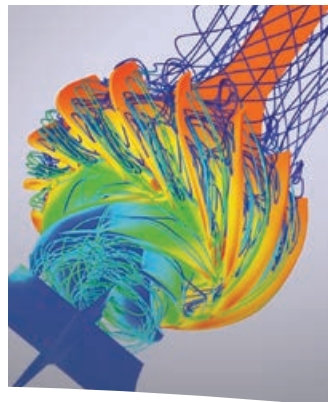




***INNOMAG<sup>®</sup> U-MAG<sup>™</sup>***  
***Fluoropolymer-Lined, Magnetic Drive Pump***



***Experience In Motion***



## ***Pump Supplier to the World***

*Flowserve is the driving force in the global industrial pump marketplace. No other pump company in the world has the depth or breadth of expertise in the successful application of pre-engineered, engineered, and special purpose pumps and systems.*

### ***Life Cycle Cost Solutions***

Flowserve provides pumping solutions that permit customers to reduce total life cycle costs and improve productivity, profitability and pumping system reliability.

### ***Market-Focused Customer Support***

Product and industry specialists develop effective proposals and solutions directed toward market and customer preferences. They offer technical advice and assistance throughout each stage of the product life cycle, beginning with the initial inquiry.

### ***Broad Product Lines***

Flowserve offers a wide range of complementary pump types, from pre-engineered process pumps to highly engineered and special purpose pumps and systems. Pumps are built to recognized global standards and customer specifications.

Pump designs include:

- Single-stage process
- Between bearings single-stage
- Between bearings multistage
- Vertical
- Submersible motor
- Positive displacement
- Nuclear
- Specialty

### ***Product Brands of Distinction***

*ACEC™*

*Aldrich™*

*Byron Jackson®*

*Calder™ Energy Recovery Devices*

*Cameron™*

*Durco®*

*Flowserve®*

*HALBERG™*

*IDP®*

*INNOMAG®*

*Lawrence Pumps®*

*Niigata Worthington™*

*Pacific®*

*Pleuger®*

*Scienco™*

*Sier-Bath®*

*SIHI®*

*TKL™*

*United Centrifugal®*

*Western Land Roller™*

*Wilson-Snyder®*

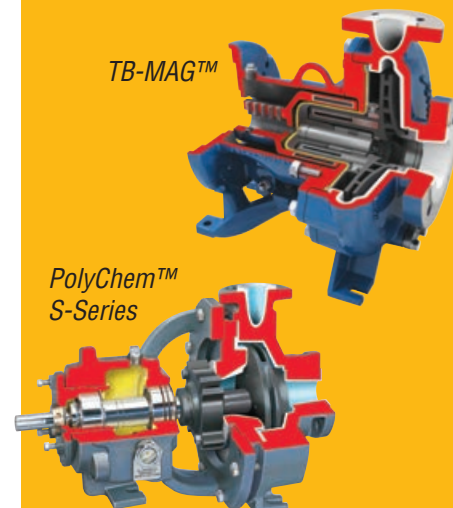
*Worthington®*

*Worthington Simpson™*

**INNOMAG U-MAG**  
**Fluoropolymer-Lined,**  
**Magnetic Drive Pump**



**Complementary Pumps**



**Performance, Versatility and Value**

*The INNOMAG U-MAG fluoropolymer-lined, magnetic drive pump has been specifically designed to provide outstanding performance and low total cost of ownership in smaller volume pumping applications in a wide variety of industries. This versatile, compact pump offers outstanding leakage protection for compliance with environmental regulations or “clean floor” initiatives. An available high-purity configuration makes it ideal for applications demanding the strictest purity requirements. Dependable and easy to maintain, the U-MAG will deliver years of reliable, cost-effective service.*

**Adaptable by Design**

The U-MAG easily adapts to a broad range of applications:

- ETFE or optional ultra-high purity PFA construction offers excellent chemical resistance.
- Universal flange design conveniently integrates with existing ISO, ASME and JIS piping connections.
- Numerous mounting and drive options accommodate site-specific requirements. Options include gasoline engines for portable and remote chemical transfer, trunk unloading, skid or cart operation.

