

CR-700 CONSTANT RATE SYRINGE

Congratulations! You have purchased the finest quality precision fluid measuring device available today. We combine the highest quality materials with skilled workmanship, ensuring the highest possible performance level of every precision fluid handling device we manufacture. With proper care and handling, the CR-700 Constant Rate Syringe will provide unsurpassed performance in precision liquid handling year after year.

Syringes and needles manufactured by Hamilton Company are intended for scientific research and laboratory use only and are not intended for human *in vivo* use.

The CR-700 Constant Rate Syringe allows easy, reproducible injection of liquid samples into many analytical instruments. Use the CR-700 directly from the shipping container. Setting the desired dispense volume is the only adjustment necessary.

The CR-700 standardizes three major variables affecting reproducibility: sample volume, rate of injection, and depth of needle penetration. Even when operated by different technicians, the CR-700 provides reproducibility of $\pm 1\%$ of the total syringe volume in routine procedures.

Choose from three models of the CR-700 with volumes of 1 – 20 μL (P/N 84301), 2 – 50 μL (P/N 84303), or 10 – 200 μL (P/N 84302).

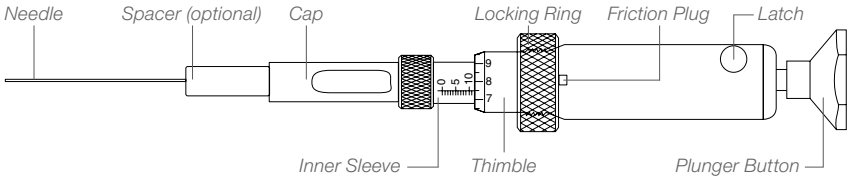
Operating the CR-700 Constant Rate Syringe

The CR-700 has a unique micrometer type volume adjustment setting. Follow these steps to operate the CR-700 (refer to Figure 1, next page):

1. Loosen the locking ring and rotate the thimble until the volume required is selected.
To read the micrometer, align a mark on the thimble with the single vertical line on the inner sleeve. The value on the inner sleeve is read first. The number associated with the line on the thimble is a decimal fraction of the coarse reading. Align the 0 mark on the thimble with the vertical line on the inner sleeve where it intersects the line of the volume you desire. To obtain a reading between two whole numbers on the inner sleeve scale, rotate the thimble. Figure 1 (next page) illustrates a CR-700-20 with a final selected volume of 11.75 μL .
2. Tighten the locking ring using your fingers.
3. Place the needle tip in your sample, and fill the syringe by pulling the plunger button.
4. To inject the sample, press the latch button located near the top of the outer sleeve.

Note: Once you select a volume by tightening the locking ring, you do not need to loosen the locking ring again until you select a different volume.

Figure 1: A CR-700-20 model showing a volume of 11.75 μL .



Cleaning and Maintaining the CR-700

The CR-700 syringe is completely serviceable on site. Replacement parts are listed and an exploded view of the syringe components is provided for your information. Re-calibrate the CR-700 after installing any new parts.

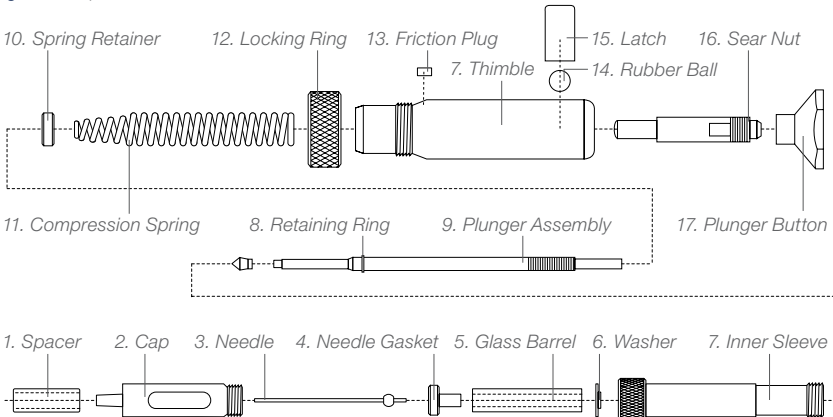
Minor disassembly is required to replace the following items: glass barrel, plunger, needle, and needle gasket. Those parts to be reused should be thoroughly cleaned using Hamilton's Cleaning Solution Concentrate (P/N 18311) or a suitable commercially available liquid detergent and warm water. Rinse and dry all parts completely before reassembly.

Disassembling the CR-700:

Refer to Figure 2 for location of all parts.

1. Press and release the latch button on the upper end of the outer sleeve to ensure that the plunger is not cocked.
2. Unscrew the cap, and remove the needle and needle gasket.
3. Remove the glass barrel and the glass barrel washer from the plunger assembly.

Figure 2: Exploded view of the CR-700.



Note: Disassembly beyond this point is discouraged since the balance of the syringe parts are not subject to excessive wear.

