PRIMEROYAL® Series
Metering Pump

Models PK and PKG

The PRIMEROYAL® PK and PRIMEROY® PKG 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 while meeting or exceeding industry standards for steady state accuracy and repeatability. 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 at flow rates that can reach up to 2,500 l/h (660.5 gph). The pumps have a modular design that accepts three types of liquid ends and offer capacity control options so they can meet the specific requirements of a large number of demanding industrial processes.

Applications

- Oil and Gas
  - Upstream – Injection of methanol at pressures of 1,034 bar (15,000 psi) and more at the wellhead for onshore and offshore 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
  - Produced water treatment – Injection of sodium hypochlorite, biocides, scale inhibitors, oxygen reducing agent, etc.
- Chemical and Petrochemical Processing
  - Dosing catalysts for polymerization of polyethylene
- Power Generation
  - High-pressure boiler feed water treatment

Features and Benefits

- Compliant with API675 standards
- Compliant with API674 standards in fixed stroke configuration
- Minimized footprint
- Available in vertical or horizontal motor configurations
- Manual or electrical stroke length adjustment
- Capacity adjustable while running or stopped
- Packed plunger, Teflon® PTFE or metallic double diaphragm liquid ends available
- Conforms to ATEX CE EX II 2G/D c T3 with ATEX motors
- Multiplexable

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General Specifications

Accuracy	± 1% over a range of 10 to 100% nominal flowrate
Flow rate adjustment	Micrometric adjustment of stroke while running or stopped
Maximum stroke	40 mm (1.57 in)
Frequencies at 50 Hz 960 rpm	39 and 120 spm
Frequencies at 50 Hz 1,440 rpm	59, 100, 144 and 180 spm
Frequencies at 60 Hz 1,140 rpm	47 and 144 spm
Frequencies at 60 Hz 1,725 rpm	71, 120, and 173 spm
Thrust	475 daN (1,068 lbf)
Ambient operating temperature	Standard: -10°C to 50°C (14°F to 122°F) Low temperature option: -40°C to 50°C (-40°F to 122°F)
API675	Confroms (exemptions available on request)
ATEX	Conforms to TEX CE EX II 2G/D c T3 with ATEX motor ATEX for plastic liquid ends, please consult us For packed plunger liquid ends, in area 1 consult us
Suction	2 m (6.57 ft) water on M, H and P liquid ends 4 m (13 ft) water on UT liquid ends 6 m (19.7 ft) water on N and NX liquid ends
Motor mounting	Only FF165 and FF215

Design Specifications

Model PK with Packed Plunger Type NX*

Flow rate		Pressure Max. 50 Hz Motor (kW)				Freq. (spm) Motor Speed (rpm)		Flow rate		Pressure Max. 60 Hz Motor (HP)				Freq. (spm) Motor Speed (rpm)		Connections ball valves
		0.55	0.75	1.1	1.5					0.75	1	1.5	2			
10 bar	Pres. Max.	H	J	K	L	960	1,440	145 psi	Pres. Max.	H	J	K	L	1,140	1,750	
l/h		bar						gph		psi						
Ø 8 mm - Swept volume: 2.01 cm³								Ø 0.31 in - Swept volume: 0.12 in³								3/8" MP
4.2	2.7	930				39		1.3	0.86	13,488				47		(Ø 6.35 mm / 2.250 in - LD
6.6	4.2	750	930				59	2.1	1.3	10,878	13,488				71	
11.6	7.3	450	650	930			100	3.7	2.3	6,527	9,427	13,488			120	
13.9	8.8	370	530	820	930	120		4.4	2.8	5,366	7,687	11,893	13,488	144		
16.7	10.5	310	440	700	930		144[1]	Not applicable with a 60 Hz motor								
Ø 12 mm - Swept Volume: 4.52 cm³								Ø 0.47 in - Swept Volume: 0.28 in³								1/2"
9.5	8	400				39		3.0	2.5	5,801				47		(Ø 6.35 mm / 0.250 in - LD)
14.9	12.6	340	400				59	4.7	4.0	4,931	5,801				71	
26.1	22	200	280	400			100	8.3	7.0	2,901	4,061	5,801			120	
31.3	26.4	160	235	360	400	120		9.9	8.4	2,321	3,408	5,221	5,801	144		
37.5	31.7	130	195	300	400		144[1]	Not applicable with a 60 Hz motor								

