

SIEMENS

SIMOREG DC Master

6RA70 Series

Application
SIMOREG
Base Drive Panel
Voltage Modifications
Application Note #2



Microprocessor-Based Drive Panels
from 15A to 1660A

NOTE

This application note does not purport to cover all details or variations in equipment, nor to provide for every possible contingency to be met in connection with installation, operation or maintenance.

Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the local Siemens Sales Office.

The contents of this application note are not part of an earlier or existing agreement, commitment or relationship. The Sales Contract contains the entire obligations of Siemens. The warranty contained in the contract between the parties is the sole warranty of Siemens. Any statements contained herein do not create new warranties or modify the existing warranty.

**DANGER**

Converters contain hazardous electrical voltages, Death, severe bodily injury or significant material damage can occur if the safety measures are not followed.

Only qualified personnel, who are knowledgeable about the converters and the provided information, can install, start up, operate, troubleshoot or repair the converters.

The converters must be installed in accordance with all relevant safety regulations (e.g. NEC, DIN, VDE) as well as all other national or local regulations. Operational safety and reliability must be ensured by correct grounding, cable sizing and appropriate short-circuit protection.

All panels and doors must be kept closed during normal operation.

Before carrying out visual checks and maintenance work, ensure that the AC power supply is disconnected and locked out. Before the AC supply is disconnected, both converters and motors have hazardous voltage levels. Even when the converter contactor is open, hazardous voltages are still present.

When making measurements with the power supply switched on, electrical connections must not be touched under any circumstances. Remove all jewelry from wrists and fingers. Ensure that the test equipment is in good conditions and operationally safe.

When working on units that are switched on, stand on an insulating surface, i.e. ensure that you are not grounded.

Carefully follow the relevant instructions and observe all danger, warning and cautionary instructions.

This does not represent a full listing of all the measures necessary for safe operation of the equipment. If you require other information or if certain problems occur which are not handled in enough detail in the information provided in the Instruction Manual, please contact your local Siemens office.

I Introduction:

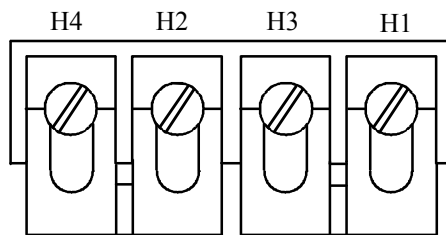
All 6RA70 Base Drive Panels are shipped from the factory for 460 volt operation and are UL508A listed. As shipped, the primary windings of the control transformers are connected for 460 volt operation.

NOTE

The Base Drive Panels are UL508A listed at 460V only

II Description of changes to 230 VAC operation:

The base drive panels can be configured for 230 volt operation. If the unit is to be operated with 230 volt input line voltage, the primary windings of the control transformers must be connected for 230 volts. Except for the 850 amp Base Drive Panel, the transformer fuses are selected to provide protection at both voltage levels. On 850 amp Base Drive Panels, the units are shipped with 3.5 amp transformer primary fuses, which are suitable for operation at 460 volt input. If the unit is to be operated at 230 volts, these 2 fuses must be changed to 7 amp, 600V, Class "CC" type fuses (Part #A1-FUF-AFA-018). Following these instructions to re-connect the control transformer for 230 volt operation. The primary connections must be changed, according to the following diagram.



230 VAC CONNECTIONS

Note: On Base Drives rated 1180 amps and 1660 amps, there are 3 transformers, each of which must be re-connected for 230 volt operation.

The Base Drive Panels are insensitive to the phase rotation of the incoming power. However, on the Base Drive Panels rated 1180 amps and 1660 amp, a 3 phase fan is used to cool the power electronics, and proper phase rotation is required to achieve correct direction of the fan rotation, and proper cooling of the unit. The fan is located at the top of the Power Module. The fan must rotate counterclockwise when viewed from above forcing air out of the top of the unit. It is easiest to observe direction of fan rotation when power is turned-off and the fan is coasting to a slower speed. If the direction of rotation is incorrect, proceed as follows.

- Turn off and lock out all sources of power to the drive unit.
- Locate the fan terminals on the Power Module unit, (labeled 4U1, 4V1, 4W1).
- Swap position of any 2 of the wires on this terminal block.
- Re-apply power to the Base Drive Panel, and verify that the fan is now rotating correctly.

