Technical Publications
Litho U.S.A.

507412-01
6/2014
Supersedes 507036-01

NOVAR ETM-2051 DDC KIT

INSTALLATION INSTRUCTIONS FOR NOVAR DDC KIT USED WITH LANDMARK® AND RAIDER™ B-BOX UNITS (605240-04 [96W11], 605240-05 [96W12], 605240-06 [96W13] AND 605240-10 [12B98]

Shipping and Packing List

Package 1 of 1 (96W11, 96W12 and 96W13) contains:

- 1 - Novar DDC assembly (A1)
- 1 - Air flow switch (S52)
- 1 - Return air sensor (A2)
- 1 - Discharge air sensor (RT1)
- 1 - Bag assembly (96W11) containing:
  - 6 - #8-32 X 1/2” screws
  - 6 - #8-32 X 1” screws
  - 3 - #10-16 X 5/8 screws
  - 1 - Wiring diagram sticker
  - 1 - Harness, J62 to A2
  - 1 - Harness, J39-P39
  - 1 - Bracket S.D.
  - 1 - Brace S.D.
  - 1 - Airflow tubing
  - 1 - Fitting
- 1 - Bag assembly (96W12) containing:
  - 11 - #8-32 X 1/2” screws
  - 4 - Wire-tie Insertion
  - 1 - Wiring diagram sticker
  - 1 - Harness, J63 to RT1
  - 1 - Harness, J39-P39
  - 1 - DDC panel holder
  - 1 - Latch
  - 1 - Airflow tubing
  - 1 - Fitting
- 1 - Bag assembly (96W13 / 12B98) containing:
  - 2 - #8-32 X 1/2” screws
  - 6 - #10-16 X 5/8” screws
  - 1 - Harness, J63 to RT1
  - 1 - Harness, J62 to A2
  - 1 - Harness, J39-P39
  - 4 - Wire-tie
  - 1 - Wire-tie insertion
  - 1 - Wiring diagram sticker
  - 1 - Airflow tubing
  - 1 - Fitting

⚠ CAUTION

Danger of sharp metallic edges.

Can cause injury.

Take care when servicing unit to avoid accidental contact with sharp edges.

Application

The Novar DDC assembly is used with the following Landmark® and Raider B-Box units:

Box Size	Unit	Tons	Cat. No.	LB No.
A	024 to 060	2 to 5	96W11	605240-04
A+	072 to 090	6 to 7.5	12B98	605240-10
B	090 to 150	7-1/2 to 12-1/2	96W12	605240-05
C	180 to 360	15 to 25	96W13	605240-06

The A2 return air sensor monitors return 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. This input may be reconfigured in the software of the DDC for use as the input from a second zone sensor for temperature averaging.

NOTE - Refer to the notes in the wiring diagram in this kit when installing optional sensors. A2 and RT1 may not be connected in some sensor applications.

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 assembly 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, service agency or the gas supplier

⚠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.

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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 + box units.
- See figures 3 and 4 for location of DDC assembly in B box units.
- See figure 5 for location of DDC assembly in C box units.

1. Disconnect all electrical power to unit.
2. Open compressor section access doors.
3. Install DDC Assembly

   A and A+ Box Units—Position the DDC assembly in front of control panel and secure the assembly with three #10-16 x 5/8" SMS screws to the compressor wall located at the right side of control panel (see figure 1 for A Box units and figure 4 for A+ Box units).

   B Box Units—Position the DDC assembly in front of control panel and secure the assembly with three #8-32 x 1/2" TFS screws to the control box located at the right side of control panel (see figure 3).

   C Box Units—Position the DDC assembly so that the DDC control module faces the control panel. Align dimples or knock-outs in unit mullion with engaging holes in DDC mounting bracket. Secure with two 5/8" sheet metal screws (see figure 7).

Jack Plug Connections

A and A+ Box Units

Route harnesses coming from sub-assembly (see figure 1 for the following steps 1 through 6):

1. Connect wires marked TB1 to terminal strip TB1.
2. Open blower compartment and install blower proving switch on top of blower wrapper with two #8-32 x ½" TFS screws (see figure 7).
3. Locate S52 terminals coming from sub-assembly and fit them through the conduit on the compressor wall. Connect S52 terminals to blower proving switch.
4. Install RT1 sensor located on the bottom left corner of the compressor compartment with two #8-32 x 1/2 TFS screws. Connect J63 jack to RT1 sensor.
5. Open filter access door, install A2 sensor on economizer wall when economizer is installed or on hat-section on units without economizer (locations shown in figure 1) with two #8-32 x 1/2 TFS screws. Get harness J62 from bag assembly; connect one end to A2 sensor and the J3-14 male terminal to the wire coming from the economizer J3 plug female terminal. Fit the other end through the conduit on the indoor coil and then through the compressor wall conduit. Connect J62 female terminals to the J62 and J3-14 male terminals from sub-assembly.
6. Use P300 (NOVAR Comm Bus connector), P301 and P302 to install field provided sensors (see wiring diagram, figure 10).

   NOTE - Wires are labeled (hot stamped) to the plugs to identify wire positions.

B Box Units

Route harnesses coming from sub-assembly (see figures 3 and 4 for the following steps 1 through 7).

1. Connect wires marked TB1 to terminal strip TB1.
2. Open blower compartment and install blower proving switch on top of blower wrapper with two #8-32 x ½" TFS screws (see figure 7).
3. Locate S52 terminals coming from sub-assembly and fit them through the conduit on the compressor wall. Connect S52 terminals to blower proving switch.
4. A2 Sensor:
   - **Landmark:** Install A2 sensor behind compressor B2, use two #8-32 x 1/2 TFS screws. Connect J62 jack to sensor plug P62.
   - **Raider B-Box:** Install A2 sensor on economizer wall when economizer is installed or in filter compartment (see figure 4).
5. Get harness J63 from bag assembly; connect one end to RT1 sensor and fit the other end through the conduit on top of indoor coil. Connect P63 connector from sub-assembly to the harness connector fitted through conduit coming from blower compartment.
6. RT1 Sensor:
   - **Landmark:** Install RT1 sensor located on the left side of blower following instructions on Discharge Air Sensor (RT1) section.
   - **Raider B-Box:** Install RT1 sensor on the blower deck through the hole covered by aluminum foil tape (see figure 4).
7. Use P300 (NOVAR Comm Bus connector), P301 and P302 to install field provided sensors (see wiring diagrams, figure 11).

   NOTE - Wires are labeled (hot stamped) to the plugs to identify wire positions.

