



**eVOQUA**  
WATER TECHNOLOGIES



## **PUMP WATER FOR LESS MONEY WITH EXTERNALIFT™ SCREW PUMPS**



## EXTERNALIFT™ SCREW PUMPS

Since the 1960's, when the technology was introduced to the US water and wastewater market, Evoqua Water Technologies has installed pumps at over 1,200 locations for a wide range of applications:

- Headworks
- Return activated sludge
- Lift stations
- Stormwater
- Industries such as pulp and paper, plastics, refineries, fish hatcheries and food processing
- Many other types of high-volume, low-head pumping applications

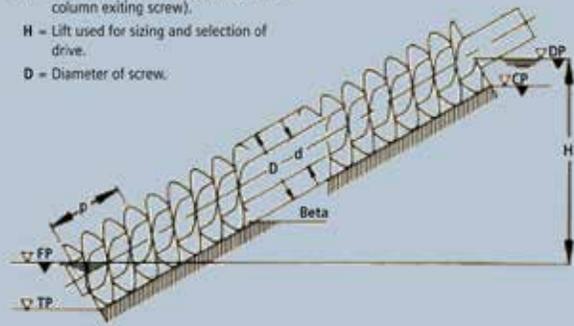
Design innovations make Evoqua Water Technologies Externalift™ screw pumps superior to other types of pumps:

- Pre-screening or grinding not required
  - All screens and grinders can be located at pump discharge level
- Inlet structures not required
  - Wet and dry pits not required
  - No wet well storage
  - No inlet or discharge pipes
  - No valves or elaborate electrical controls needed
- Variable pumping at constant speed
  - Liquid will be pumped at the rate it will be received
  - Optional VFDs and dual-speed motors available for large flow variations

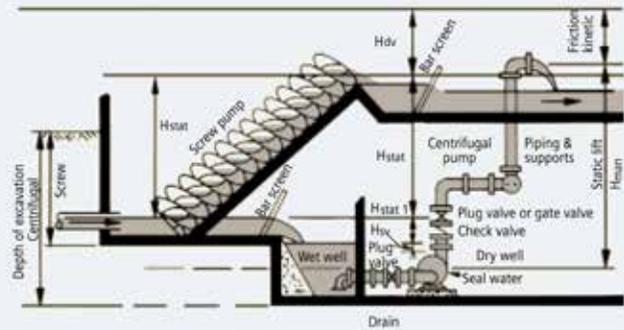
- Low-speed operation
  - Speeds range between 20 RPM and 75 RPM, based on spiral diameter
  - Low speed operation lengthens bearing life, and
  - Permits gentle pumping action for return sludge or oily wastewater
- Backstop protection
  - Backstop prevents reverse rotation when pump operation is stopped
- Maintenance free
  - Requires only lubrication
  - Automatic lubrication is provided to lower bearing
  - Manual lubrication is required for upper bearing
- Efficiency
  - Typically 75% at design capacity
  - Over 65% at 30% capacity
- High flow/High lift
  - Flows of up to 80,000 GPM (300 m<sup>3</sup>/min) for each pump
  - Lifts up to 40-ft (12.2 m)
- Reduced pumping head
  - No suction or discharge piping, gate or check valves
  - No frictional resistance
  - Lower static head, since screw pump meets the incoming water at its own level

## Terms and Definitions

- FP = Fill point, screw capacity 100%.       $d$  = Diameter of torque tube.  
 TP = Touch point (bottom tip of screw flight).       $\beta$  = Inclination of screw.  
 CP = Chute point (unload point at end of screw).       $p$  = Pitch (distance from one flight point to corresponding flight point).  
 DP = Discharge point (highest point of water column exiting screw).  
 H = Lift used for sizing and selection of drive.  
 D = Diameter of screw.



## Manometric and Static Difference in Water Level



Evoqua experts can help with an optimal design for your application.

Externalift™ pumps are designed and manufactured for optimal performance, ease of maintenance and long-lasting operation.

The Externalift Pump consists of:

- Screw
  - Steel torque tube body
  - Inclination angles of 30° and 38°
  - Two or three flights welded to exterior of tube
  - Heavy-gauge end plates machined for alignment of surfaces
  - Statically balanced
  - Shop primed
- Self-Aligning Upper Bearing
  - Split bearing housing
  - Self-aligning, spherical roller radial and thrust bearings
  - 100,000 hours Minimum B-10 life
- Lower Bearing
  - Bronze sleeve bearing resists contamination
  - Sleeve rotates with screw, while journal remains fixed
  - Automatically and continuously grease lubricated
  - Designed to compensate for temperature effects
- Deflectors
  - Circular arc formed plate sections prevent splashing
- Drive includes
  - Electric motor
  - Reducer designed to AGMA standards with 1.5 service factor
  - V-Belts and sheaves connection between motor and reducer
  - Backstop mounted on gear reducer prevents reverse rotation of screw pump

- Flexible coupling for reducer-to-motor connection (except when hollow-shaft reducer is used)
- Grease Lubricator
- Motorized and connected to the pump drive
- Designed to operate automatically when screw pump is running

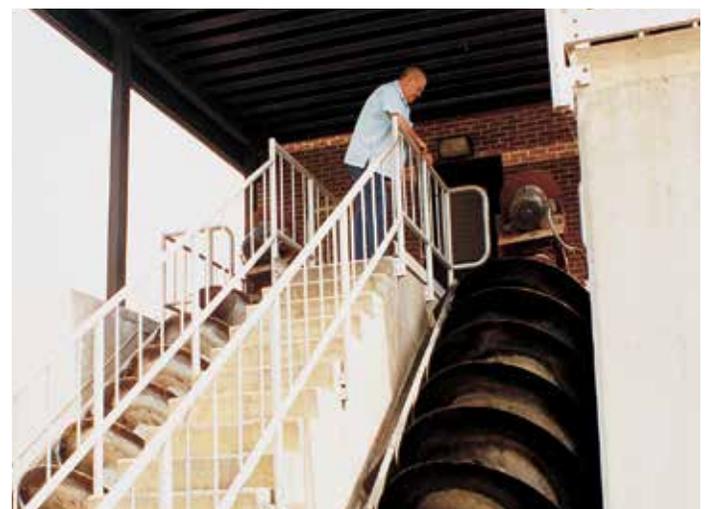
Proper influent and effluent structures are an integral part of the Externalift pump operation and critical to optimal pumping efficiency.

The influent basin should be designed to:

- Allow isolated operation of the pump(s)
- Permit maintenance around each lower bearing

Effluent channels must be designed so that:

- The discharge from the pump(s) does not flow back into the screw
- For multiple parallel pumps, the discharge point of all screw troughs must be at an elevation to prevent backflow





Visit [www.evoqua.com/externalift](http://www.evoqua.com/externalift)  
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