



Crystal Pipettes

INSTRUCTION MANUAL

Serial No. _____

112009



World Precision Instruments

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ABOUT THIS MANUAL

The following symbols are used in this guide:



This symbol indicates a **CAUTION**. Cautions warn against actions that can cause damage to equipment. Please read these carefully.



This symbol indicates a **WARNING**. Warnings alert you to actions that can cause personal injury or pose a physical threat. Please read these carefully.

NOTES and **TIPS** contain helpful information.

INTRODUCTION

Crystal Pipettes use the air displacement method (where displaced air volume by the motion of the piston is equal to the liquid volume drawn into the pipette). They are highly accurate. Within ten complete revolutions of the dial, you can set the minimum and maximum volumes. For ease of use, the dial is fixed to the plunger. The light plunger action and ergonomic handle reduce fatigue, making results more precise. Crystal pipettes are available as:

- Single channel are available in a variety of sizes up to 10mL.
- 8- or 12-channel Multipets for dispensing multiple aliquots simultaneously.

Cautions and Warnings



CAUTION: Do not autoclave the pipettes.



CAUTION: Do not use Crystal pipettes with organic solvents. Acetonitril may be used only on the **CRYSTAL-ML10** (1-10mL) pipette.



CAUTION: To accurately deliver volume, the **CRYSTAL-2, -10, -20, -10M8** and **-10M12** have a very narrow nose cone structure that is fragile. Use caution when setting the tips. The nose cone may be bent or broken off (**Fig. 3**).



CAUTION: Prolonged exposure to UV light could cause discoloration of the pipette.



CAUTION: Do not lay the pipette down when a filled tip is attached.



CAUTION: NEVER use a pipette without a tip attached.

NOTE: WPI recommends using a filter with the **CRYSTAL-ML10**.

Parts List

After unpacking, verify that there is no visible damage to the product. Verify that all items are included.

Single Channel Pipettes

- (1) Crystal Pipette
- (1) Instruction Manual

Multipets

- (1) Crystal Multipet
- (1) Tip Ejector Extension Rod
- (1) Tip Trough
- (1) Instruction Manual

Unpacking

Upon receipt of this instrument, make a thorough inspection of the contents and check for possible damage. Missing cartons or obvious damage to cartons should be noted on the delivery receipt before signing. Concealed damage should be reported at once to the carrier and an inspection requested. Please read the section entitled "Claims and Returns" on page 15 of this manual. Please contact WPI Customer Service if any parts are missing at 941.371.1003 or customerservice@wpiinc.com.

Returns: Do not return any goods to WPI without obtaining prior approval (RMA # required) and instructions from WPI's Returns Department. Goods returned (unauthorized) by collect freight may be refused. If a return shipment is necessary, use the original container, if possible. If the original container is not available, use a suitable substitute that is rigid and of adequate size. Wrap the instrument in paper or plastic surrounded with at least 100mm (four inches) of shock absorbing material. For further details, please read the section entitled "Claims and Returns" on page 15 of this manual.

