



Air-Cooled Condensing Units

INTRODUCTION

This booklet is a summary of residential system wiring diagrams.

Included are point-to-point wiring diagrams of 38GR, GS, CE, CC, SE condensing units with all current thermostats, furnaces, fan coils, electric heaters, humidifiers and air cleaners that may be combined in any one system. Shown in these diagrams are the 2-wire control hookups (with one transformer) required for all current condensing units.

All Current 38GR, GS, CE, CC, SE Units are factory wired to be started by their control relay or contactor that requires 24-volt power from external transformer. Sealed va power requirements for unit control relay or contactor are shown in table below. These condensing units have 2 yellow leads for control power (24 v) connections — 2-wire control

UNIT	38GR	38SE	38CE	38CC	38GS			
					014, 018	024, 030	036, 042	048, 060
POWER REQ (va)	10	10	14	10	10	14	9.5	

Current 38GS048-060, 38CC048-060, 38GR and 38SE units with CPCS come equipped with a transformer *used only to power internal controls* other than the control relay or contactor.

ACCESSORY TRANSFORMER — Installation of an accessory transformer in condensing unit means 3-control lead connections must be made — 3-wire control. These diagrams are not shown in this booklet. If an accessory transformer is required, mount it on indoor unit and use 2-wire hookup diagrams. It is recommended that one adequate transformer be used for entire system to avoid transformer phasing problems.

Phasing Transformers — When 2 transformers are used in a system and wired into one circuit, they must be phased. If transformers are not phased, they may be damaged. When transformers are in separate circuits, phasing is not necessary. Check phasing on transformers as follows:

Remove thermostat base from the subbase. Turn power on to system and take a voltage reading between subbase terminals Rh and Rc or R and 4. If a zero voltage reading is indicated, the transformers are phased. If other than a zero voltage reading is indicated, the transformers are not phased. To phase transformers, shut power off to system and switch position of line power leads to condensing unit. After switching leads, a zero voltage reading at subbase terminals Rh and Rc or R and 4 should be indicated.

Tag unit near controls to specify that this is a 2-transformer system.

HUMIDIFIER WIRING

Humidifiers are effective only when warm air is passing over them. Therefore, where possible, the system wiring diagrams in this booklet show the humidifier being energized with the furnace gas valve or electric heater rather than with the fan.

On some diagrams the humidifier components are connected *thru a relay* to furnace gas valve or electric heater. This wiring hookup maintains thermostat control point and ensures proper heating operation. With thermostat in heating mode the heating anticipator must be set to match the load on the circuit. If the above mentioned *relay was omitted* and the humidistat opened while the thermostat was calling for heat, the circuit load would change. This condition would change thermostat control point and provide unsatisfactory heating operation.

ELECTRONIC AIR CLEANER

When using the 31MB electronic air cleaner with the 40ES electric furnace, install a second relay (EAC-2) in the control circuit. On a call for heating, this relay prevents a feedback circuit which would bring on both heating and cooling at the same time. Use a single-pole, double-throw (SPDT) relay with a 24-v coil. This permits the 31MB to be energized on a call for cooling, heating or constant fan operation.

LEGEND

Auto. — Automatic	LPS — Low-Pressure Switch
C — Contactor or Cooling	OB — Oil Burner
CC — Cooling Compensator	R — Relay
CPCS — Compressor Protection Control System	Sw — Switch
CR — Control Relay	TB — Terminal Board
EAC — Electronic Air Cleaner	TC — Thermostat, Cooling
FR — Fan Relay	TH — Thermostat, Heating
GV — Gas Valve	Trans — Transformer
H — Heating	----- Field Wiring
HPS — High-Pressure Switch	———— Factory Wiring
Ht Ant — Heat Anticipator	 Field-Made Splice
IFR — Indoor Fan Relay	

WIRING DIAGRAM NOTES

1. Low-voltage (24-v) field wiring must be a minimum of 18 GA AWG for up to 50-ft runs.
2. Partial unit terminal boards are shown in most diagrams to indicate only terminals which are used.
3. Accessory humidifier and/or air cleaner connection diagrams are shown separately from main system diagrams. To combine accessories with main system diagrams, see Usage portion of Index.
4. For complete internal wiring of each unit (shown in system diagrams), refer to unit label diagram or Wiring Diagram booklet.

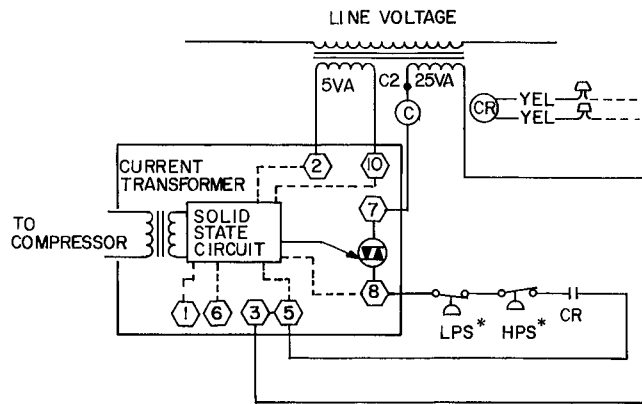
— 2 —



Fig 1

Fig 2,3,4,5,6

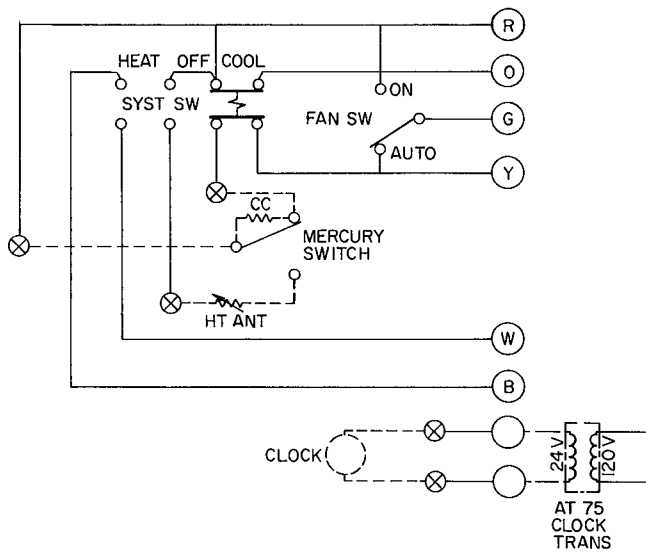




38GR, 38SE; 38GS, CC048, 060

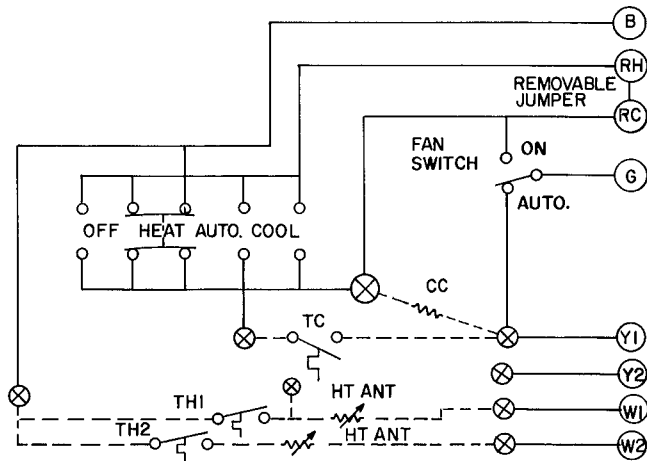
*38GS048, 060 not equipped with LPS or HPS.