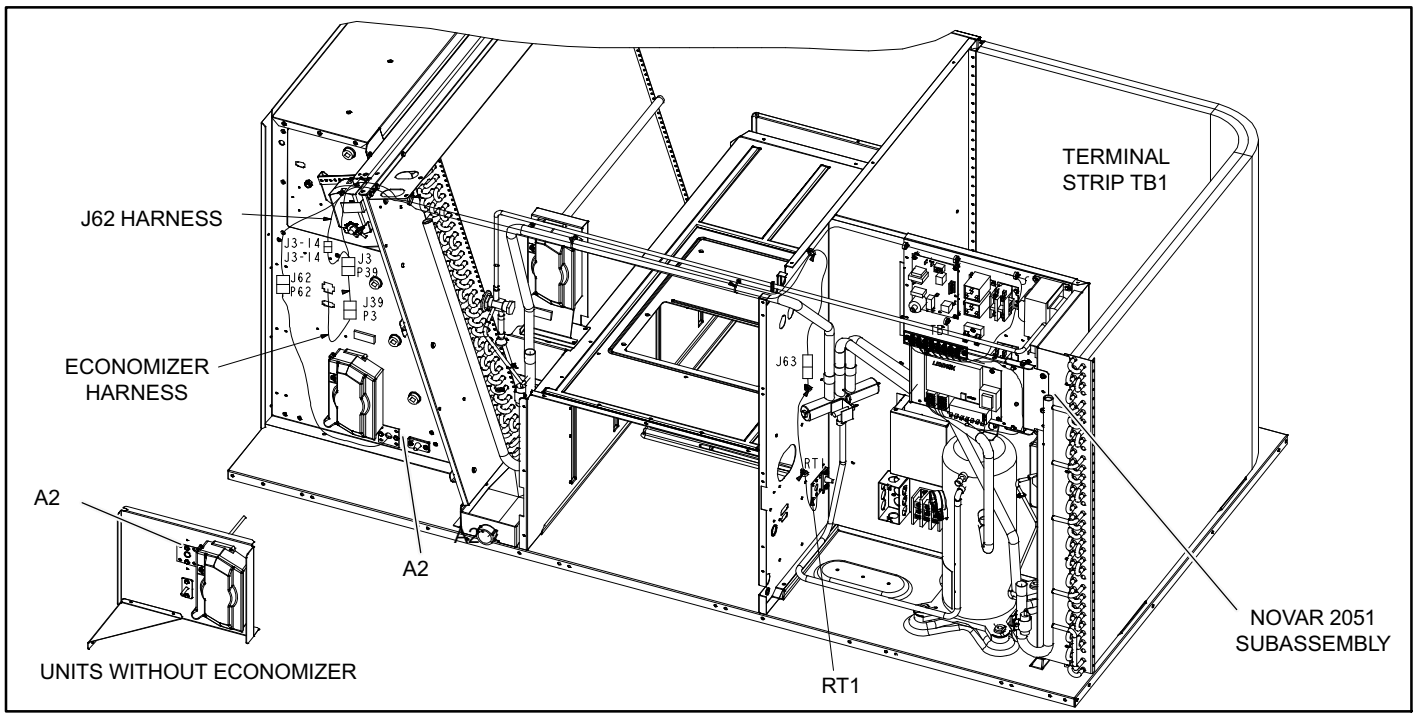


Figure 1. Novar 2051 DDC Location - A Box Units

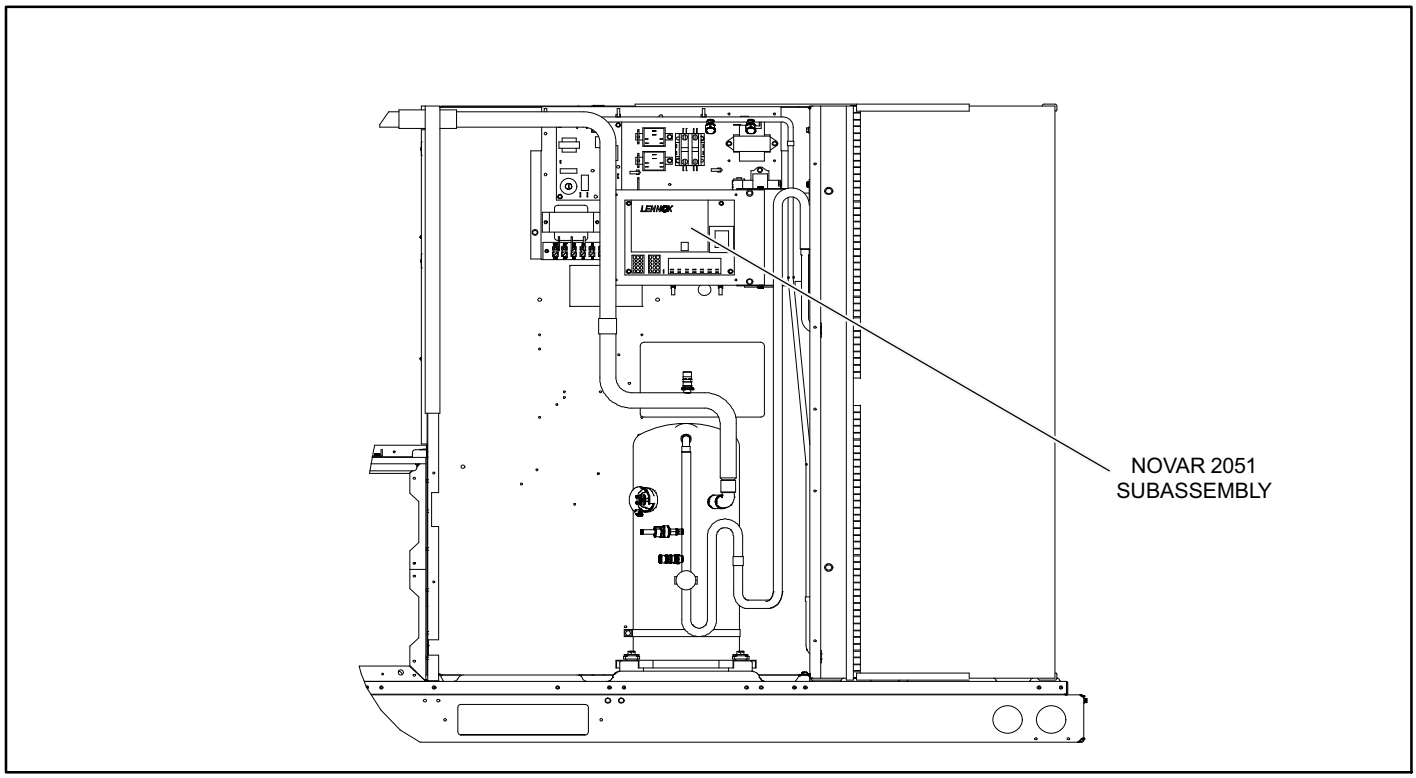


Figure 2. Novar 2051 DDC Location - A+ Box Units

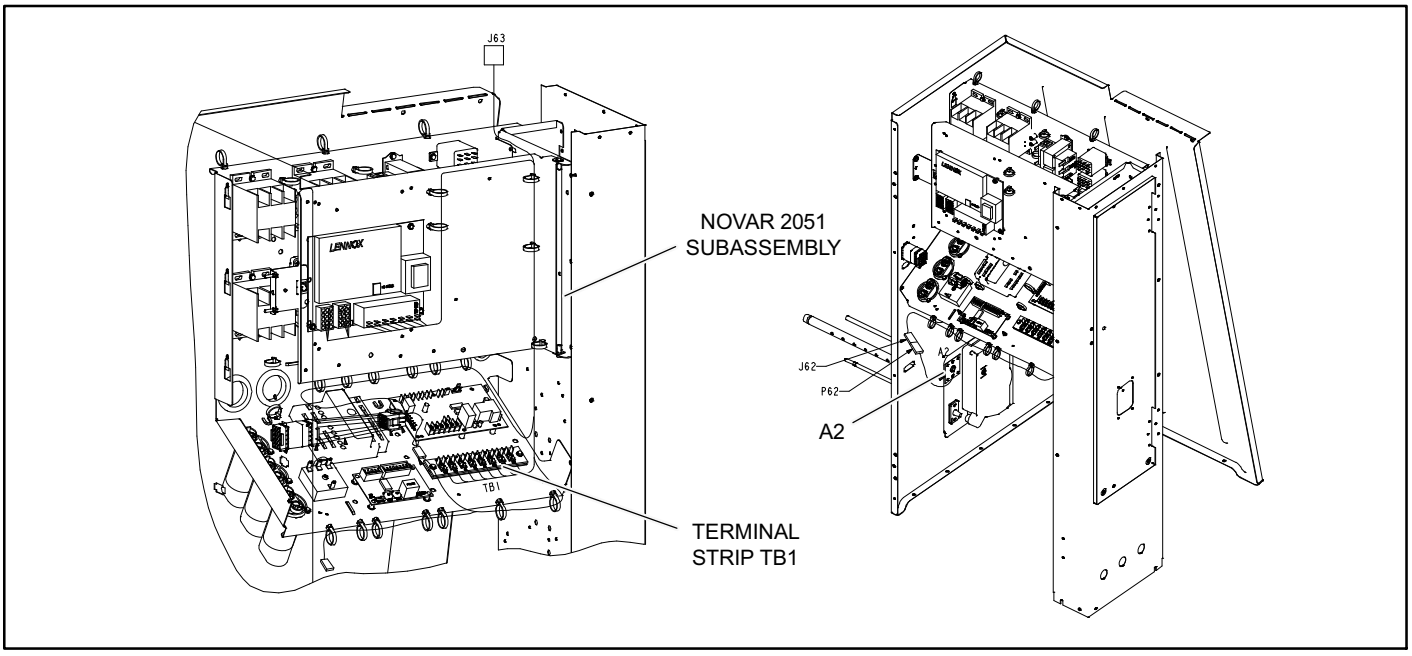


Figure 3. DDC Location - B Box Units

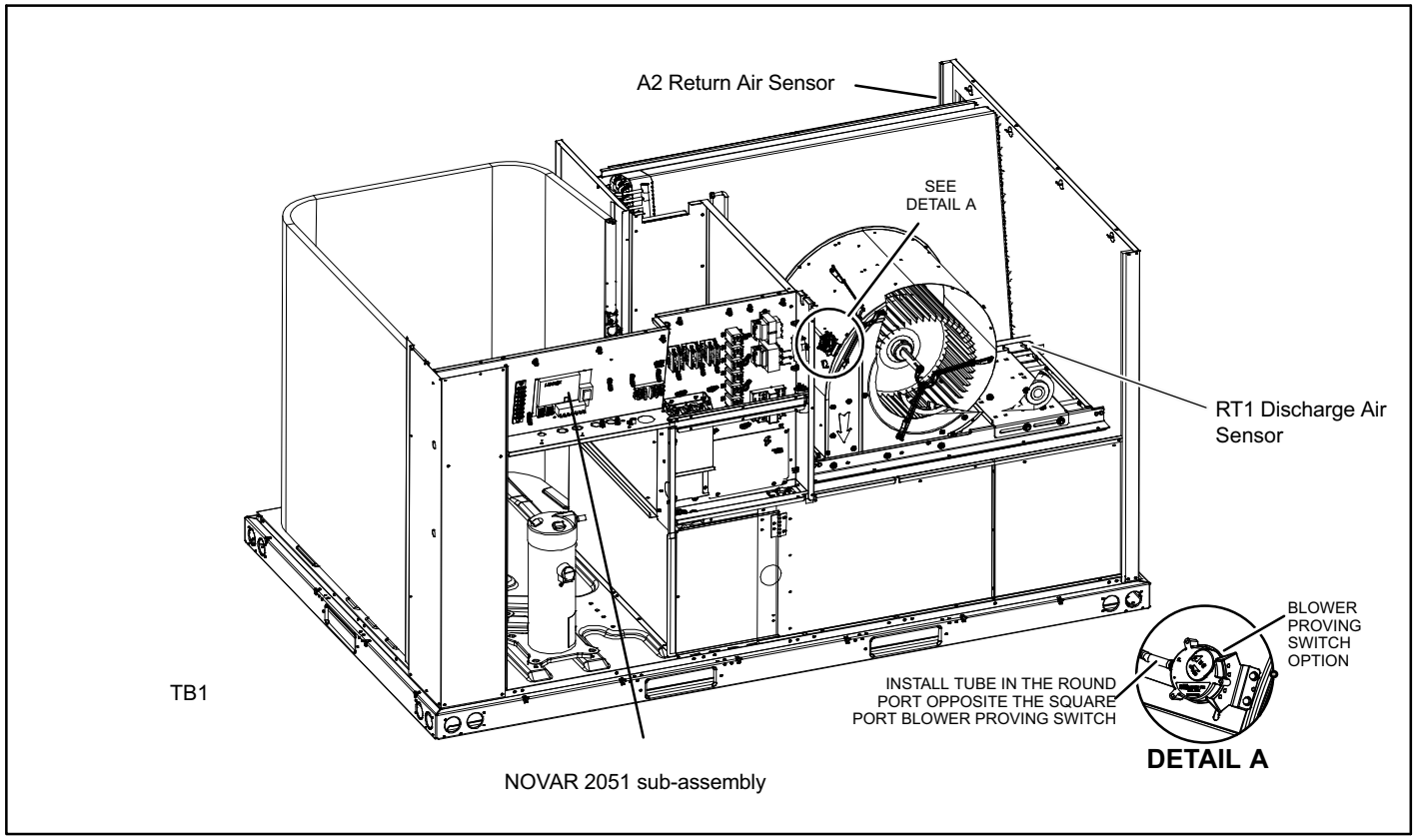


Figure 4. DDC Location - Raider B Box Units

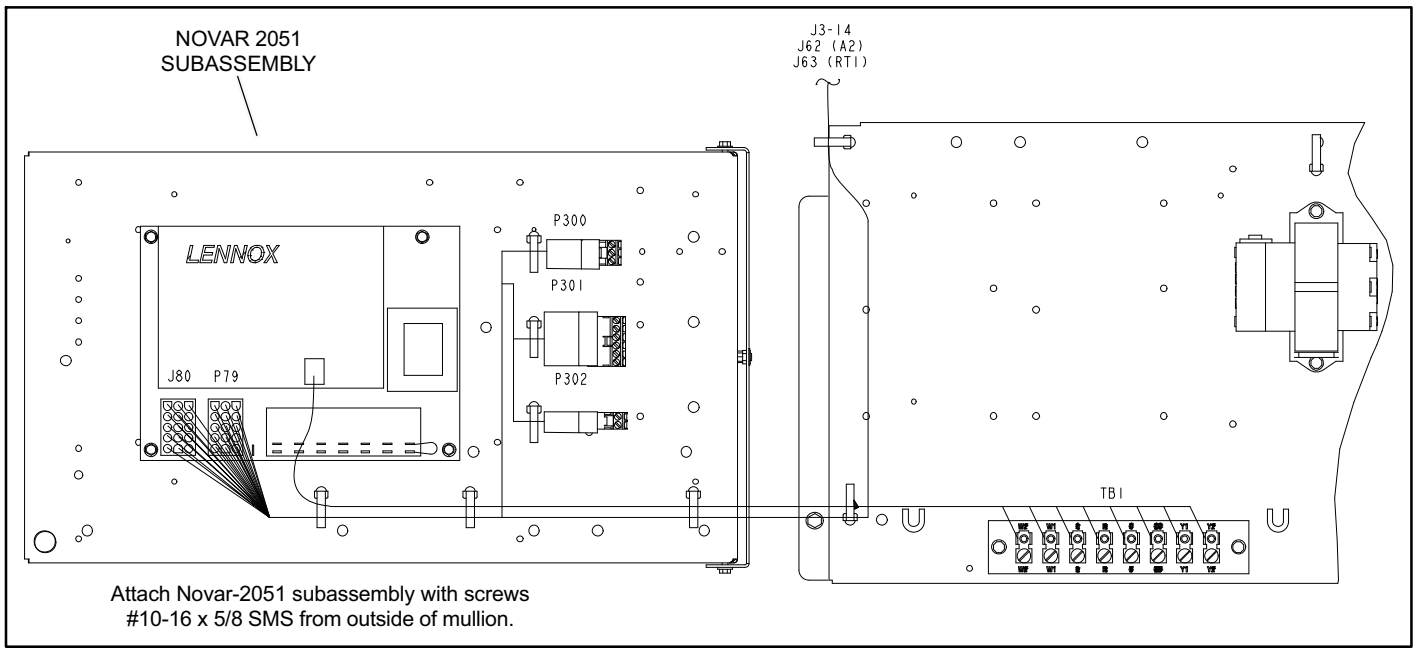


Figure 5. DDC Location - C & D Box Units

C Box Units

Route harnesses coming from sub-assembly (see figure 3 for the following steps 1 through 6).

1. Connect wires marked TB1 to terminal strip TB1.
2. Open blower compartment and install blower proving switch on top of blower wrapper with two #8-32 x ½" TFS screws (see figure 7).
