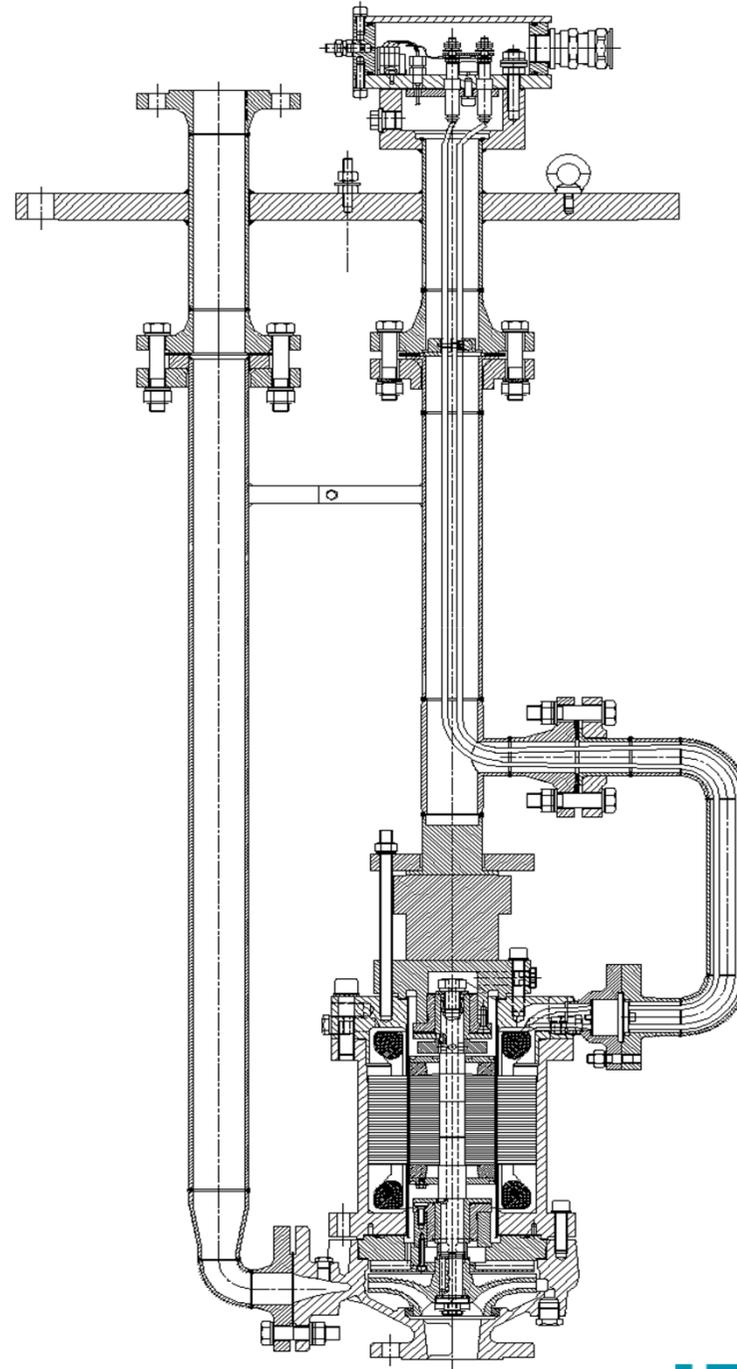


Vertical Submerged Canned Motor Pump



SUMMARY

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INTRODUCTION

DESIGN, MANUFACTURING, REPAIR

Pollution due to pump leaks at chemical and petrochemical sites as well as growing environmental awareness have resulted in a **European directive (96/61/EC) for the protection of the environment**. As a result, the way storage tanks are emptied has been reviewed.

Today, the drain holes are located on the top of the tanks to limit the risk of soil and air contamination in the event of a leak or damage. It is therefore necessary to install pumping systems that allow the tanks to be emptied.

Long shaft line pumps are often used for this purpose and installed at the bottom of the tank. However, this technology has many technical drawbacks that we will detail later.

The **Optimex vertical submersible pumps provide an optimal solution** to these constraints. The seal-less canned motor pumps are designed to remedy failures of the long shaft line pumps and eliminate the risk of volatile and environmentally hazardous substances being emitted.



