

The model 4000 Solar-Powered Chemical Injection Pump provides years of reliable, low-maintenance and low-cost service with zero environmental emissions, zero noise pollution, and zero monthly power expenses.

Timberline is committed to delivering high-quality products that meet our customers' demanding requirements. We are committed to maintaining an unbeatable service record where it counts – fast response, on-time delivery, and competent technical support.

## FEATURES:

- Variable-speed (continuous run) or constant-speed (on-off) operation
- All 316 SST wetted parts (except plunger)
- 3/16", 1/4", 3/8", and 1/2" plunger sizes
- Single or dual pump configuration options
- Standard V-ring packing
- Discharge pressures
  - Model 4000—Up to 5000 PSI
  - Model 4001—Up to 3500 PSI
- Pumping capacity from 0.25 to 130 GPD
- Continuous duty, high efficiency motor



## SPECIFICATIONS

### Materials of Construction:

Wetted Parts	316 SST (excluding plunger)
Plunger	17-4PH SST/H900, or Ceramic-coated 17-4PH SST
Packing	PTFE / Aflas, or Viton
Check Seats	TFE
Check Balls	316 SST

### Pump Features:

Discharge Pressure:	Up to 5000psi (Model 4000) Up to 3500psi (Model 4001)
Plunger Sizes:	3/16", 1/4", 3/8", and 1/2"
Pumping Capacity:	up to 130 GPD (see table 1)

### Motor and Power:

Motor Speed:	0-59 RPM
Motor Voltage:	12 VDC
Supply Voltage	12 VDC (Solar) 120 VAC (Electric Option)
Motor Power Rating:	1/10 hp (Model 4000) 1/21 hp (Model 4001)
Battery(ies):	application dependent
Solar panel:	application dependent

## SUPERIOR DESIGN

### Longer life; smoother, quieter operation

Drive shaft is rigidly supported by a stainless steel ball bearing and oil-impregnated bronze bushing. Compare to competitors' plastic bushings.

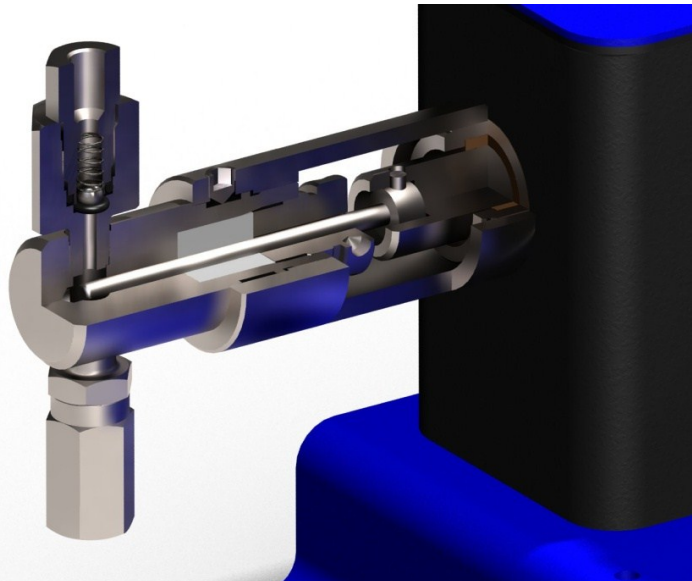
### Ease of maintenance

**Packing** – Simply remove set screws to disengage pump body from yoke and remove the packing nut.

**Plunger** – After disengaging pump body, simply remove drive pin to release plunger.

**Check valves** – Large bodies make O-rings, ball, and spring easily accessible for simple, inexpensive replacement. Compare to competitors' tiny check valves, which are difficult to repair and expensive to replace.

**Motor** – Regular preventive maintenance (annual replacement of brushes) results in long life. Our American-made motor is easily removed from the pump assembly – simply remove four bolts and disengage the shaft coupling.



## OPTIONS AVAILABLE

### Low Pressure Motor

The Model 4001 was specifically designed for lower pressure applications to significantly reduce energy usage. In some tests, efficiency was increased as much as 70% versus the standard model 4000 motor. Acceptable pressures and flow rates can be seen on page 7. Contact your local sales representative or the manufacturer directly to find out whether the Model 4001 will work for you.

### Controls

Continuous run/variable speed controls are extremely easy to set; simply turn the dial to the desired speed and it's ready to go. These controls allow for much more even chemical distribution which can save money in the long run.

