

**MG9586A/MG9587A**  
**Wavelength Reference Light Source/  
SLD Light Source**  
**Operation Manual**

**First Edition**

**Read this manual before using the equipment.  
Keep this manual with the equipment.**

**Measuring Instruments Division**  
**Measurement Group**  
**ANRITSU CORPORATION**


**Document No.: M-W1768AE-1.0**


# Safety Symbols


To prevent the risk of personal injury or loss related to equipment malfunction, Anritsu Corporation uses the following safety symbols to indicate safety-related information. Insure that you clearly understand the meanings of the symbols BEFORE using the equipment.

Some or all of the following five symbols may not be used on all Anritsu equipment. In addition, there may be other labels attached to products which are not shown in the diagrams in this manual.

## Symbols used in manual

**DANGER**  This indicates a very dangerous procedure that could result in serious injury or death if not performed properly.

**WARNING**  This indicates a hazardous procedure that could result in serious injury or death if not performed properly.

**CAUTION**  This indicates a hazardous procedure or danger that could result in light-to-severe injury, or loss related to equipment malfunction, if proper precautions are not taken.

## Safety Symbols Used on Equipment and in Manual

The following safety symbols are used inside or on the equipment near operation locations to provide information about safety items and operation precautions. Insure that you clearly understand the meanings of the symbols and take the necessary precautions BEFORE using the equipment.



This indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.



This indicates an obligatory safety precaution. The obligatory operation is indicated symbolically in or near the circle.



This indicates warning or caution. The contents are indicated symbolically in or near the triangle.



This indicates a note. The contents are described in the box.



These indicate that the marked part should be recycled.

MG9586A/MG9587A

Wavelength Reference/SLD Light Source

Operation Manual

27 April 2000 (First Edition)

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Printed in Japan

# For Safety

## WARNING



1. ALWAYS refer to the operation manual when working near locations at which the alert mark shown on the left is attached. If the operation, etc., is performed without heeding the advice in the operation manual, there is a risk of personal injury. In addition, the equipment performance may be reduced. Moreover, this alert mark is sometimes used with other marks and descriptions indicating other dangers.

2. Laser radiation warning
  - NEVER look directly into the cable connector on the equipment nor into the end of a cable connected to the equipment. If laser radiation enters the eye, there is a risk of injury.
  - Laser Radiation Markings on a following page show the Laser Safety label attached to the equipment near the cable connector.



or



3. When supplying power to this equipment, connect the accessory 3-pin power cord to a 3-pin grounded power outlet. If a grounded 3-pin outlet is not available, before supplying power to the equipment, use a conversion adapter and ground the green wire, or connect the frame ground on the rear panel of the equipment to ground. If power is supplied without grounding the equipment, there is a risk of receiving a severe or fatal electric shock.

Repair

WARNING 

4. This equipment cannot be repaired by the user. DO NOT attempt to open the cabinet or to disassemble internal parts. Only Anritsu-trained service personnel or staff from your sales representative with a knowledge of electrical fire and shock hazards should service this equipment. There are high-voltage parts in this equipment presenting a risk of severe injury or fatal electric shock to untrained personnel. In addition, there is a risk of damage to precision parts.

Falling Over

5. This equipment should be used in the correct position. If the cabinet is turned on its side, etc., it will be unstable and may be damaged if it falls over as a result of receiving a slight mechanical shock.

## For Safety

### CAUTION

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#### Changing Fuse

CAUTION 

1. Before changing the fuses, ALWAYS remove the power cord from the poweroutlet and replace the blown fuses. ALWAYS use new fuses of the type and rating specified on the fuse marking on the rear panel of the cabinet.

T\_\_\_A indicates a time-lag fuse.

\_\_\_A or F\_\_\_ A indicate a normal fusing type fuse.

There is risk of receiving a fatal electric shock if the fuses are replaced with the power cord connected.

#### Cleaning

2. Keep the power supply and cooling fan free of dust.
    - Clean the power inlet regularly. If dust accumulates around the power pins, there is a risk of fire.
    - Keep the cooling fan clean so that the ventilation holes are not obstructed. If the ventilation is obstructed, the cabinet may overheat and catch fire.
-

## **Equipment Certificate**

Anritsu guarantees that this equipment was inspected at shipment and meets the published specifications.

