CONTROLS
KITS AND ACCESSORIES

Technical Publications
Litho U.S.A.

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Supersedes 02/08

CO_2 SENSOR FIELD CONVERSION KIT

INSTRUCTIONS FOR CO_2 SENSOR FIELD CONVERSION KITS (40W24 & 40W25) FOR USE WITH SCA/SGA036/060/120/240 UNITS

Shipping & Packing List

Check for any shipping damage and that all included items (listed below) are intact. If anything is damaged, or if parts are missing, immediately contact the last carrier. CO_2 Sensor Kits includes the following items:

1 - Wiring Harness

1 - K92 Relay

1 - Bag Assembly containing

- 2 - #8-32 x 1/2” Screws
- 5 - Wire nuts
- 2 - #6-32 x 1” Screw
- 1 - Wiring Diagram - VFD Control Staged Air MSAV (shown in figure 7)
- 1 - Wiring Diagram - CPC Control (shown in figure 8)
- 1 - Wiring Diagram - Novar ETM-2024 (shown in figure 9)
- 1 - Installation Instructions

(SCA/SGA036/060 units only)

- 1 - **IN 40W24 ONLY**—GP1 General Purpose Board

Conversion Procedure

⚠ IMPORTANT

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.

Install General Purpose board (GP1) and Relay (K92)

1. Disconnect all power to the unit.
2. Open control section access panels.
3. Install the relay provided in the location shown in Figures 1, 2, or 3 (depending on unit size) with the two #8-32 screws provided.
4. On SCA/SGA036/060 units, install the GP1 board provided in the location shown in Figure 1 with the two #6-32 screws provided.

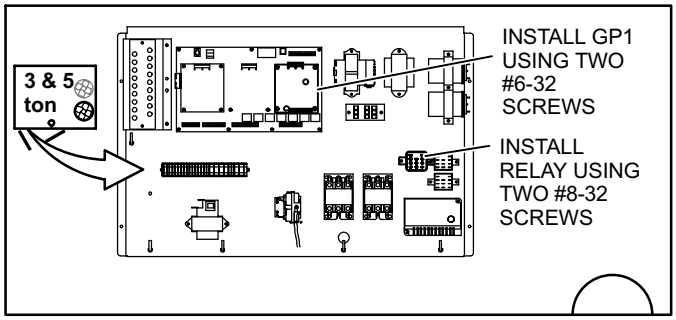


Figure 1. Installing Relay (K92) and General Purpose Board (GP1) (SCA/SGA036/060)

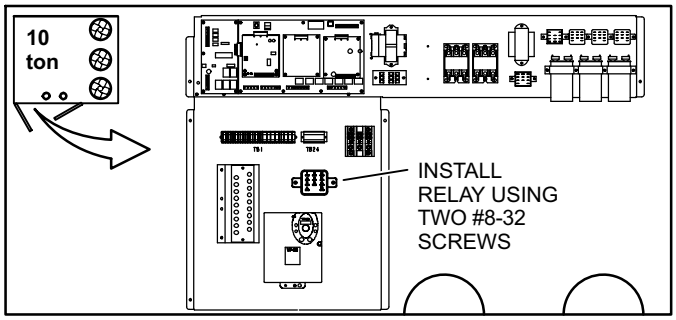


Figure 2. Installing Relay (K92) (SCA/SGA120)

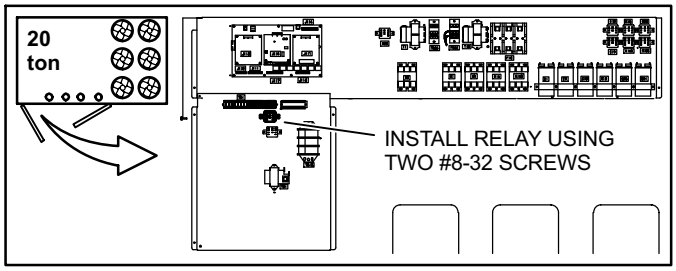


Figure 3. Installing Relay (K92) (SCA/SGA240)

