Grove Gear
E-Series 24
(High Efficiency Right Angle Gearbox)

Patent Pending

TARGETED APPLICATIONS
- New (OEM) and retro-fit (MRO/user) installations currently or potentially served by commercially available industrial worm gear products.
- Potential high-efficiency (helical-bevel and helical-worm) installations.
- Specifically targeting customers who currently use competitors' products.

SPECIFICATIONS
- **Output Torque Rating:** 2,600 in-lb (all ratios @ 1800 rpm input)
- **Torque density:** Similar to 3.25" worm (at 1800 rpm input speed)
- **Ratios:** 7:1 to 60:1 (non-integer)
- **Physical size:** Basic unit will bolt-in to 2.38" worm.

FEATURES
- **Mounting:** Accessories available to directly replace worm products from 2.38" to 3.25" CD
- **Input:** Solid shaft, quill-style motor frame (56C-180TC), coupled motor frame (56C-210TC).
- **Output:** Solid shaft up to 1.875" diameter, hollow bore up to 1.500" diameter.
- **Lubrication:** Factory-filled with synthetic food-grade PAG oil.
- **Seals:** Viton
- **Input bearings:** Double-supported high-speed shaft.
- **Gearing:** Two-stage helical-hypoid steel gearing offers better wear resistance, longer life, and higher torque capacity than traditional bronze worm gearing.
- **Washdown-duty (option):** Available with epoxy paint, v-ring excluder seals, stainless steel hardware and stainless steel output shaft.
- **Accessories (optional):** Plug-in output shaft kits, interchange (B) base kits, T-base kits, torque arm kits, side mounting flange and bracket kits, custom modifications.
- **Anti-reversing (option):** Anti-reversing mechanism available with shaft input or coupled motor frame on all ratios.

BENEFITS
- Operating efficiency: 87-92% for all ratios. (Worm drive efficiencies range from 45-85%, depending on ratio and application.)
- Rapid payback: Up to $450 annual savings per load HP.
- Increased efficiency permits motor down-sizing.
- Lower operating temperature than similar sized worm drives and potential to run vent-free.
- Power density: approximately double that of similar-sized (2.38" CD) worm gear products.
- Increased power density often permits gearbox down-sizing.
- Unit size may be selected based on torque capacity (for new or redesigned installations), or based on physical size (direct replacement of existing worm product).
- Direct replacement to standard industry worm gear products (Boston, Dodge, Emerson, etc…) with no need to modify mounting structure.
- Premium-efficiency Leeson motors can be paired with E-Series to optimize system efficiency.
- Potential torque/price advantage over helical-bevel and helical-worm products.

CONSIDERATIONS
- **Patent Pending:** High-efficiency, drop-in replacement to commercially available worm gear products.
- **Physical envelope:** added material on back side of housing may interfere with adjacent equipment or mounting structures.
- **Center distance:** Does not match 2.38" worm.
- **Mounting:** Interchanges to worm reducers with "industry standard" mounting dimensions.
- **Compact replacement** to typical European helical-bevel and helical-worm designs.
- **Lubrication:** PAG oil must not mix with any other oil types. Units must be flushed before filling with other varieties.
- **Ratios:** available ratios are not even integers. (ex. 20:1 nominal is actually 19.50:1)
- **Input:** Double-extended input shaft not available.
- **Anti-reversing:** Standard units will backdrive (all ratios). Backstop option only allows single-direction input rotation.

AVAILABILITY
- **Sample test units** available now.
- **DP3 production release:** 3/30/10.
- **Limited production** (quill input, hollow bore output, all ratios, no bases, no shaft input): 4/1/10
- **Full product release:** 5/1/10.

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