* This chart demonstrates the minimum and maximum flow rate and pressure of the pump. For other specifications, please consult your local representative.
*To have a certification in zone 1, please add probes = CONSULT
[1]Do not use with 60 Hz Motor
LD = Hardened valves - double valve

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Design Specifications

Model PK with Packed Plunger Type UT or N*

Flow rate		Pressure Max. 50 Hz Motor (kW)				Freq. (spm) Motor Speed (rpm)		Flow rate		Pressure Max. 60 Hz Motor (HP)				Freq. (spm) Motor Speed (rpm)		Connections ball valves
		0.55	0.75	1.1	1.5					0.75	1	1.5	2			
10 bar	Pres. Max.	H	J	K	L	960	1,440	145 psi	Pres. Max.	H	J	K	L	1,140	1,725	
l/h		bar						gph		psi						
Ø 9.5 mm - Swept volume: 2.85 cm³								Ø 0.37 in - Swept volume: 0.17 in³								1/2"
6.3	5	300				39		2.0	1.6	4,351				47		(Ø 6.35 mm / 0.250 in - LD)
9.6	7.7	300					59	3.0	2.4	4,351					71	
16.4	13.1	300					100	5.2	4.2	4,351					120	
19.6	15.7	257	300			120		6.2	5.0	3,727	4,351			144		
23.6	18.9	212	300				144[1]	Not applicable with a 60 Hz motor								
Ø 38.1 mm - Swept Volume: 45.60 cm³								Ø 1.5 in - Swept Volume: 2.78 in³								1"
102	100	38				39		32.3	31.7	551				47		(Ø 25 mm / 0.98 in- NS)
154	152	31	38				59	48.8	48.2	450	551				71	
262	259	15	25	38			100	83.1	82.1	218	363	551			120	
315	311	11	20	33	38	120		99.9	98.6	160	290	479	551	144		
378	373	8	15	27	38		144[1]	Not applicable with a 60 Hz motor								

* This chart demonstrates the minimum and maximum flow rate and pressure of the pump. For other specifications, please consult your local representative.
*For methanol applications, please consult us
*To have a certification zone 1, please add probes = CONSULT
[1]Do not use with a 60 Hz motor
LD = Hardened valves - double valve
NS = Single valve

Design Specifications

Model PK with Packed Plunger Type UT*

Flow rate		Pressure Max. 50 Hz Motor (kW)					Freq. (spm) Motor Speed (rpm)		Flow rate		Pressure Max. 60 Hz Motor (HP)					Freq. (spm) Motor Speed (rpm)		Connections ball valves
		0.55	0.75	1.1	1.5	2.2					0.75	1	1.5	2	3			
10 bar	Pres. Max.	H	J	K	L	M	960	1,440	145 psi	Pres. Max.	H	J	K	L	M	1,140	1,725	
l/h		bar							gph		psi							
Ø 44.5 mm - Swept Volume: 62.07 cm³									Ø 1.75 in - Swept Volume: 3.79 in³									1"
139	138	27					39		44.1	43.7	392					47		(Ø 25 mm / 0.98 in - NS)
210	208	22	27					59	66.6	65.9	319	392					71	
357	354	10	17	27				100	113.7	112.2	145	247	392				120	
429	426	7	13	24	27		120		136.0	135.0	102	189	348	392		144		
514	510		10	19	27			144[1]	Not applicable with a 60 Hz motor									
Ø 88.9 mm - Swept Volume: 248.29 cm³									Ø 3.50 in - Swept Volume: 14.66 in³									2"
	557	5	6				39			176.6	72	87				47		(Ø 40 mm / 1.1575 in - NS)
	844			6				59		267.6			87				71	
	1,432				6			100		454.0				87			120	
	1,718				5	6	120			544.6				72	87	144		
	2,062					6		144[1]	Not applicable with a 60 Hz motor									

