Test&Measurement

YOKOGAWA

Enhance productivity Photonics-Electronics convergence

AQ2300 Series

Multi Application Test System

Precision Making

Bulletin AQ2300-02EN

YOKOGAWA offers an optimal solution for evaluating and testing semiconductor devices, optical fibers, optical passive components, and transmission equipment with the AQ2300 series multi-application test system.
While maintaining the performance of its predecessor, the AQ2200 series, the AQ2300 has evolved into a faster, higher-density test system with enhanced data transfer speed and storage capacity. It also introduces a source measure unit to the module lineup and features a synchronization function between modules within a frame. Through the AQ2300 series, we are committed to ensuring high measurement quality and enhancing the operational efficiency of our customers.

Efficiency – By freely combining modules within a single frame, users can efficiently adjust the number of measurement items and channels to match the measurement target. In sweep measurement, up to 100000 points can be saved per channel, reducing the number of measurement segments. Additionally, the transfer speed of the measurement result file has been increased, which helps shorten evaluation time and manufacturing test time.
Link – Using either internal triggers or triggers from external equipment, users can select from various synchronization methods, including synchronization between channels within a frame, low-latency synchronization between frames, and synchronization with external equipment. Additionally, signals can be sent and received to initiate and terminate measurements by connecting to external equipment via the Digital I/O interface.
Credibility – YOKOGAWA prioritizes quality, ensuring stability and reliability while providing customers with trusted measurements.

Power Supply & Precision Measurement
Optical Power Measurement

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Modular Test System

Photonics-Electronics convergence

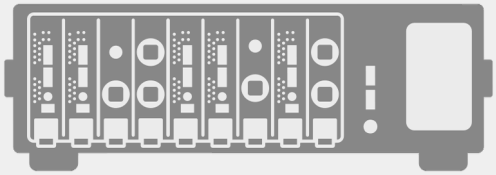
History of Multi Application Test Systems

2004 Multi Application Test System — AQ2201, AQ2202

2009 Multi Application Test System — AQ2211, AQ2212

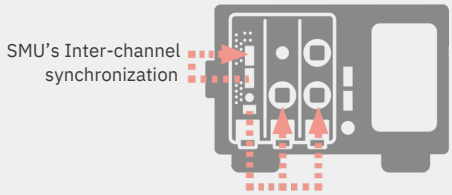
Multi-channel and high-density

Each module can be stored in a frame at high density with multiple channels. By mounting a 2-channel source measure unit or optical power meter, the number of channels can be expanded to a maximum of 6 channels in a 3-slot frame and a maximum of 18 channels in a 9-slot frame, which is useful for saving space in the measurement system.



Inter-channel synchronization

The source measure unit and optical power meter in the frame can be synchronized between channels for sweep measurements. It uses a bus connection system, so it is possible to select multiple channels that you want to synchronize, and there is no need for wiring.



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- Multi-channel, High-density, Space-saving
  Maximum 18 channels
- High-speed data transfer with large capacity
  Measurement result file transfers in less than 1 second
  Data capacity of 100001 points per channel
- Electrical and optical measurements in a single frame
  Photoelectric convergence measurement
- Highly accurate and stable modules
  Voltage/Current Source and Measurement
  Optical Power Measurement

For information on products and firmware updates, please visit:
https://tmi.yokogawa.com/p/aq2300/

2025

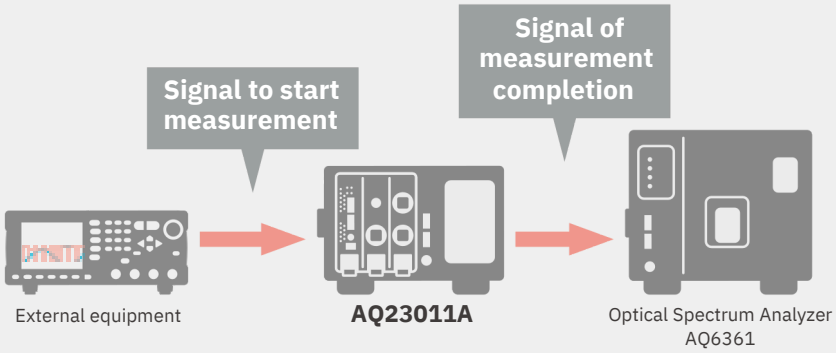
Multi Application Test System

AQ2300 Series

Module Lineup

Digital I/O Control

The frame's external control interface can be equipped with a Digital I/O interface, which receives operation start signals from external devices and sends operation end signals. Among the various modules, the source measure unit supports this function.



