

Thank you for purchasing the AQ7280 series units and modules.

To ensure correct use, please read this manual thoroughly before beginning operation. For details on the functions and performance, see the AQ7280 OTDR User's Manual (IM7280-01EN/-02EN).

In addition to this manual, the following nine kinds of manuals are provided for the AQ7280 series units and modules. Please read all manuals.

| Manual Title  | Manual No.      | Description  |
|---|-----------------|--|
| AQ7280 OTDR Getting Started Guide   | IM AQ7280-02EN  | This guide focuses on the handling precautions, basic operations, and specifications of the AQ7280.  |
| AQ7280 OTDR User's Manual (included in CD)  | IM AQ7280-01EN  | Explains all AQ7280 features, except for the communication features, and how to use them.  |
| AQ7280 OTDR Communication Interface User's Manual (included in CD)  | IM AQ7280-17EN  | Explains the features related to using communication commands to control the AQ7280.   |
| Model 739883 Battery Pack Handling Precautions  | IM 739883-01EN  | Explains the handling precautions for the battery pack.  |
| Precautions Concerning the AQ7280 Series Units and Modules  | IM AQ7280-71EN  | This manual. This is included with AQ7280 series units and modules. It explains the handling precautions of the units, modules and lists the package contents. |
| AQ7280 OTDR User's Manual   | IM AQ7280-92Z1  | A document for China.  |
| Model AQ7282A, AQ7283A, AQ7284A, AQ7285A, AQ7283F, AQ7283H, AQ7284H, AQ7283K, AQ7282M OTDR unit User's Manual | IM AQ7282A-92Z1 | A document for China.  |
| Model AQ2780, AQ2781, AQ2780V, AQ2781V OPM module User's Manual   | IM AQ2780-92Z1  | A document for China.  |
| Model AQ4780 VLS module User's Manual   | IM AQ4780-92Z1  | A document for China.  |

The "-EN" in the manual number are the language code.

Contact information of Yokogawa offices worldwide is provided on the following sheet.

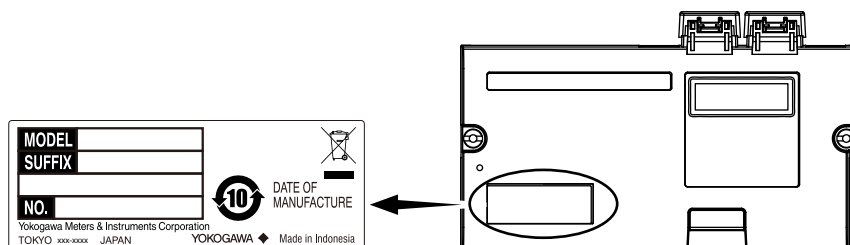
| Manual No.   | Description                |
|--------------|----------------------------|
| PIM 113-01Z2 | List of worldwide contacts |

## Checking the Package Contents

After receiving the product and opening the package, check the items described below. If the wrong items have been delivered, if items are missing, or if there is a problem with the appearance of the items, contact your nearest YOKOGAWA dealer.

Check that the product that you have received is the same product that you ordered. For reference, the model name, suffix code, and specifications of the products are listed below.

### OTDR unit



| Model                          | Suffix | Description   |
|--------------------------------|--------|---|
| AQ7282A                        |        | 2WL 1310/1550 nm 36/34 dB   |
| AQ7283A                        |        | 2WL 1310/1550 nm 40/38 dB   |
| AQ7284A                        |        | 2WL 1310/1550 nm 44/42 dB   |
| AQ7285A                        |        | 2WL 1310/1550 nm 46/44 dB (50/50 dB typ.)   |
| AQ7283F                        |        | 3WL 1310/1550, 1650 nm (1650 nm port is equipped with a built-in filter) 40/38, 37 dB |
| AQ7283H                        |        | 3WL 1310/1550/1625 nm 40/38/37 dB   |
| AQ7284H                        |        | 3WL 1310/1550/1625 nm 44/42/41 dB   |
| AQ7283K                        |        | 4WL 1310/1490/1550/1625 nm 40/36/38/37 dB   |
| AQ7282M                        |        | 2WL 850/1300 nm (MM) 22/24 dB   |
| Connector Adapter <sup>1</sup> | -USC   | Universal adapter (SC)  |
|                                | -UFC   | Universal adapter (FC)  |
|                                | -ULC   | Universal adapter (LC)  |
|                                | -ASC   | Universal adapter (Angled-PC SC) <sup>2</sup>   |
|                                | -NUA   | No universal adapter  |
| Options                        | /PC    | Power Checker <sup>2, 3</sup>   |
|                                | /SLS   | Stabilized Light Source <sup>2</sup>  |

