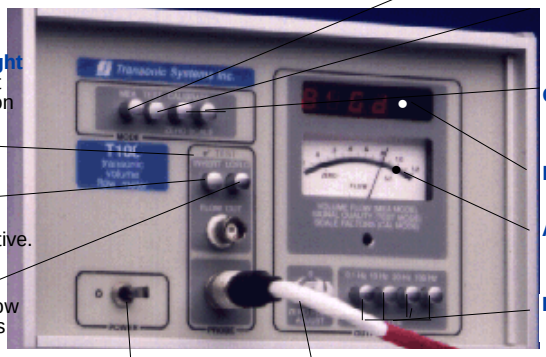
Quick Reference Guide ⇨ ⇨ T106/206 Flowmeter



MEAsure Mode
Digital Display reads average volume flow in mL or L/min.
Analog Meter gives instantaneous indication of flow

TEST Mode
Digital display shows probe size and quality of signal strength (no, Lo or Gd);
Analog meter reads signal strength in Volts;

CALIBRATE Modes Used to calibrate recorder or data acquisition

DIGITAL Display

ANALOG Meter

FILTER Buttons
0.1, 10, 30 & 100 Hz to filter analog output

CHECK (√) TEST light
indicates insufficient acoustic transmission between probe and vessel.

INVERT Mode
Changes a negative flow reading to positive.

LO FLO Button
Defines operating flow range Normal (out) is 4x that of Lo Flo (in)

AC POWER switch

ZERO FLOW adjust to remove the small zero offset in STOPPED FLOW condition.

DISPLAY MESSAGES

"MEA" Measure Mode

No.Pr. = (No Probe: probe is not connected to meter)
make sure that probe is connected to meter.
If probe is connected, change to different probe.
Return faulty probe to factory for repair.

Ac.Er: = (Acoustical Error - Air is between vessel and probe) If using Gel, apply more Gel.

"TEST" Mode

"*Probe size*".no = No ultrasonic transmission
"*Probe size*".Lo = Low ultrasonic transmission
"*Probe size*".Gd = Good ultrasonic transmission
"*Example*. 8" - Gd = 8 mm probe with good signal

TESTING PROBE FUNCTION

To check if a flowprobe is functioning properly before use.

1. Connect probe to the meter and push the "TEST" button.
2. Immerse the probe in a saline bucket and swish back and forth to insure that small air bubbles are washed off the probe body and reflector.
3. Read the received signal strength from the Analog meter. A new probe show ≥1Volt. If signal strength is ≤ 0.5 volts, do not use. Return probe to factory for repair.

Testing can be done quickly on the sterile field before the probe is applied to the vessel.

DATA ACQUISITION

- See Technical notes TN-6 and TN-10 for options.
- For Calibration of recorder:
  - ♦ Decide on Normal or Lo Flo scale before calibrating
  - ♦ Adjust Zero Flow - if applicable before calibrating recorder
  - ♦ Use Cal Zero
    - ▼ 0 Volt signal
  - ♦ Use Cal Scale
    - ▼ 1 Volt signal which equals the flow shown in the digital display
- Flow flowmeters equipped with the -P (personal computer interface) option, see Technical notes TN-22, 23, 24 for details on Windaq Software.
- Flow flowmeters equipped with the -R (pRessure) option, see Technical notes TN-13 and TN-65 for details on Transpac pressure transducers.

SCALE FACTOR

- The Flowmeter reports flow measurement via an analog output in the range of 05V to +5V DC.
- The "Scale Factor" is the flow measurement for a particular probe size when the output is 1V DC.
- Normally, mean flow measurements are made near or below the scale factor
  - ♦ Peak pulsatile flows may push the output to 5V, beyond this value "peak clipping" occurs.
- In Normal Mode, each probe cause the flowmeter to output 1V when measuring the flow listed as "Normal Scale Factor" in the probe specification tables..
- In Low Flow Mode, (with the Lo Flo control button depressed) the Normal Scale factor is divided by four while the precision of the reported flow in the digital display is increased.

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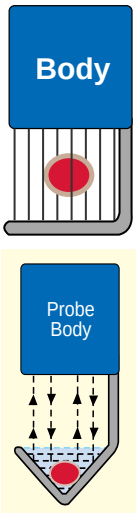
INTRAOPERATIVE MEASUREMENTS — PERIVASCULAR PROBES

(Flowprobes should be tested before each use, please see "Testing Probe Functions"

1. **Apply flowprobe to vessel** by gently slipping the probe around the vessel.
2. **Establish Good Ultrasonic Transmission**
   Displace the air between the vessel and the probe by filling this space with ultrasound gel (see Technical Note TN9). Transmission is established when the "√ TEST" light goes out. Sterile Gel is the easiest and quickest acoustical couplant to use.
3. **Push Measure (MEA) button**
4. **Reading Flow Values** Allow 10-15 seconds for the flow value to stabilize. The digital display will show volume flow in ml/min or L/min. The Analog meter will register the flow profile characteristics in a sweeping pattern.
5. **Checking for Good Ultrasound Contact**
   If the digital display reads "Ac Er", air remains between the vessel and the probe body. If using Gel couplant - add additional Gel to probe and reapply probe to vessel. Use a probe size that best matches vessel size.

A. Perivascular Probes for Acute Use

PROBE SERIES	NOTES
R	Requires vessel to fill 75% - 100% of probe lumen
S	Requires vessel to fill 75% - 100% of probe lumen *(for R and S-Series, see probe specifications & TN24)*
A	Requires vessel to fill 75% - 100% of probe lumen Close fitting is best; Control probe in position perpendicular to vessel *(see TN-16)*
V	Requires vessel to fit in small enhanced sensitivity area *(the V section of the reflector, see TN 23)*



B. Chronically Implanted Perivascular Probes

Requires probes to be manufactured for chronic work: Cable length, connector, and Calibration (R & S-Series) are typically different from Acute use probes. With variation of orientation and fit of the probe and vessel, it may take a few days to more than two weeks to establish good acoustic signal in the chronically implanted probe. (See TN-29)

PROBE SERIES	NOTES
R,S	Usually sized with a little room for growth
A	Requires vessel to fill 75% - 100% of probe lumen Close fitting is best; Control probe in position perpendicular to vessel *(TN-16)*
V	CANNOT BE USED CHRONICALLY

C. Extracorporeal Flowsensors

PROBE SERIES	NOTES
N	For direct contact with liquid. Restricted by internal turbulence to 1.5 time normal scale factor. (See sensor specifications.)
C	No contact with liquid, these sensors clip onto flexible tubings. Sensor must be used with type and size of tubing, fluid and temperature for which it was calibrated!

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