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**Centrifugal Pumps API 610**



## Heavy duty process pumps

The AP and APx pump series are designed for heavy duty continuous service at high temperatures and high pressures in oil refinery , petrochemical and chemical industries and represent the evolution our best engineering evolution.

The AP is an overhung, horizontal, centerline mounted, single stage, radially split process pump, in two basic version with standar closed impellers and with special design for low capacities, designed fully comply with ISO 13709 (API 610) standards where affidability and safety are important.

The AP process pump includes the latest in mechanical seals technology and is used in heavy-duty refinery services, petrochemical plants, gas processing and offshore services. The modular construction system, with identical dimension parts , allows minimum



spare inventories, since only four sizes of bearing frames foreseen to cover the complete range of pumps sizes. The improved bearing frame with robust shaft make a quite operation and

long reability pumps and shall be fitted with a air cooling device and options such as magnetic oil seals and monitoring instrumentation.

The mechanical seals and auxiliaries supplied are in full compliance with the requirements of ISO 21049 (API 682).

The fluids pumped include sour water, gasoline, light hydrocarbons, and vacuum bottoms. The customers benefit from the robust construction, the versatility in application, and the long reliable service life.

The APx is designed to provide an optimum solution for lower flows and higher heads. Some applications require a horizontal direct drive pump capable of delivering 3 m<sup>3</sup>/h (13 USgpm) capacity and head to 360 m (1,200 ft). Customers require low NPSHr, while meeting ISO 13709 (API 610) vibration levels.

The APx utilizes a precision cast, semi-open, multi-vaned impeller that produces much more head per mm of impeller diameter than does a conventional enclosed impeller. The impeller design provides geometric flexibility to adjust the best efficiency flow while providing excellent efficiency and a stable performance curve.

All the standard ISO 13709 (API 610) material combinations are available from S-1 to D-2 for hot or cold services.



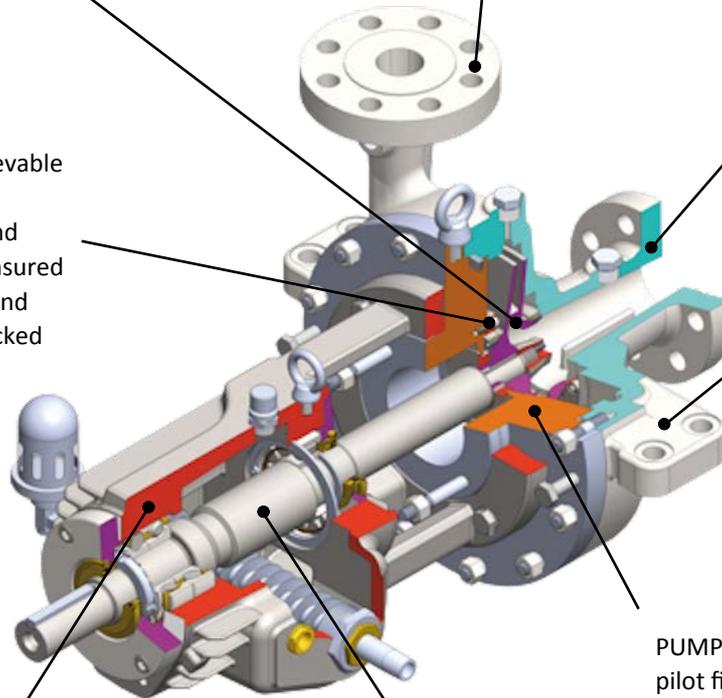
IMPELLER is closed type , single suction design so that head versus capacity Curve is stable. A large eye area insures low NPSHR requirement and reduces cavitation possibilities. External surfaces are machined. All impellers are statically and dynamically balanced. The impeller has renewable wear rings on both suction and back side and balance holes to minimize axial load.

SUCTION AND DISCHARGE FLANGES are ANSI rating 300. Upon request pumps can be furnished with ANSI 150 or 600 flanges or different standards like UNI , DIN , BS and others.

CASING is radially split with suction and discharge nozzle integrally casted. In order to minimize shaft deflection , seal and bearing failure , wear rings wear , the casing is of double volute design , which ensures radial balance. Pump casing seal is a fully confined , spiral wound metal or O-rings gasket.

