### Drive Units — Five Most Common Arrangements

1. **Top bearing type: floor-mounted**
   - Gear speed reducer type: partially mounted solid shafts
   - Flexible coupling between gearbox and screw shaft
   - Motor mounted on top of the gearbox
   - V-belts between motor and gearbox
   - Application: limited outputs

2. **Top bearing type: wall-mounted**
   - Gear speed reducer type: shaft-mounted
   - Motor mounted on top of the gearbox
   - V-belts between motor and gearbox
   - Application: all outputs

3. **Top bearing type: floor mounted**
   - Gear speed reducer type: shaft mounted
   - Motor installed on top of gearbox
   - V-belts between motor and gearbox
   - Application: 100 HP maximum

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### Prefabricated Screw Pump

- **Diameter**
  - 16" GPM @ 30°: 460 GPM @ 38°: 330
  - 20" GPM @ 30°: 780 GPM @ 38°: 570
  - 24" GPM @ 30°: 1,300 GPM @ 38°: 940
  - 30" GPM @ 30°: 2,200 GPM @ 38°: 1,570
  - 38" GPM @ 30°: 3,390 GPM @ 38°: 2,450
  - 42" GPM @ 30°: 4,750 GPM @ 38°: 3,450
  - 48" GPM @ 30°: 6,600 GPM @ 38°: 4,750
  - 54" GPM @ 30°: 8,800 GPM @ 38°: 6,300
  - 60" GPM @ 30°: 11,000 GPM @ 38°: 8,700
  - 66" GPM @ 30°: 14,000 GPM @ 38°: 10,000
  - 72" GPM @ 30°: 17,200 GPM @ 38°: 12,600
  - 78" GPM @ 30°: 21,700 GPM @ 38°: 15,300
  - 80" GPM @ 30°: 22,200 GPM @ 38°: 15,700
  - 84" GPM @ 30°: 25,400 GPM @ 38°: 18,250
  - 90" GPM @ 30°: 30,000 GPM @ 38°: 21,600
  - 96" GPM @ 30°: 35,000 GPM @ 38°: 25,200
  - 102" GPM @ 30°: 39,800 GPM @ 38°: 28,700
  - 108" GPM @ 30°: 45,400 GPM @ 38°: 32,700
  - 114" GPM @ 30°: 51,300 GPM @ 38°: 37,000
  - 120" GPM @ 30°: 55,500 GPM @ 38°: 40,000
  - 158" GPM @ 30°: 108,600 GPM @ 38°: 78,400
  - 196" (max) GPM @ 30°: 182,800 GPM @ 38°: 131,900

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### Archimedean Screw Pumps

**Certified ISO 9001**

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### Maximum Design Pumping Capacity

This table is for reference only. Please contact our engineers for specific design selection. These capacities are for three flight screw pumps with maximum pitch, flight radius and RPM.

- **Q** Capacity in meters3/sec
- **hv** Filling height
- **T** Touch point
- **S** Discharge point
- **V** Filling point
- **TI** Max. upstream water level
- **L** Length of blades
- **Sp** Pitch
- **D** Screw diameter (m)
- **d** Torque tube diameter (m)

\[ Q = 1.15 \times N \times q \times D^3 \]

\[ \text{POWER (kW)} = \frac{9.81 \times Q \times H}{\text{EFF NET}} \]

\[ \text{MAX RPM} = \frac{59 \times D^2}{V} \]

\[ \text{FILL HEIGHT} = \frac{D + d}{2} \times \cos \beta \]
In addition to the general characteristics and advantages of screw pumps, the Landy screw pumps are distinguished by:

- **World-wide service with local support**
- **Superb after-sales service**
- **We can offer full supervision of installation.**

- **Efficient design** -
  - usually 2 flights
  - Limited deflection
  - Limited occurring tension
  - High efficiency
  - Alternate flight pitch

