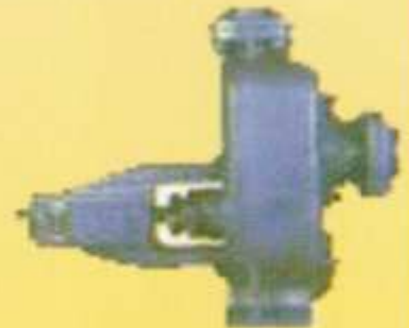




# ETA PUMPS

Efficiency & Trust . . . Affirmed



**ETA** is the seventh letter of Greek alphabet which denotes efficiency in technical parlance. We bring you **ETA** range of pumps whose **E**fficiency & **T**rust is **A**ffirmed. These pumps are designed with a thorough understanding of the Process Industry requirements and cover a wide variety of applications.

#### ETA-A



- ⇒ **Process pumps** for severe chemical duties such as transfer / circulation of corrosive liquids with upto 30% solids content.
- ⇒ Conforming to ANSI B 73.1 Standards.
- ⇒ Capacities upto 800 m<sup>3</sup>/hr & Head upto 250 m.
- ⇒ Temperature upto 250° C.
- ⇒ Special Engineered versions available for Low Flow conditions, Very High Temperatures (up to 350° C) and Vertical Configuration.

#### ETA-W



- ⇒ **Water pumps** for applications such as cooling water circulation, process water transfer, fire hydrant, HVAC, Booster, etc.
- ⇒ Conform to DIN 24255 standards.
- ⇒ Capacity upto 550 m<sup>3</sup>/hr & Head upto 100 m.
- ⇒ Temperature upto 100° C.

#### ETA-H



- ⇒ **High Flow-Low Head Pumps** for applications such as water supply, HVAC, Storm-water Drainage, etc.
- ⇒ Capacity upto 2000 m<sup>3</sup>/hr & Head upto 28 m.
- ⇒ Temperature upto 140° C.

#### ETA-S



- ⇒ **Self Priming pumps** for liquid transfer from underground tanks, dewatering operations, sewage / muddy water applications.
- ⇒ Back pullout design.
- ⇒ Capacity upto 150 m<sup>3</sup>/hr & Head upto 37 m.
- ⇒ Temperature upto 100° C.

**Our core strength lies in understanding of chemical process operation and the critical role of pumps. Based on our pool of knowledge we offer :**

- ❖ Trouble shooting of pumping installations.
- ❖ Energy Audit & residual life study of pumps.
- ❖ Retrofitment of oil seals with Labyrinth Seals for reducing lubricant contamination & improving bearing life.
- ❖ Sealing solutions with retrofitment.
- ❖ Development of cast & machined components from samples / drawings for obsolete pump models.

# ETA-A Process Pumps For Severe Chemical Duties

- ❖ Conform to ANSI B 73.1 standards
- ❖ Highly standardized design and modular for maximum interchangeability. 3 Power End Assemblies support over 25 models.
- ❖ Back pull-out construction
- ❖ Capacity : 0.5 - 800 m<sup>3</sup>/hr
- ❖ Head : 5 - 250 m
- ❖ Max Operating Pressure : 25 kg/cm<sup>2</sup>
- ❖ Temperature : 250° C

## MATERIAL OF CONSTRUCTION OF WET ENDS :

CI, DI, CS, SS 304, SS 316, CD4MCu, A-20, Hastelloy-B, Hastelloy-C, R-55, Monel, Incolly & other alloys.

## SEALING OPTIONS :

Packing : TIWA, PTFE, Graphoil in 3L2 or L5 arrangement

Mechanical Seal : Inside / Outside, Single / Double, Balanced / Unbalanced, Metal Bellows, etc.

## RIGID BEARING ASSEMBLY

Deep Groove Ball Bearings selected for 10,000 hrs of continuous duty under extreme conditions. The inboard & outboard bearings are installed to take all residual radial / axial thrust loads.

Bearing Housing & Cover provide alignment & protection for long bearing life. Rigid frame adaptor & foot to take up piping loads.

Larger oil sump for cooler bearing operation.

Sight Glass / Constant Level Oiler to monitor oil level.

MOC : CI standard, DI / CS / Higher Alloys Optional.

## NON-METALLIC LABYRINTH SEAL

Provided as a standard feature for protection of bearing & lubricant from dust & dirt. Reduces contamination of lubricant and increases bearing life. Not affected by corrosive environment.

