MODINE

6-461

November, 2008

WIRING DIAGRAMS

gas-fired, power vented and separated combustion unit heaters for models HD/HDB, HDS/HDC, PTS/BTS

⚠ WARNING

1. Fuel supply shall be shut-off and the electrical power disconnected before proceeding with the installation. Failure to do so could result in fire, explosion, electrical shock, or the unit starting suddenly resulting in injury.
2. Failure to wire this unit according to this wiring diagram may result in injury to the installer or user. For deviations, contact factory.

IMPORTANT

1. The use of this manual is specifically intended for a qualified installation and service agency. All installation and service of these kits must be performed by a qualified installation and service agency.
2. These instructions must also be used in conjunction with the Installation and Service manual originally shipped with the appliance being converted, in addition to any other accompanying component supplier literature which supersedes these instructions.

Diagram Selection

Diagrams are provided for both single and three-phase circuits, and are readily identified in the selection table on page 2. The selection table enables easy selection of the correct wiring diagram after the electrical components of the unit heater have been determined.

Diagram Interchangeability

The following gas-fired unit heater wiring diagrams are for either single-phase power, or three-phase electrical service. The single-phase diagrams may be utilized for 120V, 208V or 230V/60Hz/1φ power. The three-phase diagrams may be utilized for 208V, 230V, 460V and 575V/60Hz/3φ power.

NOTE: As indicated in every diagram, all wiring must comply with the National Electrical Code and all local codes. All components must agree with their respective power source.

Abbreviations and Symbols

To facilitate interpretation and enable simplification the abbreviations and symbols have been selected as recommended by ANSI (American National Standards Institute) and NEMA (National Electrical Manufacturers Association) standards.

XFMR or TR	Transformer
H1, H2, etc.	Transformer Primary Terminals
X1, X2, etc.	Transformer Secondary Terminals
V	Volts
Hz	Hertz
ø	Phase
RC	Relay Contactor Coil
G	Ground
H	Hot
SW	Switch
HI	High
LO	Low
C	Common
“J” Box	Junction Box
SUM	Summer Contact (Summer/Winter Switch)
WIN	Winter Contact (Summer/Winter Switch)
S/W	Summer/Winter Switch
O.L.C.	Overload Contacts
SPDT	Single Pole Double Throw Switch
VA	Volt-Ampere
L1, L2, L3	Load Terminals (Connect to Supply Voltage)
T1, T2, T3	Motor or Motor Starter Terminals
Wire Color Coding	
BK	Black
BL	Blue
R	Red
W	White
Y	Yellow

THIS MANUAL IS THE PROPERTY OF THE OWNER.
PLEASE BE SURE TO LEAVE IT WITH THE OWNER WHEN YOU LEAVE THE JOB.

WIRING DIAGRAMS – MODELS HD/HDB, HDS/HDC, PTS/BTS

Wiring Diagram Selection

Select the correct wiring diagram as follows:

1. Determine the 12 digit unit heater model number. Example: PTS350SS0122
2. Breakdown the model number into the following parts:
   a. Model (PTS from example in Step 1)
   b. Size (350 from example in Step 1)
   c. Power Code (01 from example in Step 1)
   d. Control Code (22 from example in Step 1)
3. Review the model number breakdown from Step 2 against Table 3.1 to select the correct wiring diagram.

Table 3.1 – Wiring Diagram Page Location Index

Type	Model	Size	Power Code	Supply Voltage	Control Code	Gas Controls	Wiring Diagram	Page
Propeller	HD/HDS	30-125	01 ①	115V/1ph	11 or 21	Single Stage	5H079963B1	3
					12 or 22	Two Stage	5H079963B2	4
	PTS	150-350	01 ①	115V/1ph	11 or 21	Single Stage	5H079963B1	3
					12 or 22	Two Stage	5H079963B2	4
		400	01 ①	115V/1ph	11 or 21	Single Stage	5H079963B3	5
					12 or 22	Two Stage	5H079963B4	6
Blower	HDB/HDC	60-125	01 ②	115V/1ph	11 or 21	Single Stage	5H079963B1	3
					12 or 22	Two Stage	5H079963B2	4
	BTS	150	01 ②	115V/1ph	11 or 21	Single Stage	5H079963B1	3
					12 or 22	Two Stage	5H079963B2	4
		150-400	02, 13, 24,35 ②	115/230V/1ph	11 or 21	Single Stage	5H080273B1	7
					12 or 22	Two Stage	5H080273B2	8
			08, 11, 19, 22, 30, 33, 38, 41, 42, 44, 49, 53, 55, 60, 64, 66, 71, 75, 77 ②	208/230/460/575V/3ph	11 or 21	Single Stage	5H080274B1	9
					12 or 22	Two Stage	5H080274B2	10

① All propeller models (HD/HDS/PTS) are Power Code 01 for 115V/60Hz/1ph supply voltage only. To operate the unit on a supply voltage other than 115V/1ph, an accessory step down transformer is required. Refer to the latest revision of Literature #6-567 for instructions on properly wiring the unit heater and transformer.

② All blower models (HDB/HDC/BTS) that are operated with a supply voltage other than 115V/1ph, an accessory step down transformer is required. Refer to the latest revision of Literature #6-567 for instructions on properly wiring the unit heater and transformer.

