

**BIO·CHEM**  
BECAUSE SUPPORT MATTERS



# Maestro ULTRA

The Piston Pump Designed to  
Last in Concentrated Salt Solutions



## The Maestro ULTRA Piston Pump

Finally, a Piston Pump That Conquers Salt

Bio-Chem demands unrivaled performance from its products, delivering technological breakthroughs that solve real world problems. The Maestro ULTRA, like the original Maestro piston pump, is no exception to the rule. As the most feature-rich, capable, accurate, and durable piston dispense pump in existence, the Maestro ULTRA sets a new standard for piston pumps used in IVD and similar low-pressure applications.

Meticulously designed and tested to deliver double the life of any other dispense pump available on the market today – up to 10 million dispenses at 100% duty cycle – the Maestro ULTRA is engineered to withstand the impact of aggressive salt solutions, performing where the competition fails. ■ ■

### The Dangers of Salt: Where Others Fail A Leaking Pump is a Failed Pump.

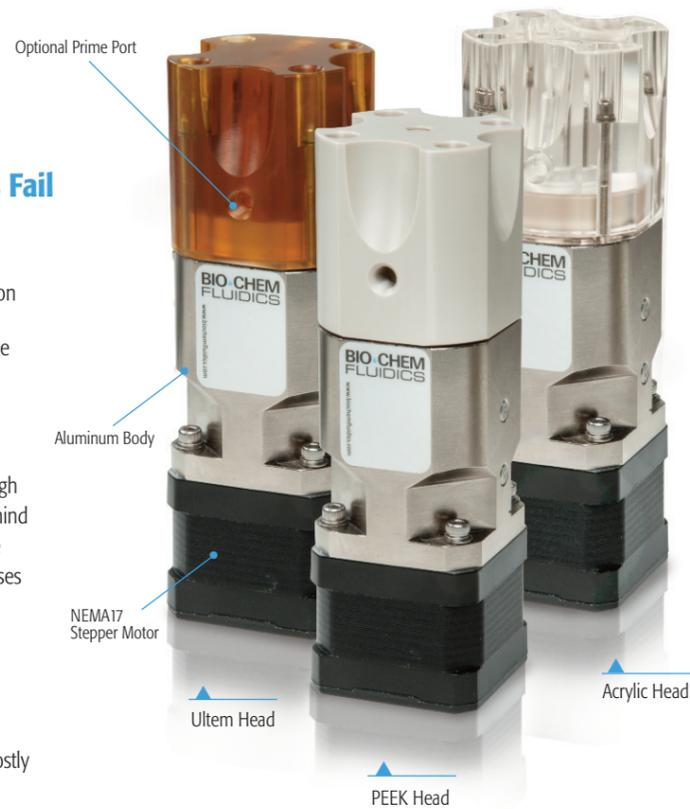
Salt damages pumps in IVD instruments. Traditional piston pumps exposed to concentrated salt solutions such as 10% NaOH, or even as benign as 0.9% saline, experience premature, catastrophic failure.

#### Here's Why:

Remnants of fluid collect on the piston as it passes through the seal. The moisture eventually evaporates, leaving behind salt crystals adhered to the piston surface. Over time, the salt layer thickens and abrades the seal as the piston passes back through the seal, causing disastrous grooves, leaks, and ultimately, pump failure.

#### Flushing is a Dangerous Option

Traditional methods of extending the life of the seal, like flushing behind the seal of the piston pump, are more costly and introduce significant risks to the instrument. They also introduce the potential for sample and reagent contamination, as well as safety hazards associated with exothermic reactions. ■ ■



## Maestro ULTRA - The 'Non-Stick' Solution

No Salt Adhesion. No Seal Abrasion. No Leaks. No Failure. No Maintenance.

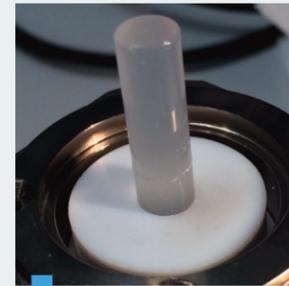
Bio-Chem's patent pending piston technology combines materials and technologies to create a groundbreaking piston pump that is immune from the seal degradation associated with salt solution residue.

#### Super Hydrophobicity

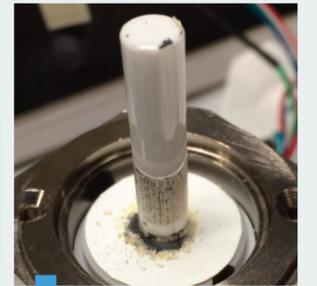
The Maestro ULTRA is specifically engineered to repel water, decreasing wettability so that less liquid seeps past the seal riding on the piston, thereby minimizing crystallized salt deposits.

#### Very Low Surface Energy

The Maestro ULTRA piston has very low surface energy, preventing materials from adhering to it. Any salt crystals that are left behind by evaporating liquid simply flake off of the piston, leaving the piston surface as clean as the day it was built... eliminating seal abrasion, leaks and failure. ■ ■



Maestro ULTRA after 3M cycles pumping 10% NaOH



Typical ceramic piston pump after 1M cycles pumping 10% NaOH

## Maestro ULTRA – Zero Maintenance and Worry Free Performance for the Life of the Instrument

A Revolutionary Advancement in Fluidics

Bio-Chem's Maestro ULTRA has a pump life expectancy that exceeds all other pumps on the market, increasing instrument safety and reliability while solving a critical unmet need.

#### What does this all mean for you?

The Maestro ULTRA reduces instrument operating costs:

- Removes the risk of sample contamination
- Reduces reagent waste from leaks
- Eliminates costly pump repairs
- Improves uptime and throughput
- Lowers the cost of instrument ownership
- Boosts instrument profitability

Here is a typical example of what a company can expect to pay over the 5-7 year life of an IVD instrument using traditional pumps exposed to concentrated salt solutions:

<b>Routine Pump Replacement Cost:</b>	> \$3,000
<b>Unplanned Pump Replacement Cost:</b>	> \$2,000
<b>Total 5-Year Maintenance Cost per Pump Position:</b>	> \$5,000

These significant costs could be avoided with the Maestro ULTRA.

The Maestro ULTRA also introduces fewer potential instrument failure points and minimizes system complexities, ensuring a shorter time to market.

**The Maestro ULTRA is uniquely positioned to drive the next phase of fluidics system advancement... and is destined to help revolutionize the diagnostic instrument industry. ■ ■**



# Maestro ULTRA

## Specifications

<b>Dispense Volumes (µl):</b>	100, 250, 500, 1000, 2500, 5000
<b>Accuracy:</b>	Programmable to 100%
<b>Precision:</b>	<0.2% CV
<b>Full Stroke:</b>	12.7mm

## Configurable Options

- Integrated 3-way Valve
- Optical Encoder
- Manifold Integration
- Pump Head Options: Acrylic, PEEK, and Ultem

The Maestro ULTRA is operationally identical to the original standard Maestro pump, allowing for a seamless ULTRA 'upgrade' if necessary.

For a detailed study of the impact of concentrated salt solutions on traditional piston pumps, read Bio-Chem's white paper, *"Removing the Risk of Concentrated Salt Solutions to Precision Dispense Pumps."*

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