

BLF22 Technical Note

Laser Doppler Probe Holders

The method of holding the Probe is critical in preparing to use a BLF21 or BLF22 Tissue Perfusion Monitor. In general, holding the Probe in a manner which fixes its position relative to the tissue under study, without applying pressure (which will occlude the underlying microvasculature) is required for meaningful measurements. There are several methods of Probe placement which may be used to meet these requirements. Among these are:

- micromanipulators
- double adhesive disks
- suturing
- bronchoscope / endoscope / cystoscope
- floating placement devices
- “non-contact” holders

MANUAL HOLDING

Manual holding of the Probe is useful for quick measurements, but care must be taken so as not to include a large motion artifact from a less than steady hand. At least, the hand should be braced against something firm so that a light touch is possible. In general, this technique should be used for preliminary sessions or for qualitative measurements only.

MICROMANIPULATORS

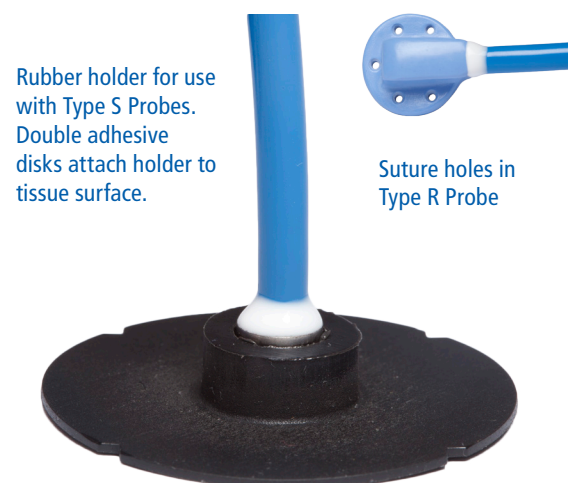
Micromanipulators hold the Probe rigidly in place and are very useful in tissues that do not exhibit significant motion. These require that the subject be firmly fixed in place (examples: in vivo animal cerebral perfusion measurement, animal intestinal mucosa preparation).

DOUBLE ADHESIVE DISKS

Double adhesive disks for use with surface Probes (Type R & DI) or with rubber Probe holders for Type S Probes are among the easiest and best methods for Probe placement (examples: cutaneous flap monitoring, forearm monitoring during exercise).

SUTURING

Suturing a Probe (Type R and Type DI come with suture holes) in place may be superior to adhesive disks for relatively long-term placement for moist tissue or for fast moving tissue. To eliminate movement between the Probe head and the tissue under study, it is important to eliminate any slack in the sutures. Equally important is to ensure that the sutures are not so snug as to compress the tissue, causing occlusion of the underlying vasculature (examples: post-op flap monitoring, bronchotracheal, bladder blood flow measurements).



Additional Laser Doppler Probe Holders

BRONCHOSCOPE/ ENDOSCOPE/ CYSTOSCOPE

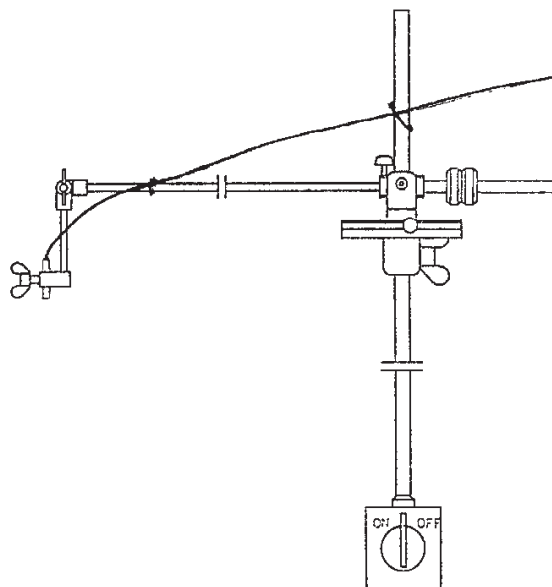
Type E Probe can be threaded through a rigid or flexible scope to allow for increased control of placement.

FLOATING PLACEMENT DEVICE OR BALANCE ARM

A floating placement device or balance arm can be used to hold a Probe with a very light pressure on tissue that moves slowly but markedly, such as by peristalsis. In using the balance arm, the weight of the Probe and suspended cable is almost totally counter balanced and the Probe is fixed to the tissue with cyanoacrylate glue (Nexaband®, Tri-Point Medical, Raleigh, NC) or an equivalent. The tissue is free to move in three dimension and the Probe will follow, neither adding Probe-to-tissue motion nor compressing the tissue (examples: intraoperative lung surface, intestinal serosa or mucosa).

"NON-CONTACT" HOLDERS

"Non-contact" holders do contact tissue, in a ring around the tissue under study, but not within several millimeters of the measurement site. The Probe is held a fixed distance above the measurement site allowing reasonable control of Probe-to-tissue motion while not irritating sensitive tissue (example: dermatological test site monitoring).



Balance Arm Probe Holder allows the Probe to move with the tissue without imparting motion artifact or occluding tissue (see Use of the Balance Arm for Laser Doppler Probes: LD-107-tn)



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