Fig. 1 – CPCS Schematic with Control Relay



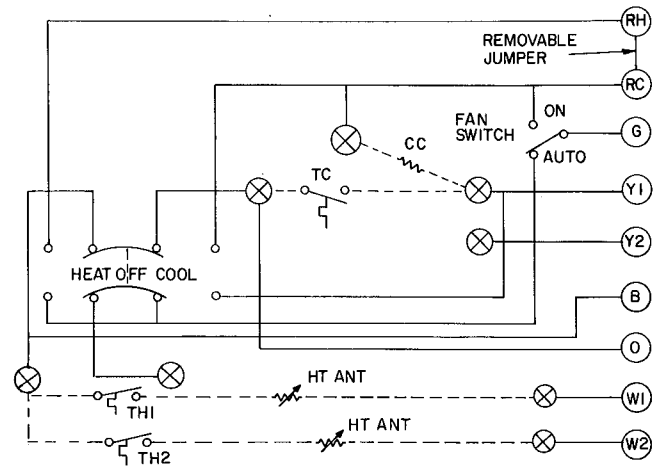
⊗ Denotes connection point between subbase and thermostat
 --- Thermostat wiring

Fig. 2 – HH93AZ041 Subbase With HH01AD041 Clock Thermostat (Night Set Back Thermostat)



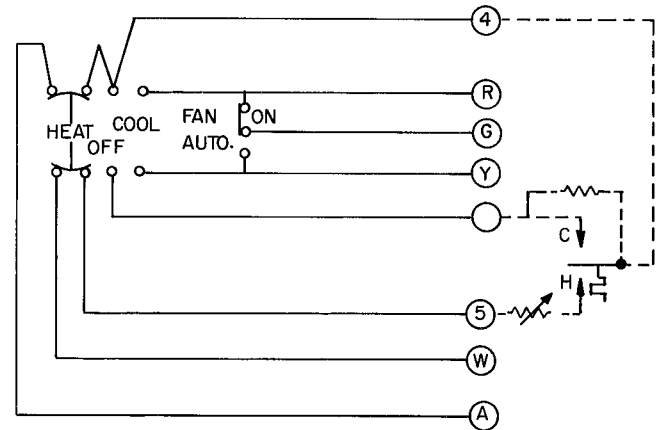
⊗ Denotes connection point between subbase and thermostat
 --- Thermostat wiring

Fig. 3 – HH93AZ076 Subbase Schematic



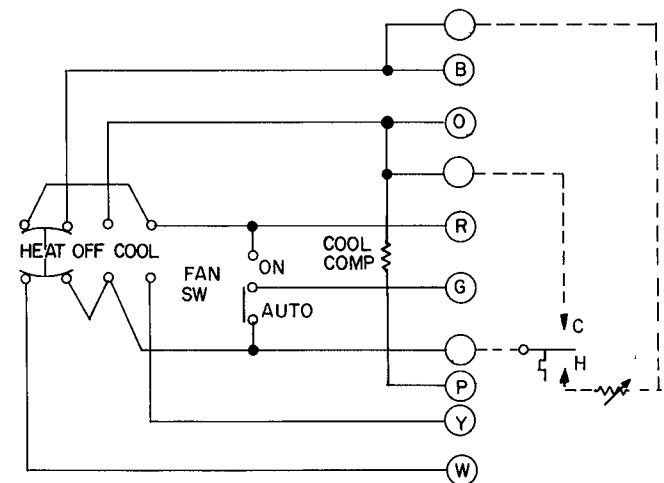
⊗ Denotes connection point between subbase and thermostat.
 --- Thermostat Wiring

Fig. 4 – HH93AZ078 Subbase Schematic



--- Thermostat wiring.

Fig. 5 – HH93AZ040,042 Subbase Schematics



--- Thermostat wiring.

