



PT. MAJU MANDIRI UTAMA

To be a preferred company in trading, repair and servicing for its commitment to excellent on quality of goods /equipment, repair and services.



HORIZONTAL PUMPING SYSTEM

The Industry Leaders in Horizontal Pumping Technology

PT. Maju Mandiri Utama offers a complete range of Horizontal Pumping System with brand name Maju Mandiri Utama. These pumps are multistage in design and each stage consists of an impeller that is mounted on the shaft and rotates with the shaft during operation and a diffuser that is stationary and mounted in the housing of the pump. The pumps are selected based on the construction of the well and the desired flow rate from the well. The stage type selected determines the flow rate and the number of stages selected determines the head or lift produced by the pump. The total head developed by the ESP system is the cumulative head produced by all the stages in the pumps in that system (Head per Stage X Total number of stages).

There are many advantages of Horizontal Pumping System such as :

- Low initial & whole life cost
- Easily adapted for changing duty conditions
- Minimal routine maintenance
- One low pressure mechanical seal
- Low noise levels
- Environmentally friendly
- Ease of repair & replacement of components

Flow rates range from 1000 BFPD to 30,000 BFPD and differential pressure up to 3000 PSI. Temperatures from 0 ° F to 300 ° F.

Horizontal Pumping System can be coupled by Fixed or Variable Speed Electric Motor with using Variable Speed Drive Panel Control.

Pump Stage Information

The Catalog provides the following information on the pumps.

Pump Data – gives the details of the pump section in terms of housing number, length, weight and the number of stages in the different build options.

Options – shows the different variable elements that can be selected to ensure that the pump used for the application is the correct one in terms of mechanical constructions and selection of materials.

Pump Curves – shows the characteristics of a single pump stage when tested as per API recommended practice 11S2. Curves are provided for both 50Hz and 60 Hz operational and additional curves are also provided for variable speed operation ranging from 45Hz to 80 Hz. The curves indicate the recommended operating range of the stage, Head developed per stage, Horse Power required per stage and the Efficiency of the pump.

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API Testing

All pumps are tested as per API recommendation 11S2. The test results must fall within $\pm 5\%$ on Head produced, $\pm 8\%$ on Horse Power across the Recommended Operating Range and a maximum deviation of -10% on efficiency at Best Efficiency Point.

Forces Acting on an Impeller & Thrust

There are three main forces acting on the impeller of a pump during normal operation.

1. The downward force of gravity that acts on top of the impeller, pushing it down
2. The resultant force from the differential pressure between the top and bottom of the stage; and
3. The force from the velocity of fluid that flows through the impeller. The resultant of all these three forces determines if the stage is working in up-thrust, down-thrust or in a balanced state. The proper selection of the stage and handling of the thrust forces is

very important for the reliability and performance of the pump. As a rule of thumb, a pump operating below the lower range of the recommended operating range is said to be running in down-thrust and that operating above the upper range of the recommended operating range is said to be running in up-thrust.

Abrasive Handling

When operating in an abrasive environment, it is very important to select the right material for the pumps especially on stage metallurgy and radial bearing material. We offer a range of abrasion resistant metallurgy for the stages and also offer industry proven Tungsten Carbide bearings in the pump.

Metallurgi	Shaft
CS Head & Base, CS Housing, CS Fastener	Standard Shaft (Monel® K-500)
SS Head & Base, SS Housing, Monel Fastener	High Strength Shaft (Inconel®)
SS Head & Base, Monel Coated CS Housing, Monel Fastener	

Abrasive Handling	Internal Coating
Tungsten carbide bearing on Head & Base	No Coating
Tungsten carbide bearing on Head Base & On Diffusers Stages	Special Coating

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Suction Chamber

- Silicone carbide mechanical seal faces
- Mechanical seal at suction pressure
- Stub Shaft design for ease of seal & shaft change out
- Cartridge seal option API 682 and API 610 flush plans available
- Front Pull-Out or Back Pullout design allows seals to be replaced without affecting alignment
- Thrust Bearing Chamber

Bearing Frame (Thrust Chamber)

Supplied as replaceable module. Interchangeable between systems regardless of the size pump element installed. Very low number of rotating parts for long trouble-free life, simple operation and minimal routine maintenance. Oil ring lubrication for optimum oil dispersion and reduced operating temperatures. Thermocouple installed to provide periodic or permanent temperature monitoring / shut down protection. Labyrinth shaft seals protect the internals from the environment without wearing the shaft surface.

Motors

Conventional industry standard 2-pole NEMA and IEC foot mounted electric motors are used in configurations to suit local requirements for; enclosure type, voltage, frequency, insulation class, hazardous area Class 1 Div II, Explosion Proff, etc. Other drive options include gas or diesel engine via a speed increaser.

Flexible Coupling

Grid or Gear Style Couplings are standard equipment for long life and minimal routine maintenance requirements. Others coupling types are available on request.

Mechanical Seal and Stub Shaft

Optimized mechanical seal only design. Operates at suction pressure. Standard seal features silicon carbide faces. Seals available suction pressure up to 500 PSI. Options include API682 cartridge type, and API flush and quench plans. Front Pull-Out design allows for rapid change-out of seal and / or stub shaft without disturbing bearing frame and flexible motor coupling thus avoiding realignment or the requirement of spacer coupling.

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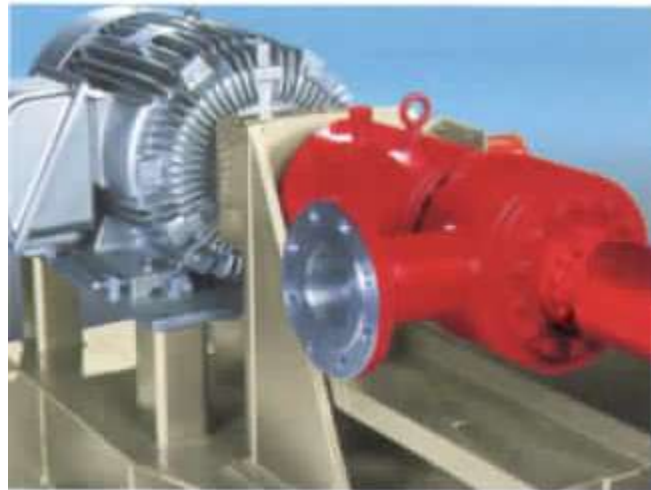
The Horizontal Pumping System consist of mainly of :

- Pump
- Mechanical Seals/Bearing Chamber
- Instrumentations
- Low Suction Pressure Automatic Shutdown
- High Pressure Discharge Automatic Shutdown
- High Vibration Shutdown
- Flowmeter & Vibration Meter
- Power units/Motor Electric
- Skid/Base
- Variable Speed Drive

Conventional, Direct-Coupled System

The conventional electric, direct-coupled pumping unit is a low-maintenance alternative to traditional reciprocating and split case pump. This design is interchangeable with most existing HPS systems.

- Most reliable and technically advanced thrust chamber available
- Rigid, low-profile HPS bench design
- Wide range of flow rates and pressures
- Designed to client specifications
- Electric motor, 2-pole 3,600-rpm, NEMA, Class 1 Div II Explosion Proff
- Thrust Chamber configured for operating pump thrust
- Modular intake adaptor
- Vibration and pressure shutdowns
- Optional Variable Speed Drive



PUMP TABLES 60 HZ 3500 RPM

Model	Series	OD (inch)	Recommended Operating Range-BPD	Maximum Down thrust Per Stage-Cprsn Pump Lbs	BHP per stage	Shut Off head per Stage ft
MH-13000	562	5.62	4000-16000	71.0	5.60	67.0
MH-15000	562	5.62	6500-18000	71.0	6.5	65
MH-20000	562	5.62	9500-24000	101.0	11.7	73.0
MJ-7500	675	6.75	3500-9000	85.0	5.90	80.5
MJ-10000	675	6.75	4000-12000	118.0	5.90	80.5
MJ-12000	675	6.75	4500-16000	144.0	10	104.0
MJ-16000	675	6.75	5000-19,500	150.2	10.18	85
MJ-21000	675	6.75	16000-25000	190.0	12.63	101.0
PIN-290	290	11.8	6000-11500	140	10.2	90

