

SLM-468/468S

Single Reflection Unit

Instruction Manual



Safety Considerations

To ensure operation safety, this instrument must be operated correctly and maintained according to a regular schedule. Carefully read to fully understand all safety precautions in this manual before operating the instrument. Please take a moment to understand what the signal words **WARNING!**, **CAUTION**, and *Note* mean in this manual.

(1) Safety symbols



Instruction manual symbol. If the product is marked with this symbol, refer to the instrument manuals to protect the instrument against damage.

WARNING! A **WARNING!** indicates a potentially hazardous situation which, if not avoided, could result in serious injury or even death.

CAUTION A **CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against damaging the equipment.

Do not proceed beyond a **WARNING!** or **CAUTION** notice until you understand the hazardous conditions and have taken the appropriate steps.

Note A *Note* provides additional information to help the operator achieve optimal instrument performance.

Regulatory Statement

CE Notice

The **CE** symbol indicates compliance of this JASCO system to the EMC (Electromagnetic Compatibility) and Low Voltage Directives of the European Community. This symbol indicates that this JASCO system meets the relevant basic safety and health requirements of the EC Directive based on the following technical standards:

- EN55011 -- "Industrial, scientific and medical (ISM) radio-frequency equipment – Radio disturbance characteristics – Limits and methods of measurement" -- Group 1, Class A.

WARNING!: This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take corrective measures.

- EN61000-6-1 -- "Electromagnetic compatibility(EMC) Part 6-1:Generic standards – Immunity for residential, commercial and light-industrial environments"
- IEC61000-3-2 -- "Electromagnetic compatibility(EMC) Part 3-2:Limits – Limits for harmonic current emissions (equipment input current up to and including 16A per phase) "
- IEC61010-1 -- "Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1:General requirements"
- A "Declaration of Conformity" in accordance with the above standards has been made and is on file at JASCO EUROPE srl, Via Confalonieri 25, 22060 CREMELLA (LC), Italy.

FCC Statement (for USA only)

Federal Communications Commission Radio Frequency Interference Statement

WARNING!: This equipment generates, uses, and can radiate radio frequency energy. If it is not installed and used in accordance with the instruction manual, it may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Preface

This instruction manual is your guide for using this instrument. It instructs first-time users on how to use the instrument, and serves as a reference for experienced users.

Before using the instrument, please read this instruction manual carefully, and make sure that the contents are fully understood. This manual should be easily accessible to the operator at all times during instrument operation. When not using the instrument, keep this manual in a safe place. If this instruction manual becomes lost, order a replacement from your local JASCO distributor.

Installation Requirements

To ensure operation safety, observe the following conditions:

To ensure operation safety, observe the following conditions:

- (1) Do not operate the instrument under voltage fluctuations exceeding 10% of the recommended line voltage. Otherwise, the instrument may not function properly.
- (2) Frequency or spike noise in the power supply should be minimal.
- (3) Ensure that the instrument is grounded.
- (4) Operate the instrument in a temperature range of 10 ~ 35°C.
- (5) Operate the instrument in a humidity range of 35 ~ 85%(RH). If ambient humidity exceeds 85%(RH), condensation may deteriorate optical components.
- (6) Operate the instrument in an atmospheric pressure range of 950 ~ 1060hPa.
- (7) Avoid strong magnetic fields and sources of high frequency. The instrument may not function properly when near a strong magnetic field or high frequency source.
- (8) Avoid vibration from vacuum pumps, electric motors, processing equipment and machine tools.
- (9) Avoid dust and corrosive gas. Do not install the instrument where it may be exposed to dust, especially in locations exposed to outside air or ventilation outlets that discharge dust particles.
- (10) Do not install the instrument in a location where it may be exposed to direct sunlight.
- (11) Install the instrument in a horizontal and stable position. (This includes a table or desk upon which the instrument is installed.)
- (12) Ensure that no air conditioner blows air directly onto the instrument. This may prevent stable measurement.
- (13) Install the instrument in a location that allows easy access for maintenance.

<p><i>Note: The above conditions do not guarantee optimal performance of this instrument.</i></p>

Servicing

Contact your local JASCO distributor for instrument servicing. In addition, contact your JASCO distributor before moving the instrument to another location. Consumable parts should be ordered according to part number from your local JASCO distributor. If a part number is unknown, give your JASCO distributor the model name and serial number of your instrument.