**Standards Compliance**

The U-MAG is CE marked and compliant with applicable directives such as ATEX.

**Typical Applications**

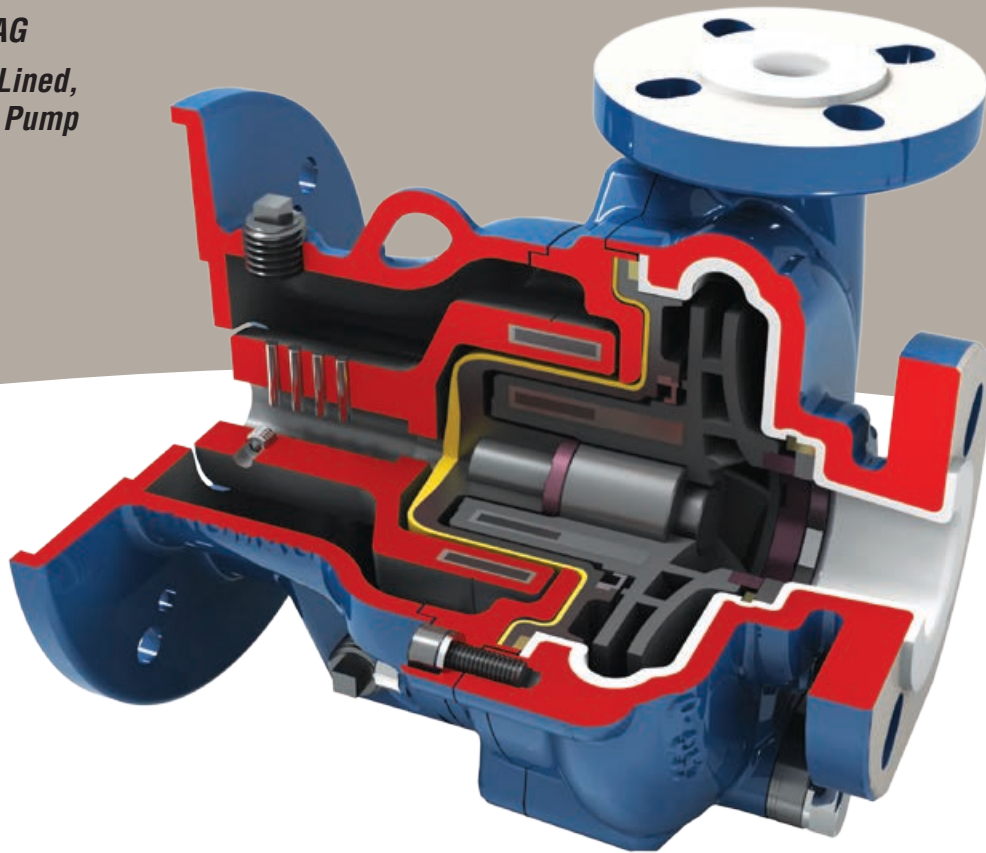
- Ultra-high purity manufacturing
  - Semiconductor
  - LCD
  - Circuit board
- Pure water (reverse osmosis and deionized)
- Pharmaceuticals manufacturing
- Chemical processing
- Metal plating
- Parts washing
- Photo processing
- Food processing
- Gas scrubbing
- Heating and cooling

**Complementary Pump Designs**

- INNOMAG TB-MAG thrust-balanced, fluoropolymer-lined, magnetic drive pump
- Durco Guardian ASME (ANSI) metallic, magnetic drive pump
- CPXS ISO metallic, magnetic drive pump
- PolyChem S-Series ASME (ANSI) or ISO fluoropolymer-lined, mechanically sealed pump



**INNOMAG U-MAG**  
**Fluoropolymer-Lined,**  
**Magnetic Drive Pump**



*The INNOMAG U-MAG fluoropolymer-lined, magnetic drive pump provides exceptional safety, performance and value in general purpose chemical process and ultra-high purity applications.*

**Operating Parameters**

- Flows to 102 m<sup>3</sup>/h (450 gpm)
- Heads to 50 m (165 ft)
- Pressures to 17 bar (250 psi)
- Temperatures from -29°C to 121°C (-20°F to 250°F)
- Power range from 0.75 kW to 10.5 kW (1 hp to 14 hp)

**Features and Benefits**

**Pure ETFE or PFA Casing Liner** is rotationally molded and vacuum rated. Liner has a minimum thickness of 3 mm (0.125 in).