Thermostat and Summer/Winter Switch Wiring Diagram Selection

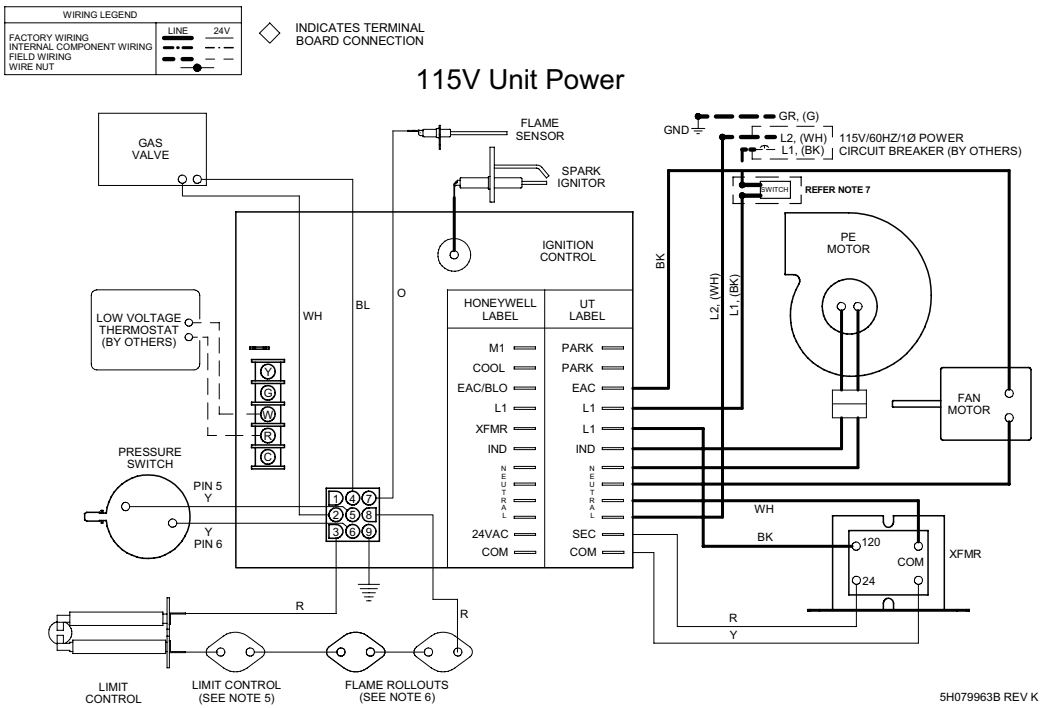
Units are equipped as standard with a controller that activates the unit fan in either of the following ways:

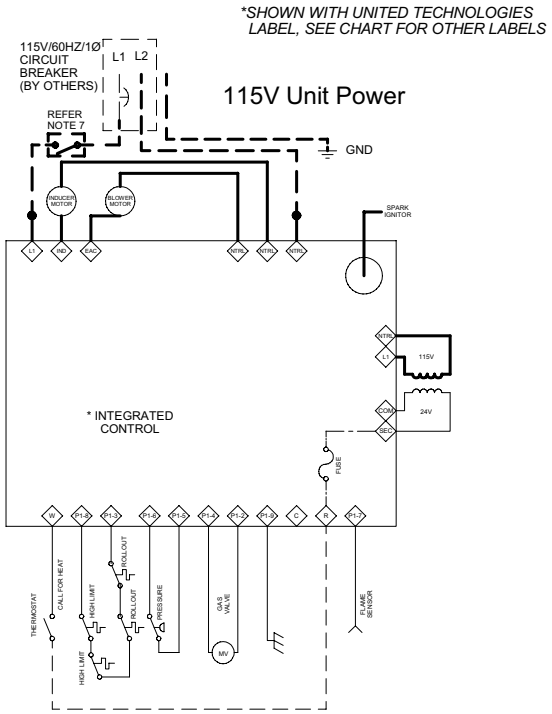
- On a call for heat (thermostat closure between R and W (W1 for 2-stage units) terminals on the unit heater terminal strip. The control automatically recognizes a call for heat as requiring fan operation.
- With switch closure between R and G terminals on the unit heater terminal strip. The control recognizes this as an override to the fan control based on a call for heat and starts the fan.

The diagrams on page 11 are arranged as follows:

1. Single stage gas controls with a thermostat with a Fan On/Auto switch for fan control.
2. Single stage gas controls with a thermostat without a Fan On/Auto switch and a Summer/Winter switch for fan control.
3. Two stage gas controls with a thermostat with a Fan On/Auto switch for fan control.
4. Two stage gas controls with a thermostat without a Fan On/Auto switch and a Summer/Winter switch for fan control.

Note: The use of a Summer/Winter switch on these models does NOT require a control relay as was required on previous models.





SINGLE STAGE, DIRECT SPARK IGNITION,
100% SHUT-OFF, MULTIPLE RETRY W/ AUTO RESET FROM LOCKOUT

MOTOR LEAD COLOR FOR DIRECT DRIVE BLOWER MOTORS ONLY.

WH-NEUTRAL
BK-HI
BL-MED
RED-LO

ATTACH WIRES NOT USED TO "PARK" TERMINALS

UNITS ARE FACTORY WIRED FOR HIGH SPEED OPERATION.

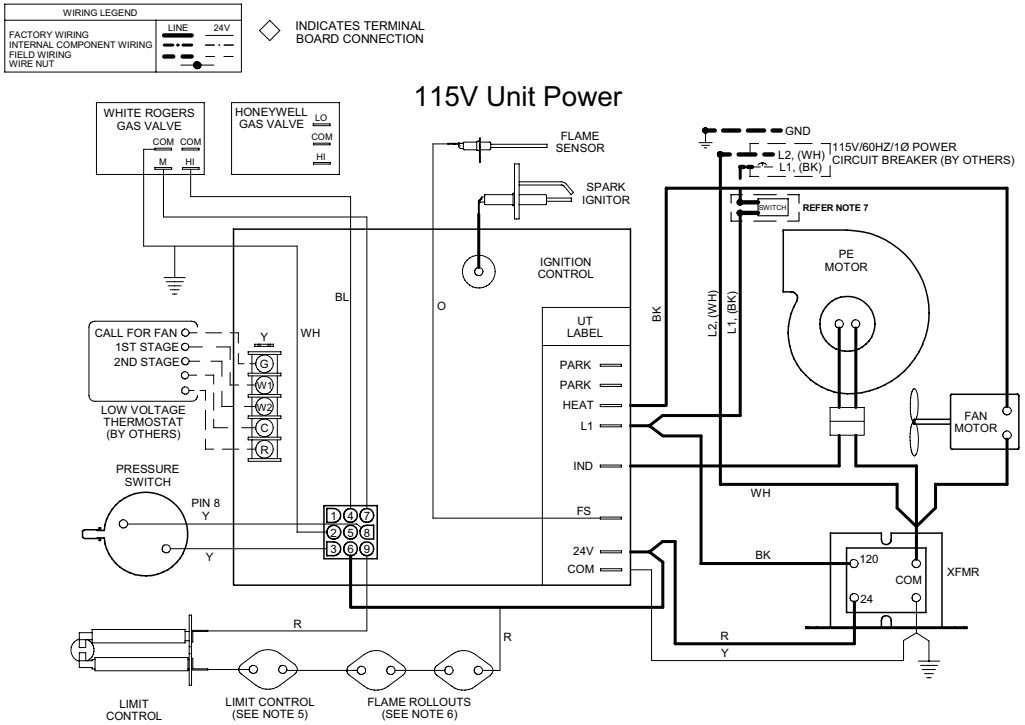
CAUTION:
FAILURE TO WIRE THIS UNIT ACCORDING TO THIS WIRING DIAGRAM MAY RESULT IN INJURY TO THE INSTALLER OR USER. FOR DEVIATIONS CONTACT THE FACTORY.

