

# INSTRUCTIONS



## Minipet<sup>®</sup> Pipettor

### *Catalog Numbers*

<i>F37900-1010</i>	<i>AQUEOUS 1ml</i>
<i>F37900-1040</i>	<i>AQUEOUS 4ml</i>
<i>F37900-1100</i>	<i>AQUEOUS 10ml</i>
<i>F37900-1300</i>	<i>AQUEOUS 30ml</i>
<i>F37900-0010</i>	<i>TEFLON<sup>®</sup> 1ml</i>
<i>F37900-0040</i>	<i>TEFLON<sup>®</sup> 4ml</i>
<i>F37900-0100</i>	<i>TEFLON<sup>®</sup> 10ML</i>
<i>F37900-0300</i>	<i>TEFLON<sup>®</sup> 30ML</i>

## **BEL-ART PRODUCTS**

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*CAUTION: The AQUEOUS MINIPET Contains A Natural Rubber Latex Gasket Which May Cause Allergic Reactions If Handled.*

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## IMPORTANT NOTE

*consult Chemical Resistance Chart before using your MINIPET® to determine that it is suitable for the chemical to be dispensed.*

*All parts of the Teflon® Minipet® that come in contact with liquid are glass and Teflon®, thus it is suitable for use with all acids and solvents except HF.*

*The parts of the Aqueous Minipet® that come in contact with fluid are a nickel plated luer lock fitting and valve with EPDM and silicone seal, a stainless steel cannula, silicone tubing and a Teflon® sinker.*

*Each Minipet® is tested before it is shipped to assure that it performs to the highest standards of accuracy and reliability. There may be a small amount of liquid in the barrel which is ordinary tap water used in the testing process.*

# PRINCIPLE OF OPERATION

Minipet® is a variable volume pipette for repetitive dispensing of pre-set amounts of liquid. The accuracy of repetition of the pipette depends mainly on the proper operation of the two-way valve and on the proper sealing between the Teflon® plunger and the glass barrel. The valve consists of two sections, the intake valve and the dispensing valve.

Depressing the plunger for dispensing opens the dispensing valve and closes the intake valve. Releasing the plunger for filling creates a vacuum in the barrel which opens the intake and closes the dispensing valve.

# SPECIFICATIONS

Maximum Volume:	1ml	4ml	10ml	30ml
Graduations:	0.01	0.05	0.2	1ml
Accuracy:	±0.5%	±0.5%	±0.5%	±1%

# ALL MODELS 30ML CAPACITY

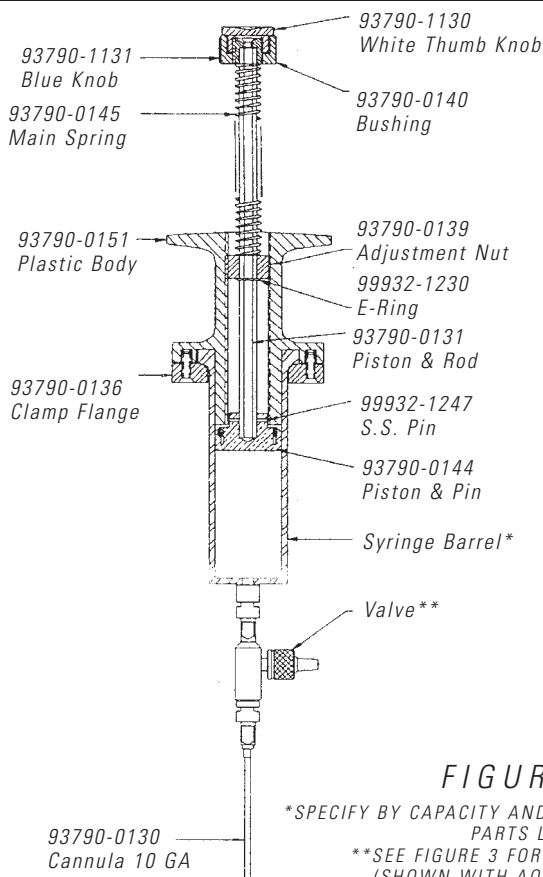


FIGURE 1

\*SPECIFY BY CAPACITY AND/OR MODEL - REFER TO PARTS LIST

\*\*SEE FIGURE 3 FOR CORRECT VALVE (SHOWN WITH AQUEOUS VALVE)

