



# HBO<sub>2</sub> - Hyperbaric Oxidiser

The rapid sample oxidiser for environmental and other samples

**Rapid - Efficient - Safe**

**Rapid conversion of organic compounds to H<sub>2</sub>O (HTO) and CO<sub>2</sub> (<sup>14</sup>C)**

*Complete and clean oxidation of organic-rich materials (foodstuffs, marine and freshwater fish, meat, vegetation, wood, oils, plastics, and soft wastes) using 15 Bar oxygen in a closed pressure-rated chamber to promote rapid combustion.*

*Application areas: Nuclear decommissioning, waste characterisation, environmental monitoring, <sup>14</sup>C extraction*

DATA SHEET: **HBO<sub>2</sub>** Raddec Hyperbaric Oxidiser



150 kg total system weight



100 - 230 VAC, 6 Amp



Working footprint with Cryoelectrical unit:  
1400 x 600 x 1000 mm (w,h,d)

### Key features

- Efficient and rapid extraction of tritium and C-14 from combustible materials.
- Ideal for production of combustion water for LSC methods requiring large volumes.
- Proven for combustion of biota (fish, meat, vegetables) to support radioactivity reassurance monitoring.
- Suitable for other organic-rich materials (e.g. soft wastes).
- Rapid and effective combustion of organic-rich samples (up to ~40g).
- Complete combustion normally in one minute - controlled extraction of combustion products takes approx 40 minutes.
- Combustion water (HTO) and CO<sub>2</sub> extraction achieved using a 2-stage controlled process (pressure release followed by vacuum evaporation through a cryotrap)
- Novel door locking mechanism with three safety interlocks.
- Conforms to the EU Pressure Equipment Directive (97/23/EC Annex III Module B1).
- Permits the water generated to be used for tritium analysis by LSC or <sup>3</sup>He in-growth mass spectrometry.
- Proven in intercomparison exercises

### Specifications & system requirements

<b>Hardware</b>	5 Litre Pressure vessel
	Easy-to-use, rotary (multi-lug) door locking mechanism
	Over pressure protection
	Sample ignition system using a glow wire
	Combustion chamber Metaglas™ viewing window in door
	Integrated gas transfer/analyte recovery using cryoelectrical trapping
	Tablet PC dashboard with digital displays and gas flow controls
	Pressure transducers with digital displays
<b>Safety systems</b>	Dual thermocouples with digital displays
	Integrated HMI-PLC with Navigation software and data storage
<b>Gas transfer system</b>	System interlocks (3 off) for safety management linked to HMI-PLC system
	User-controlled manual valves for gas charging and emptying
	2-stage vacuum pump with Fomblin or Vacuubrand oil-free screw-pump
<b>Cryo-trapping system</b>	-110°C cryo-electrical condenser to trap combustion water and CO <sub>2</sub>
	Combustion water and CO <sub>2</sub> collected in vacuum-grade glass traps held in high efficiency graphite heat exchanger in the cryoelectrical system
<b>Monitoring and visualisation software</b>	Integrated Tablet PC system for system navigation, status and data trending
<b>System requirements</b>	Input Power: ~100 - 220 VAC 6 Amp
	Compressed oxygen gas supply (10-20 Bar oxygen charge used for each combustion)
	Local site vapour extraction desirable
	Sample pelletisation press needed for powdered samples - option available

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