

Instructions on how to prime and calibrate a MICRO-MATIC[®] twin injector

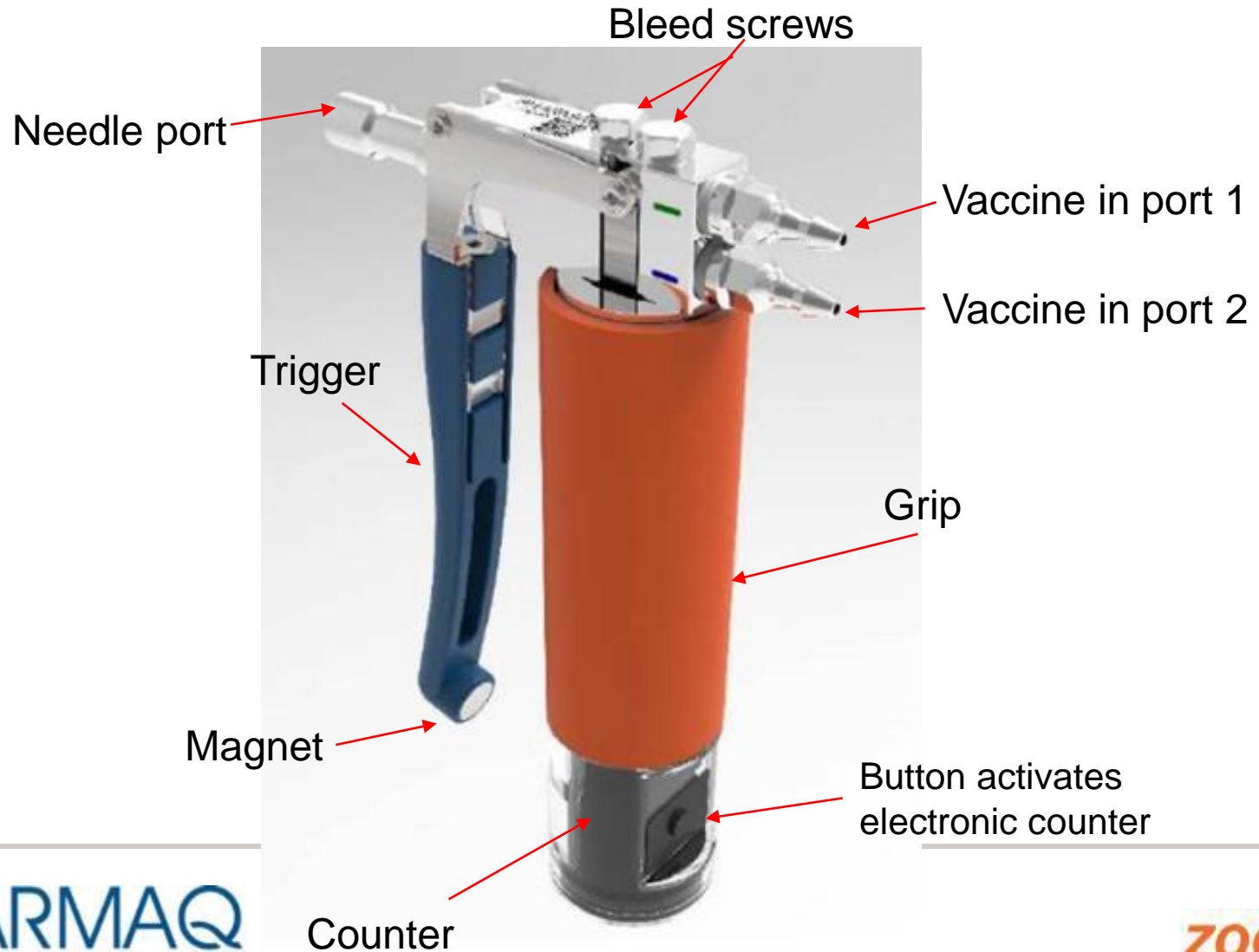


Jorge Navarro
Technical Sales Manager

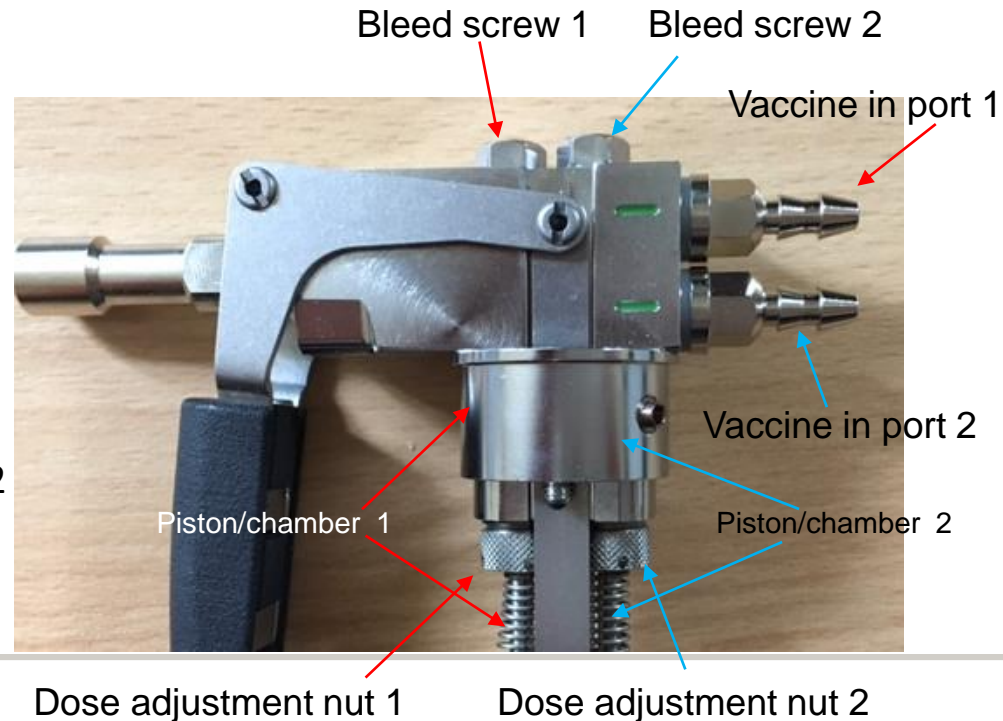
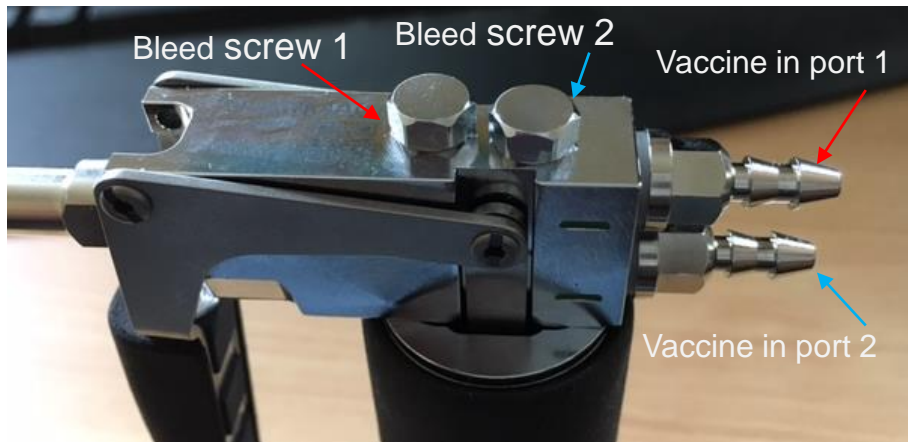
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Twin Injector parts description



