

# *Sanitary Liquid-Ring Pumps*



Fristam Pumps...  
Performance You've Come to Expect

***Fristam***  
PUMPS

# FZX Series: Fristam's Liquid-Ring Centrifugal Pumps

## Fristam Pumps

Fristam is an international manufacturer of sanitary centrifugal and positive displacement pumps respected for performance, reliability and technical superiority. Fristam's FZX Series liquid-ring pump provides new capabilities for handling products with entrained air.

## Benefits of the FZX Series

- High lifetime value
- Efficient removal of CIP solution from process equipment
- Reduced process and CIP time vs. standard centrifugal pumps
- Saves product, cleaning solution and water
- Long seal life
- Simple piping requirements due to front inlet
- Bi-directional operation

## Features of the FZX Series Liquid-Ring Pump

- Fully cleanable and steamable
- Lift capability of up to 23 feet
- Horizontal inlet
- C-faced, close coupled, flange mount design
- 316L stainless steel
- Single or double external mechanical seal
- 3-A approved
- Maximum inlet pressure 150 PSI
- Recommended maximum viscosity 5,000 cps

## The Liquid-Ring Process

Fristam's FZX pumps liquids with entrained air or gas. Its impeller has an enclosed ring with flat blades that create individual chambers. As the impeller rotates counterclockwise, the liquid is drawn into one of the chambers through the inlet of the pump. Here, the volute chamber in the housing and cover increases in depth, drawing in more product. As the chamber rotates beyond the inlet port, the volute reaches its maximum depth.

When the chamber is no longer exposed to the inlet, it seals itself with surface tension from the tight clearances between the impeller and housing, creating a liquid-ring. This liquid-ring is what allows the pump to be self-priming, even with entrained air in the product.

As the chamber continues to rotate, the velocity of the product increases, which builds force. When the chamber overlaps the discharge port, the volute in the housing and cover decreases in depth. This builds pressure and, along with the rotational energy, forces the product out the discharge port. The chamber then continues to rotate back around to the inlet port again and the process is repeated.



### Designed for CIP Return

With its specially designed impeller and housing, the FZX Series maintains its prime when other pumps become air-bound. This feature, combined with its ability to produce a vacuum, makes it an excellent CIP return pump when complete removal of fluids is needed.

### Pumping Aerated Products

The ability to pump products containing large amounts of air without becoming air-locked makes it excellent for completely emptying tanks and lines to minimize contamination between products. The pump not only removes product from tanks, it can also pull remaining foam and solution from lines saving product and money.

### Lifting Product

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.

### Pumping Shear Sensitive Products

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.

### Texturizing Product

The FZX's unique vane-shaped impeller, along with a throttling valve, imparts a smooth consistency to products like sour cream without overworking them.

### Pharmaceutical Options

- Documentation of material, finishes and performance
- Additional seal and elastomer materials
- 15 Ra mechanical finish
- Electropolish
- Casing drain

### Seals

This series is available in five models, with either a single or double external mechanical seal.

Single External:	Stationary	Rotating
Standard	Carbon	Chrome Oxide
Optional	Silicon Carbide	Silicon Carbide

Double External:	Stationary	Rotating	Secondary Stationary
Standard	Carbon	Chrome Oxide	Carbon
Optional	Silicon Carbide	Silicon Carbide	Carbon

