

# Fristam FKL

Positive Displacement Pump



***Fristam***  
**PUMPS®**  
*Engineered For Lasting Performance®*



# Engineered For Lasting Performance

Fristam is an international manufacturer of sanitary centrifugal and positive displacement pumps, mixers, and blenders, respected for unmatched product performance, reliability, and technical superiority. Fristam was founded in 1909 and manufactured its first pump in 1931. Today, Fristam equipment can be found in many of the world's top beverage, brewing, bio-pharmaceutical, and food processing companies.

## WHY CUSTOMERS CHOOSE FRISTAM

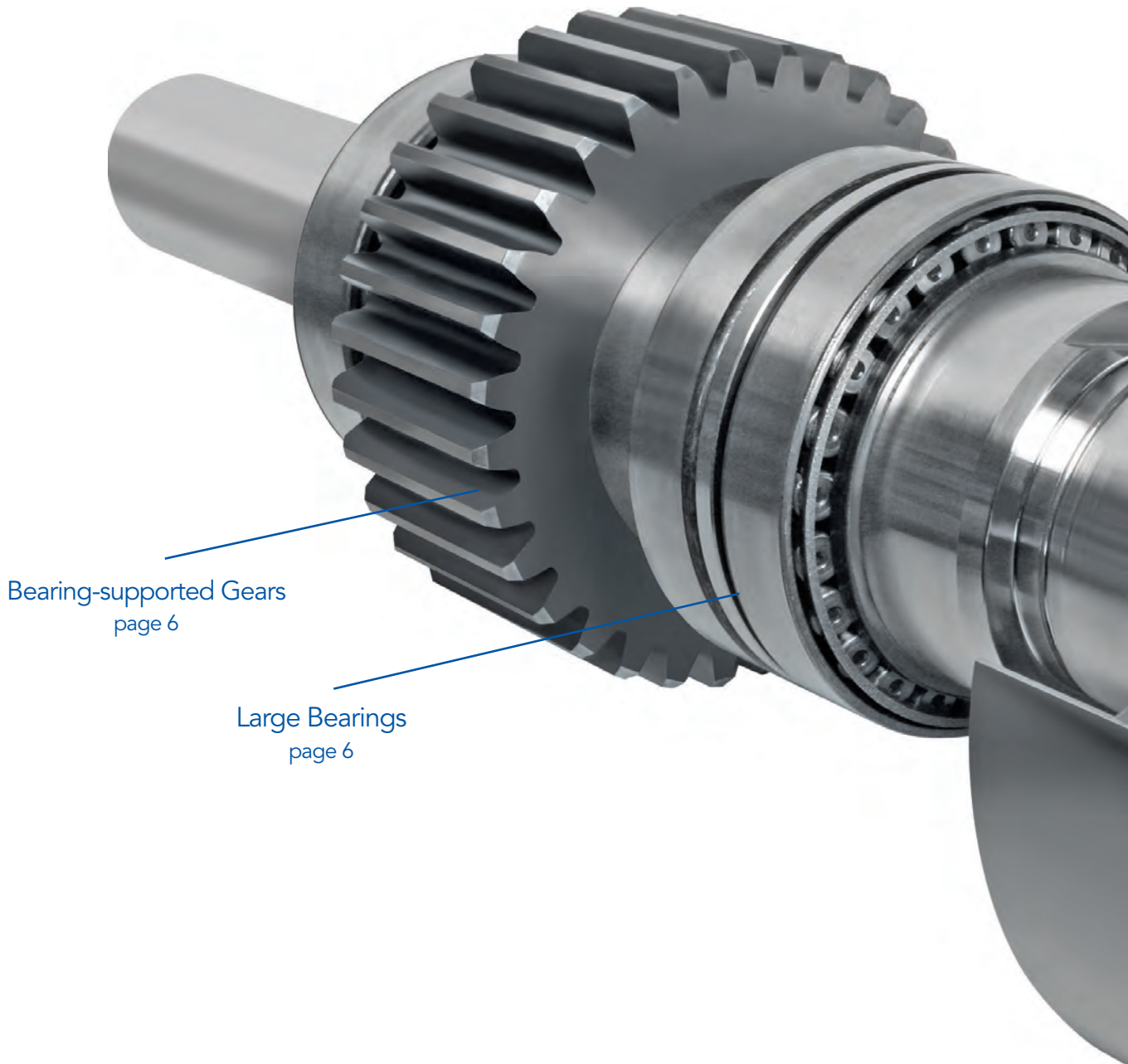
- "simply better pumps"
- "reliable, dependable"
- "high standards for sanitization"
- "people that help solve problems"

