User Manual

Outland ROV MP-200

Outland Technology, Inc.
Address: 38190 Commercial Court, Slidell, LA 70458
Phone: +1 (985) 847-1104
Email: sales@outlandtech.com
Website: www.outlandtech.com

Congratulations on the purchase of your OUTLAND Manipulator!

Outland Technology takes great pride in supplying high-quality underwater equipment.

Your Outland Manipulator has been rigorously tested. The quality and performance of this tool comes with the full confidence and backing of Outland Technology, Inc. As a measure of that confidence, your tool comes with a Limited one-year warranty that the unit remains free of defects in workmanship and materials.

Please familiarize yourself with the entire manual.

Owner's Record
Record the serial number of your Manipulator and have it available whenever contacting Outland Technology regarding this product.

Serial Number: _____

Table of Contents

Assembly Overview 4
Manipulator Actuator (MP-200) 6
Maintenance: 6
Trident Grabber Tool (MPH-201) 7
Tool Head Attachment: 7
Maintenance: 7
Interlocking Grabber Tool - Small (MPH-202) 8
Tool Head Attachment 8
Maintenance: 8
Interlocking Grabber Tool - Large (MPH-205) 9
Tool Head Attachment: 9
Maintenance: 9
Cutting Tool (MPH-204) 10
Tool Head Attachment: 10
Maintenance: 10
Parallel Jaws (MPH-206) 11
Tool Head Attachment: 11
Blade (03-0464) Replacement: 11
ROV Manipulator Mount (MPM-101) with UM-100 12
Mount (MPM-101) & UM-100 12
Installation: 12
Installing Mount onto ROV Frame: 12
Adjustment: 12
Maintenance: 12
Manipulator Controls and Calibration 13
ROV Setup: 13
Controller Operation: 13
On Screen Controls: 14
Calibration: 16

Legend

Warning/ Pay Attention

Pinch Hazard

Cutting Hazard

Safety

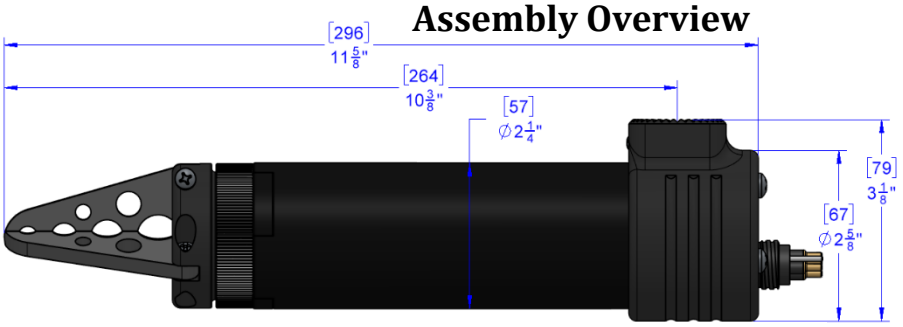
Warning

The ROV systems is supplied with $400V_{DC}$. Improper use may result in electrical shock or electrocution. Only trained and experienced personnel should operate the equipment.

Caution

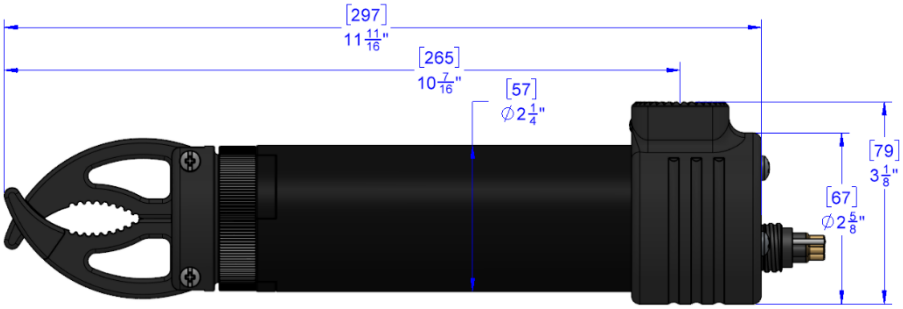
NEVER PLUG OR UNPLUG ELECTRONICS WITH POWER ON! Damage or personal injury may result.

Assembly Overview



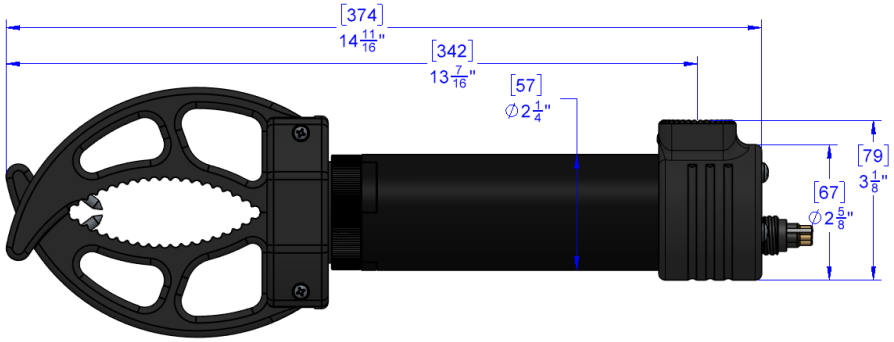
DESCRIPTION: Manipulator 2-Function with Trident Graber

MP-200 (Actuator)
MPH-201 (Tool)
MPM-101 (Mount)



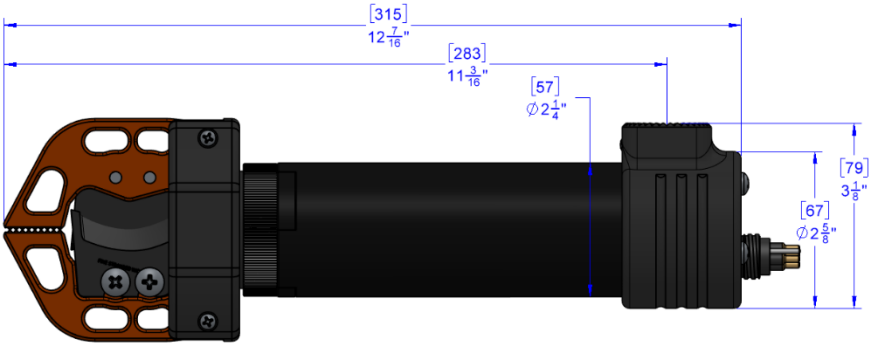
DESCRIPTION: Manipulator 2-Function with Small Interlocking Grabber

