Maintenance guide

Original instructions - February 2019

Advanced Microfluidics SA

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Published by:
ADVANCED MICROFLUIDICS SA
Chemin de la Dent d'Oche 1A
1024 Ecublens
Switzerland

WWW.AMF.CH

First printing, February 2019

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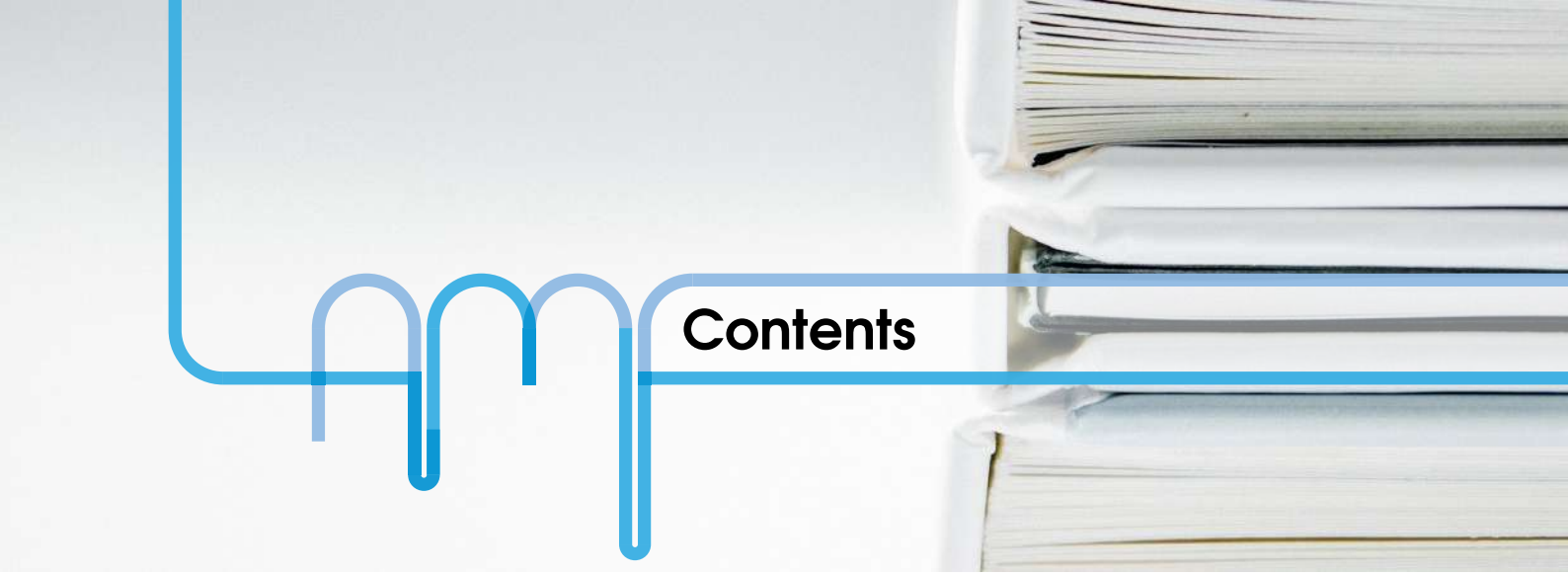
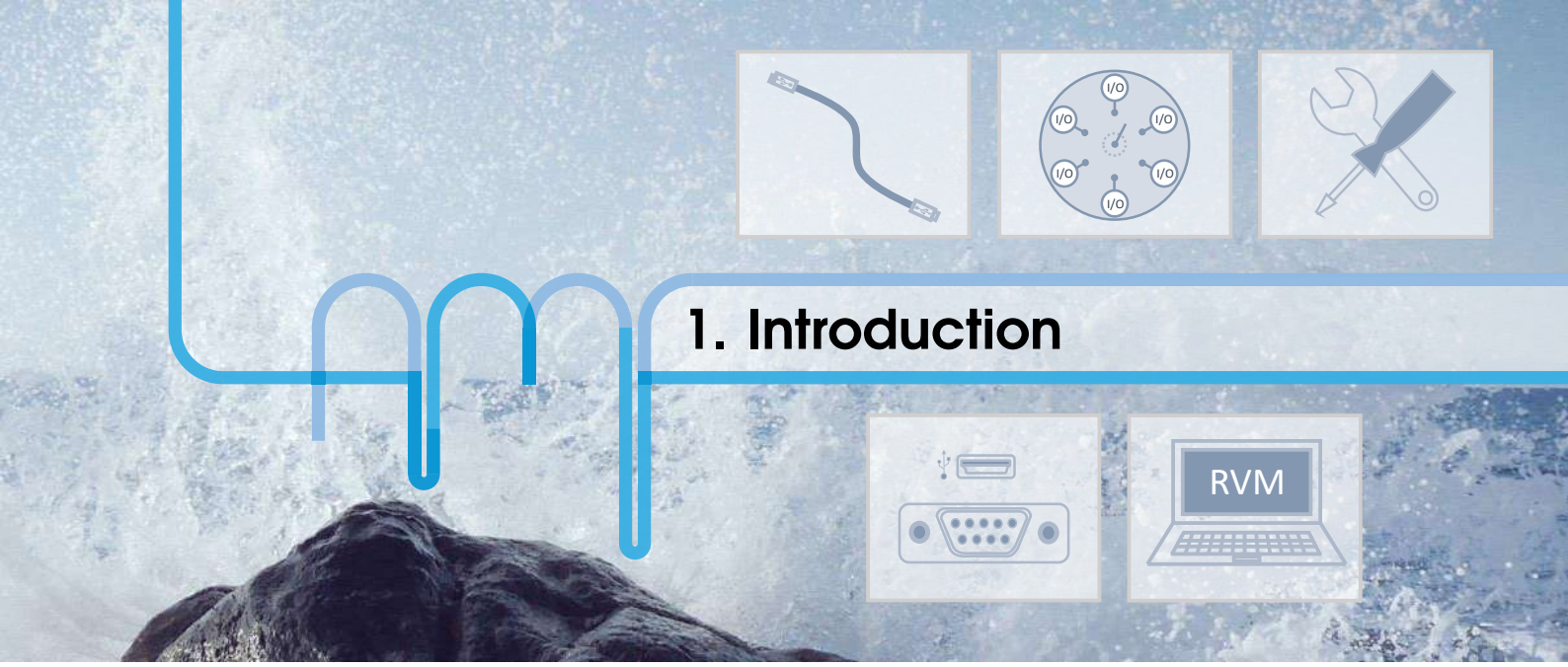


