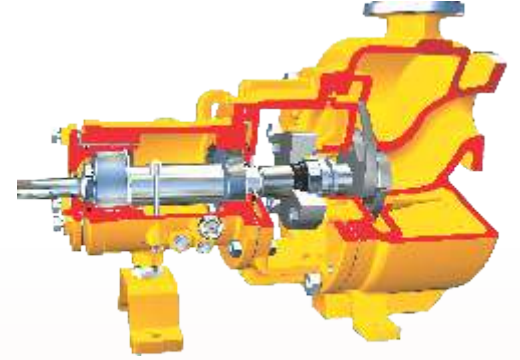
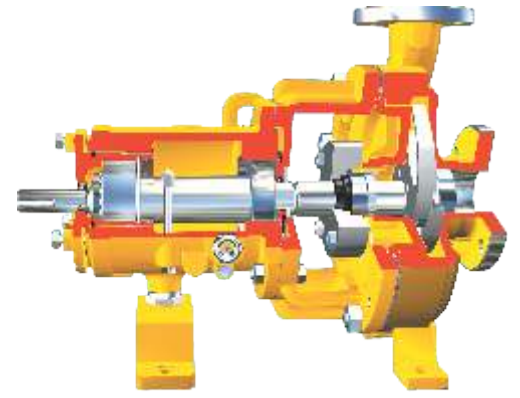




# MICROFINISH

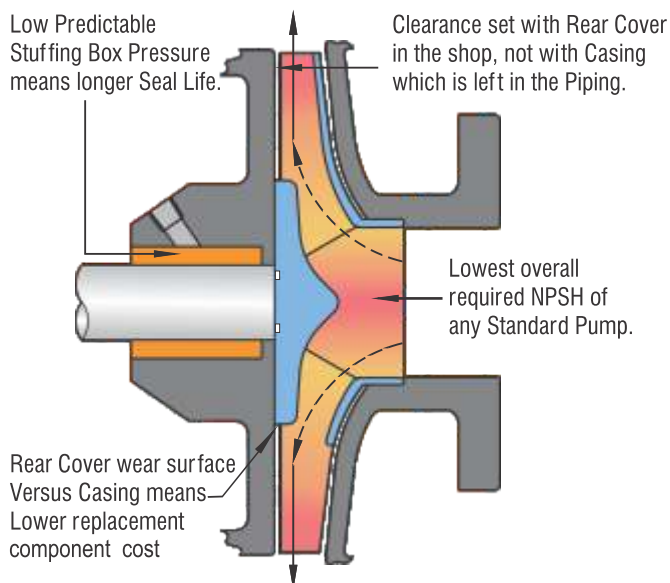
## ASME PROCESS PUMPS



**RWTÜV**



## IMPELLERS



### Unique Advantages of Reverse Vane Impeller

Reverse Vane Impeller (semi open) deliver Unequalled Efficiency and Performance. This Exclusive Impeller Design Extends Bearing as well as Seal Life.

- **Low, Predictable Stuffing Box Pressure and Thrust Loads** - Resulting from Back Vane Pumping Action and Balance Holes.
- **Low Required NPSH** - Provides Efficient Pumping even in marginal NPSH conditions minimizing cavitation problems.
- **Stuffing Box Cover Wear Surface** - as the Flow Path exits at the Rear of the Impeller, thus Abrasive Wear on the Rear Cover rather than on more Expensive Casing.

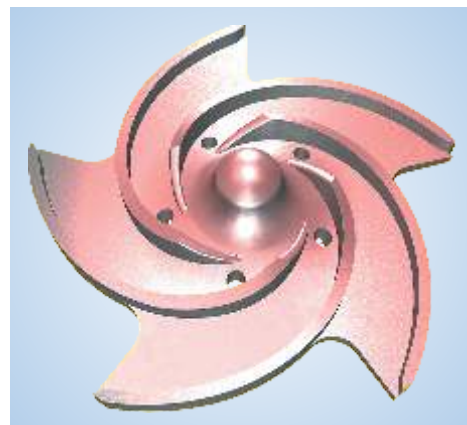
- **In-shop Impeller Adjustment** with the only Impeller Design that takes full advantage of the back pull out feature. Since the critical running clearance is set between the Rear of the Impeller and the Rear Cover. Both Impeller and Mechanical Seal settings can be done in the Shop, "on the bench," instead of under adverse field conditions.
- **Repeatable Performance Assurance** - with the only Impeller Design that offers repeatability in Seal Chamber Pressure and Bearing Thrust Loads.



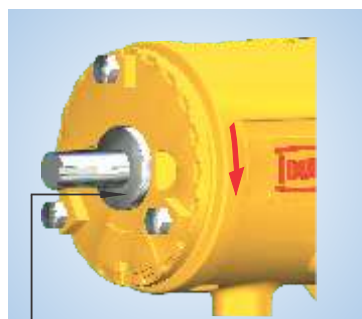
**In-shop Impeller Adjustment...**practical as well as productive!



**Exclusive Reverse Vane Impeller**  
With balance holes offers improved performance and reducing maintenance time.  
The only ASME Pump Impeller Design that offers repeatable Pump performance throughout the life of the Pump.



**Front Vane Open Style Impeller (Optional)**  
is fully interchangeable with the Reverse Vane Impeller. Excellent choice for Slurry, Stringy and Certain applications requiring high shear against the casing.



**Inpro VBX bearing isolator**  
(ASME 3A Power- End)

### Recognized Worldwide as the Premier Name in ASME Chemical Process Pumps

The advanced design and precision manufacture of the rugged, heavy-duty Mark III Chemical service Pump significantly Enhances Bearing and Seal Life.

It is committed to help users maximize mean time between planned maintenance (MTBPM).

The Unique Features and Enhancements of Durco - Microfinish Pumps provide significant Performance benefits for Pump users.

### A Choice of Power Ends

- Standard Mark III Power Ends with oil seals.
- ASME 3A Power Ends (shown here) featuring Inpro VBX bearing isolators and up to a three-year performance guarantee.

### Truest Running ASME Pump

- Four precision machined metal-to-metal fit locations. (See on page 6 & 7) Other manufacturers offer only two or three machined fits.
- Precision machined metal-to-metal cap bearing housing reduces stack-ups to improve shaft concentricity.
- Superior to jackscrew designs which can cause cocking.
- Extends bearing and Mechanical Seal Life.

The Mark III ASME Standard Process Pumps cover a broad hydraulic range.

### Twenty Nine Sizes

- Two (2). Group 0-K
- Five (5). Group 1K
- Fifteen (15). Group 2K
- Seven (7). Group 3K

### Capacities

- 0.6 m<sup>3</sup>/h to 1390 m<sup>3</sup>/h

### Head

- 3 m to 152 m (See pages 3 & 4 for Component Interchangeability & Performance Data.)

### Fastest Maintenance Turnaround Time

- Micrometer type Shaft and Impeller Adjustment Accurately Sets Impeller clearance to rear cover in 20 seconds...in the shop or Field.
- Mechanical Seals and all critical settings can be accurately set in the shop or field.

