

SUPERSEDED BY 38GR-1XA 8/74

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 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 and described below is the 2-wire control hookup required for current 38GR,GS units, and the 3-wire hookup (with 1 and 2 transformers) used on former 38GS005,006 and 38GR units.

→ **NOTE:** Current (and former) model numbers for 38GS units are 38GS014, 38GS018 (38GS001), 38GS024 (38GS002), 38GS030 (38GS003), 38GS036 (38GS004), 38GS042 (38GS045), 38GS048 (38GS005), 38GS060 (38GS006). Former model numbers are used below for all 38GS units (except new 38GS014) to simplify text.

→ **All Current 38GR,GS Units** are factory wired to be started by their control relay or contactor that requires 24-volt power from external transformer. These units have 2 yellow leads for control power connection - 2-wire control. The control relay on 38GS005,006 and 38GR units has a power requirement of 9.5 va sealed. Contactor sealed va power requirement on 38GS014,001 is 5 va; 38GS002,003 is 14 va; 38GS004,045 is 12 va.

Current 38GS005,006 and 38GR units (from serial no. K200001) with CPCS come equipped with a transformer used only to power internal controls other than the control relay.

Former 38GR,GS Units — The 38GS005,006 and 38GR units (before serial no. K200001) with CPCS require 3-control lead connections — 3-wire control. They come equipped with a transformer that can be used to power external controls.

All 38GS001,002,003,004,045 units require 24-volt power from external transformer (similar to current units). Use current 2-wire control diagrams for these units. Installation of a 38GS accessory transformer in 38GS001 thru 045 units means a 3-wire hookup must be used. 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. Diagrams shown with 2 transformers indicate whether or not phasing is required. Check phasing on transformers (after system is wired) 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 terminal 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.

LEGEND

Auto. — Automatic	LPS — Low-Pressure Switch
C — Contactor	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
HPS — High-Pressure Switch	— — — Field Wiring
Ht Ant — Heat Anticipator	— — — Factory Wiring
IFR — Indoor Fan Relay	 Field-Made Splice

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.

WIRING DIAGRAM INDEX

MODEL	38GR,GS	31MB	40GS,HH,VU	40EB	49BB,CA	58BB,BD,CH, GA,GC,GV	58H
DESCRIPTION	Air-Cooled Condensing Units	Electronic Air Cleaner	Fan Coils	Electric Furnace	Humidifiers	Gas-Fired Furnaces	Oil-Fired Furnaces

Usage column below indicates diagrams that may be combined. Example Fig. 7 may be combined with Fig. 32 or Fig. 40 for 49BB or 49CA humidifier use.

(A) Cooling Only

② Cooling and 1-Stage Heating

(C) Cooling and 2-Stage Heating

CPCS SCHEMATICS Fig. 1.2

..... Fig. 1,2

THERMOSTAT SUBBASE SCHEMATICS Fig. 3,4,5,6

38GR,GS Condensing Units (Serial no. K200001 and after; 2-Wire Control)

with Thermostat Subbase and:

USE FIG. WITH FIG.

58BB,BD,GA (B)	7	32,40
58GC (B)	8	33,39
58GV (C)	9	32,40
58H (200 Series) (B)	10	34,41
58CH (B)	11	35,39
40HH,VU (A)	12	—
40EB,HH,VU (B) (With Low-Voltage Terminal Board)	13	36,39
40EB,HH,VU (B) (Without Low-Voltage Terminal Board)	14	37,39
40EB,HH,VU (C) (With Low-Voltage Terminal Board)	15	36,39
40EB,HH,VU (C) (Without Low-Voltage Terminal Board)	16	37,39
40GS (B)	17	38,39

38GS005,006 and 38GR Condensing Units (before Serial no. K200001;

3-Wire Control) with Thermostat Subbase and:

58BB,BD,GA (B) (2 Transformers)	18	32,40
58GC (B) (2 Transformers)	19	33,39
58GV (C) (2 Transformers)	20	32,40
58BB,BD,GA (B) (1 Transformer)	21	32,40
58GV (B) (1 Transformer)	22	32,40
40HH,VU (A) (1 Transformer)	23	—
40EB,HH,VU (B) With Low-Voltage Terminal Board (2 Transformers)	24	36,39
40EB,HH,VU (B) Without Low-Voltage Terminal Board (2 Transformers)	25	37,39
40EB,HH,VU (C) With Low-Voltage Terminal Board (2 Transformers)	26	36,39
40EB,HH,VU (C) Without Low-Voltage Terminal Board (2 Transformers)	27	37,39
40EB,HH,VU (B) With Low-Voltage Terminal Board (1 Transformer)	28	36,39
40EB,HH,VU (B) Without Low-Voltage Terminal Board (1 Transformer)	29	37,39
40EB,HH,VU (C) With Low-Voltage Terminal Board (1 Transformer)	30	36,39
40EB,HH,VU (C) Without Low-Voltage Terminal Board (1 Transformer)	31	37,39

49BB Humidifier (24 V) with:

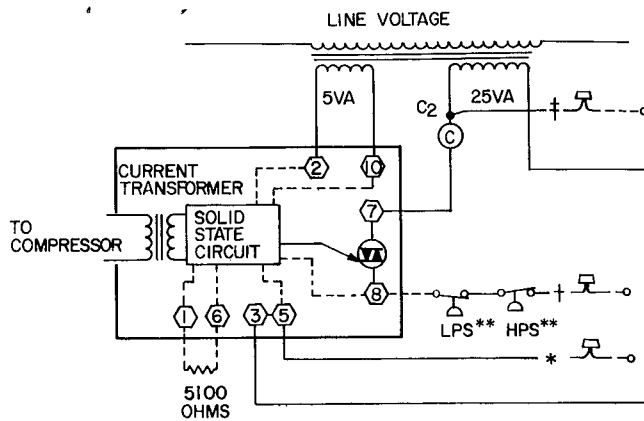
58GA (200,300 Series), 58BB,BD,GV	32	7,9,18,20,21,22
58GA (100 Series), 58GC (100,200,300 Series)	33	8,19
58H (Single Speed)	34	10
58CH	35	11
40EB,HH,VU With Low-Voltage Terminal Board	36	13,15,24,26,28,30
40EB,HH,VU Without Low-Voltage Terminal Board	37	14,16,25,27,29,31
40GS	38	17

49CA Humidifier (115 V) with:

58GC,CH 40EB,HH,VU,GS	39	8,11,13,14,15,16,17, 19,24,25,26,27,28,29,30,31
58BB,BD,GA,GV	40	7,9,18,20,21,22
58H	41	10
Humidistat (24-V Accessory)	42	—

31MB Electronic Air Cleaner with:

58 Furnaces (Heating Only With Single-Speed Fan Operation)	43	Refer to Furnace or Fan-Coil Label Diagram for Connection Points
58 Furnaces (Heating and Cooling With 2-Speed Fan Operation)	44	
58GA,GV	45	
40EB,GS,VU,HH	46	

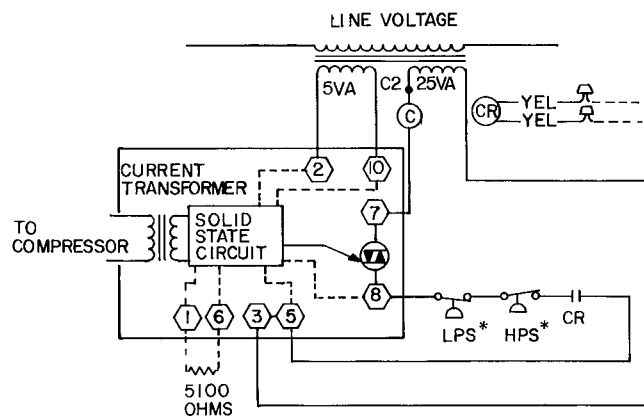


38GR; 38GS005,006

**38GS005,006 not equipped with LPS or HPS

LEAD COLORS	
38GR	38GS005,006
*Red	*Pink
†Blue	†White
‡White	‡Brown

Fig. 1 - CPCS Schematic
(Before Unit Serial No. K200001)



38GR; 38GS005,006

*38GS005,006 not equipped with LPS or HPS

Fig. 2 - CPCS Schematic with Control Relay
(Serial No. K200001 and After)

