ELKHART BRASS
FIRE FIGHTING EQUIPMENT A SAFE FLEET BRAND

WPO-2000

Water Powered Monitor Oscillator

INSTALLATION & OPERATIONS MANUAL

PHYSICAL: 1302 WEST BEARDSLEY AVE • ELKHART, IN 46514 • WWW.ELKHARTBRASS.COM
1-574-295-8330 • 1-800-346-0250

98593000 REV A

TABLE OF CONTENTS

WARNINGS 3
SAFETY CONSIDERATIONS 3
INSTALLATION 4
OPERATION OF THE WPO-2000 OSCILLATOR 10
MAINTENANCE 12
GENERAL ARRANGEMENT DRAWING 13
REVISION HISTORY 14

WARNINGS

- **DO NOT** use damaged or malfunctioning equipment.
- **FREQUENTLY** inspect the monitor and controls to detect signs of damage or poor operation before the damage renders the monitor inoperable or hazardous.
- **DO NOT** operate equipment above 200 PSI.
- **ALWAYS** return the direction and aim of the monitor to a safe area for emergency startup discharge of fire water.
- **NEVER** leave foreign objects on or around the monitor which may inhibit operation of the monitor or deflect the water stream.
- **ALWAYS** keep all parts of the body and articles of clothing away from oscillating mechanism when oscillator is in operation.

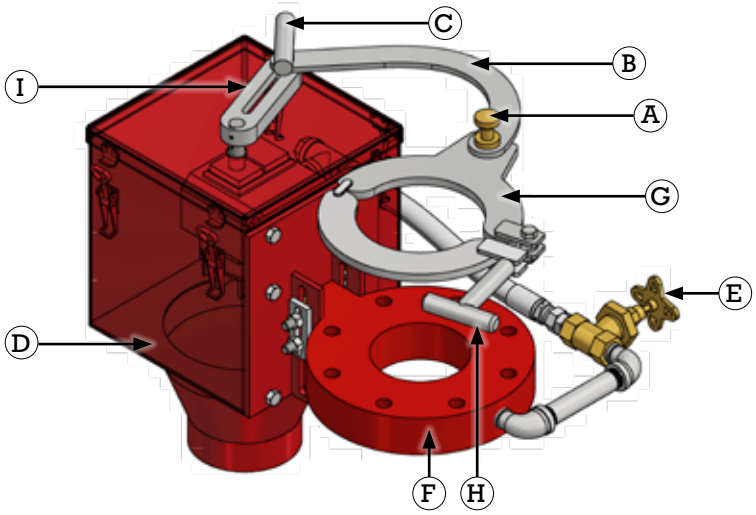
SAFETY CONSIDERATIONS

- Be aware of the pinch point that exists between the crank arm and the connecting link.
- High pressure and other forces exist within the oscillating monitor while it is in operation. Because of these forces, mishandling of the equipment could result in personal injury.
- Please read this entire manual thoroughly to acquaint yourself with proper operation and maintenance of the WPO-2000 Water Powered Oscillator.
- DO NOT operate the oscillator without full view of the monitor. If a remotely controlled valve is used, install a warning light near the monitor to indicate the water has been remotely activated, and personnel should stay clear of the water stream and powered elements.
- Observe all safety labels, decals and signs.
- Only trained personnel, who have read the operator's manual(s) and are familiar with this type of equipment should operate, service or maintain the equipment.
- These precautions do not address all safety hazards that may exist in the plant or with this equipment. Safety is everyone's responsibility, and all personnel shall be alert to any potential hazards in their specific situation.
- Keep the operating area clear around the monitor.

INSTALLATION

Components

A. Quick Release Pull Pin
B. Connecting Link
C. Angle of Oscillation Adjustment Knob
D. Water Turbine Enclosure
E. Speed Control Valve
F. Flange
G. Swivel Clamp
H. Oscillation Centering Control T-Handle
I. Crank Arm



Step by Step Installation Instructions

1. Carefully unpack the WPO-2000 from its packaging. Always protect the flange face from damage resulting from contact with other surfaces. Place plywood or other dunnage under the flange to protect the flange sealing surfaces.

2. After unpacking, thoroughly examine the unit for signs of any damage which may have occurred during shipment.

3. Before installation, inspect the mounting flange face and remove any debris adhering to the mating surface of the flange. The surface should be free of scratches, dents etc., which could inhibit proper sealing of the joint.

