

# WARRENDER, LTD.

**Mag-Drive Pump Range** 

Providing environmentally safe sealless, magnetic pumps of the highest quality for over 30 years.

Our company goal is to provide the solutions that protect our surroundings, raise the environmental awareness, and promote the growth of the community.

## 888-24-PUMPS www.warrender.com

# WARRENDER

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### WARRENDER SEALLESS MAG-DRIVE PUMPS

#### The Fine Art of Magnetic Pumps™

Over 30 years of experience in producing and applying magnetic drive pumps continues to provide problem solving for thousands of customers with an expansive array of applications. We typically solve the most challenging pumping problems with reliable and cost effective solutions.

We know the key elements that comprise a magnetic pump, engineering our own pump hydraulics and magnetic couplings to provide an integrated design.

#### **Zero Emissions and Maximum Safety**

Benefit from a process free of leakage, contamination or toxic releases while avoiding constant monitoring and potential environmental fines. Eliminate all toxic and dangerous chemical releases including explosive and volatile liquids that can react with atmospheric contact.

#### Zero Leakage- Zero Corrosion ™

WARRENDER mag-drive pumps are built in various constructional materials including: 316L-SS, Alloy-20, Incoloy-825, Hastelloy-C276, Titanium, Polypropylene, PVDF or ETFE to meet specific process requirements.

#### Advanced Technology and the Highest Quality for Long Pump Life

WARRENDER pump designs are built to the highest quality standards to protect your process, preventing costly maintenance and lost production time.

- Robust, high thickness pump casings
- High efficiency impellers with low NPSH requirements
- High strength, rare earth magnetic couplings suitable for extreme temperatures
- Heavy duty rear casings in single or double walled non-welded designs

#### **Performances to the Extreme**

- Magnetic coupling power up to 650 HP (larger couplings available)
- Flows from 0.1 to 4500 gpm
- Pressures up to 7,250 psig (higher pressures available)
- Heads to 3,250 feet (higher heads available)
- Temperatures from -200°C to +840° F
- Pump liquefied gases or liquids with low NPSH



## Three Pump Designs Provide Complete Hydraulic Coverage:

## End Suction Centrifugal for standard to the most challenging services. Transfer, unloading and circulation

- High efficiency, long life, with low maintenance costs
- Hermetically sealed to eliminate mechanical seal failures
- Modular construction for rapid and simple maintenance
- Flows up to 4500 gpm
- Heads up to 1650 feet
- System pressures from vacuum up to 7,250 psig
- Temperatures from -150°C to +650°F (650-840°F w/ heat exchanger)

#### Regenerative-Periphera I Turbine Pumps for low and medium flows High head systems requiring pulsation free performance

- Replaces oversized centrifugals, avoiding high head cavitations
- Alternative to complex and costly multistage pumps
- Handles up to 20% entrained gas, resists vapor locking
- Flows up to 45 gpm
- Heads up to 3,250 feet
- System pressures from vacuum up to 7,250 psig
- Temperatures from -150° C to +650° F (650-840° F w/ heat exchanger)

#### Rotary (Sliding) Vane Pumps for metering with pulse-free flow Injection of chemicals w/ low flow at high pressure

- Suitable for low or high viscosity liquids
- Capable of differential pressures up to 200 psig
  Selfpriming up to 13 feet of dry lift, runs dry
- without damageSystem pressures up to 7,250 psig
- Temperatures from -100°C up to +480° F
- Flow Range:

Range 1° from 0.1 to 2.2 gpm Range 2° from 2.2 to 5 gpm Range 3° from 5 to 11 gpm

## **APPLICATIONS**

#### **Corrosive Thermoplastic Pump Applications**

- Various EPA monitored chemicals
- Corrosives (e.g., HCL, HF, sulphuric, nitric, etc.)
- Caustics including sodium or potassium hydroxide, salt brine, sea water
- Permeating liquids (i.e., chlorine, fluorine, bromine or halogen solutions)

#### **Demanding Alloy Pump Services**

- All EPA monitored chemicals
- Dangerous, toxic, noxious and carcinogenic liquids
- Solvents, hydrocarbons, pyrophorics and other volatile liquids
- Heat trans fer fluids (up to 650° F, 840° F w/ heat exchanger).
- Hot water
- Refrigerants and liquefied gases
- Cryogenic fluids (down to -200°C)
- High pressure circulation systems
- Pressurizing mechanical seal pots
- Sampling, metering or chemical injection systems

We have an extensive selection of pumps and spare parts to provide the best service. Our technical department is at your disposal from the onset of plant start-up to meet all of your needs.

