

Tube Condition Monitor For UV-A Light Traps



Ultra100

The new Ultra100 provides the means to measure the Ultraviolet (UV-A) output of the tubes in insect traps, which depend on this light energy to attract flying insects. The UV-A output of such tubes should be checked periodically to ensure that the efficiency of the traps is maintained.

New Features

The ULTRA 100 monitor is a totally new concept in tube condition monitoring for insect traps, allowing all measurements to be made at the same distance from the insect trap - 1 Metre. A nylon cord is attached to the meter for exact positioning which ensures ACCURATE readings every time, regardless of the wattage of the insect trap being measured. This avoids the sort of errors that can be made when 'approximate distances' are used as the basis for measurement.

Advanced Sensor Technology

Until now, low cost instruments for measuring the UV output of insect traps have utilised phosphor based fluorescence sensors, which although cheap to produce, are slow to respond, and require routine re calibration due to drift and instability. The ULTRA 100 however, uses an entirely solid state sensor with integral UV filter window, which responds instantly, and will not require calibration.

ULTRA INDEX®

The ULTRA 100 has a measurement capability which covers the range from below 10W to over 400W, giving a two digit reading - the ULTRA INDEX® which gives a simple, reliable way of measuring insect light trap tubes as they decline in output during their life. If the ULTRA INDEX® is less than the required figure, the tubes will require replacement to maintain maximum insect attraction. The Ultra Index® is derived from the log of the UV intensity falling on the sensor, and allows easy relative measurements to be made. A difference of 10 in the Ultra Index® between one reading and another indicates a halving or doubling of UV intensity. A difference of 1 indicates a 7% change .

Simplicity of Use

The ULTRA 100 monitor is very simple to use, a single button press + hold when in front of the insect light trap at a distance of 1 metre gives the ULTRA INDEX®. The display is stored for 3 seconds after the button is pressed, to allow for a reading to be taken even in the most awkward situations.

Logarithmic Compression

The ULTRA 100 uses state of the art microprocessor techniques (logarithmic compression) to cope with the very wide range of UV power outputs from different insect traps.

The Ultra Index® can be expressed mathematically, and the relationship between Index and relative UV intensity is easy to remember.

If the Ultra Index® Increases by 10, then the UV doubles in intensity, if it increases by 20, then the UV quadruples in intensity, and so on. Similarly, if the Ultra Index® Decreases by 10, then the UV halves in intensity, and if it decreases by 20, then the UV is a quarter of its previous value.

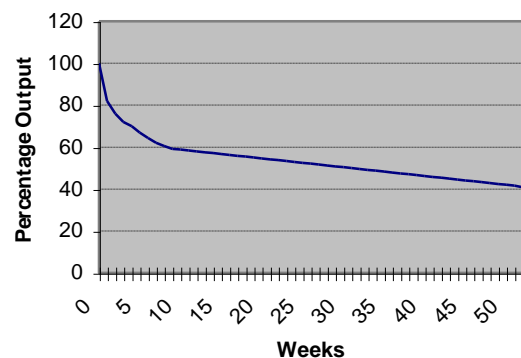
Trap Design

The ULTRA INDEX® of a trap will vary from one manufacturer to another, depending on the type and number of tubes employed, and also will depend on the cover and directionality of the individual trap design. Initial UV output, and UV decay rate depend on individual tube types, wattage and the source of the tube.

Why Measure Your UV Tube Output

UV tubes produce their output by means of a special phosphor coating on the inside of the tube. This coating gradually deteriorates with use, and as a consequence, UV output declines. The visible light output of the tube, which is a bluish colour does not deteriorate in the same way, but unfortunately, the UV output typically falls by between 60-80% over a year, with dramatic reduction of insect attraction. The visible appearance of the tube, gives no indication of the level of insect attraction.

UV- A Tube Output Decay 15W



Using ULTRA100 for measuring Tube Decay

There is a sensor aperture at the rear of the instrument, and a display which is activated by the single pushbutton operation. Before use make sure that the trap has been turned on for at least ten minutes before taking a reading. Hold the Ultra 100 one metre away from the trap using the nylon cord for accurate distance. Ensure that the sensor aperture is squarely facing the centre of the trap, and not obstructed. Press the blue button below the display and hold for two seconds. Check the display measurement against the Ultra Index® to determine tube UV output. The reading on the display will be stored for a period of three seconds after the button is released. The instrument automatically turns off after three seconds.