Vaccine in ports, bleed screws and adjustment nuts corresponding to each piston/chamber 1 and 2.

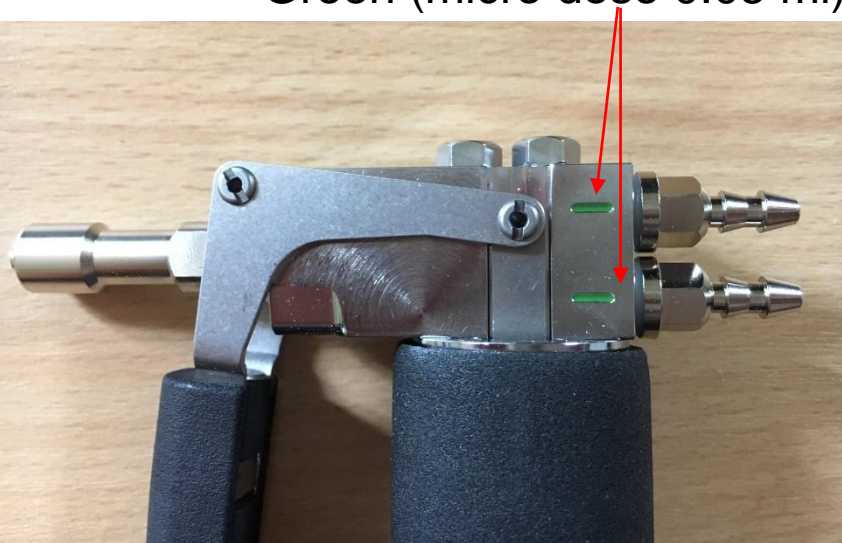


1. Vaccine in port 1 corresponds to bleed screw 1 and dose adjustment nut 1.
2. Vaccine in port 2 corresponds to bleed screw 2 and dose adjustment nut 2.

Each Injector is colour coded for 0.1ml (blue) and 0.05 ml (green) dose.