#### **Rear Cartridge Kits Minimize Downtime**

Rear cartridge kits can be changed out in minutes with registered fits, requiring no special tools. This assembly is recommended as an emergency spare for all critical services.

## **WMCA -** Compact Horizontal, End Suction





WMCA - Horizontal

**Cross-sectional view** 

#### W M C A alloy compact centrifugal mag-drive pumps provide the advantages of a heavyduty sealless process pump in a compact, cost effective design. WM CA Horizontal pumps are equipped with zero leakage magnetic couplings to meet the latest toxic emissions regulations. The absence of mechanical seals eliminates costly pump maintenance, lost production time and process contamination.

#### **Performance Range**

Flow	5-150 GPM	1.1-34 M <sup>3</sup> /H
Head	To 115 feet	35 M
Temp	-148 to 450°F	-100 to 232°C
System Pressures	To 150 PSIG	10 BAR

MATERIALS

- SS-316 stainless
   steel
   Ucotollow 0.076
- Hastelloy-C276

- Sealless magnetic drive coupling
- Rugged alloy casing and pump components
- Heavy duty alloy containment shell
- High efficiency enclosed impeller design
- High torque magnets suitable for direct starting motors
- Close-coupled NEMA motor frame or bearing pedestal

## **WMCA - ISO-2858 Process Horizontal, End Suction**



#### WMCA - ISO 2858

#### **Performance Range**

Flow	8- 4500 GPM	2-1000 M <sup>3</sup> /H
Head	To 700 feet	213 M
Temp	-238 to 600°F	-150 to 315°C
System Pressures	To 350 PSIG	24 BAR

#### WMCA-ISO 2858 alloy centrifugal process pump program is a culmination of 30 years of research, engineering, product development and manufacturing technology. The WMCA designs are the benchmark for heavy-duty sealless process pumps offering the utmost in versatility and reliability in the most arduous applications. Particularly suited to pump liquids in any industrial field.: chemical, petrochemical; pharmaceutical; paper mills, textile industry, food processing, sugar plants, dairies, electronics, water treatment or any hazardous chemical application.

#### **DESIGN FEATURES**

- Casings built with heavy wall thicknesses; Flanges machined to 150 lb. or 300 lb. R.F. ANSI configurations
- The standard one-piece Hastelloy C276 containment housing exceeds ASME pressure vessel codes; rated for 350 PSIG working pressures with capabilities to 1500 PSIG
- External lubrication maintains highest pressure differential, enabling dead-head operation
- Backed by silicon carbide thrust bearings, impeller pump-out vanes balance axial thrust
- Quick-change rear cartridge assembly (an WMCA standard) allows for replacement and restart-up within 10 minutes
- Dual back-pull-out design; service either hydraulic end or ball bearing assembly

#### MATERIALS

- AISI 316 or 316L SS
  Cast steel WCB
- (Casing and Impeller only)
- Alloy 20
- Monel-400
- Hastelloy B or C-276

## **WMCA -** ANSI B73.1 Process Horizontal, End Suction





WMCA - ANSI B73.1

**Cross-sectional view** 

#### WMCA-ANSI B73.1 alloy centrifugal process pumps feature a hydraulically balanced impeller and ample running clearances. The WMCA designs are the benchmark for heavy-duty sealless process pumps are suitable for standard applications, and extreme high temperature or cryogenic services. WMCA alloy centrifugal mag-drive designs are available in NEMA close-coupled and long-coupled pedestal

Performance Range		
Flow	8-1000 GPM	2-227 M <sup>3</sup> /H
Head	To 400 feet	122 M
Temp	0 to 250°F	-17 to 121°C
System Pressures	To 350 PSIG	24 BAR

#### MATERIALS

• AISI 316 or 316L SS

configurations.