**Universal Flanges** accommodate ASME (ANSI), ISO and JIS piping connections. Other flange designs available.

**One-piece Impeller and Inner Magnet Assembly** ensures maximum torque transmission, simplifies maintenance and eliminates balancing. Enclosed impeller with unobstructed eye delivers high efficiency and low NPSHR. Injection molded from carbon fiber reinforced ETFE or ultra-high purity PFA.

**Double-sealed Inner Magnets** offer unmatched resistance to corrosive permeation by sheathing the magnets in 316L stainless steel before they are injection molded into the impeller assembly.

**Powerful Neodymium Iron Boron (NdFeB) Magnets** maximize torque transmission.

**One-piece Composite Containment Shell** consists of aramid and carbon fiber reinforced ETFE (or PFA) for optimal leak protection, strength and corrosion resistance. Composite construction has zero eddy current losses for maximum efficiency.

**Particulate Control Ring** prevents solids from damaging the containment shell and radial bearings.

**Sintered Silicon Carbide Pump Shaft** is oversized to handle all radial loads. Stationary cantilevered design eliminates suction-blocking shaft supports to maximize flow and minimize NPSHR.

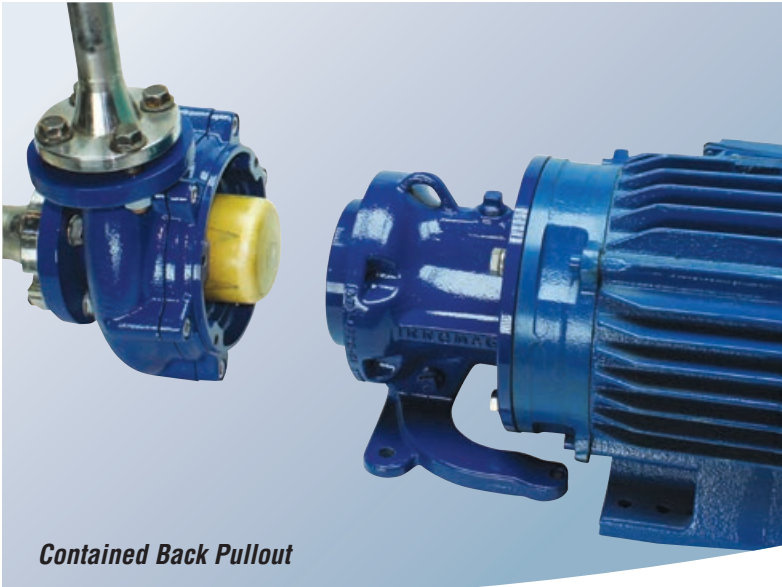
**Radial Bearing** is process lubricated and highly reliable. Graphite or silicon carbide are available.

**Parts Interchangeability** among the available sizes reduces inventory costs and eases maintenance.

**Motor Adapter With Universal Foot** mates directly to a wide range of standard NEMA and IEC C-Face motors. No alignment is required.



Optional Ultra-High Purity PFA Construction



Contained Back Pullout

### Ultra-High Purity Construction

For applications demanding the highest purity standards, such as semiconductor, circuit board and LCD manufacturing, the INNOMAG U-MAG may be specified in a high-purity configuration. For these applications, wetted components are made from ultra-high purity PFA or silicon carbide.

Refer to the materials chart on page 6 for more detailed information.