## SHAFT & SLEEVE

Fully ground & polished with protective sleeve

Shaft assembly designed for containing deflection within 0.05 mm at seal face under extreme operating conditions

MOC : Shaft 4140 / 316  
Sleeve : SS 410 / as per wet ends

## BACK PLATE

Perfectly aligned with casing & bearing housing to provide support to the sealing area.

Completely confined Non-Asbestos gasket

Stuffing box is wide & deep to accommodate packing as well as wide variety of mechanical seals.

CS / SS Jacket optional

## CASING

Self Venting discharge nozzle.

Designed with class 300 wall thickness and extra corrosion allowance.

Integral Foot Support for superior resistance to piping loads.

Flanges drilled to class 150 / 300 RF with serrated finish  
CS / SS Jacket optional

## IMPELLER

Semi-open type with back pump out vanes to reduce stuffing box pressure & axial thrust.

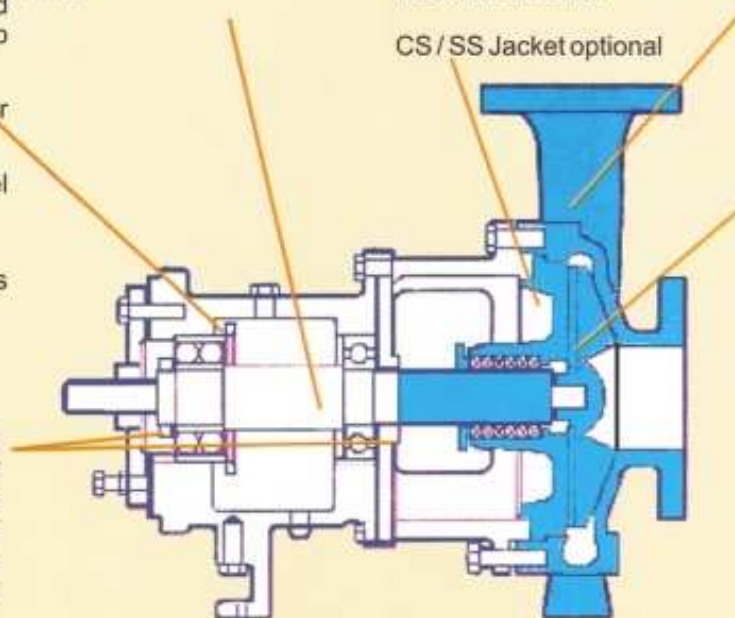
Can handle slurries with upto 30% solids / stringy material

Dynamically Balanced

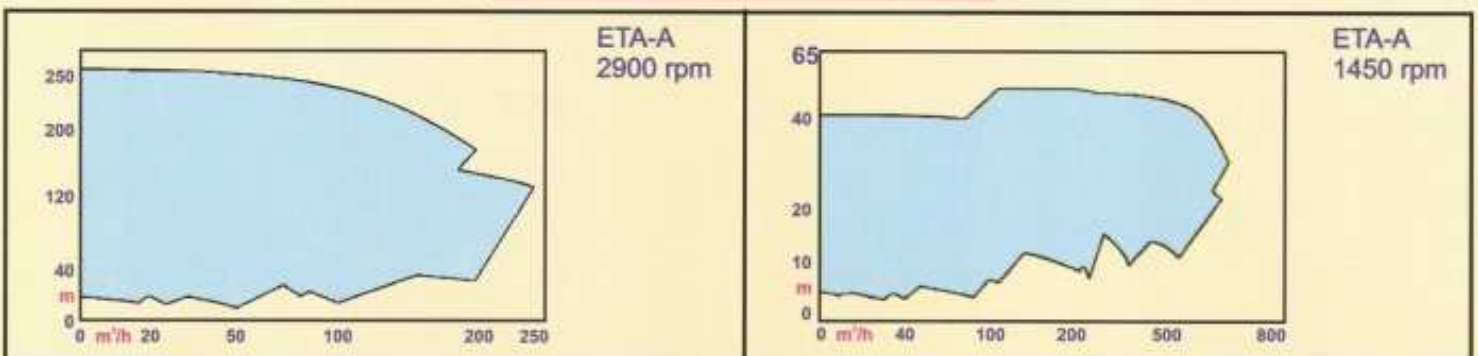
Smooth hydraulic passages ensure high Efficiency & Low NPSH

Impeller Seal Ring provided to ensure dry shaft

Provides 2 times wear area than an enclosed impeller. Hence rate of deterioration in efficiency is lower and can be easily corrected by the simple external adjustment for maintaining impeller clearance



## RANGE OF DUTY COVERED



## ETA-A EXTENDED VERSIONS

ETA-A series of pumps have a very versatile design that can be adapted for 3 additional versions. The extra features are added without compromising on the basic design criteria of ETA-A series pumps. Thus they enhance the range of the ETA-A pumps to encompass more applications.