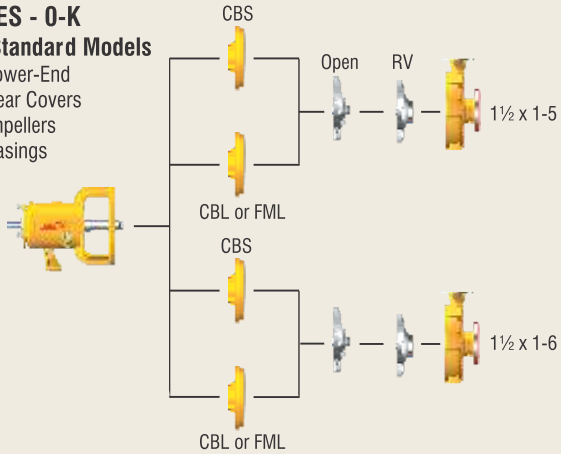
# MARK III PROCESS PUMP INTERCHANGEABILITY



## SERIES - 0-K

### Two Standard Models

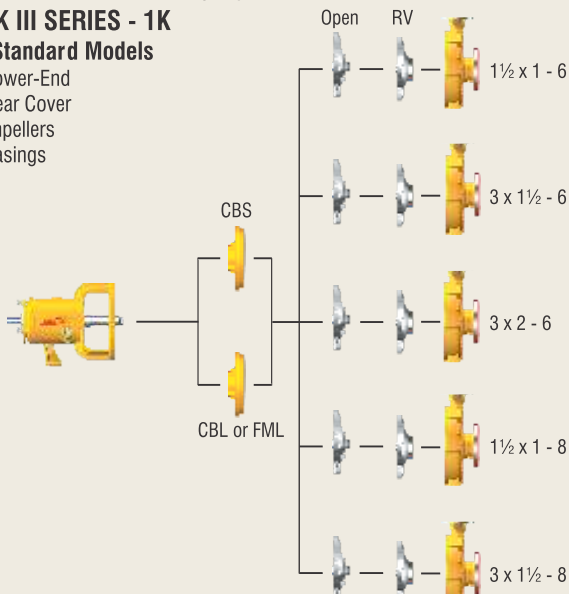
One Power-End  
Two Rear Covers  
Two Impellers  
Two Casings



## MARK III SERIES - 1K

### Five Standard Models

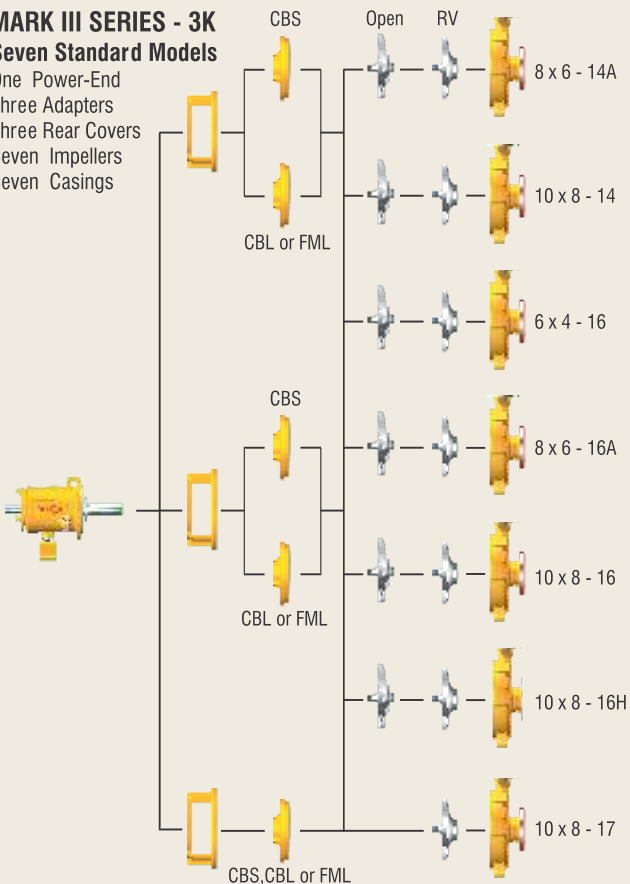
One Power-End  
One Rear Cover  
Five Impellers  
Five Casings



## MARK III SERIES - 3K

### Seven Standard Models

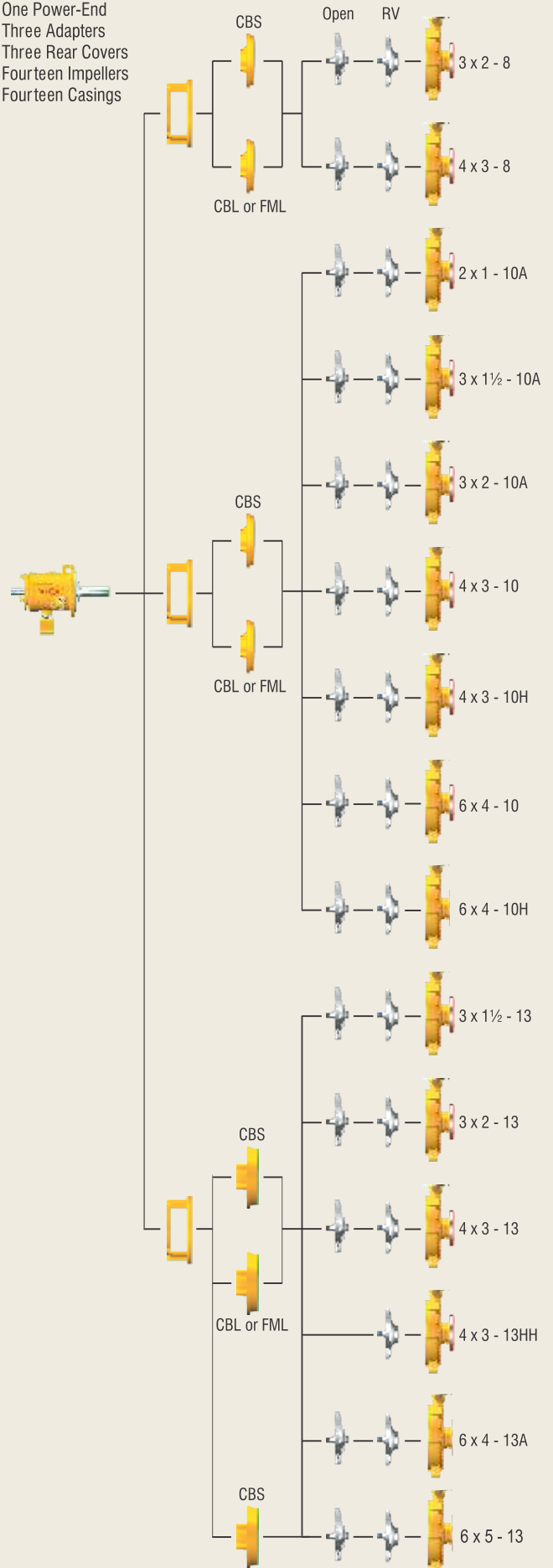
One Power-End  
Three Adapters  
Three Rear Covers  
Seven Impellers  
Seven Casings



