Technical Publications
Litho U.S.A.

504,832M
10/2003
Supersedes 503,921M

NOVAR CUSTOM CONTROLLER DDC KIT

INSTALLATION INSTRUCTIONS FOR NOVAR CUSTOM CONTROLLER DDC KIT (LB-63353CX, CBR; 48K89, 71M65) USED WITH "L" SERIES UNITS

Shipping and Packing List

Package 1 of 1 contains:

1- Novar Custom Controller DDC assembly (A1)

1- Room air sensor (A2)

1- Discharge air sensor (RT1) with P63 connector

1- Air flow switch (S52)

1- P65 wire harness

1- S52 Bracket

1- Bag assembly containing:
- 6-#10-16X3/4" screws
- 1-ECTO Label
- 3-Splice connectors
- 1-Wiring diagram sticker
- 2-#10-16 X 5/8" screws
- 1-Air flow tubing

Application

The Novar Custom Controller DDC is used with L series units.

Box Size	Unit	Tons	Cat. No.	LB No.
A	024 to 072	2-6	48K89	63353CX
A+ to D	088 to 360	7-1/2 to 30	71M65	63353CBR

The A2 room air sensor monitors room air temperature and provides input to the DDC to determine unit heating or cooling function.

The RT1 discharge air sensor monitors discharge or supply air temperature.

The normally open S52 air flow (blower proving) switch closes with static pressure increase when the blower is started. If the static increase is not sensed, the DDC will keep the heating and cooling functions locked out and also show an alarm in the system.

⚠WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a qualified installer or service agency.

⚠WARNING

Electric shock hazard. Can cause injury or death. Before attempting to perform any service or maintenance, turn the electrical power to unit OFF at disconnect switch(es). Unit may have multiple power supplies.

Install DDC Assembly

See figure 1 for location of DDC assembly in A box units. See figure 2 for location of DDC assembly in A+, B, C, and D box units.

1- Disconnect all electrical power to unit.

2- Open compressor section access doors.

3- *A Box Units* -
Position the DDC assembly beneath the IMC board as shown in figure 1. Secure with four 3/4" sheet metal screws.

DDC LOCATION - A BOX

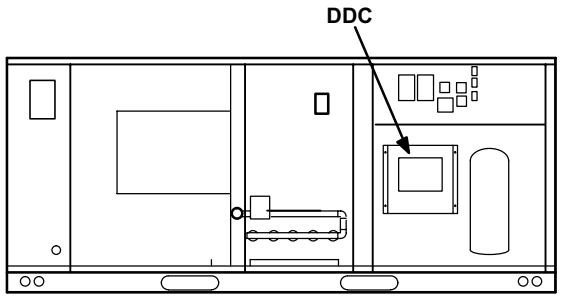


FIGURE 1

⚠CAUTION

Danger of sharp metallic edges. Can cause injury. Take care when servicing unit to avoid accidental contact with sharp edges.

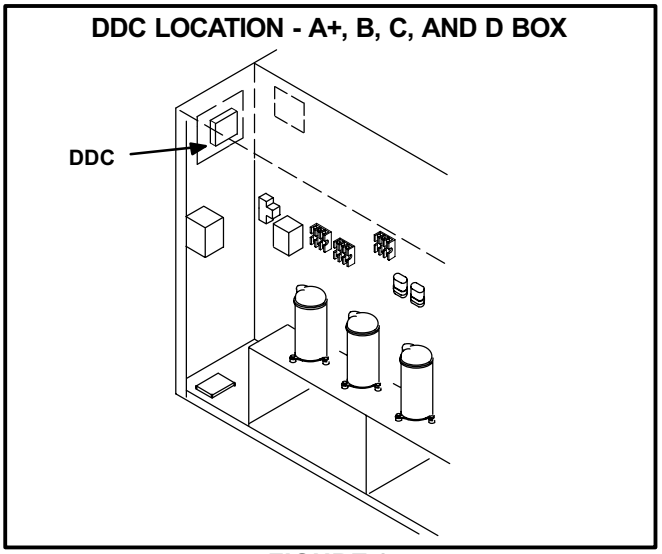


FIGURE 2

A+ through D Box Units -

Locate the 1/2" hole on the DDC assembly L-shaped flange. Position hole in DDC assembly flange over IMC board hat section screw. See figure 3.

Align dimples or knock-outs in unit mullion with engaging holes in DDC assembly U-shaped flange. Secure with two 5/8" sheet metal screws. See figure 3.

Jack Plug Connections

1- Disconnect J16/P16 unit jack/plugs located near the IMC board. Connect unit plug P16 to DDC jack J17 and unit jack J16 to DDC plug P17. See figure 4.

2- Disconnect unit J66/P66 cool 1 jack/plugs. Connect DDC J66 cool 1 jack to unit P66 cool 1 plug. Unit J66 cool 1 jack to TB1 remains disconnected. See figure 5.

3- Disconnect J125/P125 blower proving switch jack/plugs. Connect blower proving switch jumper jack J126 to blower proving switch plug P125. Connect P126 blower proving switch plug to J125 blower proving switch jack. See figure 6.

