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STOPPED-FLOW MAINTENANCE

MAKING BRILLIANT BREAKTHROUGHS HAPPEN. SINCE 1980

Most maintenance procedures required to keep the *OLIS* U.S.A.-Stopped-Flow in good working order can be performed by the user. Routine maintenance practices are described below. Procedures for changing stopped-flow syringes start on page 3.

Routine Maintenance

Proper Use

Do not use your stopped-flow unit outside of the temperature range for which it is intended. The temperature range is determined by the type of seals. *OLIS* has an ambient-range model (10–80°C) and two models (low-temperature and fluorescence) that stretch the low end of the range to 0°C. Identify the type you have—operating a stopped-flow at temperatures outside of its range causes damage that is expensive to repair!

Do not use low-temperature syringes at temperatures above 6°C. The low-temperature syringes are designed to provide a very tight fit for low-temperature operation. At temperatures above 6°C, however, when the syringe shaft is at normal state (i.e., not contracted), retracting the syringe shaft will cause the safety washer on the tip to fall off. If you need to use your low-temperature stopped-flow at temperatures above 6°C, replace the low-temperature syringes with standard *OLIS* stopped-flow syringes. **Using low-temperature syringes at temperatures above 6°C will void your warranty.**

The following procedure may help to prevent dislodging the safety washer on the tips of low-temperature drive syringes: When retracting the shaft of the drive syringe, use your other hand to push down on the corresponding fill syringe at the same time. Simultaneously pushing down on the fill syringe eliminates the vacuum produced by pulling out on the drive syringe shaft, which reduces the friction that causes the safety washer to become dislodged. In this manner, you are using the fill syringe to "push out" the shaft of the drive syringe with the safety washer intact.

Cleaning

The importance of keeping your stopped-flow unit clean cannot be overemphasized. Treat your stopped-flow just as you would any sophisticated piece of laboratory equipment: keep it in good working order by cleaning it frequently.

1. Use distilled water to flush valves and syringes. Refer to the attached flow-path diagram.
2. If your *OLIS* stopped-flow is an anaerobic model, flush valves and syringes with de-gassed distilled water after flushing with distilled water to minimize introduction of oxygen.

On-Line Instrument Systems, Inc.
130 Conway Drive, Suites A & B
Bogart, Georgia 30622-1724
U.S. & Canada (800) 852-3504
Worldwide (706) 353-6547
Teletax (706) 353-1972
URL: http://www.olisweb.com
e-mail: olis@mindspring.com

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3. Use a toothbrush, cotton swab, test tube brush, or clean cloth as necessary to remove any dust, corrosion, or other type of contamination from all parts of the stopped-flow unit.
4. Gently wipe the stopped-flow unit using a clean cloth dampened with soapy water.
5. After the unit has been completely cleaned, finish by spraying furniture polish on a clean cloth and rubbing the cloth over the unit. Furniture polish protects the unit's anodized surfaces from chemicals and moisture.
6. Maintain clean water bath fluid at all times (see the following section on "water bath fluid mixture"). The water bath should be emptied and cleaned occasionally using a cotton swab or clean cloth. If the stopped-flow is to be left idle for some time (such as during a holiday), drain and clean water bath chamber and leave it empty during the period in which the stopped-flow will be left idle.

The *OLIS* U.S.A.-Stopped-Flow mixer will provide many years of service if properly maintained. **Failure to maintain your *OLIS* stopped-flow may void your warranty.**

Water Bath Fluid Mixture

Distilled water should be used as the stopped-flow water bath fluid. If you are using the stopped-flow at temperatures below freezing, add Methanol or antifreeze as needed to keep the water bath from freezing. As a general rule, approximately one part alcohol or antifreeze to ten parts distilled water is sufficient to prevent the fluid from freezing when the stopped-flow is used at temperatures to approximately –2°

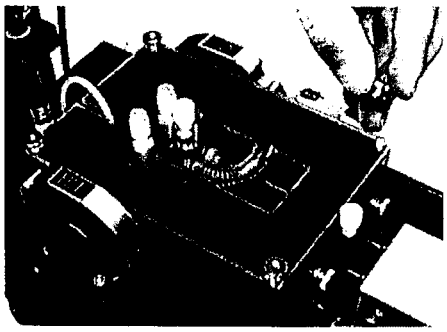
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Changing Syringes

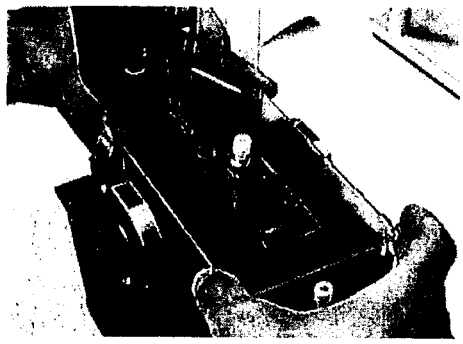
Changing the stopped-flow syringes is required when a syringe breaks or when you want to switch to variable-ratio mixing. Changing syringes is not difficult, but does involve the risk of damaging your stopped-flow. The following instructions take you step-by-step through the process and provide illustrative photos for most steps. **Before changing the syringes, read all the instructions to ensure that you understand the process and to assess your level of comfort in performing the task.**

Please note that overtightening a syringe during installation may severely damage the syringe and associated valve, rendering the stopped-flow inoperable and requiring expert repair by *OLIS* personnel. If you prefer not to change the syringes yourself, or if syringe replacement is not permitted by your institution, *OLIS* will be happy to replace syringes for you at no cost except the price of new parts and shipping and handling fees both ways. This warning is given not to discourage your from attempting to change the syringes yourself, but to ensure that you are aware of the risk of damage involved and to offer you the alternative of having *OLIS* take the responsibility.