## **Anritsu Warranty**

Anritsu Corporation will repair this equipment free-of-charge if a malfunction occurs within 1 year after shipment due to a manufacturing fault, provided that this warranty is rendered void under any or all of the following conditions.

- The fault is outside the scope of the warranty conditions described in the operation manual.
- The fault is due to mishandling, misuse, or unauthorized modification or repair of the equipment by the customer.
- The fault is due to severe usage clearly exceeding normal usage.
- The fault is due to improper or insufficient maintenance by the customer.
- The fault is due to natural disaster including fire, flooding, earthquake, etc.
- The fault is due to use of non-specified peripheral equipment, peripheral parts, consumables, etc.
- The fault is due to use of a non-specified power supply or in a non-specified installation location.

In addition, this warranty is valid only for the original equipment purchaser. It is not transferable if the equipment is resold.

Anritsu Corporation will not accept liability for equipment faults due to unforeseen and unusual circumstances, nor for faults due to mishandling by the customer.

## **Anritsu Corporation Contact**

If this equipment develops a fault, contact Anritsu Corporation or its representatives at the address in this manual.

### Notes on Export Management

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This product and its manuals may require an Export License/Approval by the Government of the product's country of origin for re-export from your country.

Before re-exporting the product or manuals, please contact us to confirm whether they are export-controlled items or not.

### Waste Management Plan

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- The electrical circuit of this equipment contains arsenic. The user must comply with the regulations of his country/district for the disposal of the equipment.

Please contact ANRITSU or the sales representatives of Anritsu if there are any doubts or questions about the disposal of waste.

# CE Marking

Anritsu affix the CE Conformity Marking on the following product (s) in accordance with the Council Directive 93/68/EEC to indicate that they conform with the EMC directive of the European Union (EU).

## CE Conformity Marking



### 1. Product Name/Model Name

Product Name: Wavelength Reference Light Source/SLD Light Source  
Model Name: MG9586A/MG9587A

### 2. Applied Directive

EMC : Council Directive 89/336/EEC  
Safety: Council Directive 73/23/EEC

### 3. Applied Standards

EMC:

Electromagnetic radiation:

EN55011 (ISM, Group 1, Class A equipment)

Immunity:

EN50082-1

Performance Criteria\*

|                               |   |
|-------------------------------|---|
| IEC801-2 (ESD) 4 kVCD, 8 kVAD | B |
| IEC801-3 (Rad.) 3 V/m         | A |
| IEC801-4 (EFT) 1 kV           | B |

\*: Performance Criteria

A: No performance degradation or function loss

B: Self-recovered temporary degradation of performance or temporary loss of function

Harmonic:

EN61000-3-2

Note: This product isn't applied to the EN61000-3-2

Safety: EN61010-1 (Installation Category II, Pollution Degree 2)





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# Section 1 Outline

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1

Outline

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## 1.1 MG9586A Wavelength Reference Light Source/ MG9587A SLD Light Source

The MG9586A Wavelength Reference Light Source is a light source that uses acetylene having absorption lines of which physical wavelengths are highly stable. Acetylene gas has a property which absorbs the optical spectrum of a specific wavelength. Therefore, when a broad light, such as the SLD light source, is launched into the acetylene, a Dip (absorption) occurs in the light spectrum of the output light at specified wavelengths. The Dip wavelength (absorption line wavelength) that has been known can be measured, utilizing this characteristics, then having the measured value as the reference value allows the wavelength axis be calibrated. As a result, the wavelength accuracy can be improved.

MG9587A is an SLD light source that has a high output level of -40 dBm/1 nm. Because of this it is possible to evaluate the wavelength transmission characteristics of optical elements at a high dynamic range.

## 1.2 Applications

### MG9586A

- Optical Spectrum Analyzer wavelength calibration light sources
- Reference wavelength absolute value light source utilizing absorption line

### MG9587A

- Reference light sources for measuring wave transmission characteristics
- Reference light sources for measuring dispersion

## 1.3 Standard Configuration

### 1.3.1 MG9586A Wavelength Reference Light Source

#### Main unit

- MG9586A wavelength reference light source

#### Standard accessories

- Optical connector adapter \*1
- MG9586A Operation Manual

\*1 The connector specified from the following options at the time of contract.

