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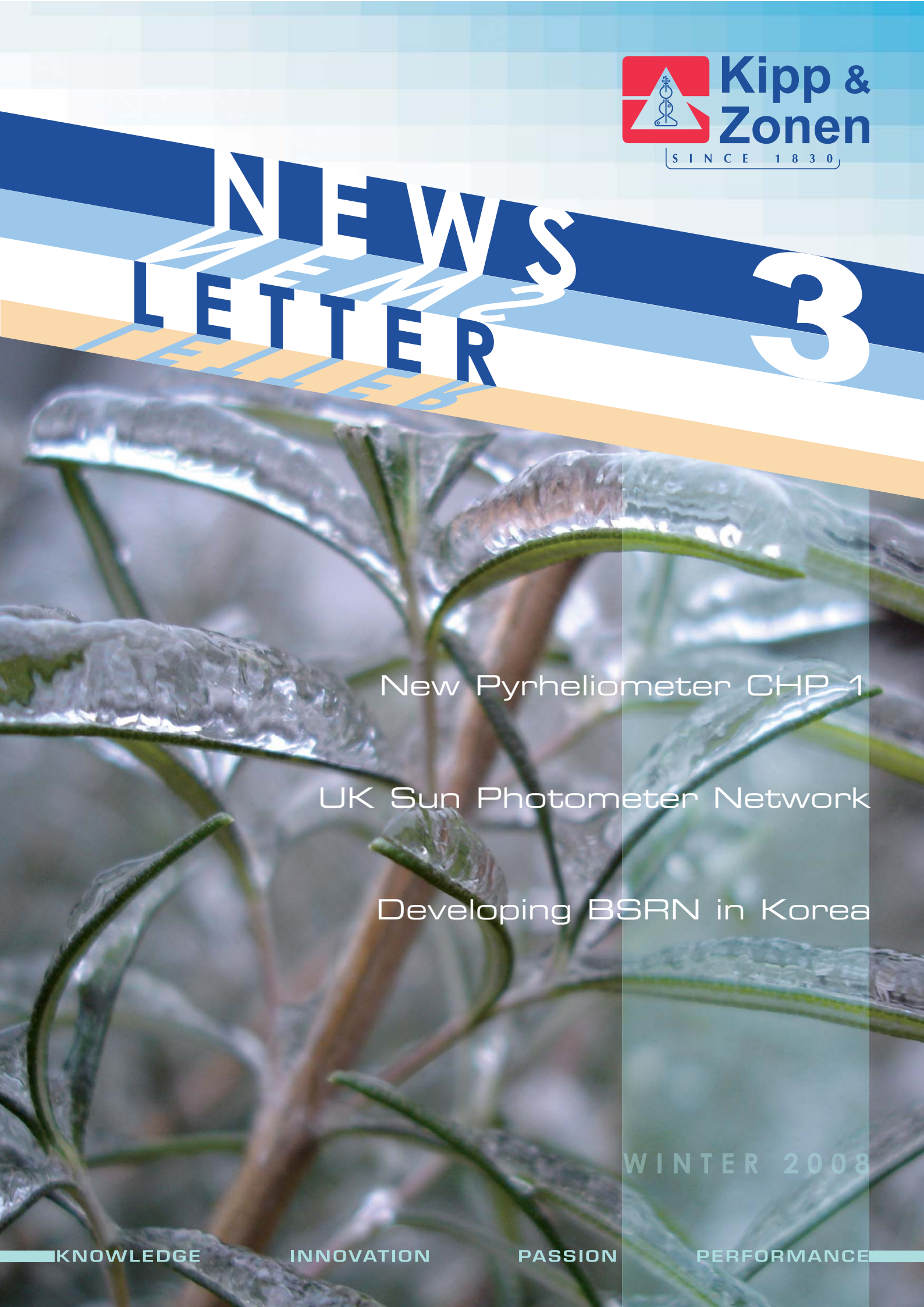
SINCE 1830