NOTES TO INSTALLER:

1. ALL WIRING MUST COMPLY WITH NATIONAL ELECTRIC CODE AND ALL LOCAL CODES.
2. ALL COMPONENTS MUST AGREE WITH THEIR RESPECTIVE POWER SOURCE.
3. VERIFY THE POWER SOURCE AND THE UNIT POLARITY.
4. USE TYPE 105°C REPLACEMENT WIRE 300V OR GREATER.
5. USED ON PROPELLER MODELS 100 AND LARGER.
6. TWO SWITCHES: 30-75, ONE SWITCH: 100-125 NOT USED ON 150-400 UNITS.
7. OPTIONAL UNIT DISCONNECT SWITCH.

5H079963B1

WIRING DIAGRAM, SINGLE STAGE



TWO STAGE, DIRECT SPARK IGNITION,
100% SHUT-OFF, MULTIPLE RETRY W/ AUTO RESET FROM LOCKOUT

MOTOR LEAD COLOR FOR DIRECT DRIVE BLOWER MOTORS ONLY.

WH-NEUTRAL
BK-HI
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RED-LO

ATTACH WIRES NOT USED TO "PARK" TERMINALS

UNITS ARE FACTORY WIRED FOR HIGH SPEED OPERATION.

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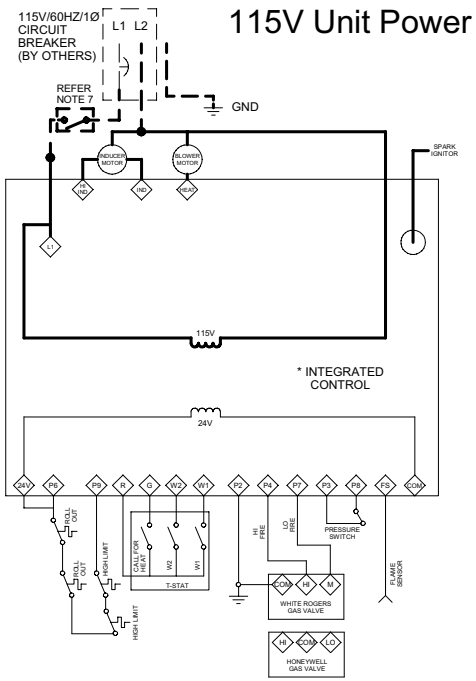
7. OPTIONAL UNIT DISCONNECT SWITCH.



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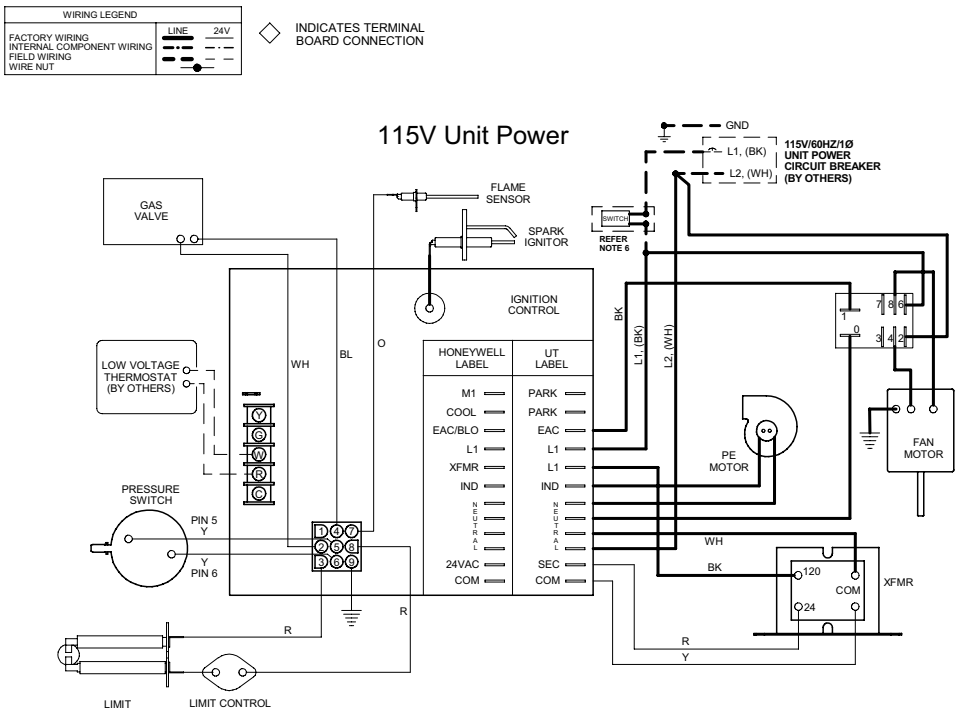
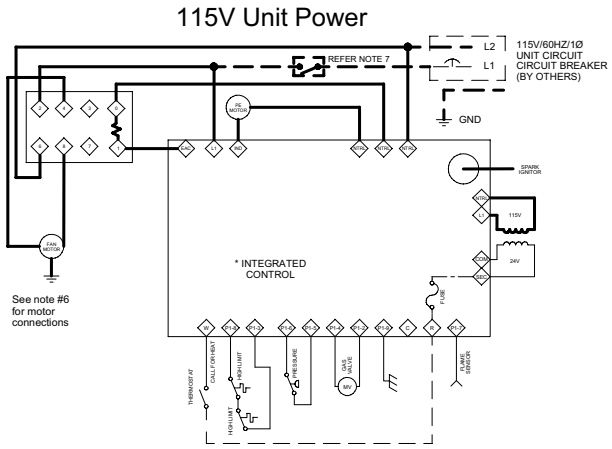
WIRING DIAGRAM, TWO STAGE



SINGLE STAGE, DIRECT SPARK IGNITION,
100% SHUT-OFF, MULTIPLE RETRY W/ AUTO RESET FROM LOCKOUT



NOTES TO INSTALLER:

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2. ALL COMPONENTS MUST AGREE WITH THEIR RESPECTIVE POWER SOURCE.
3. VERIFY THE POWER SOURCE AND THE UNIT POLARITY.
4. USE TYPE 105°C REPLACEMENT WIRE 300V OR GREATER.
5. USED ON PROPELLER MODELS 100 AND LARGER.
6. OPTIONAL UNIT DISCONNECT SWITCH.

