

1. TDI – Semi-Closed Circuit Rebreather Diver Course, Unit Specific- DOLPHIN, RAY, Atlantis, & AZIMUTH

1.1 Introduction

This is the entry-level certification course for recreational divers wishing to utilize one of the Semi-closed circuit Rebreathers Dolphin, Ray or Azimuth. The objective of this course is to train recreational divers in the benefits, hazards and proper procedures for using SCR Rebreathers.

1.2 Qualifications of Graduates

Upon successful completion of this course, graduates may engage in no decompression diving activities utilizing the Dolphin, Ray or Azimuth to a maximum depth of forty (40) msw / one hundred thirty (130) feet. Utilizing nitrox mixes not exceeding their level of certification.

1.3 Who May Teach

Who may teach this course:

1. Any active TDI Rebreather Instructor may teach this course. Specific instructor certification required for each specific rebreather.

1.4 Student – Instructor Ratio

Academic:

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

Confined Water (Swimming pool-like conditions):

2. N/A.

Open Water (Ocean, lake, quarry, spring, river or estuary):

3. A maximum of six (6) students per Instructor. However, it is the instructor's discretion to reduce this number as conditions dictate.

1.5 Student Pre-Requisites

The student must:

1. Be a minimum age of fifteen (15).
2. Have a minimum certification of TDI Nitrox Diver (may be combined in program), or equivalent at the discretion of the instructor.

1.6 Course Structure and Duration

Open Water Execution:

1. Six (6) dives with a minimum of one hundred (150) accumulated minutes for the Azimuth .
2. Four (4) dives with a minimum of one hundred (100) accumulated minutes for the Drager units.

Course Structure:

3. TDI allows instructors to structure courses according to the number of students participating and their skill level.

Duration:

4. The minimum number of classroom and briefing hours is six (6).

1.7 Administrative Requirements

The following is the administrative tasks:

1. Collect the course fees from all the students.
2. Ensure that the students have the required equipment.
3. Communicate the training schedule to the students.
1. Have the students complete the Liability Release and Medical history forms.
2. The instructor must review the liability Release and Medical Forms before starting on the course.

Upon successful completion of the course the Instructor must:

3. Complete the Student Registration Form and send the Registration Form to TDI HQ.
4. Award certification card.

1.8 Required Equipment

The following are required for this course:

1. TDI Rebreather Manual.

The following equipment is required for each student:

2. Mask and fins.
3. Exposure suit adequate for the open water environment.
4. Access to oxygen analyzer (instructor may supply).
5. Adequate weight.
6. Bailout cylinder (minimum three hundred seventy (370) liter / twelve (12) cu. ft.)
7. Flow meter (instructor may supply)

1.9 Required Subject Areas

The Rebreather Manual and the manufactures' manual is mandatory for use during this course but instructors may use any additional text or materials that they feel help present these topics. The following topics must be covered during this course:

1. History and Evolution of Rebreathers.
2. Comparison of Open Circuit, Closed Circuit, and Semi-closed Circuit.
3. Practical Mechanics of the System
 - A. Assembly and disassembly of the Rebreather.
 - B. Layout and design.
 - C. Scrubber recharge.
 - D. System maintenance.
 - E. Breathing loop decontamination procedures.
4. Gas physiology
 - A. Oxygen toxicity.
 - B. Hyperoxia.
 - C. Hypoxia.
 - D. Asphyxia
 - E. Hypercapnia
 - F. Hypocapnia
 - G. Nitrogen absorption.
 - H. CO₂ toxicity.
 - I. Gas consumption.
 - i. Cylinder sizes
 - ii. Depth and workload
5. Formula Work
 - A. O₂ metabolizing calculations.
 - B. Inspired O₂ calculations (Rebreather Equation).
 - C. Equivalent air depth.
6. Dive Tables
 - A. Inspired O₂ table.
 - B. Equivalent air depth.
7. Dive Computers
 - A. Mix adjustable.
 - B. O₂ integrated.
8. Problem Solving
 - A. Canister flooding
 - B. Mouthpiece loss
 - C. Scrubber exhaustion
 - D. Breathing Bag rupture
 - E. Open circuit bailout system
 - F. Post problem maintenance of equipment
9. Dive Planning
 - A. Operational Planning
 - I. Gas requirements.
 - II. Oxygen limitations.
 - III. Nitrogen limitations.

1.10 Required Skill Performance and Graduation Requirements

The dive depth shall not exceed one point six (1.6 ATM) P_{O₂}. The following skills must be completed by the student during open water dives:

1. Properly analyze gas mixture.
2. Perform all pre dive checks (positive, negative, flow rate, relief valve pressure) a minimum of six (6) times.
3. Properly packing a scrubber canister a minimum of two (2) times (if using the ExtendAir cartridge one packing must be with granular material).
4. Demonstrate adequate pre-dive planning
 - A. Limits based on system performance.
 - B. Limits based upon oxygen exposures at planned depth with mix.
 - C. Limits based upon nitrogen absorption at planned depth with mix.
5. Properly execute the planned dive within all pre-determined limits.
6. Properly execute a recovery from a system failure and switch to bail-out stationary a minimum of two (2) times.
7. Properly execute a recovery from a system failure and switch to bail-out hovering a minimum of two (2) times.
8. Perform block switch a minimum of two (2) times, **Azimuth only**.
9. Properly execute set-up and breakdown a minimum of six (6) times.
10. Diver will demonstrate actual safety stops at pre-determined depths.
11. Properly execute cleaning and maintenance of the Rebreather.

In order to complete this course, students must:

1. Satisfactorily complete the TDI Rebreather Course written examination.
2. Complete all open water requirements safely and efficiently.
3. Demonstrate mature, sound judgment concerning dive planning and execution.

1.11 Recommended Support Material

1. TDI rebreather diver PowerPoint
2. Plastic EAD and PO₂ tables (metric or imperial)
3. TDI rebreather formulas calculator
4. TDI wall certification