

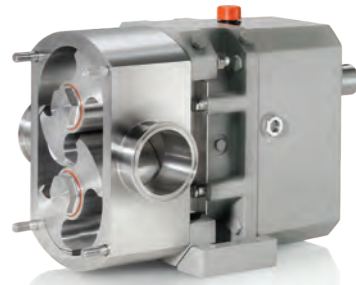
Fristam
PUMPS®
Engineered For Lasting Performance®



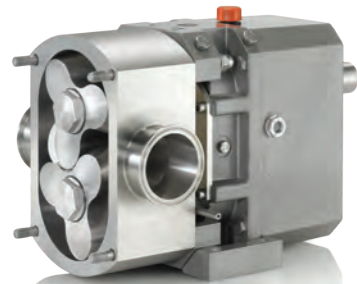
Fristam Positive Displacement Pumps
FKL



Fristam Positive Displacement Pumps
FDS



Fristam Positive Displacement Pumps
FL2



Fristam Positive Displacement Pumps
FL3



Fristam Centrifugal Pumps
FP



Fristam Centrifugal Pumps
FPX



Fristam Centrifugal Pumps
FPR



Fristam High-Pressure Centrifugal Pumps
FM



Fristam High-Pressure Centrifugal Pumps
FPH, FPHP



Fristam Liquid Ring Pumps
FZX



Fristam Shear Blenders
FS/FSI



Fristam Powder Mixers
PM

High Lifetime Value

The solid design, precise machining, and robust construction of a Fristam pump ensure efficiency and operational reliability. Fristam pumps simply run better and last longer.

EXPERIENCE & EXPERTISE

Over the past 100 years, Fristam has built its reputation with experience, attention to detail, and a willingness to adapt to changing needs. Fristam's strong applications engineering department gives you straight, smart answers to process questions.

QUALITY CONTROL

Fristam Pumps USA designs, machines, and assembles its pumps in the United States. Each component is carefully checked from raw material through final assembly. The result of this effort is a pump worthy of the valuable product your company produces. To ensure the highest level of quality, Fristam offers the most comprehensive testing and documentation packages in the sanitary pump industry.

FAST DELIVERY, NEW SOLUTIONS

Because Fristam Pumps USA manufactures its pumps in the United States, Fristam is very responsive to its customers' needs. With Fristam, there is prompt delivery, not lead times measured in months. If a new production challenge arises, Fristam is responsive enough to develop new solutions quickly.

DEDICATED SUPPORT

Fristam's dedication and quality service do not end with your initial purchase. An international network of manufacturing facilities, sales offices and distribution supports Fristam's commitment to customer satisfaction.



"It has proved to clean perfectly and drastically reduce our maintenance costs and downtime."

—Egg Product Processor

Fristam Positive Displacement Pumps

FKL

Reliability begins on the inside. Stop rebuilding, replacing, and spending your valuable time on other PD pumps. Fristam's FKL pump simply runs better and lasts longer. The FKL's large diameter shaft, balanced rotors, and heavy-duty gearbox ensure that it is the most durable sanitary positive displacement pump available. It is rated for up to 500 PSI standard.

BALANCED ROTORS

The FKL rotor is designed so that force acts through the center of the rotor to keep it from bending.



Fristam's FKL
balanced rotor



Other manufacturer's
unbalanced rotor

STRONGER SHAFT

The diameter of a Fristam FKL shaft is up to 25% larger than other manufacturers' shafts. It's made from a solid piece of 316L stainless steel and has a shorter overhung load to withstand elevated pressures without breaking.

The FKL's stronger shaft reduces rotor-to-housing contact. This "deflection" in other pump shafts causes premature wear for shafts, rotors, and housings.



EASY MAINTENANCE: TRUE CIP—NO DISASSEMBLY

The FKL is the industry's first close-clearance PD pump to be designed for true CIP.

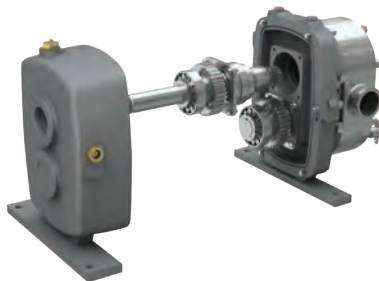
Fristam's FKL needs nothing removed from the pump for CIP. The cover and rotors remain in place. This provides a simple and effective solution with minimal downtime.

Other manufacturers have retrofitted their designs to accommodate CIP by increasing the internal slip path. This "shortcut" significantly reduces efficiency. The FKL cleans in place without losing any performance.

And for those who choose to COP (Clean Out of Place), Fristam offers a simple O-ring seal version for easy teardown and reassembly.

SPLIT GEARBOX

The FKL revolutionary split-style gearbox provides quick and easy access to bearings and shafts.