CAUTION:
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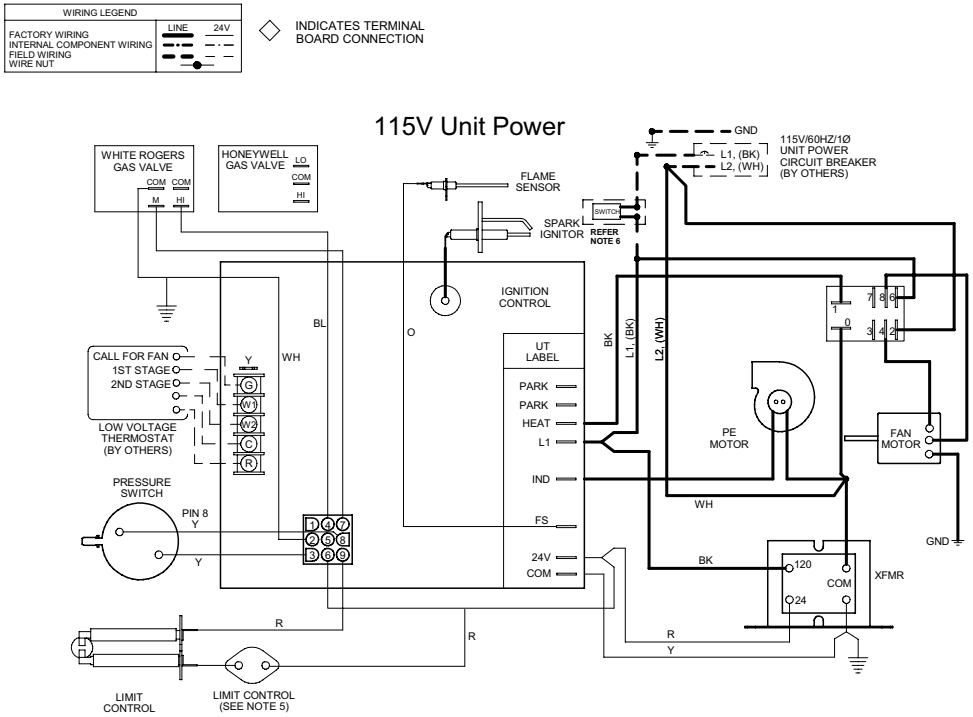
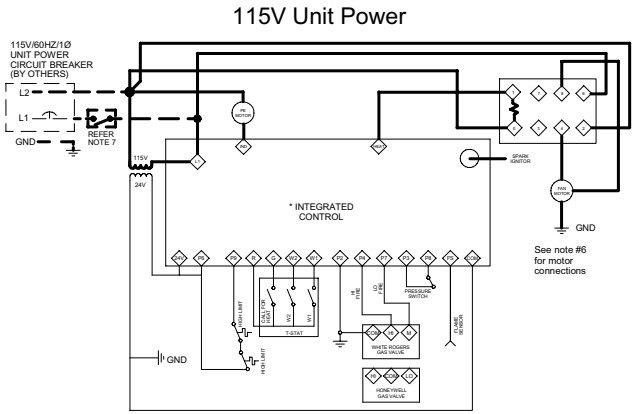
5H079963B3

WIRING DIAGRAM, SINGLE STAGE, RELAY





TWO STAGE, DIRECT SPARK IGNITION,
100% SHUT-OFF, MULTIPLE RETRY W/ AUTO RESET FROM LOCKOUT

NOTES TO INSTALLER:

1. ALL WIRING MUST COMPLY WITH NATIONAL ELECTRIC CODE AND ALL LOCAL CODES.
2. ALL COMPONENTS MUST AGREE WITH THEIR RESPECTIVE POWER SOURCE.
3. VERIFY THE POWER SOURCE AND THE UNIT POLARITY.
4. USE TYPE 105°C REPLACEMENT WIRE 300V OR GREATER.
5. USED ON PROPELLER MODELS 100 AND LARGER.
6. OPTIONAL UNIT DISCONNECT SWITCH.

CAUTION:
FAILURE TO WIRE THIS UNIT ACCORDING TO THIS WIRING DIAGRAM MAY RESULT IN INJURY TO THE INSTALLER OR USER. FOR DEVIATIONS CONTACT THE FACTORY.

