

PRIMEROYAL® Series

API 675 metering pump

DATA SHEET

Models PK and PKG

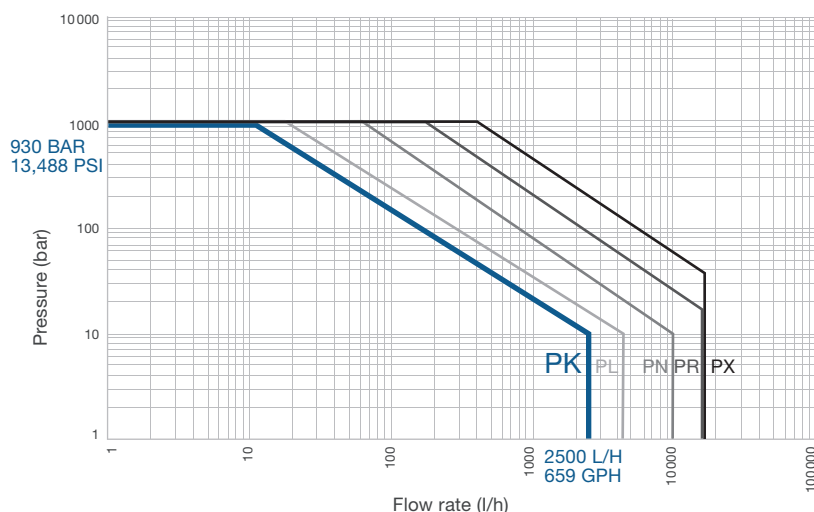
The PRIMEROYAL® metering pumps are versatile, reliable pumps that consistently and accurately inject chemicals. The pumps' field-proven design enables precise control of the pump delivery rate with a $\pm 1\%$ steady state accuracy, over a range to 10 to 100% of the nominal flowrate. They feature a compact, variable eccentric drive that changes the stroke length by changing the position of the center of the shaft in the eccentric.

Models PK and PKG provide accurate dosing of a broad spectrum of fluids used in many industrial processes thanks to their modular design which offers several types of liquid ends, capacity control options and other configuration options enabling them to meet the specific requirements of your process application.



PKG pump - GSD liquid end

Simplex PRIMEROYAL® Pumps



	50 Hz motor	60 Hz motor
Flow rate	Up to 2,500 l/h	Up to 659 GPH
Pressure	Up to 930 bar	Up to 13,488 PSI
Thrust	475 daN	1,067
100% stroke	40 mm	1.57 in
Ambient T°		
Standard	-10 to + 50 °C	+ 14 to +122 °F
Low T° design	- 40 to +50 °C	- 40 to +122 °F

Applications

- **Municipal drinking/wastewater plants:** Coagulation/flocculation (injection of ferric chloride, aluminium sulphate, etc.), pH regulation (injection of acids and alkalis), water conditioning before and/or after RO treatment in desalination plant
- **Industrial water treatment:** protection of installation such as boilers and hydraulic systems (corrosion inhibitors, biocides, scale inhibitors, amines...)
- **Chemistry/Petrochemistry:** injection of additives, injection of co-catalyst such as TEAL for polyethylene and polypropylene production, injection of sulphuric acid into water to produce diluted sulphuric acid
- **Refinery/Downstream:** Injection of chemicals for separation and treatment of refined products, injection of paraffin inhibitor into fuel storage tanks
- **Oil & Gas:** injection of biocide, corrosion/scale inhibitors, H₂S scavengers... protecting piping and other assets and maintaining production rates, transfer of steam condensate
- **Food and beverage industry:** Injection of enzymes in starch production, injection of caustic soda for process water neutralization in refining and distilling applications