### **ETA-AL - Low Flow Pumps**

### **ETA-AT - High Temperature Pumps**

### **ETA-AV Vertical Submersible Pumps**

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#### **ETA-AL : Pumps for Low Flow Applications**

A number of processes require very low flows of the order of 0.5 m<sup>3</sup>/hr continuously. The conventional solution for such application is either to throttle the discharge valve or provide a continuous by-pass. Both these methods waste energy and put a higher radial load on the rotating assembly.

We have developed a special range of **ETA-AL** pumps which have special hydraulic design for pumping low flows. The range covers Capacity of 0.3 - 10 m<sup>3</sup>/hr and Head upto 100 m.

These are Horizontal foot mounted pumps with the following additional features :

- ✓ Centric volute casing
- ✓ Radial impeller vanes

The above change in design helps to reduce the radial thrust loads at low flows and also improves the operating efficiency of the pumps.

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#### **ETA-AT : Pumps for High Temperature Duties**

The ETA-AT series pumps are horizontal end suction pumps. They have added features as per API-610 standards to extend the operating range up to 300° C. The complete duty range of ETA-A is covered in this series.

ETA-AT incorporate the following enhancements :

- ✓ Casing is centerline mounted with heavy duty pedestal support
- ✓ The bearing housing is provided in CS material for better thermal stability
- ✓ Cooling Water circulation jacket on Back Plate and Bearing Housing
- ✓ Spiral wound gasket on casing
- ✓ Nozzle flanges are machined to Class 300 rating
- ✓ Keyed & bolted shaft

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#### **ETA-AV : Vertical Submersible Pumps**

ETA-A series pumps have matched casing and impeller which makes them easier to adapt for vertical installation. The pumps are suitable for handling highly corrosive liquids, oils, solvents, etc.

The range covers Capacity from 5 - 100 m<sup>3</sup>/hr and Head upto 110 m. Depth of submergence up to 3 m.

Following design additions are provided :

- ✓ Shaft enclosed in column with intermediate non-metallic bearing support
  - ✓ The pumped liquid provides lubrication for bearings.
  - ✓ Rigid bearing lantern with deep groove ball bearings is provided for shaft support
  - ✓ Vapour sealed construction offered as an option
  - ✓ Heavy duty mounting plate provided to reduce the vibration and noise
-

## ETA-W Pumps For Water Service

- ❖ Conform to DIN 24255 standards
- ❖ Highly standardized design and modular for maximum interchangeability. 3 Power End Assemblies support over 30 models.
- ❖ Back pull-out construction
- ❖ Back pull-out design
- ❖ Capacity : 0.5 - 550 m<sup>3</sup>/hr
- ❖ Head : 5 - 100 m
- ❖ Max Operating Pressure : 15 kg/cm<sup>2</sup>
- ❖ Temperature : 100° C

### MATERIAL OF CONSTRUCTION :

All iron / bronze fitted pumps with SS impeller as option. Optionally CS, SS 304 & SS 316 can be provided.

### SEALING OPTIONS :

Gland Packing provided as standard with Mechanical Seal as option.

### RIGID BEARING ASSEMBLY

Antifriction Ball Bearings to withstand radial / thrust loads under extreme duty

Bearing Housing & Cover provide proper alignment for long bearing & seal life.

MOC : CI

Grease lubricated bearings are standard. Oil lubrication is optional

### SHAFT & SLEEVE

Fully ground & polished

Designed for deflection within 0.05 mm at seal face under extreme operating conditions

MOC :

Shaft EN8 / SS 316

Sleeve : SS 410 / as per wet ends

### BACK PLATE

Perfectly aligned with casing & bearing housing

Completely confined gasket

Stuffing box is provided with Gland Packing and optionally Mechanical Seal.

### CASING

Self Venting discharge nozzle.

Rigid foot support for superior resistance to piping loads.

Flanges drilled to class 150

Extra corrosion allowance.

