BAILOUT STANDBY MODE

MANUAL

Date of issue: 29 June 2018, rev. 2.0
CU HW rev. 1.4/1.5, HS HW rev. 3.0, FW ver. 2.11
Author: Jakub Šimánek
Published by Liberty Systems, s.r.o., ccrliberty.com

1.1 BAILOUT STANDBY (CCR) MODE

1.1.1 — Basic characteristics

The bailout standby mode is designated only for the use of the rebreather as a backup unit. As in the case where two liberty units are used simultaneously in backmount + sidemount configuration or in the double sidemount configuration. Regardless on which of these two configurations apply, one unit has to be defined as a primary unit and one as a secondary (bailout) unit. Liberty in the bailout standby mode does not add oxygen through the solenoid valves, thus not changing buoyancy of the unit and wasting oxygen. It is presumed that the diver does not breathe from the secondary unit and uses the primary unit. During descent diluent is added through an ADV, which compensates for the increase of pressure and decrease of loop volume. The oxygen is measured as normal during the whole dive, the data from all four oxygen sensors are displayed, including the voltage values and the mean of all sensors.

During the Bailout standby (CCR) mode the stack time is on hold. When the diver starts breathing from the bailout unit it must be switched to standard Dive mode (CCR). Only then will the automatic oxygen addition start maintaining the setpoint and the unit will start functioning normally. If the diver will start using the unit without switching it to Dive mode, the mode will switch automatically after a decrease of ppO2 by 20 % bellow ppO2 of diluent at the current depth. This automatic mode is only an emergency solution and at some situations (low depth, hypoxic diluent) can cause acute hypoxia of the diver before the automatic switch of the oxygen addition. For this reason, always switch the unit to dive mode when you start breathing.

1.1.2 — Decompression calculation in Bailout Standby (CCR)

Decompression is calculated from a fixed setpoint. In Bailout Standby (CCR) the partial pressure in the loop is ignored. For a correct calculation of decompression, it is necessary to have the same setpoints in your primary unit and in your bailout. The diver must switch between the setpoints at both units simultaneously.

When you switch to the bailout and when the unit is switched to the standard Dive mode (CCR), the bailout has rough information about the saturation of the tissue from the primary unit. It continues with standard decompression calculation with respect to the current ppO2 in the loop

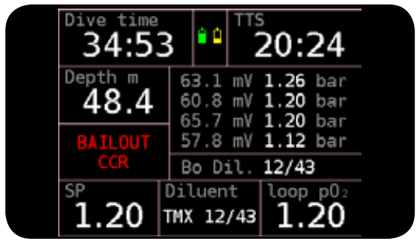
1.1.3 — Starting the Bailout Standby mode (CCR)

You can run the mode by default from Surface mode in the Dive menu by selecting Bailout Stby (CCR). After selecting this item, the Oxygen Sensor Check is triggered and a predive checklist is displayed, like in the standard Dive Mode.

At the same time, you can start this mode during the dive by choosing Bailout Standby (CCR) in the Dive mode menu. If the device is mostly used in this mode it is preferable to set it as the default mode (Menu / Setup / Preferences / Default mode).

When entering the water, the device must be switched on and properly tested, see Diving in Bailout Standby (CCR),

1.1.4 — Orientation in the Bailout standby mode (CCR)



Bailout standby (CCR) displays time, depth, battery, and time to surface (TTS) values, the same as with the standard Dive mode. It also shows that the device is in CCR bailout mode, the values of all oxygen sensors including voltage, the set bailout diluent, the setpoint, the diluent setting for the primary device (currently used in the decompression calculation), the average of ppO2 from all oxygen sensors.

Setpoint is not maintained. It serves only to calculate the decompression based on the setpoint in the primary device. In Bailout Standby (CCR) all settings are available as in Standard Dive Mode (CCR).

1.1.5 — Bailout standby setup (CCR)

In addition to basic settings, the Bailout rebreather requires additional settings. In some cases, less precise blending of the mixes may result in different diluent composition in the primary and bailout rebreather. For proper decompression calculation, it is essential that both diluent mixtures are set for both the primary and the bailout. In the Setup / Mixtures / CCR menu, set both known blends. In the Setup / Mixtures / Def. diluent set the diluent of the primary device. In the Setup / Mixtures / Def. BO dil. Set the bailout device diluent.

All setpoints must be the same on both devices, including the descent Setpoint (menu / Setup / Setpoints) being switched on or off. Check the FO2 limit setting (menu / Setup / Setpoints / FO2 limit).
Do not forget to check the automatic switching to high setpoint!

1.2 Diving with Bailout Standby (CCR)

Diving with a backup rebreather is tremendously beneficial in terms of gas management of bailout and a certain freedom in difficult and deep dives, on the other hand,

It makes caring for you equipment twice as difficult and requires special procedures during the dive.
We strongly recommend not using bailout rebreather as the only backup source. It is always necessary to have an open circuit gas supply ready for an immediate emergency an immediate emergency solution and only then switch to the backup rebreather. To use a backup rebreather, we recommend first acquiring sufficient experience and attending a special course with a Sidemount Liberty instructor.

1.2.1 — Predive preparation of a bailout rebreather

Calibrate and do the predive check with your rebreather bailout as with your main unit. Ensure that the setpoint setting is the same as the primary device, and that the gas mixture settings match the actual mixes in the primary and backup devices. Switch to Bailout Standby (CCR) mode, see chapter Starting the Bailout Standby (CCR). Use a checklist to verify all system elements. Attention should be paid to ADV and to verifying that it is open and functional. If the ADV is blocked, underpressure will occur in the loop during the descent. Underpressure in the loop is very risky, as when the diver switches to the device and wants to breathe underpressure in the loop may cause flooding of the rebreather. Start the five-minute pre-breathing timer and pre-breathe device. Close your mouthpiece.

1.2.2 — Diving with a Bailout standby (CCR)

The device must be positioned so that it is immediately available in case of an emergency. During the dive, check the functionality of the device regularly. Control of the device consists of control breathing (2 to 5 breaths). Before switching to the backup rebreather, check the ppO2 in the backup rebreather loop and make sure there is no negative pressure in the loop. The underpressure in the loop is manifested by wholly collapsed counterlungs and stiffened, shortened corrugated hoses. For safety, a short injection of diluent can be done before the using the bailout rebreather.

Every first breath of the bailout rebreather should be done with caution. The system may be partially or completely flooded. Be ready for an immediate

transition to an open circuit. We recommend performing the first check during the safety check at 5 meters (20 ft) and then every 20 m (60 ft) of descent. After reaching the bottom, check every 10-15 minutes. If a fault is detected, immediately begin ascent and terminate the dive.

When you switch the setpoint on the primary device, switch the setpoint on the bailout device at the same time.

In the event of a permanent transition to the bailout rebreather, switch the handset to the standard Dive Mode (CCR). At the same time, we recommend switching the primary device to Bailout Standby (CCR) mode to stop oxygen injecting and to maintain valid decompression calculations. If the primary rebreather is compromised and a permanent rebreather bailout occurs immediately start the ascent and terminate the dive.