Contents



1. Introduction

AMF thanks you for purchasing one of our products. This guide is intended to help you keep your product at its best shape.

We'll start with some usage tips which are good habits to abide by, followed by a series of instruction when you need to replace the wear parts of your products. If you have a problem with your product, you can refer to our debug page. This will give you a series of tests that you can do before contacting us. If the problem persists, please mention which of these steps you have already performed so we can move ahead with the diagnostic.

We hope that this guide will help you out!

2. Good usage tips

Here are a few tips and tricks to make your experience using our products as simple as possible.

- Plug the waste in port 1. It is the port selected by default when homing the pump or valve. This way, if you initialise the pump and there is still some liquid in the syringe or valve, it doesn't go straight into your experiment!
- Rinse the pump or valve after EACH experiment. If you have a delicate experiment, clean instead of rinsing.
- Clean the pump or valve about ONCE PER WEEK. For cells, you can kill and flush them. For chemicals, neutralise then flush them. Some cleaning solutions examples can be found in chapter 2.
- Be careful in aspiration. You will probably have to go slower than when dispensing to avoid creating depression, thus bubbles. If you're going through a valve, you'll have less chance of creating bubbles by pushing the liquid through it rather than aspirating from the other side.
- When creating your setup, don't forget to think about fluidic resistance! You can find different link to calculate the pressure drop on our website:
  `https://amf.ch/basics-of-microfluidics/`

3. Cleaning solutions

A cleaning procedure should be performed at the end of each day or in between two experiments. For an effective cleaning, pass your cleaning solution twice in your tubings. We suggest here several solutions but these are just examples. The solution that you should use completely depends on what passes through our systems within your setup. You are in a better position than we are to know how to neutralise your solutions.

3.1 Remove microorganisms

Bleach solution:

1. Prepare a solution of 1% chlorine bleach and deionized water
2. Prepare a reservoir and place 1 tubing in the bleach solution and 5 tubings in a waste recipient
3. Pick up the bleach solution through 1 port to entirely fill the syringe
4. Sequentially output the syringe content through the remaining ports and throw it to the waste

3.2 Remove debris

Detergent solution:

1. Prepare a solution of 0.1% detergent and deionized water
2. Move the tubing from the bleach solution reservoir and place it into a reservoir of detergent solution
3. Pick up the detergent solution through 1 port to entirely fill the syringe
4. Sequentially output the detergent solution through the remaining ports into the waste recipient

3.3 Rinse between each experiment

DI water:

1. Move the tubing from the detergent solution reservoir and place it into a reservoir of deionized water
2. Pick up the rinsing solution through 1 port to entirely fill the syringe
3. Sequentially output the rinse water through the remaining ports into the waste recipient

> **Note — Additional cleaning.** If your experiment creates precipitates, you may need to do a more extensive cleaning cycle, by manually removing the valve head. Please contact us for further details.