Unless specified, the FC connector (-37) is supplied as the standard connector with the main unit.

#### Options

- |                                |            |
|--------------------------------|------------|
| • FC connector                 | MG9586A-37 |
| • ST connector                 | MG9586A-38 |
| • DIN connector                | MG9586A-39 |
| • SC connector                 | MG9586A-40 |
| • HMS-10/A (DIAMOND) connector | MG9586A-43 |

### 1.3.2 MG9587A SLD Light Source

#### Main unit

- MG9587A SLD Light Source

#### Standard accessories

- Optical connector adapter \*1
- MG9587A Operation Manual

\*1 The connector specified from the following options at the time of contract.

Unless specified, the FC connector (-37) is supplied as the standard connector with the main unit.

#### Options

- |                                |            |
|--------------------------------|------------|
| • FC connector                 | MG9586A-37 |
| • ST connector                 | MG9586A-38 |
| • DIN connector                | MG9586A-39 |
| • SC connector                 | MG9586A-40 |
| • HMS-10/A (DIAMOND) connector | MG9586A-43 |

## 1.4 Related Parts

- Replaceable optical connector (FC) J0617B
- Replaceable optical connector (ST) J0618D
- Replaceable optical connector (DIN) J0618E
- Replaceable optical connector (HGMS-10/A) J0618F
- Replaceable optical connector (SC) J0618B
- Optical fiber cord (FC/PC-FC/PC-2M-SM) , 2 m J0575
- Ferrule cleaner Z0282
- Ferrule cleaner switching tape Z0283
- Adapter cleaner Z0284

## 1.5 Specifications

1

Outline

### MG9586A Wavelength Reference Light Source

|                       |  |
|-----------------------|--|
| Optical connector     | User-replaceable   |
| Output level          | measured with the MS9710B/C setting resolution at 1 mm $1530 \pm 5$ nm                               |
| Absorption lines      | Acetylene (C <sub>2</sub> H <sub>2</sub> ) used  |
| Environment condition | Operation temperature: 0 to +40 °C<br>Storage temperature: -20 to +60 °C<br>Relative humidity: <90 % |
| Power                 | 85 to 132 Vac/170 to 250 Vac, 47.5 to 63 Hz, 10 VA (max.)  |
| Dimensions and mass   | 213 (W) 250 (D) × 88 (H) (without projection) <3.0 kg  |

### MG9587A SLD Light Source

|                        |  |
|------------------------|--|
| Optical connector      | User-replaceable type  |
| Output level           | measured with the MS9710B/C setting resolution at 1 mm $155 \pm 10$ nm   |
| Output level stability | measured for 20 minutes with the MS9710B/C setting resolution at 1 nm, without polarization change at a specified temperature, and with the wavelength at 1550 nm *1 |
| Environment condition  | Operation temperature: 0 to +40 °C<br>Storage temperature: -20 to +60 °C<br>Relative humidity: <90 %   |
| Power                  | 85 to 132 Vac/170 to 250 Vac, 47.5 to 63 Hz, 10 VA (max.)  |
| Dimensions and mass    | 213 (W) 250 (D) × 88 (H) (without projection) <3.0 kg  |

\*1 The measurement value gained after the MG9587A was turned on for over one hour.





# Section 2 Description and Features

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## 2

### Description and Features

## 2.1 Unpacking

Take the main unit and accessories out of the packing case and check the packing list for any missing materials parts. Should any materials be missing or damaged, please contact Anritsu Corporation or your sales representative immediately.