Start/stop controls can help achieve lower flow rates not normally obtainable through the use of continuous run/variable speed controls. By running the motor in intervals at its maximum RPM, slight gains in efficiency can also be noticed.

### Battery Boxes

Two options of boxes are available, depending on preference. Choose between either a pole mounted metal battery box or a plastic box to set near the containment. Both house the selected controls and have room to store up to two batteries inside.

### Electric Pumps

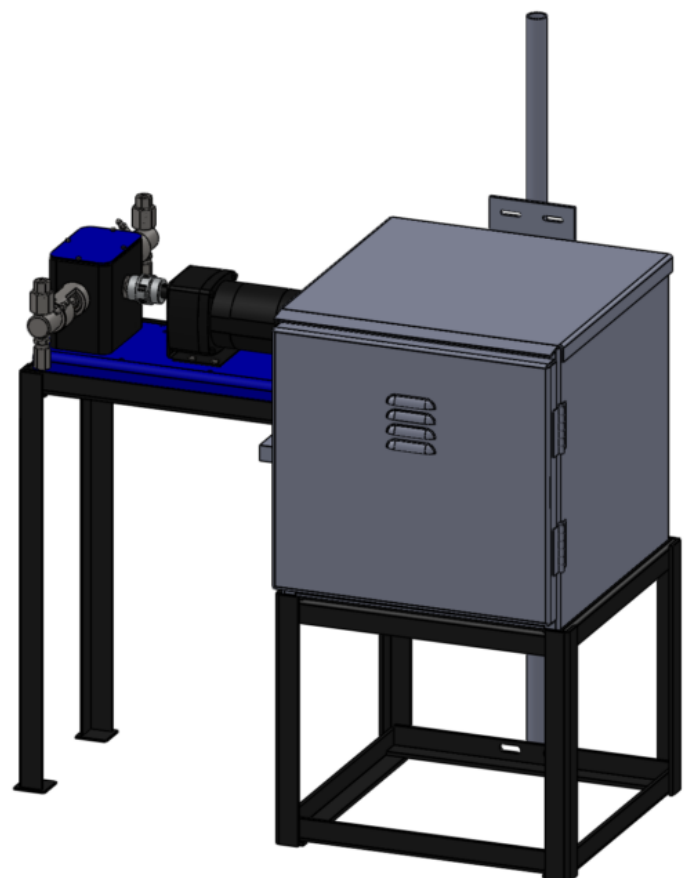
For 120V AC applications, a version with no solar panels or battery box is available. A compact box is supplied containing an AC to DC power converter and controls.

### Smarter Methanol Injection

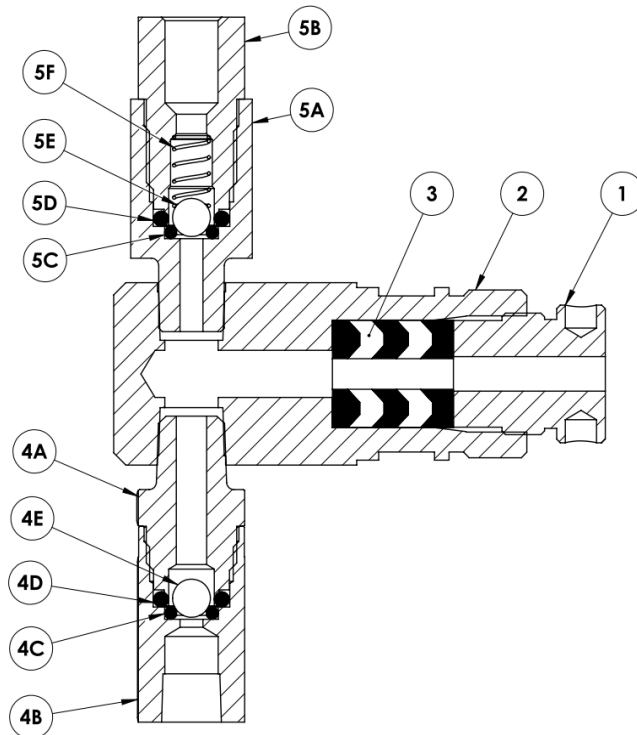
The model 4050/4051 chemical injection pump is designed to only deliver methanol when the temperature falls below a user defined setpoint. Not only does this significantly reduce methanol consumption, but also increases the life of the pump.

### Pump Stands

Pump stands designed to fit the pole mounted metal battery box are also available as seen below. Contact the manufacturer for availability.

