



PumpWorks HP-Plus

HORIZONTAL HIGH PRESSURE
MULTI-STAGE PUMP



PumpWorks HP-Plus

APPLICATIONS

Amine
 Fluid Transfer
 Gas Processing
 Mine Dewatering
 Pipeline Booster
 Saltwater Disposal
 Water Injection
 Water Flooding

FLUIDS

Amine
 Condensate
 Glycol
 Iodine
 Liquid Natural Gas
 Oil
 Water
 Saltwater

MARKETS

Chemical
 Industrial
 Oil & Gas
 Pipeline
 Refining



The PumpWorks HP-Plus pump was designed with reliability and cost reduction in mind. It is a multi-stage centrifugal pump capable of producing a full range of volumes and pressures. Each pump is individually assembled by trained PumpWorks personnel and fully tested to industry API 11S2 standards.

The PumpWorks HP-Plus skid design is the result of a century's worth of engineering, design and the technically advanced SOLIDWORKS Simulation design software. This combination of fabrication and engineering experience coupled with the modern finite element analysis that SOLIDWORKS Simulation brings has allowed PumpWorks to develop a skid design with superior strength, integrity and unsurpassed ease of installation.

As a standard, all PumpWorks HP-Plus pumps are built with hand finished Ni-Resist type 1 stages of a high nickel content steel which is excellent at withstanding hostile or aggressive fluids. The staging configuration is set so that all PumpWorks HP-Plus pumps are constructed in compression. PumpWorks HP-Plus also offers stage coating for those applications requiring additional protection.

Pump shafting options of Nitronics, K-500 Monel®, Stainless Steel, and Inconel® are available for each individual application.

PumpWorks HP-Plus offers abrasive resistant tungsten carbide (TC) bearings to add radial stability in aggressive fluid conditions. Our pumps can be assembled in a multitude of Ni-Resist/TC configurations including up to 1:1 TC to stage ratio.

All PumpWorks HP-Plus centrifugal pump heads and bases are of high quality stainless steel and each is assembled with either tungsten carbide or GRAPHALLOY® bushing and sleeve as a standard.

The PumpWorks HP-Plus components are installed in carbon steel housings but high strength and stainless steel housings are also available.

CAPABILITIES

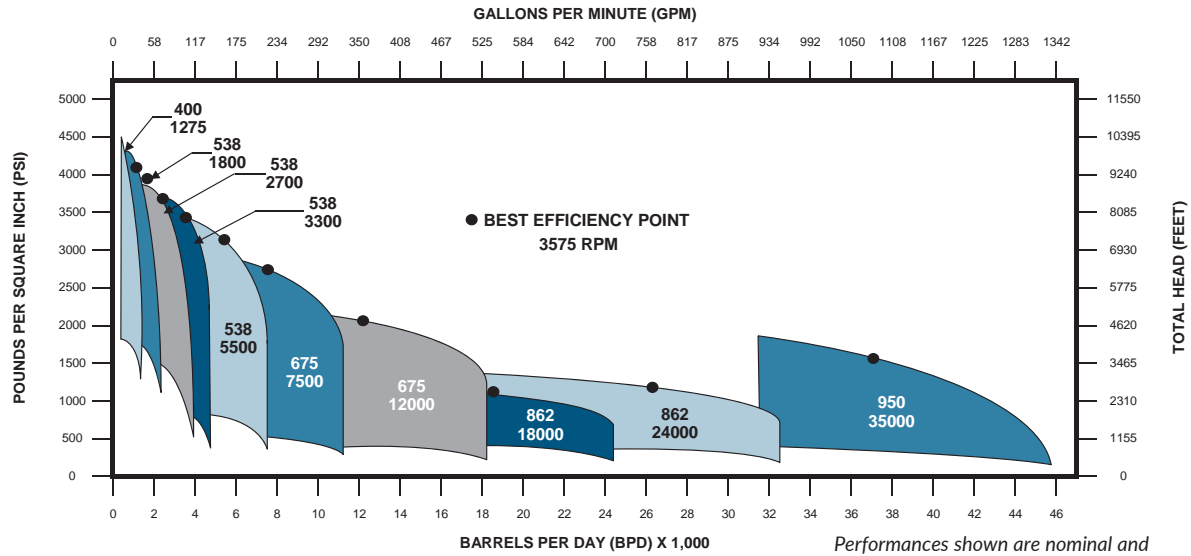
Volume	350 - 45,000 BPD / 10 - 1300 GPM
Developed Pressure	to 9,930 Feet / 4,300 PSI
Housing Pressure	to 6,000 PSI
Horsepower	to 1,500 HP