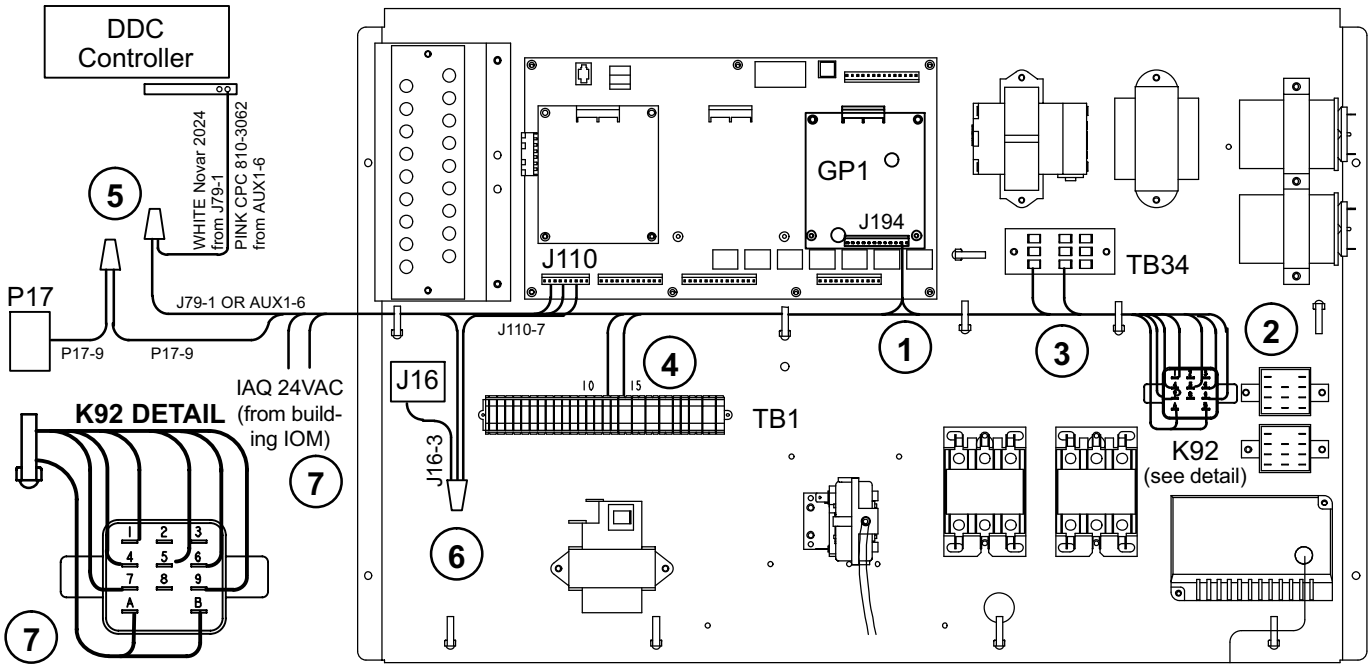


Figure 4. Installing Wiring Harness SCA/SGA036/060 Units

Install Wiring Harness

NOTE - Each harness lead has been hot stamped for ease of assembly. Encircled numbers in figures 4 through 6 correlate with the steps described below.

Depending on the size of the unit, install the harness provided in the following manner:

SCA/SGA036/060 Units (see figure 4)

1. Attach plug with wires marked J194-1, -3, -10, -12 to P194 on GP1 board.
2. Attach wires marked K92-1, -4, -5, -6, -7, -8, -9 to indicated terminals on K92 relay.
3. Attach wires marked TB34-1 and –2 to TB34 low voltage terminal strip, terminals 1 and 2, respectively.
4. Attach wires marked TB1-10 and –15 to TB1 terminal strip, terminals 10 and 15, respectively.
5. **Units with Novar 2024 Controller**—Locate white wire on the Novar DDC control module going from J79-1 on the Novar controller to P17-9. Cut the wire in the middle and strip both ends 3/8". Attach wire marked P17-9 from the harness provided in the kit to the wire marked P17-9 on the Novar controller and the wire marked J79-1/AUX1-6 to the wire marked J79-1.

   Units with CPC 810-3062 Controller—Locate pink wire on CPC DDC control module going from AUX1-6 on the CPC controller to P17-9. Cut the wire in the middle and strip both ends 3/8". Attach wire marked P17-9 from the harness provided in the kit to the wire marked P17-9 on the CPC controller and the wire marked J79-1/AUX1-6 to the wire marked AUX1-6.
6. Locate the white wire going from J110-7 on the IMC board to J16-3. Cut the wire in the middle and strip both ends 3/8". Attach wire marked J16-3 from the the harness provided in the kit to both wires.
7. Attach 24VAC signal from building IOM to K92 relay coil, terminals 'A' and 'B'.