- Cast steel WCB
   (Casing and Impeller
   only)
- Alloy 20
- Monel-400
- Hastelloy B or C-276

- Casings built with heavy wall thicknesses; Flanges machined to 150 lb. or 300 lb. R.F. ANSI configurations
- The standard one-piece Hastelloy C276 containment housing exceeds ASME pressure vessel codes; rated for 350 PSIG working pressures with capabilities to 1500 PSIG
- External lubrication maintains highest pressure differential, enabling dead-head operation
- Backed by silicon carbide thrust bearings, impeller pump-out vanes balance axial thrust
- Quick-change rear cartridge assembly (an WMCA standard) allows for replacement and restart-up within 10 minutes
- Dual back-pull-out design; service either hydraulic end or ball bearing assembly

## **WMCA** - Vertical Sump, End Suction



**Cross-sectional view** 

#### **Performance Range**

Flow	8-4500 GPM	2-1000 M <sup>3</sup> /H
Head	To 400 feet	122 M
Temp	-148 to 600°F	-100 to 315°C
System Pressures	To 350 PSIG	24 BAR

#### WMCA alloy centrifugal vertical sump pump program is free of mechanical or lip seals, ensuring leak-proof handling of

WMCA - Vertical Sump

corrosives. The heavy duty shaft is supported by bearings with no bushings to wear; shaft deflection is thereby eliminated.

#### **DESIGN FEATURES**

- Non-cantilevered shaft
- Hermetically sealed column
- · Heavy duty column shaft with oversized ball bearings
- Modular impeller allows for modifying performances
- Compact, high torque magnetic coupling with reduced mass

#### MATERIALS

- AISI 316 or 316L SS
- Cast steel WCB (Casing and Impeller only)
- Alloy 20

ALLOY

## WMCA - API 685 Process, End or Top Suction





WMCA - API 685 Version

**Cross-sectional view** 

#### WMCA API-685

alloy centrifugal process pumps are built for critical services and extreme system pressures in full accordance with the API-685 specifications. The WMCA designs are the benchmark for heavy-duty sealless process pumps. The WMCA API-685 process pump offers the utmost in versatility and reliability in the most hazardous and severe applications.

#### Performance Range

Flow	8-4500 GPM	2-1000 M <sup>3</sup> /H
Head	To 3850 feet	1173 M
Temp	-238 to 840°F	-150 to 449°C
System Pressures	To 7250 PSIG	500 BAR

WMCA alloy centrifugal mag-drive designs are available in API 610, API 685 and API 685 multistage configurations. Dynamically balanced, back-to-back impellers allow for minimal axial load on multistage units.

#### MATERIALS

- AISI 316 or 316L SS
- Cast steel WCB
   (Casing and Impeller
- only) • Alloy 20
- Monei-400
- Hastelloy B or C-276

- Casings built with heavy wall thicknesses
- The standard one-piece Hastelloy C276 containment housing exceeds ASME pressure vessel codes; rated for 350 PSIG working pressures with capabilities to 1500 PSIG
- External lubrication maintains highest pressure differential, enabling dead-head operation
- Backed by silicon carbide thrust bearings, impeller pump-out vanes balance axial thrust
- Quick-change rear cartridge assembly (an WMCA standard) allows for replacement and restart-up within 10 minutes
- Dual back-pull-out design or service either hydraulic end or ball bearing assembly

## **WMCP** - Molded Thermoplastic, Horizontal



Cross-sectional view



WMCP - Molded Horizontal

Performance	Ran	qe
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Flow	2-175 GPM	0.45-40 M <sup>3</sup> /H
Head	To 110 feet	33 M
Temp	To 180°F	85°C
System Pressures	To 50 PSIG	3 BAR

WM CP molded horizontal centrifugal sealless mag-drive thermoplastic pumps provide high reliability, with emphasis on optimum chemical compatibility. Interchangeable impellers provide flexibility for precisely matching head and flow capacities. WM CP Molded Horizontal pumps can be used in a wide range of acids and alkaline solutions up to temperatures of 180° F.