### Elastomers

Standard: Viton®

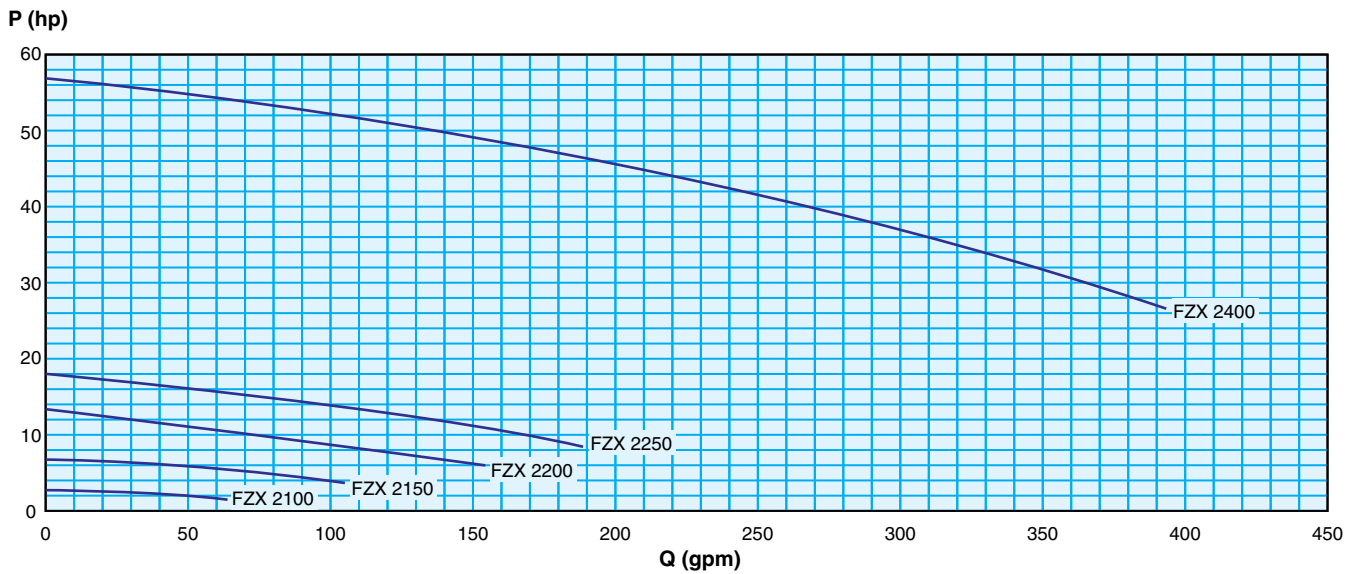
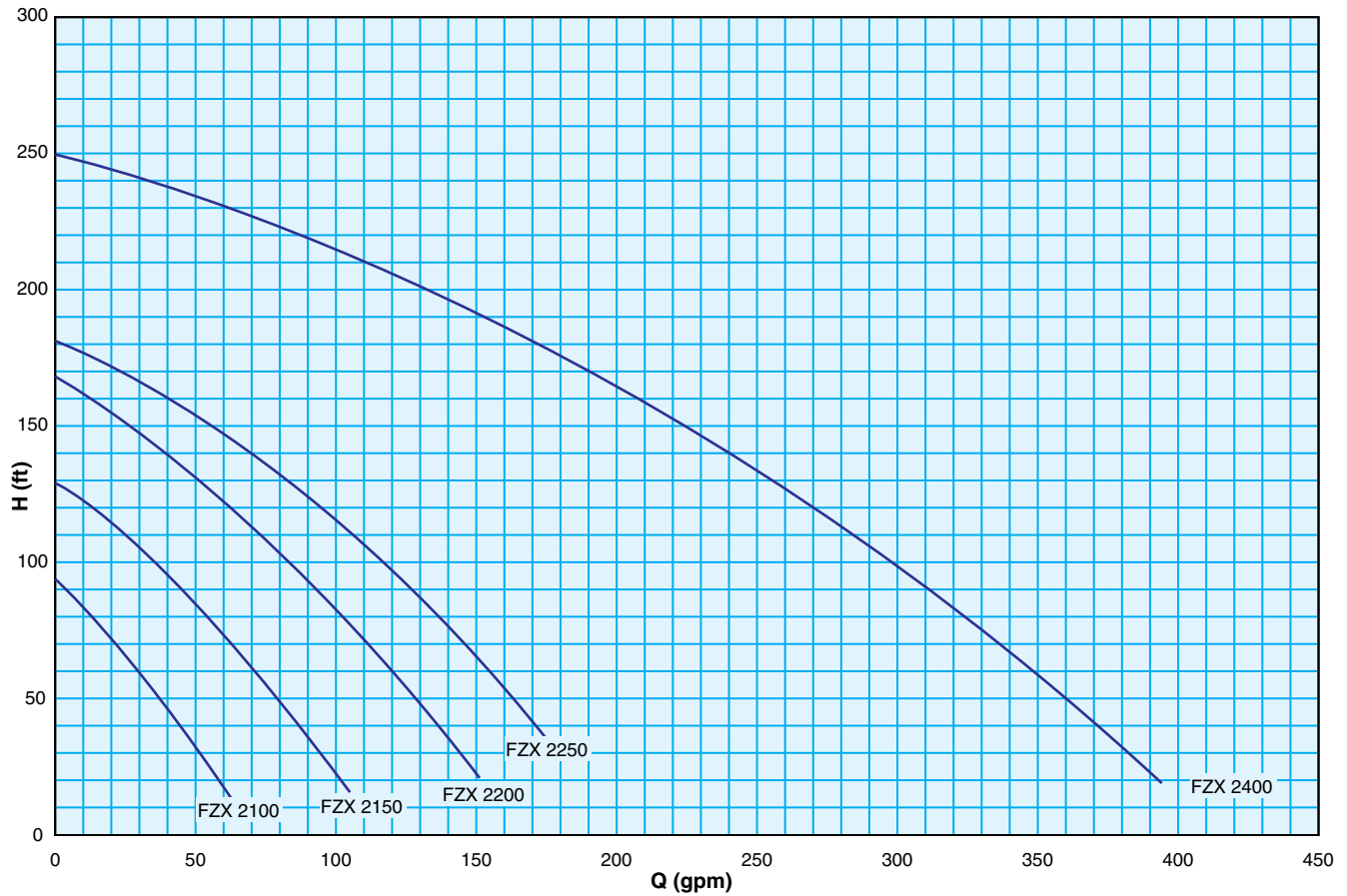
Optional: Others available upon request



