

Ingersoll Rand (NYSE:IR) advances the quality of life by creating comfortable, sustainable and efficient environments. Our people and our family of brands—including Club Car®, Ingersoll Rand®, Thermo King® and Trane®—work together to enhance the quality and comfort of air in homes and buildings; transport and protect food and perishables; and increase industrial productivity and efficiency. We are committed to a world of sustainable progress and enduring results.



To learn more about the PRIMEROYAL® series of metering pumps, contact your local representative or visit our website.

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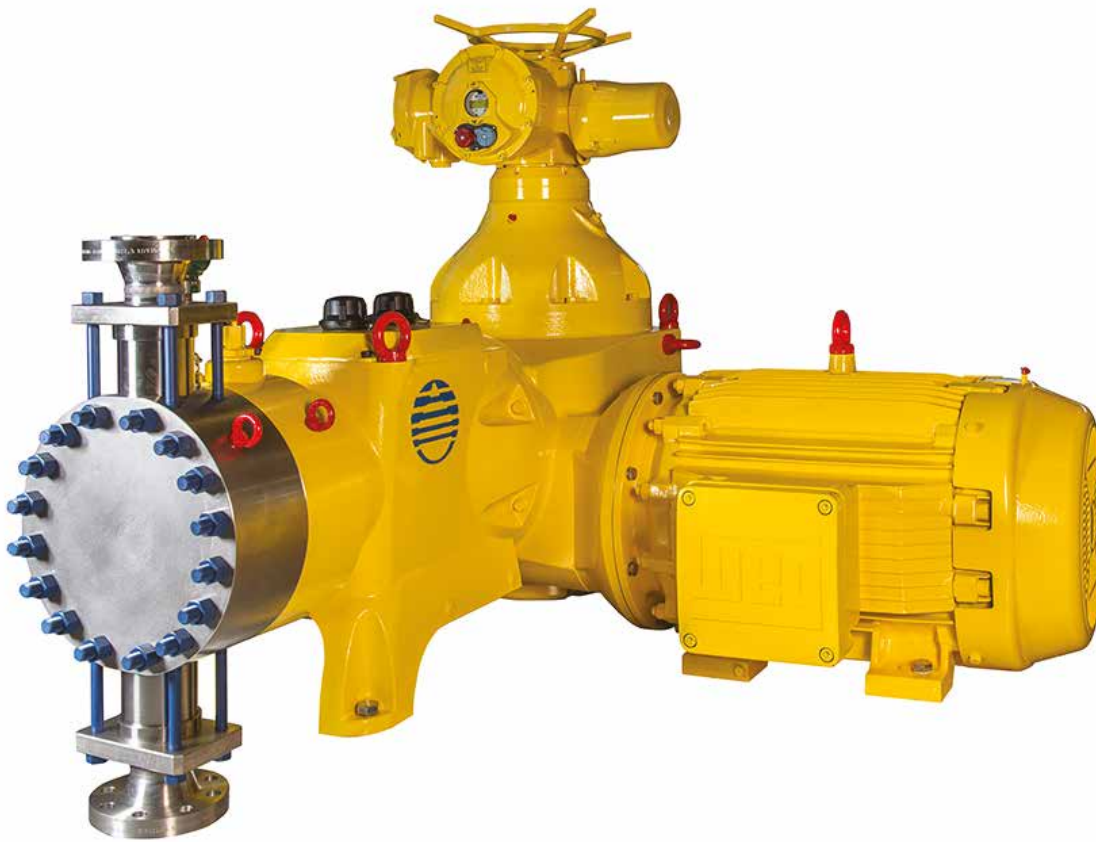
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PRIMEROYAL®

Series Metering Pumps



PRIMEROYAL® Series Metering Pumps

A history of reliability

With over 80 years of experience, Milton Roy combines vast industry experience, a proven track record, and a culture of continuous technological improvement to provide customized solutions for all pump applications.

Milton Roy delivers the market's most reliable, comprehensive range of metering pumps. Our pumps are engineered to exceed expectations and are backed by a global network of highly trained field engineers and after-sales support that are second-to-none.