Do not return contaminated products or parts that may constitute a health hazard to JASCO employees.

Notices

- (1) JASCO shall not be held liable, either directly or indirectly, for any consequential damage incurred as a result of product use.
- (2) Prohibitions on the use of JASCO software
 - Copying software for purposes other than backup
 - Transfer or licensing of the right to use software to a third party
 - Disclosure of confidential information regarding software
 - Modification of software
 - Use of software on multiple workstations, network terminals, or by other methods (not applicable under a network licensing agreement concluded with JASCO)
- (3) The contents of this manual are subject to change without notice for product improvement.
- (4) This manual is considered complete and accurate at publication.
- (5) This manual does not guarantee the validity of any patent rights or other rights.
- (6) If a JASCO software program has failed causing an error or improper operation, this may be caused by a conflict from another program operating on the PC. In this case, take corrective action by uninstalling the conflicting product(s).
- (7) In general, company names and product names are trademarks or registered trademarks of the respective companies.
- (8) JASCO and the JASCO logo are registered trademarks of JASCO Corporation

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Limited Warranty

Products sold by JASCO, unless otherwise specified, are warranted for a period of one year from the date of shipment to be free of defects in materials and workmanship. If any defects in the product are found during this warranty period, JASCO will repair or replace the defective part(s) or product free of charge.

THIS WARRANTY DOES NOT APPLY TO DEFECTS RESULTING FROM THE FOLLOWING:

- 1) IMPROPER OR INADEQUATE INSTALLATION
- 2) IMPROPER OR INADEQUATE OPERATION, MAINTENANCE, ADJUSTMENT OR CALIBRATION
- 3) UNAUTHORIZED MODIFICATION OR MISUSE
- 4) USE OF CONSUMABLE PARTS NOT SUPPLIED BY AN AUTHORIZED JASCO DISTRIBUTOR
- 5) CORROSION DUE TO THE USE OF IMPROPER SOLVENTS, SAMPLES, OR DUE TO SURROUNDING GASES
- 6) ACCIDENTS BEYOND JASCO'S CONTROL, INCLUDING NATURAL DISASTERS

This warranty does not cover the consumable parts listed below:

- 1) Tungsten lamp, and other light sources
- 2) Mirrors in the light source section, and cell windows
- 3) Fuses, batteries, glassware, chart paper and ink

THE WARRANTY FOR ALL PARTS SUPPLIED AND REPAIRS PROVIDED UNDER THIS WARRANTY EXPIRES ON THE WARRANTY EXPIRATION DATE OF THE ORIGINAL PRODUCT. FOR INQUIRIES CONCERNING REPAIR SERVICE, CONTACT YOUR JASCO DISTRIBUTOR AFTER CONFIRMING THE MODEL NAME AND SERIAL NUMBER OF YOUR INSTRUMENT.

JASCO Corporation
2967-5, Ishikawa-machi, Hachioji-shi
Tokyo 192-8537, JAPAN

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1. General Description and Specifications

1.1 General Description

The SLM-468/468S single reflection unit is designed to measure the relative reflectance of a sample using the forward reflected light from the aluminum-deposited plane mirror as a reference. This unit permits measurement of the reflectance of metal-deposited films, metal plating, etc., as well as measurement of film thickness using the application program (optional).

1.2 Specifications

Wave length range	: 250 to 1000 nm (V-530 UV/VIS spectrophotometer) 220 to 800 nm (V-550/560 UV/VIS spectrophotometer) 220 to 2200 nm (V-570 UV/VIS/NIR spectrophotometer)
Sample size	: Sample side Minimum 10x10 mm Maximum 100x120 mm Reference side Minimum 10x10 mm Maximum 100x70 mm
Beam port diameter	: 7 mm (4 mm, 2 mm as option)
Angle of Incidence	: Approx. 5°
Reflection reference	: Aluminum-deposited plane mirror (Standard mirror)
100% line flatness	: Within $\pm 1\%$ (spectral bandwidth: 2 nm, after baseline correction)

2. Unpacking and Installation

2.1 Caution

- (1) Never touch the reflecting surface of the standard mirror, which is constructed by aluminum deposition. If contaminated with dust or other contaminants, do not wipe the mirror with gauze or cloth.
- (2) Never manipulate the adjustment screw on the sample stage, because the light path will be misaligned, making measurement impossible.
- (3) Note that pressing on the sample stage or measurement of a heavy sample will change the angle of the sample stage, making measurement impossible.

