

# SAFETY SYRINGE PUMP

PHM-108

USER'S MANUAL



**DOC-093**

**Rev. 1.3**

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Med Associates Inc.  
P.O. Box 319  
St. Albans, Vermont 05478

Phone: 802.527.2343  
Fax: 802.527.5095  
[www.med-associates.com](http://www.med-associates.com)

notes

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## CHAPTER 1 | INTRODUCTION

The PHM-108 Safety Syringe Pump includes a safety timer feature that allows the user to select the maximum dose time from 1 to 99 seconds to prevent animal overdose in the event of computer failure or programming error. Additional safety features include an automatic shut-off switch that stops the infusion when the end of the syringe is reached and a secondary switch controlling power to the motor. This syringe pump is designed to connect to a 28 V DC output.

### Specifications

The standard rate is 3.33 RPM. Optional motors are available for flow rates ranging from 0.017cc/hr to 24.122cc/min.

Standard Motor:	3.33 RPM
Flow Rate:	0.115 cc/min (1 cc syringe) to 4.02 cc/min (50 cc syringe)
Accuracy:	0.50 %
Repeatability :	0.50 %

*Table 1 – Flow Rates for 3.33-RPM Motor*

Flow Rates in mL/min																
			10ml		10ml	12ml	20ml	20ml	20ml	30ml	30ml	35ml	50-60ml		50ml	
1ml	Multifit	2ml	Multifit	5ml	Multifit	Plastipak	Multifit	Monoject	Plastipak	Multifit	Monoject	Plastipak	Multifit	Monoject	Multifit	
0.115		0.408		0.706		1.066	1.102	1.288	1.856	1.965	2.154	2.385	2.636	2.914	3.614	4.02

## CHAPTER 2 | MED LEVEL OPERATE CONNECTOR

Figure 2-1 – Pin Number Diagram

Molex Pin #	Function	Wire Color
1	28V Ground	Black
2	Operate	White
3	+28 Volts	Red

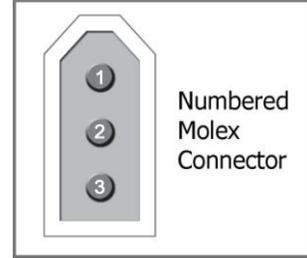
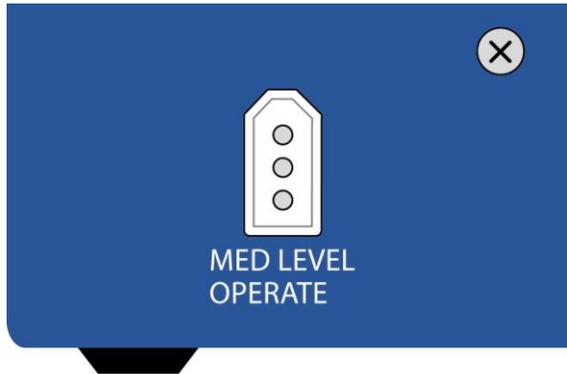


Figure 2-2 – Side Panel Diagram



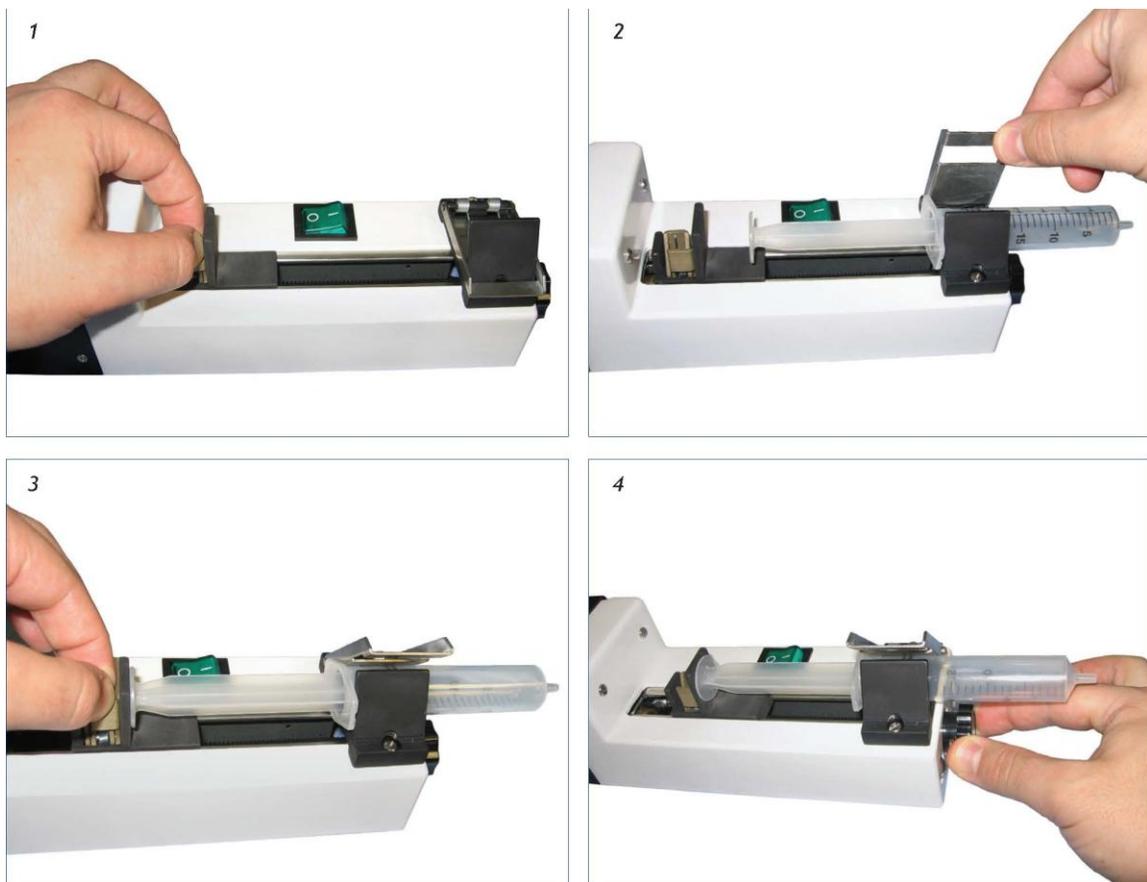
The standard MED LEVEL OPERATE connector is used to supply power, as well as to receive a MED interface output control signal to remotely control the switching on and off of the pump.

