



Newsletter **12**

Environmentally Friendly Roofs
New Turn-key Data Acquisition Solutions
Extreme Measures at Mount Sonnblick
Meteo Station at DELTA Biovalue

Content

April 2010

P2: Ben's Column

Success in Russia for Kipp & Zonen

P3: News update

Russian Solar Radiation Monitoring Network

PGS-100 Sun Photometer

90th AMS Annual Meeting

P4: Pennsylvania State University - Modelling and

Measuring Green Roof Thermal Performance

P5: New Turn-key Data Acquisition Solutions

P6: Extreme Measures at Mount Sonnblick

P7: Insights

Mierij Meteo Station at DELTA Biovalue

Fairs & Events

Contact

If you have a news item for the newsletter or want to share your experiences with Kipp & Zonen applications and contribute to our next issues, please e-mail the editor: kelly.dalu@kippzonen.com

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Kipp & Zonen B.V. - 2010

Success in Russia for Kipp & Zonen

Here is our second newsletter of 2010, which means that we are already in the second quarter of the year and winter is well behind us. In many cases the winter was unusually severe and long. In the Netherlands we had the coldest January since 1997.

A winter like this will certainly question the perceived global warming and climate situation in some countries. At Kipp & Zonen we do not involve ourselves in these and other climate related discussions, but strive for the best and most accurate instruments to measure the real values of meteorological parameters, such as solar radiation and wind. It is this accuracy that is required to make sure that the computer-based weather and climate prediction models deliver useful information.

After many years of preparations and discussions Kipp & Zonen has been chosen to deliver the equipment and systems for measuring solar radiation in the new Russian national weather network. For Kipp & Zonen this is a very prestigious project and we thank the Russian authorities for putting their trust in our products (read more on the next page).

In late 2009 Kipp & Zonen attended the well-organised annual meeting of the American Meteorological Society in Atlanta. On our booth we displayed the new CNR 4 net radiometer, a fully-equipped SOLYS 2 sun tracker station and a MTP 5 temperature profiler. The features like the dome shaped upper long wave window and the provisions for ventilation of the CNR 4 impressed many existing CNR 1 customers, as well as potential new users.

During the second quarter you can meet us in Nairobi, Kenya during the African Meteorological Meeting and in Vienna, Austria for the European Geophysical Union (EGU) Meeting. Mierij Meteo will have a booth at the annual European Wind Energy Conference (EWEC) in Warsaw, Poland.

Please enjoy reading this newsletter and if you have any suggestions or other feedback, please inform me. I really appreciate your attention.

Yours sincerely,



Ben Dieterink, President
Kipp & Zonen B.V.



Russian Solar Radiation Monitoring Network

In 2008 Kipp & Zonen provided the Russian Federal Service for Hydrometeorology and Environmental Monitoring (Roshydromet) with solar radiation monitoring equipment to set up the first WMO Baseline Surface Radiation Network (BSRN) station in Russia. The station was installed in Orgurtsovo, Western Siberia.

This first station was just a small part of a major project to update and modernise the Roshydromet network from manual observations to automated measurements and centralised data collection.

Now Kipp & Zonen is proud to announce that we have won the international tender to supply 18 solar monitoring stations to Roshydromet for installation at key locations across Russia. The stations are based on the 2AP sun tracker with active tracking sun sensors, cold weather covers, heaters, tripod stands, height extension tubes and shading ball assemblies.



The trackers are fitted with CHP 1 pyrhemometers, CMP pyranometers and CGR 4 pyrgeometers; to measure direct, diffuse and global short-wave radiation and downwards long-wave radiation. An additional pyranometer and pyrgeometers measure reflected short-wave radiation and upwards long-wave radiation. All the pyranometers and pyrgeometers are fitted with CVF 3 ventilation units.

All four components of the radiance balance are measured and Albedo can be calculated. Six of the stations also have UVS-AB-T radiometers to monitor UVA and UVB. The order includes spare instruments and an additional 2AP station for training purposes, which will be located in Moscow.

Our instruments were extensively tested by the Main Geophysical Observatory (MGO) in St. Petersburg to ensure that they comply with Russian requirements.

The Kipp & Zonen partner in Russia for this project is the Lanit systems integration company of Moscow ■

PGS-100 Sun Photometer

The majority of measurements of the direct irradiance from the sun are made using broad-band radiometers with a narrow field of view, such as our CHP 1 pyrhemometer. This is very useful for meteorology and climatology applications, but there are a number of areas of research, such as in photovoltaics, where it is interesting to know the energy reaching the ground at different wavelengths.