Unsurpassed reliability and versatility in critical chemical dosing applications

The outstanding reliability of PRIMEROYAL® series pumps begins with a robust gear mechanism and a modular design. These highly flexible pumps accept several types of liquid ends and capacity-control options for the specific requirements of your application. With more than fifty years of experience and advanced pump-engineering technologies, PRIMEROYAL® metering pumps provide continuous operation with the longest possible time between scheduled maintenance.

The combination of robust, field-proven design and flexible modularity makes PRIMEROYAL® pumps suitable for a large number of industrial processes. The PRIMEROYAL® range provides accurate dosing of a broad spectrum of fluids at flow rates that can reach more than 6,853 gph (25,941 L/h) in the triplex configuration.

(With its versatile, modular design and wide range of options, PRIMEROYAL® pumps can be precisely configured for your applications.)

Flexible Design

With its versatile, modular design and wide range of equipment and material options, PRIMEROYAL® pumps are an integrated pump system that can be precisely configured for your applications.

- Six frame sizes with a wide flow rate and pressure range
- Selection of liquid-end types and capacity-control options
- Multiplexing available in any combination of frame sizes
- Variable or fixed stroke length
- Adjust flow manually or automatically while running or stopped



The PRIMEROYAL® X with metallic liquid end and PTFE double diaphragm, horizontal motor configuration, and actuator with integrated electronics.








PLG pump - GSD liquid end



PRIMEROYAL® R Triplex Configuration

PRIMERROY® and PRIMERROYAL® Range

Selection chart

Liquid End		Packed Plunger				Metallic Diaphragm				PTFE Diaphragm					
		P4 (NX)		P2-P3 (UT or N)		M2 (MX)		M1 (M)		H5 (HX)		H1-H2-H3-H4 (HPD)		G1-G2 (GSD)	
		Max. Flow gph (L/h)	Max. Pressure psi (bar)	Max. Flow gph (L/h)	Max. Pressure psi (bar)	Max. Flow gph (L/h)	Max. Pressure psi (bar)	Max. Flow gph (L/h)	Max. Pressure psi (bar)	Max. Flow gph (L/h)	Max. Pressure psi (bar)	Max. Flow gph (L/h)	Max. Pressure psi (bar)	Max. Flow gph (L/h)	Max. Pressure psi (bar)
	PK	10 (38)	13,488 (930)	544 (2,062)	4,351 (300)			51 (195)	7,251 (500)			87 (330)	2,190 (151)		
	PKG													660 (2,500)	536 (37)
	PL	22 (87)	14,503 (1,000)	919 (3,480)	4,481 (309)	17 (66)	14,997 (1,034)	63 (242)	7,251 (500)			1,164 (4,410)	4,148 (286)		
	PLG													871 (3,300)	652 (45)
	PN	70 (265)	14,504 (1,000)	2,605 (9,863)	3,539 (244)	95 (363)	14,996 (1,034)	60 (230)	7,251 (500)	517 (1,958)	3,596 (248)	2,284 (8,649)	4,351 (300)		
	PP			4,138 (15,665)	4,438 (306)					2,188 (8,284)	4,496 (310)	2,656 (10,056)	1,348 (93)		
	PR	209 (793)	14,503 (1,000)	4,136 (15,659)	4,626 (319)	209 (793)	14,996 (1,034)			2,188 (8,284)	5,758 (397)	3,315 (12,549)	362 (25)		
	PX	334 (1,268)	14,213 (980)			523 (1,980)	14,924 (1,029)			4,356 (16,490)	3,654 (252)				

The values are based on a 50 Hz motor. For a 60 Hz motor, the values increase by approximately 20% so please consult your representative to verify.