INSTRUMENT DESCRIPTION

Single/Multi-Channel Crystal Pipettes

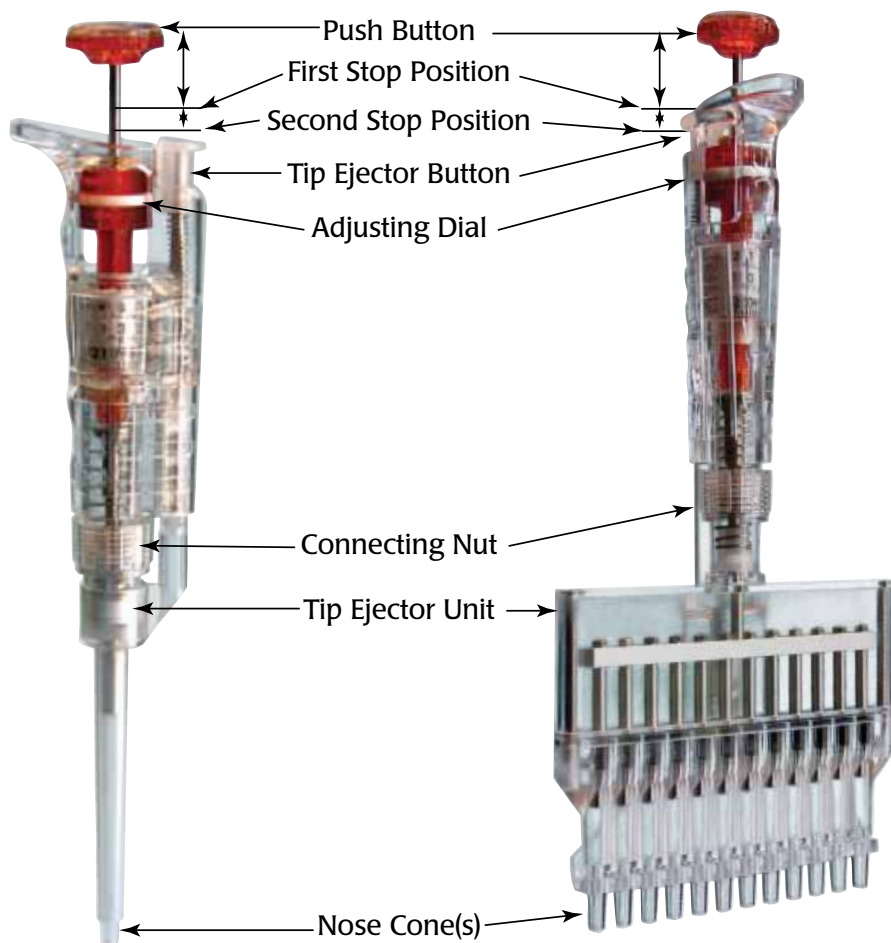


Fig. 1—Single and multi-channel Crystal pipettes

Push Button—The push button is designed with two stop positions. The first stop position displaces the air volume indicated on the dial. The second stop position dispenses the liquid retained in the tip.

Adjustment Dial—Turn the dial to the right (clockwise) to increase the dispensing volume.

Tip Ejector Button—Push the button down to eject the pipette tip.

Connecting Nut—Loosen nut to remove the tip ejector unit.

Tip Ejector Unit—This section may be removed for cleaning.

Nose cone—Position a disposable pipette tip on the nose cone.

Setup

The single pipettes are shipped fully assembled. However, the tip ejector extension rod must be installed on the multipipets.

1. Loosen the connecting nut of the multipipet by rotating it counter-clockwise a couple of turns.
2. Rotate the handle 90° so that the ejector rod in the handle lines up with the tip ejector plate on the back of the tip ejector unit (**Fig. 2**).

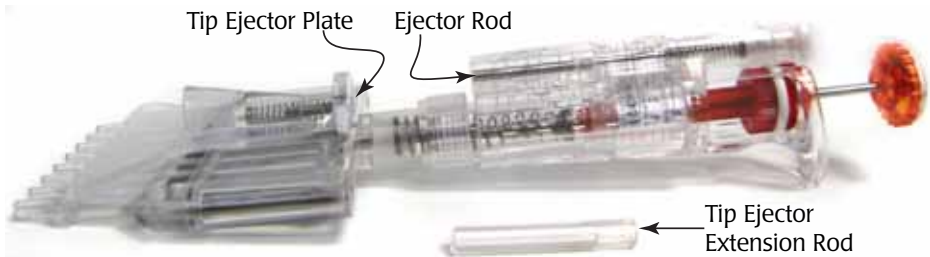


Fig. 2—Align the ejector rod with the tip ejector plate

3. Tighten the connecting nut.
4. The tip ejector extension rod is hollow on the top side. Gently press the tip ejector plate down while sliding the hollow end of the tip ejector extension rod over the ejector rod.
5. When the tip ejector extension rod is in place, release the tip ejector plate.

OPERATING INSTRUCTIONS

Aspirating Liquid

- 1. Adjust the delivering volume by turning the adjusting dial to the desired volume.
- 2. Install the appropriate pipette tip on the nose cone (**Fig. 3**). The table below shows which tips are compatible with Crystal pipettes.

