



## Marine Habitat Maintenance Equipment Product Guide

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**Designed by divers, for divers.™**

Meridian Subtek 8121 S. Lemont Rd. Darien, IL 60561  
630 910 4970 tel 630 910 4969 fax meridian.cc



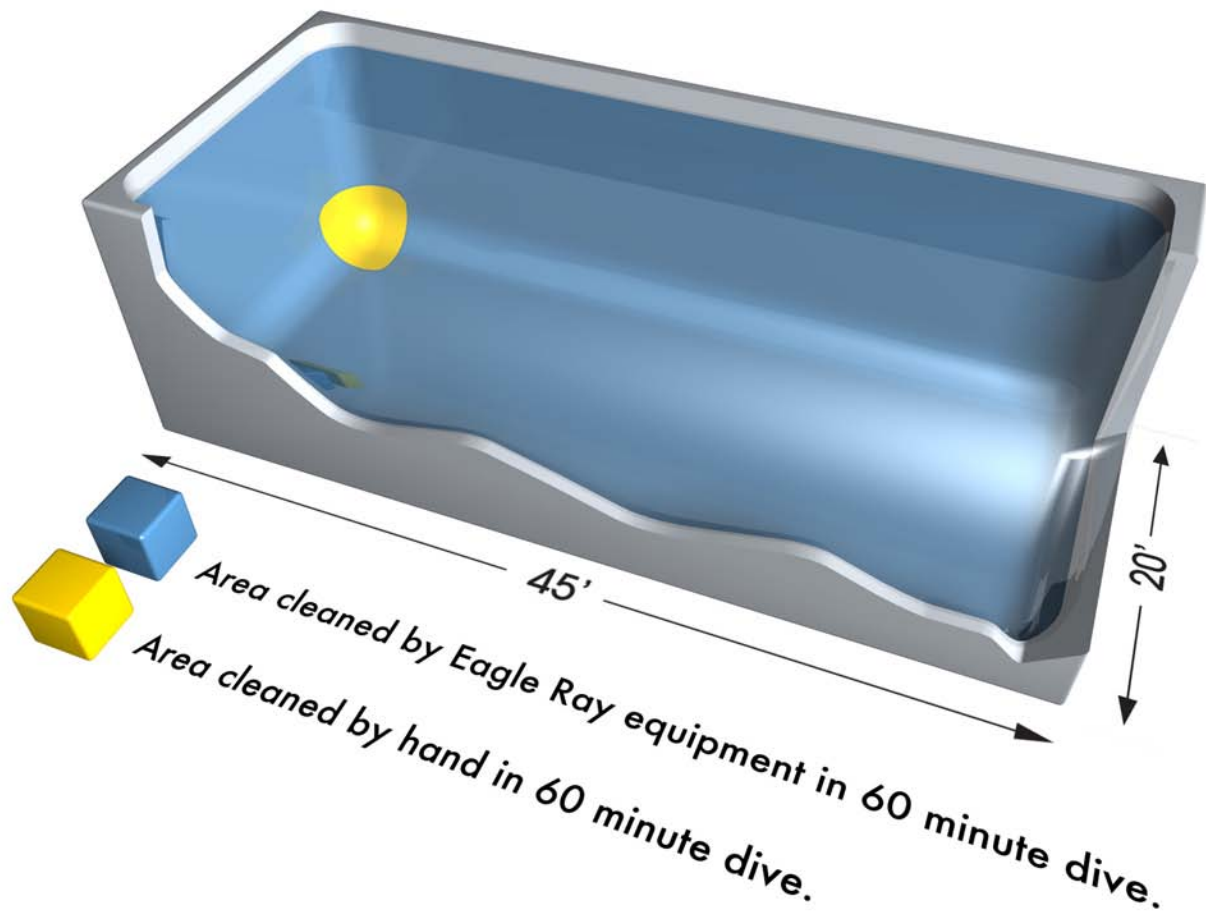


### Economics

When compared to hand cleaning, an institution can conservatively clean 180 times more aquarium area in a single dive! This means more of your aquarium is being cleaned by less dive time.

This effective cleaning time has multiple positive effects on your dive staff:

- » Your aquarium is cleaned faster.
- » Divers are free to perform other more important tasks.
- » With less dive time required, less diver supervision is required.
- » Less air is consumed per month, saving your institution on operating costs.
- » The equipment is ergonomically designed. This design will eliminate the instance of carpal tunnel syndrome that is associated with hand scrubbing.
- » With less dive hours required the chance for a dive related accident is greatly reduced.