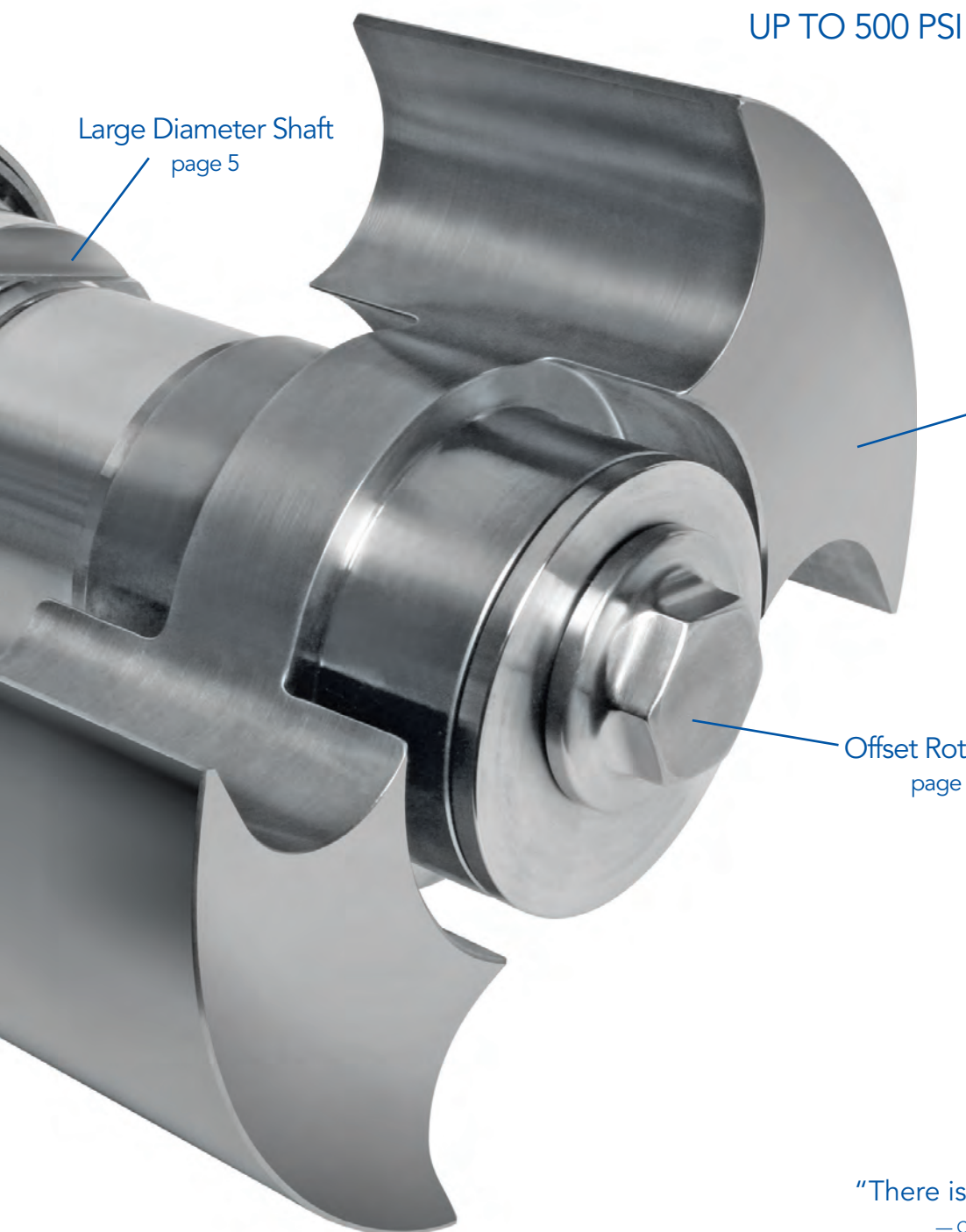


Friedrich Stamp, Founder

# Reliability Begins on the Inside

Stop rebuilding, replacing, and spending your valuable time on other PD pumps. The solid design, precise machining, and robust construction of a Fristam FKL ensures efficiency and operational reliability. Fristam pumps simply run better and last longer.





UP TO 500 PSI

Large Diameter Shaft  
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TRUE CIP  
Without Disassembly  
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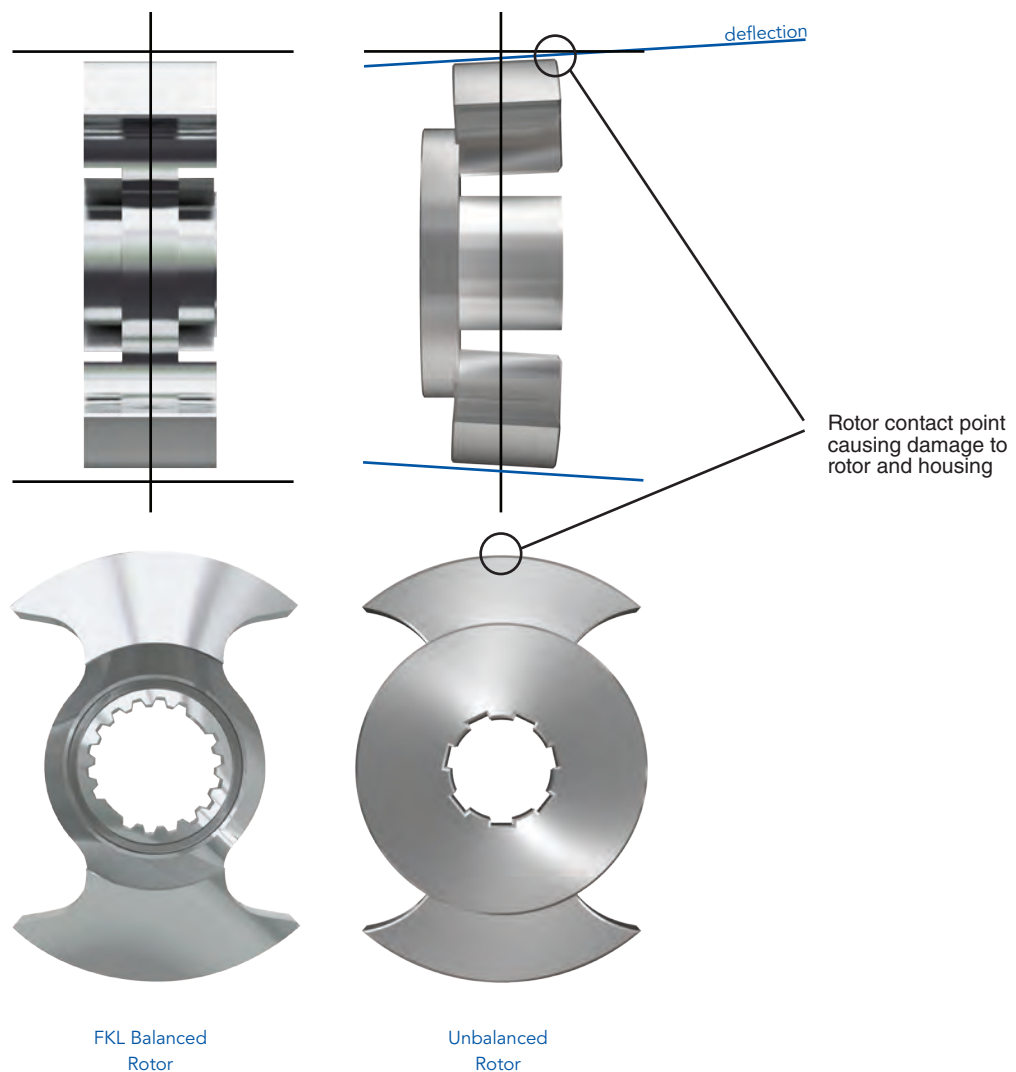
Offset Rotor Bolt  
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"There is no doubt the FKL is stout."

— Consumer and industrial chemical manufacturer

# Balanced Rotors

Fristam FKL rotors are balanced, meaning the support hub is centered so that force acts through the center of the rotor to keep the lobes from distorting. Other pumps' unbalanced rotors do not distribute force evenly. At higher pressures, unbalanced rotors can bend at their tips (deflection), further damaging the pump.





# 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.

In a less robust pump, the deflecting shaft and rotor strike the pump housing with every revolution. This continual rubbing wears not only the rotors but the internal surface of the pump, increasing its clearances. With an FKL, clearances remain tight and efficiencies remain high, saving you a costly rebuild or pump replacement.



*"In all my years, I've never  
seen an FKL shaft break."*

*—35-year processing industry expert*

# Gearbox – The Business End

The gearbox may be the most important part of a pump when it comes to long life and uninterrupted performance.