NEWS LETTER 3



New Pyrheliometer CHP 1

UK Sun Photometer Network

Developing BSRN in Korea

WINTER 2008

KNOWLEDGE INNOVATION PASSION PERFORMANCE

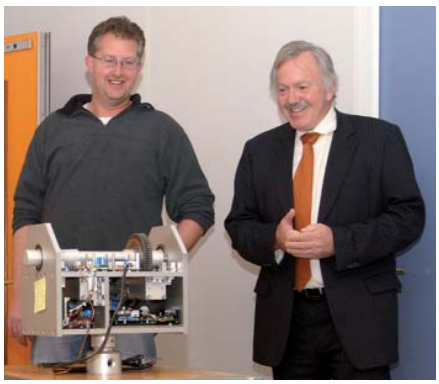
THIS ISSUE

If you have a news item for the news letter 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

After a Successful 2007, We Look Forward to an Even Better 2008

Autumn is always a time of interesting events. We are travelling all around the world to demonstrate Kipp & Zonen products. From the European Meteorological Society (EMS) meeting in Spain to the 4th China International Exhibition on Technology & Equipment for Meteorology, Science & Hydrology to the American Geophysical Union (AGU) in San Francisco. At the moment that I'm writing this text we are preparing ourselves for AGU to launch in the USA our new SOLYS 2 Sun Tracker and to preview the latest developments from our R&D department in net radiometers.

In November Kipp & Zonen reached a milestone, the delivery of the 400th 2AP Sun Tracker to a customer in Spain. I remember when, back in 1994, Kipp & Zonen introduced the 2AP to its product portfolio. Slowly (at that time a sun tracker like the 2AP was more or less a novelty in the market) the 2AP has established itself as a reliable work-horse resistant to all kinds of climatic condition, from Antarctica to the Negev desert.



In one of the sessions on future strategy during the EMS conference it became clear that there is a demand for more accurate fore-casting, near-casting and now-casting. This requires higher density networks and research into climate change requires higher accuracies in measurements. For both demands Kipp & Zonen offers the right type of instrumentation for measuring solar radiation. Our recently renewed, improved and restyled radiometers meet these future expectations and our goal for 2008 is to continue at this level of performance.

Together with all the staff of Kipp & Zonen I wish you a great start to 2008!

With best regards,

Ben Dieterink, President

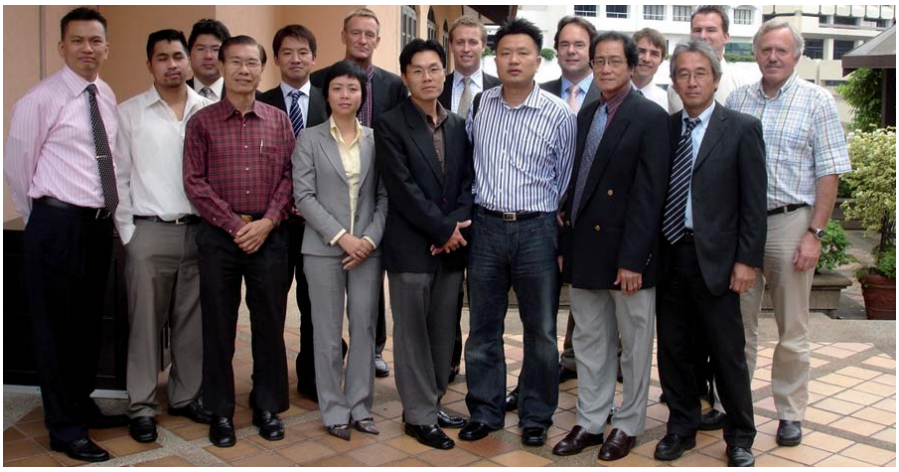
SOLYS 2 Development Update

The prototype of the new Solys 2 Sun Tracker Lorenzo de El Escoria in October and has bee

Following initial feedback we have decided to the AC power input only, on 24 VDC power o than 10 minutes to raise the internal temperatu

This decision will make production easier and This means that the date for production has bee

The 10th Kipp & Zonen International Sales Meeting in Singapore



On 1st January 2007 we opened a local sales office in Singapore to promote our growing interests in the Far East and South East Asia.

