



NANOLITER2020 INJECTOR

Precise Nanoliter-Volume Injections With Intuitive
SMARTouch™ Controller








Precision Nanoliter-Volume Injections

NANOLITER2020 is the updated version of WPI's popular **NANOLITER2010** Injector that is capable of performing precision injections in the nanoliter range using a variety of glass micropipette sizes. The new model connects directly to the WPI **MICRO2T** SMARTouch™ controller, which can also be used with WPI's UMP3 pump, allowing the pumps to be controlled individually or synchronously. The new injector head has a LED indicator which shows proper communication between the pump and controller. **NANOLITER2020** offers improved precision by in-depth plunger displacement validation. The system is easier to use and has a chic silver injector head.

- Perform nanoliter volume injections using glass micropipettes
- Nanoliter Injector works on the principle of positive displacement. An internal micrometer step motor precisely moves the metal plunger which pushes the oil inside the micropipette, and the oil-layer pushes nanoliter volumes of aqueous sample out of the pipette tip.
- Fine control of plunger displacement (along with proper sealing among gasket, glass micropipette and oil) ensures precision and accuracy
- **NANOLITER2020** system includes the **300704** Injector, the **MICRO2T** SMARTouch™ Controller and many accessories. The **300704** Injector is also sold separately, but it requires the **MICRO2T** SMARTouch™ controller, glass micropipettes and the **300746** Spare Parts Kit for use.
- Control up to two pumps simultaneously
- Mounts easily on a stereotaxic frame or a micromanipulator
- LED run indicator offers a visual indication of connectivity
- Injector accepts a range of glass micropipettes (OD 1.1-1.5 mm)



BENEFITS

-  Minimize the use of costly or scarce samples by performing injections with mineral oil back-filled glass micropipettes
-  Precise control over injection volumes (in the nanoliter to microliter range) and injection rates
-  Simple to use touchscreen interface and graphical representation of volume status on **MICRO2T** controller
-  Perform injections with a foot switch (optional)
-  **15% LESS** NANOLITER2020 costs 15% less than the previous model (**NL2010MC2T**)



NANOLITER2020 is the complete system. 300704 is the NANOLITER2020 Injector Head only. The controller and the accessories are not included.

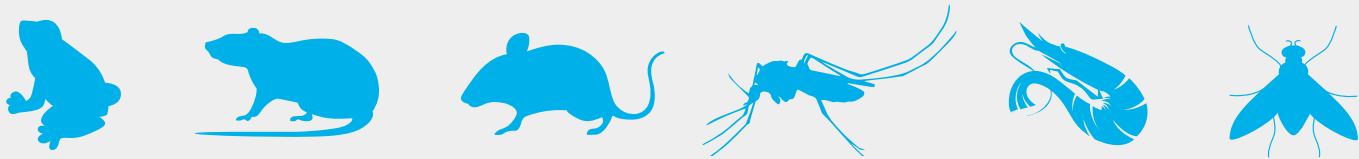
ACCESSORIES

- | | |
|-------------------|--|
| TIP10XV119 | Glass Micropipettes (ID: 0.53 mm, OD: 1.14 mm) |
| 504949 | Glass Capillary (ID: 0.53 mm, OD: 1.14 mm), pkg of 300 |
| 501981 | Tweezers to scoop out gaskets |
| 13142 | Optional Foot Switch |



APPLICATIONS

Nanoliter to microliter injection into frogs (*Xenopus* oocytes), rats, mice, mosquitoes, shrimps, insects (e.g., Brown Planthopper), flies (e.g., *Drosophila*) and fish (Zebrafish) embryos using glass micropipettes



REFERENCES

WPI's previous versions of NANOLITER2020 (NANOLITER2010, NL2010MC2T and NANOLITER2000) that worked on same oil-plunger based, positive-displacement technique were used for research studies involving injection into rats, mice, mosquitoes, shrimps, frogs, insects, flies and fish embryos. Here are a few selected citations. (More can be found on the WPI website or by using web search engines.)