The PGS-100 Sun Photometer manufactured by Prede Co. Ltd. of Tokyo and distributed by Kipp & Zonen measures the spectrum of the direct solar radiation in the wavelength range from 350 nm to 1050 nm. It uses a spectrometer with no moving parts, for reliability and low maintenance, and has a weather-proof housing. The instrument has a 2° field of view and must be mounted on an automatic sun tracker to make measurements.

Previously, the PGS-100 was only supplied together with a Prede sun tracker, but now it is available as a stand-alone instrument that can be fitted to the Kipp & Zonen SOLYS 2 or 2AP sun trackers using a dedicated mounting kit. The PGS-100 comes with a weather-proof AC mains power supply unit and a data cable for connection to the RS 232 port of a computer (not included). The Windows™ spectrometer control software acquires and stores the spectral data and visualizes it graphically.

Now customers can use the PGS-100 with an existing Kipp & Zonen sun tracker or buy it complete with a SOLYS 2 ■

90th AMS Annual Meeting

In January 2010 Kipp & Zonen USA exhibited at the 90th annual AMS meeting in Atlanta, Georgia. Kipp & Zonen is a Corporate Member of the AMS. It was the 20th year that we have been a participant in the annual meetings and.

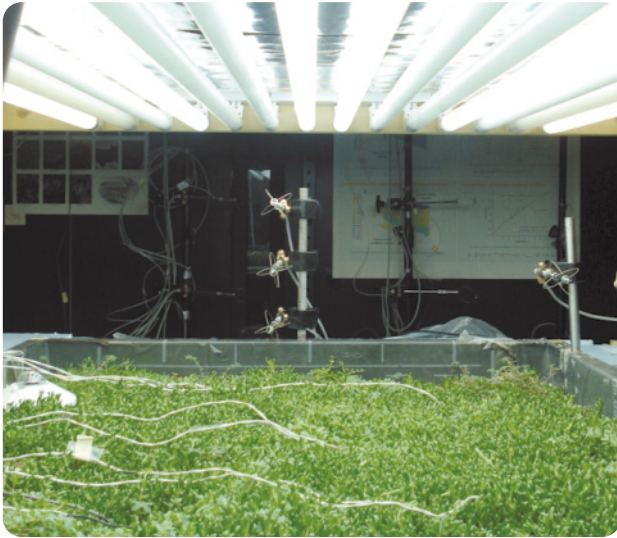
On our booth Kipp & Zonen featured the MTP 5-HE microwave temperature profiler, SOLYS 2 solar sun tracker (complete with the shading assembly, a CGR 4 pyrgeometer, CMP 11 pyranometers, CVF 3 ventilation units and CHP 1 pyrhemometer), NR Lite2, CNR 2 and our unique new 4-component CNR 4 net radiometer with CNF 4 ventilator.

AMS is the major meteorological conference and exhibition of the year and attracts scientists and researchers from around the world to hear about, see and discuss the latest information and technologies. Visitors to our booth were very favourably impressed by our new developments that keep Kipp & Zonen at the head of the field ■

Passion for Precision

Pennsylvania State University - Modelling and Measuring Green Roof Thermal Performance

The thermal performance of green roofs has been studied worldwide using three different approaches; field experimentation, numerical studies, and a combination of laboratory or field experiments with numerical models. All the reviewed studies concluded that green roofs can reduce the heat flux from buildings.



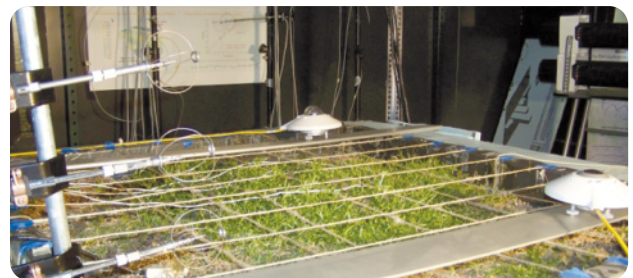
4 However, design engineers do not have a standard calculation procedure or a tool to calculate energy savings from green roofs. Therefore, Pennsylvania State University has spent seven years developing an accurate model to predict the thermal resistance “R” value of a green roof. These “R” values represent a set of equations from the model that could be implemented in energy simulation programs commonly used in building design practice.

In the summer of 2003 researchers began construction of a number of green roofs for laboratory testing of their thermal properties. The example pictured above is constructed to simulate a green roof on a typical brick-built structure. From bottom to top this construction includes plywood sheathing, a water-proof membrane, a drainage and filtering mat, 3.5 inches of growing medium, and plants.

Two plants, *Sedum spurium* and *Delosperma nubigenum*, were chosen to examine how the choice of flora affects the thermal performance of green roofs. Analysis of previous

research and theoretical formulations led researchers to conclude that the R-value will likely be a function of the current weather conditions, the type of plant, and the type of construction. The same analysis showed that the best way to control the wide set of weather parameters is to establish the roof in an environmental chamber, thus eliminating the non-steady state conditions present in field experimentation.

