DANFYSIK

Newsletter 2014

50 YEARS excellence in acceleration technology

DANFYSIK

“ – 50 Years of excellence in accelerator technology within industry, research and healtcare.

New and younger experienced forces in CEO seat

–

"I look forward to working closely with our customers" *Frank Ebskamp, CEO*

Page 2

50 years in accelerator business

–

From farm house to high tech facility – the story of Danfysik

Page 8-9

Magnet systems for synchrotron light sources

–

MAX-lab and SOLARIS a new generation of high brightness light sources

Page 12

Content

HOW TO MAKE LASER ACCELERATION FIT FOR INDUSTRIAL APPLICATIONS?
Danfysik joins international training network LA³NET...
p. 6

50 YEARS IN ACCELERATOR BUSINESS
In 1964 a young engineer, Ejnar Jespersen, founded a small company with the purpose of providing...
p. 8-9

DANFYSIK DELIVERY TO BIG SCIENCE PROJECT IN POLAND
The new 1.5 GeV synchrotron radiation facility SOLARIS...
p. 13

A STRONG GLOBAL SALES FORCE – DANFYSIK AGENT AND DISTRIBUTOR TEAM MEETING IN TAASTRUP
In October, 2013, Danfysik's Agents...
p. 16

New CEO in Danfysik

> "I am very excited to take over as the CEO of Danfysik. Danfysik is in an excellent position to serve our customers in research, healthcare and industry, and I look forward to working closely with our customers"

Frank Ebskamp, CEO Danfysik

After more than 35 years of service in Danfysik, and the last 15 years as the CEO, I have decided to pass the command on to new and younger forces. I am pleased that I will continue in the company on part time basis as Executive Advisor. My successor, Frank Ebskamp, started in his new job as CEO of Danfysik on March 1st, 2014.

He has a degree in physics from University of Leiden and a PhD from the Danish Technical University. Frank has extensive managerial experience from high-tech companies, including NKT Electronics, Tellabs and last as the CEO of Dynatest International. Let me use this occasion to thank you, our customers, for the trust you have shown me and the Danfysik team over the past 15 years.

Best regards,
Bjarne Roger Nielsen
Executive Advisor

Back in system business
– two ion beam system deliveries to India

Turn-key beamline systems for 30 MeV high power medical cyclotron in Kolkata

The Medical Cyclotron (30 MeV, 500 micro-amp, proton beam) is being set up by Indian Department of Atomic Energy at VECC, Kolkata. It has one beam line for producing PET radioisotopes and two beam lines for producing SPECT isotopes. Danfysik has taken up the challenging task for development of two turn-key high current proton beam lines; one with two horizontal branches and one with a vertical beam transfer to an underground beam irradiation cave at -8 m level. The two beam lines will be used for material science study and ADSS target development.

Starting with optimizing the ion optical layout of the system, Danfysik has been designing all magnets, the vacuum system, beam diagnostics and power supplies. Manufacturing will start as soon as design is approved. The two beam lines will be installed and commissioned by the experienced Danfysik medical accelerator team in early 2015. Experiences from Danfysik's installation and commissioning of the particle therapy project in Shanghai are warrants of successful completion of the Medical Cyclotron project in Kolkata. This Medical Cyclotron will be first of its kind in India producing high intensity proton beam.

Magnets and power supplies for high current injector program at IUAC, New Delhi

In total 51 quadrupole magnets, 8 bending magnets and 56 power supplies Model 9100 are being designed, built and tested by Danfysik. These magnets are going to be used into beam transport system comprising four 90° achromatic bends for High Current Injector (HCI) project, an ECR based alternate injector for LINAC accelerator at IUAC, New Delhi, India.

Highly charged ions from ECR are analysed and further accelerated through room temperature Radio Frequency Quadrupole (RFQ) and Drift Tube LINAC (DTL) to 1.8 MeV/u. Seven singlet quadrupoles are used to transport beam RFQ to DTL and other magnets for transporting from DTL to the entrance of a superconducting linac, approximate 50 meters away from DTL.

The facility will be used for nuclear physics, materials science, atomic physics, radiation biology and radiation physics. All magnets and power supplies will be delivered in early summer 2015. ■