## LOW MAINTENANCE LUBRICATION

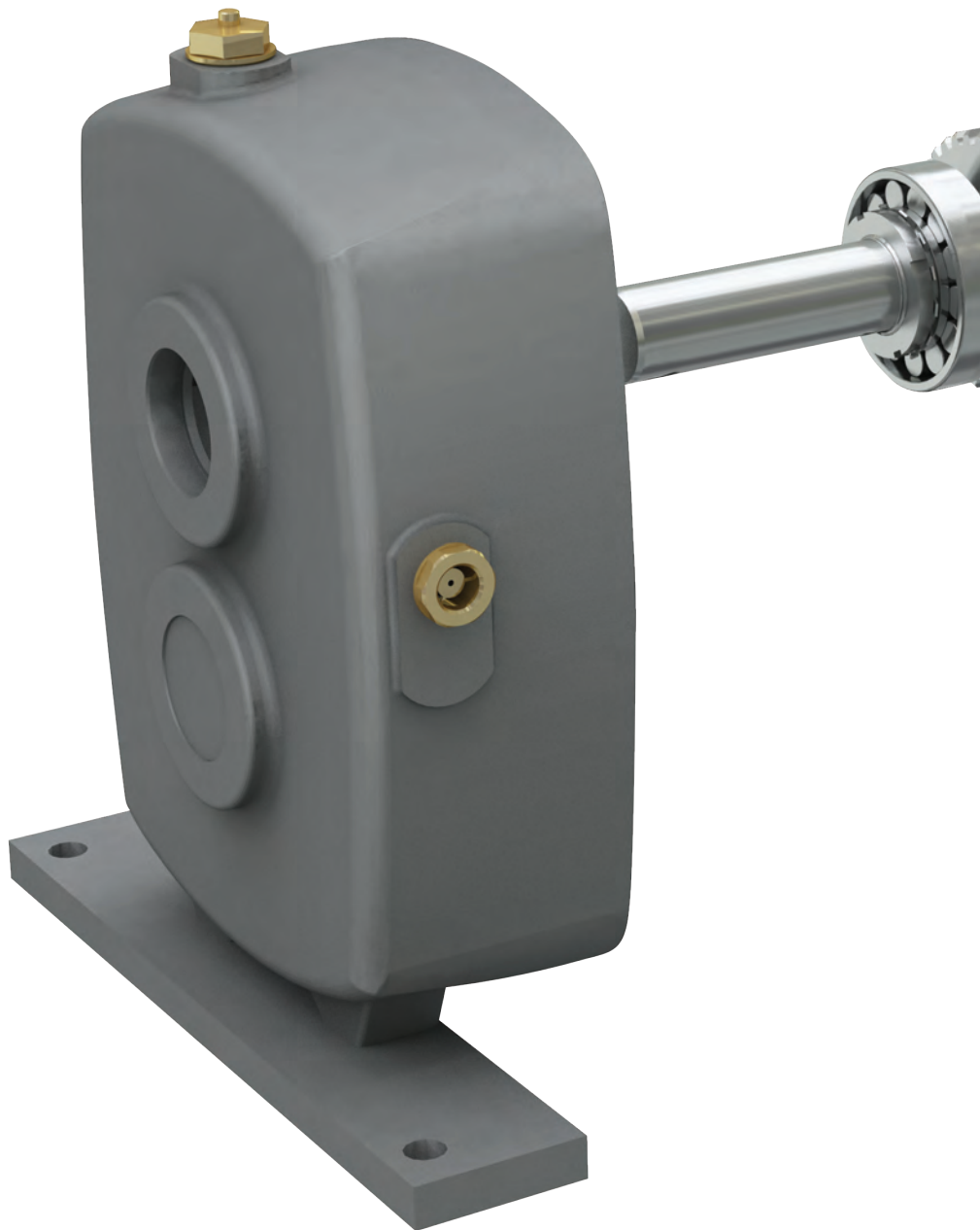
The FKL uses petroleum or food grade oil instead of grease to lubricate its gears. With this design, the oil lasts eight times longer than grease and only needs to be changed once every 4,000 hours. Using oil avoids the need for grease change-out and eliminates grease-related contaminant build-up that reduces bearing life.

## BEARING-SUPPORTED GEARS

Fristam gears are located between the front and rear bearings for even load distribution and less shaft deflection. FKL gears are straight-cut for easy timing.

## LARGE BEARINGS

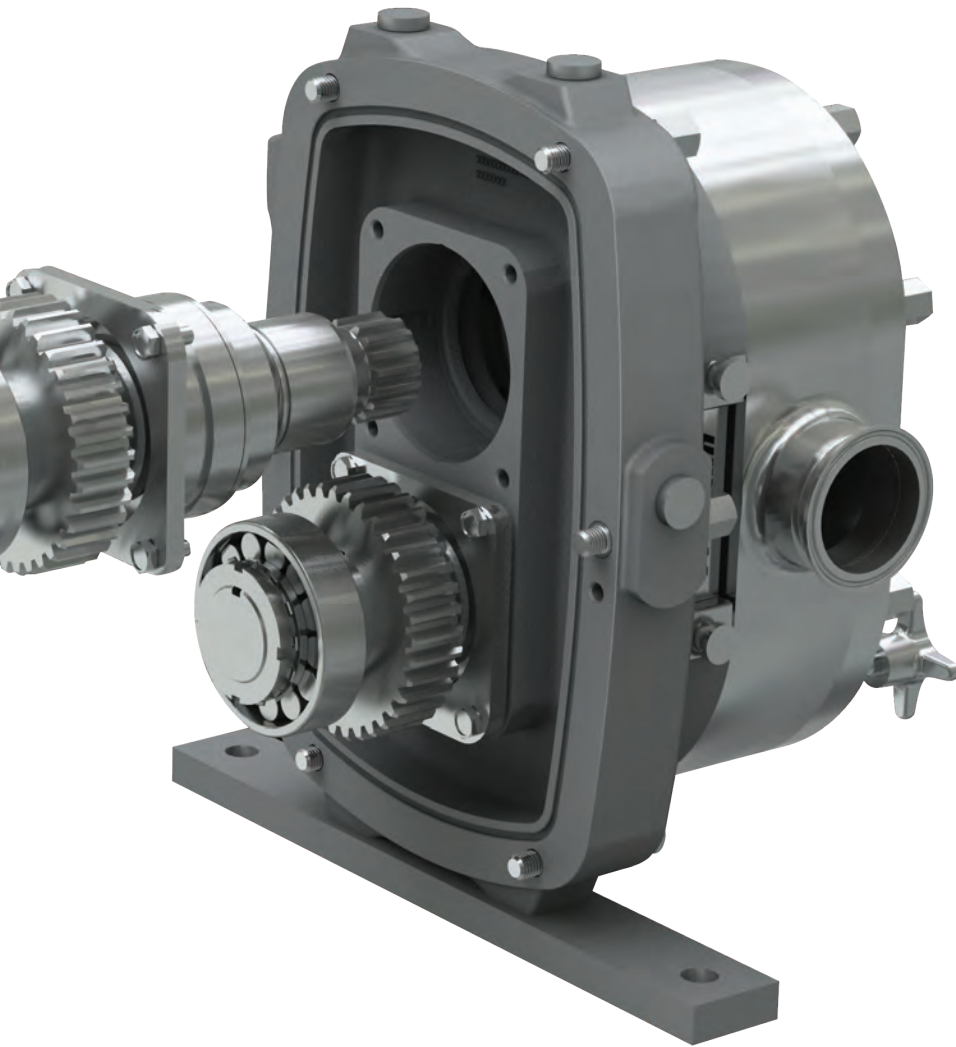
The FKL uses large bearings for longer bearing life, meaning less maintenance. Quite simply, larger means stronger, and stronger lasts longer.





