

# Tank Farm Fire Protection: Elkhart Brass WPO-2000 Water Powered Monitor Oscillator

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## **Introduction**

If you are a specifying engineer, a contractor, or a distributor in the fire protection industry, then you have probably run into the dead end with finding cost effective and reliable fire monitor solutions for tank farm fire protection that does not expose operators to the fire hazard in case of an emergency. Typically, engineers and specifiers have had to rely on hydrant mount manual monitor systems which expose operators to the fire hazard. These hydrant mount systems are often unreliable when an emergency situation occurs as operators typically have to abandon the monitor and flee to safety as the hazard begins to spread from tank to tank. This has been seen in recent incidents including the Intercontinental Terminals tank fire in Deer Park, Texas in March 2019, the KMCO Chemical plant tank fire in Crosby, Texas in April 2019, and the tank fire at Miller Chemical plant in Conewago Township, Pennsylvania in June 2019. Lack of an effective cooling system in all of these incidents enabled the fire to spread to multiple tanks from where it began.



The advent of water powered monitor oscillator systems like the Elkhart Brass WPO-2000 ensure reliable and effective solutions for cooling tanks in a tank farm without human intervention. It is against this background that this paper was authored: to explore the benefits of the Elkhart Brass WPO-2000 water powered monitor oscillator system for tank farm fire protection.

## **Easy to Install**

The Elkhart Brass WPO-2000, unlike other integrated water powered monitor oscillator systems, can easily be added onto an installed fixed manual monitor and enable automation of the oscillation by simply installing the flange of the WPO-2000 between the standpipe flange and the monitor. The compact design also enables retrofitting with existing installed fixed systems without any concern about increasing monitor elevation to alter original aiming of the monitor at the

hazard. The WPO-2000 system can be tested with a garden hose by connecting the hose to the test plug and oscillating the monitor without flowing the monitor.

The arrival of the Elkhart Brass WPO-2000 provides contractors the installation flexibility that instills confidence in their ability to set up the tank farm fire protection system to function in accordance with design intent.

### **Easy to Operate**

Water powered monitor oscillator systems enable automation of fixed monitor fire protection systems without the need for running electrical wires. The Elkhart Brass WPO-2000 can simply be turned on by flowing the monitor when the standpipe valve is opened either locally or via remote valve controls. Unlike traditional water powered oscillator systems which require taking the monitor and water powered oscillator out of service and using specialized tools before the arc of oscillation can be adjusted, the Elkhart Brass WPO-2000 can be adjusted while the monitor is flowing by simply adjusting the arc of oscillation knob along the crank arm. This ensures reliability and efficient firefighting operations in case of an emergency. It also enables rapid and decisive tank farm cooling and tank farm firefighting with little to no human intervention.



A – Water turbine enclosure  
B – Bypass hose connection flange to water turbine  
C – Flange  
D – Speed control  
E – Swivel clamp  
F – Oscillation centering control T-handle  
G – Connecting link  
H – Angle of oscillation adjustment knob  
I – Crank arm  
J – Test connection plug

The WPO-2000 supports monitors with up to 2000 GPM (7570 lpm) flow rate at 200 PSI. If needed, the speed of oscillation can also be adjusted simply by opening or closing the speed control valve while the WPO-2000 is in operation. Once in operation, the WPO-2000 can run for many days, depending on the swivel quality of the installed monitor. This ensures reliability of the fire protection system as it eliminates the need for human intervention and exposure of operators to a fire hazard in case of an emergency. The Elkhart Brass WPO-2000 design also eliminates liabilities often associated with injuries or sometimes deaths of operators of fixed manual monitors in tank farm fire emergencies.

**Built to Last**

The Elkhart Brass WPO-2000 is constructed with materials suitable for the aggressive environmental conditions of many tank farm locations. It is constructed with corrosive resistance materials such as 316 stainless steel and 85 Brass. These materials are suitable for seaside and corrosive refinery environment applications. All waterway components of the WPO-2000 system, including flange, bypass pipe, and turbine, are constructed out of biofouling resistant materials. The use of a double reduction oil bath gearbox ensures durability, reliability, and extends the life for continuous use.

**WPO-2000 component materials**

Item	Component	Material
A	Water turbine enclosure	316 Stainless steel
B	Bypass hose connecting flange to water turbine	PSI Teflon internal lining with 316 SS braided jacket
C	Flange	Marine grade brass
D	Speed control	Brass
E	Swivel clamp	316 Stainless steel
F	Oscillation centering control T-handle	316 Stainless steel
G	Connecting link	316 Stainless steel
H	Angle of oscillation adjustment knob	316 Stainless steel
I	Crank arm	316 stainless steel
	Turbine	Marine grade brass



**WPO-2000 Solution is the Future for Tank Farm Fire Protection**

In today’s competitive business environment, no tank farm operators can afford the kind of business disruption and financial losses that fire incidents can cause as witnessed in recent months. A robust fire protection solution for a tank farm is a business survival insurance and exactly what the Elkhart Brass WPO-2000 is designed to offer. The spread of fire to multiple tanks with excessive losses in recent tank farm fire incidents highlight the limitation of the use of human operated, traditional, manual fixed monitors for tank farm fire protection. The Elkhart Brass WPO-2000 water powered oscillator design enables automation of manual fixed monitors in tank farms and ensures reliable tank farm fire protection solutions without reliance on electric power and



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human intervention. The WPO-2000 fire protection solution could also be remotely activated by using motor operated valves (MOV) and remote valve control panel.

Erasmus Acquah is a Sr. Product Manager at Elkhart Brass where he is responsible for managing the industrial products portfolio including the Elkhart Brass industrial fire monitor systems and fire protection valves. Erasmus has more than fifteen years of experience within the Fire Protection and Life Safety industry, working for Elkhart Brass, Tyco, Kidde Fenwal Inc. (a UTC Fire and Security Company) and Acuity Brands Inc., where he held product management and engineering roles. Erasmus holds an MBA from Clark University in Worcester, Massachusetts, an MS in Engineering Management from Northeastern University in Boston, Massachusetts, an MS in Manufacturing Engineering from WPI in Worcester, Massachusetts and a BS in Mechanical Engineering from the University of Science and Technology in Ghana. Erasmus is based in Atlanta and may be reached at [eacquah@safefleet.net](mailto:eacquah@safefleet.net).