## MARK III SERIES - 2K

### Fourteen Standard Models

One Power-End  
Three Adapters  
Three Rear Covers  
Fourteen Impellers  
Fourteen Casings

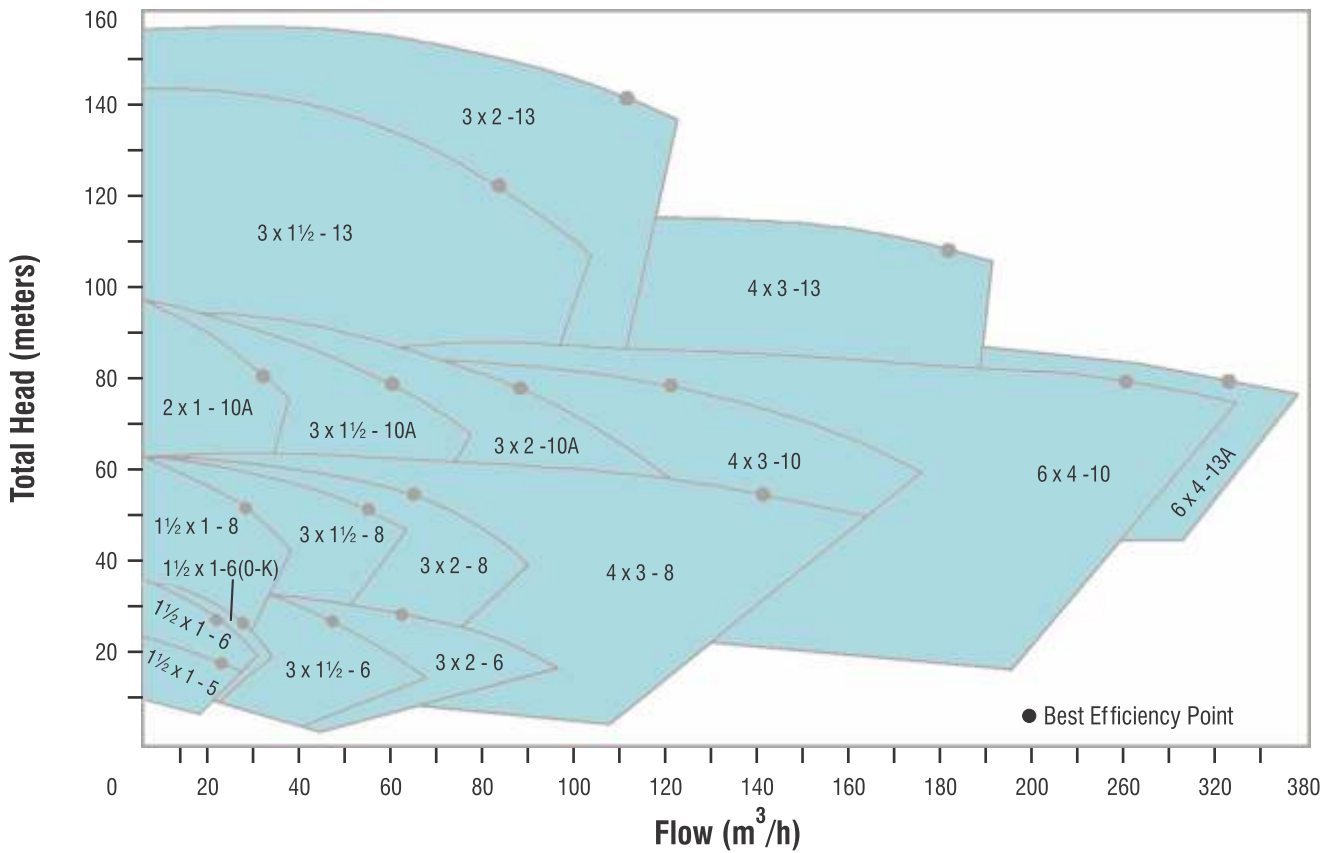


# MARK III PROCESS PUMP

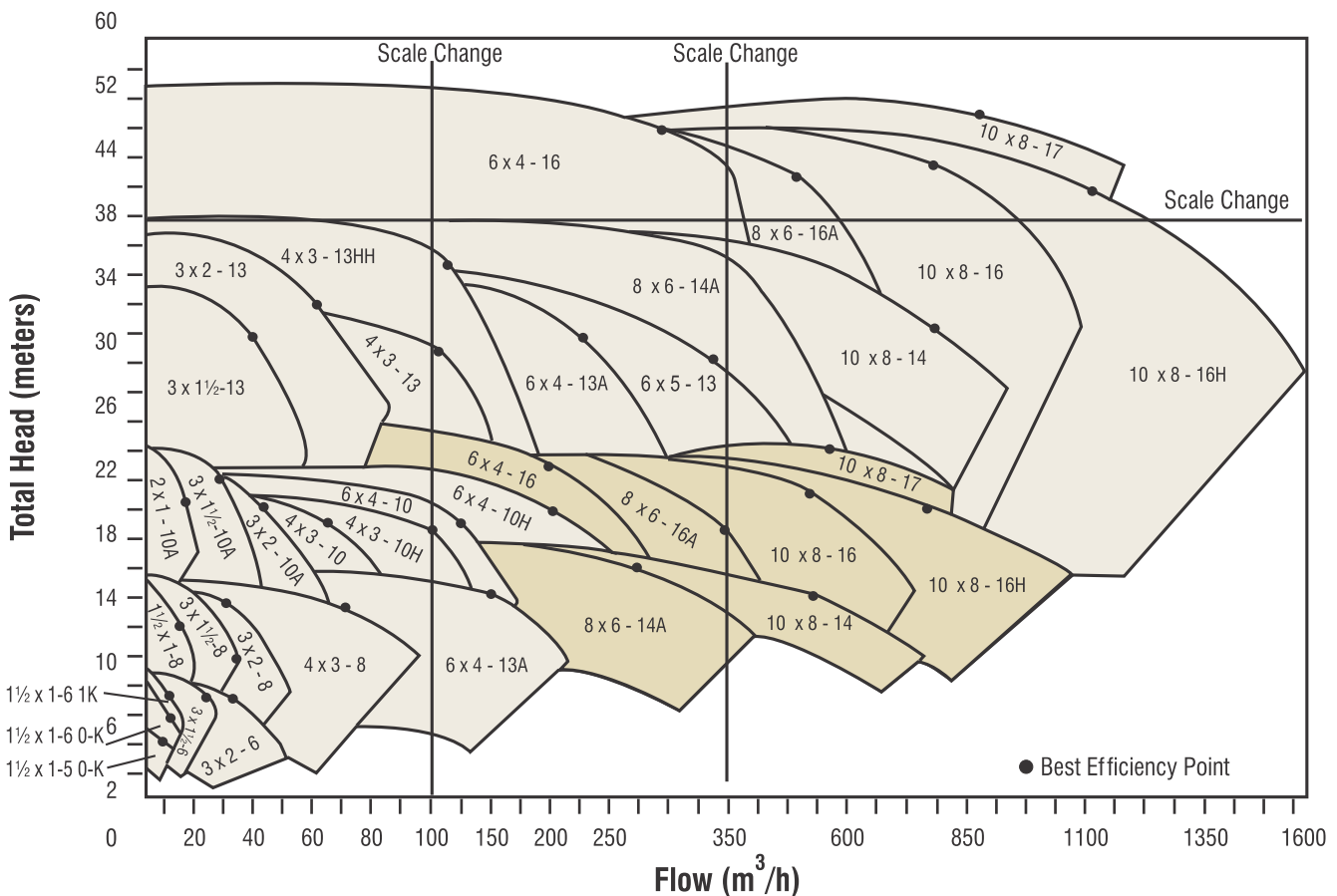
## SELECTION PERFORMANCE CURVES



2900 RPM



● 1450 and ● 960 RPM



# MARK III ASME PROCESS PUMP



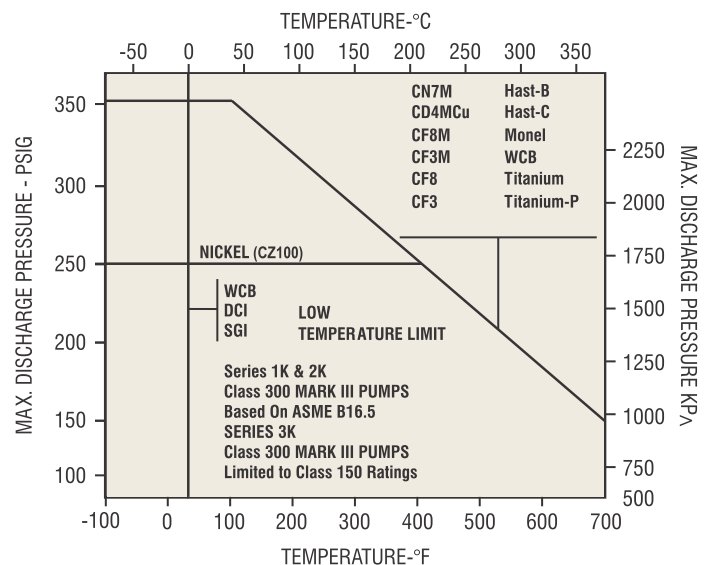
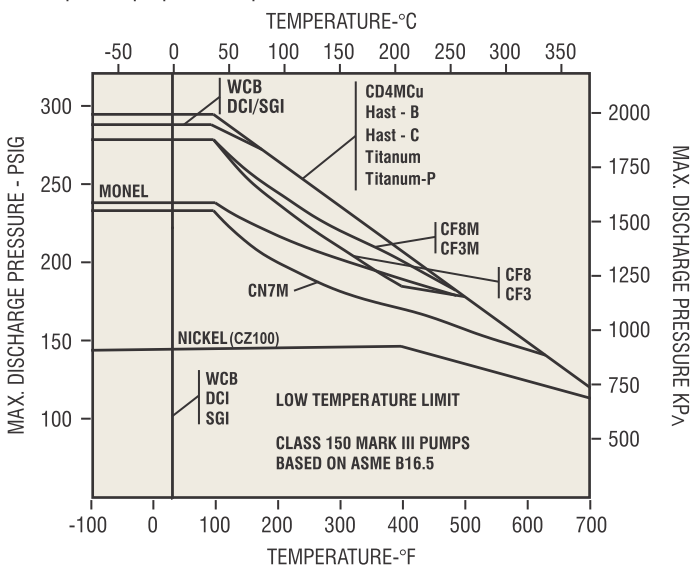
## TECHNICAL DATA

Pump Series	Pump Model	Min. Casing Thickness mm (inch)	Max. Sphere Thru Imp. (RV) mm (inch)	RV Impeller Eye Area cm <sup>2</sup> (inch <sup>2</sup> )	Corrosion Allow. mm (inch)	Min. Temp. °C (°F)	Max. Temp. °C (°F)	Max. Allow Horse Power			Max. Shaft End Play mm (inch)	Bearing number	Max. Impeller Dia. mm (inch)
								960 kW	1450 kW	2900 kW			
OK	1½ x 1 - 5	10 (0.39)	11.1 (0.43)	20 (3.1)	3 (0.12)	-149 (-236.2)	175 (380) [380 (716)] with cooling	6	10	20	0.03 (0.001)	(I.B.) 6305	130 (5.1)
	1½ x 1 - 6	10 (0.39)	9.5 (0.37)	20 (3.1)								(O.B.) 3305A 5305	158 (6.2)
1K	1½ x 1 - 6	10 (0.39)	9.5 (0.37)	20 (3.1)	3 (0.12)	-149 (-236.2)	175 (380) [380 (716)] with cooling	8.5	12.5	25	0.03 (0.001)	(I.B.) 6207	158 (6.2)
	3 x 1½ - 6	10 (0.39)	11.1 (0.43)	28.4 (4.4)								(O.B.) 3306/5306	158 (6.2)
	3 x 2 - 6	10 (0.39)	11.1 (0.43)	36.1 (5.6)								208 (8.2)	
	1½ x 1 - 8	10 (0.39)	8.7 (0.34)	20 (3.1)								208 (8.2)	
	3 x 1½ - 8	11 (0.43)	14.3 (0.56)	35.5 (5.5)									
2K	3 x 2 - 8	11 (0.43)	13.5 (0.53)	43.8 (6.8)	3 (0.12)	-149 (-236.2)	175 (380) [380 (716)] with cooling	31	46.5	93	0.03 (0.001)	(I.B.) 6310 (O.B.) 3310/5310	208 (8.2)
