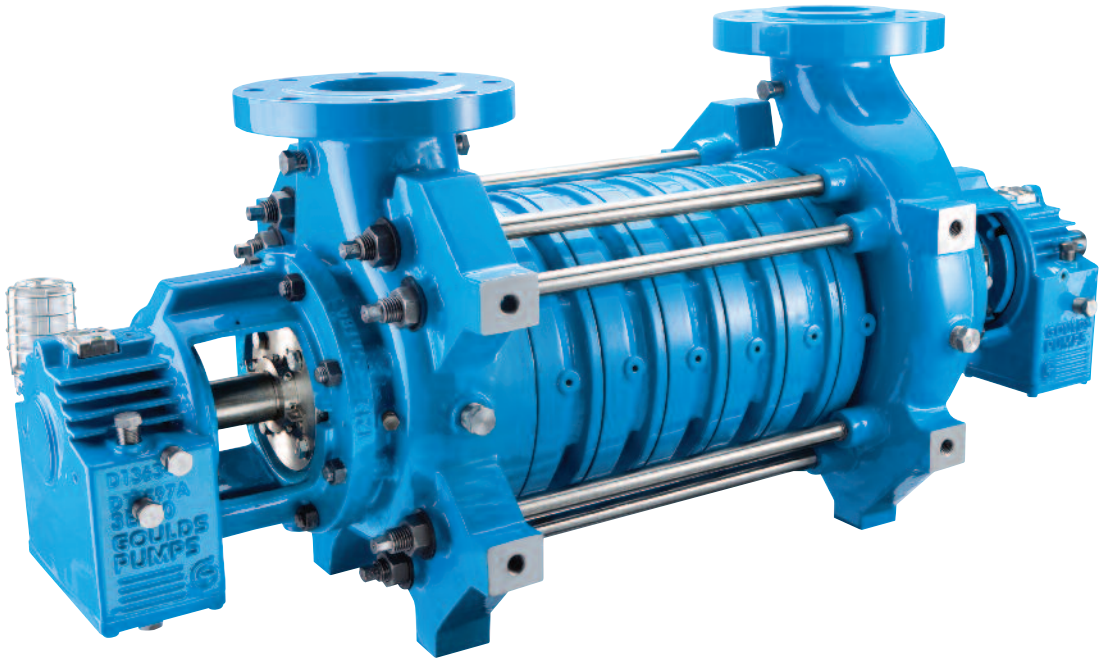
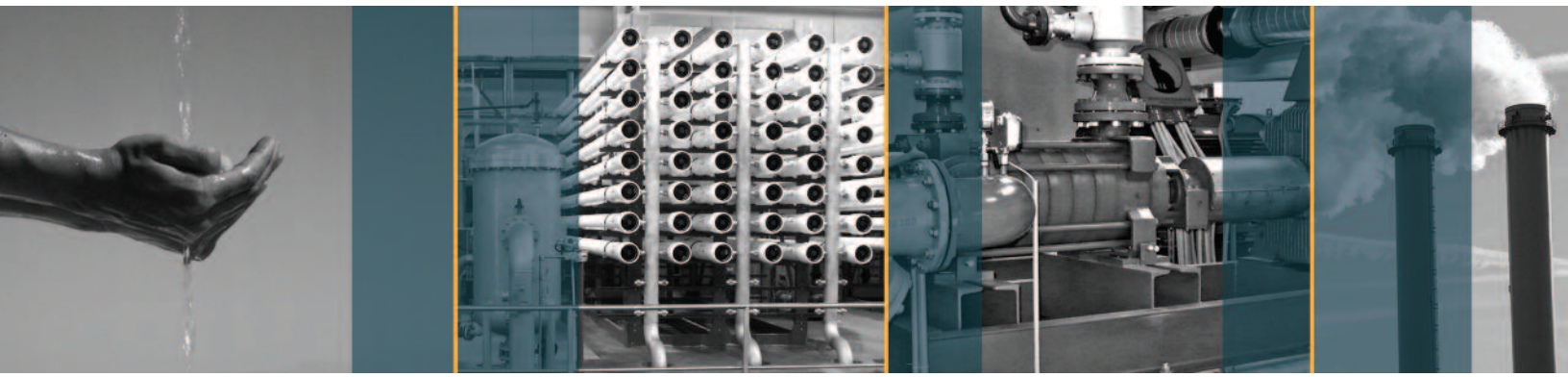
ITT

Goulds Pumps

Goulds 3393

High Pressure, Multistage Ring Section Pumps

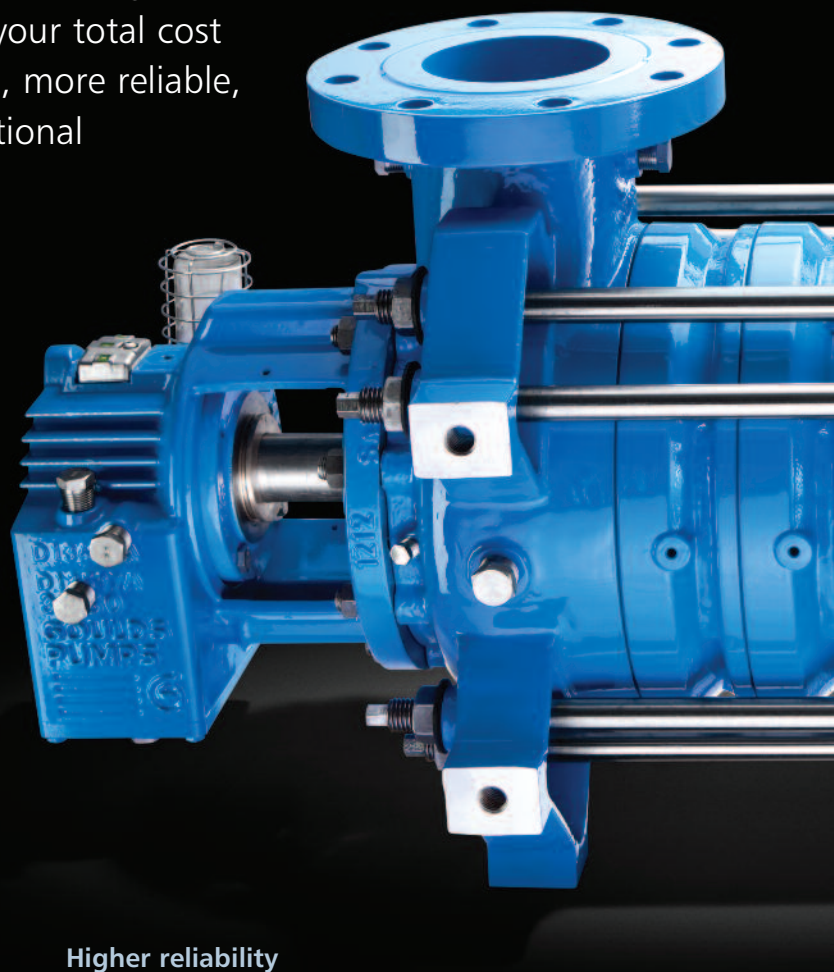




Engineered for life

Lower TCO for demanding, high-pressure applications.