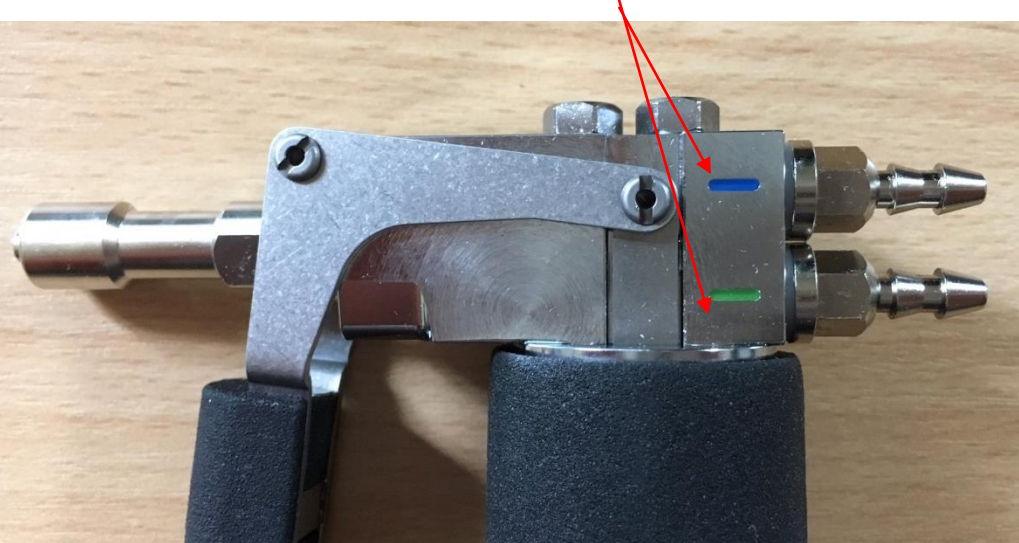
Dose

- Green (micro dose 0.05 ml)
- Green (micro dose 0.05 ml)



Dose

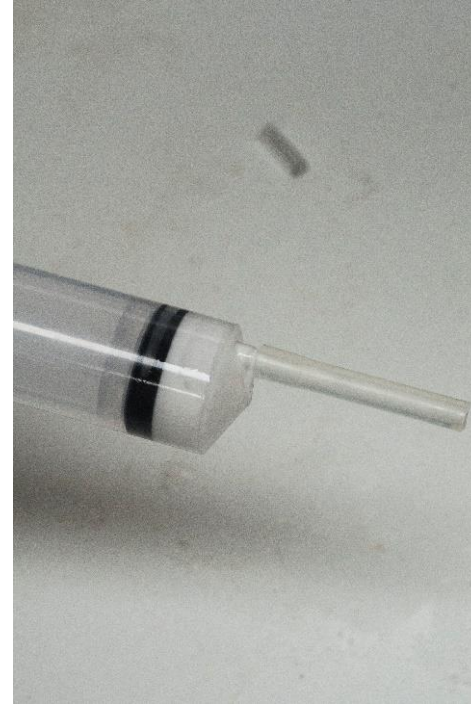
- Blue (0.1 ml)
- Green (micro dose 0.05 ml)



A. Prime piston/chamber 1:

1. - Connect the free end of the vaccine tube that is connected to the vaccine bag to the syringe and pull the plunger to draw in a small amount of vaccine into the syringe.





2. - Disconnect the syringe from the tube of the vaccine bag.
 - Attach a small piece of tube to the syringe.



3. - Connect the syringe and piece of tube to the injector vaccine in port 1 which will be primed and calibrated first.
 - Place the injector with the barrel-needle attachment facing down. 90 degree angle.
 - Press the injector trigger and hold, at the same time press the syringe plunger until all air and vaccine comes through the barrel-needle attachment. In some injectors more plunger force will be needed.
 - Disconnect the piece of tube and syringe. **DO NOT OPERATE THE INJECTOR TRIGGER** or air will be introduced.

