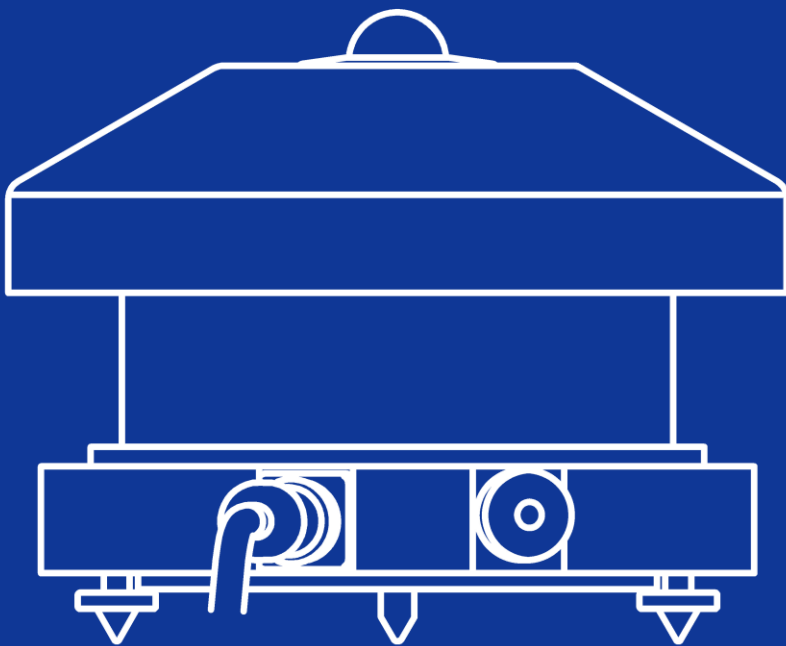


SPECIFICATIONS

Grating Spectroradiometer
WISER
VIS-NIR/NIR

MS-711N
MS-712



EKO

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2. Introduction

For solar spectral research, we believe only one measurement concept can be the best. The Grating Spectroradiometers MS-711N and MS-712, also called as “WISER”, are references in the market and designed to provide the most accurate solar spectral data outdoors. The MS-711N and MS-712 spectroradiometer are unique all-weather concept instruments with no moving parts and temperature-controlled spectrometers, which provide seamless spectral range measurements from 300nm to1700nm (MS-711N from 300nm and 1100nm, and MS-712 covers the near-infrared (NIR) range between 900nm and 1700nm). Both spectroradiometers are accurately calibrated with traceability to the International Standards and issued with a calibration uncertainty budget.

Temperature changes of the detector inside the spectrometer have a strong effect on the measurement uncertainty. Therefore, the sensor unit inside the MS-711N and MS712 main body is accurately controlled at a stable temperature in order to provide the best performance in a wide operating temperature range. The rugged optical design of the diffusor and input optics make the MS spectroradiometer series concept superior to any fiber optic spectroradiometer which will be susceptibel to mechanical vibration and handling. The MS spectroradiometer series are designed for permanent installation, but are are perfectly suited as a traveling reference.

Both spectroradiometers have a separate power supply and can be controlled through RS232 / 422 by a PC or data logger. The PC software provide different fuctions for operating, data management andvisualisation. Software can also be customized to the individual user purpose by making use of the existing system control functions through the open command protocol.

Measuring spectral irradiance is a must to understand the effect of the non-uniform energy distribution of the sun. Since the solar spectrum varies as a function of air-mass and composition of the atmosphere, the MS-711N reveals those details. While thermopile pyrheliometer and pyranometer are most suitable to quantify the total DNI or global radiation (W/m^2), spectroradiometers give detail about the energy distribution ($W/m^2/nm$), which is most important for PV or CPV cell research and performance analysis.

1. All-Weather

MS-711N/712 is designed based on our extensive experience in development, production and distribution of various kinds of meteorological instruments. MS-711N/712 can be used for continuous outdoor use as all-weather equipment.

2. High Durability

Providing accurate spectral data over a long period of time requires a stable spectrometer and robust opto-mechanical concept. All parts used in the MS-711N/712, such as dome, diffuser optics, grating and photo-diode array are designed without any moving parts.

3. Wide Measurement Range

With the automatic exposure function, MS-711N/712 can measure a wide range of solar illumination from low to high illuminance in high S/N proportion. MS-711N can measure from 300nm to 1,100nm, MS-712 can measure from 900nm to 1,700nm wavelength range; combination of them will allow taking measurements which covers the wide range of wavelength from 300nm to 1,700nm.