- **Ongoing R&D**

- **Finite Element Analysis standard on all new designs.**

- **Full in-house integrated manufacturing**
- **Totally reliable manufacturing schedules and delivery times**

- **Manufactured with permanent lifting eyes and balancing weights**

- **Flanged shafts are monolithically cast nodular cast iron.**
- **Use of fully self-aligning bearings**

- **Reinforced leading edges of flights**

- **Endplates**
  - Fully watertight with internal caps over threads of connection bolts
  - Precisely parallel and centric manufacture using special lathes
  - Special ST-44 material

- **Surface Preparation. Shot blasting to SP-10 standards.**

- **Coating. All required coatings are professionally applied, and can be formulated for extreme environments.**
  - Please contact us for severe abrasion, chloride, pH or H2S applications.

- **Stainless Steel Screw Pumps available.**

- **Nearly 100 years experience**

- **Fully qualified welders**
  - X-ray or ultrasonic
  - Welding Shop Approval
  - AWS/DIN standards

- **State-of-the-art**

**Landy Screw Pumps Because...**

- A first class product with STATE-OF-THE-ART screw pump technology

**Landustrie**
Landustrie Screw Pumps are available with four different Lower Bearing designs. The newest and most exciting of which is the permanently lubricated, completely self-contained, and fully self-aligning in all 3 axes, Landy Eco-Friendly system as detailed below.

All our Lower Bearing types carry the radial thrust forces while also accommodating longitudinal expansion and contraction brought about by temperature changes. The special merits of all four Landustrie Lower Bearing designs are conveniently outlined in the Table on the opposite page.
### LOWER BEARING SELECTION TABLE

<table>
<thead>
<tr>
<th></th>
<th>Eco-friendly</th>
<th>Conventional</th>
<th>Medium</th>
<th>Heavy Duty</th>
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</thead>
<tbody>
<tr>
<td><strong>Lubrication</strong></td>
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<tr>
<td>Lifetime</td>
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<td><strong>Grease filling</strong></td>
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<td><strong>3D-self-aligning</strong></td>
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<td><strong>Investment</strong></td>
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<td>long</td>
<td>longest</td>
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</table>

### UPPER BEARINGS

For the upper bearing EPIC can offer the choice between two different versions; a wall-mounted or a foot-mounted upper bearing. The benefits of the wall-mounted upper bearing are that the forces on the civil construction will be better absorbed, and also that an odor-tight separation is created between the screw pump and the room in which the drive-unit is installed.
**EPIC “FLIGHT DEK” COVERS**

On request we can cover the installation with modular, light weight, maintenance free, pultruded FRP covers. Advantages are:
- protection of the screw pump against thermal expansion
- creates a safe working environment
- reduces the levels of noise production

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**TROUGHS**

With us there are several choices of Screw Pump troughs.

- Conventional, classic concrete, custom grouted by the Screw Pump
- Conventional, classic concrete with removable steel grout casting molds
- Permanently Cast-In steel or stainless steel trough liners
- Pre-Fabricated, fully self-supporting 'U' steel trough
- Pre-Fabricated Screw Pump in an enclosed 360° tube

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**RESEARCH AND DEVELOPMENT**

For many generations Landustrie has been actively conducting research to continuously improve Screw Pump performance, efficiency and longevity.

The newest development in the most recent 10 years of our testing program is the permanently lubricated, fully 3-dimensionally self-aligning, and completely self-contained Eco-Friendly Lower Bearing. In addition, Landustrie now conducts Finite Element Analysis on all our new Screw Pump designs.
Basic Technical Data

The capacity flowing through the screw pump is a function of the physical parameters of the screw, the speed at which it turns, and the inclination of the screw to the horizontal.

\[ \text{viz. } Q = 1.15N q D^3 \]

where \( Q \) = capacity in \( \text{m}^3/\text{sec} \)
\( q \) = specific capacity (constant)
\( N \) = RPM
\( D \) = outside diameter of screw in meters
where \( d \) = torque tube diameter in meters

The relationship between \( Q \), \( N \) and \( D \) will be obvious and the constant \( q \) takes into account the relationship of \( d/D \), the number of flights on the screws and the angle of inclination.

