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**Product Type:** ZETA4-240 Stepper Drive

The above product is in compliance with the requirements of directives

- 89/336/EEC Electromagnetic Compatibility Directive  
as amended by Directive 92/31/EEC

The product is intended for use in the Commercial, Light Industrial and Industrial Environments as defined in the relevant EMC standards.

This product is compliant with the Low Voltage Directive.

- 72/23/EEC Low Voltage Directive
- 93/68/EEC CE Marking Directive

The ZETA4-240 Drive, when installed according to the instructions in this user guide, and particularly in *Appendix B, LVD and EMC Installation Guide*, has been shown to comply with the Electromagnetic Compatibility Directive (EMC) and the Low Voltage Directive (LVD) of the European Community. If you do not follow these instructions, the operation and protection of the product may be impaired.

CHAPTER ONE

# Introduction

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## IN THIS CHAPTER

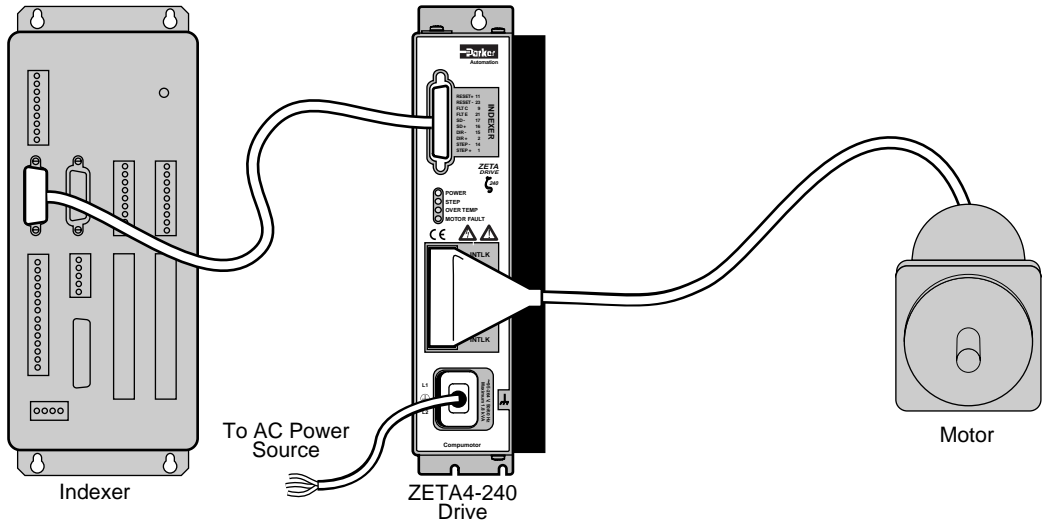
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- ZETA4-240 Drive Description
  - Anti-Resonance
  - Active Damping
  - Electronic Viscosity
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# ZETA4-240 DRIVE – DESCRIPTION

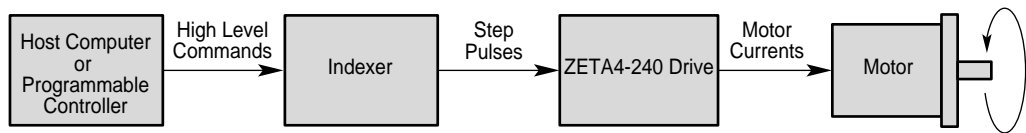
The ZETA4-240 Drive is a microstepping drive that runs two-phase step motors. It operates directly from 240VAC power; no separate DC power supply or transformer is required.

A typical system is shown below.



*System Components*

The indexer sends step and direction signals to the drive. For each step pulse it receives, the drive will commutate the motor to increment rotor position. This is shown in the next drawing.



*Block Diagram of ZETA4-240 System*

The host computer or programmable controller may or may not be necessary, depending upon the indexer's capabilities.

The motor can be wired in series or parallel; the amount of current the drive sends to the motor is set by DIP switches.

## DIP SWITCHES

DIP switches are located on top of the ZETA4-240 Drive, behind a removable metal cover. During the installation procedure, the user sets these DIP switches to scale the drive for motor current, resolution, waveform, and other functions.

## INPUT & OUTPUT

All communications with the indexer take place through the ZETA4-240 Drive's 25-pin D-connector. Available inputs and outputs are:

- Step Input
- Direction Input
- Shutdown Input
- Fault Output
- Reset Input
- Clockwise/Counterclockwise Input

## ROTARY SWITCHES

Two rotary switches are located on top of the ZETA4-240 Drive, next to the DIP switches. The rotary switches are used to adjust the drive's active damping and electronic viscosity circuits.

## POTENTIOMETERS

Three potentiometers are located on top of the ZETA4-240 Drive, next to the rotary and DIP switches. The potentiometers are used to adjust the drive's electrical characteristics to match the motor's individual characteristics.

## **DAMPING TECHNOLOGIES IN THE ZETA4-240 DRIVE**

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All step motors are subject to resonance, and to ringing after quick transient moves. The ZETA4-240 Drive has three unique circuits that can damp resonance and ringing.

### **ANTI-RESONANCE**

This is a general purpose damping circuit that provides aggressive and effective damping. The user sets DIP switches to choose one of two ranges, based upon system resonant frequency and inertia.

### **ACTIVE DAMPING**

This is an extremely powerful damping circuit. The user sets seven DIP switches and one rotary switch on the drive, to optimize active damping for a specific motor and load.

Anti-resonance and active damping work at speeds greater than three revolutions per second.

### **ELECTRONIC VISCOSITY (EV)**

This circuit provides damping at speeds from rest up to three revolutions per second. The user sets one rotary switch on the drive, to optimize EV for a particular application. EV can reduce settling time at the end of a move, which can lead to increased machine throughput.

## THE ZETA4-240 NAME

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In the equation that describes the transfer function of a step motor, the Greek symbol  $\zeta$  (zeta) is used to represent the damping ratio. Because our drive has such sophisticated and unique damping capabilities, we decided to name it the *ZETA4-240 Drive*.

## R SERIES MOTORS

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R Series motors are available from Compumotor for use with the ZETA4-240 Drive. These motors are designed to match the drive's high performance capabilities.

## COMPUMOTOR FAMILY OF PRODUCTS

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The ZETA4-240 Drive is completely compatible with Compumotor's broad range of microstepper indexers (single-axis and multi-axis) and motion control products.