



EKO INSTRUMENTS
CO., LTD.

Single arm with GPS
STR-21G

Dual arm with GPS
STR-22G

High Torque Dual Arm with GPS
STR-32G

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Sun Tracking Systems

Precise tracking, Accurate measurement



EKO INSTRUMENTS

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System Accessories

Item	Model	Item	Model
1 Sun Tracker (Single Arm)	STR-21G	13 Tripod for STR-32G	STR-32-T
2 Sun Tracker (Dual Arm)	STR-22G	14 Shading Ball Assembly (Single Type)	MB-12-1
3 a/b Sun Tracker (High Torque Dual Arm)	STR-32G	15 Shading Ball Assembly (Dual Type)	MB-12-2
4 Top Mounting Plate for one Pyranometer	TMP-S-XXX (*)	16 Shading Ball Assembly for WISER (MS-710, MS-712)	MB-13-2
5 Top Mounting Plate for two Pyranometers	TMP-D-XXX (*)	17 Pyrheliometer	MS-56
6 Top Mounting Plate for WISER (MS-710, MS-712)	TMP-WISER	18 Pyranometer	MS-802, MS-402, MS-410, MS-802F, MS-402F
7 Mounting Plate for a Pyranometer (Normal Incidence)	STR-22-SMP	19 Spectroradiometer	MS-712
8 Extra Pyrheliometer Mount	STR-22-AD	20 Spectroradiometer	MS-710
9 Mounting plate for MS-700DNI (Primary)	STR-22-P	21 DNI Spectroradiometer	MS-700DNI
10 Mounting plate for MS-700DNI (Secondary)	STR-22-S	22 Collimation Tube for MS-712	STR-32-CT712
11 Mounting plate for MS-712 Spectroradiometer (Primary)	STR-32-P	23 Collimation Tube for MS-710	STR-32-CT710
12 Mounting plate for MS-710 Spectroradiometer (Secondary)	STR-32-S		

(*) : Please contact EKO for more details.

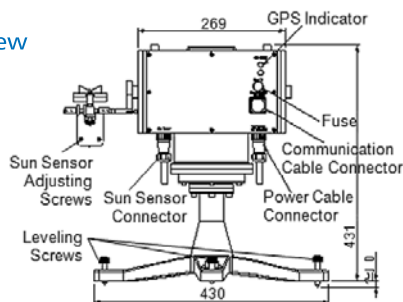
Specifications

Model	STR-21G	STR-22G	STR-32G
	Single Arm	Dual Arm	High Torque Dual Arm
Motor	Stepping Motor		
Driving method	Harmonic Drive		
Accuracy	<0.01° (Solar Elevation: 0~87°)		
Angular Resolution	0.009°		0.000375°
Torque	12 Nm	24 (12+12) Nm	60 (30+30) Nm
Payload	7 kg balanced	15 kg balanced	60 kg balanced
Sun-sensor tracking accuracy	±0.01°		
Sun-sensor field of view	±15°		
GPS Sensor positioning start time	~5min (depends on the receiving condition)		
Operating Temperature	-30~+50°C		
Communication	RS-232C, 9600bps, 8N1		
Power requirement	100-240VAC, 50/60Hz, 50VA (DC24VA version is optional.)		
Dimension	430(W) x 380(D) x 440(H)mm (main body+tripod)	430(W) x 380(D) x 440(H)mm (main body+tripod)	430(W) x 380(D) x 249(H)mm (main body)
Weight	14.5 kg (main body+tripod)	15.5 kg (main body+tripod)	15.0 kg (main body)

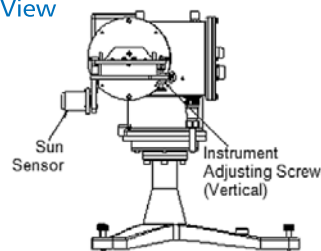
Outline dimensional drawing (STR-22G *1)

*1 : The dimensions of the main body are the same for all three models.

Back View



Left View



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Solar measurement configuration

Direct Normal Incidence (DNI)

A compact measurement system based on STR-21G sun-tracker and ISO 9060 first class pyrheliometer MS-56, which attained the world's fastest response time.

It perfectly suits for the evaluation of CPV (Concentrated Photovoltaic) and CSP (Concentrated solar Power).



Diffuse radiation (DHI)

The system is based on the STR-22G sun tracker, shading-ball MB-21, small size mounting plate and secondary standard pyranometer MS-802 to measure diffuse radiation (DHI). MS-56 pyrheliometer simultaneously measures the DNI.