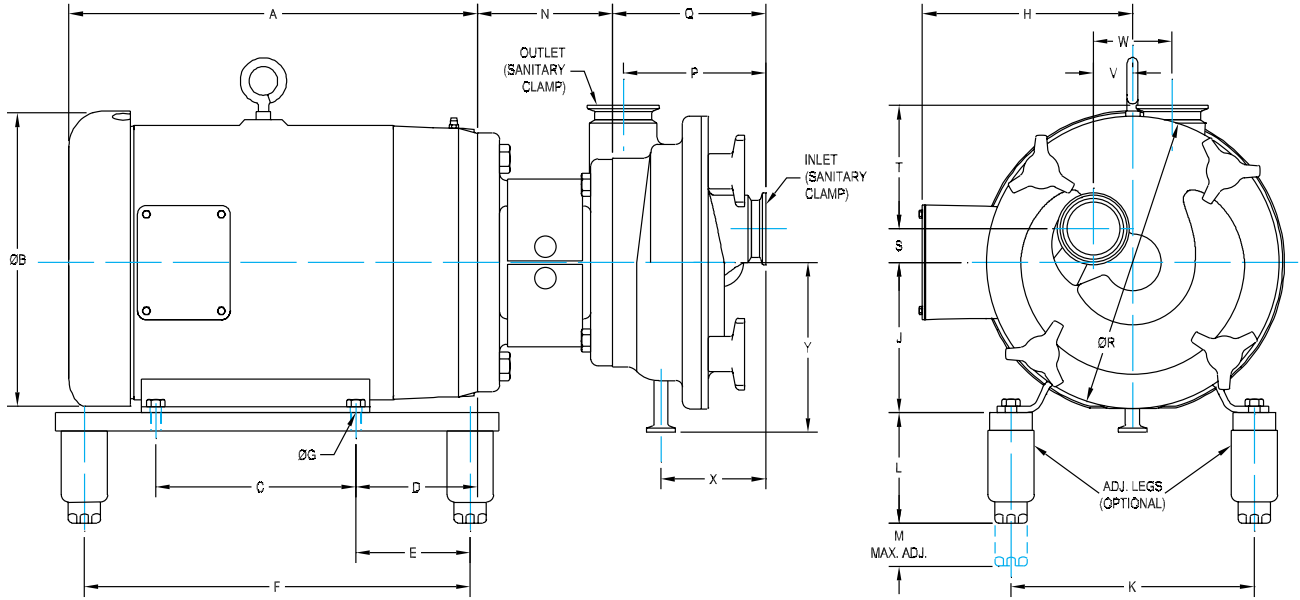
# FZX Composite Performance Curve

1750 RPM (60 Hz)

Performance curve based on tests using 70°F water, atmospheric inlet pressure and 32 Ra finish. Please contact us for different conditions. A tolerance of  $\pm 5\%$  applies to all figures.