4. Operating Software

The operating software has different measurement functions, to make either a "single measurement" or "scheduled measurement" which takes periodical measurements every day.

Data as well as the details of the spectral data can be displayed simultaneously. It combines the data obtained from both MS-711N and MS-712, and takes re-samples and keeps the spectral data in every 1nm and automatically calculates the obtained data.

3. Specifications

3-1. Sensor

Table 3-1. Sensor Specification

	MS-711N	MS-711NF (With Ventilator)	MS-712	MS-712F (With Ventilator)
Wavelength	300~1100nm		900~1700nm	
Wavelength Interval	0.3~0.5nm		1.2~2.2nm	
Spectral Resolution	<7nm		<7nm	
Wavelength Accuracy	±0.2nm			
Temperature Dependency	±2%		±5%	
Operating Temperature	-10~ +50°C		-10~ +40°C	
Temperature Control (Ta: Ambient Temperature)	25°C±2°C (Ta = -10~+40°C) 25°C~ 32°C (Ta = +40 ~ +50°C)		Cooling sensor Controlled @ -5°C±0.5°C	
Exposure time	10msec~5000msec, automatically controlled			
Dome material	Synthetic Quartz		BK7	
Communication	RS422 (between sensor and power supply unit)			
Power supply	12VDC	Sensor: 12VDC Ventilator: 100VAC, 50/60Hz	12VDC/5VDC	Sensor: 12VDC, 5VDC Ventilator: 100VAC, 50/60Hz
Maximum Power Consumption	50W	66W	65W	81W
Dimension (Including cover & dome)	240(φ)×197(H) mm	260(φ)×263(H) mm	320(φ)×200(H) mm	320(φ)×270(H) mm
Weight (Sensor Part)	4.5kg	7.8kg	7.5kg	11.3kg

3-2. Power Supply

Table 3-2. Power Supply Specification

Items	MS-711N	MS-712
Power supply (Standard)	Input : 100~240V, 50/60Hz Output : 12VDC(50W)	Input : 100~240V, 50/60Hz Output : 12VDC(50W), 5VDC(15W)
Maximum Power Consumption	100W (when DC output 50W)	130W (When DC output 65W)
Fuse	φ5.2x20, 250V, 2A	
Communication	RS232C(between power supply and PC)	
Operating conditions	Temperature: 0~+40°C, Humidity: 0~90%RH *No condensation.	
Dimension	320(W) x 240(D) x 80(H) mm	320(W) x 220(D) x 120(H) mm
Weight	1kg	1kg

3-3. Software Specifications

Table 3-3. Software Specifications (WSDac, WSDisp)

	Details
Software Versions	Measurement Software Version: 3.0.x.x Data Analysis Software Version: 3.0.x.x
Applicable OS	Microsoft Windows XP/Vista/7/8/10/11
Operation Environment	CPU: Pentium 1GHz or more Memory: More than 1GB HHD Capacity: More than 20GB Display Resolution: More than 1024 x 768 Interface: RS-232C port Optical drive: CD-ROM drive
Software Function	Data Measurement (Continuous, free exposure time adjustments) Data Saving (Personalized format, CSV format) Data Graphing (Tiled/Detailed display, Unit conversion) Data Calculation (PAR, PPFD, Illuminance, Integral)

3-4. Output Cables & Ventilation Unit Power Cables

Table 3-4. Cable Specifications

Cables	Details	
Sensor Cable	Cable Type:	MVVS
	Diameter:	0.5mm ² x 12pins
	Outer Diameter:	Φ10.4mm
	Cable end	Y Terminal (Model Number)
	Cable Length:	10m

