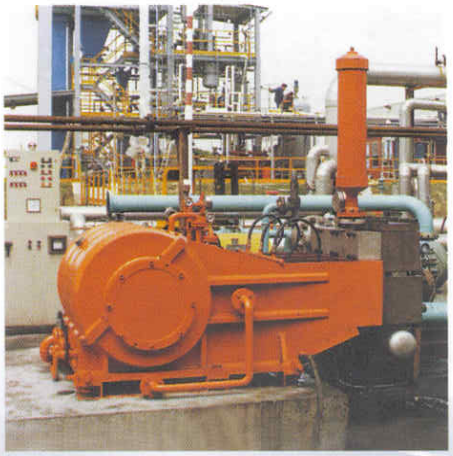
PTO/PQO/PSO series

PERONIPOMPE

PTO - PQO - PSO Series

The pumps of the PTO-PQO-PSO series comply with API 674 and ASME standards and are specifically designed and manufactured for process applications where continuous heavy duties are involved with the highest operating reliability and the longest maintenance intervals.



PTO 190 triplex pump for coal slurry pipeline

The pumps of this series are made in horizontal execution, a solution providing several advantages if compared with the vertical one and which has been chosen by Peroni since the mid 60's, when the company discontinued the production of vertical pumps.

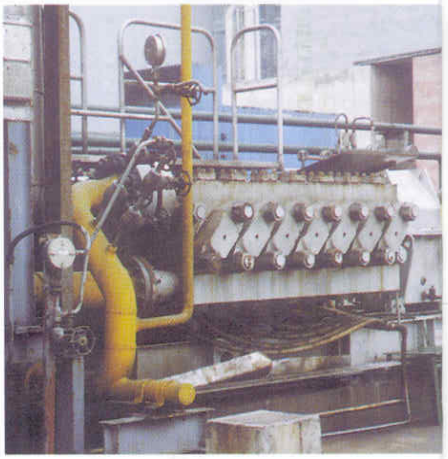
The series includes two pump sizes, 160 and 190. For each size triplex and quintuplex versions are available together with a septuplex model for the 190 size.

Multiplunger solution allows better design optimization as the number of pump sizes necessary to cover the performance range is minimized.

Quintuplex or septuplex pumps, compared with a triplex pump of equivalent performances, have reduced static and dynamic loads, extended components life and smaller pressure pulsations.

This determines higher reliabilty, maintenability and smoother operation of the pump.

The PTO/PQO/PSO series covers the highest range of performances in the field required by the market of reciprocating pumps.



PSO 190 septuplex pump for liquid ammonia in an ure

PQO 160 quintuplex pumps for carbamate in a melam

PTO 190 triplex pump in a water injection packaged u

Crankmechanism

The design of the crankmechanism of PTO-PQO-PSO pumps takes into account the highest reliability requirements, typical of the applications where this type of pump is normally used:

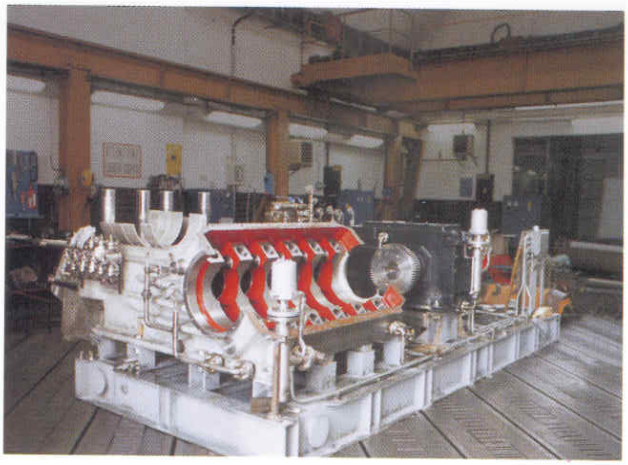
- ***Continuous shaft support, obtained with individual sleeve bearings for each plunger**. This allows a greater stiffness of the system and consequently the bending phaenomena are negligible and the stresses in the shaft are reduced to such values as to make its life practically unlimited.*

