TAKASAGO ELECTRIC, INC.

Metering Pump

MCP-50

Features

- **Highly Accurate Dispensing**

Dispenses accurate amount of fluids per cycle, repeatability of ±1% at 15μL to 50 μL and ±2% at 5μL to 15 μL*[1]

*1: It was determined by measurement under the standard test conditions (please see the following). Set pumped volume may alter or repeatability may decrease depending on usage conditions.

- **Simply Driven by DC Solenoid**

Only controlled by the ON and OFF operations of DC power supply while no stepper motor nor special driver is required

- **Adjustable Dispensing Volume**

Dispensing volume can be manually adjusted to between 5 μL and 50 μL per shot.

- **Excel in chemical resistance**

This pump is compatible with a wide variety of chemicals because of its diaphragm.

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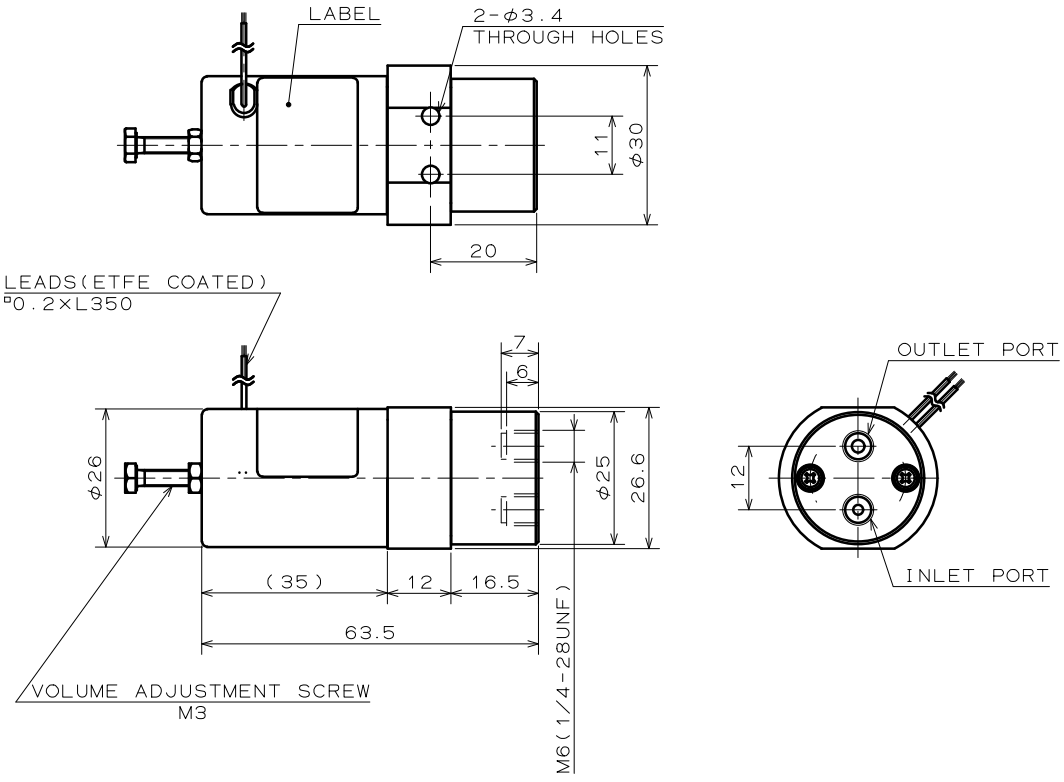
2008.08

Specifications

Model Number	MCP-50	
Rated Voltage	12 VDC, 24 VDC	
Power Consumption	4.4 W	
Repeatability	±1% at 15μL to 50 μL ±2% at 5μL to 15 μL	
Maximum Operating Frequency	4 Hz	
Port Connection	M6, 1/4-28UNF	
Fluid	Fluid chemically compatible with wetted materials below	
Media Temperature Range	10°C to 40°C	
Ambient Temperature Range	10°C to 40°C	
Weight	About 110 g	
Insulation Class	Class B	
Dielectric Strength	1500 VAC for 60 seconds	
Wetted Materials	Valve case, Piston, Cylinder	PTFE, POM or PP
	Diaphragm	FPM
	Check valve	FPM

Dimensions



Adjusting the discharge of the metering pumps

By turning the volume adjustment screw, the pumped volume per cycle can be changed.