The tools needed to change stopped-flow syringes are included in tool kit provided with purchase.

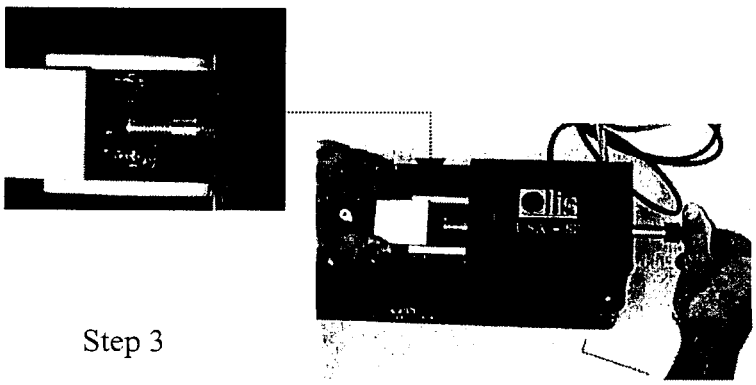


Step 1



Step 2

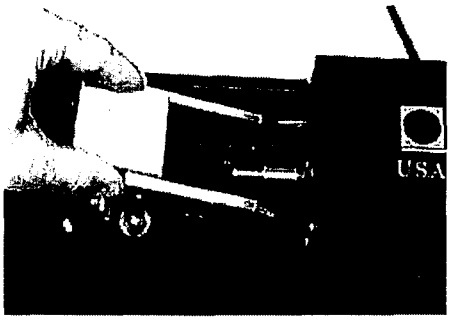
1. Remove the four thumbnuts from the cover of the water-bath chamber.
2. Gently remove water-bath cover, easing it carefully over syringe extenders.



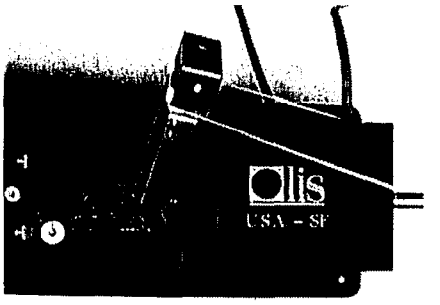
Step 3

3. In your right hand, grasp the black knob at the end of the cylinder shaft; in your left hand, hold the plunger block steady. Unscrew the cylinder shaft from the plunger block by turning the knob counterclockwise.

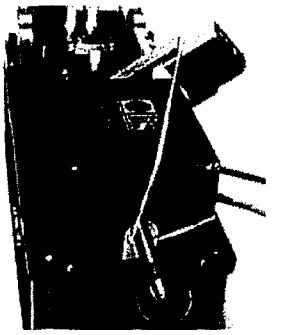
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Step 4a

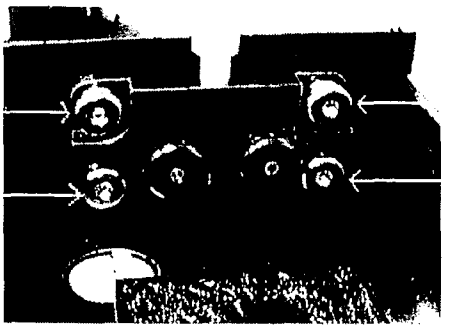


Step 4b

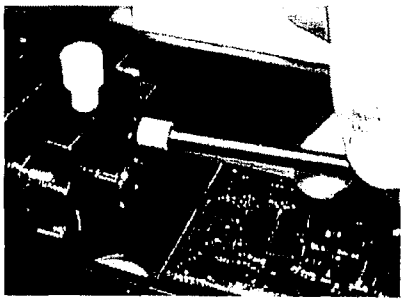


Step 4c

4. Lift the plunger block assembly as shown in photo 4a and move it out of the way; do not disconnect the wires, but allow the plunger block assembly to rest against the side of the air cylinder cover. To keep the plunger block assembly out of the way, you may secure it using a rubber band, as shown in photos 4b and 4c.