- ***Main and connecting rod sleeve bearings, of the thin shell type, made of steel white metal lined**, manufactured with a construction and assembling technique providing optimum lubrication and heat transfer.*

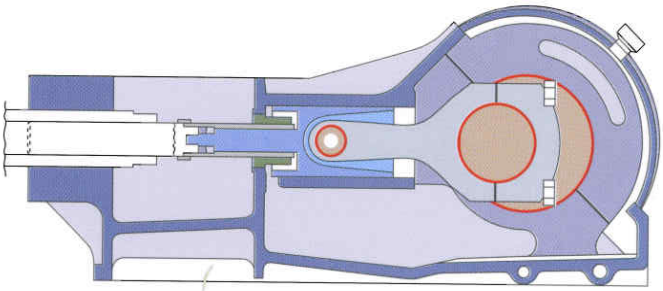
- ***Perfect alignment between power end and hydraulic end** assured by machining on a single boring the frame area where the crosshead and the hydraulic cylinder are housed.*

- ***Connection of the plunger to the crankmechanism through spherical joint** with subsequent limited loads on the sealing area giving longer life of the stuffing box packings.*

- ***Forced lubrication of the crankmechanism of balanced type**, i.e. with oil inlet from both sides of crankshaft. This solution guarantees an efficient lubrication of all moving parts.*



The continuous shaft support of a PQO 190 pump



PTO/PQO/PSO series: power end arrangement

These technical solutions have proved in the field that the design objectives have been fully satisfied.

For the smallest pump of the series, model PTO 160, a version adopting the traditional shaft support with two roller bearings at the shaft ends, but with all the other characteristics of the series, is also available.

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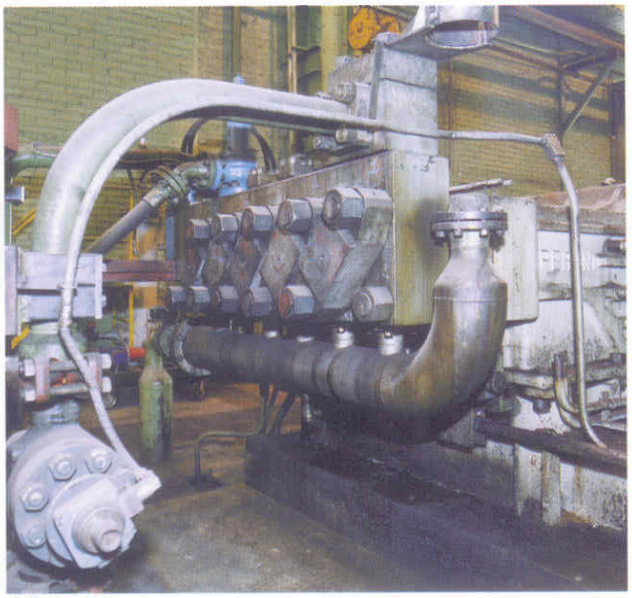
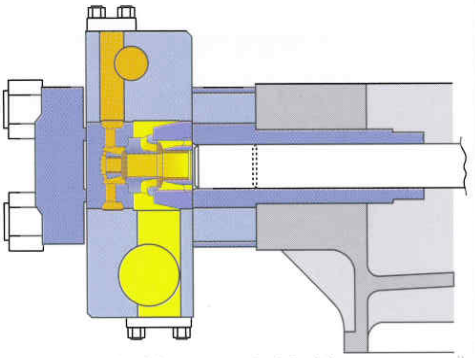
Liquid end

In order to meet the different requirements connected with various operating conditions and fluid characteristics, the hydraulic head is defined by combining different configurations of the liquid end, valve assembly and sealing systems and by selecting the most suitable materials for each specific application.
Each solution has been widely researched and proven to meet the requirements of high reliability, easy maintenance and long life of the single components.
The design of the liquid end assures very high stiffness and fatigue stress resistance of the structure offering the possibility to install pre-assembled units of valves/valve seats and cylinders/plungers/sealings with consequent downtime minimization.
The shown arrangement of the hydraulic head is the most widely used, since it is suitable for a wide range of operating temperatures and also for hazardous fluids and/or fluids containing suspended solids.