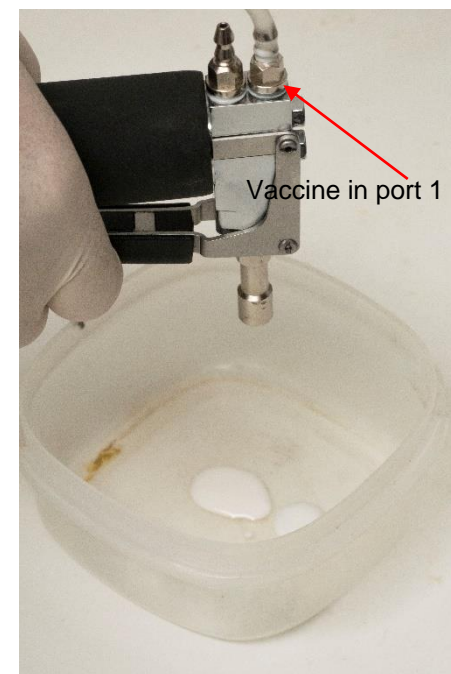
Photo A



Photo B

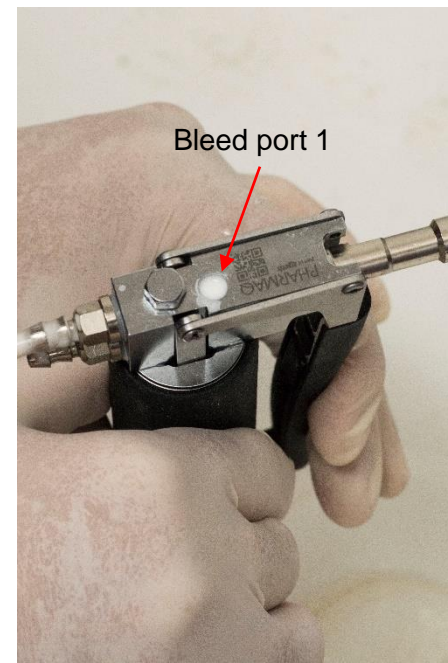
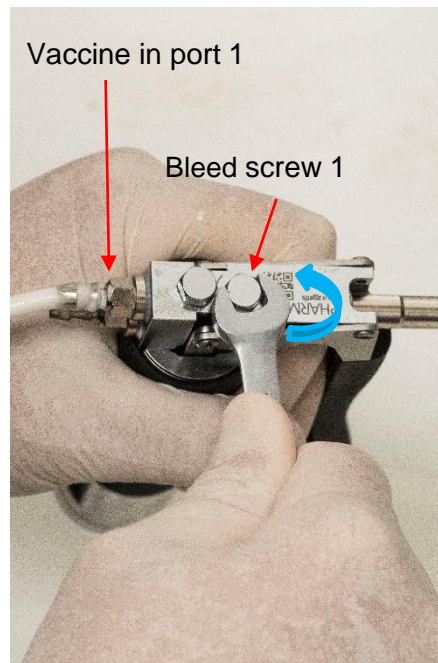


Photo C



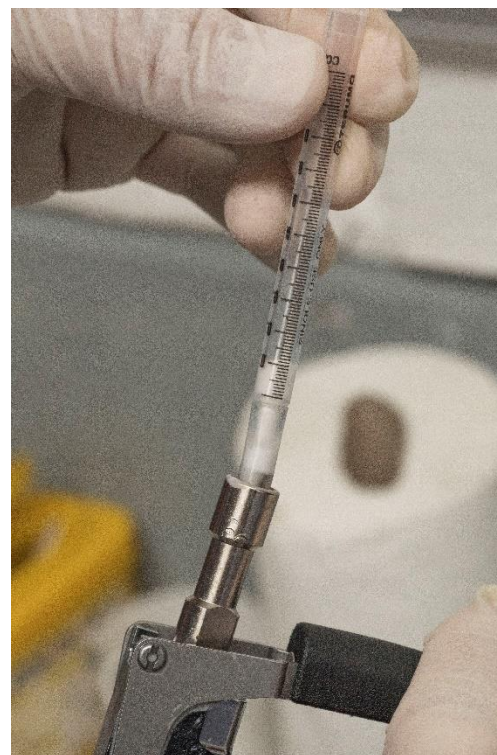
4. – Remove any air from the tube connected to the vaccine bag before connecting to the injector (photo A). Squeeze vaccine bag until only vaccine flows.
 - Connect the vaccine's bag own tube to vaccine in port 1 (photo B).
 - Operate the trigger a few times to get vaccine passing through the injector piston/chamber 1 (photo C).

Priming cont. piston/chamber 1

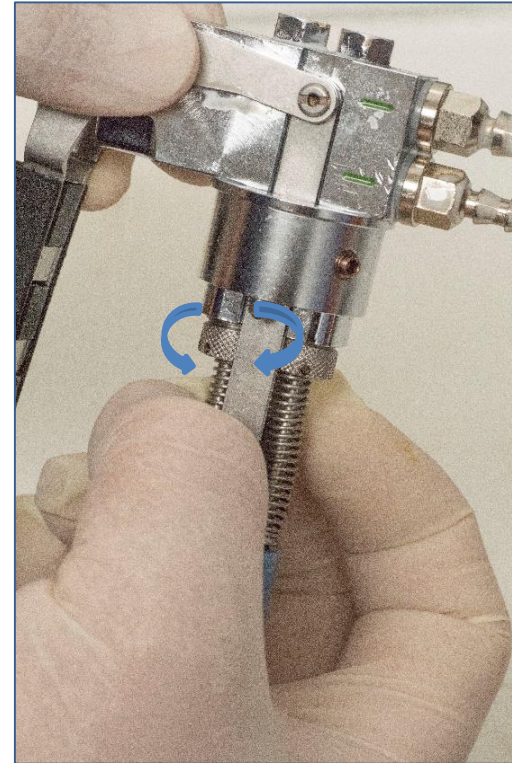
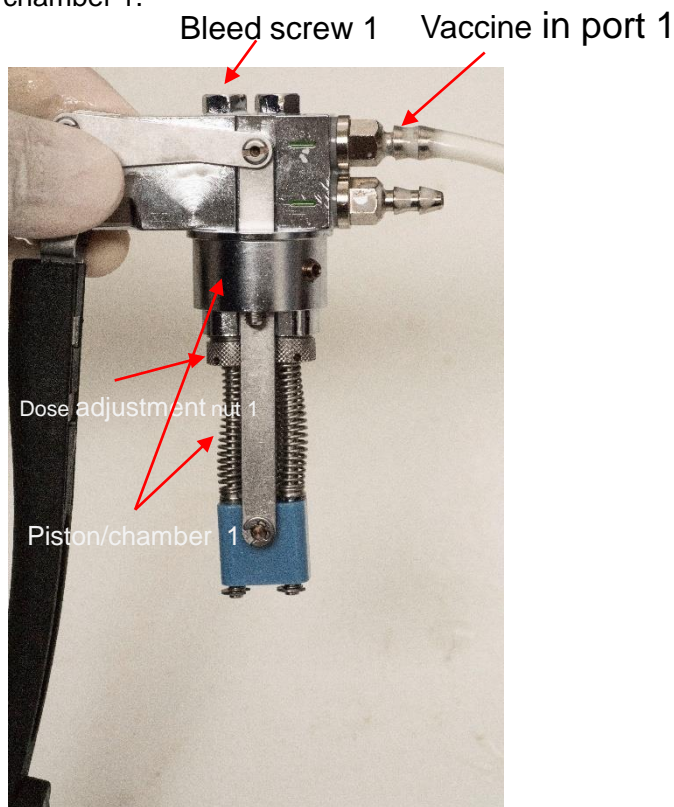