VERTICAL SUBMERGED CANNED MOTOR PUMP CHARACTERISTICS

APPLICATIONS:

All industrial processes : Chemical, Oil & Gas, Nuclear

Examples of pumping liquids:

- Liquefied gas (Ammoniac, LPG, Ethane, Ethylene, butadiene, propylene, etc.)
- Hot liquids
- Dangerous liquid (H₂S, Anhydric fluorhydric, phosgene, chlorine...)

Wherever reliability and safety are the first requirements!

CONSTRUCTION:

Mono-stage or **multi-stages** pumps according to **ISO 15783** or **API 685**

Compliance with PED directive 2014/68/EU

Slide bearings lubricated by the pumping liquid dedicated to guide the mobile parts.

Two alternatives for the bearings :

316L/Graphite or 316L/SIC30

Options:

- Inducer to decrease the NPSH required and mini level in the tank
- Filter for liquid with particles
- Charge barrel with an isolation valve which can be installed in a tank
- Suction strainer and anti-vortex system
- Drain for liquefied gas

INSTALLATION:

Pump can be proposed in both option:

- Directly mounting on tank/barrel with adapting mounting plate
- Delivered with tank/barrel

Optimex is able to propose customized arrangement to redesign or retrofit existing pump/tank

WORKSHOP CONTROLS:

- Balancing test of mobile according to ISO 1940
- Hydrostatic test of the pump, tank plate, charge barrel
- Performance test (QHP) according to ISO9906 level 1 or 2
- Motor insulation test
- Axial displacement & forces measurement
- Material certificate 3.1 or 2.2 according to EN 10204

EX-PROOF DIRECTIVES:

Remaining attentive to its international customers' requirements, OPTIMEX adapts its production to local Ex-proof directives (ATEX, CUTR, UL, CSA).

WORKING RANGE:

Flow	Up to 700 m ³ /h
Head	Up to 1000 m
Frequency	50 HZ / 60 Hz
Pumping temperature	-200°C / 600°C
Pressure design	Up to 100 bar g

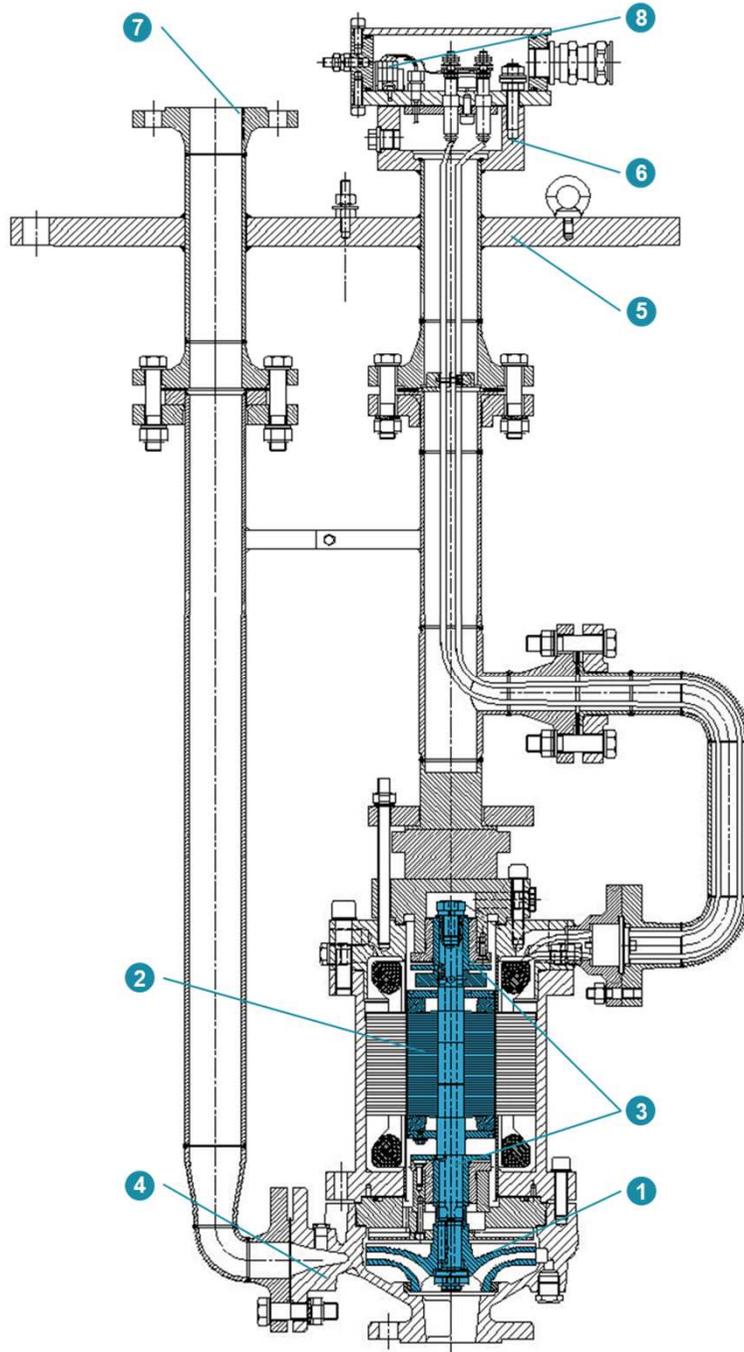
MOTOR:

Speed	1450 or 2900 rpm at 50Hz 1750 or 3600 rpm at 60Hz
Voltage	230 to 690V
Frequency	Working with VFD possible
Motor protection	PTC or PT100 in windings

MATERIAL:

- Carbon steels
- Stainless steel 316L/304L
- Duplex Uranus U55
- Compliant with the API codes S5, S6, A-8
- Others materials possible on demand

SPECIFICATIONS OF DESIGN



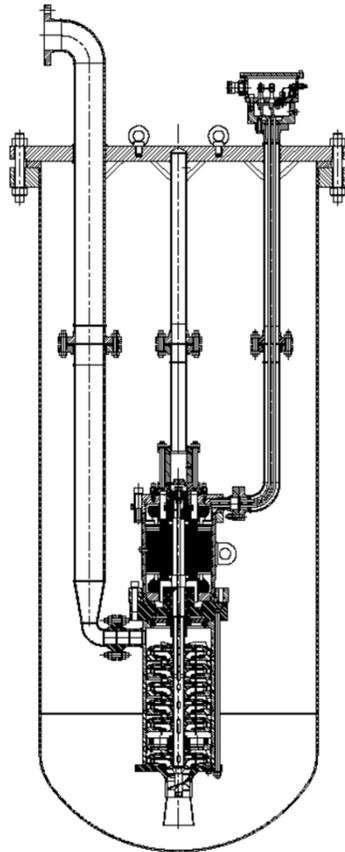
#	Designation
1	Impeller
2	Mobile (Shaft + Rotor)
3	Front and Rear Sleeve Bearings
4	Casing
5	Soleplate
6	Deported Terminal Box
7	Discharge Flange
8	Instrumentation (temperature probe, pressure switch and other instruments available)