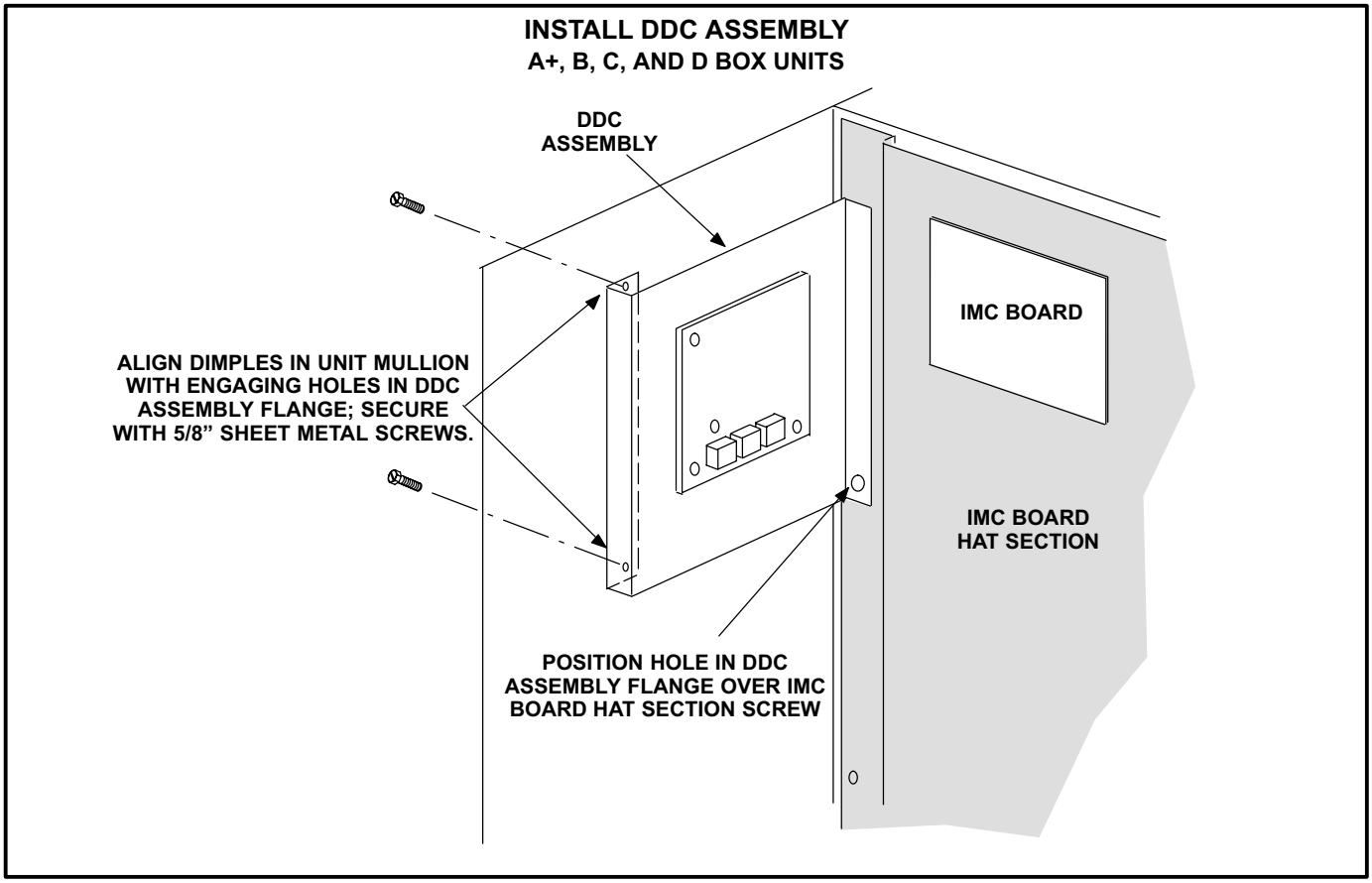


FIGURE 3

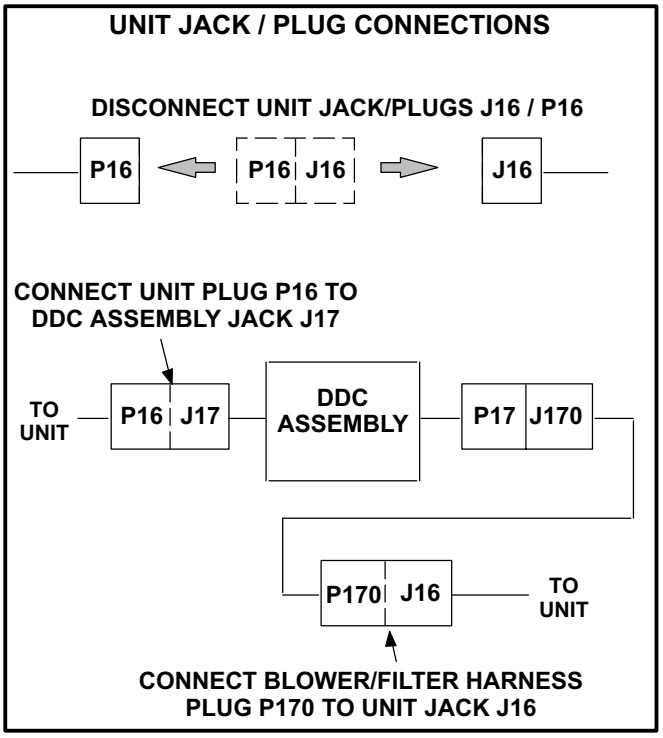


FIGURE 4

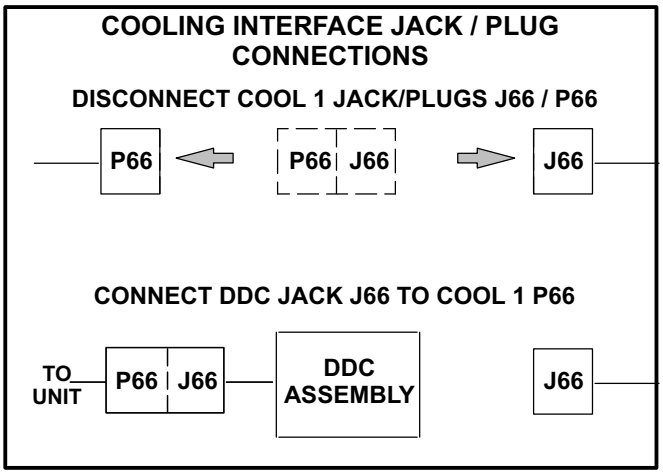


FIGURE 5

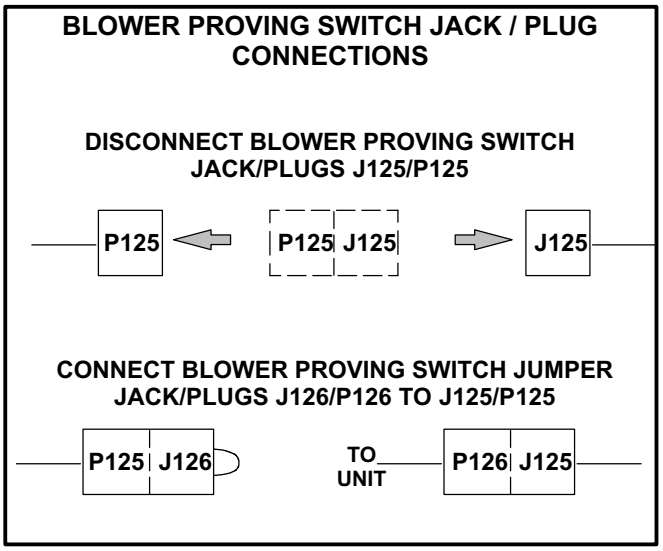


FIGURE 6

Wire Splices

Refer to IMC manual provided with unit for location of IMC and economizer board jack plugs. If the unit does not contain an economizer discard the splice connectors.

A Box Units Only

1- Locate wire harness to P115 on the IMC economizer board. Cut wire stamped J115-9/SPLICE A approximately 10” from the IMC board. Splice the resulting two wires to the DDC wire stamped J115-9. Wrap the splice connection with UL approved electric tape.

2- Locate wire harness to P114 on the IMC board. Cut wire stamped J114-12 approximately 10” from the IMC board. Splice the resulting two wires to the DDC wire stamped TB1-15. Wrap the splice connection with UL approved electric tape.

3- Cut wire stamped J114-11 approximately 10” from the IMC board. Splice the resulting two wires to the DDC wire stamped TB1-10. Wrap the splice connection with UL approved electric tape.

A+ Through D Box Units Only

1- Locate wire harness to P115 on the IMC economizer board. Cut wire stamped J115-9 approximately 10” from the IMC board. Splice the resulting two wires to the DDC wire stamped J115-9.

2- Connect the DDC wire stamped TB1-10 to terminal #10 of TB1.

3- Connect the DDC wire stamped TB1-15 to terminal #15 of TB1.

Room Air Sensor A2

1- Install air sensor in conditioned space.

2- Route wiring to unit controls / compressor area.

3- Connect room air sensor wires to TB1 terminals 5 and 9 located below IMC board. Refer to figure 15.

Discharge Air Sensor RT1

1- Open blower access doors.

2- Insert discharge air sensor probe into knockout as shown in figure8on A box units, figure 9 on A+ and B box units, and figure 10 on C and D box units. Secure with two screws provided.

3- Connect RT1 discharge air sensor plug P63 to RT1 discharge air sensor jack J63 on supply air division panel or blower deck.

