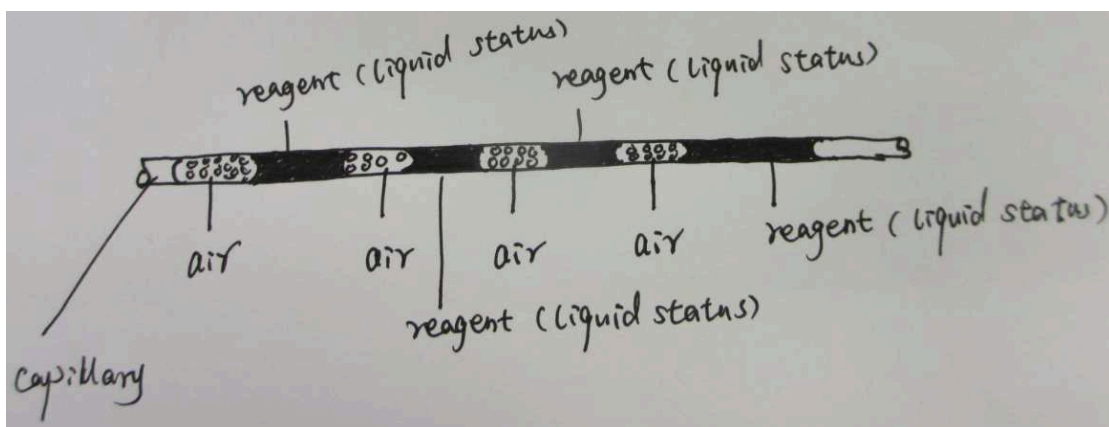


Reagent valve failure or clogging of a capillary will cause very low-to-zero sample readings or “-----“(less than zero) readings.

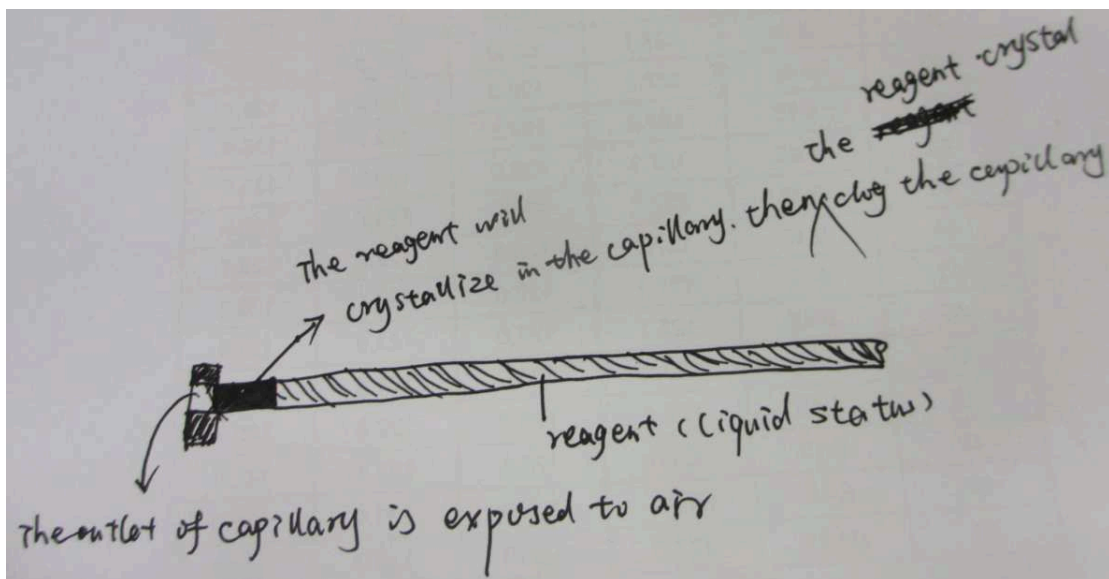
If the capillary is totally full of reagent (liquid status) also there is no any damage on the capillary, normally the capillary will not be clogged.

**1. Why the capillary is clogged? If the follow situation happen, the capillary will be clogged.**

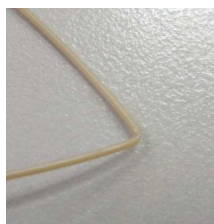
1.1. If there is a lot of air mixed into reagent also enter the capillary as that is indicated in the below picture, there will be big resistance in the capillary during reagent delivery process, it is much bigger than 4 psi, as a result the capillary is clogged.



2.2 If the capillary is disassembled from colorimeter or the analyzer stop run for a long term also the colorimeter is empty, there is still reagent in the capillary, the outlet of capillary is exposed to atmosphere, the reagent around outlet of capillary will crystallize in the capillary, and as a result the reagent crystal will clog the capillary.



2.3 If the capillary suffer accidentally big bend as that is indicated in the below picture, the reagent will not be delivered into colorimeter per required flow rate.





## 2. How to avoid the capillary is clogged as much as possible?

2.1 Avoid the capillary suffer big bend.

2.2 Before analyzer storage or shipping or need to stop the analyzer running for a long time, please do the below preparation(which is indicated in maintenance and troubleshooting manual,HACH P/N DOC023.97.80475) to make sure the capillary is clean with deionized water, no any reagents exist in the capillary.