4. Use only quality ASTM A193 GRADE B7 studs and A194 GRADE 2H nuts for mounting of the flange (not included). Studs should be 5/8–11 x 5 ½" long, which is sufficient length to extend through the piping flange, the threaded oscillator flange, the monitor flange, and a minimum of two (2) threads beyond the nuts. Standard non-asbestos fiber gaskets rated for 175 PSI working pressure are sufficient for most installations (Elkhart Brass P/N 33383000 or equivalent)

5. Have all wrenches, installation hardware, and gaskets easily accessible prior to installation. Studs should be threaded into the flange and properly measured to ensure adequate thread engagement for both the lower base flange and the monitor inlet flange.

6. If the monitor is to be installed near ground level, two persons can easily lift the oscillating flange into position. If the monitor is elevated, utilize approved lifting mechanisms and strapping to lift the oscillating flange into place.

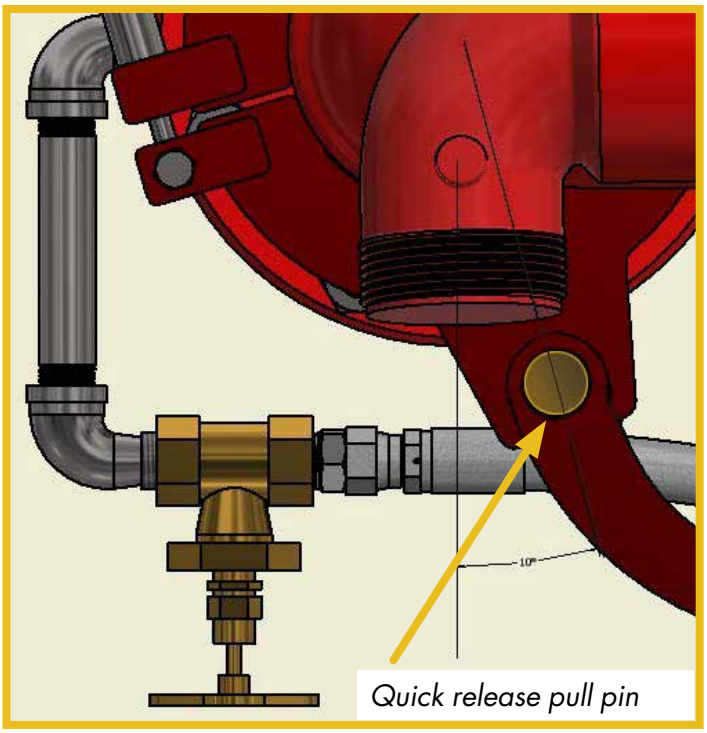
7. Place a gasket onto the inlet piping flange. Next place the oscillator onto the piping flange with the water turbine box on the left side, when facing the center of the target to be protected. After positioning of the oscillator onto the inlet piping flange,install all nuts and torque them to 60-70 Ft. Lbs. uniformly in increments of 20 Ft. Lbs.

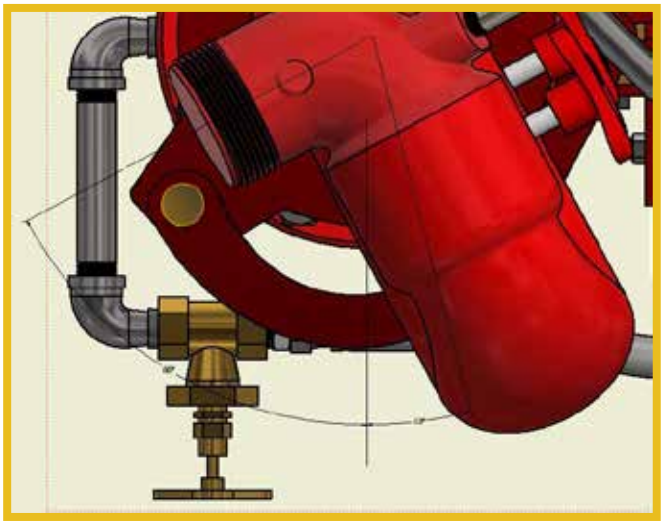
8. Place a gasket on top of the oscillator flange. Set the monitor onto the flange. The monitor should be generally aimed at the center of the target area that is to be protected. Precise alignment is not critical at this time. Final alignment will be adjusted when installing the monitor swivel bracket. After the monitor is positioned onto the oscillator flange, install the nuts to secure the monitor in place and torque them to 60-70 Ft. Lbs. uniformly in increments of 20 Ft. Lbs.

