

isolated heart systems



Student Isolated Heart Perfusion Apparatus



- For the perfusion of the excised mammalian heart
- Large capacity warming bath with temperature controlled to 0.5°C
- Free-standing apparatus uses minimal bench space

The 'Langendorff' preparation offers extreme flexibility for handling the perfusing fluids:

- **The perfusing fluid reservoir serves as a Mariotte flask that maintains a constant perfusion pressure as the reservoir empties**
- **The perfusion pressure can be varied easily and rapidly by varying the height of the reservoir above the perfused heart. The height of the reservoir can be varied through 62.5 cm (24 in)**
- **To rapidly change perfusing fluids a second reservoir (offered as an accessory) can be added to the second frame upright and a 'Y' connector can connect it to the glass warming coil**

The 1 liter reservoir supplies a constant head of perfusate. The perfusate flow rate is controlled by one of two methods. If the Reservoir cap is off, the flow rate is controlled directly by a pinch clamp on the outlet tubing. If the reservoir cap is tightly sealed, a Mariotte flask is created and the flow rate is set by the perfusion pressure. The height of the reservoir determines this pressure which in turn sets the rate of air allowed to enter the reservoir. As air enters, the perfusate flows out. This reservoir is placed in the three-prong, spring clip reservoir holder that has a 20 cm (8 in) long tube that slips on the top of a rod and locks in place by a knurled set screw. Using this set screw the height of the Reservoir can be varied from 15 cm (6 in) above the top of the rod down to the top of the rod. If it is necessary to lower the reservoir even more, the holder has a clamp mounted on one side that can locate the holder at any point on the rod. The total vertical movement of the reservoir is 62.5 cm (24 in) above the top of the fluid warming coil. The aeration reservoir is mounted to the side of the reservoir holder. The perfusing fluid is led from the main reservoir to the aeration reservoir by tubing provided. The aeration stone is mounted on the end of 2 m (6.6 ft) tubing. This aeration stone fits inside the aeration reservoir and provides a high level of oxygenation to the perfusant.

The transparent, heavy plastic water bath which warms the perfusant measures, H x W x D, 15.5 x 16.5 x 14 cm (6-1/4 x 6-1/2 x 5-1/2 in) and has a capacity of 3.6 liters. The bath is heated by two simple sturdy cartridge elements that are mounted through the front of the tank near the bottom and extend 5 cm (2 in) into it. These heating elements have a combined rating of 80 watts. The temperature of the water is controlled by a front panel dial graduated from 15° to 45°C by 5°C graduations. A metal tube mounted inside the bath carries a sensitive thermistor sensing bead. Once stabilized, this system maintains the water temperature within 0.5°C of the desired temperature. The front panel of the water bath has

two indicator lights. One illuminates when the bath is plugged into the AC line. The second illuminates whenever the heating circuit is energized. A screw-in fuse holder is also mounted on the front panel for easy access. A drain hole with tubing, a plug and a tapered plastic cone are located in the bottom of the water tank. The soft rubber bung that carries the stem of the warming coil fits into the cone making a leakproof joint. The glass warming coil for the perfusing fluid is 5 cm (2 in) diameter by 9 cm (3-1/2 in) long. It has a capacity of approximately 35 ml. The stem of the warming coil connects to the heart cannula with tubing and a pinch clamp controls the flow of the warmed perfusate. A clamp and grooved rod are supplied for securing the bottom of the excised mammalian heart.

The heart cannula has openings to accommodate both a manometer and thermometer. The manometer has a fixed clamp for mounting directly to a crossbar and is connected to the cannula by tubing. The scale reads 0 to 250 mmHg and is free to move up and down behind the tubing to facilitate zero adjustment. The glass thermometer is straight, 10 cm (4 in) long and graduated from 0° to 50°C by 0.1°C increments. It is mounted in a rubber bung and fits into the side arm of the heart cannula. All of the clamps, stands and rods supplied with this apparatus are from our Stronghold™ line. Two light pulleys are supplied and carry a thread from the heart to a transducer (not supplied) or writing point.

Order #	Product
System Components	
50-0496	Constant Head 1 L Reservoir
50-0488	Reservoir Holder
50-0587	Aeration Reservoir
50-0595	Aeration Stone with Tubing
50-0537	Bath Assembly
50-2898	Tubing 1 m (3-1/4 ft)
50-0554	Warming Coil
50-2369	Rubber Bung
50-2914	Screwclips, 2
50-0562	Red Rubber Bung
50-0563	Cannula
50-6287	Thermometer
50-0588	Manometer
50-7624	Plug
50-0596	Tying Rod
53-2262	Pulleys, qty. of 2
53-2512	Rod, 150 mm (6 in)

Order #	Product
System Components	
53-2522	Rod, 250 mm (10 in)
53-2530	Rod, 500 mm (20 in)
53-2550	Rods, 750 mm (29 in), qty. of 3
53-2336	Extra Weight Rectangular Laboratory Stand Base, qty. of 2
53-2102	Small Clamp with Extension Stem
53-2012	Closed Connectors, qty. of 5
53-2032	'T' Connectors, qty. of 3
53-2062	Large 360° Rotation Connector
53-2244	Male-Female Hinged Adapter
50-0686	Ink Pen with Lever
50-7681	Replacement Ink Pen
50-0678	Brodie Lever

Order #	Product
50-2864	Student Isolated Heart Perfusion Apparatus, 115 VAC, 60 Hz
50-2872	Student Isolated Heart Perfusion Apparatus, 230 VAC, 50 Hz
50-2880	Second Reservoir Set Includes Reservoir Holder, 1 L Reservoir, glass Aeration Reservoir and Aeration Stone. Set comes complete with tubing and connectors for mounting on second rod of Perfusion Apparatus

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