 Moving parts independent of tank depth

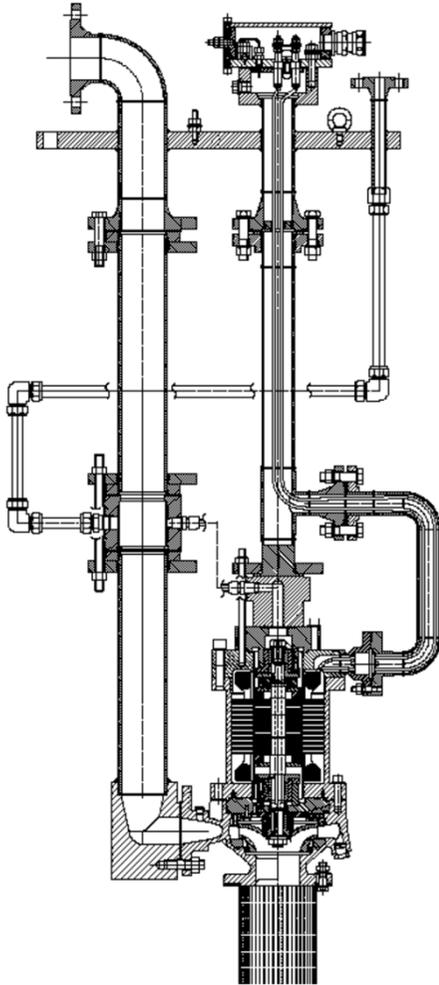
 Fixed parts

VARIOUS DESIGNS

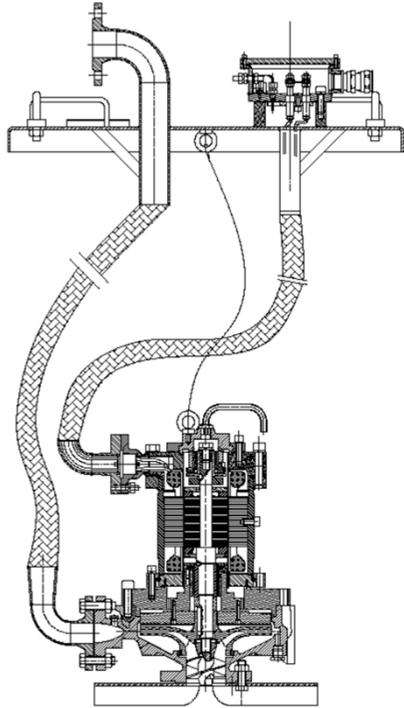
Submerged Multi-stages Pumps



Submerged Pump with Flushing system and Suction strainer

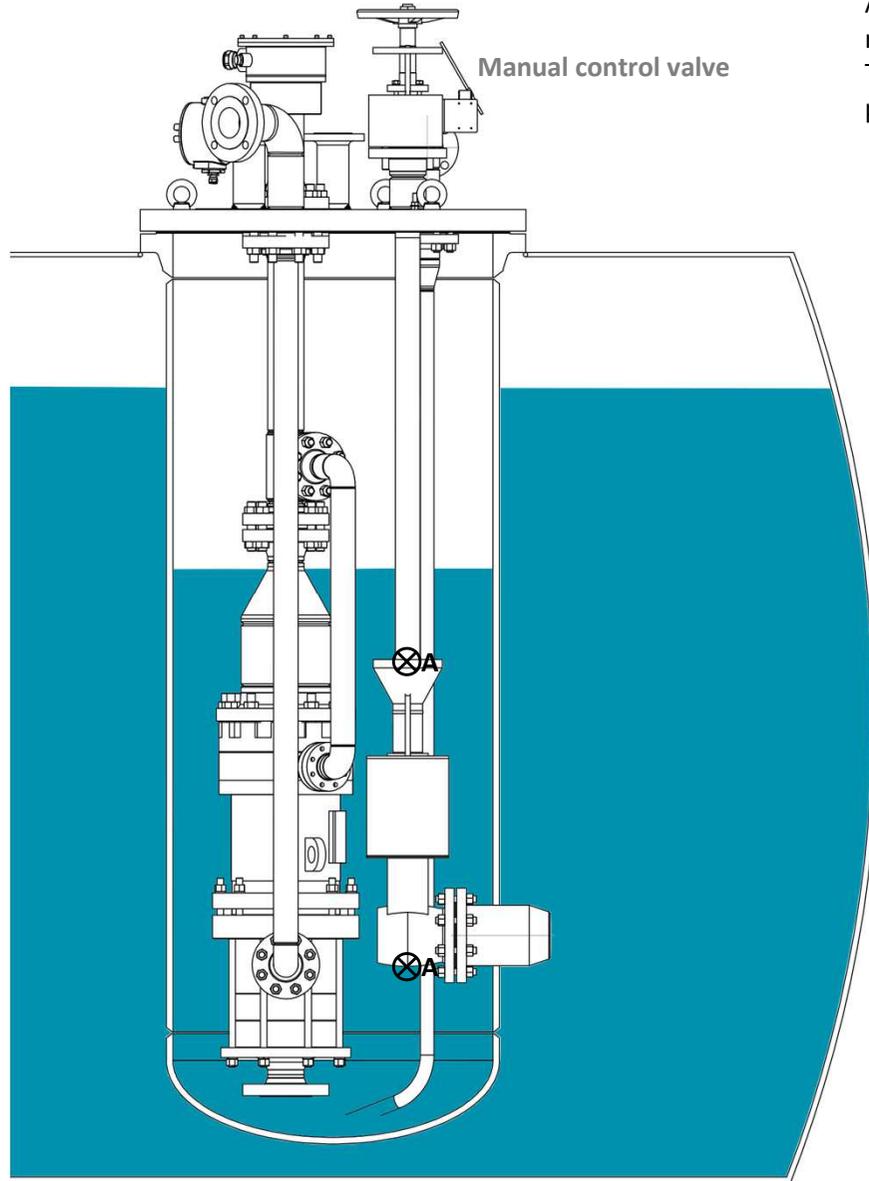


Flexible Submerged Mono-stage Pump



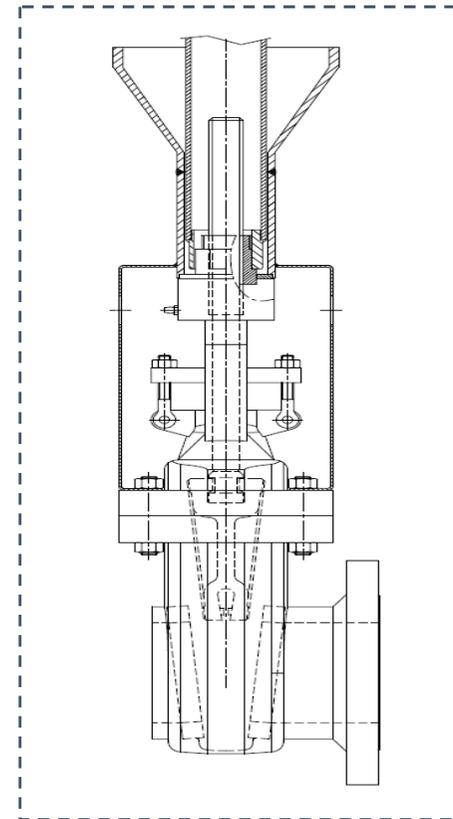
