

TUBING AND FITTINGS SETUP

1

Please check that all components are intact before use. Place the water bath and motor on the grey PVC base, and place the swim tunnel chamber inside the bath. Gradually tighten all chamber base bolts to firmly attach the chamber to the bath. The entire setup must be placed on a firm and level surface strong enough to support the full weight. Remove any protective film from the tank walls.

2

Attach PVC T-fitting (2a) onto water bath and stopper and flush outlet (2b) to the swim tunnel chamber. If needed, connect outlet tubing (red) and inlet tubing (blue, connected to an Eheim pump in bucket) to recirculate water from the water bath and to a pump sump below, e.g., for temperature control and/or purification (2c).

3

Place an Eheim flush pump in the water bath and connect tubing between pump and flush inlet fitting (3a). Ensure that all tubing is submerged for constant temperature control. Attach flush outlet fitting, temperature port and oxygen sensor port to the swim tunnel lid (3b). Attach tubing to flush outlet fitting and make sure that tube is high enough, so that water does not spill out even at the highest water velocity (3c).

MOTOR SETUP AND ALIGNMENT

4

IMPORTANT: Never run the motor/propeller without water in the water bath and swim tunnel chamber as the mechanical shaft sealings will be destroyed in a matter of seconds without water for lubrication!

Place motor control box above the swim tunnel and away from any electrical devices and cables (4a). Keep analog data cables away from other electrical cables/devices to avoid signal noise. Connect SUPPLY and MOTOR cables from the motor to the motor control box. For software control of motor speed, connect green data cables between the motor control box and DAQ-BT and turn control knob towards EXT (4b, red arrow). KNOB will allow for manual control of motor speed using the speed knob above the control knob.

5

IMPORTANT: The red rubber disk (5b, red arrow) must sit between the two aluminum shaft couplings when running the motor! Otherwise, the aluminum shaft couplings will be destroyed.

The motor shaft must be aligned with the connecting shaft and propeller shaft to avoid unwanted noises and vibrations during operation. If noises or vibrations occur, carefully pull the two shafts from each other, as shown in (5a+b), to check the alignment. Remove shaft couplings (5.1a, loosen tailstock screw with the hex wrench) for better visuals on shaft alignment (5.1b). If the two shafts are not aligned, change the motor position accordingly by adjusting the four motor base bolts (5.2). To raise the motor, add thin sheets of plastic below.

TEMPERATURE AND OXYGEN SENSOR SETUP

6

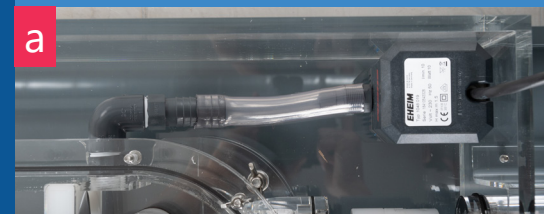
To measure the water temperature or oxygen content inside the swim tunnel chamber, insert probes into the small or large port and tighten the threaded cap to seal it (6a + 6b).

The tip of the sensors should align with the underside of the swim tunnel chamber lid (6c) to avoid disturbing the flow.

2



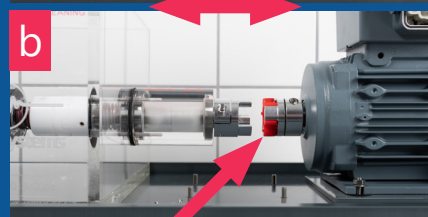
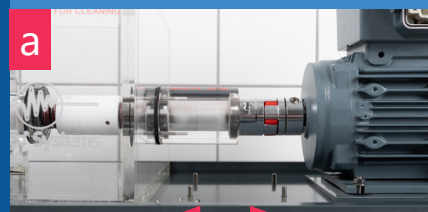
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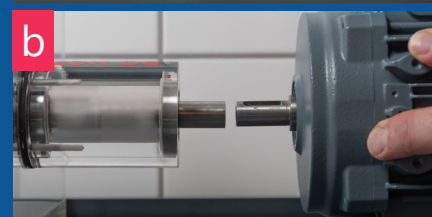
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5