3. Locate S52 terminals coming from sub-assembly and fit them through the conduit on the compressor wall. Connect S52 terminals to blower proving switch.
4. Install RT1 sensor (on bottom of blower compartment) with two #10-16 x 5/8 SMS screws (see figure 3). Get harness J63 from bag assembly; connect one end to RT1 sensor and fit the other end through the conduit on the compressor wall. Connect J63 female terminals to the J63 male terminals from sub-assembly.
5. Open filter access door, install A2 sensor (location shown in figure 3) with two #10-16 x 5/8 SMS screws. Get harness J62 from bag assembly; connect one end to A2 sensor and the J3-14 male terminal to the wire coming from the economizer J3 plug female terminal. Fit the other end through the conduit on the indoor coil and then through the compressor wall conduit. Connect J62 and J3-14 female terminals to the J62 and J3-14 male terminals from sub-assembly.
6. Use P300 (NOVAR Comm Bus connector), P301 and P302 to install field provided sensors (see wiring diagram, figure).

   NOTE - Wires are labeled (hot stamped) to the plugs to identify wire positions.

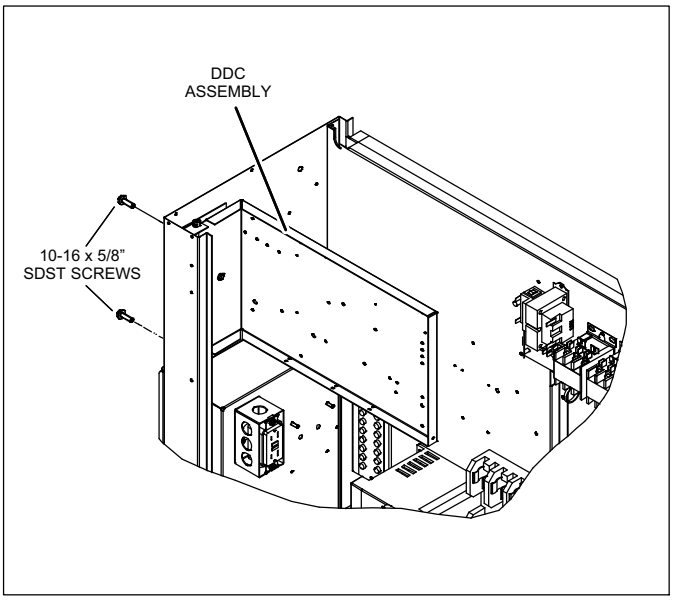


Figure 6. Install DDC Assembly (C Box Units)

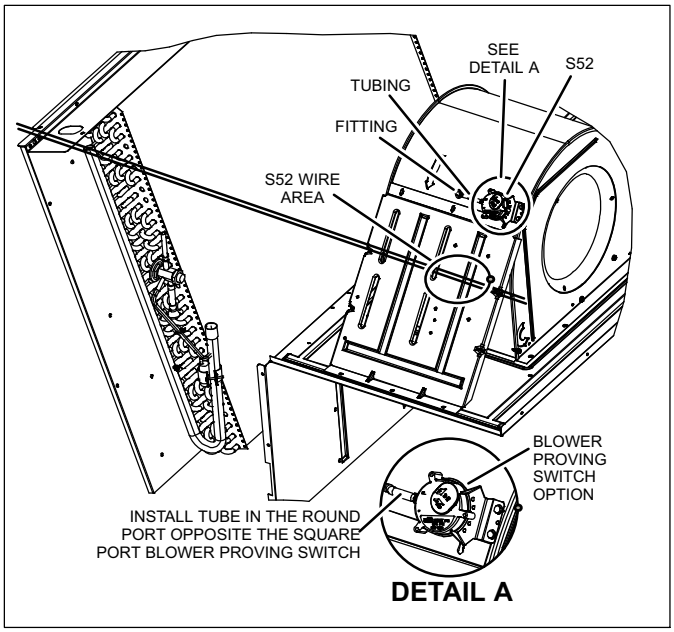


Figure 7. Blower Proving Switch Location

Return Air Sensor (A2) A and A+ Box only

1. Open filter access door.
2. Insert return air sensor probe into hole (location shown in figure 8). Secure with screws provided.
3. Connect A2 return air sensor plug P62 to A2 return air sensor jack J62.