# Gearbox – Revolutionary Design

The Fristam FKL's revolutionary split-style gearbox provides quick and easy access to bearings and shafts (available on models 15–250).



## EASY ACCESS

Using simple forcing studs, the gearbox halves can be separated in less than one minute.

## COMPLETE SHAFT ASSEMBLY

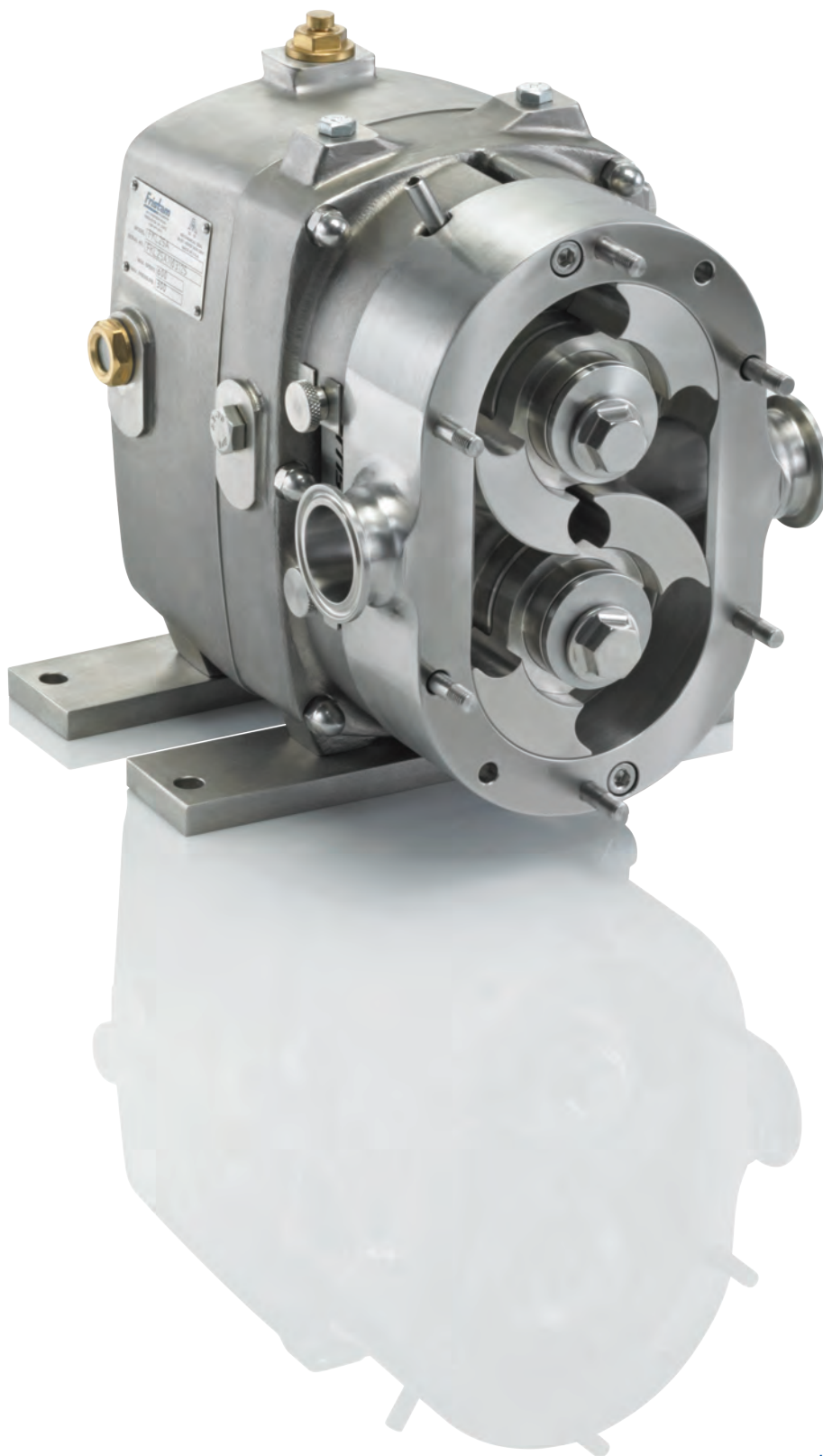
Once separated, only a few bolts need to be loosened; then, the entire shaft, gears, and bearings assembly can be removed as one complete set.

## SIMPLE REASSEMBLY

Reassembly is just as simple, and there is no need for an arbor press to reinstall the shaft assembly into the gearbox or to join the two gearbox halves.

**“It’s built like a tank!”**

—Salad dressing and sauce producer



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

—Egg Product Processor

# True CIP – No Disassembly Required

The FKL is the first close-clearance PD pump to be designed for “True CIP” (Clean In Place). A proper CIP system allows the pump to operate during cleaning.

## NO ROTOR REMOVAL

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.

## NO DAMAGE

Eliminating rotor removal and reinstallation reduces costly downtime and eliminates the chance of damaging pump parts, or worse yet, injuring employees.

## NO PERFORMANCE LOSS

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.

# Designed For Easy Maintenance

A rounded exterior provides a sleek look and maximum cleanability. An ultra-clean stainless steel gearbox is optional for difficult environments.

## SEAMLESS SEAL CHANGEOVER

FKL seals are completely contained within a cartridge. They can be pre-assembled and shelved for easy, one-piece replacement.

Additionally, no housing or pump modification is needed to change the Fristam FKL from a single seal to a double seal or from an O-ring seal to a mechanical seal.