1 The connectors that you select are attached to the OTDR ports prior to shipping.

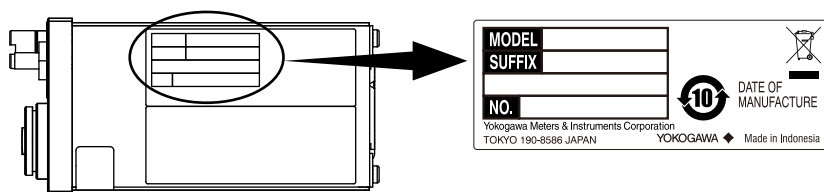
2 Not applicable to AQ7282M

3 Not applicable to the port 2 of AQ7283F

#### • Accessories

| Name    | Q'ty | Notes  |
|---------|------|--|
| Manuals | -    | IM AQ7280-71JA(This manual.)<br>PIM113-01Z2(List of worldwide contacts)<br>IM AQ7282A-92Z1 |

## Optical power meter module (OPM module)



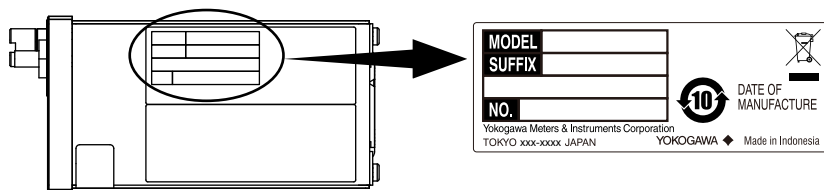
| Model                          | Suffix | Description   |
|--------------------------------|--------|---|
| AQ2780                         |        | OPM module Power range: -70dBm to +10dBm (CW)   |
| AQ2781                         |        | High Power OPM module Power range: -50dBm to +27dBm (CW)  |
| AQ2780V                        |        | OPM & VLS module<br>Power range: -70dB to +10dBm (CW)   |
| AQ2781V                        |        | High Power OPM & VLS module<br>Power range: -50dBm to +27dBm (CW) with Visible Light Source (Connector: $\phi$ 2.5 Ferrule) |
| Connector Adapter <sup>1</sup> | -SCC   | Universal adapter (SC)  |
|                                | -FCC   | Universal adapter (FC)  |
|                                | -LMC   | Ferrule adapter ( $\phi$ 1.25)  |

1 The connectors that you select are attached to the OTDR ports prior to shipping.

### • Accessories

| Name    | Q'ty | Notes   |
|---------|------|---|
| Manuals | -    | IM AQ7280-71JA(This manual.)<br>PIM113-01Z2(List of worldwide contacts)<br>IM AQ2780-92Z1 |

## Visible light source module (VLS module)



| Model  | Suffix | Description   |
|--------|--------|---|
| AQ4780 |        | VLS module Visible Light Source (Connector: $\phi$ 2.5 Ferrule) |

### • Accessories

| Name    | Q'ty | Notes   |
|---------|------|---|
| Manuals | -    | IM AQ7280-71JA(This manual.)<br>PIM113-01Z2(List of worldwide contacts)<br>IM AQ4780-92Z1 |

### No. (Instrument number)

When contacting the dealer from which you purchased the instrument, please tell them the instrument number.

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## Safety Precautions

The general safety precautions described herein must be observed during all phases of operation. If the instrument is used in a manner not specified in this manual, the protection provided by the instrument may be impaired. YOKOGAWA assumes no liability for the customer's failure to comply with these requirements.

### The following symbols are used on this instrument.



Handle with care. To protect the instrument and its users, refer to the explanation in the User's Manual or Service Manual.



Laser radiation hazard

### Safety Precautions of the Modules

The following precautions must be observed when handling the modules. YOKOGAWA assumes no liability for the customer's failure to comply with these requirements. For details on the installation/removal procedure and the specifications of the modules, see the AQ2200 Multi Application Test System User's Manual (IM735101-01EN or IM810518920-05E).



