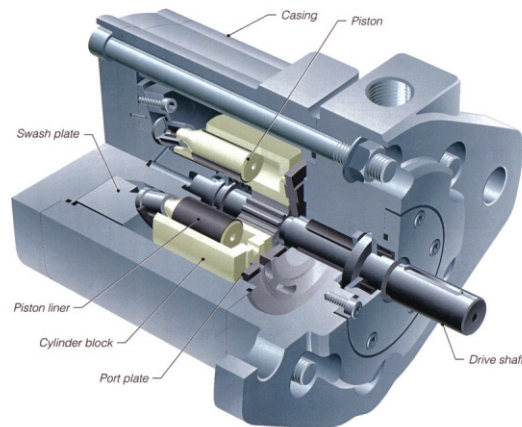




Ocean Pumps®

Ocean Pacific Technologies (OPT) in partnership with The Water Hydraulics Company (TWHC) has developed and supplies axial piston pumping and energy recovery products **specifically designed** and manufactured **for the desalination industry**. OPT's specific desalination experience and market focus combined with TWHC's experience and knowledge of water hydraulic technology ensures our customers receive the most **reliable and cost effective solutions** available in the market today.

The **axial piston pump** (APP) design has been used in the oil hydraulics industry for over 70 years with tens of thousands of units in operation, in thousands of different applications.



In the early 1980's through a public-private partnership with the British Government, a line of axial piston products that used **plain water as the hydraulic fluid instead of oil** was developed. As a result, TWHC's water hydraulic axial piston pumps, motors and other products have been marketed and applied to various industries **since 1987**. Now **Ocean Pacific Technologies** is making this technology, with its many features and benefits, available to the **Reverse Osmosis Industry**.

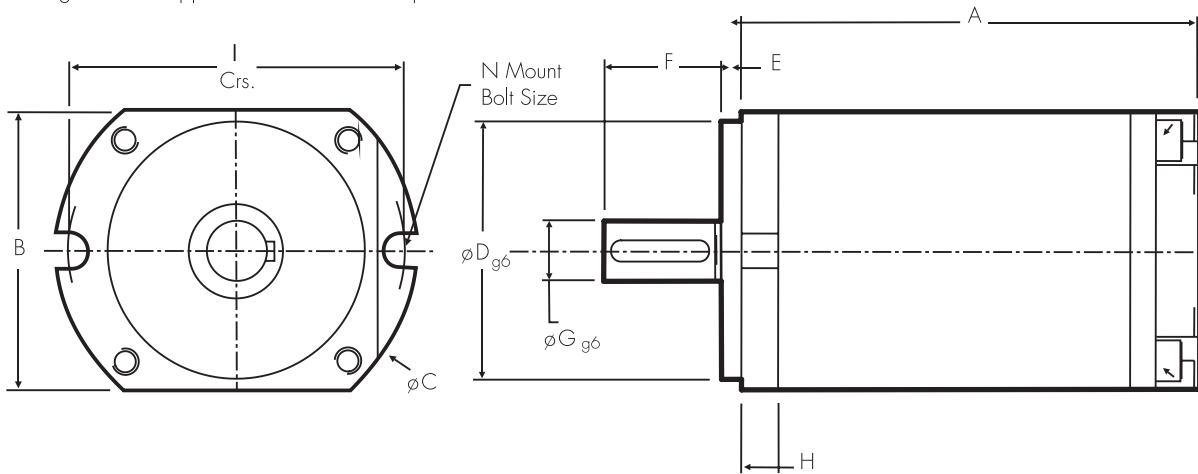
Some features and benefits include:

- **Ultra low maintenance water hydraulic design** - No oil or other lubricants to be changed or replaced and hydrodynamic bearings provide long life.
- **Smooth flow operation** - Axial piston rotary design requires no pulsation dampeners even at high flows.
- **High efficiency positive displacement design** – Low energy consumption.
- **Low energy consumption** - High efficiency positive displacement design.
- **Corrosion resistant to seawater and brine environments** - Constructed from Duplex stainless steel and polymer materials.