Everything about the new ITT Goulds 3393 multistage ring section pump is designed to minimize your total cost of ownership. Simply put, it's more efficient, more reliable, and less expensive to maintain than conventional high-pressure pumps. Here's why:



Lower energy costs

The 3393 conserves energy by delivering maximum pump efficiency. The integrated diffuser and stagepiece are cast as a single component rather than as two separate pieces. This results in smoother flow transition, which significantly reduces hydraulic losses.

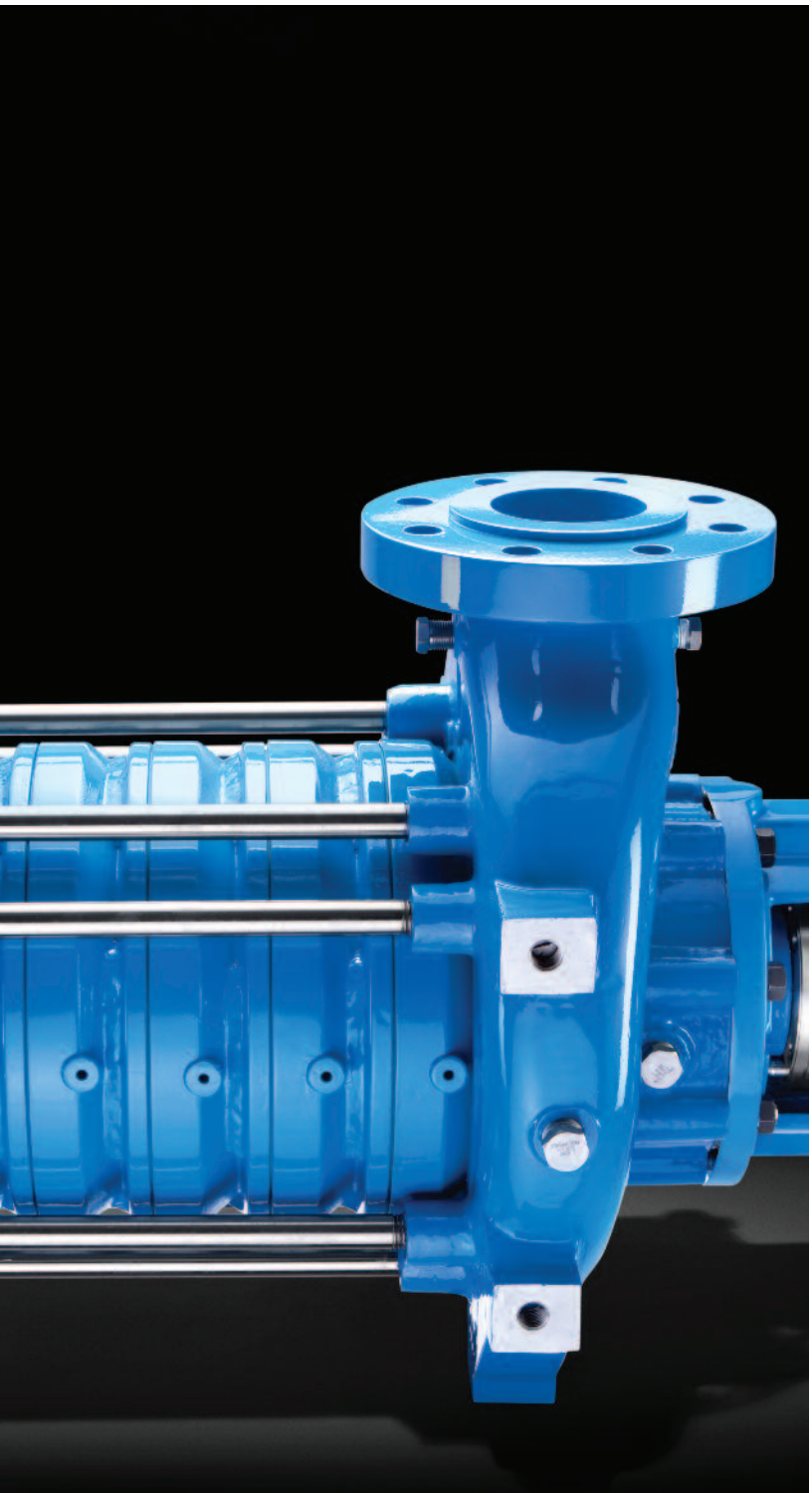
Performance testing on the 3393 has shown a two- to three-point improvement over traditional designs. This added efficiency can mean big energy savings because the same job can be done using less horsepower. For example, a 3393 in continuous operation that consumes 20 less horsepower (15 kW) will save $65,000 over a five-year period if energy costs are $0.10/kWh. A modest initial investment in close clearance PEEK wear rings will save an additional $40,000 over the same period in this application.

Plus, the 3393 doesn't just start efficient, it *stays* efficient. Standard casing rings provide an easily replaceable wear surface to restore original efficiencies.

Higher reliability

Every Goulds 3393 is equipped standard with *i-ALERT*™, an onboard condition monitoring device. It provides a visual indication if vibration and temperature limits are reached by the bearings. This highly reliable early-warning device can avoid a great deal of unplanned downtime and process disruption costs over the life of the pump.

In addition the 3393 has an integrated diffuser and interstage casing which eliminates the fit and machining tolerance between the two parts. A shorter bearing span provides a stiffer shaft with less sag and less chance of wear surface contact at start up. And impellers can be machined to accept impeller wear rings to improve wear resistance and increase useful impeller life. All these things contribute to a more reliable pump.



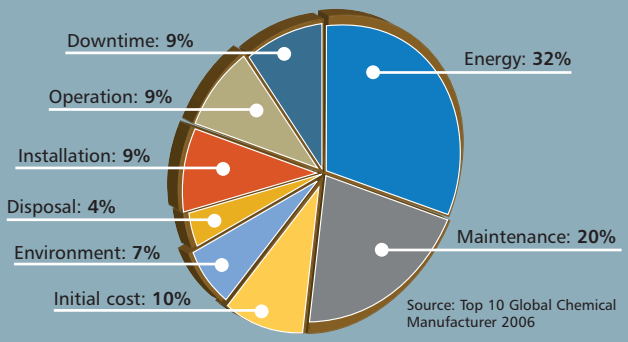
Lower maintenance costs

Maintenance and inspection are simplified in the 3393 because the balance drum is accessible and removable from the discharge side of the pump. To further aid disassembly, puller holes are provided in the major components.

When you examine all the factors, it's clear that the Goulds 3393 from ITT delivers the kind of total cost of ownership savings that desalination plants and other industrial facilities need today.

Choose ITT to always lower your total cost of ownership.

Total cost of ownership is the most comprehensive way to identify the true expenses associated with operating and maintaining pumps and related equipment. Initial price is a small fraction—on average just 10 percent—of what you'll spend to operate equipment over its lifetime.