To help raise our profile in these regions we picked Singapore to host this biennial event on 17th and 18th October.

We can look back on two very successful and interesting days. We welcomed 11 distributors from Asia, Europe and Oceania. Many different topics were presented and discussed; new products such as Solys 2, Meteon and Uviator, and also existing products such as Lidar Remote Sensing Systems, MTP 5 Temperature Profilers, Large Aperture Scintillometers and our well-known solar radiation instruments.

We would like to thank all the participants for their contributions and hope that they will look back on the 10th International Sales Meeting with the same feeling of satisfaction that we do.

Dr. Ivan Mammarella, Winner of the Kipp & Zonen Award 2007

Dr Ivan Mammarella is a University Researcher for the Division of Atmospheric Science at the University of Helsinki, Finland. In 2004 he completed his PhD in Environmental Geophysics at the Institute of Atmospheric Sciences and Climate (ISAC) of the Italian National Research Council (CNR) in Bologna, Italy. After his study he moved to Helsinki as a post-doc scientist. His scientific interests include theoretical and experimental aspects of the flows in the Atmospheric Boundary Layer (ABL) over complex and non-homogeneous terrain and micro-meteorological physics.

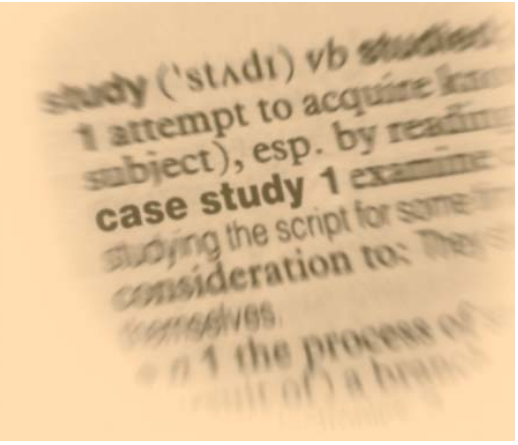
"I feel very honoured, and I am profoundly grateful to my colleagues who participated in this research study and to Kipp & Zonen for recognising this contribution through the 2007 Kipp & Zonen Award for Boundary Layer Meteorology Research.
My recent study on 'The Stability Dependence of the Roughness Length for Momentum Over Very Rough Natural Surfaces' is very important for the ABL modeling community and calls for revision of traditional flux-parameterizations above the vegetation and urban canopies. In this work it was experimentally demonstrated that the roughness length for momentum (which relates to the friction exerted by the roughness elements on the flow, and provides the crucial boundary condition for various applications in meteorology, climatology, oceanography and engineering) is not only determined by the geometrical characteristics of the surface, but it also depends on the thermal stratification of the flow. This unique result supports our new paper (S. Zilitinkevich, I. Mammarella, A. Baklanov and S. Joffre), 'The Roughness Length in Environmental Fluid Mechanics: the Classical Concept and the Effect of Stratification', submitted to Boundary Layer Meteorology).

Recognizing the fundamental importance of such an initiative (the Kipp & Zonen Award), which gives to young scientists the chance to maintain scientific collaboration at the international level, I wish other young researchers to experience it."

r was shown at the Annual Meeting of the European Meteorological Society in San
n enthusiastically received by distributors and key customers.

o include the facility to operate from - 40°C to + 50°C as standard. This applies to
peration is from - 20°C to + 50°C. After switching on at - 40°C the heater takes less
ure to - 20°C and at this point the tracker will start to operate.

reduce delivery times and to optimise this we are redesigning some of the electronics.
en delayed slightly and we now expect the first customer deliveries to be early in 2008.



