



User Guide: Breezy

Purpose: Wind direction indicator.

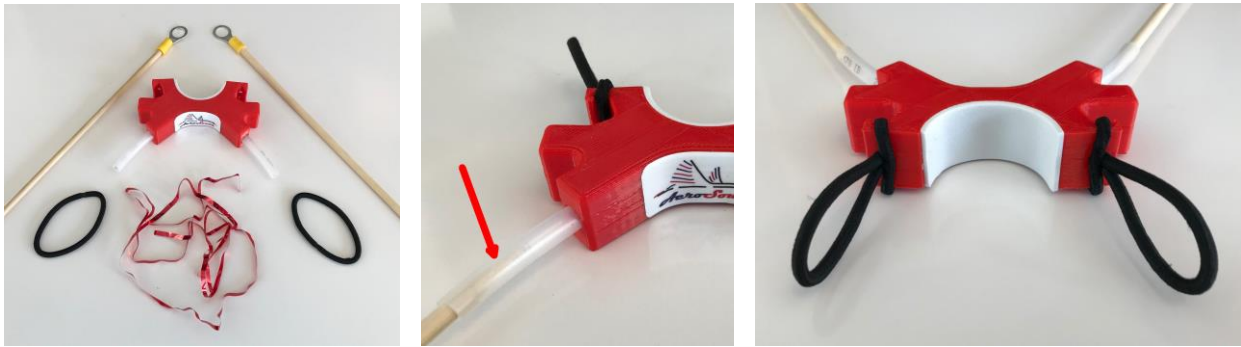
Material: Bracket from PETG, fabricated by 3D Printing with flexible PE (polyethylene) tubing couplers. Sized to fit masts and spars of 1.5" – 2.0" diameter. (Other sizes available upon request.) The round inside back surface of the bracket is covered with an EVA foam gasket to hold it securely against the mast or spar. The two "arms" of Breezy are "Jumbo" bamboo skewers, approximately 12" (30 cm) long and 5.0 mm diameter, available at most grocery stores. The tips of the arms include ring terminals (8-10 stud / 12-10 AWG), available at most hardware stores. Ribbon is 3mm wide decorative plastic film "gift shred", available at most craft/hobby stores. Several different types are included, use the ones you find most visible. Hair elastics are used to attach the bracket to a mast or spar. Extra parts are included with each purchase. As with most polymers, PETG, PE, EVA and synthetic rubber will degrade over time when exposed to UV and water. When not in use, best is to store parts in a dark, dry location.

Installation:

1. Check that the PE tubing couplers are securely seated in the central red bracket. Approximately 1-1/2" (35mm) should protrude outside the bracket. Insert the end of the arms opposite the ring terminals into the PE tubing couplers on either side of the bracket. Arms should be inserted to leave approximately ¼" room for the tube to flex (see image below). They should fit snugly; if they are not snug, secure with electrical tape on the outside or a with small amount of waterproof adhesive made for plastics, such as GOOP or E6000, available at most hardware and craft stores. (CA - super glue will not adhere to PE.)
2. The mounting bracket provides two sets of holes to orient the arms spread either 180 degrees or 90 degrees, depending on your preference.
3. The bamboo arms can be easily shortened according to your preference.
4. Should an arm break, carefully pull the end out from the PE coupler and replace with the spare arm sent with your Breezy. Such bamboo skewers are found in most grocery stores. "Jumbo" skewers with diameter 5mm work best.
5. Tie several strands of streamer ribbon onto the ring connector at the end of both arms. The choice of color and material is left to you. Several strands of colorful packing "shred", available at craft stores, have been included, as well as magnetic tape. You may

however choose to use a different material, for instance yarn. Trim to the length you prefer.

6. Attach Breezy to the mast or spar using the two hair elastics that come pre-installed on the central bracket. Note how these have been attached to prevent loss should one slip off. One hair elastic alone will hold the bracket with sufficient force. The second provides a backup should the first break. The bracket should be very snug and aligned perpendicular to the hull's long axis fore-aft. It does flex somewhat in the middle to accommodate different mast / spar diameters. Adjust its height according to your preferences.
7. Should for some reason Breezy fall from the boat, it will float.



Above, left: Breezy parts consist of a middle brackets with flexible couplers, bamboo skewer arms with ring terminal ends, streamer ribbons and hair elastics. Above, center: insert end of arm into the flexible coupler leaving at least ¼" to allow the PE tubing to flex. Above, right: hair elastics are secured by first inserting through holes on either side as shown.



Above: Secure Breezy's mounting bracket by crossing the pair of hair elastics and securing on opposite sides as shown.



Above: Arms are inserted with plastic flex couplers into either set of holes to orient the arms' spread of either 180 degrees or 90 degrees, depending on your preference.



Above, left: Breezy on a test rig, mounted with several rubber bands beneath an AeroSouth Dinghy Bob; Above, right: Shows how the arms of a Breezy will flex without breaking. Black magnetic tape is attached to the right arm and red shred tape is attached to the left arm.

Should a collision with one of the arms occur, the PE tubing coupler will flex, even in cold temperatures. It does not spring back immediately as with metal springs but will return to its original orientation in a few seconds. Important – keep your ribbons light and thin to avoid wind drag on them that might cause the arms to flex while sailing. Those sent with your Breezy are ideal, very sensitive to slight winds and should last an entire sailing season.

Although Breezy is made from robust materials, you will probably want to remove it before the sailing rig is removed to avoid damage. Check especially the hair elastics before every use as these degrade rapidly when exposed to the outdoor elements. Secure your bracket with at least two hair elastics (or rubber bands) you will have a good safety margin should one or more break while sailing.

Other than the brackets, all parts can be easily replaced with the extra parts shipped with your Breezy or obtained at most grocery, hardware, and hobby stores.

Have Questions or Comments?

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