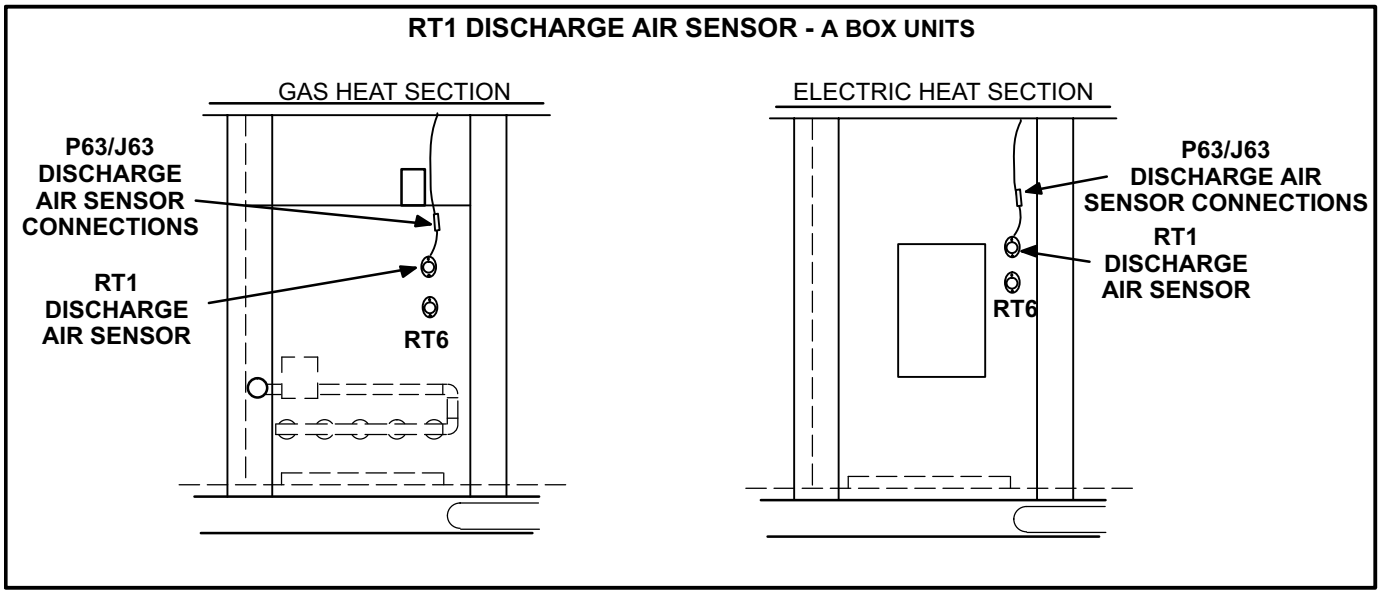


FIGURE 8

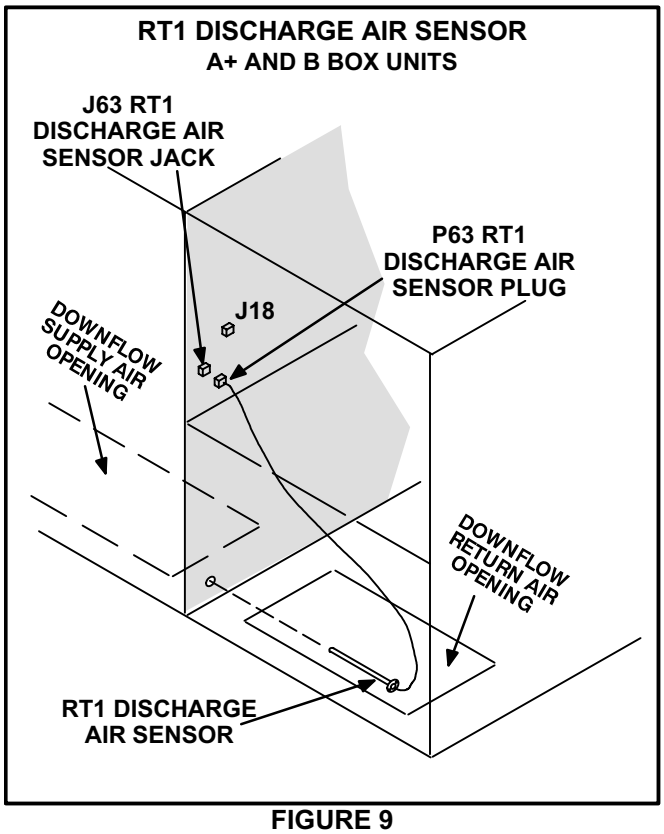


FIGURE 9

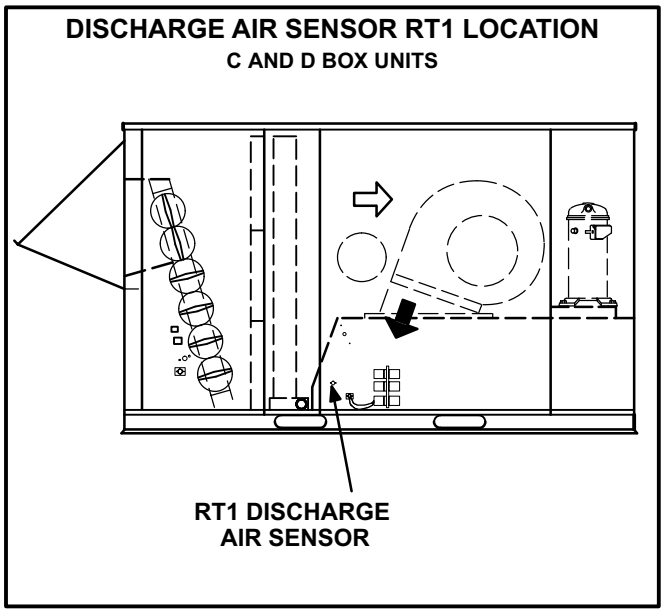


FIGURE 10

Blower Proving Switch S52

1- Open blower access doors.

2- Connect wire from P65 harness labeled “S52-C” to blower proving switch terminal C. Connect wire from P65 harness labeled “S52-NO” to blower proving switch terminal NO.

3- *A, C and D Box Units-*
Insert air flow switch air port into opening and secure to panel with screws provided. Discard bracket provided in kit. See figures 11 and 12.

