

Model 77529

F/# Matcher for Fiber Optics



User's Manual



MKS Newport Family of Brands – ILX Lightwave® • Corion® • New Focus™ • Oriel® Instruments • Richardson Gratings™ • Spectra-Physics®

P/N: M77529 REV: A, 5/22/2025

TABLE OF CONTENTS

I INTRODUCTION 1

II MOUNTING INSTRUCTIONS 1

III FIBER ALIGNMENT INSTRUCTIONS 3

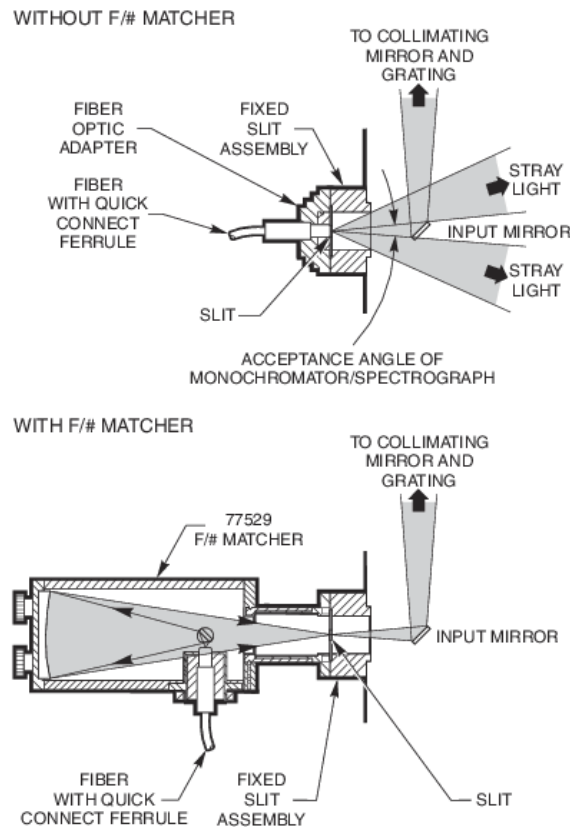
IV FIGURE 1 – DIAGRAM OF 77529 F/# MATCHER 4