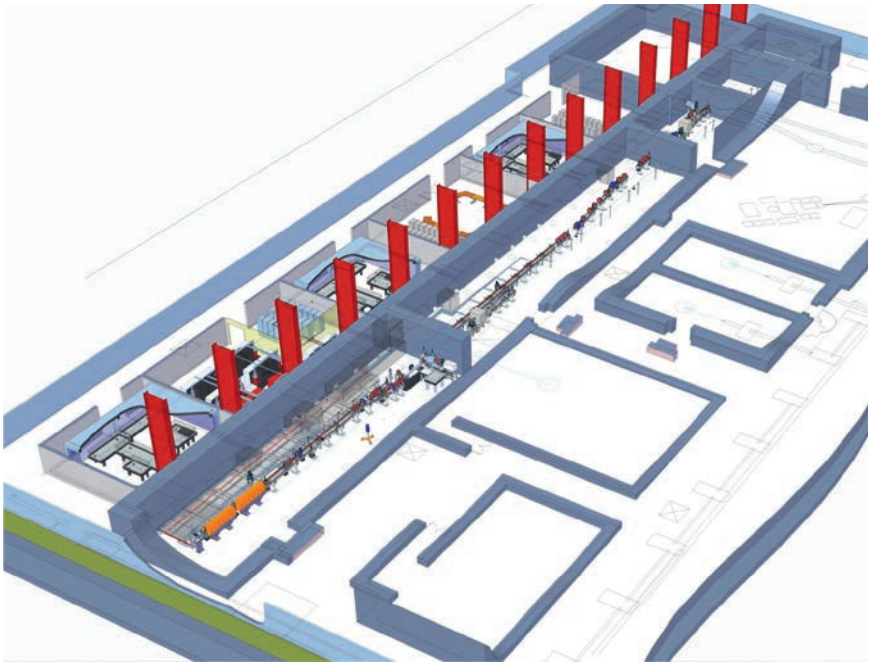
"– "It was a pleasant experience for me and my colleagues to visit Danfysik during the design phase and Phase-1 testing and acceptance of the magnets and power supplies. The Danfysik design- and test team have been supportive to our needs and always eager to keep us satisfied. The philosophy to deliver the best could be seen in their equipment during visual inspection and testing"

Dr. A. Mandal,
Senior Scientist, IUAC

Magnets for ELI NP – the Extreme Light Infrastructure for Nuclear Physics project in Romania

In April 2014 Danfysik won a major contract with the European consortium EuroGammaS for the delivery of all magnets for the most advanced and powerful gamma beam facility in the world, the European Extreme Light Infrastructure for Nuclear Physics (ELI-NP) in Romania.

The EuroGammaS consortium, which is led by Italy's Institute of Nuclear Physics INFN, has been selected to develop the accelerator based gamma source, which will form part of the major new research facility.
The ELI-NP, which will be built in Bucharest-Magurele, will be one of the three pillars of ELI - THE EXTREME LIGHT INFRASTRUCTURE, along with the facilities dedicated to the study of secondary sources (Dolni Brezany, near Prague) and attosecond pulses (Szeged).



Schematic layout of the ELI-NP (Extreme Light Infrastructure for Nuclear Physics) Gamma Beam System in Magurele, Romania.

ELI-NP will create a new European laboratory to consistently investigate a very broad range of science domains, from new fields of fundamental physics, new nuclear physics and astrophysics topics, to applications in material science, life sciences and nuclear materials management.

Extreme Light Infrastructure (ELI) will be the only European and International Centre for high-level research on ultra-high intensity laser, laser-matter interaction and secondary sources with unparalleled possibilities.
Its pulse peak power and brightness will go beyond the current state-of-the-art by several orders of magnitude.

The delivery from Danfysik includes
8 dipoles, 39 quadrupoles, 3 solenoids and 27 steerers, and the scope covers field calculation, design, manufacture and field mapping with documentation. ■

Key parameters of the ELI-NP Gamma Beam System	
Based on	**: A Compton back-scattering source**
Electron beam energy	**: 720 MeV**
Photon energy tunable	**: 1-20 MeV**
RMS bandwidth	**: <0.3%**
Spectral density	**: >104 photons/sec.eV**
Source spot sizes	**: <100 microns**
Linear polarization of the gamma-ray beam	**: >95%**

Green Magnets® are permanent magnet based, fully and passively temperature compensated accelerator magnets that are optimized for minimizing operation expenses. Green Magnets® are developed in collaboration with Aarhus University, Aalborg University and Sintex A/S.

Green Magnets®

Compact AMS with Green Magnet® Technology

By applying Danfysik compact Green Magnet® technology, Hans Arno Synal, Head of the ETH Zürich Laboratory of Ion Beam Physics, and co-founder of the Ionplus AG, a recently established ETH-spin-off company, believes that Accelerator Mass Spectrometers (AMS) can be compacted to a single-room solution which makes it possible to integrate them into common laboratory environments.

Green Magnets® are permanent magnet based, fully and passively temperature compensated accelerator magnets that are optimized for minimizing operation expenses.

> – "It was a very swift installation and beam was established right away. Since the installation last year, we have almost forgotten the existence of the magnet, even after power cuts."

Søren Pape Møller,
Director, Institute for Storage Ring Facilities
at Aarhus University

Green Magnets® are developed by a consortium of University institutions in Aarhus, Aalborg and by the Danish permanent magnet manufacturer Sintex A/S.