#### **DESIGN FEATURES**

- Heavy walled casings for added strength, pressure and temperature resistance
- Volute casing for optimum efficiencies and performances
- Interchangeable impellers, independent of internal magnets
- High torque, low mass magnetic couplings resist uncoupling
- Oversized internal shaft, sleeve and thrust bearings
- Standard 56-C, 143/5-TC & 182/4-TC NEMA frame motors

MATERIALS
• PP
• PVDF

**NON-METALLIC** 

## **WMCP** - Molded Thermoplastic, Vertical



#### WMCP Molded Vertical

WMCP molded

vertical centrifugal sealless mag-drive pumps are thermoplastic engineered for reliability, durability and chemical resistance. Molded vertical pumps are best suited for filtration and spray systems, in-tank and sump applications. Complete isolation of the motor from the process liquid prevents internal corrosion, air entrainment or product contamination. Zeroleakage operation ensures maximum safety and full compliance with toxic emissions regulations.



#### **Cross-sectional view**

#### **Performance Range**

Flow	2-175 GPM	0.45-40 M <sup>3</sup> /H
Head	To 110 feet	53 M
Temp	То 180°F	85°C
System Pressures	To 50 PSIG	3 BAR

MATERIALS
• PP

• PVDF

- Heavy walled casings for added strength, pressure and temperature resistance
- Volute casing for optimum efficiencies and performances
- Interchangeable impellers, independent of internal magnets
- High torque, low mass magnetic couplings resist uncoupling
- Oversized internal shaft, sleeve and thrust bearings
- Standard 56-C & 143/5-TC NEMA frame motors

## **WMCP** - Machined Thermoplastic, Horizontal



**Cross-sectional view** 



WMCP - Machined Horizontal

#### **Performance Range**

Flow	3-500 GPM	0.68-113 M <sup>3</sup> /H
Head	To 175 feet	53 M
Тетр	То 200°F	95°C
System Pressures	To 100 PSIG	7 BAR

WMCP machined thermoplastic horizontal centrifugal sealless magdrive pumps are fabricated from SOLID Simona ® PP or PVDF thermoplastics to resist internal or external corrosion. Heavy walled, CNC machined construction provide far greater resistance to permeation and migration of corrosive, and permeating liquids. Additionally, added strength and thermal stability resists deformation, even in the most severe applications.

#### DESIGN FEATURES

- Exclusive SOLID machined PP or PVDF casings and impeller components for maximum chemical resistance
- Non-metallic casings withstand external corrosion
- Integral raised face flanges (no threaded adapters) to ensure zero leakage
- Modular impeller allows for varying hydraulic performances
- Oversized, high purity ceramic or silicon carbide thrust bearings and shaft
- Standard, direct starting NEMA motors



**NON-METALLIC** 

## **WMCP** - Machined Thermoplastic, Horizontal Self-Priming



WMCP – Machined Horizontal Self-Priming



**Cross-sectional view** 

WMCP machined thermoplastic selfpriming centrifugal sealless mag-drive pumps apply to the Self-Priming design with the addition of a self-contained, selfpriming pump casing. Machined Horizontal Self-Priming pumps provide smooth continuous leak-proof operation where top unloading is specified.

Performance Range		
Flow	30-275 GPM	5.8-62 M <sup>3</sup> /H
Head	To 130 feet	40 M
Temp	То 200°F	95°C
System Pressures	100 PSIG	7 BAR

#### MATERIALS

- PP
- PVDF
- ETFE

- Exclusive SOLID machined PP or PVDF casings and impeller components for maximum chemical resistance
- Non-metallic casing withstands external corrosion
- Integral raised face flanges (no threaded adapters) to ensure zero leakage
- Modular impeller allows for varying hydraulic performances
- Oversized, high purity ceramic or silicon carbide thrust bearings and shaft
- Standard, direct starting NEMA motors

## **WMCP - Machined Thermoplastic, Vertical Sump**



**Cross-sectional view** 

#### Performance Range

Flow	3-500 GPM	0.68-113 M <sup>3</sup> /H
Head	To 175 feet	53 M
Temp	То 200°F	95°C
System Pressures	100 PSIG	7 BAR

#### WMCP - Machined Vertical

WM CP machined t h e r m o p l a s t i c centrifugal sealless magdrive vertical sump pumps do not require mechanical or lip seals, ensuring leak-proof handling of corrosives. The heavy duty shaft is supported by ball bearings with no bushings to wear; shaft deflection is thereby eliminated. The hermetically sealed column is permanently isolated from corrosive liquid or fumes.