* This chart demonstrates the minimum and maximum flow rate and pressure of the pump. For other specifications, please consult your local representative.
*For methanol applications, please consult us
*To have a certification zone 1, please add probes = CONSULT
[1]Do not use with a 60 Hz motor
NS = Single valve

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Design Specifications

Model PK with Metallic Single Diaphragm Liquid End Type M*

Flow rate		Pressure Max. 50 Hz Motor (kW)					Freq. (spm) Motor Speed (rpm)		Flow rate		Pressure Max. 60 Hz Motor (HP)				Freq. (spm) Motor Speed (rpm)		Connections ball valves
		0.55	0.75	1.1	1.5	2.2					0.75	1	1.5	2			
10 bar	Pres. Max.	H	J	K	L	M	960	1,440	145 psi	Pres. Max.	H	J	K	L	1,140	1,725	
l/h		bar							gph		psi						
Ø 8 mm - Swept Volume: 2.01 cm³ - Diaphragm: 92 mm									Ø 0.315 in - Swept Volume: 0.12 in³ - Diaphragm: 3.62 in								1/2"
4.3	3.1	500					39		1.4	1.0	7,252				47		(Ø 6.35 mm / 0.250 in - LD)
6.5	4.6	500						59	2.1	1.5	7,252					71	
11.1	7.8	457	500					100	3.5	2.5	6,628	7,252				120	
13.3	9.4	381	500				120		4.2	3.0	5,526	7,252			144		
16	11.3	317	455	500				144	5.1	3.6	4,598	6,599	7,252			173	
20	14.1	254	364	500				180[1,2]	Not applicable with a 60 Hz motor								
Ø 25 mm - Swept Volume: 19.63 cm³ - Diaphragm: 182 mm									Ø 0.98 in - Swept Volume: 1.20 in³ - Diaphragm: 7.2 in								1"
42	39	96					39		13.3	12.4	1,392				47		(Ø 15.9 mm / 0.625 in - LD)
63	59	79	96					59	20.0	18.7	1,146	1,392				71	
108	102	46	67	96				100	34.2	32.3	667	972	1,392			120	
130	123	39	55	85	96		120		41.2	39.0	566	798	1,233	1,392	144		
156	147	32	46	71	96			144	49.5	46.6	464	667	1,030	1,392		173	
195	184	25	37	57	79	96		180[1,2]	Not applicable with a 60 Hz motor								

* This chart demonstrates the minimum and maximum flow rate and pressure of the pump.
For other specifications, please consult your local representative.
Suction Lift: pump set to 2 m (7 ft) water

[1]Do not use a 60 Hz motor
[2]Use with "flooded suction" (0.5 bar or 7 psi)
LD = Hardened valves - double valve

