ciated with the VACM. To account for the fact that sensors cannot respond perfectly to all frequencies, Weller and Davis (1980) utilized a slower response sensor, which in effect averages over the higher-frequency scales and optimizes a linear response between the sensor output and the averaged vector component. This system has excellent cosine response and works well in both steady and unsteady flows with minimal rectification error. An important attribute of the VMCM is that the propeller speed goes through zero on flow reversal, unlike rotors, and the threshold current speed is about 1–2 cm s^{-1}. A negative aspect of the VMCM is that in oscillatory flows where the peak oscillatory speed exceeds the speed of the mean flow, it must operate in its own wake.

Weller et al. (1985) modified a VMCM to measure both vertical and horizontal velocities from the research platform FLIP in real time, observing a Langmuir cell off the coast of southern California. Many VMCMs also record temperature. Modified VMCMs or multivariable moored systems (MVMSs; Fig. 14.2) have now

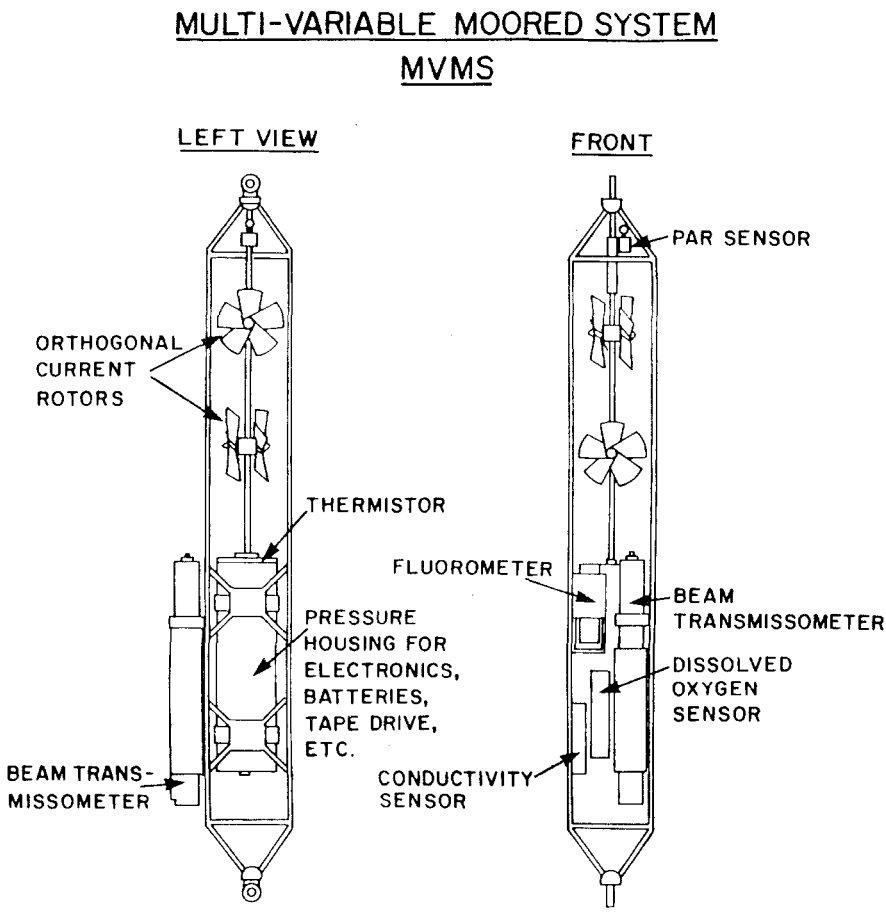

Fig. 14.2. Schematic of a multivariable moored system that measures currents and a variety of bio-optical variables. (After Dickey, 1991.)