## What actually is a power cart?

A power cart is required to power any of our water hydraulic scrubbers. What actually is a power cart?

To put it simply, a power cart is a very sophisticated pressure washer unit. Our power carts are made of the highest quality materials available and are designed to safely power our water hydraulic motors. Water hydraulic motors are very precise pieces of equipment and will last for a very long time if used properly.

All of our power carts have been designed with the water hydraulic motor in mind. We have incorporated numerous safety features to insure the operators complete safety along with dozens of features that safeguard the longevity of the water hydraulic motor. Below is a list of reasons why our specially designed power carts should be used instead of a pressure washer.

True GFI protection up to and including 480 volt 3 phase units.

Sophisticated auto start and auto shut down circuitry. Pull the trigger and the pump starts. If you don't use the scrubber for 45 seconds, the pump will automatically shut down.

Industrial crankshaft style pump rated for thousands of hours of use.

5-7.5 horsepower industrial electric motor in voltages from 208 volts to 460 volts. We also offer 9.5 horsepower gasoline models with electric start.

All electric motors are controlled by a motor starter with an appropriate motor overload for added motor protection.

All power carts are constructed with corrosion resistant materials. We only use U.S. made stainless steel and brass pipe fittings. We only use stainless steel fasteners.

5 micron water filter in a see-thru housing to protect pump and scrubber.

Thermal protection and over pressure valves are standard equipment on all carts.



### Ultimate Mobile Power Station



- » Powder coated aluminum frame.
- » Built in storage deck for scrubber.
- » Mobile Power Station is only 29 inches wide and will fit through a standard door frame.
- » 8" diameter stainless steel casters with rubber tires on delrin hubs.
- » 7.5 hp electric motor. Single or 3-phase motors are available in 60 Hz or 50 Hz. 5 hp configuration is also available.
- » Three piston positive displacement pump with internal recirculation valve.
- » Adjustable Unloader Valve.
- » Thermal Relief Valve.
- » High Pressure Relief Valve.
- » Automatic water shut-off for low/no water supply.
- » Demand start and stop. Unit starts when diver pulls scrubber handle. Unit stops 45 seconds after diver releases the scrubber handle.
- » Two stainless steel hose reels, each supplied with 100 feet of 1/4" I.D. high pressure hose (200 feet total). Stainless steel quick disconnects for all supply and return hoses.
- » All permanently mounted high pressure hoses are braided stainless steel.
- » Supply water filter—clear filter housing with 5 micron filter element.
- » All control circuits are low voltage (24VDC) to eliminate shock hazard.
- » Hour meter to track maintenance intervals.
- » Illuminated operator push buttons for start, stop, and low/no water pressure.
- » Waterproof electrical controls (NEMA 4X).
- » Ground Fault Interrupt circuitry (GFI) contained in the control panel.
- » 50 feet of electrical power cord with waterproof plug and receptacle.
- » Deluxe Mobile Power Station can be customized for institution's special requirements.

#### Notes:

1. All power carts can be configured with a scrubhead for a turnkey system.
2. We can match power requirements to suit your specific needs.



### Deluxe Power Cart



- » Non-corroding polymer chassis.
- » Molded storage tray for scrubber.
- » Power Cart is only 18 inches wide and will fit through the smallest of openings.
- » 8" diameter stainless steel casters with rubber tires on delrin hubs.
- » 7.5 hp electric motor. Single or 3-phase motors are available in 60 Hz or 50 Hz.
- » Three piston positive displacement pump with internal recirculation valve.
- » Adjustable Unloader Valve.
- » Thermal Relief Valve.
- » High Pressure Relief Valve.
- » Automatic water shut-off for low/no water supply.
- » Demand start and stop. Unit starts when diver pulls scrubber handle. Unit stops 45 seconds after diver releases the scrubber handle.
- » Stainless steel quick disconnects for all supply and return hoses.
- » All permanently mounted high pressure hoses are braided stainless steel.
- » Supply water filter—clear filter housing with 5 micron filter element.
- » All control circuits are low voltage (24VDC) to eliminate shock hazard.
- » Illuminated operator push buttons for start, stop, and low/no water pressure.
- » Waterproof electrical controls (NEMA 4X).
- » Ground Fault Interrupt circuitry (GFI) contained in the control panel.
- » 50 feet of electrical power cord with waterproof plug and receptacle.
- » Mid Level Power Cart can be customized for institution's special requirements.

