



## DHI Measurements

Diffuse Horizontal Irradiance measurements are performed with a thermopile sensor called Pyranometer mounted on a Sun tracker or shading ring. When the pyranometer is installed on an automatic sun tracker, the diffuse radiation can be measured in two different ways. Measuring Diffuse irradiance requires an accurate pyranometer with low offset properties. During clear sky conditions the DHI irradiance ( $W/m^2$ ) is less than 20% of the total irradiance. Zero offsets lead to underestimation of the measured irradiance.

When measuring the diffuse horizontal irradiance with a shaded pyranometer, you will need a sun tracker in combination with shading ball assembly. In this configuration the pyranometer (MS-80 or MS-802) is exposed to diffuse solar radiation only. The MS-80 has the lowest offset characteristics and is the best choice for DHI measurements.

As an alternative when measuring the diffuse horizontal irradiance without shading device, you can use a sun tracker in combination with a pyrhelimeter (MS-57 or MS-56) to measure DNI and pyranometer receiving the global radiation component GHI. In this configuration the DHI can be calculated from the GHI minus the cosine weighted DNI.

## HOW-TO Application Guide

- 1 The best method depends of its application and budget. The method with the shaded pyranometer on the sun tracker is the most accurate. To measure all three irradiance components (DNI, DHI, GHI) a pyrheliometer is also required.
- 2 On the other hand, if you would like a less accurate method but more cost effective. Measuring of the diffuse horizontal irradiance by using a shading could be an alternative option.
- 3 EKO's new solar Monitoring Systems, called STR-21G-S, are dedicated sensor system to perform the most accurate solar radiation measurements of the three solar radiation components (Direct, Diffuse and Global). It can be easily integrated to any DAQ system, which has multiple analog or digital inputs. With the standard sun-position sensor and GPS receiver built inside the sun tracker the system set-up will be quick and easy.