ALL MODELS 1ML, 4ML, 10ML CAPACITY

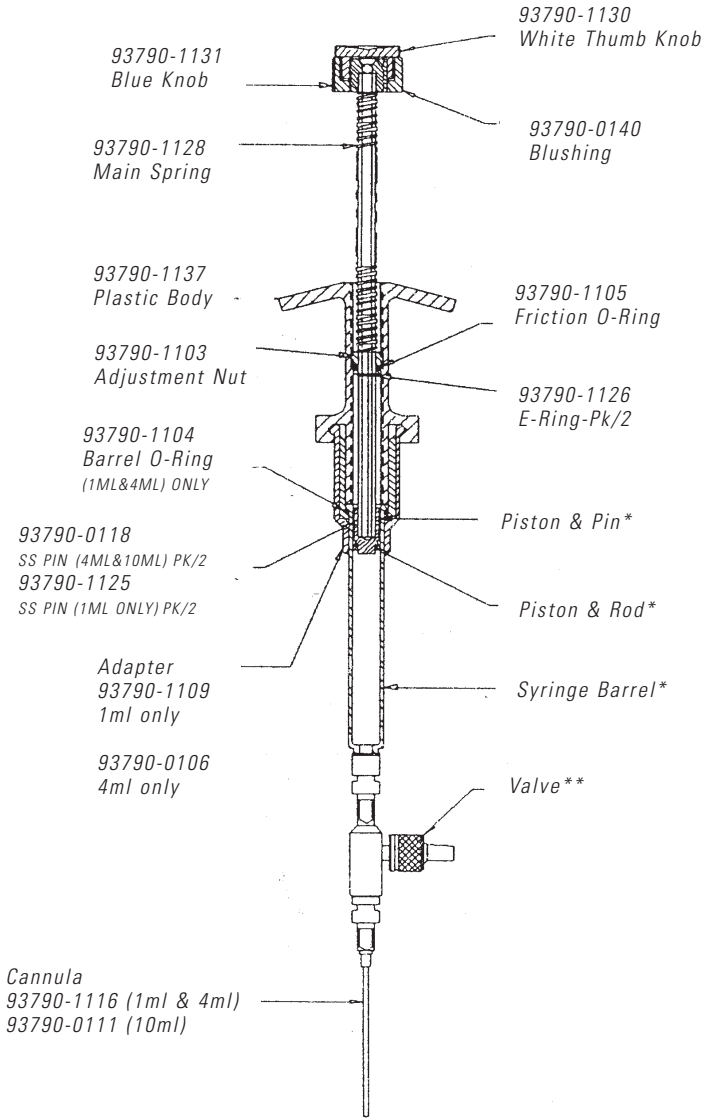
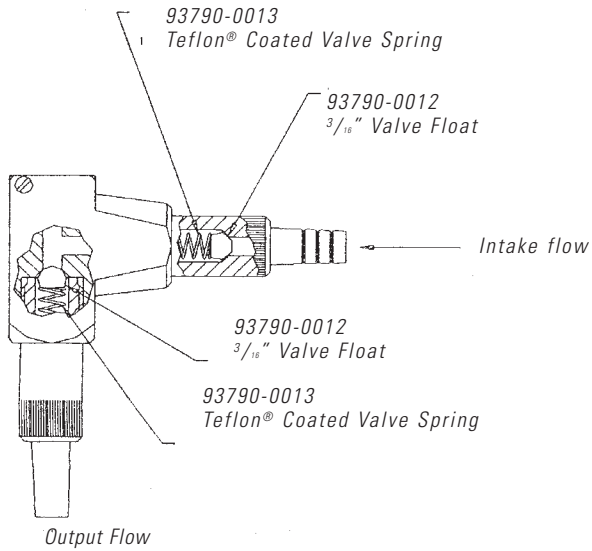


