Microbiological sampling procedures

Milli-Q® CLX 7040/7080/7120/7150 water purification systems

Contents

Introduction

1. The importance of verifying the microbiological quality of purified water

Bacterial contamination may have serious effects on analyzer operation and test result accuracy. It is good practice to verify on a regular basis that the water delivered by the water purification system meets the needs of the laboratory.

2. Good laboratory practices

We recommend to rigorously follow good laboratory practices when collecting water for microbiological testing, in order for the testing results to be accurate, reliable and truly representative of the water quality. Water samples should be collected using aseptic technique and sterile containers, and in a manner that prevents contamination by contact with skin or the environment. In addition, it is important to use proper sampling technique and equipment. It is advised that the user taking the water samples is familiar with the operation of the water purification system as well as basic aseptic techniques.

Sampling valves

The sampling valve allows to take a sample of water right before the water leaves the system.

The Luer valve (provided) may be used, or an ESP valve may be preferred (not provided, needs to be installed as described below).

Types of sampling valves used with Milli-Q® CLX 7000 series systems:

- Luer Valve
- External Sanitary Sampling (ESP) Valve

Location of the sampling valves

On the Milli-Q® CLX 7000 series systems, the sampling valve takes water from the Distribution process after the water goes through the Opticap® final filter and before it is delivered.

A - Luer valve

The Luer valve is the default sampling valve with a Luer-lock outlet

B - ESP valve

The ESP valve is a sanitary sampling valve ideal for sterile sampling of high purity water. The unique construction of the ESP valve allows the user to sample mid-stream and prevents accumulation of bacteria or particles inside the sampling probe.

The ESP valve is not supplied with Milli-Q® CLX water systems (Ordering information on page 12).

How to replace a Luer valve with an ESP valve

When changing from a Luer to an ESP valve you have to remove the Luer valve, install the ESP valve and then you must sanitize the ESP valve.

Items required (not provided):

- ESP valve
- Container large enough to collect > 100 mL of water
- PTFE Ribbon tape
- 7/16 inch hexagonal socket or equivalent
- AZ 3.5x75 Flat screwdriver or equivalent

A. Removal of the Luer Valve

The Luer valve and a connector behind it need to be removed when an ESP valve is going to be installed.

1. Place the distribution process of the water purification system into STANDBY Mode.

2. Remove the rubber septum from the Luer valve, open the Luer valve and collect the residual water that comes out (approximately 80-100 mL), twist the Luer valve about 1/4 turn anti-clockwise and pull to remove it.

3. Using a 7/16 inch hexagonal socket, unscrew the Female Luer Hex Connector by turning it anti-clockwise. Be careful not to damage the connector if it does not turn easily.

Warning: Do not leave the system at this time without installing an ESP valve. If the system is placed into DISTRIBUTION READY Mode without an installed valve, large amounts of water will come out of the hole.

B. Installation of the ESP Valve

1. Wrap 2-3 turns of PTFE Ribbon tape onto the threads of the ESP valve probe, loosen the retainer screw in the ESP valve body and remove the ESP valve stem part.

2. Thread clockwise the ESP valve probe into the hole, probe end first. The retainer screw must point down. Install the valve stem part and tighten the retainer screw. Close the ESP valve by turning clockwise the valve Male Luer-Slip nut

3. Place the distribution process of the water purification system back into READY. During this time, the ESP valve will be under pressure. Check the threaded section of the ESP valve for any leaks.

How to sanitize the ESP valve

Sanitize the ESP valve immediately after installation and after each sampling.

Items required (not provided):

- A large container of >10 litres capacity or some smaller containers with >10 litres of total capacity
- 20 mL syringe with needle
- Sanitizing agent (at least 6% hydrogen peroxide)
- Safety glasses
- Clean lab coat
- Sterile gloves or gloves disinfected with 6% hydrogen peroxide

1. Close the ESP valve by turning the Luer-Slip nut clockwise. Place distribution process into READY.

2. Remove the blue plastic cap or remove the sterile tubing (if attached to the ESP valve). Prepare the container to collect the water.

Warning: When the valve is open the water will be under pressure. Put the container close to the system.

3. Open the valve by turning the Luer-Slip nut anti-clockwise. Flush for 2 minutes. Close the valve by turning the Luer-Slip nut clockwise.

4. Fill a 20 mL syringe with at least 10 mL of 6% hydrogen peroxide solution. Insert the syringe needle all the way into the valve through the Luer-Slip. Inject a few mL of the sanitizer into the valve until the sanitizer flows out.

