



NEOS TECHNOLOGIES

A Gooch & Housego Company

OPERATING MANUAL
POLYCHROMATIC ACOUSTO-OPTIC MODULATOR

MODEL NUMBER:

48058-XX-.55

XX = 1, 2.5, OR 5

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SECTION I

INSPECTION PROCEDURE

Examine the shipping carton for damage. If the shipping carton or packing material is damaged it should be kept for the carrier's inspection. Notify the carrier and NEOS Technologies. Check the contents of the shipment for completeness, mechanical damage, and then test the equipment electronically. Operating procedures are contained in Section V. If the contents are incomplete, or the equipment does not pass the electrical testing please notify NEOS Technologies.

If there is any problem with the use of this equipment, or if the equipment fails to function as expected contact NEOS Technologies, do not try to trouble shoot or repair this equipment. Consult with a NEOS service engineer. If the equipment needs repair or replacement, contact NEOS Technologies, Inc for a Return Authorization Number.

SECTION II

DESCRIPTION

POLYCHROMATIC ACOUSTO-OPTIC MODULATOR (PCAOM)

48058-XX-.55

The modulator device is a tellurium diode (TeO₂) substrate with a lithium niobate transducer. The 48058-XX-.55 PCAOM has been designed so that the output diffracted light will remain collinear at all visible operating wavelengths. The XX in the model number is the active optical aperture which is 1, 2.5, or 5 mm. The modulator assembly should be mounted on a fixture to provide sufficient adjustment to peak the modulator efficiency. NEOS can supply precision Bragg mounts and translation stages. The modulator can be driven by any driver with a crystal controlled oscillator or a synthesized oscillator having <0.02% frequency stability and a nominal 50 ohm output. However, it is recommended that a NEOS driver such as the 64048-80-.4-8CH-16 system or the 64048-80-.4-8CH-16M module be used to drive this modulator for the system to achieve optimum performance. The total RF input should not exceed 0.8 watt CW.

The modulator is labeled on the cover as to input and output optical aperture. The input optical polarization must be vertical linear with respect to the mounting surface of the modulator housing. The Bragg angle should be adjusted so the output diffracted light is the (-1)st order. Operating the modulator in any other configuration than that described above will degrade its performance. Be extremely careful not to aim the laser beam on the gold bond wires. NEOS will not warranty any such damage. The modulator has been designed and verified to satisfy the specifications.

SECTION III
SPECIFICATIONS

48058-XX-.55

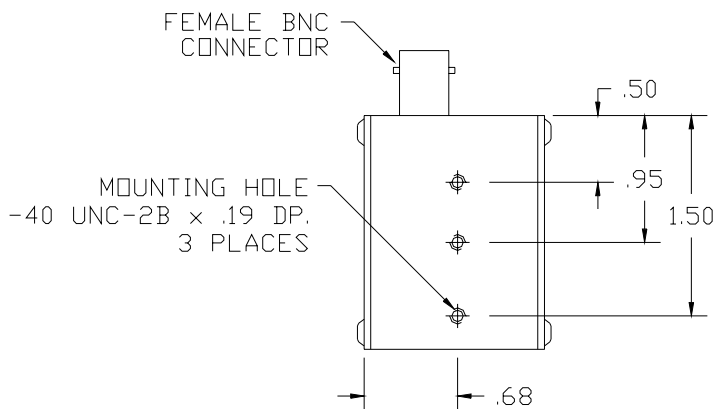
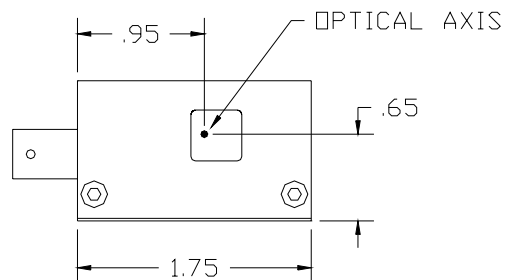
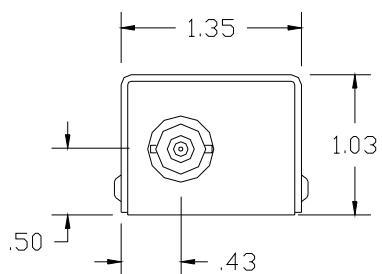
<u>PARAMETER</u>	<u>SPECIFICATION</u>
Interactive Material	TeO ₂
Acoustic Mode	Shear
Operating Wavelength	442 to 676 nm
Operating Frequency	See Chart on next page
Window Configuration	AR Coated
Static Transmission	>95 %
Diffraction Efficiency	≥ 80 % per wavelength
Input Light Polarization	Linear, Vertical (Perpendicular to acoustic propagation)
Input Beam Divergence	≤ 30 mrad (solid angle)
Acoustic Aperture Size	≤ 1 mm
Resolution	30 Å at 476 nm 75 Å at 676 nm
Deflection Angle (with respect to input beam)	1.4 degrees (wavelength insensitive)
Drive Power Per Wavelength	< 0.1 watt
Total Power	0.8 watt
Impedance	50 ohms nominal
VSWR	≤ 2:1
Housing	53B00592
Housing with 72000 Bragg Mount	53B1827
Operating Manual: 51A14978	Acceptance Test Procedure: 42A14974 Acceptance Test Results form: 52A14966
Recommended Drivers:	
Eight Channel:	PCAOM Driver System: 64048-80-.1-8CH-16 PCAOM Driver Module: 64048-80-.1-8CH-16M
Four Channel:	PCAOM Driver System: 64048-80-.1-4CH-5 PCAOM Driver Module: 64048-80-.1-4CH-5M

Wavelength vs. Driver Frequency

<u>PARAMETER</u> Wavelength (nm)	<u>SPECIFICATION</u> Approximate Frequency (MHz)
442	85.52
457*	82.21
465*	80.10
472*	78.36
476*	77.40
482	76.06
488*	74.74
496*	75.67
501*	71.85
514*	69.36
520*	68.23
525	67.34
528*	66.84
530*	66.50
532	66.17
543	64.40
561	61.78
568*	60.76
575*	59.82
632*	53.20
635	52.90
647*	51.72
650	51.38
676*	49.05

* NEOS Driver Standard Settings.
Data for other wavelengths are available.