Design Specifications

Model PK with Metallic Double Diaphragm Liquid End Type M*

Flow rate		Pressure Max. 50 Hz Motor (kW)					Freq. (spm) Motor Speed (rpm)		Flow rate		Pressure Max. 60 Hz Motor (HP)				Freq. (spm) Motor Speed (rpm)		Connections ball valves
		0.55	0.75	1.1	1.5	2.2					0.75	1	1.5	2			
10 bar	Pres. Max.	H	J	K	L	M	960	1,440	145 psi	Pres. Max.	H	J	K	L	1,140	1,725	
l/h		bar							gph		psi						
Ø 8 mm - Swept Volume: 2.01 cm³ - Diaphragm: 92 mm									Ø 0.315 in - Swept Volume: 0.12 in³ - Diaphragm: 3.62 in								1/2"
4.3	2.9	350					39		1.4	0.9	5,076				47		(Ø 6.35 mm / 0.250 in - LD)
6.5	4.3	350						59	2.1	1.4	5,076					71	
11.1	7.3	350						100	3.5	2.3	5,076					120	
13.3	8.8	350					120		4.2	2.8	5,076				144		
16	10.5	317	350					144	5.1	3.3	4,598	5,076				173	
20	13.2	254	350					180[1,2]	Not applicable with a 60 Hz motor								
Ø 25 mm - Swept Volume: 19.63 cm³ - Diaphragm: 182 mm									Ø 0.98 in - Swept Volume: 1.20 in³ - Diaphragm: 7.2 in								1"
42	38	96					39		13.3	12.0	1,392				47		(Ø 15.9 mm / 0.625 in - LD)
63	57	79	96					59	20.0	18.1	1,146	1,392				71	
108	98	46	67	96				100	34.2	31.1	667	972	1,392			120	
130	118	39	55	85	96		120		41.2	37.4	566	798	1,233	1,392	144		
156	142	32	46	71	96			144	49.5	45.0	464	667	1,030	1,392		173	
195	178	25	37	57	79	96		180[1,2]	Not applicable with a 60 Hz motor								

* This chart demonstrates the minimum and maximum flow rate and pressure of the pump.
For other specifications, please consult your local representative.
Suction Lift: pump set to 2 m (7 ft) water

[1]Do not use a 60 Hz motor
[2]Use with "flooded suction" (0.5 bar or 7 psi)
LD = Hardened valves - double valve

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Design Specifications

Model PK with HPD Diaphragm Liquid End: Metallic Type H*

Flow rate		Pressure Max. 50 Hz Motor (kW)					Freq. (spm) Motor Speed (rpm)		Flow rate		Pressure Max. 60 Hz Motor (HP)				Freq. (spm) Motor Speed (rpm)		Connections ball valves
		0.55	0.75	1.1	1.5	2.2					0.75	1	1.5	2			
10 bar	Pres. Max.	H	J	K	L	M	960	1,440	145 psi	Pres. Max.	H	J	K	L	1,140	1,725	
l/h		bar							gph		psi						
Ø 20 mm - Swept Volume: 12.57 cm³ - Diaphragm: 106 mm									Ø 0.79 in - Swept Volume: 0.77 in³ - Diaphragm: 4.2 in								1/2"
27	21	151					39		8.6	6.7	2,190				47		(Ø 9.52 mm / 0.375 in - ND)
42	33	124	151					59	13.3	10.5	1,798	2,190				71	
71	56	73	104	151				100	22.5	17.8	1,059	1,508	2,190			120	
85	68	61	87	133	151		120		26.9	21.6	885	1,262	1,929	2,190	144		
103	82	50	72	111	151			144	32.7	26.0	725	1,044	1,610	2,190		173	
128	102	40	58	89	124	151		180[1]	Not applicable with a 60 Hz motor								
Ø 32 mm - Swept Volume: 32.17 cm³ - Diaphragm: 106 mm									Ø 1.26 in - Swept Volume: 1.96 in³ - Diaphragm: 4.2 in								1/2"
71	66	59					39		22.5	20.9	856				47		(Ø 15.9 mm / 0.625 in - NS)
108	100	48	59					59	34.2	31.7	696	856				71	
183	170	28	41	59				100	58.0	53.9	406	595	856			120	
220	204	23	34	52	59		120		69.7	64.7	334	493	754	856	144		
264	245	18	28	43	59			144	83.7	77.7	261	406	624	856		173	
330	307	14	22	34	48	59		180[1]	Not applicable with a 60 Hz motor								

* This chart demonstrates the minimum and maximum flow rate and pressure of the pump. For other specifications, please consult your local representative.
[1]Do not use a 60 Hz motor
ND = Double valve
NS = Single valve