The United Kingdom Sun Photometer Network

With the increasing interest in climate change and global warming research, the effects of stratospheric aerosols are being studied in greater detail. Primarily, this refers to water vapour and suspended particles such as smoke, dust, sand and ash. These absorb and scatter solar radiation, act as nuclei for the formation of clouds and promote atmospheric chemical reactions. Understanding atmospheric aerosols is one of the most important ways that scientists can improve models for weather and air quality forecasting and for climate change prediction.

In order to gather information on the size and shape of particles it is necessary to measure the characteristics of light directly from the sun and also light scattered and absorbed by the aerosols, at angles up to 90° away from the sun. One of the most widely used instruments for this purpose is the POM Sky Radiometer, manufactured by Prede Co. Ltd. in Tokyo and distributed by Kipp & Zonen.

In 2001 the Remote Sensing Group of the Plymouth Marine Laboratory (PML) in the UK installed a POM-01 Sky Radiometer as part of an atmospheric correction exercise for ocean colour satellite data. Following consultation with PML, the MetOffice Research Centre at Cardington, Bedfordshire purchased a POM-01 for aerosol measurements. Then University College London (UCL) installed a POM-01 in the heart of London to compare ground-based aerosol measurements with satellite retrievals and to achieve a better understanding of aerosol transport from street canyon level to the planetary boundary layer and entrainment into the free atmosphere. Last year the British Antarctic Survey (BAS) in Cambridge decided to replace their Ångström Pyrheliometers for the measurement of stratospheric aerosols. These have been in service at the Rothera Antarctic Station since 1958 and each observation is manual, takes about 20 minutes, and requires calm conditions. Nowadays automated measurements are needed and BAS decided to purchase two POM-01 Sky Radiometers. Both units are installed at the Cambridge headquarters and another one will be transferred to Rothera Station in January 2008.

Plymouth is a coastal city and so the aerosols tend to be larger than those generated over land and contain a lot of salt particles. Cardington is an open inland site, Cambridge is semi-urban and London is a large city with the associated pollution and heat island effects. These four sites now form the basis of the UK sun photometer network.

The Natural Environment Research Council (NERC) runs the APPRAISE programme (Aerosol Properties, Processes And Influences on Earth's Climate) and one activity is to validate aerosol optical depth, size distribution and refractive index measurements from sun photometers around the United Kingdom. Therefore, an inter-comparison of four POM-01 Sky Radiometers took place during Summer 2007 at the Chilbolton Facility for Atmospheric and Radio Research near Stockbridge, Hampshire. There are on-going discussions about how to fund expansion of the POM network in the United Kingdom.

This example from the United Kingdom shows how a network of measurement instruments can be built up over a number of years through institutes that have similar aims and are willing to co-operate to improve knowledge.

PML

UCL

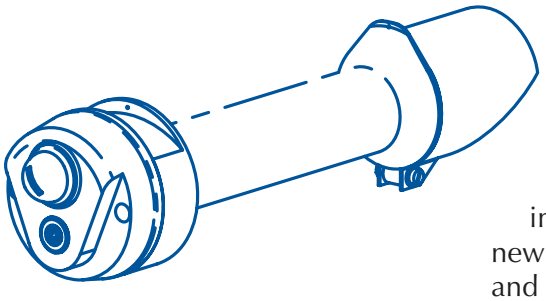
Chilbolton

Chilbolton

Introducing the Next Pyrheliometer: CHP 1

Solar radiation is the driving force behind biological and geophysical processes in meteorology, climate and our environment. The sun irradiates the top of the earth's atmosphere at an average intensity of 1367 W/mÇ. As the solar rays travel through our atmosphere they are absorbed and scattered. Resulting in different components of solar radiation reaching the earth's surface. The direct component travels in a straight beam from the sun; whilst a diffuse component comes from all directions, due to the atmospheric scattering process.