Fig. 6 – HH93AZ044 Subbase Schematic

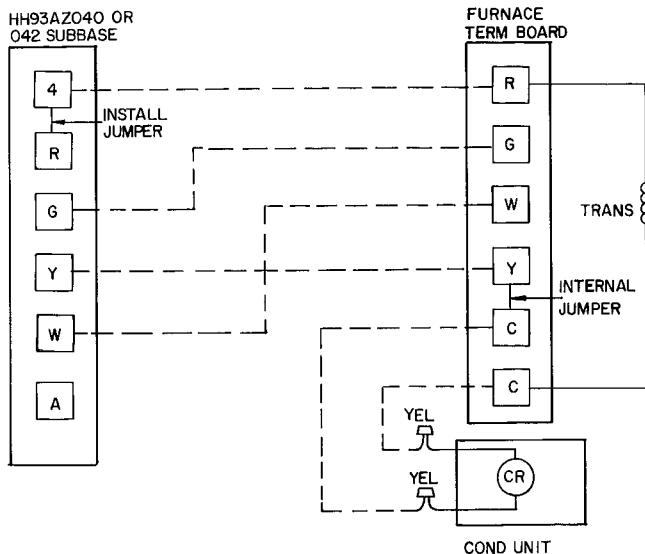


Fig. 7 – 38GR,GS,CE,CC,SE with 58BB,BD,GA;
Cooling and 1-Stage Heating

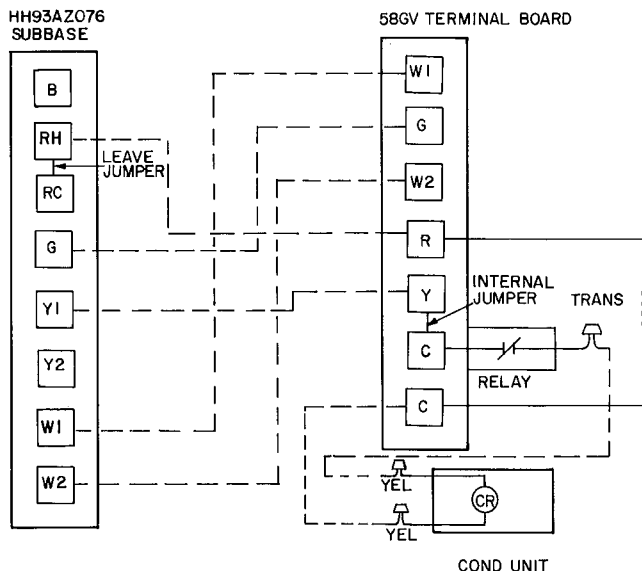


Fig. 10 – 38GR,GS,CE,CC,SE with 58GV;
Cooling and 2-Stage Heating

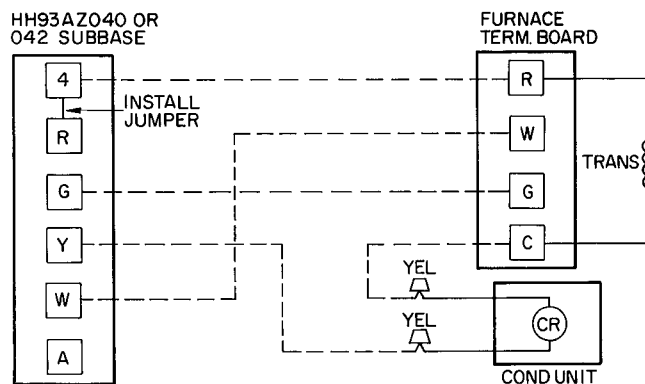
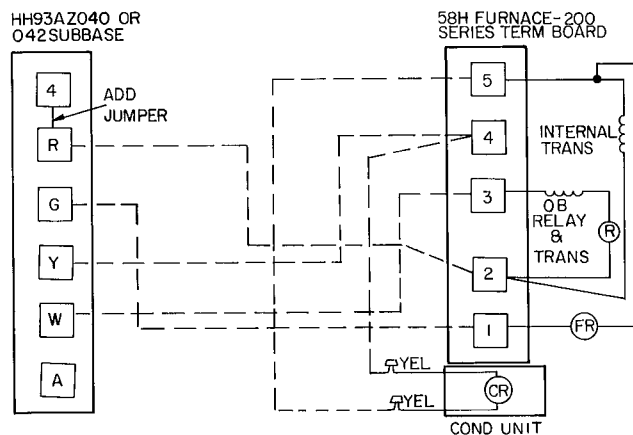


Fig. 8 – 38GR,GS,CE,CC,SE with 58DS;
Cooling and 1-Stage Heating



NOTE: IMPORTANT – Check voltage between terminals 3 & 5 on control enclosure. If voltage exceeds 24 volts interchange red & black leads at oil burner relay T-T connections

Fig. 11 – 38GR,GS,CE,CC,SE with 58H
(200 Series); Cooling and 1-Stage Heating

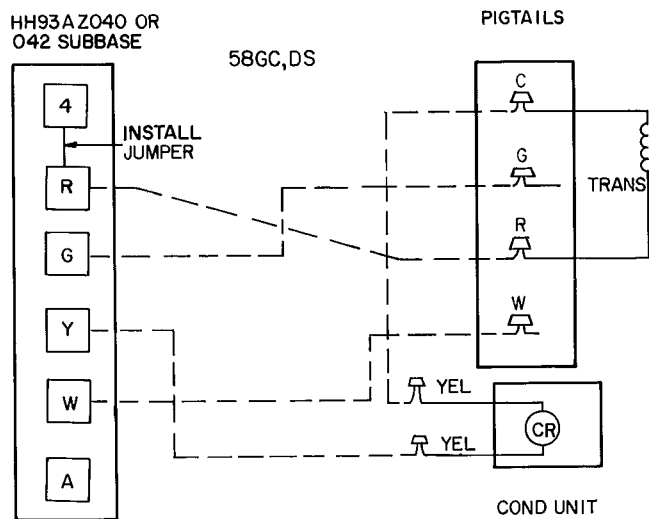


Fig. 9 – 38GR,GS,CE,CC,SE with 58GC,DS;
Cooling and 1-Stage Heating

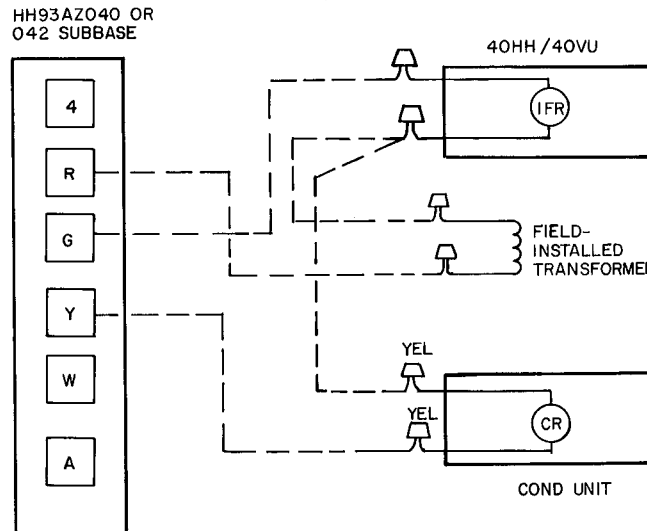


Fig. 12 – 38GR,GS,CE,CC,SE with 58CH
(200,300 Series); Cooling and 1-Stage Heating

HH93AZ040 OR
042 SUBBASE

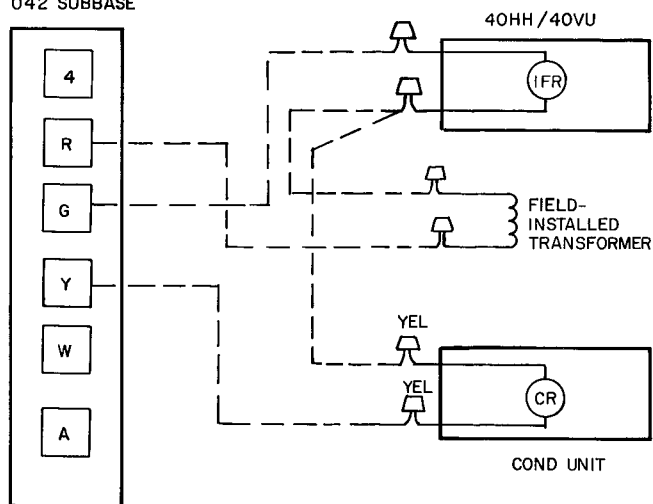
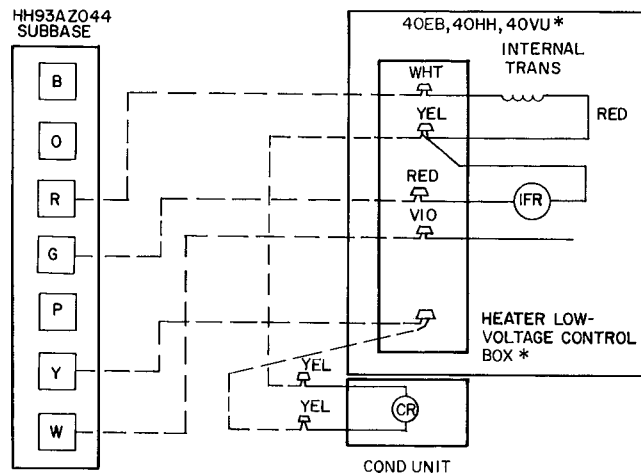


