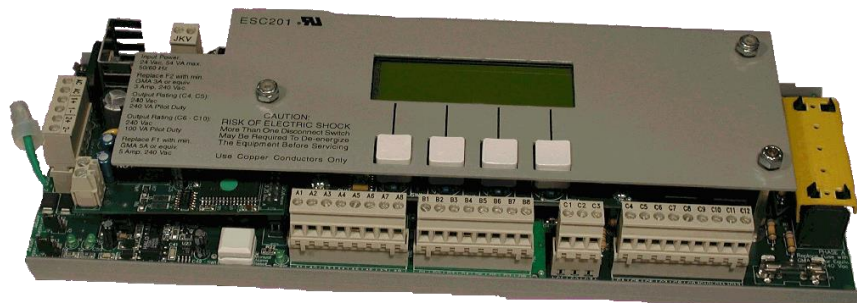




# Technical Bulletin (TB-0032)

## Conversion From ESC 100/200 to 201

Revision - December 2011



This document serves as a guideline for upgrading the obsolete ESC 100 or ESC 200 control boards to the ESC 201, and details modifications needed to make this upgrade. For a complete manual on installation and operating instructions of the ESC 201, contact BITZER U.S. and request document “ESC201 – MA-0012”.

The ESC 201 has improved features and functions, which include:

- A digital display which indicates operating parameters as well compressor faults.
- A discharge temperature control.
- Part winding contactor control.
- Separate oil and eco solenoid coils.
- Echelon & RS-485 communications.
- Liquid injection flow valve control.

### Upgrading the ESC 100 to 201

Please refer to Figure 1 (page 5) while following the steps below. Wiring diagrams for the ESC 201 can be found in Figure 3 (page 7).

#### **1. Remove the ESC 100**

- A) Disconnect power to the ESC 100.
- B) Identify and mark all the wires connected to the ESC 100 with their respective terminal point numbers.
- C) Identify and mark the three phase wires which will be placed in the same position on the ESC 201.
- D) Remove all power and control wires from the ESC 100
- E) Remove the ESC 100 from the panel.

#### **2. Install the ESC 201**

- A) Locate a place to mount the ESC 201 in the panel. Since the ESC 201 is larger than the ESC 100, it will not be able to fit in the exact same location as the previous ESC 100. (Options for mounting include any of the inside walls of the panel or on the inside of the panel door.)
- B) Because the ESC 201 will be located in a different position than the previous ESC module, extension wires will be required. The extension wires can be connected with crimp caps and placed in the wire track. Be sure to number the ends of the extension wires with the ESC 100 terminal numbers.

- C) Wires connected to terminals 2, 3, and 9 should be terminated with a cap as they will not be used with the ESC 201. If an alarm board is not going to be used then the ESC 100 alarm wires (numbers 14 – 20) must be capped or connected to one common wire which will be connected to terminal C10 on the ESC 201. If an alarm board will be used then refer to # 3 on the following page.
- D) Connect all the wires marked with the ESC 100 terminals to the ESC 201 terminals, according to the wiring schematic diagram shown in Figure 1.
- E) **Important:** The ESC 201 requires a 24VAC transformer **without** a center tap ground connection. The transformer power required is 24VAC, 16VA.

### 3. ESC 100 Alarm Function to ESC 201 Alarm Boards

- A) The ESC 201 has only one high voltage alarm output to illuminate a panel light. If the alarm outputs from the ESC 100 are required, an ESC 201 alarm board can be purchased which will display all the existing alarm lights.
- B) If only one alarm panel light is required, all the ESC 100 alarm lights can be wired to terminal C10 of the ESC 201. This will illuminate one of the existing lights and will serve as a “General Alarm.” The issue can then be read on the ESC 201 display.
- C) The alarm board will require an additional space of approximately 6” X 8” for installation. The alarm board requires 15VA power at 24VAC, as well as shielded cable connections between the comm.2 networks of the alarm board and the ESC 201. The board provides 10 high voltage and 10 digital outputs to operate the panel lights and the low voltage signals to the rack controller for remote alarms.
- D) Connect the existing alarm light wires according to the table below. The table lists the relationships of the high voltage terminals on the ESC 100 to the high voltage terminals on the ESC 201 Alarm Board.
- E) When wiring the Alarm Board please refer to chapter 13 “Alarm Boards” (pg 30) of document ESC201 - MA0012-2010 as a guide.