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Innovative automation solutions

Microfluidic connectors

Setup guide

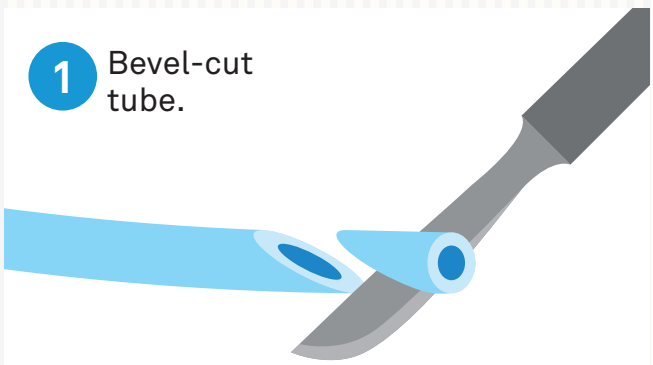
materials

- TUBE
- FERRULE
- NUT

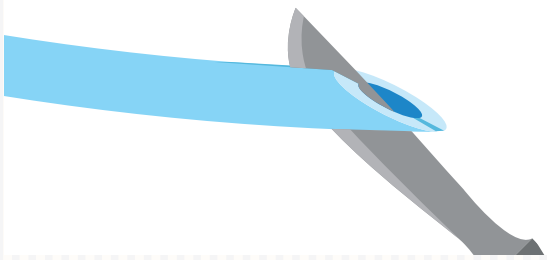
tools

- TWEEZER
- SCALPEL

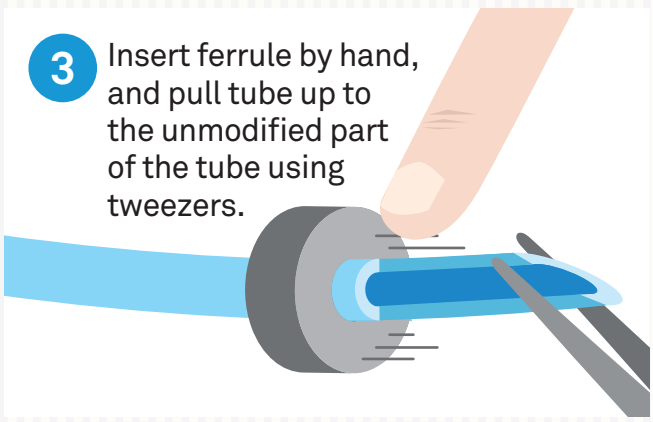
1 Bevel-cut tube.



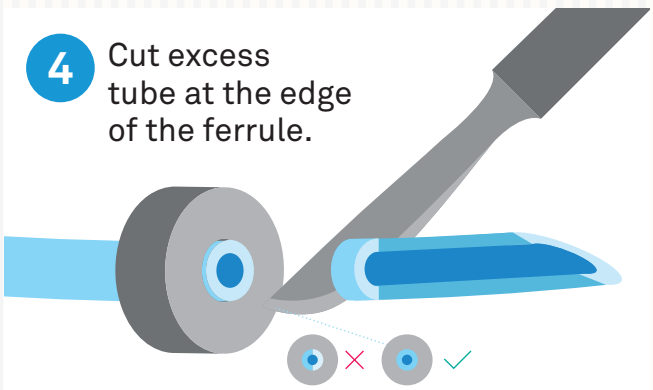
2 Cut beveled part in half to make it thinner.



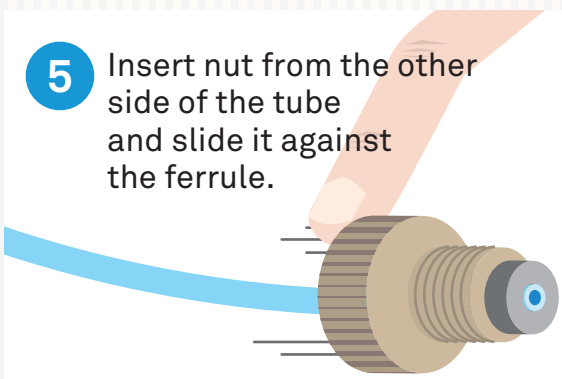
3 Insert ferrule by hand, and pull tube up to the unmodified part of the tube using tweezers.