### Configuration (MG9586A)

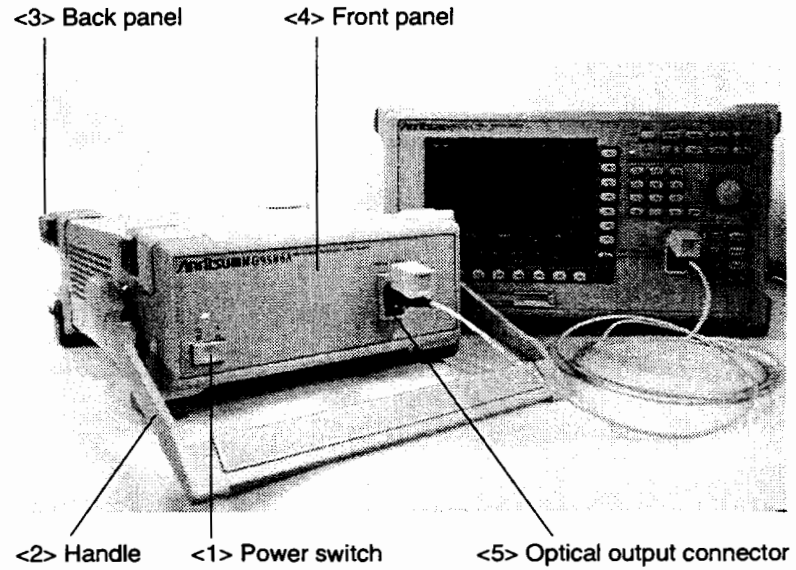
| Name                        | Quantity | Model/Order No.           |
|-----------------------------|----------|---------------------------|
| <b>Main unit</b>            |          |                           |
| Wavelength Reference        | 1        | MG9586A                   |
| Light Source                |          |                           |
| <b>Standard accessories</b> |          |                           |
| Power cord                  | 1        |                           |
| Fuse 2.0 A                  | 2        | T2.0A250V                 |
| Operation Manual            | 1        | W1768AW                   |
| (this document)             |          | (W1768AE English version) |
| Protection cover            | 1        | B0329L                    |

### Configuration (MG9587A)

| Name                        | Quantity | Model/Order No.            |
|-----------------------------|----------|----------------------------|
| <b>Main unit</b>            |          |                            |
| SLD Light Source            | 1        | MG9587A                    |
| <b>Standard accessories</b> |          |                            |
| AC power cord               | 1        |                            |
| Fuse 2.0 A                  | 2        | T2.0A250V                  |
| Operation Manual            | 1        | W1768AE                    |
| (this document)             |          | (W1768AW Japanese version) |
| Protection cover            | 1        | B0329L                     |

## 2.2 Description and Functions

Refer to the following figure to confirm the description and function of each part.



<1> Power switch

Power switch

<2> Handle:

Handles are provided on both sides of the unit.

<3> Back panel:

Refer to section 2.4.

<4> Front panel:

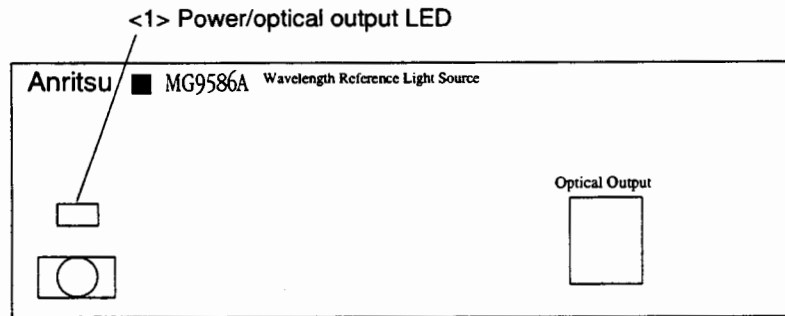
Refer to section 2.3.

<5> Optical output connector: Outputs optical signal.

## 2.3 Front Panel

<1> Power/optical output LED

The LED lights up when the unit is on and the light is output.



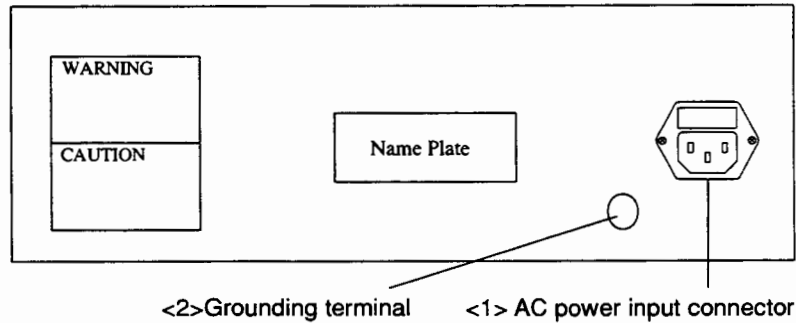
## 2.4 Back Panel

<1> AC power input connector

An input connector for AC power.

<2> Grounding terminal

A terminal used to connect the grounding wire for safety grounding.