# FZX Dimensions



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MOTOR HP 1750 RPM	MOTOR FRAME	DIMENSIONS IN MILLIMETERS (INCHES)												
		A	ØB	C	D	E	F	ØG	H	J	K	L	M	N
3 HP	182TC	354 (13.92")	183 (7.19")	114 (4.50")	73 (2.87")	102 (4.00")	343 (13.50")	10.5 (.41")	149 (5.87")	114 (4.50")	191 (7.50")	98.5 (3.88")	38 (1.50")	120 (4.72")
5 HP	184TC	361 (14.20")	226 (8.92")	140 (5.50")	73 (2.87")	102 (4.00")	343 (13.50")	10.5 (.41")	149 (5.87")	114 (4.50")	191 (7.50")	98.5 (3.88")	38 (1.50")	120 (4.72")
7.5 HP	213TC	383 (15.10")	263 (10.34")	140 (5.50")	89 (3.50")	102 (4.00")	343 (13.50")	10.5 (.41")	187 (7.37")	133 (5.25")	216 (8.50")	98.5 (3.88")	38 (1.50")	120 (4.72")
10 HP	215TC	398 (15.65")	263 (10.34")	178 (7.00")	89 (3.50")	102 (4.00")	343 (13.50")	10.5 (.41")	187 (7.37")	133 (5.25")	216 (8.50")	98.5 (3.88")	38 (1.50")	120 (4.72")
15 HP	254TC	496 (19.56")	270 (10.62")	210 (8.25")	108 (4.25")	67 (2.63")	343 (13.50")	13.5 (.53")	244 (9.62")	159 (6.25")	254 (10.00")	98.5 (3.88")	38 (1.50")	120 (4.72")
20 HP	256TC	487 (19.16")	336 (13.25")	254 (10.00")	108 (4.25")	95 (3.75")	394 (15.50")	13.5 (.53")	244 (9.62")	159 (6.25")	254 (10.00")	98.5 (3.88")	38 (1.50")	120 (4.72")
40 HP	324TC	636 (25.03")	413 (16.25")	260 (10.25")	133 (5.25")	121 (4.75")	470 (18.50")	16.7 (.66")	359 (14.12")	203 (8.00")	318 (12.50")	117 (4.62")	44.5 (1.75")	171 (6.73")
50 HP	326TC	636 (25.03")	413 (16.25")	305 (12.00")	133 (5.25")	121 (4.75")	470 (18.50")	16.7 (.66")	359 (14.12")	203 (8.00")	318 (12.50")	117 (4.62")	44.5 (1.75")	171 (6.73")
60 HP	364TC	685 (26.96")	467 (18.38")	286 (11.25")	149 (5.87")	89 (3.50")	508 (20.00")	16.7 (.66")	383 (15.06")	229 (9.00")	356 (14.00")	127 (5.00")	44.5 (1.75")	171 (6.73")
75 HP	365TC	685 (26.96")	467 (18.38")	311 (12.25")	149 (5.87")	89 (3.50")	508 (20.00")	16.7 (.66")	383 (15.06")	229 (9.00")	356 (14.00")	127 (5.00")	44.5 (1.75")	171 (6.73")