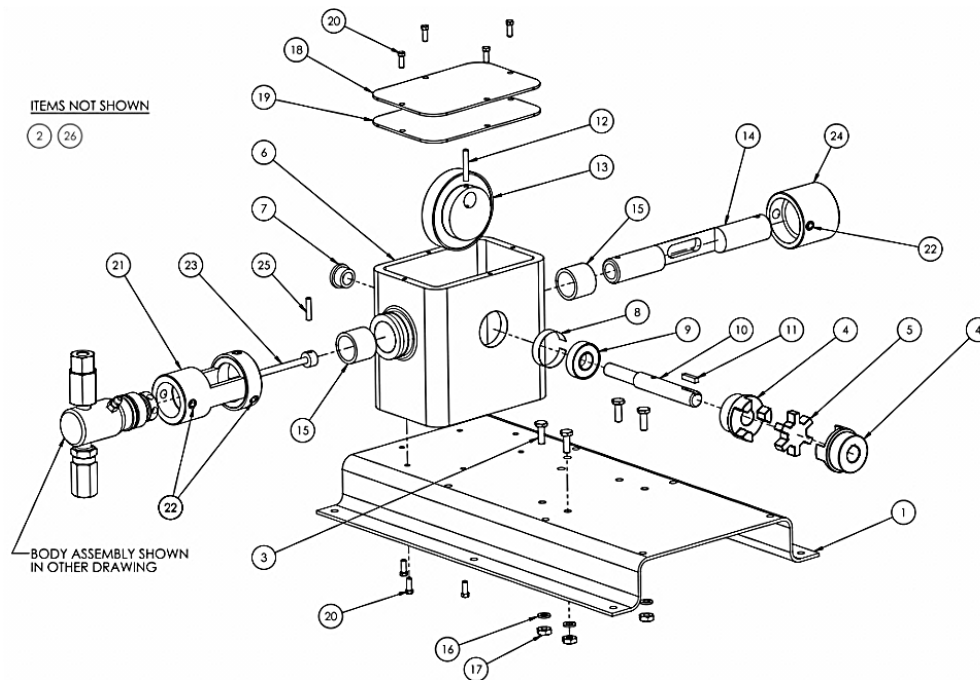


Model 4000/4001  
Solar-Powered  
Chemical Injection Pump



TIMBERLINE BODY ASSEMBLY

Item	Part Number	Description	Material	Quantity	
				Single	Dual
1	75180	Packing Nut, 3/16"	303 SST	1	2
	75181	Packing Nut, 1/4"			
	75182	Packing Nut, 3/8"			
	75183	Packing Nut, 1/4"			
2	75190	Body, 3/16"	316 SST	1	2
	75192	Body, 1/4" and 3/8"			
	75193	Body, 1/2"			
3	75339	Packing, 3/16"	Teflon/Aflas	1	2
	75341	Packing, 1/4"			
	75342	Packing, 3/8"			
	75343	Packing, 1/2"			
	75340	Packing, 3/16"	Viton		
	75344	Packing, 1/4"			
	75345	Packing, 3/8"			
75346	Packing, 1/2"				
4	75380	Suction Check Valve			
4A	60010	Suction Check Outlet Body	316 SST	1	2
4B	60020	Suction Check Inlet Body	316 SST	1	2
4C	40281	O-Ring	TFE	1	2
4D	40341	O-Ring	TFE	1	2
4E	40320	Ball	SST	1	2
5	30235	Discharge Check Valve			
5A	30230	Discharge Check Inlet Body	316 SST	1	2
5B	30240	Discharge Check Outlet Body	316 SST	1	2
5C	40281	O-Ring	TFE	1	2
5D	40341	O-Ring	TFE	1	2
5E	40320	Ball	SST	1	2
5F	40260	Discharge Check Spring	302 SST	1	2
6	30100	Bleed Screw (Not Shown)	316 SST	1	2