Benefits

- Compliant with **API675 standards**
- **Adaptability and accuracy:** capacity adjustable while running or stopped (stroke micrometric adjustment, 10 turns only from 0 to 100%, graduation scale in %)
- **Space constraints:** Minimized footprint and weight, available in vertical or horizontal motor configurations, GSD design for tiny spaces
- **Suitable for the majority of fluids in all industrial processes:** many stroke speeds for accurate dosing
- **Modular design to precisely fit your needs:** multiple options for liquid ends, check valves, connection types, and control...
- **Multiplexing capability:** providing cost savings in the power consumption and asset footprint whilst reducing pulsation and required NPSH and, giving the capability to inject several different products or meet a specific flow rate
- **Long life:** ensured by using high quality materials engineered to a robust and proven construction, oil bath lubrication to ensure reliability during continuous operation
- **Safety:** diaphragm liquid ends guaranteed leak-proof with service life in excess of 20,000 hours
- **Operations even in the most extreme conditions:** specific configurations to operate in saline/offshore conditions, desert, low temperature environment
- **Global design:** can comply with the main worldwide certifications and systems: ATEX, NACE, SASO, Customs Union, etc.
- **Over-pressure protection:** integrated safety valve to protect the pump on diaphragm liquid ends
- **Additional benefits with PTFE diaphragm liquid ends:**
 - **Maintenance easy and fast:** the patented MARS system (Mechanically Actuated Refill System) avoids the need to delicately adjust the refill valve
 - **Triple hydraulic security with the GSD design:** in addition to the internal pressure safety valve, the diaphragm controls the hydraulic refill and the diaphragm itself is protected by a valve blocking the overrunning and the extrusion
 - **Installation Monitoring Indicator (IMI) system with the GSD design:** visual indication of over-pressure, cavitation and lack of pulsation dampening that can cause disturbance and inaccuracy in the dosing process

Technical features

- Packed plunger, PTFE or metallic diaphragm liquid ends available
- Liquid end body in 316L S.S., 17-4P-H, PVC or PVDF. Other materials such as Alloy 20, Hastelloy, super Duplex available upon request
- Diaphragms in PTFE or 316L stainless steel; plunger in Z55CDV17 steel or chromium oxide coated
- 6 stroke speeds/gear ratios available with 50 Hz-motor: 39, 59, 100, 120, 144 and 180 spm. 5 stroke speeds/gear ratios with 60 Hz-motor: 47, 71, 120, 144 and 173 spm
- Manual, electrical or pneumatic stroke length adjustment
- IEC or NEMA mounting, motor for frequency variation
- Electric equipment for non-hazardous or hazardous area, large variety of protections and insulations
- Conforms to ATEX CE EX II 2G/D c T4/T3 with ATEX motors
- Optimum protection for critical processes or pumped fluids: double or triple diaphragm, diaphragm failure detection, temperature probes
- Food grade design (in accordance with CE 1935-2004)
- Special valves for any type of fluid (including concentrated sulphuric acid and slurries)
- Remote head, cooling/heating jacket to operate in processes requiring low/extreme fluid temperatures
- Full set of connections: screwed or flanged connectors (ANSI, DIN or ISO)
- Wide range of accessories available to complete your dosing installation

Design Specifications

According to your process, we advise you on the best design of liquid ends to meet your specific requirements. The following charts demonstrate the minimum and maximum flow rate and pressure of the pump for a single head on a basic configuration. To obtain the flow rate for multiplex head, multiply the flow rate by the number of heads. For other applications, please consult us.

Standard connections are depending on the plunger diameter; a full set of connections are available upon request. Please consult us for details.

Packed plunger liquid end

- High pressure capabilities
- Lowest NPSH requirements
- Ideal for viscous fluids and slurries
- Robust, Reliable and Efficient operation

TYPE P4 (NX)

- High and extreme pressure capability
- High hydraulic efficiency
- Contained leakage concept reduces monitoring and maintenance

		50 Hz Motor					60 Hz Motor					
Plunger diameter code	Swept volume	Stroke speed max	Motor speed max	Flow rate max		Pressure max	Stroke speed max	Motor speed max	Flow rate max		Pressure max	Connections
				10 bar	P.max				145 psi	P.max		
Ø	cm³	spm	rpm	l/h		bar	spm	rpm	GPH		psi	
10	3.1	144	1440	26.1	19.9	600	144	1152	6.9	5.3	8702	1/2" - VV2 m
12	4.5	144	1440	37.5	31.7	400	144	1152	9.9	8.4	5801	1/2" - VV2 m

TYPE P2 - P3 (N AND UT)

- Self-adjustment with UT design for ease of assembly and service or User adjustment with N design, a more economical alternative
- Cost effective solution