First 1 Tesla combined function Green Magnet® tested at ISA in Aarhus, Denmark

The Centre for Storage Ring Facilities, ISA, at Aarhus University has received the first permanent magnet based Green Magnet®. It is designed as a 1 m long 30° bending magnet with a maximum field of 1 T. It has been constantly operated in the 0.58 GeV beam transfer line between the injector ring ASTRID1 and the main synchrotron ASTRID2 since December 2014. A long term test of six months has proven the applicability of Green Magnet® technology in vivo under the operational conditions met at synchrotron radiation facilities in terms of radiation and temperature variations.

Supported by our customers at ISA in Aarhus we at Danfysik believe that the next generation of low emittance, synchrotron light sources with top-up injection are going to be built with compact, low power and zero cooling water consuming Green Magnets®. ■

How to make laser acceleration fit for industrial applications?

Danfysik is involved in the European research network LA³NET (www.la3net.eu). Within LA³NET, 17 early stage researchers and more than 30 partner institutes including universities, research centers and industrial companies cover the whole spectrum of laser-based applications for accelerators.

In different projects, novel accelerators for electron and ion beams, advanced ion beam generation schemes and diagnostics are exploited. LA³NET brings together laser experts and accelerator scientists to boost the research in that field and to train the next generation of experts.

When the network met for the mid-term review meeting in Copenhagen at the Danfysik site in June 2013, LA³NET received 'best marks' in research, training and networking by the project officer from the European Commission: 'A project to be proud of'!

At Danfysik, Jakob Krämer is working on 'developing the current experimental research into laser acceleration to a pre-commercial level'. He has designed a permanent magnet based final focus system for the Helmholtz-Centre Dresden-Rossendorf, which meets the requirements for a high flux Thomson X-rays source. In this source, a high power laser acts like an optical undulator on an electron beam. The emitted X-rays have high brightness and a short pulse length of about one picosecond. The focus system consists of four quadrupole magnets placed on a motorized linear stage in an industrially robust manner. By remotely changing the distances between the magnets, it can handle different electron beam energies between 20 and 30 MeV, keeping the properties of the tight focus at the interaction point with the high power laser.

Danfysik will manufacture, test and commission the final focus system in Rossendorf within 2014. ■

We take pride in applying **our technology in healthcare**

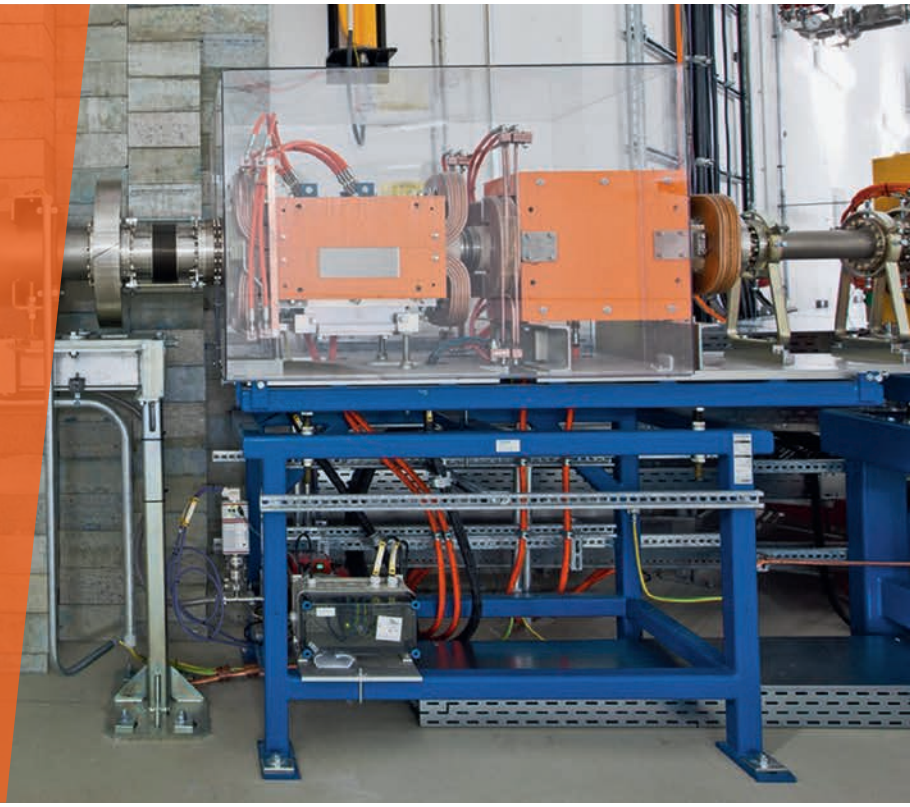
Good news for patients suffering from types of cancers, which are inaccessible for surgery and difficult to treat by conventional radiation therapy. These patients now have a new hope. Particle therapy with light ions from the elements hydrogen, helium, carbon or oxygen can kill cancer cells with millimeter precision. Due to the special properties of high velocity ions, healthy tissue is spared. In particular, children and patients with cancer surrounded by radiation sensitive tissue benefit from Particle Therapy (PT) treatment.