## OFFSET ROTOR BOLTS

Traditional rotor nuts can back-off when pumping viscous products. Once loose, they can severely damage pumps. The FKL is equipped with offset rotor bolts that lessen the unwinding force of the product.

As it rotates eccentrically, the bolt provides natural agitation to promote cleanability in the cavity.

## EXTENDED HOUSING STUDS

The long housing studs guide the housing past the shaft during assembly and disassembly. This protects against housing-to-shaft contact to prevent accidental seal and shaft damage.



# Dairy, Meat, & Food

## DAIRY AND CHEESE

The dairy industry has long been the staple of Fristam Pumps' user base. Fristam knows dairy. From gentle cream transfer to pumping frozen butter, the FKL can handle almost anything.

The large-capacity FKL 580 is becoming the 'Curd Pump' of choice in dairies. Its gentle transfer capability allows the FKL to maintain product integrity, increase fat content and reduce fines for better curd yield.

- Milk & cream
- Yogurt & sour cream
- Cheese curd & whey
- Butter
- Cream cheese
- Processed cheese
- Sweetened condensed milk

## MEAT AND POULTRY

Large rectangular inlets and front cover discharges are available to keep meat products, such as MDM, moving. Heavy-duty construction allows the FKL to withstand differential pressures up to 500 psi and adapt to variable product throughput requirements.

A stainless steel gearbox option is provided for difficult environments.

- Slurry
- Mechanically deboned meat
- Ground poultry
- Whole & liquid egg
- Salted egg yolk
- Meat emulsion
- Blood plasma

## FOOD & BAKING

Options for Kolsterising® and tungsten carbide coating, along with alloys Hastelloy® and AL-6XN®, make the FKL more resistant to internal wear.

The FKL is a favorite for abrasive products, including chocolate and fruit puree. In fact, Fristam has developed a special jacketed single seal and rotor clearances for chocolate processors.

De-gassing covers are available to allow the FKL to pump dough and products with entrained air.

- Chocolate & peanut butter
- Tomato sauce & paste
- Condiments & dressings
- Dough, batter & sponge
- Fruits, fillings, & frostings
- Soup & stew
- Masa paste
- Starch slurry



# Beverage, Industrial, & Pharmaceutical

## BEVERAGE AND BREWING

The FKL accommodates high pressures for syrups and other viscous products. Its close clearances reduce slip on thin products, increasing efficiency. Also, the FKL has excellent suction capabilities.

- Soft drink syrup
- Juice concentrate
- Beer & wort
- Yeast
- Corn syrup
- Coffee extract
- Malt extract

## INDUSTRIAL

The FKL can also fulfill the needs for processing beyond food and beverage. Its close clearances allow the FKL to pump thinner industrial liquids, and the variety of alloys can handle abrasive or caustic products.

- Biodiesel
- Solvent
- Glue
- Paint
- Dye
- Glycerine

## PHARMACEUTICAL & COSMETIC

The ultra-clean FKL has 316L stainless steel components standard. Special castings are available in low-ferrite stainless steel or high-performance alloys such as Hastelloy® and AL-6XN®.

Class VI elastomers are standard for pharmaceutical applications, with perfluoroelastomers available. Seal material options include stainless steel, ceramic, silicon carbide, and tungsten carbide.

Electropolishing and enhanced internal surface finishes to 15 Ra are available on most products.

Casing drain and mounting options provide complete drainability critical for long-term system cleanliness. The FKL can be easily configured for steam-in-place sterilization, with no external cooling devices required.

- Cell broth
- Resin
- Syrup
- Lotion & cream
- Toothpaste
- Dye
- Shampoo & soap



# FKL Model Specifications

Model		15	20	25	50	75
<b>Displacement</b> (at max rpm)	gal/rev	0.016	0.032	0.056	0.096	0.156
	gpm	15.5	25.6	33.6	57.6	93.6
	l/m	58.7	96.9	127.2	218	354
	m³/hr	3.5	5.8	7.6	13.1	21.3
<b>Speed (max)</b>	rpm	1000	800	600	600	600
<b>Pressure (max)</b>	psi	200	200	300	500	500
	bar	14	14	21	35	35
<b>Fittings</b>						
Housing		1.5" clamp	1.5" clamp	1.5" clamp	2.5" clamp	2.5" clamp
Seal Flush Thread		1/16" NPT	1/16" NPT	1/16" NPT	1/16" NPT	1/16" NPT
<b>Special Options</b>						
Rectangular Inlet		N/A	N/A	N/A	Yes	Yes
O-Ring Seal		Yes	Yes	Yes	Yes	Yes

Model		150	205	250	400	580	600
<b>Displacement</b> (at max rpm)	gal/rev	0.259	0.45	0.54	0.74	1.82	2.24
	gpm	155	270	324	444	728	896
	l/m	588	1022	1226	1681	2756	3392
	m³/hr	35.3	61.3	73	100	165	203
<b>Speed (max)</b>	rpm	600	600	600	600	400	400
<b>Pressure (max)</b>	psi	500	500	500	500	300	300
	bar	35	35	35	35	21	21
<b>Fittings</b>							
Housing		3" clamp	4" clamp	4" clamp	6" flange	6" flange	6" flange
Seal Flush Thread		1/16" NPT	1/16" NPT	1/16" NPT	1/16" NPT	1/8" NPT	M10 x 1.5
<b>Special Options</b>							
Rectangular Inlet		Yes	Yes	Yes	Yes	N/A	N/A
O-Ring Seal		Yes	Yes	Yes	N/A	N/A	N/A



# FKL Options and Ordering Matrix

MODEL	FITTING TYPE	SEAL TYPES AND MATERIALS	OTHER OPTIONS
15 20 25 50 75 150 205 250 400 580 600	C – Clamp* B – Bevel seat F – 150# flange 3F – 300# flange N – NPT I – I-Line (female) X – Other (specify)	<b>Single Mechanical Seal</b> NFR – Carbon vs. chrome oxide SS* CC – Silicon carbide vs. silicon carbide FRC – Chrome oxide SS vs. silicon carbide <b>Double Mechanical Seal</b> NFRN – Carbon vs. chrome oxide SS vs. carbon CCN – Silicon carbide vs. silicon carbide vs. carbon FRCN – Chrome oxide SS vs. silicon carbide vs. carbon <b>Single O-ring Seal (available on models 15-250)</b> V – Viton® E – EPDM <b>Double O-ring Seal (available on models 15-250)</b> VV – Viton® E – EPDM X – Other (specify)	SS – Stainless Steel Gearbox RI – Rectangular inlet (available in models 50-400) JC – Jacketed cover 25 – 25 Ra 20 – 20 Ra 15 – 15 Ra EP – Electropolish PV – Passivation KO – Kolsterising® TC – Tungsten carbide coating AS – Aseptic PR – Pressure relief cover DG – Degassing cover FD – Front cover discharge X – Other (specify)