PQO 190 quintuplex pump for forging press feed



PTO/PQO/PSO series: typical liquid end arrangement

Axial valve assembly

Other hydraulic solutions are available for high viscosity fluids, slurries and pumping conditions at high or low temperature.

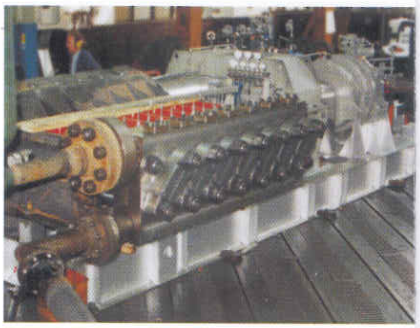
Valve assembly

The liquid end arrangement includes an axial type valve unit, used since the beginning of the 80's, providing several advantages such as:

- ***large flow section areas and consequent low fluid velocities through the valves**, allowing reduced pressure loss and wear;*

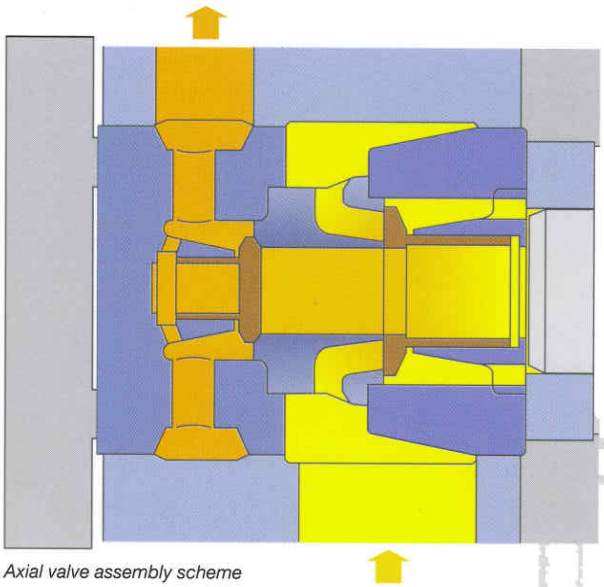
- ***dual-seal suction valves allowing high suction capability and low NPSHR**;*

- ***easy maintenance in the field**: the valves and valve seats can be preassembled and replaced in very short time (30 minutes approx.);*



PSO 190 septuplex pump in Peroni testing room

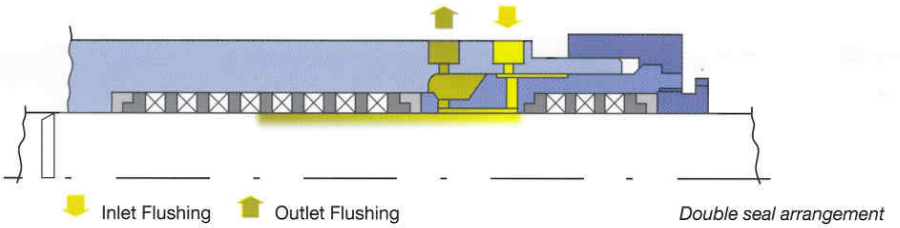
- ***limitation of the fatigue stress present in the hydraulic end to the valve seat block only**; this reduces the possibilities of failure due to fatigue in the hydraulic end to a single component of small dimensions, easy accessibility and limited cost.*