5. - Air needs to be bled out of the system and this is done using a 8 mm wrench to unscrew the bleed screw located in the top of the injector for each corresponding piston-chamber 1 or 2.
 - Remove the screw completely. In this case is bleed screw 1.
 - Press the trigger and **hold**. You will see vaccine raise to the bleed port 1. Also at this point with the trigger still pulled you can squeeze the vaccine bag to overflow the bleed port slightly.
 - Clean surface and screw back bleed screw 1.
 - Release the trigger.
 - Operate the trigger to verify vaccine is flowing through the piston/chamber 1. If not repeat the above process.
 - Piston/chamber 1 is primed and ready for calibration.

B. Calibrating piston/chamber 1:



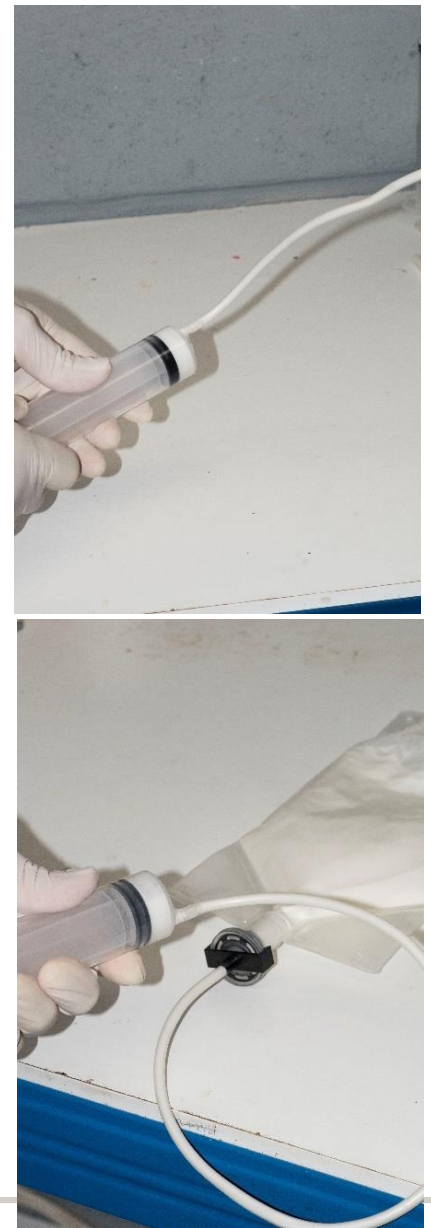
6. - Attach a small piece of vaccine tube to the barrel-needle end of the twin injector.
- Then attach a syringe or pipette to the other end and trigger vaccine and proceed to calibrate piston-chamber 1 first.

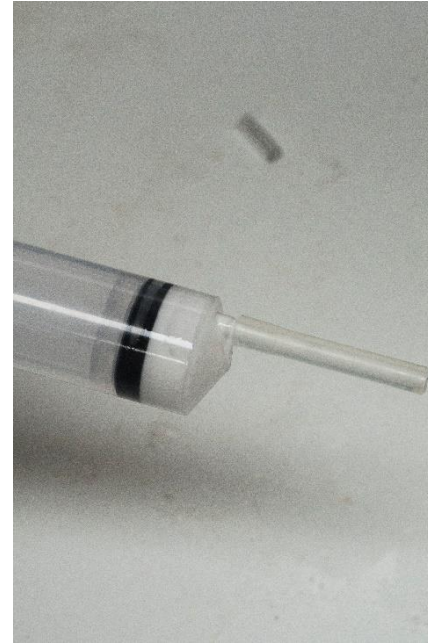


7. - To adjust the dose remove grip/handle to expose the pistons and the dose adjustment nuts. In this case dose adjustment nut 1 corresponding to piston/chamber 1.
 - Turning the dose adjustment nut clockwise will decrease the dose and counter clockwise will increase the dose.
 - The dose can only be adjusted by only $\pm 10\%$ as the injector has a fix dose of either 0.1 ml or 0.05 ml.
 - Do not detach tube and vaccine from the vaccine port 1.