Of the remaining costs, the majority can be minimized by careful attention to all aspects of owning and operating a pump. Nobody does this better than ITT. Let's take a closer look to see how:

Reliability

With over 160 years of pumping experience, ITT sets the standard for increasing mean time between failures. Plus, with our worldwide sales and service reach you have access to industry experts to resolve your process needs or to evaluate and upgrade your equipment.

What's more, ITT offers innovative ways to keep you in touch with your pumps so you can keep them operating reliably. *i-ALERT*™ provides a simple, early indication of change in a pump's operational signature. PumpSmart® and ProSmart® systems deliver continual feedback and control.

Maintenance

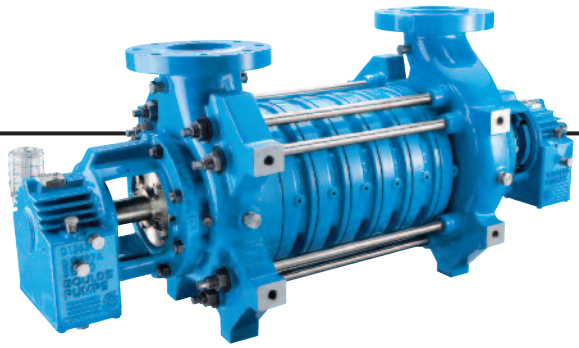
ITT is unrivaled in supplying parts globally. And, because our equipment is easier to inspect and repair than many competitors', you can get up and running quickly and minimize production losses. When repairs are necessary, our modular designs reduce inventory costs while covering a wide hydraulic window. ITT's worldwide presence puts aftermarket services where you most need them to keep your equipment running at peak performance.

Energy

ITT designs for the highest efficiency. Our wide range of models and sizes coupled with multiple hydraulic selections allows us to tailor pump performance to your process. The right pump saves energy and lowers your initial cost.

These factors are just the beginning. ITT has carefully thought out every aspect of total cost of ownership to provide maximum value with every purchase. In addition, we offer a full suite of Plant Performance Services designed to reduce your ownership costs even more.

Specifications



General
- Radially split, segmented casing, multistage pump
- Modular interstage components
- Radial and end suction configuration
- Materials: carbon steel, 12% chrome, duplex and super duplex stainless steels
- High efficiency

Pressure and Temperature Limits
- All: 400˚F
- All: 350 psig suction pressure
- Carbon steel: 1036 psig discharge pressure
- Duplex/super duplex: 1480 psig discharge pressure
- 12% chrome: 1687 psig discharge pressure

Casings
- All flanges raised face per ANSI/ISO or EN/DIN specifications

Suction and discharge casings
- All flanges raised face per ANSI/ISO or EN/DIN specifications
- Radial and end suction available for suction casing
- Product lubricated silicon carbide sleeve bearing for end suction pump
- Through bolting on all flanges
- Dual volute type discharge casing
- Radial suction and discharge casing nozzles positioned in 90˚ increments.
- Casing wear rings standard

Interstage casings
- Rigid, heavy duty parts
- One piece combined continuous channel mulitvane diffuser and stage piece
- Casing wear rings standard

Impellers
- Enclosed type
- Precision investment cast
- Keyed to the shaft
- Dynamically balanced
- Two impeller designs (min) for each pump size
- Optional impeller wear rings
- Optional low NPSH 1st stage impeller

Shafts
- Impeller keyways staggered for better balance
- Suction end drive optional for the radial suction pump

Balancing device
- Involute balance drum for axial thrust balance
- Dual step surface for closer running clearance
- Accessible and removable from the discharge side of the pump

Instrumentation
- Bearing frames pre-machined for temperature and vibration sensors
- *i-ALERT*™ standard

Seals and seal systems
- Single balanced or unbalanced mechanical seals
- Single cartridge mechanical seals
- Standard seal flush plan modified plan 11/13
- Seal chamber accepts a mechanical seal with pumping ring
- Plan 11, 21, 23 available

Bearing housings
- Radial suction pump bearing housings identical on suction and discharge ends
- Inpro VBXX-D™ labyrinth seals are standard
- Bearing housings are finned for additional cooling

Bearings
- End suction front bearing supported in the suction casing
- Heavy duty anti-friction bearings in bearing housings
- Oil lubricated anti-friction bearings

Couplings
- Disc type spacer coupling standard

Coupling guards
- Standard
- Comply with OSHA and EN requirements

Shaft guards
- 304SS expanded metal shaft guards cover bearing housing openings

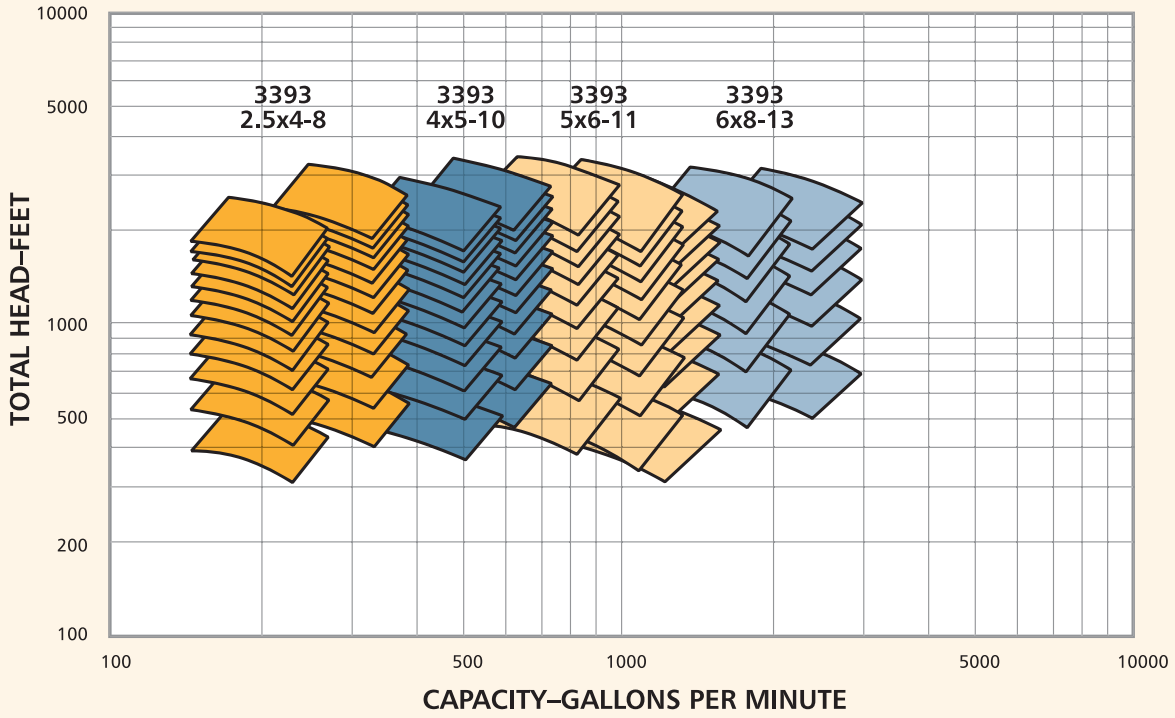
Baseplates
- Rigid fabricated steel design
- Reduced vibration
- Assured positive alignment

