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# Copeland Screw™ Compressors

INSTRUCTIONS AND GUIDELINES FOR REPLACING THE OLD ESC-200 ELECTRONIC  
CONTROL MODULE WITH THE NEW ESC-201 MODULE

FOR COMPLETE INSTALLATION AND OPERATING INSTRUCTIONS FOR THE NEW  
ESC-201 ELECTRONIC CONTROL MODULE, PLEASE REFER TO COPELAND FORM  
NO. 2001-81



## ESC-200 to ESC-201 Conversion Guidelines

When converting the compressor protection module from an ESC-200 to an ESC-201 there are certain design and feature changes that must be taken into consideration. The following is a quick reference guide to those differences, for a complete description and programming instructions of the ESC-201 please refer to the Installation & Operating Manual Form No. 2001-81.

### The added features and improved functions of the ESC-201 include:

- LCD display to indicate normal operating parameters and compressor faults
- Part winding contactor control (0.5 second standard delay)
- Discharge temperature control
  - Critical discharge temperature control
    - High Temperature
    - Low Temperature
- Separate Oil and ECO Solenoid Controls
- Liquid Injection oil cooling flow valve control
- Jet Kool Temperature Control / JKV Analoid valve controller
- Eschelon & RS-485 communications
- Compressor control via communications port possible.

### Modification require to the existing rack to be able to incorporate the ESC-201 include;

- 24 volt non-center tap A/C transformer is required to power module. The maximum operating current for the ESC-201 is 760 mA , but as a

safety factor, a rating of 900 mA should be used per board. Multiple ESC-201's can be operated from a single transformer if it's selected to handle the total power requirement. The power connections are to made to the terminal block located on the left side of the board to the terminal marked "AC". **DO NOT CONNECT ANY POWER TO THE TERMINALS MARKED 1+, 1-, 2+ OR 2-**. These are serial communication terminals and damage will occur to the ESC-201 if power is applied to these terminals.

- To be able to display discharge temperature on the ESC-201 the discharge temperature sensor must be changed to a PT1000. The existing PTC100 can be used with the ESC-201 but it will only provide high temperature protection.
- The ESC-201 has a single general compressor fault alarm output. If you were utilizing the individual alarm outputs on the ESC-200, Terminals D1 to D8, and need to continue to have this capability, a remote alarm board (Copeland part no. 560-0002-04) will need to be utilized. This board will also require a 24 VAC non-center tap power supply, power requirement is 15 VA and the same transformer that is used for the ESC-201 can be utilized if sized correctly. Individual alarms are communicated to the alarm board via a N2 network connected to the Comm. 2 terminal located on the lower left portion of the board. Two contacts are provided for each alarm point. One set of dry contacts on terminal block 2 (TB2) and a set of voltage outputs on terminal block 1 (TB1).

### Alarm Board Terminal Designations

Alarm Designation	Dry Contact	Power Terminal
Dirty Oil Filter	D1	H1
Motor Winding Overload	D2	H2
Oil Flow	D3	H3
Oil Level	D4	H4
Discharge Gas Temperature	D5	H5
Phase	D6	H6
Rotation – Wrong sequence	D7	H7
Run Proof	D8	H8
Over Discharge Temperature Limit	D9	H9
Low Discharge Temperature	D10	H10
Digital Alarm Common	D11	N/A
Alarm Output Supply Voltage	N/A	H11

The following is a list of functions and terminal connections for the ESC-200 and ESC-201. Please review this list carefully since a number of the terminal connections have changed. **Do not assume the terminal connections are the same between the two boards.**

### Control Voltage (115 / 230 Volt AC) Terminal Connections

Function	ESC-200	ESC-201
Compressor Control Input	C1	C1
Compressor Output	C4	C5
Part Winding Output (0.5 Second Delay)	N/A	C6
Loader #1 Control Input	C2	C2
Loader #2 Control Input	C3	C3
Loader #1 Control Output	C5	C7
Loader #2 Control Output	C6	C8
Control And Alarm Input Voltage	C8	C12
Oil Solenoid Output	C7	C9
Economizer Solenoid Output	C7	C11
Alarm Output	D1 to D8	C10
Direct On Line Run Proof		
Inverter by-pass Run Proof	A6*	C4

### Low Voltage Discrete Terminal Connections

Function	ESC-200	ESC-201
Dirty Oil Filter Input	A1	A1
Oil Flow Input	A2	A5
Oil Level Input	A3	A2
5 VDC Power supply to Optical Sensor	B7	B8
Compressor Rotation Input	A4	A3
Remote Alarm Reset	A7	A6
Inverter Run Proof	A5	A4
Direct On Line Run Proof		
Inverter by-pass Run Proof	A6	C4*
Digital Input Common Ground	B6**	A7