### Trouble-Free Maintenance

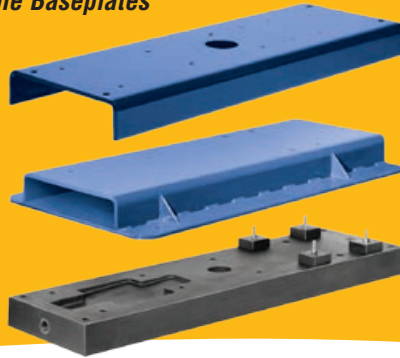
The U-MAG offers many features designed to expedite maintenance and reduce total cost of ownership:

- Standard back pullout eases general maintenance and inspection. The casing stays in-line and the piping connections remain intact.
- Contained back pullout (shown) simplifies drive end maintenance. The process fluid remains fully confined, thereby eliminating the need to drain or purge the pump. Maintenance personnel are kept safe from potentially harmful process fluids.
- Fully assembled replacement kits are available for all major components, including: casings, impeller assemblies and containment shells.
- Wear parts, including all rotating and stationary wear rings and thrust collars, are 100% replaceable.
- All mating and exposed metal surfaces are coated in a premium epoxy/epoxy polyamide primer and an aliphatic acrylic polyurethane top coat.

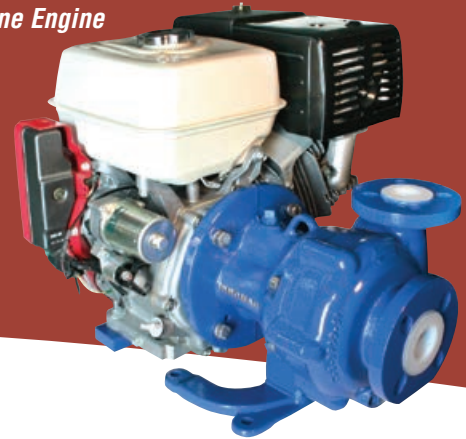


## Options and Technical Data

### Available Baseplates



### Direct Mount Gasoline Engine



### Materials of Construction

Component	Standard	Optional
Casing (armor/liner)	Ductile Iron/ETFE	Ductile Iron/PFA
Front Thrust Collar	Silicon Carbide	–
Impeller Wear Ring	CFR*PTFE	Silicon Carbide
Impeller Magnet Assembly	CFR*ETFE	PFA
Particulate Control Ring	CFR*ETFE	PFA
Shaft	Silicon Carbide	–
Radial Bearing	Graphite	Silicon Carbide
Back Thrust Collar	CFR*PTFE	Silicon Carbide
Containment Shell (liner/housing)	CFR*ETFE/Aramid Vinyl Ester	PFA/Aramid Vinyl Ester
Outer Magnet Assembly (armor/magnets)	Ductile Iron/NdFeB	–
Casing O-ring	FEP With FKM Core	FKM or EPDM
Containment Ring	Ductile Iron	–
Motor Adapter	Ductile Iron	–

\*CFR = Carbon Fiber Reinforced

### Available Baseplates

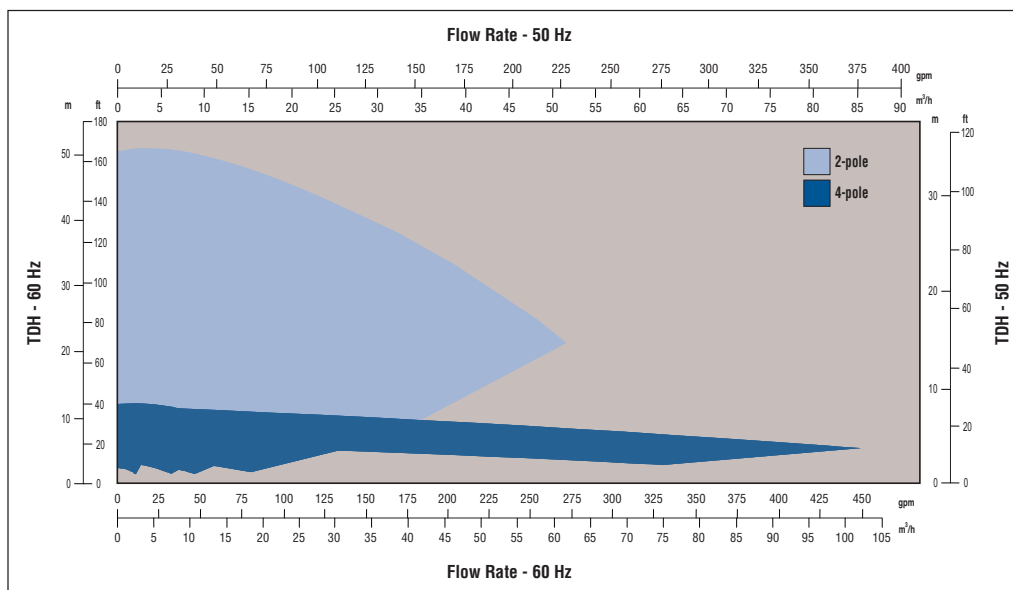
A range of baseplates is available to meet application requirements with regards to rigidity, vibration dampening, corrosion resistance, etc.

