



AUTOPILOT DRIVE SOLUTIONS 2013



PRECISION PRODUCTS FOR HYDRAULIC STEERING



outboard



sterndrive



inboard



sail

Autopilot drive solutions for hydraulic steering

OCTOPUS PRODUCTS - A WORLD LEADER IN THE DESIGN AND MANUFACTURE OF

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OCTOPUS PROFESSIONAL SOLUTIONS

PROFESSIONAL DISTRIBUTOR

Our innovative product range gives professional distributors / dealers the opportunity to offer the best solutions to their customers which gives added value to the installation and service supplied.

BOAT BUILDERS

Our highly experienced team can assist with solutions to boat builder production requirements including lean manufacturing techniques, and supply complete installation packs including all required parts and accessories.

AUTOPILOT MANUFACTURERS

Our highly experienced team can offer Autopilot manufacturers our personalized business model, where we provide engineering, prototyping and production support that is specifically designed to meet their needs, resulting in significant cost savings, increased reliability and innovation.

WHY OCTOPUS?

- Over 25 years experience designing and producing cutting-edge autopilot drive solutions
- Complete product solutions for all boat types (leisure & commercial) up to 120ft in length
- Unique drive designs for simple installation
- Integrated units, versatile and easy to install
- Customized products, compatible with all major autopilot brands
- We are committed to continuous product development and improvement
- 2 year warranty

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Contents of this Brochure are based on the latest information available at the time of publication. CMP/Octopus assumes no responsibility for the accuracy of the information contained herein. Product specifications are subject to change without notice.



AUTOPILOT DRIVE UNITS

- A range of professional hydraulic steering solutions for power and sailboats
- Designed and built to the highest standards
- Proven reliability and performance, with thousands of installations worldwide
- Patented piston pump offers pinpoint accuracy, high power and low consumption
- Multiple configurations ideal for installations with limited below deck space
- Compatible with all major brand autopilot systems



HYDRAULIC LINEAR DRIVES

Octopus linear drives are available with a huge range of stroke and pump sizes. Standard drives are available with the pump either mounted on the ram or separately. The LAU custom solutions offer 8 different configurations to suit virtually all installations. **SEE PAGES 4 - 7**



HYDRAULIC REVERSING PUMPS

Featuring a patented piston pump design which offers twice the power of competitor's models, but with half the consumption, Octopus reversing pumps are suitable for steering rams sizes from 150cc to 500cc, with pinpoint accuracy and adjustable flow rates. **SEE PAGES 8 & 9**



CONSTANT RUNNING PUMPS

Constant Running Pumps are used in larger, heavy duty hydraulic steering systems where normal reversing pumps cannot be used. The precision pump includes an inbuilt hydraulic fluid reservoir and a tandem center solenoid control valve. **SEE PAGES 10 & 11**