**Fig. 13 – 38GR,GS,CE,CC,SE with 40HH,VU;
Cooling Only**

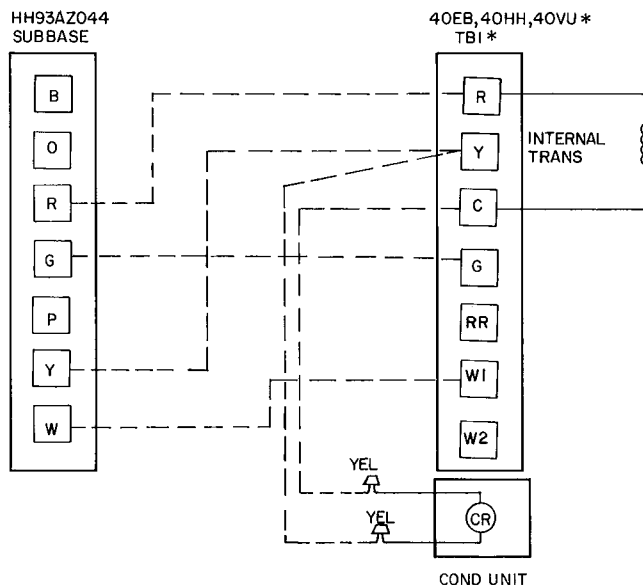
HH93AZ044
SUBBASE



*Furnace or fan coil (heater) not equipped with low-voltage terminal board.

**Fig. 15 – 38GR,GS,CE,CC,SE with 40EB,HH,VU;
Cooling and 1-Stage Heating**

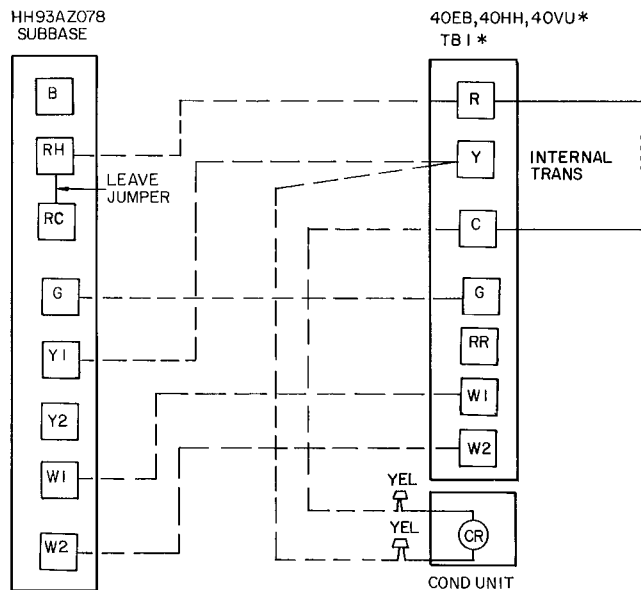
HH93AZ044
SUBBASE



*Furnace or fan coil (heater) equipped with low-voltage terminal board.

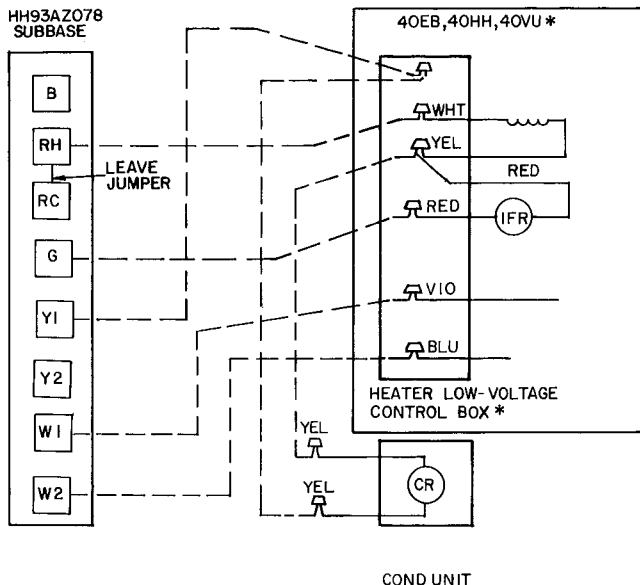
**Fig. 14 – 38GR,GS,CE,CC,SE with 40EB,HH,VU;
Cooling and 1-Stage Heating**

HH93AZ078
SUBBASE



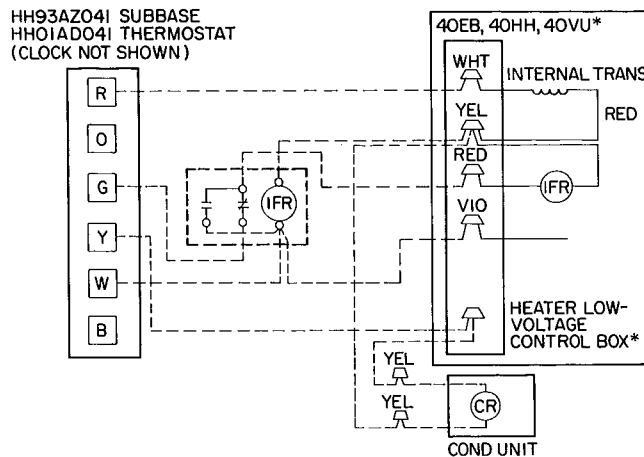
*Furnace or fan coil (heater) equipped with low-voltage terminal board

**Fig. 16 – 38GR,GS,CE,CC,SE with 40EB,HH,VU;
Cooling and 2-Stage Heating**



*Furnace or fan coil (heater) not equipped with low-voltage terminal board.

