

Penny Legrow
Application Engineer
Vaisala Boston
USA



The Mosquito PowerTrap mimics humans by generating heat, moisture, and CO₂, which are the main attractants for mosquitoes and other biting insects.

Mosquitoes have been around and have been a nuisance for thousands of years. Besides being an aggravation, mosquitoes can also transmit serious diseases such as malaria, yellow fever, dengue fever, encephalitis and West Nile virus. Although most of these diseases have not been a problem in the United States, in the last few years several lives have been claimed by the West Nile virus. One way to avoid the insects' feeding frenzy would be to limit the time spent outdoors during peak biting hours, at dawn and at dusk, but nobody wants to spoil hours of leisure time trapped indoors. Flowtron, an Armatron company, has created a device called the Mosquito PowerTrap that will help. Aided by the Vaisala CARBOCAP® Hand-Held Carbon Dioxide Meter GM70, the Mosquito PowerTrap is designed to be an effective and reliable mosquito killer. The GM70, which incorporates Vaisala's advanced CARBOCAP® technology, has been used in diverse applications, including laboratories,

What's All the Buzz About?

Imagine this familiar scenario: It's a beautiful summer night and you are outside enjoying your backyard, swimming in the pool, barbecuing, playing volleyball, whatever the case may be. Ouch! You look down to see that a pesky mosquito has just left a painful, red welt on your arm! To avoid the insects' feeding frenzy one could stay indoors during peak biting hours, at dawn and at dusk, but nobody wants to waste hours of leisure time stuck indoors. An alternative solution for ensuring mosquito-free time is to use a mosquito killer device called Mosquito PowerTrap, developed by Flowtron. With the aid of the Vaisala CARBOCAP® Hand-Held Carbon Dioxide Meter GM70, Flowtron manufactures an effective and reliable mosquito killer.

greenhouses, wineries and mushroom farms, and is now being used in this unique application as a means of evaluating the performance of the mosquito traps.

Mosquito PowerTrap mimics humans

The Mosquito PowerTrap mimics humans by generating heat, moisture and CO₂, which are the most irresistible attractants to mosquitoes, biting flies, biting midges and no-see-ums. The trap also includes a time release cartridge which adds octenol to the stream of carbon dioxide released. Octenol, 1-octen-3-ol, can be found in trace amounts in human breath and has a synergistic effect when combined with CO₂, in-

creasing the trap's effectiveness by a factor of twenty to fifty times. The Mosquito PowerTrap unit operates directly from a twenty-pound propane tank. The propane gas is released into a burner chamber where two catalysts convert it into carbon dioxide and water vapor. As the biting insects are attracted to the unit, a powerful vacuum sucks them into the trap - a removable catch tray - where they dehydrate and die.

For best results, correct placement of the unit is key. Female mosquitoes tend to fly upwind from their breeding grounds in search of the blood needed to mature their eggs. Once they fill up with blood, they double their weight and float back downstream to the breeding grounds to fertilize their eggs. The traps should be located upwind of the breeding grounds, and between the breeding grounds and the people - to ensure that "you get them, before they get you!"

Carbon dioxide emission is critical

The amount of CO₂ emitted from these traps is critical to their success. The average person emits 3.6% CO₂ with each breath. The Mosquito PowerTrap units are designed to emit 5 to 7% CO₂, which to a mosquito represents a feast. The variables controlling the percentage of exiting CO₂ are the flow of propane gas into the burner chamber and the operating temperature of the burner chamber. At the research and development phase, the GM70 was used to measure the level of exiting CO₂, to ensure that the flow of gas and the burner temperature were set to produce optimal results. As there was no easy way to sample the exiting CO₂ from the unit with the diffusion method, one of Armatron's innovative engineering consultants designed a pump aspiration system, similar to the recently launched GM70 pump, to extract the CO₂ from the unit. The GM70 is now used daily and

The Vaisala CARBOCAP® Hand-Held Carbon Dioxide Meter, the GM70, is used to measure the level of exiting CO₂, thus ensuring that the flow of gas and burner temperature will produce optimal results.



plays an integral role in the quality control program.

Proven results

Flowtron has been very pleased with the GM70 because of its accuracy and reliability, and also because of its versatile easy-to-use graphical interface which makes it easy to handle measurement data. Results from the GM70 have proven that the PowerTraps are dependable. As further evidence of this, Bruce Guttman, engineering consultant for Flowtron, tested the PowerTrap Plus at his home in NH. His home sits on an acre of land surrounded by a bog on one side and woods on the other - two major breeding grounds for mosquitoes. Using one of the "set and forget" features of the unit, preset to turn on for four hours at dusk and three hours at dawn, he anticipated revealing results in the morning. With satisfaction Guttman proclaimed, "The catch tray was packed with over 2400 mosquitoes, resembling a New York subway during rush hour!"

Other mosquito-eliminating measures

The degree of protection from and reduction of mosquitoes in certain locations depends on

many factors including the individual's tolerance level, the mosquito population size, the size and type of breeding grounds, wind direction, species of mosquitoes present, etc. With 176 species of mosquitoes recognized in the United States, it is a complex and perhaps impossible task to understand all the different behaviors displayed by mosquitoes in their quest for blood and the variables that affect that quest. Therefore, there is no trap designed to eliminate all our mosquito problems. Although these traps will catch and kill many mosquitoes, they should not be relied upon as the sole means of control and protection. For better protection, there are a few extra steps that can be taken: repellent should be worn and small standing water sources should be eliminated. Standing water sources are where mosquitoes spend 3/4 of their lives and where they lay their eggs. Small water sources which could be eliminated include discarded tires, rain gutters, cans, buckets, wading pools, pool covers, wheel barrows, anything that can hold a small amount of water for more than a couple of days. Taking these recommended steps in conjunction with us-

ing the Mosquito PowerTrap to reduce the mosquito population in your yard will allow for an enjoyable summer outdoors!

About Armatron International Inc.

Armatron International Inc., originally Automatic Radio Manufacturer, got its start in 1920 when David Housman, founder of the company, with his two fellow entrepreneurs, A.J. Housman and John Grady developed the car radio. Today Armatron International, Inc. is primarily a manufacturer of lawn and garden products. Through its Flowtron Outdoor Products division it manufactures and distributes leaf-eaters, bug killers, fly control devices, compost bins, yard carts, and other yard and garden products for consumer use. The company's products are distributed to major retailers throughout the United States, with some products distributed under customer labels. Its Automatic Radio division ceased supplying radios to Chrysler Corp. in 1991 and since then has been developing an electronic obstacle avoidance system for automotive applications under the name "Echovision". ●