

# CTD Assembly

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In this document we describe how you assemble a lowered CTD SBE9plus with a pair of temperature (temp), conductivity (cond) and oxygen (oxy) sensors as well as two pumps. Everything is described in great details in *SBE\_9\_manual-9plus\_018.pdf* and in *application-note-15Oct12.pdf*

If you need to change or fix something it will also be helpful for you to go through this manual and find the respective section that applies to the device you need to change. If you remove a sensor, **LEAVE the CABLE ON. Use a DUMMY PLUG!**

There are two versions of a CTD mounting, vertical and horizontal. The vertical mounting has some advantages but in small rosettes only horizontal mounting is possible.

## Mounting of Temperature and Conductivity Sensor

First you need to assemble the mounting for the temperature and conductivity sensor. There are different versions of the “SBE 9plus T/C mount block kit”. Choose the one that fits best.

Assemble the mounting parts for T and C sensor and mount this to the SBE9plus as shown in the respective video. Use Blue Moly or grease where needed.

Now mount the T and C sensors using a two clamps.

Every time you use a clamp, make sure there is a layer of plastic tape on the inside of the clamp. If not, or if it is damaged, replace it (see picture). Also remember to use sacrificial anodes. You can see where they are mounted in the video.



Remember to write down the serial numbers of the sensors you are using, as you need this information later to configure the CTD settings.

Next, you attach the tubes and plastic angle in between T and C sensor. Be careful not to break anything.

Be very careful to align the tube as shown (see video). This is **crucial for stable measurements**. It might help to put the tube in warm water first, to make it more flexible.

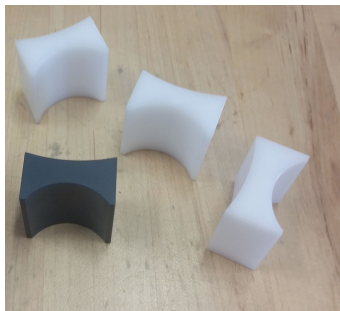
This part is also described in the SBE9plus Manual in the Section 4: *routine maintenance and calibration, TC duct disassembly/reassembly*.

Now all the cables have to be attached. Carefully inspect them for damage or dirt, clean them and apply silicon spray. Attach the cables carefully without damaging any of the pins or connectors. Tighten the cables to the frame using e.g. cable ties.

To mount the CTD to the rosette, attach the top mounting clamp to the top of the SBE9plus (see video). The other mounting clamp goes to the rosette. Check first where you want the CTD to be mounted on the rosette in case you want to mount an LADCP and battery pack. Also check where you will mount the bow to lift the rosette. You want the bow to be far away from the LADCP top element.

### Mounting of Oxygen Sensor and Pump

Next you attach the oxygen sensor and connect it with a tube to the outlet of the Cond sensor. You need white or grey plastic parts with the curvature of the oxy sensor on one side, and the curvature of the SBE9plus on the other side. Put these in between the oxy sensor and the SBE9plus and fix everything with a clamp. Make sure there is a layer of plastic tape on the inside of the clamp.



The oxygen sensor has to be mounted such that air inside the tube can easily escape from the cond sensor, through the oxy sensor towards the pump. This is especially crucial for horizontal mounting (see picture and video).

The mounting of the pump is different in vertical and horizontal mounting.

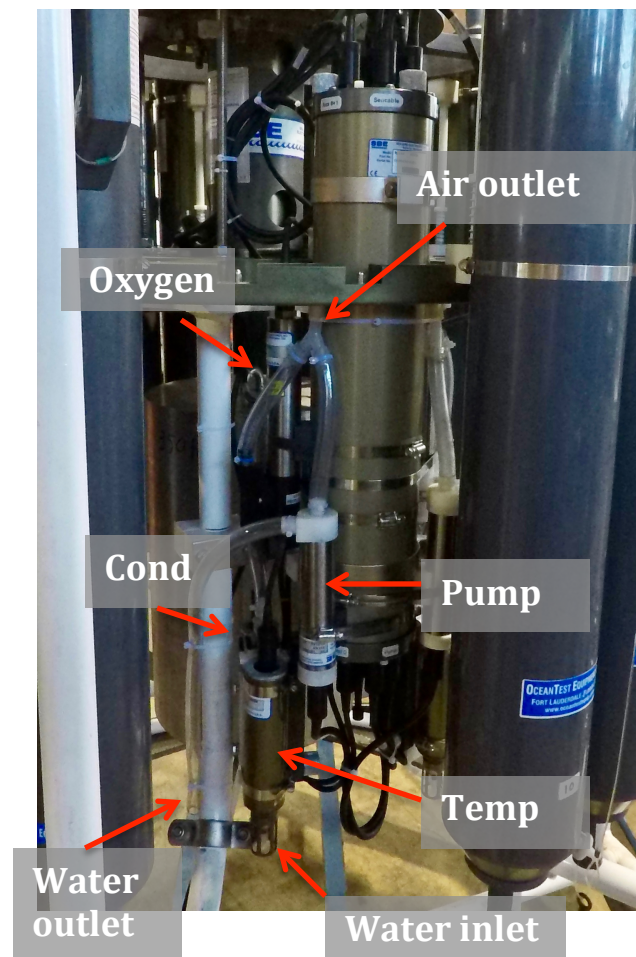
### Mounting of the pump in vertical CTD-configuration

The pump maintains a steady flow through the temp, the cond and the oxy sensor. The water inlet and outlet have to be on the same horizontal plane. This means that the water is pumped upwards through the three sensors and then down again to be released at the same horizontal plane. To allow air to escape from the tube, there is an air release valve with an 0.5 mm wide hole. The air release valve has to be mounted at the highest point of the tubing (*Air outlet*, in the picture).