FIGURE 2

\*SPECIFY BY CAPACITY AND/OR MODEL - REFER TO PARTS LIST

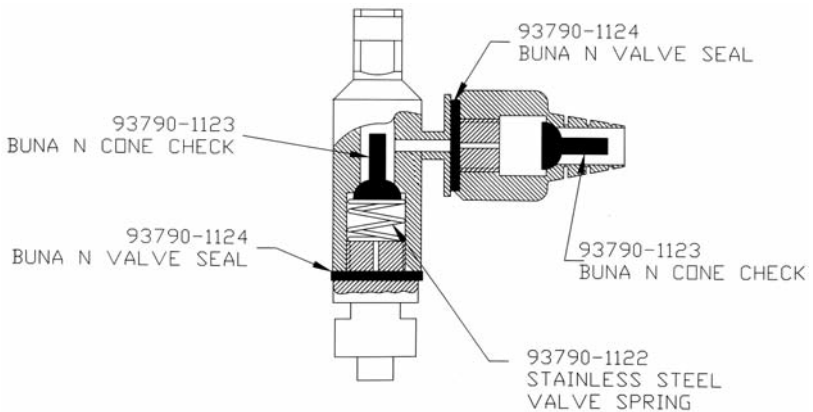
\*\*SEE FIGURE 3 FOR CORRECT VALVE (SHOWN WITH AQUEOUS VALVE)

CROSS SECTION VIEW OF VALVE ASSEMBLIES FOR THE TWO MODELS OF MINIPETS®  
 VALVE ASSEMBLY FOR TEFLON® MINIPET®

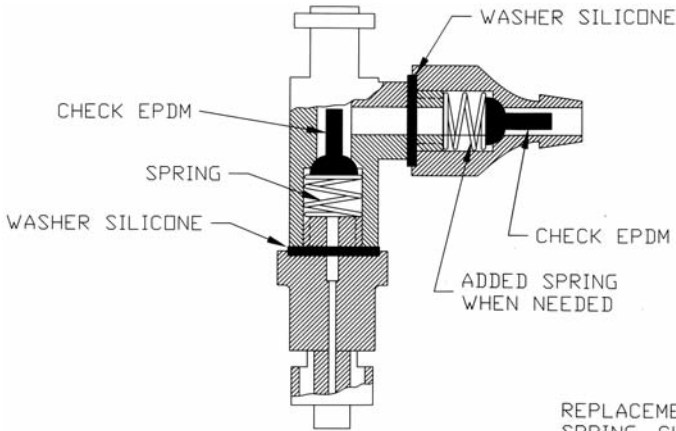


SHOULD SYRINGE BARREL BREAK, WE RECOMMEND THE PURCHASE OF A COMPLETE SYRINGE BARREL AND VALVE ASSEMBLY SEE PARTS LIST FOR ORDERING INFORMATION

VALVE ASSEMBLY FOR AQUEOUS MINIPET®  
 OLD STYLE – PRIOR TO 8/2001



VALVE ASSEMBLY FOR AQUEOUS MINIPET®  
NEW STYLE – SINCE 8/2001



REPLACEMENT  
SPRING, CHECK,  
WASHER SET (1 EACH)  
PN-93790-1139

93790-1100 VALVE ASSEMBLY

Figure 3

OPERATION

TO PRIME

AQUEOUS MODEL

1. Before attaching the two-way valve to the barrel, turn blue knob counter-clockwise to set plunger at maximum volume.
2. Insert the luer tip of the glass barrel (without the valve attached) into liquid and depress plunger fully and release to fill barrel.
3. Attach the valve to the glass barrel by inserting into the Luer lock and turning clockwise one quarter turn. Set up the filling tube with sinker and attach to the valve.

TEFLON® MODEL

1. Turn blue knob counter-clockwise to set the plunger at maximum volume.
2. Slide the coupling nut over the open end of the tubing to attach the tubing to the valve.
3. Insert the tubing into the intake hole of the valve and then push the coupling nut back over the intake, to secure the tubing in place.

WITH BOTH UNITS, then insert the sinker into reservoir and work plunger up and down several times until a smooth action of the piston is achieved.