MP-200 (Actuator)
MPH-202 (Tool)
MPM-101 (Mount)



DESCRIPTION: Manipulator 2-Function with Viper Search and Recovery Grabber

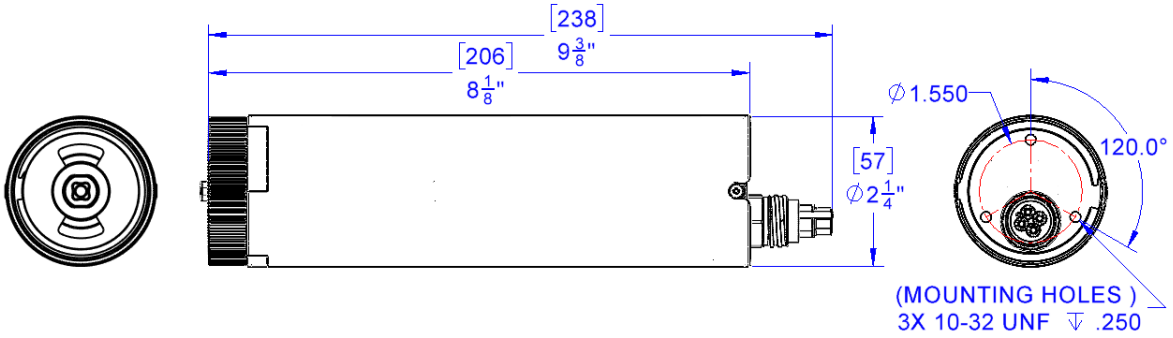
MP-200 (Actuator)
MPH-205 (Tool)
MPM-101 (Mount)



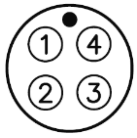
DESCRIPTION: Manipulator 2-Function with Cutter

MP-200 (Actuator)
MPH-204 (Tool)
MPM-101 (Mount)

Manipulator Actuator (MP-200)



MECHANICAL:		ELECTRICAL:	
Diameter	2.25 in. (57 mm)	Input Voltage	24 VDC
Length (excluding connector)	8.125 in. (194 mm)	Power	120 Watts
Weight in air	2.12 lb. (1.38 kg)	CONNECTOR:	
Weight in seawater	1.0 lb. (0.9 kg)	Standard Connector	MCBH4MAL
Depth Rating	2,000 ft. (610 m)	1. Power Return	
Housing Material	Aluminum & Delrin	2. Power (+)	
		3. COMM +	
		4. COMM -	
		Mate for Standard Connector	MC-IL-4-F

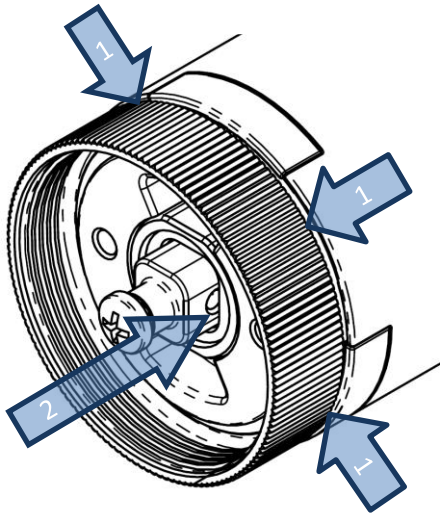


Maintenance:

Tools Required: None

Flush with fresh water before storage or if manipulator will not be used for 24 hours.

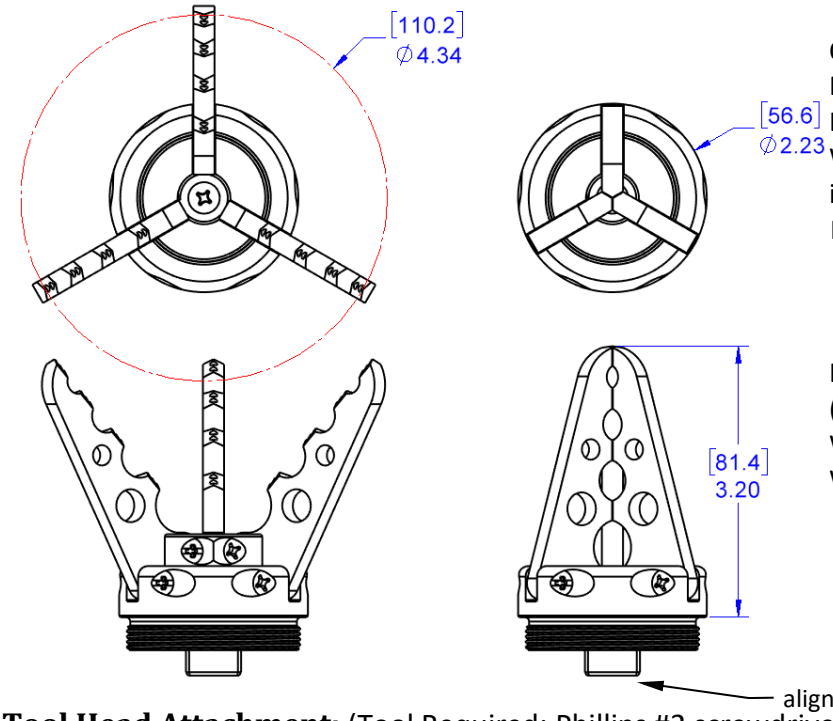
1. Direct water behind the coupling ring while rotating the tool head (CW and/or CCW).
2. Direct water towards the center tool attachment screw while fully opening and closing the manipulator (if tool head is attached; if no tool head is attached move approx. 1 inch from fully retracted position). This can be done without removing the tool head***. See water input arrow shown with each tool head in this manual.***



Tool Head Attachment Screw:

Tool heads are attached to the actuator with a #10-32 x 1/4 inch length stainless steel pan head Phillips machine screw, supplied with each manipulator and extra tool.