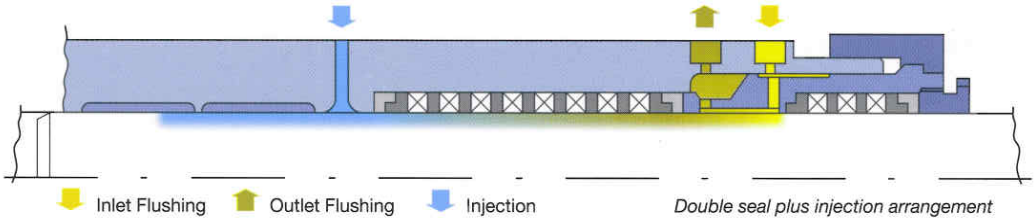


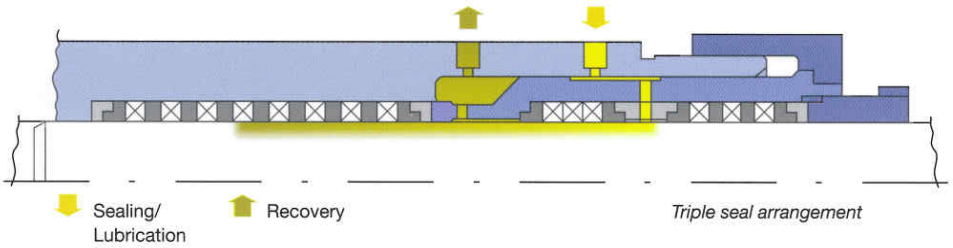
Axial valve assembly scheme

Sealing systems

According to the characteristics of the pumped fluid, various sealing systems are available in order to satisfy the various operating conditions found in the process applications.
The most frequently adopted solutions are:



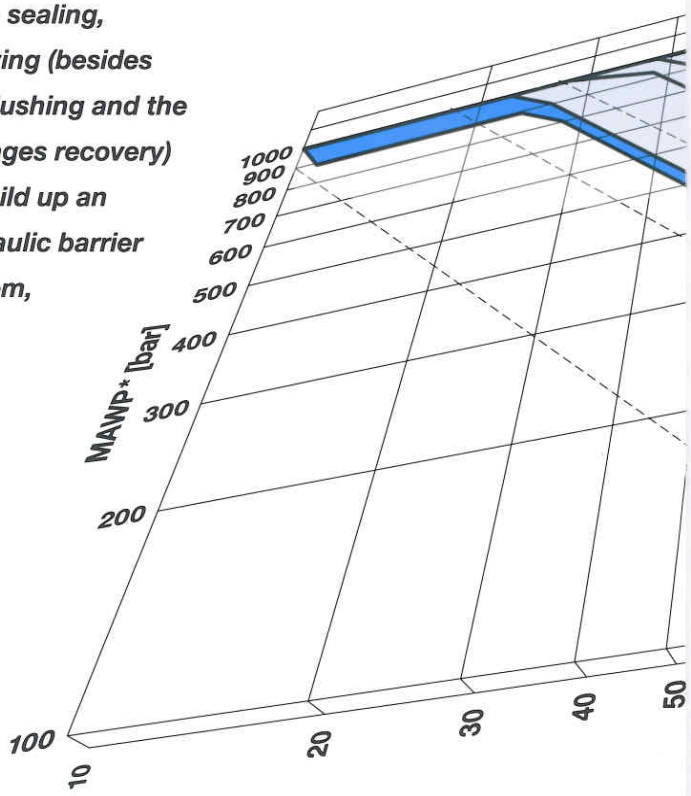




- ***double seal for clean and not dangerous fluids**; flushing will be provided for the cooling and/or lubrication of the stuffing box packings and the recovery of the leakages from the main packing;*

- ***double seal plus injection for fluids containing suspended solids or having the tendency to crystallize**; this solution (in addition to the functions indicated in the previous case) through the injection of a product suitable and compatible with the process in front of the sealings, guarantees the contact of the sealings with a clean fluid. In this way the life of plunger-sealing-hydraulic cylinder system will be considerably longer;*

- ***triple sealing, allowing (besides the flushing and the leakages recovery) to build up an hydraulic barrier system,***