A+ and *B Box Units-*
Secure the S52 switch to the bracket. Secure the switch assembly to the unit. See figure 13.

4- Disconnect jumper plug connected to J65. Connect S52 blower proving switch plug P65 to S52 blower proving switch jack J65 located on the unit.

5- *A+ and B Box Units Only-*
Connect one end of air tubing to port on blower proving switch. Insert other end of air tubing through hole in blower deck. See figure 13.

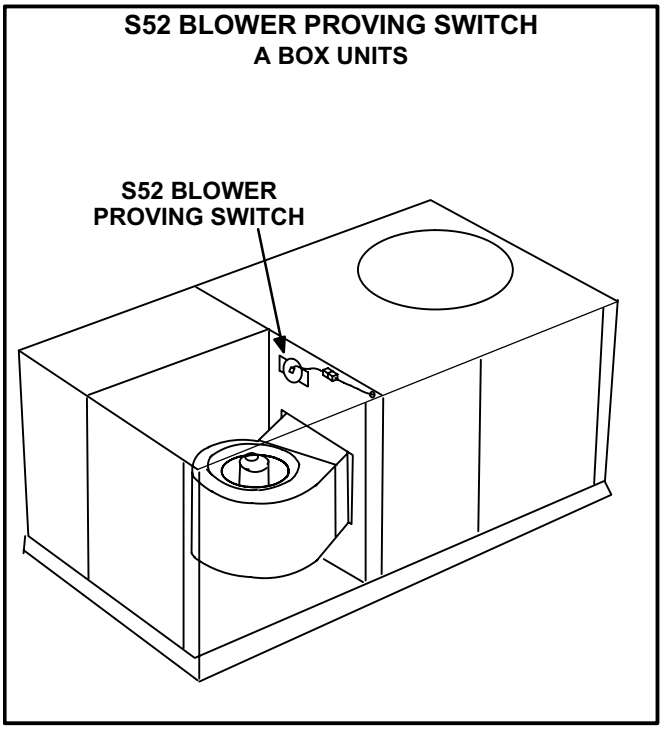


FIGURE 11

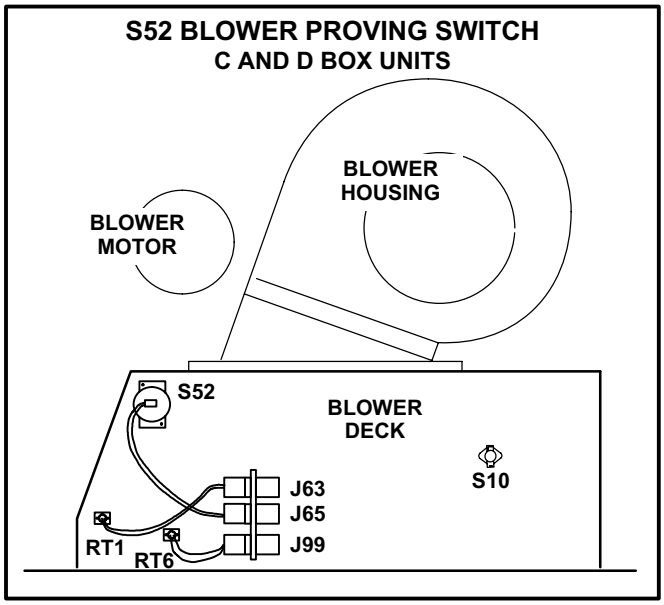


FIGURE 12

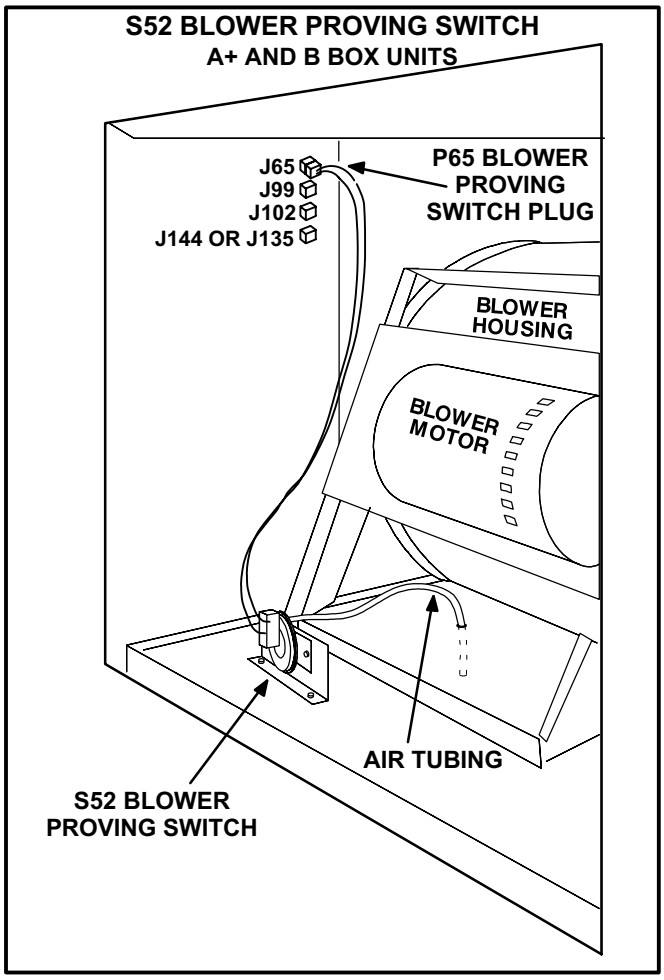


FIGURE 13

Wiring

A-Field Wiring

Controls other than A2 and RT1 are field-provided and wired by a controls contractor. Dotted lines in figure 15 show field wiring connections.