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## WARNING

### Use the Instrument Only for Its Intended Purpose

This optical measuring instrument is designed to measure the optical characteristics of light sources and evaluate their performance. Do not use this instrument for anything other than as an optical measuring instrument.

### Check the Physical Appearance

Do not use the instrument if there is a problem with its physical appearance.

### Do Not Operate in an Explosive Atmosphere

Do not operate the instrument in the presence of flammable gasses or vapors. Doing so is extremely dangerous.

### Laser Beam

Do not look directly or indirectly into the laser beam or at a specular reflection of the beam without protective equipment. Do not aim the laser beam at the eye. The laser beam may cause blindness or damage to your eyes. Attach the cover to the optical connector when it is not in use. Turn the power OFF when you are cleaning the AQ7280.

### Connecting Optical Fiber Cables

Use optical fiber cable connectors that conform to the included universal adapter and connector adapter (the universal adapter specified by the suffix code).

### Apply Correct Signals to the Optical Connectors

Do not apply light that is  $-5$  dBm or greater to the OTDR unit optical connectors (PORT1 and PORT2). Doing so may damage the OTDR unit.

Do not apply light that is  $+10$  dBm or greater to the OPM module (AQ2780, AQ2780V). Do not apply light that is  $+27$  dBm or greater to the OPM module (AQ2781, AQ2781V). Doing so may damage the OPM module.

### Do Not Operate in an Explosive Atmosphere

Do not use the instruments in the presence of flammable gasses or vapors. Doing so is extremely dangerous.

### Do Not Remove the Covers or Disassemble or Alter the Instrument

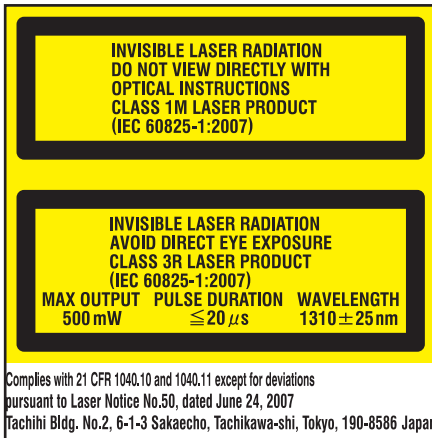
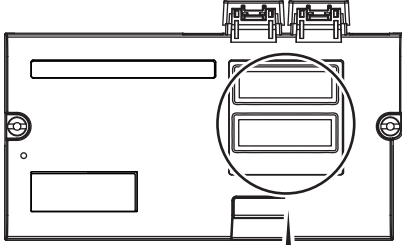
Only qualified YOKOGAWA personnel may remove the covers and disassemble or alter the instrument.

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## Safety Precautions for Laser Products

This instrument uses a laser light source. This instrument is a Class 1M laser product as defined by IEC60825-1 Safety of Laser Products—Part1: Equipment Classification and Requirements. In addition, this instrument complies with 21 CFR 1040.10 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007.

### OTDR unit (AQ7284A, AQ7285A, AQ7284H, AQ7283K)



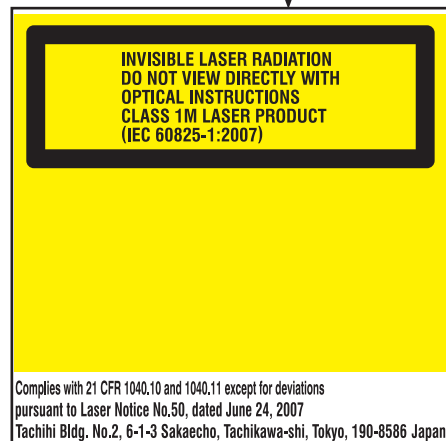
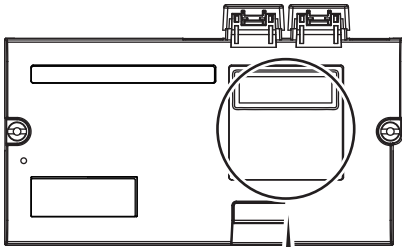
#### Laser Class 1M Label

Using an optical instrument, such as a loupe, magnifying glass, or microscope, when observing the laser beam from a distance of less than 100 mm may cause eye injury.

