

## SECTION I

### GENERAL INFORMATION

#### INTRODUCTION

This manual contains installation, operation, and maintenance and repair instructions for Fincor Series 2230/2240 Single-Phase Adjustable-Speed Regenerative DC Motor Controllers. A parts list, list of options, ratings and specifications, and drawings are also included.

#### GENERAL DESCRIPTION

Series 2230/2240 Controllers statically convert AC line power to regulated DC for adjustable-speed armature control of shunt-wound and permanent-magnet motors.

Applications include those requiring controllable bi-directional torque for overhauling loads, contactor-less reversing, and position control.

Series 2230/2240 Controllers comply with applicable standards established by the National Electrical Code and NEMA for motor and industrial control equipment. The controllers are Underwriters Laboratories Listed.

#### MODEL TYPES

**TABLE 1-1. SERIES 2230/2240 MODEL MATRIX**

MODEL	FUNCTION		CONFIGURATION		OPERATOR CONTROLS		POWER SOURCE <sup>a</sup> & HP RANGE		CONNECTION DIAGRAM FIGURE
	RUN/STOP/ JOG <sup>b</sup>	RUN/STOP/ JOG AND DB <sup>c</sup>	OPEN CHASSIS	ENCLOSED	LOCAL INTEGRAL	REMOTE	115V	230V	
2231	X		X			X	1/6 - 1	1/3 - 2	2-5, 2-6, 2-7, 2-8, 2-11
2231B		X	X			X			2-9, 2-10
2231P0	X			X		X			2-5, 2-6, 2-7, 2-8, 2-11
2231P1	X			X	X				2-5
2231BP0		X		X		X			2-9, 2-10
2231BP1		X		X	X				2-10
2232	X		X			X	1/6 - 1	1/3 - 3	2-5, 2-6, 2-7, 2-8, 2-11
2232B		X	X			X			2-9, 2-10
2232P0	X			X		X			2-5, 2-6, 2-7, 2-8, 2-11
2232P1	X			X	X				2-5
2235	X		X			X	1/6 - 1	1/3 - 2	2-5, 2-6, 2-7, 2-8, 2-11
2235B		X	X			X	1/6 - 1	1/3 - 2	2-9, 2-10
2236	X		X			X	1/6 - 1	1/3 - 3	2-5, 2-6, 2-7, 2-8, 2-11
2236B		X	X			X			2-9, 2-10

**TABLE 1-1. SERIES 2230/2240 MODEL MATRIX**

MODEL	FUNCTION		CONFIGURATION		OPERATOR CONTROLS		POWER SOURCE <sup>a</sup> & HP RANGE		CONNECTION DIAGRAM FIGURE
	RUN/STOP/JOG <sup>b</sup>	RUN/STOP/JOG AND DB <sup>c</sup>	OPEN CHASSIS	ENCLOSED	LOCAL INTEGRAL	REMOTE	115V	230V	
2242	X		X			X	1/6 - 1	1/3 - 5	2-5, 2-6, 2-7, 2-8, 2-11
2242B		X	X			X			2-9, 2-10
2242P0	X			X		X			2-5, 2-6, 2-7, 2-8, 2-11
2242P1	X			X	X				2-5
2242BP0		X		X		X			2-9, 2-10
2242BP1		X		X	X				2-11

- a. Controllers are reconnectable
- b. No armature contactor
- c. Includes an armature contactor

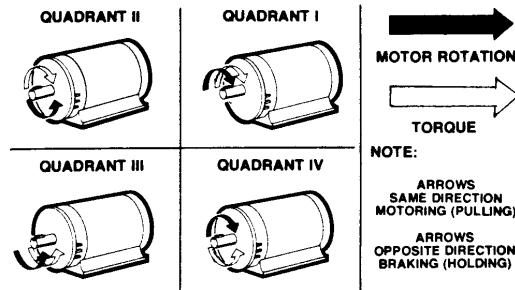
**MOTOR SELECTION**

Series 2230/2240 Controllers control the operation of general purpose DC motors designed for use with solid-state rectified power supplies. The motor may be shunt-wound, stabilized shunt-wound, or permanent magnet. For maximum efficiency, the motor should be rated for operation from a NEMA Code K power supply.

**DESCRIPTION OF OPERATION**

Series 2230/2240 Regenerative Controllers, also known as four-quadrant controllers, not only control motor speed and direction of rotation, but also the direction of motor torque.

Referring to Figure 1-1, when the drive (controller and motor) is operating in Quadrants I and III, motor rotation and torque are in the same direction, and the drive functions as a conventional non-regenerative drive. In Quadrants II and IV, motor torque opposes the direction of motor rotation, which results in controlled braking. The drive can switch rapidly from motoring to braking modes while simultaneously controlling the direction of motor rotation.



**FIGURE 1-1. FOUR-QUADRANT OPERATION**

Under braking conditions, Series 2230/2240 Controllers convert the mechanical energy of the motor and connected load into electrical energy, which is returned (regenerated) to the AC power source.