Note - Microprocessor and room air sensor are polarity sensitive; proper connections to TB1 are necessary for proper unit operation.

B-Wiring Diagrams

Wiring diagram sections are affixed to inside of unit panel in alpha-numeric order. Figure 14 shows an example of a complete system diagram on an installation consisting of an LGA240 unit with an electro-mechanical or electronic control system and a modulating economizer. Affix the “C8” section wiring diagram, provided, over the top of the existing “C” section wiring diagram.

C-ECTO Label

1- Affix ECTO label to inside of control access door.

2- Change ECTO parameters as specified on ECTO label.

D-Final Wiring Check

Before applying power to unit check the following wiring:

1- Remove TB1 jumper wires.

2- Jack/plug connections to DDC, RT1, S52, and A2 sensor.

3- Jack/plug connections to system options such as electric heat or economizers.

4- Polarity of wiring between A16 control microprocessor, room air sensor if used, and TB1 terminal strip.

5- Line voltage to unit and/or options such as electric heat.

6- ECTO parameters per ECTO label.

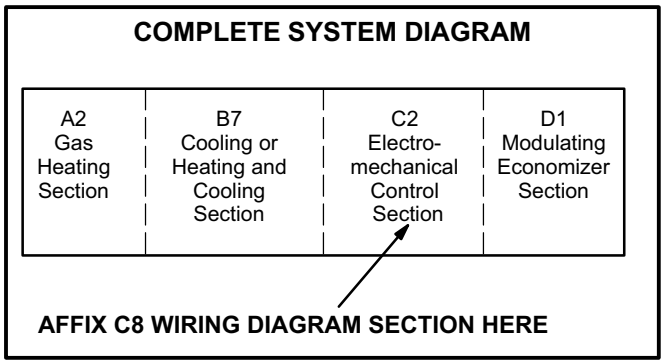
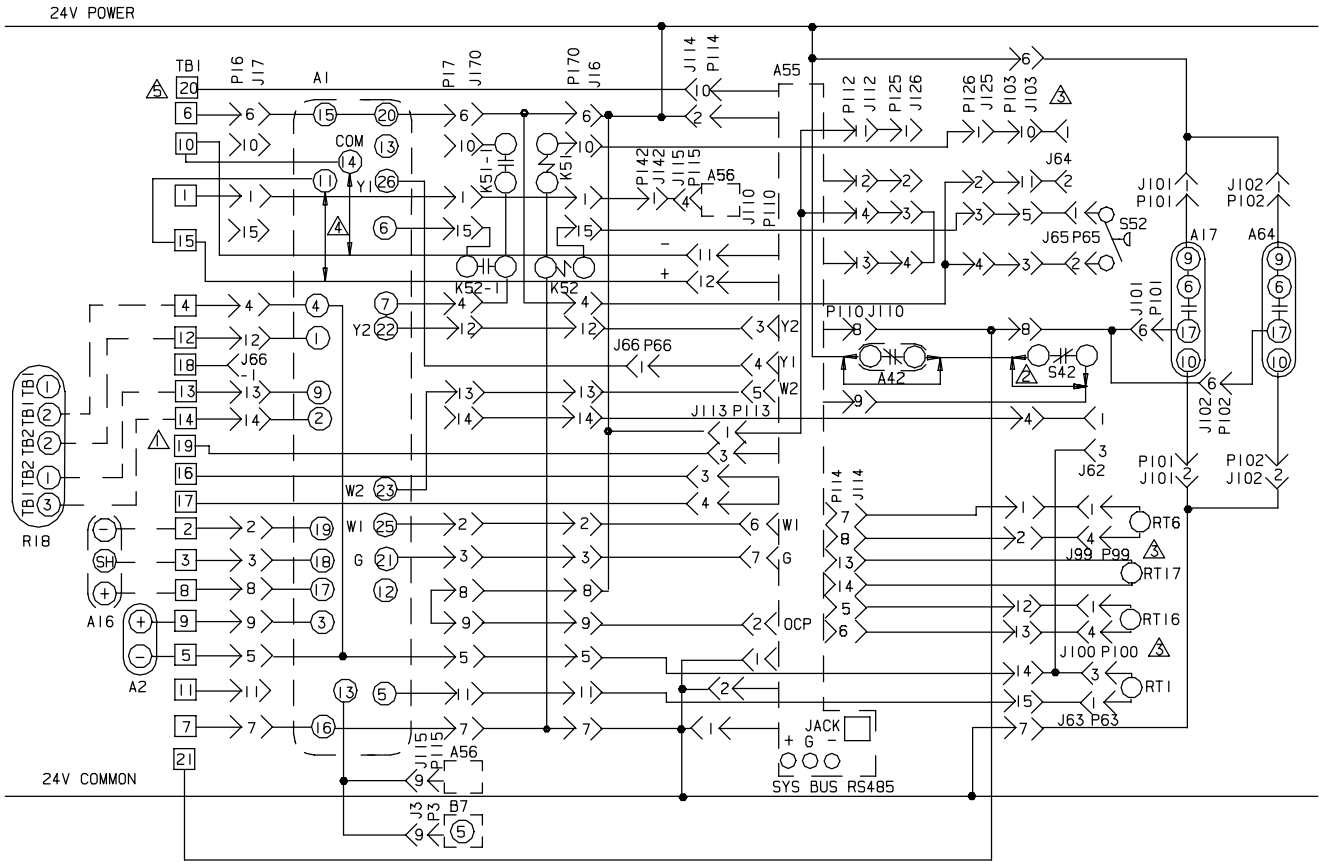