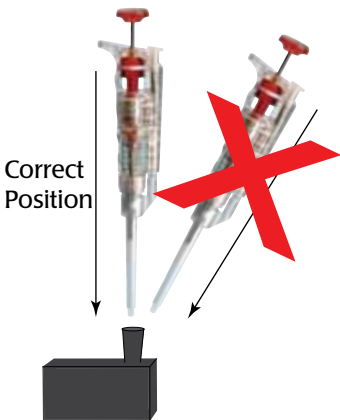


Fig. 3—Proper position for setting the tips

CAUTION: WPI recommends using a filter with the **CRYSTAL-ML10**.

Crystal Tip Compatibility Chart				
Pipette	Tips			Stands
	WPI Universal	Eppendorf	Gilson	
CRYSTAL-2	500191, 500192, 500199,			14239, 500876
CRYSTAL-10	500202, 500203, 500204			
CRYSTAL-20				
CRYSTAL-200	500193,500194, 500200, 500205, 500206			
CRYSTAL-ML10			10mL	
CRYSTAL-1000	500195, 500196	50-1000µL	None	
CRYSTAL-10M8	500191, 500192			
CRYSTAL-10M12				
CRYSTAL-200M8	500193, 500194, 500200,			
CRYSTAL-200M12	500205			

3. Press the push button down to the first stop position.
4. Hold the pipette vertically and immerse the tip into the solution so that it is just deep enough to draw in the liquid (about 2-4mm).
5. After 2-3 seconds, slowly release the push button and allow it to return to the initial position. The solution is drawn up after a brief interval.
6. Slowly remove the tip from the liquid, keeping the pipette in a vertical position.



CAUTION: Do not lay the pipette down when a filled tip is attached.

Dispensing Liquid

1. To dispense the liquid, position the pipette tip close to the inner wall of the receiving vessel and press the push button down to the first stop position.
2. Press the push button down to the second stop position to remove all the liquid from the tip.
3. Press the tip ejector button to remove the used pipette tip.

Exchanging Tip Ejector Unit (Single channel only)

NOTE: The **CRYSTAL-ML10** has no tip ejector.

- To remove the tip ejector unit, hold the tip ejector button down and pull out the tip ejector unit from the ejection rod along the nose cone.
- To install the tip ejector unit, hold down the tip ejector button and check the position of ejector connection. While holding down the tip ejector button, fit the tip ejector unit on the rod.



CAUTION: The stopper on the tip ejector button may be damaged if you do not hold down the tip ejector button while reassembling.

MAINTENANCE

Grease the O-Rings of Single Channel Pipette

When liquid is accidentally drawn into the nose cone or the piston movement becomes sluggish, perform this procedure.

NOTE: The O-ring cannot be removed from the piston unit of the 2-, 10- and 20 μ L pipettes.

CAUTION: This process involves disassembly of the pipette which has many pieces. Be **VERY CAREFUL** not to loose pieces or get them out of order. If it is disassembled, the pipette must be properly fit together. If improperly fitted, plunger action may be rough and the 2-stop action may not work correctly. Do not disassemble if you are not mechanically inclined.

1. Remove the tip ejector unit. See “Exchanging Tip Ejector Unit (Single channel only)” on page 7.
2. Hold the pipette securely as you rotate the connecting nut to remove the nose cone. The springs inside will push the tip of the pipette off of you aren’t careful. **Fig. 3** shows a disassembled **CRYSTAL-200**.