V WARRANTY AND RETURNS 5

VI CONTACT US 6

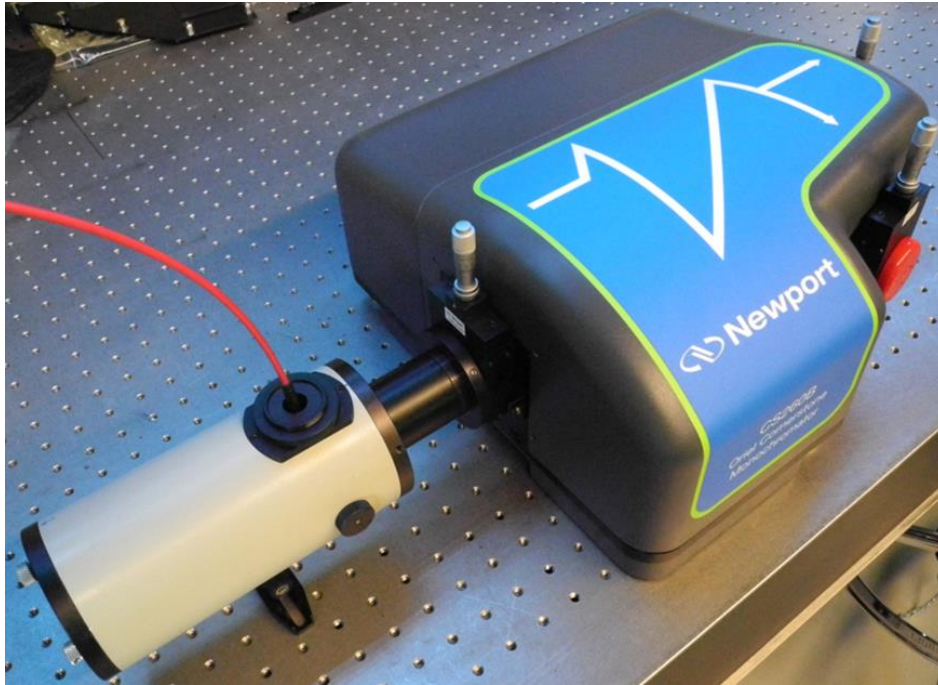
I INTRODUCTION

The F/# Matcher was designed to match the F/# of the optical fiber ($f/2$) to the monochromator ($f/4$). This will minimize the stray light of the system, with on axis optics to minimize aberrations. The output from most fiber optics, characterized by the fiber F/#, is too divergent for efficient acceptance by a monochromator; this leads to potentially significant loss in efficiency and increased stray light inside the instrument. The below diagram illustrates the fiber optic coupling efficiency and stray light improvements of using the F/# Matcher when connecting to a monochromator, compared to a direct connection without the F/# Matcher.



II MOUNTING INSTRUCTIONS

To mount the F/# Matcher, first rotate the housing until the quick connect fiber optic adapter is in the vertical or upwards position. Utilize the 1/4-20 tapped hole on the bottom of the F/# Matcher for proper rod mounting support. Connect the F/# Matcher onto the monochromator slit housing via the female quick connect flange. Secure the F/# Matcher by tightening the thumb screw on the female quick connect flange. An example of an F/# Matcher properly rod supported and connected to a monochromator is shown on the following page for reference.



Example of F/# Matcher properly rod supported and mounted to a monochromator input slit

The F/# Matcher is built with the quick connect fiber optic adapter, for use with Oriel standard 11mm ferrule products and adapters (sold separately). With the appropriate 11mm sized ferrule adapter installed, insert the fiber optic into the top of the fiber adapter tube, and secure the ferrule with the supplied set screw. The ferrule should be flush with the end of the tube, as shown in the below image. To insert the fiber into the F/# Matcher, place the tube into the quick connect adapter, and use the supplied set screw on the housing to secure the tube inside the adapter.

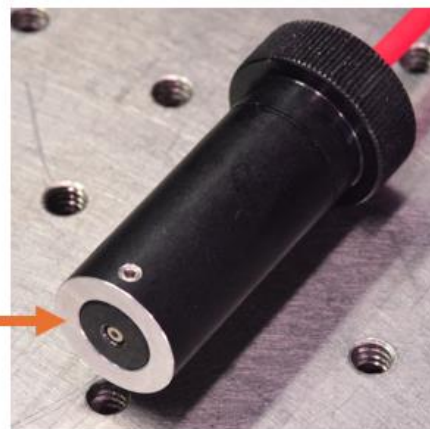
Fiber adapter tube
with set screw

Optical fiber



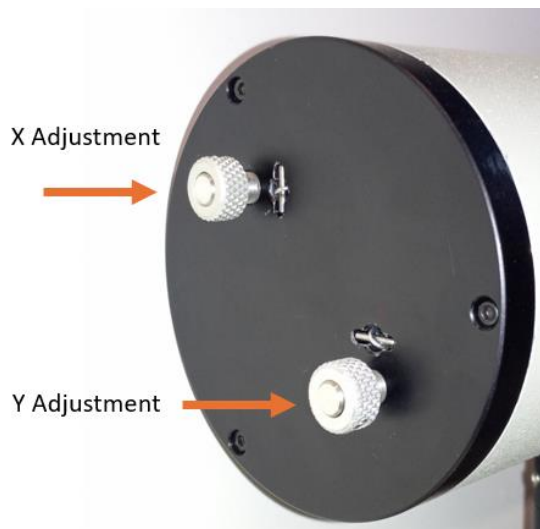
SMA to 11mm ferrule adapter (77670)

Flush



III FIBER ALIGNMENT INSTRUCTIONS

The F/# Matcher is equipped with x, y position and z focus adjustments to achieve fine alignment to your monochromator system. These adjustments will allow you to precisely locate the fiber image in the input image plane of your monochromator. To achieve x, y alignment, use the two thumb adjustment screws located in the rear plate of the F/# Matcher housing, as shown below.



To achieve coarse z focus, use the adjustable tube on the female quick connect flange, loosen the thumb screw and slide the F/# Matcher housing forward and back, see Figure 1 for details.