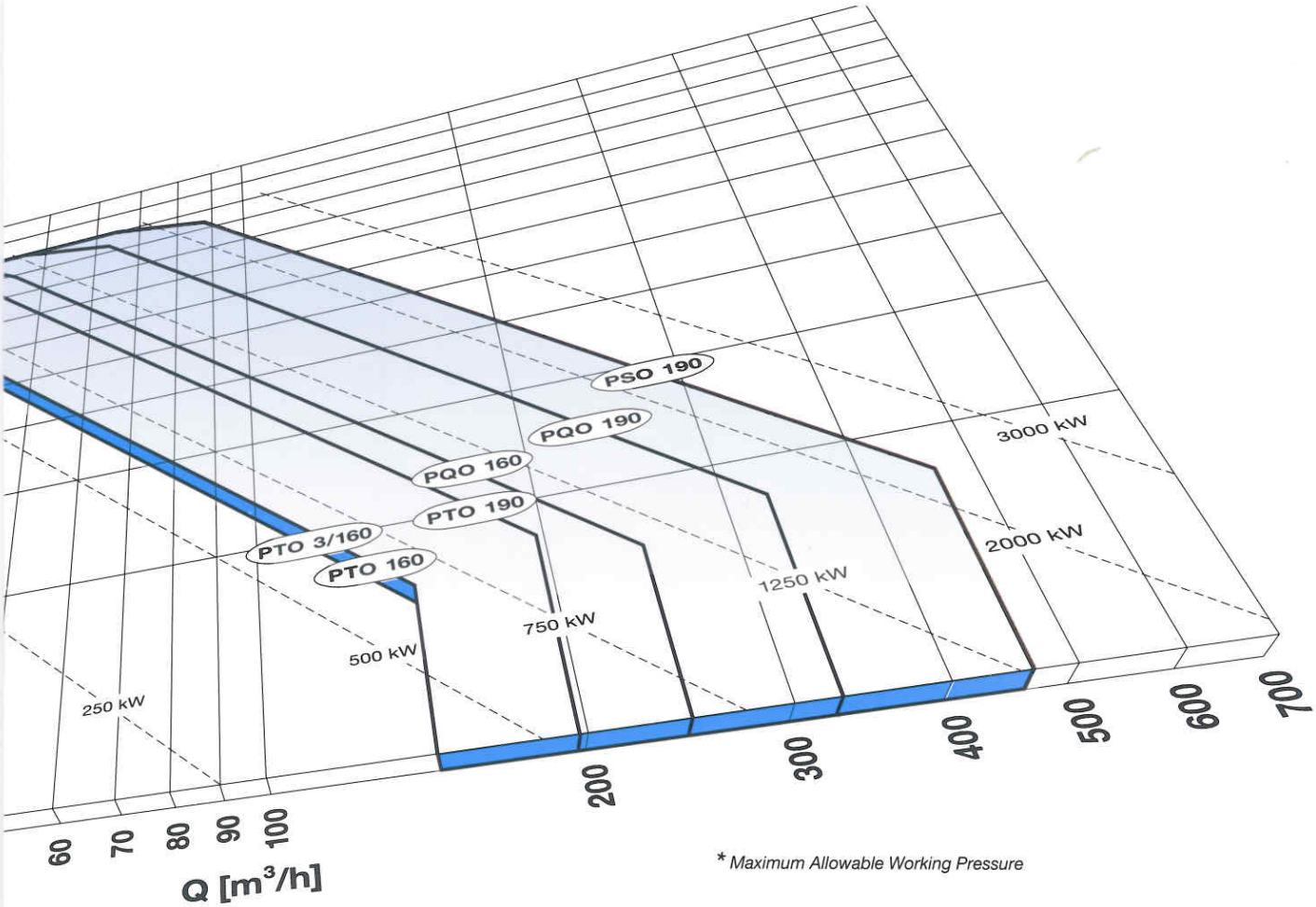


***preventing the leakage of product out of the pump**; this is the solution adopted for the pumping of condensate hydrocarbons, liquefied gases and toxic or explosive products.*

