

PRECISION PRODUCTS FOR POWER AND SAIL BOATS

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PRECISION

PRODUCTS is a world leader in the design and manufacture of automatic pilot drive units.

Our products are backed by twenty five years of continuous experience in the design of marine steering systems. Since their introduction in 1984 our products have been used on thousands of commercial vessels and yachts using virtually every make of autopilot.

Electronic manufactures worldwide recommend and use these products as the muscle to move rudders on all kinds of vessels from runabouts to tugs.

This catalogue shows our standard product range. Our company is committed to providing the highest standard of service to customers and we are always willing to discuss your special requirements.

WHY OCTOPUS

- Years of experience as a market leader adopting on-the-edge technology
- Customized products, compatible with all major brands of Autopilots
- Committed to continuous process improvement
- Integrated units, versatile and easy to install
- Efficient & powerful motors
 - MDR's deliver up 300 lbs thrust
 - Minimal power draw:
 MDR's average less than 5 amps, and 12v reversing pumps average 7 amps
- Fixed and remote jog steering controllers enable convenient use as a stand alone jog steering system
- Complete product solutions for all boat types (pleasure/commercial up to 120')



CNC MACHINE CENTER

MECHANICAL DRIVE UNITSP4 12V D.C.



REVERSING ADJUSTABLE HYDRAULIC PUMPS......P5 12V and 24V D.C.



CONTINUOUS RUNNING SOLENOID OPERATED PUMP SETS......P6

SINGLE SPEED OR ADJUSTABLE DUAL SPEED 12V D.C., 24V D.C., 110V A.C. and 220V A.C.







IN-HOUSE TEST

Mechanical Drive Units



The Octopus mechanical autopilot drives come in four types:

- **TYPE S** Standard Straight shaft for mounting behind the dash This drive can be mounted in 2 ways, either at 90 degrees to the dashboard or at 20 degrees to the dashboard. Spacer Kits are also available to reduce the space required behind the dashboard.
- **TYPET** Straight shaft tilt version for mounting behind the dash with a steering wheel tilt mechanism The Tilt drive allows the steering wheel angle to be adjusted in relationship to the dash. The drive requires Tilt Mechanism used from your current steering or purchased separately.
- **TYPE R** Stand Alone Remote version for mounting as a separate drive system with its own cable and mounting kit The Remote drive unit can be installed in any convenient location; it requires the addition of a second steering cable and connection kit. There are connection kits for Mercruiser or Volvo Penta stern drive engines, Outboard engines and a universal kit for inboard engines.
- **TYPE RS** Unique RS Sailboat Drive designed for simple mounting to mid-range yachts with restricted installation space The Octopus Remote Sailboat Drive System makes it easy and economical to install an automatic pilot on light displacement Sail Boats steered with a mechanical system from a wheel or tiller. The system is designed for the modern mid range sail boat which has restricted space to mount a standard Linear drive. The drive is very responsive and has little feedback resistance when in 'Stand by' mode making it very suitable for racing yachts. It is recommended for Yachts up to 38Ft (11.5m) with a maximum displacement of 15400 lbs / 7000 kg.

INTEGRATED RUDDER FEEDBACK UNITS

Rudder Feedback Units come in two types. The universal RFB unit (OC15SUK06) has small switches making it generic to all major Autopilot manufacturers(except Simrad.) The standard RFB unit's (i.e. OC15SUK06B for Raymarine, OC15SUK06H for Furuno, etc.) are dedicated to a particular manufacturer (see our website for a complete list.)

REVERSING **P**UMPS

Reversing pumps are used when hydraulic steering is fitted on boats up to 65 feet L.O.A. (depending on rudder torque).

The pump has only three moving parts and requires no complicated check valves to prevent rudder movement when de-energized. Output flow is completely adjustable to 50% of rated flow allowing the pump output to be adjusted precisely to the volume of steering cylinder fitted. The pump is exceptionally reliable and delivers a very high degree of volumetric efficiency that is only matched by very sophisticated gear pumps.

Motors are heavy duty, a full 85 mm in diameter with long brushes and sealed ball bearings for long service life. The molded rubber mounting foot can be rotated to allow the pump to be mounted on any surface. Three flexible hoses terminating in 1/4-inch JIC swivel fittings (which can be readily adapted to piping systems in all countries) are supplied.



A useful range of accessories can be used to enhance the pump by incorporating added valves and solid state FET switching. The valves mount directly to the pump body. The FET switch mounts adjacent to the pump. No other autopilot pump made offers such advantages.