General Specifications

- Flow rate: from 0.05 gph (0.2 L/h) to 3,315 gph (12.5 m³/h) in simplex configuration
- Pressure: up to 15,000 psi (1,034 bar) in standard
- Multiplexable
- Accuracy: ±1%, even for low flow rates and high pressures
- Fluid temperature: from -22°F to 230°F (-30°C to 110°C) as standard/up to 600°F (315°C) on request
- Ambient operating temperature: from -40°F to 122°F (-40 °C to + 50 °C)
- Stroke adjustment: from 0 to 100% of nominal flow rate
- Explosion-proof version: conforming to ATEX CE EX II 2 G/D c T3 or T4 upon request
- Standard liquid-end materials include: 316L, PVC, 17-4ph, and Alloy 20

Milton Roy and our trusted partners can help to:

- Guide in selecting the turnkey solution that best suits your needs
- Advise on the optimum installation of your equipment
- Propose a wide range of accessories to complete the installation of your pump
- Advise on the essential parts to keep on hand in order to optimize the performance of your equipment
- Provide turnkey dosing solutions from a skid-mounted pump to a complex, customized chemical injection package

Applications

Chemical / Petrochemical

- Injection of additives and injection of sulphuric acid into water and/or transfer of ammonia water
- ETO charge pump, dosing ENB (Ethylidene Norbornene), injection of additives and reactants, transfer of condensate before treatment
- Dosing catalyst for polymerization of polyethylene and polypropylene

Food and Beverage

- Cleaning in place
- Injection of enzymes and caustic soda in refining and distilling applications

General industry

- Treat for scaling, corrosion and the accumulation of microbiological activity that could diminish the quality and efficiency of the process, if not treated
- Treat water that enters a plant prior to and after use to allow for reuse or release into the environment.

Industrial Water Treatment

- Treat for scaling, corrosion and the accumulation of microbiological activity that could diminish the quality and efficiency of the industrial process or damage expensive equipment, if not treated.
- Treat water that enters a plant prior to and after use to allow for reuse or release into the environment.
- Protection of equipment such as boilers and hydraulic systems (corrosion inhibitors, biocides, scale inhibitors, amines, etc.)

Mining

- Injection of reagents to wash extracting ores such as platinum or gold

Municipal Drinking / Wastewater Plants

- Coagulation/flocculation (injection of ferric chloride, aluminum sulphate, etc.) pH control (injection of acids and alkalis), water conditioning before and/or after RO treatment in desalination plant

- Provide safe potable water by effectively disposing of solid material, like sludge and sedimentation to dissolving suspended organic materials and disinfecting water by killing disease-causing micro-organisms. Each step requires the efficient use of chemicals and equipment that is reliable and accurate.

Oil and Gas

- **Upstream:** injection of methanol, monoethylene glycol, corrosion inhibitors and many more to prevent hydrate formation, wax and scale deposits and corrosion in deepwater wells
- **Midstream:** injection of corrosion inhibitors for produced oil and gas integrity during transportation
- **Downstream:** injection of chemicals for separation and treatment of refined products to control the oil viscosity, treatment of produced water (transfer, injection of coagulants)
- **Produced Water Treatment:** injection of sodium hypochlorite, biocides, scale inhibitors, oxygen reducing agent, demulsifier, reverse emulsion breakers etc.

Power Generation

- Metering of biocide, hypochlorite to prevent fouling of the mechanical equipment and pipework
- High-pressure boiler feed water treatment

Refinery / Downstream

- Injection into boiler feedwater and anti-fouling, transfer of sour water before treatment, injection of catalyst
- Injection of DMDS (dimethyl disulfide), boiler feed water pump, metering of additives
- Injection of chemicals, injection of paraffin inhibitor into fuel storage tanks

Refinery / Chemical / Petrochemical

- Pumping of hydrocarbons/LP steam condensate, transfer of ammonia water in fertilizer plant, manufacturing of DME (dimethyl ether) from methanol

Utilities

- Optimal water conditioning to protect equipment by addressing scaling, corrosion and accumulation of microbiological activity.