Hydraulic Performance Coverage

60HZ

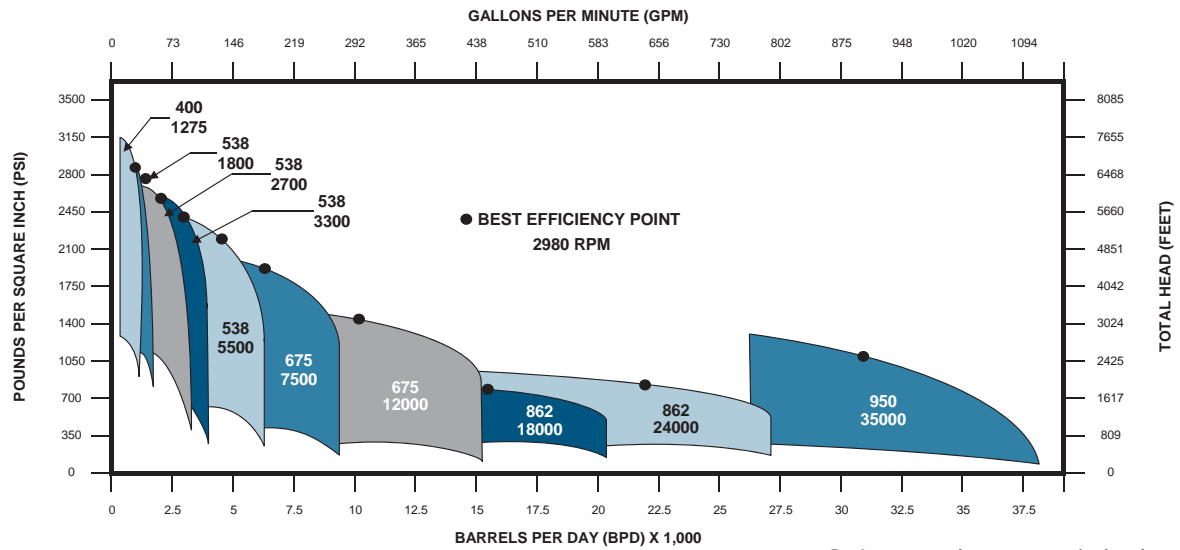
HYDRAULIC COVERAGE--60HZ



Performances shown are nominal and are to be used for preliminary selection only.

50HZ

HYDRAULIC COVERAGE--50HZ



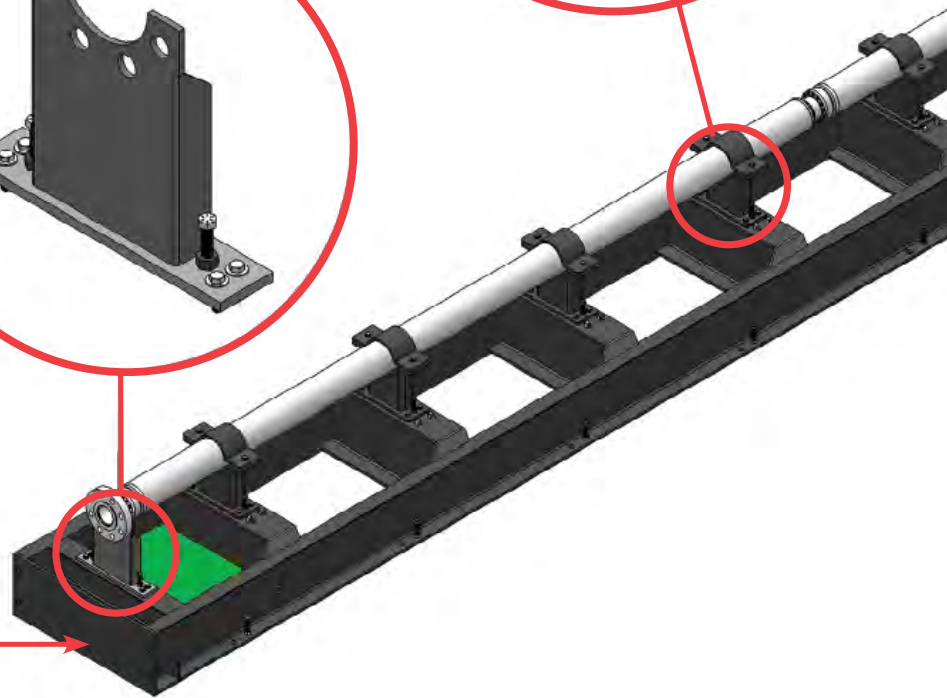
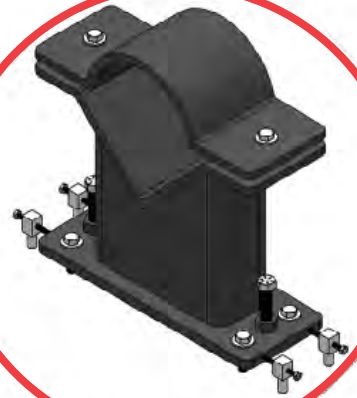
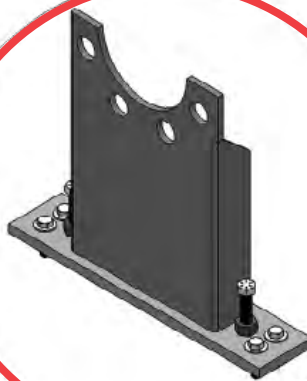
Performances shown are nominal and are to be used for preliminary selection only.