Ocean Pumps® Performance Specifications

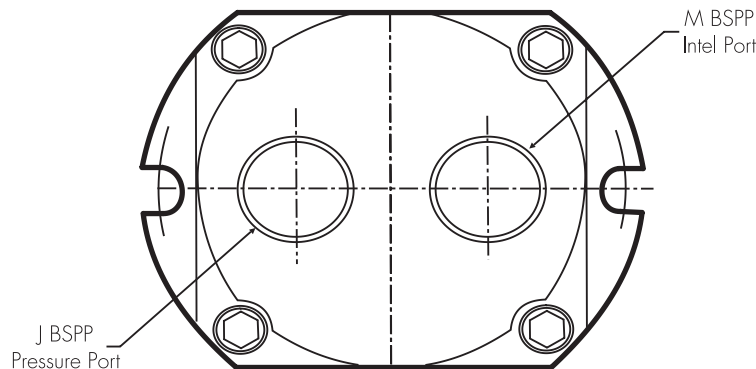
Model #	OP-3.3	OP-6	OP-15	OP-19	OP-30	OP-35	OP-60	OP-73	OP-180	OP-225
Displacement (cc/rev) max	3.3	6	15	19	30	35	63	70.3	180	225
RPM max	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
min	500	500	500	500	500	500	500	500	500	500
Max flow (l/min)	6	10	26	32	51	60	108	120	308	385
Max flow (gpm)	1.5	2.7	6.8	8.6	14	16	28	32	81	101
Min inlet press	Atm	Atm	Atm	Atm	Atm	Atm	Atm	Atm	Atm	Atm
Max inlet press (bar)	2.5	2.5	7	7	7	7	7	7	7	7
Max inlet press (psi)	36	36	102	102	102	102	102	102	102	102
Pump kW @ 69 bar (1000 psi)	0.8	1.5	4	5	7	8	14	16	40	50
Weight (kg)	2.2		8		10		19		82	
Weight (lb)	5		18		22		42		180	
Inlet port	1/2" BSP		3/4" BSP		1" BSP		1 1/2" BSP		3" SAE *	
Outlet port	3/8" BSP		3/4" BSP		3/4" BSP		1" BSP		2" SAE *	

*SAE fittings can be supplied with Victaulic adaptor.



Model #	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Key-way	SAE SIZE
OP 3.3-6	85	-	75	37	16	18	9	-	67.5	3/8"	1/2"	3/8"	1/2"	M5*	3x3	-
OP 15-19	145	89	114	82.5	6.3	37	19	12	106.3	3/4"	3/4"	1/2"	3/4"	M10	6x6	A
OP 30-35	181	110	174	101.8	9.4	51.3	24	13.5	144	3/4"	1"	1/2"	1"	M12	8x7	B
OP 60-73	202	139	215	127	12.6	63	28	21.5	181	1"	1"	1/2"	1 1/2"	M18	8x7	C
OP180-225	339	220	290	152.4	12.7	77	8/16	25	250	SAE	SAE	1"	3"	M20	13T Spline	**

Note: All dimensions are in millimeters unless otherwise noted.



1. Max discharge pressure 83 bar / 1200 psi.
2. UP to 2000 RPM continuous operation is acceptable.
2. OP-15 and larger pumps use standard mechanical seals. Smaller units employ radial seal.
3. Pre-filtration requirement is 25 micron absolute (10 micron nominal).
4. Units are manufactured in duplex stainless steel as standard.
5. 316SS through bolts supplied with unit.
6. Contact OPT for performance and operating parameters outside limits.
7. Manufacturer reserves the right to make changes to specifications at anytime.
8. Pumps will not lift water, a positive head is required at all times.
9. Pumps are supplied with clockwise rotation when facing shaft.
10. Units manufactured by The Water Hydraulics Company to OPT's specifications under an exclusive agreement.