a Place the Power Supply Switch to INTERNAL (See Note 1, Fig. 5)

b. Close the Control Power Circuit Breaker (See Note 1).

c. Initiate the Control Switch to RAISE or LOWER to operate the regulator switch mechanism to NEUTRAL (position "0") as shown on the Position Indicator. The NEUTRAL position lamp mounted on the control panel will light (See Note 1). Return the Control Switch to the OFF position.

d. Open the Control Power Circuit Breaker.

4.B SM-3 Control Instructions (see 4A for VR-1A control)

a. Place the Power Supply Switch to INTERNAL (See Note 1, Fig. 5)

b. Place the Motor Control switch to manual.

c. Initiate the Control Switch to RAISE or LOWER to operate the regulator switch mechanism to NEUTRAL (position "0") as shown on the Position Indicator. The NEUTRAL position lamp mounted on the control panel will light (See Note 1). Return the Control Switch to the OFF position.

d. Place the Internal / External power switch to OFF.

5. Close Load Disconnect Switch "C".
6. Open By-pass Switch "A".
7. Visually check the voltage level, bandwidth and time-delay settings.
8. Visually check the Line Drop Compensation settings.
9. Place the Power Supply Switch to INTERNAL
10. Place the Motor Control Switch to AUTO (+remote).

REMOVING FROM SERVICE

1. Operate the regulator switch mechanism to NEUTRAL (position "0") as shown on the Position Indicator. The NEUTRAL position lamp mounted on the control panel will light. In closed delta banks, all three regulators must be moved to neutral position.
2. Turn the control power OFF,. In delta hook-ups, turn all controls OFF.
3. Close By-pass Switch "A". In delta banks, by-pass all three units.
4. Open Load Disconnect Switch "C" and then Open Source "B".
5. Open Disconnect Switch "D" **last.**

THREE-PHASE CONNECTIONS

The line connections for three-phase operations are shown in Fig. 5.

Note that Type VR-1 regulator cannot be operated in Y-connection with the bank-neutral isolated. **When these regulators are Y-connected, the neutral of the regulator bank must be effectively connected to the system neutral, preferably by the fourth wire.** Without this interconnection, Y-connection is hazardous, as the individual and independent voltage control of each phase can cause unequal turn ratios between phases, resulting in shifting of an isolated neutral with extreme distortion of phase voltages.

SHORT-CIRCUIT RATING

The impedance of a regulator is practically negligible for reducing short-circuit current. The impedance of the feeder up to the point at which the regulator is installed should be sufficient to limit the short-circuit current in the regulator to the value for which it is designed. It is recommended that feeder current-limiting reactors be installed on the feeder to keep the short-circuit curre within the required limits.

Short-circuit rating on any position is 40 times the rated current at $\pm$ 10 percent regulation for 0.8 seconds. For short-circuit duration above 0.8 seconds, the permissible short-circuit current is reduced to keep the product I^2t product constant. In this formula, I is the short-circuit current and it is the time in seconds. For instance, if the regulator is rated 2500 volts, 400 amperes, at $\pm$ 10 percent regulation, $I^2t = (400 \times 40)^2 \times 0.8 = 205 \times 10^6$. Then for a short-circuit duration of 2 seconds, $2I^2 = 205 \times 10^6$ and I = 10 100 amperes.

OVERLOADING REGULATORS

The regulator can be overloaded in accordance with the ANSI Guide for Loading Step Voltage Regulators, Appendix C57.95-1955.