With our synchrotron technology, we are a leading commercial provider of total accelerator system and subsystem solutions for the newest, second generation PT facilities. Second generation PT uses light ions instead of the light protons used in the first generation technology. In addition, second generation, synchrotron based facilities offer a wide range of ions for flexible treatments at ultimate precision and efficiency. Newest research in the field has indicated that ions as heavy as carbon or oxygen can kill cancer cells most efficiently due to a higher biological effect.

Danfysik PT technology is being applied in two world class facilities, at the University Hospital in Marburg-Giessen in Germany and at the ShaPHIH hospital in Shanghai, China. ■

Key parameters of the Danfysik PT accelerator

Available Ions protons	**$^{3}He^{++}$, $^{4}He^{++}$, C^{6+}, O^{8+}**
Ion Energy	
Protons	**: 50-250 MeV**
Carbon	**: 85-430 MeV/u**
Dose distribution	**: Pencil beam scanning**
Transverse field	
Protons	**: 200 x 200 mm²**
Carbon	**: 200 x 200 mm²**
Particle Intensity	
Protons	**: $2 \cdot 10^{8}$ to $2 \cdot 10^{10}$ (per spill)**
Carbon	**: 10^{7} to 10^{9} (per spill)**
Extraction/ramping time	**: 10s/1s**



50 years in accelerator business

In 1964 a young engineer, Ejnar Jespersen, founded a small company with the purpose of providing particle accelerator equipment for the research market. The company was named Danfysik and for the first 25 years both offices and workshops were located in idyllic farm buildings in the middle of the village Jyllinge, north of Roskilde in Denmark. Those of you who were customers at that time will recall these buildings and the charm of making high technology accelerator equipment in a farm.

Sværdagergaard in Jyllinge is well known to many customers as the first site of Danfysik (from 1964 to 1990).

Fifty years have passed since then – and the company history counts numerous new developments. The first complete particle accelerator designed and built by the young company was an isotope separator for National Bureau of Standards in Washington DC. This machine was delivered and installed in 1967. Later several other isotope separators were built, including three ISOLDE type on-line isotope separators to Japanese laboratories.

In the early days of ion implantation for semiconductor fabrication a 350 keV ion implanter was made for ETL (Electro Technical Laboratory) in Tsukuba, at that time one of the leading Japanese development centers for advanced computer technology. The first industrial ion implanter with two silicon wafer stations were delivered to IBM in 1973. Much later, in the late 80'es, when Geoff Dearnaley at Harwell developed ion beam modification of metals (ion hardening), we made a number of versatile high current ion implanters for this application.

During the period 1980-1985 we got deeply involved in the neutral beam heating technology at European fusion energy laboratory JET at Culham, UK. Our task was to safely handle the eight very high power ion beams (4,8 MW each!).

Ejnar Jespersen taking part in the site acceptance test at ETL, Tohoku, Japan in 1971.

Our magnet power supply technology went through a major leap forward when we developed the Ultrastab Current Transducer in the late 80'es. Now it was possible to match the fast increasing demands to current stability and regulation of the particle accelerator market and not

to forget the MR imaging equipment manufacturers. Furthermore, when we developed System 8000 Magnet Power Supplies with digital control, versatile interfaces and modern product design, our power supply platform was optimized for the future.

In 1995 we developed our first undulator for NSRRC in Taiwan. Since then, for almost 20 years we have delivered 45 insertion devices of mostly different designs for various synchrotron light sources over the world, PPM, HPM, IVUN, cryo-IVUN, EPU, SCW, EMW, etc.

“ –"In our business, collaboration between researchers and industry is a must"

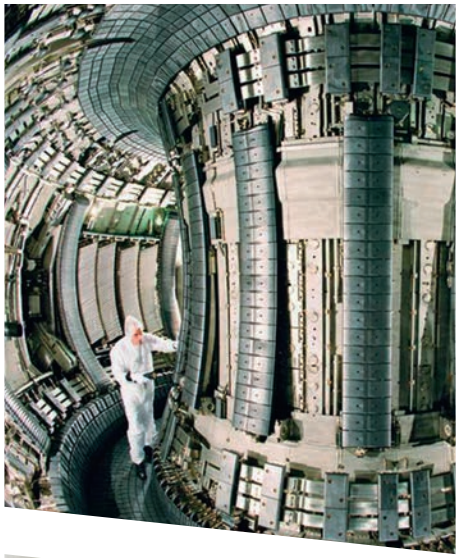
Ejnar Jespersen,
founder of Danfysik A/S

The greatest leap towards building advanced accelerator systems was without doubt in 1997, when we accepted a contract with FZ Karlsruhe (now KIT) to deliver a complete 500 MeV booster synchrotron with a 100 MeV injector microtron for the ANKA synchrotron light source. The machine was designed, manufactured and installed within 30 months. In 2000 when ANKA was delivered our next turnkey synchrotron project started. This time it was a 2.9 GeV injector synchrotron for the Canadian Light Source, and when that was commissioned the job went to Melbourne where we delivered the 3 GeV injector synchrotron for the Australian Synchrotron Project.