hydraulic linear drives



POWERFUL, EFFICIENT DRIVES FOR SAILBOATS

RELIABLE - Only three moving parts, increasing reliability

EFFICIENT - Three times more efficient, half the battery consumption

TIME SAVING - Rudder feedback option mounts directly on drive

ADJUSTABLE FLOW RATE - Configure performance to suit your vessel



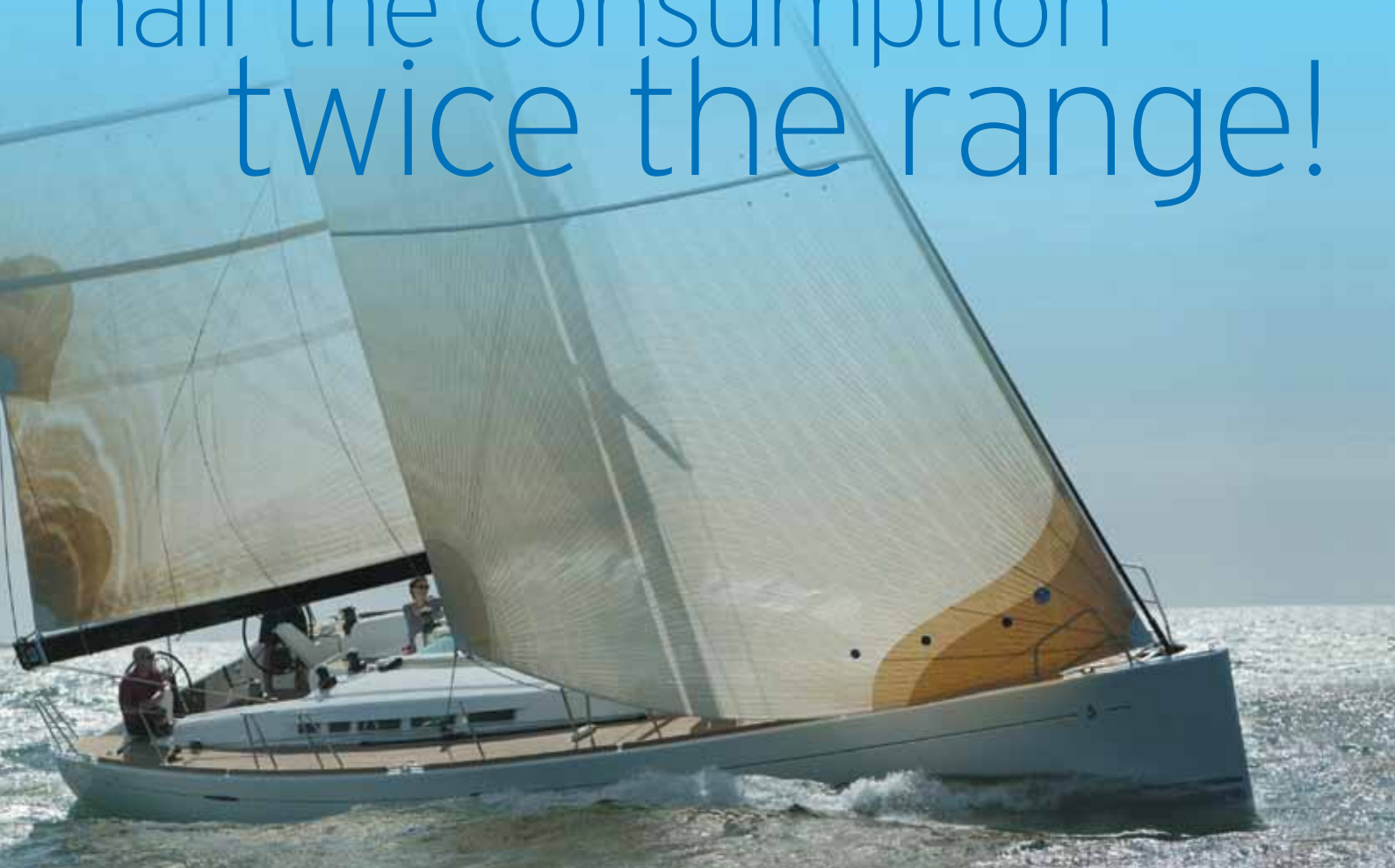
LAM MOUNTED STYLE



LAR REMOTE STYLE



half the consumption
twice the range!

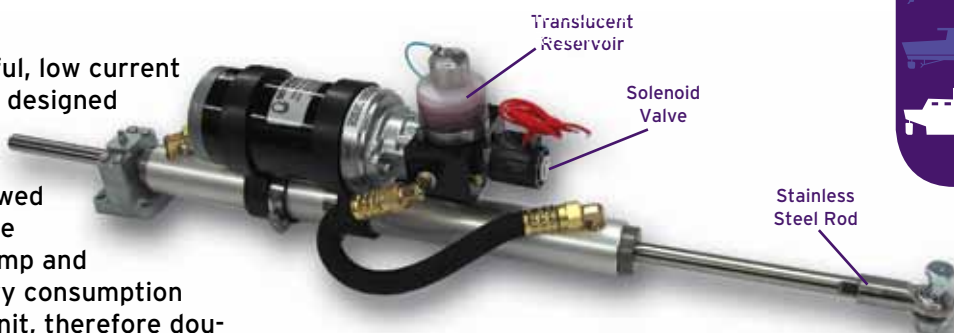




SUITABLE FOR BOATS UP TO 100FT (30.5M) - 64,000LBS (29,000KG)

PATENTLY BETTER

Octopus offer a full range of powerful, low current consumption hydraulic linear drives designed for long passage making. An independent comparison by the University of British Columbia* showed that Octopus piston pumps are three times more efficient than a gear pump and can be expected to halve the battery consumption when compared to a competitor's unit, therefore doubling the effective range of the autopilot on one battery charge.



The drives are available either with the pump mounted on the cylinder or mounted separately.