Drivers
- Electric motor
- Steam turbine
- Diesel engine
- Speed increasing or reducing gears

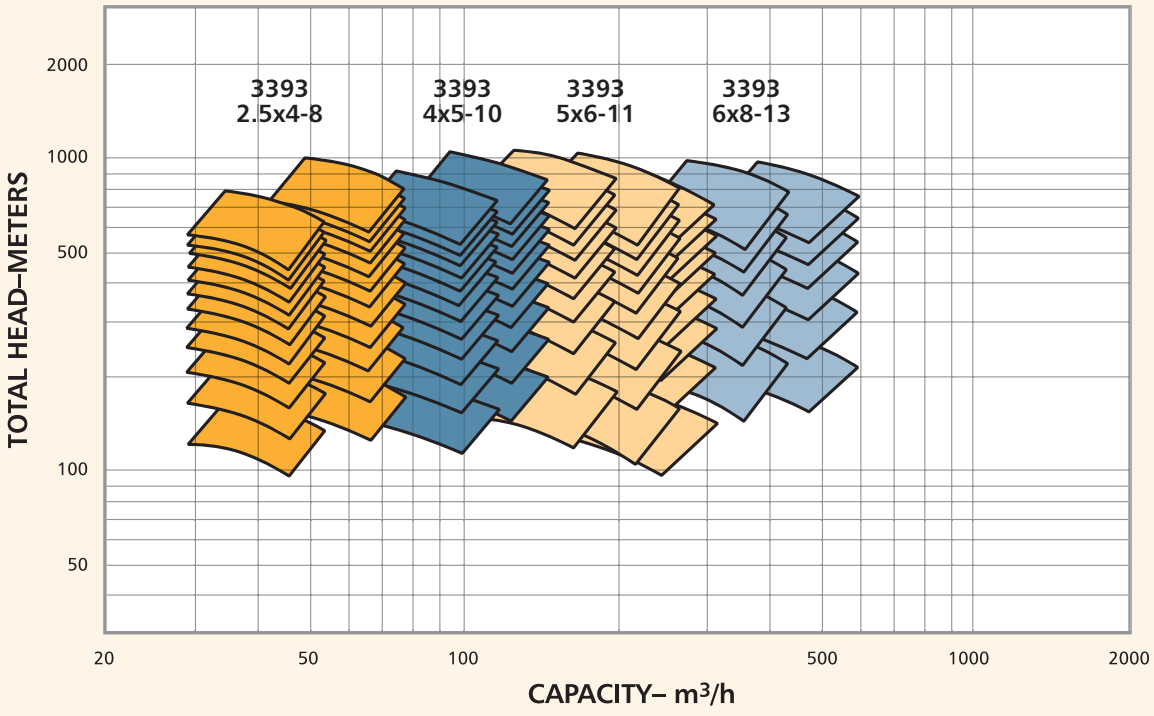
Certifications
- CE marking and ATEX certification

Hydraulic Coverage 3393

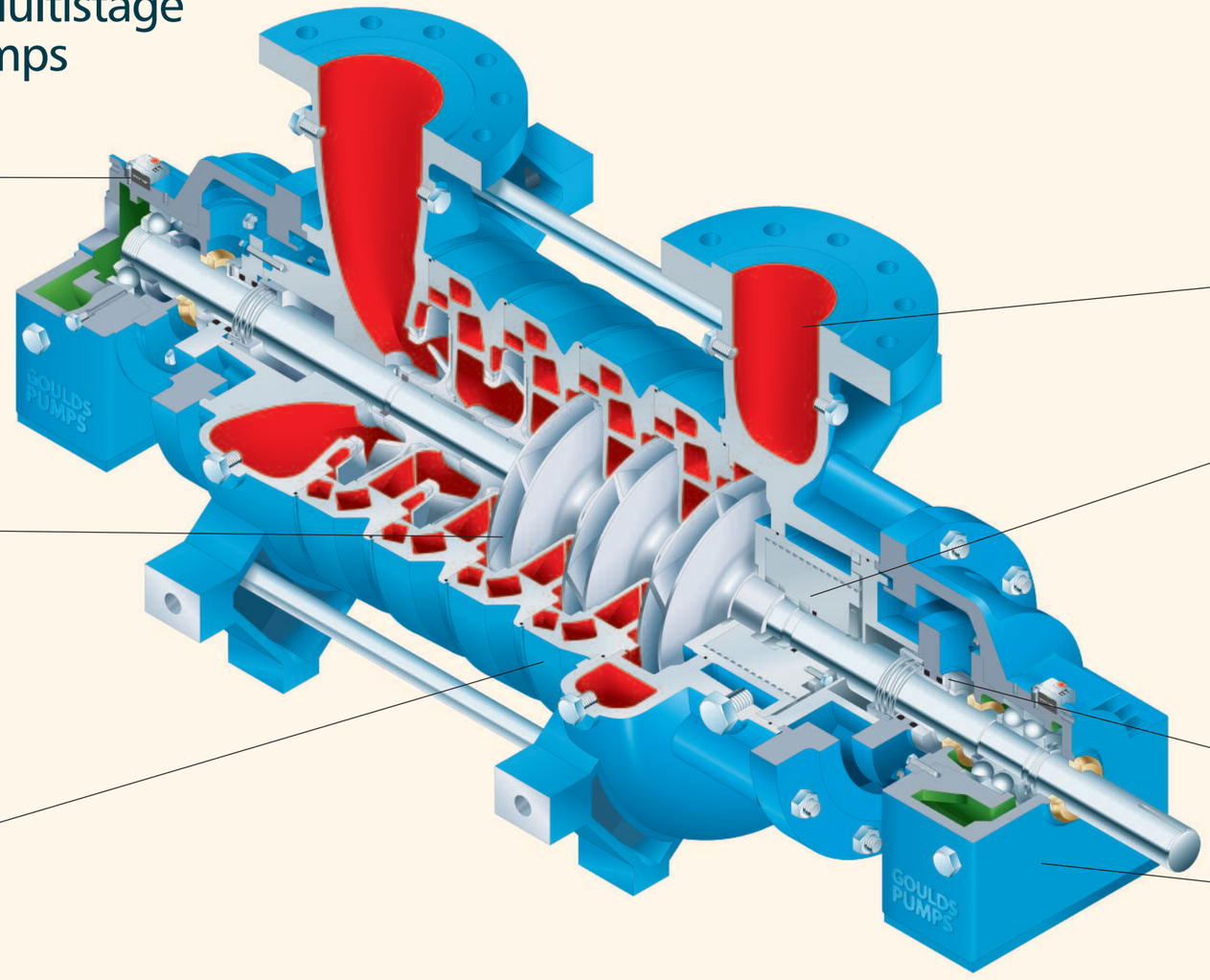
60 Hz

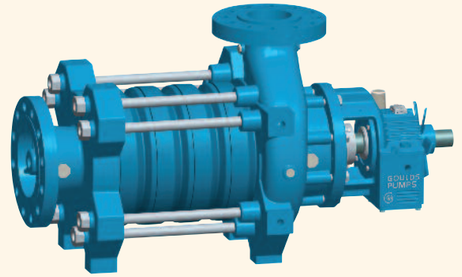


50 Hz



3393
High Pressure, Multistage Ring Section Pumps





The 3393 is also available in end suction configuration.

