

The air vacuum pumps are ideal for collecting sampling media onto filters, or pulling airborne gases through active sampling systems, for radiological detection applications.

RAP-1 & RAP-3

Regulated Air Vacuum Pumps



Model RAP-1



Model RAP-3

- Regulated airflow
- Durable construction
- Portable system
- Adjustable flow rate

RAP-1

The Model RAP-1 is a compact, portable system containing an oilless vacuum pump, motor and airflow regulator. The Thermo Scientific airflow regulator is designed to maintain a constant pressure drop across an in-line orifice by controlling a variable bypass valve into the pump. The orifice is adjustable, permitting flow rate adjustment from near zero up to the maximum pump flow capacity. This flow control system permits the pump to operate at a minimum pressure drop at all times which provides cooler pump operation to extend the lifetime.

Some RAP-1 operating curves are shown on the backside. The top line is the pump operating curve. The curves below the pump operating curve show how the sample inlet flow varies with intake vacuum for two different regulated settings.

After the regulator is set at a particular inlet flow the sample flow rate follows a similar curve, decreasing as intake vacuum increases.

RAP-3

The Model RAP-3 consists of a diaphragm vacuum pump with regulator for use with air monitors or samplers where a nearly constant airflow is desirable. Airflow into the controlled air inlet passes through a variable orifice, causing a pressure drop across that orifice. Each side of the orifice is vented to one side of the regulator diaphragm so the diaphragm is positioned by the pressure drop across the orifice and, therefore, by the flow.

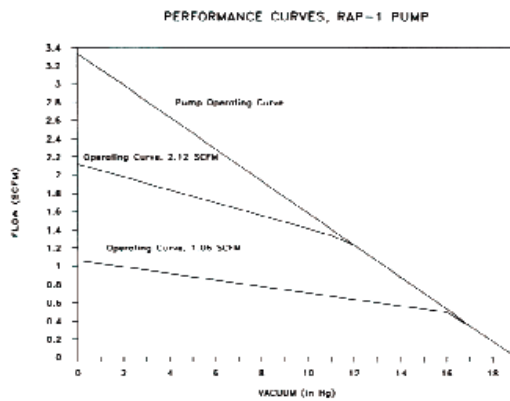
Attached to the regulator diaphragm is a bypass valve. When the pressure drop across the orifice exceeds the spring pressure on the diaphragm, the bypass valve will start opening. Air will then flow into the bypass inlet and out to the pump. Thus, the bypass flow is varied by the diaphragm to hold the controlled flow constant. This system allows the pump to move a maximum amount of air at minimum head pressure at all times. The pump, therefore, runs cooler and has a longer lifetime.

It should be noted that when pressure varies, at a constant rate, the flow through an orifice varies approximately as the square root of the ratio of the absolute pressure. Thus, if paper loading causes a pressure drop to one-half of the original, the flow, referred to atmosphere, will decrease to 0.7 of the original. The orifice is adjustable, allowing flow rate adjustment from near zero up to the maximum capacity of the pump.

RAP-1 & RAP-3 Specifications

RAP-1

Pump Type: Oilless, carbon vane.
 Motor: 1/4 HP, 115 V, 60 Hz, 6 A (220 B, 50 Hz optional)
 Vacuum: 19 in. Hg at sea level.
 Flow Rates: See figure.
 Size: 451 x 178 x 235 mm (18 x 7 x 9.5 in.)
 Weight: 15 kg. (33 lbs.)

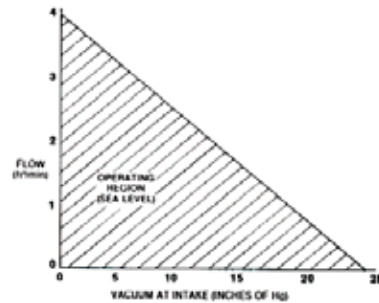


RAP-3

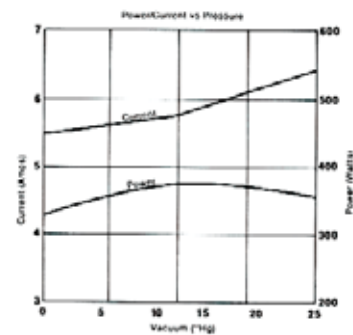
Pump Type: Diaphragm
 Maximum Capacity: 111 L/min.
 Maximum Vacuum: 23 in Hg at sea level.

Typical Operating

Flow Rates: Shaded region of figure below.
 Filter: Inlet moisture trap and bypass filter furnished.
 Power: 115 V ac, 60 Hz, 9.0 A.
 Thermal protector: Furnished in the motor.
 Size: 377 x 283 x 167 mm (15 x 11 x 6.5 in.)
 Weight: 11.45 kg. (25 lbs.)



Typical Operating Flow Rates



Power Curve

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