



**DEEP DOWN DIVING**  
**CLOSED CIRCUIT REBREATHER DIVER COURSE**  
**UNIT SPECIFIC – KISS CCR – MODULE 1**

**I. INTRODUCTION**

This is the entry level certification course for recreational divers wishing to utilise the Jetsam Technologies KISS Closed Circuit Rebreather.

**ii. COURSE OBJECTIVES**

The objective of this course is train recreational divers in the benefits, hazards and proper procedures for rebreather diving on the KISS CCR and to develop basic rebreather diving skills appropriate to diving within the normal recreational depth limits of 40 meters for no decompression diving.

**iii. QUALIFICATION OF GRADUATES**

Upon successful completion of this course, graduates may engage in diving activities utilising the KISS rebreathers to a maximum depth of 40 msw, utilising normoxic O<sub>2</sub> content diluents. Diluents may consist of air or helium based mixtures provided they are breathable to the surface.

**iv. STUDENT - INSTRUCTOR RATIO**

**A. Classroom**

Unlimited so long as adequate facility, supplies and additional time are provided to ensure comprehensive and complete training.

**B. Open Water**

A maximum of 1 student per active Instructor + Certified Assistant is allowed. Ratios may be increased on a 1 student per Instructor + Certified Assistant basis.

**v. STUDENT PRE-REQUISITES**

A. A minimum of 18 years of age.

B. Have a verified log of a minimum of 30 dives.

C. Minimum certification level of Advanced Nitrox Diver (may be combined with the program) or equivalent at the Instructors discretion.

D. Have completed the CCR Introductory Rebreather Course (may be combined with the program).

**vi. REQUIRED COURSE MINIMUMS**

**A. Classroom**

Minimum of 5 hours for academic development and a further 2 hours for equipment maintenance workshop.

**B. Confined Water Training**

A minimum of 80 minutes training in confined water.

**C. Open Water Training**

A minimum of 180 minutes in water time to be completed over 4-8 dives. 60 minutes of in water time may be credited from the Introductory Rebreather course at the Instructors discretion.

- D.** Pass the written exams with a pass score of 80% or higher. The exam may be given orally if not available in a language the student understands.

**vii. REQUIRED EQUIPMENT**

The following equipment is required for each student:

- A. A KISS rebreather.
- B. Mask, fins & a suitable line-cutting device.
- C. Slate & pencil.
- D. Depth gauge & timer.
- E. Lift bag & reel.
- F. Exposure suit adequate for the open water environment where training will be conducted.
- G. Access to an oxygen analyser.
- H. Adequate weight.
- I. Bailout gas supply (may be the on-board diluent supply or an externally carried redundant air source).

**viii. REQUIRED SUBJECT AREAS**

The following topics must be covered during the course. The manufacturers approved slide set and manual is mandatory for the course.

- A. History and evolution of Rebreathers.
- B. Comparison of Open Circuit, Closed Circuit and Semi Closed Circuit Rebreather systems and the benefits/problems with each.
- C. Practical Mechanics of the System.
  - 1. Assembly and disassembly of the KISS.
  - 2. Layout & design of the unit.
  - 3. Scrubber design & maintenance.
  - 4. Electronic systems design & maintenance.
  - 5. System electronics functionality and calibration procedures.
  - 6. Sensor checks and maintenance.
  - 7. Battery management.
  - 8. Breathing loop de-contamination procedures.
- D. Gas Physiology.
  - 1. Oxygen toxicity.
  - 2. Nitrogen absorption.
  - 3. Helium absorption.
  - 4. CO<sub>2</sub> toxicity.
  - 5. Gas consumption.
- E. Formula Work.
  - 1. O<sub>2</sub> metabolising calculations.
  - 2. Equivalent Air Depth theory.
  - 3. Constant PPO<sub>2</sub> theory.
  - 4. CNS tracking.
  - 5. OTU Tracking.
- F. Dive Tables.
  - 1. Equivalent Air Depth.
- G. Dive Computers.
  - 1. Mix adjustable.
  - 2. Constant PPO<sub>2</sub>
  - 3. O<sub>2</sub> integrated.

- H. Dive Planning.
  - 1. Operational Planning.
    - A. Gas requirements including bailout scenarios.
    - B. Oxygen limitations.
    - C. Nitrogen limitations.
    - D. PPO2 Monitoring.

**ix. REQUIRED OPEN WATER SKILLS**

The students during open water training dives must complete the following skills.

- A. Verify diluent and O<sub>2</sub> cylinder contents using O<sub>2</sub> analyser where appropriate.
- B. Calibration of Oxygen sensors and sensor evaluation.
- C. Demonstrate correct pre dive planning procedures including:
  - 1. Limits based on system performance.
  - 2. Limits based on oxygen exposures at chosen PPO<sub>2</sub> levels.
  - 3. Limits based on nitrogen absorption at planned depth and PPO<sub>2</sub> level.
- D. Bailout procedures.
- E. Mouthpiece familiarity drills.
- F. Gas shutdowns & loss of gas.
- G. Broken hoses.
- H. Flooded scrubber.
- I. Scrubber CO<sub>2</sub> breakthrough.
- J. Semi-Closed mode.
- K. Oxygen rebreather mode.
- L. Correct monitoring of PPO2 displays.
- M. Gas flushing methods - Diluent & Oxygen.
- N. In water sensor checks.
- O. Use of BC/suit for buoyancy control.
- P. Effective management of loop breathing volume.
- Q. Pre dive checks.
- R. Stop at 5m on descent for leak bubble check.
- S. Electronics systems monitoring for PPO<sub>2</sub> levels.
- T. Proper execution of the dive within all pre-determined dive limits.
- U. Demonstration of safety stops at pre-determined depths.
- V. Post dive clean of unit to avoid contamination and spread of disease.

**x. PROGRAM LIMITS**

- A. No dives deeper than 130 fsw / 40 msw.
- B. No dives shallower than 15 fsw / 6 msw.
- C. Dive PO<sub>2</sub> not to exceed manufacturer recommendation or a working limit of 1.4 bar.
- D. All dives to be no decompression dives.
- E. All dives to be completed within CNS% limits with a recommend maximum of 80% of the total PO<sub>2</sub> CNS limit.
- F. All appropriate safety stops to be conducted with a minimum 3 minutes at 15 fsw / 6 msw to be conducted.
- G. The student is only certified for use of the KISS.

**xi. GRADUATION REQUIREMENTS**

In order to complete the course and achieve the Module 1 KISS Rebreathers rating the student must:

- A. Complete to the Instructors satisfaction all confined and open water skill development sessions.
- B. Demonstrate mature, sound judgement concerning dive planning and execution.

- C. Satisfactorily complete the written examination with a pass mark of greater than 80%.
- D. Course must be completed within 4 months from the starting date.
- E. Complete the CCR Introductory Course again if there has been a period of 6 months diving inactivity following certification as a Module 1 KISS CCR diver.

xii. **SUPPORT MATERIALS**

Manufacturer Specific OHP/PC Slide Set

Multimedia Slide Presentation

Richard Pyle's – A Learners Guide to Closed Circuit Rebreather Operations

Laminated Pre-Dive check sheet

Oxygen Dangerpoints sheet