- Standard foundation mounted C-channel
- Foundation or stilt mounted reinforced C-channel
- Foundation or stilt mounted polymer concrete

### Additional Options and Accessories

- Direct mount gasoline engines for tanker trucks and remote locations (shown)
- Low-flow models
- Power monitors and temperature probes
- Priming tanks and systems
- Lined specialty pipe and spool pieces

### Range Chart



### Five Sizes

- U0: 1.5 x 1 x 5 (40 x 25 x 127)
- UL: 1.5 x 1 x 5LF (40 x 25 x 127)
- U1: 2 x 1.5 x 6 (50 x 40 x 152)
- U3: 3 x 2.5 x 6 (80 x 65 x 152)
- U4: 2.5 x 2 x 6 (65 x 50 x 152)

**Global Service  
and Technical  
Support**



## Life Cycle Cost Solutions

Typically, 90% of the total life cycle cost (LCC) of a pumping system is accumulated after the equipment is purchased and installed. Flowserve has developed a comprehensive suite of solutions aimed at providing customers with unprecedented value and cost savings throughout the life span of the pumping system. These solutions account for every facet of life cycle cost, including:

**Capital Expenses**

- Initial purchase
- Installation

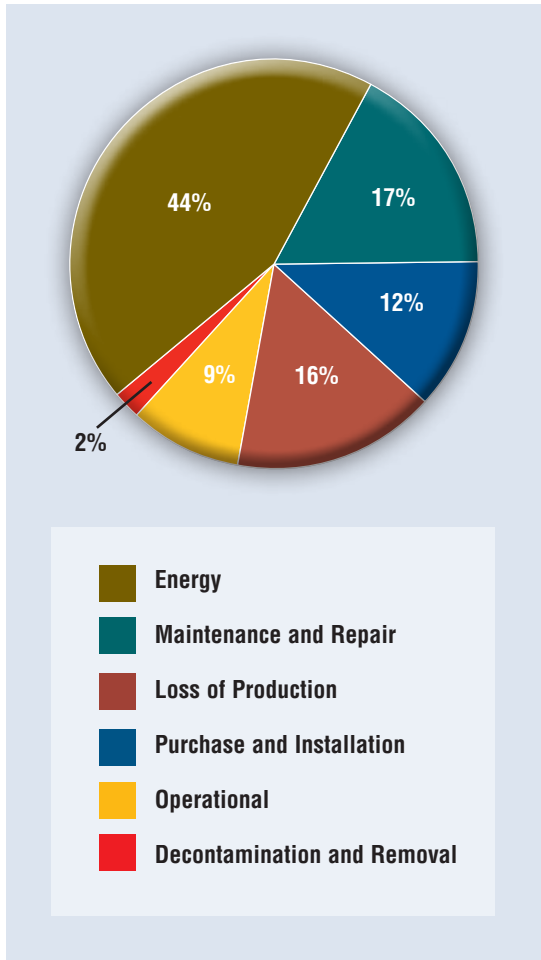
**Operating Expenses**

- Energy consumption
- Maintenance
- Production losses
- Environmental
- Inventory
- Operating
- Removal