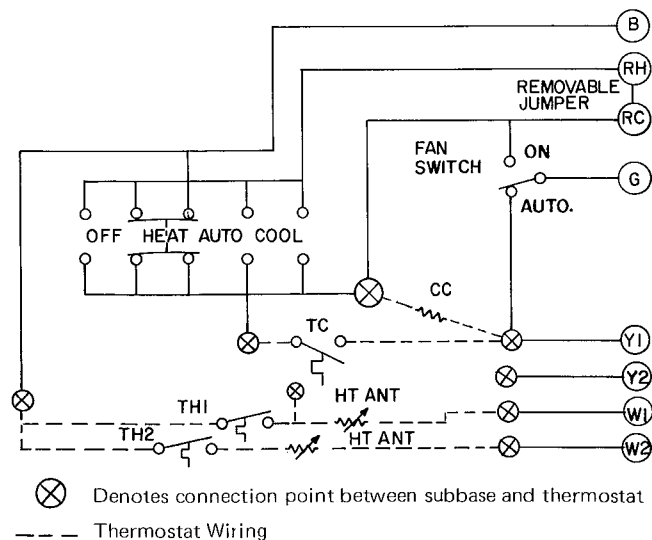


Fig. 3 - HH93AZ076 Subbase Schematic

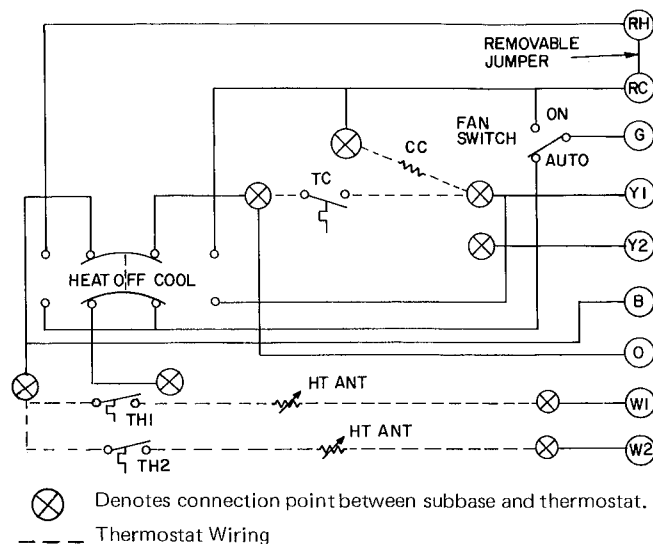


Fig. 4 - HH93AZ078 Subbase Schematic

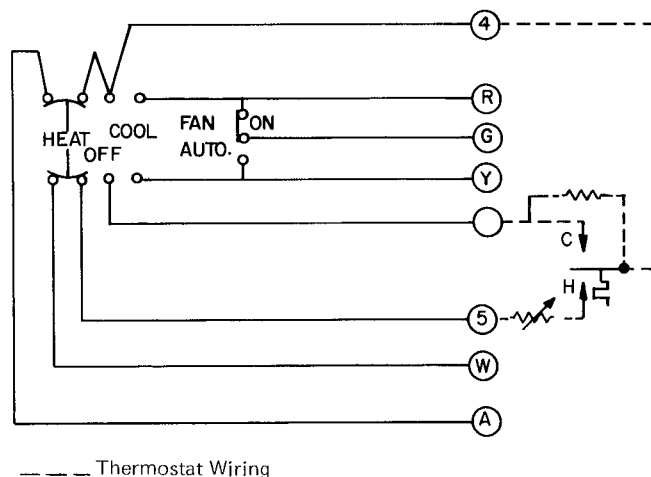


Fig. 5 - HH93AZ040,042 Subbase Schematics

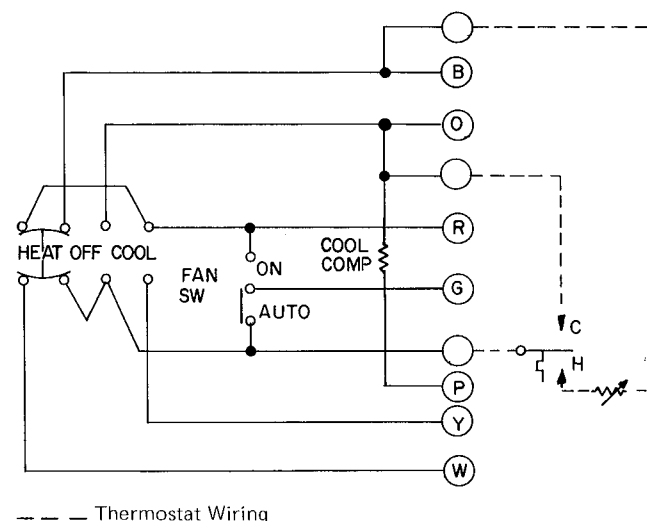


Fig. 6 - HH93AZ044 Subbase Schematic

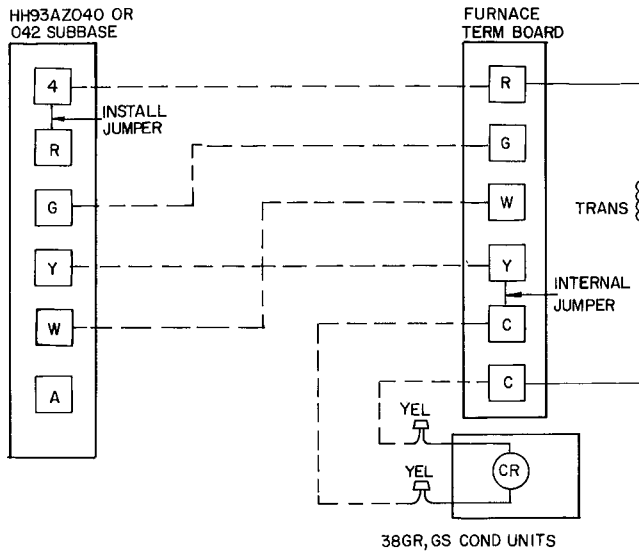


**Fig. 7 – 38GR,GS with 58BB,BD,GA;
Cooling and 1-Stage Heating**

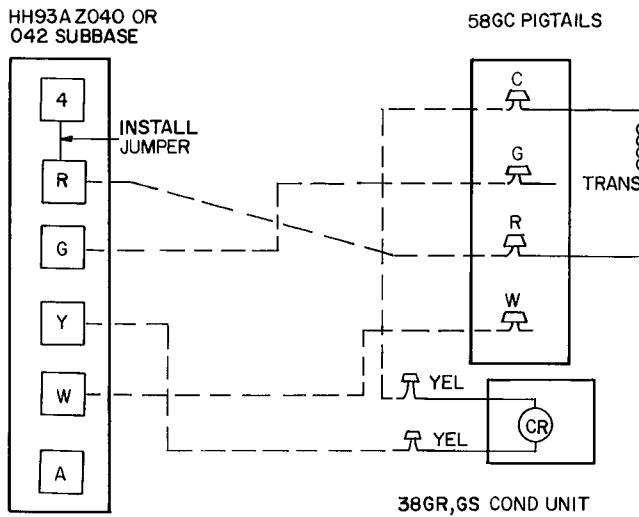


**Fig. 8 – 38GR,GS with 58GC;
Cooling and 1-Stage Heating**

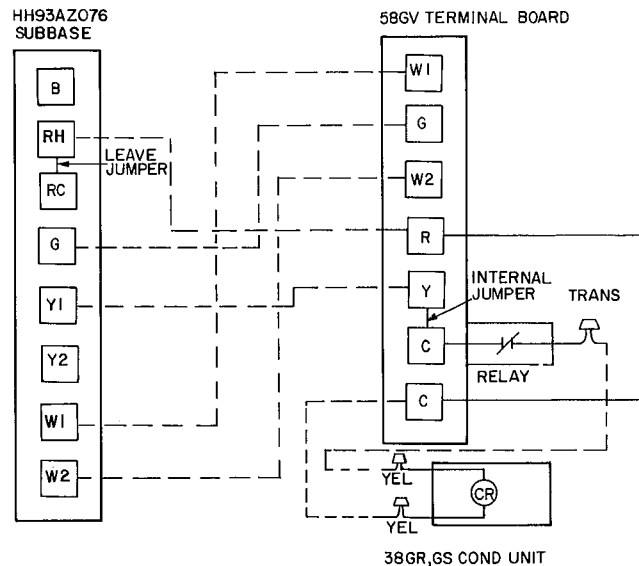
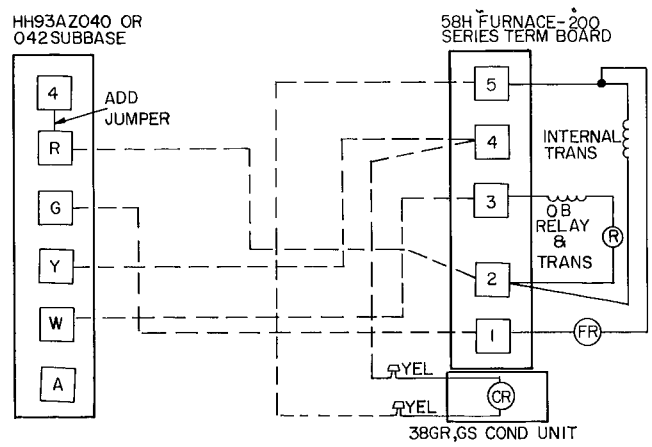


