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SBE 37 Pumped MicroCAT Change Notice – March 2011

A redesign of the pump, housing, electronics, and battery pack is being implemented in SBE 37 **Pumped** MicroCATs (37-IMP, 37-SMP, 37-SIP). The redesign brings significant benefits without increasing the prices for new pumped MicroCATs. Sea-Bird can ship these redesigned instruments starting April 2011. The new MicroCATs can be distinguished by the housing changes as well as the firmware revision (firmware 4.0 and later).

Because of customer concerns about maintaining physical compatibility with their existing MicroCATs, **the old design will be available until the end of September 2011**. When you place an order to be delivered before that date, **you may request the old design** (Sea-Bird will ship the redesigned instruments unless the old design is specifically requested). The details of the changes follow:

1. New Pump Design with 90% Reduction in Pump Power Use
The integrated pump has been redesigned, resulting in a significant reduction in the power required for the pump from 0.26 Amp-second/sample to 0.025 Amp-second/sample. Significantly longer deployments (or shorter sampling intervals) are now possible, because the pump power was previously the major contributor to the total power required (see *New Battery Pack* below for an example calculation of deployment length).

2. New Battery Pack
The redesigned pump requires a higher input voltage than the old version. To accommodate this, the redesigned MicroCATs use the same battery pack as the MicroCATs with Integrated Dissolved Oxygen (IMP-IDO, SMP-IDO, SIP-IDO) have been using for the past 1½ years. The battery packs look similar and use the same twelve AA lithium cells, but the wiring is different and the cover plate color is different to differentiate between the packs. The red-cover-plate pack does not fit into the redesigned MicroCAT housing; similarly, the yellow-cover-plate pack does not fit into the old MicroCAT housing.

Yellow cover plate battery pack, PN 801863 (without batteries) – **New Pumped MicroCATs**

Red cover plate battery pack, PN 801797 (without batteries) - **Old MicroCATs**

The new Yellow-cover-plate holder (PN 801863) connects four AA lithium cells in series, with three parallel strings, forming a 14.4-volt battery having a factory rating of 7.8 Amp-hours. Sea-Bird recommends using a conservative value of 6.0 Amp-hours in battery endurance calculations.

Example: A **new** MicroCAT (with **yellow battery pack**) with pressure sensor is set up to sample autonomously every 2 minutes (30 samples/hour), and is transmitting real-time data. How long can it be deployed?
Sampling time (autonomous sampling, with pressure sensor) = 2.6 seconds
Sampling current consumption = 0.0091 Amps * 2.9 seconds = 0.026 Amp-seconds/sample
In 1 hour, sampling current consumption = 30 * 0.026 Amp-seconds/sample = 0.78 Amp-seconds/hour
Pump current consumption = 0.025 Amp-seconds/pulse
In 1 hour, pump current consumption = 30 * 0.025 Amp-seconds/pulse = 0.75 Amp-seconds/hour
Quiescent current = 30 microAmps = 0.03 mA
In 1 hour, quiescent current consumption ≈ 0.03 mA * 3600 seconds/hour = 0.11 Amp-seconds/hour
Total current consumption / hour = 0.78 + 0.75 + 0.11 = 1.64 Amp-seconds/hour
Capacity = (6.0 Amp-hours * 3600 seconds/hour) / (1.64 Amp-seconds/hour) = 13170 hours = 549 days = 1.5 years
Number of samples = 13,170 hours * 30 samples/hour = 395,000 samples

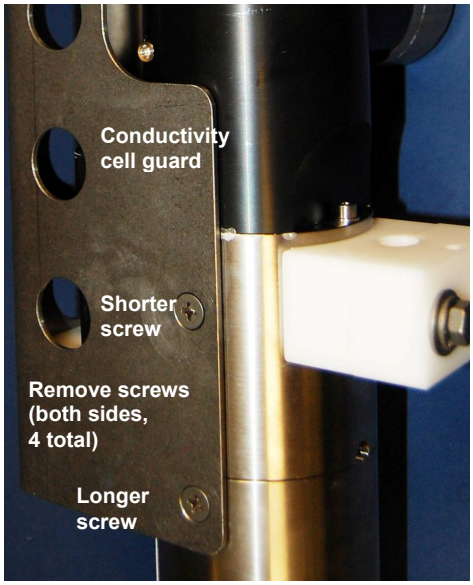
Summarizing the example, **the new MicroCAT can be deployed for 1.5 years when sampling every 2 minutes (395,000 samples). The old MicroCAT can be deployed for only 0.4 years (105,000 samples)** for the same sampling scheme.