VARIOUS DESIGN

Pump with Isolation Valve System



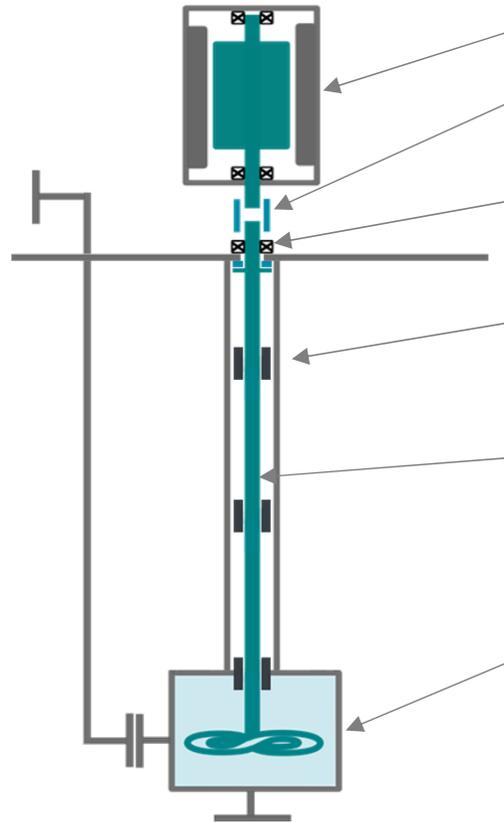
A charge barrel with an isolation valve can be proposed as an option to facilitate maintenance when the tank must always be filled. The valve can be activated via a mechanical system to drain the barrel and isolate the pump from the liquid in the tank.