FKL SERIES SPECIFICATIONS

- 11 Models
- Max. Discharge Pressure 500 psi (35 bar)
- Max. Flow Rate 900 gpm (204 m³/hr)
- Max. Viscosity 1,000,000 cps
- Performance Curves Page 23



Fristam Positive Displacement Pumps

FDS

A concept perfected. By assembling a team of experienced twin screw pump experts and allowing them to design their dream pump, Fristam has developed the most robust and easy to maintain sanitary twin screw pump on the market.

A BETTER PUMP

We have addressed the limitations of twin screw technology—temperature stability, durability, and maintenance.

The versatile FDS Twin Screw pump provides quick, yet gentle product handling of delicate and shear sensitive products, as well as exceptional suction for pulling thick or viscous products. It is virtually pulsation-free and can pump large particulates and entrained air.

The combination of particularly large bearings and an increased bearing distance results in impressive stability even with high axial forces and high speeds.

Also, thanks to its compact size and specially designed bearings the Fristam FDS can be mounted horizontally as well as vertically.

DUAL DUTY: PROCESS AND CIP

The FDS is capable of reaching higher speeds of up to 3,600 RPM. Consequently, it can transport significant amounts of any low-viscosity medium (CIP solution). By using the FDS for both process and CIP supply, you can eliminate an additional CIP pump. This is an ideal space saver for batch blend systems.

SOLID SHAFT

When constructing the shaft, we specifically focused on adding strength in the area of its critical diameter. This ensures maximum durability even under conditions of elevated pressure.

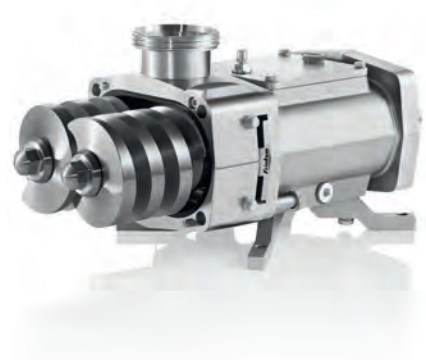


EASY MAINTENANCE

The FDS' pump casing, cover and the two screws can be removed in just a few simple steps.

The mechanical seals can be removed and replaced easily and quickly from the front of the pump.

The gearbox is designed for optimized lubrication and oil circulation, which ensures a lower operating temperature and significantly longer service life.



FDS SERIES SPECIFICATIONS

- 5 Models
- Max. Discharge Pressure 363 psi (25 bar)
- Max. Flow Rate 1,200 gpm (270 m³/hr)
- Max. Viscosity 1,000,000 cps



"Fristams are the best pumps going."

—Maintenance Manager, Dairy Plant

Fristam Positive Displacement Pumps

FL2 & FL3

The Fristam FL2 positive displacement pump handles products gently and efficiently and is completely CIP'able. Fristam's FL2 Series pumps use a proven design to provide gentle product handling, complete cleanability, high efficiencies, and ease of maintenance. Nine pump models and a full range of options are available to match process needs precisely.

PROTECT YOUR VALUABLE PRODUCT: GENTLE PRODUCT HANDLING

The FL2's bi-wing rotor design eliminates metal contact and maintains product integrity. Its large displacement cavities reduce shear.

COMPLETE CLEANABILITY

The entire wet end of the pump is made from 316L low-ferrite stainless steel. 3-A approved, the internal design allows for complete cleanability with no product entrapment areas.

- CIP'able
- SIP'able

HIGH EFFICIENCY

The FL2 features a low-slip bi-wing rotor that maintains efficiency even on low viscosity products or when trimmed for high temperature.

SIMPLE MAINTENANCE

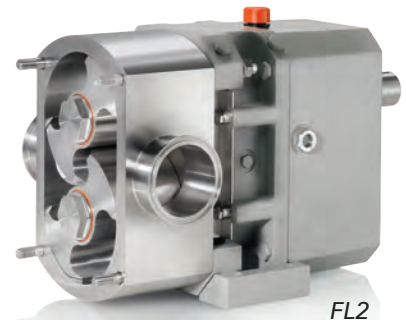
Simple gear timing reduces maintenance and minimizes the potential for rotor-to-rotor contact. It's easy to assemble with pinless seals and universal mounting.

FL3—TRANSFER AND CIP WITH ONE PD PUMP

Fristam's FL3 series positive displacement pump provides gentle, high speed product transfer and complete CIP in one pump.

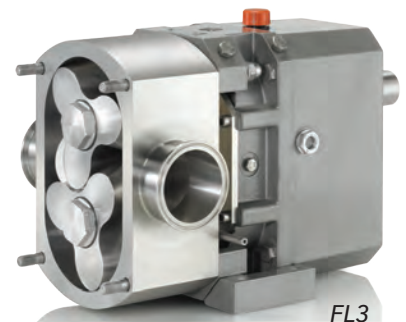
The FL3 ensures an almost perfectly steady product stream, with exceptionally gentle treatment of product. The key is its helix-shaped tri-wing rotary lobes that reduce noise and virtually eliminate pulsation. This design also allows the pump to be run at high speeds to facilitate high transfer capacity and effective CIP.