**Fig. 9 – 38GR,GS with 58GV;
Cooling and 2-Stage Heating**



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. 10 – 38GR,GS with 58H (200 Series);
Cooling and 1-Stage Heating**

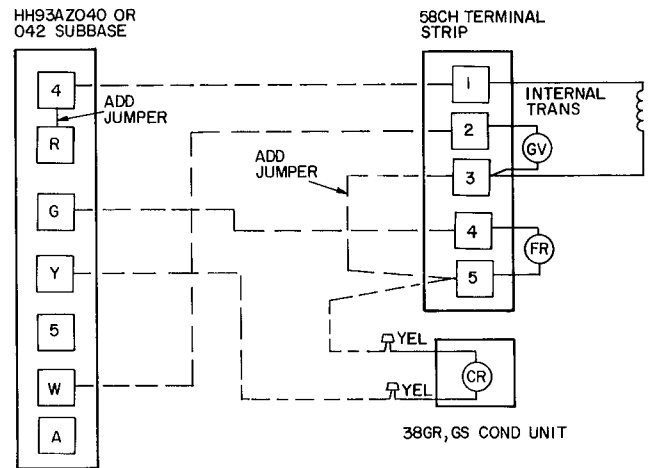


**Fig. 11 – 38GR,GS with 58CH (200,300 Series);
Cooling and 1-Stage Heating**

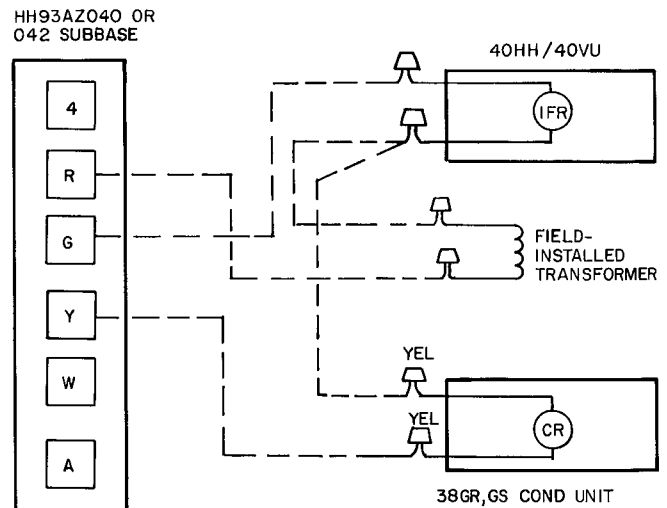
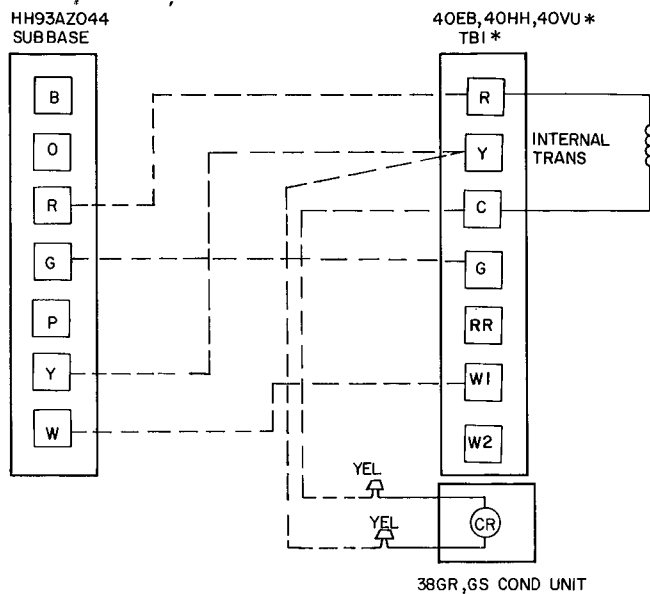
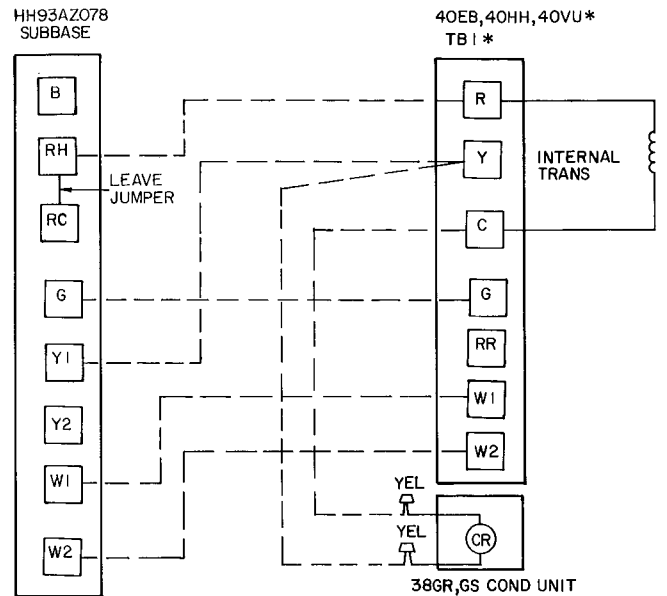


Fig. 12 – 38GR,GS with 40HH,VU; Cooling Only



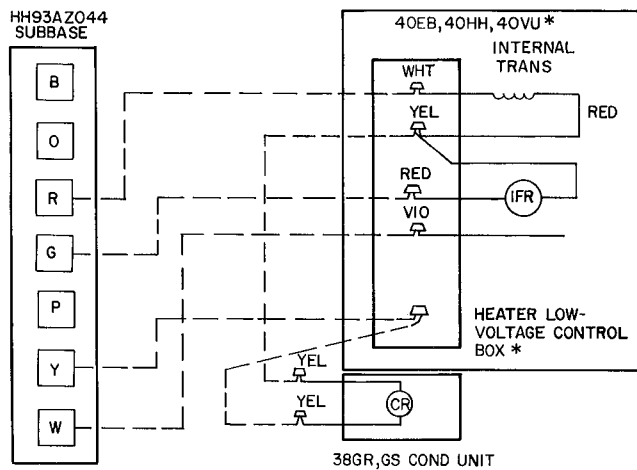
*Furnace or fan coil (heater) equipped with low-voltage terminal board