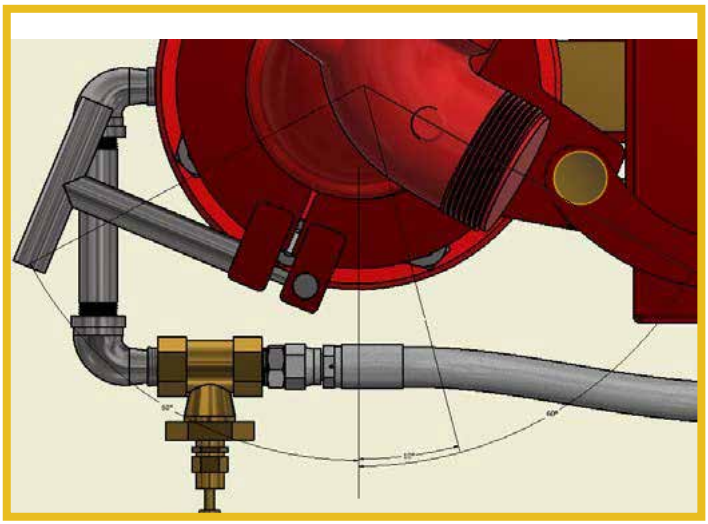
9. With the monitor approximately aligned with the center of the hazard to be protected, install the bracket loosely around the horizontal swivel of the monitor. Hook the T-handle into the fork on the bracket and loosely tighten the handle until the bracket no longer slips on the swivel. (see below)

10. It is important to note that due to the nature of the oscillating mechanism, the oscillating arm quick release pull pin must be offset approximately 10 degrees to the left of the center line of the monitor discharge when looking from the monitor to the target. (see Illustration at right)

    The WPO-2000 oscillates through a maximum arc of 120 degrees. However the swing of the arc is not symmetrical and must be accounted for when attaching the swivel clamp to the monitor. The unit moves 70 degrees to the right and 50 degrees left. By offsetting the pull pin 10 degrees to the left, the center of the arc of oscillation will be aligned with the center of the target. (see Illustrations below). This measurement need not be exact as there is ample flexibility for monitor alignment during functional testing and commissioning.







11. Next, the elevation of the water turbine must be adjusted so that the connecting link is level.

    a. Loosen the two slide bolts that hold the water turbine enclosure to the flange. (see photo at right)

    b. Raise or lower the water turbine enclosure until the crank arm and the swivel bracket are level. A simple level placed on the connecting link is used to verify that the crank arm and the bracket are positioned at the same height. (see photos below)

    c. Tighten the two slide bolts to secure the water turbine enclosure in place. Torque to 75 ft. lbs.

12. Complete the installation by installing the quick release pull pin (A) to connect the connecting link (B) to the swivel clamp(G). Apply a thin coating of GLGI (EP2) grease to holes in the swivel clamp and connecting link prior to installation of the quick release pull pin.

OPERATION

The WPO-2000 has three adjustments: Oscillation Angle, Oscillation Speed, and "LOCK ON TARGET" Oscillation Centering Control. In addition, a test connection is available for testing the operation of the oscillator without flowing fire water through the monitor. The minimum operating pressure to turn the water wheel 40 PSI. The maximum operating pressure is 200 PSI.

NOTE: THE FOLLOWING SHOULD BE PERFORMED WITH ACTUAL FLOW OF FIREWATER.

SPEED CONTROL: Speed of oscillation can be adjusted by opening or closing the speed control knob (shown at right). Turning the knob clockwise slows the speed of oscillation until it stops when the valve is closed. Turning the knob counterclockwise increases oscillation speed.


Speed control knob

At 100 PSI at full open the unit should oscillate approximately 7 times a minute. The valve may be closed to reduce flow and slow down the oscillation speed, or in higher pressure be closed to reduce over speeding.

OSCILLATION CENTERING CONTROL: The center of the oscillation range of the WPO-2000 can be easily adjusted to center oscillation on a target.