		50 Hz Motor					60 Hz Motor					
Plunger diameter code	Swept volume	Stroke speed max	Motor speed max	Flow rate max		Pressure max	Stroke speed max	Motor speed max	Flow rate max		Pressure max	Connections
				10 bar	P.max				145 psi	P.max		
Ø	cm³	spm	rpm	l/h		bar	spm	rpm	GPH		psi	
Packed Plunger (N)												
7.9	2	144	1440	14.4	9	690	144	1152	3.8	2.4	10007	1/2" - VV1 m
11.1	3.9	144	1440	28.2	20.9	478	144	1152	7.4	5.5	6937	1/2" - VV1 m
15.9	7.9	144	1440	61.6	54	232	144	1152	16.3	14.3	3364	1/2" - VV1 m
22.2	15.5	144	1440	120.7	113.6	117	144	1152	31.9	30	1692	1/2" - VV1 m
9.5	2.8	144	1440	23.6	20.8	300	144	1152	6.2	5.5	4351	1/2" - VV1 m
15.9	7.9	144	1440	65	59	231	144	1152	17.1	15.5	3350	1/2" - VV1 m
19.1	11.5	144	1440	94	88	159	144	1152	25	23	2306	1/2" - VV1 m
25.4	20.3	144	1440	168	162	88	144	1152	44	43	1276	1/2" - VV1 m
31.8	31.8	144	1440	262	257	55	144	1152	69	68	797	1/2" - VV1 m
38.1	45.6	144	1440	378	373	38	144	1152	100	99	551	1" - VV1 m
44.5	62.2	144	1440	514	510	27	144	1152	136	135	391	1" - VV1 m
50.8	81.1	144	1440	672	669	20	144	1152	178	177	290	1" - VV1 m
57.2	102.8	144	1440	851	848	16	144	1152	225	224	232	1" - VV1 m
63.5	126.7	144	1440	1050	1049	12	144	1152	277	277	174	2" - VV1 m
69.9	153.5	144	1440	1271	1271	10	144	1152	336	336	145	2" - VV1 m
79.4	198.1	144	1440	-	1642	7	144	1152	-	434	101	2" - VV1 m
88.9	248.3	144	1440	-	2062	6	144	1152	-	545	87	2" - VV1 m

PTFE diaphragm liquid ends

- Widest chemical compatibility
- 100% leakage-free
- High operational safety: integrated relief valve
- Improved lifecycle costs
- The MARS system offers a number of advantages over traditional refill systems in hydraulically actuated diaphragm liquid ends: easy start-up without the need to adjust the refill valve, a delicate procedure.

TYPE H1 – H3 (HPD) and H7 (for High Pressure and Low Flow applications)

- Universal solution
- High hydraulic efficiency
- Low flow rates and high pressure

		50 Hz Motor					60 Hz Motor					
Plunger diameter code	Swept volume	Stroke speed max	Motor speed max	Flow rate max		Pressure max	Stroke speed max	Motor speed max	Flow rate max		Pressure max	Connections
				10 bar	P.max				145 psi	P.max		
Ø	cm³	spm	rpm	l/h		bar	spm	rpm	GPH		psi	
Stainless steel liquid end - Type H1 - H3 - H7 - PTFE diaphragm												
13	5.3	180	1440	44.7	31.7	350	173	1728	11.3	8.0	5076	1/2" - W1 m
14	6.2	180	1440	51.8	42.5	309	173	1728	13.1	10.7	4475	1/2" - W1 m
15	7.1	180	1440	59.5	50.2	269	173	1728	15.0	12.7	3898	1/2" - W1 m
16	8.0	180	1440	71.2	61.5	236	173	1728	18.0	15.6	3426	1/2" - W1 m
20	12.6	180	1440	120	98	151	173	1728	31	27	2190	1/2" - W1 m
20	12.6	180	1440	120	107	96	173	1728	31	27	1392	1/2" - W1 m
25	19.6	180	1440	201	176	96	173	1728	51	45	1392	1/2" - W1 m
32	32.2	180	1440	330	330	59	173	1728	84	78	855	1/2" - W1 m

TYPE G1 - G2 (GSD)

