



ENGLISH

Diving in extreme conditions

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Cold water conditions / Low air temperatures

Freezing may result in more or less serious malfunctions. These malfunctions can be reduced or prevented by the measures described in this document.

Expansion of air causes the inhalation part of the breathing valve to be cooled to about 15 °C / 59 °F below the ambient temperature. Any moisture in the inlet section of the breathing valve might freeze to ice with the risk of causing free flow or that the valve becomes completely blocked.

Moisture can find its way into the breathing valve in the following ways:

1. The breathing valve has been washed in water but not properly dried.
2. The non-return valve of the breathing valve is not watertight.
3. The breathing valve is immersed in water.
4. By moisture from medium pressure hoses.
5. By moist air from the cylinder.
6. By moisture from DP1 surface supply unit.

It is important that the breathing valve and medium pressure hoses are **absolutely dry** when starting a dive in cold conditions. The breathing valve is the most common part of the breathing equipment to freeze during a dive. The breathing valve may be disassembled to allow all parts to completely dry or they can be manually dried, before starting a dive in cold conditions. If the operating procedure at the dive does not allow the breathing valve to be disassembled, make sure to use a valve that is dry.

To avoid moist from cylinders it is important that the gas used for filling the cylinders meets the requirements in EN12021 of according maximum water content.

If surface supply is used, use a completely dry P+ regulator and dry DP1 surface supply hose. The anti freezing cap shall be checked before the dive and be completely dry. Dry the P+ regulator and hose by using the vent handle before the dive to remove any moisture from the system. The surface supply system should be pressurized when using the vent handle to expel any moisture without allowing new moisture to enter.

Diving in extreme conditions

In regulators MKII and MKIII the anti freezing cap/s shall be checked before dive and to be completely dry.

In regulator RS4 / Divator Pro, when pressurized, press on the diaphragm on the safety pressure unit to make sure that the diaphragm is inflated and springs back.



Notice

A properly used Divator Full Face Mask decreases the risk of freezing and improves the divers comfort in cold water.

Donning

1. Don the face mask/mouthpiece as late as possible in the procedure.
2. The diver should hold his breath, if possible, until he is under the water surface.

Entering the water

1. Submerge directly to avoid breathing from the cylinder above the surface.
2. If possible, the diver should avoid spending a long time at surface water, since freezing is more likely to occur in surface water than in deep water.
3. When in the water, pre-dive checks shall be made below the water surface.

During dive

1. Repeatedly monitor the pressure gauge.
2. Abort the dive at a pre-calculated air pressure.
Make sure to pre-calculate appropriate amount of air for a safe return to the surface including a safety margin and/or necessary decompression time.
3. Abort the dive if there are any sign of loss of pressure.
4. Abort the dive if there are any sign of loss of functionality.
5. The diver shall avoid breathing on the water surface, except after the dive when exiting the water.

Repeated dives

Repeated dives is when a new dive takes place while the equipment still is wet.

1. On land, as soon as possible after leaving the water: Blow the breathing valves dry by pushing on the purge button (a few seconds) before you remove the full face mask (FFM) or mouthpiece/Octopus breathing valves. This will remove most of the water in the breathing valves.
2. Shake out water from the full face mask and the breathing valve.
3. Place the full face mask on a dry surface with the visor upwards to prevent snow and water from getting inside the mask.
4. Disconnect necessary quick couplings as quickly as possible to prevent them from sticking together due to freezing.
5. If possible, exchange the breathing valve(s) to a dry one(s).
6. If possible, store the equipment in a warm environment between dives.
7. It is useful to have access to hot water in a thermos/insulated container at the dive site.
8. If external ice has formed or parts have frozen together use warm water to melt the ice.
9. A free flowing or partly blocked breathing valve due to ice in the exhalation side may be de-iced by:
 1. putting it in warm water in a suitable container. Submerge only the exhalation part until it is fully functional again.
 2. if step 1 doesn't work, remove the exhalation unit (if allowed) and rinse it in warm water.
 3. if step 1 and 2 doesn't work, replace with a dry breathing valve.
10. If there is a certified service technician available, dismantle the breathing valve(s) and dry them. Assemble when dry and continue diving.