As a result, the FL3 eliminates the need for both a transfer and CIP pump, saving time and money.



FL2 SERIES SPECIFICATIONS

- 9 Models
- Max. Discharge Pressure 170 psi (11.7 bar)
- Max. Flow Rate 380 gpm (86 m³/hr)
- Max. Viscosity 100,000 cps
- Performance Curves Page 23



FL3 SERIES SPECIFICATIONS

- 3 Models
- Max. Discharge Pressure 115 psi (8 bar)
- Max. Flow Rate 220 gpm (50 m³/hr)
- Max. Viscosity 100,000 cps



"They give us better efficiency
and performance, and require
less maintenance, than any
other centrifugal pump we've
had in the plant."

—Dairy Processor

Fristam Centrifugal Pumps

FP & FPX

Benchmarks of Quality. Fristam centrifugal pumps run smoothly and quietly, and are the sanitary industry's leading pumps for reliability, high performance, and efficiency.

FP: THE ORIGINAL FRISTAM CENTRIFUGAL

The versatile heavy-duty FP pump is the cornerstone of the Fristam line. For vacuum withdrawal from evaporators, viscous, hot or abrasive products, and many other applications, the pedestal-mounted Fristam FP Series is the benchmark for the sanitary processing industry.

FPX: THE INDUSTRY STANDARD

The FPX Series centrifugal pump features the same high-performance pump head as the FP. The FPX is the pump of choice for most conventional applications. Superior value results from its mounting style and the use of a single internal seal.

HEAVY-DUTY CONSTRUCTION

A Fristam centrifugal pump's housing, cover, and impeller are made from 316L stainless steel castings and forgings for more substantial mass. Due to its solid construction, a Fristam centrifugal can withstand more hydraulic shock and cavitation which can ruin a pump.

INTERNAL SEAL

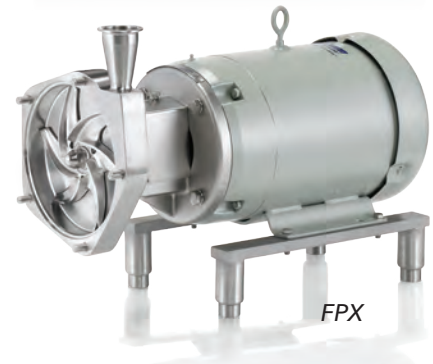
Fristam's unique internal seal uses the cooling and lubrication of the product to provide longer seal life.

CLOSE INTERNAL CLEARANCES

Internal clearances are as tight as 0.5 mm, making the pumps highly efficient and very gentle on product.

OPTIMIZED IMPELLER

The 'optimized vane angle' design of Fristam centrifugal impellers maximizes efficiency and allows for low NPSH requirements.



FP/FPX SERIES SPECIFICATIONS

- 26 Models
- Max. Discharge Pressure 180 psi (12.4 bar)
- Max. Flow Rate 900 gpm (204 m³/hr)
- Max. Viscosity 1,200 cps
- Performance Curves Page 24



"...reliable, easy maintenance,
very good centrifugal pump..."

—Maintenance Planner, Pharmaceutical Facility

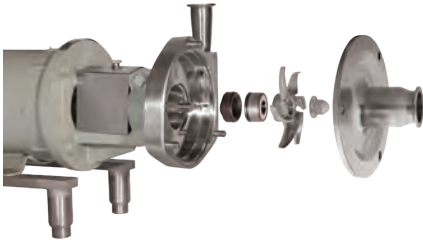
Fristam Centrifugal Pumps

FPR

Easy maintenance centrifugal pump. With the same great performance you've come to expect from a Fristam centrifugal, the third-generation FPR Series reduces maintenance time and effort.

IN-LINE SEAL CHANGES

FPR Series centrifugal pumps reduce maintenance time and effort. Designed with a front-loading seal, the FPR allows production personnel to service the pump in place—processors no longer need to pull pumps out of line to change seals, single or double.



SELF-ALIGNING SHAFT

The self-aligning FPR shaft design allows for easy installation and gapping. The concentric collar on the shaft prevents run-out, protecting the seal from damage.



LESS MAINTENANCE INVENTORY

Only two seal sizes are needed to fit 25 FPR models. For each pump model, seal size remains the same regardless of motor size.

FPR pump shafts are designed to fit both the single and double mechanical seal arrangements. This reduces the number of shafts needed to stock for spare parts.

SIMPLE TOOLS

No special tools are needed to service the FPR.

FPR LIFETIME VALUE ADVANTAGE

- High Efficiency
- Low Maintenance
- Gentle Product Handling
- CIP'ability
- Low NPSH Requirements
- Long Seal Life
- Quiet Operation
- Reliability and Durability



FPR SERIES SPECIFICATIONS

- 26 Models
- Max. Discharge Pressure 195 psi (13.4 bar)
- Max. Flow Rate 2,000 gpm (454 m³/hr)
- Max. Viscosity 1,200 cps
- Performance Curves Page 25



Fristam High-Pressure Centrifugal Pumps FM & FPH / FPHP

Long life, low maintenance. Fristam high-pressure centrifugal pumps are available in single-stage or multi-stage and are known for their non-pulsating flows, low maintenance, and long operating life.