i-ALERT™ CONDITION MONITOR

- Proprietary on-board condition monitoring integrated with bearing housings is standard
- Early visual indication of operating performance facilitates proactive maintenance practices

PRECISION CAST IMPELLER

- Optional impeller wear ring renews efficiencies to as-new condition
- Multiple hydraulic designs maximize efficiency for customer applications

PRECISION CAST CONTINUOUS CHANNEL DIFFUSER/STAGE CASING

- Integrated design simplifies alignment for ease of maintenance
- Smooth flow transition reduces hydraulic losses

DUAL VOLUTE TYPE DISCHARGE CASING

- Improved efficiency
- Lower radial loads

INVOLUTE BALANCE DRUM

- Involute configuration reduces installation footprint
- Accessibility from discharge side simplifies maintenance
- Dual step surface yields reliability under all conditions

SEAL CHAMBER

- Accepts a range of mechanical seals and piping plans

RUGGED BEARING HOUSING

- Finned for additional cooling
- Instrumentation ready
- Heavy duty anti-friction bearings

DESIGNED TO MINIMIZE YOUR TOTAL COST OF OWNERSHIP

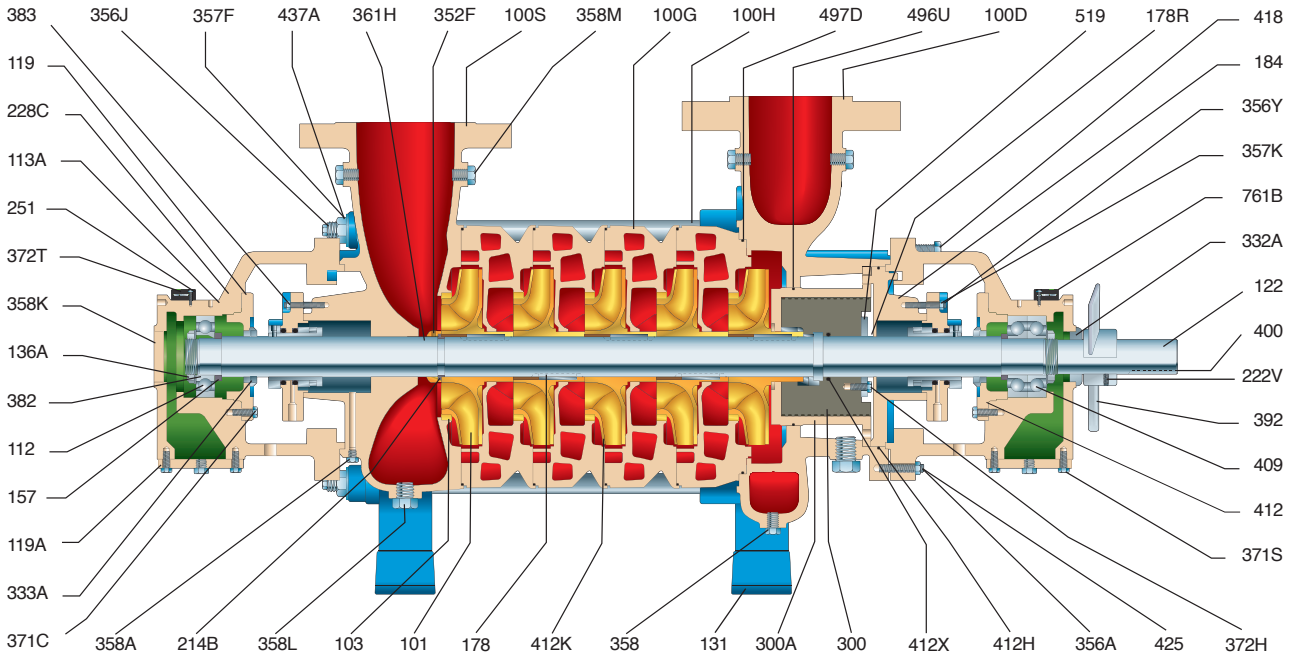
FEATURES

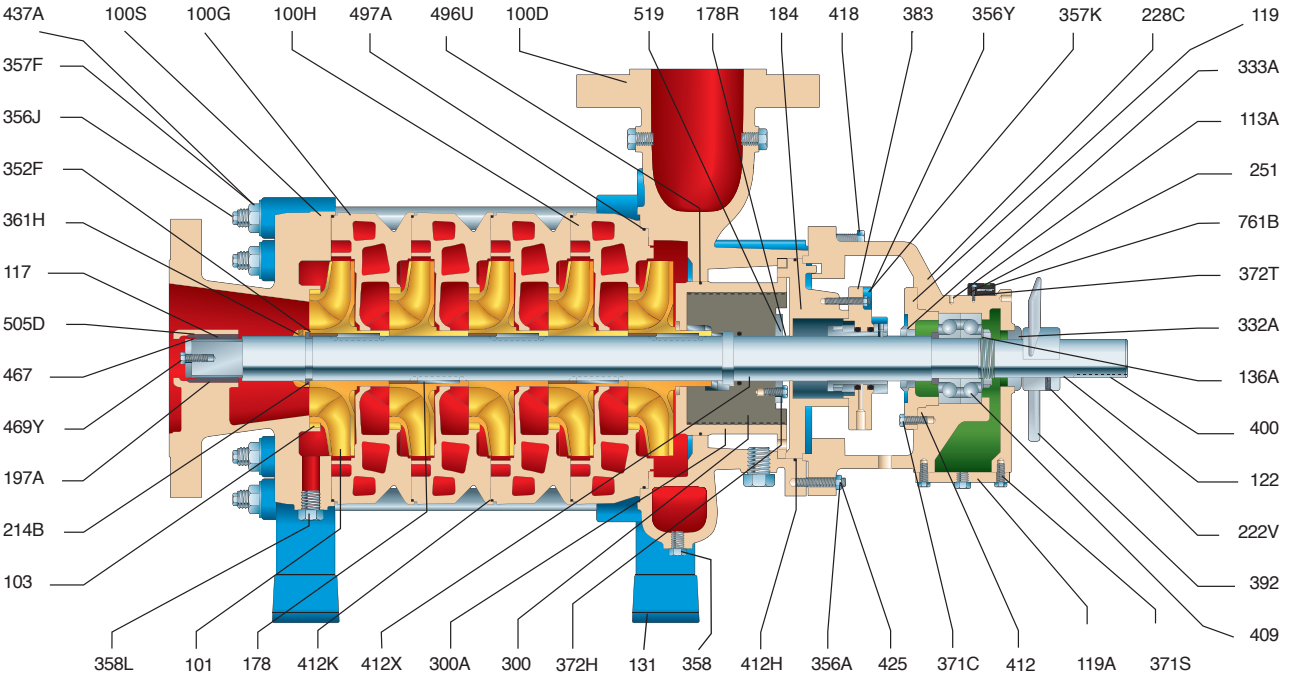
- Designed for world class efficiency and reliability
- Precision cast components
- Modular design
- End or radial suction configurations
- Multiple hydraulics
- Multiple nozzle orientations for radial suction pump