	4 x 3 - 8	11 (0.43)	12.7 (0.50)	80 (12.0)									208 (8.2)
	2 x 1 - 10A	11 (0.43)	10.3 (0.40)	22.6 (3.5)									254 (10.0)
	3 x 1½ - 10A	11 (0.43)	11.9 (0.46)	35.4 (5.5)									254 (10.0)
	3 x 2 - 10A	11 (0.43)	13.5 (0.53)	41.3 (6.4)									254 (10.0)
	4 x 3 - 10	13 (0.51)	16.7 (0.65)	85.2 (13.2)									254 (10.0)
	4 x 3 - 10H	13 (0.51)	19.8 (0.77)	85.2 (13.2)									254 (10.0)
	6 x 4 - 10	13 (0.51)	17.5 (0.68)	126.5 (19.6)									254 (10.0)
	6 x 4 - 10H	13 (0.51)	14.3 (0.56)	142 (22.0)									254 (10.0)
	3 x 1½ - 13	11 (0.43)	15.1 (0.59)	48.4 (7.5)									330 (13.0)
	3 x 2 - 13	11 (0.43)	10.3 (0.40)	48.4 (7.5)									330 (13.0)
	4 x 3 - 13	11 (0.43)	17.5 (0.68)	98 (15.2)									330 (13.0)
	4 x 3 - 13HH	11 (0.43)	17.5 (0.68)	98 (15.2)									330 (13.0)
	6 x 4 - 13A	11 (0.43)	26.2 (1.03)	187.1 (29.0)									330 (13.0)
	6 x 5 - 13	11 (0.43)	26.2 (1.03)	187.1 (29.0)									330 (13.0)
3K	8 x 6 - 14A	13 (0.51)	41.3 (1.62)	292 (45.3)	3 (0.12)	-149 (-236.2)	175 (380) [380 (716)] with cooling	134	200	-	0.03 (0.001)	(I.B.) 6314 (O.B.) 3314/5314	356 (14.0)
	10 x 8 - 14	16 (0.63)	38.1 (1.50)	410 (63.6)									356 (14.0)
	6 x 4 - 16	16 (0.63)	30.2 (1.18)	172 (26.7)									406 (16.0)
	8 x 6 - 16A	14 (0.55)	31.7 (1.24)	292 (45.3)									406 (16.0)
	10 x 8 - 16	14 (0.44)	39.7 (1.56)	410 (63.6)									406 (16.0)
	10 x 8 - 16H	13 (0.51)	41.3 (1.62)	506 (78.4)									406 (16.0)
	10 x 8 - 17	13 (0.51)	39.7 (1.56)	515 (79.8)									432 (17.0)