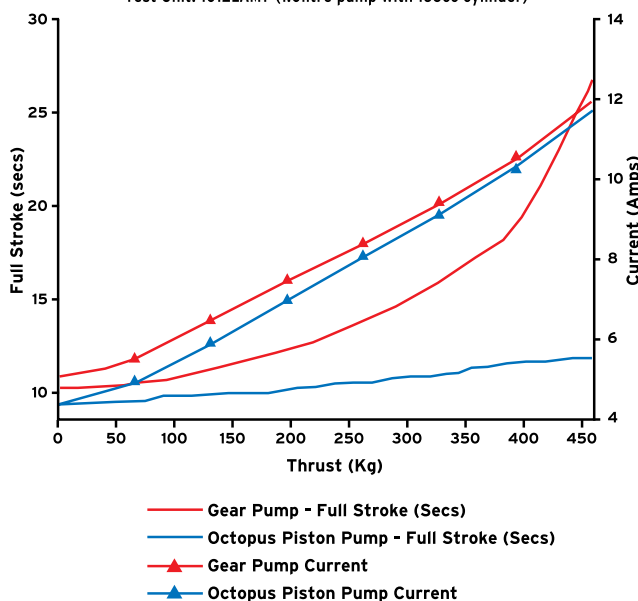
* To see the full report visit www.octopusmarine.com

ADJUSTABLE FLOW RATE

A linear drive that does not have variable flow (unless dedicated to a range of yachts) will be operating either too quickly or too slowly in 90% of cases. Autopilot manufacturers get around this problem by adjusting the output to the pump to compensate. However, this either forces the pump to operate for longer periods of time which increases power consumption and wear on the parts, or the pump will operate at high pressure for short periods of time - also putting unnecessary strain and wear on the system.

Octopus variable flow reversing pumps precisely control the speed of the ram, reducing battery consumption, pressure, strain and wear on the hydraulic system.

Performance Curve of Octopus Pump vs Competitor's Gear Pump at 12v
Test Unit: 1012LAM7 (1.0litre pump with 168cc cylinder)



DRIVES	AVERAGE / MAX CURRENT (Piston pump efficiency will reduce actual consumption)	FEATURES				PERFORMANCE			YACHT SELECTION	
		Order Codes	Volts	Cylinder Bore	Variable Flow Rate	Stroke	Hardover Time (Suggested)	Max Rudder Torque	Peak Thrust	Max Boat Length
1012LAM7 1012LAR7	4 - 6A / 19A	12V	38MM	500cc - 1 litre/min	178mm 7in	12 - 14 sec	750Nm 6,630lbin	400Kg 882lbs	14m 45ft	11,000Kg 24,200lbs
1024LAM7 1024LAR7	2 - 3A / 10A	24V	38MM	500cc - 1 litre/min	178mm 7in	12 - 14 sec	750Nm 6,630lbin	400Kg 882lbs	14m 45ft	11,000Kg 24,200lbs
1212LAM12 1212LAR12	4 - 6A / 19A	12V	38MM	600cc - 1.2 litre/min	305mm 12in	14 - 16 sec	1,200Nm 10,600lbin	400Kg 882lbs	18m 60ft	15,000Kg 33,000lbs
1224LAM12 1224LAR12	2 - 3A / 10A	24V	38MM	600cc - 1.2 litre/min Reversing	305mm 12in	14 - 16 sec	1,200Nm 10,600lbin	400Kg 882lbs	18m 60ft	15,000Kg 33,000lbs
2012LAR9	6 - 8 / 22A	12V	45MM	1 - 2 litres/min Reversing	228.6mm 9in	14 - 16 sec	1,200Nm 10,600lbin	600Kg 1,322lbs	22m 70ft	17,000Kg 37,500lbs
2024LAR9	3 - 4A / 11A	24V	45MM	1 - 2 litres/min Reversing	228.6mm 9in	14 - 16 sec	1,200Nm 10,600lbin	600Kg 1,322lbs	22m 70ft	17,000Kg 37,500lbs
2012LAR12	6 - 8 / 22A	12V	45MM	1 - 2 litres/min Reversing	305mm 12in	14 - 16 sec	1,500Nm 13,200lbin	600Kg 1,322lbs	24.5m 80ft	20,000Kg 44,000lbs
2024LAR12	3 - 4A / 11A	24V	45MM	1 - 2 litres/min Reversing	305mm 12in	14 - 16 sec	1,500Nm 13,200lbin	600Kg 1,322lbs	24.5m 80ft	20,000Kg 44,500lbs

LAU hydraulic linear drives (custom solutions)



SMALL SPACE? THINK BIG!