Source Measure Unit
±6 V/±600 mA, 2 ch
AQ23811A

Optical Power Meter
−90 to +15 dBm, 1 ch
AQ23211A

Optical Power Meter
−90 to +15 dBm, 2 ch
AQ23212A

Lineup

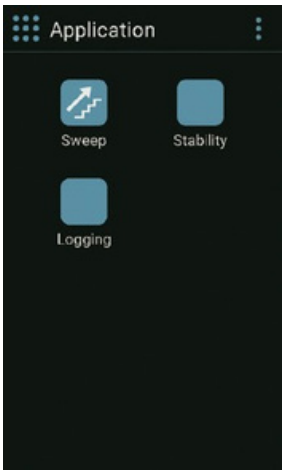
Frame

Various trigger synchronization functions

For source measure units and optical power meters, it is possible to connect a trigger signal from an internal trigger (Timer) within the frame or from external equipment to each channel. Additionally, triggers can be output to other channels when voltage or current settings are completed or during measurement timing.

Useful Applications

- Sweep: Sweep measurement (I-V, I-L)
- Logging: Short-term optical power measurements
- Stability: Long-term optical power measurement (up to 99 days)
- Other: Display of optical connector end-face image



Application menu

Logging/Stability Graph

Image of optical connector end face

AQ23011A /AQ23012A

- Number of slots: 3 or 9 slots
- Remote Interface: Ethernet, USB (Type-C), GP-IB (Optional)
- External interface: Trigger I/O, Trigger I/O 2 or Digital I/O (Available options)
- External storage interface: USB (Type-A)

AQ23011A

AQ23012A

SMU (Source Measure Unit)

AQ23811A

- ±6 V/±600 mA, 2 channels (1 slot)
- Voltage accuracy: ±0.02%
- Current accuracy: ±0.03% (Range 20 µA to 200 mA)
- Output waveform: DC, Pulse (50 µs to 1 second)
- Resolution: 100 µV/1 pA
- Sweep: Linear, Logarithmic, Program

OPM (Optical Power Meter)

AQ23211A

- Number of channels: 1 channel (1 slot)
- Power range (CW): −90 to +15 dBm
- Wavelength range: 800 to 1700 nm
- Uncertainty: ±2.5%
- Minimum averaging time: 20 µs
- Applicable fiber: SMF (ITU-T G.652.D)
- Connector: FC, SC, LC, MU
- Analog output: Approx. 0 to 2 V/Approx. 0 to 5 V

AQ23212A

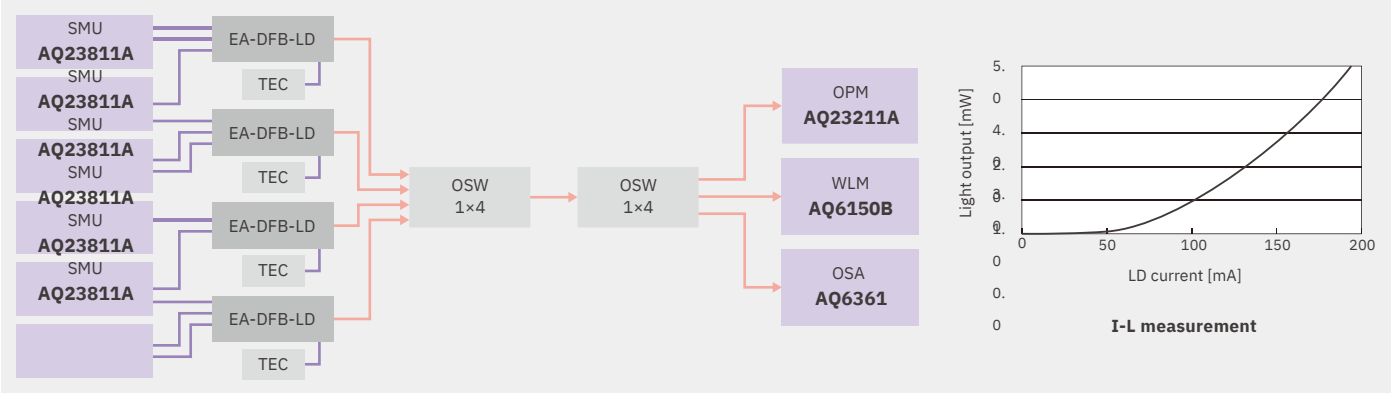
- Number of channels: 2 channel (1 slot)
- Power range (CW): −90 to +15 dBm
- Wavelength range: 800 to 1700 nm
- Uncertainty: ±2.5%
- Minimum averaging time: 20 µs
- Applicable fiber: SMF (ITU-T G.652.D)
- Connector: FC, SC, LC, MU

