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Find the *Transonic Systems Inc. TS410* at our website: *Click HERE*

T400 SERIES

Precision *In Vitro* & Extracorporeal Tubing Flow Measurement

TS410 Flowmeter Module



TS410 Tubing Flow Module

Whether you require tubing flow measurements in the animal lab or in the R & D engineering suite, Transonic Systems TS410 Tubing Flowmeter Module gives you precision volume flow measurements in tubing with user friendly features applicable to laboratory bench settings, *in vitro* and extracorporeal use.

Compact single-channel TS410 Flowmeter modules plug into 400-Series Instrumentation Consoles (T402/T403) to mix or match measurement capabilities with other Transonic Systems laboratory modules and provide:

- True Volume Flow Measurement in Tubing
- Gold Standard Transit-time Technology
- Measurement Capability for Diverse Fluids: Blood, Saline, Water, Cell Culture, Physiological Buffer Solutions, Blood Analogs such as Glycerine/Water Solutions
- Programmable Alarm Conditions:
  - High / Low Flow Threshold Alarm
  - Bubble / "Received Signal" Alarm
- On-site Recalibration of Flowsensors for changed or new parameters (or conditions)
- 400-Series Instrumentation Console compatibility: T402, T403.



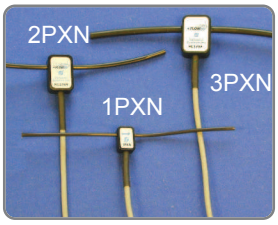
ME-PXL Clamp-on Sensor



ME-PXN Inline Sensor

Two tubing flowsensor styles and multiple sizes from 1.2 mm ID to 25.4 mm ID offer versatile functionality to fit every flow circuit application including:

- Circulatory support device development (VAD Performance & Artificial Heart Development)
- Isolated heart and perfused organ studies
- Mock circulatory models
- Non-contact sterile flow measurement of biologicals and bioreactors
- Flow phantoms and any experimental, or non-human clinical or process application where flow measurement in tubing is needed.



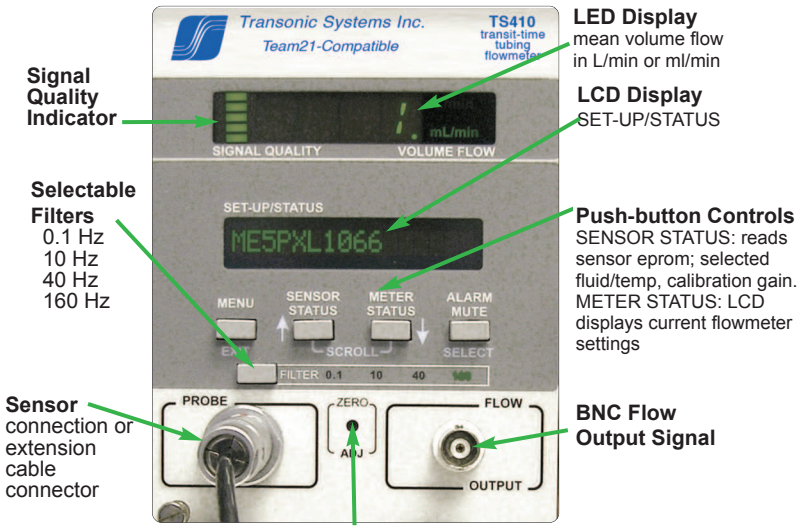
ME-PXN inline Sensors

CE

Transonic Systems Inc.
The Flow Measurement Specialists
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TS410 Tubing Module Specifications



GENERAL FEATURES

Weight/ Size 5.125" high x 4" wide x 9.062" deep; 2.3 lbs.
Module is 2 console slots (20HP) wide.

Console Compatibility 400-Series Flowmeter Consoles (T402, T403):
96 pin DIN connector to proprietary backplane.
Thumb-screw to lock into console on front panel
Power: Derives input power from 400-Series Consoles

AUTOMATIC FLOWMETER ADJUSTMENTS

Sensor size identification and corresponding flow output ranges.
Volume flow calibration of applied sensor; serial number displayed of active Flowsensor.

SET/UP STATUS & PROGRAM PARAMETERS

STATUS MODE (White button labels)
Status message displayed on LCD.
Sensor Status: sensor type & calibration
Meter Status: Active flowmeter settings & alarm status
Alarm Mute: Audible alarm On/Off

PROGRAM MODE: (Blue button labels) - EXIT; SCROLL; SELECT.

SENSOR CONTROLS Select factory preprogrammed calibration options; Adjust Flowsensor gain to change calibration on-site

METER CONTROLS

1/4 Flow Scale: increases flow gain by factor of 4 for low flow measurements
Calibrate Scale: sets output to 0 and 1 Volt to calibrate external recording devices with scale factor flow.
Invert flow: inverts polarity of analog outputs & flow display
Alarms Menu: 3 level program to select, set thresholds, and activate Alarms for "Low Flow", "High Flow" and "Received Signal" Interruption

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

ZERO FLOW ADJUST: momentary recessed push button to zero flow reading at stopped flow.

DIGITAL DISPLAY: 4-Digit (14 segment) **LED**
Displays Volume flow / Probe data / Error Messages
Bar Indicator Light: Displays received signal for continuous monitoring of sensor signal quality

LCD DISPLAY: One line 16-character alpha numeric LCD displays program parameters, sensor and meter status, alarm settings. Default displays sensor serial number.

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)

SENSOR CONNECTOR Front panel 16-pin connector
Accepts research Inline and Clamp-on Flowsensors and extension cables with male ODU16-pin connectors.

AUTOMATIC DIGITAL SENSOR IDENTIFICATION & CALIBRATION: TS410 circuitry reads connector operational data (size, scale & calibration) programmed in the sensor's EPROM.

ULTRASONIC FREQUENCY RANGE
600 KHz to 14.4 MHz; Sensor size dependent

FLOWSENSOR COMPATIBILITY
Accepts Transonic "Precision" Tubing Flowsensors with 16-pin ODU connectors
ME-Prefix: Extracorporeal Sensors for 400-Series Flowmeters
PXL-Series: Precision XL-Series Clamp-on Sterile Tubing Flowsensors with 4 transducers
PXN-Series: Precision XN-Series Inline Flowsensors with 4 transducers

SIGNAL OUTPUTS: 8 accessible signals via 400-series Flowmeter Console's odd numbered back-panel terminal block connections:
Pulsatile Volume Flow; Mean Volume Flow
Received Signal Amplitude (2); Phase (4)

SYNCHRONIZATION: Module rear panel switch for selecting 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.

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