SPECIFICATIONS AND DIMENSIONS										
PUMP MODEL	DIMENSIONS MM			VOLTS	FLOW PER MINUTE		MAXIMUM PRESSURE		AVERAGE* CURRENT	PEAK CURRENT
	А	В	С	D.0.	cu. cm.	cu. in.	bar	psi	DRAW(amps)	(amps)
1012	195	114	100	12	1000	60	70	1000	7-8	25
1024	220	114	100	24	1000	60	70	1000	3-4	12
1212	195	114	100	12	1200	72	70	1000	7-8	25
1224	220	114	100	24	1200	72	70	1000	3-4	12
2012	220	114	100	12	2000	120	55	800	7-8	25
2024	220	114	100	24	2000	120	60	900	3-4	12
* AVERAGE DURING COURSE HOI DING WITH 15% DUTY CYCLE										



OPTIONAL ACCESSORIES FOR OCTOPUS REVERSING PUMPS

Shut Off Valve SV	The shut off valve mounts on the end of the pump enabling the pump unit to be disconnected from the steering system without loss of hand steering.
By-Pass Valve BP12V (12 volt) BP24V (24 volt)	The bypass valve can be mounted to the pump and consists of a normally open solenoid valve (which is connected across the pump output) and a translucent plastic reservoir. When the valve is mounted to the pump and the assembly connected to a balanced hydraulic cylinder, the cylinder can be used to drive the rudder on vessels with mechanical steering. No external reservoir is required. Built-in bleeder screws allow the unit to be quickly filled and purged.
Unbalanced Valve UB	The unbalanced valve fits on the pump to adapt flow to unbalanced steering cylinders.

C.R. TYPE PUMPSETS

OCTOPUS CR (CONTINUOUS RUNNING) pumps are used in larger steering systems where control limitations preclude using reversing type pumps. The pumpset has a motor driving a precision pump. Oil from the built in reservoir is passed through a tandem center solenoid control valve with left and right solenoid coils. When the autopilot makes a correction the appropriate solenoid coil is energized and oil flows into the steering system. All Octopus CR pumpsets are completely integrated with custom manifolds. There are no complicated external pipes and fittings to break or leak. AC or DC motors can be supplied.





CRA





* consult factory

RESSURE GAUGE

CRA Pump sets are continuously running D.C. motor driven pumps which are used for autopilot drive service on larger vachts and small commercial vessels. These pump sets can be used on steering cylinders up to 60 cu.in. (1000 cu.cm.) in volume.

Unlike reversing pumps, which in sizes over 1/2 gallon/min (2000 cc/min) are rarely capable of delivering full steering pressure, these pumps deliver over 500 psi (35 bar) and are very economical in power consumption.

The solenoid coils draw only 12 watts; therefore, it is possible to drive the pump directly from the autopilot control without a power switch. This significantly reduces the cost of the automatic pilot.

CRB pump sets are heavy duty continuous running D.C. or A.C. motor driven pumps which are used for autopilot service on larger yachts and commercial vessels. These pump sets can be used on steering cylinders up to 200 cu. in. (3500 cu. cm.) in volume.

All models are fitted with an adjustable pressure relief valve and pressure gauge. They can be supplied as a simple pump unit, a motor and reservoir combination to replace an engine driven pump or fitted with a direction solenoid valve. Adjustable flow control and dual speed options are also

2 Volt DC		d
4 Volt DC 2 Volt DC	Options A Basic Unit	m
10 Volt AC 20 Volt AC	B Single Speed & Flow Control C Two Speed & Flow Control	De ra
Ļ		wR
		to

Electric motors are heavyuty ball bearing type. A echanical seal is used etween the motor and pump ther than the usual lip seal; nis ensures a long service life vithout "grooving" the shaft. eservoirs are large capacity ensure cool running in all climates.

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HYDRAULIC LINEAR ACTUATORS



An Octopus Hydraulic Linear Actuator is a simple, effective way to drive the rudder on a boat equipped with a mechanical steering system. When the autopilot is not in use the cylinder runs freely along with the rudder. When the automatic pilot is in use a solenoid valve on the actuator closes and locks the cylinder. Steering signals from the pilot are now fed to the D.C. motor, which drives the pump to move the cylinder back and forth. De-energized, the solenoid valve immediately disconnects the automatic pilot from the rudder. The actuator has a small translucent oil reservoir, making it easy to check fluid levels. These actuators have only five moving parts. Mechanical simplicity gives our product reliability and ease of service when compared to complicated gear and screw actuators, making our units a favorite for offshore mariners. These actuators are shipped from our factory completely filled with oil and require no additional plumbing.