A pyrheliometer is an instrument designed specifically to measure the direct beam solar irradiance with a field of view limited to 5º. This is achieved by the shape of the collimation tube, with precision apertures,



and the detector design. The front aperture is fitted with a quartz window to protect the instrument and to act as a filter that passes solar radiation between 200 nm and 4000 nm in wavelength. A pyrheliometer needs to be pointed at the sun at all times so that the solar disk always falls within the field of view of the instrument. Using an automatic sun tracker the direct solar irradiance can be measured very accurately during the whole day.

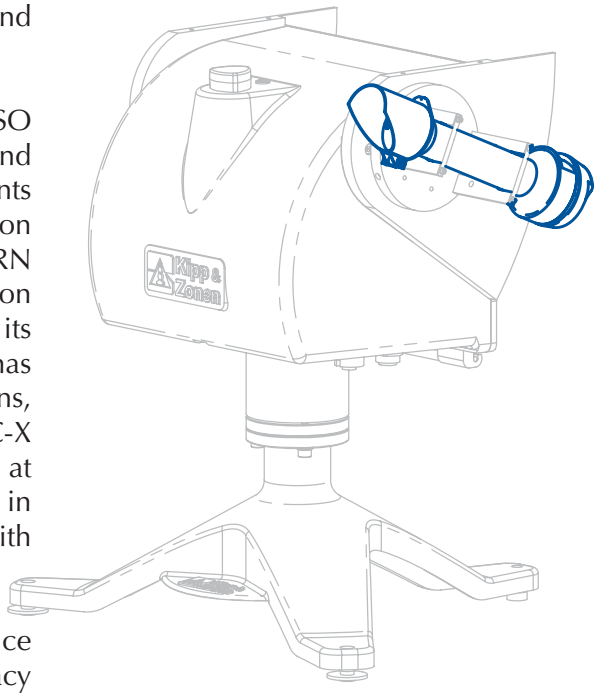
For many years Kipp & Zonen has provided a complete range of solar radia tion measurement instruments, including the CH 1 pyrheliometer. We are now proud to announce our latest development, the eagerly awaited ***CHP 1.***

CHP 1 is a new pyrheliometer that builds on the legacy of the CH 1, offering the reliability and durability of its predecessor together with important improvements. Highlights are improved temperature dependency and a new detector design that minimizes the influence of ambient temperature fluctuations. An internal temperature sensor is installed as standard and the new design is more installation and service friendly thanks to the new signal cable connector and screw-in desiccant cartridge.

The specifications exceed the ISO 9060 'First Class' standard and ***CHP 1*** meets all the requirements for high end solar radiation networks, such as the BSRN (Baseline Surface Radiation Network). During its development ***CHP 1*** has participated in field campaigns, including the IPC-X pyrheliometer intercomparison at the World Radiation Centre in Davos Switzerland, with excellent results.

CHP 1 will be the best choice available for high accuracy measurements of direct solar radiation for meteorological, climatological and renewable energy research. It will fit easily to all Kipp & Zonen sun trackers, including the new SOLYS 2, using the existing ***CH 1*** mounting fixtures.

For more information please visit our website or contact your local distributor.



The Start of a Baseline Surface Radiation Network in Korea

B&P International became our Korean distributor in 1998 and began actively promoting Kipp & Zonen products to the Korean Meteorological Administration (KMA) and other customers.

KMA is the national authority for weather forecasting and managing various weather related equipment, such as Automatic Weather Stations (AWS), buoys, wind profilers, Radar and meteorological satellite data. B&P's relationship with the KMA began many years ago as the provider of their data loggers and technical support.

Upon the requests of several researchers and other users, KMA was asked to provide a means to calibrate the various pyranometers used in the Korean field.

