CHAPTER ONE

1 Introduction

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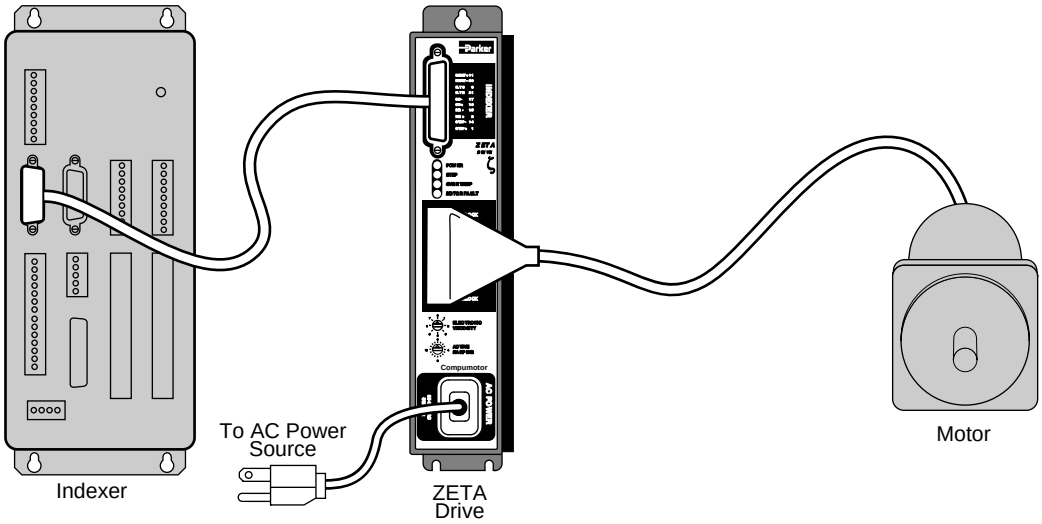
ZETA DRIVE – DESCRIPTION

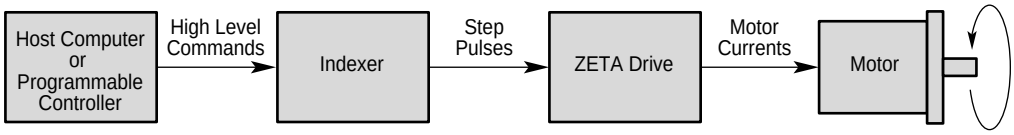
The ZETA Drive is a microstepping drive that runs two-phase step motors. It operates directly from 120VAC power; no separate DC power supply or transformer is required.

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 ZETA 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 ZETA 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 ZETA Drive's 25-pin D-connector. Available inputs and outputs are:

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

POTENTIOMETERS

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

DAMPING TECHNOLOGIES IN THE ZETA DRIVE

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

ANTI-RESONANCE

This is a general purpose damping circuit that works automatically. No configuration is necessary. Anti-resonance provides aggressive and effective damping.

ACTIVE DAMPING

This is an extremely powerful damping circuit. The user sets four 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 ZETA NAME – ζ

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

ZETA MOTORS

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

COMPUMOTOR FAMILY OF PRODUCTS

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