5. Remove the syringe from the Luer-Slip and spray a few mL of the sanitizer over the outer surface of the Luer-Slip.Fill the blue plastic cap with sanitizer and slip it over the stem of the Luer-Slip.

How to sample water from the system

Items required (not provided):

- A clean lab coat
- 20 mL syringe
- Sterile gloves or gloves disinfected with 6% hydrogen peroxide solution
- Sterile sampling tubing (with Luer-lock male/female connections if Luer valve is used)
- Container of >2 L capacity
- Sterile sample container
- Identification labels and permanent pen

How to sample from a Luer valve

When sampling from a Luer valve you have to attach sterile tubing and flush the Luer valve.

Attaching the sterile tubing, flushing the Luer valve and taking the sample must be done in sequence; performing any of the steps separately may cause inaccurate results.

How to sample from an ESP valve

When sampling from an ESP valve, you have to attach sterile tubing, flush the ESP valve and, after sampling, you must sanitize the ESP valve. All steps must be done in sequence; performing any of the steps separately may cause inaccurate results.

The ESP valve must have been sanitized after last use. In case it was not, it must be sanitized before taking a sample.

A. Attach sterile tubing to an ESP or Luer valve

1. Place the Distribution process of the water system into STANDBY.

2. Position the container on the floor near the system and in front of it.



Warning: Wear sterile gloves for these steps.

3. Remove the blue cap from the ESP valve or remove the rubber septum from Luer valve. Wash the inside and the surface of the Luer valve outlet using the syringe or wash bottle.



4. If using the ESP valve, push the open end of the sterile tubing onto the Luer-Slip of the valve. Twist it slightly clockwise to have it grip the Luer-Slip. For the Luer valve connect the clear female threaded end of the sterile tubing to the Luer-lock outlet of the Luer Valve.


B. Flush the valve

Proper flushing prevents a false measurement when taking a sample of water from the valve.

1. Place the Distribution process of the water system into READY

2. Remove the cap from the unattached end of the sterile tubing. Check that the sterile tubing is well attached to the valve. Point the open end of the sterile tubing into a container. Do not touch the open end of the sterile tubing with the surface of the container.

3. Open the valve. Flush >200 mL for ESP Valve and >1 L for Luer.

Warning: Do not allow the end of the sterile tubing to touch the water in the container. Do not close the ESP valve. If it is closed the ESP valve will need to be flushed again.

C. Collect water sample

1. Open the cap on the sterile sample container. Fill up the sterile sample container with water from the valve.

Warning: Do not overfill it and do not allow the open end of the sterile tubing to touch either the surface of the container or the collected water.

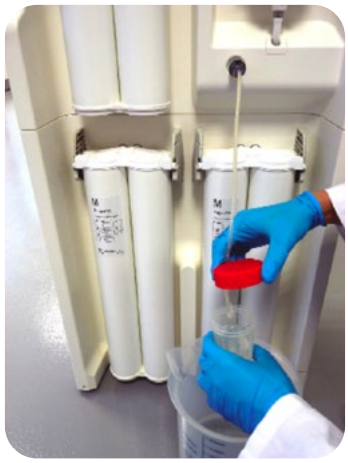
2. Put the cap back on the sterile sample container immediately after the sample has been collected.

3. Close the valve. Put the rubber septum or the blue cap of the valve back in place.

4. Label the sample.

5. Remove the sterile tubing and discard it.

6. Sanitize the ESP valve.



Microbiological analysis of the water sample

Microbiological analysis of the water sample should be performed as soon as possible. If it is not possible to analyze the sample immediately after collection, store the sterile flask containing the sample for a maximum of 2 hours at room temperature or refrigerate it at 2°C to 8°C for a maximum of 24 hours.

Use a thermally insulated shipping container in case the sample is sent to another location for analysis. Samples should be allowed to reach ambient temperature before testing.

Samples need to be prepared according to laboratory guidelines for analysis of high purity water using suitable media such as R2A agar.

As an alternative, you may use an on-line filtration system such as the MicropreSure® device.

By reducing the sampling process to a few simple steps performed within a closed system, this on-line filtration sampler improves microbiological testing of purified water at the point-of-use.

Ordering information

Valves, accessories and consumables are available for ordering.

Item	Cat. No.
Luer valve	ZF000PLSV
External Sanitary Sampling (ESP) Valve	MXPESP18N
Sterile Tubing	M00000001
MicropreSure® Sampler	MSHABGT48

Contact information

To get help from our dedicated team of customer service and technical support specialists, please fill the form in the link below to contact us:
SigmaAldrich.com

Lit. No.
MK_DS13160EN