NOTE - Refer to the notes in the wiring diagram in this kit when installing optional sensors. A2 and RT1 may not be connected in some sensor applications.

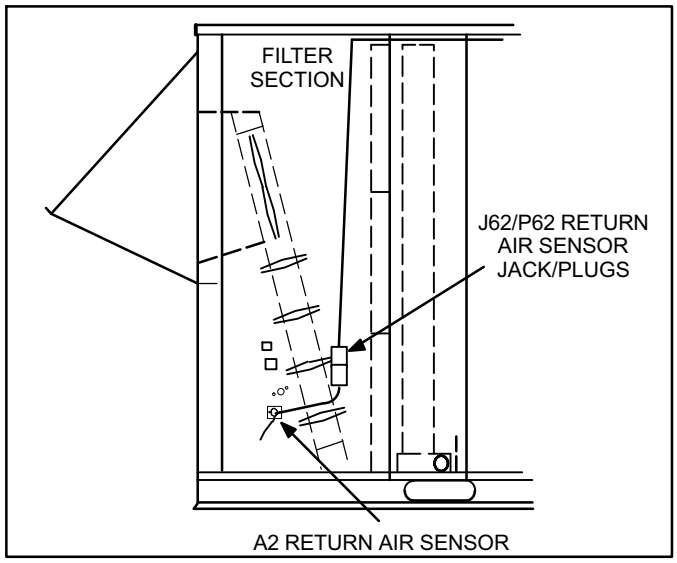


Figure 8. A2 Return Air Sensor

Discharge Air Sensor (RT1) B-Box only

1. Slide out the blower deck.
2. Connect RT1 discharge air sensor plug P63 to RT1discharge air sensor jack J63 coming from the single wire just installed.
3. Insert discharge air sensor probe into hole at the left of blower deck as shown in figure 3. Secure with two #8 -32 x 1/2 TFS screws provided.
4. Cut wire ties holding sensor RT6 and secure both harnesses with pushing wire ties provided as shown in figure 4.
5. Slide blower deck back in the unit.

Wiring

1. Controls contractor completes field wiring connections to optional system components shown in dotted lines in figures 10 and 12.
2. Wiring diagram sections are affixed to inside of unit panel in alphabetical order. Figure 9 shows an example of a complete system diagram on an installation consisting of a LGH240 unit with an electro-mechanical or electronic control system and a modulating economizer. Affix the C section wiring diagram, provided, over the top of the existing C section wiring diagram.

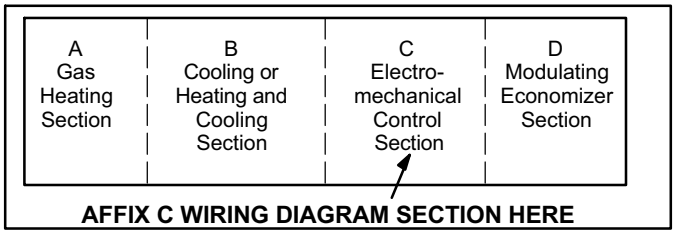
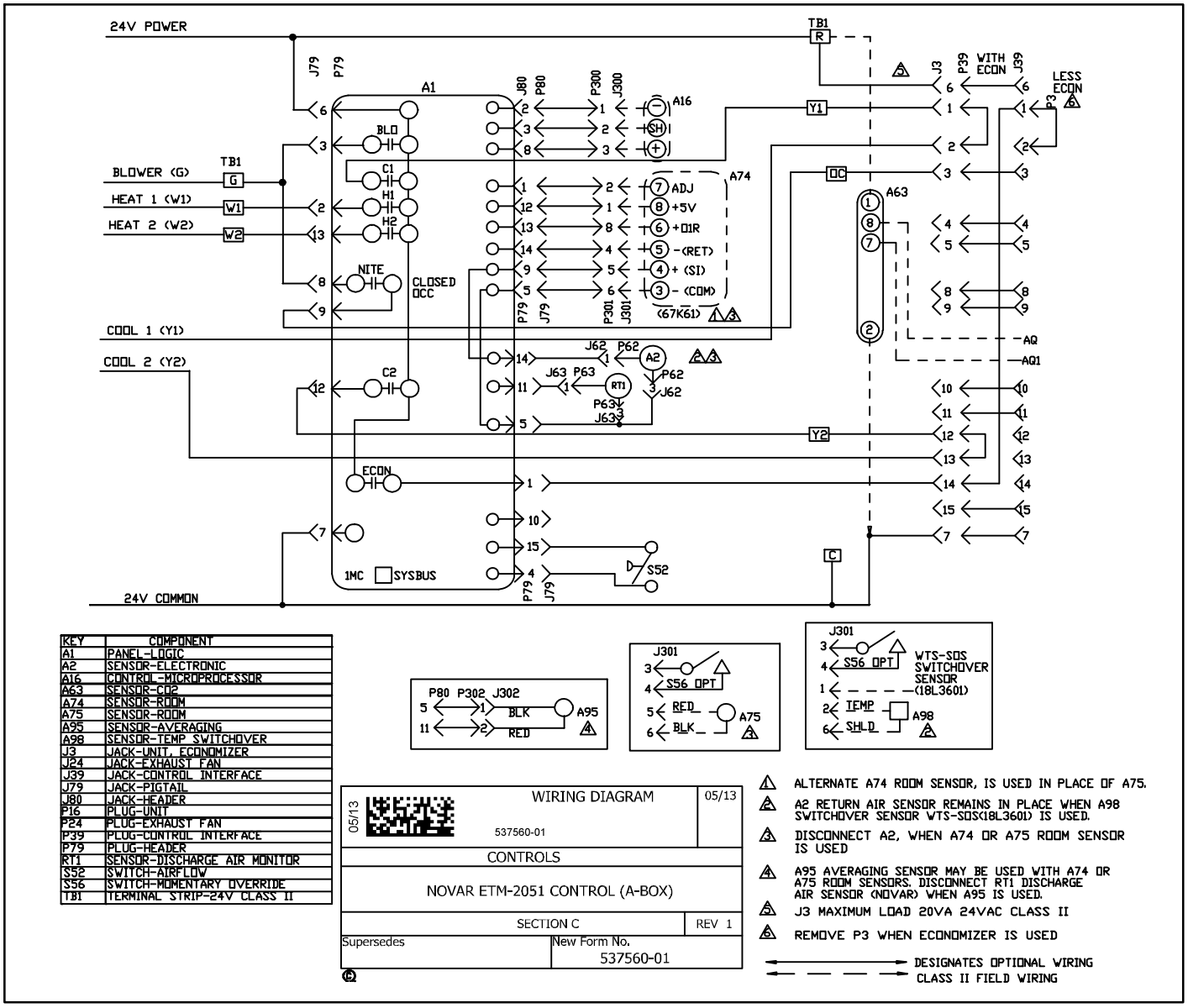