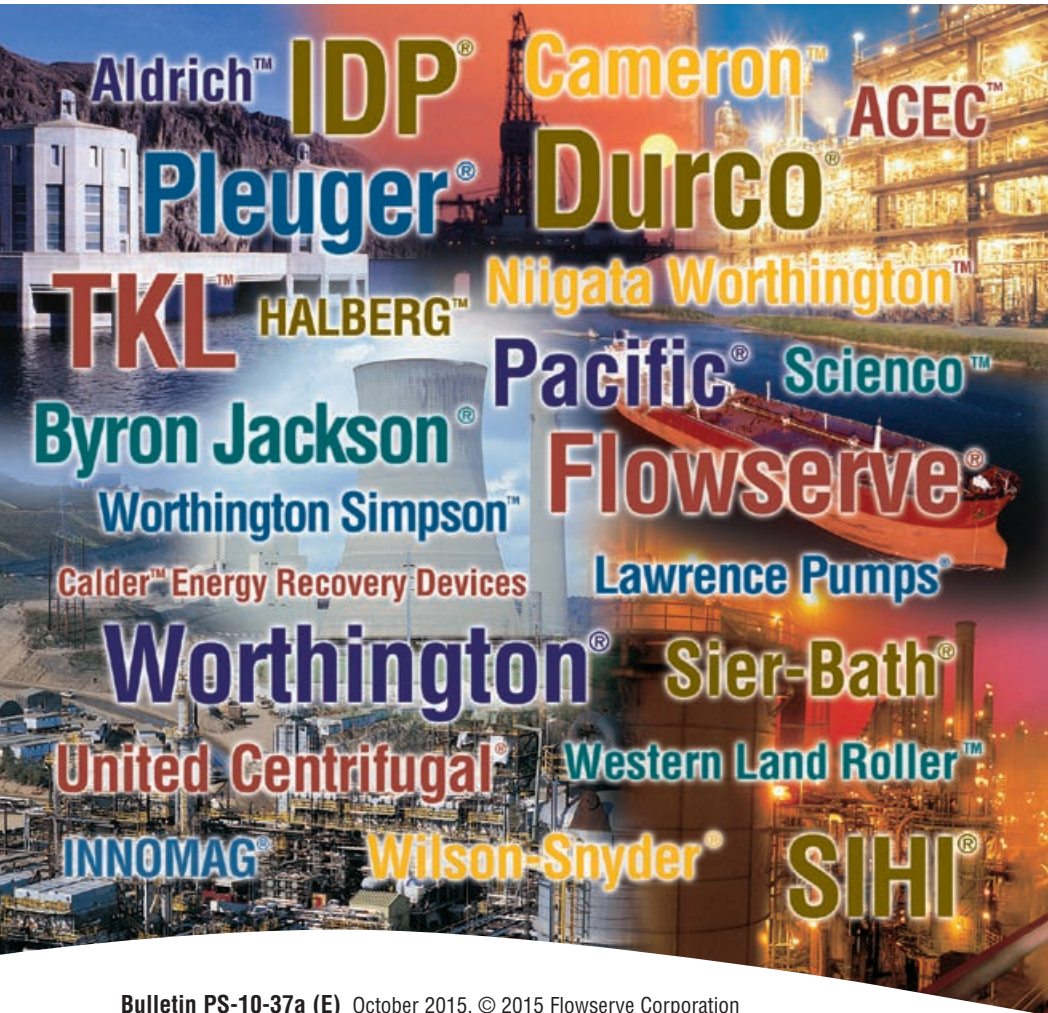
### Innovative Life Cycle Cost Solutions

- New Pump Selection
- Turnkey Engineering and Field Service
- Energy Management
- Pump Availability
- Proactive Maintenance
- Inventory Management

### Typical Pump Life Cycle Costs<sup>1</sup>



<sup>1</sup> While exact values may differ, these percentages are consistent with those published by leading pump manufacturers and end users, as well as industry associations and government agencies worldwide.



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