### Analog Input Terminal Connections

Function	ESC-200	ESC-201
Motor Overload Input	B1	B1
Discharge Temperature Input***	B2	B2
Jet Kool Temperature Input	N/A	B3
Discharge Pressure input	N/A	B4
Suction pressure input	N/A	B5
Oil Flow Transducer Input	N/A	B6
15 VDC Power Supply to Oil Flow Transducer	N/A	A8
Analog Input Ground	B6**	B7

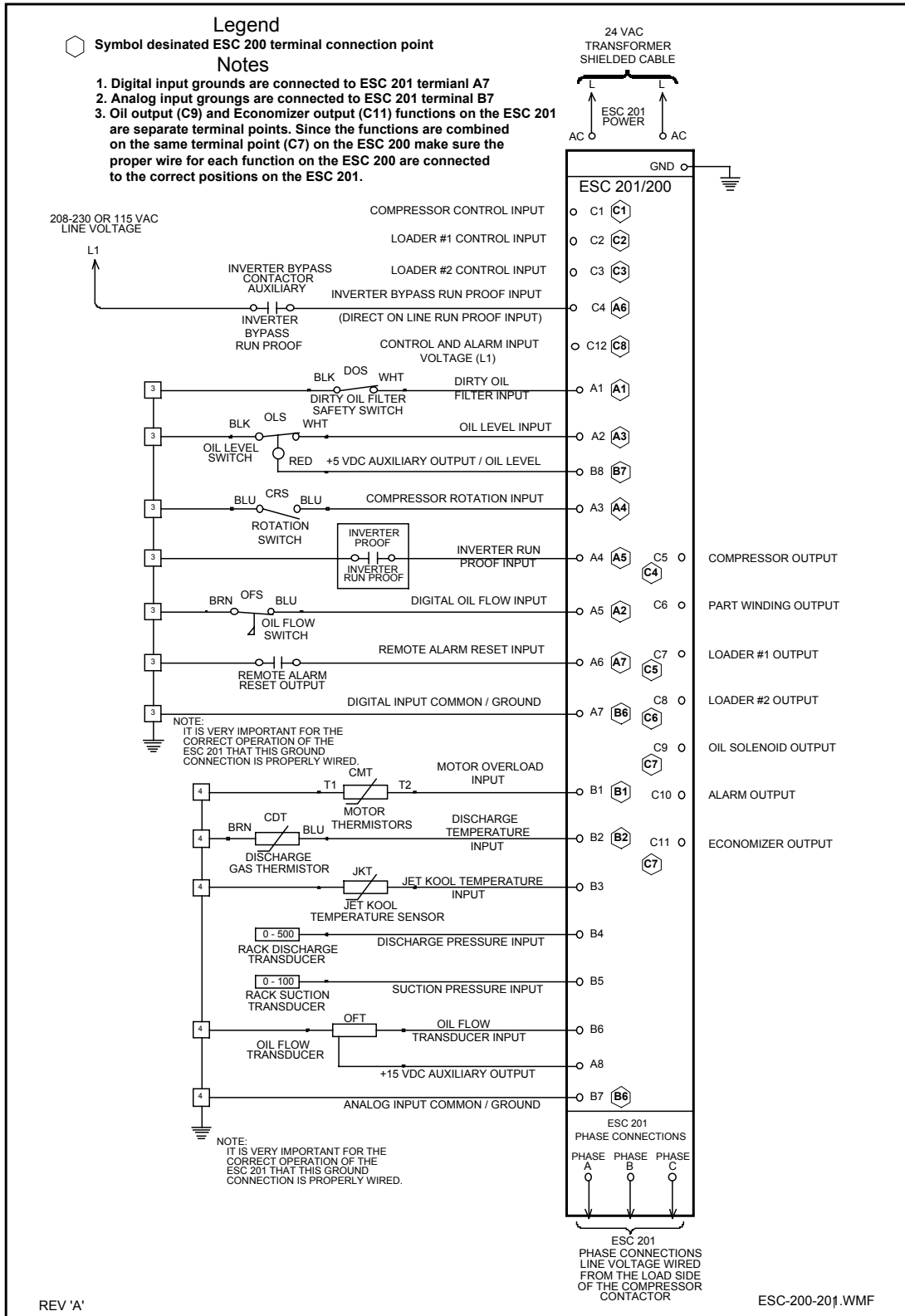
\* The Direct On Line Run Proof / Inverter by-pass Run Proof connection on the ESC-200 was a low voltage signal, on the ESC-201 a control voltage signal (115 / 230 VAC) is required.

\*\* The ESC-201 requires individual ground for the Discrete and analog input functions

### Line Voltage Phase monitor

Power Supply	ESC-200	ESC-201
L1	A	A
L2	B	B
L3	C	C

# ESC 200 Conversion to ESC 201



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