

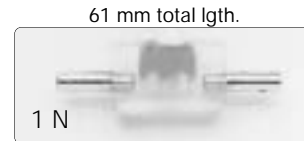
N-Series In-Line Flowprobes



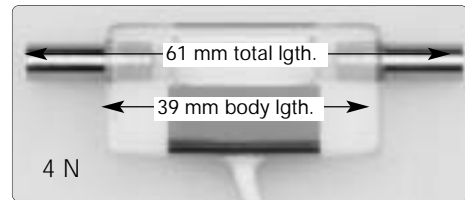
In-line (N-Series) flowprobes splice into laboratory tubing & measure absolute volume flow of blood or other fluids

In-line flowprobes offer maximum flexibility in experimental design since the ultrasound signal need not be timed and calibrated for a specific tubing material (*as with sterile tubing flowsensors*).

- These probes have the highest resolution for low flow conditions in perfused organ studies for venous cannulation.
- Exceptional electrical and zero baseline stability
- Measure saline solutions and other non-aerated liquids, as well as blood.
- Nonmagnetic probes available for MRI



Sample In-Line Probes



Ideal for Isolated Organ Preps

Information needed for flowprobe calibration includes: application, operational temperature; fluid to be used (blood, saline, other); flow ranges expected.

Please note:

In-line flowprobes have a limited maximum flow range as indicated in the table below. The non-uniform flow cavity is sensitive to highly pulsatile and turbulent flow profiles with peak flow above the maximum range. For highest accuracy over a wide dynamic flow range we recommend our sterile tubing flowsensors.

Specifications

| In-Line Flowprobes | Lgth Total | Lgth Probe Body | FOR TUBING ¹ | | BIDIRECTIONAL FLOW | | | | ACCURACY | | Maximum 5 average probe power dissipation |
|--------------------|---------------|--------------------|-------------------------|------------------|--------------------|----------|--------|---------|-----------|------------|---|
| | | | I.D. | | Resolution | Low Flow | Normal | Maximum | Maximum 3 | Absolute 4 | |
| | mm | mm | inches | mm | ml/min | ml/min | ml/min | ml/min | ml/min | % | mW |
| 1N | 25 | 13 | 0.046 | 1.2 ⁶ | 0.05 | 5 | 20 | 30 | ± 0.5 | ± 15 | 0.2 |
| 2N | 42 | 31 | 1/8 | 3.2 | 0.1 | 25 | 100 | 150 | ± 2 | ± 7 | 0.7 |
| 4N | 61 | 39 | 3/16 | 4.8 | 0.4 | 100 | 400 | 600 | ± 5 | ± 7 | 1.1 |
| 6N | 70 | 44 | 1/4 | 6.3 | 1 | 250 | 1 L | 1.5 L | ± 10 | ± 7 | 1.6 |
| 8N | 96 | 74 | 3/8 | 9.5 | 2 | 500 | 2 L | 3 L | ± 20 | ± 7 | 1.7 |
| 12N | 85 | 56 | 1/2 | 12.7 | 8 | 1 L | 4 L | 6 L | ± 80 | ± 7 | 1.7 |
| 16N | 88 | 56 | 0.710 | 18.0 | 20 | 2.5 L | 10L | 15L | ± 200 | ± 7 | 2.5 |
| 20N | 96 | 63 | 0.817 | 20.8 | 20 | 2.5 L | 10 L | 15 L | ± 200 | ± 7 | 2.5 |
| 24N ⁷ | 121 | 92 | 0.930 | 23.6 | 40 | 5 L | 20 L | 30 L | ± 400 | ± 7 | 3.3 |

Molded cases: 2N, 8N, 12N

Machined plastic cases: 1N, 4N, 6N, 16N, 20N, 24N

Tubing fittings: stainless steel is standard; can be supplied in brass for MRI or other:

- May be used on different tubing sizes if tubing seals well on the stainless steel fittings of the probe
- Maximum flow capability: Flowsensors will underestimate flow at rates exceeding the maximum linear range with loss of linearity.
- The actual maximum zero offset for a probe is often lower than this value, as specified on the probe's Data sheet.
- Precalibrated for use on specified fluid and temperature. Indicated flow decreases by 1% for every 5°C increase in temperature. Probe recalibration is necessary when used on liquid with acoustic velocity different than water.
- This is the time averaged sum of both the electrical dissipation (self-heating) within the probe, and the radiated ultrasonic power.
- The O.D. of the stainless steel fittings of the 1N in-line probe is 3/32" (2.4 mm). This wall thickness is needed to ensure integrity of the probe.
- For use on T108 / T208 flowmeters only.

Circulatory Models
Flowmeters & Flowsensors