In 2006-2008, we delivered the world's first industrialized complete light ion accelerator for the Siemens particle therapy facility at Marburg University Hospital in Germany. A very large and complex system with extreme demands to specifications, quality, reliability and uptime. A similar system was later delivered to the international hospital ShaPHIH in Shanghai.

Our recently introduced Green Magnet® products are one of our flagships in accelerator technology development. Green Magnets® can save up to more than 75% energy consumption and make infrastructure such as cooling and cabling obsolete. Another one is the industrial mastering of manufacturing the compact magnet technology for ultra-bright synchrotron light sources as invented by MAX-lab for MAX IV in Lund.

In 1964 the vision of Ejnar Jepsersen was to provide excellent particle accelerators and related equipment to the research, healthcare and industrial markets. This vision has led us to become our customer's technologically preferred supplier of accelerator products – and it will continue for many years to come. ■



Left:
Danfysik made the large magnet systems for neutral beam heating at the European fusion energy laboratory JET at Culham, UK (1982-1985).

Below:
In 2014 we deliver the advanced compact magnet systems for the new ultra-bright synchrotron light source MAX IV in Lund, Sweden.

Photo: FOJAB arkitekter

Cool model 9100 power supplies – now without water hoses

2013 was a record selling year for the Danfysik System 9100. Part of this success was the introduction of a new air-cooled version and it was well received by our customers. The air-cooled version has the same performance as the water cooled version. The system 9100 can be configured with up to four power modules, which can provide up to 12 kW electrical power (200 A / 60 V) with 10ppm long term stability (8 h). The air cooled System 9100 is also available as a bipolar version with up to ±100 A / ±60 V (2 quadrant operation).

Currently the System 9100 is available in a 400 VAC mains voltage version and the product family will be expanded to also cover the 208 V market with delivery in the first quarter 2015. The first 208 VAC mains versions planned are the unipolar 100 A / 60 V both water cooled and air cooled versions. ■

"–"I see the introduction of a three phase 208 V, 60 Hz input power option for the System 9100 as enabling Danfysik's North American Customers to utilize the Power Supply in accelerator and laboratory electromagnet applications requiring a very high performance, compact, high efficiency, Unipolar and True Bipolar Power Supply."

Brian Richter,
President of GMW Associates

POWER UNITS FOR THE DESY XFEL PROJECT

Danfysik has received a contract for 120 power converter modules for the XFEL project at the DESY facility in Hamburg, Germany. Each water cooled module, contains a 200 A / 150 V Buck switch mode converter unit which can be connected in parallel for high output current. ■

HIGH POWER

Over the years Danfysik has built up experience in the high power converter field.
This has resulted in contracts for some technically challenging and innovative power supply projects. After commissioning of the booster power supplies for NSNL-II at Brookhaven National Laboratory last year, Danfysik have delivered a 1.4 MW converter for the Rutherford-Appleton Laboratory in UK. This converter will be used for the DC biasing of the 50 Hz White-circuit for the ISIS synchrotron.

JINR Russia
Danfysik has just completed the commissioning of a 2800 A / 400 V high stability power supply at the Joint Institute for Nuclear Research in Dubna, Russia. The unit is part of the U400 cyclotron upgrading. The U-400 cyclotron used for experiments on the synthesis of heavy and exotic nuclei. ■

Always at your service

Modern accelerators are operated almost around the clock and every day of the year, regardless of their application. Up-time requirements are ever increasing, often exceeding 95%. In order to free resources at our customers' organizations, we continuously develop our service and maintenance activities at Danfysik.

Focus on Customer Services
Our aim is to provide our customers with the quality service and support required for maintaining high reliability and long-term use of their equipment. This was a main factor in our decision to split up the Test- and Service Department making it possible for the Service Department to strengthen our focus on customer service.

New online Helpdesk System for technical questions
For technical questions, please use our helpdesk system by sending your question or inquiry to service@danfysik.dk. If your inquiry is related to a specific part, please always include serial- and part number of the power supply and specific part. Please feel free to download our quick guide on our website.