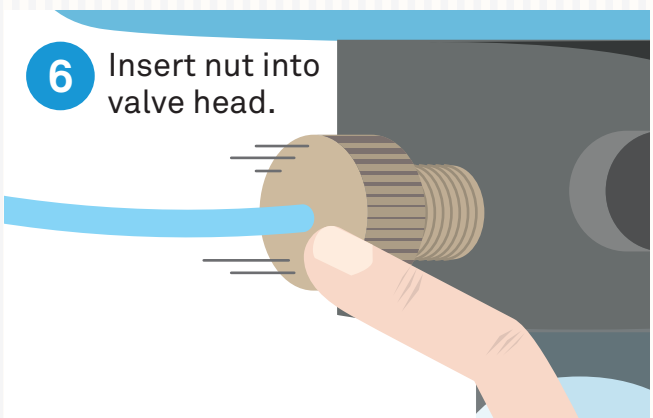
4 Cut excess tube at the edge of the ferrule.



5 Insert nut from the other side of the tube and slide it against the ferrule.



6 Insert nut into valve head.



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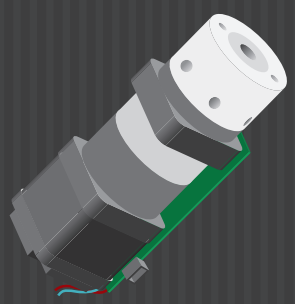
Valve (un)mounting

RVM

materials

VALVE RVM



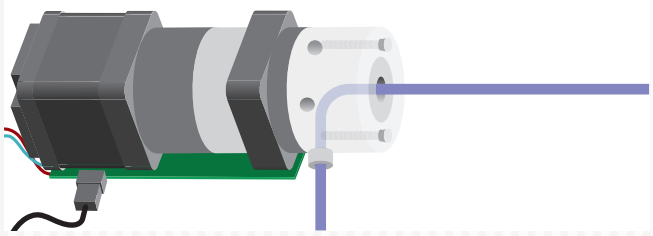
SPARE VALVE (WITH PLUG)

ISOPROPANOL

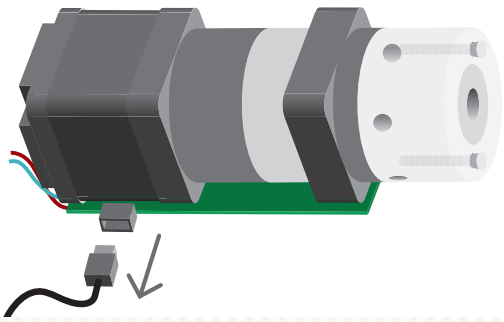
tools

ALLEN KEY

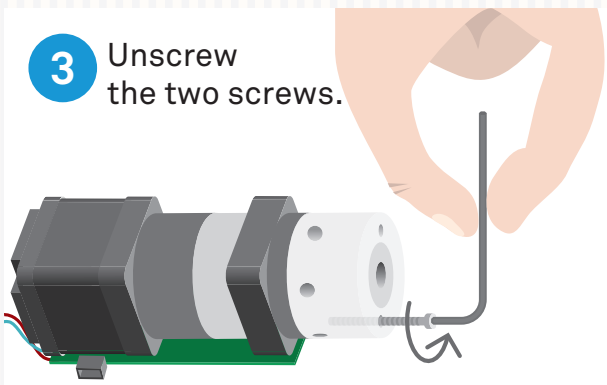
1 Pass isopropanol through valve using pump or syringe.



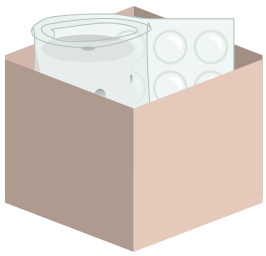
2 Unplug.



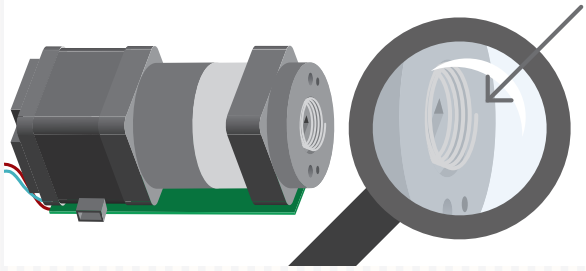
3 Unscrew the two screws.