- Exclusive solid CNC machined thermoplastic casings and impeller components
- Hermetically sealed column
- Oversized, high purity ceramic or silicon carbide thrust bearings and shaft
- Modular impeller allows for modifying performances
- Isolated heavy duty column shaft with oversized ball bearings
- Direct starting NEMA motors



## WMTA - Cast, Single stage





WMTA - Cast, Self-Priming

**Cross-sectional view** 

#### WMTA alloy

regenerative turbine sealless mag-drive pumps are ideally suited for low flow / high head applications. All WMTA pumps are equipped with zero leakage magnetic couplings to meet the latest toxic emissions regulations. The absence of mechanical seals or packing glands eliminates costly pump maintenance, lost production time and process contamination.

#### **Performance Range**

<b>u</b>								
Flow	0.25-55 GPM	0.5-10 M <sup>3</sup> /H						
Head	To 700 Feet	213 M						
Temp	-148 to 600°F	-100 to 316°C						
System Pressures	To 700 PSIG	48 BAR						

The WMTA pumps are able to pump liquids containing up to 20% entrained gas. The WMTA pumps are suitable for thin non-lubricating liquids and/or high differential pressures.

#### MATERIALS

- AISI SS-316 Stainless
   Steel
- Alloy-20
- Incoloy-825
   Hastelloy-64

#### • Hastelloy-C27

- High head / low flow capability minimizes by-pass requirements and prevents overheating of centrifugals and high head cavitation
- Self balancing impeller—zero axial thrust loading
- Impeller design handles up to 20% entrained gas—ideal for pumping liquefied gases
- No galling or metal to metal contact
- Heavy duty alloy containment shell
- High torque magnets, suitable for direct starting motors

## **WMTA - Machined Billet, Single Stage**





**Cross-sectional view** 

WMTA Machined Billet, Single Stage

#### **Performance Range**

Flow	0.25-45 GPM	0.5-10 M <sup>3</sup> /H
Head	To 700 Feet	213 M
Temp	-148 to 600°F	-100 to 316°C
System Pressures	To 7250 PSIG	500 BAR

#### WMTA machined billet alloy regenerative turbine sealless mag-drive pumps can be constructed for high system pressures and special alloy configurations. All WMTA pumps are equipped with zero leakage magnetic couplings to meet the latest toxic emissions regulations. The absence of elaborate mechanical seal systems eliminates costly pump maintenance, lost production time and process contamination.

Variations in head calculations have minimal effect on the flow of a turbine pump. Also, turbine pumps can be throttled to a required duty point without by-passing.

#### **DESIGN FEATURES**

- High head / low flow capability minimizes by-pass requirements and prevents overheating of centrifugals and high head cavitation
- Self balancing impeller—zero axial thrust loading
- Impeller design handles up to 20% entrained gas—ideal for pumping liquefied gases
- No galling or metal to metal contact
- Heavy duty alloy containment shell
- High torque magnets, suitable for direct starting motors
- Heavy walled casings withstand extreme system pressures.

#### MATERIALS

AISI SS-316 Stainless
 Steel

ALLOY

- Allov-20
- Incoloy-825
- Hastelloy-C27

## WMTA - Cast, Multi-Stage





WMTA - Cast, Multistage

**Cross-sectional view** 

#### WMTA alloy

regenerative turbine sealless mag-drive pumps are ideally suited for low flow / high head applications. All WMTA pumps are equipped with zero leakage magnetic couplings to meet the latest toxic emissions regulations. The absence of mechanical seals or packing glands eliminates costly pump maintenance, lost production time and process contamination.