#### Notes:

1. All power carts can be configured with a scrubhead for a turnkey system.
2. We can match power requirements to suit your specific needs.



### Standard Power Cart

- » Powder coated aluminum frame.
- » Power Cart is less than 27 inches wide and will fit through a standard door frame.
- » 10" diameter semi pneumatic tires on steel hubs.
- » 5 hp electric motor. Single or 3-phase motors are available in 60 Hz or 50 Hz.
- » Three piston positive displacement pump with internal recirculation valve. 4 GPM @ 2000 psi.
- » Adjustable Unloader Valve.
- » Thermal Relief Valve.
- » High Pressure Relief Valve.
- » Demand start and stop. Unit starts when diver pulls scrubber handle. Unit stops 45 seconds after diver releases the scrubber handle.
- » Stainless steel quick disconnects for all supply and return hoses.
- » Supply water filter—clear filter housing with 5 micron filter element.
- » Waterproof electrical controls (NEMA 4X).
- » Ground Fault Interrupt circuitry (GFI) contained in the control panel.
- » 30 feet of electrical power cord with waterproof plug and receptacle.
- » 6000 psi glycerin filled high pressure gauge.
- » All 316 stainless steel fittings.
- » On/off power switch control box.
- » Economy Power Cart can be customized for institution's special requirements.

#### Notes:

1. All power carts can be configured with a scrubhead for a turnkey system.
2. We can match power requirements to suit your specific needs.

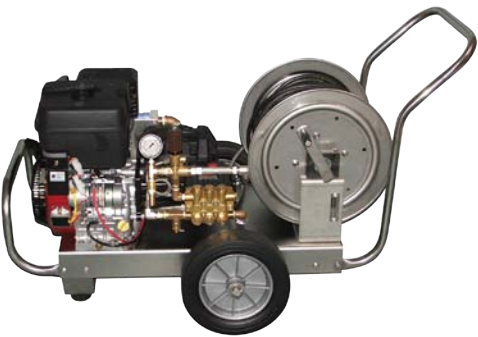


### Economy Power Cart



- » Powder coated aluminum frame.
- » Power Cart is less than 27 inches wide and will fit through a standard door frame.
- » 10" diameter semi pneumatic tires on steel hubs.
- » 5 hp electric motor. Single or 3-phase motors are available in 60 Hz or 50 Hz.
- » Three piston positive displacement pump with internal recirculation valve. 4 GPM @ 2000 psi
- » Adjustable Unloader Valve.
- » Thermal Relief Valve.
- » High Pressure Relief Valve.
- » Demand start and stop. Unit starts when diver pulls scrubber handle. Unit stops 45 seconds after diver releases the scrubber handle.
- » Stainless steel quick disconnects for all supply and return hoses.
- » Supply water filter—clear filter housing with 5 micron filter element.
- » Waterproof electrical controls (NEMA 4X).
- » 30 feet of electrical power cord with waterproof plug and receptacle.
- » 6000 psi glycerin filled high pressure gauge.
- » All 316 stainless steel fittings.
- » On/off power switch control box.
- » Economy Power Cart can be customized for institution's special requirements.

### Gas Powered Cart



*Same as the Economy Power Cart, except for the following:*

- » Gas Power Cart is only 29 inches wide and will fit through a standard door frame.
- » 10" diameter rubber tires on steel hubs.
- » 9.5 hp gasoline engine with electric start.
- » 12 volt battery in waterproof battery box.
- » Three piston positive displacement pump with internal recirculation valve.
- » Stainless steel hose reel.
- » All permanently mounted high pressure hoses are braided stainless steel.
- » Gas Power Cart can be customized for institution's special requirements.

#### Notes:

1. All power carts can be configured with a scrubhead for a turnkey system.
2. We can match power requirements to suit your specific needs.

## Stationary Power Skid



Stationary Power Skids are typically used where aquarium staff does not want to or can't move a power cart into the exhibit area. The Stationary Power Skid is usually located in a machinery room that is dry and not in close proximity to salt water. The Stationary Power Skid can be piped with stainless steel tubing to supply the exhibit. The Stationary Power Skid can be located as much as 2000 feet from the exhibit without loss of pressure or flow. This configuration allows for multiple ports to be located in the exhibit thus reducing the length of supply hose required for the scrubber. Each unit is customized for the specific requirements of the institution but the standard features are as follows:

- » Powder coated aluminum frame.
- » 7.5 hp electric motor. Single or 3-phase motors are available in 60 Hz or 50 Hz.
- » Three piston positive displacement pump with internal recirculation valve.
- » Adjustable Unloader Valve.
- » Thermal Relief Valve.
- » High Pressure Relief Valve.
- » Automatic water shut-off for low/no water supply.
- » Demand start and stop. Unit starts when diver pulls scrubber handle. Unit stops 45 seconds after diver releases the scrubber handle.
- » All permanently mounted high pressure hoses are braided stainless steel.
- » Supply water filter—clear filter housing with 5 micron filter element.
- » All control circuits are low voltage (24VDC) to eliminate shock hazard.
- » Hour meter to track maintenance intervals.
- » Illuminated operator push buttons for start, stop, and low/no water pressure.
- » Waterproof electrical controls (NEMA 4X).
- » Ground Fault Interrupt circuitry (GFI) contained in the control panel.
- » Stationary Power Skid can be customized for institution's special requirements.



Control Panel



Valve and quick connect assembly

### Notes:

1. All power carts can be configured with a scrubhead for a turnkey system.
2. We can match power requirements to suit your specific needs.





### Green Machine Mobile Water Supply

Save 180 gallons of water per hour and save the environment at the same time.

The Green Machine is a portable water supply unit that in conjunction with our power carts and scrubbers allows you to recirculate the supply water for the power cart. A single head water hydraulic scrubber flows approximately 4 gallons per minute while in operation. This is water that is vented into the water column or returned to a drain and wasted. Though some water is consumed during the scrubbing session, the Green Machine will eliminate the wasting of hundreds of gallons of water per hour. Check out the facts.

In an hour dive, a scrubber will be actually used for about 50 minutes. Let's look at the raw numbers.

4 gallons of water per minute times 50 minutes equals 200 gallons of water wasted.

The Green Machine needs only 26 gallons to fill the tank. During the one hour dive, the Green Machine will consume only 17 gallons of water. You will end the dive with 9 gallons still in the tank. This water can be saved for the next dive or can be used wherever fresh water is needed.

Your actual one hour water savings is 183 gallons per cleaning system.

If you clean every day, your water savings per week would be 915 gallons, with a yearly savings of 47,580 gallons (assuming that you only clean 5 days a week). This is a significant water savings considering that many institutions have to pay for water plus you are also conserving our planet's most precious natural resources.



#### Green Machine Features

- » Works with all SubTek power carts.
- » Saves 180 gallons of water per hour.
- » Saves 47,580 gallons per year (assuming that you only clean 5 days a week).
- » Does not add any fresh water to your display.
- » Powder coated aluminum frame.
- » Foot brake.
- » The Green Machine is only 24 inches wide and will fit through a standard door frame.
- » 8" diameter aluminum casters with rubber tires.
- » 26 gallon blow molded water tank with 8 inch diameter vented lid.
- » Positive pressure non-priming demand pump.
- » Float switch to shut off pump in case of low/no water.
- » All piping is schedule 80 grey pvc.
- » Supply water filter—clear filter housing with 20 mesh filter element.
- » Quick disconnect fitting for scrubber return line.
- » Requires only 120 volt power.
- » Illuminated operator switch for start and stop.
- » Waterproof electrical controls (NEMA 4X).
- » Ground Fault Interrupt circuitry (GFI) contained in the control panel.
- » 50 feet of electrical power cord with waterproof plug and receptacle.
- » Deluxe Mobile Power Station can be customized for institution's special requirements.



### All hydraulic powered scrubber share these features:

- » Scrub head is powered by filtered fresh water. No oils or chemicals are used.
- » Can be operated by the smallest of divers.
- » Paint-safe brushes featuring our unique quick release system.
- » "Dead man" on/off trigger
- » Can be operated using any SubTek Power Cart.
- » All Scrubbers effortlessly clean walls and floors with water displacement auto-suction.
- » Return on investment in 3 to 6 months!

### Mini Ray

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- » "The Ultimate Corner Cleaning Tool". Compact and lightweight design allows effortless cleaning of floors, walls, rock work, overhead structures, sharp corners, scum lines, drains, grating and all surface types.
- » The Mini Ray is our smallest, most compact tool. It is the tool of choice for rock cleaning.
- » The high torque water hydraulic motor can spin a 6", 8" or 10" brush with ease.
- » The Mini Ray features a diver adjustable PVC handle or fixed stainless steel handle.
- » "Quick Change" Brushes can be changed underwater.
- » An optional vacuum shroud is available.