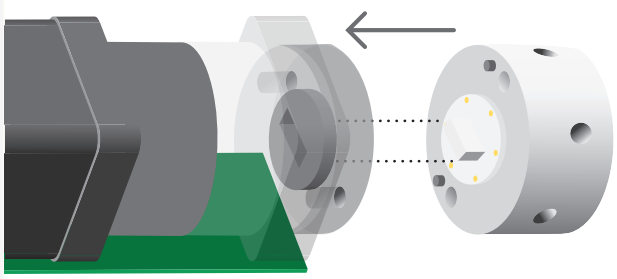
4 Let dry.
Store with bubble wrap.



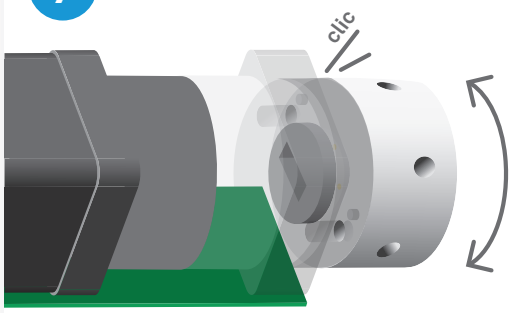
5 If RVM - Low Power, check that the spring is still in place.



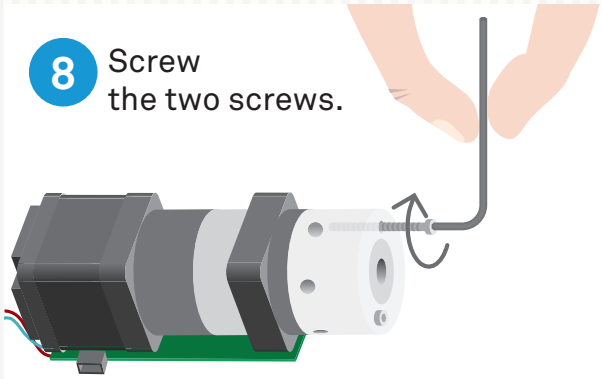
6 Align new plug with motor shaft.



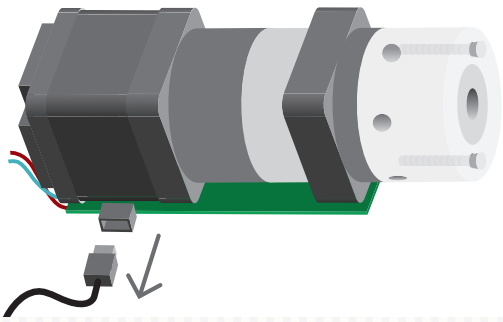
7 Align pins.



8 Screw
the two screws.



9 Replug.



10 Check port number config.
Send command /1?801.
Answer must be: number of port.
If not, change with /1!80<n>,
where <n> is the number of ports.

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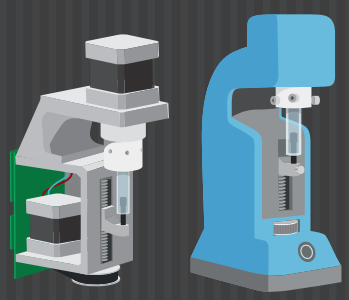
Syringe (un)mounting

