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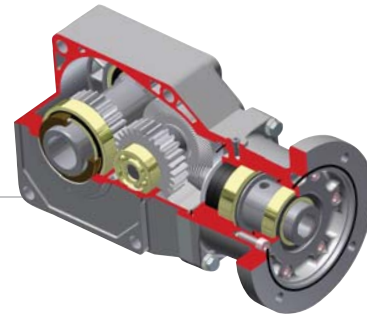
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# Efficiency Pay\$



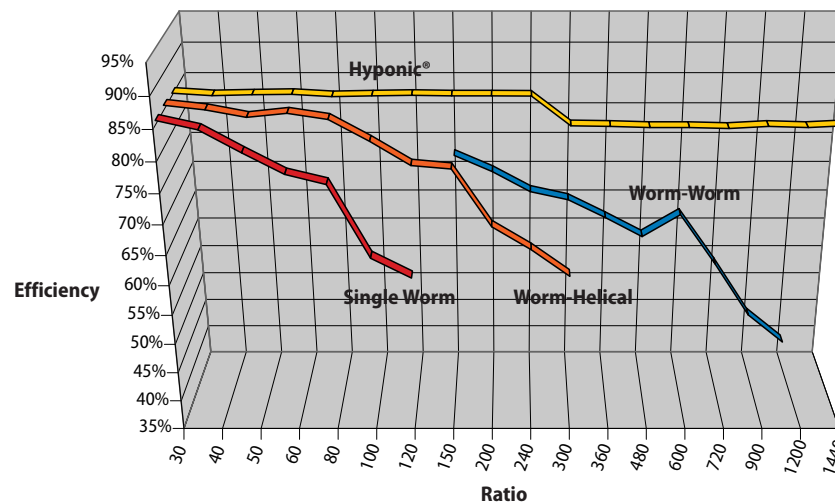
## Hyponic® Reducers

- ▶ **Patented hypoidal gear technology**
  - ~ Leads the industry in high-efficiency and quiet operation
  - ~ All steel gearing for long operation life
- ▶ **All-steel hypoid gears transmit torque more efficiently**
  - ~ More torque density in a compact unit
- ▶ **Significantly outperform worm gearing across ratios from 30:1 to 1440:1**
  - ~ 80 - 85% efficiency across the entire ratio range



## Worm Gear Reducers

- ▶ **Operate at low efficiencies**
  - ~ Worm gear reducer with a 40:1 ratio operates at less than 75% efficiency
  - ~ Bronze gearing shortens operation life
- ▶ **Efficiency declines as ratio increases**
  - ~ High ratio, double reduction worm gear sets can have efficiencies below 60%
- ▶ **Worm-helical combinations have higher efficiencies than single and double worm reducers**
  - ~ Efficiencies drop below 80% at ratios higher than 120:1



► **Significantly Lower Utility Costs**

The annual utility cost to operate the drives can be calculated using the formula:

$$Cost = \frac{Rate \times Connected\ Horsepower \times 0.746 \times Hours\ Run}{Motor\ Efficiency \times Gearbox\ Efficiency}$$

Where:

Cost = Annual utility cost

Rate = Local cost of power per kWh

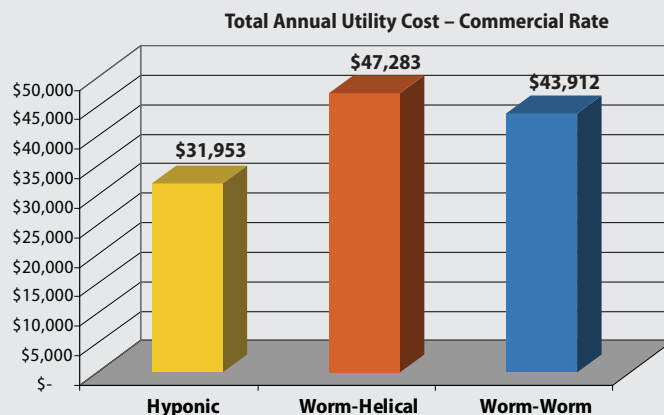
Connected Horsepower = Number of operating drives x HP

Hours Run = Hours per day multiplied by number of operating days per year

► **Commercial Example**

Customer has 200, 1/2 HP drives at  
7.3 RPM Output, Ratio 240:1

- ~ Rate \$ / kWh = 0.082
- ~ Connected HP = 100
- ~ HP to kW Conversion = 0.746
- ~ Hours / Day = 16
- ~ Days / Year = 200
- ~ Motor Efficiency = 0.719
- ~ Reducer Efficiency: Hyponic = 0.85  
Worm-Helical = 0.58  
Worm-Worm = 0.62



► **Industrial Example**

Customer has 400, 1/4 HP drives at  
1.9 RPM Output, Ratio 900:1

- ~ Rate \$ / kWh = 0.051
- ~ Connected HP = 100
- ~ HP to kW Conversion = 0.746
- ~ Hours / Day = 24
- ~ Days / Year = 360
- ~ Motor Efficiency = 0.698
- ~ Reducer Efficiency: Hyponic = 0.85  
Worm-Worm = 0.44