**Fig. 13 – 38GR,GS with 40EB,HH,VU;
Cooling and 1-Stage Heating**



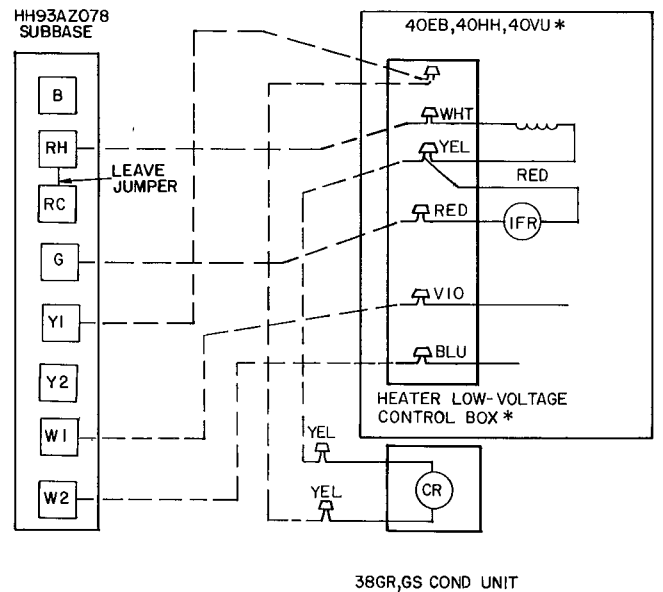
*Furnace or fan coil (heater) equipped with low-voltage terminal board

**Fig. 15 – 38GR,GS with 40EB,HH,VU;
Cooling and 2-Stage Heating**



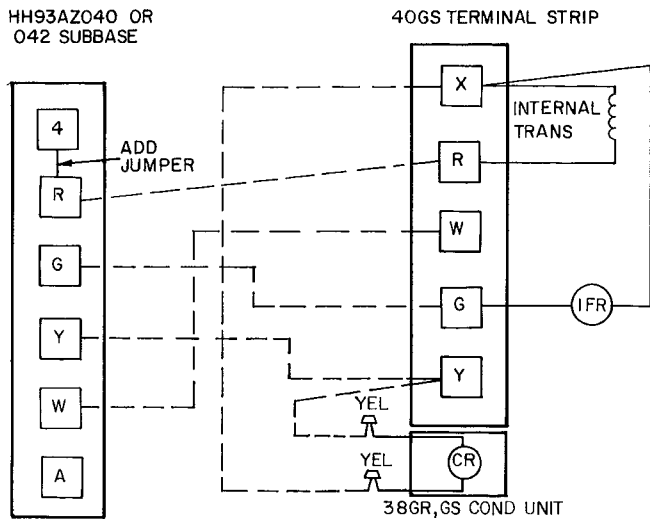
*Furnace or fan coil (heater) not equipped with low-voltage terminal board

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



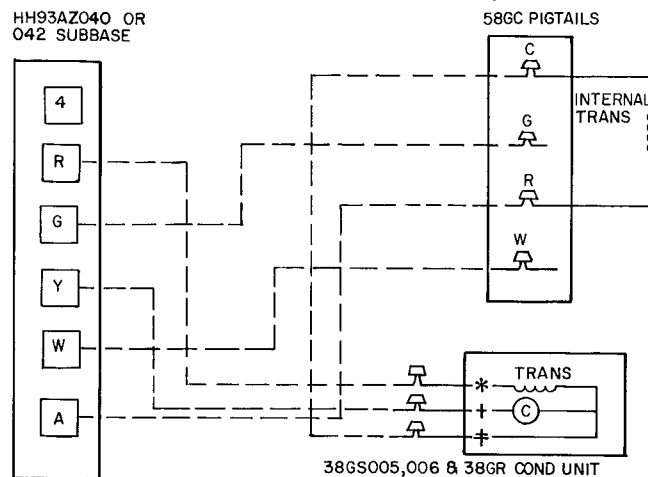
*Furnace or fan coil (heater) not equipped with low-voltage terminal board

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



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

**Fig. 17 – 38GR,GS with 40GS;
Cooling and 1-Stage Heating**

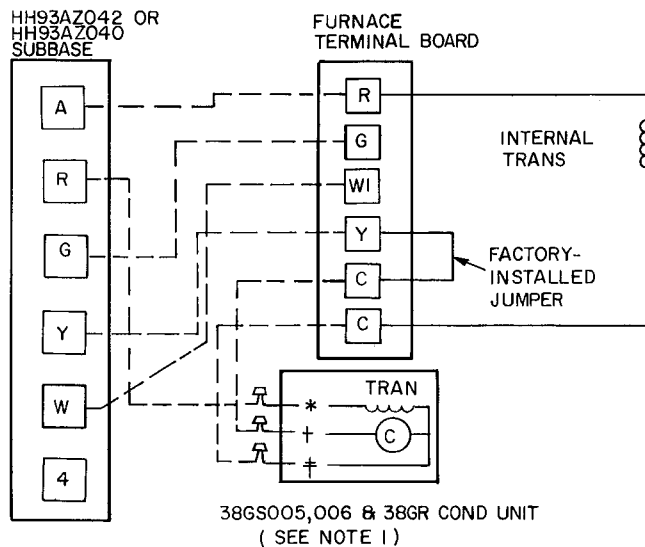


LEAD COLORS

38GR	38GS005,006
*Red	*Pink
†Blue	†White
‡White	‡Brown

NOTE: Transformer phasing required. (See page 1)

**Fig. 19 – 38GS005,006 and 38GR with 58GC;
Cooling and 1-Stage Heating; 2 Transformers**



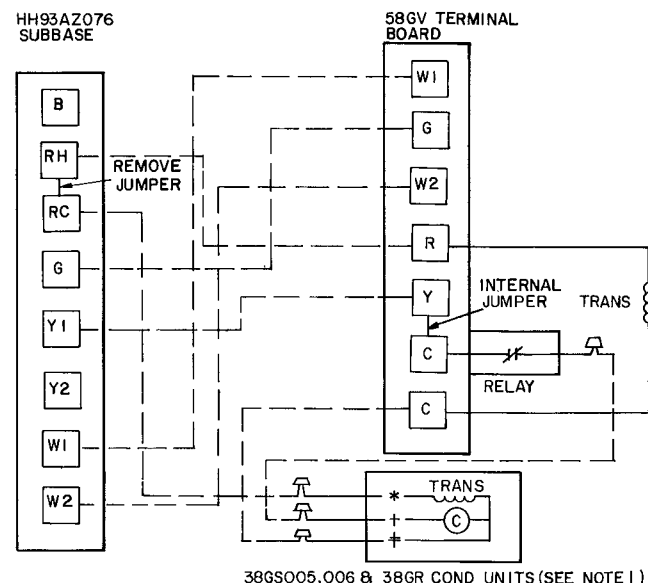
LEAD COLORS

38GR	38GS005,006
*Red	*Pink
†Blue	†White
‡White	‡Brown

NOTES

- 1 Safety circuit not shown
- 2 Phasing of transformers not necessary. Transformers are in separate circuits when using subbase terminal A
- 3 Continuous fan on heating is available when power is connected to condensing unit

**Fig. 18 – 38GS005,006 and 38GR with
58BB,BD,GA; Cooling and 1-Stage Heating;
2 Transformers**



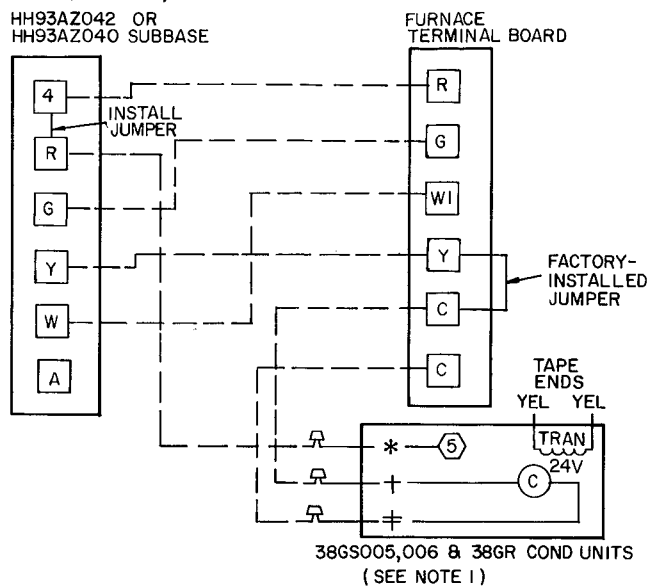
LEAD COLORS

38GR	38GS005,006
*Red	*Pink
†Blue	†White
‡White	‡Brown

NOTES

- 1 Safety circuit not shown
- 2 Transformer phasing required (See page 1)