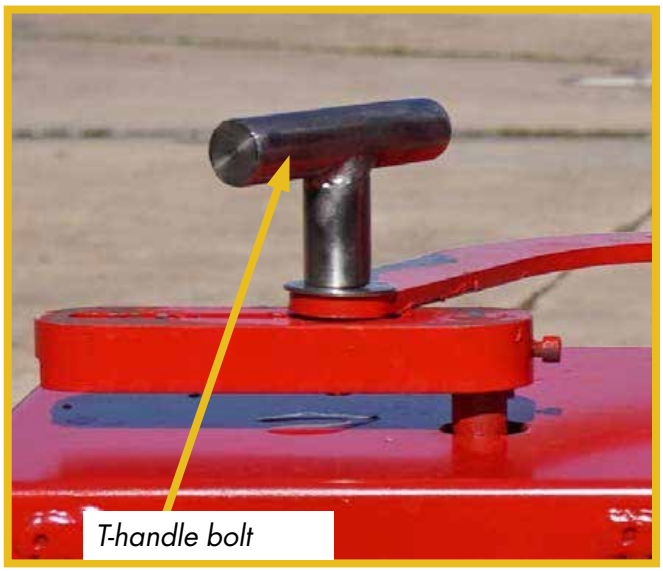
1. Stop the oscillation in the center of its travel range (when the crank arm is pointed toward either side of the water turbine enclosure with the over-center clamps) by turning the speed control valve handle clockwise to close the valve.
2. Loosen the T-handle Oscillation Centering Control knob to disengage the swivel clamp from the monitor (photo at right).
3. Manually turn the monitor so the water stream is centered on the target.


Oscillation Centering Control

4. Tighten the T-Handle Oscillation Centering Control knob to engage the swivel clamp and Lock the monitor On Target.
5. Open the speed control valve by turning the handle counterclockwise to resume oscillation.

DO NOT USE A WRENCH OR ANY OTHER DEVICE TO TIGHTEN THE OSCILLATION CENTERING CONTROL KNOB. EXCESSIVE TORQUE COULD DAMAGE THE MONITOR.

ANGLE OF OSCILLATION: The angle through which the WPO-2000 oscillates horizontally can be adjusted from 15 degrees up to a maximum of 120 degrees. The angle of oscillation is adjusted by loosening the T-handle bolt that connects the crank arm to the connecting link and sliding it in the slot in the crank arm. Moving the bolt closer to the gearbox output shaft decreases the angle of oscillation, and moving it toward the end of the crank arm increases angle of oscillation. When the desired angle is achieved, tighten the T-handle bolt to lock it in place.



WARNING: THE CRANK ARM AND CONNECTING LINK JOINT PRESENTS A PINCH HAZARD. CLOSE OSCILLATION SPEED CONTROL VALVE TO STOP OSCILLATION PRIOR TO ADJUSTMENT OF OSCILLATION ANGLE.

TEST CONNECTION: A test connection port is provided to test the operation of the oscillator without flowing water through the monitor.

1. Completely close Oscillator Speed Control Valve by turning speed control knob clockwise.
2. Remove pipe plug from test connection.
3. Connect hose to ½ NPTF test connection using appropriate adapters as required.
4. Connect hose to water supply capable of delivering at least 10 psi at the test connection.
5. The monitor should oscillate when the water supply is turned on.
6. After test is complete, turn off water, disconnect hose, and replace pipe plug to test connection.
7. Open Oscillator Speed Control valve by turning sped control knob counterclockwise to prepare oscillator for automatic operation.

MAINTENANCE

The WPO-2000 oscillator has been designed with ease of maintenance in mind and requires only semi-annual inspection. The WPO-2000 will provide many years of service when maintained in accordance with the following instructions.

FREQUENCY OF MAINTENANCE

- EVERY SIX (6) MONTHS OR
- AFTER EMERGENCY USE OR
- AFTER INCLEMENT WEATHER CONDITIONS (OUTSIDE LOCATIONS)

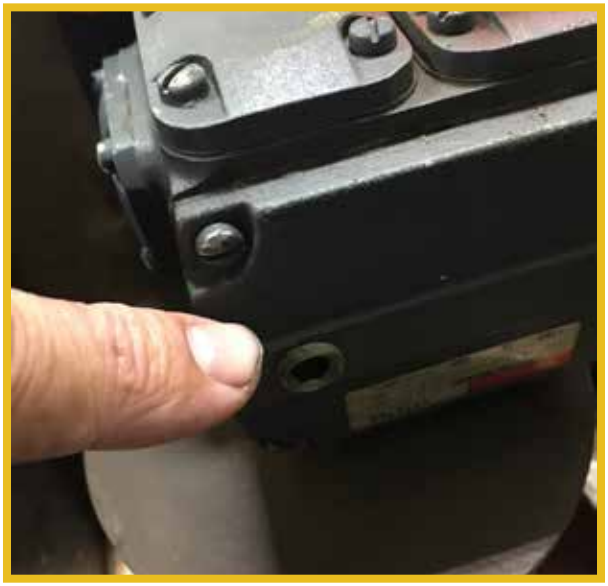
IMPORTANT: PRIOR TO PERFORMING MAINTENANCE ON THE OSCILLATOR OR THE ATTACHED MONITOR, SHUT OFF WATER SUPPLY BY CLOSING APPROPRIATE ISOLATION VALVES AND FOLLOWING LOCK OUT/TAG OUT PROCEDURES.