GREATER FLEXIBILITY- 8 configurations allows you to choose the best for each boat

EASY TO SUPPLY, EASY TO SPECIFY - Available in kit form

LOW POWER CONSUMPTION - High precision technology halves battery consumption

QUIET OPERATION - Separate pumpset can be located for maximum noise suppression

HALF THE DRAG - 50% less backdrive friction when steering manually



fight the
wheel...

...or make life
easy

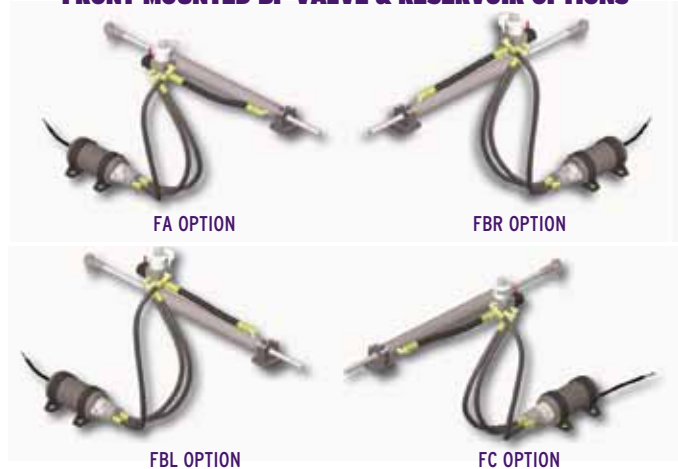
LAU hydraulic linear drives specification



FOUR DRIVE VERSIONS FOR YACHTS UP TO 80FT, 20 TONS

Each with eight possible configurations or in universal kit form:

FRONT MOUNTED BP VALVE & RESERVOIR OPTIONS



REAR MOUNTED BP VALVE & RESERVOIR OPTIONS



POWERFUL DRIVES FOR TIGHT SPACES

The fixed design of traditional hydraulic linear drives means that there often isn't enough room by the rudder, forcing you to settle for a less powerful alternative. Octopus LAU drives set you free from this limitation - the multiple configurations offer professional installers the versatility to pick the correct fitting combination to get the job done in a tight space - no more settling for second best!

configuration of the LAU drives means 50% less drag than other drives, giving the benefit of more feel on the steering wheel.

TWICE THE FEEL ON THE WHEEL

Any helmsperson knows that feedback from the wheel is essential to efficiently steer a sailboat. The drawback to traditional hydraulic linear drives was the friction from backdriving the steering ram, which often killed this vital feedback. Not any more - the unique

MAXIMUM PERFORMANCE

Variable flow pumps professionally set the ram speed to ensure the performance is fine tuned to suit the exact steering characteristics of the yacht.

EASY TO SERVICE

The pumpset has inbuilt shutoff valves, recommended on all professional hydraulic installations - no more bleeding the system each time the pump is removed!

STANDARD HOSE LENGTH 6ft (2M)

Custom lengths available.

DRIVES Order Codes	AVERAGE / MAX CURRENT (Piston pump efficiency will reduce actual consumption)	FEATURES				PERFORMANCE			YACHT SELECTION	
		Volts	Cylinder Bore	Variable Flow Rate	Stroke	Hardover Time (Suggested)	Max Rudder Torque	Peak Thrust	Max Boat Length	Max Laden Displacement
1012LAU7	4 - 6A / 19A	12V	38MM	500cc - 1 litre/min	178mm 7in	12 - 14 sec	750Nm 6,630lbin	400Kg 882lbs	14m 45ft	11,000Kg 24,200lbs
1024LAU7	2 - 3A / 10A	24V	38MM	500cc - 1 litre/min	178mm 7in	12 - 14 sec	750Nm 6,630lbin	400Kg 882lbs	14m 45ft	11,000Kg 24,200lbs
1212LAU12	4 - 6A / 19A	12V	38MM	600cc - 1.2 litre/min	305mm 12in	14 - 16 sec	1,200Nm 10,600lbin	400Kg 882lbs	18m 60ft	15,000Kg 33,000lbs
1224LAU12	2 - 3A / 10A	24V	38MM	600cc - 1.2 litre/min Reversing	305mm 12in	14 - 16 sec	1,200Nm 10,600lbin	400Kg 882lbs	18m 60ft	15,000Kg 33,000lbs
2012LAU9	6 - 8 / 22A	12V	45MM	1 - 2 litres/min Reversing	228.6mm 9in	14 - 16 sec	1,200Nm 10,600lbin	600Kg 1,322lbs	22m 70ft	17,000Kg 37,500lbs
2024LAU9	3 - 4A / 11A	24V	45MM	1 - 2 litres/min Reversing	228.6mm 9in	14 - 16 sec	1,200Nm 10,600lbin	600Kg 1,322lbs	22m 70ft	17,000Kg 37,500lbs
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2024LAU12	3 - 4A / 11A	24V	45MM	1 - 2 litres/min Reversing	305mm 12in	14 - 16 sec	1,500Nm 13,200lbin	600Kg 1,322lbs	24.5m 80ft	20,000Kg 44,500lbs