Working Pressure Maximum 20 bar (290 psi) at 38°C (100°F), Test Pressure Maximum 30 bar (435 psi)

### PRESSURE TEMPERATURE RATINGS MARK III PUMPS FOR LOW AND HIGH TEMPERATURE SERVICES

Based on years of satisfactory experience, MARK III Pumps are increasingly being used to handle liquids ranging in temperature from as low as -149°C (-236.2°F) to as high as 380°C (716°F). Combine the great hydraulics, easy maintenance and readily available parts of the Standard MARK III with specific design options and you have an extremely reliable Pump for your demanding services... at a cost less than previously used specific-purpose Pump



# MARK III ASME PROCESS PUMPS



**Custom Made With Sophisticated Simplicity.**

**The First Choice of Decision Makers Because they save money in the long run...**

- Unique external Micrometer Impeller adjustment for quick, Easy and accurate setting.
- Reverse Vane Impeller requires less NPSH minimizing Cavitation problems. Maintains lower Stuffing Box pressure that increases Mechanical Seal life. Impeller setting against the face of Stuffing Box Cover, so the Wear Surface is Cover and not the more Expensive Casing.
- New Heavy Duty Power-End for rugged dependable service.
- New Pump Sizes for improved Hydraulic coverages and higher Efficiencies resulting in Lower Operating Costs.
- The Built in Quality that makes MARK III the Standard Pump of the Process Industries.

**Double Row Thrust. Single Row Radial Bearings.**

- Less than 0.03 mm (0.001") End Play.
- Exceeds Bearing Life of 17,500 hours.

**Oil Seals Inboard and Outboard.**

- Maintain Clean Bearing Environment.

**O-Rings Thread Protection**

- Seal Threads from Environment.
- Insures easy Rotating.

**Micrometer Shaft Adjustment**

- 20 Second Adjustment. Without Feeler Gauges
- Double Accurate Bearing Alignment.
- Concentricity is maintained thus better than Jack Screw Designs.

**Breather**

**Bearing Housing and Adapter**

- S.G. Iron for More Strength (Standard)
- Cast Steel and Stainless Steel (Optional)

**Shafts & Sleeves**

- Corrosion, Wear and Shock Resistance.
- Hook Type Sleeve.

**Minimum Shaft Deflection**

- Less than 0.025 mm (0.001")
- Mechanical Seals run true

**Three Stuffing Box Designs**

- Standard Dimension for Most Seals or Packing.
- Oversize Dimensions for Longer Seal Life and Special Seals

**PTFE & Silicon Rubber Impeller Gasket.**

- Corrosion resistance of PTFE.
- Sealing resiliency of Silicon Rubber.
- Maximum Protection of Impeller and Shaft Threads.

**Exclusive MARK III "Reverse Vane" Impeller**

- Optimum Performance and Efficiency.
- Lowest overall NPSH requirements.
- In-shop Impeller Setting without disturbing Casing from pipeline.