Applications

Static characteristics measurement of laser diode modules and photodiode modules

By synchronizing the source measure unit and optical power meter and utilizing the sweep function, the I-L characteristics of LD modules can be measured.

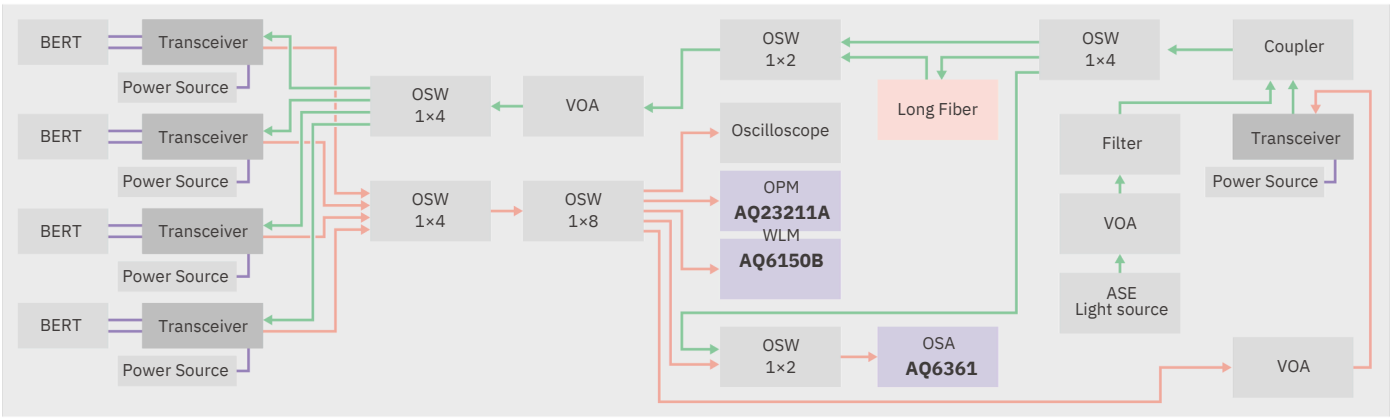
[Measurement items] I-L measurement, DC extinction ratio, PD current, Modulator current



Optical transceiver measurements

Optical transceivers' optical power can be measured.

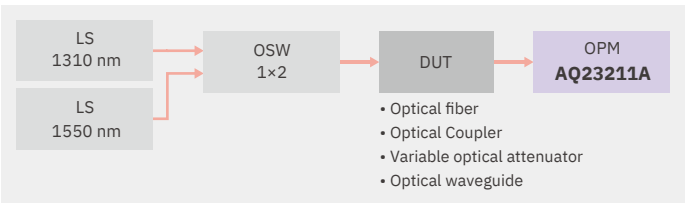
[Measurement items] Optical power, Optical input interruption alarm

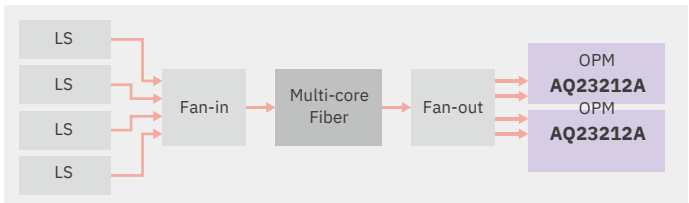


Loss measurement of optical passive components

Optical insertion loss of optical fibers, etc. can be measured.