Coupe A-A
Isolation valve system

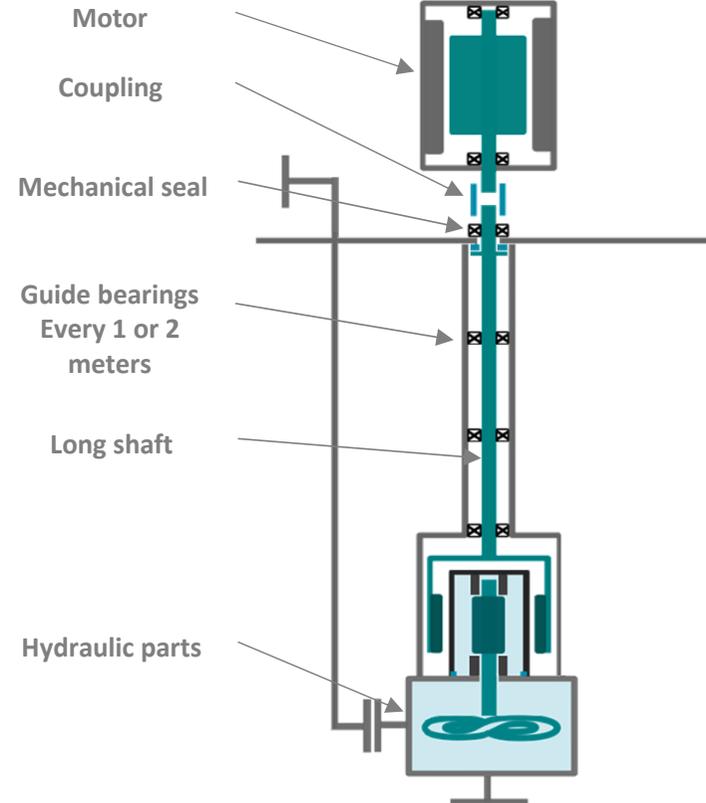


LONG SHAFT LINE PUMPS

MECHANICAL SEAL PUMP



MAGNETIC DRIVE PUMP

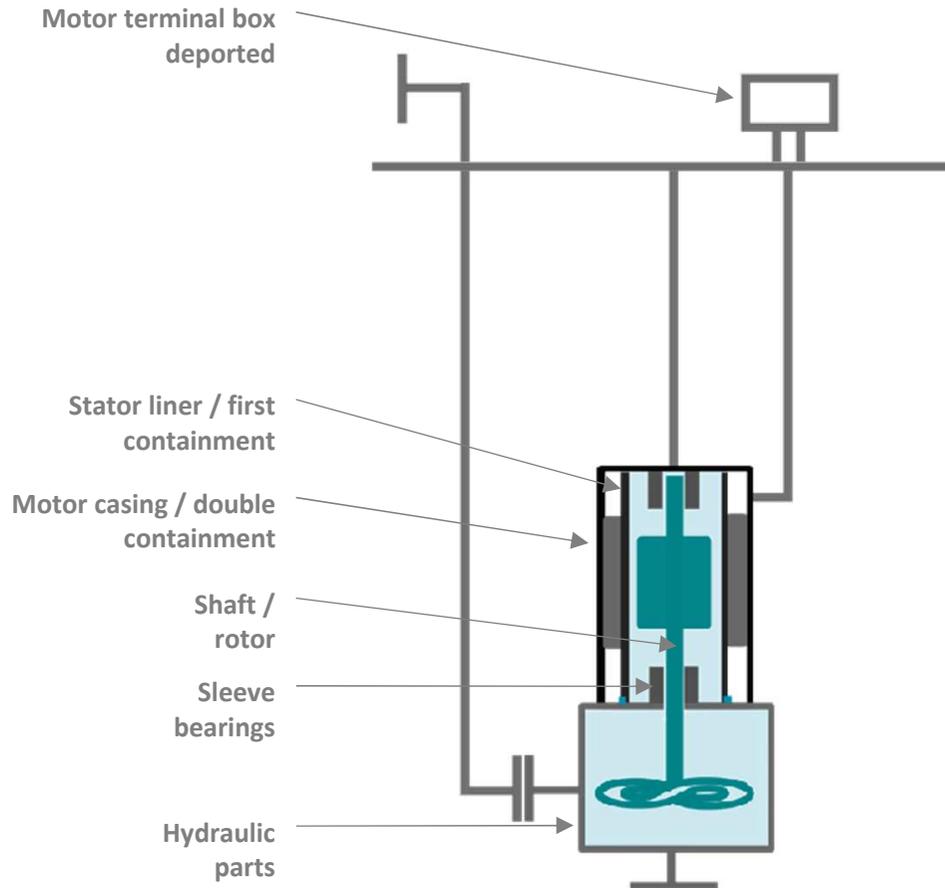


MAIN POSSIBLE ISSUES :

- ✗ Limited lifetime of the guide bearings lubrication management
- ✗ The mechanical seal management between the motor and the soleplate is complicated and can be deficient
- ✗ Important number and dimensions of rotating parts
- ✗ Difficult to install and maintain
- ✗ High maintenance cost
- ✗ Important space required above soleplate due to the mechanical seal system, the coupling and the motor

VERTICAL SUBMERGED CANNED MOTOR PUMP

OPTIMEX SOLUTION



ADVANTAGES OF OPTIMEX PUMP:

- ✓ No long shaft with guiding bearings
- ✓ No need of lubrication system : lubrication of the bearings with the pumped liquid
- ✓ No seals between the motor and soleplate
- ✓ Reliable and leakfree solution
- ✓ Whatever the tank depth, rotating parts have reduced dimensions
- ✓ Simplicity of pump design
- ✓ Reduced maintenance costs due to a reduction of wear parts
- ✓ Space saving outside the tank, solution completely submerged
- ✓ No noise and vibrations outside the tank

CONTACT



269, rue de Montepy
69210 Fleurieux sur l'Arbresle
France

Tel : +33(0)4 72 52 95 74
contact@optimex-pumps.com
<https://www.optimex-pumps.com/>