### IMPELLER

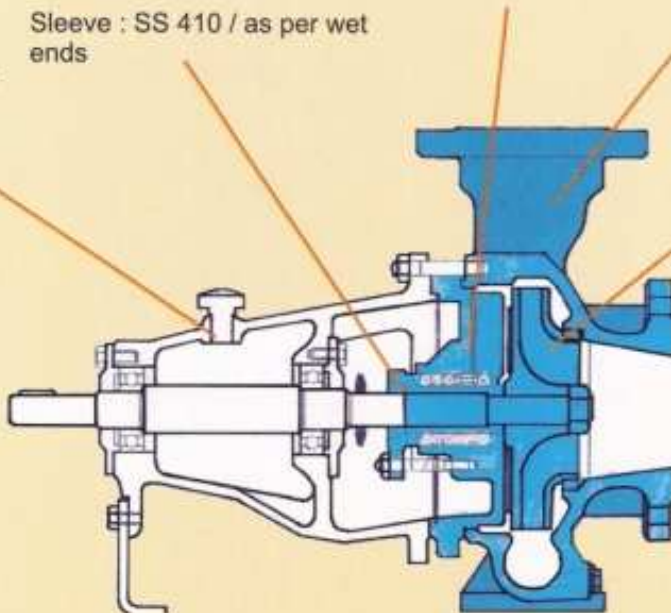
Closed type

Can handle dirty / muddy water.

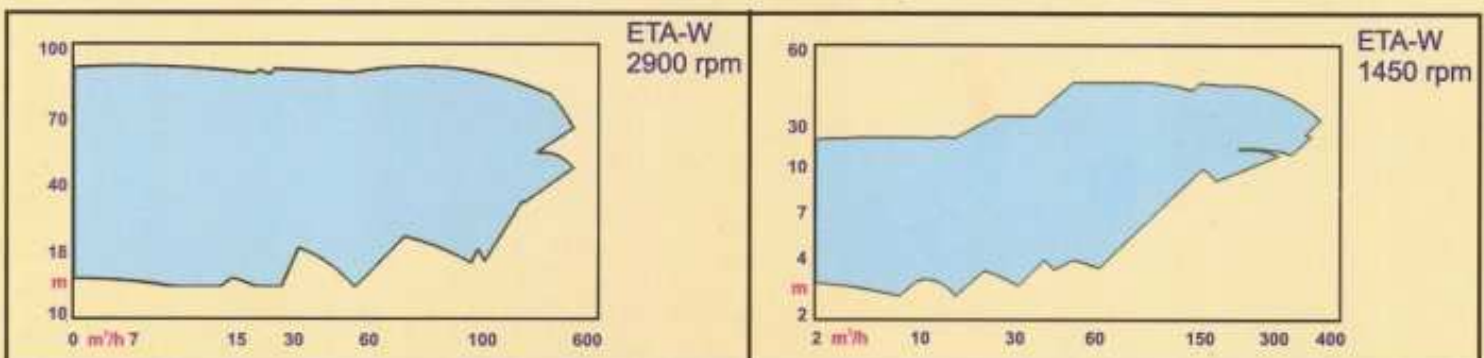
Dynamically Balanced

Smooth hydraulic passages ensure high efficiency & low NPSH

Low radial & axial thrust



### RANGE OF DUTY COVERED



# ETA-H High Flow Low Head

- ❖ Most suitable for applications such as water supply, cooling water circulation, drainage, etc.
- ❖ Delivery nozzle position can be vertical, horizontal or inclined by 45°.
- ❖ Capacity : 100 - 2000 m<sup>3</sup>/hr
- ❖ Head : 8 m - 28 m
- ❖ Max Operating Pressure : 15 kg/cm<sup>2</sup>
- ❖ Temperature : 140° C

## MATERIAL OF CONSTRUCTION :

All iron / bronze fitted pumps with SS impeller as option. Optionally CS, SS 304 & SS 316 can be provided.

## SEALING OPTIONS :

Gland Packing provided as standard with Mechanical Seal as option.

### RIGID BEARING ASSEMBLY

Antifriction deep groove Ball Bearings at DE & NDE to withstand radial loads under extreme duty. Additional thrust bearing is provided at NDE for axial thrust loads.

Bearing Housing & Cover provide proper alignment for long bearing & seal life.