Preferred Ordering Sequence (sample)

<b>FKL</b>	<b>150</b>	<b>30</b>	<b>C</b>	<b>CC</b>	<b>VB</b>	<b>S</b>	<b>2</b>	<b>15-EP</b>
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\* Standard

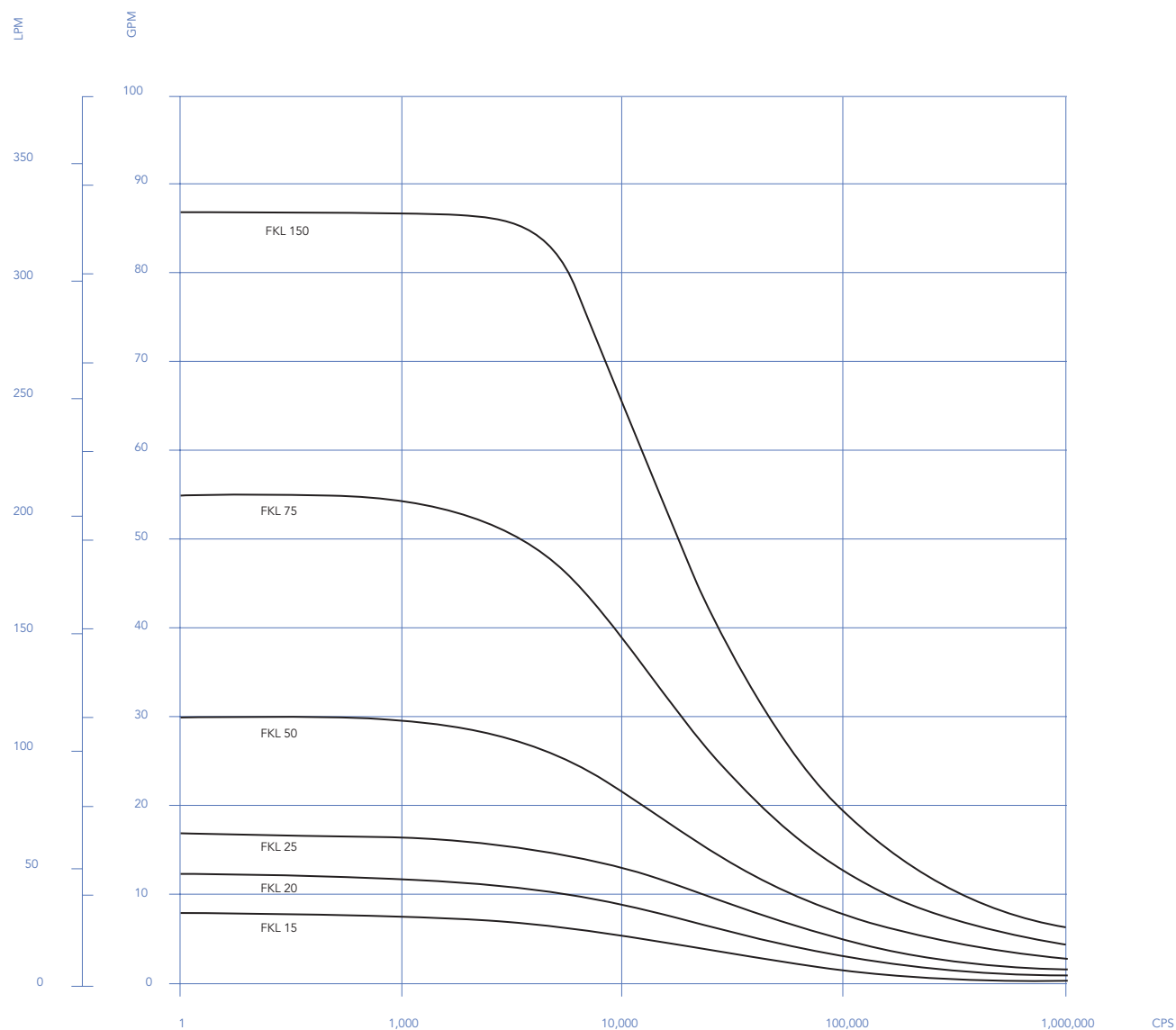
FITTING SIZE	ELASTOMERS	ROTORS (TEMPERATURE DIFFERENTIALS)
15 – 1.5" 20 – 2" 25 – 2.5" 30 – 3" 40 – 4" 60 – 6"	1st – seal (Viton®*) 2nd – cover gasket (Buna*) V – Viton® B – Buna E – EPDM X – Other (specify)	S – Standard ( $\Delta$ 140° F) H – High temp ( $\Delta$ 210° F) SS – Stainless steel X – Special clearance (specify)

MOUNTING (DRIVE SHAFT POSITION)			
1	2	3	4
● – Drive Shaft	○ – Idle Shaft	1 – Horizontal (top)	3 – Vertical (left)
		2 – Horizontal (bottom)	4 – Vertical (right)

