

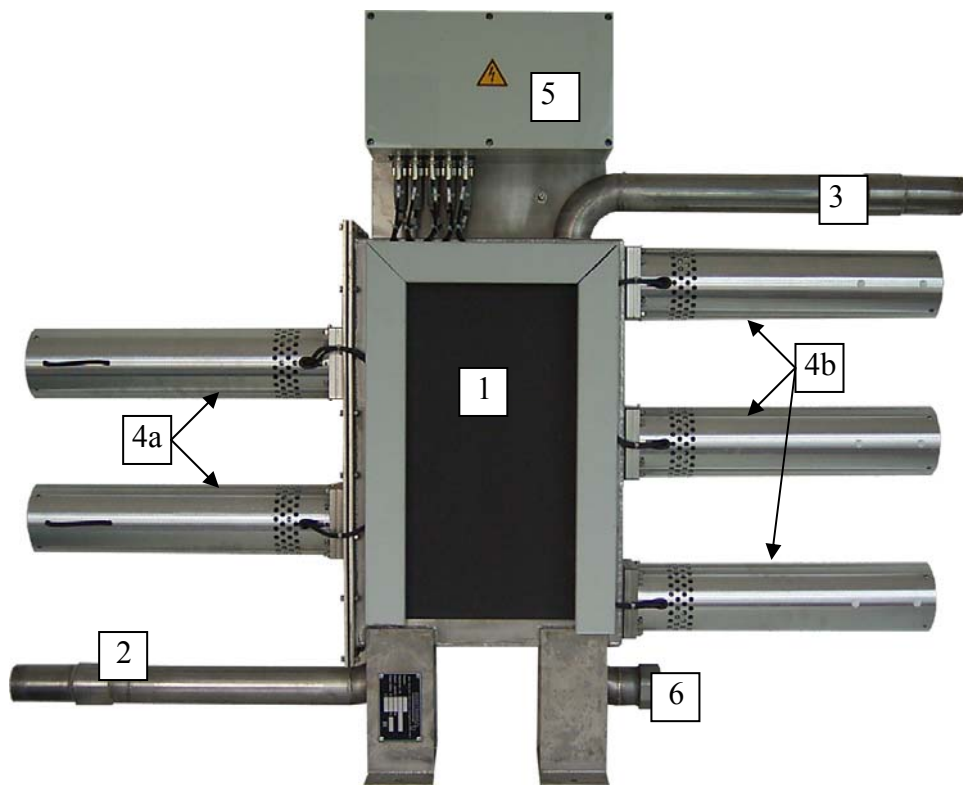
## Product description - Ultrasound reactor for sewage sludge disintegration

### Reactor system (Scheme, Scope of delivery)

The delivered reactor system consists of the reactor container, 19“-rack with five ultrasound generators of the type KS1000/2000, as well as the electrical connecting pipes between generators and reactor container. The reactor system is defined for installation in a subordinated system.

### Reactor container with oscillating unit

The reactor container includes oscillating units each equipped with an aerating pipe. The oscillating units move the ultrasound energy onto the streaming medium (sewage sludge, biomass).

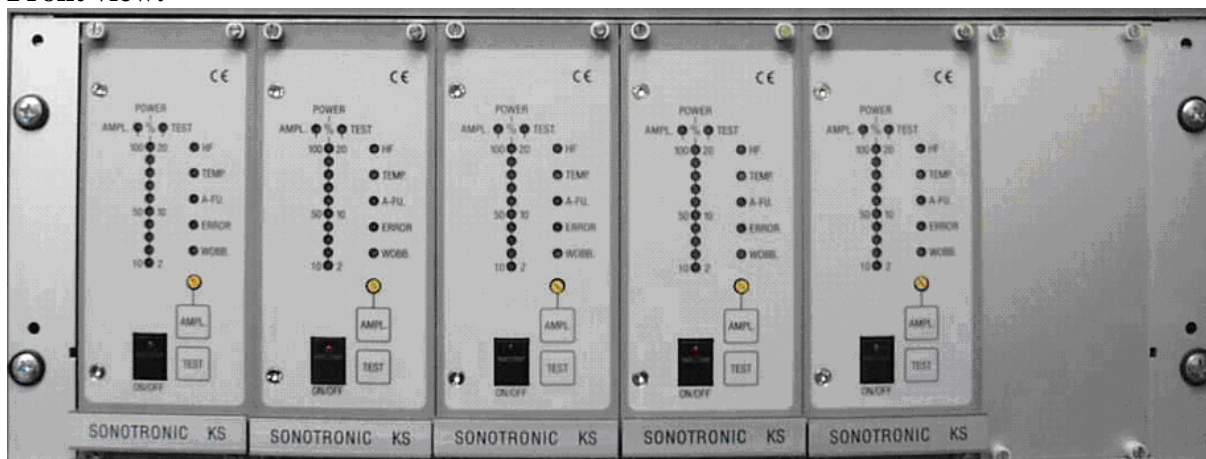


- 1.) Reactor container
- 2.) Intake pipe
- 3.) Outlet pipe
- 4.) Oscillating unit with aerator pipe
- 5.) Electrical connection box with connector for HF- and control lines
- 6.) Runoff support