MOC : CI

Oil lubricated bearings

### SHAFT & SLEEVE

Fully ground & polished

Designed for deflection within 0.05 mm at seal face under extreme operating conditions

MOC :

Shaft EN8 / SS 316

Sleeve : SS 410 / as per wet ends

### BACK PLATE

Perfectly aligned with casing & bearing housing

Completely confined gasket

Stuffing box is provided with Gland Packing and optionally Mechanical Seal

### CASING

Rigid Foot Support

Spindle Volute with 3 delivery nozzle positions.

Extra corrosion allowance.

Flanges drilled to class 150

### IMPELLER

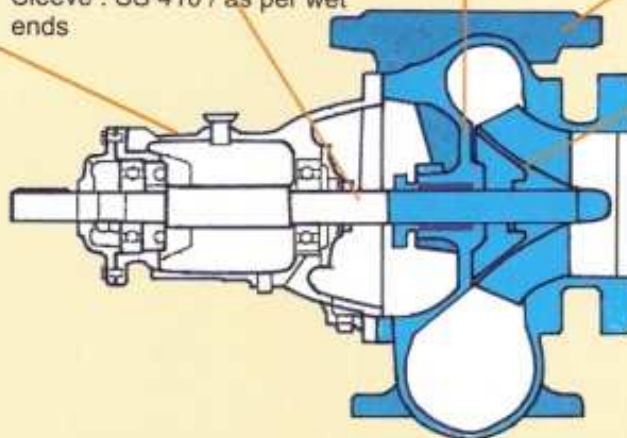
Semi Open type

Can handle dirty / muddy water.

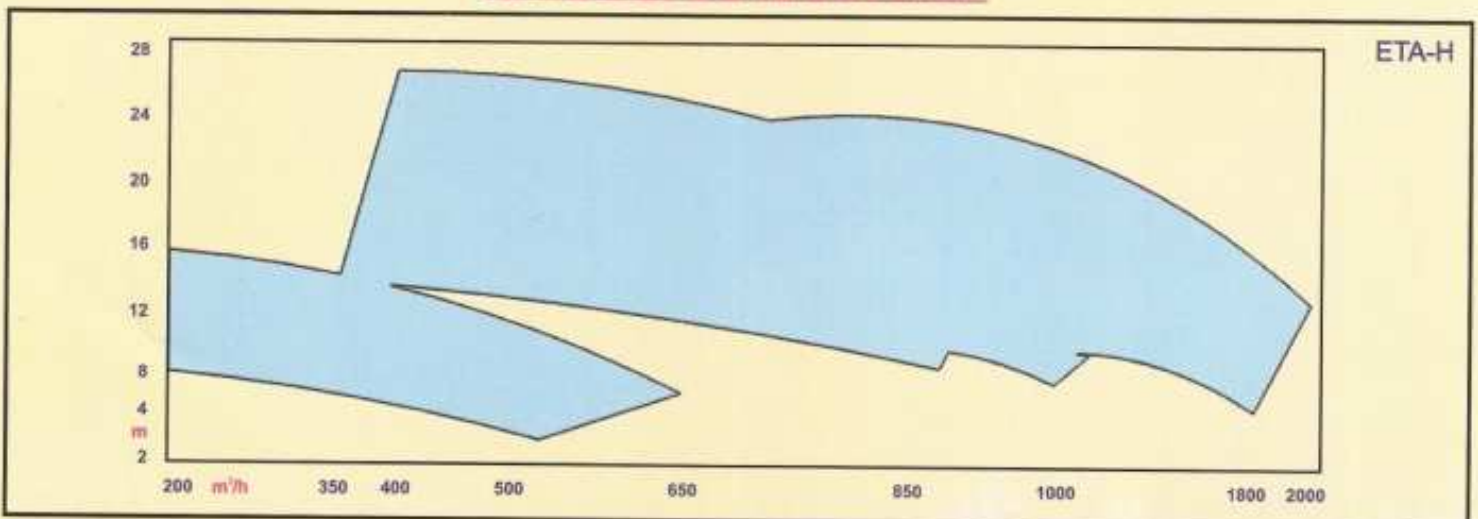
Dynamically Balanced

Smooth hydraulic passages ensure high efficiency & low NPSH

Low radial & axial thrust



## RANGE OF DUTY COVERED



# ETA-S Self Priming Pumps

Suitable to pump water, dirty liquids, etc. from underground tanks of upto 6 m depth.