C. Prime piston/chamber 2:

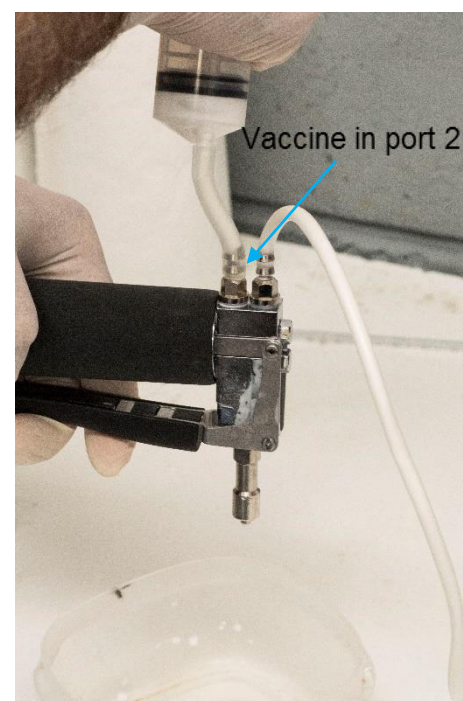
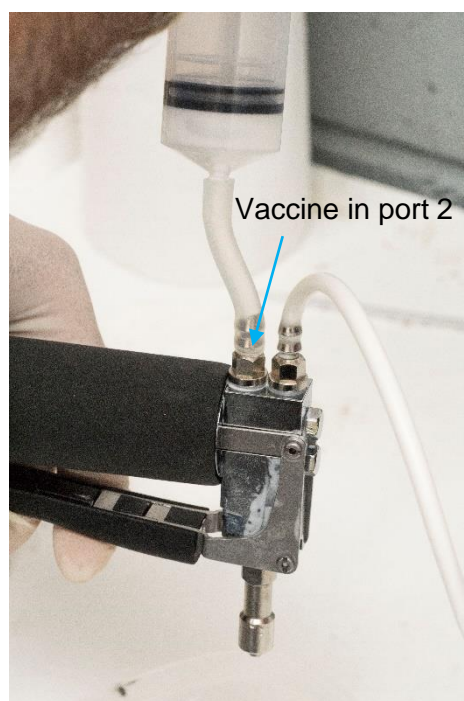
8. - Connect the free end of the vaccine tube that is connected to the vaccine bag to the syringe and pull the plunger to draw in a small amount of vaccine into the syringe.





9. - Disconnect the syringe from the tube of the vaccine bag.
 - Attach a small piece of tube to the syringe.

Priming cont. piston/chamber 2.



10.- Connect the syringe and piece of tube to the injector vaccine in port 2.

- **Do not detach vaccine tube attached to vaccine bag of piston/chamber 1.** If removed, air will be introduced and priming will need to be done again.
- Place the injector with the barrel-needle attachment facing down. 90 degree angle.
- Press the injector trigger and hold, at the same time press the syringe plunger until all air and vaccine comes through the barrel-needle attachment. In some twin injectors more plunger force will be needed.
- Disconnect the piece of tube and syringe. **DO NOT OPERATE THE INJECTOR TRIGGER** or air will be introduced.