Figure 9. Affixing System Wiring Diagram



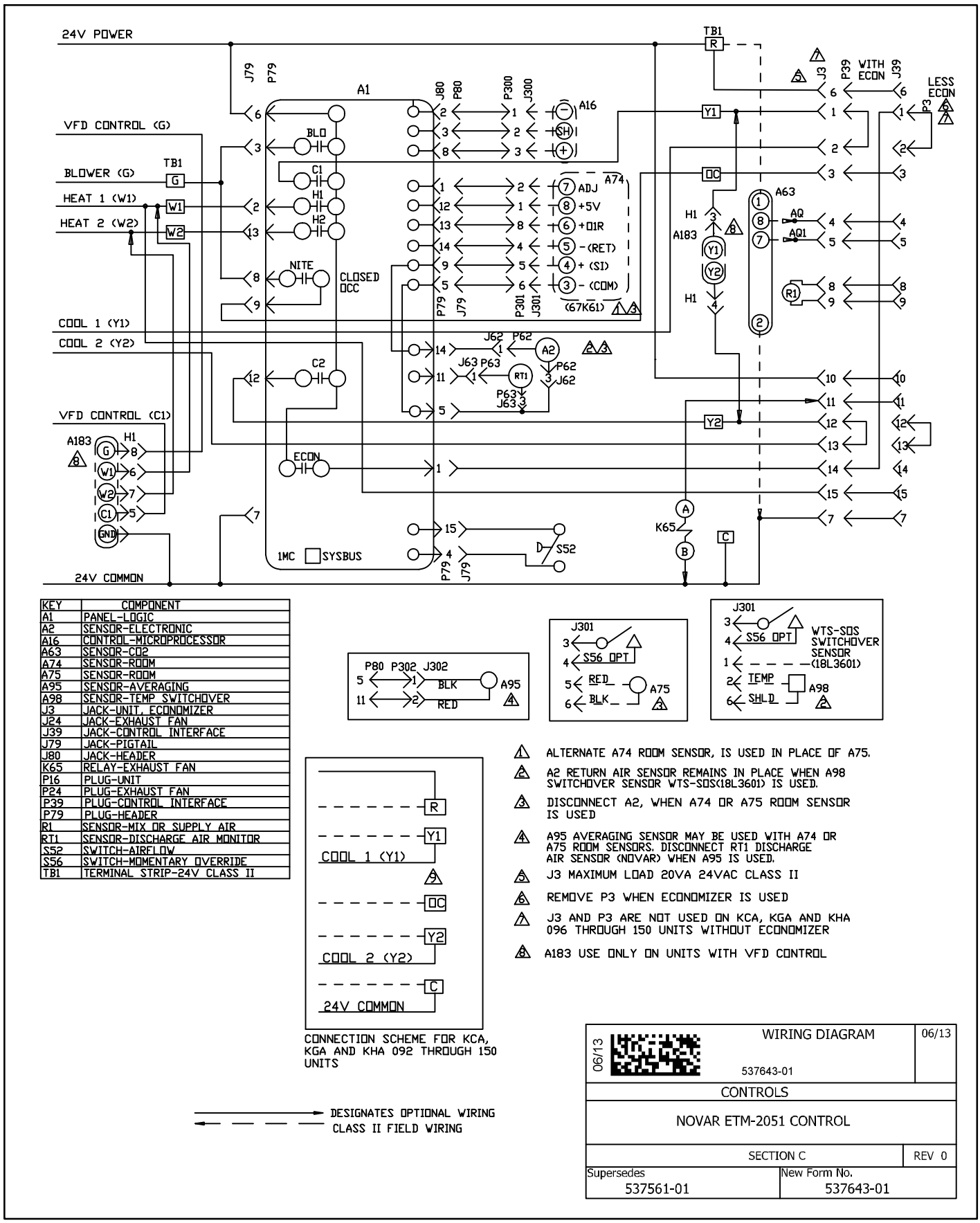
KEY	COMPONENT
A1	PANEL-LOGIC
A2	SENSOR-ELECTRONIC
A16	CONTROL-MICROPROCESSOR
A63	SENSOR-CO2
A74	SENSOR-ROOM
A75	SENSOR-ROOM
A95	SENSOR-AVERAGING
A98	SENSOR-TEMP SWITCHOVER
J3	JACK-UNIT, ECONOMIZER
J24	JACK-EXHAUST FAN
J39	JACK-CONTROL INTERFACE
J79	JACK-PIGTAIL
J80	JACK-HEADER
P16	PLUG-UNIT
P24	PLUG-EXHAUST FAN
P39	PLUG-CONTROL INTERFACE
P79	PLUG-HEADER
RT1	SENSOR-DISCHARGE AIR MONITOR
S52	SWITCH-AIRFLOW
S56	SWITCH-MOMENTARY OVERRIDE
TB1	TERMINAL STRIP-24V CLASS II

05/13	WIRING DIAGRAM 537560-01 — 05/13
CONTROLS	
NOVAR ETM-2051 CONTROL (A-BOX)	
SECTION C	REV 1
Supersedes	New Form No. 537560-01

1. ALTERNATE A74 ROOM SENSOR, IS USED IN PLACE OF A75.
2. A2 RETURN AIR SENSOR REMAINS IN PLACE WHEN A98 SWITCHOVER SENSOR WTS-SOS(18L3601) IS USED.
3. DISCONNECT A2, WHEN A74 OR A75 ROOM SENSOR IS USED
4. A95 AVERAGING SENSOR MAY BE USED WITH A74 OR A75 ROOM SENSORS. DISCONNECT RT1 DISCHARGE AIR SENSOR (NOVAR) WHEN A95 IS USED.
5. J3 MAXIMUM LOAD 20VA 24VAC CLASS II
6. REMOVE P3 WHEN ECONOMIZER IS USED