LSPone or SPM

materials

LSPone or SPM



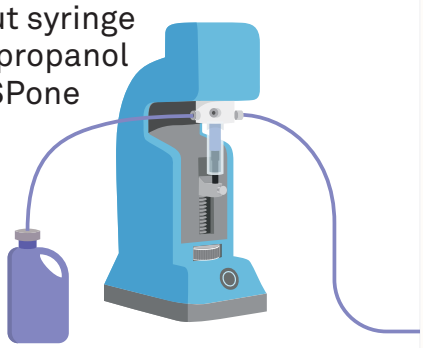
SYRINGE

ISOPROPANOL

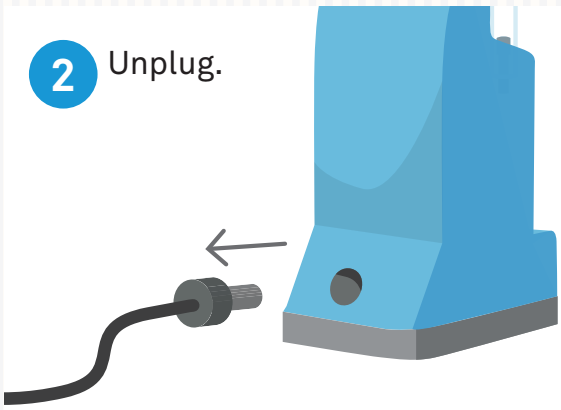
tools

SYRINGE CHANGE TOOL

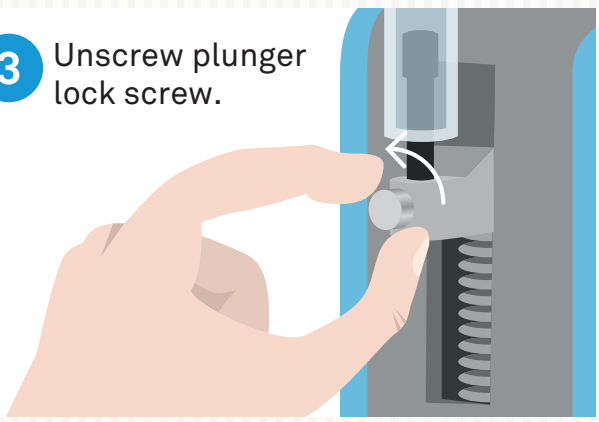
1 Rinse out syringe with isopropanol using LSPone or SPM.



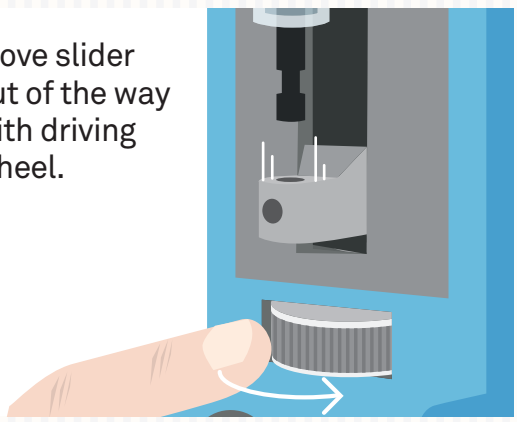
2 Unplug.



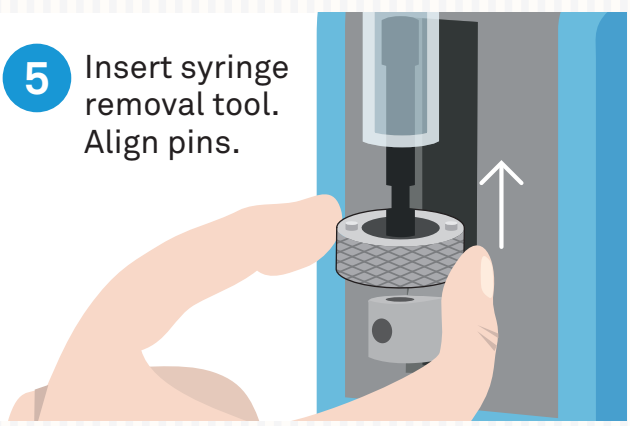
3 Unscrew plunger lock screw.



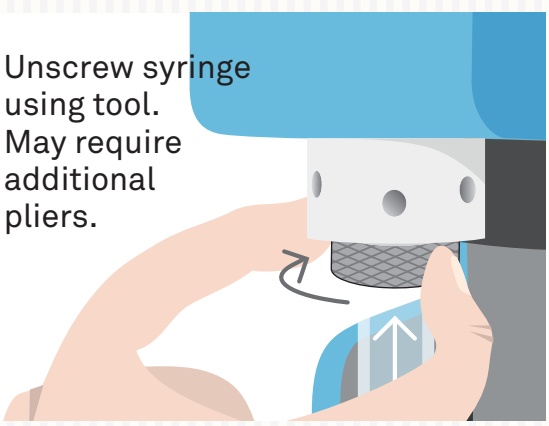
4 Move slider out of the way with driving wheel.



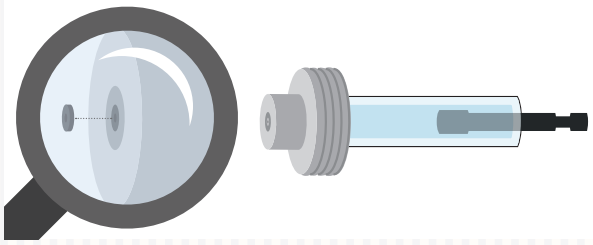
5 Insert syringe removal tool. Align pins.



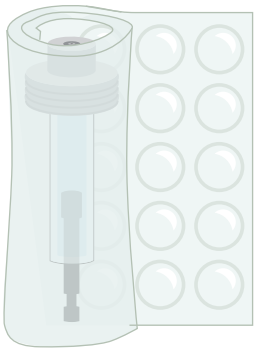
6 Unscrew syringe using tool. May require additional pliers.