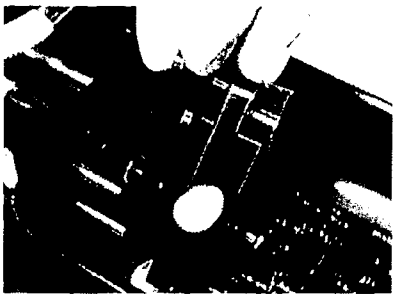


Step 5

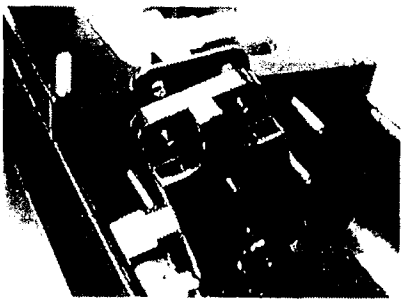


Step 6

5. Remove the four thumbnuts from the purge cap.
6. Remove the plunger from the body of the syringe by gently pulling it straight out.



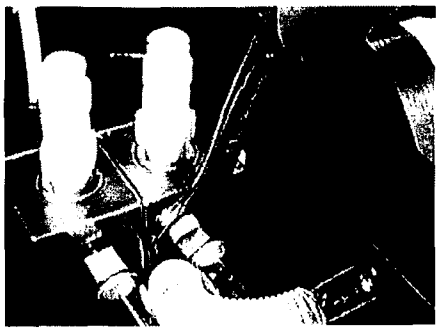
Step 7



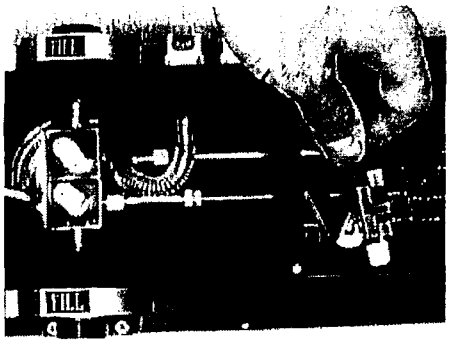
Step 8

9. Pull out the second syringe plunger slightly to free the purge cap; you will notice that the syringe clamp is directly behind the purge cap, as shown in photo 7. If the syringe clamp does not slide out along with the purge cap, use the tip of the Allen wrench to free it.
10. Rotate both the purge cap and the syringe clamp slightly and allow them to rest against the side of the stopped-flow in order to provide access to the syringe.

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Step 9

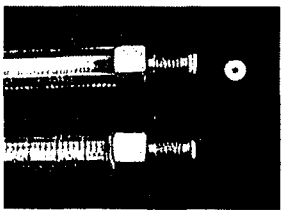


Step 10

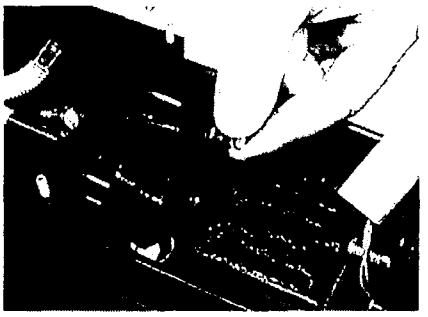
9. Using the 7/16" end of the wrench provided, loosen the stainless steel end of the syringe by turning the wrench counterclockwise.
11. Grasp the other end of the syringe and finish unscrewing it, then gently remove the syringe as shown in photo 10. Inspect the new syringe to ensure that a new black rubber O-ring is included (we provide a new O-ring with each new syringe); also, if you have the *OLIS* low-temperature stopped-flow with ceramic valves, ensure that a white safety washer is attached to the threaded end of the new syringe. The photo at right labeled "safety washer" shows a syringe <u>with</u> the safety washer attached (the syringe at the top of the photo) and a syringe <u>without</u> a safety washer (the syringe at the bottom of the photo); an unattached safety washer is lying to the right of the top syringe to show you what a safety washer looks like. As you can see, the safety washer looks very much like the white plastic tip of the syringe; with a safety washer attached, however, syringes appear to have a "double tip." Also, safety washers are slightly larger in diameter than the white plastic syringe tips. If you have the *OLIS* low-temperature stopped-flow and the new syringe does <u>not</u> include a safety washer or if the safety washer falls off during installation, do not use it; call *OLIS*. If you do not have the *OLIS* low-temperature stopped-flow, your new syringe should <u>not</u> have a white safety washer.