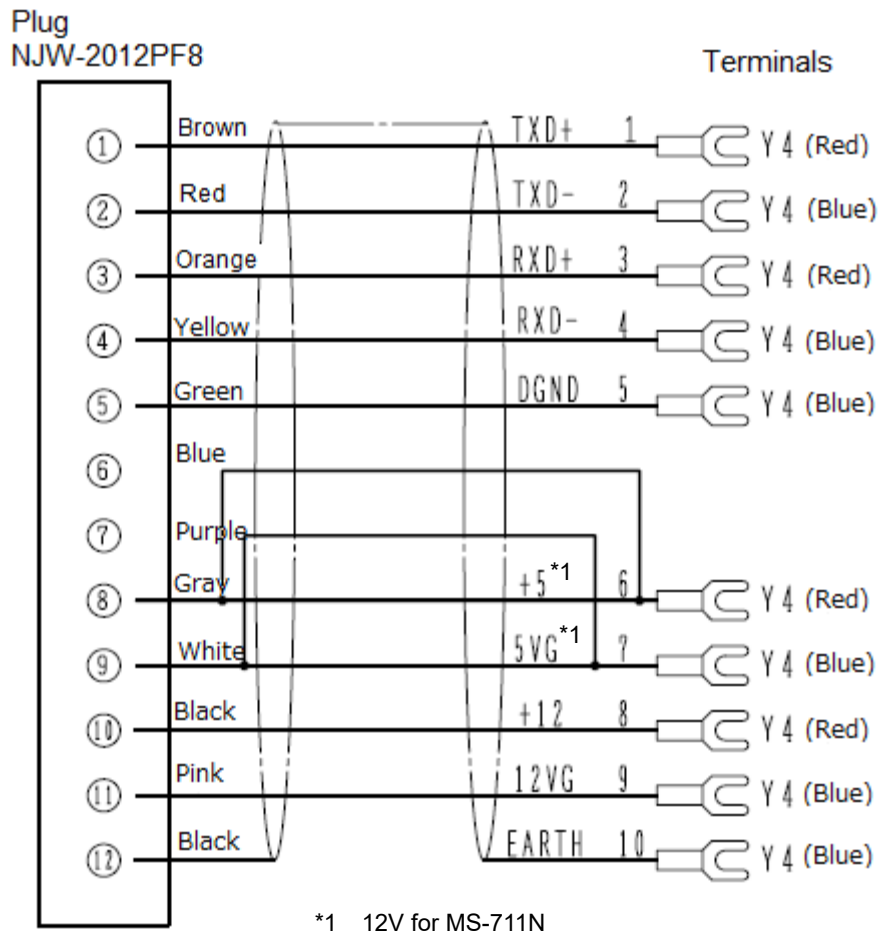


Figure 3-1. Sensor Cable Connections

3-5. Dimensions

1. Sensor Part

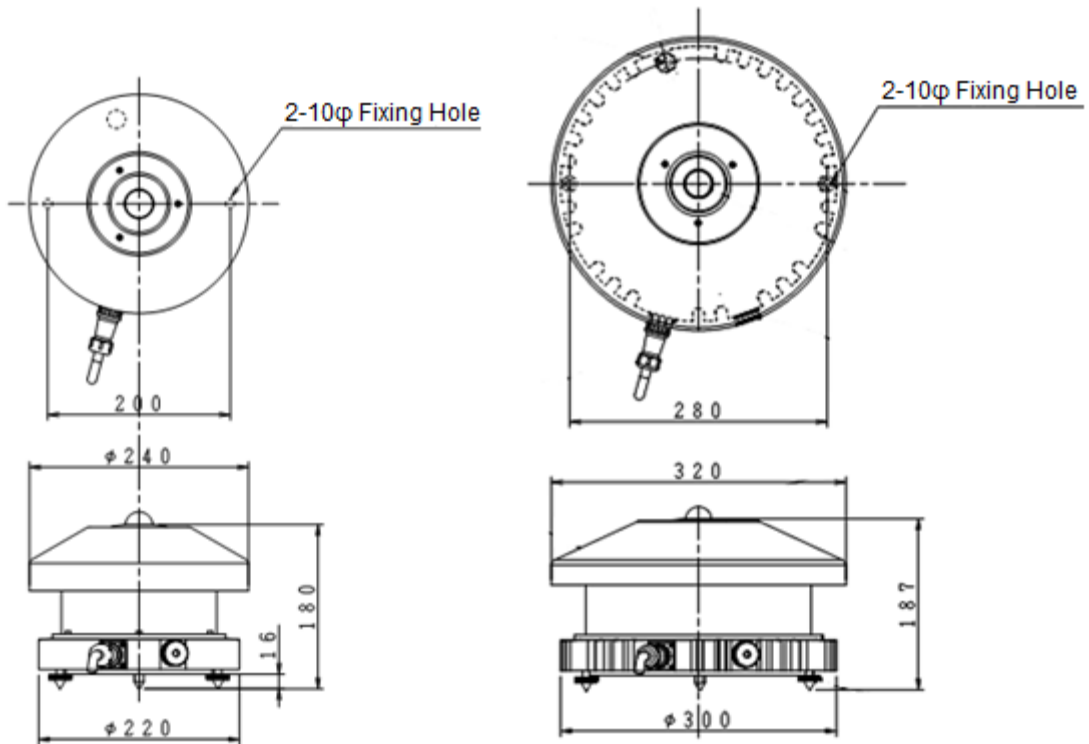


Figure 3-2. Sensor Part Dimensions (Left: MS-711N, Right: MS-712)

