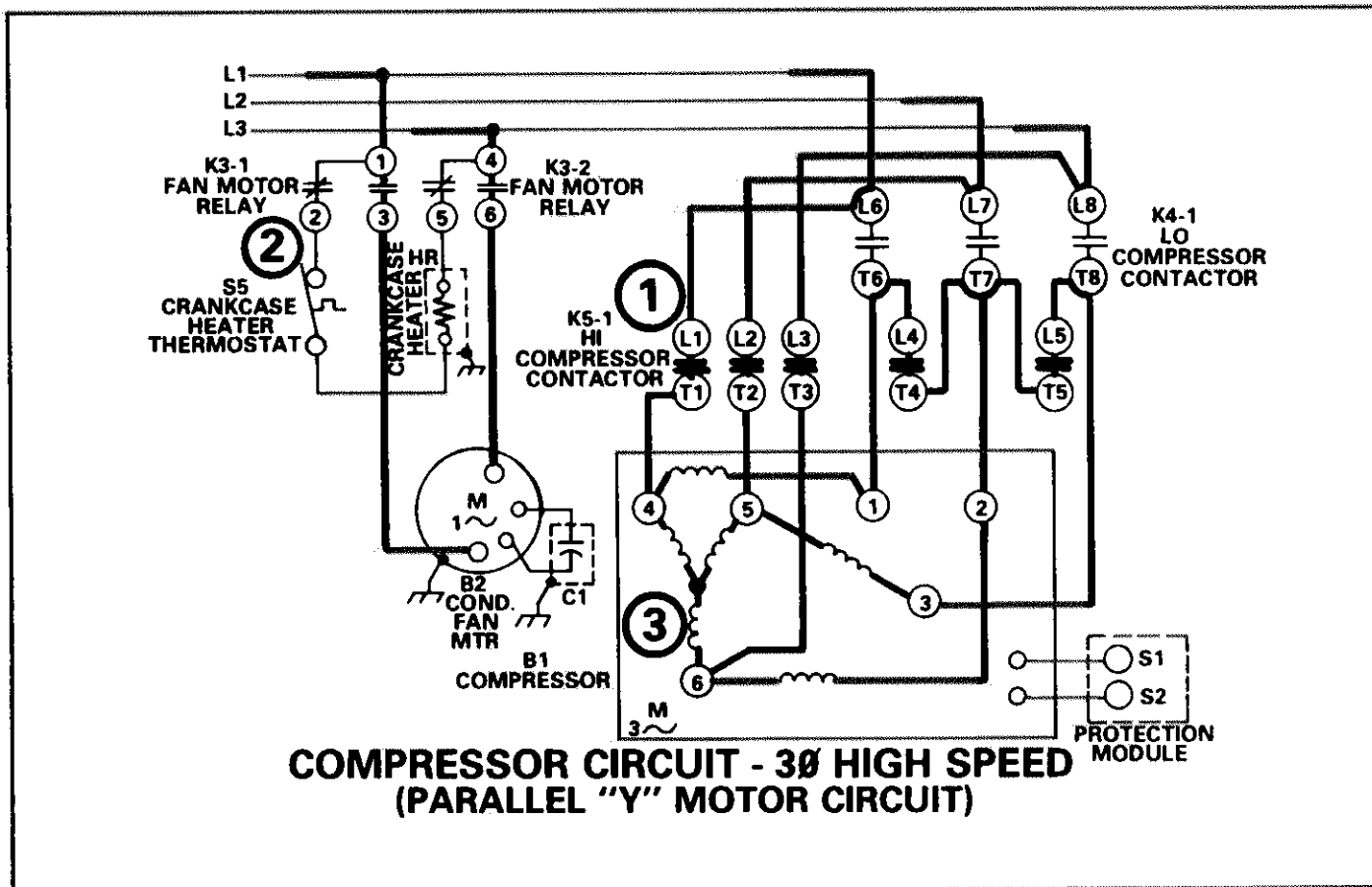


FIGURE 21

## LOW & HIGH SPEED INDICATOR LIGHTS OPERATION (FIGURE 22)

- 1 - C1 bulb closes to energize K1 low speed relay through K7-2, from the Y1 leg.
- 2 - At the same time, the green low speed light is energized from C1 bulb through the Y2 Leg by feeding through the K2 relay coil.
- 3 - When C2 bulb closes, K2 high speed relay is energized from the Y2 leg. The amber high speed light is energized from C2 bulb through C leg to transformer common. With C1 and C2 closed the potential voltage at Y1 and Y2 is the same (24V) and the green light turns off.

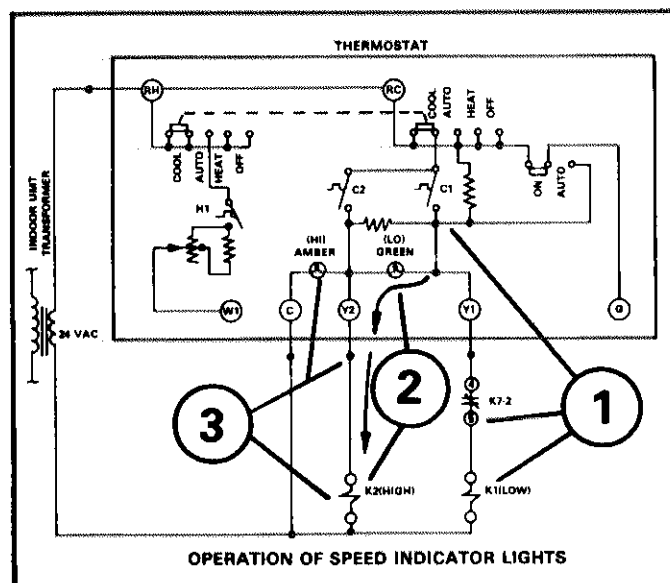


FIGURE 22

## ACCESSORY SEQUENCE

### A - Latent Load Discriminator Kit (Optional) (Figure 23)

The latent load kit functions during low speed compressor operation to lower the indoor blower motor speed for increased dehumidification when needed.

