# Tech Support Bulletin

## NANOLITER2020

Releasing a Jammed Pump when Fully Withdrawn

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082725

## ISSUE

The NANOLITER2020 head can become stuck in the fully withdrawn position when used with the MICRO2T controller.

This bulletin describes how to avoid the problem, and how to fix it if it occurs.

## BACKGROUND

Sometimes the NANOLITER2020 can get stuck in the fully withdrawn position when using the MICRO2T SMARTouch™ controller. This isn't a problem when using the standard controller, because it has a software limit in the withdraw direction (home position). Although there is no limit in the inject direction, this generally isn't a problem because the piston usually comes into contact with the tapered end of the micro-pipette and may even push the glass forward before driving further into the mechanical limit. It's easy to see when the piston is approaching the mechanical limit in the forward direction, but not so easy in the retracted position because the piston is hidden from view once it is recessed below the hole in the collet.

The MICRO2T controller does not have a software limit (home position). The head can continue running in withdraw mode after the piston is fully retracted, and a bind can occur.

The way to prevent the possibility of a bind is to halt the withdrawal of the piston before it reaches the mechanical limit. This can be done by visually by monitoring the position of the piston during the injection process, and making sure that once it is retracted into the opening in the collet that the withdrawal is stopped. Obviously, it's also possible to address the issue by calculating the travel distance per unit volume and programming the MICRO2T to halt withdrawal before the mechanical limit is reached. The most recommended suggestion to implement during your set up is to set your end-stop appropriately to avoid overdriving the piston during use.

## RELEASING A BOUND PUMP HEAD

If the mechanical limit in withdrawal is reached, it's possible that the unit could get stuck in this position. If this happens it's possible to free the bind by performing some minor disassembly. Here's how:

1. Remove the collet (and internal seals) from the tip.

2. Remove the cylinder by turning it counter-clockwise (looking into the tip).


3. Using a 0.89 mm hex wrench, loosen the two screws securing the brass clamp which secures the piston. This releases the binding tension on the on the lead screw.


4. Re-tighten the screws on the brass clamp to re-secure the piston.
5. Test the NANOLITER2020 head by running the piston through its full range of travel without driving it into the mechanical limit in withdrawal. The mechanical limit in withdrawal is reached when the brass clamp comes into tight contact with the body of the pump.

If the head is operational, re-assemble the cylinder and collet and test again.

## RE-ASSEMBLY TIP

There's a trick to putting the cylinder back on. Hold the injector head with the piston pointed upward. Gently place the cylinder on top of the piston and release it without worrying about locating the piston in the hole. While maintaining the upright position, shake the body of the injector head back and forth perpendicular to the axis of the piston. This will cause the cylinder to move around randomly on the tip of the piston until the hole in the end "auto locates" on the piston and falls into position. Then simply turn the cylinder clockwise with gentle pressure to re-tighten it. Don't over tighten it!


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