### Prepare for storage or shipping

<b>⚠ CAUTION</b>	
 	Chemical exposure hazard. Obey laboratory safety procedures and wear all of the personal protective equipment appropriate to the chemicals that are handled. Refer to the current safety data sheets (MSDS/SDS) for safety protocols.

Remove all the fluids and the power from the analyzer for long-term storage.

1. Push **menu** and then go to SETUP SYSTEM>DECOMMISSIONING.
2. Select YES to stop the analyzer and start the decommissioning cycle.
3. Remove the reagents, the standards and the cleaning solution bottles for disposal in accordance with local, state, and federal regulations.
4. Flush and then fill the bottles with deionized water.
5. Install the bottles.




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14 *English*

6. Make sure that all of the liquid is drained from the colorimeter, sample holder and tubing.
7. Set the power switch to off.
8. Clean the bottom enclosure.

2.3 If the analyzer give a warning of REAGETN LOW, should replace the analyzer bottle in time. If replacing the reagent bottle after the reagent bottle is empty, at the moment, the air has been delivered into capillary, as a result the capillary will be clogged.

## Replace the analyzer bottles

▲ CAUTION	
 	Chemical exposure hazard. Obey laboratory safety procedures and wear all of the personal protective equipment appropriate to the chemicals that are handled. Refer to the current safety data sheets (MSDS/SDS) for safety protocols.
▲ CAUTION	
	Chemical exposure hazard. Dispose of chemicals and wastes in accordance with local, regional and national regulations.

Replace the reagent(s), standard(s) or cleaning solution before the level in the analyzer bottle(s) is less than 10%. Measurements are not accurate when the level is less than 10%.

1. Put the analyzer in shutdown mode. Refer to [Put the analyzer in shutdown mode](#) on page 6.
2. When the status shows 100% completion, open the lower door.
3. Remove the cap from the reagent(s), standard(s) or cleaning solution, then remove the bottle(s) from the analyzer.
4. Install the new analyzer bottle(s) and close the lower door. Refer to the operations manual.
5. Push **menu** and go to REAGENTS/STANDARDS.
6. Select RESET REAGENT LEVELS or RESET STANDARD LEVELS or RESET CLEANING SOLUTION LEVELS.
7. For reagents, select PRIME REAGENTS and confirm.
8. When the reagent prime is complete, start the analyzer. Refer to [Put the analyzer back into operation](#) on page 6.

### 3. What to do if the capillary is clogged?

3.1 First confirm the capillary is clogged. Please refer to service manual.

3.2 If the capillary is clogged, replace the capillary assembly (P/N 9568601 ASSY, CAPILLARY TBG, COLORIMETER, RED and P/N 9568602 ASSY, CAPILLARY TBG, COLORIMETER, BLACK)



Capillary assembly 9568601



Capillary assembly 9568602

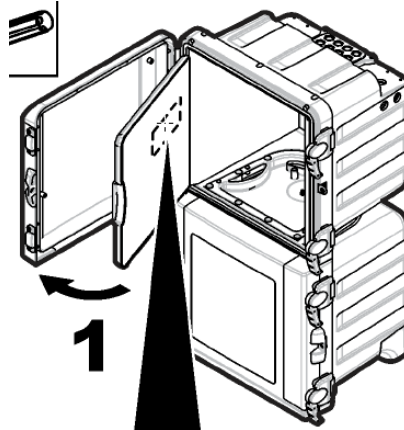
3.3 If the capillary is clogged, it is urgent to repair the analyzer but have no any new capillary assembly in hands, can do follow the below steps:

3.3.1 Prepare a syringe with about 1" silicone tubing HACH P/N 6790700 and a beaker.

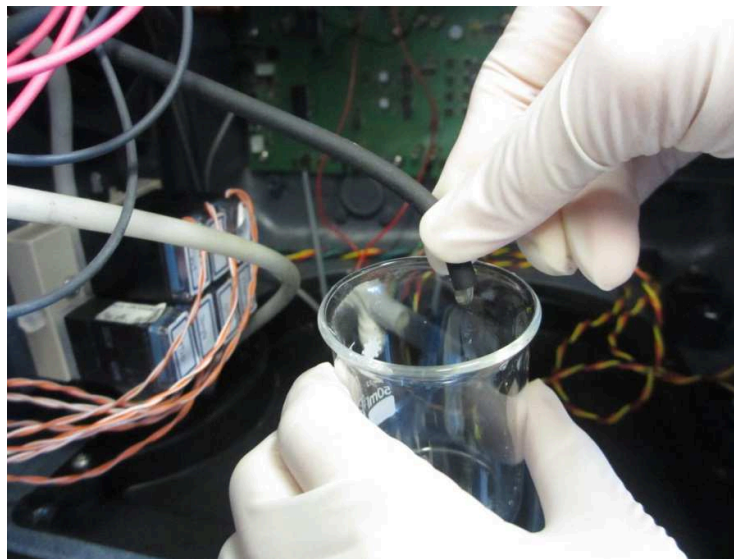


About 1" silicone tubing HACH P/N 6790700.