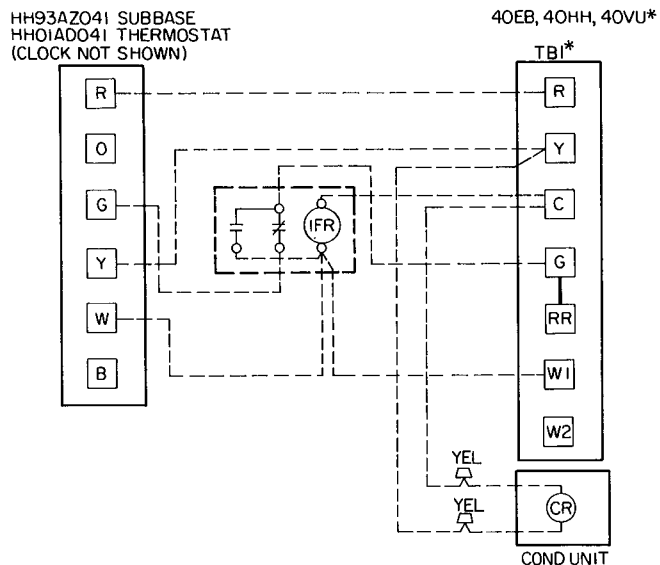
Fig. 17 — 38GR,GS,CE,CC,SE with 40EB,HH,VU; Cooling and 2-Stage Heating



IFR — Indoor Fan Relay (Field Supplied)

*Furnace or fan coil (heater) not equipped with low-voltage terminal board.

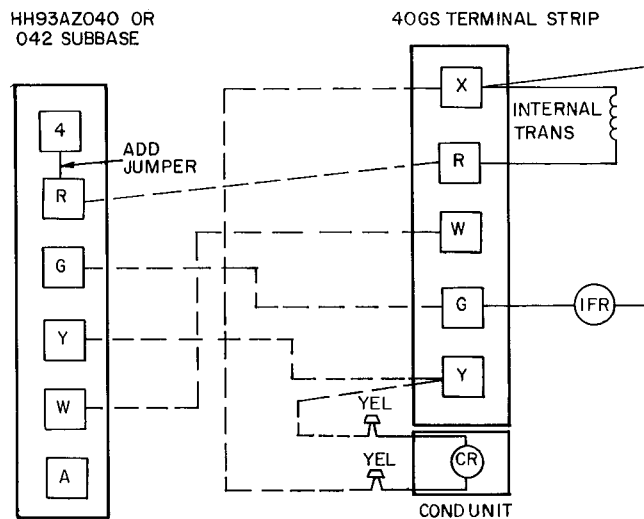
Fig. 19 — 38GR,GS,SE,CE,CC with 40EB,VU,HH and Energy Saver Thermostat; Cooling and 1-Stage Heating



IFR — Indoor Fan Relay (Field Supplied)

*Furnace or fan coil (heater) equipped with low-voltage terminal board

Fig. 18 — 38GR,GS,SE,CE,CC with 40EB,HH,VU and Energy Saver Thermostat; Cooling and 1-Stage Heating



NOTE For 40GS without heaters use accessory control package and omit W wire.