Choose the best mounting option and include the relevant two letter code at the end of the part no. eg OCTAF1212LAU12FA.

hydraulic reversing pumps



THE BENEFITS OF AN OCTOPUS REVERSING PUMP

RELIABLE - Patented piston pump technology with only three moving parts

TWICE THE POWER - Delivers over twice the hydraulic output per watt of input

HALF THE CONSUMPTION - Accurate ram positioning means fewer course corrections

ADJUSTABLE FLOW RATE - Configure performance to suit your vessel

EASY SERVICING - Shut off valves allow removal without draining steering system

**ONLY
THREE
MOVING
PARTS!**

Ball Bearing Motor

Flow Adjustment

Molded Rubber
Mounting Foot

Shut Off Valve
(included)

pinpoint accuracy...
...maximum performance





PROFESSIONAL SOLUTIONS FOR HYDRAULICALLY STEERED BOATS

TWICE THE POWER

The unique Octopus piston pump delivers over twice the hydraulic output per watt of input than a standard hydraulic gear pump.

HALF THE CONSUMPTION

Gear pumps leak oil between the gears, while a piston (such as used in car engines) does not. This means the piston pump will place the cylinder ram exactly where it is required, positioning the rudder accurately. This gives far sharper steering, reducing unnecessary course corrections meaning battery consumption on Octopus pumps is up to half that of other pumps.

PINPOINT ACCURACY

Leading autopilot manufacturers choose Octopus pumps for their non RFB pilot systems which do not have a Rudder Feedback unit. Previously, slop in the system caused by gear leakage meant that a Rudder Feedback unit was necessary to tell the pilot the exact rudder position. As Octopus pumps will always bring the ram back to the required position the Rudder Feedback unit is not required, which also greatly simplifies installation.

SAVE ON INSTALLATION COSTS

A professional installation should always have a method of isolating the pump from the steering system - Octopus pumps feature inbuilt shut off valves in the pump manifold.

ADJUSTABLE FLOW RATE

A pump that does not have variable flow (unless dedicated to a range of cylinders such as our fixed 0.8L pump) will be operating too fast or too slow in 90% of cases. Autopilot manufacturers get around this problem by adjusting the output to the pump to compensate, which either forces the pump to operate for longer periods of time which increases power consumption and wear on the parts, or it will operate at high pressure for short periods of time - also putting unnecessary strain and wear on the system.

Octopus Variable Flow Reversing Pumps precisely control the speed of the ram, reducing unnecessary battery consumption, pressure, strain and wear on the hydraulic system.

SELECTION GUIDE

PART No.	FLOW RATE (Adjustable)	CYLINDER RANGE	VOLTAGE	MAX CURRENT	AVERAGE CURRENT
1012	500cc - 1L/min	150-300cc (9-18in ³)	12v	19A	4-6A
1024	500cc - 1L/min	150-300cc (9-18in ³)	24v	10A	2-3A
1212	600cc - 1.2L/min	180-360cc (11-22in ³)	12v	19A	4-6A
1224	600cc - 1.2L/min	180-360cc (11-22in ³)	24v	10A	2-3A
2012	1.0 - 2.0L/min	245-500cc (15-30in ³)	12v	22A	6-8A
2024	1.0 - 2.0L/min	245-500cc (15-30in ³)	24v	11A	3-4A

GETTING THE BEST STEERING PERFORMANCE FOR THE BOAT

The flow rate of the pump can be set to get the best 'hard over time' (cylinder ram speed) for the particular boat. There is a simple equation to calculate the hard over time:

$$\text{HARDOVER TIME} = \frac{\text{CYLINDER (RAM) CAPACITY} \times 60}{\text{FLOW RATE}}$$