Description	ESC 100 Outputs	ESC 201 Outputs
1. Dirty Oil Filter Alarm	15	H1
2. Motor Winding Overload Alarm	16	H2
3. Oil Flow Alarm	17	H3
4. Oil Level Alarm	N/A	H4
5. High Discharge Gas Alarm	18	H5
6. Phase Loss Alarm	19	H6
7. Rotation / Wrong Sequence	20	H7
8. Run Proof / By-Pass Alarm	N/A	H8
9. Over Discharge Limit	N/A	H9
10. Low Discharge Temperature	N/A	H10

#### Part Numbers:

- ESC 201: 855-8002-00  
Required transformer power: 24VAC, 16VA without Jet Kool & Echelon, 24VAC, 22VA with Jet Kool & Echelon
- ESC 201 Alarm Board: 800-4006  
Required transformer power: 24VAC, 15VA

**Please note:** When using the ESC 201, BITZER protection module SE-E1 is not needed.

## Upgrading the ESC 200 to 201

Please refer to Figure 2 (page 6) while following the steps below. Wiring diagrams for the ESC 201 can be found in Figure 3 (page 7).

### 1. Remove the ESC 200

- A) Unplug all terminal plugs on the ESC 200.
- B) Identify and mark the three phase wires which will be placed in the same position on the ESC 201.
- C) Disconnect the three phase wires.
- D) Remove the ESC 200 from the snap track.

### 2. Install the ESC 201

- A) Place the ESC 201 in the snap track, positioning the control close to the old terminal plugs.
- B) Connect the phase wires in the same position as was on the ESC 200.
- C) Remove the control wires from the ESC 200 terminal plugs and wire them on the new terminal plugs of the ESC 201, per the wiring schematic.
- D) **Important:** The ESC 201 requires a 24VAC transformer **without** a center tap ground connection. The power requirement will be different depending on the control's operation with or without Jet Kool:
  - Transformer without Jet Kool & Echelon - 24VAC, 16VA
  - Transformer with Jet Kool & Echelon - 24VAC, 22VA

If ESC 200 and ESC 201 controls are both used on the same equipment, they will require different power supplies. Suggestion: A transformer that can handle multiple ESC 201 controls may be the best alternative for expansion or future replacement purposes.

### 3. ESC 200 Alarm Function to ESC 201 Alarm Boards

- A) The ESC 201 has a provision for one high voltage alarm output to illuminate a panel light. If the alarm outputs from the ESC 200 are required, an ESC 201 alarm board can be purchased to display all existing alarm lights.
- B) If the system requires the use of only one alarm panel light, the present alarm lights can be eliminated by using the alarm output on terminal C10 of the ESC 201, calling it a "General Alarm," thus illuminating one of the existing lights to indicate an alarm has occurred. The alarm can then be read on the ESC 201 display.
- C) Installation of the ESC 201 alarm board will require approximately 6"X8" of additional panel space. Each alarm board requires 15VA power at 24VAC, as well as shielded cable connections between the comm. 2 networks of the alarm board and the ESC 201. The board provides 10 high voltage and 10 digital outputs to operate the panel lights; the low voltage signals to the rack controller for remote alarms.
- D) Listed in the table below are the terminal relationships from the high voltage terminals on the ESC 200 to the high voltage terminals on the ESC 201 alarm board.
- E) When wiring alarm boards please refer to section 13.0 "**Alarm Boards**" (pg 30) of document ESC201 MA-0012-2011 as a guide.