B&P offered the CM 21 as the new reference pyranometer for solar radiation measurements, and with activities such as live demonstrations B&P promoted the CM 21 to KMA. As a result KMA purchased six CM 21 pyranometers as references for its regional branches in 2000 and is now also equipped with a full Kipp & Zonen Calibration Facility.

The normal AWS (Automatic Weather Station) used by KMA only measures air temperature, wind and precipitation. However, a Synoptic Weather Observation Station (SWOS) collects more data: air temperature, humidity, wind direction, wind speed, air pressure, solar radiation, sunshine duration, precipitation, ground temperature and (sometimes) visibility.

Therefore, KMA is expanding their network with SWOS's. Each year from 2001 to 2006 four or five new SWOS were deployed and in 2007 KMA has set up 14 new SWOS's with installation by B&P.

Every SWOS is equipped with a Kipp & Zonen CM 21(now CMP 21) pyranometer.

Y.K. Kim, B&P Engineer, installing a CMP 21 on a Synoptic Weather Observation Station

In 2005 a committee was formed representing the various weather authorities, including the KMA and universities meteorologists. They came together to define a standard list of meteorological instrument requirements together with recommendations and advice for people who are not familiar with weather instruments. The purpose was also to encourage the use of high quality instruments. At the KMA's suggestion, the CM(P) 21 was defined as the standard pyranometer.

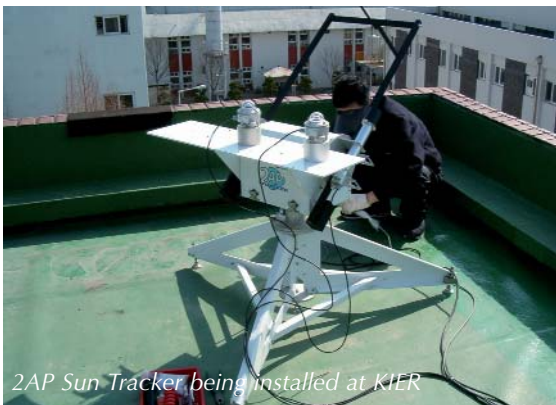
Due to the recent frequent unusual changes of weather patterns and the rapidly increasing price of oil, the Korean government has enlarged the budget for climate research and renewable energy development.

Mr. Jung S. Suh, President of B&P

With these recent developments in Korea, the available budget and expanding professionalism, the KMA is now planning to establish a Baseline Surface Radiation Network (BSRN) of more than 10 stations around Korea, beginning in 2008.

Each BSRN station requires as a minimum: a 2AP sun tracker, a shading assembly, two CMP 21 pyranometers and one CGR 4 pyrgeometer fitted with CV 2 ventilation units, one CH 1 pyrheliometer, and a high performance data logger.

The 2AP is recognized as the best sun tracker in use in Korea, proven by the good experiences of the Korean Institute of Energy Research (KIER). B&P involvement is to provide the required instruments for the BSRN stations that will include mainly Kipp & Zonen products.



2AP Sun Tracker being installed at KIER

Extreme Weather Conditions at Canadian Scientific Network Sites

A good sensor continues to operate well under all the environmental conditions that it is subjected to, and the Canadian High Arctic offers a demanding test site. Campbell Scientific (Canada) Corp. is Kipp & Zonen's exclusive Canadian distributor, supplying to radiation monitoring networks and high level scientific research across the country. Here they share some of their experiences.

At the summit of the Agassiz Ice Cap on northern Ellesmere Island, one unique application has a CM 3 installed upside down – on purpose! In order to get an idea of the radiation load on temperature measurements, collecting reflected radiation data gives an indication of the incoming radiation if the Albedo is constant.

Since this station is only visited once per year, the data would be lost when the pyranometer dome became covered by snow or frost, a problem that is eliminated by mounting the sensor upside down. Another application uses 2AP Sun Trackers with integrated radar and transects immense ice packs by sled to get mobile readings. The Canadian Arctic Archipelago is the location of many field sites for Campbell's clients as well as their own research and development stations.