Downloads
Customer Service offers latest version manuals as free downloads from our website. Lab View drivers for our standard systems are available as well. ■

"–"Our team of 7 highly skilled people has more than 55 years of experience with test and customer service at Danfysik"

Christian Pilegaard,
VP, Customer Service

New High Precision System 9100 Power Converter, air cooled version, for TIFR, India

Early this year, 8 air cooled System 9100 Power Converters were successfully commissioned at the Tata Institute of Fundamental Research (TIFR), Mumbai. Since then, the air cooled power converters are a valued asset to TIFR and providing very stable beam. Due to the high reliability and performance of our air cooled power converters, TIFR will purchase 8 more and delivery will be later this year. ■

"–"We are pleased with the performance of the highly stable, air cooled power supplies, System 9100. Danfysik's innovative development of producing a true 10ppm air cooled power supply with light weight, makes life easier for maintenance and handling"

Professor Vandana Nanal,
TIFR

Magnet systems for extremely bright and compact synchrotron light sources

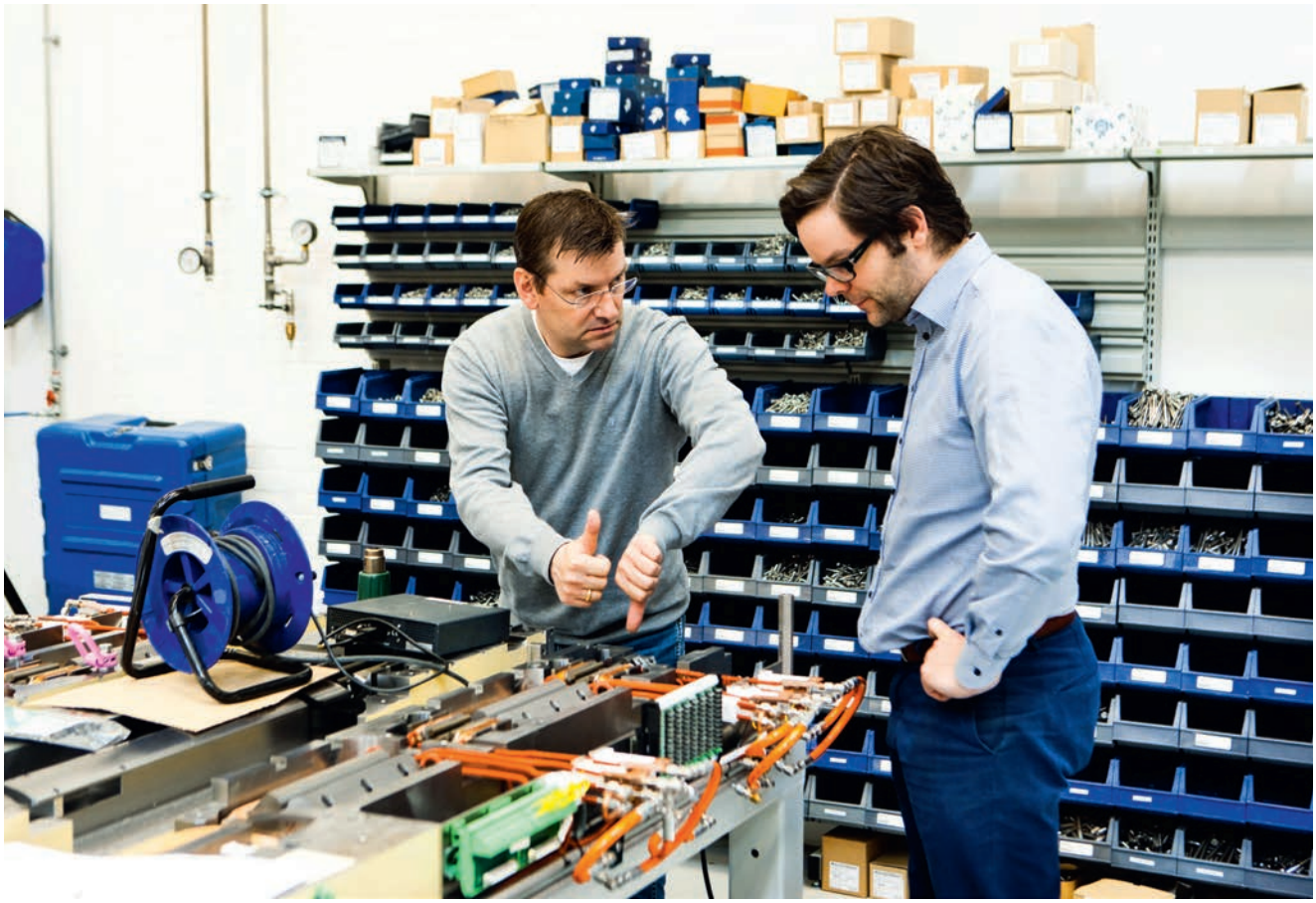
Danfysik is finalizing its delivery of three different types of of the compact multiple bend achromat sections for the 3 GeV and the 1.5 GeV synchrotron light sources of MAX IV in Lund, Sweden. Many seperate and combined functions are integrated into single yokes, which provide bending, focusing, defocusing and steering of electrons in magnet systems of lengths ranging from 2.5 m to 4.5 m.