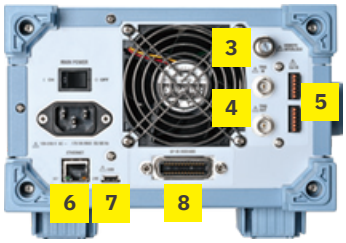
[Measurement items] Optical insertion loss



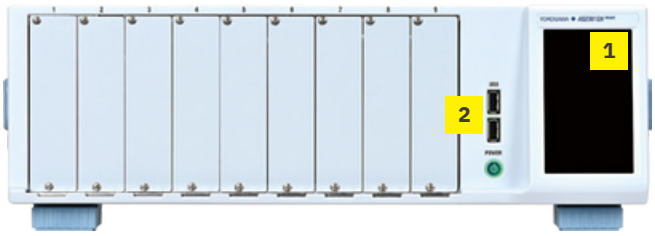


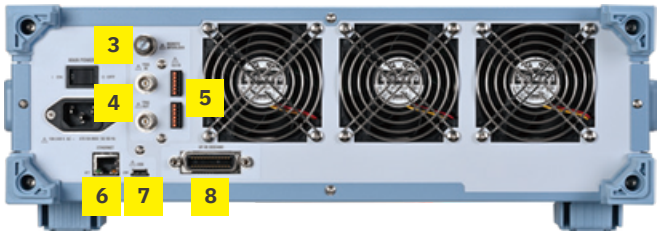
Functions and connection interfaces

AQ23011A

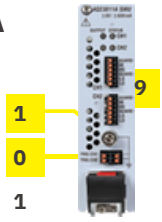


AQ23012A





AQ23811A



AQ23211A

AQ23212A

1 **Display screen**

2 **USB ports for peripherals (Type A, 2 ports)**
Compatible with data storage devices and keyboards

3 **Remote interlock terminal**
For safety functions

4 **Trigger input terminal, Trigger output terminal**

5 **Digital I/O terminal**

6 **Ethernet port (10/100/1000BASE-T)**
Used to remotely control the instrument

7 **USB port for PCs (Type C)**
Used to access the instrument's internal memory or remotely control the instrument from a PC

8 **GP-IB port (Optional)**
Used to remotely control the instrument

9 **Output terminals (CH1, CH2)**

10 **Functional ground terminal**

11 **Trigger signal I/O terminal**

12 **Analog signal output terminal**

13 **Optical input port**

Specification

Frame AQ23011A/AQ23012A

Items		Specifications	
Model		**AQ23011A**	**AQ23012A**
Number of slots		3	9
Display		Color LCD (Touchscreen)	
Remote interface	Ethernet	IEEE-802.3 compatible, connector: RJ-45 × 1, transmission method: Ethernet (1000BASE-T), protocol: TCP/IP, DHCP	
	USB	USB Rev2.0 compatible, connector: type-C × 1, protocol: Mass Storage, USB-TMC (Separate driver installation required.)	
	GP-IB*1	IEEE-488 compatible, protocol: IEEE-488.2 compatible, Factory-installed option	
Interlock function (safety function)		Contact input, connector: BNC	
External storage interface		USB Rev2.0 compatible, connector: USB type-A × 2, Power supply: 5 V/500 mA	
External control interface*2	Trigger I/O 1, 2	TTL level (Low active), connector: BNC, Trigger I/O 2: Factory-installed option	
	Digital I/O	CMOS level (5 V/3.3 V) × 8 ports, connector: push-in connection plug × 2, Factory-installed option	
Power requirement		100 to 240 VAC, 50/60 Hz	
Power consumption		170 VA (including modules)	470 VA (including modules)
Withstand voltage (between power supply cases)		1.5 kVAC for 1 minute (Insulation resistance: 500 VDC, >10 MΩ)	
Operating conditions		Ambient temperature: +5 to +40˚C, Ambient humidity: 20 to 80%RH (no condensation), Altitude: 2000 m or less	
Storage conditions		Ambient temperature: −20 to +60˚C, Ambient humidity: 20 to 80%RH (no condensation), Altitude: 3000 m or less	
Safety standard		EN61010-1, EN IEC 61010-2-030, Overvoltage category (installation category) II, Pollution degree 2	
Emissions		EN61326-1 Class A, EN55011 Class A Group1, EN61000-3-2. EN IEC 61000-3-2, EN61000-3-3	
Immunity		EN61326-1 Table2 (for industrial locations)	
Dimensions (excluding protrusions)		213 (W) × 132 (H) × 420 (D) mm	426 (W) × 132 (H) × 470 (D) mm
Weight		Approx. 6 kg	Approx. 10 kg
Sweep function*3	Minimum sampling interval	100 µs	
	Maximum number of points	100000 points	
Logging function*4	Measurement power range	Fixed	
	Minimum sampling interval	100 µs	
	Maximum number of points	1000000 points	
Stability function*3	Minimum sampling interval	100 ms	
	Maximum number of points	1000000 points	
	Maximum measurement time	99 days	