   NOTE - Wires from the building are rolled up inside the unit and labeled with tag that reads "IAQ".
8. Depending on which control module is installed, place appropriate control diagram provided over Temperature Controls diagram.
9. Apply power to unit and set ECTO parameters to the following for proper economizer operation:
   8.16 to 2
   8.17 to 100
   5.26 to 5 (maximum value) (V5.21 or later)
   5.26 to 1 (prior to V5.21)

SCA/SGA120/240 Units (see figures 5 and 6)

1. Remove J194 plug from GP1 board and attach wires marked J194-1, -3, -12 into J194 plug and replace on GP1 board.
2. Attach wires marked K92-1, -4, -5, -6, -7, -8, -9 to indicated terminals on K92 relay.
3. Attach wires marked TB34-1 and –2 to TB34 low voltage terminal strip, terminals 1 and 2, respectively.
4. Attach wires marked TB1-10 and –15 to TB1 terminal strip, terminals 10 and 15, respectively.
5. Locate gray wire going from J194-10 to J248-3 at inverter. Cut wire in the middle and strip both ends 3/8". Attach both wires together with wire from harness marked J194-10/J248-3 with wire nut provided.
6. **Units with Novar 2024 Controller**—Locate white wire on Novar DDC control module going from J79-1 on the Novar controller to P17-9. Cut the wire in the middle and strip both ends 3/8". Attach wire marked P17-9 from the harness provided in the kit to the wire marked P17-9 on the Novar controller and the wire marked J79-1/AUX1-6 to the wire marked J79-1.

   Units with CPC 810-3062 Controller—Locate pink wire on CPC DDC control module going from AUX1-6 on the CPC controller to P17-9. Cut the wire in the middle and strip both ends 3/8". Attach wire marked P17-9 from the harness provided in the kit to the wire

marked P17-9 on the CPC controller and the wire marked J79-1/AUX1-6 to the wire marked AUX1-6.

7. Locate the white wire going from J110-7 on the IMC board to J16-3. Cut the wire in the middle and strip both ends 3/8". Attach wire marked J16-3 from the the harness provided in the kit to both wires.
8. Attach 24VAC signal from building IOM to K92 relay coil, terminals 'A' and 'B'.

   NOTE - Wires from the building are rolled up inside the unit and labeled with tag that reads "IAQ".

9. Depending on which control module is installed, place appropriate control diagram provided over Temperature Controls diagram. Place Blower VFD Control diagram provided over diagram on unit.
10. Apply power to unit and set ECTO parameters to the following for proper economizer operation:
    8.16 to 2
    8.17 to 100
    5.26 to 5 (maximum value) (V5.21 or later)
    5.26 to 1 (prior to V5.21)