**Spherical Washer & Adjuster**

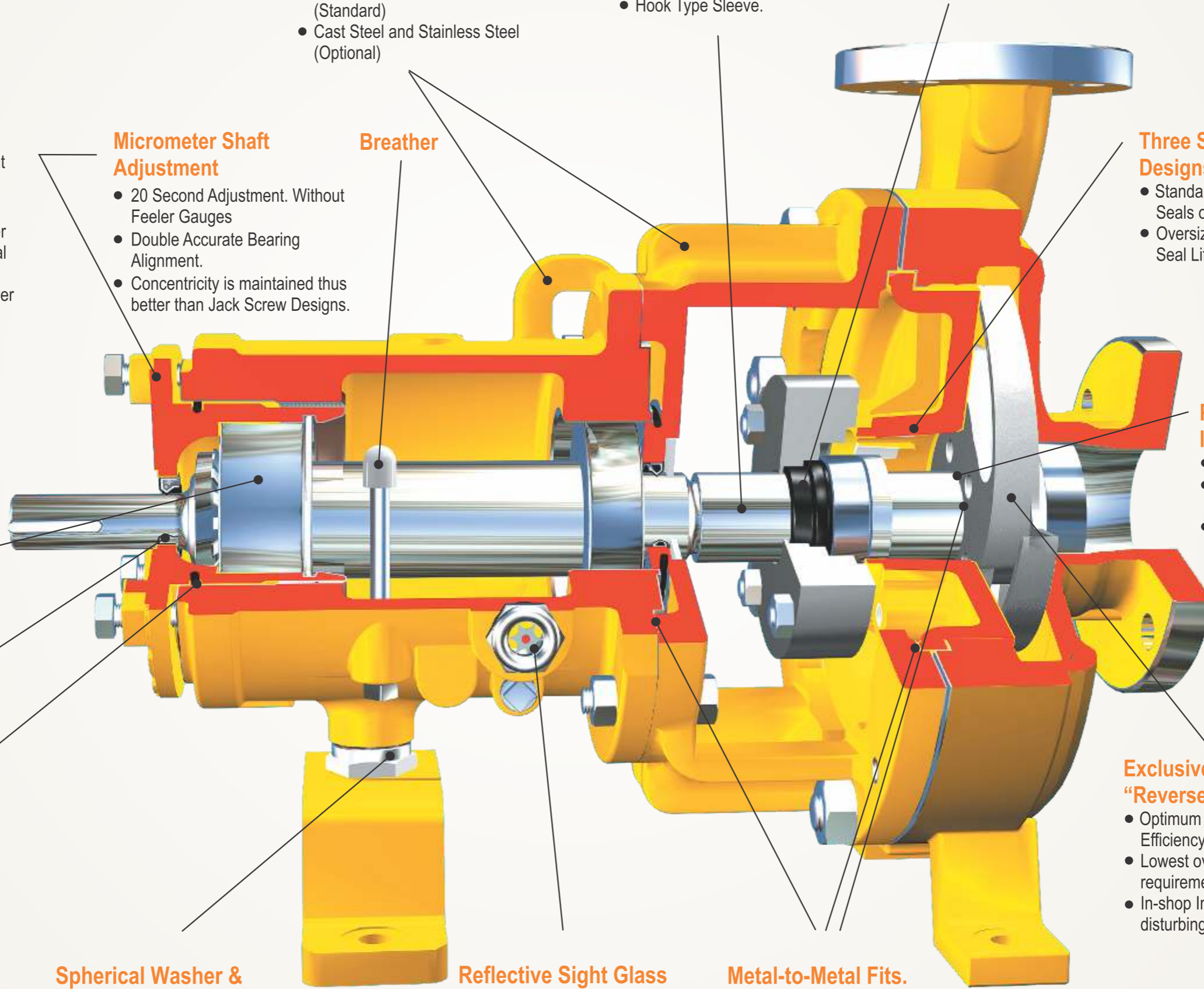
- For Ease of Online Maintenance

**Reflective Sight Glass**

- For Quick, Accurate Oil Level reading.

**Metal-to-Metal Fits.**

- Precision Alignment for Longer Mean Time between Planned Maintenance (MTBPM)



# MARK III SEALSENTRY FM SERIES SEAL CHAMBERS



## Advanced FM SealSentry Design Technology Provides

- Self-Flushing.
- Self-Venting.
- Self-Draining.

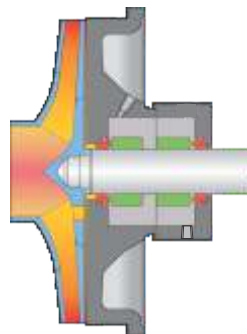
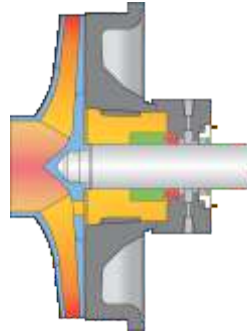
Seal life is extended due to superior purging of Heat, Solids and Vapors. Single Seal can often be selected where Dual Seals or External Flush and Throat Bushing combinations had been used, such as on Solids, Slurry and Liquor services. Flush plans 11, 32, 52, 53, etc; can be eliminated. Costs are reduced where as Pump reliability is increased.

Maximizing Seal Life involves proper selection of the Seal Chamber' Seal and Gland combination. Generally, the Seal Faces should be located directly in the Flush Path.

## Flow Modifiers Extend Mechanical Seal MTBPM

- Flow Modifiers Redirect Flow from Circumferential to Axial.
- Balanced Flow with Low Pressure drop in the Chamber helps keep Solids in suspension, minimizing Erosive Characteristics of the Process.
- A Mechanical Seal creates a Centrifuging Action away from its parts and into the Returning Flow Path of the Process Liquid.
- Solids and Slurry merge in the Returning Flow Path and are Flushed out of the Seal Chamber.

Microfinish SealSentry™ Family of Seal Chambers offers FM (Flow Modifiers) and Cylindrical Bore (CB) Options.



## FML

Preferred Selection In Most Applications. Designed for,

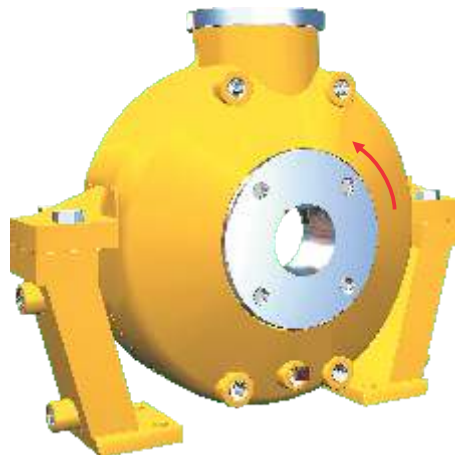
- Single Internal Cartridge Seals.
- Dual Internal/External Cartridge Seals.
- Single Internal Component Seals.
- Dual Internal "True" Tandem Design Cartridge Seals.

## CBL

Oversize, Cylindrical Step Bore Designed for,

- Dual Internal Component Seals and Isolates the Seal Chamber from the Process with External Source Flush.
- Single Seal with Throttle Bushing and Flush to Boost Pressure Over Flash Point.

## JACKETED COMPONENTS



### Jacketed Casing

Provide Temperature Control. Cast Jacket Available. It's a Customer Choice Depending on Application.

### Centerline Mounted Casing

May be used to reduce loads caused by Thermal Expansion. Jacketed Feet with Inlet / Outlet Ports Further Assure Effective Temperature Control. (For Cooling API plan G)

### Jacketed Cover

Designed for effective Heat Transfer in the Stuffing Box area or across the entire Surface area of the Process Fluid. It is mandatory for fluid temperature 175°C (347°F) and for high viscous fluid (150 to 600 Cp)

# MARK III UNITIZED SELF-PRIMING PUMPS



**Conveniently located high and dry at ground level where Installation is simple. Maintenance can more easily and more Economically be Performed**

Costing less to buy, install and maintain than **Submersible Pumps** The Mark III Self-Priming Pumps are designed to draw from liquid sources below the ground levels or from sources which have no positive pressure to naturally Prime the Pumps. Its compact design enables it to fit in tight clearance locations... It can be easily mounted on a trailer for movement to Various Pumping locations such as Wastewater Lagoon Service.

## Applications

- Sump Service.
- Tank Car unloading.
- Duplex Pumping Lift Station.
- Available with most of the Standard and Optional Features of the Mark III ASME Standard Pump
- Casing has large Priming Chamber, Air Separator and Volute in one Integral Piece.
- Utilizes Standard Mark III Pump Power-End.

## Eight Sizes

- Two. Group 0-K & 1K  
0-K 1½x1US-6  
1K 1½x1½US-8
- Six. Group II  
2K 2x1½US-10A  
2K 3x2US-10  
2K 4x3US-10H  
2K 3x2US-13  
2K 4x3US-13  
2K 6x4US-13A