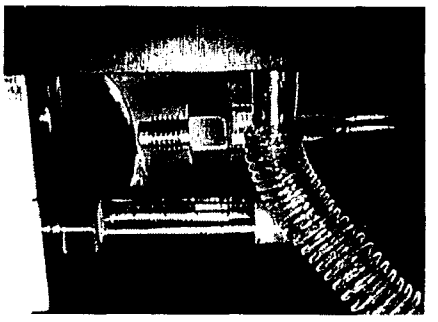
O-ring



safety washer



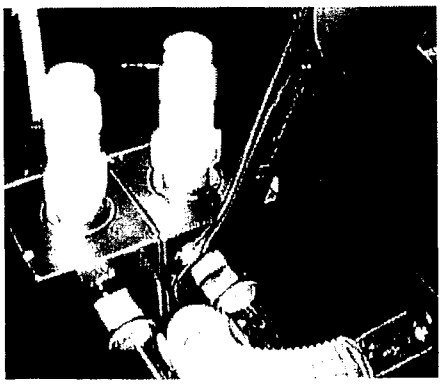
Step 11a



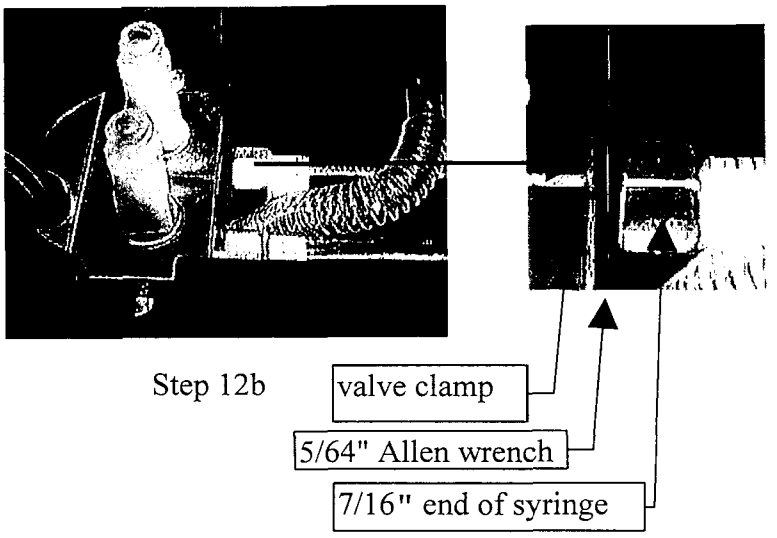
Step 11b

11. Carefully install the replacement syringe as shown in photos 11a and 11b. Secure the syringe in place by gently turning it clockwise; <u>hand tighten</u>.

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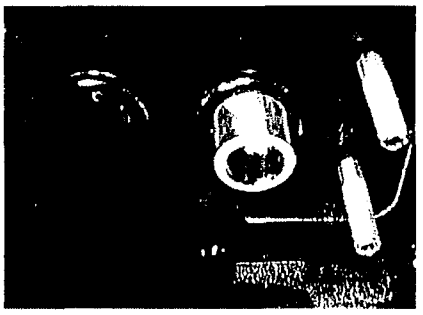
Step 12a



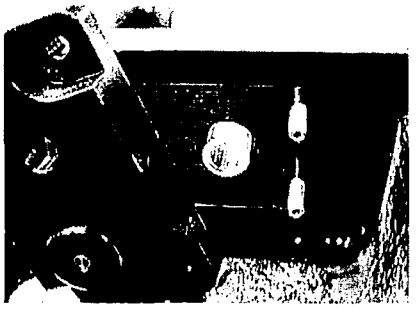
Step 12b

12. Using the 7/16" end of the wrench provided, complete syringe installation by turning the 7/16" end of the syringe approximately 45° clockwise. **This is a critical step because overtightening will cause permanent damage to the syringe and valves. It is better to undertighten than to overtighten; you can always further tighten the syringe if you find that the stopped-flow leaks. You will not feel a firm stop or hear a click when the syringe is sufficiently tight, and you should never attempt to tighten the syringe until it touches the valve clamp; when the syringe is correctly seated, a 5/64" Allen wrench will approximate the width of the space that should be left between the valve clamp and the 7/16" end of the syringe, as shown in the photos for step 12b.**

    Please note that the damage resulting from overtightening the syringe will cause the stopped-flow to leak just as undertightening will; however, leaking caused by under-tightening can be corrected by the user—leaking caused by overtightening causes damage (i.e., ruins the syringe and/ or valve) that requires expert repair by *OLIS* personnel, and parts are costly. Avoid damage by using the guideline described in the preceding paragraph to verify the width of the gap between the 7/16" end of the syringe and the valve clamp.



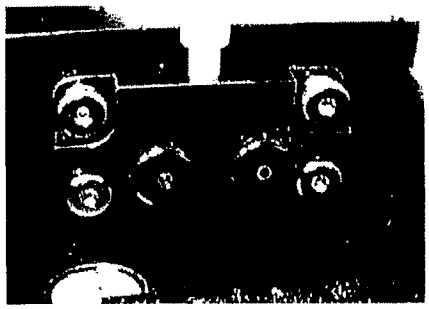
Step 13



Step 14

13. Gently push the O-ring until it is flush with the water bath chamber. The O-ring is a water seal for the bath chamber.
14. Slip the syringe clamp into place in the recession on the side of the water bath chamber.

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Step 15

15. Replace the purge cap and fasten it with the four thumbnuts. Dip the tip of the plunger in water to lubricate it for easy insertion, then install plunger in replacement syringe.* Gently push both plungers until they are flush with the purge cap as shown in the photo.

**The syringe manufacturer suggests that placing the syringe plunger in boiling water for a few minutes before inserting the plunger in the syringe will cause the teflon tip of the plunger to swell, which may improve performance of the syringe.*

16. Replace the plunger block assembly (i.e., reverse step 4).
17. While holding the plunger block assembly in your left hand and the cylinder shaft knob in your right hand, screw the cylinder shaft into the plunger block assembly (i.e., reverse step 3).
18. Reverse steps 2 and 1 to replace and secure the cover of the water-bath chamber.