## CHAPTER 3 | SYRINGE PLACEMENT

Care should be exercised that the hub of the syringe barrel is positioned against the syringe clamp when loading the infusion pump. Accurate flow rates cannot be assured if there is a gap between the hub and the clamp, as the entire syringe may move forward. It is recommended that the movement of the plunger be checked prior to the experiment by turning the front knob of the Pump.

Figure 3-1 shows the procedure for loading a syringe into the PHM-108 Pump.

*Figure 3-1 – Loading the Syringe*



1. Move the slide to rear (toward motor section) by squeezing the jaws.
2. Insert syringe by lifting clamp cover and placing the syringe body into the clamp.
3. Move the slide to the end of the syringe.
4. Rotate the knob so that the slide makes contact with the plunger and the syringe contacts the clamp.

Once the syringe is installed, operate the Pump until liquid drips out of the syringe or tubing. This ensures that fluid will be infused properly when the Pump is activated.

## CHAPTER 4 | SYRINGES

### Glass Syringes

Extra caution is needed when using glass syringes with a ground glass plunger. These syringes exhibit almost no sliding friction and thus can cause an uncontrolled infusion in the following two ways:

1. The weight of the plunger may be sufficient to push the fluid out of the syringe if the syringe is held with the plunger above the syringe.
2. The weight of the fluid in the tubing may be sufficient to siphon the fluid out of the syringe if the catheter infusion site is below the height of the syringe.

To test for these two conditions, it is suggested that the syringe be connected to the tubing and held vertically at the height of the pump. If no motion occurs, the syringe can then be placed in the pump.

The following may reduce the danger of an uncontrolled infusion:

1. Lower the relative height of the infusion pump in relation to the infusion site. With the pump below the infusion site, the instrument will pump the fluid to the higher elevation.
2. Use a smaller bore catheter, which will reduce the weight of the fluid in the tubing and increase the friction on the flowing fluid.
3. Position the pump so that the syringe is vertical (plunger below), thus the weight of the syringe plunger will be acting against the weight of the fluid.
4. Use a syringe with a rubber seal on the plunger, i.e. an O-ring sealed or plastic syringe.

### Small Syringes

Syringes of less than 5 ml capacity can be held more securely in the syringe clamp if the micro-syringe adapter is used. This insert slides into the standard syringe clamp and can hold two micro-liter syringes if required.

## CHAPTER 5 | OPERATING INSTRUCTIONS

Figure 5-1 – Top of the Controller



1. Load the syringe as described in “Syringe Placement” and begin infusion. The green “INFUSING” light indicates that the Pump is operating.
2. For remote operation, connect the five-foot cable supplied with the unit from the **MED LEVEL OPERATE** connector (Figure 5-1) to an available output on a standard MED connection panel. Switch the ON/OFF switch to ON.
3. For manual operation, press the **MANUAL OPERATE** button located on the top of the controller. The pump will infuse for as long as this button is held down.
4. Set the **MAXIMUM INFUSION TIME** (0 – 99 seconds) using the pushbutton switch on the top of the controller. If the infusion time exceeds this setting due to a programming error or computer failure, the safety timer will activate, which causes the infusion to be stopped and the red “OVER RANGE” light to come on.

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**NOTE:** In order to reset the safety timer once it has been activated, disconnect then reconnect the cable from the MED LEVEL OPERATE connector. This safety feature has been included to ensure that the user recognizes the activation of the timer.