1. Perform a visual inspection of all exposed parts for signs of worn or damaged components. If any worn or damaged parts are found, the parts should be replaced immediately.
2. Maintain protective coating by touching up any damaged paint.
3. Inspect and lubricate the oscillator mechanism. (Refer to components section page 4)
   a. Remove the quick release pull pin (A) to disengage the connecting link from the swivel clamp (G). Wipe the quick release pull pin clean with a rag, and inspect for excessive wear. Replace if badly worn.
   b. Unscrew the T-handle bolt (C) that connects the crank arm (I) to the connecting link (B), and remove the bolt and the connecting link, being careful not to lose the sliding nut from the underside of the crank arm (I).
   c. Remove crank arm (I) by loosening the set screw with a 3/32" hex wrench and pulling it free of the gearbox shaft being careful not to lose the square key between the shaft and the crank arm.

d. Remove the water turbine enclosure cover by unfastening the over-center clips and lifting the lid off the enclosure.

e. Inspect gear box and water wheel to insure they are in good condition. (Page 13, items 13 & 14)

f. Remove the oil fill plug located on the side of the gear box housing. Fill gearbox to the bottom of the filler hole with high quality gear lubricant such as Mobilgear 600 XP 460 industrial gear oil or equivalent. (140 weight/ISO 460/AGMA 7 EP) Replace filler plug when finished.



g. Replace water turbine cover and secure the four over-center clamps.

h. Install the crank arm (I) and square key on the gearbox output shaft so the top surface of the crank arm is flush with the end of the shaft. Apply purple Loctite 222 to set screw threads securely tighten with a 3/32" hex wrench.

i. Wipe the connecting link (B) clean with a rag and inspect the holes. Replace part if holes are excessively worn. Completely coat connecting link holes with a film of NLGI (EP2) grease. Apply grease using a bristle brush. NEVER APPLY THE GREASE DIRECTLY WITH YOUR HANDS.

j. Position end of connecting link (B) with the large hole onto swivel clamp (G) and reinstall quick release pull pin (A).

k. Position end of connecting link (B) with small hole over crank arm (I). Position rectangular sliding nut into slot in bottom of crank arm, and install the T-handle bolt (C) through the connecting link and the crank arm, threading it into the rectangular nut.

4. Note the current direction the monitor is aimed. Loosen T-handle screw (H) that attaches swivel clamp (G) to monitor. Lubricate monitor swivel joints per monitor maintenance instructions and move monitor through its entire range of motion to distribute lubrication and check for faulty operation. Align monitor as it was prior to disengaging the swivel clamp (G), and re-tighten the T-handle screw (H).
5. Verify all labels and signs on and around are readable and the operating area is clean. Never leave items on or around the monitor which may inhibit operation.
6. Test oscillator operation by flowing water through monitor, or by attaching hose to Test Connection. See section “4.0 Operation” for instructions on using the test connection.
7. After servicing the monitor, return the monitor to HOME position.
8. Make sure the riser pipe is completely drained to prevent freezing and rust build up inside the riser.

REVISION HISTORY

REV	DATE	ECN	DESCRIPTION
REL	07/16/2018	180710	INITIAL ISSUE
A	04/16/2020	200415	ADDED OPERATING PRESSURE

NOTES:

ELKHART BRASS
FIRE FIGHTING EQUIPMENT A SAFE FLEET BRAND

ELKHART BRASS
PHYSICAL: 1302 WEST BEARDSLEY AVE • ELKHART, IN 46514
PHONE: 1-574-295-8330 • 1-800-346-0250
FAX: 1-574-293-9914
WWW.ELKHARTBRASS.COM

WPO-2000 WATER POWERED MONITOR OSCILLATOR
INSTALLATION & OPERATIONS MANUAL
98593000 REV. A