Fig. 20 — 38GR,GS,CE,CC,SE with 40GS; Cooling and 1-Stage Heating

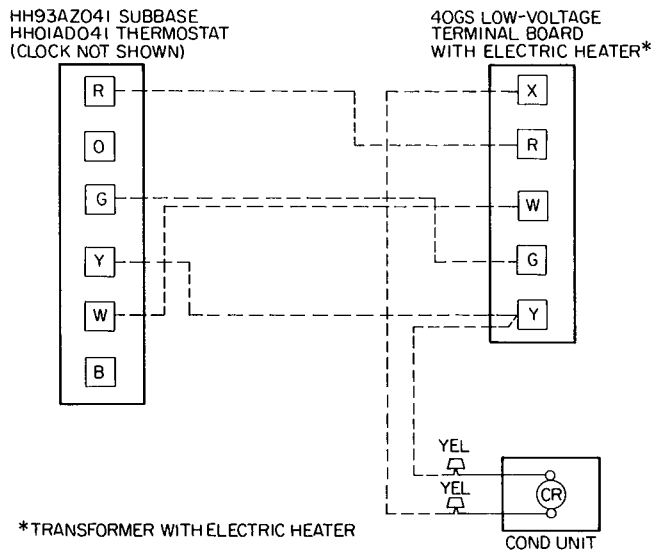


**Fig. 21 – 38GR,GS,SE,CE,CC with 40GS
and Energy Saver Thermostat;
Cooling and 1-Stage Heating**

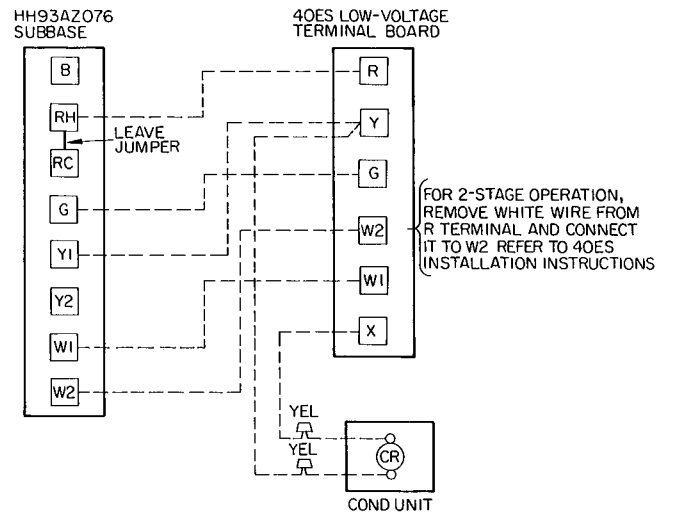


**Fig. 24 – 38GR,GS,SE,CE,CC with 40ES –
Cooling and 2-Stage Heating**

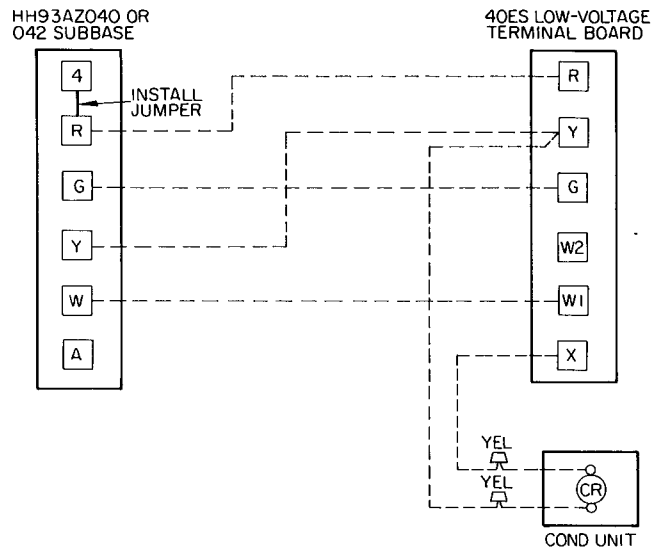


**Fig. 22 – 38GR,GS,SE,CE,CC with 40ES;
Cooling and 1-Stage Heating**

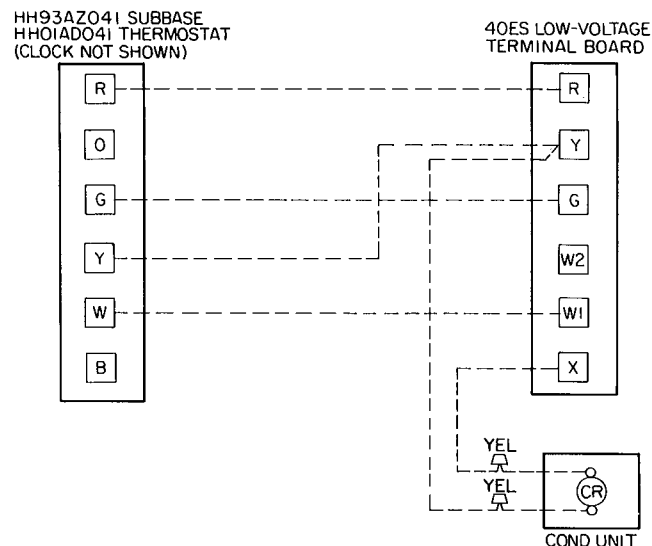


**Fig. 23 – 38GR,GS,SE,CE,CC with 40ES
and Energy Saver Thermostat;
Cooling and 1-Stage Heating**

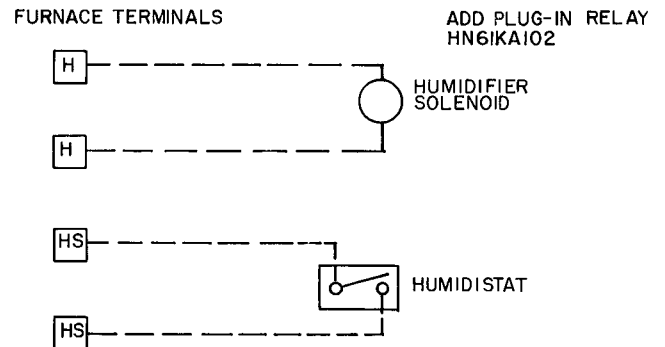
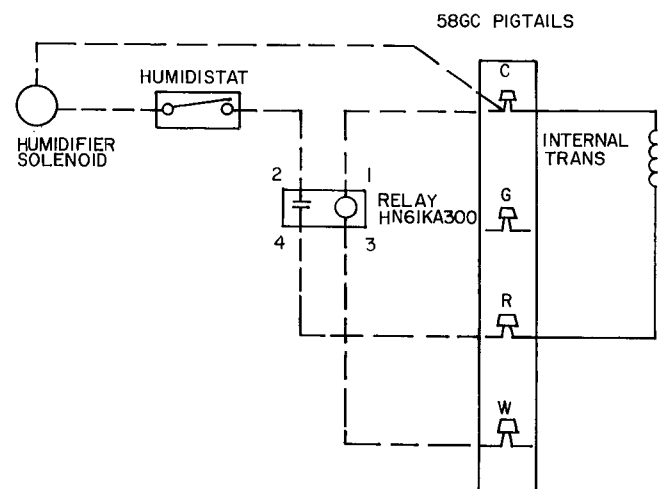


**Fig. 25 – 49BB or 49BH with 58GA
(200,300 Series), and 58BB,BD,GV,DS**



NOTES:

1. Set heating anticipator 14 amp higher
2. For 58GA,GC 100 Series furnaces connect 1 and 3 from relay to gas valve terminals and set anticipator up 14 amp.

**Fig. 26 – 49BB or 49BH with 58GC (200,300
Series) and 58GA,GC (100 Series)**

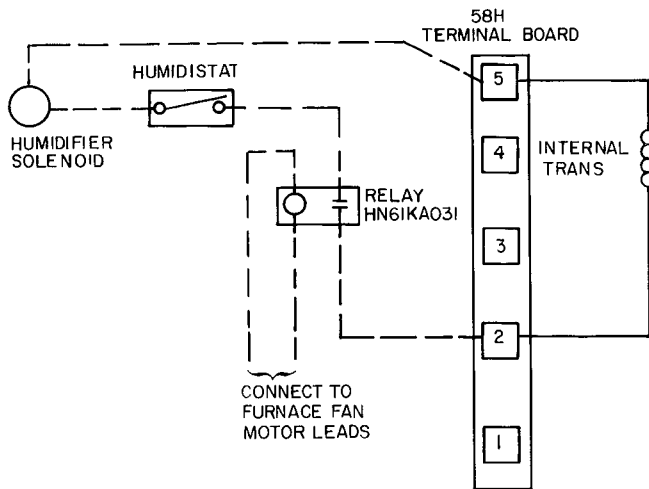
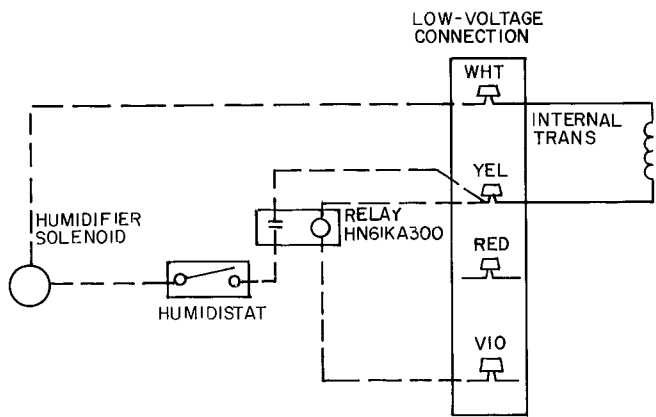
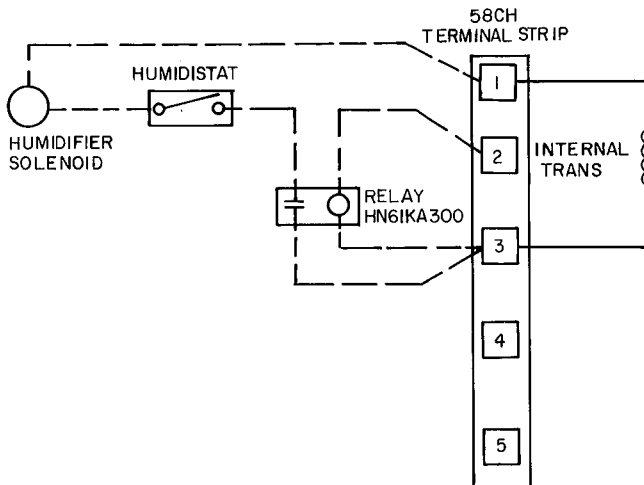


Fig. 27 – 49BB or 49BH with 58H (Single Speed)