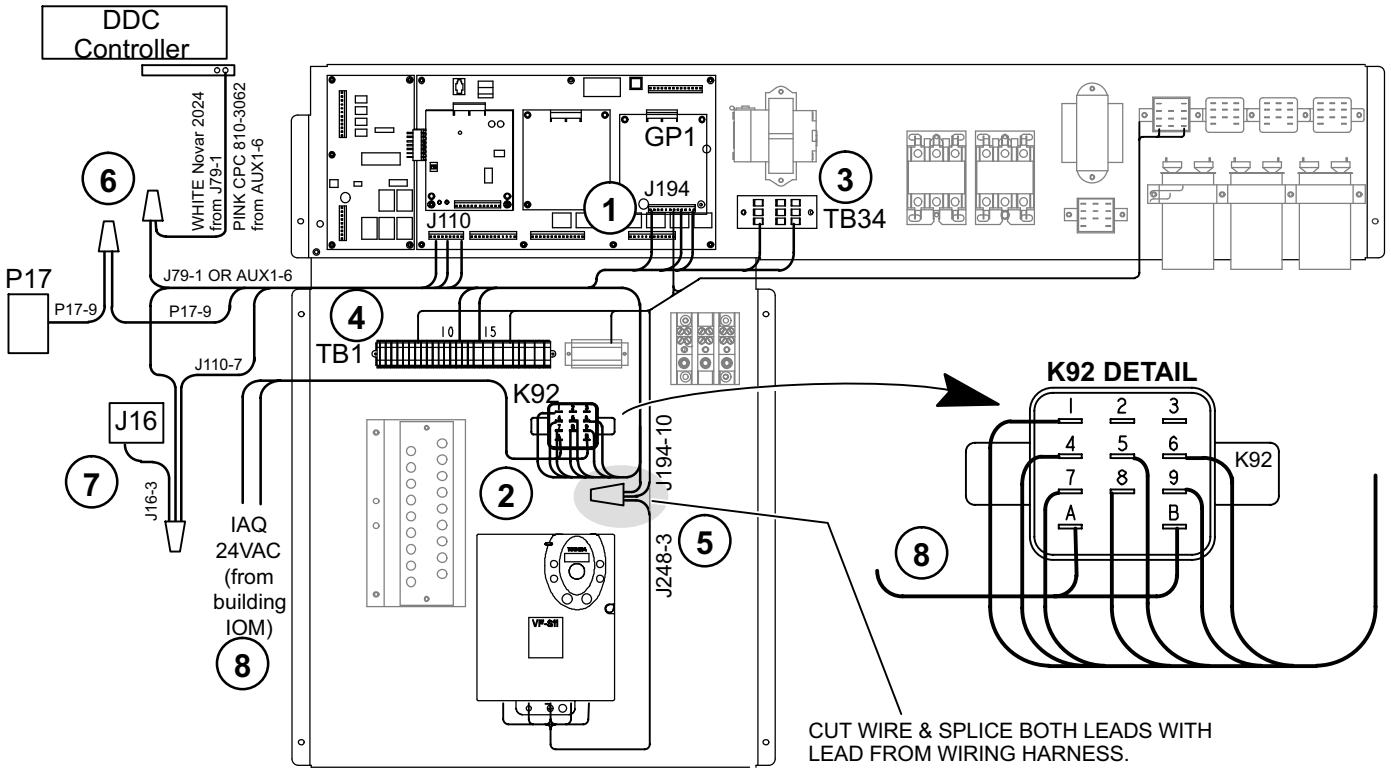


Figure 5. Installing Wiring Harness SCA/SGA120 Units

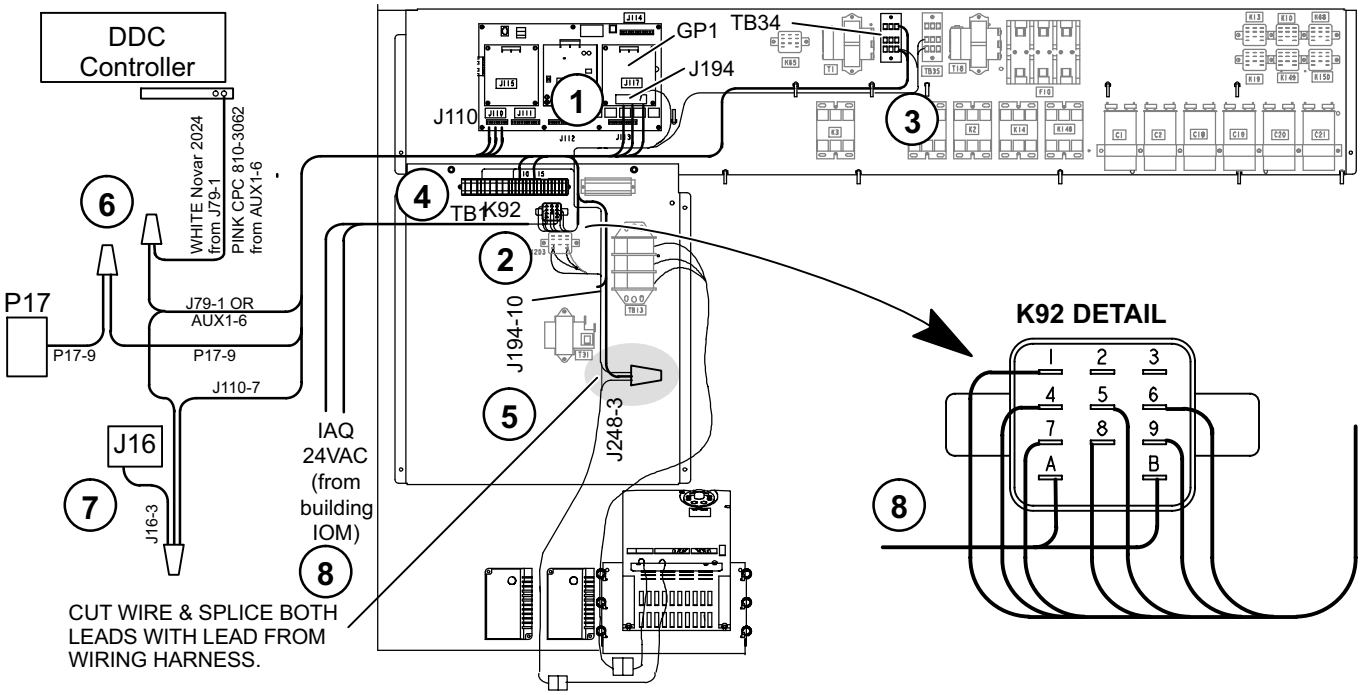
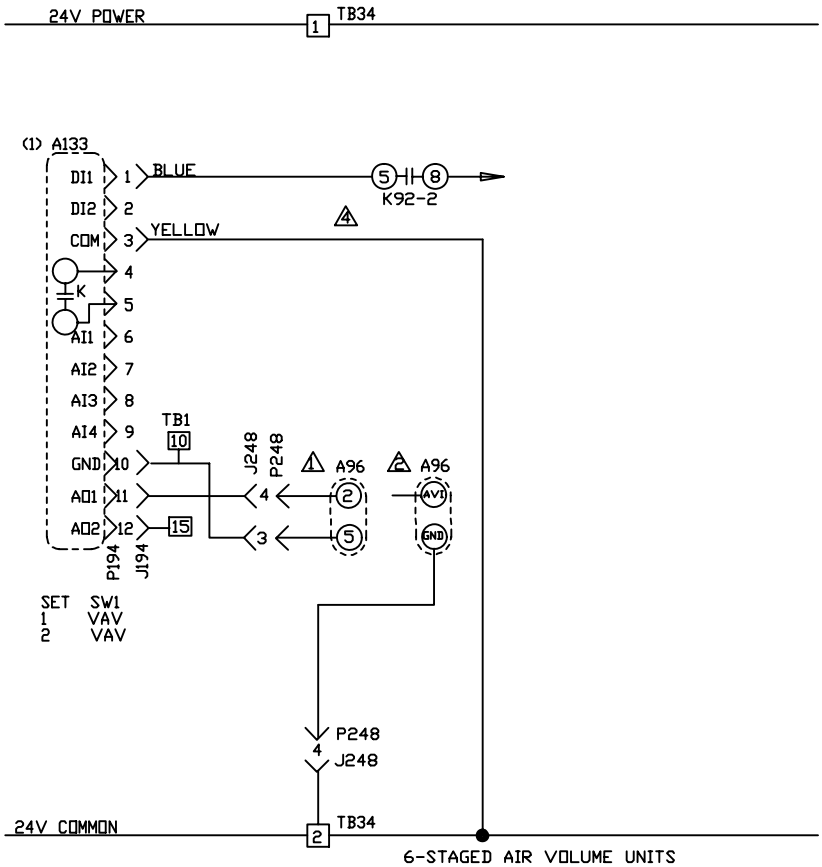