Photo D

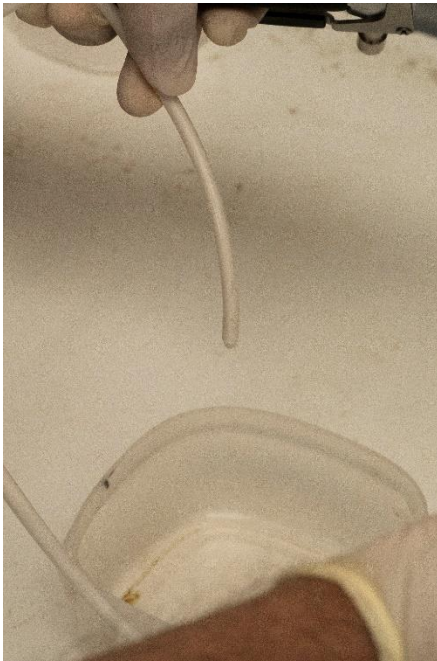


Photo E

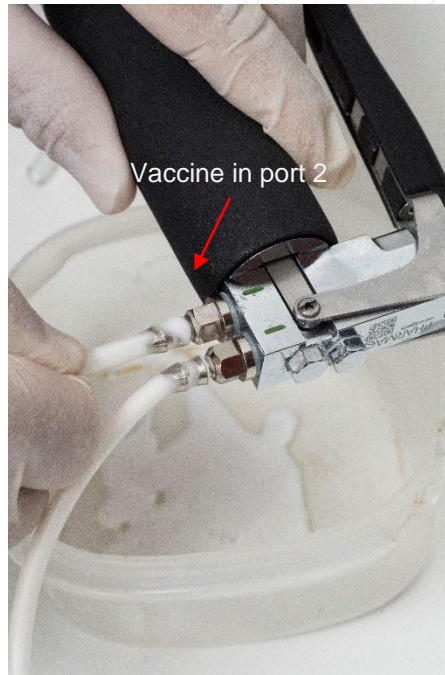
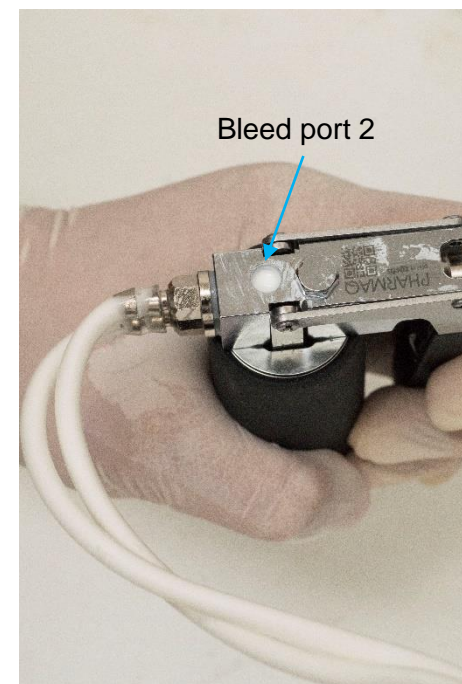
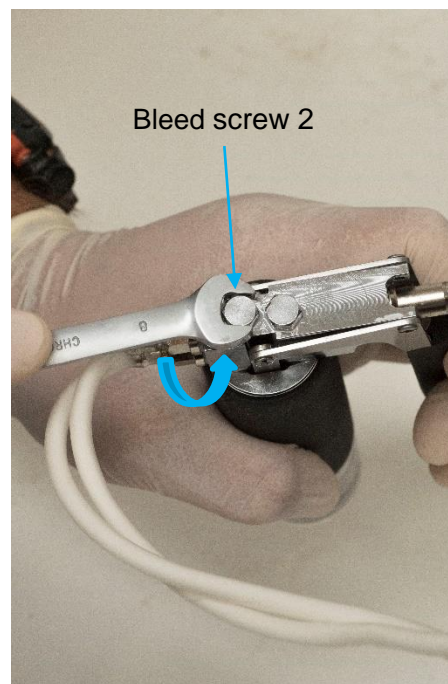
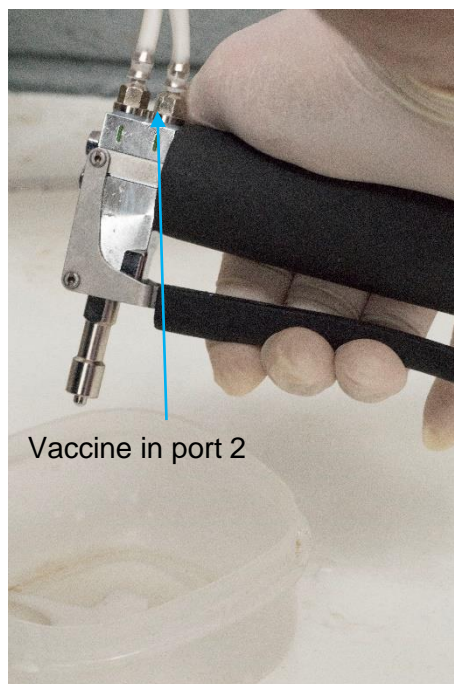


Photo F

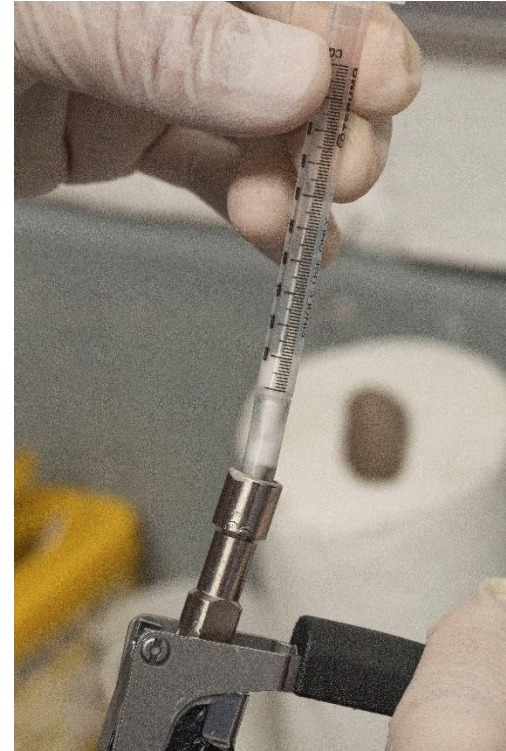


11. – Remove any air from the tube connected to the vaccine bag before connecting to the injector (photo D). Squeeze vaccine bag until only vaccine flows.
 - Connect the vaccine bag own tube to vaccine in port 2 (photo E). Vaccine port 1 will still be connected to vaccine tube and vaccine (do not remove).
 - Operate the trigger a few times to get vaccine passing through the injector piston/chamber 2 (photo F).