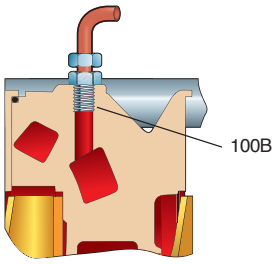
APPLICATIONS

- Reverse osmosis
- Boiler feed
- Cogeneration
- Shower/Spray service
- Pressure boosting
- High pressure cleaning
- Snow making

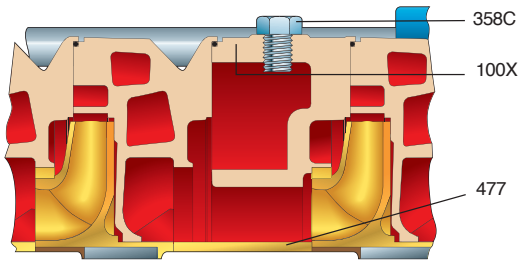
Sectional View 3393



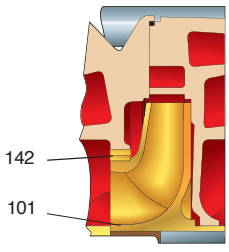




3393 Optional Tapping



3393 Optional Interstage



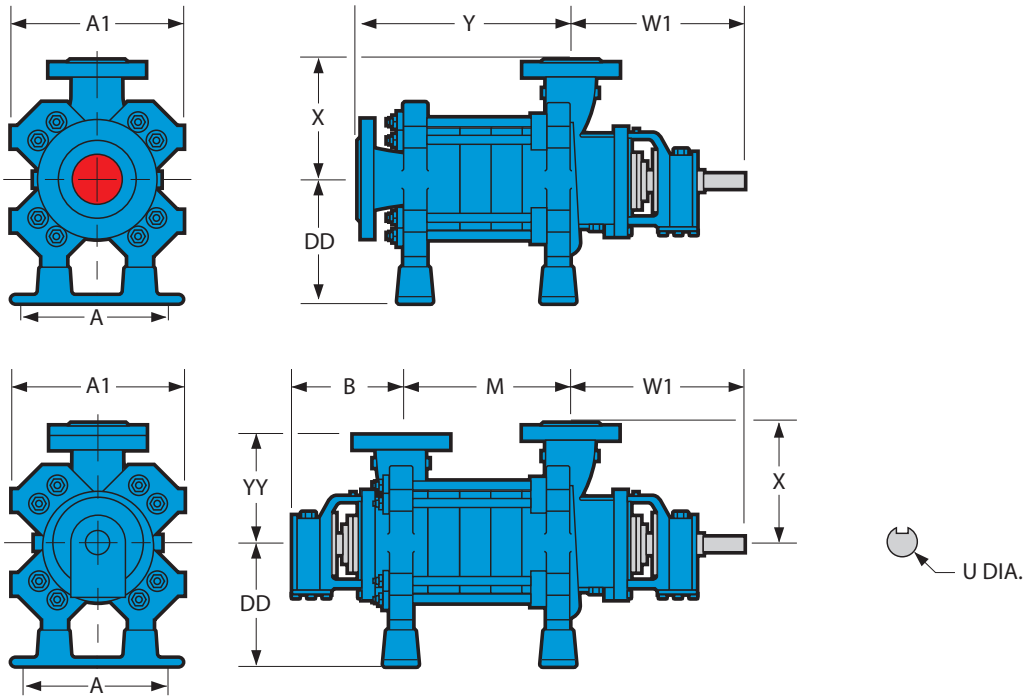
3393 Optional Impeller Wear Rings

Parts List and Materials of Construction

Item Number	Description	Materials				
		Duplex	Super Duplex	Chrome Steel	Carbon Steel chrome fitted	Carbon Steel
100B	1st Stage Remachine for Plan 11 takeoff	Duplex SS	Super Duplex SS	12 Chrome	Carbon Steel	
100D	Casing (Discharge)	Duplex SS	Super Duplex SS	12 Chrome	Carbon Steel	
100G	Casing (Stage)	Duplex SS	Super Duplex SS	12 Chrome	Carbon Steel	
100H	Casing (Final Stage)	Duplex SS	Super Duplex SS	12 Chrome	Carbon Steel	
100S	Casing (Suction)	Duplex SS	Super Duplex SS	12 Chrome	Carbon Steel	
100X	Casing (Destaging and Takeoff)	Duplex SS	Super Duplex SS	12 Chrome	Carbon Steel	
101	Impeller (Series)	Duplex SS	Super Duplex SS	12 Chrome		Carbon Steel
103	Case Wear Ring (Standard Clearance)	PEEK		420 SS +PEEK		
112	Ball Bearing (Radial)	Steel				
113A	Breather	Steel				
117	Bearing Sleeve	Silicon Carbide				
119	Cover (Bearing Housing)	Ductile Iron				
119A	Cover (Bearing Housing Sump)	Steel				
122	Shaft	Duplex SS		17-4 PH		
131	Foot	Steel				
136A	Bearing Nut	Steel				
142	Impeller Wear Ring	Duplex SS		17-4 PH		
157	Spacer Sleeve	Carbon Steel				
178	Key (Impeller)	Duplex SS		17-4 PH		
178R	Key (Balance Drum)	Duplex SS		17-4 PH		
184	Seal Chamber	Duplex SS	Super Duplex SS	12 Chrome	Carbon Steel	
197A	Bearing Bushing	Silicon Carbide				
214B	Split Ring	Duplex SS		17-4 PH		
222V	Set Screw (Fan)	316 SS				
228C	Bearing Housing	Ductile Iron				
251	Oiler (Constant Level)	Aluminum/Glass				
300	Balance Drum	Duplex SS	Super Duplex SS	12 Chrome		Carbon Steel
300A	Balance Drum Stator	Duplex SS	Super Duplex SS	12 Chrome		Carbon Steel
301	Impeller (Option - Low NPSH 1st Stage)	Duplex SS	Super Duplex SS	12 Chrome		Carbon Steel
332A	Bearing Isolator (Outboard)	Bronze/Viton				
333A	Bearing Isolator (Inboard)	Bronze/Viton				
352F	Set Screw (Retaining Ring)	20Cb3 SS		316 SS		
356A	Stud (Bearing Housing to Suction/Discharge Casing)	Alloy Steel				
356J	Tie Rod	4140 Steel				
356Y	Stud (Seal Chamber)	316 SS				
357F	Nut (Tie Rod)	Alloy Steel				
357K	Nut (Seal Chamber)	316 SS				
358	Drain Plug (Casing)	20Cb3 SS		316 SS	Carbon Steel	
358A	Plug (Seal Chamber Flush)	20Cb3 SS		316 SS	Carbon Steel	
358C	Plug (Casing Destaging)	20Cb3 SS		316 SS	Carbon Steel	
358K	Plug (Bearing Housing Opening)	Carbon Steel				
358L	Plug (Balance Return)	20Cb3 SS		316 SS	Carbon Steel	
358M	Plug (Casing Branch Tapping)	20Cb3 SS		316 SS	Carbon Steel	
361H	Retaining Ring	Duplex SS		17-4 PH		
371C	Cap Screw (Bearing Housing Cover)	316 SS				
371S	Cap Screw (Bearing Housing Sump Cover)	316 SS				
372H	Cap Screw (Balance Drum Locking Plate)	20Cb3 SS		316 SS		
372T	Cap Screw (i-ALERT to Bearing Housing)	316 SS				
382	Lockwasher (Thrust, Radial Bearing)	Steel				
383	Mechanical Seal					
392	Fan (Bearing Cooling)	Aluminum				
400	Key (Coupling)	1018 Steel				
409	Ball Bearing (Thrust)	Steel				
412	O Ring (Bearing Housing Cover)	Buna-N				
412H	O Ring (Seal Chamber)	EPDM				
412K	O Ring (Stage Casing)	EPDM				
412X	O Ring (Balance Drum)	EPDM				
418	Cap Screw (Bearing Housing Jacking)	316 SS				
424	Screw (Plate to Casing/Frame)	304 SS				
425	Nut (Bearing Housing to Pump Casing)	Alloy Steel				
437A	Washer (Tie Rod)	Carbon Steel				
467	Retaining Plate (Bearing Bushing)	Duplex SS		17-4 PH		
469Y	Cap Screw (Retaining Plate to Shaft)	20Cb3 SS		316 SS		