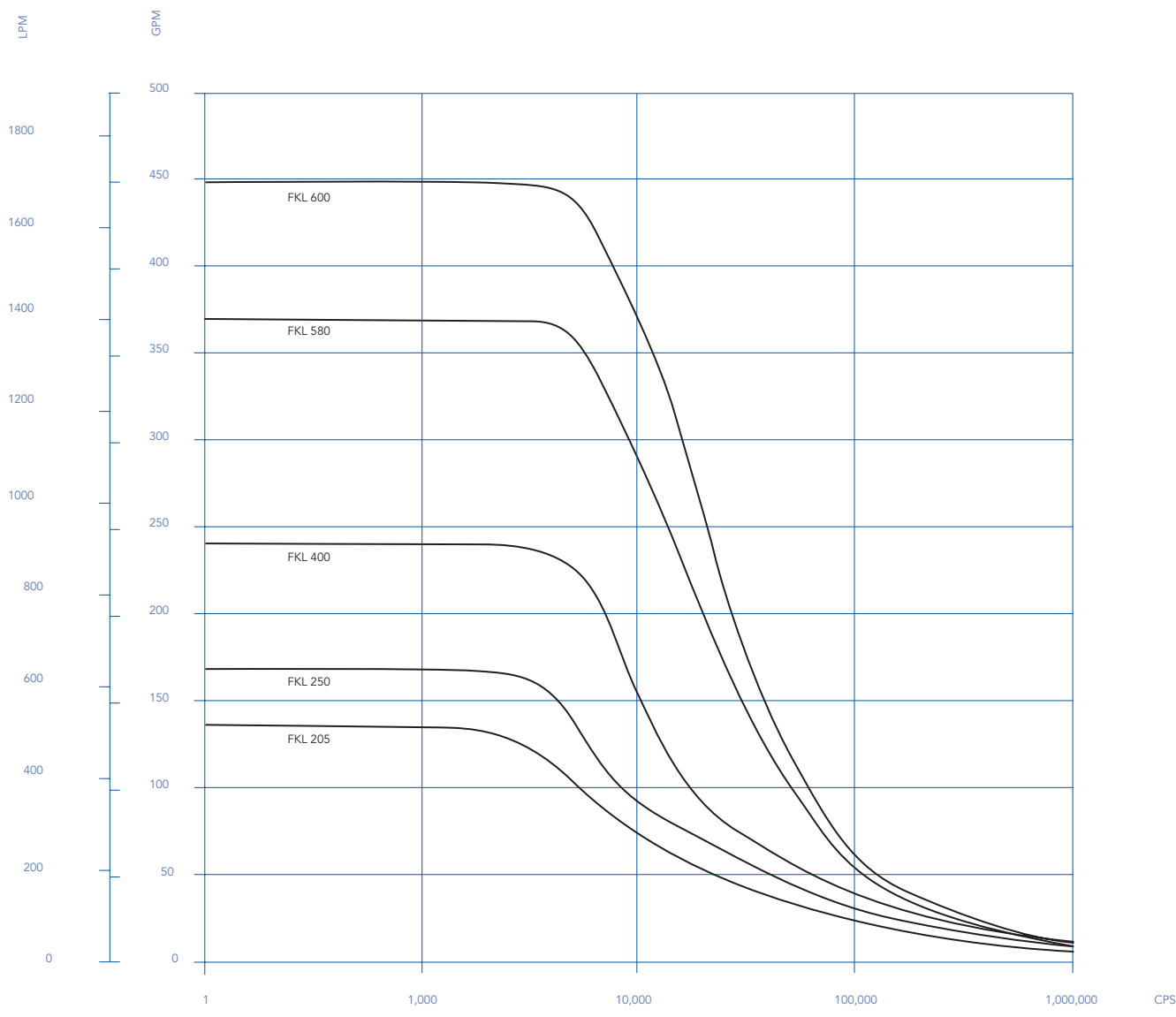
# Composite Performance Curves

FKL MODELS 15-150



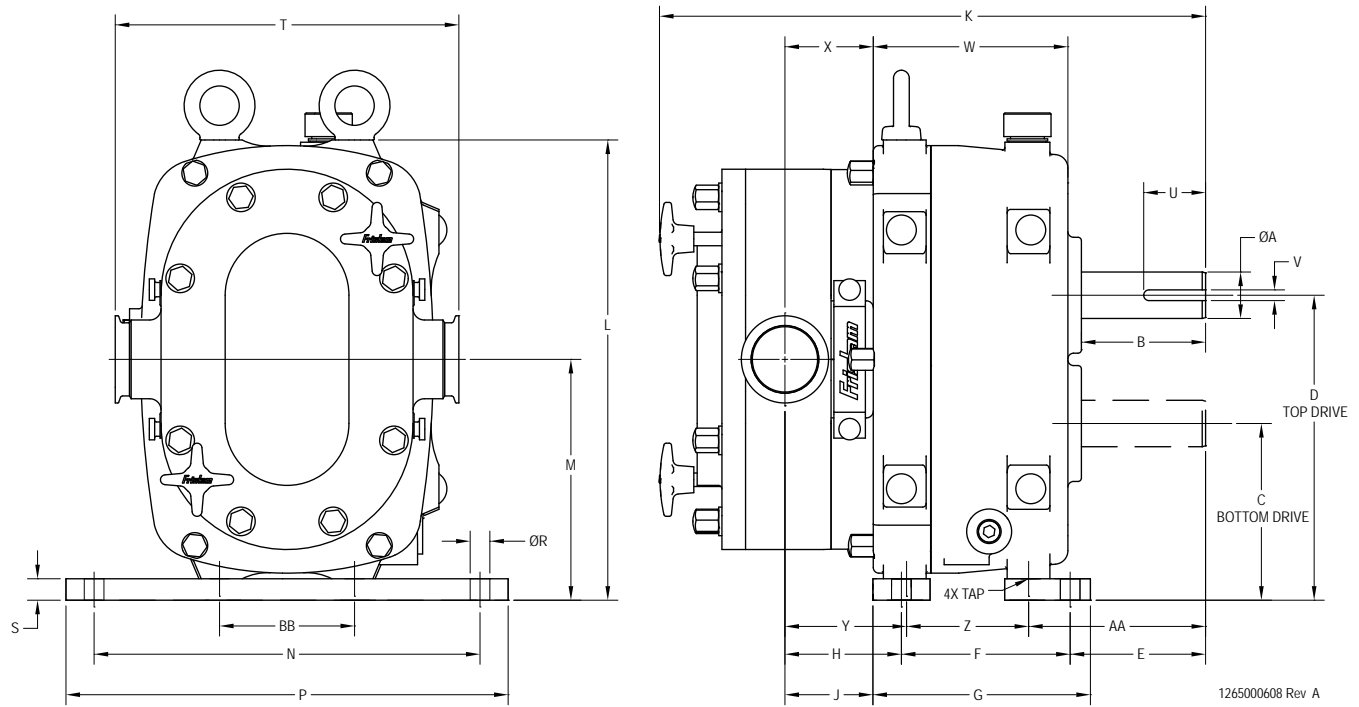
Curves are based on 70°F water and full-speed operation

