

# **Variable Speed Machine Control**

**A 2 hour Crash Course by Power Control Products**

## Mechanical Refresher

- speed
- torque
- power

## Variable Torque Loads

- centrifugal pumps
- centrifugal fans

## Constant Torque Loads

- conveyors & apron feeders
- augers & screw drives
- shuttles, trolleys & travels
- positive displacement pumps & compressors

## Electric Motors

- performance curves / DOL characteristics
- starting vs. running characteristics

## Variable Speed Drives

- what they are
- how they work
- how to use them
- understanding ratings

## Soft Starters

- what they are
- how they work
- how to use them
- understanding ratings

## Equipment Selection

- load details
  - power & speed
  - starting torque
- motor selection
- drive selection
- unusual operating conditions

## Setup

- adjust parameters for reliable operation
- even the correct equipment can be “sabotaged” by incorrect adjustment

## Troubleshooting

Q. What does the drive or starter indicate as the fault?

- External Fault
  - Overloaded machine
  - Emergency Stop / Safety Interlock
  - Limit switch
  - Blown fuse or missing phase
  - Motor isolator
  - Wiring faults
- Internal Fault
  - Non destructive
    - Nuisance trip
    - Repetitive Trip
    - Setup Error
    - Changed operating conditions
  - Destructive
    - Is damaged item field replacable?
      - Fuse
      - Control PCB
    - Replace entire controller & setup to suit