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NEW & IMPROVED NANOLITER2020 INJECTOR

Precise nanoliter-volume injections with intuitive SMARTouch™ controller



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NANOLITER2020 INJECTOR

NANOLITER2020

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)



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



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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)



NANOLITER2020 costs 15% less than the previous model (**NL2010MC2T**)



NANOLITER2020 System



300704 NANOLITER2020 Injector Head

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 |



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>

NANOLITER200 INJECTOR

SYSTEM COMPONENTS

| WHAT IS INCLUDED | QTY | NANOLITER200 | 300704 |
|--------------------------------------------------------------------------------------------------------|-----|--------------|--------|
| 300704 Nanoliter 200 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 NANOLITER200 | 5 | ✓ | |
| 3563 1 cc Syringe | 1 | ✓ | |
| 300514 Replacement Piston for NANOLITER200 | 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 NANOLITER200 system. Use WPI pre-pulled glass micropipettes or use a glass capillary (504949 or 504950) (included with NANOLITER200) and a puller to make your own micropipettes.

SPECIFICATIONS

| | |
|----------------------------------------------|------------------------------------------------------------------------|
| NANOLITER200 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.



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