IDEAL APPLICATIONS

- Reverse Osmosis (RO) Systems
- Filtration/Ultrafiltration (UF)
- Pressure Feed
- Recirculation

FRISTAM FM

The Fristam FM is a multi-stage, high-pressure centrifugal pump that features high, non-pulsating flow for quality product and less maintenance. Capable of withstanding up to 1,000 PSI inlet pressure and available with up to four stages, Fristam FM pumps can be configured to meet your pressure and flow needs.

HIGH-PRESSURE AT HIGH FLOW

The FM5 is designed for today's larger filtration systems. It can deliver an average of 300 PSI in the 300-500 GPM flow range. This higher pressure and flow can decrease the number of feed pumps needed, reducing maintenance and saving space.

FRISTAM'S FPH AND FPHP SERIES

Fristam's FPH and FPHP Series centrifugal high-pressure pumps supplement the capabilities of the Fristam multi-stage pumps. These models were designed specifically for recirculation in reverse osmosis systems or handling high process line pressures. As recirculation pumps, they offer greater flexibility when designing or upgrading your system.



FM SERIES SPECIFICATIONS

- 5 Models
- Max. Discharge Pressure 340 psi, 1,250 psi in stages (23.5, 86 bar)
- Max. Flow Rate 600 gpm (136 m³/hr)
- Max. Viscosity 600 cps
- Performance Curves Page 26



FPH/FPHP SERIES SPECIFICATIONS

- 5 Models
- Max. Discharge Pressure 180 PSI (12.4 bar)
- Max. Flow Rate 750 gpm (170m³/hr)
- Max. Viscosity 800 cps
- Performance Curves Page 26



"The pump not only removed all the water from the tanks, but also helped pull remaining water and solution from the lines themselves."

—Dairy Processor

Fristam Liquid Ring Pumps

FZX

Fristam's FZX Series sanitary liquid ring pumps provide new capabilities for handling products with entrained air. By using a specially designed impeller, cover, and housing, FZX pumps maintain their prime when other pumps become air-bound. This feature makes the FZX more efficient for complete evacuation of tanks and lines during normal process or CIP.

PUMPS LIQUIDS WITH ENTRAINED AIR OR GAS

The FZX uses a special impeller and extremely tight internal tolerances to produce a liquid ring of fluid inside the pump. Once this ring is formed, the FZX can pump both liquid and air while producing vacuum capable of lifting 23 feet.

DESIGNED FOR CIP RETURN

The FZX's self-priming capability, combined with its ability to produce a vacuum, makes it an excellent CIP return pump when complete removal of fluids is needed.

REPLACES CENTRIFUGAL PUMP/AIR COMBINATIONS

Because the FZX can pump CIP solution containing air, it replaces centrifugal pumps and the need for air eliminators and check valves on the discharge. With the FZX, processors no longer have caustic cleaning solution discharging onto the floor.

REDUCES WATER & CHEMICAL USAGE

The FZX pump requires less fluid to charge a system. It also reduces residual water and cleaner left in lines and vessels and decreases soiling of wash water through better evacuation of pre-rinse.

REPLACES MULTIPLE CIP PUMPS

One FZX pump can handle the CIP return of multiple tanks eliminating the need for one CIP pump per tank.

LIFTING PRODUCT & UNLOADING TANKS & DRUMS

The FZX can produce several inches of vacuum in the inlet piping and lift water up to 23 feet in a 2" pipe from drums and sumps. This makes the FZX ideal for drum and tote unloading and removing whey from cheese vats. Other typical applications include ice cream mix, sweeteners, glycerin and reclaimed water.

Processors have found the FZX not only removes product from tanks, it can also pull remaining foam and solution from lines saving product and money.

PUMPING SHEAR SENSITIVE PRODUCTS

At low back pressure, the wedge-shaped impeller openings and tight internal tolerances allow the FZX to efficiently pump shear-sensitive products such as cream, liquid egg, and yeast.



FZX SERIES SPECIFICATIONS

- 7 Models
- Max. Discharge Pressure 100 psi (7 bar)
- Max. Flow Rate 400 gpm (91 m³/hr)
- Max. Viscosity 5,000 cps
- Performance Curves Page 27



Fristam Shear Blenders

FS & FSI

Fristam's FS Series shear blender for in-line mixing, blends products **quickly and consistently**. Compared to conventional methods, the shear blender shortens processing times significantly. The shear blender's rotor-stator design eliminates unblended product and prevents lumps and masses in product for consistent, repeatable results.

EASY MAINTENANCE

Fristam's FS Series sanitary blender, designed for easy maintenance and less parts inventory, retains the standard established with our high performance centrifugal and positive displacement pumps. Featuring a front-loading seal, the FS allows production personnel to service the pump in place.