2.2 Unpacking

Upon unpacking the unit, check the components against the list below. If any part is missing or damaged, contact your local JASCO distributor.

Table 2.1 List of Components

Description	Q'ty	Notes
Single reflection unit	1 pc	Deposited aluminum plane mirror
Sample chamber lid	1 pc	
Standard mirror	2 pcs	
Instruction manual	1 copy	

Optional accessories

- GPH-506/PFH-507 Polarizer
- Application program (Film thickness calculation program, etc.)
- Sample stage with 2-mm-dia. port (See supplement)
- Sample stage with 4-mm-dia. port (See supplement)

2.3 Installation

2.3.1 Installation

Caution: Always turn 'Off' the power switch of the spectrophotometer before mounting or removing accessories on or from the spectrophotometer. Otherwise, the internal detectors may be damaged.

Mount or remove accessories on or from the spectrophotometer as follows:

- (1) Removing the standard cell holder
 - 1) Loosen the two fixing screws on the bottom of the sample chamber.
 - 2) Pull out the front panel of the standard cell holder, and then lift up to remove the entire holder unit from the spectrophotometer.
- (2) Affixing the accessory
 - 1) Gently mount the accessory in the sample chamber, and move it to the back until it comes into contact with the positioning pin.
 - 2) Firmly tighten the two fixing screws on the bottom of the sample chamber.
 - 3) Mount the sample chamber lid for the accessory on the spectrophotometer.

2.3.2 Checking the 100% line

Note: Be sure to perform this check when this accessory is mounted on the spectrophotometer for the first time. The check is not required each time the accessory is remounted.

- (1) Start the spectrophotometer in accordance with the instruction manual.
- (2) Measure the baseline correction data with the mounted standard cell holder.
- (3) Dismount the standard cell holder from the spectrophotometer and gently mount the single reflection unit in the sample chamber (See section 2.3.1.).
- (4) Place the standard mirror on the sample side and reference the side sample stage. Here, the mirror should be in contact with the sample securing screw.
- (5) Mount the supplied sample chamber lid in position.
- (6) Measure the 100% line data under the following parameters.

	V-530	V-550/560	V-570
Photometric mode :	%R	%R	%R
Spectral band width :	2 nm	2 nm	UV: 2 nm, NIR: 8 nm
Response :	Fast	Fast	Fast
Scanning range :	250 to 1000 nm	220 to 800 nm	220 to 2200 nm
Scanning speed :	400 nm/min	400 nm/min	1000 nm/min

- (7) Ensure that the line is within $100 \pm 1\%R$. If the line exceeds this range, contact your local JASCO distributor.

Note: The above criterion is that required before shipment from the factory. After prolonged use, the above range may be exceeded due to deterioration of the mirror or deviation of the optical system, but this will not be a problem unless high-precision measurement is performed because the sample is measured after measuring baseline correction data with an accessory set in position.