The nylon cord ensures that the 1 Metre measurement distance is accurate, which is necessary because UV energy levels vary considerably with distance from the UV source.

How to Measure Ultra Index®

If you do not know what the Ultra Index® should be for your particular insect trap, then the following procedure determines this. Firstly, take an Ultra Index® reading with the existing tubes fitted, using the method described above. Then replace all of the tubes in the insect trap with new ones. Take another reading, and keep this one for future reference. This becomes the Ultra Index® for this particular insect trap in this location. If the Ultra Index® for the old tubes is ten or more lower than that for the new tubes, then replacement is recommended.

UV tube output vs. tube life.

The measured Ultra Index® of an insect trap gradually gets lower as the tubes UV output decays with age. This ageing process is quite rapid at first, with a typical fall of as much as 3 in the Ultra Index® in the first week of tube life. After this the decay is less rapid, as in the following chart:-

Typical Example for a 15W tube:-

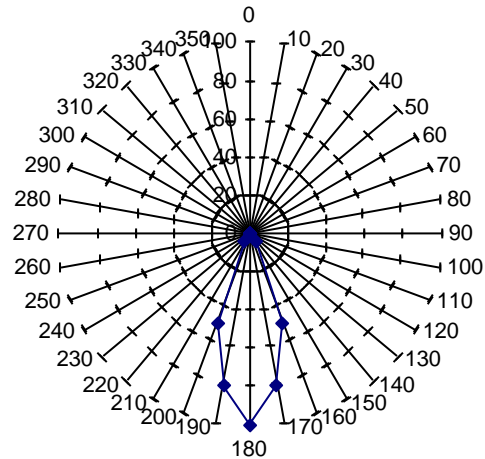
Run time from new (months)	Typical drop in Ultra Index®	% UV output
1	-6	
2	-7	
3	-8	60%
4	-8	
5	-9	
6	-10	50%
7	-11	
8	-11	
9	-12	48%
10	-13	
11	-13	
12	-14	40%

The typical decay for a 15, 20, or 40W tube over a 12 month period is down to 20- 40% of the initial output, (Ultra Index® falls by -14) This represents typical values and will depend on tube type. Different tube manufacturers types will gave varying readings.

Measuring Ambient UV

In order to optimise the placement of an insect light trap, the Ultra 100 can be used to establish the position in the room with the lowest level of Ultra Index®. Having chosen a suitable placement position by following the normal guidelines, then a reading should be taken by pointing towards any suspected source of UV from that position. The Ultra 100 is quite directional, having a +/- 20degree angle of acceptance, and can establish the direction from which any competing sources of UV are emanating. Ideally the display will read a low figure, which may be '--', indicating a low level of UV.

Directional Sensitivity Of Ultra 100



Polar Diagram of Directional Sensitivity of Ultra100

Warning: This meter should not be used for any other purpose than that which is described in this brochure. It should not be used for the attempted measurement of the sun's UV-B or UV-C ultraviolet rays, or the output of sun beds, health tubes, or with sources emitting UV-B or UV-C, or any other application which could affect health due to exposure to ultraviolet light. The measurement of sources emitting UV-B and UV-C is extremely hazardous, and this instrument is incapable of responding to such radiation. Brandenburg UK Ltd accepts no responsibility for any loss of any nature.

SPECIFICATION

Ultra 100 – Hand held instrument for measuring UVA output of insect light traps with outputs ranging from 10 to 400 Watts.

Size	37mmx15mmx60mm (1.5" x 0.6" x 2.4")
Weight	50g
Battery type	"N" type single cell (1.5V)
Battery low indication	Display = 'Lo'
Battery Life	~2000 measurement operations
UV energy range	4uW/cm2 > 1000uW/cm2 @ 1 metre (Ultra Index® 22 - 99)
UV wavelength sensitivity	UVA spectrum (315 - 400nm)
Angle of acceptance	+/- 20 degrees
Resolution	7% steps
Accuracy of measurement	+/- 7% (see test conditions)
Operating temperature	5C to 38C (41F to 100F)
Operating humidity	0 – 85% non-condensing.



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