FULLY CIP'ABLE

The design of the FS meets the most stringent sanitary standards. Its internal seal performs at virtually any pressure.

SUPERIOR ROTOR-STATOR DESIGN

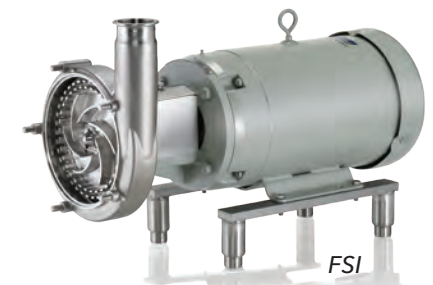
- Improved product texture
- Reduced processing time
- Economical operation and maintenance

DIVERSE APPLICATIONS

- Blend
- Emulsify
- Disperse
- Dissolve
- Texturize
- Reduce particle size

FSI MODIFICATION

Fristam's FSI Series Shear Pump is an impeller-style version of the Fristam FS Series Shear Blender. Pump and blender in one—for applications requiring both pumping and mixing, Fristam's FSI has an integrated impeller that provides high flow rates while still mixing your product.



FS/FSI SERIES SPECIFICATIONS

- 12 Models
- Max. Tip Speed 44m/s
- Max. Flow Rate 375 gpm (85 m³/hr)
- Max. Viscosity 30,000 cps
- Performance Curves Page 27



"[The trial] proved so successful, we kept it. The chemist and I wouldn't let it leave.

We were able to achieve results that we weren't able to achieve with the old system, and in only 30 minutes mixing time."

—Vice President of Operations,
Coats Aloe International

Fristam Powder Mixers

PM

Better blending—in less time. Stop wasting your valuable time and money on outdated, oversized, and underperforming mixing systems. The Fristam Powder Mixer provides quick, high-performance blending of wet and dry ingredients into a fluid stream.

INTEGRATED SYSTEM

Fristam's Powder Mixer incorporates the uniform powder induction of the FZX liquid ring pump and thorough blending of the FS Shear Blender into a single, compact system.

CONSISTENT POWDER INDUCTION

The FZX is unparalleled as a self-priming pump, easily pulling liquids and solids together.

The table's full-port valve inducts powders fully, eliminates powder bridging and ensures maximum powder induction rate. Vacuum gauges monitor suction for repeatable results.

BLENDS BETTER

Using an intermeshed rotor/stator system, tight gaps at high speeds and high turbulence the Powder Mixer achieves a complete and consistent mix, time after time.

PROCESSES LARGER BATCHES

Since the Fristam Powder Mixer is an in-line system, the batch size is infinite.

BLENDS IN MINUTES

Powders can be wetted and dispersed on the first pass through the Powder Mixer, dramatically reducing process times.

PORTABLE

Smaller models are portable, with locking wheels. The Powder Mixer can be moved easily to different processes as needed.

ERGONOMIC & SAFE

The Powder Mixer operates at floor-level, eliminating dangerous ladder climbing or accidental falling or dropping of equipment from mezzanines. Also, with its waist-height funnel top, there is no bending to pour.

WHY IT'S BETTER THAN BATCH MIXERS

- Devours lumps and clumps
- Blends in minutes
- Processes larger batches

WHY IT'S BETTER THAN FUNNEL/PUMP COMBINATIONS

- High-intensity blending
- Repeatable product consistency

NO RISK TRIAL

Fristam offers on-site trials with your product. For only a nominal fee, Fristam will put our Powder Mixer to work for you, so you can see the amazing results for yourself.

- Fully operational Powder Mixer
- Factory-trained technician on-site
- Expert process guidance



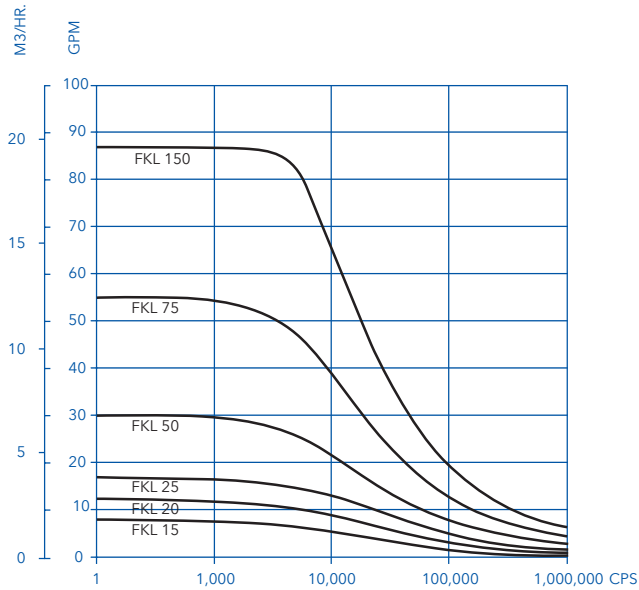
SPECIFICATIONS

- 7 Models
- Max. Flow Rate 350 gpm (80 m³/hr)
- Max. Induction Rate 600 lb/min (272 kg/min)