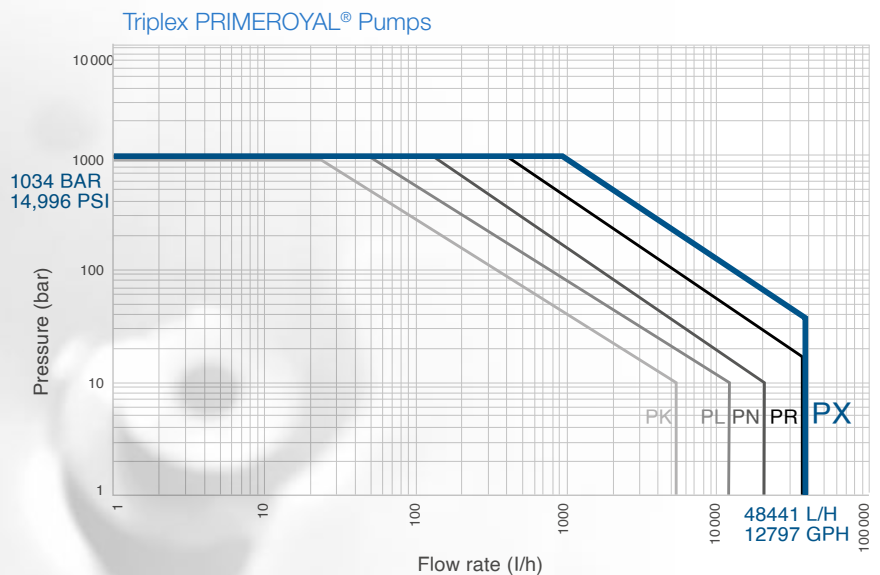
Features and Benefits

Why PRIMEROYAL® pumps are your best choice

Reliability and Precise Control

Innovations such as the variable eccentric drive combined with proven experience in metering pump technology to give you the highest reliability in the most critical applications while performing with high repeatable accuracy.

- Built to API 675 standards
- Maximum performance in a small footprint
- Diaphragm liquid ends guaranteed leakproof with service life in excess of 20,000 hours
- Field-proven operation under low temperatures or offshore applications
- Can pump a wide range of chemicals including acids, bases, corrosive or viscous liquids, and slurries



Durable Variable Eccentric Drive in a Compact Design

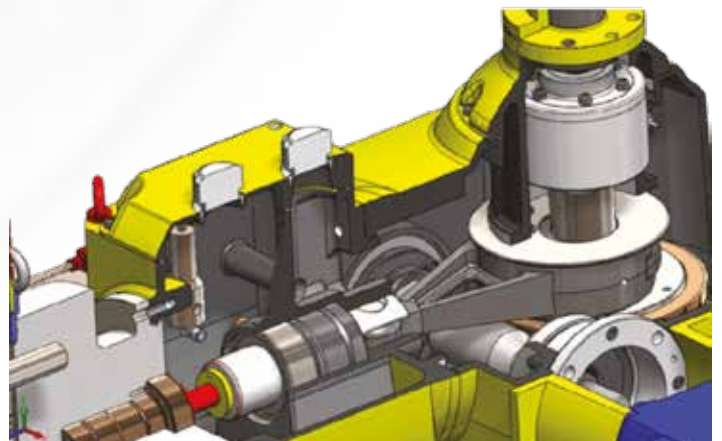
In critical processes, the PRIMEROYAL® variable eccentric drive ensures small footprint, durability and optimum performance for the entire chemical dosing system.

This innovation is a no-lost-motion design compared to designs that have stop plates or rods to limit the plunger travel. Lost-motion designs also rely on spring return mechanisms to keep the plunger in contact with the eccentric.

PRIMEROYAL® pumps power the full stroke cycle, which eliminates the mechanical and hydraulic shocks inherent in lost-motion drives.

The PRIMEROYAL® variable eccentric drive enables precise control of the pump delivery rate while meeting or exceeding industry standards for steady-state accuracy and repeatability.

PRIMEROYAL® pumps achieve this high level of performance in a compact design, for the greatest installation flexibility.