5H079963B4

WIRING DIAGRAM, TWO STAGE, RELAY

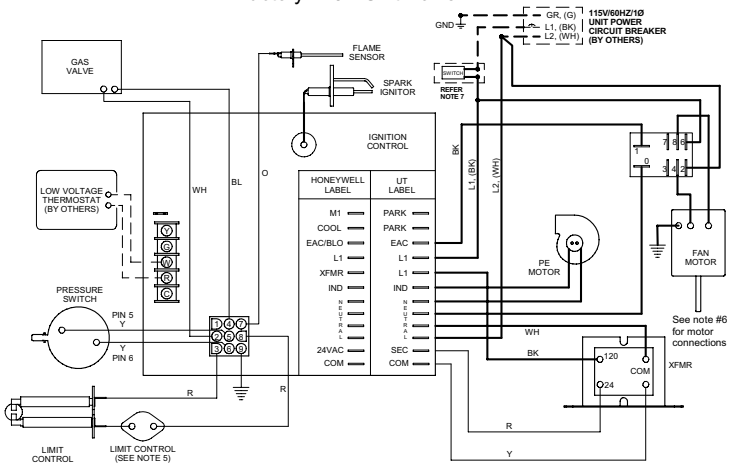
WIRING LEGEND

	LINE	24V
FACTORY WIRING		
INTERNAL COMPONENT WIRING		
FIELD WIRING		
WIRE NUT		

◇ INDICATES TERMINAL BOARD CONNECTION

SINGLE STAGE, DIRECT SPARK IGNITION,
100% SHUT-OFF, MULTIPLE RETRY W/ AUTO RESET FROM LOCKOUT

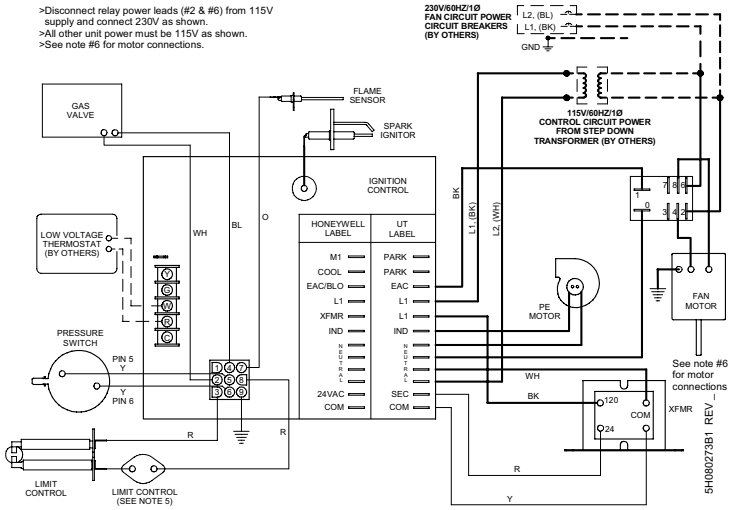
Factory 115V Unit Power



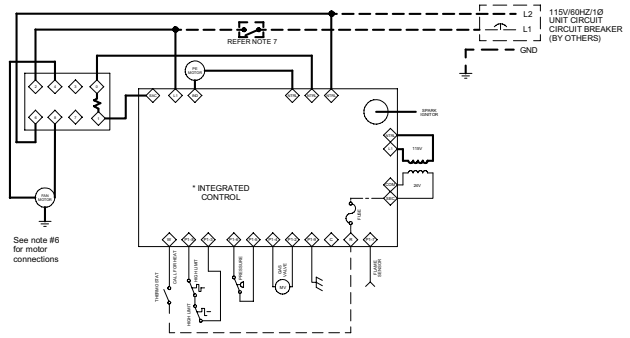
230V Fan/Blower Power Only

CONTROL CIRCUIT MUST BE 115V POWER

>Disconnect relay power leads (#2 & #6) from 115V supply and connect 230V as shown.
>All other unit power must be 115V as shown.
>See note #6 for motor connections.

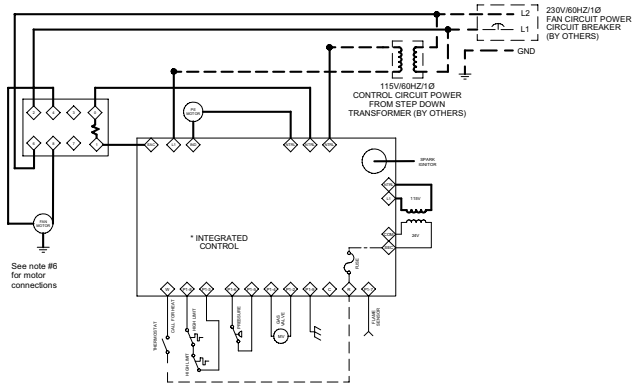


Factory 115V Unit Power



230V Fan/Blower Power Only

CONTROL CIRCUIT MUST BE 115V POWER



*SHOWN WITH UNITED TECHNOLOGIES LABEL, SEE CHART FOR OTHER LABELS

CAUTION:
FAILURE TO WIRE THIS UNIT ACCORDING TO THIS WIRING DIAGRAM MAY RESULT IN INJURY TO THE INSTALLER OR USER. FOR DEVIATIONS CONTACT THE FACTORY.

NOTES TO INSTALLER:

1. ALL WIRING MUST COMPLY WITH NATIONAL ELECTRIC CODE AND ALL LOCAL CODES.
2. ALL COMPONENTS MUST AGREE WITH THEIR RESPECTIVE POWER SOURCE.
3. VERIFY THE POWER SOURCE AND THE UNIT POLARITY.
4. USE TYPE 105°C REPLACEMENT WIRE 300V OR GREATER.
5. USED ON PROPELLER MODELS 100 AND LARGER.
6. UNIT IS SHIPPED WIRED FOR 115V. WHEN WIRING FOR 230V FOLLOW THIS DIAGRAM AND MOTOR WIRE LABELS FOR 230V.
7. OPTIONAL UNIT DISCONNECT SWITCH USED ON 115V UNITS ONLY.