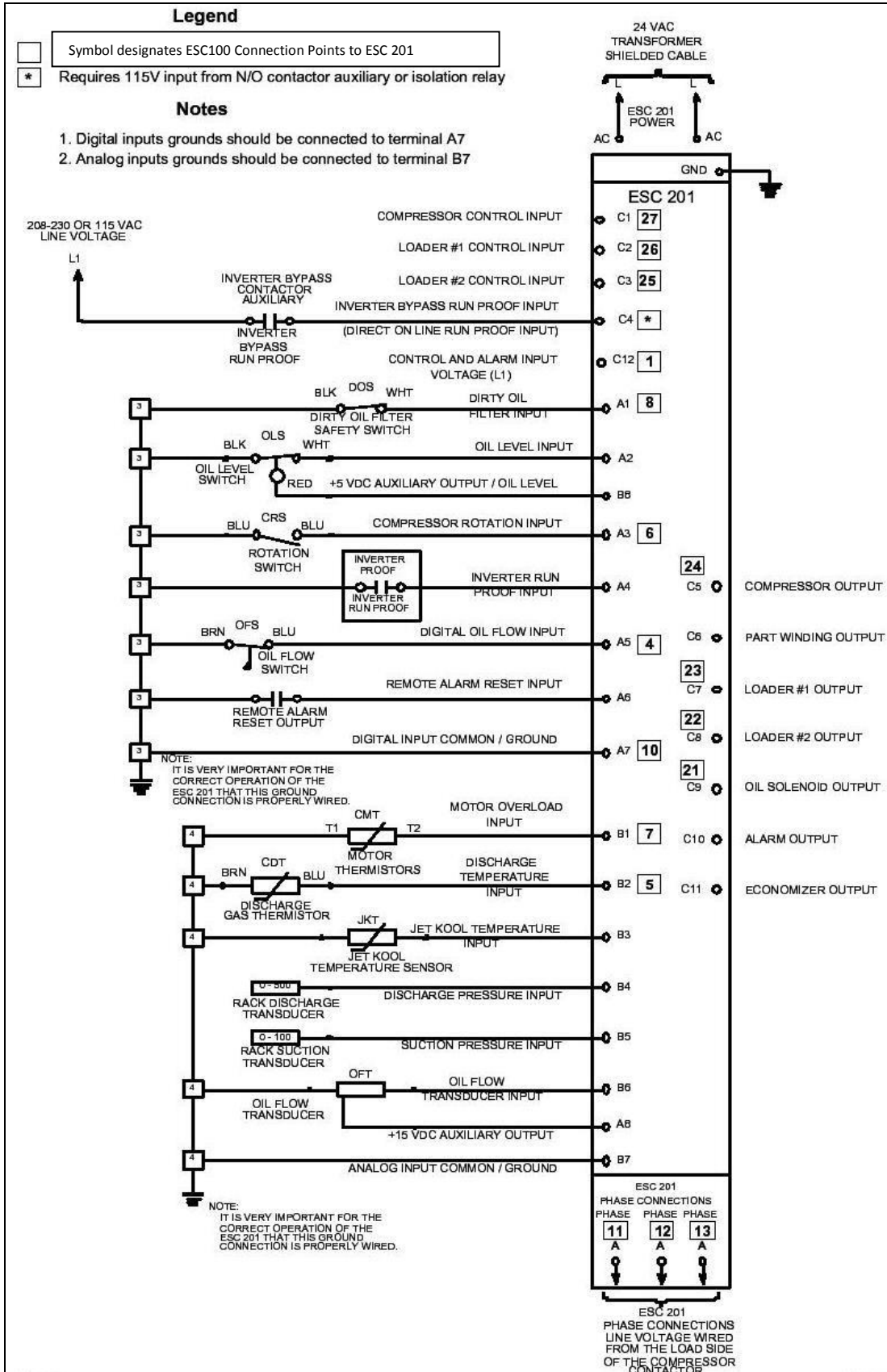
Description	ESC 100 Outputs	ESC 201 Outputs
1. Dirty Oil Filter Alarm	D1	H1
2. Motor Winding Overload Alarm	D2	H2
3. Oil Flow Alarm	D3	H3
4. Oil Level Alarm	D4	H4
5. High Discharge Gas Alarm	D5	H5
6. Phase Loss Alarm	D6	H6
7. Rotation / Wrong Sequence	D7	H7
8. Run Proof / By-Pass Alarm	D8	H8
9. Over Discharge Limit	N/A	H9
10. Low Discharge Temperature	N/A	H10