Figure 6. Installing Wiring Harness SCA/SGA240 Units



THE MIN/MAX AND STAGED SPEEDS ARE LISTED AS FOLLOWS:

OPERATION	STAGED SPEED ECTO
COOLING 1	0.05
COOLING 2	0.14
COOLING 3	0.15
COOLING 4	0.16
G, BLOWER	0.03
SMOKE ALARM MODES	0.02
HEATING	0.04

STAGED % SPEED CAN BE ADJUSTED FOR EACH OPERATION 3

6-STAGED AIR VOLUME UNITS
ECTO 6.01 OPTION (LOCAL THERMOSTAT) OR 3 (ZONE SENSOR)
ECTO 0.01 OPTION 3=OPTION 1+OPTION 2

THIS CONFIGURATION IS A SPECIAL CASE APPLICATION, WHERE THE BLOWER SPEED IS STAGED BY THE FACTORY INSTALLED VFD FOR FIXED SPEEDS FOR DIFFERENT OPERATION. THERE ARE UP TO SEVEN DIFFERENT SPEED STAGES, ONE FOR EACH COOLING STAGE (4), ONE FOR BLOWER, ONE FOR HEATING AND ONE FOR OPERATION DURING SMOKE ALARM MODES. THE BLOWER IS ENABLED BY A G DEMAND.