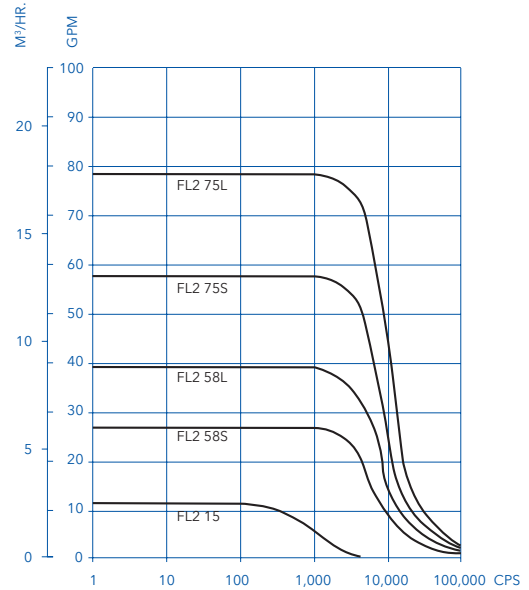
Composite Performance Curves



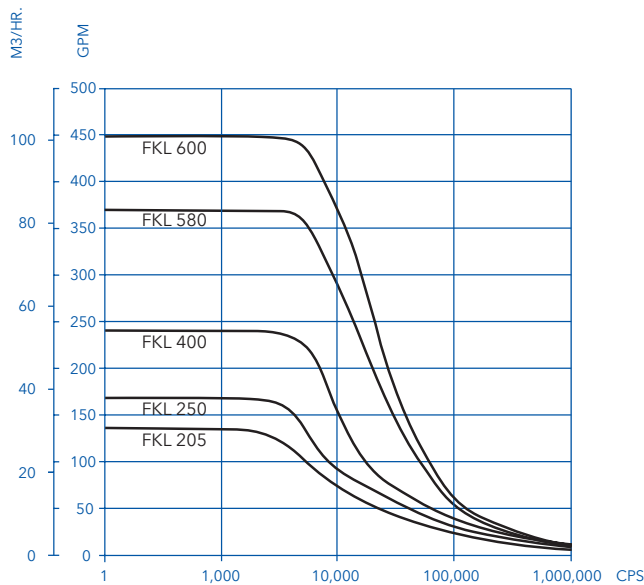
FRISTAM POSITIVE DISPLACEMENT
PUMPS FKL 15-150



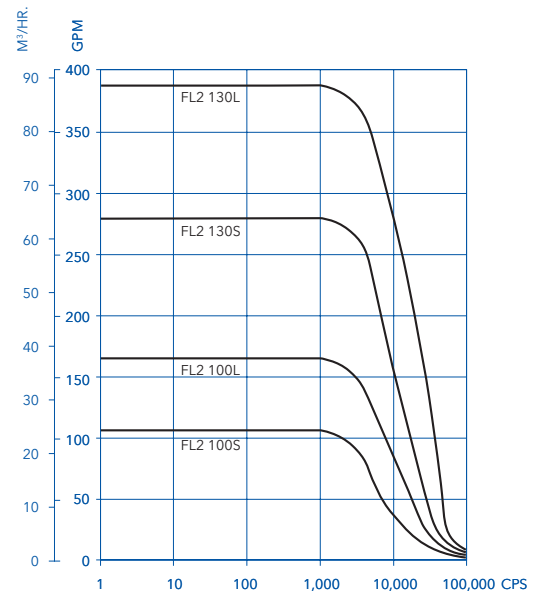
FRISTAM POSITIVE DISPLACEMENT
PUMPS FL2 15-75