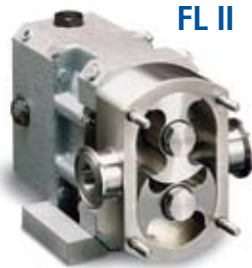
PUMP MODEL	INLET & OUTLET	DIMENSIONS IN MILLIMETERS (INCHES)								
		P	Q	ØR	S	T	V	W	X	Y
2100/2150	2"	133.5 (5.26")	141 (5.56")	226 (8.90")	21 (.83")	110 (4.33")	30 (1.18")	62.5 (2.46")	94 (3.70")	131.5 (5.18")
2200	2"	126.9 (5.00")	136.5 (5.37")	260 (10.24")	30 (1.18")	110 (4.33")	35 (1.38")	70 (2.75")	93 (3.66")	151 (5.94")
2250	2.5"	137.5 (5.41")	141 (5.56")	275 (10.83")	25 (.98")	117 (4.61")	37.2 (1.46")	75.5 (2.97")	100 (3.94")	153 (6.02")
2400	3"	158.2 (6.23")	164.2 (6.46")	340 (13.39")	29 (1.14")	151 (5.93")	49 (1.93")	96.6 (3.80")	110 (4.33")	186.5 (7.34")

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## Other Superior Quality Fristam Products



FKL



FL II

### Positive Displacement Pumps

- Heavy-duty FKL Series pumps are fully CIP'able without performance loss, operate at up to 500 PSI and handle viscosities to one million cps.
- Standard-duty FL II Series pumps reduce product damage through low pulsation and gentle handling. Their bi-wing rotor simplifies maintenance and allows for CIP/SIP cleaning.



FPR

### Centrifugal Pumps

Fristam centrifugal pumps serve as industry benchmarks for quiet, efficient, low maintenance operations. The FPR Series is designed for easy maintenance and fewer inventory parts. Its front pull-out seal allows for production personnel to service the FPR in place. Two seal sizes fit the entire line and FPR pumps have fewer parts, allowing processors to stock fewer maintenance parts.



FM 5

### High-Pressure Centrifugal Pumps

- FM multi-stage pumps have become the benchmark for reverse osmosis system pumps with a non-pulsating flow and lower maintenance costs. FM pumps can operate at discharge pressures up to 340 PSI and inlet pressures up to 750 PSI.
- FPH and FPHP Series high-pressure pumps supplement the operating capability of the Fristam multi-stage product line. FPH and FPHP Series pumps operate with discharge pressures to 1,250 PSI.



FS

### Shear Blenders

FS Series blenders improve product consistency by removing agglomerates and preventing lumps and masses in product. Use the FS Series to blend, emulsify, disperse, dissolve, texturize and reduce the particle size of a wide range of products, from simple to demanding applications. CIP'able/SIP'able, it saves processors time and money, in addition to improving product quality.



Powder Mixer

### Powder Mixers

The Powder Mixer's unique pump and blender system provides quick, high-performance blending of wet and dry ingredients into a fluid stream. It's easy to use and saves time and money.

The self-priming FZX Liquid-Ring pump creates consistent suction at the bottom of the funnel to prevent plugging and maintain powder rate, even as viscosity increases. The rotor-stator design of the FS Series Shear Blender eliminates unblended product and prevents lumps and masses for consistent batch-to-batch repeatability.

## Worldwide commitment to customer satisfaction

Fristam is represented worldwide through an international sales and service network. Fristam has been manufacturing pumps in the United States since 1983.



# Worldwide Contact Details

## North America/ South America

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Gallarate

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Elst (gld)

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Auckland

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Warsaw

## Russian Federation

Fristam Pumpen OOO  
Moscow

## Scandinavia

Fristam Pumper A/S

## South/East Asia

Fristam Pumps (S.E.A.) Pte. Ltd.  
Singapore

## Spain/Portugal

Fristam Iberica S.L.  
Porqueres (Girona)

## Fristam's Commitment

Fristam Pumps manufactures the sturdiest products in the industry. Our design reduces repair/replacement cost, downtime and energy consumption, and therefore yields high lifetime value. Fristam is one of the most accessible equipment companies in the world. 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.

## 3-A, GMP, U.S.D.A., F.D.A., ISO and EHEDG

Fristam complies with and supports regulatory standards. FZX Series pumps meet all applicable industry standards for performance, cleanliness and design. As a registered ISO 9001:2000 company, Fristam is committed to consistent quality products.



Visit [www.fristam.com](http://www.fristam.com) for  
a current list of literature

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