EXAMPLE

A boat has a 200cc steering cylinder (ram) and a 12 volt system. So either the OCTAF1012 or the OCTAF1212 would be suitable (see table below left). For this example we are using the OCTAF1212 which has a minimum flow rate of 600cc/min and a maximum flow rate of 1200cc/min:

$$\text{MIN HARDOVER TIME: } \frac{200 \times 60}{600} = 20 \text{ sec}$$

$$\text{MAX HARDOVER TIME: } \frac{200 \times 60}{1200} = 10 \text{ sec}$$

The flow rate on the pump can be adjusted so that the hard over time is between 10 & 20 seconds - select which is most suitable for this particular boat.

ACCESSORIES



- OCT17SUK01 #8 Bypass Valve Manifold 12v DC
- OCT17SUK02 #8 Bypass Valve Manifold 24v DC



- OCT17SUK03 Unbalanced Valve



- OCT17SUK34 Verado Hydraulic Hose Kit

hydraulic constant running pumps



HIGH PERFORMANCE, LOW POWER CONSUMPTION

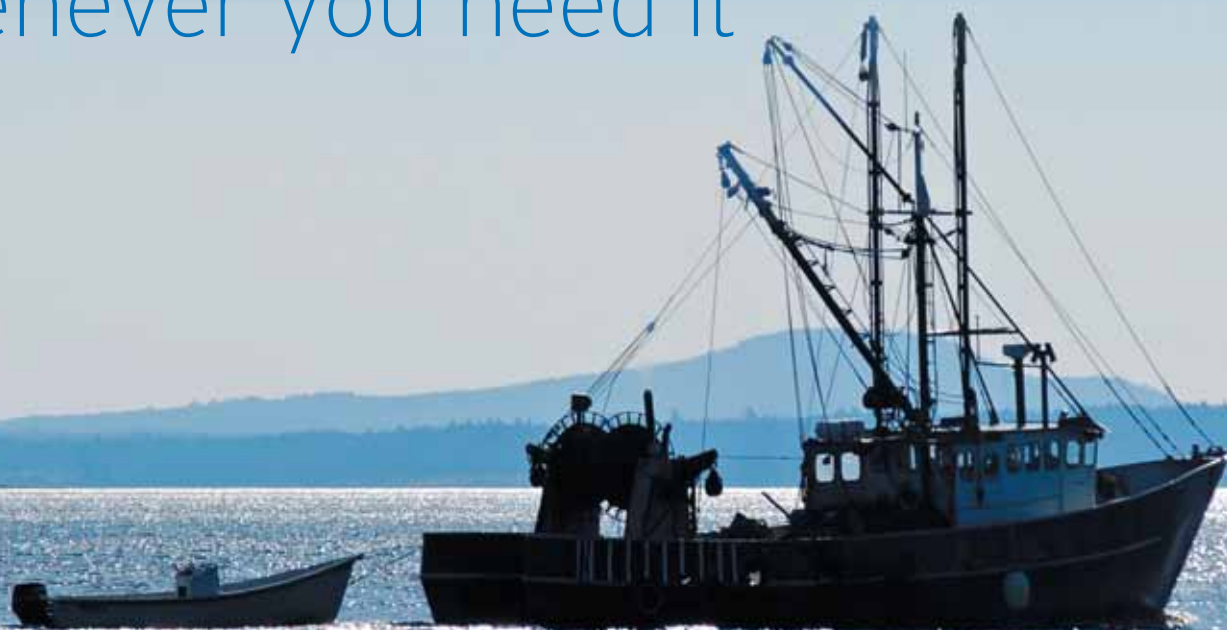


POWERFUL - Suitable for steering cylinders up to 200cu in (3500cc)

ECONOMICAL - High performance, low power consumption, compact design

FULLY INTEGRATED DESIGN - No complicated external pipes or fittings to break or leak

power & reliability
whenever you need it





SUITABLE FOR SMALL COMMERCIAL VESSELS AND LARGE YACHTS

POWER AND CONTROL - FULLY INTEGRATED

Octopus Constant Running pumps are used in larger, heavy duty hydraulic steering systems where normal reversing pumps cannot be used. The precision pump includes an inbuilt hydraulic fluid reservoir and a tandem center solenoid control valve. Available with AC or DC motors.