When no signal is detected through your monochromator, take the following steps:

- 1) Without the fiber adapter tube in place, look to see if small mirror is visible, looking downwards inside the F/# Matcher. This mirror should be aligned properly from the factory, held in position by the external housing mounting components as shown below. If you suspect damage or misalignment of this mirror, **do not attempt to adjust these mounting components, contact Newport for further support.**



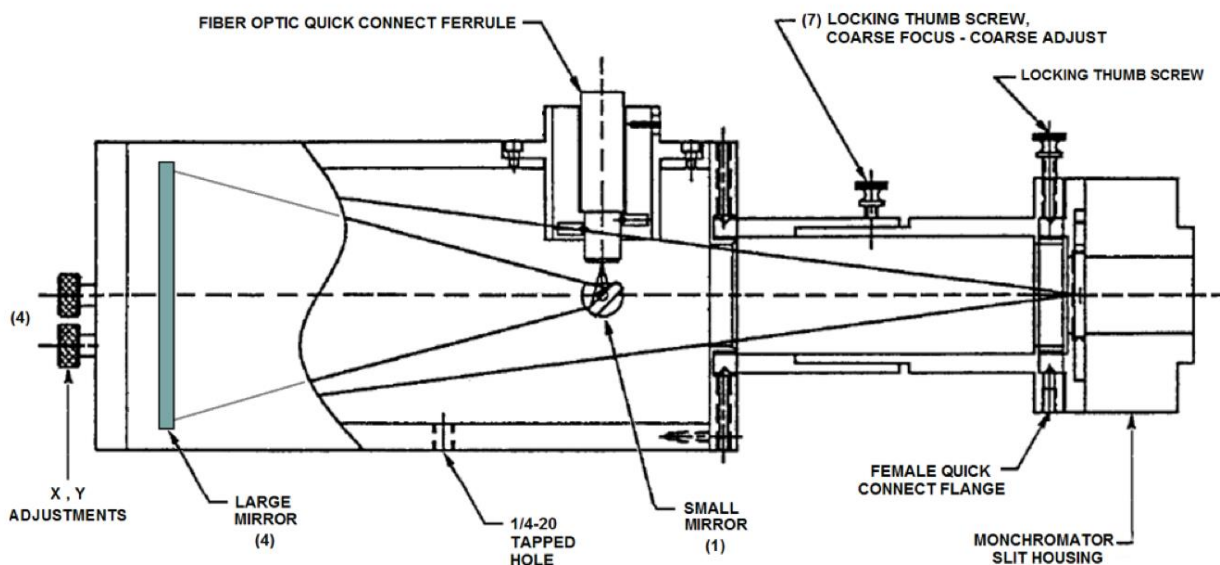
- 2) Disconnect F/# Matcher from the Monochromator.

- 3) Place the fiber adapter tube fully flush into the F/# Matcher quick connect adapter.
- 4) Shine a visible light or laser into the other end of the fiber, and by holding a paper in front of the F/# Matcher output, check to see if output is in the center of F/# Matcher. If offset horizontally or vertically, adjust the position of the Large Mirror by turning the two x-y adjustment thumb screws. An example of this coarse alignment with a visible HeNe laser, coupled through the fiber optic, is shown below for reference.



- 5) When properly centered, re-attach the fiber plus F/# Matcher to the monochromator.
- 6) Remove your fixed slits, or fully open your adjustable input and output slits of your monochromator, and check for a proper signal on the output port. When the expected signal is observed, put the slits back in their original positions.
- 7) Perform the coarse z adjust by loosening the female quick connect flange thumb screw and move the F/# Matcher forward and backwards, until signal is maximized.
- 8) Finally, perform fine tuning of x-y adjustments as necessary for optimum throughput.

IV FIGURE 1 – DIAGRAM OF 77529 F/# MATCHER



V WARRANTY AND RETURNS

Newport warrants that all goods described in this manual (except consumables such as lamps, bulbs, filters, ellipses, etc.) shall be free from defects in material and workmanship. Such defects become apparent within the following period:

1. All products described here, except spare parts: one (1) year or 3000 hours of operation, whichever comes first, after delivery of the goods to the buyer.
2. Spare parts: ninety (90) days after delivery of goods to the buyer.