FIGURE 14



KEY	DESCRIPTION COMPONENT
A1	PANEL-LOGIC
A2	SENSOR-ELECTRONIC
A16	CONTROL-MICROPROCESSOR
A17	DETECTOR-SMOKE
A42	MONITOR-PHASE PROTECTION
A55	PANEL-MAIN
A56	PANEL-ECONOMIZER
A64	DETECTOR-SMOKE,SUPPLY AIR
B7	MOTOR-DAMPER,ECONOMIZER
J3	JACK-UNIT,ECONOMIZER
J16	JACK-UNIT
J17	JACK-LOGIC PANEL
J62	JACK-A2 RETURN AIR SENSOR
J63	JACK-RT1 DISCH. AIR SENSOR
J64	JACK-S27 FILTER SWITCH
J65	JACK-S52 FAN SWITCH
J66	JACK-COOL 1 INTERFACE
J99	JACK-DISCHARGE TEMP SENSOR
J100	JACK-RETURN TEMP SENSOR
J101	JACK-SMOKE DETECTOR,RETURN AIR
J102	JACK-SMOKE DETECTOR,SUPPLY AIR
J103	JACK-SENSORS,CONTROL
J110	JACK-THERMOSTAT INPUT
J112	JACK-COOLING SENSOR INPUT
J113	JACK-BLOWER & COOL 1 CONTROL
J114	JACK-SENSOR INPUT
J115	JACK-ECONOMIZER OUTPUT
J125	JACK-BLOWER PROVING
J126	JACK-JUMPER,BLOWER PROVING
J142	JACK-ECONOMIZER HARNESS
J170	JACK-BLOWER/FILTER SIGNAL

KEY	DESCRIPTION COMPONENT
K51,-1	
K52,-1	
P3	PLUG-UNIT,ECONOMIZER
P16	PLUG-UNIT
P17	PLUG-LOGIC PANEL
P62	PLUG-A2 RA SENSOR
P63	PLUG-RT1 DA SENSOR
P64	PLUG-S27 FILTER SWITCH
P65	PLUG-S50 FAN SWITCH
P66	PLUG-COOL ONE
P99	PLUG-DISCHARGE TEMP SENSOR
P100	PLUG-RETURN TEMP SENSOR
P101	PLUG-SMOKE DETECTOR,RETURN AIR
P102	PLUG-SMOKE DETECTOR,SUPPLY AIR
P103	PLUG-SENSORS,CONTROL
P110	PLUG-THERMOSTAT INPUT
P112	PLUG-COOLING SENSOR INPUT
P113	PLUG-BLOWER & COOL 1 CONTROL
P114	PLUG-SENSOR INPUT
P115	PLUG-ECONOMIZER OUTPUT
P125	PLUG-BLOWER PROVING
P126	PLUG-JUMPER,BLOWER PROVING
P142	PLUG-ECONOMIZER HARNESS
P170	PLUG-BLOWER/FILTER SIGNAL
R18	POT-REMOTE,SETPOINT
RT1	SENSOR-DISCHARGE
RT6	SENSOR-ADDER DISCHARGE CONTROL
RT16	SENSOR-RETURN AIR TEMP
RT17	SENSOR-OUTSIDE AIR TEMP
S42	OVERLOAD-RELAY,BLOWER MOTOR
S52	SWITCH-AIR FLOW
TBI	TERMINAL STRIP-24V CLASS II

5 TBI-20 FOR DEHUMIDIFICATION CONTROL

4 WIRE HOOKUP FOR "A" BOX

3 J99/P99,J100/P100 AND J103/P103 ARE NOT USED ON -036,042,048,060,072,088 AND 100 UNITS

2 FOR MOTORS WITH S42 EXTERNAL OVERLOAD AND WITH A55(IMC) SOFTWARE VERSION 1.07 & NEWER

1 TBI-19 IS SERVICE RELAY OUTPUT(24VAC). IF USED CONNECT TO A INDICATOR LIGHT OR RELAY COIL (MAX 4VA)

DESIGNATES OPTIONAL WIRING

CLASS II FIELD WIRING

WIRING DIAGRAM	3/03
ACCESSORIES	
NOVAR CUSTOM CONTROLLER FOR "L" SERIES UNITS	
TEMPERATURE CONTROL SECTION C8	
Supersedes Form No. 533,634W	New Form No. 534,393W

FIGURE 15

Check-Out Procedure

Field installed jumpers or toggle switches may be connected to the DDC output terminals to simulate a thermostat demand and confirm proper unit operation. See figure 16.

1- Use IMC manual to troubleshoot and/or clear any errors codes from the IMC main board readout.