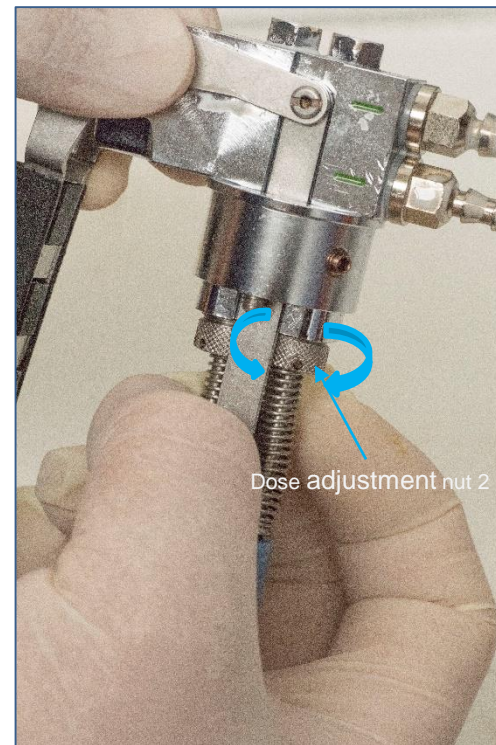
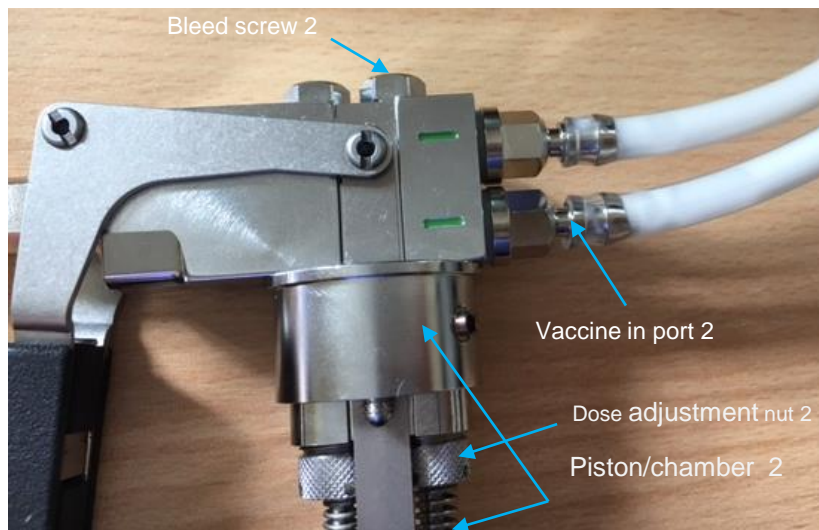


12. - Air needs to be bleed out of the system and this is done using a 8 mm wrench to unscrew the bleed screw located in the top of the injector for each corresponding piston-chamber 1 and 2.
- Remove the screw completely. In this case is bleed screw 2.
- Press the trigger and **hold**. You will see vaccine raise to the bleed port 2. Also at this point with the trigger still pulled you can squeeze the vaccine bag to overflow the bleed port slightly.
- Clean surface and screw back bleed screw 2.
- Release the trigger.
- Operate the trigger to verify vaccine is flowing through the piston/chamber 2. If not repeat the above process.
- Piston/chamber 2 is primed and ready for calibration.

D. Calibrating piston/chamber 2:



13. - Attach a small piece of vaccine tube to the barrel-needle end of the twin injector.
 - Do not detach tube-vaccine connected to vaccine in port 1 or air will be introduced and will need bleeding again.
 - Then attach a syringe or pipette to the other end and trigger vaccine and proceed to calibrate piston-chamber 2 on the **total dose** for each specific twin injector (0.1 ml or 0.15 ml) as piston/chamber 1 was already calibrated. Any deviation observed at this point should be from piston/chamber 2.



14. - To adjust the dose remove grip/handle to expose the pistons and the dose adjustment nuts. In this case dose adjustment nut 2 corresponding to piston/chamber 2.
- Turning the dose adjustment nut clockwise will decrease the dose and counter clockwise will increase the dose.
- The dose can only be adjusted by only $\pm 10\%$ as the injector has a fix dose of either 0.1 ml or 0.05 ml for each piston/chamber.

Troubleshooting

- If injector is not delivering the correct dose:
 - Check the calibration.
 - Air in the system and needs to be bleed out and recalibrated.
- If any of the tubes are detached after priming and calibration and the trigger operated the twin injector will draw in air and will need bleeding again.
- Some injectors are more stubborn to prime and calibrate, usually one of the piston/chambers and the above instructions may not work that well. Do this if it happens. Attach syringe with vaccine to the vaccine in the port of the piston/chamber not working. Remove the correct bleed screw. Press trigger and hold then press plunger until vaccine is forced out through the bleed port and barrel-needle attachment. Screw back bleed screw and attach vaccine tube. Operate trigger to get vaccine flowing and then calibrate.

The background of the slide is a light blue gradient with numerous white and light blue bubbles of various sizes scattered across it, particularly concentrated on the right side.

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