SECTION IV
OUTLINE DRAWING
48058-XX-.55



53B0592

Dimensions are in inches

Dimensions in [] are in mm.

Tolerances: Decimal: .xx = .01 .xxx = .005

Milimeter: .xx = .25mm .xxx = .127mm

Angle: = ± 30'

SECTION V

OPERATING PROCEDURE

Direct a vertically polarized light beam into the center of the input aperture the PCAOM optical aperture labeled “input”. Be careful that any mirrors in the optical path between the laser and PCAOM do not undesirable change the polarization direction. Select the drive frequency for 488 nm wavelength on the NEOS driver and apply the driver’s RF power to the PCAOM with a 50 ohm cable. If using a different driver, see Acceptance Test Report for drive frequency information. Rotate the Bragg angle of the PCAOM to achieve the brightest light output for the minus (-) first order beam. (as shown in figure 1) This beam will be deflected by 1.4 degrees from the input beam and is the output beam. The other un-diffracted wavelengths from the laser will be present in the zero order and should be optically blocked. If the other wavelengths need to be adjusted for diffraction efficiency, adjust the driver’s output frequency and drive power one at a time for each of the other wavelengths without changing the Bragg angle of the PCAOM. Apply the signals to modulate each of the wavelength as desired.

The RF power from the driver can be adjusted to achieve the required diffraction efficiency for each wavelength. However, in no case should the total RF power with all drive frequency on, exceed 0.8 Watt. NEOS will not warranty any failure resulting from the application of too much RF power.

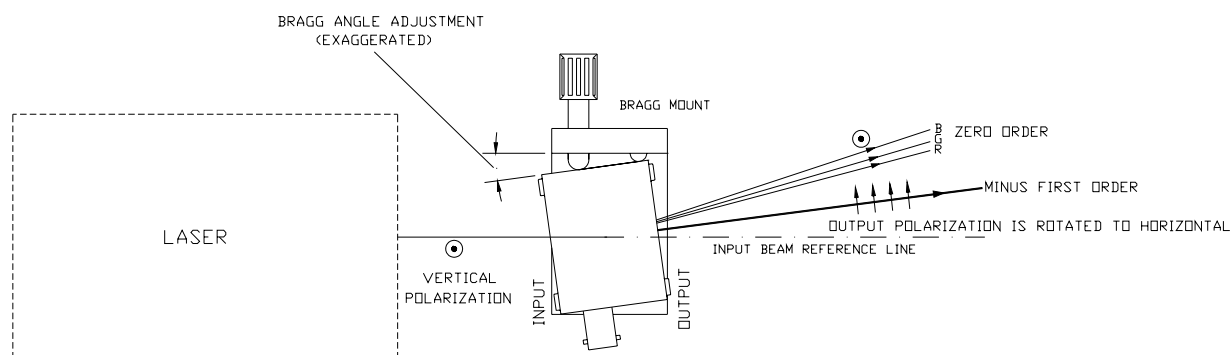


Figure 1

45A15236

SECTION VI

OPTICAL CLEANING FOR PCAOM MODULATORS

Periodic cleaning of the PCAOM device is a normal part of maintaining an optical system. When the device is installed in an optical system, make sure that there is access to allow removal of the protective cover and room to clean the device. If removal from the system is necessary, then follow the alignment procedure in this manual to reinstall, realign and, adjust the PCAOM device.

To clean the PCAOM device, remove the screws that hold the cover to the mount. **Caution** must be used when placing a screw driver near the window opening in the cover, as it is best to protect the opening with tape or cover the opening with your finger (without touching the crystal) to protect it. NEOS will not warrant any damage or scratches caused by inserting the screwdriver into the window opening.

- Remove the protective cover.
- Blow off any visible dust with canned air. Do not use an air gun unless it is filtered and water and oil free!
- Fold (4 times) a new lens tissue into a triangle to make a cleaning tool.
- Dip the tip of the lens tissue into fresh acetone or spray fresh acetone from a squeeze bottle onto the lens tissue. Then shake excess fluid out of the lens tissue. Do not handle the wet area of the tissue, as your finger oil will be absorbed and contaminate the optical surface of the crystal.
- Wipe (only once) across the crystal in an even motion, starting near the transducer and drawing the tissue across the optical surface toward the other end. Do not damage the bond wires! Do not reuse the tissue as the mounting silver epoxy may be spread onto the window of the crystal.
- Repeat with a new tissue each time and for each surface that needs cleaning.
- Replace the protective cover and screws.
- Realign the device in your system and adjust the Bragg angle for maximum diffraction efficiency as described in section V.

Notes:

- The lens tissue must be lint free and the best grade available.
- Only use each tissue once, for only one surface. Do not reuse the tissue, as it will redistribute the removed dust or mounting silver epoxy.
- The acetone must be electronic grade. The acetone must be fresh from a new bottle, as the acetone will absorb water from the air and cause streaks. Discard any acetone, which has been exposed to the air for more than 4 hours. If the bottle is half- empty, do not use.