DESCRIPTION	
KEY	COMPONENT
A96	CONTROL-INVERTER
A133	CONTROL-GENERAL PURPOSE
J194	JACK-INPUT, OUTPUT
J248	JACK-VFD CONTROL
K92,-1	RELAY-INTERLOCK
P194	PLUG-INPUT, OUTPUT
P248	PLUG-VFD CONTROL
TB1	TERMINAL STRIP-CLASS II VOLT
TB34	TERMINAL STRIP-TRANSFORMER

1. MITSUBISHI FR-E500 INVERTER CONTROL FOR B3 SUPPLY AIR BLOWER
2. DELTA VFD-M A96 VFD CONTROL FOR B3 SUPPLY AIR BLOWER
3. REFER TO UNIT ECTO FACTORY SETTINGS STICKER FOR BLOWER STAGED SPEEDS
4. SET ECTO PARAMETERS
   8.16 TO 2
   8.17 TO 100
   5.26 TO 5 (V5.21 OR LATER)
   5.26 TO 1 (VERSIONS PRIOR TO V5.21)

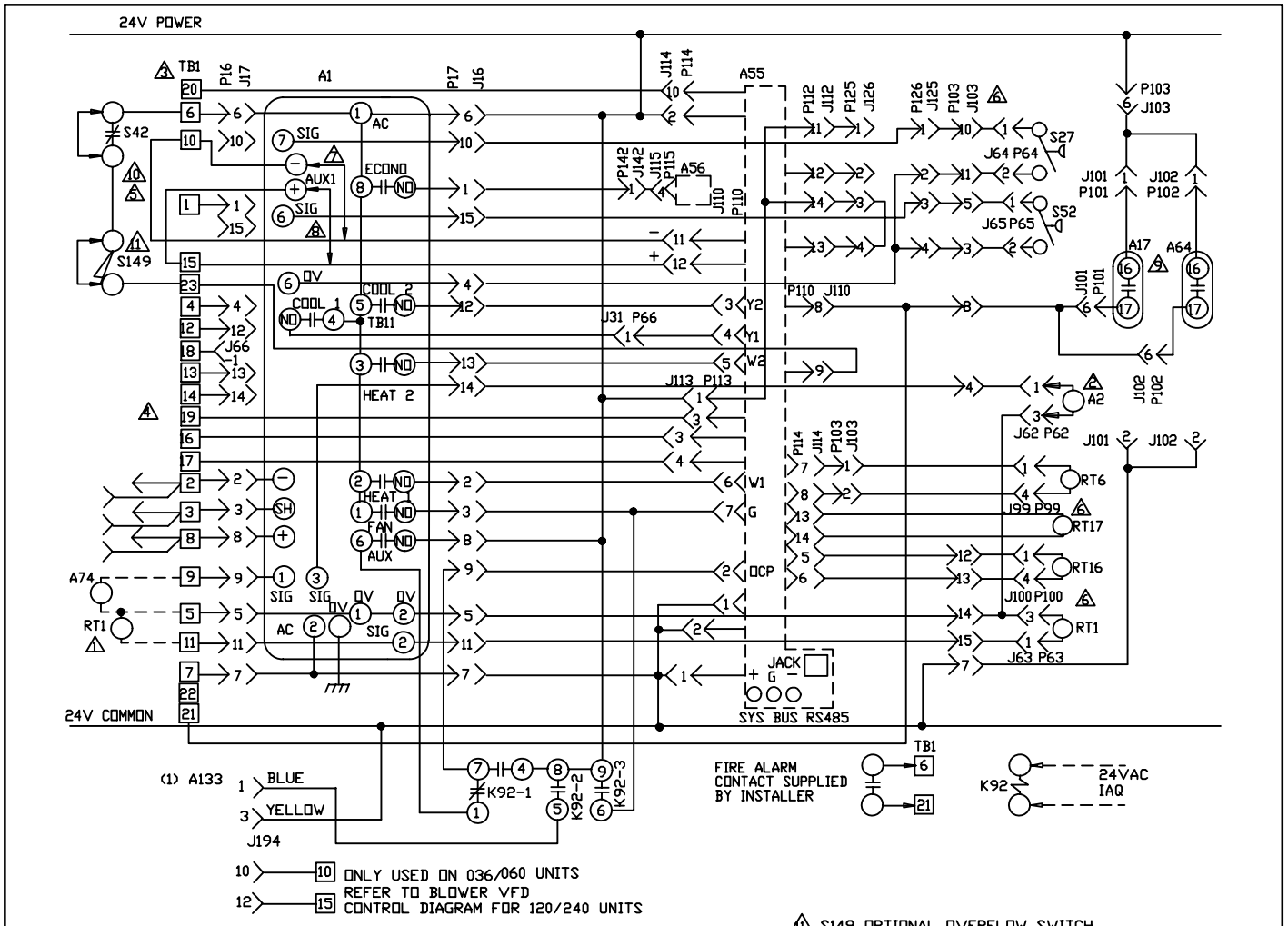
– – – – – FIELD WIRING

WIRING DIAGRAM 2/08

BLOWER VFD CONTROL
STAGED AIR VOLUME
MSAV FIELD SENSOR KIT
HEAT/COOL SECTION 4B

Supersedes Form No. | New Form No. 537031-01

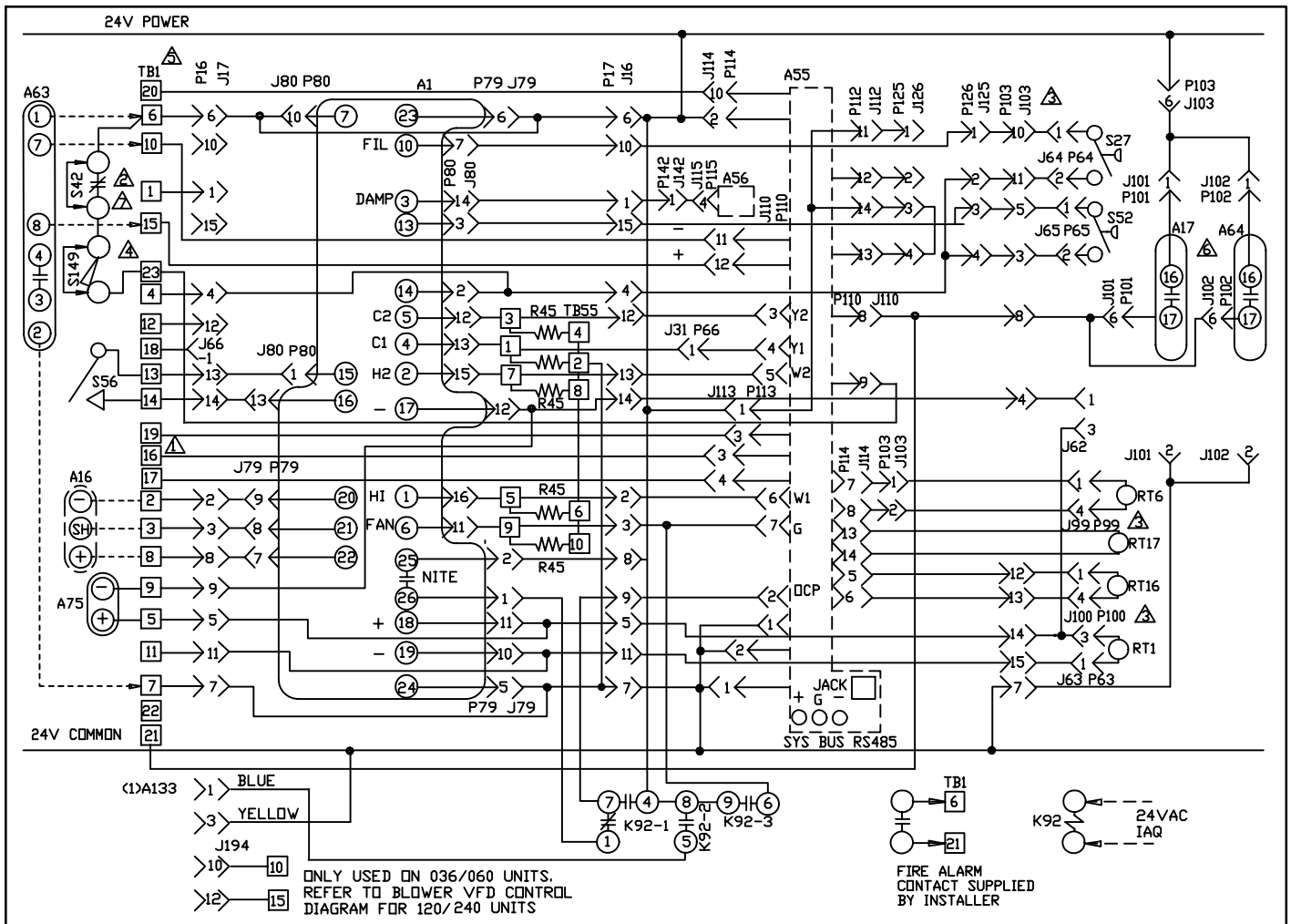
Figure 7. Wiring Diagram - VFD Control Staged Air MSAV



