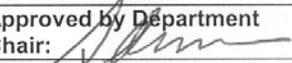


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| BROOKHAVEN NATIONAL LABORATORY | | Number: PO-P-ATF-0022 | Revision: 1 |
| PHYSICS DEPARTMENT | | Effective: 08/12/2004 | Page 1 of 2 |
| Subject: ATF Nd: YAG Maintenance Procedures | | Prepared by: Marcus Babzien | |
| Reviewed by ES&H Coordinator:  | Approved by ATF Head:  | Approved by Department Chair:  | |

ATF Nd:YAG Maintenance Procedures

The following procedures may be performed at the specified intervals:

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| 1. Preamp flashlamp replacement: | 5-10 million shots, or if lamp instability is suspected |
| 2. Amp flashlamp replacement: | same as preamp |
| 3. Water filter replacement: | annually |
| 4. Head rebuild: | every three years |

1. Preamp Flashlamp Replacement Procedure

- 1.1. Remove key for flashlamp power supply and turn power supply off. Retain key for the duration of the work.
- 1.2. Eye protection and gloves shall be worn at all times when handling the pressurized flashlamps.
- 1.3. Drain water from preamplifier head at valve manifold in vestibule.
- 1.4. Disassemble preamplifier head and remove old flashlamp.
- 1.5. Inspect preamplifier rod, flow tubes, pump cavity, and electrical connections for corrosion, debris, and damage.
- 1.6. Clean and insert new preamplifier flashlamp.
- 1.7. Reassemble preamplifier head and turn on power supply to begin water circulation.
- 1.8. Inspect preamplifier head for water leakage.
- 1.9. Refill preamplifier reservoir with distilled water.
- 1.10. Circulate for at least 6 hours to remove trapped air.
- 1.11. Return key to power supply and resume normal operation.

2. Amp Flashlamp Replacement Procedure

- 2.1. Remove key for flashlamp power supply and turn power supply off. Retain key for the duration of the work.
- 2.2. Eye protection and gloves shall be worn at all times when handling the pressurized flashlamps.
- 2.3. Disassemble amplifier head, allowing water to drain into reservoir.
- 2.4. Remove old amplifier flashlamps and inspect head for corrosion and water leakage.
- 2.5. Clean and insert new amplifier flashlamps.
- 2.6. Reassemble amplifier head and turn on power supply to begin water circulation.
- 2.7. Inspect amplifier head for water leakage.
- 2.8. Circulate for at least 6 hours to remove trapped air.
- 2.9. Return key to power supply and resume normal operation.

3. Water Filter Replacement Procedure

- 3.1. Turn off both preamplifier and amplifier power supplies in vestibule.

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- 1.1. Open rear panel of preamplifier power supply and clamp hoses at each end of filter cartridge.
- 1.2. Exchange preamplifier filter cartridge.
- 1.3. Remove hose clamps and turn on preamplifier power supply. Inspect plumbing for leaks and refill reservoir with distilled water
- 1.4. Open access panel at bottom of amplifier power supply.
- 1.5. Exchange filter cartridge.
- 1.6. Turn on amplifier power supply and inspect plumbing for leaks. Refill reservoir with distilled water.
- 1.7. Resume normal operation after 24 hours.

2. Head Rebuild Procedure

- 2.1. Remove keys for flashlamp power supplies and turn both power supplies off. Retain keys for the duration of the work.
- 2.2. Eye protection shall be worn at all times when handling the pressurized flashlamps.
- 2.3. Drain water from preamplifier head at valve manifold in vestibule.
- 2.4. Disassemble preamplifier head and remove old flashlamp.
- 2.5. Remove preamplifier rod and inspect for optical damage and water leakage. Replace as necessary.
- 2.6. Remove preamplifier pump cavity and inspect for corrosion. Invert or replace as necessary.
- 2.7. Remove preamplifier electrical feedthroughs and inspect for corrosion. Replace as necessary.
- 2.8. Clean head of debris and deposits.
- 2.9. Inspect water circulation system and replace parts as necessary.
- 2.10. Reassemble preamplifier head in reverse order and turn on power supply to begin water circulation.
- 2.11. Inspect preamplifier head for water leakage.
- 2.12. Refill preamplifier reservoir with distilled water.
- 2.13. Open seals on amplifier head, allowing water to drain into reservoir.
- 2.14. Remove flashlamps, hoses, and electrical connections from amplifier head and move to work bench.
- 2.15. Remove all end plates from amplifier head and inspect for corrosion. Clean and replace as necessary.
- 2.16. Note orientation and remove amplifier rod. Inspect for optical damage and or water deposits. Clean or replace as necessary.
- 2.17. Clean internal passages in amplifier pump chamber of deposits.
- 2.18. Inspect water circulation system and replace parts as necessary.
- 2.19. Replace o-rings during reinstallation.
- 2.20. Set up alignment laser and install amplifier rod in original orientation.
- 2.21. Reassemble amplifier head in reverse order and turn on power supply to begin water circulation.
- 2.22. Inspect amplifier head for water leakage.
- 2.23. Refill amplifier reservoir with distilled water.
- 2.24. Circulate for at least 6 hours to remove trapped air.
- 2.25. Return keys to power supplies and resume normal operation.