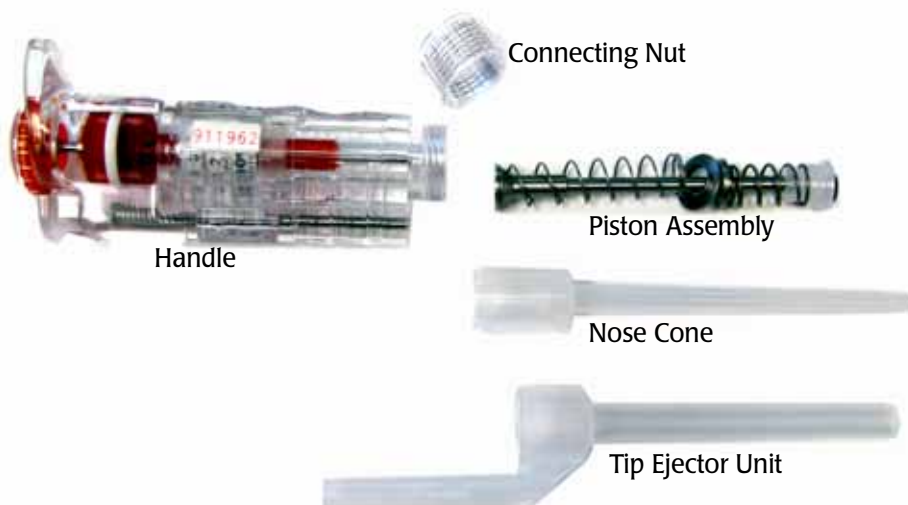


Fig. 4—CRYSTAL-200 dis-assembled

3. Remove the piston assembly (**Fig. 5**). **Fig. 6** shows drawings of the CRYSTAL pipette piston assemblies.

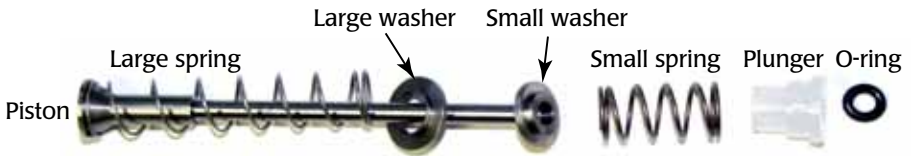


Fig. 5—Piston assembly from the CRYSTAL-200

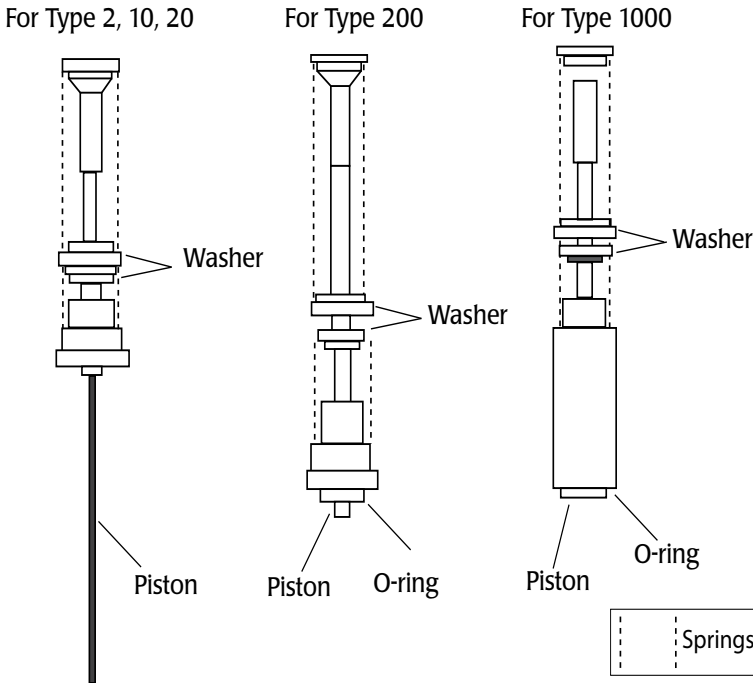


Fig. 6—Tip ejector units.

NOTE: When properly assembled on the piston shaft, the larger sides of the two washers face each other so that the smaller side of each washer (the side with the inset) fit into the springs of the pipette.

4. Put a little silicone grease (WPI # **503787**) on the O-ring. Use only a small amount of silicone grease, because too much grease can affect the pipette's accuracy.

-
- Reassemble the piston unit, and insert it into the nose cone so that the small washer slides into the top of the nose cone. Hold it securely and push the other end of the piston assembly into the handle so that the large washer fits inside the handle. Without letting the springs go, slide the connecting nut in place and tighten it.
-

⚠ CAUTION: Verify that the washers are re-installed in the same order as they were removed. Ensure that the large sides of the washers face each other.