**Part Numbers:**

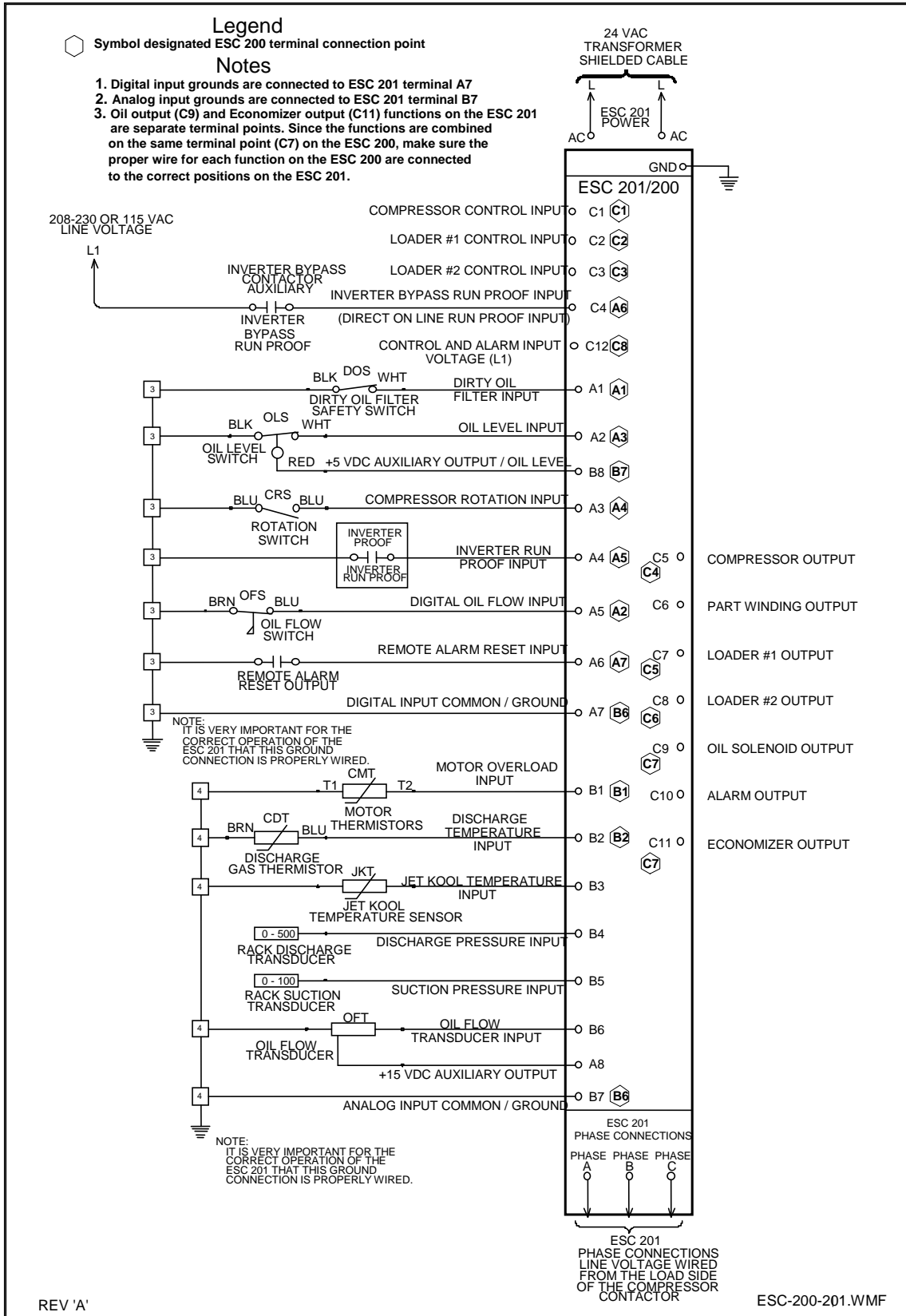
- ESC 201: 855-8002-00  
Required transformer power: 24VAC, 16VA without Jet Kool & Echelon  
24VAC, 22VA with Jet Kool & Echelon
- ESC 201 Alarm Board: 800-4006  
Required transformer power: 24VAC, 15VA

**Please note:** When using the ESC 201, BITZER protection module SE-E1 is not need

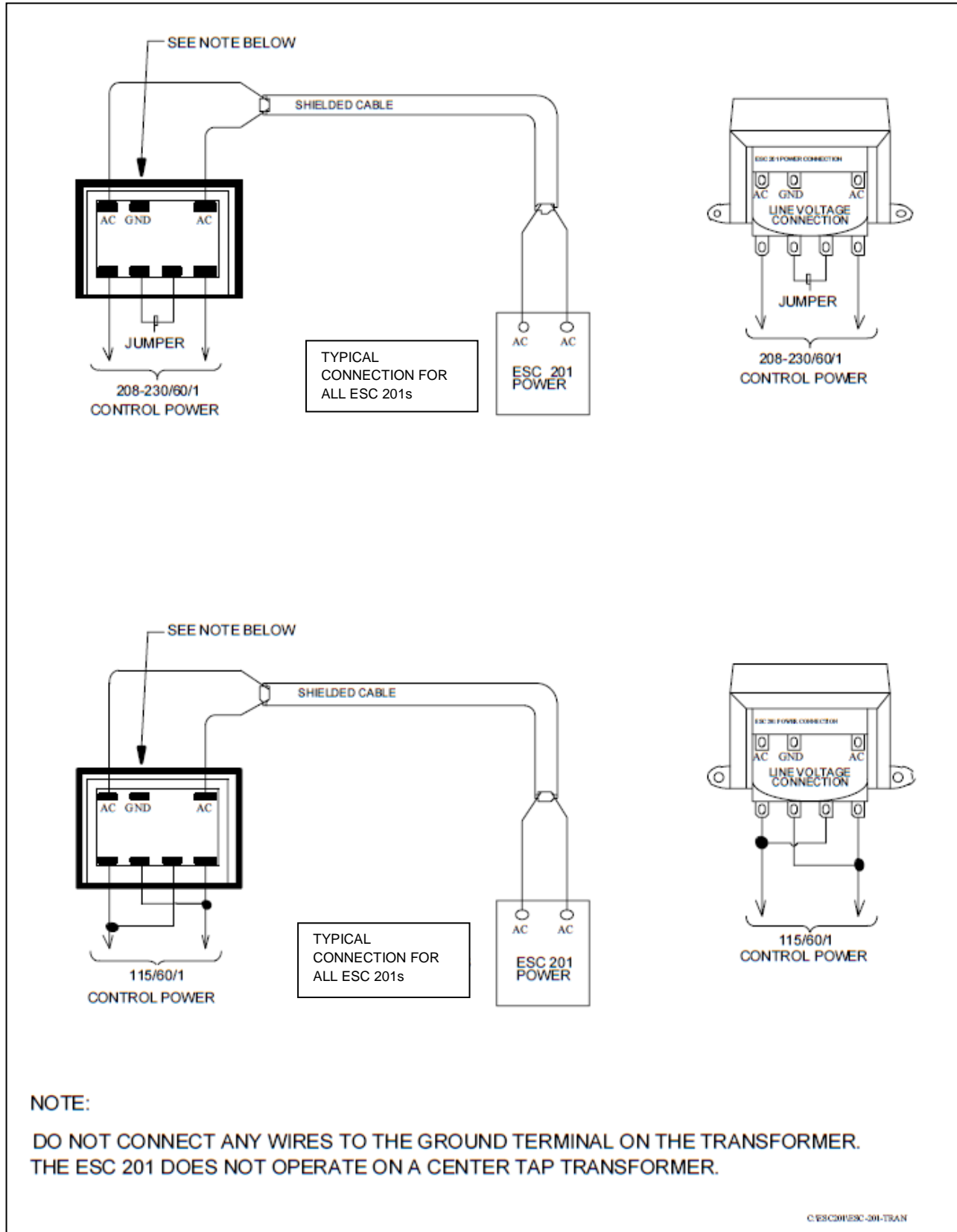
**Figure 1**  
**ESC 100 to ESC 201 Conversion**