5.1



5.2



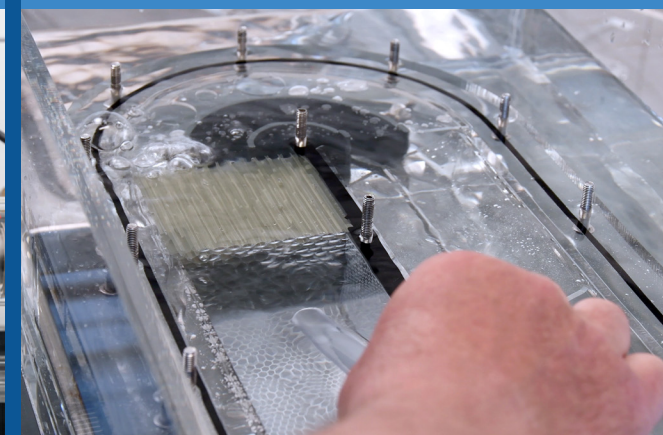
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REMOVING AIR BUBBLES

Remove the swim tunnel main lid by unscrewing the lid bolts. Fill the water bath and swim tunnel chamber with water until the water is covering the entire swim tunnel chamber (8).

1. Keep entire swim tunnel system at desired temperature for 30-45 min. before trials to avoid air bubbles forming due to temperature changes.
2. Gently brush off air bubbles from the different parts. Alternatively, use an Eheim pump with a piece of tubing to flush out air bubbles caught inside the honeycomb material and tubes (8.1).
3. Put the main lid back on while tilting the lid to avoid trapping air bubbles inside the swim tunnel chamber (8.2). If removed, attach also the smaller lid covering the test section.
4. Flush entire swim tunnel for a few seconds using the Eheim pump before starting an experiment (8.3). *NB. The sensor ports should be blocked with sensors or fingers.*
5. Remove the smaller lid to get the last few bubbles out.

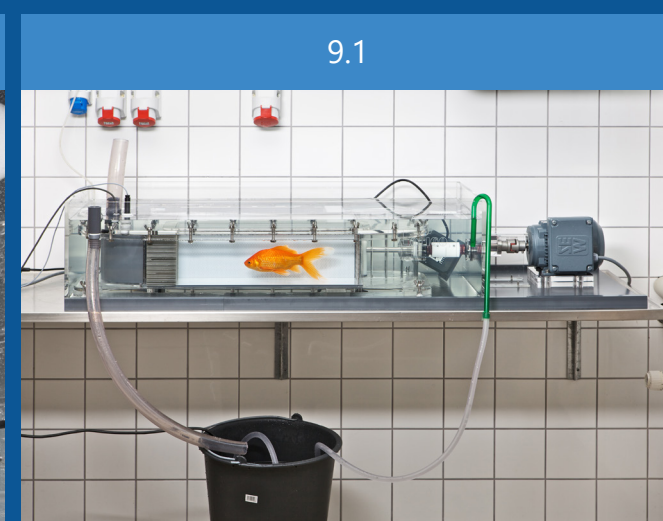


ADDING ANIMAL TO CHAMBER

The animal can be introduced to the test section by removing the small lid attached to the swim tunnel lid. Load the animal by hand or by using a small net.

Keep the animal's head pointing in the direction of the flow (9). *Note: Some animals can turn around inside the test section. If this happens, the flow must be stopped or lowered until the animal faces the correct direction again.*

When the animal has been introduced, quickly put the small lid back on and tighten the lid bolts gradually. Be careful not to harm the animal during entire procedure (9.1).



CLEANING AND MAINTENANCE

The large swim tunnel is made of non-corroding parts. However, we recommend frequent cleaning (use a mild detergent) and flushing of all parts with tap water to avoid problems with corrosion and wear of seals and bearings – especially if using warm full-strength sea water.

IMPORTANT: Do not use alcohol on any acrylic surfaces as it will cause cracks.

Shaft ball bearings will eventually wear down with use. We therefore recommend an annual check for any backlash due to wearing of bearings. Also, check the shafts and the propeller for any damage. The maintenance kit also comes with spare bearings etc., and we offer replacement parts, if needed.

Remove water from the water bath and swim tunnel chamber, and dry off all parts before storing the swim tunnel between trials.