Edition 1|2021

The Magazine for Electrical Safety

MONITOR

BENDER Group

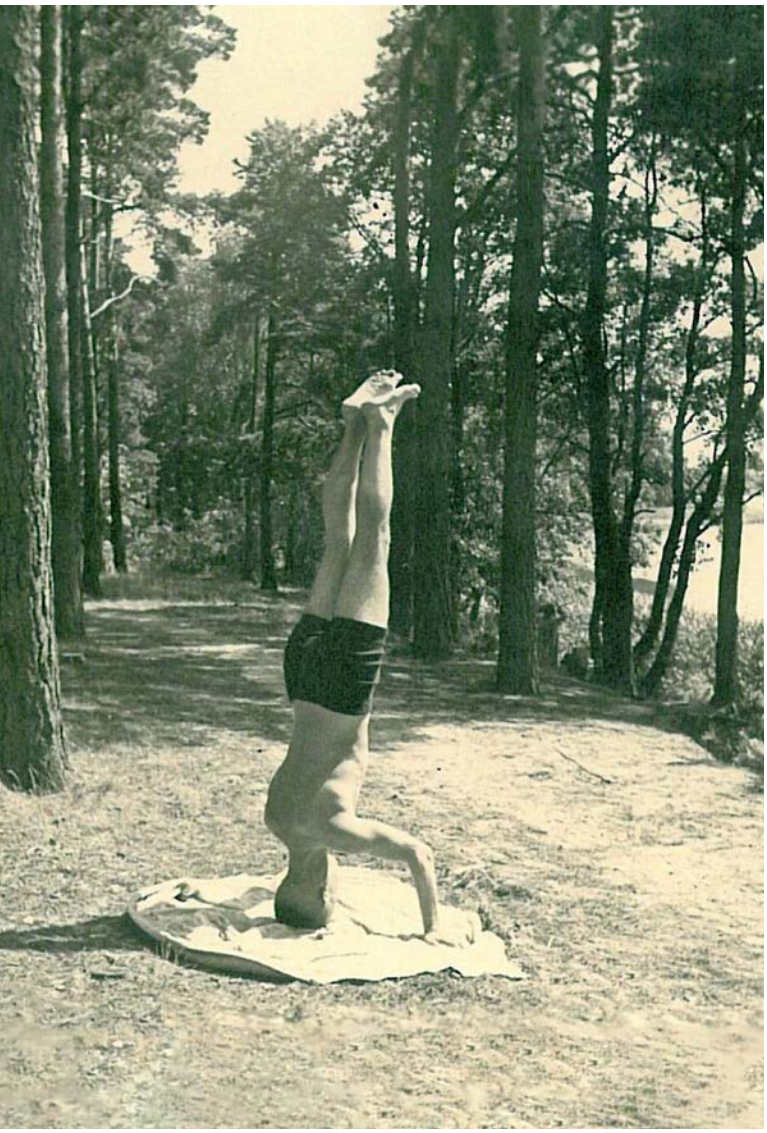
75 1946 – 2021

Jubilee edition

75 years of Bender
Make an Impact!

Simple, safe and compact.
The ISOMETER® iso415R

Customer Service Solutions
The new Business Unit



Walther Hans Bender
in 1949 during his daily
gymnastics.

Imprint

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Have you ever started your day **with a headstand?**

A headstand was a permanent part of Walther Hans Bender's morning routine. Doesn't that sound more refreshing than 139 emails in your inbox? But that's the whole point: The faster the world turns, the more important it is to take a short breather.
So far so good. Unfortunately, it is one of the most human characteristics to forget such clever tricks in the rush. Emails, video calls and online conferences don't make things any easier.

Let us take this photo as a gentle reminder not to let ourselves be driven crazy by the speed of our world. Don't let digitalisation, globalisation and the pandemic make your head spin! How does it work? Simple. Short. Stop what you are doing – even without a headstand. This often provides an effective change of perspective all by itself.

This jubilee issue is full of new perspectives – from solutions & products, to glimpses of our history, and our jubilee motto "Make an Impact!".
To find out why you are also a part of this motto, and what this has to do with our social electric project, read on.
On the subject of perspective …
Even though we are not able to celebrate with you as we usually do – that time will come!

Until then enjoy reading!
We look forward to the next 75 years with you!