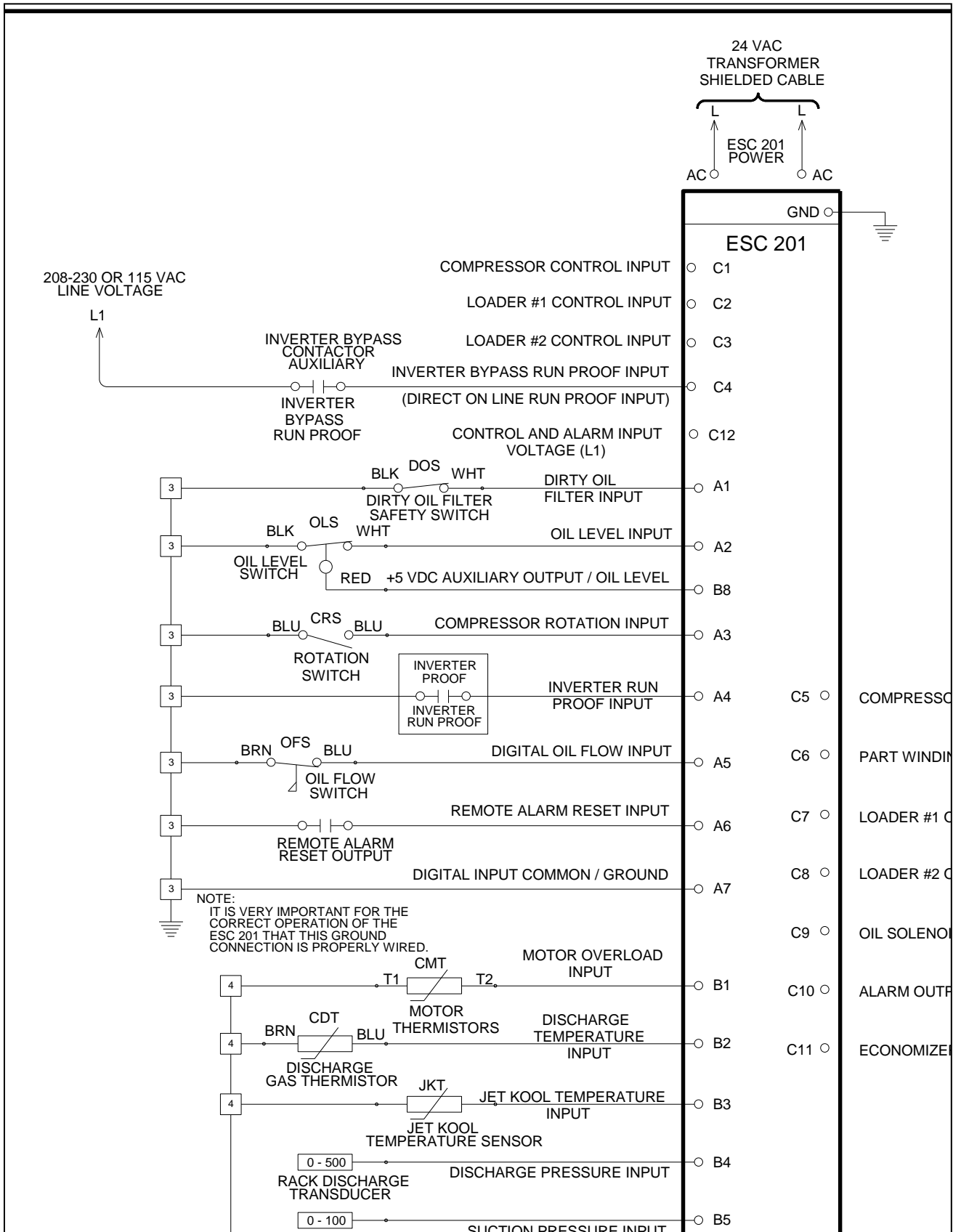
**Figure 2**  
**ESC 200 to ESC 201 Conversion**