DESIGNATES OPTIONAL WIRING
CLASS II FIELD WIRING

Figure 10. Wiring Diagram



KEY	COMPONENT
A1	PANEL-LOGIC
A2	SENSOR-ELECTRONIC
A16	CONTROL-MICROPROCESSOR
A63	SENSOR-CO2
A74	SENSOR-ROOM
A75	SENSOR-ROOM
A95	SENSOR-AVERAGING
A98	SENSOR-TEMP SWITCHOVER
J3	JACK-UNIT, ECONOMIZER
J24	JACK-EXHAUST FAN
J39	JACK-CONTROL INTERFACE
J79	JACK-PIGTAIL
J80	JACK-HEADER
K65	RELAY-EXHAUST FAN
P16	PLUG-UNIT
P24	PLUG-EXHAUST FAN
P39	PLUG-CONTROL INTERFACE
P79	PLUG-HEADER
R1	SENSOR-MIX OR SUPPLY AIR
RT1	SENSOR-DISCHARGE AIR MONITOR
S52	SWITCH-AIRFLOW
S56	SWITCH-MOMENTARY OVERRIDE
TB1	TERMINAL STRIP-24V CLASS II

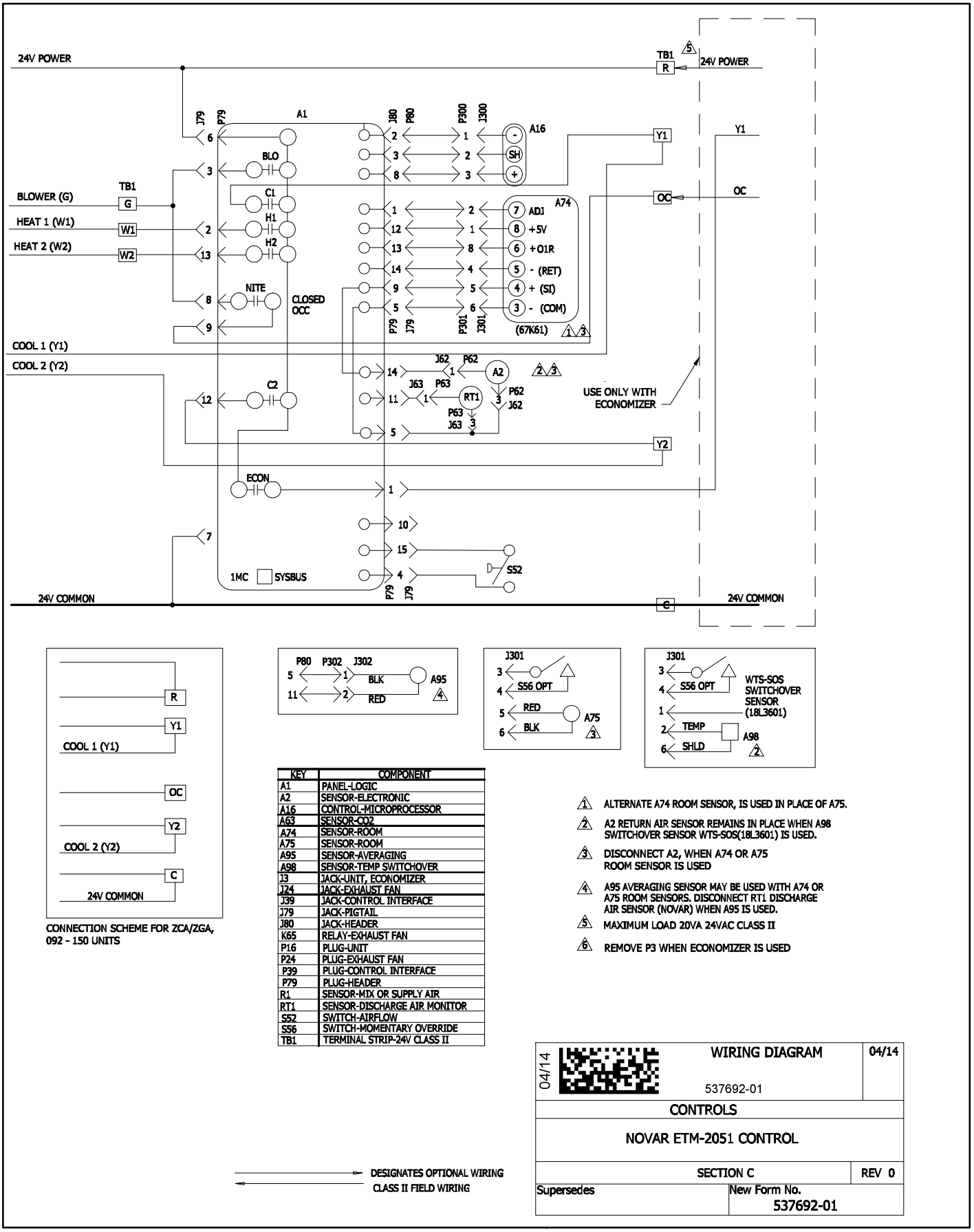
CONNECTION SCHEME FOR KCA, KGA AND KHA 092 THROUGH 150 UNITS

1. ALTERNATE A74 ROOM SENSOR, IS USED IN PLACE OF A75.
2. A2 RETURN AIR SENSOR REMAINS IN PLACE WHEN A98 SWITCHOVER SENSOR WTS-SOS(18L3601) IS USED.
3. DISCONNECT A2, WHEN A74 OR A75 ROOM SENSOR IS USED
4. A95 AVERAGING SENSOR MAY BE USED WITH A74 OR A75 ROOM SENSORS. DISCONNECT RT1 DISCHARGE AIR SENSOR (NOVAR) WHEN A95 IS USED.
5. J3 MAXIMUM LOAD 20VA 24VAC CLASS II
6. REMOVE P3 WHEN ECONOMIZER IS USED
7. J3 AND P3 ARE NOT USED ON KCA, KGA AND KHA 096 THROUGH 150 UNITS WITHOUT ECONOMIZER
8. A183 USE ONLY ON UNITS WITH VFD CONTROL

DESIGNATES OPTIONAL WIRING
CLASS II FIELD WIRING

06/13	WIRING DIAGRAM	06/13
	537643-01	
CONTROLS		
NOVAR ETM-2051 CONTROL		
SECTION C		REV 0
Supersedes 537561-01	New Form No. 537643-01	