2. Power Supply

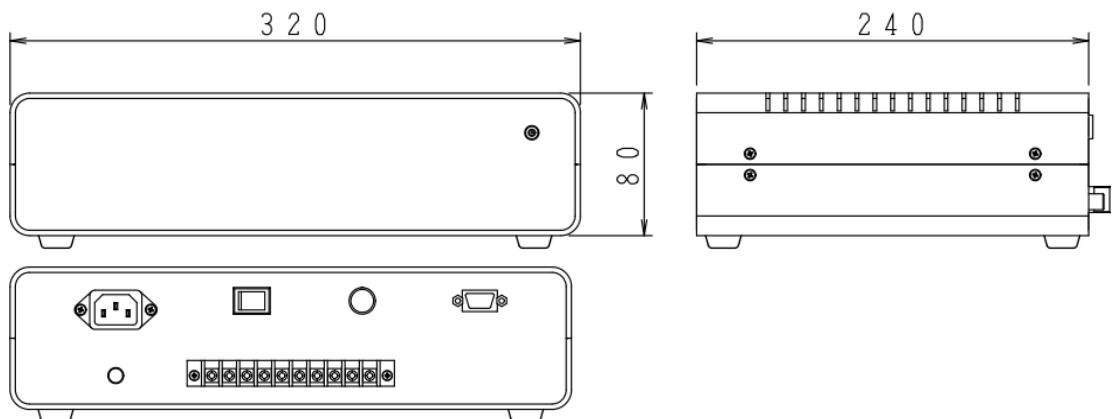


Figure 3-3. MS-711N Power Supply

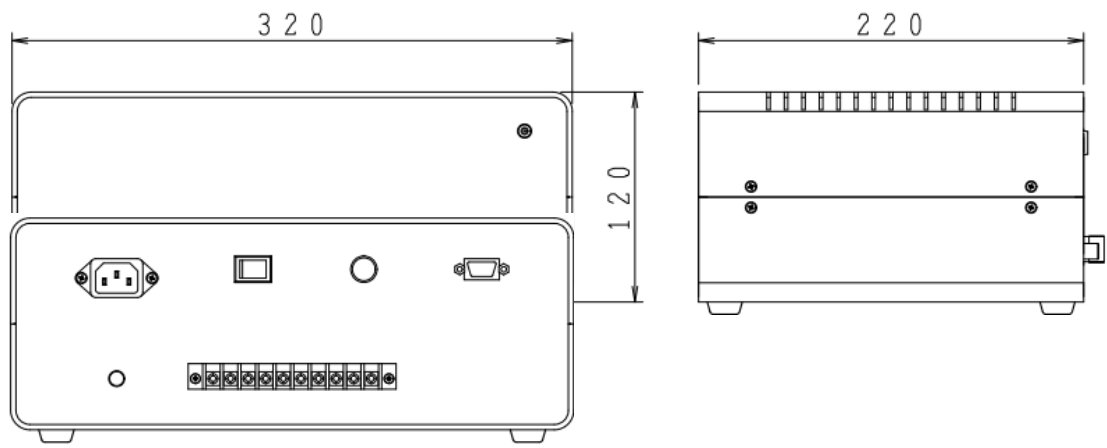


Figure 3-4. MS-712 Power Supply Dimensions

4. Standard Items & Accessories

Table 4-1. Package Contents

Standard Items	Qty.	Remarks
Sensors	2	MS-711N x 1 unit, MS-712 x 1 unit
Set of Sensor fixing screws	1	MS-711N: Bolts: M8 x 75, Washers, Nuts (x2 each) MS-712: Bolts: M8 x 90, Washers, Nuts (x2 each)
Power supply	2	One power supply unit for each MS-711N and MS-712
Sensor cable	2	Standard Length : 10m
Power supply cable	2	Length : 2m
RS-232C cable	2	Length : 1.5m
CD-ROM	1	Software (WSDac_V3.0.x.x.exe and WSDisp_V3.0.x.x.exe) contained
Calibration Certificate	1	Includes Cosine Response Test report
Instruction Manual	1	