#### **Performance Range**

Flow	10-45 GPM	2.2-10 M <sup>3</sup> /H			
Head	To 3000 Feet	915 M			
Temp	-148 to 650°F	-100 to 343°C			
System Pressures	7250 PSIG	500 BAR			

The WMTA pumps are able to pump liquids containing up to 20% entrained gas. The WMTA pumps are suitable for thin non-lubricating liquids and/or high differential pressures.

#### MATERIALS

ALLOY

- AISI SS-316 Stainless
   Steel
- Alloy-20
- Incoloy-825
- Hastelloy-C27

- High head / low flow capability minimizes by-pass requirements and prevents overheating of centrifugals and high head cavitation
- Self balancing impeller—zero axial thrust loading
- Impeller design handles up to 20% entrained gas—ideal for pumping liquefied gases
- No galling or metal to metal contact
- Heavy duty alloy containment shell
- High torque magnets, suitable for direct starting motors

## **WMTP** - Machined Thermoplastic, Self Siphoning



**Cross-sectional view** 



WMTP - Machined Thermoplastic, Self Siphoning

# NON-METALLIC

**Performance Range** 

Flow	0.6-65 GPM	0.13-13M <sup>3</sup> /H			
Head	To 180 Feet	55 M			
Temp	To 200°F	95°C			
System Pressures	100 PSIG	7 BAR			

#### r er for mande mange

WMTP machined thermoplastic regenerative turbine sealless mag-drive pumps are ideally suited to low flow applications. WMTP regenerative turbine pumps avoid oversized centrifugals, that require flow by-passing and excessive horsepower. WMTP nonmetallic turbine designs have excellent chemical resistance and extremely low wear characteristics. Variations in head calculations have minimal effect on the flow of a turbine pump. Also, turbine pumps can be throttled to a required duty point without by-passing.

- Exclusive solid machined PP or PVDF casings and impeller components
- Heavy casing wall thicknesses
- Resists external corrosion
- Self-balancing impeller eliminates thrust bearing wear
- Handles up to 20% entrained gas, resists cavitation
- Direct starting, standard NEMA motors

MAI	<b>FERIALS</b>
•	PP
•	<b>PVDF</b>
•	ETFE

## **WMTP** - Machined Thermoplastic, Self-Priming





WMTP - Machined Thermoplastic, Self-Priming

**Cross-sectional view** 

WMTP machined thermoplastic selfpriming regenerative turbine sealless mag-drive pumps provide smooth, continuous, leak-proof operation where top unloading is required. The same basic features of Self-Siphoning pumps apply to the Self-Priming series design with the addition of a self-contained, self-priming pump casing.

#### **Performance Range**

Flow	0.60-55 GPM	0.13-13 M <sup>3</sup> /H			
Head	To 180 Feet	55 M			
Temp	То 200°F	95°C			
System Pressures	100 PSIG	7 BAR			

#### MATERIALS

- PP
- PVDF
- ETFE

- Exclusive solid machined PP or PVDF casings and impeller components
- Self-priming pump housing
- Resists external corrosion
- Self-balancing impeller eliminates thrust bearing wear
- Handles up to 20% entrained gas, resists cavitation
- Direct starting, standard NEMA motors

## WMRA - Cast, Top Port





**Cross-sectional view** 

WMRA Cast, Top Port

#### Performance Range

Flow	0.1-11 GPM	22-2500 l/h				
Head	To 180 psig	12 bar				
Тетр	То 450°F	232°C				
System Pressures	350 PSIG	24 BAR				

WMRA series alloy P.D. rotary vane sealless mag-drive Pumps are ideally suited for low flow / high head applications. The top porting design is ideally suited for confined piping systems. All WMRA pumps are equipped with zero leakage magnetic couplings to meet the latest toxic emissions regulations. The WMRA pumps feature self-compensating sliding-vanes which maintain design head and flow capacities for extended operating life. The WMRA pumps are suitable for thin non-lubricating liquids and/or high differential pressures. The pumps are capable of self-priming from a dry