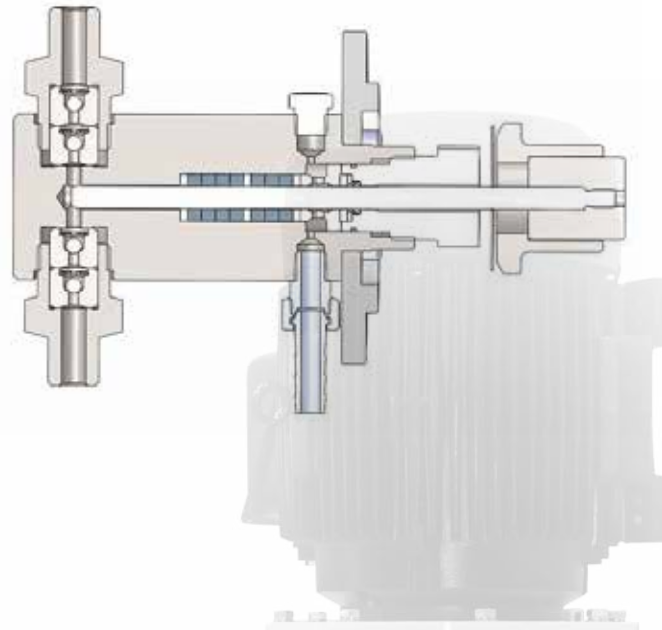
Liquid Ends

Packed Plunger Liquid Ends

Models UT, N, or NX

The packed plunger liquid end offers the best performance when net-positive inlet pressure is an issue. The plunger is in direct contact with the process fluid, to provide the most efficient pumping performance.

- Ideal for viscous fluids and slurries (low NPSH)
- Options available to handle temperatures as high as 600°F (315°C)
- Pressures up to 14,504 psi (1,000 bar)
- Standard plungers provide long plunger life in excess of 20,000 hours
- Model NX provides leakproof operation

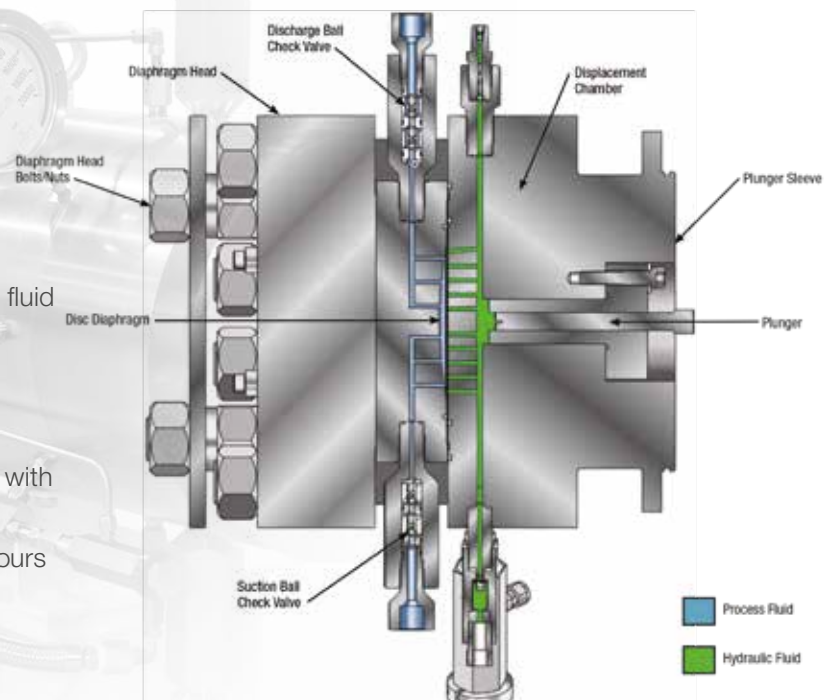


Metallic Double Diaphragm Liquid Ends

Models M or MX

Milton Roy's metallic diaphragm liquid end easily handles the most severe high-pressure, high-flow applications:

- High-pressure applications up to 4,996 psi (1,034 bar)
- Hydraulically balanced diaphragm minimizes stress
- Standard diaphragm material is 301 or 316L stainless steel. Modified materials are available to suit the process fluid
- Sealless liquid-end design assures leak-free operation
- Dosing of specific products such as radioactive or diffusing liquids
- Internal safety valve: patented, differential pressure valve with integrated air bleed. Adjustable pressure setting
- Assembly designed for service life in excess of 10,000 hours
- Oil compensation valve with adjustable pressure setting