Turning the volume adjustment screw clockwise (screwing the volume adjustment screw into the metering pump) decreases the pumped volume, and turning the volume adjustment screw anticlockwise (unscrewing the volume adjustment screw from the metering pump) increases the pumped volume. After making an adjustment, please tighten the volume adjustment screw with the locknut. The adjustable range of the pumped volume is limited by the number of turns, which is about four anticlockwise turns from the point where the screw is fully tightened (pumped volume = 0 mm^3).

Usage Precautions

• When a pre-set pumped volume is small, it may take a long time to completely displace the air inside the metering pump/piping with liquid. At the initial discharging of the metering pump, the displacement of the air can be done much faster if the pumped volume setting is set around the maximum value.

• The displacement efficiency of gas varies depending on the installation position of the metering pump. It is recommended to install with the recommended position since the position influences the displacement of gas bubbles formed in fluid.

• A set value of pumped volume may be altered by the looseness of the volume adjustment screw. Please tighten the locknut firmly in order to prevent such a problem.

• When you decrease pumped volume by turning the volume adjustment screw clockwise, please do not turn the volume adjustment screw with excessive torque while exceeding the adjustable range. It may cause failure.

• When you increase pumped volume by turning the volume adjustment screw anticlockwise, please do not turn the screw too much. If the volume adjustment screw is turned in the excess of the maximum pumped volume, the volume adjustment screw may become detached from the metering pump and there is a risk that the internal parts could be displaced.

Standard test conditions

Tubing (Please see the figure of the tubing for the standard test on the following page.)

• PTFE tube (I.D. x O.D. = 2 mm x 3 mm) is used.

• The length of the tubing is set at 1000 mm on the inlet side and at 100 mm on the outlet side.

• A reservoir tank is placed below the metering pump. The height from the liquid surface to the inlet is set at 500 mm.

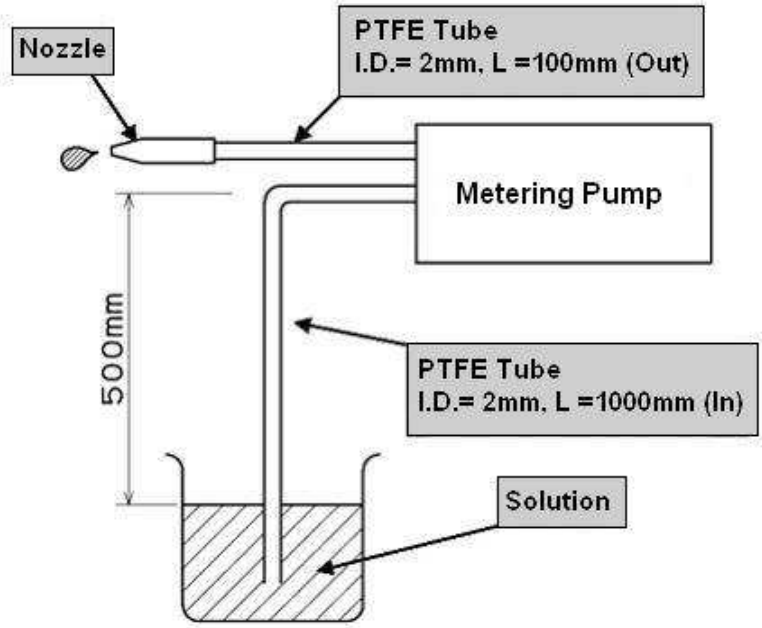
• The height of the tip of the outlet tube is set at 0mm from the horizontal plane.

• Depending on the set pumped volume, a nozzle is installed at the end of the outlet tube to reduce the diameter of the tube.

Note: If the discharge of the metering pump is set low and the diameter of the tube is large, the pump may not discharge liquid in each cycle due to the influence of surface tension etc.

Pumped volume and nozzle installation guide

Set pumped volume (mm^3)	10 – 50	50 – 100	100 and over
Diameter of the nozzle tip (mm)	0.5	1.5	No nozzle



Operating Conditions

• Ambient temperature and fluid temperature are maintained at room temperature (20°C).

• The rated voltage is applied. It is operated with the maximum operating frequency and a duty cycle of 50%. Example: In the case of MCP-50, it is operated with the operation frequency of 4 Hz (ON: 125 ms, OFF: 125 ms).

Measurement Conditions

• The liquid used is water.

• The metering pump is continuously operated until the inside of the metering pump and the tubing are filled with the fluid before the measurements are commenced.

• The pumped volume of 10 cycles is measured by gravimetry after which the pumped volume per cycle is calculated.

Measuring the accuracy of the discharge

• The pumped volume of 10 cycles is measured ten times and the average is calculated.

• The difference between the maximum and minimum values of the ten cycles and the average is determined. The repeatability of pumped volume is expressed in percentage variation from the average.