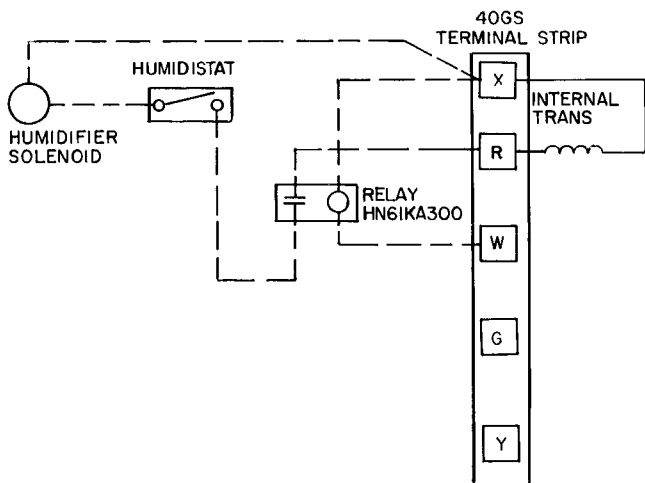
NOTE: Set 1st-stage heating anticipator 14 amp higher

Fig. 30 – 49BB or 49BH with 40EB, HH, VU (without Low-Voltage Terminal Board)



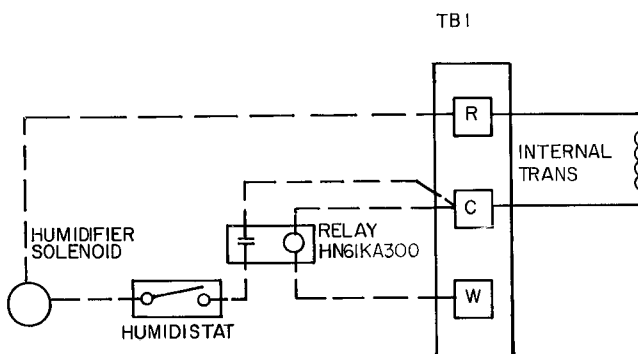
NOTE: Set heating anticipator 14 amp higher.

Fig. 28 – 49BB or 49BH with 58CH (200,300 Series)



NOTE: Set thermostat heating anticipator .14 amp higher.

Fig. 31 – 49BB or 49BH with 40GS (Equipped with Heater)



NOTE: Set 1st-stage heating anticipator 14 amp higher

Fig. 29 – 49BB or 49BH with 40EB, HH, VU (with Low-Voltage Terminal Board)

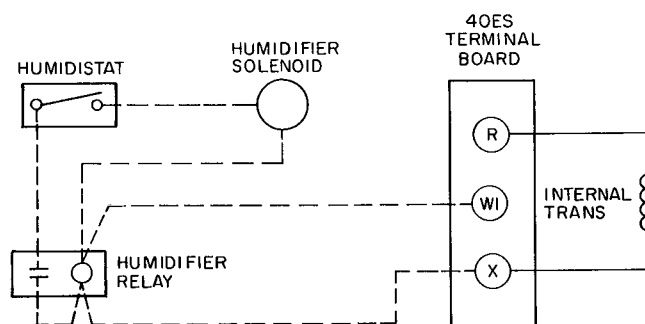
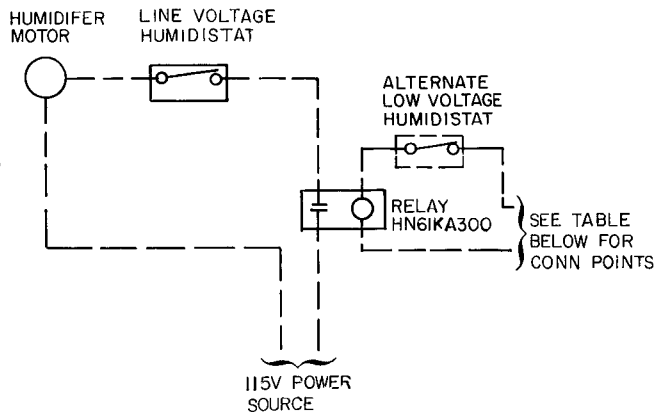


Fig. 32 – 49BB or 49BH with 40ES



NOTE: Set 1st-stage heating anticipator 14 amp higher

FIG. NO.	RELAY WIRE CONNECTIONS
9, 14, 16	C & W
15, 17	Yellow and Violet Pigtails
20, 21, 22, 23, 24	X-W Terminals
12	2-3 Terminals

Fig. 33 – 49CA or 49CB with 40EB,ES,HH,VU,GS or 58CH,GC,DS

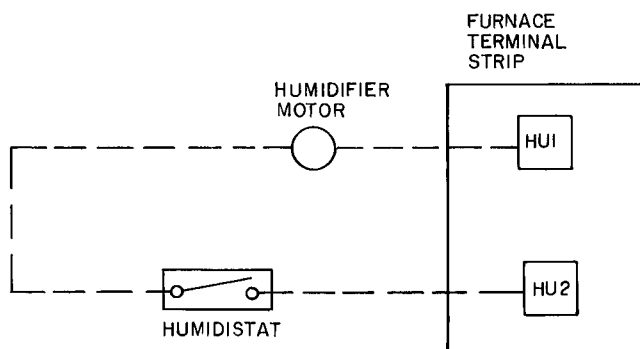


Fig. 34 – 49CA or 49CB with 58BB,BD,GA,GV,DS

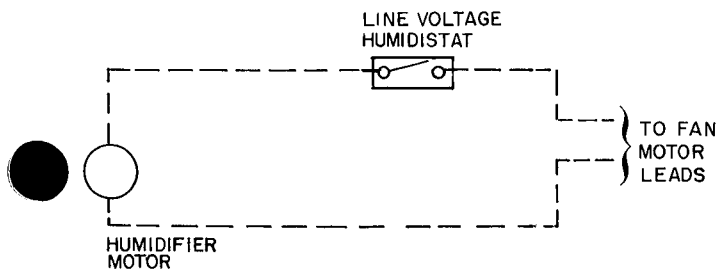
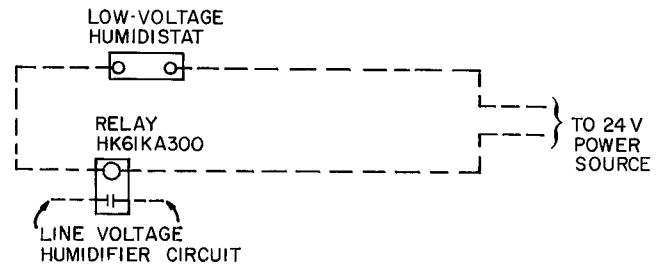


Fig. 35 – 49CA or 49CB with 58H (Single Speed)



NOTE: Wiring is identical to Fig. 33, 34 and 35 except additional relay contacts replace line voltage humidistat