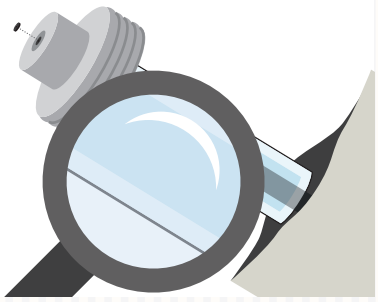
7 After syringe removal, check that o-ring is still in place and in good shape.



8 Store in bubble wrap for reuse.

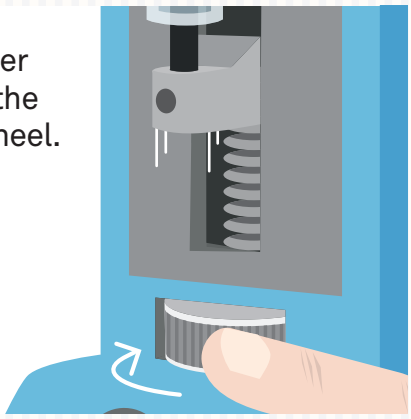


9 Check new syringe for cracks or fissures. Nothing should be seen. Check that o-ring is in place.

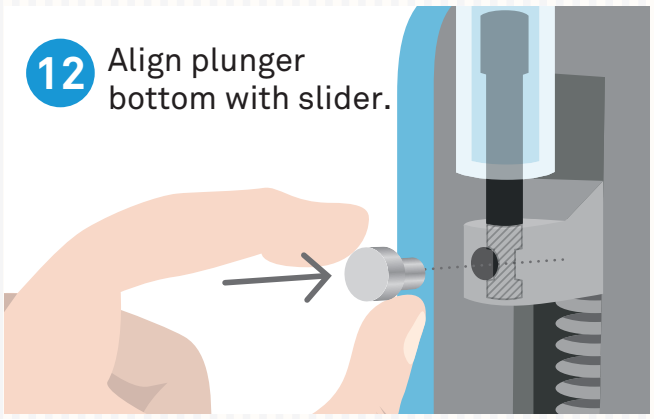


10 Screw new syringe in place. Should be smooth. Tighten by hand only using tool.

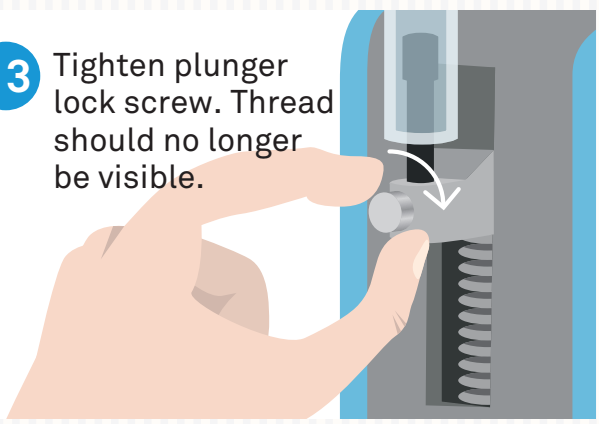
11 Move slider up using the driving wheel.



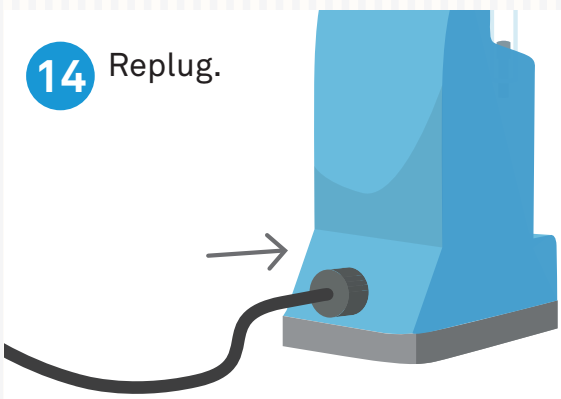
12 Align plunger bottom with slider.