Design Specifications

Model PK with HPD Diaphragm Liquid End: Plastic Type P*

Flow rate		Pressure Max. 50 Hz Motor (kW)			Freq. (spm) Motor Speed (rpm)		Flow rate		Pressure Max. 60 Hz Motor (HP)			Freq. (spm) Motor Speed (rpm)		Connections ball valves
		0.55	0.75	1.1					0.75	1	1.5			
10 bar	Pres. Max.	H	J	K	960	1,440	145 psi	Pres. Max.	H	J	K	1,140	1,725	
l/h		bar					gph		psi					
Ø 32 mm - Swept Volume: 32.17 cm³ - Diaphragm:106 mm							Ø 1.26 in - Swept Volume: 1.96 in³ - Diaphragm: 4.2 in							1/2"
71		10			39		22.5		145			47		(Ø 15.9 mm / 0.625 in - NS)
108		10				59	34.2		145				71	
183		10				100	58.0		145				120	
220		10			120		69.7		145			144		
264		10				144	83.7		145				173	
330		10				180[1]	Not applicable with a 60 Hz motor							

* This chart demonstrates the minimum and maximum flow rate and pressure of the pump. For other specifications, please consult your local representative.
[1]Do not use a 60 Hz motor
NS = Single valve

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Design Specifications

Model PKG with Metallic Liquid End with GSD Diaphragm Type H*

Flow rate		Pressure Max. 50 Hz Motor (kW)					Freq. (spm) Motor Speed (rpm)		Flow rate		Pressure Max. 60 Hz Motor (HP)					Freq. (spm) Motor Speed (rpm)		Connections ball valves
		0.55	0.75	1.1	1.5	2.2					0.75	1	1.5	2	3			
10 bar	Pres. Max.	H	J	K	L	M	960	1,440	145 psi	Pres. Max.	H	J	K	L	M	1,140	1,725	
l/h		bar							gph		psi							
Ø 40 mm - Swept Volume: 50.27 cm³ - Diaphragm: 145 mm									Ø 1.57 in - Swept Volume: 3.07 in³ - Diaphragm: 5.7 in									1/2"
105	96	37					39		33.3	30.4	537					47		(Ø15.9 mm / 0.625 in - NS)
160	147	31	37					59	50.7	46.6	450	537					71	
271	249	17	26	37				100	85.9	78.9	247	377	537				120	
325	298	13	21	33	37		120		103.0	94.5	189	305	479	537		144		
390	358	10	16	27	37			144	123.6	113.5	145	232	392	537			173	
488	448	7	12	21	31	37		180[1]	Not applicable to a 60 Hz motor									
Ø 100 mm - Swept Volume: 314.16 cm³ - Diaphragm: 225 mm									Ø 3.94 in - Swept Volume: 19.17 in³ - Diaphragm: 8.86 in									2"
	676		5				39			214.3		73				47		(Ø 40 mm / 1.575 in - NS)
	1,023		4	5				59		324.3		58	73				71	
	1,734				5			100		549.7				73			120	
	2,080				4	5	120			659.4				58	73	144		
	2,500					5		144[1]	Not applicable to a 60 Hz motor									

* This chart demonstrates the minimum and maximum flow rate and pressure of the pump. For other specifications, please consult your local representative.
[1]Do not use a 60 Hz motor
NS = Single valve