### Rack with five generators KS1000/2000

The energy for the oscillating units is produced in these five generator modules of the type KS1000/2000. The supply voltage of 230 V /50-60 Hz is transformed into an electrical sinusoidal oscillation of 20 kHz and applied via the HF-line to the oscillating units. Each generator produces a continuous output of up to 1000 Watts. However, the internal electrical units are designed for peak capacities of up to 2000 Watts. The rack with the five generator modules is normally placed by the manufacturer in the entire system into a control cabinet.

#### Front view:



#### Electrical connecting pipes:

The following pipes are included in the scope of delivery:

Quantity	Description
1	Feed line for reactor terminal box
1	Control line for reactor terminal box
5	HF-line to the connection of oscillating unit (generator- terminal box)
5	Feed line for the ultrasound-generators
5	Control line for control and analysis of the generators

### Technical data reactor system KR3\_2005

#### Reactor container (without sound insulation)

Weight (empty, incl. oscillating unit)	101 kg (Material thickness: 6 mm)
Material	V2A (1.4301)
Measurements (LxBxH)	1450mm x 250mm x 1126 mm
Volume treated with Ultrasound	0,025 m <sup>3</sup>
Quantity of oscillating units	5
Cooling system of converter	Air

Sonotrode amplitude at adjustment 100 %	17 - 20 µm
Continuous output per oscillating unit	1000 Watts
Continuous output release of reactor module	5000 Watts
Allowable overpress	0,5 to 1,5 bar, depending on the medium
Recommended capacity	1,25 m³/h
Thread at inflow alternatively downspout	2“ Widworth external screw thread
Ambient air temperature	5°C – 35°C
Humidity	30 % - 90 %
Protection category	IP20, with sound insulation cover up to IP44
Demand for cooling air (ambient air)	Clean, not-aggressive air
<b>Insertion Generator module KS1000/2000 (per reactor 5 units)</b>	
Weight and measurements	3,5 kg, 71 mm x 175 mm x 430 mm
Operating voltage	230 V / 50-60 Hz
Charging rate at 1000 W power output	4,8 A
Power output	800 to 1000 Watts, depending on the medium and hydraulic pressure
On-time	100% ED
Humidity	30 % - 90 %
Ambient air temperature	5°C – 40°C
Protection category	Dependant on utilised control cabinet

### **Requirements regarding the installation location of the generators (control cabinet)**

The generators are delivered in a rack, for installation in a control cabinet or a container of the standardised 19“ system (rack for 19“ width and 4HE). For the installation depth in the control cabinet, a 50 mm empty space for the purpose of harbouring the connector is part of the design. The installation position of the rack with the generators is horizontal, so that the text on the front plates of the generators is clearly visible on the side.

On the back-board of the rack four ventilators are mounted for heat removal. The fresh air reaches the generators through slots at the bottom plate of the rack. Always ensure sufficient ventilation of the control cabinet. The manufacturer suggests installing an effectively dimensioned ventilator.

The control cabinet has to be equipped with an effectively dimensioned electrical connection. It must be taken into consideration that the generator module is operated with 230 V and the total reverse current flows via the N-conductor. Therefore, a 32 A feed line is required for a 5000 Watt system. The manufacturer of the complete system can avoid the unsymmetrical network load, through the insertion of an isolating transformer and through the production of an artificial N-conductor. Due to this procedure, the high currents only appear on the artificial N-conductor in the control cabinet.

### Connection of the pipelines

The connecting pipes of the container are provided with a 2"-Widworth-external screw thread for the connection to the inlet and outflow. The integration into an existing system can optionally be carried out via a hose line or a compact pipe work of type DN50. Appropriate hose lines or pipelines with applicable adapters are not included in the scope of delivery and should be provided by customer.

Please note prior to the connection of the pipelines that the inlet is at the bottom and the outlet at the top.



The method for counting the oscillating units S1 to S5 is done utilising the direction of flow!

The following is as ideal accessory available:

Description	Order Number
Sound insulation cover, Protection category up to IP 45, Measurements: 1300mm x 400mm x 1300 mm, guaranteed maximum noise level: 90 dB	302. 512.2

### Pump for the transportation of the medium through the reactor

The pump is not included in the scope of delivery. Nevertheless, we suggest the application of a screw pump equipped with a frequency converter and protection against running dry. The capacity should lie in the field of a minimum of 0,5 m<sup>3</sup>/h to a maximum of 3,0 m<sup>3</sup>/h.