## Capacities

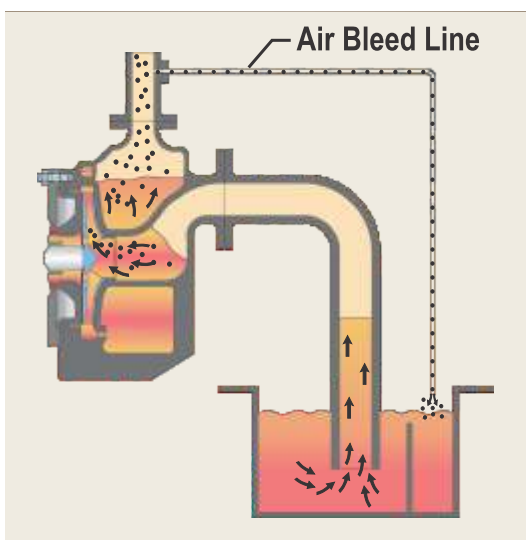
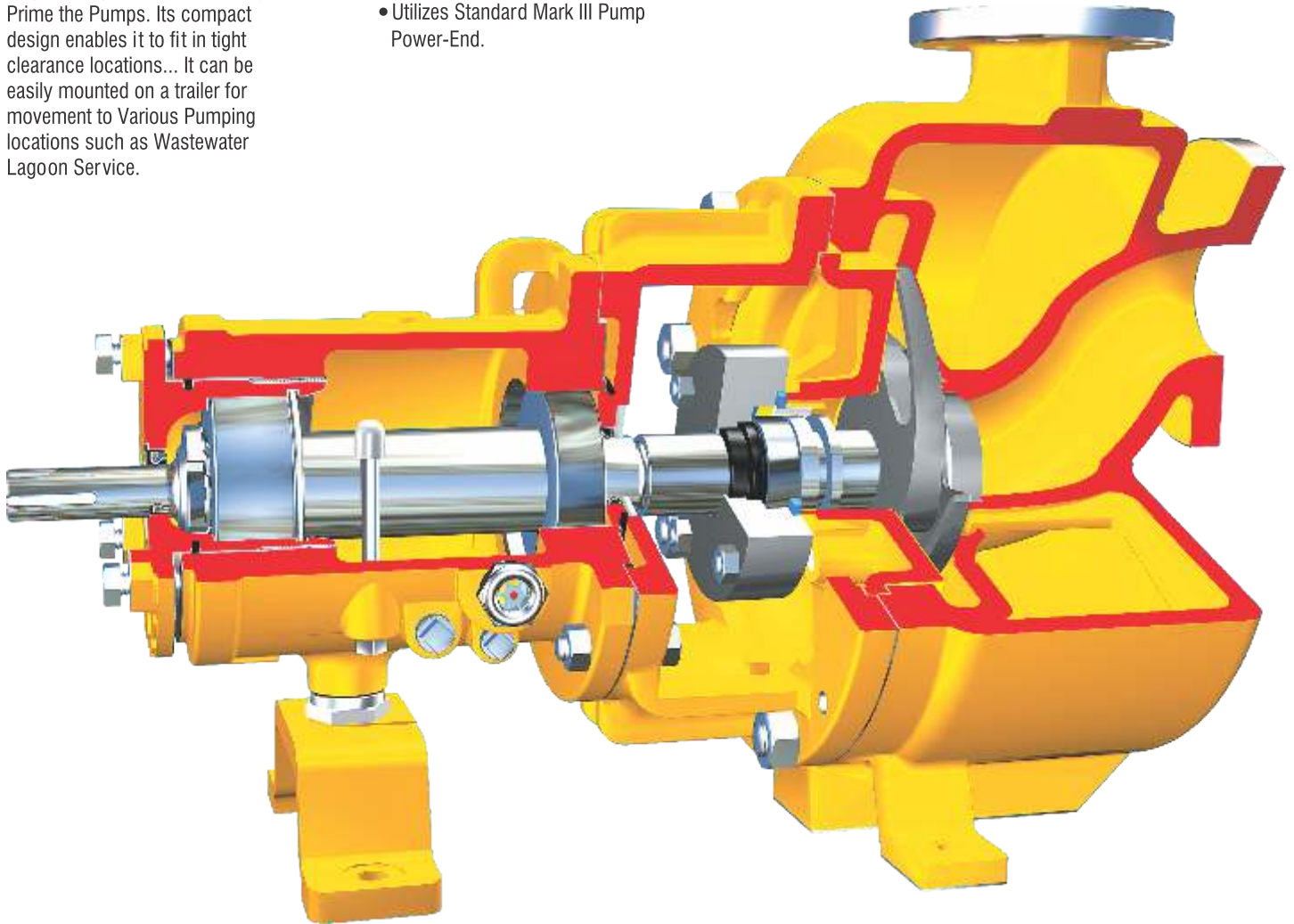
- Up to 265 m<sup>3</sup>/h

## Head

- Up to 85 m

## Static Suction Lift

- To 6 m Max with SG of 1.0



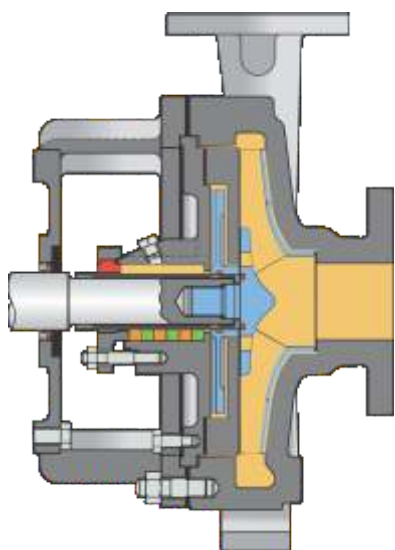
**Attention to following criteria will assure Trouble - Free Service from your Self-Priming Pump**

- Locate Pump near Source.
- Limit Suction line lengths to less than 7.6 m (24.9 ft).
- Select Suction pipe size to match suction flange size.
- Avoid Foot Valves on Suction lines.
- Provide a small diameter air bleed line from discharge pipe to Sump if the air is not able to freely vent out from the discharge pipe as shown.

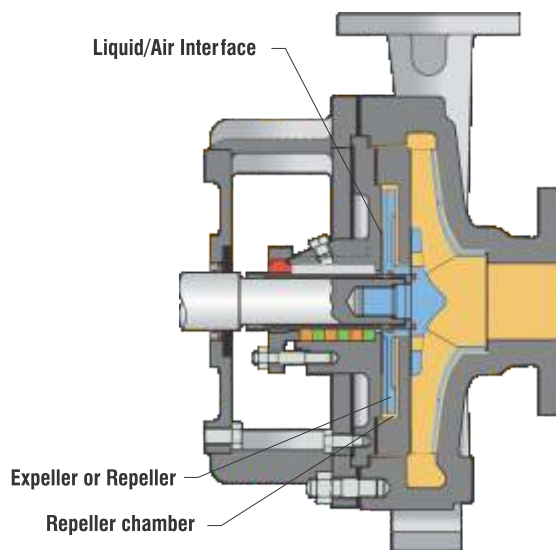


## SEALMATIC PUMPS

Dynamically Sealed Pump Eliminates the Need for Conventional Mechanical Seal.



**STOPPED**



**RUNNING**

No Mechanical Seal is needed during operation as Centrifugal Force created by a Spinning Repeller removes Fluid from the Seal Chamber. When the Pump is stopped, a Static Seal is used to keep it from leaking. The need for External Flushing and Process contamination controls are eliminated.

### Applications

- Tough services where Sealing is difficult.
- Services where a Flush is Undesirable (e.g. Evaporator Feed.)
- Continuous, around-the-clock service.
- Batch operations where a "run dry" condition might exist.