As stated in the introduction to this section, if you do not feel comfortable replacing stopped-flow syringes, or if equipment maintenance is not permitted by your institution, *OLIS* will gladly replace syringes for you. Call *OLIS* first to let us know that you are sending your stopped-flow for syringe replacement; your only expenses will be the cost of replacement parts and shipping/ handling fees to and from *OLIS*.

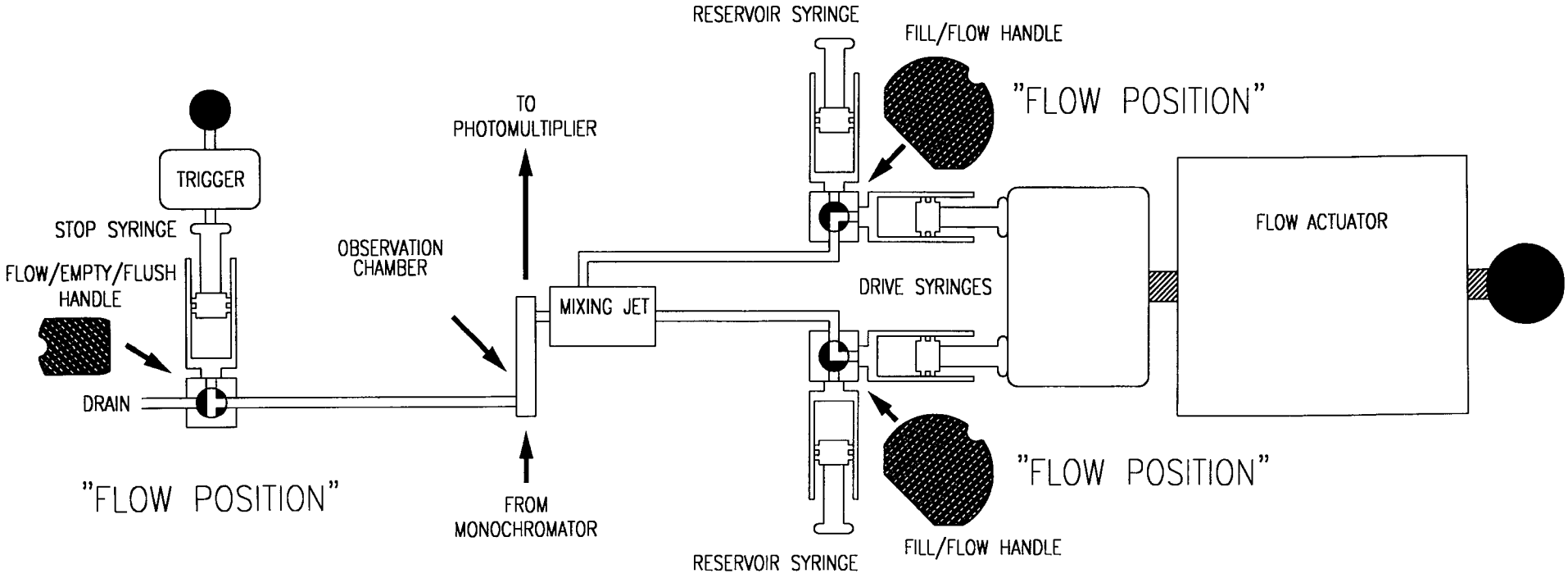
STOPPED-FLOW PURCHASE/ MAINTENANCE RECORD

Purchase date	Type (standard or low-temperature)	Date cleaned	Date syringes replaced	Work performed by (*OLIS* or other)

Additional notes:

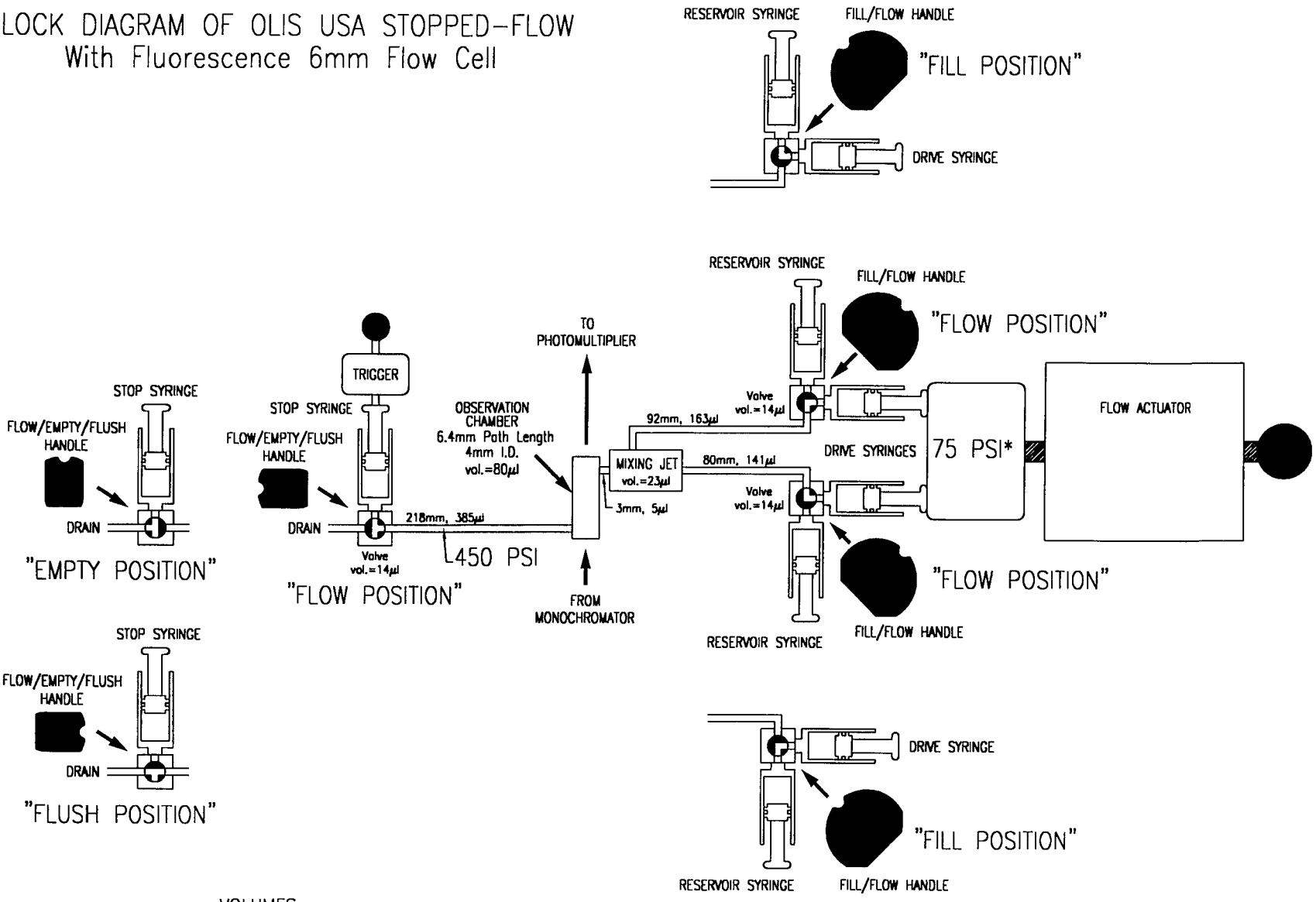
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FLOW PATH OF THE OLIS U.S.A. STOPPED-FLOW



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BLOCK DIAGRAM OF OLIS USA STOPPED-FLOW
With Fluorescence 6mm Flow Cell