**SOLAR BREAKDOWN**

ITEM	PART NUMBER	DESCRIPTION	MATERIAL	QUANTITY			
				SINGLE HEAD		DUAL HEAD	
				4000	4001	4000	4001
1	75260	BASE PLATE	CARBON STEEL	1			
2	70020	MOTOR 1/9 HP	N/A	1		1	
	70021	MOTOR 1/21 HP			1		1
3	75360	HEX SCREW 1/4-20 X .625	CARBON STEEL	4			
4	75320	COUPLING .625 BORE	ALUMINUM	2	1	2	1
	75321	COUPLING .50 BORE			1		1
5	75319	COUPLING SPIDER	RUBBER / BUNA	1			
6	75250	SOLAR HOUSING	ALUMINUM	1			
7	75220	DRIVESHAFT BUSHING	BRONZE	1			
8	75211	TOLERANCE RING	SST	1			
9	75210	DRIVESHAFT BEARING	SST	1			
10	75150	DRIVESHAFT	303 SST	1			
11	75420	DRIVESHAFT KEY	CARBON STEEL	1			
12	75390	ROLL PIN 3/16 X 1.25	SST	1			
13	75145	CAM AND BEARING ASSEMBLY	303 SST	1			
	75140	CAM					
	75200	MAIN BEARING					
14	75130	PUSHROD	17-4 PH SST / 1150M	1			
15	75230	PUSHROD BUSHING	BRONZE	2			
16	75367	LOCK WASHER 1/4	CARBON STEEL	4			
17	75365	NUT 1/4-20	CARBON STEEL	4			
18	75280	HOUSING COVER	CARBON STEEL	1			
19	75270	HOUSING COVER GASKET	RUBBER	1			
20	75330	SCREW 10-32 X 1/2	CARBON STEEL	16			
21	75172	YOKE 3/16"-3/8" PLUNGERS	303 SST	1		2	
	75173	YOKE 1/2" PLUNGER		1		2	
22	75400	SET SCREW 3/8-24 X .375	SST	7		10	
23	75240	PLUNGER 3/16	17-4 PH SST / H900				
	75241	PLUNGER 1/4					
	75242	PLUNGER 3/8					
	75243	PLUNGER 1/2					
	75245	PLUNGER 3/16	CERAMIC COATED 17-4PH SST	1		2	
	75246	PLUNGER 1/4					
	75247	PLUNGER 3/8					
	75248	PLUNGER 1/2					
24	185290	SOLAR BLANK CAP	CARBON STEEL	1			
25	75410	ROLL PIN 3/16 X .875	SST	1		2	
26	75430	MOTOR COVER	CARBON STEEL	1			

