

UV STERILIZER "STRL" SERIES

ENERECO srl has developed a series of photovoltaic and wind KITS for the sterilization of water becoming drinkable, exploiting the ultraviolet radiation emitted by particular lamps. This radiation destroys all the microbic forms, both bacterial and viral, present in the water,. STRL sterilizers, complete with the prefiltering unit, are used for well, spring, lake, tank and aqueduct water, polluted by microbiologic agents.

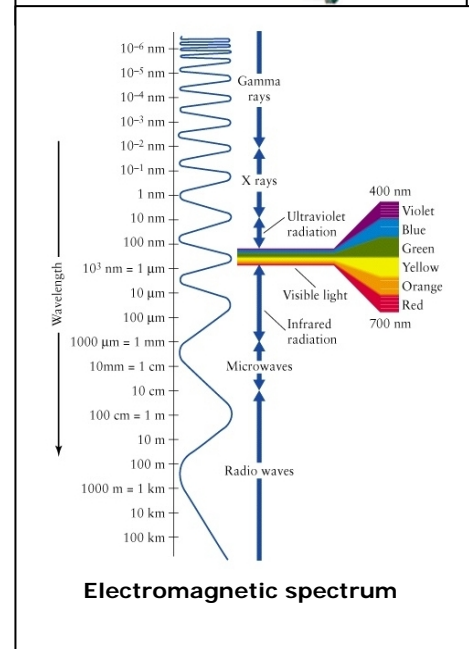
UV RAYS

The bactericide action of UV rays is known for many years. If they are used with a wave length of 2537Å (Å= Angstrom: measurement unit of the radiations, it corresponds to 1/100.000 millimetre), they will produce a sure germicidal effect of 99,9% and they will grant the destruction of bacteria, moulds, yeasts, protozoans and viruses present in the water. Compared to other chemical substances used for the sterilization of water such as:

- OZONE,
- HYDROGEN PEROXIDE,
- CHLORINE DIOXIDE,
- SODIUM HYPOCHLORITE (mainly used).

UV rays have the following advantages:

- The organoleptic characteristics of water are unchanged.
- UV rays act instantaneously at cellular level (DNA) inhibiting the microorganisms affected (on the contrary, chemical agents need time to act).
- No microorganism is immune from the action of UV rays.
- No problem linked to a possible effect of overdosage (this problem can appear in dissolved chlorine systems)
- Easy installation and low maintenance.
- Very low management costs.
- Small dimensions of the complete system.



All the units type STRL produce a solar radiation of 36.000 $\mu\text{Wsec}/\text{cm}^2$, proper to the inactivation of the microbiologic forms, some of which are the following ones:

Bacillus subtilis	Streptococcus faecalis	Clostridium tetani	Agrobacterium tumefaciens
Salmonella typhosa	Bacillus megaterium	Bacillus anthracis	Salmonella paratyphi
Escherichia coli	Rhodospirillum rubrum	Rotavirus	Corynebacterium diphtheriae
Shigella dysenteriae	Legionella bozemanii	Shigella flexneri	Staphylococcus epidermidis
Legionella dumoffii	Legionella gormanii	Legionella micdadei	Legionella pneumophilia
Bacteriophage	Leptospira interrogans	Influenza virus	Staphylococcus aureus
Proteus vulgaris	Pseudomonas aeruginosa	Poliovirus	Mycobacterium tuberculosis