**Figure 3**  
**ESC 201 Low Voltage Transformer Wiring Diagram**

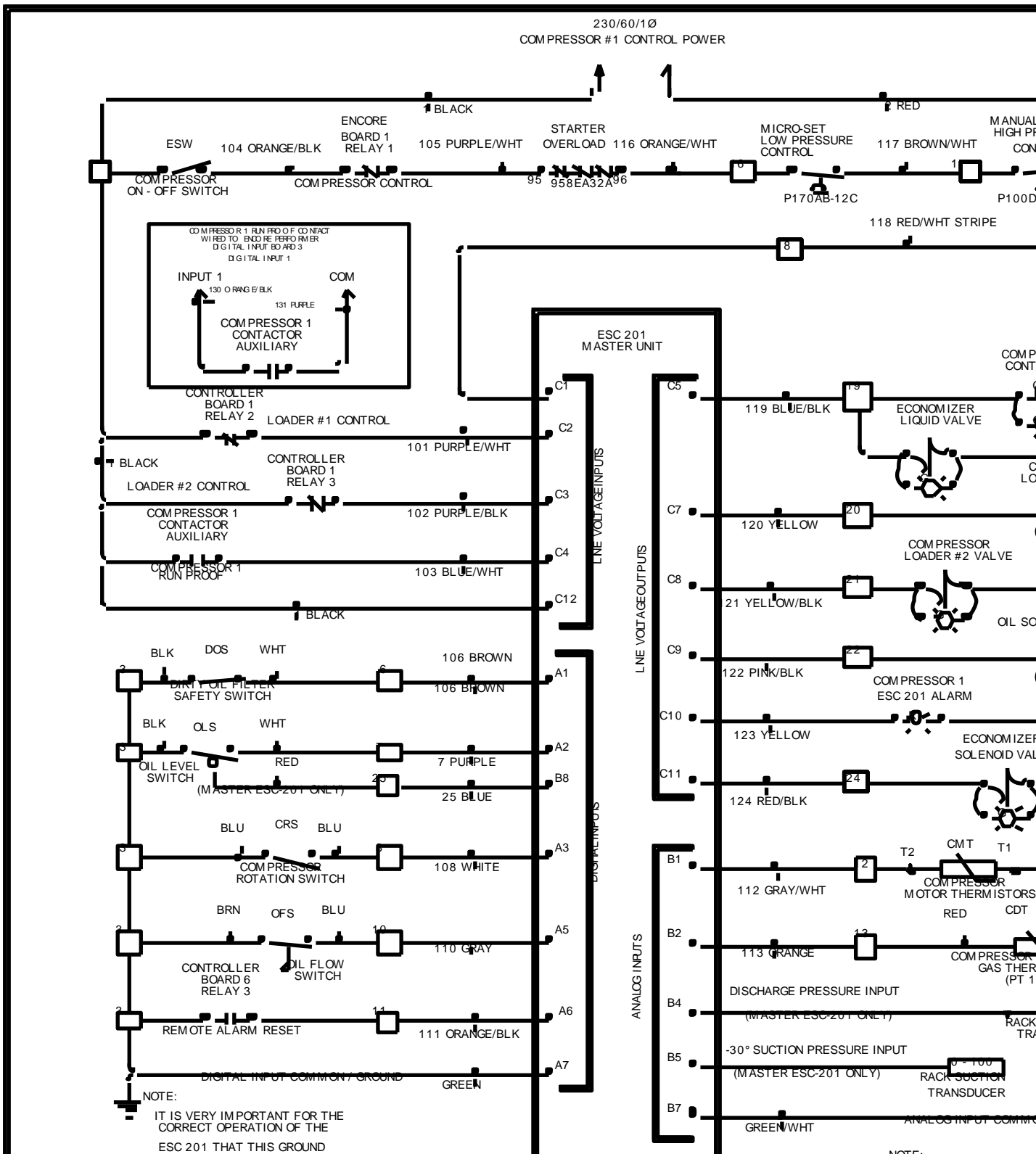


**Figure 4**  
**ESC 201 Compressor Control Diagram**





**Figure 5**  
**ESC 201 System Wiring Diagram**



**Figure 6**  
**ESC 201 Alarm Board**

