User's Guide

About Us

Meridian Design, Incorporated, was founded in 1986 as an engineering company specializing in turnkey embedded control solutions. Meridian Design has developed products in fields as diverse as fiber optic transceiver modules, LED flashlights, kitchen composters, laboratory test equipment, shape memory muscle actuators, avionics, microscopy, medical centrifuges, model train electronics, and pulse detonation wave engine controllers.

Our mission is to use our engineering expertise to design very low cost solutions for developing world needs that can be sold into first world markets to fund future work.

The AquaStar™ UV Portable Water Treatment System was the first directly marketed product offered by Meridian Design. Other versions of the AquaStar *Plus!*™, including solar-powered, are being developed for use in impoverished areas of the world where water-borne illness ends the lives of over two million people each year.

For more information about us, our products, or the latest Frequently Asked Questions (FAQ) and Rarely Asked Questions (RAQ),

Visit our website:

www.uvaquastar.com

Write us:

shop@uvaquastar.com

Meridian Design, Incorporated
820 Canoas Creek Circle
San Jose, CA 95136

Or Call:

(760) 494-0696, 9 am - 5 pm, Pacific Time

Meridian Design, Incorporated
EPA Est. 82431-CO-001

Limited One Year Warranty / Repair information

Your *mÜV*™ UV Portable Water Treatment System (the "Product") is warranted by Meridian Design, Incorporated to be free from defect in materials or workmanship for a period of one year from the date of purchase. Meridian Design, Incorporated will either repair or replace (at our option) free of charge, any parts necessary to correct defects in materials or workmanship. Should repair be needed within the warranty period, ship the Product prepaid, insured, together with $5 U.S. for return shipping and handling, and a copy of your original sales receipt, to:

Meridian Design, Incorporated
ATTN: Service Dept.
820 Canoas Creek Circle
San Jose, CA 95136

(For those outside the U.S., please contact us for international shipping charges).

Be sure to include your name, address and phone number with your *mÜV*. This warranty excludes normal wear and tear, tube glass breakage, and improper use. In no event shall Meridian Design, Incorporated be liable, or in any way responsible, for any damages or defects in the Product caused by third-party repairs or modifications.

NO-HASSLE LIFETIME REPLACEMENT POLICY

Accidents happen. Rather than throw away your damaged *mÜV*, we offer a simple lifetime replacement policy. Send us your broken *mÜV*, together with $20 U.S to cover our repair costs and return shipping, and we'll send you a new or rebuilt unit in exchange. (Note: The repair and shipping fee is valid through 2008, and may be adjusted annually for inflation. In any case, we'll always make sure you have a working *mÜV* for less than half the cost of a new unit.)

mÜV Specifications

Weight
- 2.5 ounces total (71 grams) with end cap and prefilter

Dimensions
- 4.5" h x 1.75" w (11.5 cm x 4.5 cm)
- Displacement Volume (when floating): 2 ounces (50 mL)

Components
- Battery: 1 x Type RCR123 Li-ion rechargeable battery. 16, 75 second cycles per charge; 500 recharge battery life
- UV-C Tube: 10V3W Germicidal 3W UV-C (254 nm) ozonating, hot-cathode, low-voltage. Rated useful life (to 85% efficiency) = 3,000 hours. Expected life as used in *mÜV* (driven at 4W, producing 0.6W UV-C at 20 ° C) = 1,500 hours
- Pre-filter: Nylon mesh 0.2mm screen
- White LED: 1/4W high efficiency solid state lamp, 12 Lumens out

Dosage and Efficacy
- Dosage Time: 75 seconds per liter (1 cycle). Below 40°F (5°C), dosage time should be doubled (2 cycles per liter)
- UV-C light is highly effective in killing pathogens, while filters tend to miss the very small viruses, some pathogens, such as Cryptosporidium, are resistant to chemicals because of their tough spore shell.
- When water quality is suspect, such as unclear water or when storing water for longer periods of time, combinations of methods work best.
- Charge time: 8hrs on alkaline or NiMH cell. 5Hrs on solar panel.
- See www.uvaquastar.com for testing and other efficacy details.

Congratulations!

Thank you for purchasing the *mÜV* ™ (pronounced “move”) Ultraviolet Portable Water Treatment System by Meridian Design, Incorporated. Our products are designed with the highest quality components to ensure years of trouble-free service in a variety of environments.

The *mÜV* is an ultraviolet (UV-C) water treatment solution appropriate for use in all climates and settings. Campers, hikers, emergency crews – or anyone who values having clean water, will benefit from *mÜV* .

mÜV has a “Lantern Mode”. It contains a handy separate low power, white LED for lighting.

Using a rechargeable Li-ion battery, the *mÜV* can quickly treat a liter of water in less than 2 minutes, and provide over 15 liters, or 4 gallons, of clean water on a single charge. Lightweight, rugged and simple to operate, *mÜV* is the ideal water solution for everyone's survival kit.

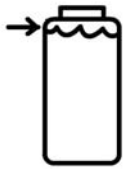
Before using your *mÜV* for the first time, we recommend reading the next section of this manual, Using the *mÜV* , to familiarize yourself with the unit.

- *UV-C light can cause irritation to the eyes and skin if exposed for an extended period.* The UV-C light is reflected back into the container by the water surface and is absorbed by all common container materials (including plastic, metal and glass except quartz) and is therefore entirely safe when operated as intended. If the light is ever turned on outside of the container the user should simply turn it off by pressing the button again.
- *Keep away from children*
- Operation in air generates ozone which is an eye and lung irritant
- Please wash your *mÜV* with a mild detergent and water prior to first use. Clean it and store it in a dry environment when not in use.
- Recharge at least once per year.
- Never insert in any bodily orifice. Just don't. Please.