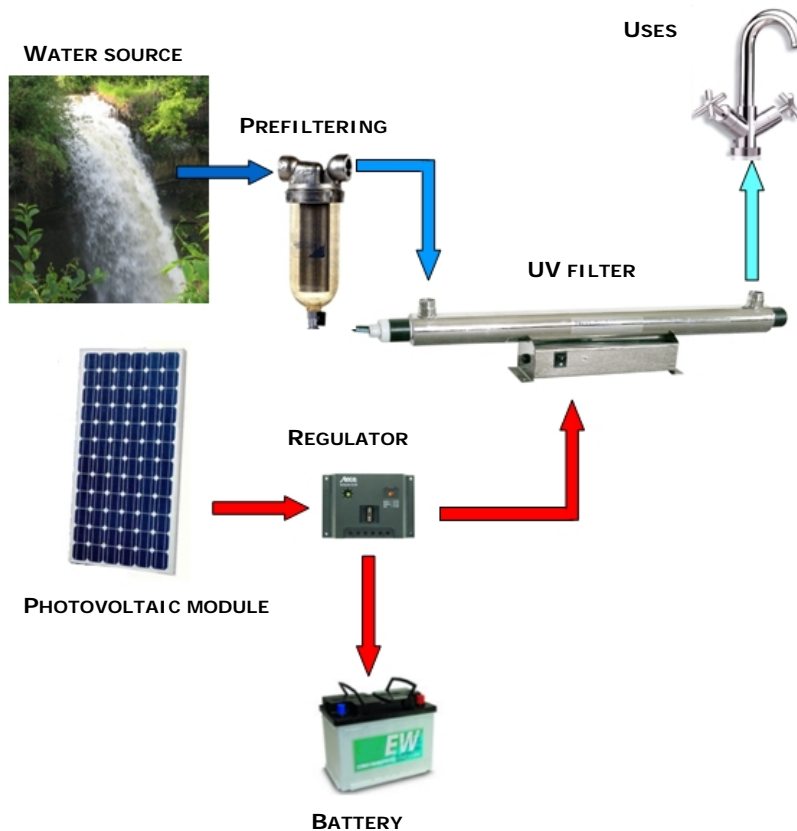
"STRL" UNITS RANGE

Model	Flow rate l/h	Pressure bar		Lamps		In/out	Size d x l
		Serv.	Max	n°	W tot.		
<i>STRL150</i>	150	0.5	5	1	11	¾"	135x370mm
<i>STRL600</i>	600	0.5	8	1	16	½"	100x450mm
<i>STRL1200</i>	1200	0.5	8	1	22	¾"	100x560mm
<i>STRL2500</i>	2500	0.5	8	1	40	¾"	97x960mm
<i>STRL5000</i>	5000	0.5	8	2	80	1.¼"	210x970mm
<i>STRL10000</i>	10000	0.5	8	4	160	1.½"	240x970mm
<i>STRL15000</i>	15000	0.5	8	6	240	2"	280x970mm

We can develop further "STRL" units according to the customer's demand.

All the models grant a solar radiation of 36000 μ Wsec/cm² and a life span of the lamp of about 7500 hours. In all the models the water temperature has to be between 2 and 40°C.

COMPOSITION OF A STERILIZATION SYSTEM "STERIL KIT" SERIES



"STERIL KIT" DESCRIPTION

WATER SOURCE: of various nature, the important thing is that water is of good quality.

PREFILTERING: it is used to pre-treat water removing possible chemical and organic agents. It can have more elements according to the quality of water to be sterilized.

UV FILTER: of a capacity according to the quantity of water to be sterilized. It works at 12 or 24Vdc and it is supplied by the photovoltaic, wind or hybrid system.

PHOTOVOLTAIC MODULE: of a power calculated according to the daily consumption of the sterilizer and to the installation site.

REGULATOR: of a proper power, it regulates the charge and discharge of the battery, granting the functioning of the battery itself.

BATTERY: of a power proper to the consumptions of the system and to the power of the photovoltaic generator used.

N.B.: The sterilization KITS can be complete with photovoltaic, wind or hybrid system according to the installation site. The power of the generators and the capacity of the batteries depend on the characteristics of production of water sterilized per day, decided by the customer and according to the weather conditions of the site (solar radiation and wind characteristic). This is why these KITS are dimensioned from time to time.

"STRL/PV" KITS RANGE

Characteristics	STRL 150/70	STRL 600/110	STRL 1200/150	STRL 2500/495	STRL 5000/875	STRL 10K/1750	STRL 15K/PV-W
Av. litres/day of water sterilized (*)	2345	9480	18982	60000	12000	24000	360000
Photovoltaic array	70Wp	110Wp	150Wp	495Wp	875Wp	1750Wp	1750Wp
Supporting structure	TSTP	TSTP	TSTP	VT/OZ	VT/OZ	VT/OZ	VT/OZ
Junction box	no	no	no	JB3/24	JB5/24	2xJB5/24	2xJB5/24
Wind generator	no	no	no	no	no	no	1000W
Charge regulator	STC8	STC8	STC12	STC20	STC30	2xSTC30	2xSTC30
Batteries	12V/65Ah	12V/100Ah	12V/120Ah	24V/300Ah	24V/600Ah	24V/1200Ah	24V/2000Ah
STRL unit	STRL150	STRL600	STRL1200	STRL2500	STRL5000	STRL10000	STRL15000
We can develop further kits according to the customer's demand.							

(*) with the solar radiation and wind characteristics described in the calculation

<p>FOR THE DIMENSIONING OF THE SYSTEMS MENTIONED ABOVE THE FOLLOWING DATA HAVE BEEN CONSIDERED:</p> <p>MIN. SOLAR RADIATION OF THE SITE: 3kWh/m²/day</p> <p>ARRAY/LOAD RATIO COEFFICIENT: 1.2%</p> <p>NO-SUN DAYS FOR THE CALCULATION OF THE BATTERY CAPACITY/PHOTOVOLTAIC: 7 days</p> <p>AVERAGE WIND CHARACTERISTIC CONSIDERED: 5m/sec</p>
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CHARACTERISTICS OF THE WATER TO BE TREATED

In a fluid to be treated the max transparency is an important condition for a correct effect of UV rays. In particular, water contains suspended substances of various nature which negatively affect the transmission of UV rays in the fluid, acting as a barrier and reducing the intensity of dosage of UV in proportion to the deepness of the fluid (permeability index to UV rays). Therefore, before installing a UV sterilizer, it is necessary to take some samples of water to be treated and test them:

- Chemical/physical analysis to check the composition, possible contaminations from external agents and the presence of minerals, iron, manganese, acids. All these substances, also in small quantities, absorb the emission of UV rays making the sterilization difficult.
- Microbiologic analysis to know the bacterial or viral contamination level.

When the microbiologic contamination value is high, particular prefiltrations are needed before treating water through the UV sterilizer.

Prefiltration is also necessary to make transparent the water to be treated, as turbid water is less permeable to UV rays (for ex.: rainwater), or to remove toxic chemical agents.

Here are some technical data not to exceed related to the chemical/physical composition of the water to be treated:

- Salinity = Max 600 p.p.m
- Turbidity = less than 10mg/l
- Colour = less than 20mg/l
- Manganese = max 0,05mg/l
- Iron = max 0,2mg/l
- Hardness = less than 10°F
- Colour = transparent
- Hydrogen sulphide = less than 0,05mg/l
- Optimum temperature = 40°C.

ATTENTION: to grant the UV sterilization it is necessary that the water to be treated meets the requirements mentioned above.