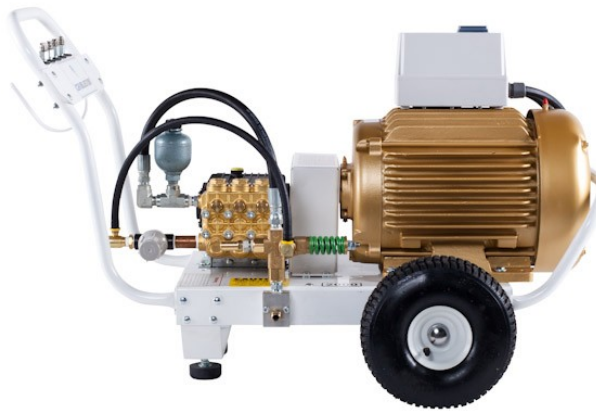




CAVIBLASTER[®]



Model 1222-E60
Operation & Maintenance Manual



cavidyne[®]

www.cavidyne.com

1222-E60 OPERATING INSTRUCTIONS

WARNING: To ensure operator safety and efficient operation of the CaviBlaster™, it is essential to follow these instructions.

Preparing the CaviBlaster™ system for operation:

1. Inspect the CaviBlaster™ power unit, hoses and Zero Thrust Gun for any signs of damage.
2. Inspect inlet strainer (Figure 1) to ensure that it is not clogged. Clean if necessary.
3. Check for proper oil level in pressure pump (Figure 2).
4. Fill lubricating oil to proper level in the pressure pump (yellow cap on pump) (Figure 3) per manufacturer's operating manual. ****SAE 30W Non-detergent oil****

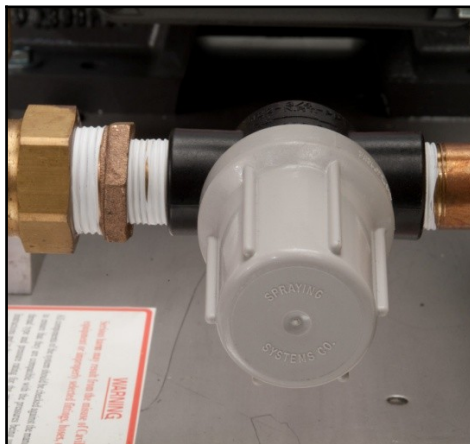


Figure 1



Figure 2



Figure 3

5. To supply water to the CaviBlaster™ power unit, connect a 1" (25 mm) diameter feed hose to the cam-lock plug on the inline strainer inlet (Figure 4). Either fresh water or seawater can be used with this system. **The water source must supply the CaviBlaster™ with water at a volume of greater than 12 gallons (45 liters) per minute at a maximum pressure of 70-psi (5 bar).** **Ensure that the feed hose is connected to the pressure pump and the water is on prior to starting the pressure pump.**
6. Connect the 1" (25 mm) red rubber bypass hose to the cam-lock plug on the pressure-regulating unloader (Figure 5). The bypass hose has a cam-lock socket on one end. Direct the bypass hose away from the working area and secure the hose.





Figure 4

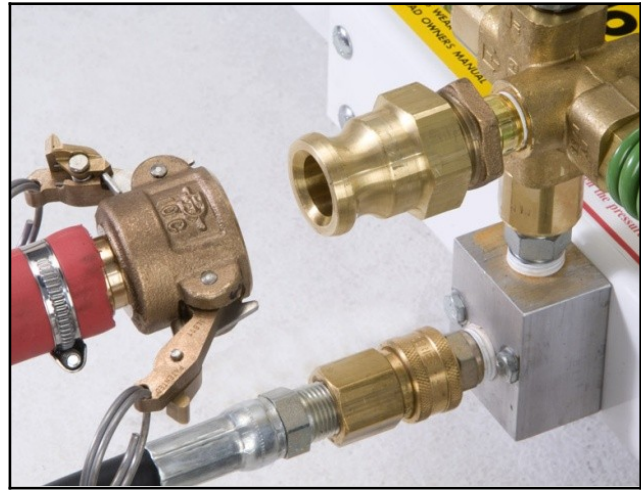


Figure 5

Starting the CaviBlaster™ power unit:

1. Turn on the water supply to the system.
2. Ensure that the system is primed with water and that there are no leaks in the system. The pressure pump is a positive displacement pump and water must be supplied under pressure. **Failure to pump feed water to the pressure pump will result in damage to the pump.**
3. Once the system is primed, turn off the water supply to the system.
4. Connect the ½" (13 mm) high-pressure hose to the quick-connect plug under the pressure-regulating unloader (Figure 6). The high-pressure hose has a brass quick-connect socket on the end. The 1222-E CaviBlaster™ can deliver the required pressure utilizing up to 300 feet (100 meters) of ½" diameter rubber hose or 600 feet (200 meters) of thermoplastic hose. **Using greater lengths or smaller diameters of hose may degrade performance.** If greater hose lengths are required, ¾" (19 mm) diameter hose must be used.
5. Connect the Zero Thrust Gun to the high pressure hose (Figure 7) and submerge the Zero Thrust Gun in water.



Figure 6



Figure 7



6. Restart the water supply.
7. Connect the power cable for the motor to the power source.
8. It is recommended that the Zero Thrust Gun trigger be in the open or “ON” position (Figure 9) when starting the motor.
9. Depress the green “START” button on the motor controller (Figure 8) mounted on top of the motor to start the motor.
10. The system is now ready to operate (refer to photo on cover for overall system set-up).



Figure 8

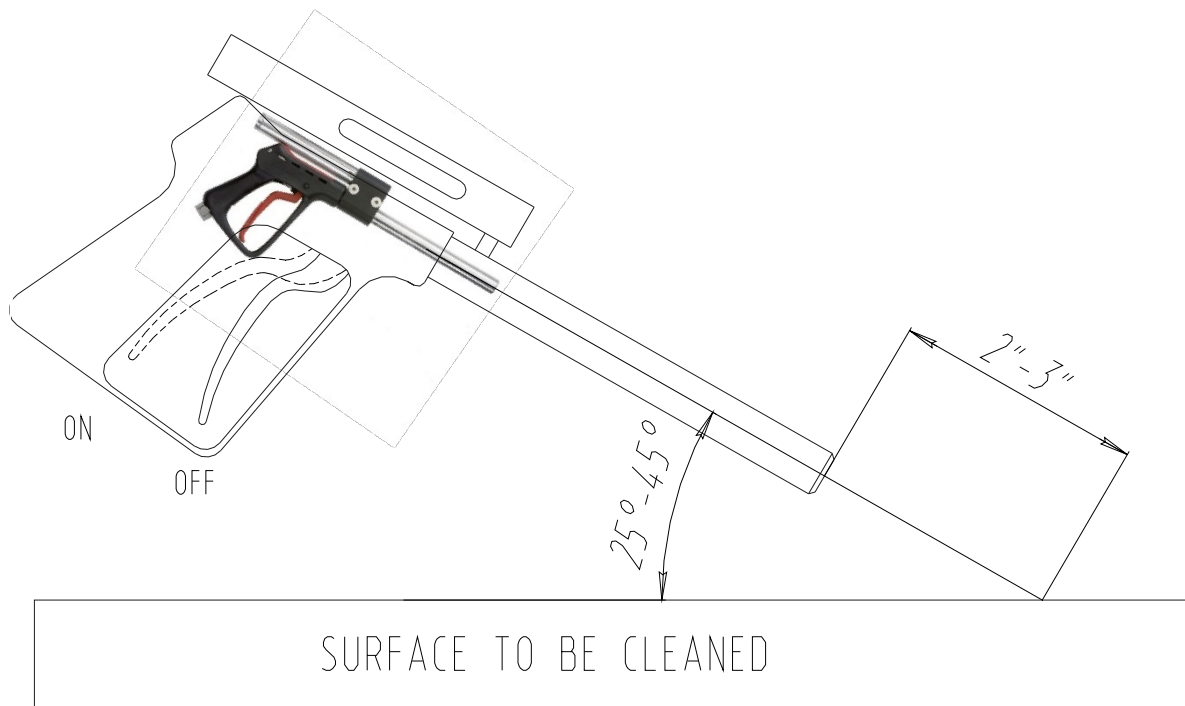


Figure 9

WARNING: Although the CaviBlaster™ system is safe to use when submerged in water, the system generates a high-pressure (up to 2,200-psi) water stream, which can cause injury when the Zero Thrust Gun is out of the water. ALWAYS keep the Zero Thrust Gun submerged when the pressure pump is engaged.



Operating the CaviBlaster™ system:

1. When the diver is ready to commence cleaning operations, ensure that the Zero Thrust Gun is submerged in water. If the diver is not wearing a helmet, hearing protection is recommended. Cavidyne recommends “Doc’s Proplugs” vented earplugs for diver hearing protection.
2. Activate the cleaning cavitation stream by squeezing the trigger to the open or “ON” position (Figure 9).
3. The most efficient operating technique is to hold the Zero Thrust Gun 2-3 inches (5-8 cm) away from the surface to be cleaned and at a 25 to 45 degree angle to the surface being cleaned (Figure 9). Placing the Zero Thrust Gun closer than 2-3 inches from the surface being cleaned will not allow for efficient cavitation performance and will degrade the cleaning capability of the system.
4. Wear neoprene or rubber gloves to protect the hands and follow all safety regulations that may be applicable to the work being performed.
5. If the diver operating the unit must be replaced or the cleaning operation must be interrupted for a prolonged period or terminated, shut down the motor by depressing the red “STOP” button (Figure 8) on the motor controller. Turn off the water supply to the pump, and then release the water pressure in the hose(s) by squeezing the Zero Thrust Gun trigger to the open or “ON” position (Figure 9) while under water. Revert back to step 1 of the operating instructions when the replacement diver is ready to continue cleaning.
6. Ensure that the Zero Thrust Gun is submerged any time the motor and pressure pump are operating.

Adjusting the CaviBlaster™ system for maximum performance:

1. If using a calibration pressure gauge situated between the pressure hose and the CaviBlaster™ Zero Thrust Gun, the water pressure should be 2,200-psi with the Zero Thrust Gun submerged and the Zero Thrust Gun trigger in the open or “ON” position. The pressure is adjusted by turning the nuts on the end of the pressure-regulating unloader (Figure 10) to compress or relax the green spring. This adjustment increases or decreases the flow of water through the bypass hose when the CaviBlaster™ Zero Thrust Gun trigger is in the open or “on” position. The flow of water through the bypass hose, in turn, determines the flow of water through the pressure hose and the Zero Thrust Gun. Less flow through the bypass hose means more flow through the Zero Thrust Gun which translates to higher velocity and pressure. Turn the nuts to compress the spring to decrease the amount of water passing through the bypass and increase the water flow and pressure at the Zero Thrust Gun. Turn the nuts to relax the spring to increase the amount of water passing through the bypass and decrease the water flow and pressure at the Zero Thrust Gun. There should always be a trickle of water through the bypass when the Zero Thrust Gun trigger is in the open or “ON” position. This ensures that the bypass will open without a pressure shock wave damaging the pump when the Zero Thrust Gun trigger is released to the closed position.



2. If using a pressure gauge located on the CaviBlaster™ power unit, the water is adjusted as described in step 1 above. However, pressure will need to be higher to account for sidewall friction loss in the pressure hose. The pressure at the pump should be 2,200-psi plus 0.75-psi per foot of thermoplastic pressure hose. For example, if using the CaviBlaster™ with 100 feet of pressure hose, the pressure gauge located next to the pump should indicate 2,275-psi. Pressure adjustments are made in the same manner as described above. **There should always be a trickle of water through the bypass when the Zero Thrust Gun trigger is in the open or “ON” position.**

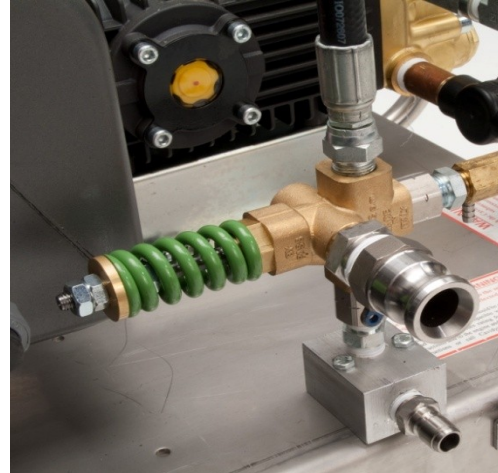


Figure 10

3. If adjusting the CaviBlaster™ without a pressure gauge, close the pressure-regulating unloader until there is just a trickle of water (less than ¼ gallon or 1 liter per minute) coming out of the bypass with the Zero Thrust Gun trigger in the open or “ON” position.

Shutting down the CaviBlaster™ power unit:

1. Stop the motor by depressing the red “STOP” button (Figure 8) on the motor controller.
2. Shut off the supply of water to the pump.
3. **Squeeze the Zero Thrust Gun trigger to the open or “ON” position (Figure 9) to release the water pressure remaining in the hose(s) while the Zero Thrust Gun is submerged.**
4. It is now safe to remove the Zero Thrust Gun from the water.
5. Flush the system and rinse the power unit with fresh water at the end of the day.

Maintenance of the CaviBlaster™ unit:

1. Empty and clean the inline strainer every day.
2. Check the pressure pump oil level and consistency every day.
3. Flush the system and rinse the power unit with fresh water after each days use.
4. Inspect the pump drive belt every week and replace the belt when cracking appears.



5. Change the oil in the pressure pump after the first 50 hours and every 500 hours thereafter.
6. Change the spring for the Zero Thrust Gun trigger every 12 months or less if required.

Summarizing the operating instructions:

1. Inspect the system for damage. Clean the inlet strainer. Check pressure pump oil level.
2. Attach the feed and bypass hoses.
3. Start the water supply and ensure that the system is primed (water should be coming out of the pressure hose quick-connect plug).
4. Attach the pressure hose and Zero Thrust Gun.
5. Connect the power cable to the power source.
6. **Make sure that the diver is ready to work and that the Zero Thrust Gun is submerged in the water. Apply hearing protection if the diver is not wearing a helmet.**
7. Start the motor.
8. Activate the cleaning cavitation stream by squeezing the Zero Thrust Gun trigger to open or “ON.”
9. Proceed with cleaning.
10. Stop the motor.
11. Shut off the water supply to the pump.
12. **Release pressure from the hose(s) by squeezing the Zero Thrust Gun trigger to the open or “ON” position while under water.**
13. Remove the Zero Thrust Gun from the water.
14. Disconnect the power cable from the power source.
15. Flush the system and rinse the outside of the power unit with fresh water.



WARNING

While the CaviBlaster™ system is very safe, operators should exercise care when using the equipment. The cavitation “flame” can be safely passed over the operators’ skin at normal operating distances of 2” - 3” (5 - 8 cm) from the tip of the nozzle. However, at very close distances (typically less than 1”) both nozzles are capable of causing harm to the operator, particularly in the initial instant that the system is activated. For that reason, **operators should exercise caution when operating the Zero Thrust Gun with the nozzles in close proximity to the body. The operators should also ensure that the reverse-thrust nozzle guard is secured in the correct position prior to operating the Zero Thrust Gun.**

The operators of the CaviBlaster™ system should always wear neoprene or heavy rubber gloves to provide protection to the hands and, in particular, to the nails. The gloves will absorb most of the energy produced by bursting cavitation bubbles and prevent the cavitation bubbles from contacting the operators’ hands. The gloves will also protect operators’ hands from the initial shockwave when the Zero Thrust Gun is activated.

Serious harm and injury may result from the misuse of CaviBlaster™ system equipment or improperly selected fittings, hoses or attachments. All components of the system should be checked against the manufacturers’ instructions to ensure that they are compatible with the pressures being used and of the correct thread type and pressure rating for the intended service. Refer to these Operating Instructions and to the motor and pressure pump manufacturers’ operation manuals for instructions or call CaviDyne, LLC at (352) 275-5319 with any questions.



CAUTION:

DO NOT USE THIS EQUIPMENT TO CLEAN SENSITIVE SURFACES as LED-Lights, Underwater Lights, Electronic Equipment, Etc.