Recent Publications

Gaete, P., Lillo, M., López, W., Liu, Y., Harris, A., & Contreras, J. (2020). A novel voltage clamp/dye uptake assay reveals saturable transport of molecules through CALHM1 and connexin channels. *BioRxiv*, 2020.02.15.950923. <https://doi.org/10.1101/2020.02.15.950923>

Atif, M., Lynch, J. W., & Keramidas, A. (2020). The effects of insecticides on two splice variants of the glutamate gated chloride channel receptor of the major malaria vector, *Anopheles gambiae*. *British Journal of Pharmacology*, 177(1), 175–187. <https://doi.org/10.1111/bph.14855>

Hao, D.-L., Yang, S.-Y., Liu, S.-X., Zhou, J.-Y., Huang, Y.-N., Véry, A.-A., ... Su, Y.-H. (2020). Functional Characterization of the Arabidopsis Ammonium Transporter AtAMT1;3 With the Emphasis on Structural Determinants of Substrate Binding and Permeation Properties. *Frontiers in Plant Science*, 11, 571. <https://doi.org/10.3389/fpls.2020.00571>

Li, Y., Liu, Z., Guo, Q., & Luo, M. (2019). Long-term Fiber Photometry for Neuroscience Studies. *Neuroscience Bulletin*, 35(3), 425–433. <https://doi.org/10.1007/s12264-019-00379-4>

Li, R., Weng, J., Wang, X., Meng, Q., Wang, Y., & Sun, J. (2019). Bursicon homodimers induce innate immune by activating the expression of anti-microbial peptide genes in the shrimp *Neocaridina heteropoda*. *Fish and Shellfish Immunology*, 84, 906–911. <https://doi.org/10.1016/j.fsi.2018.10.080>

SYSTEM COMPONENTS

WHAT IS INCLUDED	QTY	NANOLITER2020	300704
300704 Nanoliter 2020 Injector Head with Universal Adapter (500778)	1	✓	✓
MICRO2T SMARTouch™ Controller	1	✓	
501981 Tweezers to scoop out gaskets	1	✓	
504949 Glass Capillary (ID: 0.53 mm, OD: 1.14 mm), pkg of 300	1	✓	
1TIP10XV119 Glass Micropipettes (ID: 0.53 mm, OD: 1.14 mm),	2	✓	
300746 Spare Parts Kit Includes			
14456 Allen Wrench 0.035" Hex Tool	1	✓	
MF34G MicroFil, 34 gauge	1	✓	
300733 O-Ring Kit for NANOLITER2020	5	✓	
3563 1 cc Syringe	1	✓	
300514 Replacement Piston for NANOLITER2020	2	✓	
Instruction Manual (download from www.wpiinc.com/manuals)			

NOTE: One set of gaskets (Front Green Gasket) to use with 1.1-1.15 mm glass is installed in the Injector when the unit ships from the factory.

NOTE: Two sample glass micropipettes are included with the NANOLITER2020 system. Use WPI pre-pulled glass micropipettes or use a glass capillary (504949 or 504950) (included with NANOLITER2020) and a puller to make your own micropipettes.

SPECIFICATIONS

NANOLITER2020 Plunger Outer Diameter	482 µm
Plunger Movement for 100 nL Volume Dispensed	550 µm ± 55 µm
Piston Movement per dispensed volume (nL)	5.5 µm/nL
Linear Travel Per Full Step	12.7 µm/step
Minimum Volume (Injection)	5 nL
Recommended Glass	
TIP10XV119 (Micropipette)	
1.14 mm OD Fire Polished Glass Capillaries (504949 & 504950)	
Glass Use Capabilities	
1.10-1.15 mm OD Glass with Green Front Gasket	
1.30-1.35 mm OD Fire-polished Glass with Black Front Gasket	
1.5 mm OD Fire-polished Glass with Red Front Gasket	
Minimum Recommended Volume Injection	
25 nL with 1.14 OD Glass (TIP10XV119 and Green Front Gasket)	
50 nL with 1.5 mm OD Glass (Fire Polished 1.5 mm Glass and Red Gasket)	
Maximum Possible Volume	4200 nL
Maximum Rate	644 nL/sec

Specifications subject to change without notice.