Kipp & Zonen products feature prominently in many regions of Canada, including at the Saskatchewan Research Council's long-term meteorological station - a 100-year plus project that was initially launched using a Campbell Stokes Sunshine Recorder. It has since graduated to a CSD1 Sunshine Duration Sensor which has been entrusted with the continuance of the original manually recorded data.

Thanks to Campbell Scientific (Canada) Corp. for providing the cover photo.

Update of Ice Warning System

Since 1991 Mierij Meteo has installed and maintained the Meteorological part of the Ice Warning System (IWS) in the Netherlands. IWS is a comprehensive network of 320 stations beside the Dutch motorways providing accurate data to the Road Authorities. Using this information the Road Authorities are able to forecast slippery conditions up to 3 hours in advance.

The meteorological part of the IWS measures Air Temperature, Relative Air Humidity and Detection of Precipitation. Together with the Road Surface Temperature and Road Conductivity, decisions are taken by the Road Manager to reduce the chance of slippery roads – for example, when to apply salt or grit.

In Autumn 2007 Mierij Meteo was commissioned to update the IWS.

Ice Warning System

The main improvements to the meteorological part is the replacement of the old Precipitation Detection sensors with the new optical Rain Detector model 205. The data acquisition system has also been updated and this second generation IWS will be fully operational along the Dutch motorways this winter.

For more information please contact Barry Engelen:
be@mierijmeteo.nl

FAIRS & EVENTS

AMS – New Orleans, USA	20-24 January
European Wind Energy Conference & Exhibition – Brussels, Belgium (Mierij Meteo)	31 Mar – 3 Apr
EGU – Vienna, Austria	13-18 April

“I have no special talent. I am only passionately curious”

(Albert Einstein 1879 – 1955)

KNOWLEDGE INNOVATION PASSION PERFORMANCE

Passion is one of our key values

The sun and the atmosphere drive the weather, climate and life on our planet and we are committed to helping the scientific community to better understand our changing environment and what might happen in the future.

Our mission is to satisfy the fundamental need to monitor atmospheric properties related to climate change, classical meteorology, agronomy, renewable energy and the available water budget. To achieve this we support significant research and development by offering the highest quality equipment, solutions and support for these markets.

Everyone involved in these subjects is passionate about them. We share this desire to improve scientific knowledge of the world that we live in and to contribute to the exploration of our future climate and its effects on eco-systems and bio-diversity.

Therefore it is with passion that we develop, produce and market our products worldwide. Kipp & Zonen is a business, but we also believe that what we do is of genuine benefit to the global scientific community.

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Head Office

Kipp & Zonen B.V.
Delftechpark 36, 2628 XH
P.O. Box 507 2600 AM
Delft, The Netherlands

T +31 15 2755 210
F +31 15 2620 351
E info@kippzonen.com

Sales Offices

Kipp & Zonen France S.A.R.L.
7, Avenue Clément Ader
ZA Ponroy - Bât. M
F-94420 LE PLESSIS TREVISE

T +33 1 49 62 41 04
F +33 1 49 62 41 02
E kipp.france@kippzonen.com

Kipp & Zonen Asia Pacific Pte. Ltd.
583 Orchard Road
16–01 Forum Building
Singapore 238884

T +65 6735 5033
F +65 6735 8019
E kipp.singapore@kippzonen.com

Kipp & Zonen U.K. Ltd.
P.O. Box 819,
LINCOLN, Lincolnshire
LN6 0WY

T +44 1522 695 403
F +44 1522 696 598
E kipp.uk@kippzonen.com

Kipp & Zonen USA Inc.
125, Wilbur Place
BOHEMIA
NY 11716

T +1 631 589 2065
F +1 631 589 2068
E kipp.usa@kippzonen.com

Kipp & Zonen SINCE 1830

Find your local distributor at: www.kippzonen.com

NL-4414-103-0801