Trident Grabber Tool (MPH-201)



Tool Only (MPH-201)

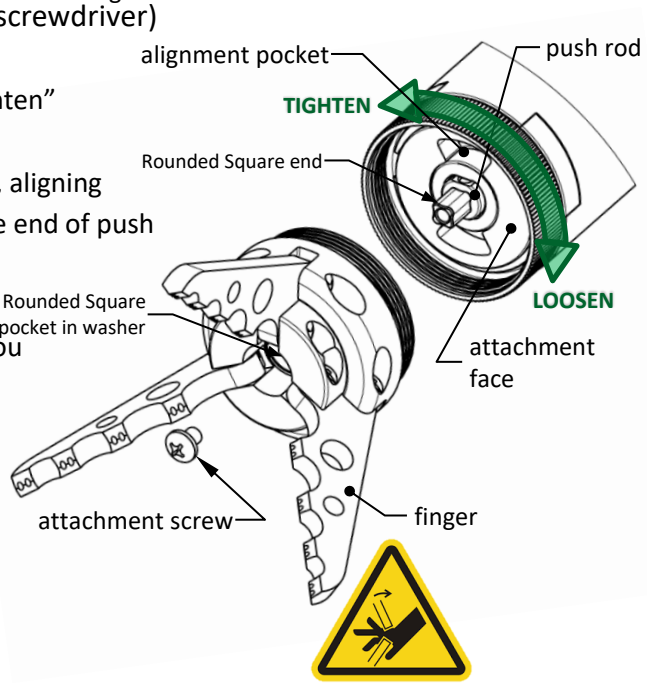
Opening size	4.34 in. (110 mm)
Diameter	2.23 in. (56.6 mm)
Length	3.2 in. (88 mm)
Weight in air	0.28 lb. (0.13 kg)
in seawater	0.13 lb. (0.06 kg)
Materials	Aluminum Teeth & Delrin Base

Tool with Actuator & Mount

Length (to mount pivot point)	10.38 in. (236.7 mm)
Weight in air	2.4 lb. (1.1 kg)
Weight in seawater	1.1 lb. (0.5 kg)

Tool Head Attachment: (Tool Required: Phillips #2 screwdriver)

1. Start with center push rod fully retracted.
2. Align teeth with pockets and turn coupling ring in "tighten" direction to pull tool head against attachment face.
3. Open fingers on tool and extend push rod into washer, aligning rounded square pocket in washer with rounded square end of push rod.
4. Install attachment screw and tighten.
5. The attachment screw will not engage the threads if you do not have the rounded square push rod aligned with rounded square washer.

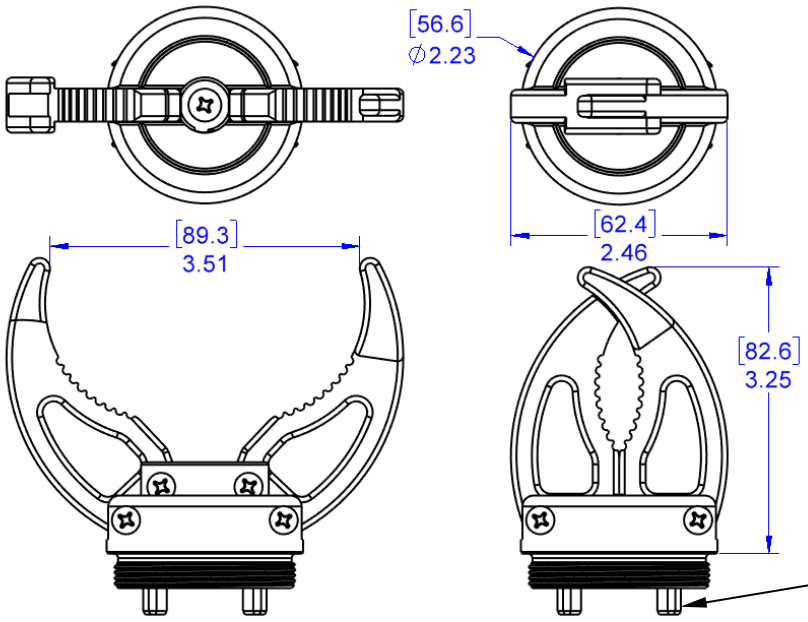


Maintenance:

Tool Required: #2 Philips Screwdriver

- Replace fingers (11-0141) if they become too damaged to continue to grip adequately.
- Tighten binding barrel screws if they become loose and the screw heads protrude out of the counterbored holes.

Interlocking Grabber Tool - Small (MPH-202)



Tool Only (MPH-202)

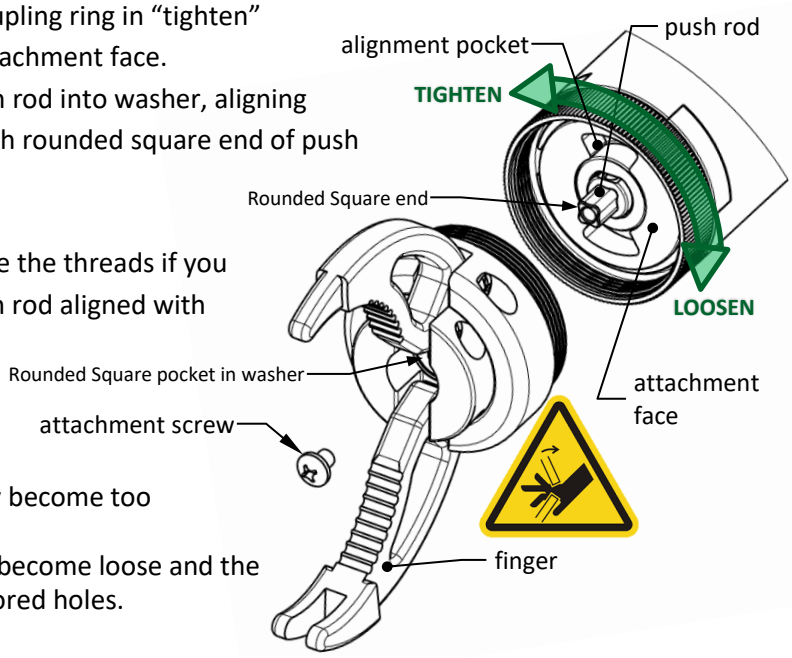
Opening size	3.51 in. (89 mm)
Diameter	2.23 in. (56.6 mm)
Length	3.25 in. (82.6 mm)
Weight in air	0.25 lb. (0.11 kg)
in seawater	0.16 lb. (0.07 kg)
Materials	Delrin

Tool with Actuator & Mount

Length (to mount pivot point)	10.4 in. (264 mm)
Weight in air	2.37 lb. (1.08 kg)
Weight in seawater	1.16 lb. (0.53 kg)

Tool Head Attachment: (Tool Required: Phillips #2 screwdriver)

1. Start with center push rod fully retracted.
2. Align teeth with pockets and turn coupling ring in "tighten" direction to pull tool head against attachment face.
3. Open fingers on tool and extend push rod into washer, aligning rounded square pocket in washer with rounded square end of push rod.
4. Install attachment screw and tighten.
5. The attachment screw will not engage the threads if you do not have the rounded square push rod aligned with rounded square washer.

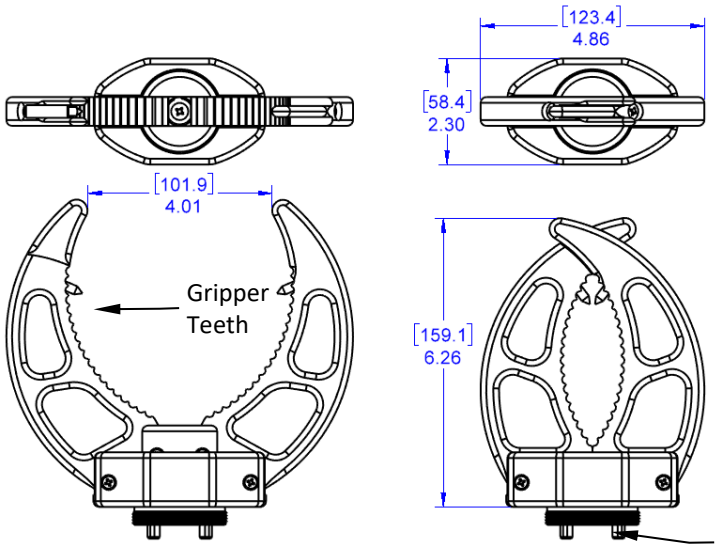


Maintenance:

Tool Required: #2 Philips Screwdriver

- Replace fingers (11-0183-1/-2) if they become too damaged to grip adequately.
- Tighten binding barrel screws if they become loose and the screws protrude out of the counterbored holes.

Interlocking Grabber Tool - Large (MPH-205)



Tool Only (MPH-205)

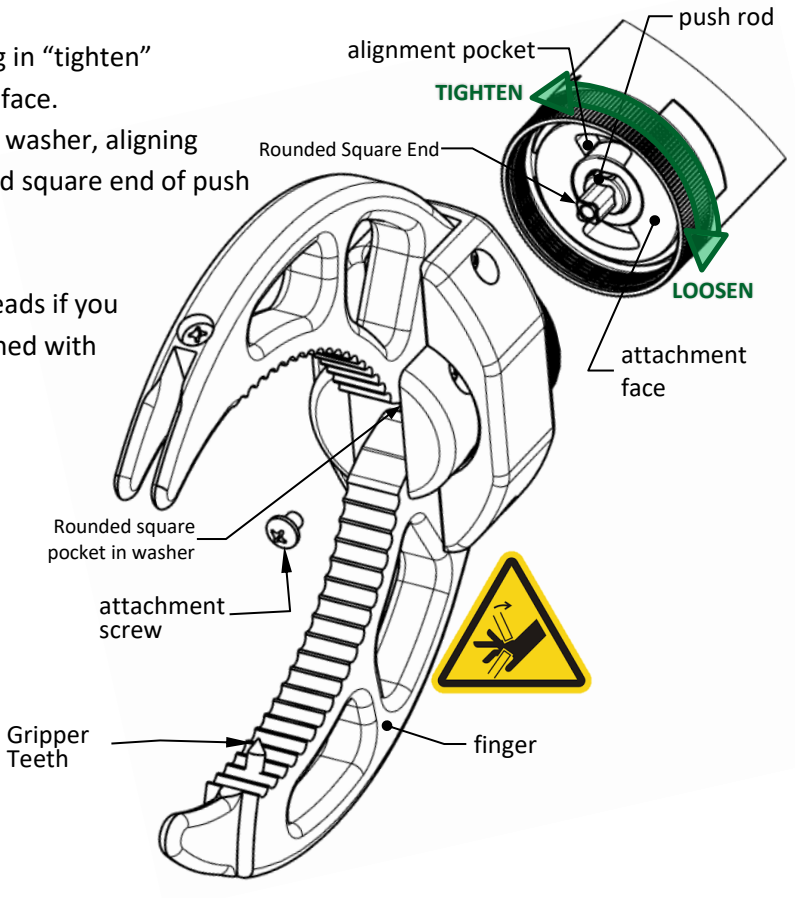
Opening size	4.0 in. (102 mm)
Width	4.86 in. (123 mm)
Length	6.26 in. (159 mm)
Weight in air	0.78 lb. (0.35 kg)
Weight in seawater	0.26 lb. (0.12 kg)
Materials	Delrin

Tool with Actuator & Mount

Length (to mount pivot point)	13.44 in. (391 mm)
Weight in air	4. 1 lb. (1.9 kg)
Weight in seawater	2.44 lb. (1.11 kg)

Tool Head Attachment: (Tool Required: Phillips #2 screwdriver)

1. Start with center push rod fully retracted.
2. Align teeth with pockets and turn coupling ring in "tighten" direction to pull tool head against attachment face.
3. Open fingers on tool and extend push rod into washer, aligning rounded square pocket in washer with rounded square end of push rod.
4. Install attachment screw and tighten.
5. The attachment screw will not engage the threads if you do not have the rounded square push rod aligned with rounded square washer.

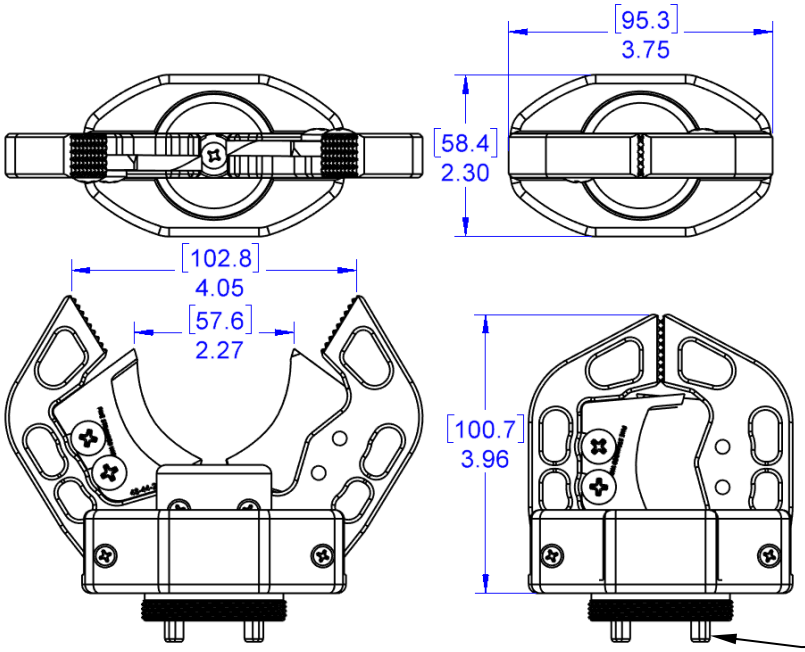


Maintenance:

Tool Required: #2 Philips Screwdriver

- Replace fingers (11-0184-1/-2) if they become too damaged to grip adequately.
- Tighten shoulder screws if they become loose and the screw heads protrude out of the counterbored holes.
- Replace gripper teeth (11-0545) if they become dull or too damaged to grip adequately.

Cutting Tool (MPH-204)



Tool Only (MPH-204)

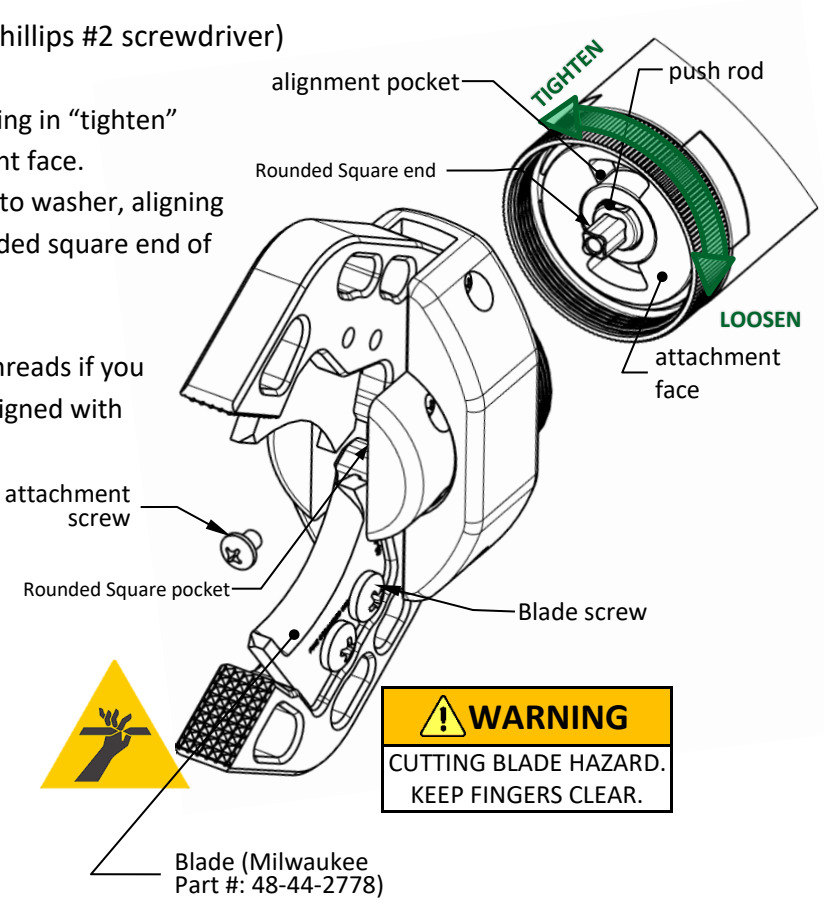
Opening size 2.27 in. (57.7 mm)
Width 3.75 in. (95.3 mm)
Length 3.96 in. (100.7 mm)
Weight in air 1.01 lb. (0.46 kg)
Weight in seawater 0.59 lb. (0.27 kg)
Materials Aluminum & Delrin
Blade Hardened Steel

Tool with Actuator & Mount

Length 13.19 in. (345 mm) (to mount pivot point)
Weight in air 3.13 lb. (1.42kg)
Weight in seawater 1.59 lb. (0.7 kg)

Tool Head Attachment: (**Tool Required:** Phillips #2 screwdriver)

6. Start with center push rod fully retracted.
7. Align teeth with pockets and turn coupling ring in "tighten" direction to pull tool head against attachment face.
8. Open fingers on tool and extend push rod into washer, aligning rounded square pocket in washer with rounded square end of push rod.
9. Install attachment screw and tighten.
10. The attachment screw will not engage the threads if you do not have the rounded square push rod aligned with rounded square washer.

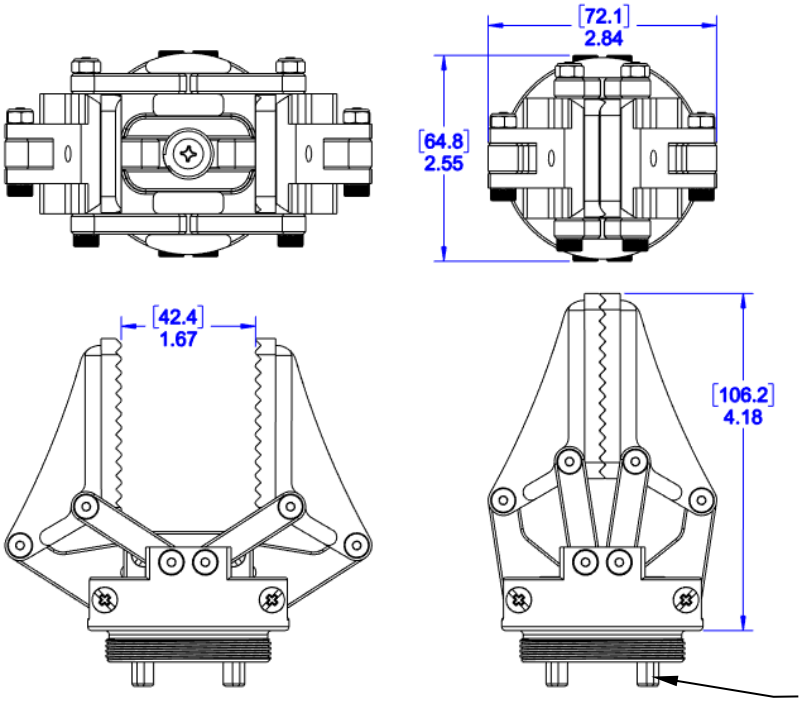


Maintenance:

Tool Required: #2 Philips Screwdriver

- Fully Open Jaws Up
- Loosen blade screws and slide blades out.
- Install new blades (Milwaukee Part#: 48-44-2778)
- Tighten blade screws.

Parallel Jaws (MPH-206)



Tool Only (MPH-204)

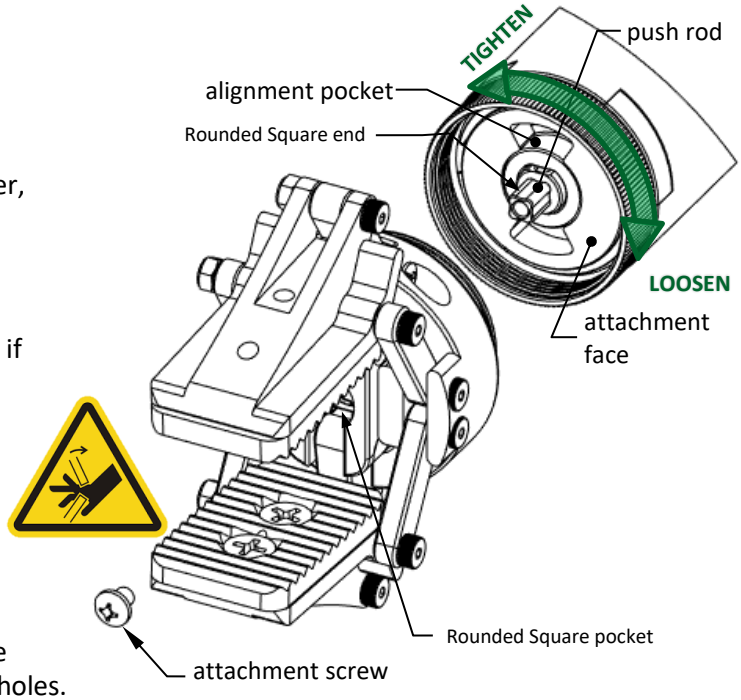
Opening size 1.67 in. (42.4 mm)
Width 2.84 in. (72.1 mm)
Length 4.18 in. (106.2 mm)
Weight in air 0.64 lb. (0.30 kg)
Weight in seawater 0.3 lb. (0.14 kg)
Materials Aluminum & Delrin

Tool with Actuator & Mount

Length 11.39 in. (289 mm) (to mount pivot point)
Weight in air 2.97 lb. (1.35 kg)
Weight in seawater 1.37 lb. (0.62 kg)

Tool Head Attachment: (**Tool Required:** Phillips #2 Screwdriver)

11. Start with center push rod fully retracted.
12. Align teeth with pockets and turn coupling ring in "tighten" direction to pull tool head against attachment face.
13. Open jaws on tool and extend push rod into washer, aligning rounded square pocket in washer with rounded square end of push rod.
14. Install attachment screw and tighten.
15. The attachment screw will not engage the threads if you do not have the rounded square push rod aligned with rounded square washer.



Blade (03-0464) Replacement:

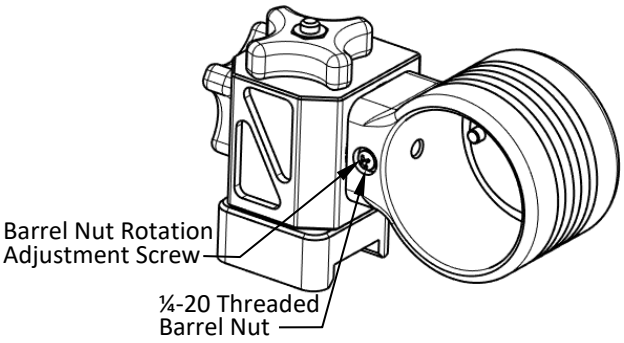
Tool Required: #2 Philips Screwdriver

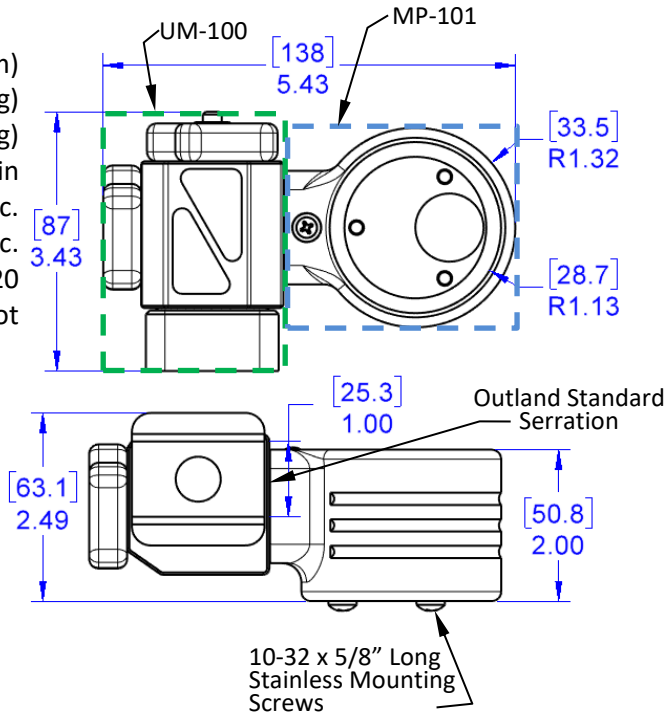
- Replace grip pads (11-0984) if they become too damaged to grip adequately.
- Tighten binding barrel screws if they become loose and the screws protrude out of the counterbored holes.

ROV Manipulator Mount (MPM-101) with UM-100

Mount (MPM-101) & UM-100

Length	2.49 in. (50.8 mm)
Weight in air	0.832 lb. (0.38 kg)
Weight in seawater	0.289 lb. (0.13 kg)
Materials	Delrin
Rotation adjustment arc	360°@10° Inc.
Tilt adjustment arc	360°@10° Inc.
Mounting screw size	1/4-20
Mounting Style	1inx1in T-Slot





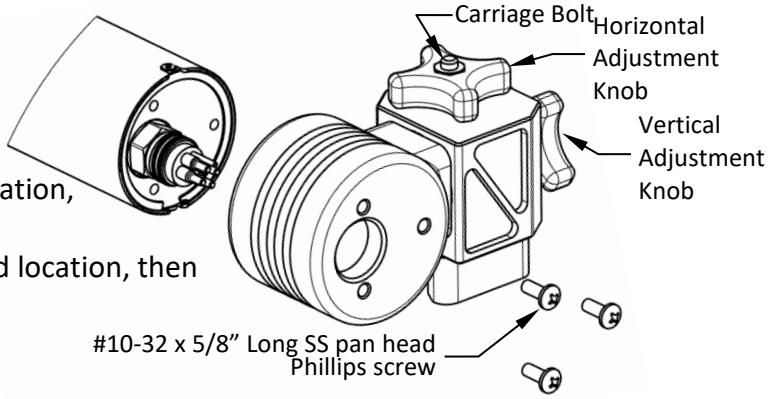
Installation:

Installing Manipulator into Mount:

1. Place connector end of Manipulator Actuator (MP-200) into mount sleeve.
2. Install 3x #10-32 SS pan head Phillips screws.
3. Connect connector through hole in mount sleeve.

Installing Mount onto ROV Frame:

Remove bolt from 1"x1" T-slot rail and remove from pocket in frame. Slide mount assembly onto the T-slot. Be aware the carriage bolt does have flats so it will need to be aligned properly.



Adjustment:

Tilt: Loosen side knob and adjust to desired location, then tighten knob.

Rotation Loosen top knob and adjust to desired location, then tighten knob.

Maintenance: (Tools Required: None)

Rinse with fresh water or soak in fresh water before storage or if manipulator will not be used for 24 hours.

Manipulator Controls and Calibration

ROV Setup:

1. Power off ROV. Connect the manipulator to the light and manipulator whip, which is plugged into Port B on the control bottle of the Outland ROV.
2. Power on the ROV. The ROV should detect the MP-200 and allow you to actuate it.

Controller Operation:

On the Outland hand controller, the manipulator controls are located at the bottom left.

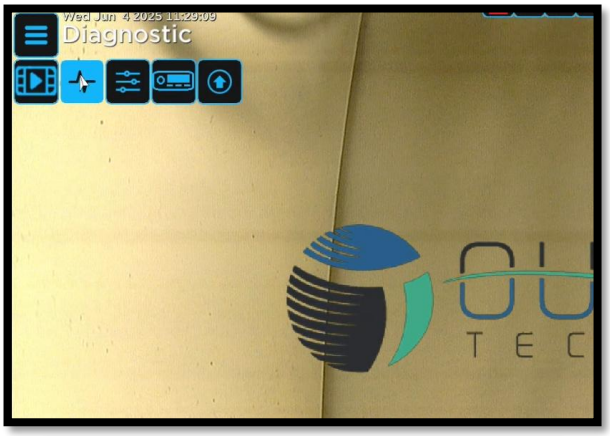
- Pushing the switch up opens the manipulator.
- Pushing it down closes the manipulator.
- Left rotates the manipulator counterclockwise.
- Right rotates it clockwise.

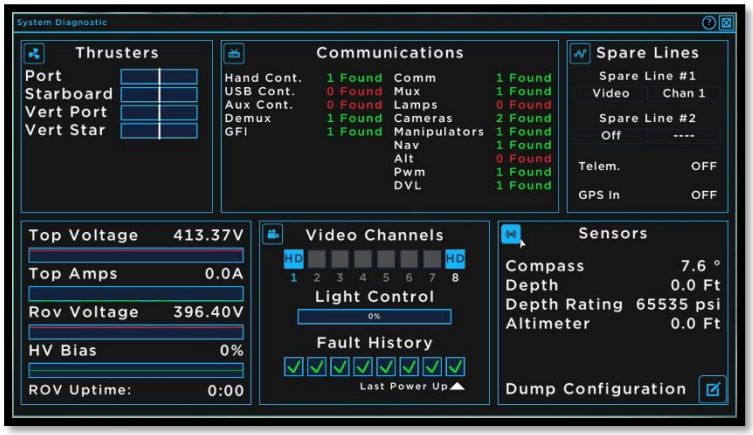
These controls are clearly labeled on the controller for your convenience. See below for an illustration.

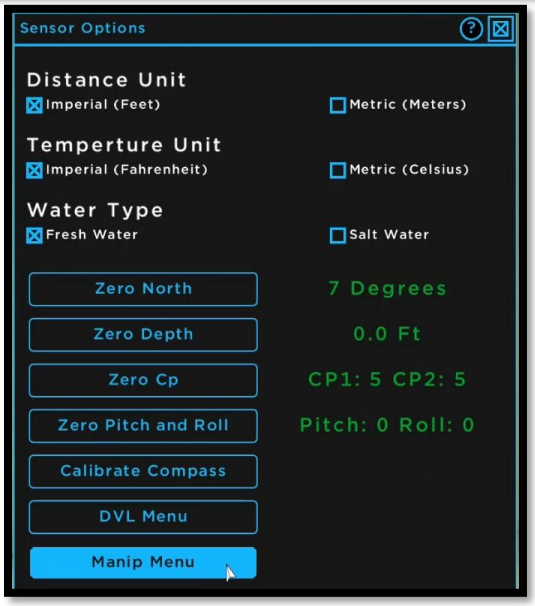
On Screen Controls:

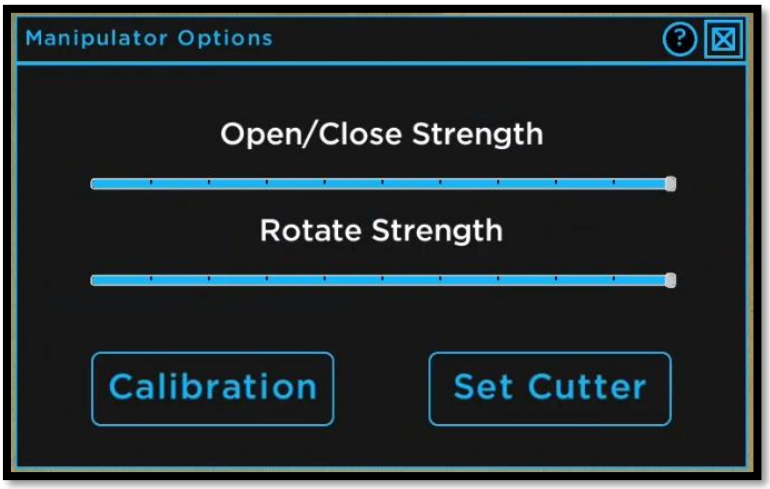
On the ROV overlay, navigate to the **Diagnostics** screen, then go to the **Sensor** menu. From there, you will see the **Manip** menu (this menu only appears when a manipulator is detected by the ROV).

Refer to the images below for a visual guide on how to access the Manip menu.





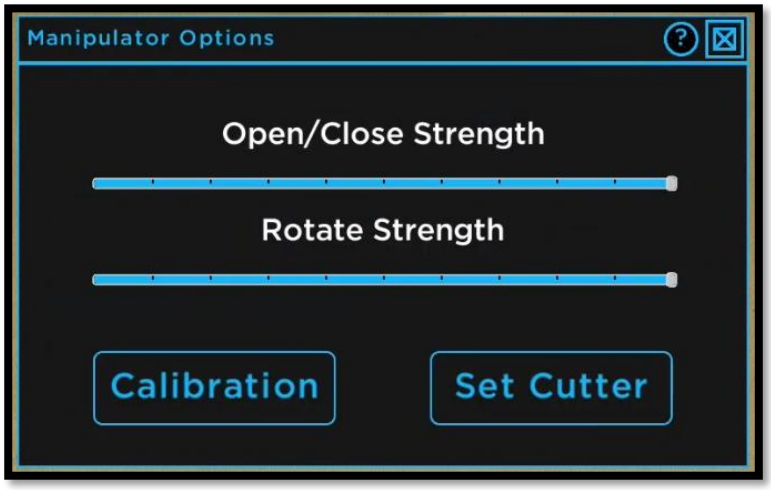




In the **Manip** menu, you'll find sliders to adjust the **grip** and **rotation** strength and speed. Alongside these sliders are two buttons, one of which is the **Set Cutter** button.

The Set Cutter button modifies how the cutter behaves when gripping objects. If the cutter is obstructed, the motor will continue attempting to cut through the material.

Important: When the *set cutter* button is set the motor could potentially overheat. Therefore, be careful when this is activated.



Calibration:

The other button in the **Manip** menu is the **Calibration** button. The manipulator's open/close motor includes an encoder that tracks the position of the jaws throughout their cycle.

Follow these steps to calibrate:

1. Press the **Calibration** button, then select **Begin**.

2. Open the jaws fully using the controller.

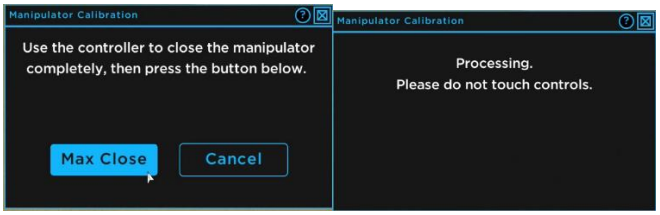
⚠ *Only open the jaws until they stop—do not continue applying force.*

3. Press **Max Open** and wait for the system to process the input.

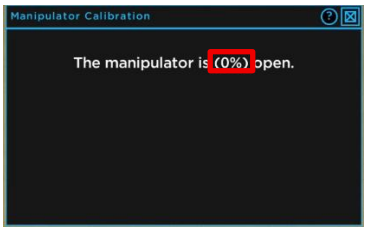
4. Close the jaws completely.

⚠ *Only close the jaws until they stop—do not continue applying force.*

5. Press **Max Closed** and wait for the system to process the input.



6. Test the manipulator to ensure it behaves as expected. Open and close the jaws while observing the percentage indicator on the screen.



IMPORTANT NOTE: ⚠

A calibration will need to be performed anytime you change the Jaws on the Manipulator. The calibration **will** hold through power cycles.