477	Sleeve (Destaging and Takeoff)	Duplex SS		17-4 PH		
496U	O Ring (Balance Drum Stator)	EPDM				
497D	O Ring (Discharge Casing)	EPDM				
499	Guard (Shaft Seal)	304 SS				
505D	Tolerance Ring (Bearing Sleeve)	Hastelloy C				
519	Locking Plate (Balance Drum)	Super Duplex SS		12 Chrome		
534C	Bolt Retainer (Guard to Bearing Housing)	Steel				
569F	Cap Screw (Guard to Bearing Housing)	316 SS				
761B	*i-ALERT*™ Condition Monitor	Stainless Steel/Epoxy				

Dimensions 3393

All dimensions in inches and (mm). Not to be used for construction.



DIMENSIONS												
	Suction Flange (in.)		Discharge Flange (in.)	A	A1	U	DD	X	YY	W1	B
Size	ES	RS	ES / RS								
2.5x4-8A, B	5 (125)	4 (125)	2.5 (65)	14.25 (362)	17.32 (440)	1.46 (37)	12.50 (318)	10.43 (265)	10.43 (265)	18.00 (457)	13.36 (339)
4x5-10A, B	6 (150)	5 (125)	4 (125)	15.50 (394)	20.08 (510)	1.65 (42)	14.25 (362)	13.58 (345)	11.81 (300)	18.54 (471)	13.78 (350)
5x6-11A, B, C	8 (200)	6 (150)	5 (125)	17.50 (445)	23.23 (590)	2.05 (52)	16.00 (406)	15.55 (395)	13.98 (355)	23.12 (587)	15.02 (382)
6x8-13A	10 (250)	8 (200)	6 (150)	19.75 (502)	28.75 (730)	2.60 (66)	18.25 (464)	17.52 (445)	17.24 (438)	25.00 (635)	16.97 (431)
6x8-13B	10 (250)	8 (200)	6 (150)	19.75 (502)	28.75 (730)	2.60 (66)	18.25 (464)	19.09 (485)	17.24 (438)	25.00 (635)	16.97 (431)

		NUMBER OF STAGES												
		2	3	4	5	6	7	8	9	10	11	12	13	14
2.5x4-8A	Y	9.36 (238)	11.52 (293)	13.88 (353)	16.15 (410)	18.41 (468)	20.68 (525)	22.94 (583)	25.21 (640)	27.47 (698)	29.74 (755)	32.00 (813)	34.26 (870)	36.52 (928)
	M	5.86 (149)	8.12 (206)	10.39 (264)	12.65 (321)	14.91 (379)	17.18 (436)	19.44 (494)	21.71 (551)	23.97 (609)	26.23 (666)	28.50 (724)	30.76 (781)	33.03 (839)
2.5x4-8B	Y	9.62 (244)	12.16 (309)	14.70 (373)	17.24 (438)	19.78 (502)	22.32 (567)	24.86 (631)	27.40 (696)	29.94 (760)	32.48 (825)	35.02 (890)	37.56 (954)	40.10 (1019)
	M	6.12 (155)	8.66 (220)	11.20 (284)	13.74 (349)	16.28 (414)	18.82 (478)	21.36 (543)	23.90 (607)	26.43 (671)	28.97 (736)	31.51 (800)	34.05 (865)	36.59 (929)
4x5-10A	Y	11.82 (300)	14.64 (372)	17.45 (443)	20.27 (515)	23.08 (586)	25.90 (658)	28.72 (729)	31.53 (801)	34.34 (872)	37.16 (944)	39.97 (1015)	42.79 (1087)	45.60 (1158)
	M	7.05 (179)	9.87 (251)	12.68 (322)	15.50 (394)	18.31 (465)	21.13 (537)	23.94 (608)	26.76 (680)	29.57 (751)	32.39 (823)	35.20 (894)	38.02 (966)	40.83 (1037)
4x5-10B	Y	11.69 (297)	14.82 (376)	17.95 (456)	21.08 (535)	24.20 (615)	27.33 (694)	30.46 (774)	33.59 (853)	36.72 (933)	39.85 (1012)	42.98 (1092)	46.11 (1171)	
	M	7.36 (187)	10.49 (266)	13.62 (346)	16.75 (425)	19.88 (505)	23.01 (584)	26.14 (664)	29.27 (743)	32.40 (823)	35.53 (902)	38.65 (982)	41.78 (1061)	
5x6-11A	Y	14.57 (370)	18.50 (470)	22.43 (570)	26.36 (670)	30.29 (769)	34.22 (869)	38.15 (969)	42.08 (1069)	46.01 (1169)				
	M	9.42 (239)	13.36 (339)	17.30 (439)	21.24 (539)	25.18 (640)	29.12 (740)	33.06 (840)	37.00 (940)	40.94 (1040)				
5x6-11B	Y	14.57 (370)	18.50 (470)	22.43 (570)	26.36 (670)	30.29 (769)	34.22 (869)	38.15 (969)	42.08 (1069)	46.01 (1169)				
	M	9.42 (239)	13.36 (339)	17.30 (439)	21.24 (539)	25.18 (640)	29.12 (740)	33.06 (840)	37.00 (940)	40.94 (1040)				
5x6-11C	Y	15.34 (390)	19.67 (500)	24.00 (610)	28.33 (720)	32.66 (830)	36.99 (940)	41.32 (1050)	45.65 (1160)	49.98 (1269)				
	M	10.20 (259)	14.53 (369)	18.86 (479)	23.19 (589)	27.52 (699)	31.85 (809)	36.18 (919)	40.51 (1029)	44.84 (1139)				
6x8-13A	Y	17.39 (442)	22.10 (561)	26.81 (681)	31.52 (801)	36.23 (920)	40.94 (1040)							
	M	11.61 (295)	16.32 (415)	21.03 (534)	25.74 (654)	30.45 (773)	35.16 (893)							
6x8-13B	Y	18.32 (465)	23.63 (600)	28.94 (735)	34.25 (870)	39.56 (1005)	44.87 (1140)							
	M	12.30 (312)	17.61 (447)	22.92 (582)	28.23 (717)	33.54 (852)	38.85 (987)							