## TO ELIMINATE AIR BUBBLES

*Should air bubbles appear around piston, the following corrective action should be taken:*

- 1. Make sure the sinker is fully immersed in liquid. Depress plunger quickly and forcefully several times using short strokes.*
- 2. Turn pipette tip end up and tap glass barrel until air bubbles rise to the top. Slowly depress plunger until air is expelled. Make sure to place some absorbent material on the dispensing tip to prevent dripping/spilling.*
- 3. Make sure glass barrel and plunger are free of air bubbles.*

## TO SET VOLUME

- 1. Rotate blue knob clockwise to decrease volume; counter-clockwise to increase volume.*
- 2. Rotate the knob until the bottom edge of the piston is aligned with the appropriate graduation on the glass barrel.*
- 3. Dispense the set volume in a graduated cylinder or use a balance to check and readjust if necessary.*

## REPETITIVE DISPENSING

- 1. Depress plunger fully each time, release pressure and wait until plunger completely returns to the set volume position before dispensing again.*
- 2. Dispensing viscous liquids can be facilitated by placing the liquid container higher than the Minipet® itself.*
- 3. Repetitive accuracy can be enhanced by depressing the plunger rapidly and with uniform force each time.*
- 4. An additional spring is supplied with the AQUEOUS model. The spring may be inserted in the intake side of the two-way valve to increase accuracy, however it will slow the refill cycle.*

## CLEANING

*Harsh and corrosive chemicals should not be left in the unit for extended periods of time. Clean immediately after each use.*

*For general cleaning, use detergent (such as Bel-Art's AQUET® Catalog No. F17094-0030).*

- 1. Empty Minipet® by removing sinker and filling tube from reservoir and depressing the plunger a few times until the fluid is expelled from the barrel.*
- 2. Place sinker in cleaning solution. Depress plunger several times to flush and then empty the unit.*
- 3. Use only chemicals that are compatible with the specific model.*

*Refer to the AQUEOUS TWO-WAY VALVE section for proper handling and cleaning of the valve.*

## AUTOCLAVING

All parts of the AQUEOUS and TEFLON® MINIPET® are autoclavable. However: it is necessary to separate the plunger assembly from the glass barrel to prevent damage to the piston (Refer to Assembly and Disassembly Section for proper handling). Before autoclaving the METAL valve assembly, loosen the two knurled (rough surface) nuts 1/2 turn to relieve compression of the soft gaskets. After autoclaving, remember to tighten the knurled nuts. For safety, test the assembly of Aqueous or Teflon® Minipet® for leaks with water before using.

## ASSEMBLY AND DISASSEMBLY

### TO DISASSEMBLE (1, 4, 10 ml; Models)

1. Hold the plastic syringe adapter (93790-1109, 1ml or 93790-0106, 4ml) or the glass barrel of the 10ml unit in one hand, and the plastic body in the other hand.
2. Twist one quarter turn to release, and then pull the plunger assembly completely out of the glass barrel.

### TO REASSEMBLE (1, 4, 10 ml; Models)

1. Carefully insert piston into glass barrel at an angle so as not to damage the piston edges. Push the piston all the way in the glass barrel.
2. While rotating the plastic syringe adapter (93790-1109, 1ml or 93790-0106, 4ml) or the glass barrel of the 10ml push both parts together until the adapter of the barrel flange disappears into the plastic body.
3. Once the pieces fit together rotate a quarter turn to lock into position. A slight rotating motion of the glass barrel in the locked position will not affect the operation of the Minipet®.



## ASSEMBLY AND DISASSEMBLY

### TO DISASSEMBLE 30 ml MODEL

1. *Remove the flange screws that hold the plunger assembly and the glass barrel together.*
3. *Separate the plunger assembly from the glass barrel by pulling plunger assembly all the way out of the barrel.*

### TO REASSEMBLE 30 ml MODEL

1. *Carefully insert piston into glass barrel at an angle so as not to damage piston edges. Push the piston all the way in the glass barrel.*
2. *Line up the screw holes in the flange and reinsert screws.*

## HINTS FOR TROUBLESHOOTING

### TO CHECK THE TWO-WAY VALVE

*When the two-way valve does not work properly, the unit may not prime, dispense the proper amount, or may fill with air getting into the system through the dispensing valve side, or liquid passing through the intake valve when dispensing.*

1. *Check Intake Valve*
  - a) *Fill system.*
  - b) *Lift sinker out of container.*
  - c) *Dispense while watching sinker. If liquid flows out through the sinker during downstroke, the intake valve is not operating properly.*
2. *Check Dispensing Valve*
  - a) *Remove filling tube from valve*
  - b) *Depress plunger and keep depressed*
  - c) *Place your finger over the intake hole and seal air tight.*