13 Tighten plunger lock screw. Thread should no longer be visible.



14 Replug.



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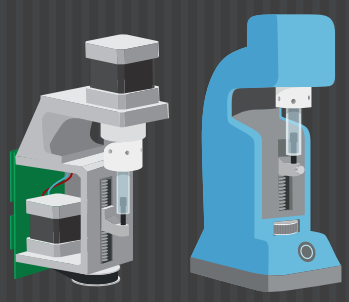
Valve (un)mounting

LSPone or SPM

materials

LSPone or SPM

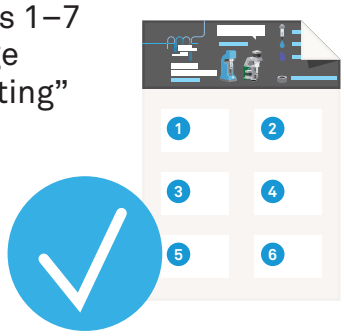


- SPARE VALVE (WITH PLUG)
- ISOPROPANOL

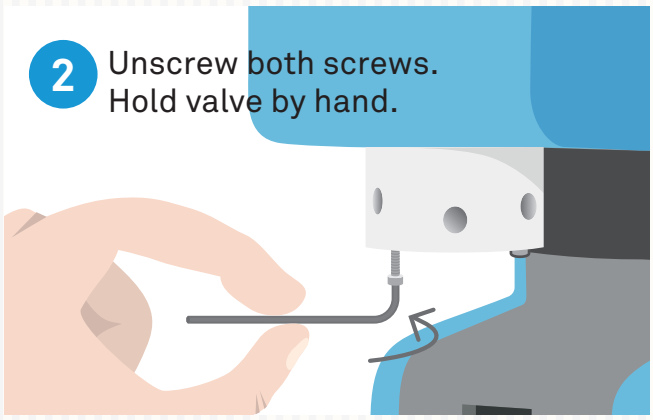
tools

- SYRINGE CHANGE TOOL
- ALLEN KEY

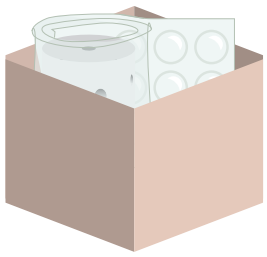
1 View steps 1–7 of “Syringe (un)mounting” doc.



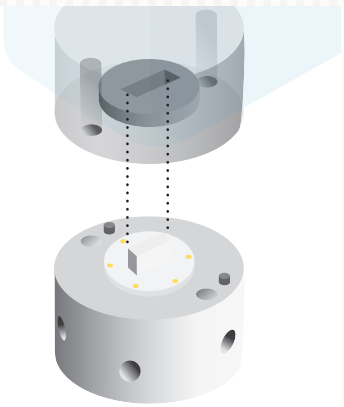
2 Unscrew both screws. Hold valve by hand.



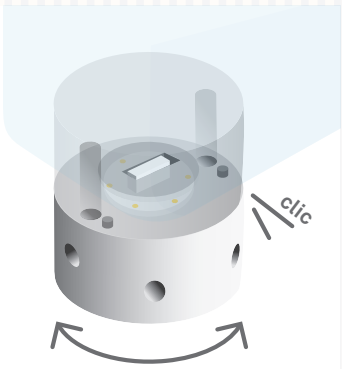
3 Let dry. Store in bubble wrap inside box.



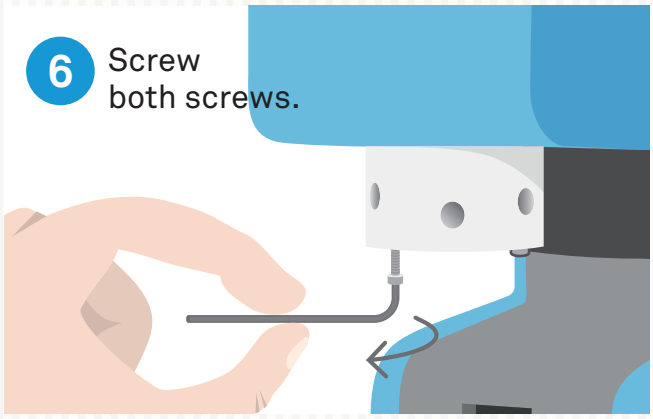
4 Align new plug with motor shaft.



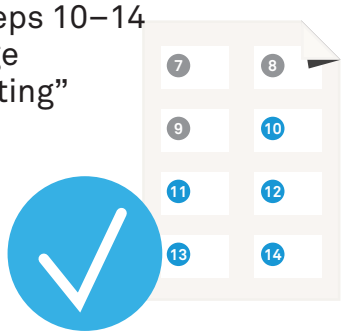
5 Turn until pins are aligned.



6 Screw both screws.



7 Follow steps 10–14 of “Syringe (un)mounting” doc.



8 Check port number config.
Send command /1?801.
Answer must be: number of port.
If not, change with /1!80<n>,
where <n> is the number of ports.