- Reinstall the tip ejector unit by depressing the tip ejector button and sliding the tip ejector unit over the nose cone and into place.

Grease the Seals of CRYSTAL-ML10

When liquid is accidentally drawn into the nose cone or the piston movement becomes sluggish, perform this procedure.

- Hold the pipette securely as you rotate the nose cone counterclockwise to unscrew and remove it. **Fig. 7** shows a disassembled **CRYSTAL-ML10**.



Fig. 7—*Crystal-ML10 dis-assembled*

- Press the push button down to expose the black rubber seal. Remove the seal.
- Wash the nose cone, seal and piston assembly with warm, soapy water. Rinse thoroughly and allow them to dry completely.

NOTE: Acetonitril may be used on the **CRYSTAL-ML10** pipette.

- Put a little silicone grease (WPI # **503787**) on the seal. Use only a small amount of silicone grease, because too much grease can affect the pipette's accuracy.
- Slide the seal onto the piston assembly. The widest part of the seal slides onto the piston assembly first.
- Reinstall the nose cone.

Grease the Seals of Multipet

When liquid is accidentally drawn into the nose cone or the piston movement becomes sluggish, perform this procedure.

1. Remove the two long screws located on the sides of the main body (**Fig. 8**).

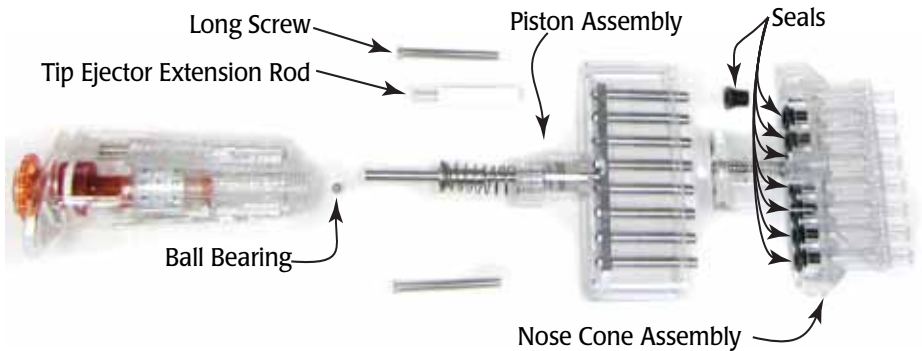


Fig. 8—Crystal-200M8 Multipet dis-assembled

2. Gently pull the nose cone assembly to separate it from the piston assembly.
3. Set the dial to the minimum volume to extend the piston rods as far as possible.
4. Wash the piston assembly with warm, soapy water. Rinse thoroughly and allow the unit to dry completely.
5. Lubricate each piston rod with silicone grease (WPI # **503787**). Use only a small amount of silicone grease, because too much grease can affect the pipette's accuracy.
6. Remove the rubber seals and wash them with warm soapy water. When they are completely dry, lubricate them with silicone grease.
7. Reposition tip ejector extension rod and slide the nose cone assembly back into place on the piston assembly.
8. Reinstall the two long screws and tighten them.

NOTE: If the pipette is inaccurate after this maintenance, it must be returned to the factory or sent to a qualified repair center for repair and calibration.

ACCESSORIES

Accessories

Part Number	Description
C-STAND	Pipette Stand (holds 6 pipettes)
503787	Silicone grease
503764	CRYSTAL-10ML (10mL) nose cone
503765	CRYSTAL-1000 (1000μL) nose cone
503766	CRYSTAL-200 (200μL) nose cone
503767	CRYSTAL-20 (20μL) nose cone
503768	CRYSTAL-10 (10μL) nose cone
503769	CRYSTAL-2 (2μL) nose cone
503770	CRYSTAL-1000 ejector
503771	CRYSTAL-200 ejector
503772	CRYSTAL-20 ejector
703773	CRYSTAL-10 ejector
503774	CRYSTAL-2 ejector
503782	CRYSTAL-10M8 ejector
503780	CRYSTAL-10M12 ejector
503781	CRYSTAL-200M8 ejector
503779	CRYSTAL-200M12 ejector
503786	CRYSTAL-10M8 seals
503784	CRYSTAL-10M12 seals
503785	CRYSTAL-200M8 seals
503783	CRYSTAL-200M12 seals
503775	CRYSTAL-10ML seals
503776	CRYSTAL-1000 O-rings
503777	CRYSTAL-200 O-rings