*1: Factory-installed option (Cannot be retrofitted)
*2: Choice External Trigger I/O 2 or Digital I/O (Cannot be retrofitted)
*3: This function is only for source measurement units and optical power meters.
*4: This function is only for optical power meters.

Source Measure Unit AQ23811A (±6 V/±600 mA)

Items	**Specifications**
Number of channels (Slot widths)	2 channels (1 slot)
Function	Output waveform, Sweep mode
Voltage	Voltage, Current
sense	DC Voltage, Source DC
Current	DC, Pulse (Pulse width: 50 µs to 1 second)
Source	Linear, Logarithmic, Program (up to 100001 steps)
Output	2-wire, 4-wire
Noise (Typical)	Range: ±6.0000 V, Resolution: 100 µV, Maximum load current: ±600 mA/±200 mA*1
DC Voltage Measurement*3	Range: ±200.000 nA to ±600.00 mA, Minimum resolution: 1 pA, Maximum load voltage: ±6 V/±2 V*2
DC Current Measurement*3	20 mVp-p (For 10 Hz to 20 MHz, 6 V Voltage source range, Output liberation)
Response time (Typical)	Range: ±6.3000 V, Resolution: 100 µV, Accuracy: ±0.02% + 500 µV
	Range: ±210.000 nA to ±630.00 mA, Minimum resolution: 1 pA, Accuracy: 0.03% + 30 nA (200 µA range)
	10 µs (Voltage source mode, 6 V range, Current limiter setting ±600 mA, Output open)
	15 µs (Current source mode, 600 mA range, Voltage limiter setting ±6 V, Output short-circuited)
Calibration cycle	1 year
Dimensions (excluding protrusions), Weight	106.5 (H) × 31 (W) × 321.5 (D), 800 g

*1: Sink maximum load currents exceeding ±2 V are allowed up to ±200 mA.
*2: The sink maximum load voltage in the 600 mA range is allowed up to ±2 V.
*3: If the integration time is less than 1 PLC, an additional value must be added. Please refer to the manual for details.
Note: For details, please refer to another catalog “AQ2300 Series Source Measure Unit”.

Optical Power Meter AQ23211A/AQ23212A

Items	**Model** Number of channels	**Specifications** **AQ23211A** 1 channel (1 slot)	
Detector type Wavelength range Power		InGaAs 800 to 1700 nm −90 to +15 dBm*1	**AQ23212A**
range (CW) Minimum display resolution		1/10000 ≤62.5/125 µm (GI), NA ≤0.275, SMF	2 channel (1 slot)
Applicable fiber*3 Uncertainty under		(ITU-T G.652.D) ±2.5%*3 ±5% ±5 pW*4 0.02 dBp-	
reference conditions Total uncertainty		p (typ.)*5 ±0.02 dB ±5 pW*6 Less than 5 pW*7 20	
Polarization dependence Linearity Noise		µs AUTO, LINEAR, LOG Approx. 0 to 2 V/Approx. 0	
level Averaging time (minimum)		to 5 V BNC connector Approx. 100 ohm AQ9335C	
		connector adapter*8 1 year 106.5 (H) × 31 (W) ×	
		321.5 (D), Approx. 0.8 kg	
Analog output	Mode		––
	Output voltage		
	Connector type		
	Output impedance		
Optical connector			
Calibration cycle			
Dimensions (excluding protrusions)			106.5 (H) × 31 (W) × 321.5 (D), Approx. 0.9 kg