Design Features and Benefits

Adjustable V-shaped pump cradles provide for reliable centering while horizontal and vertical adjustments allows for easier alignment.

Adjustable discharge flange support helps protect the pump from static pipe loads and reduces piping fit problems during installation.

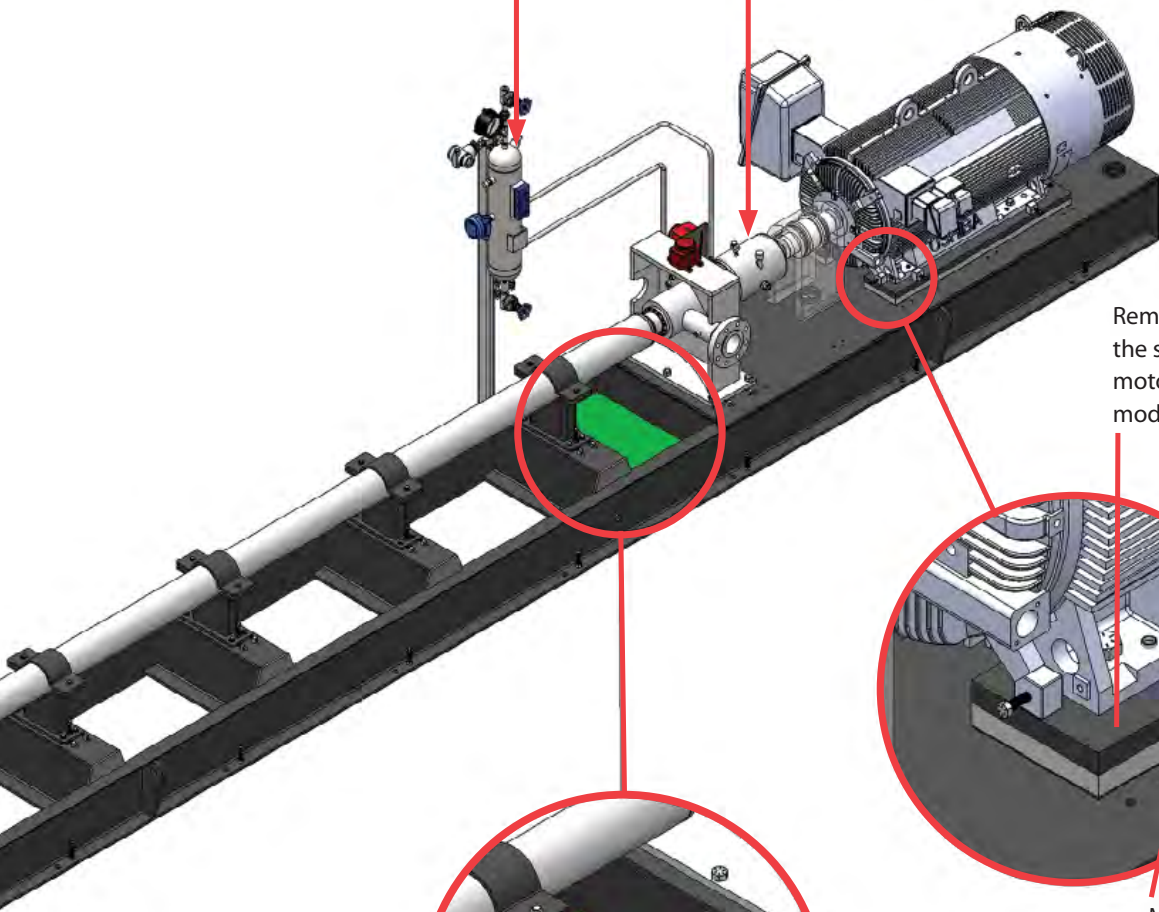
Bolt-on skid extension allows skids to easily be extended to accommodate longer pump lengths due to future operating conditions.