**Fig. 20 – 38GS005,006 and 38GR with 58GV;
Cooling and 1-Stage Heating; 2 Transformers**

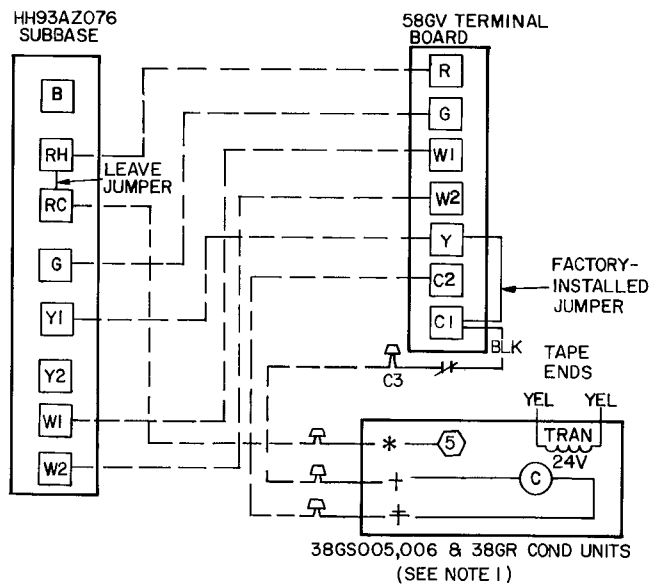


LEAD COLORS	
38GR	38GS005,006
*Red	*Pink
†Blue	†White
‡White	‡Brown

NOTES:

- 1 Safety circuit not shown
- 2 ⑤ is marked terminal on CPCS board.

Fig. 21 – 38GS005,006 and 38GR with 58BB,BD,GA; Cooling and 1-Stage Heating; 1 Transformer

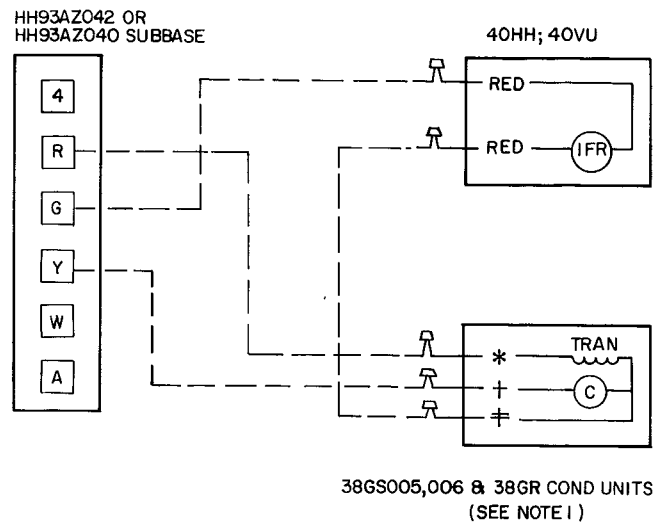


LEAD COLORS	
38GR	38GS005,006
*Red	*Pink
†Blue	†White
‡White	‡Brown

NOTES:

- 1 Safety circuit not shown
- 2 ⑤ is marked terminal on CPCS board

Fig. 22 – 38GS005,006 and 38GR with 58GV; Cooling and 2-Stage Heating; 1 Transformer

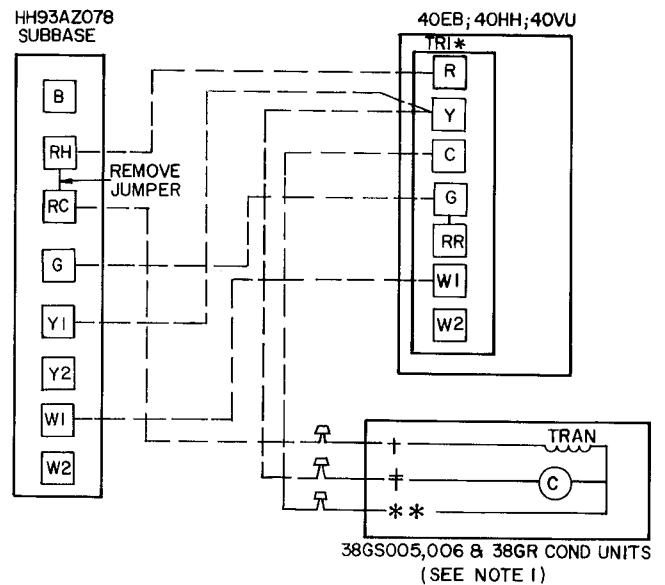


LEAD COLORS	
38GR	38GS005,006
*Red	*Pink
†Blue	†White
‡White	‡Brown

NOTES:

- 1 Safety circuit not shown
- 2 RR (Reed Relay in units with Accu-Air™) is the indoor fan relay

Fig. 23 – 38GS005,006 and 38GR with 40HH,VU; Cooling Only; 1 Transformer



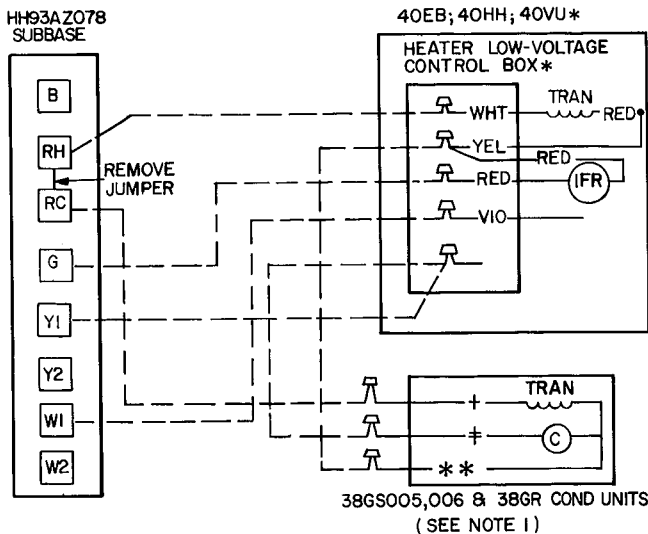
*Furnace or fan coil (heater) equipped with low-voltage terminal board.

LEAD COLORS	
38GR	38GS005,006
†Red	†Pink
‡Blue	‡White
**White	**Brown

NOTES:

- 1 Safety circuit not shown
- 2 Phasing of transformers not necessary. Transformers are in separate circuits when using this subbase
- 3 Continuous fan on heating is available when power is connected to condensing unit

Fig. 24 – 38GS005,006 and 38GR with 40EB,HH,VU; Cooling and 1-Stage Heating; 2 Transformers



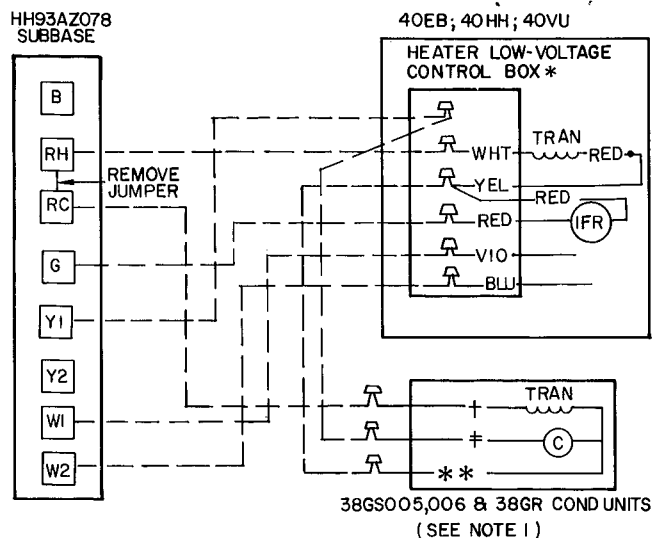
*Furnace or fan coil (heater) not equipped with low-voltage terminal board

LEAD COLORS	
38GR	38GS005,006
†Red	†Pink
‡Blue	‡White
**White	**Brown

NOTES:

- 1 Safety circuit not shown
- 2 RR (Reed Relay in units with Accu-Air™) is the indoor fan relay
- 3 Phasing of transformers not necessary. Transformers are in separate circuits when using this subbase.
- 4 Continuous fan on heating is available when power is connected to condensing unit