- ❖ Self Priming Operation
- ❖ Back pull-out design
- ❖ Capacity : 1 - 140 m<sup>3</sup>/hr
- ❖ Head : 5 - 36 m
- ❖ Max Operating Pressure : 15 kg/cm<sup>2</sup>
- ❖ Temperature : 100° C

## MATERIAL OF CONSTRUCTION :

All iron / bronze fitted pumps with SS impeller as option. Optionally CS, SS 304 & SS 316 can be provided.

## SEALING OPTIONS :

Gland Packing provided as standard with Mechanical Seal as option.

### RIGID BEARING ASSEMBLY

Antifriction Ball Bearings to withstand radial / thrust loads under extreme duty

Bearing Housing & Cover provide proper alignment for long bearing & seal life.

MOC : CI

### SHAFT & SLEEVE

Fully ground & polished

Designed for deflection within 0.05 mm at seal face under extreme operating conditions

MOC :

Shaft EN8 / SS 316

Sleeve : SS 410

### BACK PLATE

Perfectly aligned with casing & bearing housing

Completely confined gasket

Stuffing box is provided with Gland Packing and optionally Mechanical Seal.

### CASING

Integral priming chamber  
Self Venting discharge nozzle.

Rigid foot support for superior resistance to piping loads.

Flanges drilled to class 150

Extra corrosion allowance.

### IMPELLER

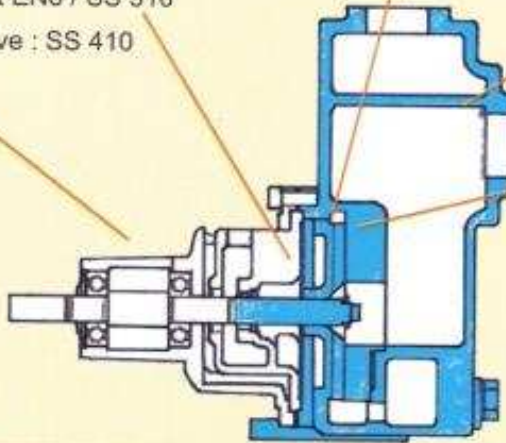
Semi-open type

Can handle slurries having upto 10% solids, dirty / muddy water.