Spectral Direct Normal Incidence Irradiance

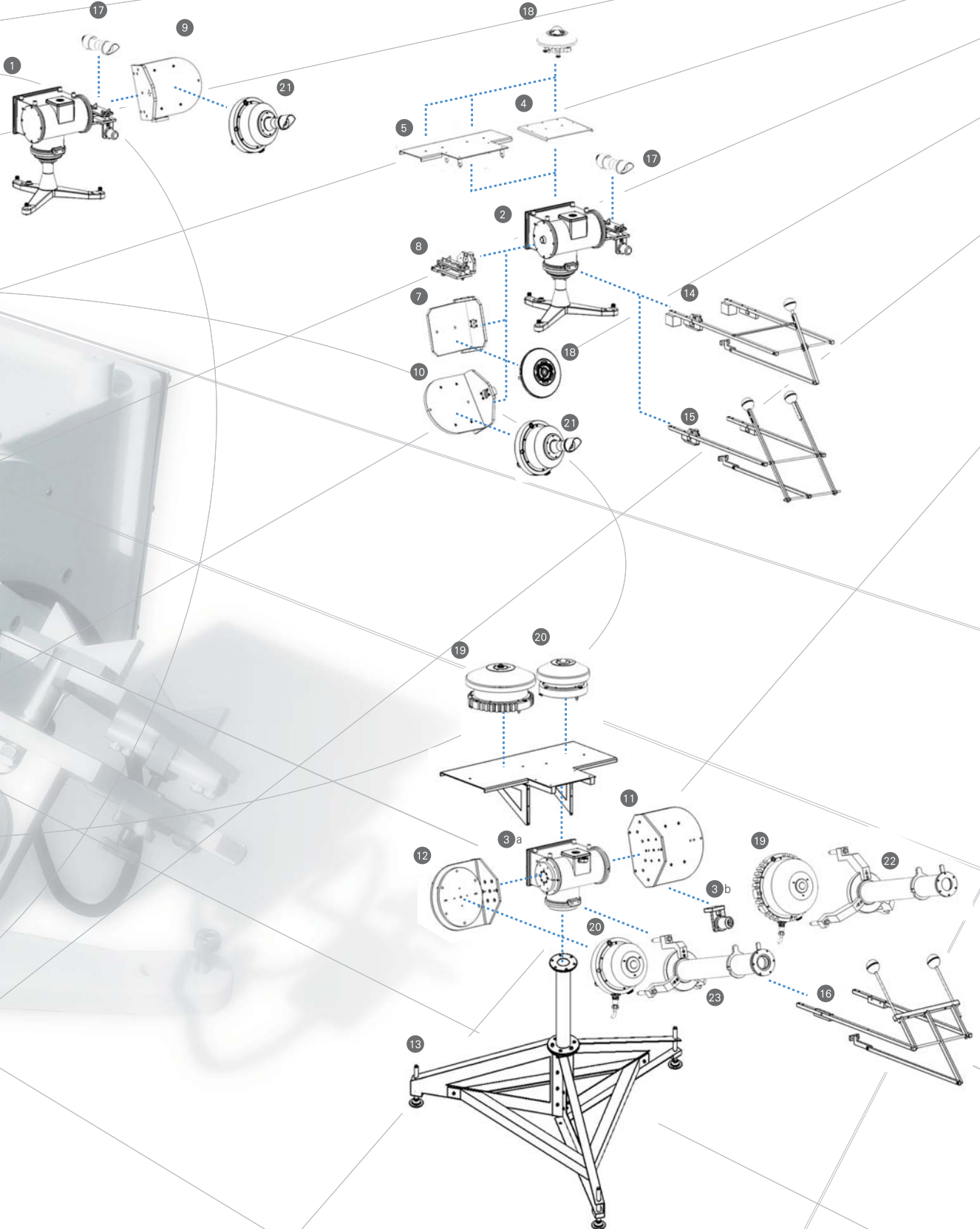


STR-21G Sun tracker with MS-700 DNI which provide direct spectral irradiance in the range 350-1050 nm.



STR-32G high torque sun tracker and MS-710 / 712 spectroradiometers with collimating tube provide direct spectral irradiance in the range 350 - 1700 nm.

System Configurations



The compact STR sun trackers are perfectly suited to support all kinds of measurement sensors for measuring Global, Diffuse and Direct Radiation. The STR-21G and 22G Sun Tracker come with a small tripod that offers a stable surface for the measuring equipment and adjustable pyrheliometer mount for a fine alignment. Besides, various mounting kits are available to accommodate the MS pyranometer series or other types of pyrheliometers. The latest heavy duty STR-Sun Tracker STR-32G is capable of taking the highest load with maximum performance to support EKO's spectral measurement solutions.

EKO Instruments high precision STR Sun Tracker models STR-21G (single arm), STR-22G (dual arm) and STR-32G (high torque dual arm) provide high tracking reliability, enhanced functionalities with fully automated set up procedure through a built-in GPS receiver.



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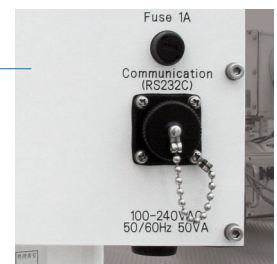
Two independent sun tracking modes

The sun path can be determined by two independent methods, either by tracking the exact solar position through the sun sensor or calculating the position through the solar algorithm. If the sun is absent only the calculating mode will be activated. Based on the calculated solar position and actual position of the sun the STR will correct the angular difference and automatically compensate for any mis-alignment.



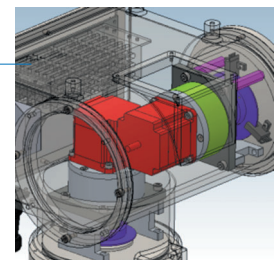
Positioning function

Next to the basic sun tracking function, the STR-series can be fully controlled through the so-called "open command protocol". This allows to command the position of the tracker manually. By using a PC or data logger with RS-232 serial interface the sun tracker can easily be accessed.



Durable compact drive

High precision, maximum torque, small size and durability are the most valuable assets given by the Harmonic drives used inside the STR-Sun Tracker. Due to their high working efficiency, the motors are relatively small and use less power.



Easy set-up

Due to the built-in GPS and integrated sun-sensor, installing the STR sun trackers gets most easy. Thanks to the embedded GPS, the position and time information is obtained automatically. Thanks to the integrated sun-sensor, orientation and leveling are no issues anymore (+/-15 degree acceptance angle).

