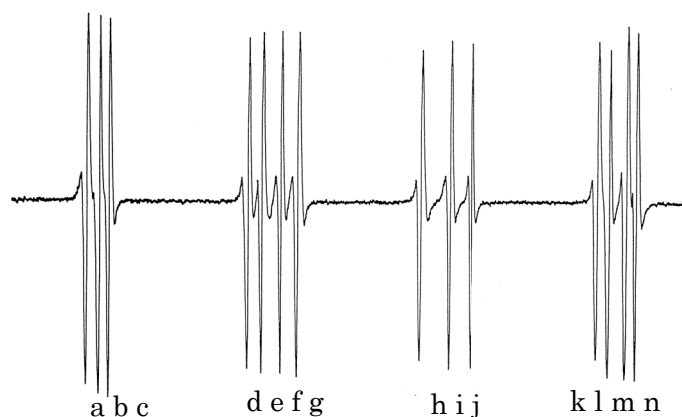


# Compact Iodine Stabilized He-Ne Laser

★ Meets all the requirements of the 1992 and 1997 CIPM Mise en Pratique.

★ Relative standard uncertainty of  $2.5 \times 10^{-11}$



## NEO-92SI-NF

### ■Introduction

The MODEL NEO-92SI-NF is the most accurate and downsized portable Iodine-stabilized He-Ne laser among the commercially available lasers.

It was developed in cooperation with National Metrology Institute of Japan (NMIJ), National Institute of Advanced Industrial Science and Technology (AIST), and meets all the requirements of the 1992 and 1997 CIPM Mise en Pratique. The MODEL NEO-92SI-NF is traceable to the NATIONAL STANDARD LASER in NMIJ and confirmed to accomplish a relative standard uncertainty of less than  $2.5 \times 10^{-11}$ .

The standard operating condition of the MODEL NEO-92SI-NF is as follows;

TEMPERATURE RANGE : 15°-25°C

RELATIVE HUMIDITY : LESS THAN 70%

And the laser can be operated with the frequency uncertainty  $2.5 \times 10^{-11}$ .

The MODEL NEO-92SI-NF is adopted as the NATIONAL STANDARD LASER (NRLM-P1) for length at NMIJ as of the first of April 1998

### ■Principal

The principal of the stabilization is to keep the laser wavelength resonant one of 14 hyper fine transition of molecular iodine by adjusting the length of the cavity.

When the lasing wavelength locking a specific iodine peak, the frequency locking indicator of the laser controller shows green. Frequency unlocking indicator shows red when locking is off by a disturbance and etc.

Also, Iodine peak pattern is recognized and specific iodine peak can be detected by new developed automatic frequency locking method. The reliability of laser is ensured by this new method

### ■Features

1. Operates as a true primary laser wavelength standard
2. Compact and durable
3. Operates in wide temperature range
4. Easy operation

### ■Main specifications

1. Meets all the requirements of the 1992 and 1997 CIPM Mise en Pratique.
2. Relative standard uncertainty of  $2.5 \times 10^{-11}$

# Compact Iodine Stabilized He-Ne Laser

## ■Specifications

### A Compact Iodine Stabilized He-Ne Laser

- |                                           |                                                                                                                                       |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| 1. Wave length:                           | 632.991 nm                                                                                                                            |
| 2. Uncertainty of Frequency ( $\sigma$ ): | $2.5 \times 10^{-11}$                                                                                                                 |
| 3. Lock Method:                           |                                                                                                                                       |
| <b>AUTO LOCK:</b>                         | Iodine peak spectrum pattern is recognized by sweeping of Laser wavelength resonance and specific iodine peak is detected and locked. |
| <b>MANUAL LOCK:</b>                       | hyper fine components (a-n) are observed on oscilloscope and iodine peak is locked on real time.                                      |
| 4. Output Beam Power:                     | $50 \pm 25 \mu\text{W}$ CW                                                                                                            |
| 5. One Way Intracavity Beam Power:        | $10 \pm 5\text{mW}$                                                                                                                   |
| 6. Optical Polarization:                  | Linear horizontal plane                                                                                                               |
| 7. Modulation Frequency:                  | 3.255kHz sine wave                                                                                                                    |
| 8. Frequency Modulation Width:            | $6 \pm 0.3\text{MHz}$                                                                                                                 |
| 9. Iodine Cell Cold-Finger:               | $15 \pm 0.2$                                                                                                                          |
| 10. Temperature Warm-Up Time:             | approx.2 hours                                                                                                                        |
| 11. Interface:                            | GPIB                                                                                                                                  |
| 12. Environmental Conditions              |                                                                                                                                       |
| Temperature Range:                        | Operation: $15^{\circ}\text{-}25^{\circ}\text{C}$<br>Storage: $0^{\circ}\text{-}40^{\circ}\text{C}$                                   |
| Relative Humidity Range:                  | Operation: $<70\%\text{RH}$<br>Storage: $<80\%\text{RH}$                                                                              |
| 13. Physical Dimensions:                  |                                                                                                                                       |
| Laser head:                               | $110(\text{W}) \times 115(\text{H}) \times 420(\text{D})$ mm                                                                          |
| Controller head:                          | $216(\text{W}) \times 132.5(\text{H}) \times 450(\text{D})$ mm                                                                        |
| 14. Weight                                |                                                                                                                                       |
| Laser head:                               | 7kg                                                                                                                                   |
| Controller:                               | 8kg                                                                                                                                   |
| 15. Power requirements                    | AC 100V/120V/230V, 50/60Hz, 50VA                                                                                                      |

Subject to change of specifications without prior notice.



## NEOARK Corporation

2073-1 Nakanomachi, Hachioji-shi, Tokyo, 195-0015 Japan