FKL 205-600

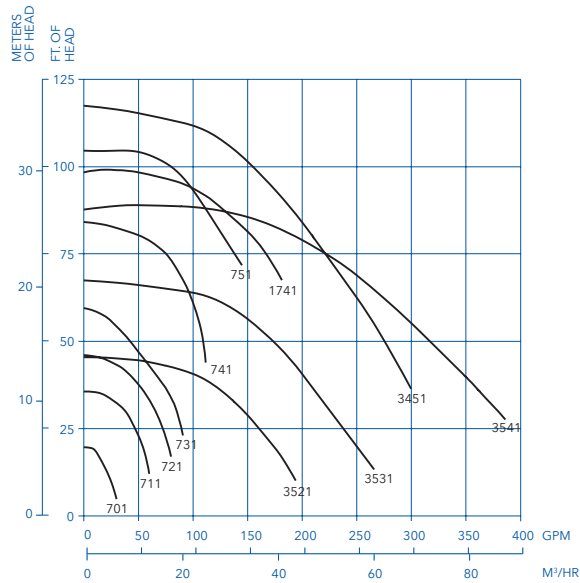


FL2 100-130

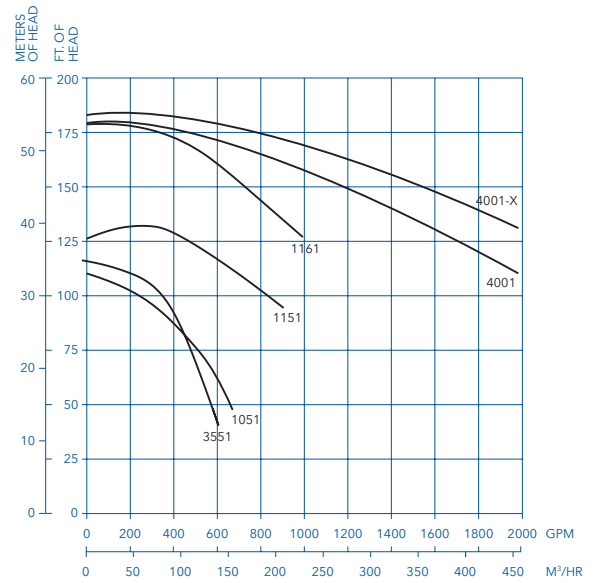




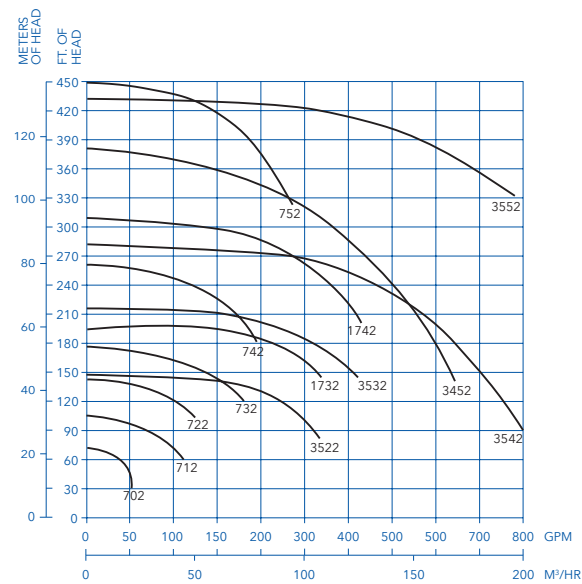
FRISTAM CENTRIFUGAL PUMPS 1750 RPM (TO 400 GPM)



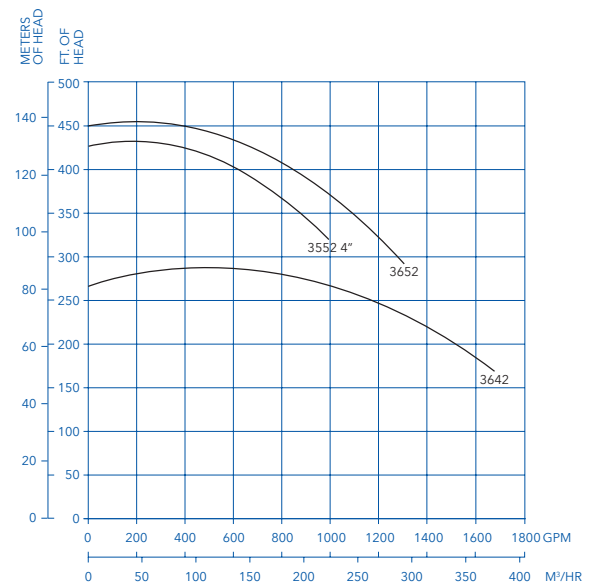
FRISTAM CENTRIFUGAL PUMPS 1750 RPM (TO 2000 GPM)



FRISTAM CENTRIFUGAL PUMPS 3500 RPM (TO 800 GPM)



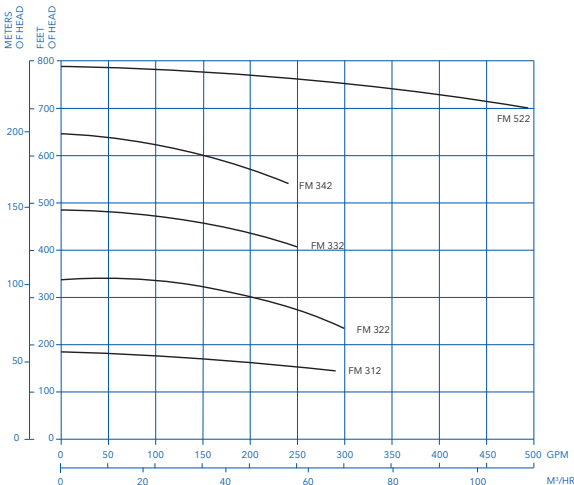
FRISTAM CENTRIFUGAL PUMPS 3500 RPM (TO 1700 GPM)