Throughout the entire production the mechanical tolerances of ±0.02 mm were kept across the compact multi-function magnet block (lattice element). The performance of each magnetic function has been measured in ultra-stable Hall mapping and Rotating Coil measuring systems enabling the engineering and scientific staff at Lund to preconfigure the lattice elements for a fast installation and commissioning operation.

The delivery of twelve 4.5 m long lattice elements for the 1.5 GeV SOLARIS synchrotron light source will commence early summer 2014 followed by an equal amount of elements for the MAX IV 1.5 GeV ring.

Machining of the very long and 8 tons heavy element to an absolute tolerance less than 0.02 mm has been approved through validation of the first produced element. Magnetic properties are being validated and will be completed end of June 2014. ■

MAX IV and SOLARIS magnets



Danfysik delivery to big science project in Poland

The new 1.5 GeV synchrotron radiation facility SOLARIS of the Jagiellonian University in Krakow is one of the largest research installations in Poland. Danfysik is applying the most advanced magnet technology for extreme low emittance operation of synchrotron light sources, which has been co-developed with MAX-lab in Lund, Sweden. Twelve compact magnet systems, integrating dipole, multipole and corrector functions into one magnet yoke are being designed, manufactured and tested at Danfysik. A copy of the magnet systems will be delivered to the 1.5 GeV MAX IV light source at MAX-lab in Lund.

Test measurements of the pre-series magnet showed excellent performance of the magnets and series production was approved early this year.

The Danfysik delivery include power supplies for most of the large magnet functions. Both the magnet and power supply deliveries will be completed by September, 2014. ■

“ –"We know Danfysik as one of the technologically most advanced suppliers of accelerator products. Therefore we are convinced that they will master the challenge of building the complex magnet systems for the synchrotron light source SOLARIS, the biggest project of the Polish Research Infrastructure Road Map."

Carlo J. Bocchetta,
Project Leader, Solaris Synchrotron

Large Q13 quadrupole magnets for ISIS in process

The manufacture and testing of the 10 large aperture Q13 quadrupole magnets for the ISIS Proton Beam Transport Lines at the Rutherford Appleton Laboratory is progressing well. The 310 mm aperture quadrupoles will produce magnetic field gradients of 8 T/m, corresponding to pole tip fields of 1.24 T. First quadrupoles have been completed, and field measurements have been successfully performed using our rotating coil measuring bench equipped with a dedicated measuring coil of 280 mm diameter and 1,400 mm length. RAL have subsequently contracted with Danfysik to equip 5 out of the 10 quadrupole magnets with dipole coil assemblies, 2 vertically and 2 horizontally orientated dipole magnets installed in the quadrupole apertures. The dipoles run at high current. Because of this the straight sections of the magnets will need to be stiffened to ensure the magnet do not fail due to yield, so stiffening plates have to be added forming part of the magnet body. Included in the scope for delivery of the dipole coil assemblies Danfysik have optimized and confirmed the design by Finite Element Analysis. ■

CERN's HIE-ISOLDE cryo modules will be equipped with superconducting solenoids from Danfysik

The new superconducting linear accelerator (sc linac) at the new HIE-ISOLDE facility at CERN will be built from independently phased superconducting quarter-wave resonators. These structures will provide high accelerating gradients for accelerating beams of short living radioactive isotopes and rare stable beams to energies of 10 MeV/n.

Danfysik will supply the focusing elements of the sc linac based on high field compact solenoids placed in-between superconducting RF cavities inside the vacuum tank of the cryo-modules.

The solenoids will be operating in a helium bath at 4.5 K, with a stable operating integrated squared field of 13.5 T^2m.

The stray field is less than 12 Gauss at 43 mm from exit, which is supporting a compact lattice structure.

Inherent Quench protection is applied through a special evolved electrical design using cryogenic compliant and validated active and passive components.

Safety operation has been applied in the design through CE certification according to Pressure Equipment Directive and compliance to endurance limit/fatigue limit stipulated by British Stainless Steel Association.

Magnetic validation is planned to be performed in July 2014 immediately followed by first delivery. ■

Large electrostatic deflector for Jyväskylä University

In March 2014, Danfysik delivered an electrostatic deflector to the Accelerator laboratory of the University of Jyväskylä. The deflector will be used in the new MARA (Mass Analysing Recoil Apparatus) recoil mass spectrometer, which is planned to complement and extend the research possibilities of the laboratory. MARA will enable spectroscopic studies of nuclei produced in fusion evaporation reactions along the N~Z line in the region around ^{100}Sn and below.