3. Nomenclature and Functions of Components

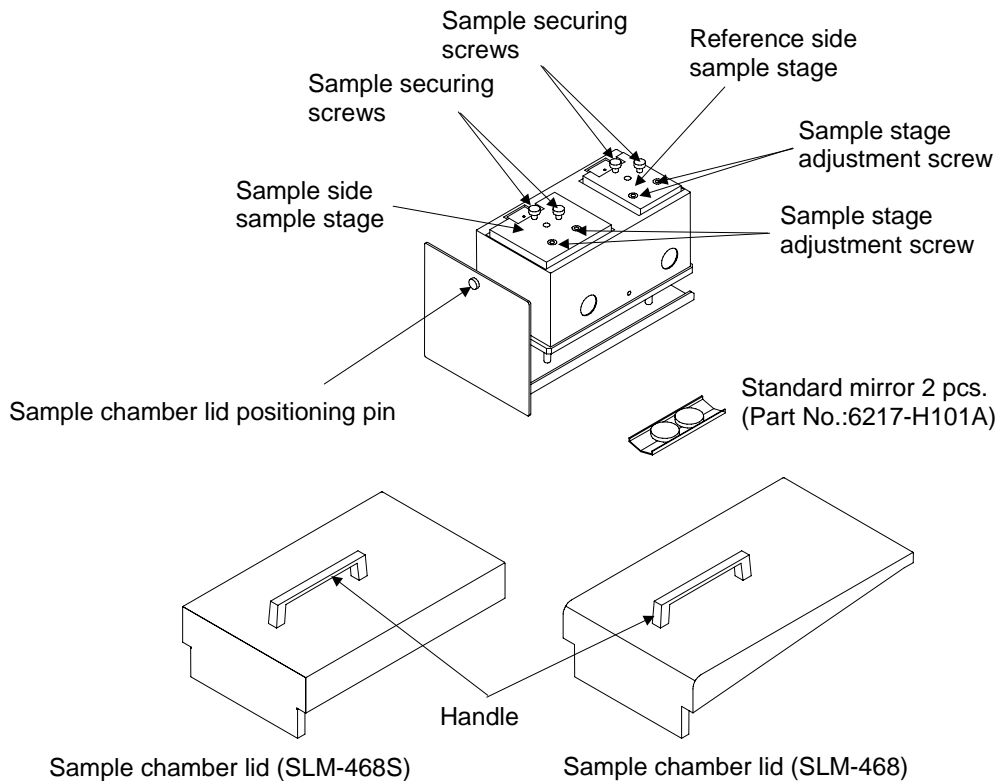


Fig. 3.1 Single reflection unit

4. Cautions

- (1) Never touch the reflecting surface of the deposited aluminum standard mirror. If contaminated with dust or other contaminants, do not wipe the mirror with gauze or cloth.

*Note: The standard mirror is a consumable. If the mirror is so severely contaminated as to cause measurement problems, replace the mirror. When ordering, please include the following part number.
Part No. of standard mirror: 6217-H101A*

- (2) Never manipulate the adjustment screw on the sample stage, because the light path will be misaligned, making measurement impossible.
- (3) Note that pressing the sample stage or measurement of a heavy sample will change the angle of the sample stage, making measurement impossible.
- (4) When measuring a spectrum, place the standard mirror on both the sample side and reference side sample stages, and measure the baseline correction data.
- (5) The sample securing screws are for positioning the standard mirror and measuring sample. When measuring a large sample, remove the sample securing screws.
- (6) After use, remove the accessories from the sample chamber and store them in a safe, dust-free place. The accessories may be left in position if further measurements are to be made. Store small parts together with accessories so that they are not lost.

Supplement **MSK-001 Sample stage with 2-mm-dia. port** **MSK-002 Sample stage with 4-mm-dia. port**

The MSK-001 Sample stage with 2-mm-dia. port and MSK-002 Sample stage with 4-mm-dia. port are the accessories for measuring small samples that cannot be measured on the standard sample stage (7-mm-dia. port, minimum sample size 10x10). These accessories can also be used for spot measurement of samples.

1. Name

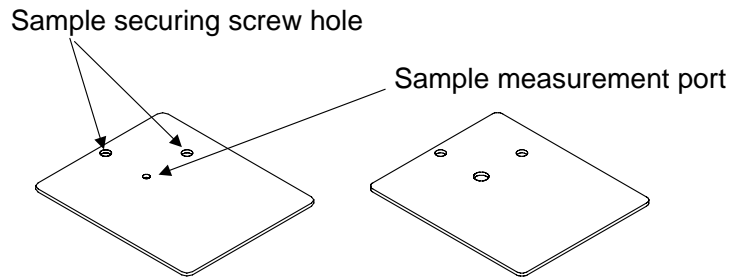


Fig 1 MSK-001 Sample stage with 2-mm-dia. port or
 MSK-002 Sample stage with 4-mm-dia. port

2. Specifications

MSK-001 Sample stage with 2-mm-dia. port	MSK-002 Sample stage with 4-mm-dia. port
Diameter of port : 2 mm	Diameter of port : 4 mm
Sample size : Minimum 3x3 mm Maximum 50x50 mm	Sample size : Minimum 5x5 mm Maximum 50x50 mm
Code No. : G121	Code No. : G122
Part No. : 6708-J103A	Part No. : 6708-J203A

3. Installation

- (1) Remove the sample securing screws from the standard sample stage.
- (2) Mount the either the 2-mm-dia.-port sample stage or the 4-mm-dia.-port sample stage on the standard sample stage using the sample securing screws.

4. Caution in Using the Single Reflection Unit

Place the standard mirror on both the sample-side and reference-side sample stages and measure the baseline correction data before measuring a sample.

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