After dive

1. Shake out water from the full face mask and the breathing valve.
2. Disconnect necessary quick couplings as quickly as possible to prevent them from sticking together due to freezing.
3. Put the wet and icy equipment in a heated environment to melt the ice.
4. Remove anti freeze caps (MKII/MKIII) and allow any moisture inside to dry completely. If there is water inside the anti freeze cap on the MKII/MKIII regulator unit it should be serviced.
5. Follow the after use and cleaning instructions in the equipments user manuals.



Notice

An air gun (31844-01) can be used to quicker remove water and moisture.

Instructions for specific equipment

Divator Pro

During extreme conditions (water temp lower than 0 °C / 32 °F and current waters) an outer ice layer could cover the reserve warning so that operation of the reserve air is not possible.

Ice may form on quick couplings so that they are impossible to disconnect/connect during a dive.

Pre dive

- The Divator Pro has a built-in anti freeze function that does not need to be disassembled before each dive in cold water.
Follow the manual to check that the anti freeze function works before each dive.

Recommendations during the dive

1. Repeatedly check the function of the reserve air valve by moving the lever, checking that it is still possible to move.
2. Use a Divator DP1 surface supply together with the regulator for extra safety.
3. Use a higher "abort dive" pressure than 55 bar (level for reserve air warning).

Divator RS4

During extreme conditions (water temp lower than 0 °C / 32 °F and current waters) an outer ice layer could cover parts of the equipment so that operation of couplings may not be possible.

Ice may form on quick couplings so that they are impossible to disconnect/connect during a dive.

Pre dive

- The Divator RS4 has a built-in anti freeze function that does not need to be disassembled before each dive in cold water.
Follow the manual to check that the anti freeze function works before each dive.

Recommendations during the dive

1. Use a Divator DP1 surface supply together with the regulator for extra safety.
2. Use a sufficiently "high" air pressure to end the dive safely.

Divator MKII

During extreme conditions (water temp lower than 0 °C / 32 °F and current waters) an outer ice layer could cover the reserve warning so that operation of the reserve air is not possible.

Ice may form on quick couplings so that they are impossible to disconnect/connect during a dive.

Pre dive

1. Check that the anti freezing cap is completely dry before the dive.
2. Perform the function test of the reserve valve described in the manual before each dive.

Recommendations during the dive

1. Repeatedly check the function of the reserve air valve by moving the lever, checking that it is still possible to move.
2. Use a Divator DP1 surface supply together with the regulator for extra safety.
3. Use a higher "abort dive" pressure than 55 bar (level for reserve air warning).

Divator MKIII

During extreme conditions (water temp lower than 0 °C / 32 °F and current waters) an outer ice layer could cover the reserve warning so that operation of the reserve air is not possible.

Ice may form on quick couplings so that they are impossible to disconnect/connect during a dive.

Pre dive

1. Check that the anti freezing caps are completely dry before the dive.
2. Perform the function test of the reserve air handle described in the manual before each dive.

3. Add the "Ice-dive Kit" (31724-51) for the MK III regulator reserve air handle.

Recommendations during the dive

1. Repeatedly check the function of the reserve air handle by pushing and pulling the handle, checking that it is still possible to move from D to C position and back to D.
(Some reserve valves have a locking ring so they cannot switch to C.)
2. Use a Divator DP1 surface supply together with the regulator for extra safety.
3. Use a higher "abort dive" pressure than 55 bar (level for reserve air warning).

Surface supply

Pre dive

1. Dry the P+ regulator and hose by using the vent handle before the dive to remove any moisture from the system.
2. Perform the function test of the reserve valve described in the manual before each dive.
3. Check that the whistle warning is working.

Recommendations during the dive

1. **Surface:** Repeatedly monitor the pressure gauge as the whistle warning on the Surface supply might not work if it is wet and frozen.
2. **Diver:** Repeatedly monitor the pressure to make sure that the "Bail out" air pressure is not falling (changing).





Keeps You Breathing