- Compact footprint, fewer components due to the lack of hydraulic fluid reservoir
- High flow at medium pressure
- IMI system (Installation Monitoring Indicator) to visualize any variations in the dosing process

		50 Hz Motor					60 Hz Motor					
Plunger diameter code	Swept volume	Stroke speed max	Motor speed max	Flow rate max		Pressure max	Stroke speed max	Motor speed max	Flow rate max		Pressure max	Connections
				10 bar	P.max				145 psi	P.max		
Ø	cm³	spm	rpm	l/h		bar	spm	rpm	GPH		psi	
Stainless steel liquid end - Type H - PTFE diaphragm												
40	50.3	180	1440	488	448	37	173	1728	124	113	536	1/2" - VV1 m
50	78.5	180	1440	780	747	24	173	1728	198	189	348	1" - VV1 m
63	124.7	180	1440	1238	1219	15	173	1728	314	309	217	1" - VV1 m
70	153.9	144	1440	1197	1189	12	144	1152	316	314	174	2" - VV1 m
80	201.1	144	1440	-	1598	9	144	1152	-	422	130	2" - VV1 m
90	254.5	144	1440	-	2022	7	144	1152	-	534	101	2" - VV1 m
100	314.2	144	1440	-	2500	5	144	1152	-	659	72	2" - VV1 m
PVC liquid end - PTFE diaphragm- Type H1												
40	50.3	180	1440	488	488	10	173	1728	124	124	145	1" - VV1 f
50	78.5	180	1440	780	780	10	173	1728	198	198	145	1" - VV1 f
63	124.7	180	1440	1238	1238	10	173	1728	314	314	145	1" - VV1 f
70	153.9	144	1440	1197	1197	10	144	1152	316	316	145	1" 1/2 - VV1 f
80	201.1	144	1440	-	1598	9	144	1152	-	422	130	1" 1/2 - VV1 f
90	254.5	144	1440	-	2040	7	144	1152	-	539	101	1" 1/2 - VV1 f
100	314.2	144	1440	-	2500	5	144	1152	-	659	72	1" 1/2 - VV1 f

Metallic diaphragm liquid end

- High pressures
- High pumped liquid temperatures
- Challenging products dosing: diffusing, radioactive or abrasive liquids
- “Metal to Metal” sealing design assures leak free operation
- Single and Double Stainless steel diaphragm available

TYPE M1 (M)

		50 Hz Motor					60 Hz Motor						
Plunger diameter code	Swept volume	Stroke speed max	Motor speed max	Flow rate max		Pressure max	Stroke speed max	Motor speed max	Flow rate max		Pressure max	Connections	
				10 bar	P.max				145 psi	P.max			
Ø	cm³	spm	rpm	l/h		bar	spm	rpm	GPH		psi		
Stainless steel liquid end, Type M1, with Stainless steel single diaphragm													
8	2	180	1440	20	14.1	500	173	1728	5.1	3.6	7251		1/2" - VV1 m
10	3.1	180	1440	31	21	500	173	1728	7.9	5.6	7251		1/2" - VV1 m
12	4.5	180	1440	44	33	419	173	1728	11.1	8.2	6077	1/2" - VV1 m	
14	6.2	180	1440	61	50	308	173	1728	15.2	12.4	4467	1/2" - VV1 m	
16	8	180	1440	79	68	236	173	1728	20	17.1	3422	1/2" - VV1 m	
18	10.2	180	1440	101	90	186	173	1728	25	23	2697	1/2" - VV1 m	
20	12.6	180	1440	124	113	151	173	1728	31	29	2190	1/2" - VV1 m	
22	15.2	180	1440	151	140	124	173	1728	38	35	1798	1" - VV1 m	
25	19.6	180	1440	195	184	96	173	1728	49	47	1392	1" - VV1 m	