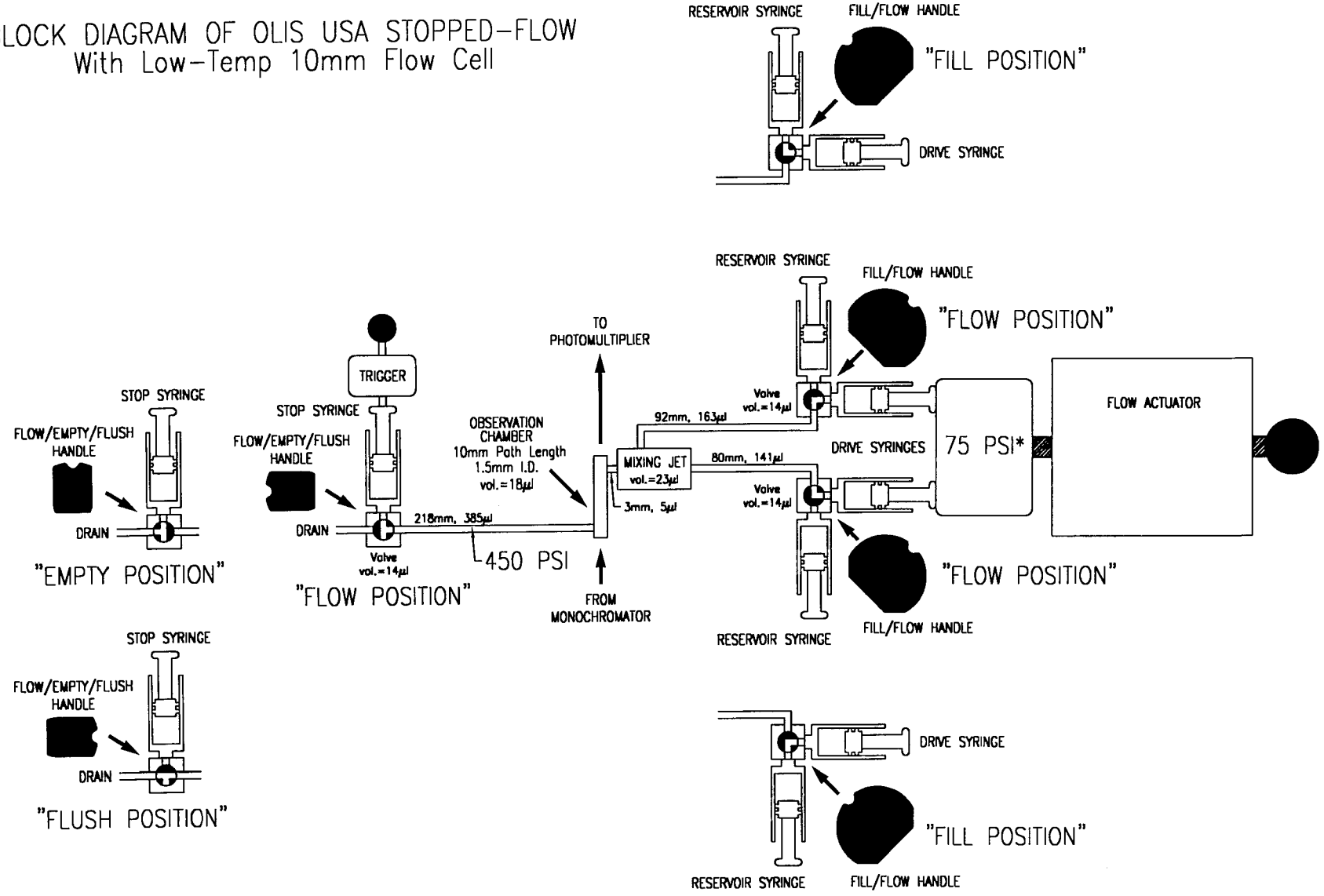
VOLUMES

440µl from Drive Syringe to filled Observation Chamber
840µl from Drive Syringe to Stop Syringe

* Exceeding 75 PSI at the drive syringe will void your warranty; 65 PSI is recommended every 5 lb. at the drive syringe increases the pressure at the stop syringe by 50 lb.

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BLOCK DIAGRAM OF OLIS USA STOPPED-FLOW With Low-Temp 10mm Flow Cell



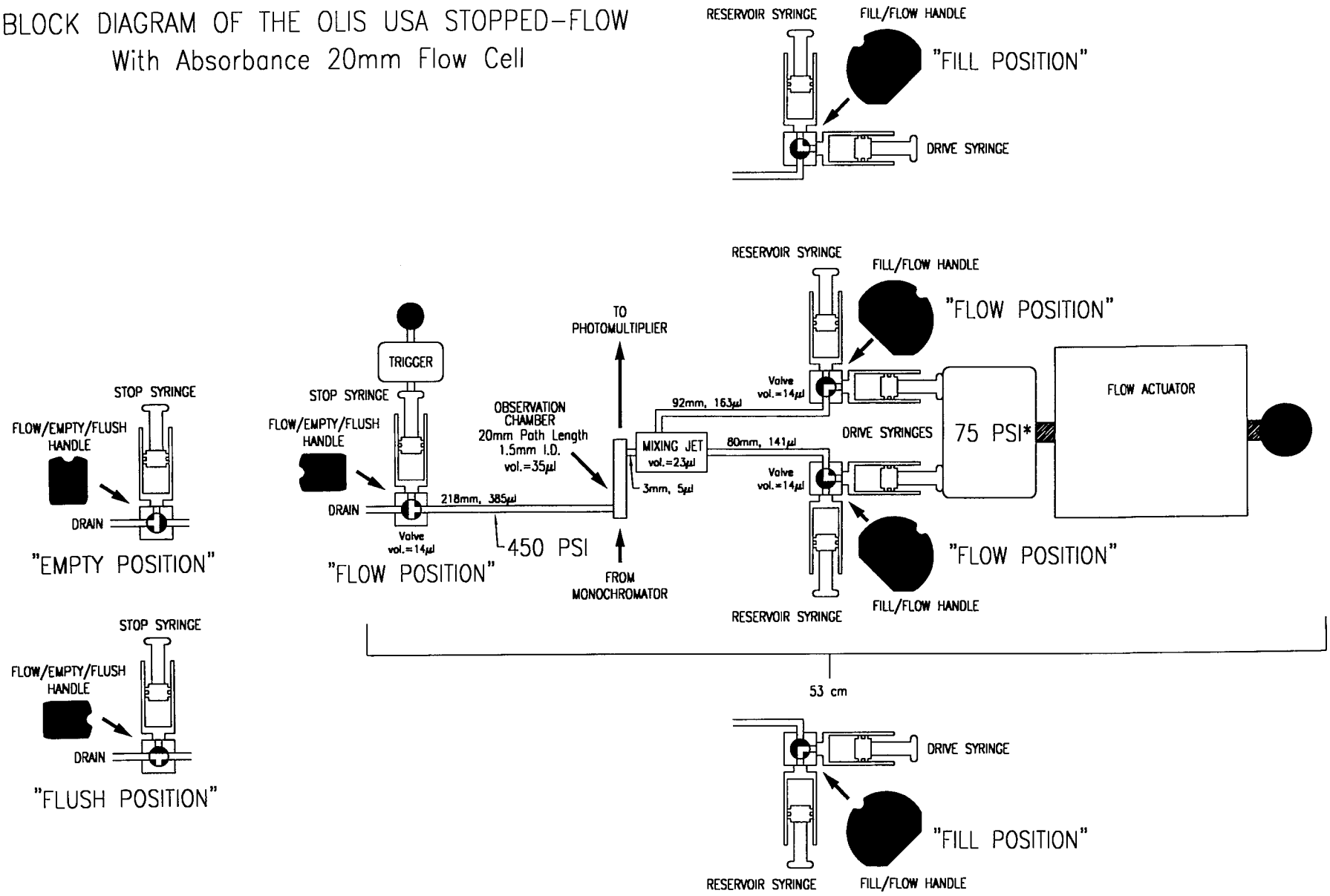
VOLUMES

378µl from Drive Syringe to filled Observation Chamber
777µl from Drive Syringe to Stop Syringe

* Exceeding 75 PSI at the drive syringe will void your warranty; 65 PSI is recommended every 5 lb. at the drive syringe increases the pressure at the stop syringe by 50 lb.