# Section 3 Before Operation

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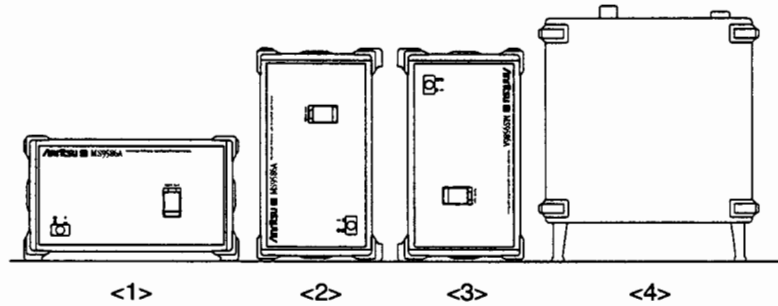
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## 3.1 Installation Conditions

### 3.1.1 Orientation

Basically, the installation <1> shown below is recommended.

With the other installation of <2>, <3>, or <4>; this analyzer operates, but may not satisfy the specifications described in paragraph 1.5.



### 3.1.2 Operating Environment

This analyzer should be used in a temperature range from 0 to 40 °C. In addition, to prevent malfunctions, it should not be used:

- Where there are high levels of vibration
- In very humid or dusty locations
- On an incline
- In direct sunlight
- Where there are active gases
- Where there are extreme temperature changes

Furthermore, if this analyzer is moved to a warm location after being used in cold location for an extended period, condensation may form inside and possibly cause a malfunction due to short-circuiting. In these circumstances, allow the analyzer to dry out thoroughly before supplying power to it.

### 3.1.3 Power Supply/Voltage

Supply the power source within the range of 100 Vac to 120 Vac or of 200 Vac to 225 Vac (47.5 to 63 Hz). It does not require setting for 100-V or 200-V systems.

## 3.2 Grounding

Supply power to this analyzer using the accessory 3-wire power cord connected to a grounded power outlet.

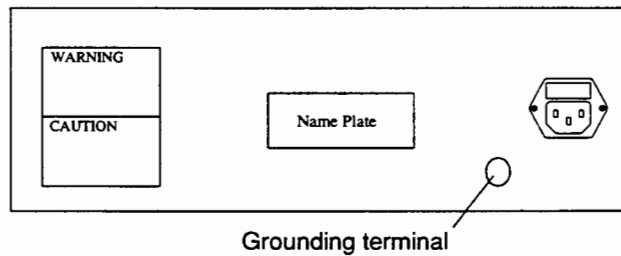
If a grounded power outlet is not available, use the conversion adapter to connect the 3-pin power plug to the 2-pin power outlet and connect the green wire from the conversion adapter to ground. If this is not possible, connect the Frame Ground terminal on the back panel to ground.

3

Before Operation

### WARNING

If power is supplied to this analyzer without grounding it, there is a danger of serious injury or death from electric shock. **ALWAYS** ground this analyzer using the accessory 3-wire power cord connected to a grounded power outlet, or ground the green wire from the conversion adapter or Frame Ground terminal on the back panel.



### **3.3 Cautions Against Vibration and Mechanical Shock**

The heart of this analyzer is a diffraction grating with a precision on the order of several microns. When using, maintaining and transporting this analyzer, it is important to take precautions against excessive vibration and mechanical shock.



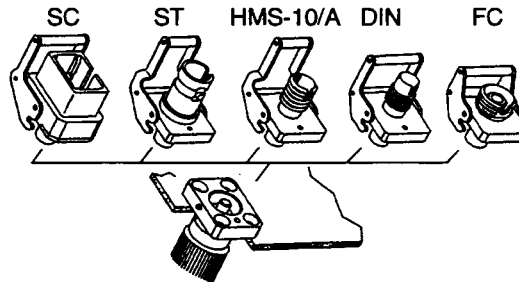
## 3.4 Replacing Optical Connector

### 3.4.1 Replaceable Optical Connectors

Unless otherwise specified, the FC connector (MG9586A-37/MG9587A-37) is supplied as the standard connector with the main unit. The following connectors are also available and can be changed by the operator.