MODEL	STROKE	THRUST	STROKE TIME/SEC	D	VESSEL		
NUMBER	MM(IN)	Kg(Lb)		A	В	С	APPLICATION
1012LAM7	178 (7)	400 (882)	8	150(5.9)	500(19.68)	162(6.38)	Up to 45ft
1212LAM12	305 (12)	400 (882)	14	253(9.96)	690(27.1)	288(11.34)	Up to 60ft
1012LAR7	178 (7)	400 (882)	8	150(5.9)	500(19.68)	162(6.38)	Up to 45 ft
1212LAR12	305 (12)	400 (882)	14	253(9.96)	690(27.1)	288(11.34)	Up to 60 ft
2012LAR12	305 (12)	600 (1322)	16	253(9.96)	730(28.74)	260 (10.24)	Over 60 ft



How To Select AN Octopus PUMPSET

To choose a suitable Octopus Pumpset for you steering system calculate the size of the pumpset required as follows. Output of pumpset requied =

Volume of your steering cycinder x 60

H.O. to H.O. time in seconds required

H.O. = Hard Over, typically a time of 13-15 seconds is desireable. Though do not use a time less than 10 seconds.

EXAMPLE 1:

If you have an 18 cubic inch volume steering cylinder and require a H.O. to H.O. time of 16 seconds

pumpset output in = $\frac{18 \times 60}{16}$ = 67.5 cu, in per min

cu, in per min.

Model 1212 or 1224 pump can be used as it pumps a maximum of 72 cu.in./min.

EXAMPLE 2:

4000 cu.cm./min.

If you have a 1350 cu. cm steering cylinder and require a H.O. to H.O. time of 20 seconds

displacement. If system not balanced

add unbalanced value (OC17SUK03).

pumpset output in = $\frac{1350 \times 60}{20}$ = 4050 cu. cm per min. Model CRB04 pump can be used as it pumps a maximum of

COMMON STEERING CYLINDER MODELS AND VOLUMS (cu. in.(1 cu. in.= 16.4 cu.cm.										
HYDRIVE		HYNAUTIC		HYDRAFLEX		TELEFLEX		ULTRAFLEX		
210BH	9.3(154)	K-1-B	12.1(198)	I-B116	7.0(116)	BA200-11	26(426)	UC116-I	7.0(116)	
212BH	8.2(134)	K-2-B	17.6(288)	I-B173	10.5(173)	BA125-7ATM	7.2(118)	UC168-I	10.3(168)	
212T	4.8(78)	K-3-B	23.1(379)	I-B222	13.5(222)	BA135-7ATM	9.5(155)	UC215-I	13.1(215)	
216FM	8.4(137)	K-4-B	30.5(500)	I-B293	17.9(293)	BA150-7ATM	10.2(167)	UC133-IOB	8.0(132)	
210	9.3(154)	K-5	15.9(260)	I-B378	23(377)	BA150-7AT	10.2(167)	UC128-0BF	7.8(128)	
212	4.1(68)	K-8	39.2(642)	I-B648	39.5(648)	BA175-7AT	13.7(225)	UC132-0BS	8.0(132)	
216	8.4(137)	K-9	55(905.3)	IO-B133	8.1(132)	FRONT				
213	10.7(175)	K-22	13.3(218)	PMAXQM	8.8(144)	MOUNT	8.34(137)	NOIE 1	a reversing	
313	11.9(196)	K28	16(262)	OB-BFM	8.1(132)	PIVOT		pumps, the	f the pump	
314	18.9(130)	K-29	16(262)				0.0/105)	can be adjusted down to 5		50% of rated
316	8.4(137)	K-6	9(147)				0.3(133)	flow to get a	speed.	
150-9	10.5(172)	K-7	12.5(205)			SPLASH-				
150-12	14(229)	K-10	7.5(123)			WELL	9.3(152)	When ordering a CBB num		mnset with
175-10	18(296)	K-18	7(115)			MOUNT		two speeds,	mpset to give	
175-12	21.6(355)	K-19	9(148)					the fastest rudder speed wanted. T second slower speed can be adjust down to 50% of the rated speed		
200-12	28.2(463)	K-13	11(180)							
200-15	35.3(579)	K-14	8.6(141)					4000110007	1 opood.	
250-12	49.5(811)							NOTE 3		
250-15	61.8(1014)							svstem mus	ctively, the st t have a balai	nce

INSTALLING OCTOPUS PUMPSETS



The pumpset should be mounted on a horizontal surface in a clean dry area. The three hydraulic connections to the steering system should be made with tubing which meets the steering system manufacturers specification with short lengths of flexible hose between the pumpset and the tubing to isolate vibration. In all cases all three connections must be used and in no circumstances must the pumpset be run without the compensating line connected to the steering system reservior.

CONTACT YOUR LOCAL DEALER: