

TS420 Perivascular Flow Module

Precision Blood Flow Measurements for *In Vivo* Animal Studies

Gold Standard Ultrasonic Transit-Time Technology

Transonic® TS420 Perivascular Flow Modules provide unprecedented waveform quality and resolution. They incorporate plug and play features with virtually maintenance-free construction for the perfect combination of sophisticated and simple. TS420 Flow Modules and compatible Flowprobes measure absolute blood flow in arteries, veins & ducts for acute and chronic cardiovascular research applications.

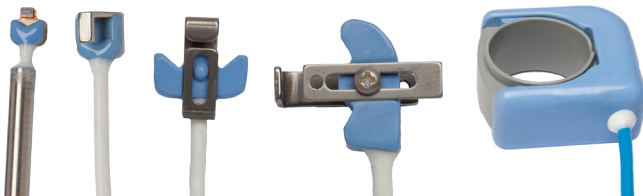
UNLIMITED APPLICATIONS

- Small Animal Cardiovascular; Even Mice!
- Renal Hypertension Studies
- Carotid Occlusion Thrombosis Models
- Large Animal Cardiovascular
- Exercise Physiology, Heart Failure Models, Pregnancy Research, Myocardial Ischemia & Reperfusion
- VAD Implantation & Heart Assist Models
- Novel Species: Comparative Physiology

COMPATIBLE FLOWPROBES (0.5 - 36 MM)

- PR/PS/V-Series Flowprobes & Nanoprobes
- PAU-Series CONfidence Flowprobes® for Cardiac Output and great vessels
- PMP-Series - Handle style Flowprobes for acute intraoperative applications

Selection of compatible perivascular Flowprobes



**T403 Console
with TS410 and
TS420 Modules**



TS420 Flow Module requires a T400 Console in order to take measurements. Consoles can hold multiple Modules of various functionality.

TS420 Perivascular Flow Module Specifications

GENERAL FEATURES

Size 5.125" h x 4" w x 9.062" d

Weight: 2.2 lbs.

Module fits 2 Console slots (20HP) in T402 or T403 Consoles

Power: Derives input power from 400-Series Consoles. Installation in a Console is required.

OPERATIONAL TECHNOLOGY

Ultrasonic Transit-time

FLOWPROBE COMPATIBILITY

PS-, V-, PR-, PMP- & PAU-Series

PROBE CONNECTOR

Front panel 10-pin connector. Accepts research perivascular Flowprobes and extension cables with male CRA 10-pin connectors.

AUTOMATIC ADJUSTMENTS

Probe size identification and corresponding flow output ranges. Volume flow calibration of applied Probe.

DIGITAL DISPLAY

4-Digit (14 segment) LED displays Flow / Probe data / Error Messages

Bar Indicator Light: Displays received signal amplitude for continuous monitoring of Probe signal quality

ANALOG DISPLAY

Taut-band needle (-0.2 volts to +1.2 volts) displays Flow / Received Signal Amplitude / Calibration information

ZERO ADJUST

Recessed momentary push button to zero flow reading at stopped flow

MODE BUTTON CONTROLS

Select modes of operation of displays and outputs

- **MEASURE MODE:** Displays current volume flow values. Indicator light bar shows received signal strength
- **TEST MODE:** Displays Probe size & received signal amplitude
- **ZERO MODE:** Sets outputs to zero flow to calibrate external recording device
- **SCALE MODE:** Sets outputs to scale factor flow to calibrate external recording device

LOW RANGE

Low Range increases flow gain by a factor of 4

FILTER PROPERTIES

- 0.1, 10, 40 Hz: 2nd order Butterworth, with a third passive pole at 160 Hz
- 160 Hz: 3rd order Butterworth

INVERT

Invert the polarity of analog flow outputs and flow displays

SIGNAL OUTPUTS

8 accessible signals via 400-Series Flowmeter Console's back-panel terminal block: Pulsatile Volume Flow; Mean Volume Flow, Received Signal Amplitude (2); Phase (4)

ULTRASONIC FREQUENCY RANGE

600 KHz to 14.4 MHz; Probe size dependent.

FLOW OUTPUT

Front panel mounted BNC output connector & rear panel terminal block:

- Pulsatile/Average Volume Flow
- Filtering controlled by front panel selectable filters
- Voltage range: -5 to +5 volts
- Output resistance: 500 Ohm
- Full Range for Flow: -5 to +5 V (bidirectional flows, with range of 5 x scale factor flow)

AUTOMATIC DIGITAL PROBE ID & CALIBRATION

TS420 circuitry reads Probe operational data (size, scale & calibration) programmed in the probe's EPROM.

- Probes with 10 or 12-pin connectors: EPROM installed in the connector.
- 4-pin Probe connectors require separate EPROM keys

CAL KEY PORT: Front panel socket accepts 3-pin EPROM calibration keys for Flowprobes with 4-pin connectors. Flowmeter reads and uses "CAL KEY" data if both a separate calibration key and connector EPROM are present.

SYNCHRONIZATION

Rear panel jumpers select synchronization mode

- Self-Triggering Mode: "SYNC IN" to "SYNC OUT" jumper on each Module
- Sequential Triggering Mode: "SYNC IN" crossed to "SYNC OUT" between Modules