Fig. 25 – 38GS005,006 and 38GR with 40EB,HH,VU; Cooling and 1-Stage Heating; 2 Transformers



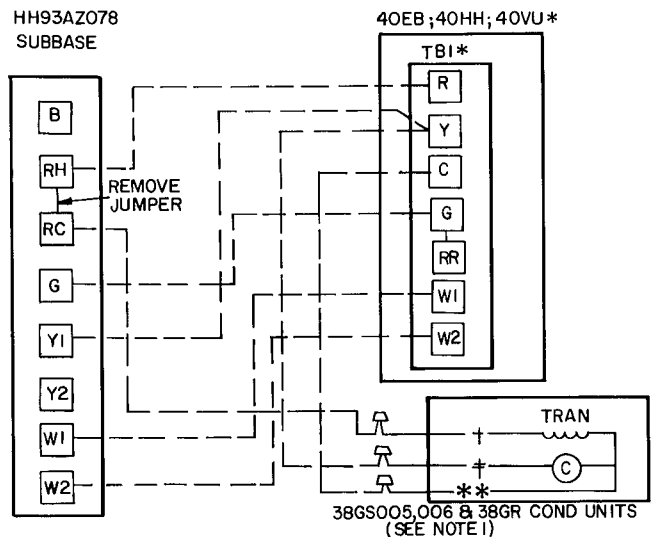
*Furnace or fan coil (heater) not equipped with low-voltage terminal board

LEAD COLORS	
38GR	38GS005,006
†Red	†Pink
‡Blue	‡White
**White	**Brown

NOTES:

- 1 Safety circuit not shown
- 2 RR (Reed Relay in units with Accu-Air™) is the indoor fan relay
- 3 Phasing of transformers not necessary. Transformers are in separate circuits when using this subbase.
- 4 Continuous fan on heating is available when power is connected to condensing unit

Fig. 27 – 38GS005,006 and 38GR with 40EB,HH,VU; Cooling and 2-Stage Heating; 2 Transformers



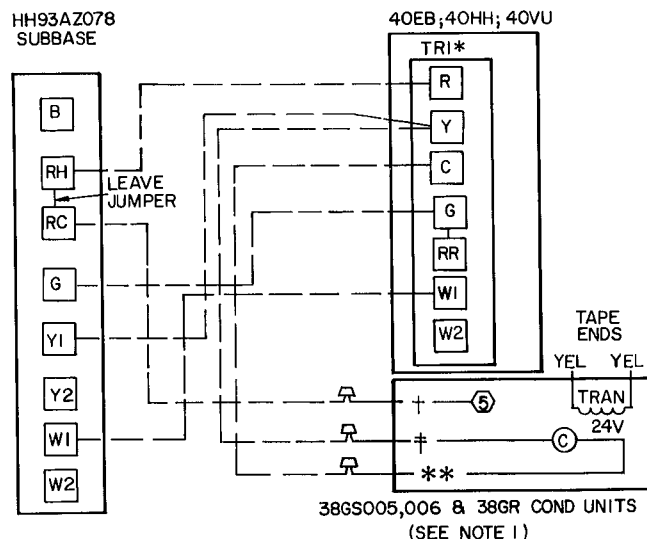
*Furnace or fan coil (heater) equipped with low-voltage terminal board

LEAD COLORS	
38GR	38GS005,006
†Red	†Pink
‡Blue	‡White
**White	**Brown

NOTES:

- 1 Safety circuit not shown
- 2 RR (Reed Relay in units with Accu-Air™) is the indoor fan relay
- 3 Phasing of transformers not necessary. Transformers are in separate circuits when using this subbase.
- 4 Continuous fan on heating is available when power is connected to condensing unit

Fig. 26 – 38GS005,006 and 38GR with 40EB,HH,VU; Cooling and 2-Stage Heating; 2 Transformers



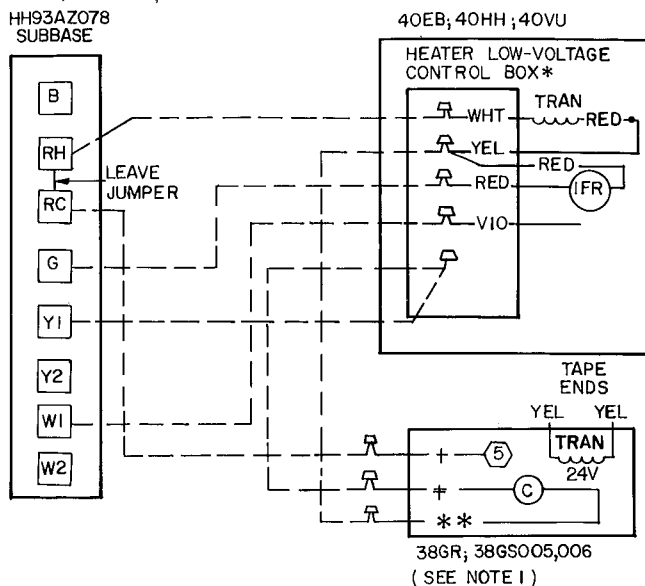
*Furnace or fan coil (heater) equipped with low-voltage terminal board

LEAD COLORS	
38GR	38GS005,006
†Red	†Pink
‡Blue	‡White
**White	**Brown

NOTES:

- 1 Safety circuit not shown
- 2 ⑤ is marked terminal on CPCS board

Fig. 28 – 38GS005,006 and 38GR with 40EB,HH,VU; Cooling and 1-Stage Heating; 1 Transformer



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

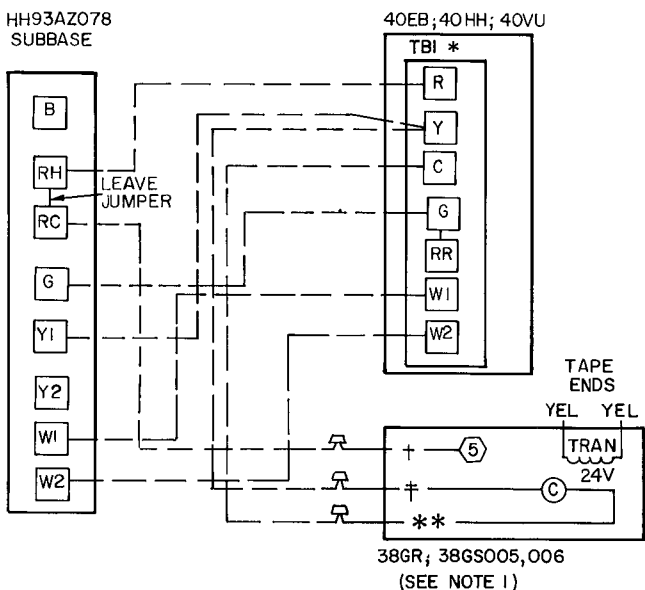
LEAD COLORS

38GR	38GS005,006
†Red	†Pink
‡Blue	‡White
**White	**Brown

NOTES

1. Safety circuit not shown
2. (5) is marked terminal on CPCS board
3. RR (Reed Relay in units with Accu-Air™) is the indoor fan relay

Fig. 29 – 38GS005,006 and 38GR with 40EB,HH,VU; Cooling and 1-Stage Heating; 1 Transformer



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

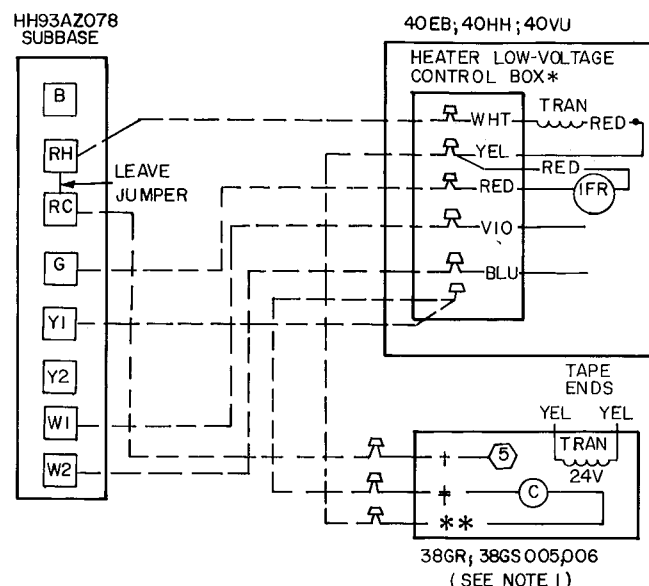
LEAD COLORS

38GR	38GS005,006
†Red	†Pink
‡Blue	‡White
**White	**Brown

NOTES:

1. Safety circuit not shown
2. (5) is marked terminal on CPCS board.

Fig. 30 – 38GS005,006 and 38GR with 40EB,HH,VU; Cooling and 2-Stage Heating; 1 Transformer



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

LEAD COLORS

38GR	38GS005,006
†Red	†Pink
‡Blue	‡White
**White	**Brown

NOTES:

1. Safety circuit not shown
2. (5) is marked terminal on CPCS board
3. RR (Reed Relay in units with Accu-Air™) is the indoor fan relay

Fig. 31 – 38GS005,006 and 38GR with 40EB,HH,VU; Cooling and 2-Stage Heating; 1 Transformer

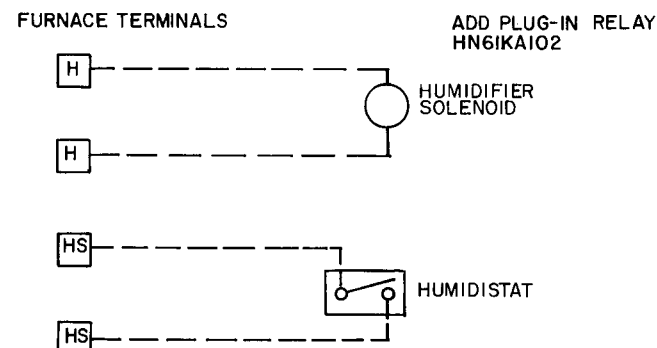
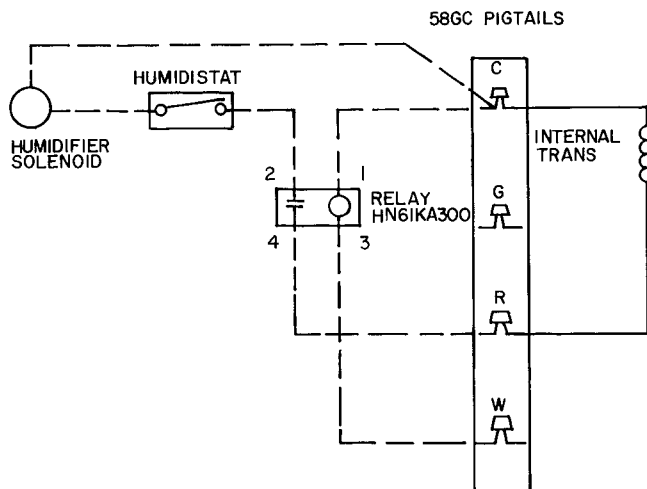


Fig. 32 – 49BB with 58BB,BD,GA (200,300 Series), GV



NOTES

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

Fig. 33 — 49BB with 58GC (200,300 Series) and 58GA,GC (100 Series)

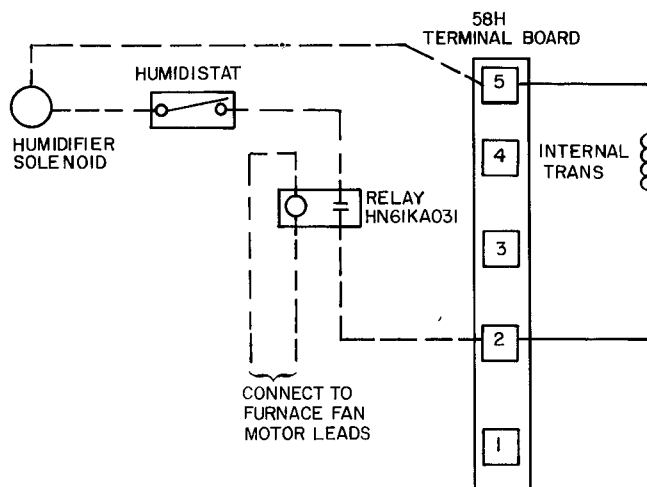
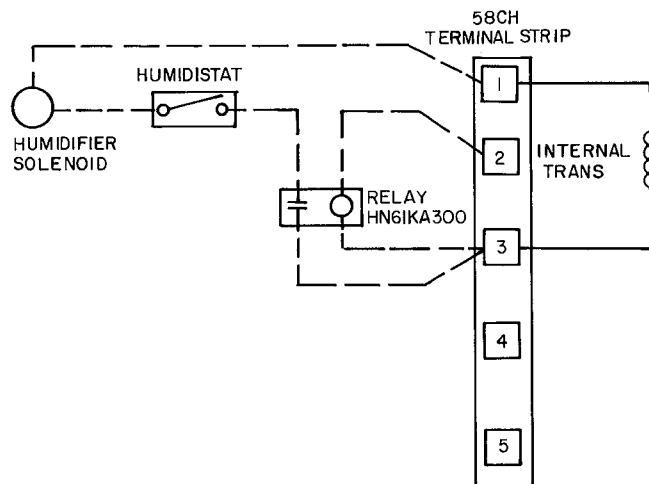
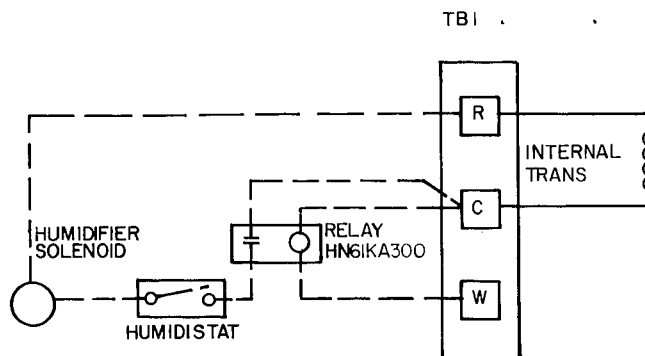


Fig. 34 — 49BB with 58H (Single Speed)



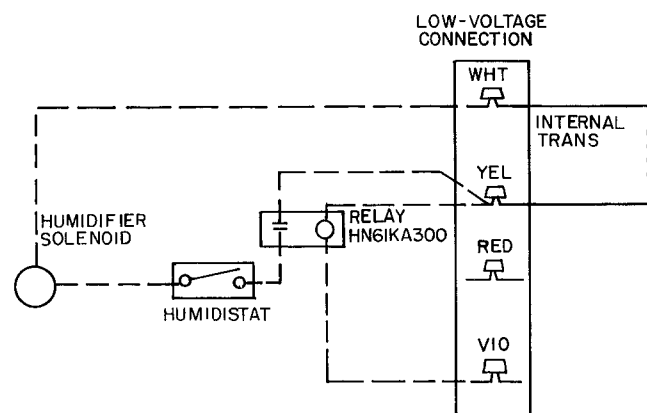
NOTE: Set heating anticipator 14 amp higher

Fig. 35 — 49BB with 58CH (200,300 Series)



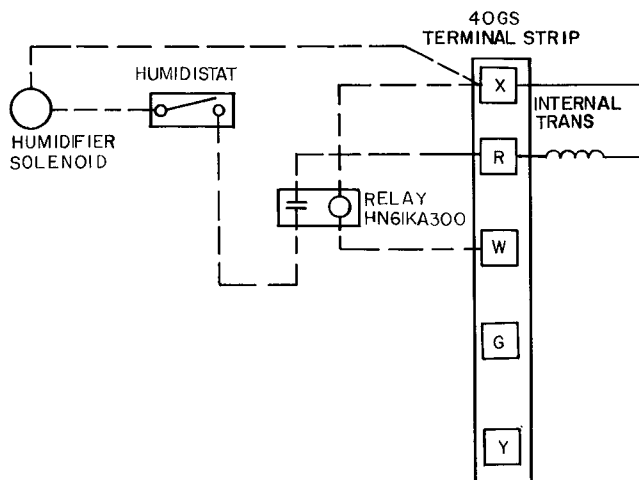
NOTE: Set 1st-stage heating anticipator 14 amp higher.

