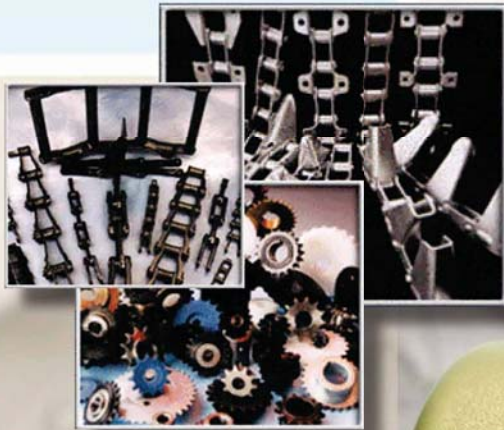


DRIVETECH

AUTOMATION, INC.

FLORIDA'S AUTHORITATIVE MOTION CONTROL DISTRIBUTOR
MOTORS, VARIABLE SPEED DRIVES, CONTROLS, POWER TRANSMISSION EQUIPMENT



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ELECTRIC and ELECTRO-MECHANICAL PRODUCTS



■ **ELECTRIC MOTORS**

AC, DC, Stepper, Servo, Nema & IEC Frames.

Brands

ABB, Baldor, Boston, Control Techniques, Fincor DC, WEG, Leeson, Lenze (AC Tech), Marathon, Reliance, Sterling, Sumitomo.

■ **MOTOR CONTROL & PROTECTION**

Magnetic Starters, Contactors, Circuit Breakers, Disconnect Switches, Relays, Pilot Devices, Fuses & Fuse Holders, Terminal Blocks.

Brands

ABB, Advance Controls, CSI, Danfoss, Ferraz Shawmut, IDEC, Lovato, Moeller, Omron, WEG.

■ **VARIABLE SPEED DRIVES & SOFT START CONTROLS**

AC, DC, Servo, Stepper, Electronic Starters & Electronic Brakes.

Brands

ABB, AC Tech, Baldor, Control Techniques, Danfoss, Delta, Fincor, Hitachi, Kebco, Leeson, Minarik, Motortronics, Nord, Reliance, Saftronics, Sew-Eurodrive, Sprint-Bardac, Sterling, Sumitomo.

■ **INSTRUMENT & PROCESS CONTROLS**

Counters, Timers, LED Displays, PID Controllers, Load Cells, Potentiometers, Power Conditioners, Pressure Flow & Temperature Transducers, Meters & Controllers, Chart Recorders.

Brands

Danaher, Eagle Signal, Veeder-Root, Dynapar, Partlow, KEP, Omron.

■ **PROGRAMMABLE LOGIC CONTROLS & FEEDBACK DEVICES**

Limit Switches, Tachometers, Inductive, Capacitive Photoelectric & Ultrasonic Sensors, Incremental & Absolute Encoders, PLC, Programmable Relays (smart relays).

Brands

ABB, Dynapar, Efecter, Entertron, IDEC, KEP, Lovato, Moeller, Omron, Pepperl & Fuchs.

■ **OPERATOR INTERFACE**

LED & LCD Displays, Graphical Displays, Touch Screens.

Brands

Control Techniques, Danaher, IDEC, KEP, Maple Systems, Omron.

■ **TRANSFORMERS, LINE REACTORS & DC POWER SUPPLIES**

Control & Power (1&3 phase).

Brands

ABB, Genesis, Hammond, Micron, Omron, Puls, REX, TCI.

■ **ENCLOSURES & ELECTRICAL CABINETS**

All sizes & types.

Brands

Hammond, Rital, Saginaw, Schaeffer's.

MECHANICAL POWER TRANSMISSION & CONVEYOR COMPONENTS

■ BEARINGS

Ball & Roller Bearings, Sleeve Bushings, Housed Units, Rod Ends, Cam Followers.

Brands

Boston, Carter, Dodge, FK Rod Ends, FYH, General, Hub City, IKO, Isostatic, Moline, PCI, Peer, Smith, RBI, NBK, Pobco.

■ BELTS & PULLEYS

V Belts, Timing Belts, V Belt Pulleys, Timing Pulleys, Variable Speed Belts & Pulleys.

Brands

Ametric, Bando, Dodge, Jason, Maska, Maurey, Thermoid, Moline, Revco.

■ CHAIN & SPROCKETS

American, British Standard & Metric, Roller Chain, Engineering Class Chain. Steel, Cast Iron & Flame Cut, Sprocket.

Brands

Ametric, Allied-Locke, Boston, Brewton, Daido, Dodge, Hitachi, Jeffrey, Linn, Moline, Revco, UST, Whitney.

■ OPEN GEARING

Spur, Worm, Helical, Miter & Bevel.

Brands

Ametric, Boston, Globe, Linn.

■ SPEED REDUCERS & GEAR MOTORS

Worm, Planetary, Helical, Bevel, Low Backlash, Cycloidal, Inline & Right Angle, Shaft Mounted, Precision Servo.

Brands

Alpha, Baldor, Boston, Bonfiglioli, Cone Drive, Dodge, David Browne, Exlar, Grove, Hub City, IPTS, Kepco, Leeson, Lenze, Micron, Nord, Reliance, Sew-Eurodrive, Shimpo, Sterling, Stober, Sumitomo, Winsmith, Zero-Max.