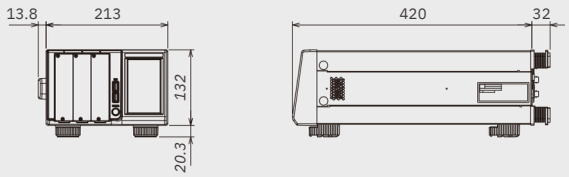
*All values in the specifications assume a warm-up period of one hour. *The environmental conditions are subject to the specification of frame controller.

*1: At 1310 nm
*2: When the AQ9335C connector adapter is used.
*3: Power level: 100 µW (−10 dBm), CW light, wavelength:1310/1550 ±20 nm, light source spectrum width: 10 nm or less, ambient temperature: 23 ±1°C, optical fiber: SMF (ITU-T G.652.D), optical connector: FC/PC, wavelength setting error: 0.5 nm or less, changes to the measuring instrument due to the passage of time are not included in these conditions. More than 1 year but less than 2 years since the last calibration: add 0.5%, over 2 years: add 1.0%, averaging: 1 second, polarization dependence is not included.
*4: Power level: 10 mW to 100 nW (−40 dBm to +10 dBm), CW light, wavelength range: 1200 to 1600 nm, optical fiber: SMF (ITU-T G.652.D) [add ±1% if GI 50/125 (ITU-T G.651.1), add ±9% if GI 62.5/125 (IEC 60793-2)], auto range, Other condition are the same as*3's conditions.
*5: Wavelength: 1550 ±30 nm, ambient temperature: 23 ±1°C, optical fiber: SMF (ITU-T G.652.D), optical connector: FC/PC
*6: Power level: 10 mW to 100 nW (−40 dBm to +10 dBm), CW light, wavelength range: 1200 to 1600 nm, ambient temperature: 23 ±1°C (constant temperature), optical fiber: SMF (ITU-T G.652.D), auto range, averaging: 1 second
*7: Wavelength: 1200 to 1600 nm, ambient temperature: 23 ±1°C (constant temperature), averaging: 1 second, within 5 minutes after zero set execution.
*8: Select FC, SC, LC, or MU

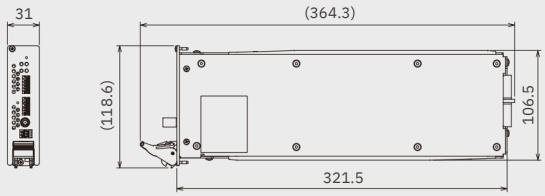
External Dimension

Unit: mm

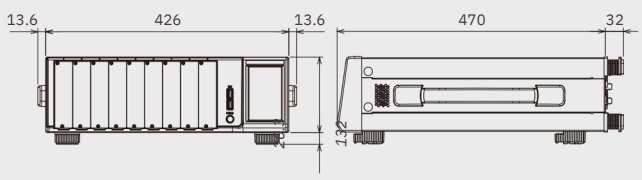
AQ23011A Frame



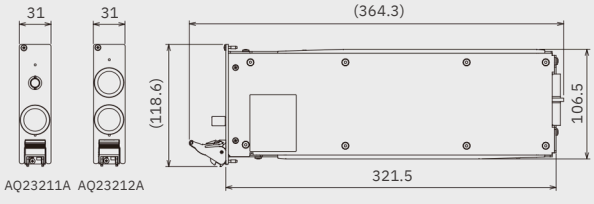
AQ23811A SMU (±6 V/±600 mA)