FKL MODELS 205-600



Curves are based on 70°F water and full-speed operation

# FKL Dimensional Drawing



DIMENSIONS IN MILLIMETERS (INCHES)														
PUMP MODEL	INLET/ OUTLET	ØA	B	C	D	E	F	G	H	J	K	L	M	N
FKL 15	1-1/2" CLAMP	3/4"	62.5 (2.46")	71.5 (2.81")	137.5 (5.41")	82 (3.23")	82 (3.23")	107 (4.21")	39 (1.54")	27 (1.06")	277 (10.91")	199.5 (7.85")	104.5 (4.11")	150 (5.91")
FKL 20	1-1/2" CLAMP	3/4"	62.5 (2.46")	71.5 (2.81")	137.5 (5.41")	82 (3.23")	82 (3.23")	107 (4.21")	39 (1.54")	27 (1.06")	280 (11.02")	199.5 (7.85")	104.5 (4.11")	150 (5.91")
FKL 25	1-1/2" CLAMP	1-1/4"	61 (2.40")	93.5 (3.68")	173.5 (6.83")	76 (2.99")	117 (4.61")	155 (6.10")	84 (3.31")	65 (2.56")	358 (14.09")	254.5 (10.02")	133.5 (5.26")	219 (8.62")
FKL 50	2-1/2" CLAMP	1-3/8"	73 (2.87")	102.5 (4.04")	192.5 (7.58")	120.5 (4.74")	85 (3.35")	136 (5.35")	88 (3.46")	63 (2.48")	391 (15.39")	282.5 (11.12")	147.5 (5.81")	240 (9.45")
FKL 75	2-1/2" CLAMP	1-5/8"	108 (4.25")	157 (6.18")	271 (10.67")	118 (4.65")	150 (5.91")	193 (7.60")	103.5 (4.07")	78 (3.07")	483 (19.02")	409 (16.10")	214 (8.43")	343 (13.50")
FKL 150	3" CLAMP	1-3/4"	99.5 (3.92")	171 (6.73")	291 (11.46")	114 (4.49")	177.5 (6.99")	227.5 (8.96")	111.5 (4.39")	86.5 (3.40")	521 (20.51")	443 (17.44")	231 (9.09")	364 (14.33")
FKL 205	4" CLAMP	2-1/4"	116 (4.57")	174.5 (6.87")	323 (12.72")	143 (5.63")	182 (7.17")	233 (9.17")	113 (4.45")	87.5 (3.44")	577 (22.72")	478.5 (18.84")	249 (9.80")	381 (15.00")
FKL 250	4" CLAMP	2-1/2"	122 (4.80")	194.5 (7.66")	357 (14.06")	129.5 (5.10")	215 (8.46")	265 (10.43")	123 (4.84")	98 (3.86")	604 (23.78")	532.5 (20.96")	276 (10.87")	381 (15.00")
FKL 400*	6" CLAMP	2-7/8"	95 (3.74")	209.5 (8.25")	385.5 (15.18")	152.5 (6.00")	234 (9.21")	285 (11.22")	106 (4.17")	80.5 (3.17")	637.5 (25.10")	569.5 (22.42")	297.5 (11.71")	432 (17.01")
FKL 580*	6" CLAMP	100 (3.94")	141 (5.55")	235 (9.27")	455 (17.93")	208 (8.19")	204 (8.03")	255 (10.03")	173 (6.80")	148 (5.81")	777 (30.60")	681 (26.81")	345 (13.58")	500 (19.69")
FKL 600*	6" CLAMP	100 (3.94")	141 (5.55")	235 (9.27")	455 (17.93")	208 (8.19")	204 (8.03")	255 (10.03")	197 (7.75")	172 (6.77")	801 (31.54")	681 (26.81")	345 (13.58")	500 (19.69")

DIMENSIONS IN MILLIMETERS (INCHES)													
PUMP MODEL	INLET/ OUTLET	P	ØR	S	T	U	V	W	X	Y	Z	AA	TAP
FKL 15	1-1/2" CLAMP	170 (6.69")	10.5 (0.41")	9.5 (0.37")	173 (6.81")	50 (1.97")	4.8 (0.19")	107 (4.21")	33 (1.30")	60 (2.36")	61.5 (2.42")	81.5 (3.21")	M8 X 1.25"
FKL 20	1-1/2" CLAMP	170 (6.69")	10.5 (0.41")	9.5 (0.37")	173 (6.81")	50 (1.97")	4.8 (0.19")	107 (4.21")	33 (1.30")	60 (2.36")	61.5 (2.42")	81.5 (3.21")	M8 X 1.25"
FKL 25	1-1/2" CLAMP	241 (9.49")	11 (0.43")	12.5 (0.50")	198 (7.80")	33 (1.30")	6.4 (0.25")	137 (5.39")	69.5 (2.74")	96 (3.78")	93 (3.66")	88 (3.46")	M10 X 1.5"
FKL 50	2-1/2" CLAMP	280 (11.02")	13.5 (0.53")	12.5 (0.50")	285 (11.22")	55 (2.17")	7.9 (0.31")	141 (5.55")	67.5 (2.66")	94.5 (3.72")	85 (3.35")	114 (4.49")	M10 X 1.5"
FKL 75	2-1/2" CLAMP	393 (15.47")	17.5 (0.69")	19 (0.75")	306 (12.05")	55 (2.17")	9.5 (0.38")	173 (6.81")	78.5 (3.09")	103.5 (4.07")	115 (4.53")	153 (6.02")	M16 X 2.0"
FKL 150	3" CLAMP	414 (16.30")	17.5 (0.69")	19 (0.75")	326 (12.83")	61 (2.40")	9.5 (0.38")	184 (7.24")	96.5 (3.80")	123.5 (4.85")	121 (4.76")	158.5 (6.24")	M16 X 2.0"
FKL 205	4" CLAMP	419 (16.50")	17.5 (0.69")	19 (0.75")	344 (13.54")	75 (2.95")	12.7 (0.50")	222 (8.74")	88.5 (3.48")	126.5 (4.98")	155 (6.11")	156.5 (6.16")	M16 X 2.0"
FKL 250	4" CLAMP	419 (16.50")	17.5 (0.69")	19 (0.75")	377 (14.84")	65 (2.56")	15.9 (0.63")	234 (9.21")	106.5 (4.19")	144.5 (5.69")	172 (6.77")	151 (5.94")	M16 X 2.0"
FKL 400*	6" CLAMP	482 (18.98")	22 (0.88")	25.5 (1.00")	499.5 (19.66")	80 (3.15")	19 (0.75")	285 (11.22")	81.5 (3.21")	106 (4.17")	234 (9.21")	152.5 (6")	M20 X 2.5"
FKL 580*	6" CLAMP	540 (21.25")	22 (0.88")	25.5 (1.00")	704 (27.72")	135 (5.31")	28 (1.10")	254 (10.00")	148 (5.83")	173 (6.81")	204 (8.03")	209 (8.23")	M20 X 2.5"
FKL 600*	6" CLAMP	540 (21.25")	22 (0.88")	25.5 (1.00")	707 (27.83")	135 (5.31")	28 (1.10")	254 (10.00")	172 (6.77")	197 (7.76")	204 (8.03")	209 (8.23")	M20 X 2.5"

\* Models are not available in split gearbox design. Please visit [www.fristam.com/usa](http://www.fristam.com/usa) for larger model drawings.

1265000609 Rev C



**Designed, Manufactured &  
Assembled in Middleton, WI**





CENTRIFUGAL



POSITIVE DISPLACEMENT



MIXING & BLENDING