Dynamically Balanced

Smooth hydraulic passages ensure high efficiency & low NPSH

Low radial & axial thrust

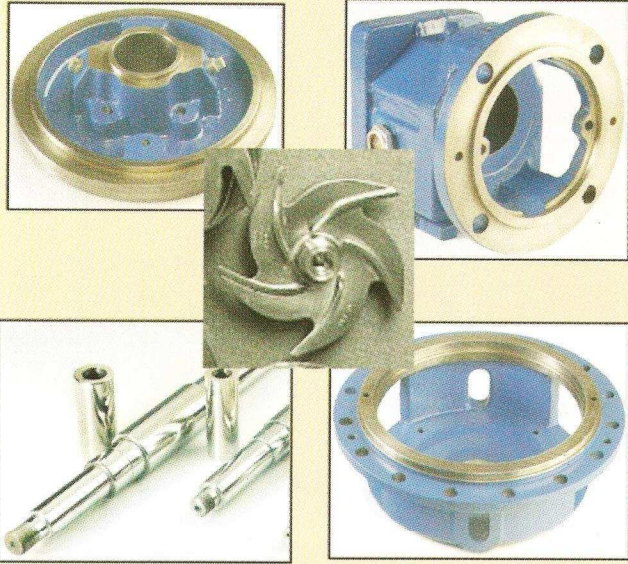


## RANGE OF DUTY COVERED

| Model                |       | Capacity (m <sup>3</sup> /hr) |    |                          |    |    |                           |                             |    |    |     |     |     |
|----------------------|-------|-------------------------------|----|--------------------------|----|----|---------------------------|-----------------------------|----|----|-----|-----|-----|
|                      |       | 5                             | 10 | 15                       | 20 | 25 | 30                        | 50                          | 60 | 80 | 100 | 120 | 140 |
| ETA-S-<br>A-115-40   | H (m) | 14                            | 12 | 8                        | -- | -- | --                        | --                          | -- | -- | --  | --  | --  |
|                      | Motor | 0.75 kW (1 hp) / 2900 rpm     |    |                          |    |    |                           |                             |    |    |     |     |     |
| ETA-S-<br>B-135-40   | H (m) | 19                            | 17 | 16                       | 12 | -- | --                        | --                          | -- | -- | --  | --  | --  |
|                      | Motor | 1.5 kW (2 hp)                 |    | 2.2 kW (3 hp) / 2900 rpm |    |    |                           |                             |    |    |     |     |     |
| ETA-S-<br>C-145-50   | H (m) | --                            | 24 | 22                       | 20 | 17 | --                        | --                          | -- | -- | --  | --  | --  |
|                      | Motor | 2.2 kW (3 hp) / 2900 rpm      |    |                          |    |    |                           |                             |    |    |     |     |     |
| ETA-S-<br>D-175-80   | H (m) | 32                            | 31 | 29                       | 27 | 26 | 24                        | --                          | -- | -- | --  | --  | --  |
|                      | Motor | 5.5 kW (7.5 hp) / 2900 rpm    |    |                          |    |    |                           |                             |    |    |     |     |     |
| ETA-S-<br>D-175-80X  | H (m) | --                            | 36 | 35                       | 34 | 33 | 32                        | 26                          | -- | -- | --  | --  | --  |
|                      | Motor | 7.5 kW (10 hp) / 2900 rpm     |    |                          |    |    |                           |                             |    |    |     |     |     |
| ETA-S-<br>E-290-100  | H (m) | --                            | -- | 25                       | 25 | 25 | 24                        | 23                          | 22 | 20 | 17  | 12  | --  |
|                      | Motor | 5.5 kW (7.5 hp) / 1450 rpm    |    |                          |    |    | 7.5 kW (10 hp) / 1450 rpm |                             |    |    |     |     |     |
| ETA-S-<br>E-290-100X | H (m) | --                            | -- | --                       | 27 | 27 | 26                        | 25                          | 24 | 22 | 19  | 16  | 12  |
|                      | Motor | 7.5 kW (10 hp) / 1450 rpm     |    |                          |    |    |                           | 9.3 kW (12.5 hp) / 1450 rpm |    |    |     |     |     |

The above motor ratings are for pumping water only.

## ETA PUMPS MANUFACTURING



ETA Pump components are sourced from manufacturers after thorough evaluation. Strict quality control ensure a reliable pump.

Castings are the heart of pump manufacturing. They form the pressure containing parts of the wet ends and the power end support structure. We source all the castings from an ISO 9001:2000 certified foundry that has in-house spectrometer & testing facility. The patterns of most of the components are in Aluminium which ensure dimensional stability over a long period.

Machining is carried out using specially made jigs and fixtures. These ensure dimensional repeatability and perfect alignment. The assembly of the pump then becomes very easy. We have an in-house test bed to check the performance of every pump.

**Exports form a major part of our turnover. The pumps and their components are exported to Netherlands, USA & Middle East.**

### Labyrinth Seals

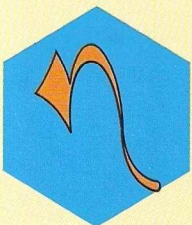
ETA pumps have non-metallic Labyrinth seals **"ETA BEARING SHIELD"** installed on the bearing housing which present a formidable dual barrier against leakage of oil and atmospheric contamination of the oil bath. It is constructed out of the best known corrosion resistant material.



Any well manufactured pump designed to international standards can go wrong in only 2 places. One is the mechanical seal and other is the bearings. While problems in Mechanical Seals can be overcome by proper selection and environmental controls as per API 682 standards built into the pumps, bearing life becomes difficult to manage. By & large even exceptionally well made bearings tend to fail due to contamination of the oil bath. The rudimentary oil seal design uses some form of rubber wiper or "lip" seal. The seals work well when new but the contact pressure at shaft will cause wear. The resultant broken surface acts as a capillary and causes ingress of liquid contaminants like water under the lip. This leads to contamination of the lubricant in the reservoir and corrosion of shaft & bearing.

According to a study by the American Society for Lubrication Engineers, only 0.002% water in oil can reduce bearing life by 48%. We offer **"ETA BEARING SHIELD"** as an effective retrofitment solution for pump problems.

A labyrinth seal presents 2 closely rotating labyrinths at the oil-atmosphere interface instead of a single tight fitting barrier. The labyrinths increase the path of flow and get drained by gravity. Thus it successfully contains the oil inside and prevents ingress of fluids from outside. A labyrinth seal reduces friction and seal / shaft wear. The labyrinth seal is suitable for multiple use and need not be replaced every time the shaft assembly is dismantled for servicing. Studies abroad indicate that bearing life has been enhanced as much as 3 times because of the use of labyrinth seals on the bearing frames.



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