Model 4000/4001  
Solar-Powered  
Chemical Injection Pump

**MODEL 4000 CONSTANT RUN PUMP OUTPUT (GALLONS/DAY)**

Style	Plunger Size	Discharge Pressure (psi)	Speed Adjustment Setting										
			1	2	3	4	5	6	7	8	9	10	
Single	3/16"	500	0.19	1.2	2.17	3.37	4.36	4.79	6.28	7.3	7.78	8.79	
		1000	-	1.13	2.05	2.95	4.02	5.02	6.07	7.36	8.33	8.67	
		2000	-	0.99	1.89	1.88	3.64	4.64	5.56	6.54	7.53	7.7	
		3000	-	0.82	1.66	2.51	3.22	4.07	4.79	5.65	6.58	6.76	
		4000	-	0.41	1.11	1.79	2.41	2.97	3.65	4.37	5.39	5.44	
		5000	-	-	1.01	1.63	2.15	2.66	3.23	3.85	4.34	5.14	
	1/4"	250	-	2.14	4.42	6.51	8.56	10.79	13.18	15.66	18.1	18.28	
		500	-	2.18	4.20	6.31	8.42	10.61	12.99	15.32	17.46	17.87	
		750	-	2.03	4.05	6.16	8.22	10.55	13.01	15.07	17.5	17.55	
		1000	-	1.99	4.06	5.98	8.22	10.33	12.33	14.55	17.05	17.36	
		1250	-	2.09	4.01	6.05	7.89	10.04	12.33	14.38	16.44	16.9	
		1500	-	1.74	3.85	5.75	7.7	9.7	11.75	13.87	16.18	16.44	
		1750	-	1.86	3.77	5.65	7.51	9.45	11.68	13.35	15.58	16.09	
		2000	-	1.85	3.7	5.54	7.62	9.42	11.3	13.43	15.24	15.49	
		2250	-	1.78	3.64	5.48	7.19	9.14	11.04	12.91	14.89	15.41	
		2500	-	1.51	3.48	5.25	6.95	8.94	10.85	12.62	14.47	14.64	
		2750	-	1.62	3.42	5.02	6.8	8.56	10.61	12.18	14.06	14.38	
		3000	-	1.46	3.12	4.74	6.37	7.97	9.59	12.18	13.08	13.23	
		3250	-	1.39	3.06	4.65	6.24	7.7	9.42	11.17	12.98	13.2	
		3500	-	1.29	2.94	4.53	6.16	7.7	9.24	10.85	12.55	12.72	
	3750	-	-	2.89	4.37	5.92	7.53	9.07	10.79	12.11	12.33		
	3/8"	250	-	5.39	9.65	14.81	19.66	24.76	29.56	34.86	40.4	40.92	
		500	-	7.97	10.21	14.68	19.52	24.11	29.56	34.17	40.23	40.45	
		750	-	4.47	8.73	13.7	19.02	24.55	29.39	33.83	38.78	39.38	
		1000	-	-	8.51	13.67	18.53	23.71	28.99	33.9	37.49	38.91	
		1250	-	-	-	13.21	18.44	23.58	28.19	32.87	37.8	38.01	
		1500	-	-	-	-	-	22.09	27.05	31.61	35.47	36.5	
	1/2"	250	-	8.12	18.32	26.61	34.93	44.24	53.93	63.34	71.22	72.59	
		500	-	6.89	16.9	25	34.45	43.08	53.36	62.25	71.56	72.59	
		750	-	-	-	-	33.67	43.94	53.36	61.94	70.76	71.9	
	Dual	1/4"	250	-	4.51	8.36	12.77	16.53	21.06	25.58	29.85	34.58	35.47
			500	-	3.81	7.83	11.94	16.09	20.2	25.24	29.22	33.76	34.45
			750	-	3.44	7.45	11.56	15.41	19.29	23.87	27.73	31.67	32.87
			1000	-	3.37	7.26	11.11	14.77	18.49	21.96	25.97	30.3	30.87
			1250	-	3.08	6.8	10.1	13.7	17.36	21.31	25.24	29.5	30.19
			1500	-	2.77	6.3	9.87	13.48	17	21.46	25.78	29.39	30.02
			1750	-	2.51	5.86	9.82	13.21	16.44	20.66	24.31	28.42	28.99
2000			-	2.33	6.13	9.36	12.99	16.58	20.74	24.07	27.56	28.19	
2250			-	2.4	5.89	9.44	12.91	15.07	20.09	23.58	26.41	27.39	
2500			-	2.23	5.82	9.07	12.47	15.87	19.52	22.79	26.64	27.22	
2750			-	2.35	5.56	9	12.18	15.32	18.95	22.66	26.19	26.78	
3000			-	-	4.94	8.32	11.81	15.07	18.72	22.47	26.02	26.56	
3250			-	-	-	-	-	-	18.08	21.44	24.95	24.65	
3/8"			250	-	9.14	17.18	27.59	36.47	47.34	59.24	69.85	79.18	80.46
		500	-	6.68	15.87	26.41	36.52	45.73	56.84	66.08	75.71	77.04	
		750	-	6.85	15.78	25.31	35.38	45.54	56.34	64.29	74.47	75.76	
		1000	-	-	14.89	23.88	34.58	45.2	54.78	63.92	72.59	74.04	
		1250	-	-	-	23.56	32.87	43.58	53.42	63	72.25	73.62	
		1500	-	-	-	-	-	-	51.01	59.58	68.05	68.86	
1/2"		250	-	8.63	27.44	46.07	63.53	82.18	91.66	119.84	137.72	141.53	
		500	-	-	25.39	43.89	61.63	80.22	99.3	119.84	136.96	139.32	

## MODEL 4001 CONSTANT RUN PUMP OUTPUT (GALLONS/DAY)

The model 4001 pump has been proven to greatly increase efficiency (up to 70% at lower pressures), resulting in fewer batteries and solar panels needed. Contact the manufacturer to see if a model 4001 will work for you, and to get an accurate sizing for your application<sup>1</sup>.