WEAR RINGS are renewable to obtain the original running clearances and efficiency. They are insured in the casing , cover and impeller positively locked by stainless

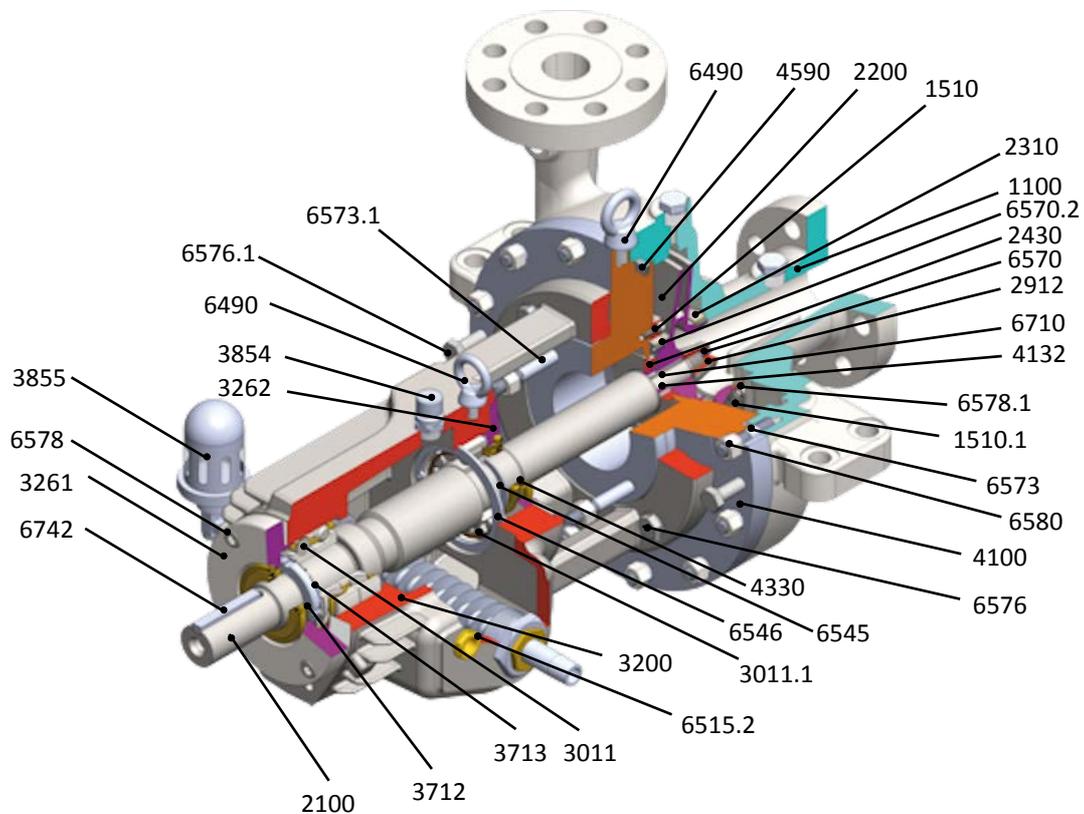
The PUMP CASING is located at center line to maintain alignment at high temperatures and to minimize the reactions caused by the pipework forces.



BEARING HOUSING is made in onepiece and has machined pilot fit to pump cover. Double row ball thrust and single row roller radial bearing are provided. Both radial and thrust bearing are sized to give 25.000 Hours minimum Lh-10 rating life with continuous operation at rated pump conditions. To allow oil mist lubrication , when required , an 1/4 " NPT connection on top of the bearing housing is provided. Bearing are flood oil lubricated. Oil level is maintained by a 4 once constant level oiler. The Bearing housing is completely water jacketed. (Non-cooled bearing housing also available). The oil chamber is sealed with noncontact labyrinth deflectors as API 610 requirements, up to IP66 mechanical protection

PUMP COVER is aligned by machined pilot fit. Mechanical seal chamber is in according to API standards API 610 or API 682. Single , double , balanced or unbalanced mechanical seal , with all possible combination flash and quench glands are available.

SHAFT deflection is minimized by proper span between bearing, short impeller overhung and large shaft diameter with oversize bearings.



1100	Pump casing	4100	Pump cover
1510	Casing wear ring, suction side	4132	impeller spacer
1510.1	Casing wear ring, rear side	4330	Bearing Housing Seal DE
2100	Shaft	4590	Gasket
2200	impeller	6490	Lifting Device
2310	impeller wear ring, suction side	6570	Grub screw, impeller lock nut
2310.1	impeller wear ring, rear side	6570.2	Grub screw
2430	Throttle bushing	6573	Stud, pump casing
2912	impeller lock nut	6573.1	Stud, Mechanical Seal
3011	Thrust bearing	6576	Screw, Bearing Housing
3011.1	Radial bearing	6576.1	Screw, Cover extractor
3200	Bearing housing	6578.1	Screw, Casing wear rings
3261	Bearing housing cover, DE side	6580	Bolts, pump casing
3262	Bearing housing cover, NDE side	6710	Key, impeller side
3712	Lock nut	6515.2	Bearing housing oil level plug
3713	Safety washer	6545	Lock ring, shaft
3854	Oil filling plug	6546	Lock ring, Bearing housing
3855	Constant level oiler	6578	Screw, Bearing Housing Cover



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