PUMP SELECTION

The pump selected must match the size of the vessel's steering ram and the power supply capability of the autopilot must also be considered. For optimum autopilot performance the pump should be able to drive the rudder hardover from lock to lock within 13-15 seconds. The drive flow rate should be approximately four times that of the steering ram volume.

CRA PUMPSETS

- For steering cylinders up to 60cu in (1000cc)
- CRA pumps deliver over 500psi (35 bar) and are very economical, typically drawing under 150 watts
- DC models: 12v, 24v or 32v
- Wide flow range - units available with max flow rates from 0.5gpm (2000 cc/min) up to 1gpm (4,000 cc/min) with adjustable flow control and dual speed options
- As the solenoids only draw 12watts, the pump can be driven directly from the autopilot course computer without a relay, significantly reducing installation costs
- Inbuilt shut off valves mean the pump can be removed for servicing without draining the steering system

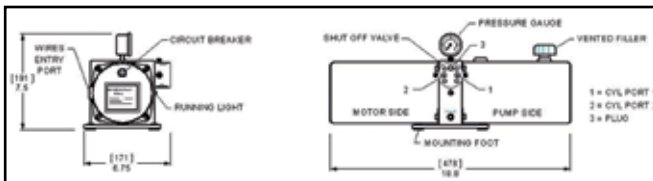
CRB PUMPSETS

- For steering cylinders up to 200cu in (3500cc)
- Available as a simple pump unit, a motor and reservoir combination to replace an engine driven pump or fitted with a direction solenoid valve
- DC models: 12v, 24v or 32v
AC models: 110v or 220v single phase
220v, 460v or 575v three phase
- Wide flow range - units available with max flow rates from 1gpm (4000 cc/min) up to 3.5gpm (13,000 cc/min) with adjustable flow control and dual speed options
- Adjustable pressure relief valve (100 - 1200psi)
- Inbuilt pressure gauge
- Heavy-duty ball bearing electric motors
- Long life mechanical seal between motor and pump instead of a lip seal, which wears a groove in the shaft
- Large capacity reservoir for cool running in all climates

ACCESSORIES



OC17SUK19 Constant Flow Regulator Valve. This regulator valve runs with an engine driven pump, and is usually fitted to commercial boats that require a constant hydraulic flow for use with a steering cylinder for an autopilot. Please refer to our website or contact us for the possible different versions available.

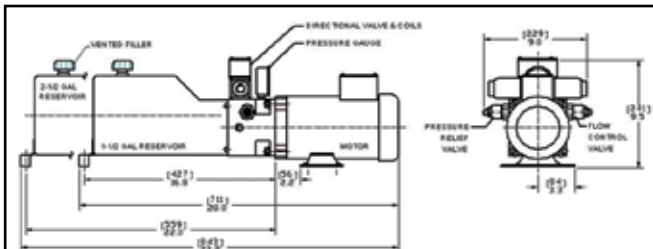


CRA PUMPSET ORDER CODE

CRA FF - VV - P - F - R

Flow (FF) 02 - 2000cc/min (0.50gpm) 03 - 3000cc/min (0.75gpm) 04 - 4000cc/min (1.00gpm)	Voltage (VV) 12 - 12v DC 24 - 24v DC	Options P - Pressure Gauge F - Flow Control R - Relief Valve
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eg **CRA02-12-F-R** = 2000cc/min, 12v with flow control & relief valve



CRB PUMPSET ORDER CODE

CRB FF - VVV - SS - O

Flow (FF) 04 - 4000cc/min (1.00gpm) 06 - 6000cc/min (1.50gpm) 08 - 8000cc/min (2.00gpm) 10 - 10000cc/min (2.80gpm) 13 - 13000cc/min (3.50gpm)	Voltage (VVV) 12 - 12v DC 24 - 24v DC 32 - 32v DC 11S - 110/220v AC (Single Phase) 22T - 220/440/575v AC (Three Phase)	Solenoid Voltage (SS) 12 - 12v DC 24 - 24v DC 32 - 32v DC 11 - 110v AC 22 - 220v AC	Options (O) A - Basic Unit B - Single Speed + Flow Control C - Two Speed + Flow Control
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eg **CRB06-11S-22-C** = 6000cc/min, 110/220v single phase with 220v AC solenoid, two speed with flow control



OCTOPUS PRODUCTS

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Dealer