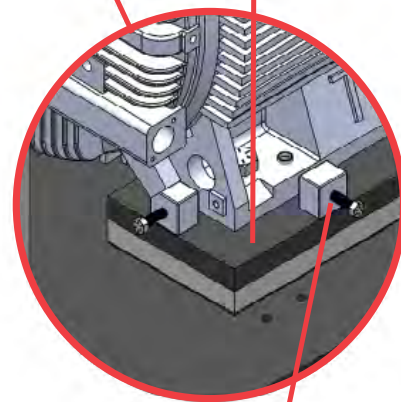


Optional API-610 seal flush systems as required.

Thrust Chamber is heavy duty, bi-rotational with standard API-682 seal chamber and rear pullout feature for easy maintenance. Alternate thrust chamber designs are also used including non-rear pullout, depending on the application and/or customer preference.

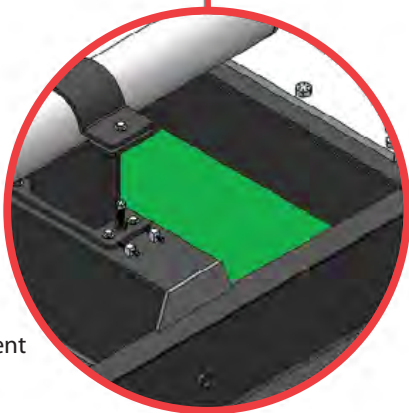


Removable motor pads allow the skid to accept the next larger motor frame without major skid modification.

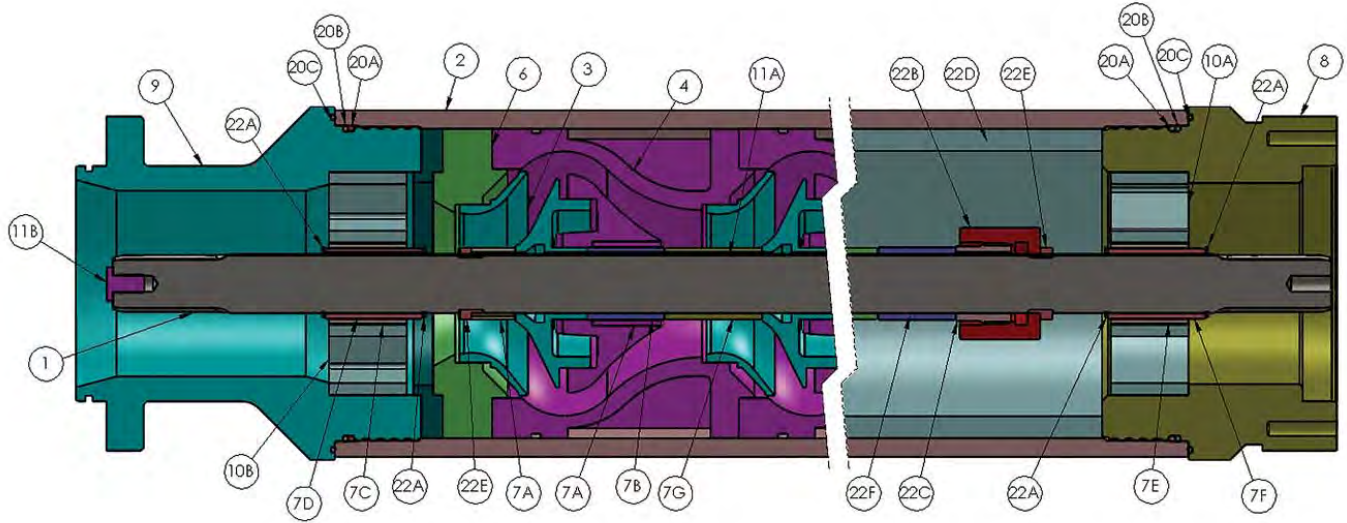


Motor mounting adjustment screws standard for ease of installation and alignment.

Intake and discharge drip pans with drain plugs for spill containment capture potential piping and mechanical seal leakage.