A new test apparatus was required to be able to measure all of the important physical parameters affecting the performance of green roofs, a task not done previously due to the complexity of the phenomena involving plants, growing media and weather conditions. The new apparatus utilises an environmental chamber for thermal property tests. Inspired by ASTM standards C177 and C1363, which respectively govern hot plate and hot box tests for thermal properties, researchers developed a cold plate box which would rely on the chamber to serve as a heat source.



The picture above shows Kipp & Zonen’s CMP 21 pyranometer & CGR 4 pyrgeometer being used to measure the heat source. The source can be suspended at various heights above the green roof samples to simulate varying amounts of solar radiation. The remaining meteorological properties (air temperature, wind velocity, and relative humidity) can be set using the control systems of the chamber in combination with appropriate air supply diffusers ■



New Turn-key Data Acquisition Solutions

Kipp & Zonen offers a wide range of measurement instruments for many different applications. For high quality instruments such as ours the way that measurement data is collected is very important for accuracy and reliability. Therefore, Kipp & Zonen offers a range of read-out devices and data acquisition systems that are compatible with our instruments.



For maximum portability we offer the single channel METEON hand-held read-out device, which also offers simple data logging. Low Power stand-alone data logging is achieved with the weather-proof LOGBOX SD, for applications where data from a single, or small number, of instruments needs to be continuously recorded. For advanced data acquisition solutions we offer the COMBILOG data logger.

For customers requiring complete measurement and data acquisition solutions Kipp & Zonen introduces a new range of data acquisition system configurations based on the COMBILOG.

Turn-key data acquisition solutions

Because of its excellent performance and ease of use we recommend COMBILOG for our higher quality solar radiation monitoring stations, especially those complying with the requirements of the Baseline Surface Radiation Network (BSRN).

COMBILOG is compatible with the full range of Kipp & Zonen solar radiometers and industry standard meteorological instruments for wind, temperature, pressure, precipitation, etc. It also directly accepts 0 - 20 mA and 4 - 20 mA signals.

COMBILOG systems can be configured with a choice of enclosure, power supply, solar powered back-up power and GSM modem. They have full over-voltage protection for the signal inputs. For large systems two COMBILOGs can be linked together to increase the number of channel available.

Application example

For example, a SOLYS 2 sun tracker is often equipped with two ventilated pyranometers for global and diffuse measurement, a ventilated pyrgeometer for long-wave infra-red, and a pyrhelimeter for direct radiation. The data from the instruments and the fan speed signal from the CVF 3 ventilation units need to be recorded. In addition the data needs to be collected through remote communication.

We will assume that there is mains power available for the SOLYS 2 and the data logger. A suitable solution in this case consists of a COMBILOG in an IP 65 enclosure complete with over-voltage protection, GSM data modem and mains to 12 V adapter for powering the data logger and the ventilation units. This is just one of the new configurations we can offer, as shown in the table below.

Data acquisition solution	Included in configuration	Options
Compact system, 1x COMBILOG data logger Stainless steel enclosure Weather-proof to IP 65 38 x 38 x 21 cm	Over voltage protection Power terminals Cable glands RS232 and RS485 communication	GSM Modem Mains to 12 V DC power adapter Back-up battery and charger Solar powered back-up battery Data processing and graphical display software
Extended system, 2x COMBILOG data loggers Stainless steel enclosure Weather-proof to IP 65 50 x 50 x 21 cm	DIN-rail mountings Configuration software	

More detailed information on our data acquisition solutions can be found in the new brochure available from our website. Or contact your local Kipp & Zonen distributor ■

Extreme Measures at Mount Sonnblick

When weather conditions are harsh, instruments need to be of the best quality and have an outstanding performance and reliability. Kipp & Zonen products are renowned for their durability and all-weather capabilities and are the equipment of choice for use in extreme conditions.



6

Mount Sonnblick is such a location. At 3106 m above sea level in the central range of the Austrian Alps it is a world of extremes. The lowest temperature ever recorded was -37.4 °C, the greatest snow depth 11.9 m, and the highest wind speed 242.6 km/h. A perfect location for a 2AP sun tracker that was recently delivered!

The Sonnblick Observatory, located at the top of the mountain, has been in operation since 1886 and has a large range of instrumentation for meteorology and atmospheric science. This data is combined with satellite and other observations for climate studies. The observatory also researches radiation physics, air composition, hydrology and geophysics, as well as glaciology and pollution of the Earth's atmosphere.

Sonnblick is an ideal centre for atmospheric research because it is a unique environment for scientists. Far away from sources of pollution that affect the careful measurement of the free atmosphere above the European continent and the interaction between solar radiation and precipitation at different heights.

