



## MS-21S Pyrgeometer

### Technical Specifications

4.5 $\mu$ m - 42 $\mu$ m flat spectral response

Lowest window heating offset

PT 100 / 4W temperature sensor

Smart interface: (MODBUS 485 RTU, SDI-12)

Diagnostic functions (relative humidity, temperature, tilt angle)

The MS-21S pyrgeometer is added to the top of the range, of most accurate and robust infrared radiometers for scientific research applications. The analog sensor can measure longwave downwelling radiation and longwave net-radiation in a wide spectral band. In meteorology, wavelengths from 0.3 to about 4.5 $\mu$ m are called shortwave radiation, which is the solar radiation measured by a pyranometer. Wavelengths beyond the solar spectrum are called longwave radiation which is a function of the sky temperature and typically measured with a pyrgeometer. For climate research applications it is important to measure the earth surface radiation balance which is an important parameter and critical process indicator for climate change.

The MS-21S includes the new internal diagnostics system, and 2-channel smart interface. The internal diagnostics system offers users visibility over internal temperature, humidity, tilt and roll angle; helping to ensure optimum performance without the need for

regular physical checks; while the 2-channel smart signal transducer allows the MS-21S to easily connect to any digital measuring system, giving users a choice with Modbus 485 RTU, and SDI-12 for digital output; alongside 4-20mA, and 0-10mA (0-1V) analogue options just for checking the signal output.

The digital output options also enable users to connect with a standard laptop and 'Hibi'; a new, custom-built program developed by EKO, giving real-time access to the internal diagnostics, custom settings, and data on irradiance, humidity, internal temperature and tilt angle from the sensor.

MS-21S has Silicon meniscus dome with solar blind interference filter (cut-on 4.5 $\mu$ m) and hard carbon coating to measure only the longwave radiation component under all atmospheric conditions. During the day the unwanted solar shortwave radiation will be blocked and longwave radiation can be accurately measured. Based on a new thermal design the

common window heating error phenomenon could be strongly suppressed. It makes that the sensor can be operated during daytime without the need for a sun tracker with shading device or shadow ring. The onboard temperature compensation electronics guarantee a stable sensitivity independent from the sensor operating temperature, which make setup and operating much easier without the need to make significant corrections.

MS-21S is supplied with WISG (World Infrared Standard Group) traceable calibration and 5 years warranty.

	<b>MS-21S</b>
<b>Output</b>	MODBUS 485 RTU, SDI-12
<b>Response time 95%</b>	< 18 Sec.
<b>Non-linearity</b>	< 1 %
<b>Sensitivity</b>	> 10 - < 20 $\mu\text{V}/\text{W}/\text{m}^2$
<b>Temperature response -20°C to 50°C</b>	< 1 %
<b>Window heating Offset</b>	< 4 W/m <sup>2</sup>
<b>Operating temperature range</b>	-40 - 80 °C
<b>Wavelength range</b>	4.5 - 42 $\mu\text{m}$
<b>Dome temperature</b>	-
<b>Body temperature</b>	PT-100
<b>Field of View FOV</b>	180 °
<b>Power supply</b>	5-30 VDC
<b>Power consumption</b>	< 0.2 W
<b>Additional signal processing errors</b>	< 1 W/m <sup>2</sup>
<b>Cable length</b>	10 m

<b>Options</b>	<b>MS-21S</b>
<b>Cable length</b>	20 / 30 / 40 / 50 m
<b>Ventilation unit</b>	MV-01
<b>Albedo mounting kit</b>	MS-albedo kit (for net radiation)

Specifications are subject to change without further notice.