



Valcor Scientific

Principles of Operation

Dispensing Pumps

Inert, Solenoid Operated, Piston Design

Model: SV600

INTRODUCTION

Valcor Scientific, a Division of Valcor Engineering Corporation has designed and engineered rugged, reliable solenoid operated pumps for more than 20 years.

These pumps are activated by a solenoid coil, which when electrically energized and de-energized, move the piston back and forth to dispense liquids.

The SV600 Series pumps are cost-effective, low maintenance dispensers for a wide variety of liquids. Each model provides a different output range.

CONSTRUCTION

The pump materials in contact with fluids are FDA Generally Regarded As Safe grade of polypropylene, borosilicate glass, and elastomers of either Viton®, EPDM or silicone.

For less aggressive fluids or those not requiring high-purity contact surfaces, Valcor Scientific offers the SV500 Series of stainless steel dispensing pumps. Please consult the SV500 data sheets for more information.

GENERAL OPERATION

The accompanying diagram illustrates the internal construction of the SV600 Series pump. A unique feature of these pumps is the employment of a rolling diaphragm to isolate the metal actuator parts from the wetted pump surfaces.

The pumps employ Valcor's exclusive dynamic o-ring pumping system. This o-ring system seals the piston while allowing the pump chamber to refill.

The piston is retracted when the solenoid is energized, allowing liquid to enter the volume above the

A dynamic pump o-ring rides in a groove on the piston. When the solenoid coil is energized, the piston and its dynamic pump o-ring are drawn through the fluid present in the pump chamber - the dynamic o-ring slips (it does not seal in this energization stroke) while the umbrella shaped outlet check valve maintains a seal at its end of the pump.

De-energization of the solenoid coil allows the return spring to push the piston back to its stop with the redundant o-ring seal in its groove against the lower land of the piston as well as the glass cylinder wall, thus creating an output pressure stroke while at the same time creating suction to draw liquid through the inlet port.

The piston return stroke yields the preadjusted volumetric output set by the stroke length on the stop adjusting screw.

The complete pumping cycle requires energizing the solenoid coil momentarily (typically 1/4 second) and de-energizing to permit the fill and output dispense to occur. Individual data sheets specify output capabilities of the various pumps in the SV600 Series.

pump o-ring. A return spring pushes the piston back down when the coil is de-energized.

The dynamic o-ring seal divides the pump into an upper and lower chamber. As the coil is energized and energized, liquids are drawn into the lower chamber at the same time as they are dispensed from the upper chamber.

The volume of liquid dispensed per stroke depends on the piston stroke length which can be adjusted manually. Additionally, the frequency of stroking can be controlled digitally.



By adjusting stroke length and frequency, the desired flow rate can be achieved.

To adjust the liquid dispensed per stroke, a locknut is loosened on the solenoid stop screw, the screw is rotated to increase or decrease the stroke length. The locknut is then re-tightened.

To adjust the frequency of stroking, the coil can be energized more or less frequently until the desired dispense rate is achieved.

HOW TO ORDER

Select the voltage code and elastomer code from the table below. **Example:** SV603P + [Voltage Code] + [Elastomer Code] = SV603P24V

Voltage Code	
115V/60Hz AC = 115	12VDC = 12
24VDC = 24	
Elastomer Code	
Viton® = V	EPDM = E



Valcor Scientific

Valcor Engineering Corporation®

2 Lawrence Road • Springfield, New Jersey 07081

973-467-8400 • Fax: 973-467-9592

<http://www.valcor.com>

© Valcor Engineering Corporation® Printed in USA