SPECIFICATION

	Type	Volume (μL)	Accuracy	Precision
CRYSTAL-2	Single	0.2-2	0.2μL ±12.0% 2μL ±5.0%	±6.0% ±1.0%
CRYSTAL-10	Single	1-20	1.0μL ±2.5% 20μL ±1.0%	
CRYSTAL-20	Single	2-20	2μL ±5.0% 20μL ±1.0%	±1.5% ±0.3%
CRYSTAL-200	Single	20-200	20μL ±2.5% 200μL ±0.8%	±0.4% ±0.15%
CRYSTAL-1000	Single	200-1000	200μL ±2.5% 1000μL ±0.8%	±0.3% ±0.15%
CRYSTAL-ML10	Single	1-10mL	1mL ±2.5% 10mL ±0.8%	±0.6% ±0.16%
CRYSTAL-10M8 CRYSTAL-10M12	Multipet	0.5-10	0.5μL ±2.5% 10μL ±1.0%	
CRYSTAL-200M8 CRYSTAL-200M12	Multipet	10-200	10μL ±2.5% 200μL ±1.0%	

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WARRANTY

WPI (World Precision Instruments, Inc.) warrants to the original purchaser that this equipment, including its components and parts, shall be free from defects in material and workmanship for a period of one year* from the date of receipt. WPI's obligation under this warranty shall be limited to repair or replacement, at WPI's option, of the equipment or defective components or parts upon receipt thereof f.o.b. WPI, Sarasota, Florida U.S.A. Return of a repaired instrument shall be f.o.b. Sarasota.

The above warranty is contingent upon normal usage and does not cover products which have been modified without WPI's approval or which have been subjected to unusual physical or electrical stress or on which the original identification marks have been removed or altered. The above warranty will not apply if adjustment, repair or parts replacement is required because of accident, neglect, misuse, failure of electric power, air conditioning, humidity control, or causes other than normal and ordinary usage.

To the extent that any of its equipment is furnished by a manufacturer other than WPI, the foregoing warranty shall be applicable only to the extent of the warranty furnished by such other manufacturer. This warranty will not apply to appearance terms, such as knobs, handles, dials or the like.

WPI makes no warranty of any kind, express or implied or statutory, including without limitation any warranties of merchantability and/or fitness for a particular purpose. WPI shall not be liable for any damages, whether direct, indirect, special or consequential arising from a failure of this product to operate in the manner desired by the user. WPI shall not be liable for any damage to data or property that may be caused directly or indirectly by use of this product.

Claims and Returns

Inspect all shipments upon receipt. Missing cartons or obvious damage to cartons should be noted on the delivery receipt before signing. Concealed loss or damage should be reported at once to the carrier and an inspection requested. All claims for shortage or damage must be made within ten (10) days after receipt of shipment. Claims for lost shipments must be made within thirty (30) days of receipt of invoice or other notification of shipment. Please save damaged or pilfered cartons until claim is settled. In some instances, photographic documentation may be required. Some items are time-sensitive; WPI assumes no extended warranty or any liability for use beyond the date specified on the container.

Do not return any goods to us without obtaining prior approval and instructions from our Returns Department. Goods returned (unauthorized) by collect freight may be refused. Goods accepted for restocking will be exchanged or credited to your WPI account. Goods returned which were ordered by customers in error are subject to a 25% restocking charge. Equipment which was built as a special order cannot be returned.

Repairs

Contact our Customer Service Department for assistance in the repair of apparatus. Do not return goods until instructions have been received. Returned items must be securely packed to prevent further damage in transit. The Customer is responsible for paying shipping expenses, including adequate insurance on all items returned for repairs. Identification of the item(s) by model number, name, as well as complete description of the difficulties experienced should be written on the repair purchase order and on a tag attached to the item.

** Electrodes, batteries and other consumable parts are warranted for 30 days only from the date on which the customer receives these items.*



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