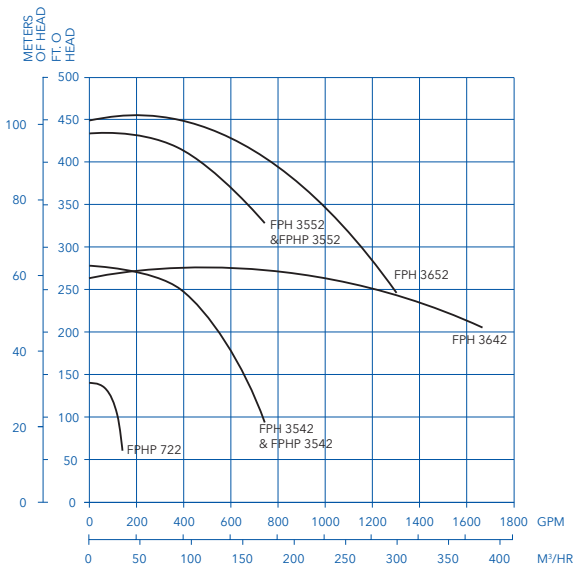
Composite Performance Curves



FRISTAM HIGH-PRESSURE CENTRIFUGAL PUMPS
FM 3500 RPM

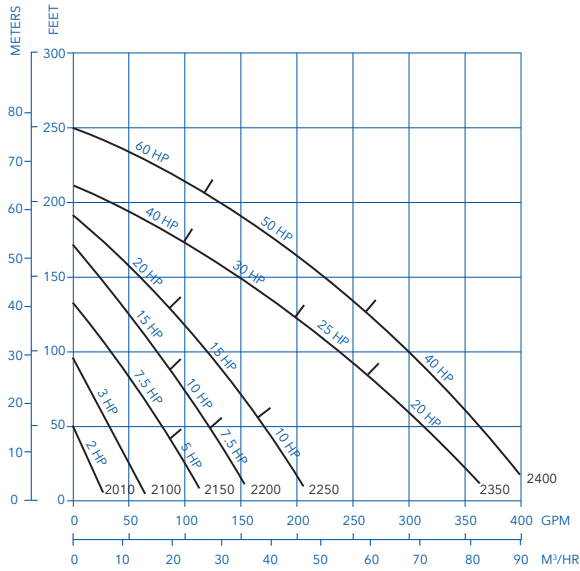


FRISTAM HIGH-PRESSURE CENTRIFUGAL PUMPS
FPH/FPHP 3500 RPM

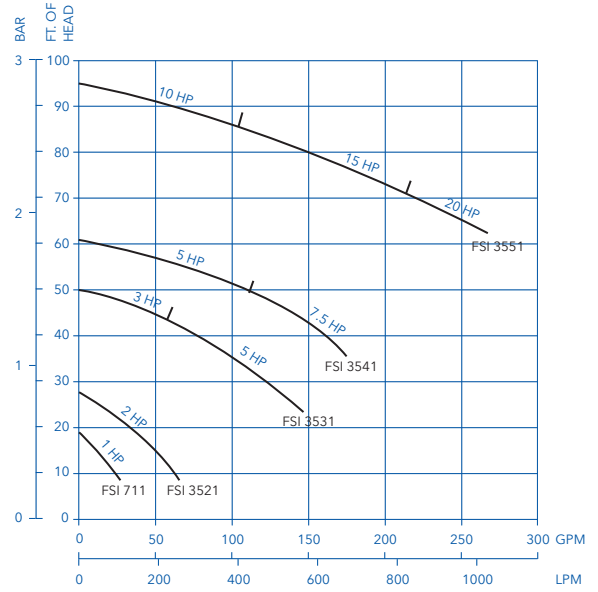




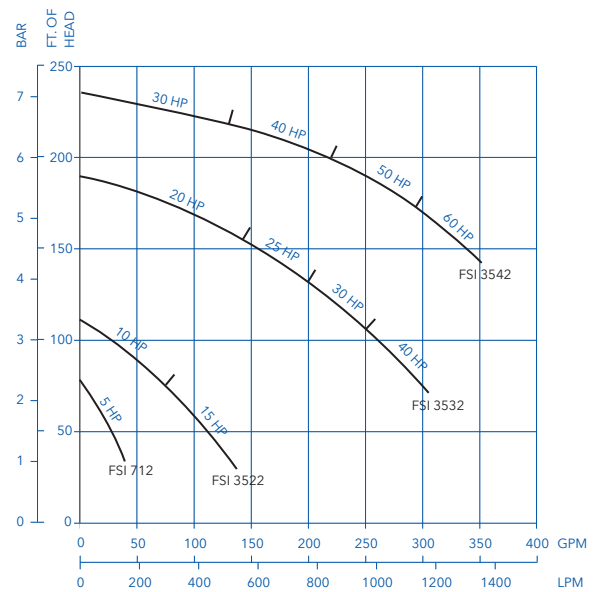
FRISTAM LIQUID RING PUMPS
FZX 1750 RPM



FRISTAM SHEAR PUMPS
FSI 1750 RPM



FSI 3500 RPM







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