To avoid that water from the outlet is sucked in again, place intake and outlet as far apart as possible. Tie everything to the cage with. Moving tube will lead to errors in the measurement.

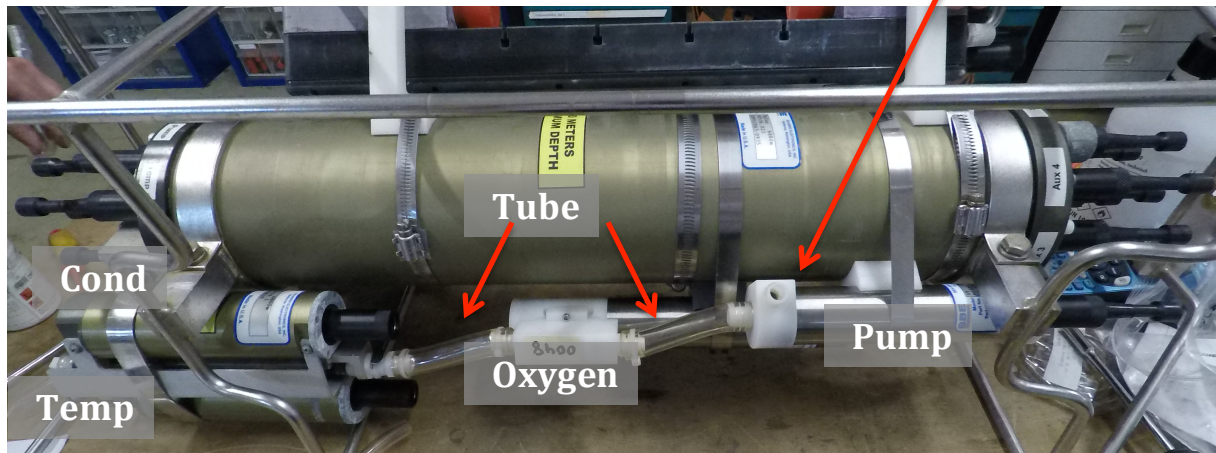
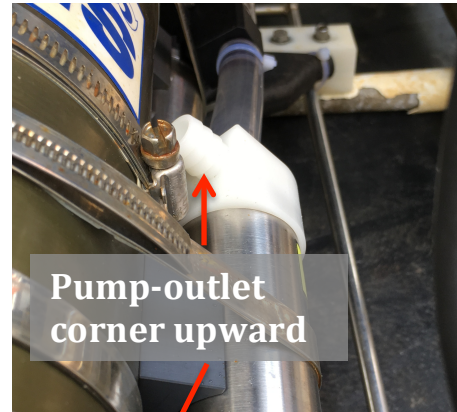
For more details see *application-note-15 or -38.pdf* by Seabird.

Mounting Oxy and Pump when the main CTD is already hanging on the Rosette has the advantage of immediately seeing where to place and how to mount each item.



### Mounting of the for horizontal CTD-configuration

Attach the pump behind the oxygen sensor. Use again one of the white or grey plastic parts, watch out for the tube mounting and air release and fix everything with a clamp. **The outlet of the pump is also crucial.** It has to be oriented such that the exhaust outlet corner points upward. See pictures here and check SBE9plus Manual Section 3: *Deploying and Operating SBE9plus* under *horizontal mount*.



### Mounting SBE 32 Carousel Water Sampler

The SBE 32 carousel water sampler is mounted to the rosette with screws from below. If you need to remove or mount the SBE 32 make sure to use the plastic insulator. Details about the SBE 32 can be found in the manual *SBE\_32\_023.pdf*.

The cable of the carousel water sampler is connected to the CTD with a 6 pin wet-pluggable connector at the Top-End-Cape centre plug (JT7, see page 13 of the *SBE\_9\_manual\_9plus\_018.pdf*).

### Mounting additional sensors

If you mount additional sensors to the Rosette, make sure that you do not interfere with other measurements or instruments. The **altimeter** needs to be mounted such, that is has free vision to the bottom.

Special mounting kits or a rubber layer and a clamp can be used for mounting. For the transmissometer there are e.g. two plastic frames (see picture and video).

Connect everything with the correct cables. Make sure that all connectors are clean and well oiled (Silicon Spray). Fix the cables to the frame with e.g. cable ties.

If you remove a sensor, **LEAVE the CABLE ON. Use a DUMMY PLUG!**

### Configuration

When the CTD hardware is done you need to tell the software which sensor is on which channel and how to interpret the sensors signals. This procedure is described in the document *Settings\_SeaSaveDataProcessing\_ManageCTD.pdf*