### Mega Ray

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- » The Mega Ray is designed to clean large areas quickly. This tool is suitable for smooth surfaces or very rough surfaces. Brushes can be customized to fit different applications.
- » The extra large water hydraulic motor can effortlessly spin a 12" or 14" brush with our unique "Quick Change" feature.
- » The Mega Ray features a diver adjustable PVC handle. Buoyancy foam is incorporated to allow near neutral buoyancy for cleaning walls and ease of movement under water.
- » An optional vacuum shroud is available.



### Eagle Ray



- » The Eagle Ray uses two extra large water hydraulic motors to spin 10" brushes. The 10" brushes feature our unique "Quick Change" system.
- » The two counter rotating 10" brushes clean an extra wide area on each pass. The extra large motors deliver maximum torque and blast through the toughest of algae. The Eagle Ray can scrub virtually any surface type from extra smooth to extra rough.
- » The buoyancy foam can be adjusted to trim the scrubber from negative buoyancy to neutral buoyancy. A weight strap is available for divers who want to add a little weight to make the unit negatively buoyant.
- » An optional vacuum shroud is available.

### Bull Ray



- » "The new workhorse of the Single Brush Scrubbers." The Bull Ray is designed to clean very large areas quickly. This tool is suitable for smooth surfaces or very rough surfaces. Brushes can be customized to fit almost any application.
- » The extra large water hydraulic motor can spin a 12" or 14" brush with ease. The brush can be changed in seconds with our exclusive "Quick Change" feature. The brush can even be changed underwater.
- » The Bull Ray has an adjustable pivot arm. The pivot arm can be adjusted above or below the surface without the use of any tools. The Bull Ray also has removable and repositionable ergonomic handles. These handles can be adjusted without tools above and below the water. There are literally dozens of pivot arm and handle combinations to suit every diver.
- » Divers can easily operate the Bull Ray under water like a floor polishing machine. The smallest of divers can effortlessly control this large scrubber under water.
- » The Bull Ray is supplied with three layers of adjustable flotation foam. The unit can be trimmed for positive, neutral or negative buoyancy.
- » An optional vacuum shroud is available:





### Bat Ray

The greenest and most cost effective way to clean. The tool body is a lightweight aircraft aluminum housing that is anodized for corrosion protection. Inside the housing is a 24 volt military spec motor coupled to a three stage planetary gear transmission. Adjustable delrin handles provide maximum diver comfort. This versatile tool can spin 6" or 8" diameter brushes. As with all of our tools, the brushes feature SubTek's "quick change" mounting system. The gel batteries are housed in a waterproof container that floats at the surface in its own custom foam float. Average run time is 2 hours minimum. The batteries fully charge in less than 4 hours using our advanced computer charging system. The whole Bat Ray system is compact and easy to transport from one exhibit to another. An optional surface supplied power unit is available that gives the Bat Ray unlimited run time. Please consult with the SubTek engineering team for power unit specifications.

### Optional Components



Surface Mounted Power Panel



Surface Mounted Power Port



Floating Battery Pack



## Bristle Types

Meridian SubTEK has 44 different kinds of rotary brushes consisting of a wide range of bristles, in stock. Our range goes from soft (.026-.032 diameter bristles) that are great for gel coat surfaces, to very aggressive bristles (.040-.065 diameter bristles) that work very well on unpainted concrete or gunite surfaces. Most of our bristles are nylon or polypropylene. We also have bristles that are impregnated with abrasive materials.

### Brush Recycling

Meridian SubTek is proud to offer brush recycling. Send us the white poly brush base back with the bristles removed and we will rebristle the brush. Recycled brushes are priced at 20% less the cost of a new brush. The best part is that you are keeping the brush bases out of the land fill.



.065 Aggressive Surface Blue Bristle

## Rotary Brushes

At Meridian SubTek, we manufacture our own brushes. Every brush we make is custom designed for each institution's specific application. All rotary brushes are constructed from a high impact polymer base and nylon bristles. The bristles are tied into recessed holes with stainless steel wire. Yes, finally no more broken or lost bristles! There is no plywood base to delaminate. Our high quality brush construction ensures a longer brush life span.

Depending on application and use, brushes have lasted 6 to 9 months under daily use.

Brushes are available in standard sizes of 6", 8", 10", 12" and 14". Custom sizes are also available.

Please contact our engineering department for your specific cleaning application.

SubTek also manufacturers brushes for use with non-SubTek equipment.