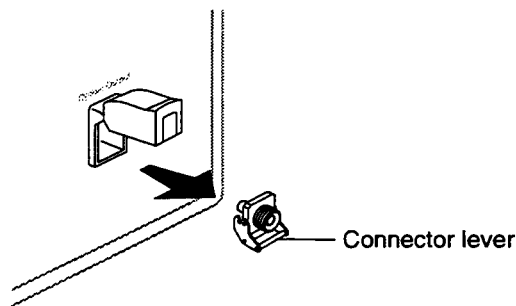
| Name                         | Model                 |
|------------------------------|-----------------------|
| ST Connector                 | MG9586A-38/MG9587A-38 |
| DIN (47256) Connector        | MG9586A-39/MG9587A-39 |
| SC Connector                 | MG9586A-40/MG9587A-40 |
| HMS-10/A (DIAMOND) Connector | MG9586A-43/MG9587A-43 |

Remove the optical connector supplied with the main unit and fit the new connector (sold separately). The inner face of the optical connector can also be cleaned.



Use the following procedure to remove the optical connector. For the cleaning method, refer to Section 5.1 "Periodic Maintenance."

- (1) Open the connector cover.
- (2) Lift up the connector lever and gently pull the connector straight out after confirming that the locking latch is disengaged.



- (3) Fit the new connector in the reverse procedure of removal. Take great care not to scratch or otherwise damage the connector or end face of the ferrule.

## 3.5 Replacing Fuses

If a fuse blows, first find the reason why and perform the repair. Then change the fuse following the steps in the caution below.

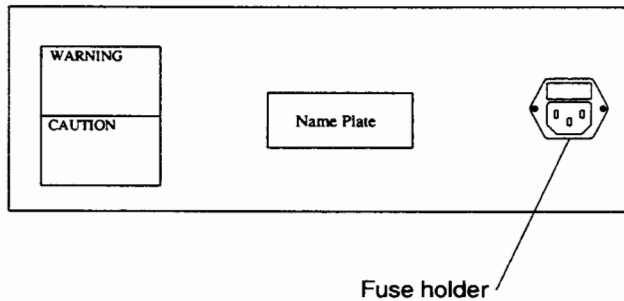
### CAUTION

**BEFORE** changing a fuse, **ALWAYS** disconnect the power cord from the power outlet. If the fuse is changed with the power cord connected to the power outlet, there is a risk of receiving a serious or fatal electric shock.

In addition, **ALWAYS** replace the blown fuse with a new fuse of the same type and power rating. The fuse rating and type are indicated on the back panel of the main unit and in the operation manual. The marking T2.0 A on the fuse indicates a timelag fuse rated at 3.5 A.

#### (1) Fuse Replacement Procedure

- (a) The AC fuse holders are on the back panel upper the AC power input connector. Remove the fuse holder caps.
- (b) Mount the fuse holder caps.



# Section 4 Operation

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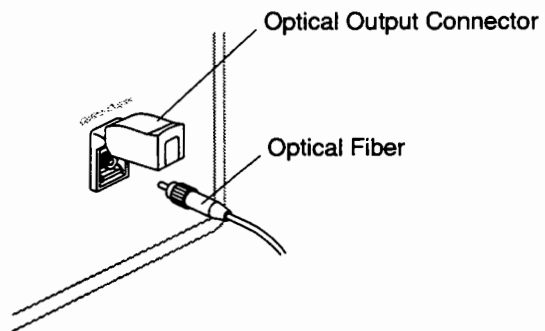
- 4.1 Connecting Optical Fiber Cords ..... 4-2
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## 4

Operation

## 4.1 Connecting Optical Fiber Cords

Open the cover of the optical output connector and connect the optical fiber to the connector.



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### CAUTION

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**Before connecting the optical fiber, always clean the end face of the fiber. In addition, periodically clean the end face of the socket in the optical input connector.**

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## 4.2 Turning on Power

- (1) If the attached 3-wire power cord with the connected conversion adapter is used, make sure that either the green wire from the conversion adapter or the grounding connector on the back panel of this unit is properly grounded.
- (2) Check that the power switch is set to off, and connect the power inlet on the rear side to the outlet using the power cord.
- (3) Press the power switch on the front panel to turn on the unit.

Use the Optical Spectrum Analyzer (MS9710B/C or others) to confirm that the optical output level is  $>-48\text{dBm}$  (measured with the MS9710B/C setting resolution at  $1\text{ nm } 1530 \pm 5\text{ nm}$ ) for the MG9586A and  $>-40\text{dBm}$  (measured with the MS9710B/C setting resolution at  $1\text{ nm } 1550 \pm 10\text{ nm}$ ) for the MG9587A, respectively.