Fig. 36 — 49BB with 40EB,HH,VU (with Low-Voltage Terminal Board)



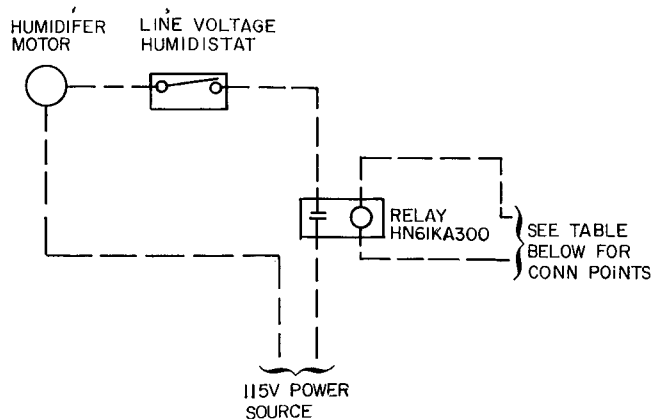
NOTE Set 1st-stage heating anticipator 14 amp higher

Fig. 37 — 49BB with 40EB,HH,VU (without Low-Voltage Terminal Board)



NOTE: Set thermostat heating anticipator 14 amp higher

Fig. 38 — 49BB with 40GS (Equipped with Heater)



NOTE Set 1st-stage heating anticipator 14 amp higher

FIG. NO.	RELAY WIRE CONNECTIONS
8, 13, 15, 19, 24, 26, 28 & 30	C & W
14, 16, 25, 27, 29 & 31	Yellow and Violet Pigtailed
17	X-W Terminals
11	2-3 Terminals

Fig. 39 – 49CA with 40EB,HH,VU,GS or 58CH,GC

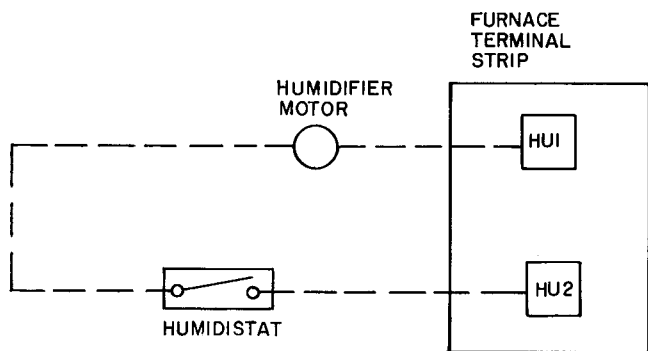


Fig. 40 – 49CA with 58BB,BD,GA,GV

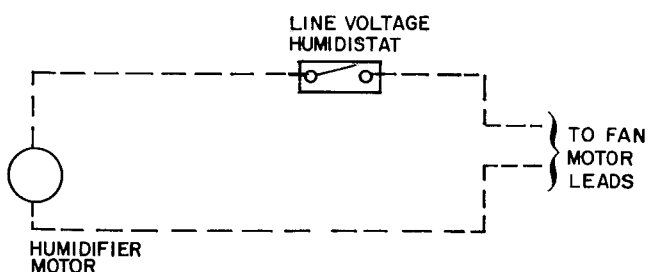
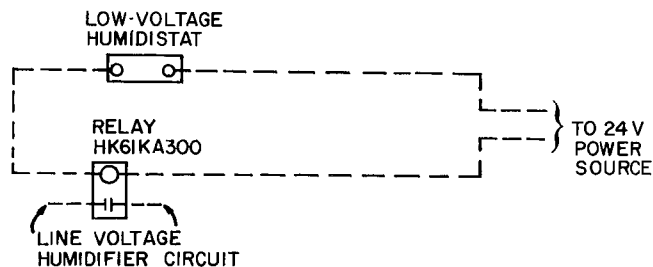


Fig. 41 – 49CA with 58H (Single Speed)



NOTE: Wiring is identical to Fig. 39, 40 and 41 except additional relay contacts replace line voltage humidistat

Fig. 42 – 49CA with Room Low-Voltage (24 v) Humidistat

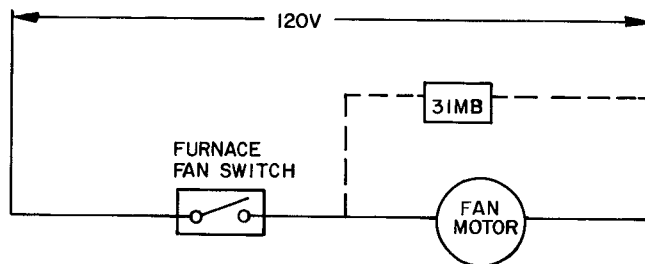


Fig. 43 – 31MB with Heating Only, Gas or Oil Furnace (Single-Speed or 2-Wire Speed Selector Motor)

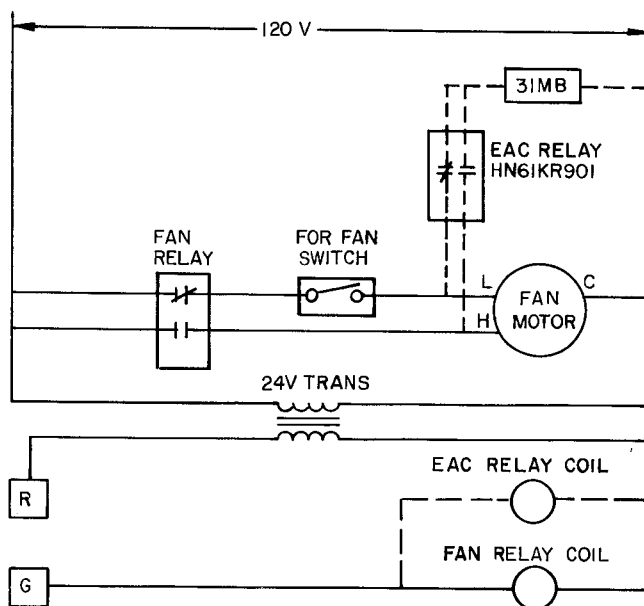


Fig. 44 – 31MB with Heating – Cooling, Gas or Oil Furnace (2-Speed Motor and Fan Relay)

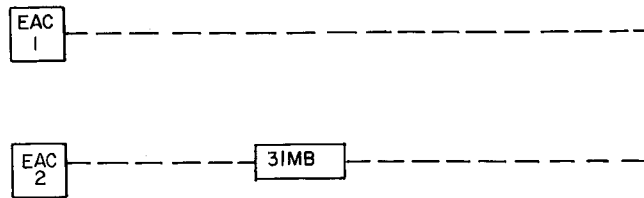


**Fig. 45 – 31MB with Heating – Cooling,
Furnace Equipped with Printed Circuit
Control Center**

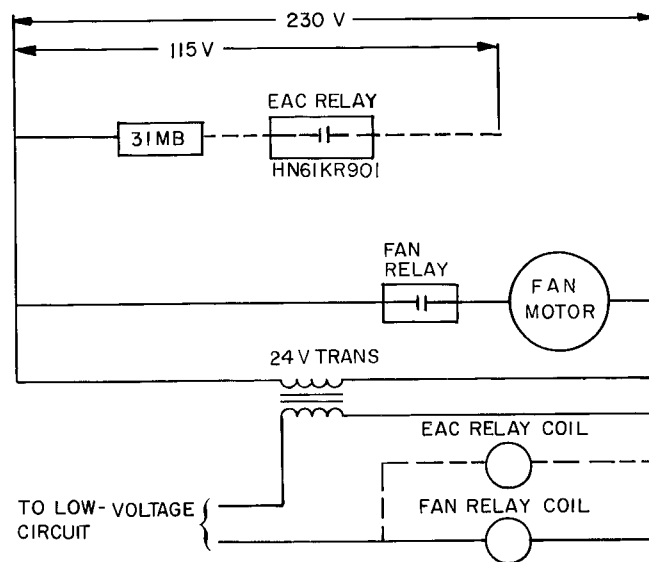


**Fig. 46 – 31MB and Fan Coil
(with or without Electric Heat)**

Manufacturer reserves the right to change any product specifications without notice.

CARRIER AIR CONDITIONING COMPANY • SYRACUSE, NEW YORK