## HINTS FOR TROUBLESHOOTING

- d) *Release plunger. The plunger should move up a short distance and stop. If the plunger returns to its original set position, the dispensing valve is not operating properly.*

*To correct either problem, flush the system to remove any solid particles that may be lodged under the valve seat. If this doesn't work, disassemble valve and clean or replace necessary parts. If there is excessive backflow, the supplied extra spring may be inserted into the intake valve to force the check against the intake seal. Note: adding this spring may slow down the fill rate. Refer to the AQUEOUS MODEL TWO-WAY VALVE section for instructions on valve removal and disassembly.*

### TO CORRECT PISTON LEAKS

*When liquid passes behind the Teflon® piston it is because the Teflon® plunger and the glass barrel are no longer forming a proper seal.*

*FOR 1 ML MODELS, F37900-0010 & F37900-1010*

- 1. Disassemble the unit by removing the plunger assembly from the glass barrel.*
- 2. Insert a blunt object like a ball point pen in the front face groove of the plunger.*
- 3. Gently force the thin Teflon® edge outward by circling the pen around the entire circumference. If the Teflon® edge is intact and has no nicks, this simple operation will restore the sealing ability of the plunger.*

### FOR ALL OTHER MODELS

- 1. Disassemble the unit by removing the plunger assembly from the glass barrel.*
- 2. Closely inspect the plunger; if there is a nick in the plunger, it should be replaced.*

### AQUEOUS MODEL TWO WAY VALVE

*The valve of the AQUEOUS MINIPET® can be removed at the Luer lock by turning a quarter turn counter-clockwise.*

*The two-way valve contains a spring and check. To disassemble the valve, retainers on the intake or outlet can be removed by turning counterclockwise until free. The spring and valve check can then be removed for proper cleaning.*

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## PARTS LIST

93790-1103	Adjustment nut, 1, 4 & 10ml
93790-1109	Adapter, 1ml
93790-0106	Adapter, 4ml
93790-1104	Barrel "O" ring, 1 & 4ml
93790-1105	Friction "O" ring
93790-1100	Aqueous valve, 1, 4 & 10ml
32903-0102	Teflon® Sinker
93790-1102	Barrel, 1ml Aqueous
93790-1116	Cannula, 16ga, 1 & 4ml
93790-0111	Cannula, 13ga, 10ml
93790-0130	Cannula, 10ga, 30ml
93790-1117	Fill tube, Aqueous, All sizes
93790-0110	Barrel, 10ml Aqueous
93790-0104	Barrel, 4ml Aqueous
93790-1120	Piston & pin, 1ml
93790-1121	Piston & rod assembly, 1ml
93790-0116	Piston & pin, 4ml
93790-0117	Piston & rod assembly, 4ml
93790-0119	Piston & pin, 10ml
93790-0120	Piston & rod assembly, 10ml
93790-0015	Teflon® valve & barrel, 1ml
93790-0004	Teflon® valve & barrel, 4ml
93790-0118	Pin, 4 & 10ml, pk/2
93790-1125	Pin, 1ml, pk/2
93790-1126	"E" Ring, 1, 4 & 10ml, pk/2
93790-0016	Teflon® valve & barrel, 10ml
93790-1128	Main spring, 1, 4 & 10ml
93790-0136	Clamp flange, 30ml
93790-0131	Piston & rod assembly, 30ml
93790-0139	Adjustment nut, 30ml
93790-1130	Thumb knob
93790-1131	Knob
93790-0140	Bushing, 30ml
93790-0141	Main spring, 30ml Teflon®
93790-0142	Barrel, Aqueous, 30ml
93790-0144	Piston & pin, 30ml
93790-0145	Main spring, 30ml Aqueous
93790-1132	Bushing
93790-0132	Aqueous valve, 30ml
99932-1230	"E" ring, 30ml
99932-1247	Pin, 30ml
93790-0300	Teflon® valve & barrel, 30ml
93790-0018	Fill tube w/adapter, all Teflon® units
93790-0151	Plastic Body 30ml
93790-1137	Plastic Body 1ml, 4ml, & 10ml