Style	Plunger Size	Discharge Pressure (psi)	Speed Setting <sup>2</sup>								
			2	3	4	5	6	7	8	9	10
Single	3/16"	500	1.32	2.255	3.19	4.13	5.06	5.99	6.93	7.87	8.81
		1000	1.26	2.13	3	3.88	4.75	5.63	6.51	7.38	8.26
		1500	1.22	2.03	2.84	3.65	4.46	5.28	6.09	6.9	7.71
		2000	1.22	1.94	2.66	3.37	4.09	4.81	5.52	6.24	6.96
		2500	-	1.68	2.41	3.14	3.87	4.6	5.32	6.05	6.78
		3000	-	1.49	2.16	2.83	3.5	4.17	4.84	5.5	6.17
		3500	-	-	2.09	2.69	3.28	3.88	4.48	5.08	5.68
	1/4"	250	3.11	4.88	6.65	8.43	10.2	11.97	13.74	15.51	17.29
		500	2.76	4.54	6.31	8.09	9.86	11.64	13.41	15.19	16.96
		750	2.38	4.12	5.85	7.58	9.32	11.05	12.75	14.51	16.25
		1000	2.24	3.92	5.59	7.26	8.93	10.6	12.27	13.95	15.62
		1250	2.26	3.86	5.45	7.05	8.64	10.24	11.83	13.42	15.02
		1500	-	3.62	5.25	6.88	8.5	10.13	11.76	13.4	15.01
		1750	-	3.58	5.08	6.58	8.08	9.57	11.07	12.57	14.07
		2000	-	3.48	4.98	6.48	7.97	9.47	10.97	12.47	13.96
	2250	-	3.144	4.62	6.1	7.58	9.06	10.54	12.02	13.5	
	3/8"	250	5.34	11.9	15.85	19.75	23.92	28.4	31.45	35.47	39.78
		500	-	11.42	15.4	19.38	23.35	27.33	31.3	35.28	39.25
		750	-	11.02	15.38	19.02	22.91	26.87	31.03	35.22	39.3
		1000	-	9.06	13.4	17.75	22.1	26.45	30.8	35.15	39.5
	Dual	3/16"	500	1.8	3.86	5.93	7.99	10.06	12.12	14.19	16.25
1000			1.4	3.17	4.94	6.71	8.48	10.24	12.01	13.78	15.55
1500			-	2.95	4.56	6.17	7.78	9.38	10.99	12.6	14.21
2000			-	2.4	3.99	5.58	7.16	8.75	10.34	11.39	13.52
2500			-	-	3.36	4.81	6.25	7.7	9.14	10.59	12.04
3000			-	-	3.59	4.95	6.31	7.67	9.03	10.39	11.75
3500			-	-	2.74	3.97	5.2	6.43	7.66	8.89	10.12
1/4"		250	4.02	7.95	11.94	16.12	20.5	24.89	29.27	33.65	38.04
		500	3.95	7.88	11.81	15.73	19.66	23.59	27.52	31.45	35.38
		750	3.64	7.45	11.25	15.06	18.86	22.67	26.47	30.27	34.08
		1000	2.82	6.61	10.4	14.18	17.97	21.76	25.55	29.33	33.12
		1250	2.53	6.26	9.99	13.72	17.46	21.19	24.92	28.65	32.39
		1500	-	6.51	10.04	13.57	17.1	20.63	24.15	27.68	31.21
		1750	-	5.75	9.17	12.62	16.07	19.53	22.97	26.42	29.87
		2000	-	-	9.29	12.63	15.98	19.32	22.66	26.01	29.35
2250		-	-	8.52	11.82	15.11	18.4	21.69	24.98	28.27	
3/8"		250	8.98	18.29	27.6	36.91	46.22	55.53	64.84	74.15	83.45
		500	-	16.04	25.16	34.27	43.39	52.5	61.62	70.73	79.85
		750	-	13.02	22.16	31.3	40.4	49.58	58.72	67.86	77
		1000	-	-	21.24	30.13	39.02	47.92	56.81	65.7	74.59

<sup>1</sup> Solar panel/battery bank size is dependent upon location, flow rate, and pressure. Not all flow rates are achievable with base model.

<sup>2</sup> Running the motor at extremely slow speeds may damage the motor; avoid using below the recommended speed settings listed.

## Model Code Information

Sample Model Code : 4 0 0 0 - = 4 A 1 A - 0 2

Configuration	Code
Standard	0
Methanol	5
Motor	Code
Standard	0
Low Pressure	1
Box Style	Code
Metal (Standard)	
Plastic	P
Electric	E
Packing	Code
PTFE / Aflas (Standard)	-
Viton	V
Plunger Size	Code
3/16"	3
1/4"	4
3/8"	6
1/2"	8
Style	Code
Single Head Pump	A
Dual Head Pump	B
Plunger Material	Code
17-4PH SST / 1150 M	1
Ceramic Coated 17-4PH SST	2
Control	Code
Continuous Run/Variable Speed	A
Start-Stop/Constant Speed	B
Batteries	Code
No batteries (Standard)	0
One 100Ah-battery	1
Two 100Ah batteries	2
Solar Panel(s)	Code
One 85W Panel	1
One 130W Panel	2
Two 85W Panels	3
Two 130W Panels	4

Before setting up any solar pump system, contact the manufacturer for proper sizing based on your location, pressure, and flow rate. Improper sizing and/or unintended use may cause system failure.



### LEGACY Pumps & Instruments, LLC

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