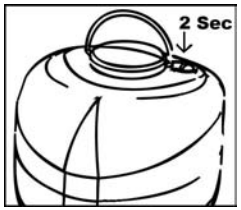
Thanks!

-- Team AquaStar

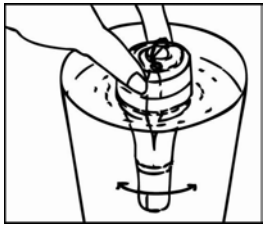
Using the *mÜV*



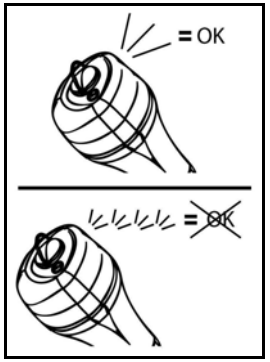
1. Fill a container with water to between 300ml and 1L. If the water is too silty the UV-C will be less effective. In this case we recommend pre-filtering the water until it is clear, agitating the water so that more of it comes into closer contact with the lamp, and/or running the water through more than one cycle to assure complete disinfection. Remove protective end cap from unit.



2. To start cleaning cycle, press and hold the button for two seconds until the LED blinks and release. The tube will light after 3 seconds of blinking giving you time to immerse the bulb end in the water. The bulb will glow blue while the cleaning cycle runs.



3. Stir with the unit during the cleaning cycle to improve the disinfection process. The unit will float if dropped into the container but this is not the most effective way to treat. Agitating the water thoroughly assures a complete treatment. The unit will fit into and plug a standard 1L-2L soda bottle. Shake to mix well.



4. The cleaning cycle will run for about 75 seconds. If less than 1L is being treated, then the cycle can be terminated early by pressing the button again. The blue UV-C lamp will turn off and the white LED in the cap will turn on when the disinfection cycle has finished. A flashing LED indicates an error and the cycle may not have been completed (see "Tips" and "FAQ" for more information).

Cover UV-C lamp to protect bulb when not in use.

Lantern Mode

mÜV contains a handy, separate, low-power, white LED for lighting. Click twice to start flashlight. (LED light does not clean water, and is safe to use out of container)

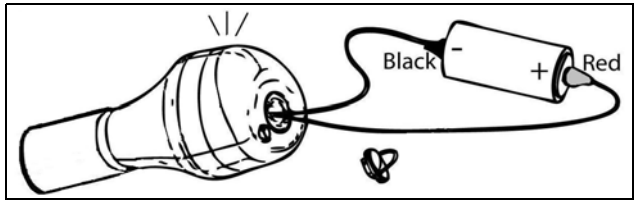
The LED light is self timed and will go dim in 12 minutes, and will go off a minute later. Clicking the button when the light is in dim mode will return it to bright mode for 12 more minutes. Each 12 minute cycle of white LED light uses approximately 2% of the battery capacity.

Recharging the *mÜV*

Single Cell Battery

Open the top screw cover with a ¼ turn twist to reveal the recharge wires. Separate the two gold plated magnets and attach the red end to the positive contact of the source battery and the black end to the negative battery contact. In a few seconds the white LED should start 'pipping' (dim blinking once per second) if connected properly. The pipping will stop when trickle charging is complete, in at most 10 hours .

A D-cell is the most cost effective recharge option as it can recharge the unit 10 times. An AA or 9V cell will only supply 1-2 recharges.



Solar panel or wall charger

Connect the red and black wire ends to the positive and negative steel contact points on the panel. The LED will pip and also will go on solid when charging is complete. The high voltage input from the panel does not engage the step-up switching charger circuit.

Frequently Asked Questions (FAQ)

1. What if the unit won't respond at all?
Rub the contacts against the battery to improve contact or clean surfaces. The unit has a battery deep-discharge protection mode. In rare instances it may be necessary to recharge the unit with the solar panel or a 9V battery to recharge the Li-ion cell from a completely discharged state.

2. Can the *mÜV* be used with any container?
Yes. Any container that the unit can fit into and still be agitated so all the water gets treated. When treating a quantity of water larger than 1L, make sure to dose the water with proportionately longer times. i.e. more than 2L but less than 3L gets 3 doses, and so on.

3. What recharging sources can be used?
Any single cell battery: AA, C, D in carbon zinc, alkaline or NiCd, NiMH or Lithium CR123, CR2 or rechargeable RCR123, 18650 cell or our accessory solar panel.

4. Can I replace the tube if it breaks?
No. The UV tube is not field-replaceable. The *mÜV* has been substantially reinforced with the tube sealed in the plastic and should withstand all but the most severe abuse.

Tips

- Use the cap on it's retainer lead to remove the unit easily if dropped or floated in water
- When the bright white spot at the top of the tube turns a dimmer orange, the battery is getting low; you will have about 5 cleaning cycles left at this point. When the batteries are too low for a complete cleaning cycle, the LED will flash and abort the cycle.
- Just as filters don't like to be frozen, neither does the *mÜV.* Below freezing the battery cannot supply adequate power to the unit and freezing diminishes its life as well. Consider leaving the unit inside the tent if below-freezing temperatures are expected.
- When cold, let the bulb strike up bright before dunking the end in water.
- The tube cover will glow in the dark making the unit easy to find at night.