2- Disconnect power to unit.

3- Disconnect wires from DDC terminal 16 (24v common) to disconnect power to DDC.

4- Install a jumper wire across terminal 15 (24v power) and 21 (G) to provide 24v to the blower.

5- Apply power to unit. Blower will operate. Leave blower jumper in place throughout check-out.

6- Manually activate stages of heating and cooling with a jumper connection between terminal 15 (24v power) and each of the following terminals:

Terminal	Function
25	First-stage heating
23	Second-stage heating
26	First-stage cooling
22	Second-stage cooling

IMPORTANT - Do not jumper cooling and heating outputs at the same time.

The corresponding indicating light on the A55 (M1) main control board should turn on. This indicates that the IMC (A55) board is receiving a demand from the DDC. This also indicates that wiring between the DDC output terminal block and the IMC (A55) input terminal is correct for each function.

NOTE - When a jumper is removed a delay may keep a component functioning. A short press on the IMC pushbutton will reset the delay.

7- Turn off power.

8- Remove all jumpers or toggle switches.

9- Reconnect wires originally to terminal 16 on DDC.

10- Restore power to unit. Blinking status LED indicates normal operation.

11- Repeat check-out procedure if needed.

NOTE - All field installed jumpers or toggle switches should be removed after service has been completed to ensure that unit control has been switched back to the Novar DDC.

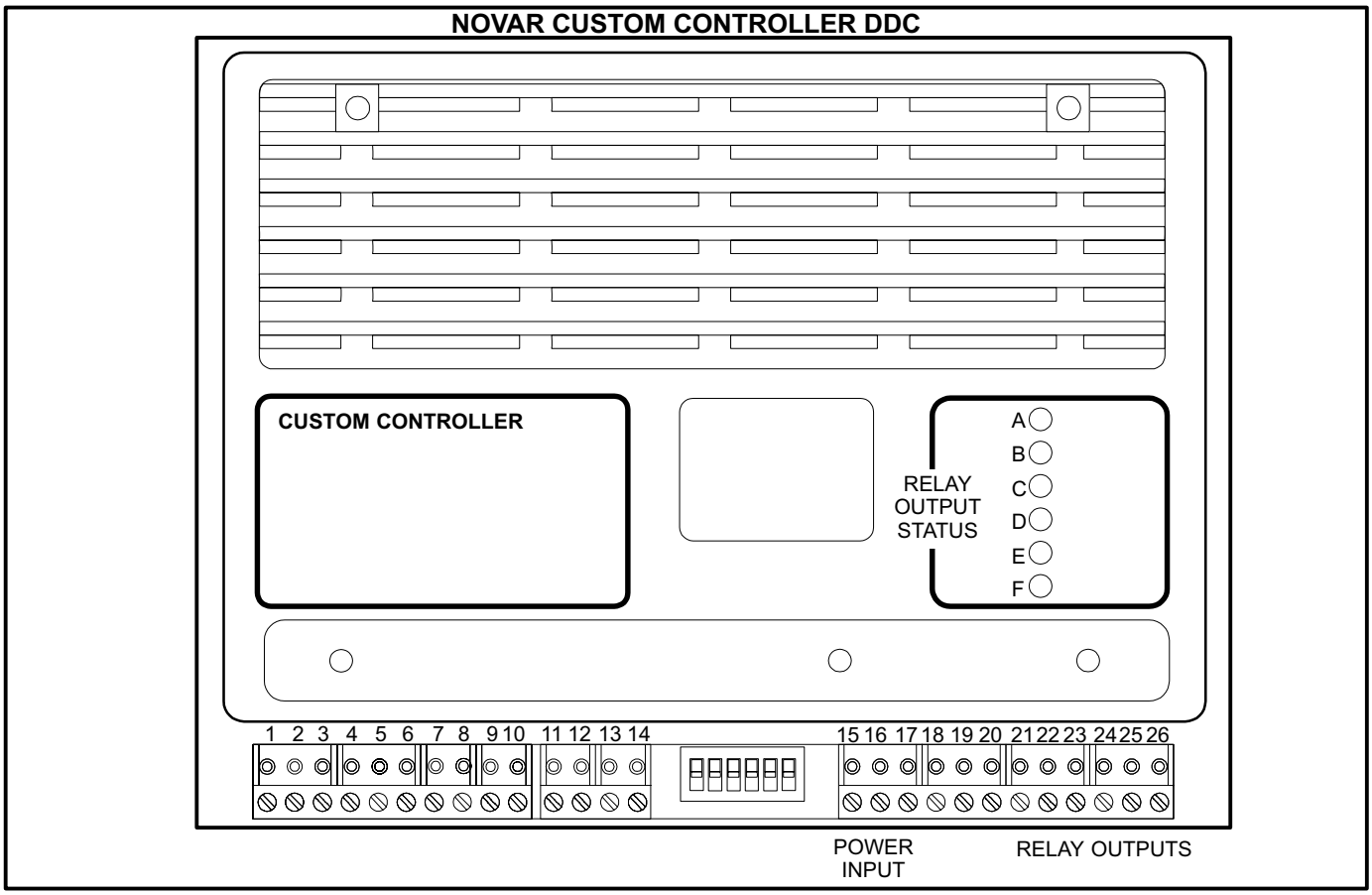


FIGURE 16