Newport's liability under this warranty is limited to the adjustment, repair and/or replacement of the defective part(s). During the above listed warranty period, Newport shall provide all materials to accomplish the repaired adjustment, repair or replacement. Newport shall provide the labor required during the above listed warranty period to adjust, repair and/or replace the defective goods at no cost to the buyer ONLY IF the defective goods are returned, freight prepaid, to a Newport designated facility. If goods are not returned to Newport, and the user chooses to have repairs made at their premises, Newport shall provide labor for field adjustment, repair and/or replacement at prevailing rates for field service, on a portal-to-portal basis.

Newport shall be relieved of all obligations and liability under this warranty of:

1. The user operates the device with any accessory, equipment or part not specifically approved or manufactured or specified by Newport unless buyer furnishes reasonable evidence that such installations were not the cause of the defect. This provision shall not apply to any accessory, equipment or part, which does not affect the safe operation of the device.
2. The goods are not operated or maintained in accordance with Newport's instructions and specifications.
3. The goods have been repaired, altered or modified by other than authorized Newport personnel.
4. Buyer does not return the defective goods, freight prepaid, to a Newport facility within the applicable warranty period.

IT IS EXPRESSLY AGREED THAT THIS WARRANTY SHALL REPLACE ALL WARRANTIES OF FITNESS AND MERCHANTABILITY. BUYER HEREBY WAIVES ALL OTHER WARRANTIES, GUARANTEES, CONDITIONS OR LIABILITIES, EXPRESSED OR IMPLIED, ARISING BY LAW OR OTHERWISE, WHETHER OR NOT OCCASIONED BY NEWPORT'S NEGLIGENCE.

This warranty shall not be extended, altered or varied except by a written document signed by both parties. If any portion of this agreement is invalidated, the remainder of the agreement shall remain in full force and effect.

CONSEQUENTIAL DAMAGES

Newport shall not be responsible for consequential damages resulting from misfunctions or malfunctions of the goods described in this manual. Newport's total responsibility is limited to repairing or replacing the malfunctioning or malfunctioning goods under the terms and conditions of the above described warranty.

INSURANCE

Persons receiving goods for demonstrations, demo loan, temporary use or in any manner in which title is not transferred from Newport, shall assume full responsibility for any and all damage while in their care, custody and control. If damage occurs, unrelated to the proper and warranted use and performance of the goods, recipient of the goods accepts full responsibility for restoring the goods to their condition upon original delivery, and for assuming all costs and charges.

RETURNS

Before returning equipment to Newport for repair, please call the Customer Service Department at (203) 377-8282. Have your purchase order number available before calling Newport. The Customer Service Representative will give you a Return Material Authorization number (RMA). Having an RMA will shorten the time required for repair, because it ensures that your equipment will be properly processed. Write the RMA on the returned equipment's box. Equipment returned without a RMA may be rejected by the Newport Receiving Department. Equipment returned under warranty will be returned with no charge for the repair or shipping. Newport will notify you of any repairs not covered by the warranty, with the cost of the repair, before starting the work.

Please return equipment in the original (or equivalent) packaging. You will be responsible for damage incurred from inadequate packaging, if the original packaging is not used.

Include the cables, connector caps and antistatic materials sent and/or used with the equipment, so that Newport can verify correct operation of these accessories.

VI CONTACT US

To obtain further information regarding sales, technical support or factory service, United States and Canadian customers should contact Newport directly.

Newport - Oriel Instruments
1791 Deere Avenue
Irvine, CA 92606 USA

Telephone: 877-835-9620 (toll-free in United States)
800-222-6440

Fax: 949-253-1680

Sales and Technical Assistance: salesirv@mksinst.com

Customers outside of the United States must contact their regional representative for all sales, technical support and service inquiries. A list of worldwide representatives can be found on Newport's website: <https://www.newport.com/contact/contactslocations>

© 2025 by Newport Corporation, Irvine, CA. All rights reserved.

No part of this manual may be reproduced or copied without the prior written approval of Newport Corporation.

This manual has been provided for information only and product specifications are subject to change without notice.

Any change will be reflected in future printings.

Newport Corporation 1791 Deere Avenue Irvine, CA, 92606 USA

Part No. M77529