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BLOCK DIAGRAM OF THE OLIS USA STOPPED-FLOW
With Absorbance 20mm Flow Cell



VOLUMES

395µl from Drive Syringe to filled Observation Chamber
794µl from Drive Syringe to Stop Syringe

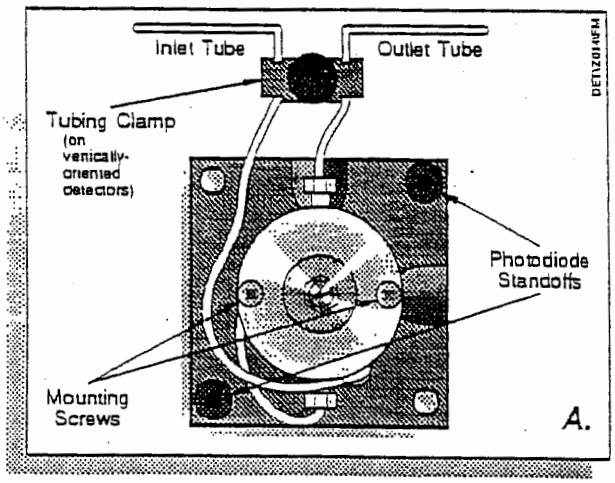
* Exceeding 75 PSI at the drive syringe will void your warranty; 65 PSI is recommended every 5 lb. at the drive syringe increases the pressure at the stop syringe by 50 lb.

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Flowcell Orientation

This flowcell is configured for use with *vertically*-oriented detectors (detectors that have the tubing clamp located above the flowcell, see Figure A). If you plan to use this flowcell on a *horizontally*-oriented detector (one that has its tubing clamp located to the left side of the flowcell, see Figure C), you must realign the cell holder as described in the following instructions.

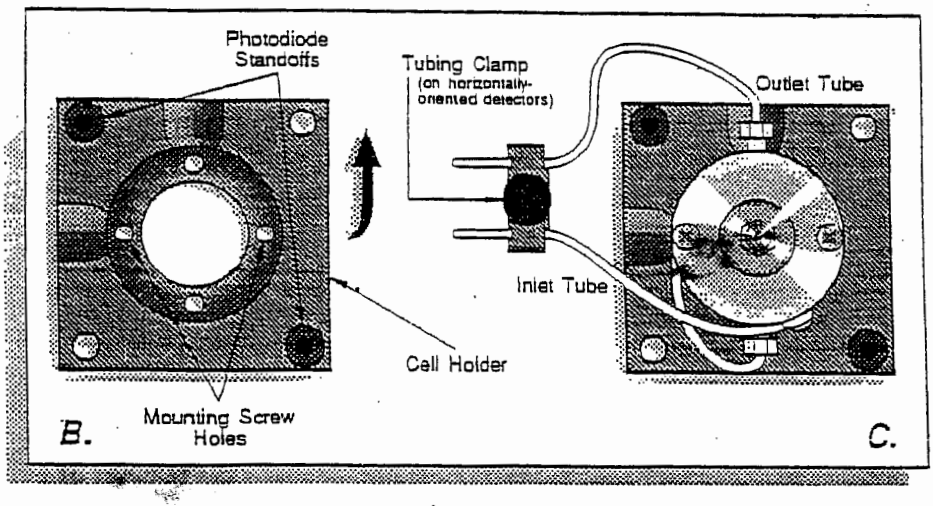
Figure A shows the flowcell as it is shipped.



NOTE: These illustrations show the tubing clamp as an aid to the proper positioning of the inlet and outlet tubes. The tubing clamp, however, is actually mounted onto the detector, and is not part of the flowcell itself.

If you have a horizontally-oriented detector and want to use this flowcell in it, use the following steps to realign the cell holder relative to the cell body. To ensure proper alignment, always hold the cell holder and flowcell in the orientation shown in the illustrations.

1. Remove the mounting screws and set them aside.
2. Rotate the cell holder 90° counterclockwise. Do not rotate the cell body! Figure B shows the cell holder in its new position. Note the new position of the photodiode standoffs.
3. Reattach the cell body by replacing and securing the mounting screws.
4. Gently bend the inlet and outlet tubes as shown in Figure C. The inlet tube (wound around the cell body) should always enter at the bottom of the flowcell; the outlet tube should always exit at the *top* of the flowcell.



Instructions for mounting the flowcell to the detector are found in the appropriate reference manual.

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