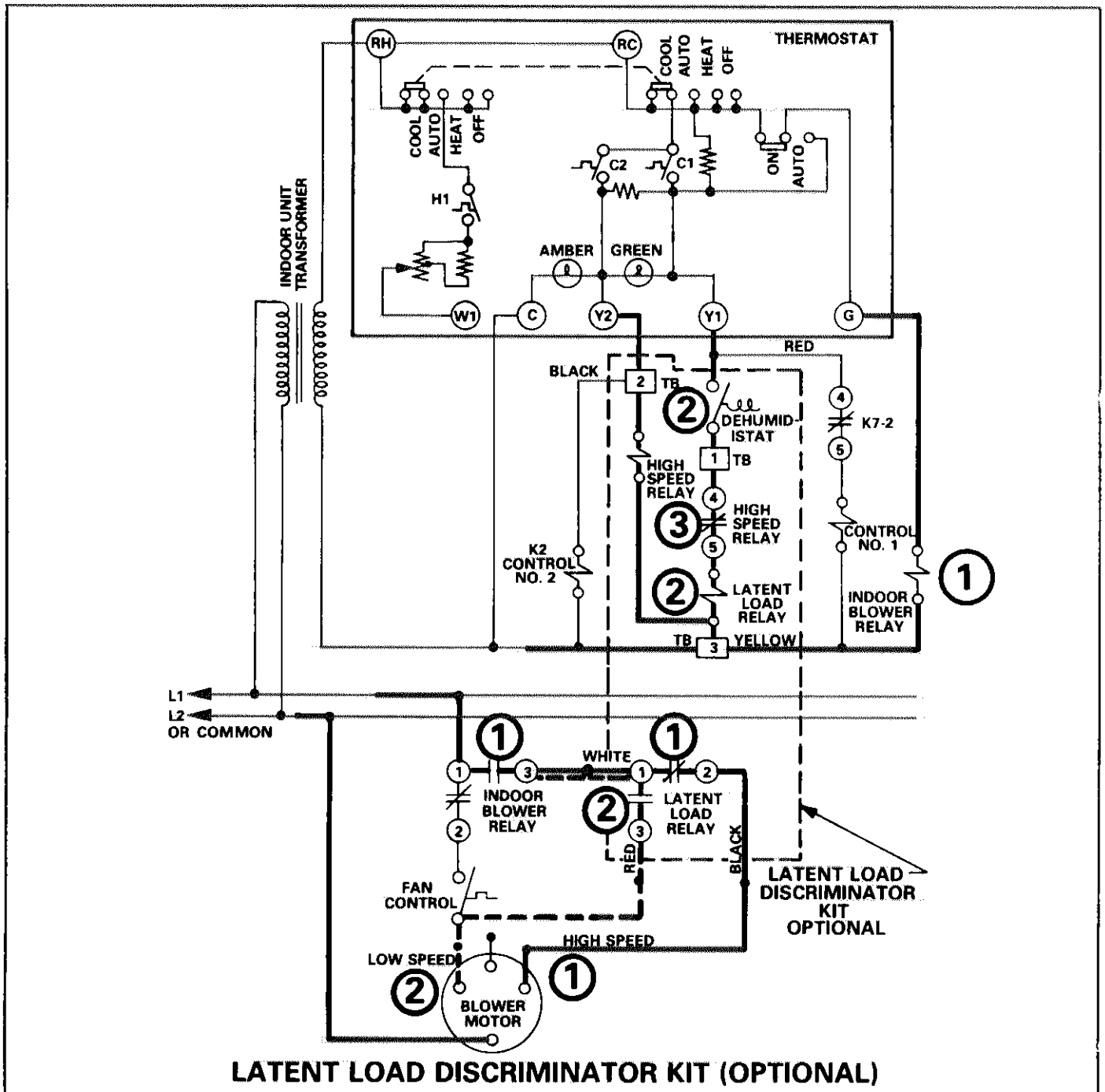
- 1 - Blower operation during cooling or continuous operation is thru the blower relay N.O. contacts and latent load relay N.C. contacts to the high speed tap.
- 2 - During first stage cooling (Y1 terminal powered at thermostat) the latent load relay coil is energized by the dehumidistat thru the high speed relay N.C. contacts, if the

humidity rises sufficiently.

The latent load relay N.C. contacts open de-energizing high blower speed & the N.O. contacts close energizing low speed.

- 3 - During second stage cooling (Y2 terminal powered at thermostat) the high speed relay coil is also energized.

The high speed relay N.C. contacts open preventing the latent load relay from operating - the blower runs on high speed only.



LATENT LOAD DISCRIMINATOR KIT (OPTIONAL)

FIGURE 23