#### Laser Class 3R Label

Avoid direct eye exposure.

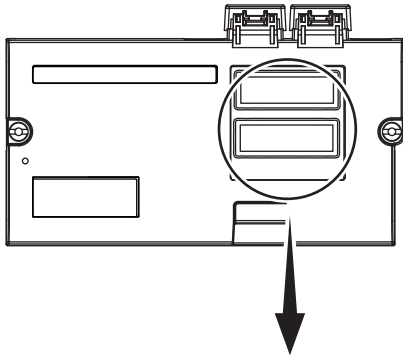
### OTDR unit (AQ7282A, AQ7283A, AQ7283F, AQ7283H)



#### Laser Class 1M Label

Using an optical instrument, such as a loupe, magnifying glass, or microscope, when observing the laser beam from a distance of less than 100 mm may cause eye injury.

**OTDR unit (AQ7282M)**



**INVISIBLE LASER RADIATION  
DO NOT VIEW DIRECTLY WITH  
OPTICAL INSTRUMENTS  
CLASS 1M LASER PRODUCT  
(IEC 60825-1:2007)**

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**INVISIBLE LASER RADIATION  
AVOID DIRECT EYE EXPOSURE  
CLASS 3R LASER PRODUCT  
(IEC 60825-1:2007)  
MAX OUTPUT    PULSE DURATION    WAVELENGTH  
400 mW            ≤ 1 μs            850 ± 30 nm**

Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No.50, dated June 24, 2007  
Tachihi Bldg. No.2, 6-1-3 Sakaecho, Tachikawa-shi, Tokyo, 190-8586 Japan

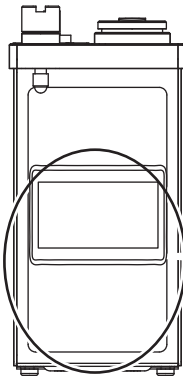
**Laser Class 1M Label**

Using an optical instrument, such as a loupe, magnifying glass, or microscope, when observing the laser beam from a distance of less than 100 mm may cause eye injury.

**Laser Class 3R Label**

Avoid direct eye exposure.

**OPM module (AQ2780V, AQ2781V)**



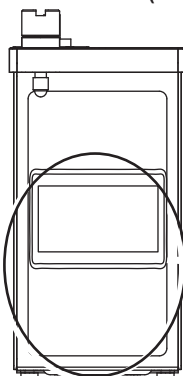
**Laser Class 3R Label**

Avoid direct eye exposure.

**VISIBLE LASER RADIATION  
AVOID DIRECT EYE EXPOSURE  
CLASS 3R LASER PRODUCT  
(IEC 60825-1:2007)  
MAX OUTPUT    5mW  
PULSE DURATION    CW  
WAVELENGTH    650 ± 20nm**

Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No.50, dated June 24, 2007  
Tachihi Bldg. No.2, 6-1-3 Sakaecho, Tachikawa-shi, Tokyo, 190-8586 Japan

**VLS module (AQ4780)**



**Laser Class 3R Label**

Avoid direct eye exposure.

**VISIBLE LASER RADIATION  
AVOID DIRECT EYE EXPOSURE  
CLASS 3R LASER PRODUCT  
(IEC 60825-1:2007)  
MAX OUTPUT    5mW  
PULSE DURATION    CW  
WAVELENGTH    650 ± 20nm**

Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No.50, dated June 24, 2007  
Tachihi Bldg. No.2, 6-1-3 Sakaecho, Tachikawa-shi, Tokyo, 190-8586 Japan