The total length of MARA is less than 7 m and its first order mass resolving power is about 250. ■

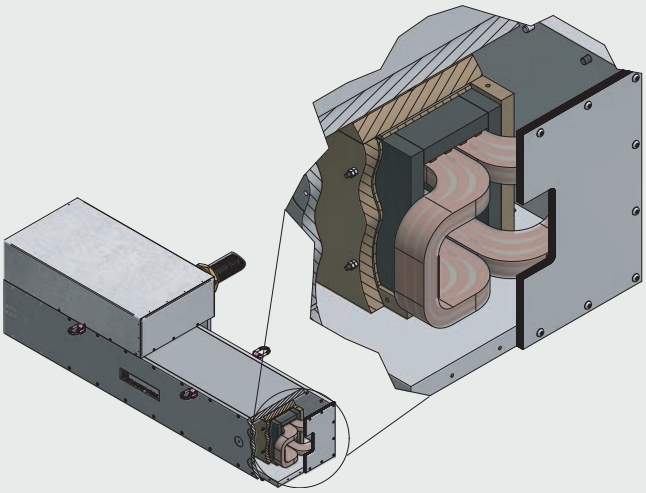
Key parameters of the electrostatic deflector

Conditioned to	**: 460kV (+/- 230kV)**
Bending angle	**: 20°**
Bending radius	**: 4000mm**
Electrode gap	**: 140mm**
Split anode with anode gap	**: 15 mm**
Titanium electrodes with height	**: 460mm**

Kicker system for TRIUMF

Danfysik is currently designing and manufacturing a kicker system (magnet and power supply) for the new Ultra Cold Neutron (UCN) beam line being constructed at TRIUMF, Canada's national laboratory for particle and nuclear physics. The kicker will deflect a proportion of the incoming beam vertically. The goal of the UCN beam line is to provide the world's highest density of ultra-cold neutrons.

The magnet, which is a fast switching, high repetition rate, ferrite core kicker magnet will be powered by a custom built 250 A / ±1800 V pulsed (50 µs rise and fall time) Danfysik power supply. The magnet will be delivered in spring 2015. ■



In-vacuum Undulator for NSLS-II at Brookhaven National Laboratory

In-vacuum undulator for NSLS-II

Danfysik is manufacturing a 22 mm period length in-vacuum undulator (IVU) for the Inelastic X-ray Scattering beamline (IXS) at the new NSLS-II light source of Brookhaven National Laboratory (BNL). The Undulator is currently being shimmed at Danfysiks facilities. The NdFeB magnet-based hybrid undulator is going to be operated at a minimum gap of 5.5 mm, resulting in a peak field of 1.096 T and a corresponding K-value of 2.09. All permanent magnets were TiN coated in-house.

At the IXS beamline, the IVU will produce X-rays for high-resolution studies of vibrational dynamics and excitations in condensed matter systems. ■

A strong global sales force – Danfysik agent and distributor team meeting in Taastrup

In October, 2013, Danfysik's Agents and Distributors gathered for a two days meeting in Taastrup and Copenhagen. Our strong sales force from Asia and USA met with Danfysik's sales and service teams in order to exchange experiences from different regions and markets and in order to get prepared for a growing global demand of accelerator products.

In order to exploit increasing sales opportunities in particular in the Asian markets agent and distributor agreements of our long time partners in China, Japan and South Korea were extended to including agency of Physics products in the respective regions.

After a Danfysik tour and latest product updates the agent and distributor day finished in a relaxed get-together in downtown Copenhagen. Danfysik wishes to thank all agent and distributors for their excellent sales work and branding of Danfysik. Without the strong customer relations of our overeas representatives, the latest success story of Danfysik would not have been possible. ■

"–"Danfysik's growing success is built on three pillars: The strong faith of our customers in our technologically advanced products, our highly skilled staff and a strong global sales force including our agents and distributors"

Arnd Baurichter,
VP sales & Marketing, Danfysik A/S

Facts

Company Address
Danfysik A/S
Gregersensvej 8
DK-2630 Taastrup
Denmark

Sales
Phone: +45 7220 2400
Fax: +45 7220 2410
Email: sales@danfysik.dk

Service
Phone: +45 7220 2403
Fax: +45 7220 2410
Email: service@danfysik.dk
www.danfysik.com

Production facilities
Gregersensvej 7-8
DK-2630 Taastrup

Danfysik would like to talk to you about how our competence in accelerator technology could benefit your business.
To hear more please contact our sales team at sales@danfysik.dk or our service team at service@danfysik.dk

Ownership and workforce
Danfysik A/S is 100% owned by the Danish Technological Institute and employs around 125 staff.

www.gebet.dk · 91698 · 06.14 · 200