Ionizer – Technical Specifications

Unit Name & Model: Ionizer, 4-inch diameter flowing at 1,500 barrels of water per day (240m^3/day)

Physical description:

Dimensions	Length	Height	Diameter	Pipe Connection	Weight
Imperial	88”	40”	4”	2”	725 lbs
Metric	223 cm	100 cm	10 cm	5 cm	328 kg

Including standard off the shelf 1/4 turn lever operated ball valves & liquid filled 0-100 psi gauges
Pressure testing: 150 psi hydrotest

Shipping dimensions

Dimensions	Length	Width	Height	Weight
Imperial	104”	34”	46”	750 lbs
Metric	264 cm	86 cm	116 cm	340 kg

Operating pressures:

Pressure	Minimum	Recommended	Maximum
Imperial (psi)	25	40 – 70	110
Metric (pa)	170	270 – 475	750

Pump: Positive displacement pump

Minimum flow-rate: Not less than 1/3 of rated flow (or 500 bwpd for the 4” unit), must still have the proper pressures. If the field cannot support this flow continuously, then it should be operated intermittently.

Tie-in / connections: (diameter of inlet pipe) 2" 150 RF connection (ANSI 150# RF flange)

Settling tank requirements: should contain 1-12 hrs of flow or be fitted with filtration.
Exact requirements depend upon the contaminants
Oil should be skimmed regularly
Scum (bottoms) should be cleared regularly
Most efficient way is to circulate the pond while using an inlet filter

Operating temperatures: above freezing and below 180 degrees F, though it performs better at lower temperatures

Maximum sulfur (H2S):
Above 35-50 ppm will require chemical treatment to neutralize the water
Between 5-35 ppm will require sacrificial nickel piping in front of the unit
Note: iron in the water will counter-act effects of hydrogen-sulphide (H2S)

Filtration requirements:
Particulate filter to prevent fouling: 1/16" mesh with inlet & outlet same as Ionizer unit with the same flow volume.

Maximum of any other contaminants or hydrocarbons:
Above a 30% oil cut (below 70% water cut), the user should switch to an Oil Ionizer

Monitoring & Maintenance schedule:
Weekly check inlet and outlet pressures
Weekly check for cavitation (i.e., bubbles in the water)
Besides the gauges and valves, there are no user serviceable parts
Return to dealer or manufacturer for Service

Performance characteristics:
Typical removal of contaminants with the Ionizer in series with a heater-treater or standard settling tank. Exact performance depends on site characteristics and exact water specification:

Chemical	Removal
Hydrocarbons	< 250 ppm
Barium	~100%
Mercury	~100%
Selenium	~100%
Arsenic	~99%
Lead (as PBCl)	~94%
Cadmium	~90%
Chromium VI	~65%
Chromium III	~60%
Nitrate	~33%
Fluoride	~15%

Cautions:
To avoid damage to the unit or injury to the operator:

1. Do not pump sand or high viscosity fluids through the unit.
2. Do not flow it backwards.
3. Do not connect it to anything that is incompatible with or that degrades or damages
    a. copper,

b. steel,
c. 150# flanges.

4. Note: normally there are no poisonous or harmful effects of ionized water and most biological hazards are neutralized by the unit. However, ionizing water produced water does not make it fit for human or animal consumption without further filtration and desalination.

Patents:

Protected by US and International patents and patent applications.
The original device called the Ion Collider and later the Velocity Induced Cavitation Reactor (or VICR) bears US patent numbers: 5,482,629; 5,485,883; 5,538,081 and 5,554,301.