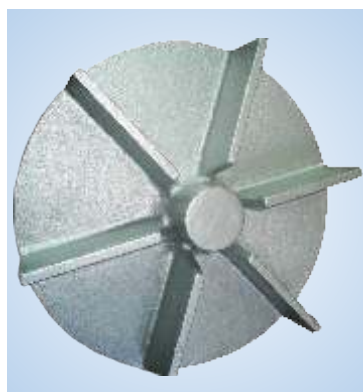
- Available with most of the Standard and Optional Features of the Mark III ASME Standard Pumps (2K & 3K only).
- Standard Mark III Reverse Vane Impeller for Peak Efficiency.
- Sealmatic Design is also available with Recessed Impeller Pumps.
- Performance similar to Mark III Standard ASME Pumps. (Page 4) Repeller power extra
- Standard Mark III Pump can be converted to Sealmatic Pump by replacing cover plate, Repeller and Repeller cover

### Seventeen Sizes

- Eleven. Group II
  - 2K 2X1M-10A
  - 2K 3X1½M-10A
  - 2K 3X2M-10A
  - 2K 4X3M-10
  - 2K 4X3M-10H
  - 2K 6X4M-10
  - 2K 6X4M-10H
  - 2K 3X1½M-13
  - 2K 3X2M-13
  - 2K 4X3M-13
  - 2K 6X4M-13A
- Six. Group III
  - 3K 8X6M-14A
  - 3K 10X8M-14
  - 3K 6X4M-16
  - 3K 8X6M-16A
  - 3K 10X8M-16
  - 3K 10X8M-16H

## MARK III RECESSED IMPELLER PUMPS

Vortex action assures trouble - free Pumping of large diameter Solids and Slurry Services. Also used to Process Shear Sensitive Products.



### Trouble-Free Pumping of Solid, Stringy or Fibrous Slurries

Combines the best design features of the Mark III ASME Standard Pump with the Vortex action of a Recessed Impeller. These specific purpose features along with thick wall, wet-end components offer extended service life when handling media typically too tough for an ASME Process Pump.

### Applications

- Light Slurries.
- Corrosive/Erosive services.
- Large diameter Solids.
- Waste Streams.
- Fluid where Shearing must be avoided.
- Protection of Solids Integrity.

- Available with most of the Standard and Optional Features of the Mark III ASME Standard Pump and the Sealmatic dynamically Sealed Repeller design.
- Available with SealSentry or Sealmatic Chambers.
- Tangential discharge minimizes Turbulence.
- Like the Reverse Vane, the Recessed Impeller sets to the rear cover.
- With only a Fraction of the media contacting the Impeller, the Vortex action minimizes abrasive wear while maintaining solids integrity.
- Available in all Standard Alloy materials.
- Utilizes Standard Mark III Pump Power-end.

### Five Sizes

- One. Group I
  - 1J 2x2R-6
- Four. Group II
  - 2K 2x2R-10
  - 2K 3x3R-10
  - 2K 4x3R-13
  - 2K 6x4R-13

### Capacities

- Up to 394 m<sup>3</sup>/h

### Head

- Up to 82 m

# MARK III LO-FLO PUMPS



Radial Vane Impeller with Circular Concentric Casing is Specifically Designed for High Head / Low Flow Applications.



The first to introduce ASME Standard High Head / Low Flow Pumps. They are designed with a circular concentric Casing to complement its Radial Vane Impeller. The result has been improved Pump reliability with extended MTBPM at low flow rates.

#### Applications

Used throughout the Process Industries for general purpose applications requiring high heads with low flow rates.

#### Circular Concentric Casing and Radial Vane Impeller

The unique design of these components further extends MTBPM when compared with Standard Pumps.

- Radial loads are reduced up to 90% at low flows.
- Shaft vibration is reduced up to 50%.
- Bearing life is extended.
- Mechanical Seal life is extended.



Expanding Volute Casing (Standard Pump)

#### Radial Vane Impeller Design Provides

- Minimal Thrust Loads.
- Reduced NPSH Requirements.
- Low Seal Chamber Pressures.
- Broader Applications Range.
- Longer Seal and Bearing Life.

- Conforms to Standard ASME dimensions.
- Offered in a wide selection of metallurgy.
- Utilizes Standard Mark III Pump Power End.

#### Four sizes

- 0-K 1.5 x 1LF-5
- 1K 1.5 x 1LF-8
- 2K 2 x 1LF-10
- 2K 3 x 1.5LF-13

#### Capacities

- 0.6 m<sup>3</sup>/h to 40 m<sup>3</sup>/h

#### Head

- 4 m to 190 m



Circular Concentric Casing

## MARK III POLYCHEM S-SERIES NON-METALLIC PUMPS

Durco Plastic Lined Sealed Pumps offer outstanding performance and significant economy in highly Corrosive Process applications. Incorporating the advanced design and precision manufacture of the rugged, heavyduty Mark III Chemical Service Pump significantly Enhances bearing and Seal Life. The PolyChem S-Series Pumps are engineered to maximize mean time between planned maintenance (MTBPM)

Meet the ASME B73.1 dimensional Standard.

#### A Choice of Power Ends

- Mark III A Features.
- ANSI 3A™ Power End Featuring Inpro VBX Bearing Isolators and a three-year performance guarantee.

#### Fastest Maintenance Turnaround time

- Micrometer adjustment accurately sets Impeller clearance to Rear Cover in 20 seconds...in the shop or field.
- Mechanical Seals and all critical settings can be accurately set in the shop or field.



#### Nine Sizes

- Three (3) Group I
- Six (6) Group II

#### Capacities

- UP to 260 m<sup>3</sup>/h

#### Head

- UP to 160 m

#### Fluoropolymer PFA Lined Wet End

is globally preferred for its superior corrosion resistance and temperature allowance to 149°C (300°F) PFA is Carbon Reinforced where required for superior stiffness and strength.

#### Enclosed Impeller Design

Provides balanced hydraulic loads and superior efficiency compared to open Impeller designs.

#### Silicon Carbide Shaft Sleeve

Provides optimum corrosion and wear resistance.

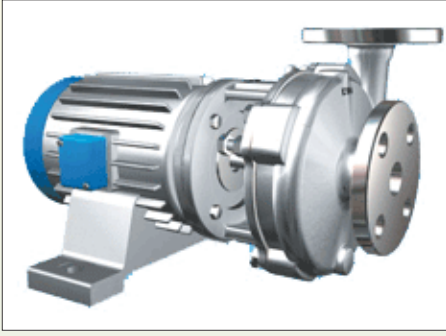
#### Exclusive Oversized "FM" Seal Chamber

The FM (Flow Modifier) is designed to self flush the Mechanical Seal to offer longer seal life. Reduced costs and improved Pump and Seal reliability.

#### Unique Seal Chamber Canister

allows for double component seals to be applied in the FM Seal Chamber.

- Enables quick retrofit of different Seal styles
- Eliminates the need for stocking additional Rear Covers.



**Mono Block  
Process Pump**



**Slurry Pump**



**Hygienic Pump**

### Sales Offices

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