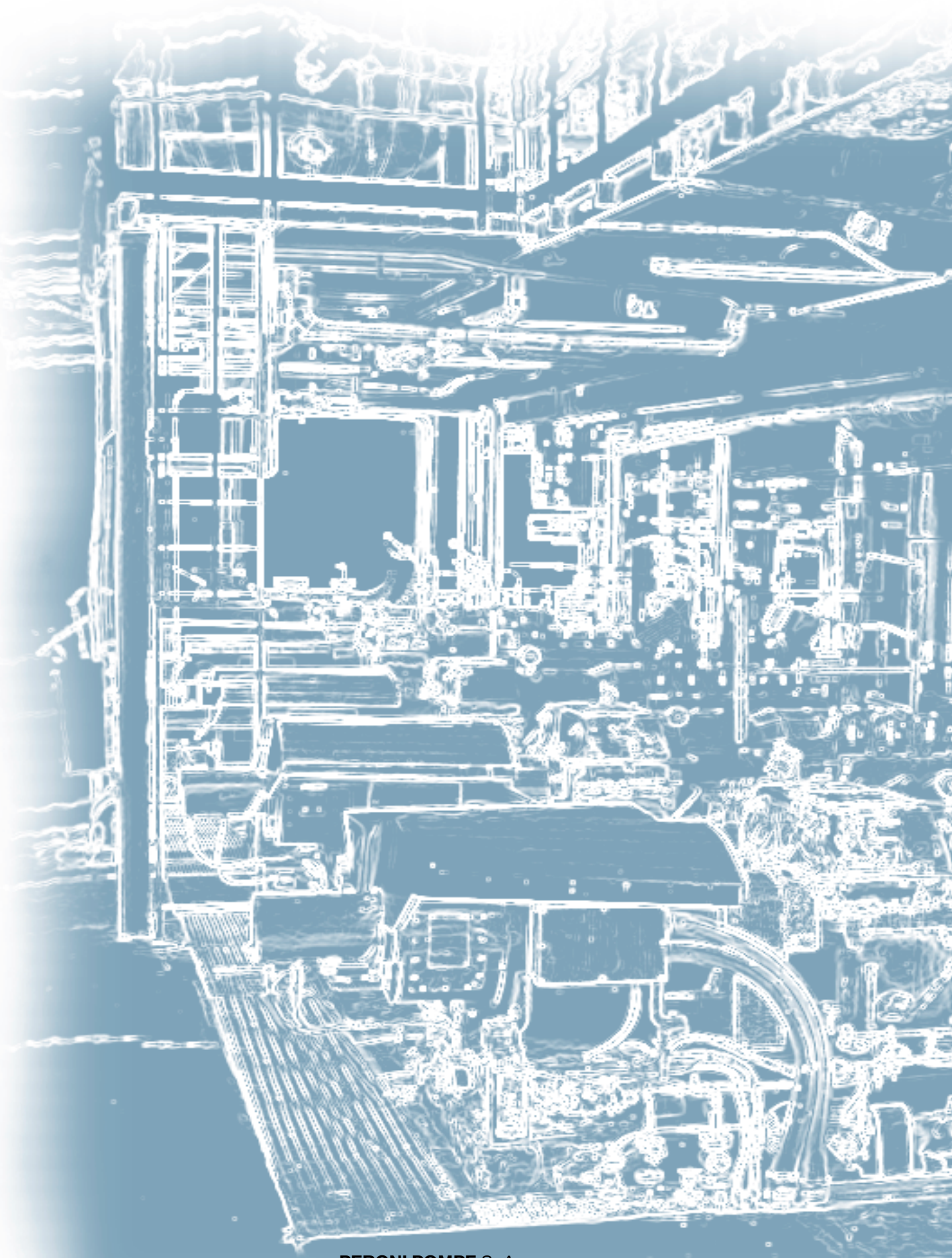
In the above solutions the stuffing box packings are made with preformed braid rings, in specific materials according to the pumped fluid, but in any case spaced out with support rings having the function to support the braid rings under pressure stress and assure optimum heat transfer.

Performances

The diagram shows the performances of the PTO-PQO-PSO series pumps to allow a preliminary selection of the most suitable model for the required application.



* *Maximum Allowable Working Pressure*



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