Figure 11. Wiring Diagram - Landmark



CONNECTION SCHEME FOR ZCA/ZGA, 092 - 150 UNITS

KEY	COMPONENT
A1	PANEL-LOGIC
A2	SENSOR-ELECTRONIC
A16	CONTROL-MICROPROCESSOR
A63	SENSOR-CO2
A74	SENSOR-ROOM
A75	SENSOR-ROOM
A95	SENSOR-AVERAGING
A98	SENSOR-TEMP SWITCHOVER
J3	JACK-UNIT, ECONOMIZER
J24	JACK-EXHAUST FAN
J39	JACK-CONTROL INTERFACE
J79	JACK-PIGTAIL
J80	JACK-HEADER
K65	RELAY-EXHAUST FAN
P16	PLUG-UNIT
P24	PLUG-EXHAUST FAN
P39	PLUG-CONTROL INTERFACE
P79	PLUG-HEADER
R1	SENSOR-MIX OR SUPPLY AIR
RT1	SENSOR-DISCHARGE AIR MONITOR
S52	SWITCH-AIRFLOW
S56	SWITCH-MOMENTARY OVERRIDE
TB1	TERMINAL STRIP-24V CLASS II

1. ALTERNATE A74 ROOM SENSOR, IS USED IN PLACE OF A75.
2. A2 RETURN AIR SENSOR REMAINS IN PLACE WHEN A98 SWITCHOVER SENSOR WTS-SOS(18L3601) IS USED.
3. DISCONNECT A2, WHEN A74 OR A75 ROOM SENSOR IS USED
4. A95 AVERAGING SENSOR MAY BE USED WITH A74 OR A75 ROOM SENSORS. DISCONNECT RT1 DISCHARGE AIR SENSOR (NOVAR) WHEN A95 IS USED.
5. MAXIMUM LOAD 20VA 24VAC CLASS II
6. REMOVE P3 WHEN ECONOMIZER IS USED

DESIGNATES OPTIONAL WIRING
CLASS II FIELD WIRING

04/14	WIRING DIAGRAM 537692-01	04/14
CONTROLS		
NOVAR ETM-2051 CONTROL		
SECTION C		REV 0
Supersedes	New Form No. 537692-01	

Figure 12. Wiring Diagram - Raider B Box

Check-Out Procedure

The DDC contains relay outputs. Field installed jumpers or toggle switches may be connected to the relay tabs to simulate a thermostat demand (see figure 9). Refer to unit installation instructions provided with unit.

1. Disconnect all electrical power to unit.
2. Remove fuse (F1) from the DDC to disable automatic control of the DDC outputs.
3. Install toggle switches across the relay tabs. If using jumper wire, connect individual jumper wires across the two tabs on each relay. Do not install jumper wires between relays.
4. Restore power to unit. One relay at a time, turn on toggle switch or make jumper connection to other relay tab. The corresponding contactor, relay or solenoid should turn on. This indicates that the unit is receiving a demand from the DDC and the wiring between the DDC output terminals and the TB1 input terminals is correct for each function.

   NOTE - When a jumper is removed, a delay may keep a component functioning.

   IMPORTANT - Do not jumper cooling and heating outputs at the same time.
5. Turn off power.
6. Remove all jumpers or toggle switches.
7. Replace fuse (F1) on DDC.
8. Restore power to unit. Blinking status LED indicates normal operation.
9. 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 DDC.

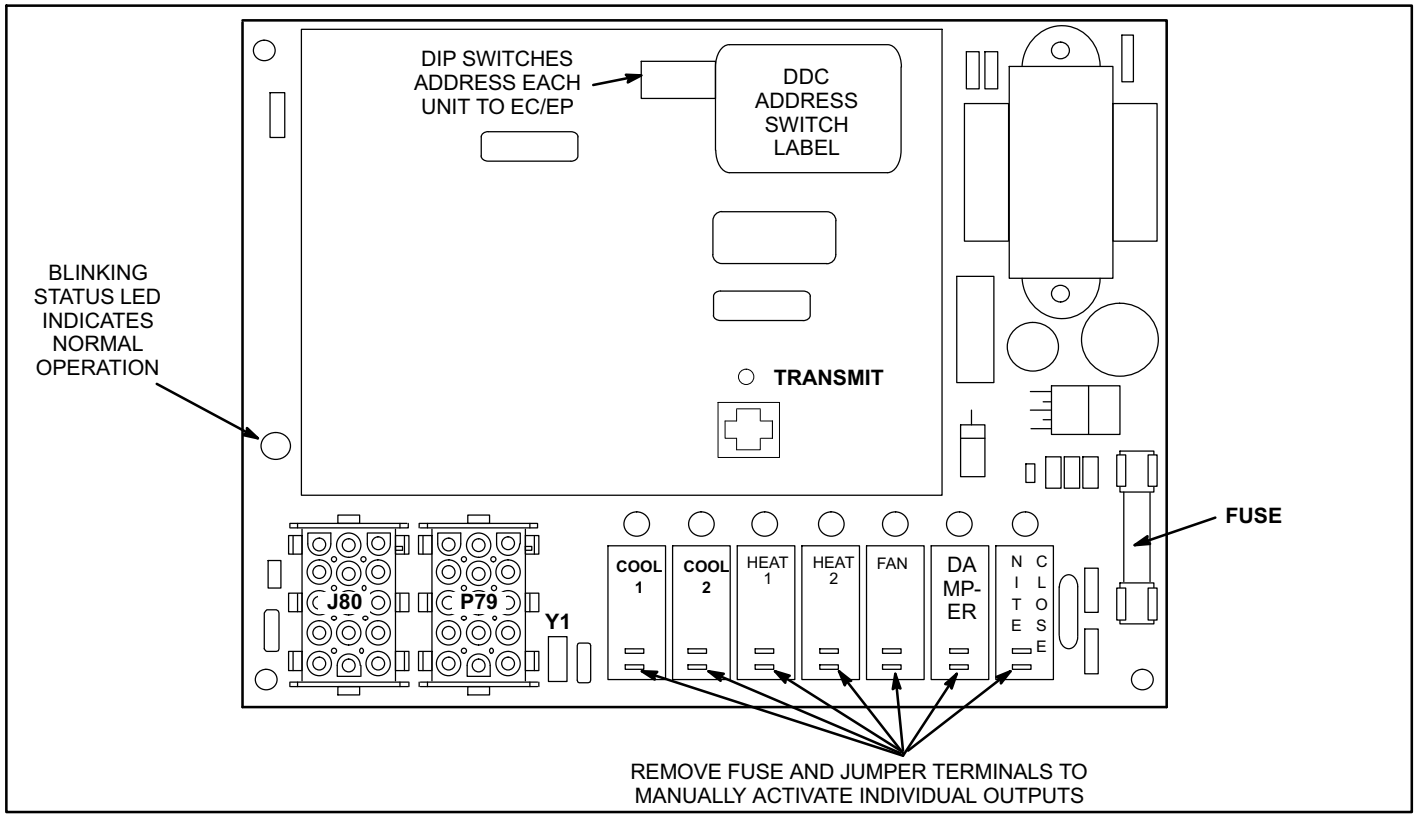


Figure 13. NOVAR ETM-2051 DDC