AQ23012A Frame



AQ238211A /AQ23212A OPM



Models and suffix codes

AQ23011A

Model	Suffix Code	Description
AQ23011A		AQ23011A Frame (3 slots)
External interface	-ETP	No Digital I/O, ExtTrigger I/O 2 per port (Not for retrofitting)
	-EDP	Digital I/O 8 ports, ExtTrigger I/O 1 port
GP-IB interface	-N01	No GP-IB interface included (Not for retrofitting)
	-C01	Equipped with GP-IB interface
Power cord	-D	UL/CSA Standard and PSE compliant, 125 V
	-F	VDE/Korean standard, 250 V
	-H	Chinese standard, 250 V
	-N	Brazilian standard, 250 V
	-Q	British standard, 250 V
	-R	Australian standard, 250 V
	-T	Taiwanese standard, 125 V
	-B	Indian standard, 250 V
	-U	IEC plug Type B, 250 V

Accessories: Blank panel × 3

AQ23012A

Model	Suffix Code	Description
AQ23012A		AQ23012A Frame (9 slots)
External interface	-ETP	No Digital I/O, ExtTrigger I/O 2 per port (Not for retrofitting)
	-EDP	Digital I/O 8 ports, ExtTrigger I/O 1 port
GP-IB interface	-N01	No GP-IB interface included (Not for retrofitting)
	-C01	Equipped with GP-IB interface
Power cord	-D	UL/CSA Standard and PSE compliant, 125 V
	-F	VDE/Korean standard, 250 V
	-H	Chinese standard, 250 V
	-N	Brazilian standard, 250 V
	-Q	British standard, 250 V
	-R	Australian standard, 250 V
	-T	Taiwanese standard, 125 V
	-B	Indian standard, 250 V
	-U	IEC plug Type B, 250 V

Accessories: Blank panel × 9

AQ23211A/AQ23212A

Model	Suffix Code	Description
AQ23211A AQ23212A		AQ23211A Optical Power Meter (1 ch) AQ23212A Optical Power Meter (2 ch) AQ9335C (FC) Connector Adapter (with a light shielding cap) AQ9335C (SC) Connector Adapter (with a light shielding cap) AQ9335C (LC) Connector Adapter AQ9335C (MU) Connector Adapter No connector adapter
Spec code	-FCC	
	-SCC	
	-LCC	
	-MUC	
	-NCA	

AQ23811A

Model	Suffix Code	Description
AQ23811A		AQ23811A Source Measure Unit (±6 V/±600 mA)
Spec code	-10	Standard model

Packaging: Modules are shipped with frames inserted.
If shipping only the module, up to 3 units can be included.

Accessories

Model	Description
735186	Blank panel for AQ2300 series frames
735183-03	Rackmount kit for AQ23011A Rackmount kit for
735183-09	AQ23012A AQ9335C (FC) Connector Adapter (No light
AQ9335C-FCC	shielding cap)* AQ9335C (SC) Connector Adapter (No light
AQ9335C-SCC	shielding cap)*
AQ9335C-LCC	AQ9335C (LC) Connector Adapter (With a dust protection cap)
AQ9335C-MUC	AQ9335C (MU) Connector Adapter (With a dust protection cap)
M3407HA	Light shielding cap (FC)
M3407HB	Light shielding cap (SC)
M3407HD	Dust protection cap (LC)
M3407HE	Dust protection cap (MU)

*When executes the ZERO-SET of optical sensors, use a light shielding cap (option).

NOTICE

● Before operating the product, read the user's manual thoroughly for proper and safe operation.

Yokogawa's approach to preserving the global environment

- Yokogawa's electrical products are developed and produced in facilities that have received ISO14001 approval.
- In order to protect the global environment, Yokogawa's electrical products are designed in accordance with Yokogawa's Environmentally Friendly Product Design Guidelines and Product Design Assessment Criteria.

This is a Class A instrument based on Emission standards EN61326-1 and EN55011, and is designed for an industrial environment.
Operation of this equipment in a residential area may cause radio interference, in which case users will be responsible for any interference which they cause.

YOKOGAWA

https://tmi.yokogawa.com/

YMI-N-MI-M-E03

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