5H080273B1

WIRING DIAGRAM, SINGLE STAGE, RELAY

WIRING LEGEND

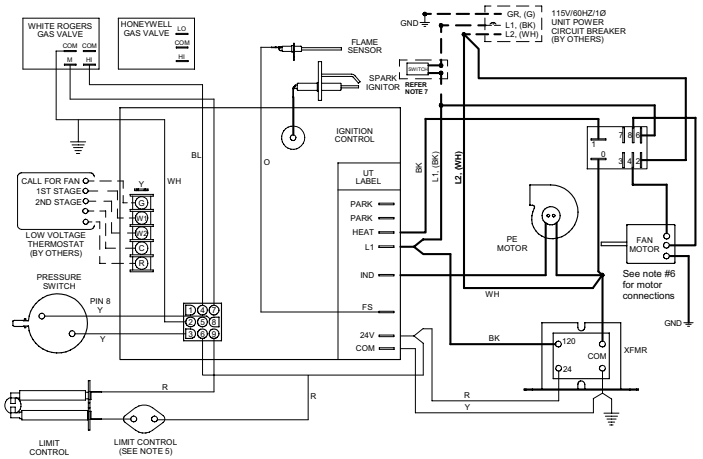
FACTORY WIRING
INTERNAL COMPONENT WIRING
FIELD WIRING
WIRE NUT

LINE
24V

◇ INDICATES TERMINAL BOARD CONNECTION

TWO STAGE, DIRECT SPARK IGNITION,
100% SHUT-OFF, MULTIPLE RETRY W/ AUTO RESET FROM LOCKOUT

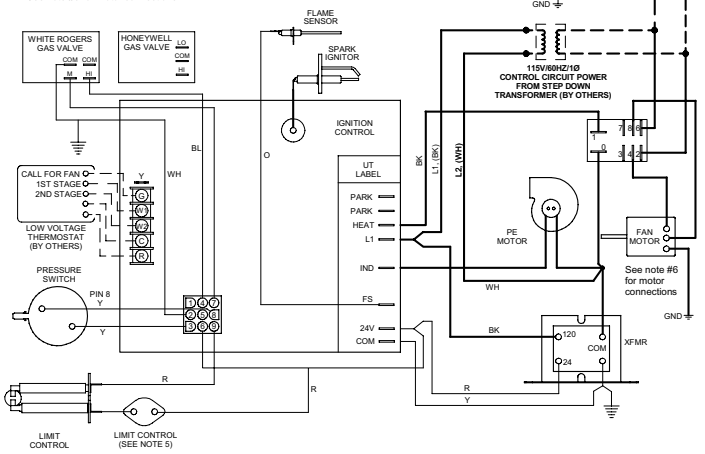
Factory 115V Unit Power



230V Fan/Blower Power Only

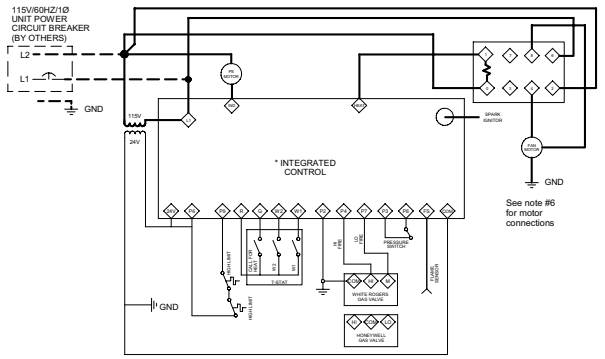
CONTROL CIRCUIT MUST BE 115V POWER

>Disconnect relay power leads (#2 & #6) from 115V supply and connect 230V as shown.
>All other unit power must be 115V as shown.
>See note #6 for motor connections.



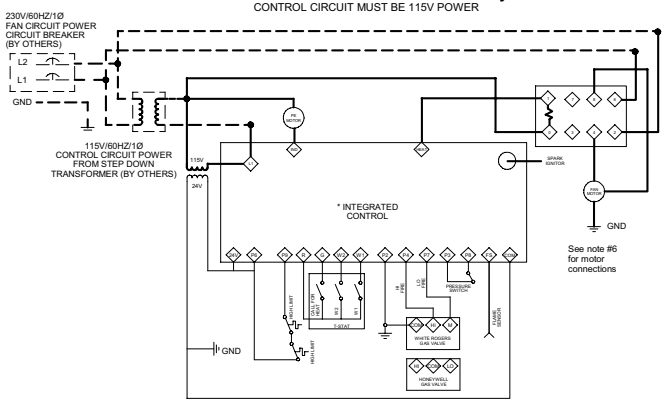
5H080273B2 REV _

Factory 115V Unit Power



230V Fan/Blower Power Only

CONTROL CIRCUIT MUST BE 115V POWER



SHOWN WITH UNITED TECHNOLOGIES LABEL, SEE CHART FOR OTHER LABELS

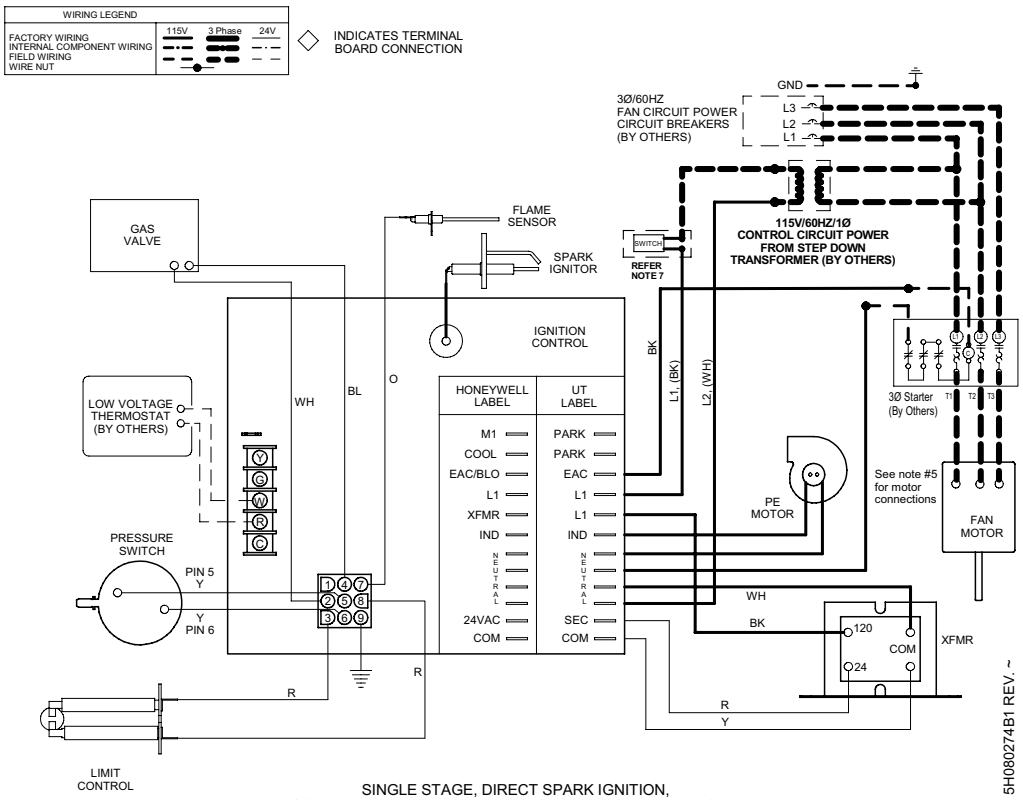
NOTES TO INSTALLER:

1. ALL WIRING MUST COMPLY WITH NATIONAL ELECTRIC CODE AND ALL LOCAL CODES.
2. ALL COMPONENTS MUST AGREE WITH THEIR RESPECTIVE POWER SOURCE.
3. VERIFY THE POWER SOURCE AND THE UNIT POLARITY.
4. USE TYPE 105°C REPLACEMENT WIRE 300V OR GREATER.
5. USED ON PROPELLER MODELS 100 AND LARGER.
6. UNIT IS SHIPPED WIRED FOR 115V. WHEN WIRING FOR 230V FOLLOW THIS DIAGRAM AND MOTOR WIRE LABELS FOR 230V.
7. OPTIONAL UNIT DISCONNECT SWITCH USED ON 115V UNITS ONLY.