The difference in the design-head requirements between the screw and the centrifugal pump is clearly shown in the above diagram for identical outfall and lift conditions. This difference is a major factor when considering operational costs.

Efficiency/Capacity Curve

The curve shows:

1. that the screw efficiency stays very high even with flows as low as 20–30% of full capacity.
2. the importance of clearly specifying the maximum value to be pumped as the screw cannot deliver a greater volume than that delivered when the water inlet is up to the fill point.

Advantages of Screw Pumps

- Low wear/low speed
- High efficiency
- Capable of pumping highly polluted liquids
- Automatic priming
- Easily accessible
- Long service life
- Low maintenance
- High reliability
- May rotate in dry condition
- Self regulating
- Simple regulating
- Low noise
- Non-clogging

4. Top bearing type: floor mounted
   Gear speed reducer type: parallel mounted solid shafts
   Motor directly coupled to the gearbox
   Flexible coupling between motor and gearbox
   Flexible coupling between reducer and screw shaft
   Application: all outputs

5. Top bearing type: floor mounted
   Gear speed reducer type: parallel-mounted solid shafts
   Flexible coupling between gearbox and screw shaft
   V-belts between motor and gearbox
   Application: all outputs
Special Features of EPIC Screw Pumps

ISO 9001 certified
Full penetration welding according to AWS, DIN, ASTM, or API standards
Internal Bulkheads provide additional watertight fail safe sealing of the Torque Tube
Endplates are watertight welded with threaded holes for the shaft connections
Fully self-aligning Upper and Lower Bearing Assemblies
Monolithic Cast Shafts
Minimum of two (2) Seals in Lower Bearings
Separate radial thrust and axial thrust Upper Bearing Assemblies
Permanent Lifting Eyes built in
Screed Bar tack welded to tip of flights for screeding
Shot blasting to SA 2.5 (SSPC-SP10) standards
Prime coating is standard for all parts above and below water level
Full factory coating under environmentally controlled conditions is recommended
Reinforced leading edges of the Flights

Additional Services & Optional Testing

Ultrasonic Liquid Level Sequential Control System
X-Ray Weld Testing
Full Submerged Arc Welding
Ultrasonic Weld Testing
Left Hand and Right Hand Flights
Torque Tube Air Pressure Testing
Double Lift
Finite Element Analysis

Partial Installation List (USA)

Mobridge, SD       Mineral Wells, TX       N. Charleston, SC       Saugat, IL
Appomattox, VA     Fallbrook, CA        Henderson, NV         USAF, Shaw A.F.B, SC
Chelsea, MI        Emporia, VA          Lubbock, TX           Elkhart, IN
Springfield, OH     Des Plains, IL      Mt. Washington, KY     CA Dept. of Corrections
Englewood, TN      Barceloneta, PR      Passaic Valley, NJ     Van Buren, AR
Hope Mills, NC     Salt Lake City, UT   St. George, UT         Dallas Center, IA
Santa Rosa, CA     Williamston, MI      Pittsburgh, KS        Newnan, GA
Oyster Bay, NY     Wauseon, OH          Monett, MO             Mesquite, NV
LeRoy, NY          York, PA             American Fork, UT      Carthage, MO
Indianapolis, IN    Gloucester, MA      Henrico County, VA      Logan, UT
Secaucus, NJ        Teterboro, NJ       HRSD-Newport News, VA  Ocean County Utilities, NJ
Coachella, CA       Meridian, ID         Caldwell, ID           Mountain Home, ID
U.S. Army, Ft. Carson, CO  Perryville, MD  Gilbert, AZ

Other Fine EPIC Products

• “Flight Dek” Screw Pump Covers
• St-Steel Direct Drive Floating Aerators
• St-Steel Direct Drive Down Pumping
• Floating Mixers

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