#### **DESIGN FEATURES**

- Self-priming and can run dry without damage
- No gears to wear or metal to metal contact, low internal slip •
- Capable of proportioning with variable speed drives, turn-down • ratios depend upon differential head requirements
- Heavy duty alloy containment shell for added safety •

start

- Replaceable carbon cartridge—low maintenance costs •
- High torque magnets for direct starting motors
- Internal relief valve prevents over pressurization •

#### MATERIALS

- AISI SS-316 Stainless Steel
- Incolov-825
- Hastelloy-B or C-276

ALLOY

## WMRA - Cast, In-line Port





WMRA Cast, In-line

**Cross-sectional view** 

WMRA series alloy<br/>P.D. rotary vane sealless<br/>mag-drive pumps are<br/>ideally suited for low flow /<br/>high pressure applications<br/>including chemical injection and<br/>metering systems. All WMRA pumps are<br/>equipped with zero leakage magnetic<br/>couplings to meet the latest toxic emissions<br/>regulations. The WMRA pumps feature self-<br/>compensating sliding-vanes which maintain design head and<br/>flow capacities for extended operating life. The WMRA pumps are<br/>suitable for thin non-lubricating liquids and/or high differential head<br/>pressures. The pumps are capable of self-priming from a dry start.Perform<br/>Flow

#### **Performance Range**

Flow	0.1-11 GPM	22-2500 l/h			
Head	To 180 psig	12 bar			
Temp	To 450°F	232°C			
System Pressures	350 PSIG	24 BAR			

#### MATERIALS

- AISI SS-316 Stainless
   Steel
- Incoloy-825
- Hastelloy-B or C-276

- Self-priming and runs dry without damage
- No gears to wear or metal to metal contact, low internal slip
- Capable of proportioning with variable speed drives, turn-down ratios depend upon differential head requirements
- Heavy duty alloy containment shell for added safety
- Replaceable carbon cartridge—low maintenance costs
- High torque magnets for direct starting motors

## WMRA - Machined Billet, In-Line Port





**Cross-sectional view** 

WMRA Machined Billet, In-Line Port

#### **Performance Range**

Flow	To 0.1-11 GPM	22 to 2500 l/h
Head	To 180 psig	12 bar
Temp	To 450°F	232°C
System Pressures	To 7250 PSIG	500 BAR

WMRA machined billet rotary vane sealless mag-drive pumps are built for high system pressures and special alloy requirements. All WMRA pumps are equipped with zero leakage magnetic couplings to meet the latest toxic emissions regulations. The absence of mechanical seals eliminates costly pump maintenance, lost production time and process contamination. The WMRA pumps feature self-compensating sliding-vanes which maintain design head and flow capacities for extended operating life. The WMRA pumps are suitable for thin non-lubricating liquids and/or high differential pressures. The WMRA pumps are capable of dry self-priming.

#### **DESIGN FEATURES**

- Self-priming and runs dry without damage
- No gears to wear or metal to metal contact, low internal slip
- Capable of proportioning with variable speed drives, turn-down ratios depend upon differential head requirements
- Heavy duty alloy containment shell for added safety
- Replaceable carbon cartridge—low maintenance costs
- High torque magnets for direct starting motors

#### MATERIALS

- AISI SS-316 Stainless
   steel
- Incoloy-825
- Hastelloy-B or C-276

ALLOY

## **WMRP** - Machined Thermoplastic, In-Line





Cross-sectional view

Thermoplastic , In-Line

WMRP - Machined

WMRP machined thermoplastic selfpriming rotary vane sealless mag-drive pumps are positive displacement pumps intended for low-flow/ high head applications, high-pressure systems or where metering is required. CNC machined from solid Simona polypropylene or polyvinylidene fluoride (PVDF), WMRP Machined In-Line pumps are extremely resistance to internal or external corrosion, permeation and migration of solvents and corrosives. WMRP Machined In-Line pumps are capable of dry priming. Zero-leakage operation ensures maximum safety and full compliance with toxic emissions regulations.