Table 4-2. Accessories List

Option Items	Remarks
Sensor Cable	Cable Length: 20m, 30m
STR-22G	Double Arm Sun Tracker
STR-32G	Heavy Duty Sun Tracker
STR-32G DNI Measurement Mounting Plate	STR-32G Mounting Plate for MS-710/711 (Secondary Side)
Collimation Tube for MS-711	
Collimation Tube for MS-712	
Mounting Plate for Diffuse Measurement	
Shading Ball Assembly	Dual Type

Table 4-3. Consumable Items

Parts Name	Remarks
Silica Gel	Particle size: $\phi 2.2 \sim \phi 11$
Fuse	$\phi 5.2 \times 20$, 250V, 2A

5. APPENDIX

5-1. Warranty and Liability

For warranty terms and conditions, contact EKO or your distributor for further details.

EKO guarantees that the product delivered to customer has been verified, checked and tested to ensure that the product meets the appropriate specifications. The product warranty is valid only if the product has been installed and used according to the directives provided in this instruction manual.

In case of any manufacturing defect, the product will be repaired or replaced under warranty. However, the warranty does not apply if:

- Any modification or repair was done by any person or organization other than EKO service personnel.
- The damage or defect is caused by not respecting the instructions of use as given on the product brochure or the instruction manual.

5-2. Environment

1. WEEE Directive 2002/96/EC (Waste Electrical and Electronic Equipment)



In August of 2005, the European Union (EU) implemented the EU WEEE Directive 2002/96/EC and later the WEEE Recast Directive 2012/19/EU requiring Producers of electronic and electrical equipment (EEE) to manage and finance the collection, reuse, recycling and to appropriately treat WEEE that the Producer places on the EU market after August 13, 2005. The goal of this directive is to minimize the volume of electrical and electronic waste disposal and to encourage re-use and recycling at the end of life.

EKO products are subject to the WEEE Directive 2002/96/EC. EKO Instruments has labeled its branded electronic products with the WEEE Symbol (figure Trash bin) to alert our customers that products bearing this label should not be disposed of in a landfill or with municipal or household waste in the EU.

If you have purchased EKO Instruments branded electrical or electronic products in the EU and are intending to discard these products at the end of their useful life, please do not dispose of them with your other household or municipal waste. Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

2. RoHS Directive 2002/95/EC

EKO Instruments has completed a comprehensive evaluation of its product range to ensure compliance with RoHS Directive 2002/95/EC regarding maximum concentration values for substances. As a result all products are manufactured using raw materials that do not contain any of the restricted substances referred to in the RoHS Directive 2002/95/EC at concentration levels in excess of those permitted under the RoHS Directive 2002/95/EC, or up to levels allowed in excess of these concentrations by the Annex to the RoHS Directive 2002/95/EC.

5-3. CE Declaration



IMPORTANT USER INFORMATION



DECLARATION OF CONFORMITY

We: EKO INSTRUMENTS CO., LTD
1-21-8 Hatagaya Shibuya-ku, Tokyo
151-0072 JAPAN

Declare under our sole responsibility that the product:

Product Name: Spectroradiometer
Model No.: MS-711N

To which this declaration relates is in conformity with the following
harmonized standards of other normative documents:

Harmonized standards:

EN 61326-1:2021 Class A (Emission)
EN 61326-1:2021 (Immunity)


Following the provisions of the directive:

EMC-directive: 2014/30/EU

Date: July 14, 2025

Position of Authorized Signatory: General Manager of R & D Center

Name of Authorized Signatory: Hitoshi Yokemura

Signature of Authorized Signatory: 



DECLARATION OF CONFORMITY

We: EKO INSTRUMENTS CO., LTD
1-21-8 Hatagaya Shibuya-ku,
Tokyo 151-0072 JAPAN

Declare under our sole responsibility that the product:

Product Name: Spectroradiometer
Model No.: MS-712

To which this declaration relates is in conformity with the following harmonized standards of other normative documents:

Harmonized standards:

EN 61326:1997+A1+A2 Class A (Emission)
EN 61326:1997+A1+A2 (Immunity)
EN61000-4-2 EN61000-4-3
EN61000-4-4 EN61000-4-5
EN61000-4-6 EN61000-4-11

Following the provisions of the directive:

EMC-directive: 89/336/EEC
Amendment to the above directive: 93/68/EEC

Date: December 4, 2025

Position of Authorized Signatory: General Manager of R & D Center

Name of Authorized Signatory: Hitoshi Yokemura

Signature of Authorized Signatory: *Hitoshi Yokemura*



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