DESCRIPTION	
KEY	COMPONENT
A1	PANEL-LOGIC
A2	SENSOR-ELECTRONIC
A17	DETECTOR-SMOKE
A55	PANEL-MAIN
A56	PANEL-ECONOMIZER
A64	DETECTOR-SMOKE,SUPPLY AIR
A74	SENSOR-ROOM
J16	JACK-UNIT
J17	JACK-LOGIC PANEL
J31	JACK-COOL ONE,DDC CONTROL
J62	JACK-A2 RETURN AIR SENSOR
J63	JACK-RT1 DISCH. AIR SENSOR
J64	JACK-S27 FILTER SWITCH
J65	JACK-S52 FAN SWITCH
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
J194	JACK-INPUT/OUTPUT A133
K92,-1,2,3	RELAY-INTERLOCK

DESCRIPTION	
KEY	COMPONENT
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
RT1	SENSOR-DISCHARGE
RT6	SENSOR-ADDER DISCHARGE CONTROL
RT16	SENSOR-RETURN AIR TEMP
RT17	SENSOR-OUTSIDE AIR TEMP
S27	SWITCH-FILTER
S42	OVERLOAD-RELAY,BLOWER MOTOR
S52	SWITCH-AIR FLOW
S149	SWITCH-OVERFLOW
TB1	TERMINAL STRIP-24V CLASS II

Figure 8. Wiring Diagram - CPC Control



DESCRIPTION	
KEY	COMPONENT
A1	PANEL-LOGIC
A16	CONTROL-MICROPROCESSOR, EP
A17	DETECTOR-SMOKE
A55	PANEL-MAIN
A56	PANEL-ECONOMIZER
A63	SENSOR-CO2(IAQ)OPTIONAL
A64	DETECTOR-SMOKE,SUPPLY AIR
A75	SENSOR-ROOM (95H5301)
J16	JACK-UNIT
J17	JACK-LOGIC PANEL
J31	JACK-COOL ONE
J62	JACK-A2 RETURN AIR SENSOR
J63	JACK-SENSOR CO2 (IAQ) OPTIONAL
J64	JACK-S27 FILTER SWITCH
J65	JACK-S52 FAN SWITCH
J66	JACK-COOL 1 INTERFACE
J79	JACK-PIGTAIL TO P17
J80	JACK-HEADER
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
J194	JACK-INPUT, OUTPUT A133
K92,-1,2,3	RELAY-INTERLOCK

DESCRIPTION	
KEY	COMPONENT
P16	PLUG-UNIT
P17	PLUG-LOGIC PANEL
P63	PLUG-SENSOR CO2 (IAQ) OPTIONAL
P64	PLUG-S27 FILTER SWITCH
P65	PLUG-S50 FAN SWITCH
P66	PLUG-COOL ONE
P79	PLUG-HEADER
P80	PLUG-PIGTAIL TO J17
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
R45	RESISTOR-1K OHM,5 WATT,TRIAC
RT1	SENSOR-DISCHARGE
RT6	SENSOR-A55 DISCHARGE (IMC)
RT16	SENSOR-RETURN AIR TEMP
RT17	SENSOR-OUTSIDE AIR TEMP
S27	SWITCH-FILTER
S42	OVERLOAD-RELAY,BLOWER MOTOR
S52	SWITCH-AIR FLOW
S56	SWITCH-MOMENTARY OVERRIDE
S149	SWITCH-OVERFLOW
TB1	TERMINAL STRIP-24V CLASS II
TB55	TERMINAL STRIP-RESISTOR, 1K

1. S42 HOOKUP ARE UNITS LESS INVERTER, SEE INVERTER WITH BYPASS DIAGRAMS FOR S42 HOOKUP
2. TERMINAL DESIGNATION WHEN USING DH400 SENSOR
3. TB1-20 FOR DEHUMIDIFICATION CONTROL
4. S149 OPTIONAL OVERFLOW SWITCH
5. J99/P99,J100/P100 AND J103/P103 ARE NOT USED ON-036,042,048,060,072,088 AND 100 UNITS
6. FOR MOTORS WITH S42 EXTERNAL OVERLOAD AND WITH A55(IMC) SOFTWARE VERSION 1.07 & NEWER
7. TB1-19 IS SERVICE RELAY OUTPUT(24VAC). IF USED CONNECT TO A INDICATOR LIGHT OR RELAY COIL (MAX 4VA)

DENOTES OPTIONAL COMPONENTS
CLASS II FIELD WIRING

WIRING DIAGRAM 2/08

ACCESSORIES

CONTROL FOR SCA,SGA UNITS
NOVAR ETM-2024
FIELD SENSOR KIT

TEMPERATURE CONTROL SECTION C44

Supersedes Form No. | New Form No. 537033-01

 Litho U.S.A.

Figure 9. Wiring Diagram - Novar ETM-2024