#### **Performance Range**

Flow	0.1-11 GPM	22-2500 l/h			
Head	To 50 psig	3.4 bar			
Тетр	То 200°F	95°C			
System Pressures	100 PSIG	7 BAR			

MATERIALS

- **PP**
- PVDF

- Self-priming and can run dry without damage
- No gears to wear or metal to metal contact, low internal slip
- Capable of proportioning with variable speed drives, turn-down ratios depend upon differential head requirements
- Replaceable carbon cartridge—low maintenance costs
- High torque magnets for direct starting motors
- All non-metallic wetted components





## Replacement Spare Kits And Components

WARRENDER, LTD. sealless mag-drive pumps encompass 30 years of research and development with many stages of design advancements. Virtually all WARRENDER pump designs can be serviced or upgraded with spare components or complete assembly kits.

These upgraded/latest edition WARRENDER pump repair components are readily available:

- Complete Pump Assemblies
- Wet End Kits
- Rear Wet End Kits
- Shaft, Sleeve & Thrust Bearings
- Internal & External Magnets
- Impeller & Channel Rings
- O-ring Kits
- Cartridge Kits

Please Contact Our Sales Department if you have further questions:

888-24-PUMPS sales@warrender.com





Date of Request:	DATA SHEET	_
Company Name:		
Address:	Please Fax to:	
City/State/Zip:	WARRENDER, LTD	
Contact:	20401 N. Delland Dr. Ste H.	
Phone:	28401 N. Ballard Dr., Ste. H	
Fax:	Lake Forest, IL 60045	
E-mail:	Fax: 847-247-8680	
Distributor:	Email: sales@warrender.com	
Contact:		
Process/Project Description		

Time Needed: Due Date:	🗆 Immediate	ely		□ 1-3 Months		□ 3-6 Months		10	□ More than 6 months		
Fluid & Process Conditions	D	esign		Max	Min	Cur	rent Install	ation			
Liquid & Percentage:						— Man	ufacturer:				
Temp (F):						— Desi	ign:				
Flow (GPM):						-Pum	np Size:				
TDH:						Mod	lel No.				
Suction Head:						—Imp	eller Diamete	er:			
Suction Pressure:						—Mate	erial:	. —			
Discharge Pressure:						—Suct	tion Port Dian	neter:			
NPSHa:						—Disc Diar	harge Port neter:				
Specific Gravity:						Mot	or HP:				
Viscosity:						RPM	1:				
Specific Heat:											
pH:						-N	otes:				
Particles (% by vol.)											
Particle Size:											
Liquid Level (Ft):											
Suction Lift:											
System Design			M	lotor Speci	ficatio	ns					
Tank Material:				Enclo	sure 🗆	1 TEFC		Chem Duty	, D	Exp	DC DC
Tank Volume:				Mou	nting 🗆	1 Close	Coupled 🗆 L	ong Coupl	ed		
Piping Material:				Preferred	RPM 🗆	1 1750		3500			
Suction Pipe Diameter	:			I	Hertz 🗆	1 50 Hz		50 Hz			
Discharge Pipe Diamet	er:			Р	hase 🗆	1 Single	01	hree			
				Vo	ltage 🗆	1 115 V		208 V		230 V	
Electronic Flowmet	ers 🗆 Yes		0			1 380 V		460 V		575 V	
Liquid Level Cont	rols 🗆 Yes		0			1 12 V		24 V			
Will system be flus	ned 🗆 Yes		° c	)ptions& *	Monito	ring:					
Can pump run d	lry? □ Yes		o P	ower Monito	or		🗆 Single Tri	p 🗆 Dua	al Trip	🗆 Dual Tri	o w/4-20 mA
Can pump dead-he	ad? □ Yes		о т	hermocoupl	e Probe	2	□ Yes	□ No			
NPT Pump Ports: 🗆			v	Velded Stear	m Jacke	ets	□ Casing	🗆 Bra	cket	□ Internal	Bearings
Flanged Pump Ports: [	2			I Self-Clean	ing Disc	harge S	Strainer (WM	CA models	only)		-
Preliminary Pump S	election:				-	-					
Centrifugal	] Turbine		□ Self-P	riming	6	] Vane					

Pump Model:

Pump Material:

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\* **NOTE:** Pump warranty is contingent upon an approved electronic monitoring device.







WARRENDER, LTD. 28401 N. Ballard Dr., Suite H Lake Forest, IL 60045

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