CAUTION:
FAILURE TO WIRE THIS UNIT ACCORDING TO THIS WIRING DIAGRAM MAY RESULT IN INJURY TO THE INSTALLER OR USER. FOR DEVIATIONS CONTACT THE FACTORY.

5H080273B2

WIRING DIAGRAM, TWO STAGE, RELAY



SINGLE STAGE, DIRECT SPARK IGNITION,
100% SHUT-OFF, MULTIPLE RETRY W/ AUTO RESET FROM LOCKOUT

CAUTION:
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NOTES TO INSTALLER:

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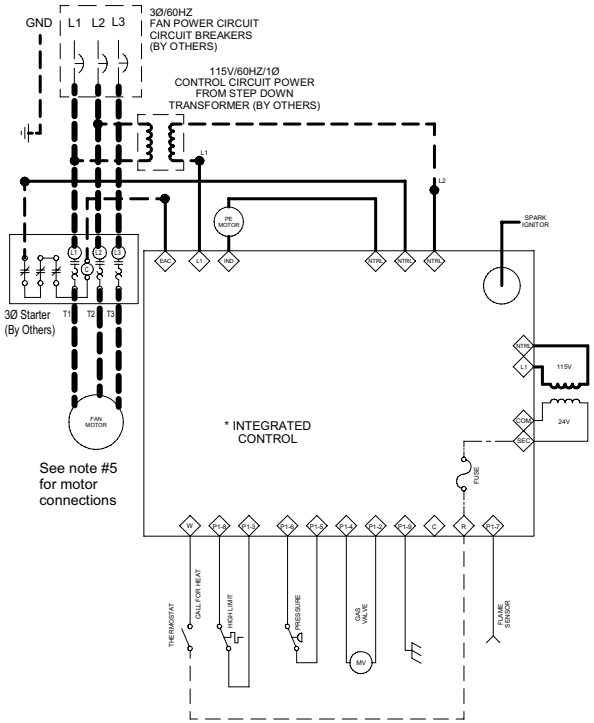
2. ALL COMPONENTS MUST AGREE WITH THEIR RESPECTIVE POWER SOURCE.
3. VERIFY THE POWER SOURCE AND THE UNIT POLARITY.
4. USE TYPE 105°C REPLACEMENT WIRE 300V OR GREATER.
5. MAKE MOTOR CONNECTIONS PER THE MOTOR WIRE DIAGRAM.
6. NA
7. OPTIONAL UNIT DISCONNECT SWITCH.

*SHOWN WITH UNITED TECHNOLOGIES LABEL, SEE CHART FOR OTHER LABELS



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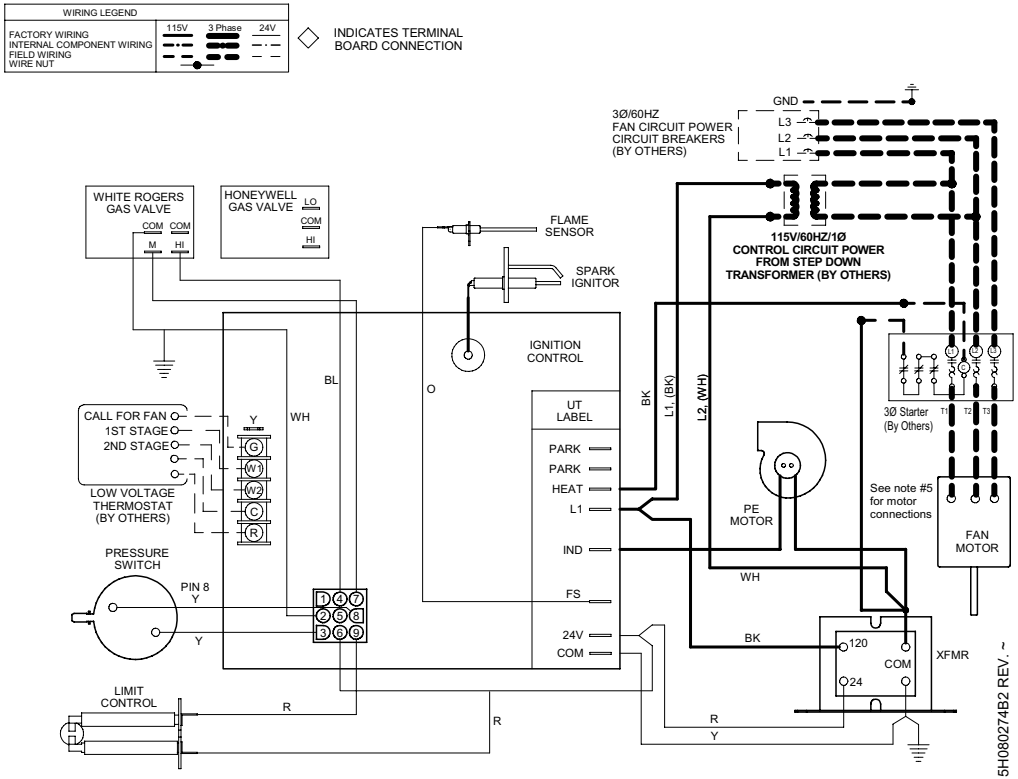
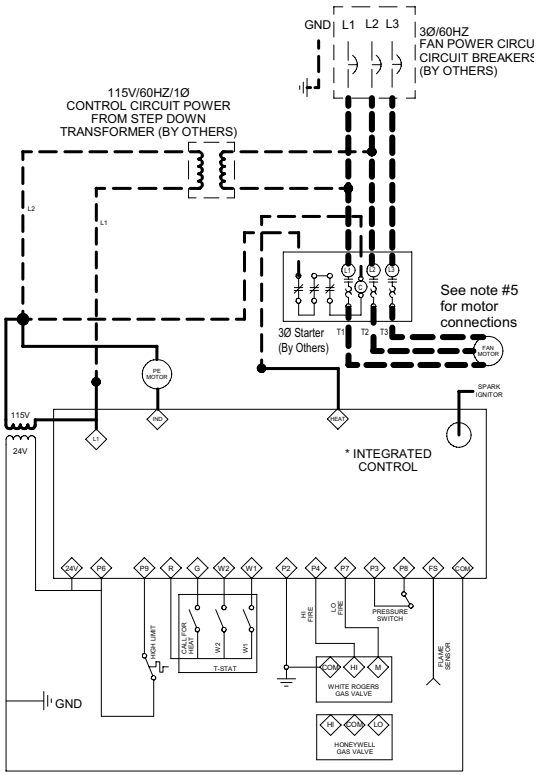
WIRING DIAGRAM, SINGLE STAGE, 3 Ø