■ LINEAR MOTION COMPONENTS

Actuators, Ball Bushings, Rails, Slides, Shafting, Ball Screws, Acme Screws.

Brands

Bishop-Wisecarver, Exlar, IKO, Nock, Pacific, Thompson.

■ CLUTCHES, BRAKES & COUPLINGS

Air, Electric & Mechanical.

Brands

Boston, Dodge, Dynacorp, Kebco, Lovejoy, Magpower, Nexen (Horton), Stearns, Zero-Max, Warner, R&W, Rotex.

■ MECHANICAL VARIABLE SPEED

Pulleys, Disc Drive, Ring-Cone.

Brands

Bonfiglioli, HI-LO, Lenze, Nord, Shimpo, Stober, Sumitomo, Zero-Max, Lovejoy.

■ CONVEYORS & CONVEYOR COMPONENTS

Driven and Non-Driven Conveyors, Gravity Conveyors, Rollers, Pulleys, Take-Ups, Conveyor Belting, Belt Lacing, Guides, Wearstrip.

Brands

Chantland, Clipper, Douglas, Endura, Flexco, Habasit, Intralox, Mulhern, Omni, PCI, Rainbow, Trico, UNI, Value Guide, Solus, Slideways.



Motor Application Formula

Calculating Horsepower

Once the machine torque requirement is determined, horsepower can be calculated using the formula:

$$HP = \frac{T \times N}{5,250}$$

where,

HP = Horsepower
T = Torque (ft-lb)
N = Base speed of motor (rpm)

If the calculated horsepower falls between standard available motor ratings, select the higher available horsepower rating. It is good practice to allow some margin when selecting the motor horsepower.

For many applications, it is possible to calculate the horsepower required without actually measuring the torque required. The following useful formulae will help:

Conveyors

$$HP \text{ (Vertical)} = \frac{\text{Weight (lb)} \times \text{Velocity (FPM)}}{33,000}$$

$$HP \text{ (Horizontal)} = \frac{\text{Weight (lb)} \times \text{Velocity (FPM)} \times \text{Coefficient of Friction}}{33,000}$$

Web Transport Systems and Surface Winders

$$HP = \frac{\text{Tension (lb)} \times \text{Velocity (FPM)}}{33,000}$$

Note: The tension value used in this calculation is the actual web tension for surface winder applications. For sectional drives, it is the tension differential: downstream tension – upstream tension.

Center Winders (Control to Base Speed Only)

$$HP = \frac{\text{Tension (lb)} \times \text{Line Speed (FPM)} \times \text{Buildup}}{33,000 \times \text{Taper}}$$

Center Winders (Field Control)

If Taper x Field Range ≥ Buildup, then,

$$HP = \frac{\text{Tension (lb)} \times \text{Line Speed (FPM)}}{33,000}$$

If Taper x Field Range ≤ Buildup, then,

$$HP = \frac{\text{Tension (lb)} \times \text{Line Speed (FPM)} \times \text{Buildup}}{33,000 \times \text{Taper} \times \text{Field Range}}$$

NOTE: The preceding formulae for calculating horsepower do not include any allowance for machine function windage or other factors. These factors must be considered when selecting a drive for a machine application.

Fans and Blowers

$$HP = \frac{\text{CFM} \times \text{Pressure (lb/ft}^2\text{)}}{33,000 \times \text{Efficiency of Fan}}$$

Effect of Speed on HP:

HP = K₁ (RPM)³ — Horsepower varies as the 3rd power of power of speed.

T = K₂ (RPM)² — Torque varies as the 2nd power of speed

Flow = K₃ (RPM) — Flow varies directly as the speed

$$HP = \frac{\text{CFM} \times \text{Pressure (lb/in}^2\text{)}}{229 \times \text{Efficiency of Fan}}$$

$$HP = \frac{\text{CFM} \times \text{Inches of Water Gauge}}{6356 \times \text{Efficiency of Fan}}$$

Pumps

$$HP = \frac{\text{GPM} \times \text{Head (ft)} \times \text{Specific Gravity}}{3960 \times \% \text{ Efficiency of Pump}}$$

Specific Gravity of Water = 1.0

1 ft³ per sec. = 448 GPM

1 PSI = A head of 2.309 ft for water weighing 62.36 lb/ft³ at 62°F

Constant Displacement Pumps

Effect of Speed on HP:

HP = K (RPM) — Horsepower and capacity vary directly as the speed.

Displacement pumps under constant head require approximately constant torque at all speed.

Centrifugal Pumps

Effect of Speed on HP:

HP = K₁ (RPM)³ — Horsepower varies as the 3rd power of speed.

T = K₂ (RPM)² — Torque varies as the 2nd power of speed.

Flow = K₃ (RPM) — Flow varies directly as the speed.

Efficiency:

500 to 1,000 gal/min = 70% to 75%

1,000 to 1,500 gal/min = 75% to 80%

Larger than 1,500 gal/min = 80% to 85%

Displacement pumps may vary between 50% and 80% efficiency, depending on size of pumps.

CAPABILITIES

- Field Service-Machine troubleshooting
- Drives & Circuit Board Repairs
- Custom Electrical panels-design & build
- Autocad Drawing & electrical schematics
- Machine design & consultation
- Systems integration
- Drives & PLC programming

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