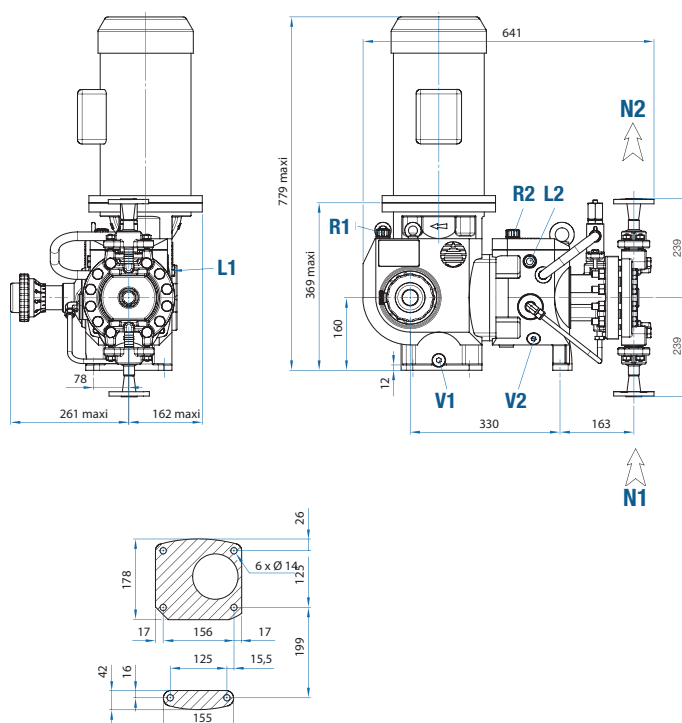
Dimensions, Weight and Packing

The general dimensions are given in mm and as an indication only.

The dimensions given correspond to the maximum dimensions (largest liquid ends, most powerful motor)

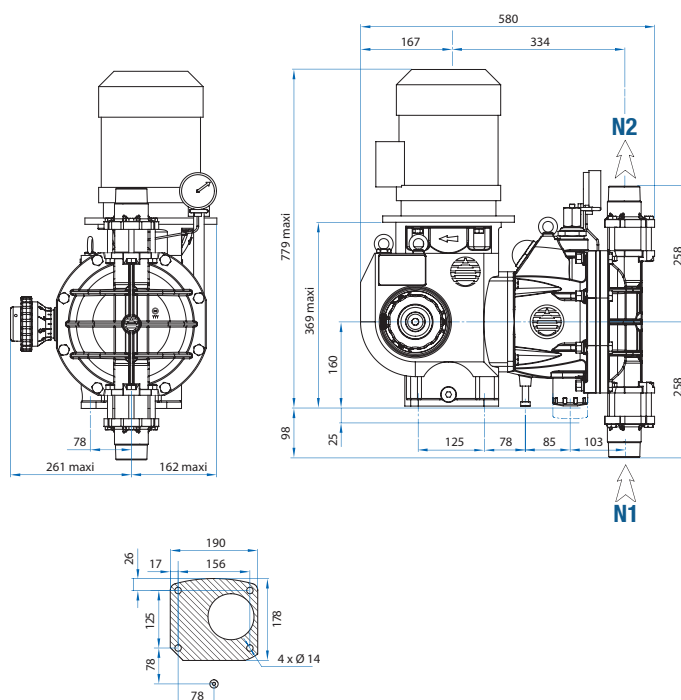
HPD PTFE DIAPHRAGM LIQUID END

Simplex configuration



GSD PTFE DIAPHRAGM LIQUID END

Simplex configuration



N1 Suction - N2 Discharge - V2 Drain hydraulic oil - L2 Hydraulic oil level - R2 Hydraulic oil filling - V1 Drain mechanic oil - R1 Mechanic oil filling - L1 Mechanic oil level

Version	Net weight(*)		Gross weight(*)		Packing	
	kg	lbs	kg	lbs	(L x W x H) mm	(L x W x H) in
Series PK - Simplex	110	242	168	370	900 x 600 x 1,050	35.5 x 23.6 x 41.4
Series PKG - Simplex	120	265	170	375	700 x 650 x 1,000	27.6 x 25.6 x 39.4

(*) Approximately

Milton Roy and our trusted partners can help to:

- Guide you in selecting the turnkey solution that best suits your needs
- Advise you on the optimum installation of your equipment
- Propose a wide range of accessories to complete the installation of your pump
- Advise you on the essential wear parts to be kept on hand in order to optimize the performance of your equipment
- Provide turnkey dosing solutions, from a skid-mounted pump to a complex, 100% customized chemical injection package

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