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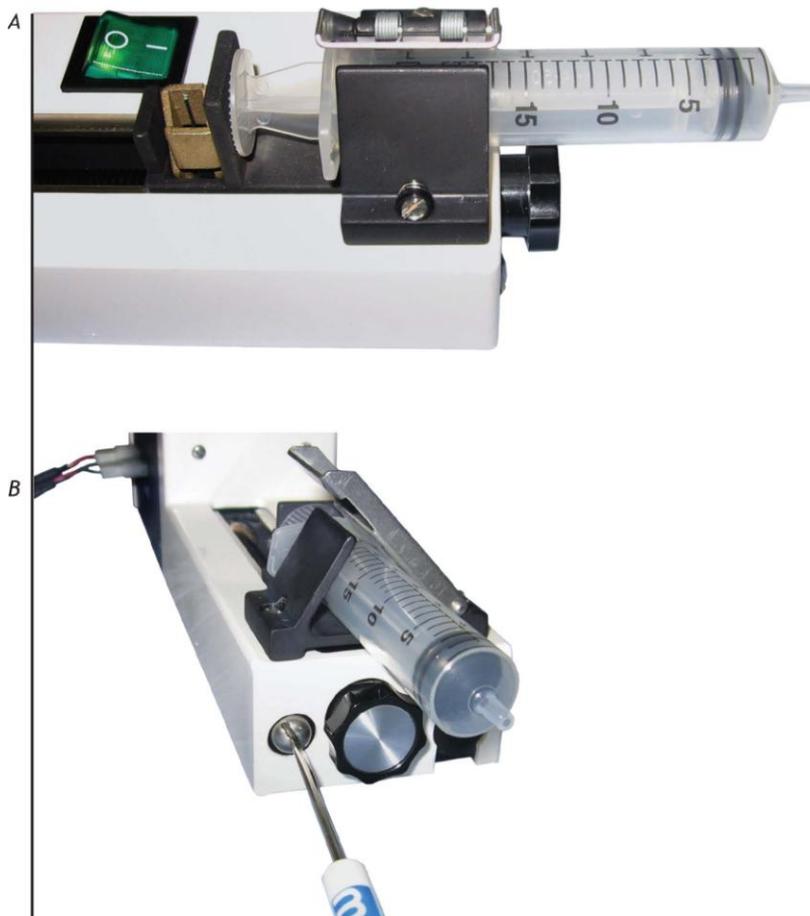
5. The automatic shut-off switch detects when the end of the syringe has been reached, and the infusion will be stopped. The position of the automatic shut-off switch can be adjusted. Refer to the directions below.

## CHAPTER 6 | AUTOMATIC SHUT-OFF SWITCH ADJUSTMENT

The automatic shut-off switch uses an internal micro-switch that detects when the slide assembly reaches a certain point. This point is adjustable so that the pump can accommodate various sizes and brands of syringes. When the automatic shut-off switch is activated, the pump motor will cease operation and the “INFUSING” light will go out.

To adjust the automatic shut-off switch, insert an empty syringe with the plunger at the desired shut-off position. Move the slide assembly to the rear of the plunger (Figure 5A). With the pump on, rotate the adjustment screw (Figure 5B) counterclockwise until the “INFUSING” indicator light turns off (Figure 4). If it is desirable to completely empty the syringe, rotate the adjustment screw clockwise until the syringe plunger is at the 0 ml mark and the “INFUSING” light turns off. Turning the screw counterclockwise will allow the pump to operate longer before the automatic shut-off switch activates. Conversely, turning the screw clockwise will cause the automatic shut-off switch to activate sooner.

*Figure 5 – Automatic Shut-Off Switch Adjustment*



## CHAPTER 7 | MAINTENANCE AND TROUBLESHOOTING

- Cleaning:** Apply alcohol or a mild detergent to a soft cloth to clean the pump. Never submerge the Pump in water. Not Autoclavable.
- Lubrication:** It is recommended that annually a drop of oil be applied to the bearings and Vaseline or silicone spray be applied to the lead screw.
- Changing Motor:** With the power cable disconnected, remove the black motor cover by removing the two Philips screws. Set the screws aside. Disconnect the yellow and white motor cable. Remove the motor and disconnect the cable connection. Connect the desired motor and install. Reconnect the yellow and white motor cable and replace the motor cover using the screws that were set aside.
- Electrical:** All electrical wiring can be checked with an ohmmeter when the power cable is disconnected.
- Mechanical:** If the fluid is not infusing when the Pump is running, check for occlusions in the IV line. If there is no occlusion then the lead screw and slide should be inspected for any signs of visible wear. Any worn part should be replaced.

## Appendix A | Contact Information

Please contact MED Associates, Inc. for information regarding any of our products.

Visit our website at [www.med-associates.com](http://www.med-associates.com) for contact information.

For technical questions, email [support@med-associates.com](mailto:support@med-associates.com).