Parts List and Materials of Construction



Materials of Construction

Item Number	Part Name	Compression Standard	Compression Abrasion Resistant	Compression Stainless Steel	Compression High HP / High Pressure
02	Housing	Carbon Steel	Carbon Steel	Stainless Steel	High Strength
03	Impeller	Ni-Resist	Ni-Resist	Ni-Resist	Ni-Resist
04	Diffuser	Ni-Resist	Ni-Resist	Ni-Resist	Ni-Resist
06	Lower Diffuser	Ni-Resist	Ni-Resist	Ni-Resist	Ni-Resist
08	Head	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
10A	Head Bearing Support	Ni-Resist	Ni-Resist	Stainless Steel	Ni-Resist
20A	Head O-Rings	Viton	Viton	Viton	Viton
20B	Head Backing Ring	Peek	Peek	Peek	Peek
20C	Head Face O-Ring	Viton	Viton	Viton	Viton
09	Base	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
10B	Base Bearing Support	Ni-Resist	Ni-Resist	Stainless Steel	Ni-Resist
20A	Base O-Rings	Viton	Viton	Viton	Viton
20B	Base Backing Ring	Peek	Peek	Peek	Peek
20C	Base Face O-Ring	Viton	Viton	Viton	Viton
07A	Bushing, Stage	Ni-Resist	Carbide	Carbide	Carbide
07B	Sleeve, Stage	Ni-Resist	Carbide	Carbide	Carbide
07C	Bushing, Base	Carbide	Carbide	Carbide	Carbide
07D	Sleeve, Base	Carbide	Carbide	Carbide	Carbide
07E	Bushing, Head	Carbide	Carbide	Carbide	Carbide
07F	Sleeve, Head	Carbide	Carbide	Carbide	Carbide
07G	Spacer	Ni-Resist	Ni-Resist	Stainless Steel	Ni-Resist
22A	Snap Ring	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
01	Shaft	Monel	Monel	Monel	Inconel
11A	Key Stock	Monel	Monel	Monel	Monel
11B	Shaft Plug	Monel	Monel	Monel	Monel
22E	Two Piece Ring	Monel	Monel	Stainless Steel	Monel
22F	Compression Sleeve	Ni-Resist	Ni-Resist	Stainless Steel	Ni-Resist
22B	Compression Nut	Stainless Steel or Monel	Stainless Steel or Monel	Stainless Steel	Stainless Steel or Monel
22C	Compression Screw	Stainless Steel or Monel	Stainless Steel or Monel	Stainless Steel	Stainless Steel or Monel
22D	Compression Tube	Stainless Steel or Ni-Resist	Stainless Steel or Ni-Resist	Stainless Steel	Stainless Steel or Ni-Resist



Smart Reliability

Controlling Performance and Continuously Monitoring for Maximum Profitability.

From constant speed to integrated pump control,

PumpWorks offers multiple options for motor control solutions to meet our customers needs.

Constant Speed Operation

In those cases where constant speed operation is preferred, PumpWorks can provide high quality across the line starters in whatever NEMA enclosure specified. However we recommend the use of our soft starters with maximum pump protection to minimize energy costs, reduce maintenance and provide maximum reliability.

Variable Frequency Drives

PumpWorks offers the Toshiba Plus Pack with the ground breaking Virtual Linear Pump (VLP) technology to provide advanced pump control and protection. The Plus Pack is a solid-state AC drive that ranges from 66-1500 KVA and features *true torque control* enabling motors to develop high starting torque and compensating for motor slip. Available in NEMA 3R enclosures, ASD rated for 50 degrees C and 4500 fashl with no derate of output current. The enclosure cooling

technology requires no exchange of inside air to outside air with no filters that require maintenance and no unreliable air conditioners. A 3-year parts and labor warranty is offered when packaged with Toshiba's EQP series motor, even covering bearing fluting failures.



Predict-Plus®

A revolutionary and economical product to continuously monitor vibration in all three axis plus temperature providing the user early detection of anomalies. Predict-Plus® captures the power of the Industrial Internet of Things and transmits machine data to the cloud so that when alarmed, proactive measures can be taken by the user to protect the rotating equipment. Predict-Plus® is adaptive and flexible enough to continuously monitor most rotating equipment.

Predict-Cloud is the powerful user interface in which technical machine data can be viewed from anywhere in the world, trended and exported for reports. This tool allows the user to customize alarm/alert levels, text/email call out lists and, general registration information. Managing this data is a powerful component in attaining the goal of reducing maintenance spending and increasing Mean Time Between Repair (MTBR).

DXP Pump Controller

DXP offers a pump specific controller with quick and easy setups for submersible and centrifugal pumps. The pump controller is available in NEMA1, 3R or 4 enclosures up to 700 hp including explosion proof. Our controllers are rated 110 degrees F, standard and have advanced pump protection features which protect the pump from common process upsets such as; dry run, no flow, broken pipe and run out control. These advanced features are designed to protect the asset and prevent catastrophic failure to the rotating equipment, improving pump reliability and maximizing uptime.





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