Design Specifications

Model PKG with Plastic Liquid End with GSD Diaphragm Type P*

Flow rate		Pressure Max. 50 Hz Motor (kW)					Freq. (spm) Motor Speed (rpm)		Flow rate		Pressure Max. 60 Hz Motor (HP)					Freq. (spm) Motor Speed (rpm)		Connections ball valves
		0.55	0.75	1.1	1.5	2.2					0.75	1	1.5	2	3			
10 bar	Pres. Max.	H	J	K	L	M	960	1,440	145 psi	Pres. Max.	H	J	K	L	M	1,140	1,725	
l/h		bar							gph		psi							
Ø 40 mm - Swept Volume: 50.27 cm³ - Diaphragm: 145 mm									Ø 1.57 in - Swept Volume: 3.07 in³ - Diaphragm: 5.7 in									1"
105		10					39		33.3		145					47		(Ø25 mm / 0.98 in- NS)
160		10						59	50.7		145						71	
271		10						100	85.9		145						120	
325		10					120		103.0		145					144		
390		10						144	123.6		145						173	
488		7	10					180[1]	Not applicable to a 60 Hz motor									
Ø 100 mm - Swept Volume: 314.16 cm³ - Diaphragm: 225 mm									Ø 3.94 in - Swept Volume: 19.17 in³ - Diaphragm: 8.86 in									1" 1/2
	676		5				39			214.3		73				47		(Ø 40 mm / 1.575 in - NS)
	1,023		4	5				59		324.3		58	73				71	
	1,734				5			100		549.7				73			120	
	2,080				4	5	120			659.4				58	73	144		
	2,500					5		144[1]	Not applicable to a 60 Hz motor									

* This chart demonstrates the minimum and maximum flow rate and pressure of the pump. For other specifications, please consult your local representative.
[1]Do not use a 60 Hz motor
NS = Single valve

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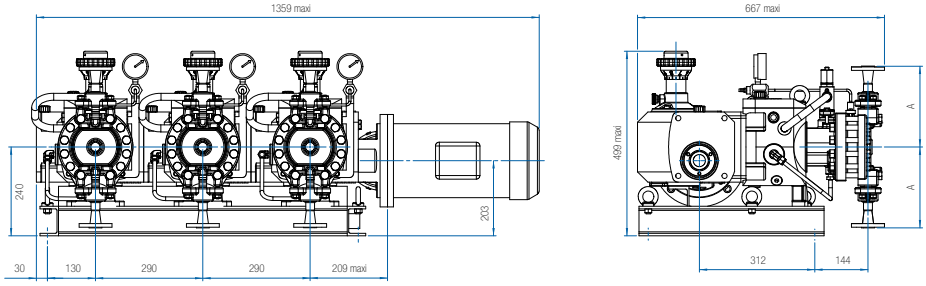
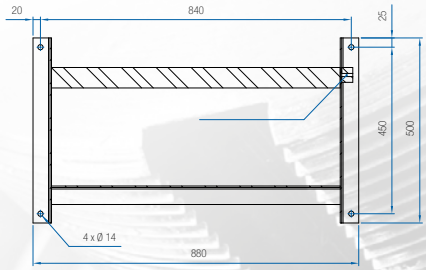
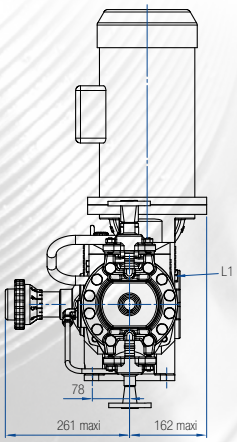
Dimensions

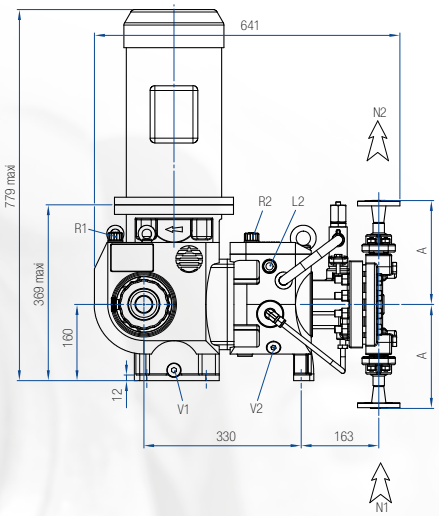
HPD Diaphragm Liquid End Triplex Configuration

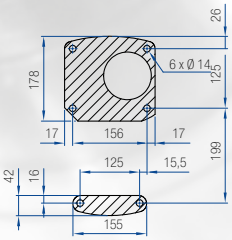


HPD Diaphragm Liquid End Simplex Configuration









Weight and Packing

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

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