

ITDA TRIMIX CLOSED CIRCUIT REBREATHER DIVER COURSE

UNIT SPECIFIC - BUDDY INSPIRATION

INTRODUCTION

This is the highest level certification course for recreational divers wishing to utilize the AP Valves Buddy Inspiration Closed Circuit Rebreather for mixed gas technical diving.

COURSE OBJECTIVES

The objective of this course is train recreational divers in the benefits, hazards and proper procedures for mixed gas rebreather diving on the Buddy Inspiration CCR and to develop advanced rebreather diving skills appropriate to technical diving to depths greater than the recreational limit of 40m.

QUALIFICATION OF GRADUATE

Upon successful completion of this course, graduates may engage in diving activities utilizing the Buddy Inspiration rebreather to depths greater than 40msw, utilizing any diluent of Air, Tri-mix or Heliox appropriate to the dive plan.

WHO MAY TEACH

An active ITDA Closed Circuit Rebreather Instructor with a Buddy Inspiration Mixed Gas Instructor rating and Open Circuit Mixed Gas Instructor rating may teach this course.

STUDENT - INSTRUCTOR RATIO

1. CLASSROOM
Unlimited so long as adequate facility, supplies and additional time are provided to ensure comprehensive and complete training.
2. OPEN-WATER
A maximum of 2 students per active ITDA Instructor is allowed or 4 with a certified assistant. The ratio should be reduced as required due to environmental or operational constraints.

STUDENT PRE-REQUISITES

1. A minimum of 18 years of age.
2. Have a verified log of a minimum of 100 rebreather hours distributed over a minimum of 100 dives on the Buddy inspiration
3. Minimum certification level of ITDA Trimix(Mod1) diver or equivalent at the Instructors discretion
4. Having completed the ITDA Basic CCR Inspiration Course or Equivalent

REQUIRED COURSE MINIMUMS

1. CLASSROOM
 - a) Minimum of 6 hours for academic development and a further 2 hours for equipment configuration workshop
2. OPEN-WATER TRAINING
 - a) 6 dives to include 2 shallow water equipment configuration and drills practice and a 40m air diluent bailout dive. maximum dive depth must not exceed 75 metres and this must only be achieved after a series of work up dives.
3. EXAMINATION
 - a) 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.
 - b) REQUIRED EQUIPMENT

The following equipment is required for each student:

1. A Buddy Inspiration rebreather.
2. Bailout gas supply in a minimum of 2 stage cylinders.
3. Two bailout regulators
4. Mask, fins and a suitable line-cutting device.
5. Slate and pencil.
6. Minimum 2 x depth gauge and timer.
7. Lift bag and reel.
8. Exposure suit adequate for the open water environment where training will be conducted.
9. Access to an oxygen analyser
10. Adequate weight.

REQUIRED SUBJECT AREAS

The following topics must be covered during the course. The ITDA Rebreather manual where available is required for use but instructors may use any additional text or materials they feel represent the topic in an educational manner.

1. GAS PHYSIOLOGY
 - a) Oxygen toxicity
 - b) Nitrogen absorption
 - c) Helium absorption
 - d) CO₂ toxicity
 - e) Gas consumption
2. GAS MIXING
3. FORMULA WORK
 - a) O₂ metabolising calculations
 - b) Equivalent narcosis depth theory
 - c) CNS tracking
 - d) OTU tracking
4. GAS MANAGEMENT
5. DIVE TABLES
 - a) Creation of custom dive tables appropriate to dive depths.
 - b) Creation of lower PO₂ diluent to support loop flushing.
6. DIVE COMPUTERS
 - a) Mix adjustable.
 - b) Constant PPO₂
 - c) O₂ integrated.
7. DIVE PLANNING
 - a) Operational planning.
 - b) Gas requirements including bailout scenarios.
 - c) Oxygen limitations.
 - d) Nitrogen limitations.
 - e) Helium limitations.

REQUIRED OPEN WATER SKILLS

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

1. Verify diluent and O₂ cylinder contents using O₂ analyser where appropriate.
2. Demonstrate correct pre dive planning procedures including:
 - a) Limits based on system performance
 - b) Limits based on oxygen exposures at chosen PPO₂ levels.
 - c) Limits based on nitrogen absorption at planned depth and PPO₂ level.
 - d) Limits based on helium absorption.
 - e) Correct narcotic depth planning and diluent selection to allow cell flushing at target depth.
 - f) Bailout procedures including 1 open circuit bailout from 40m on air diluent and 1 open bailout circuit bailout utilizing mixed gas diluent with appropriate decompression profile.

- g) Gas shutdowns and loss of gas.
- h) Broken hoses.
- i) Flooded scrubber.
- j) Use of BC/suit for buoyancy control.
- k) Pre dive checks.
- l) Deployment of a delayed SMB.
- m) Remove and replace stage cylinders underwater.
- n) Stop at 5m on descent for leak bubble check and diluent flush
- o) Electronics systems monitoring for PPO2 levels.
- p) Proper execution of the dive within all pre-determined limits.
- q) Demonstration of decompression stops at pre-determined depths.
- r) Post dive clean of unit to avoid contamination and spread of disease.

PROGRAM LIMITS

1. No dives deeper than 75msw.
2. No dives shallower than 40msw
3. Equivalent narcosis depth not to exceed 40msw with a working recommendation of 30msw
4. Dive PO2 not to exceed manufacturer recommendation or a working limit of 1.4 bar
5. All dives to be completed within appropriate decompression tables.
6. All dives to be completed within CNS% limits with a recommended maximum of 80% of the total PO₂ CNS limit
7. The student is only certified for CCR mixed gas diving on the Buddy Inspiration.

GRADUATION REQUIREMENTS

In order to complete the course and achieve the Buddy Inspiration Mixed Gas Rebreather rating the student must:

1. Complete to the instructor's satisfaction all confined and open water skill development sessions.
2. Demonstrate mature, sound judgment concerning dive planning and execution.
3. Satisfactorily complete the written examination with a pass mark of greater than 80%.
4. Course must be completed within 4 months from the starting date.

SUPPORT MATERIALS

1. ITDA student registration
2. ITDA rebreather manual
3. ITDA mixed gas diver manual
4. AP valves Buddy Inspiration user manual
5. Manufacturer specific OHP/PC slide set
6. Richard Pyle's - A learners guide to Closed Circuit Rebreather Operations