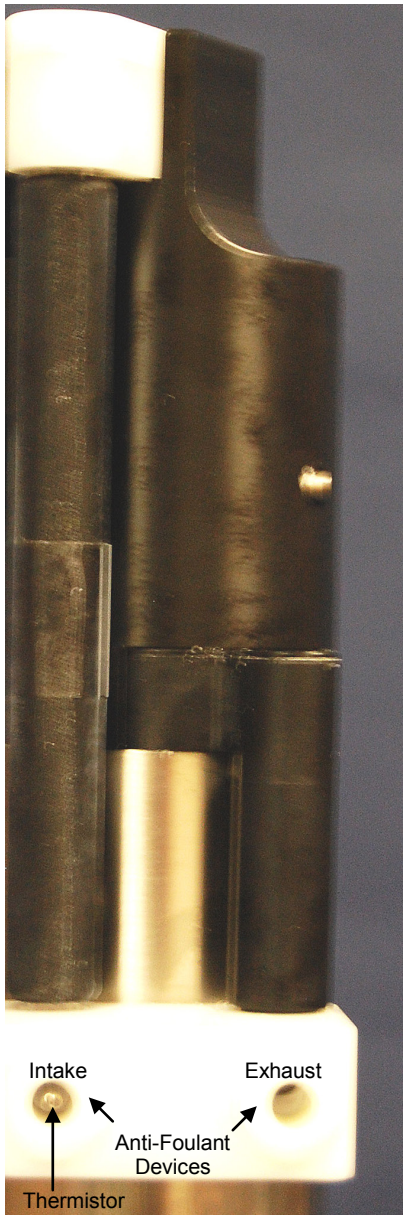
3. Temperature Sensor Placement

The temperature sensor is now in the intake flow path, just before the conductivity cell. This ensures that the temperature sensor and conductivity sensor *see* the same parcel of water, resulting in more accurate calculation of salinity and other derived parameters.

4. Anti-Foulant Device Holder

The old design used an anti-foul holder cup and cap to secure the anti-foulant device. The new design uses anti-foul holders that are inside the conductivity cell guard. Replacing the anti-foulant device requires removing 4 screws and the conductivity cell guard; there are no caps to be misplaced.

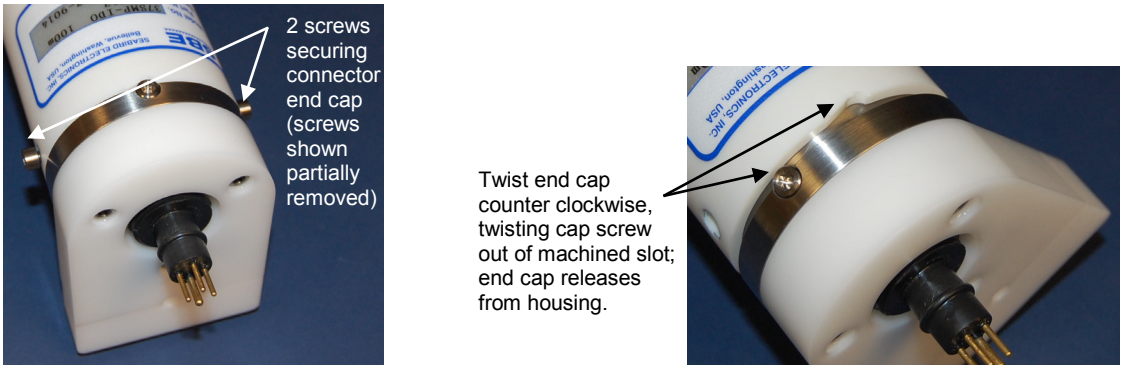




Shown with conductivity cell guard removed

5. Easier to remove Battery End Cap (37-SMP, 37-IMP)
The old design required a significant amount of strength to remove the end cap to access the battery compartment. Sea-Bird recommendation for removal included the possibility of twisting or rocking the end cap back and forth, or using a non-marring tool on the edge of the cap to loosen it.

The new design utilizes a cap screw in a machined slot; as the end cap is twisted, the edge of the cap screw pushes against the housing, easily releasing the end cap from the housing.



New End Cap Design for Easier Access to Battery Compartment

6. Shorter Housing
The housing length has been reduced approximately 7%. For example, the SBE 37-SMP overall length (to end of connector dummy plug) has been reduced from 65.6 cm to 60.7 cm. The housing diameter remains unchanged.