5.2 Checklist - Prior the dive

Prior every dive on the XCCR unit it is essential that the diver executes all the checks according to this checklist:

	Check procedures - Prior the dive
Step	Procedure description
1	Check the CO2 scrubber that is filled with new soda lime that has never been used before.
2	Check that the CO2 scrubber is inserted in the canister
3	Check the sensor cartridge is inserted into the head
4	Check the sensor lid is inserted and locked.
5	Analyze the content and the sufficient pressure of the diluent and oxygen tanks. Check the tanks are fastened properly.
6	Take a Bailout system adequate for the dive, while assume the worst case scenarios.
7	Open the tank valves on the both tanks and check displaying of the pressure.
8	Check the medium pressure of both 1st stage regulators. The medium pressure of oxygen and diluent pressure must be within the range 9,5 +/-0,5 bar and stable. It is prohibited to dive the unit, if the medium pressure is out of the range.
9	Calibrate the O_2 sensors and CO_2 sensor
10	Place the head onto the canister and lock the head bayonet
11	Check the head bayonet whether red dot marks being accurately one above the other.
12	Check all the LP and HP hoses are connected. Take care to ensure that the O-rings are clean.
13	Check that the both one-way directional valves in the BOV are in good condition and work correctly!
14	Check the manual adding valves that are working properly.
15	Check the ADV that is working properly.
16	Check the BCD wing inflating valve that it works properly.
17	Check the BOV to ensure that the CC/OC switch and the 2nd stage regulator are working properly.
18	Check the overpressure / drain valve on the counterlungs that is working properly.
19	Perform the negative pressure test: Close the both tank valves and perform suction via the mouthpiece and make underpressure in the breathing loop. Close the BOV and wait a few minutes, whether the breathing loop still keeps underpressure.
20	Open the both tank valves.
21	Perform the positive pressure test: Fill the breathing loop with air fully via the mouthpiece, until the overpressure valve on the counterlungs releasing the overpressure. Close the mouthpiece and wait a few minutes, whether the breathing loop still keeps overpressure.
22	Switch the primary handset on and check the status of batteries, pressure in the tanks, the HUD functioning well, solenoid works correctly.
23	Open the BOV - switch to CC mode
24	Breathe for 2-3 minutes from the unit in order to check that the CO_2 scrubber works properly.
25	Close the BOV - switch to OC mode
26	Switch the primary handset off and close the both tank valves

5.3 Checklist - Just before the dive

Prior entering the water, the diver has to execute all the checks according to this checklist:

	Check procedures - Just before the dive
Step	Procedure description
1	Open the tank valves on the both tanks and check the system, that no gas leak anywhere
2	Check the manual adding valves that are working properly.
3	Check the ADV that is working properly.
4	Check the BCD wing inflating valve that it works properly.
5	Check the BOV to ensure that the CC/OC switch and the 2nd stage regulator are working properly.
6	Perform the negative pressure test
7	Perform the positive pressure test
8	Turn On the primary controller handset and check the Low setpoint, status of batteries, pressure in the tanks, the HUD functioning and that the solenoid works correctly.
9	Breathe for 2-3 minutes from the unit in order to check that the CO_2 scrubber works properly.

5.4 Checklist - When entering the water

Do not enter the water without having performed the Prior dive check !
Just after entering the water, the diver has to execute all the checks according to this checklist:

	Check procedures - When entering the water
Step	Description
1	Perform a bubble check in the shallow water between the surface and 3m depth. Never start a deeper descent without carrying out the bubble check.
2	Check the display on the primary controller and whether the Low setpoint is set. Check the HUD is operating correctly.
3	Check that the unit is positioned correctly and sits comfortably on the back, that every its part is in the right position.
4	Check that breathing is comfortable and without any increased breathing resistance

5.5 When diving

When diving the unit, the diver have to read the HUD signals and check the current values on the primary handset. The diver has to check the current ppO2 reading on every cell, the current status of batteries, pressure in the tanks, any alarms displayed on the screen, current depth and time, the status of the stack timer and CO_2 reading.

The most important information, which must be known by the diver in every moment, is the current ppO_2 in the breathing loop !!!

The optimum diver's position in the water with respect to minimum breathing effort is at an angle of 10 - 20 degrees, this means that the diver's head is a little bit higher than the legs. Breathing should be deep and continuous all the time. The volume of the breathing loop should be as low as needed for comfortable breathing. Too high volume brings effect on breathing effort as well as on buoyancy. Low volume is optimal until spontaneous triggering of the ADV is not needed.

In case, that the ppO_2 deviation from the setpoint is close to the safe limits (0,4 bar or 1.6 bar), then there is necessary intervention of the diver to maintain the ppO_2 in the breathing loop manually within the safe limits:
At high ppO_2 - flush the loop with diluent in appropriate volume via the manual adding valve.

At low ppO_2 - use manual dosing of oxygen via the manual adding valve, while dose in a few steps with a delay of 10 seconds between doses (due to delay on O_2 cell readings).

This situation can happen during diving if too fast ascent or too fast descent of the diver or when a failure of the solenoid.

5.6 Checklist - After the dive

This procedure describes all steps that should be performed on the XCCR unit after the dive.:

	After the dive Procedures
Step	Procedure description
1	Never close the tank valves until you take off the XCCR unit.
2	Take off the XCCR unit.
3	Turn Off the primary controller handset and make its wet contacts dry.
4	Turn Off the Head-Up Display and make its wet contacts dry.
5	Close the oxygen and diluent tank valves.

6	Remove the head, open the sensor container and pull out the sensor cartridge to dry.
7	Take off the scrubber and leave it out to dry.
8	Wipe the canister to dryness.
9	Remove the breathing hoses from the head, remove the T-pieces from Counterlungs and remove the BOV.
10	Rinse the breathing hoses and T-pieces with fresh water, hang them in a vertical position and leave to dry.
11	Rinse the BOV and leave it to dry.
12	Take off the counterlungs, rinse with fresh water and hang to dry.

Steps 5 to 10 are only necessary if no further dive will be done in the same day.

5.7 Quick cleaning of the unit

The quick-cleaning procedure should be performed after every dive.

	Quick cleaning Procedures
Step	Procedure description
1	Rinse the fully assembled and closed XCCR unit with fresh water.
2	Remove the head, open the sensor container and pull out the sensor cartridge
3	Take off the scrubber
4	Wipe the canister, the sensor container and the sensor cartridge to dryness.
5	Remove the breathing hoses with T-pieces, the BOV and Counterlungs
6	Rinse the breathing hoses with T-pieces, the BOV and the counterlungs thoroughly with fresh water and leave them to dry.
7	Hang the breathing hoses with T-pieces in a vertical position and leave them to dry
8	Leave the unit to dry.

Each time before every cleaning REMOVE the sensor cartridge from the Head ! The sensor cartridge contain electronics parts, which may be damaged.

Each time before every cleaning REMOVE the Scrubber from the Unit ! Soda lime with water forms caustic solution, which may damage electrical and metal parts of the Unit.

5.8 Complete cleaning of the unit