WIRING DIAGRAMS – MODELS HD/HDB, HDS/HDC, PTS/BTS



TWO STAGE, DIRECT SPARK IGNITION,
100% SHUT-OFF, MULTIPLE RETRY W/ AUTO RESET FROM LOCKOUT



CAUTION:
FAILURE TO WIRE THIS UNIT ACCORDING TO THIS WIRING DIAGRAM MAY RESULT IN INJURY TO THE INSTALLER OR USER. FOR DEVIATIONS CONTACT THE FACTORY.

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3. VERIFY THE POWER SOURCE AND THE UNIT POLARITY.
4. USE TYPE 105°C REPLACEMENT WIRE 300V OR GREATER.
5. MAKE MOTOR CONNECTIONS PER THE MOTOR WIRE DIAGRAM.

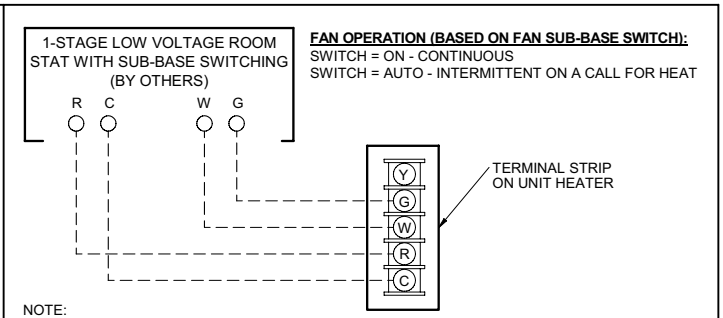
5H080274B2

WIRING DIAGRAM, TWO STAGE, 3 Ø

WIRING DIAGRAMS – MODELS HD/HDB, HDS/HDC, PTS/BTS

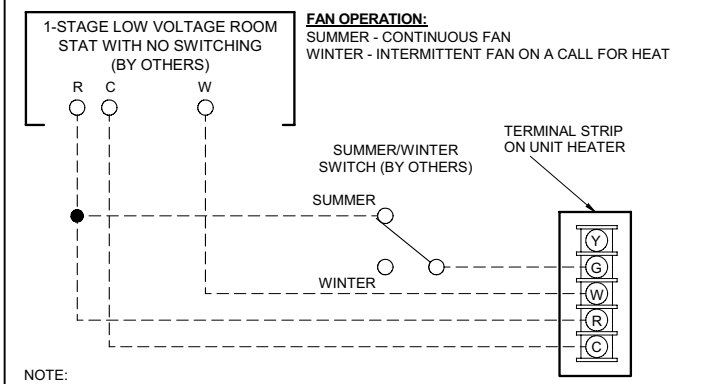
Thermostat and Summer/Winter Switch Wiring

1-STAGE ROOM STAT WITH SUB-BASE FAN SWITCH



NOTE:
GENERIC ROOM STAT TERMINALS SHOWN. ACTUAL STAT MAY USE DIFFERENT TERMINALS AND/OR WIRING. PLEASE CONSULT WIRING INSTRUCTIONS FOR STAT FOR PROPER WIRING.

SUMMER/WINTER SWITCH AND 1-STAGE ROOM STAT WITHOUT SUB-BASE FAN SWITCH



NOTE:
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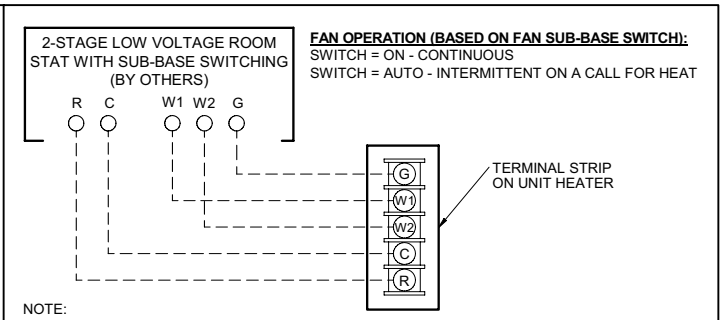
2-STAGE ROOM STAT WITH SUB-BASE FAN SWITCH



NOTE:
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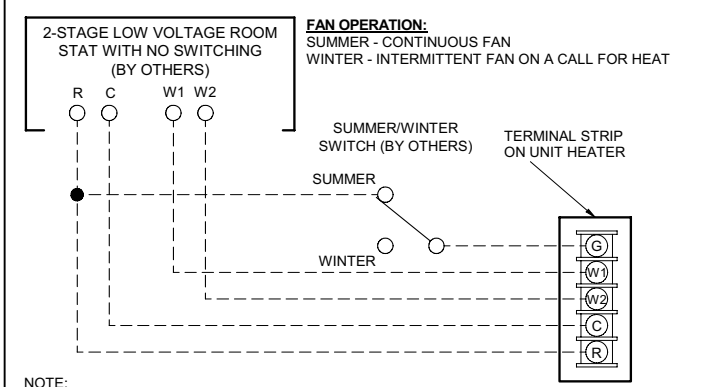
SUMMER/WINTER SWITCH AND 2-STAGE ROOM STAT WITHOUT SUB-BASE FAN SWITCH



NOTE:
GENERIC ROOM STAT TERMINALS SHOWN. ACTUAL STAT MAY USE DIFFERENT TERMINALS AND/OR WIRING. PLEASE CONSULT WIRING INSTRUCTIONS FOR STAT FOR PROPER WIRING.

11/08 Litho in USA