PTFE Double Diaphragm Liquid Ends

Models H, HX, or P

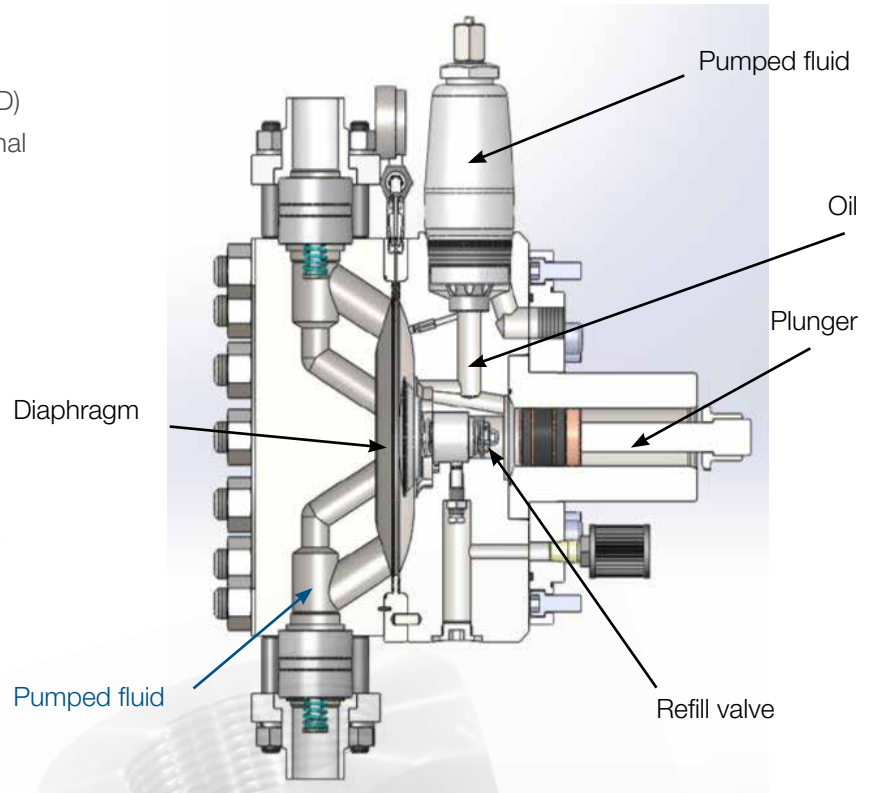
Milton Roy's proven High Performance Diaphragm (HPD) liquid end combines the best characteristics of traditional liquid ends with a simple and elegant design.

- Hydraulically balanced diaphragm minimizes stress and assures long diaphragm life
- Diaphragm PTFE wetted surface provides wide chemical compatibility with process fluids while composite materials allow maximum flexibility
- Adjustable internal relief valve in hydraulic system protects pump from overpressure
- Patented MARS hydraulic fluid compensation system eliminates the need for process side diaphragm containment that restricts flow
- 316L stainless steel or PVC version with single or double diaphragm
- Handles pressures up to 5,758 psi (397 bar) without impact on diaphragm life
- Virtually leakproof
- Self-formed PTFE/elastomer compound diaphragm or molded preformed PTFE diaphragm, depending on model
- Patented reusable diaphragm. Service life in excess of 20,000 hours

Responsive Support

Our outstanding team of highly competent engineers, technicians and partners can provide world-class service and support. Not only can we assist in selecting the optimal pump to meet your requirements, but we can deliver service through the pump's lifecycle, from installation to after-sales support.

- Asset mapping and health check services
- Project management and packaging services
- Installation and commission of your pump
- Manufacturer's documentation including material certifications, drawings, parts list, etc.
- Testing services such as hydrostatic, vibration, noise, X-ray, etc.
- Spare parts and repair services for preventative and critical maintenance



Design Options

The PRIMEROYAL® series offers options to meet the requirements of most applications including, but not limited to:

- Electronic capacity control by actuator
- Variable speed drive control
- Flanged, NPT, and other connections as required
- Specified liquid end materials
- Special base plates
- Diaphragm Rupture Detection system
- Steam or cooling jackets
- Remote head
- High and low temperature configurations
- Low temperature options
- NEMA and IEC flange motor mount options
- Special check valves for all types of fluid (including concentrated sulphuric acid)