# Section 5 Maintenance and Troubleshooting

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This section describes the periodic maintenance procedures, storage precautions, transporting and troubleshooting of the MG9586A/MG9587A Optical Spectrum Analyzer.

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## 5.1 Periodic Maintenance

### 5.1.1 Cleaning Exterior

If the exterior of this analyzer becomes soiled, or before long-term storage, clean off using a soft cloth lightly moistened with soapy water. Do not use thinners or benzene solvents which will damage the case.

If the LCD becomes soiled, wipe it gently with a clean cloth. If it is very dirty, clean it by wiping gently with a soft cloth lightly moistened with soapy water.

### CAUTION

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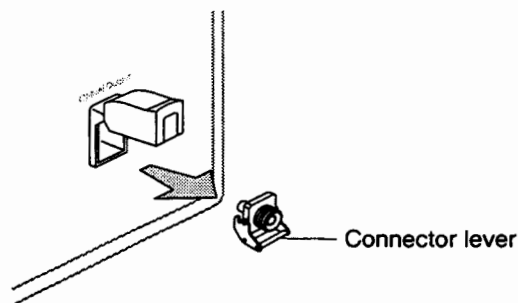
**The MG9586A/MG9587A uses micron-precision components; do not disassemble or lubricate it.**

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### 5.1.2 Cleaning Ferrule

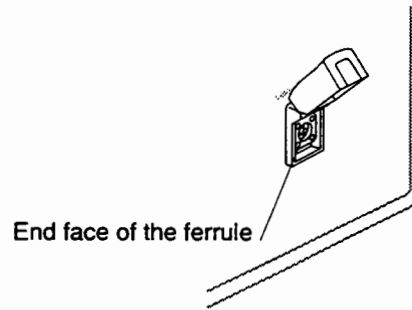
Remove the optical output connector as described below and clean inner part of the ferrule before measurement.

- (1) Open the connector cover.
- (2) Lift the connector lever until it unlatches and carefully remove the connector.





- (3) Carefully wipe any dirt from the end face of the ferrule.



- (4) Carefully refit the optical input connector taking care not to scratch or otherwise damage the end face of the ferrule.

## 5.2 Storage Precautions

Do not store this analyzer where:

- The temperature exceeds 60 °C or is less than –20 °C
- It will be exposed to direct sunlight
- It is very dusty
- High humidity will cause condensation
- There are active gases.

## 5.3 Transporting




Note the following precautions when repacking the MG9586A/MG9587A for transport.

- Repack this analyzer in the original packing that the analyzer was delivered in.
- Instruct the shipper to keep this analyzer horizontal as much as possible during shipping.

If the original packing cannot be used for some reason, repack as described below.

- (1) Fit the protective covers to the front panel.
- (2) Wrap this analyzer in a plastic sheet.
- (3) Put this analyzer in a cardboard, wooden or aluminum box 10 to 15 cm larger than the analyzer on all sides.
- (4) Pack 10 to 15 cm of shock-absorbent material around the analyzer on all sides.
- (5) Securely bind the box using packing cord, adhesive tape, bands or other means.

## 5.4 Troubleshooting

| Problem                                     | Probable case   | Solution   |
|---|---|--|
| No power                                    | Power switch not on   | Switch on.   |
|   | AC power cord not properly connected to AC inlet or AC socket     | Connect AC power cord.   |
|   | Fuse blown  | Find reason why fuse blew and change fuse.<br> Section 3.5 |
| Cannot connect optical fiber cord           | Optical fiber cord and optical input connector mismatched         | Change to correct optical input connector.<br> Section 3.4 |
|   | Fiber and connector misaligned                                    | Check alignment and reconnect.   |
| Measured spectrum level is incorrect (low). | Fiber cord end face or optical input connector is dirty.          | Clean fiber end face and connector.<br> Section 3.4        |
|   | Fiber cord is not connected correctly to optical input connector. | Check connection of fiber cord to optical input connector  |
|   | Fiber cord is bent excessively, etc.                              | Check for heavy object pinching fiber cord or other stresses on cord.  |



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