Full Portfolio of Multistage Pumps

Ring Section

Model 3393

Model 3355

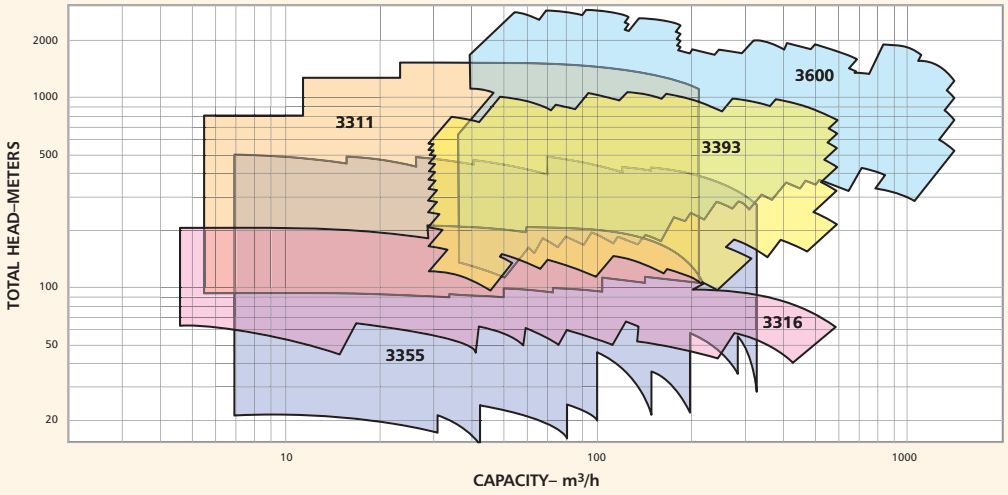
Model 3311

Axially Split

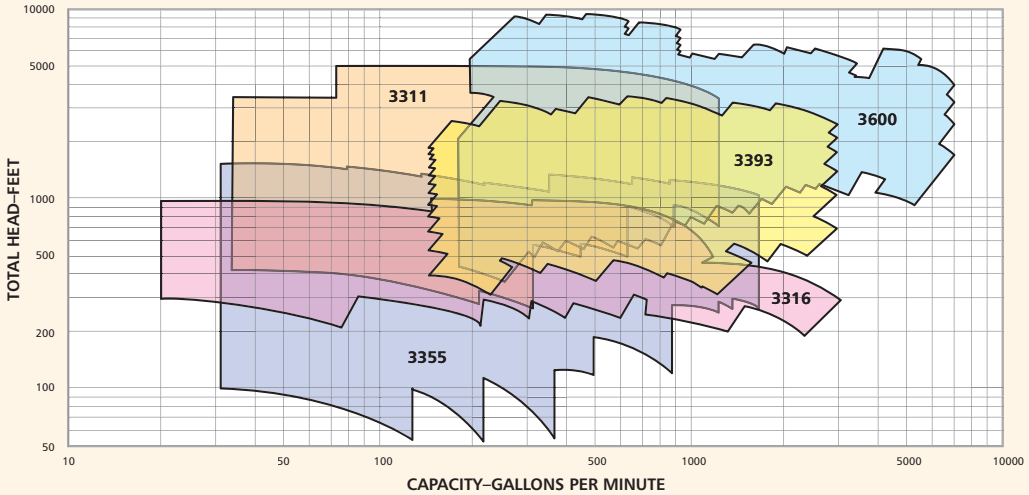
Model 3600

Model 3316

50 Hz



60 Hz



PRO Services® Extending Equipment Life...

Product Repair (all types and brands of rotating equipment)

- Service Center Repair
- Field Service
- Parts Supply

Reliability Improvement

- Inventory Management
- Replacement/Exchange
- Turnkey Repair/Installation
- Training

Optimization of Assets

- Predictive Analysis/Condition Monitoring
- Root Cause Failure Analysis
- Pump & System Assessments
- Upgrades – Mechanical & Hydraulic
- Maintenance Management/Contract Maintenance

- Technical Expertise
- Factory Trained Service Personnel
- Quality
- Fast Turnaround
- Emergency Service – 24 hours/day, 7 days/week
- ISO and Safety Certified

PROSMART

ProSmart® provides continuous machinery monitoring to identify little problems before they become big problems…like downtime. Using wireless technology, advanced signal processing capabilities, and easy-to-deploy sensors, ProSmart offers an affordable means to monitor all of your rotating equipment anywhere in the world. By identifying and alerting you to changes in operating conditions, ProSmart increases your time to respond to either correcting the upset condition, or properly plan its repair.

Key Features include:

- Continuous data acquisition and analysis – ProSmart collects vibration, temperature, and available process conditions every five seconds; saving you time from routine data collection.
- Automatic Notification and Accessibility – By alerting when a machine goes into distress, you are able to focus your resources on recovery activities. The ProNet web-hosted solution allows access to information anywhere in the world through a standard Internet browser connection.
- Advanced diagnostic tools – More than simple overall data, ProSmart provides advanced analysis capabilities such as time-waveform, spectral, and spectral windowing.
- Easy to deploy – Using plug and play sensors, wireless connectivity, and an industrially hardened enclosure, ProSmart can be easily deployed throughout your plant, including hazardous areas.

Aftermarket

Global Parts Network

- Over 10,000 unique parts and $100 million in inventory
- Parts stocked in more than 75 locations around the world
- 98% on-time performance
- All inventories in a single electronic network

Parts Advantage

- OEM tolerances every time
- 99.9% parts-quality-rating
- Goulds OEM parts deliver the best long-term value

Visit our Web site at www.gouldspumps.com

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