The Central Institute for Meteorology and Geodynamics (ZAMG) is the oldest Weather Service in the World, founded in

1851. It uses the observatory to make reliable, comprehensive observations of the chemical composition and selected physical characteristics of the atmosphere on global and regional scales.

Sonnblick Observatory participates in the Global Atmosphere Watch (GAW) programme. GAW was established by the World Meteorological Organization amid concerns for the state of the atmosphere in the 1960's. It focuses on global networks for monitoring greenhouse gases, ozone, UV, aerosols, selected reactive gases and precipitation chemistry. The Kipp & Zonen 2AP sun tracker and complete set of radiometers will be used to ensure the highest quality solar radiation measurements, even under extreme conditions.

Recomatic Electronics Handelsgesellschaft GmbH is the exclusive distributor for Kipp & Zonen in Austria and responsible for the installation of the 2AP sun tracker at Mount Sonnblick ■

www.sonnblick.net/portal

for the Sonnblick Observatory (German only)

www.wmo.int/pages/prog/arep/gaw/gaw_home_en.html
for Global Atmosphere Watch (GAW)

Mierij Meteo Station at DELTA Biovalue

Recently Mierij Meteo has commissioned a meteorological station for DELTA Biovalue in Eemshaven, the Netherlands. DELTA Biovalue is the first Dutch biodiesel plant with its own crushing and processing facilities. Production started in August 2007 and the annual capacity is 80,000 tonnes.

The raw material for the biodiesel is rapeseed. This is delivered by ships and cannot be unloaded when it is raining. Therefore, Mierij Meteo has installed a Weather Station for the accurate measurement of rainfall. The MR 41 fast response optical rain detector and MR 21-H rain gauge monitor periods of rainfall accurately and the readings are



recorded by a MU 32 data logger. The MU 32 has 2 GB storage capacity on SD card, which allows easy storage and retrieval of more than 4 years of data.

MU 32 data logger in MU 32-K2 enclosure

DELTA Biovalue needs very accurate rain data to verify the outcome of eventual “demurrage” claims. This refers to the period during which the charterer remains in possession of the vessel after the period of time normally given to him to load or unload the cargo, and the additional charges thus incurred. The start and end of periods of rainfall are accurately detected with the Mierij Meteo MR 41 rain detector and used to explain that the waiting hours and delays are due to rainfall and are out of the charterer’s control. This information can help save on the demurrage charges.



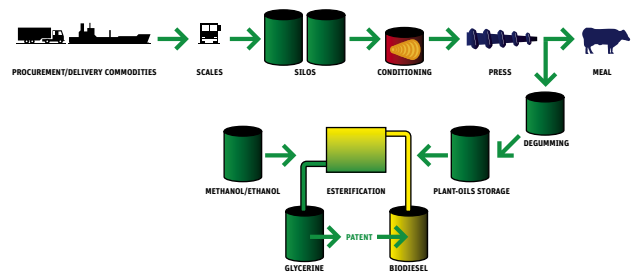
Weather station at Biovalue in Eemshaven, the Netherlands

The weather station at DELTA Biovalue is also equipped with the MW 31 anemometer and MW 32 wind vane, providing accurate wind measurements to improve safety on site, for example when working at height and the use of cranes. The Mierij Meteo instruments help DELTA Biovalue to achieve the most efficient use of resources.

Biovalue’s total production process is as follows:

- Procurement, delivery and weighing of the raw material (rapeseed)
- Storage in silos
- Rapeseed conditioning to achieve the required humidity level
- Rapeseed pressing - resulting in oil, rapeseed cakes and slime
- Removal of rapeseed cakes for the animal feed industry
- Purification of the oil
- Purified oil is transferred to a storage tank
- From the storage tank, the oil is transported to the esterification plant
- The oil is mixed with ethanol or methanol, resulting in biodiesel and glycerine
- Via a patented process, the glycerine is converted to an additive that can be added to the biodiesel
- The biodiesel is stored and ready for sale

The described process from the raw material to the final products can be represented schematically as follows:



For further information visit: www.biovalue.eu

Fairs & Events

The First Conference of Ministers Responsible for Meteorology in Africa Nairobi - Kenya	12 - 16 April 2010
European Wind Energy Conference Warsaw - Poland	20 - 23 April 2010
European Geophysical Union General Assembly Vienna - Austria	02 - 07 May 2010
InterSolar Munich - Germany	09 - 11 June 2010

Passion for Precision

Kipp & Zonen is the leading company in measuring solar radiation and atmospheric properties. Our passion for precision has led to the development of a large range of high quality instruments, from all weather radiometers to complete measurement systems.

We promise our customers guaranteed performance and quality in: Meteorology, Climatology, Hydrology, Industry, Renewable Energy, Agriculture and Public Health.

We hope you will join our passion for precision.

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