Doppler Flow Pump

Model 769

PERFORM SENSITIVITY & VELOCITY QA ON DOPPLER ULTRASOUND

The Doppler Flow Pump is designed to simulate blood flow in a tissue mimicking phantom, and may be used to perform quality assurance testing of Doppler ultrasound devices. The two most common tests are sensitivity and velocity accuracy, but a number of other useful tests are also described in the literature (see references).

The pump is compatible with all ATS and CIRS doppler flow phantoms. A complete list can be found on the back of this page.

The Pump includes the following components:

1) A peristaltic pump that provides flow at rates from 0.04 to 750 ml/min, which translates to an average flow velocity of 2-70 cm/s. (Peak flow velocities will be 2-4 times greater than the average flow velocity, because of laminar and pulsatile flow.)

2) A fluid reservoir pre-filled with CIRS Doppler fluid. Replacement fluid may be ordered separately.

3) A pulse dampener that converts the pulsatile flow from the peristaltic pump into constant velocity flow.

4) Convenient color-coded tubing with quick-disconnect fittings

5) Graduated cylinder for purging phantoms of Doppler Fluid after each use. Also useful for calibrating the pump.

6) Pump-to-USB cable, allowing the pump to be programmed to mimic a human pulse. Instructions and examples are included.

Features

- Used in conjunction with ATS Urethane or Zerdine phantoms
- Max Flow Rate is 750 mL/ min
- Min Flow Rate can be as low as 0.04 mL/ min*
- Pulsatile or Constant Velocity configurations available
- Doppler fluid simulates acoustic and physical characteristics of blood
- All components stored in compact case for easy transport

*Actual value will vary depending on phantom used

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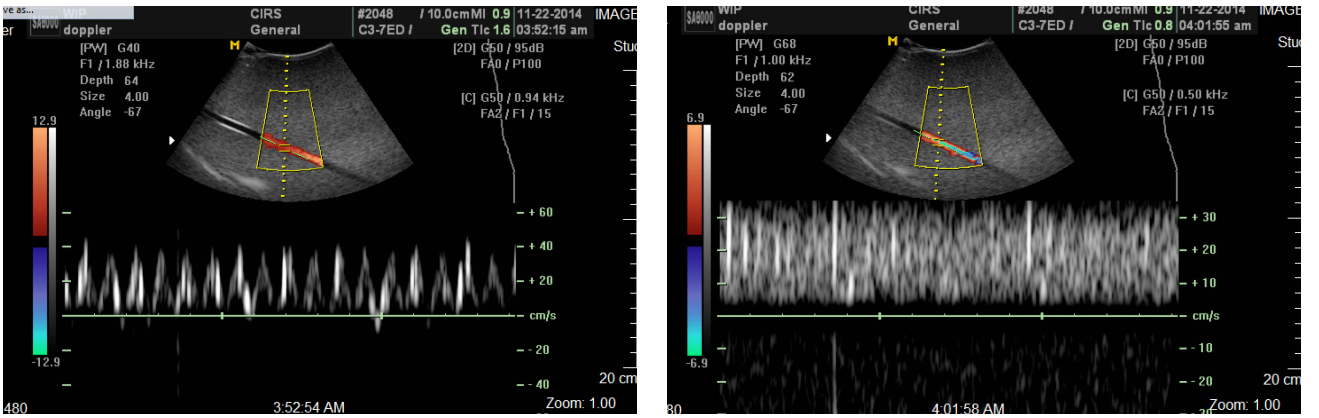
Tissue Simulation & Phantom Technology



Doppler ultrasound images with Doppler Ultrasound Flow Phantom showing pulsatile and continuous flow.

SPECIFICATIONS

DOPPLER FLOW PUMP

MOTOR TYPE	Step motor
MOTOR STEPS PER REVOLUTION	200
MICROSTEPPING	1/8 to 1/1 depending on motor speed
DC CONNECTOR	2.1mm, center positive
VOLTAGE AT DC CONNECTOR	24V DC at full load
AMPERAGE	900mA at full load
POWER SUPPLY TYPE	Unregulated linear external wall adapter, country and power source specific
POWER SUPPLY OUTPUT RATING	24V DC @ 1A
DIMENSIONS	9” x 4” x 8” High (23 cm x 10cm x 20 cm)
WEIGHT	4.51 lbs. (2.05 kg)
MAXIMUM SPEED	372 rpm
MINIMUM SPEED	0.0168 rpm
MAXIMUM PUMPING RATE	775.2 mL/min with 3/16 ID tubing
MINIMUM PUMPING RATE	0.04 mL/min with 3/16 ID tubing

DOPPLER FLUID

PROPERTY	HUMAN BLOOD (37°C)	DOPPLER FLUID (22°C)
Viscosity (mPa)	3	4 ± 0.5
Velocity (m/s)	1583	1570 ± 30
Attenuation (dB/cm/MHz)	0.15	< 0.1
Backscatter ($f^4\ m^{-1}\ sr^{-1}$)	$4x10^{-31}$	Not Measured
Fluid Properties	Non Newtonian	Newtonian
"Validation of a New Blood-Mimicking Fluid for Use in Doppler Flow Test Objects", K. Rammnarine, et. al., Ultrasound in Medicine & Biology, Vol. 24. No. 3, pp.454.		

COMPATIBLE PHANTOMS

MODEL	DESCRIPTION
ATS 524 & 525	Peripheral Vascular Doppler Flow Phantom
ATS 527	Doppler Flow Directional Discrimination Phantom
ATS 523 & 523A	Cardiac Doppler Flow Phantom
069A	Doppler Flow Phantom
Custom phantoms are available upon request. Contact customer service at admin@cirsinc.com for more information.	

References:
1.Performance Criteria and Measurements for Doppler Ultrasound Devices: Technical Discussion; Second Edition. AIUM Technical Standards Committee, 2002.
2.Testing of Doppler Ultrasound Equipment. Institute of Physical Sciences in Medicine, Report No. 79, ed. PR Hoskins, SB Sherriff and JA Evans, 1994.
3.IEC TS 61895: Ultrasonics – Pulsed Doppler diagnostic systems – Test procedures to determine performance. First edition, 1999-10.

Publication: Doppler Ultrasound Flow Pump DS 021020

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