



Use of Type M Laser Doppler Probe

Animal Research Use Only

Components

The type M probe consists of one probe cable and three semi-disposable monofiber implants. (Replacement implants can be purchased in packets of 3 using part number AFAL1026.)

- The **PROBE CABLE** which connects to the BLF21 Laser Doppler Flowmeter is 2 meters long and has two glass optical fibers, as do all BLF probes. It terminates in a connector ready to accept the single fiber portion of the probe.
- The **MONOFIBER IMPLANT** is inserted in the tissue of interest and is connected to the probe cable when measurements are to be taken. The monofiber is a 0.5 mm diameter plastic optical fiber with a plastic "spacer" made on to one end. Both ends of the fiber are factory cleaved to give the best optical property coupling. The end of the fiber which is in the "spacer" is recessed for proper optical coupling with the probe cable.

Use of the Type M Probe

This probe can be used to obtain perfusion measurements in tissue where surface and needle type probes are inappropriate. The light gathering properties of monofiber probes are not as strong as in other probes. Therefore, this probe is most useful in well perfused tissues, where a strong signal is assured.

Cleaving the Implant to Length

The monofiber is shipped 1 meter long. In some applications this may be appropriate but in others it will need to be shortened for use. When the proper length has been selected, cut the fiber as follows. Place the fiber on a hard surface (steel if possible) and using a new single edge razor, cut the fiber with a single firm motion. Examine the cut end under magnification, and re-cut if the end does not look smooth and sharp.

Connect of the Implant to the Probe Cable

The plastic "spacer" is inserted into the open end of the type M probe cable. Push the spacer all the way in to obtain a firm connection. In earlier designs, the fiber butted directly against the end of the probe cable and some users added a drop of immersion oil to facilitate optical coupling. We think that immersion oil is not appropriate in the current design.

Artifact Signal

Motion artifact is a major consideration with plastic step index optical fibers. Bending of the fiber causes the flowmeter to "see" perfusion that does not exist. The fiber may be in a bent position, but it is essential that bending movement of the monofiber be minimized during measurement.

Meaning of Measurement

The BLF21 reports readings in Tissue Perfusion Units (TPUs). When using the two fiber probes, TPUs are proportional to ml/min/100g tissue but this is not true of the Type M probe. The instrument readings for the Type M probe are only relative measurements. In order to use them meaningfully, a baseline measurement and an interventional measurement should be used to determine percent change. If the animal is sacrificed at the conclusion of the study, the zero offset should be measured several minutes after sacrifice. This zero offset should be subtracted from both the baseline and interventional measurement prior to determining % change.