III Description of changes to other Voltages (i.e. 380 VAC)

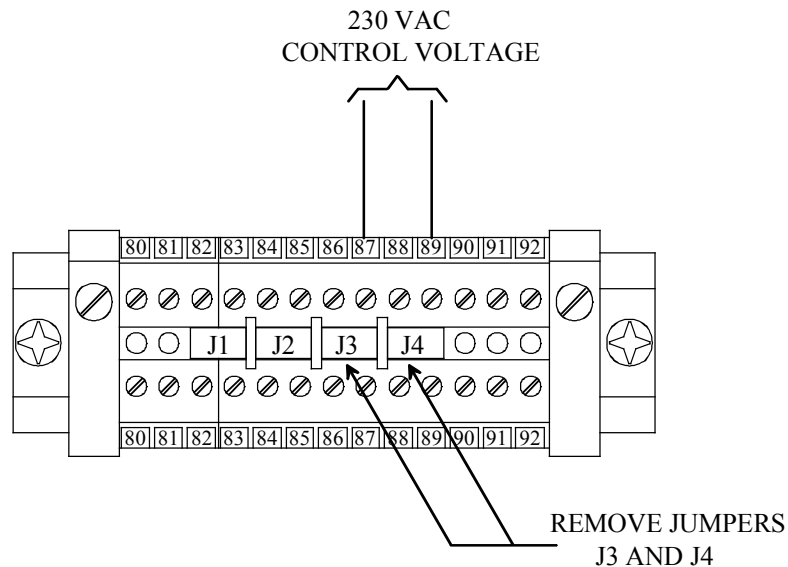
a) Armature Voltage Modifications on 460 V Units:

The armature supply on 460 volt Power Modules is capable of operating at voltages as low as 85 VAC (Parameter setting P078.001). To change the armature converter operating voltage to a voltage other than 460 VAC or 230 VAC it will be necessary to provide a separate 230 VAC supply voltage for the electronic power supply, main contactor, and fans.

15 to 850 Amp Base Drive Panels:

To modify the armature operating voltage, remove jumpers J3 and J4 from the control terminal block, CTB, at terminals 86-87 and 88-89. Jumpers J3 and J4 are metal jumpers installed in the top of the terminal block. Connect the desired armature AC supply voltage to the Base Drive Panel Terminals L1, L2, and L3.

Depending on the application, it may be necessary to additionally modify the field circuit for a supply voltage different from the armature converter.



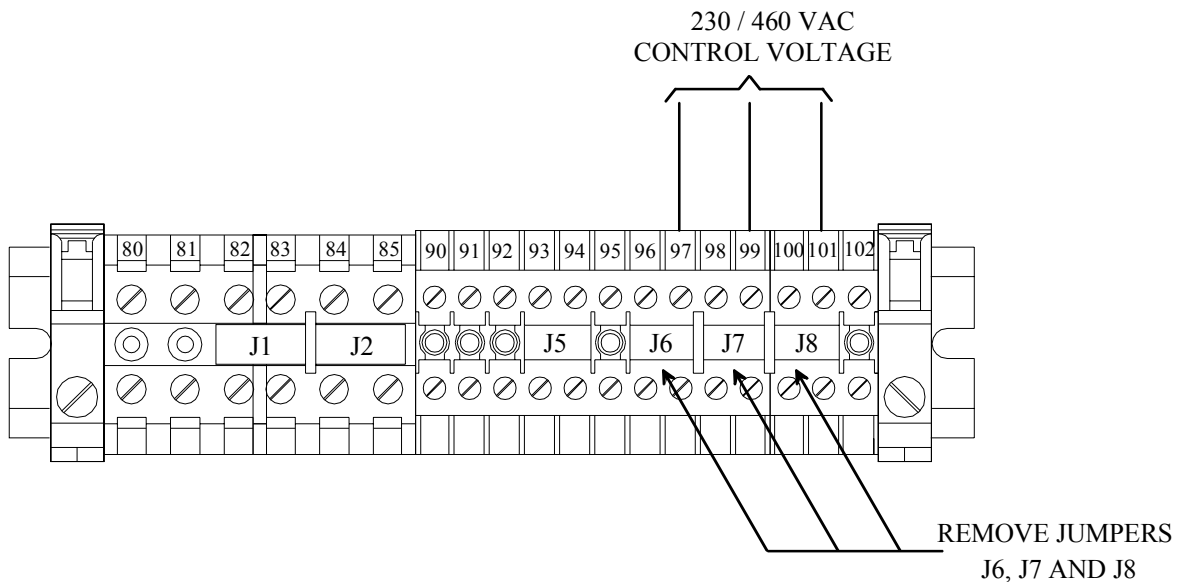
Connect a separate 230 VAC single phase supply voltage to CTB terminals 87 (hot) and 89 (ground) to supply a 230 volt power for the electronic power supply, main contactor, and fans. The current capacity requirements of the 230 volt supply is:

15 to 100 amp base drive panel	0.55 amps
140 to 255 amp base drive panel	1.2 amps
255 to 510 amp base drive panel	1.6 amps
850 amp base drive panel	4.6 amps

1180 and 1660 Amp Base Drive Panels:

The power modules on the 1180 and 1660 amp base drive panels are designed to operate with armature supply voltages from 85 VAC to 575 VAC. It is possible to modify the 460 volt base drive panel of these 2 units to allow an armature supply of 575 VAC and 600 VDC applications. The rated supply voltage for the field converter is still limited to a maximum of 460 VAC. (Refer to Page 7 for field modifications).

To modify the armature operating voltage, remove jumpers J6, J7 and J8 from the control terminal block, CTB, at terminals 96-97, 98-99 and 100-101. Jumpers J6, J7 and J8 are metal jumpers installed in the top of the terminal block. Connect the desired armature AC supply voltage to the Base Drive Panel Terminals L1, L2, and L3.



Connect a separate 230 VAC 3 phase, or 460 VAC supply voltage to CTB terminals 97, 99 and 101. Configure the primary winding connections of the 3 control transformers to agree with the supplied 3 phase voltage. The current capacity requirements of the 3 phase supply voltage is:

1180 and 1660 amp base drive panel	2.5 amps at 460 VAC 3 phase
1180 and 1660 amp base drive panel	5.0 amps at 230 VAC 3 phase

Note:

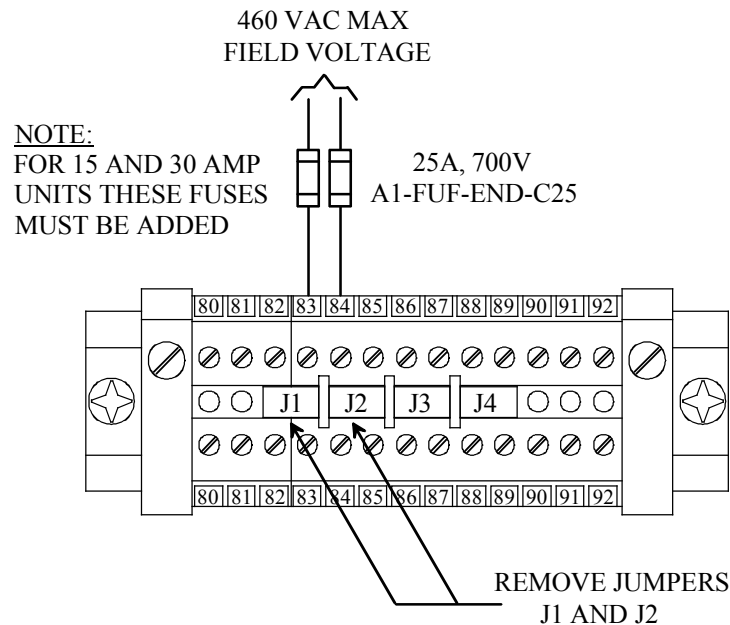
Phase sequence is important for the fan direction of rotation. The fan must rotate counter-clockwise when viewed from above. If necessary, change any 2 phase wires at CTB to change the fan direction

b) Field Voltage Modifications:

The field supply is capable of operating at supply voltages as low as 85 VAC (Parameter setting P078.002). Any voltage from 85 to 460 VAC can be used for the field supply. The resulting available field DC voltage is approximately $(0.65 * \text{AC supply voltage})$. The current capacity of the AC supply must be equal or greater than the rated current of the motor field. The field supply voltage is not phase sensitive relative to the armature voltage.

15 and 30 Amp Base Drive Panels:

To modify the field operating voltage, remove jumper J1 and J2 from the control terminal block, CTB, at terminal 82-83 and 84-85. Jumpers J1 and J2 are metal jumpers installed in the top of the terminal block. Connect desired field AC supply voltage to terminals 83 and 84. Because the 15 and 30 amp base drive panels field converters share the same armature converter fuses, it will be necessary to add 2 additional semiconductor fuses in series with the AC supply in order to provide short circuit protection of the field converter. Fuses rated 25 amp, 700 V are recommended for both base drive panels.



60 to 1660 Amp Base Drive Panels:

To modify the field operating voltage, remove jumper J1 and J2 from the control terminal block, CTB, at terminal 82-83 and 84-85. Jumpers J1 and J2 are metal jumpers installed in the top of the terminal block. Connect desired field AC supply voltage to terminals 83 and 84.