If necessary, continue with these steps for a major disassembly:

4. Remove the locking ring and friction plug.
5. Cock the syringe plunger and remove the syringe inner sleeve. While holding the sear nut, remove the plunger button.

CAUTION: With the syringe plunger cocked and the plunger button removed, pushing the latch will cause the plunger assembly to eject with great force and could result in personal injury and damage to the plunger assembly.

6. Securely holding the sear nut with your right hand, position the thimble with the plunger assembly in the palm of your left hand. Push the latch and slowly release the spring tension, allowing the plunger to separate from the thimble.
7. Remove the latch and rubber ball.
8. Remove the plunger retaining ring, spring retainer, compression spring, and sear nut.

Reassembling the CR-700

1. Clean all parts to be reused and allow them to dry.
2. Install the rubber ball and latch into the thimble, being sure to position the latch with the larger bore diameter towards the plunger button.

Note: The syringe will not cock, and calibration will not be possible after syringe assembly, if you install the latch incorrectly.

3. Apply a small amount of lubricating grease to the compression spring in the area just behind the spring retainer.
4. While pressing the latch, install the plunger assembly into the thimble and through the hole in the latch. Keep the latch pressed until you feel the plunger cock.
5. Install the plunger button finger-tight.
6. Apply a small amount of lubricating grease to the threads on the inner sleeve. Thread the inner sleeve into the thimble to approximately 1/2 of the syringe's volume.
7. Install the washer with the shoulder on the washer facing the plunger button. Wet the PTFE plunger tip. Then install the glass barrel, needle gasket, needle, and cap.
8. Install the friction plug and locking ring.
9. Press the latch while holding the plunger button, and gently allow the plunger to move forward.
10. Calibrate the CR-700 as instructed in the Calibration of the CR-700 section that follows.

Note: Do not cock and release the plunger before calibrating the syringe, as the plunger tip may become distorted by hitting the needle gasket.

Calibration of the CR-700

1. Set the CR-700-20 at 3 μL (use 6 μL for CR-700-50 or 30 μL for CR-700-200), cock the plunger, and release. If the plunger fails to cock, remove the plunger button, and while holding the sear nut on the flat edges with a wrench, rotate the plunger 1/2 turn counterclockwise with a screw driver. This adjustment will back the plunger tip away from the needle gasket. Adjust the plunger 1/2 turn at a time until the syringe successfully cocks.
2. Reset the syringe to 0.2 μL (0.4 μL for CR-700-50 or 2 μL for CR-700-200). Cock the syringe and proceed to step 3. If the syringe will not cock, repeat step 1.
3. Press the latch to release the plunger. Set the syringe to 3 μL (6 μL for CR-700-50 or 30 μL for CR-700-200), cock, and release. Reset the syringe at two graduation marks before zero (a minus reading). Cock the syringe and release. You should feel a very slight movement of the plunger. The syringe should not cock and release at a setting less than the minus two marks. If the syringe fails to cock when set at two graduation marks before zero, the plunger tip is too far away from the needle gasket. Reset the plunger as instructed in step 1 after turning the plunger clockwise 1/2 turn. Repeat step 3 until the slight plunger movement is detected upon latch release.

Replacement Parts & Supplies

Description	Syringe Model		
	CR-700-20	CR-700-50	CR-700-200
1. Spacer	86201	86201	86201
2. Cap	15933	15933	15933
3. Needle	15934	15936	15936
4. Needle Gasket	15930	15946	15931
5. Glass Barrel	15927	15945	15928
6. Washer	15932	15932	15932
7. Inner Sleeve and Thimble	15903	—	15904
8. Retaining Ring	19663	19663	19663
9. Plunger Assembly	15909	15944	15910
10. Spring Retainer	15917	15917	15917
11. Compression Spring	19607	19622	19608
12. Locking Ring	15925	15925	15925
13. Friction Plug	15926	15926	15926
14. Rubber Ball	15923	15923	15923
15. Latch	15922	15922	15922
16. Sear Nut	15921	15921	15921
17. Plunger Button	15924	15924	15924

WARRANTY STATEMENT

Hamilton Company unconditionally guarantees its products to be free of defects in materials and workmanship. Any product that fails due to such a defect will be repaired or replaced at our discretion without cost, provided the device is returned on a Return Materials Authorization (RMA). It is the responsibility of the purchaser to determine the suitability of application and material compatibility of the product based on the published specifications of the product.

RETURN OF GOODS

Hamilton Company's return and repair policy is written to protect its employees from potentially hazardous materials (e.g., serum, radioactive materials, carcinogenic chemicals, etc.) or any substance that may cause them partial or permanent disability during the inspection or repair process. In returning a product, the customer acknowledges that the product is free from any hazardous materials. Furthermore, the customer assumes responsibility should the returned product prove to be hazardous.

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