### Flat Brush

The bristles are the same length. This brush is made to clean large flat smooth surfaces.



### Rock Brush

All (3) rows of bristles are different lengths starting with the outer row being the longest. This style brush is perfect for rock work or uneven surfaces.





### Special Use Rotary Brushes

We design and manufacture "special use" rotary brushes to get those extremely difficult areas clean. Meridian also has the perfect super soft brush to clean your acrylic windows, tunnels, or vinyl liners.



Christmas Tree Brush

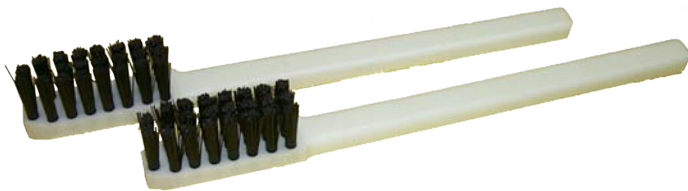
### Hand Brushes

Excellent for scumline, corner, floor and wall cleaning.



### Extended Handle Brushes

The 24" long extended handle is perfect for those hard to reach places.



### Rock Brush

For cleaning of artificial rock and extremely delicate artificial coral. Extension handle optional.





## Pistol Grip Spray Handle with Spray Flex Wand and Turbo Nozzle

Quick Disconnect allows you to change from flex to stubby pistol grip underwater.

Use for below and above surface cleaning chores. Very effective at cleaning tight and highly textured surfaces. Spray Flex Wand gives added control to aim at target. Very versatile design allowing the spray gun to be used with or without flex wand.



## Long Lance Spray Wand

Use for below and above surface cleaning chores. Very effective at cleaning tight and highly textured surfaces. Adjustable Nozzle Barrel for spray pattern.



## Replacement Nozzles

For continued effective use, nozzles should be replaced every 100 hours of use.



Adjustable Nozzle



Rotorjet Turbo Nozzle



## Rebuilding/Refurbishing of Non-SubTek Equipment

If your current equipment is old and wore out, we can rebuild it to like new condition. You can even select the color you want the new finish to be! From fittings and valves to motors and buoyancy foam—we can refurbish and add years to the life of your current system!

### 5 Micron High Capacity Filters

These filters are designed to increase pump and motor life of your system. Typically, these filters should be changed every 6 months. If regular backwashing is a practiced measure, the life of these filters can extend to 1 year.



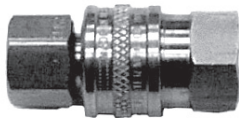
### Hydraulic Hoses

SubTek supplies the highest quality high pressure hose available. Standard Pressure Washer Hoses can damage your scrubber. We start with Parker thermoplastic hose that contains no steel reinforcing and crimp on stainless steel fittings. Please note that standard pressure washer hoses are not compatible with water hydraulic motors. Our standard lengths are 50' and 100'. Longer lengths are available upon request. All hoses are supplied with stainless steel quick disconnect fittings.



### Quick Disconnects

Stainless steel quick disconnects used for all supply and return hoses make changing systems easy and, of course, quick.



### In-Line Strainer

Used on scrubbers and spray guns, the in-line strainer should be replaced every 12 months (every 6 months under heavy use) to ensure a strong running system.



### Silicone “Food Grade” Lubricant

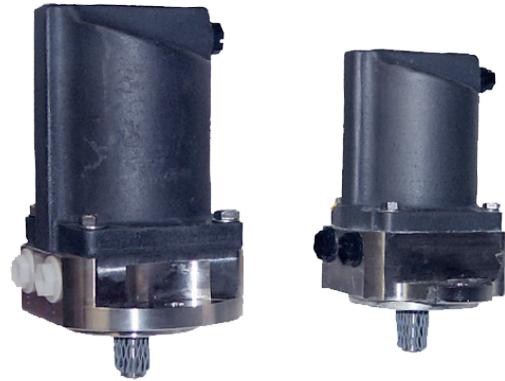
Don't accept anything less for the health and safety of your marine mammals! This organic material is used to lubricate parts on our systems for proper maintenance. Using this will ensure absolutely no contamination of the mammal's habitat.





## Motors

If your water hydraulic motors on your equipment fail, we have direct replacement parts to get you back up and running again in no time. Our motors are the same as what you currently have on your equipment but at a fraction of the cost of our competitors.



## Foam

Difficulties in buoyancy on your current equipment? We have buoyancy kits available that maintain the same equipment buoyancy at the bottom as at the surface. No more inflating and deflating air bladders!