## OTDR unit

| Model   | Class | Center Wavelength        | Maximum Output Power <sup>1</sup>  | Mode Field Diameter | Beam Divergence |
|---------|-------|--------------------------|--|---------------------|-----------------|
| AQ7282A | 1M    | 1310nm/1550nm            | CW: 50mW@1310nm/1550nm<br>PULSE: 200mW@1310nm/1550nm<br>PULSE width: 20µs@1310nm/1550nm, Duty: ≤ 3.0%  | 9µm                 | 11.5°           |
| AQ7283A | 1M    | 1310nm/1550nm            | CW: 50mW@1310nm/1550nm<br>PULSE: 200mW@1310nm/1550nm<br>PULSE width: 20µs@1310nm/1550nm, Duty: ≤ 3.0%  | 9µm                 | 11.5°           |
| AQ7284A | 3R    | 1310nm                   | CW: 140mW@1310nm/1550nm<br>PULSE: 500mW@1310nm/1550nm<br>PULSE width: 20µs@1310nm/1550nm, Duty: ≤ 3.0%   | 9µm                 | 11.5°           |
|         | 1M    | 1550nm                   |  |                     |                 |
| AQ7285A | 3R    | 1310nm                   | CW: 140mW@1310nm/1550nm<br>PULSE: 500mW@1310nm/1550nm<br>PULSE width: 20µs@1310nm/1550nm, Duty: ≤ 3.0%   | 9µm                 | 11.5°           |
|         | 1M    | 1550nm                   |  |                     |                 |
| AQ7283F | 1M    | 1310nm/1550nm,<br>1650nm | CW: 50mW@1310nm/1550nm/1650nm<br>PULSE: 200mW@1310nm/1550nm/1650nm<br>PULSE width: 20µs@1310nm/1550nm/1650nm, Duty: ≤ 3.0%                       | 9µm                 | 11.5°           |
| AQ7283H | 1M    | 1310nm/1550nm/<br>1625nm | CW: 50mW@1310nm/1550nm/1625nm<br>PULSE: 200mW@1310nm/1550nm/1625nm<br>PULSE width: 20µs@1310nm/1550nm/1625nm, Duty: ≤ 3.0%                       | 9µm                 | 11.5°           |
| AQ7284H | 3R    | 1310nm                   | CW: 140mW@1310nm/1550nm/1625nm<br>PULSE: 500mW@1310nm/1550nm/1625nm<br>PULSE width: 20µs@1310nm/1550nm/1625nm, Duty: ≤ 3.0%                      | 9µm                 | 11.5°           |
|         | 1M    | 1550nm/1625nm            |  |                     |                 |
| AQ7283K | 3R    | 1310nm                   | CW: 140mW@1310nm/1490nm/1550nm/1625nm<br>PULSE: 500mW@1310nm/1490nm/1550nm/1625nm<br>PULSE width: 20µs@1310nm/1490nm/1550nm/1625nm, Duty: ≤ 3.0% | 9µm                 | 11.5°           |
|         | 1M    | 1490nm/1550nm/<br>1625nm |  |                     |                 |
| AQ7282M | 3R    | 850nm                    | CW: 400mW@850nm/1300nm<br>PULSE width: 1µs@850nm, Duty: ≤ 2.5%   | 50µm                | 23.1°           |
|         | 1M    | 1300nm                   | PULSE width: 5µs@1300nm, Duty: ≤ 1.2%  |                     |                 |

<sup>1</sup> Under single fault conditions.

## OPM/VLS module

| Model   | Class | Center Wavelength | Maximum Output Power <sup>1</sup> | Mode Field Diameter | Beam Divergence |
|---------|-------|-------------------|-----------------------------------|---------------------|-----------------|
| AQ2780V | 3R    | 650nm             | CW: 5mW                           | 9µm                 | 11.5°           |
| AQ2781V | 3R    | 650nm             | CW: 5mW                           | 9µm                 | 11.5°           |
| AQ4780  | 3R    | 650nm             | CW: 5mW                           | 9µm                 | 11.5°           |

<sup>1</sup> Under single fault conditions.

## Waste Electrical and Electronic Equipment



Waste Electrical and Electronic Equipment (WEEE), Directive 2012/19/EU (This directive is valid only in the EU.) This product complies with the WEEE Directive (2012/19/EU) marking requirement. This marking indicates that you must not discard this electrical/electronic product in domestic household waste.

Product Category

With reference to the equipment types in the WEEE directive Annex I, this product is classified as a "Monitoring and Control instrumentation" product.

Do not dispose in domestic household waste.

When disposing products in the EU, contact your local Yokogawa Europe B. V. office.

## Authorized Representative in the EEA

Yokogawa Europe BV. is Authorized Representative of Yokogawa Meters & Instruments Corporation in the EEA for this Product. To contact Yokogawa Europe BV., see the separate list of worldwide contacts, PIM 113-01Z2.