Fig. 36 – 49CA or 49CB with Room Low-Voltage (24 v) Humidistat

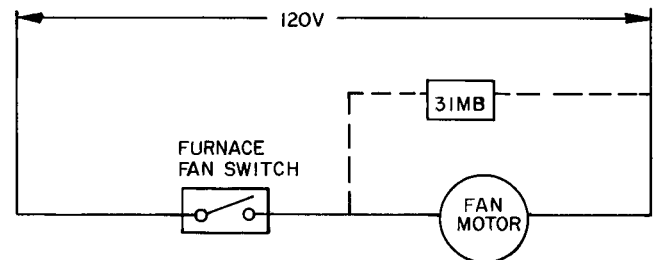


Fig. 37 – 31MB with Heating Only, Gas or Oil Furnace (Single-Speed or 2-Wire Speed Selector Motor)

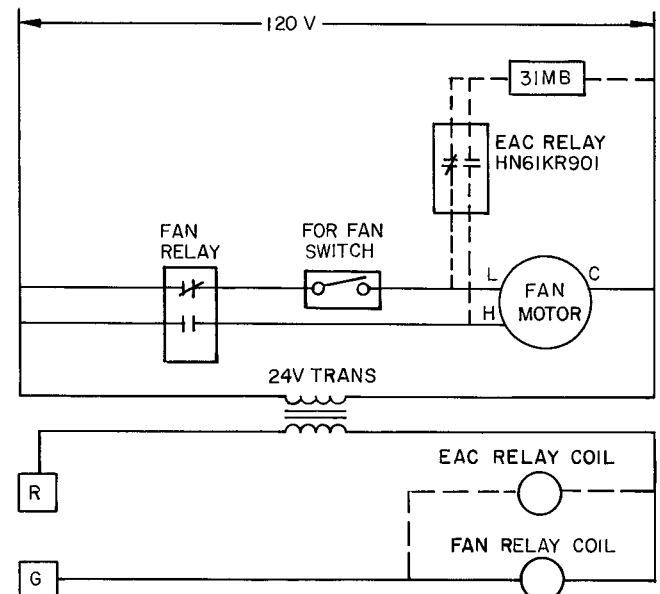


Fig. 38 – 31MB with Heating – Cooling, Gas or Oil Furnace (2-Speed Motor and Fan Relay)

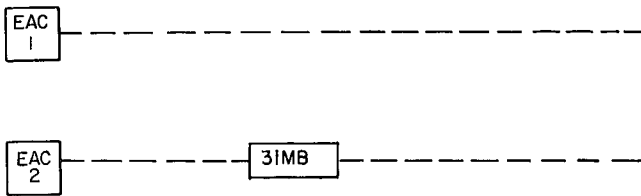


Fig. 39 — 31MB with Heating — Cooling, Furnace Equipped with Printed Circuit Control Center

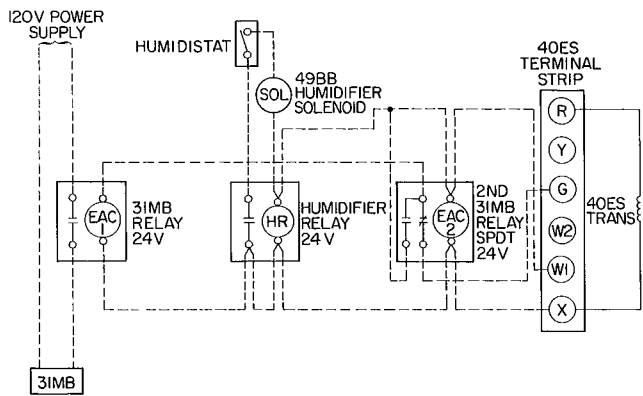


Fig. 42 — 31MB with 40ES and 49BB or 49BH

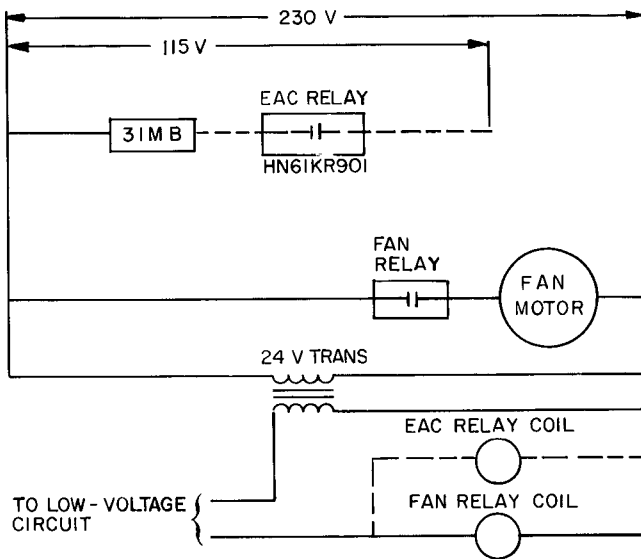


Fig. 40 — 31MB and Fan Coil (with or without Electric Heat)

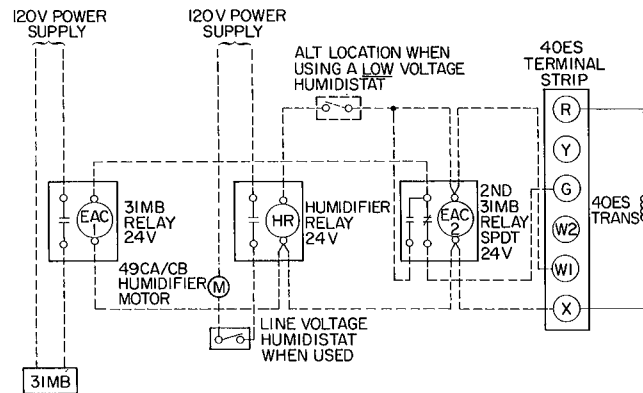


Fig. 43 — 31MB with 40ES and 49CA or 49CB

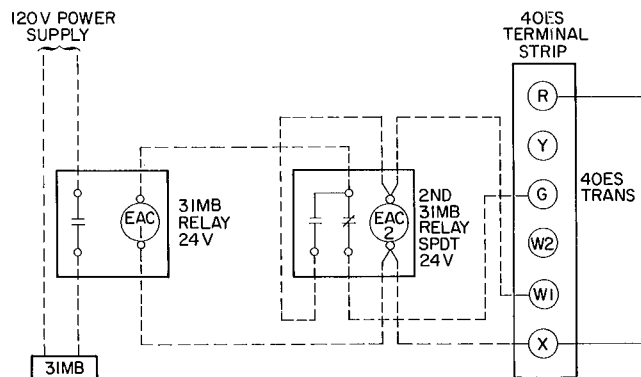


Fig. 41 — 31MB with 40ES

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

Tab 4

Form 38GR-1XA Supersedes 38GR,GS-1XA

Printed in U S A

8-74

PC 101

Catalog No 513-812

Book	1
Tab	3a