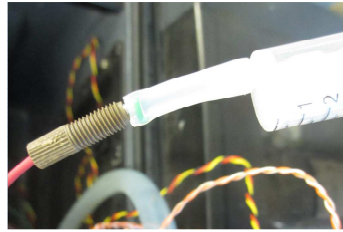
- 3.3.2 Put the analyzer in shutdown mode, open the upper enclosure door and analytic panel as the below.



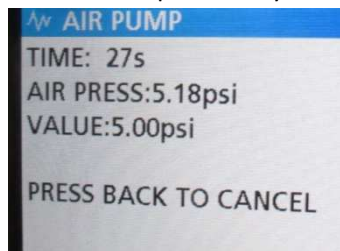
- 3.3.3 Empty two cells.  
Prepared a beaker, pinch and disconnect the tubing from the fitting where in 7-way manifold and for cell 1 as the below, loose the tubing then let the liquid in cell1 stream into the prepared beaker.  
Repeat this step for cell 2.



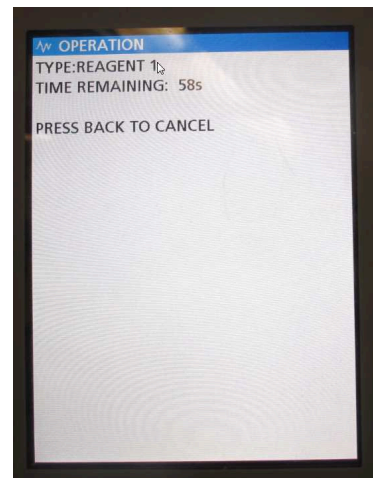
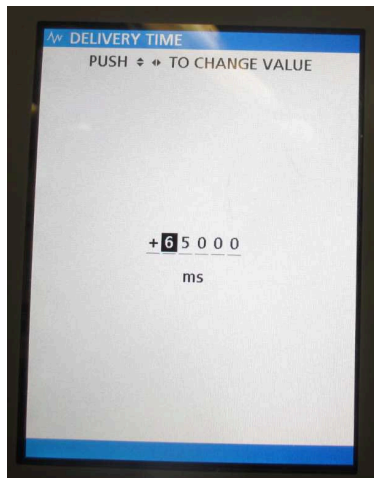
- 3.3.4 Carefully disassemble the clogged capillary tubing from cell base, mark which reagent and which cell ( R1/2/3-cell1, R1/2/3-cell 2). Connect the clogged capillary to the syringe as the below picture.



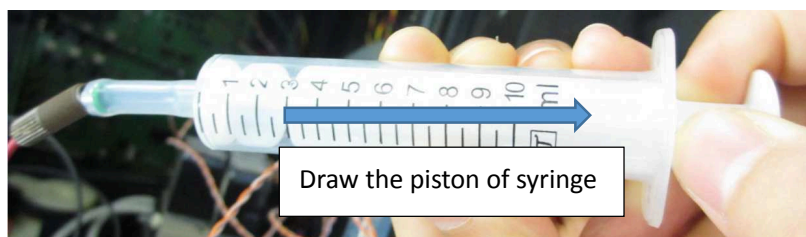
- 3.3.5 Go to Diag/Perform Test, press [Enter]/Air Pump, and press [Enter] /Start, and then Press [Back] when the air pressure system is stable.

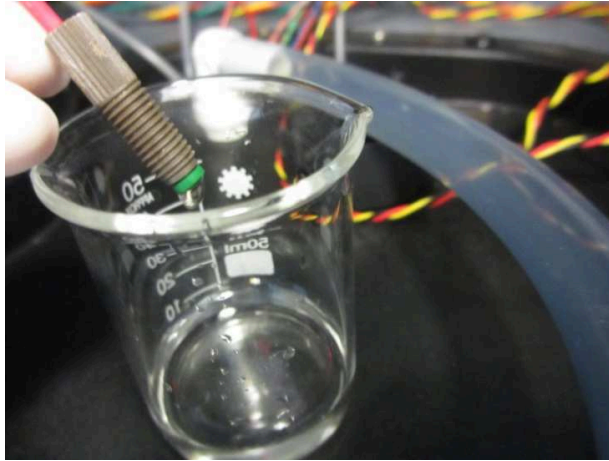


- 3.3.6 Go to Reagent Delivery, press [Enter]/cell1/2,press [Enter]/Reagent 1/2/3, press [Enter]/Time, press [Enter]/Set time for delivery, press [Enter], press [Enter]



- 3.3.7 While holding the clogged capillary, draw the piston of syringe, observe whether reagent can be dispensed. Disconnect the capillary form syringe, holding the capillary above the beaker, observe whether reagent is dispensing. If yes, that means the capillary is repaired, it isn't any longer clogged.





- 3.3.8 Reassemble the capillary back onto cell base.
- 3.3.9 Repeat above steps for the other clogged capillary.