MAKE AN IMPACT!

Heinz Nowicki Monika Schuster Winfried Möll

MAKE AN 75 IMPACT!

1946 – 2021

Time for celebrations.

ISOMETER® iso415R

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Product introduction

New solutions

Time for **celebrations.**

by Vivien Ulmer
The interview partners were selected at random. The author would have loved to interview all employees & customers - but unfortunately this would have delayed publication by years.

The word "jubilee" is derived from the Latin 'jubilaeus' and 'jubilare', which mean 'to shout with joy'. So when a company reaches the grand old age of 75, this is an excellent reason to shout with joy. Let's get started!

When we think back on jubilees, we often remember them as wonderful parties. Parties where we put everything on hold, and just for a moment, forgot our daily lives. The guests have all arrived and are exchanging good wishes. Between the buffet and the live band, we dip in and out of conversations – we laugh at stories, reflect on experiences, revel in the past and gaze into the future. Until finally, late in the evening – warm of heart and light of head – we make our way home, carefree and a little unsteadily.

In times of the coronavirus, it is not easy to celebrate. But what would you say to a small, symbolic party? Here and now. Put your coffee cup down, open a bottle of champagne and immerse yourself in a small party of moments and stories from 75 years of Bender.

Now – fork clinking against champagne glass – I would like to propose a toast (or invite someone to propose it). I will therefore pass you over to Dr Koch, Vice President of Research & Development at VACUUMSCHMELZE GmbH & Co. KG:

"I believe that with its strong foundation in Grünberg, its acquisitions and realignments, Bender has embarked on an excellent path into the future. I always say: We have already accomplished much together, but the best is yet to come. And this is exactly what I wish for the Bender company on its 75th anniversary."

From your time at Bender, what are the moments that you remember fondly?

Robert Weyrauch
CTO & General Manager,
ebee smart technologies GmbH/Berlin

"We are proud and we always tell everyone that our cooperation is a wonderful, textbook example of innovation in a mid-size company through cooperation with a start-up. Many mistakes, which may well be made otherwise, have not been made. For example, we have not been fully assimilated, but we all wear Bender caps. Well, Winni (Winfried Möll) tried, but the caps are in the cupboard behind me.
We were both well aware that we had to proceed with caution in order to reap the benefits of both worlds. This awareness was the reason it went so well."

Monika Schuster
CFO Bender Group

"There have been so many happy times at Bender in the last few years, I can't pick out just a single one. It's always wonderful to talk to colleagues, exchange ideas, find solutions together. The best part is when colleagues who I perhaps don't even know come to me with their problems – I never fail to be touched by their trust."

Dirk Christian Bender,
Founder and Managing Partner

"My father was still working with relay technology. In those days, you could actually see the relays, the resistors and the capacitors. Then when I showed up with my printed circuit board, he just looked at me wide-eyed and asked what it was. And today? The engineers are sitting in front of me at their computers and I stare wide-eyed as they calculate faults with formulas.
Our colleagues at ebee in Berlin are a shining example. The workforce spent some time here with us a little while ago. They were some characters – young, modern, alternative. At first glance, you would not have guessed what they do. But they are extraordinary engineers, with fantastic ideas. Incredible!
It's just a completely different world, they leave me floundering. And I admit it, my father said to me: You do your electronics thing. I say: Guys, you do your software thing."

„One great moment was the first international meeting of the Bender Group Members (BGM) in Majorca. It was great to be able to swap ideas and experiences about different cultures, different countries, different problems with different colleagues in this way. At some of the BGM meetings after that, we sat outside our rooms in the hotel corridor for almost three hours in the evening and had great conversations. Then I drove to some petrol station again to get more beer."

Thomas Nuño Mayer,
Managing Director,
Bender Iberia

Omar Seijo,
Managing Director, Optec

"My 19th birthday was on the same day as the building opening party in Grünberg. The boss called me up on stage and congratulated me personally, and everyone sang 'Happy Birthday' to me."

"There have been several great moments, including the magnificent jubilee party five years ago, the cooperation I have enjoyed with colleagues for more than ten years, and then there was also the purchase of Optec by Bender. In the beginning, our staff were worried that a lot of negative changes would be made. But we soon realised that our co-operation remains and is developed on a trusting, partnership footing."

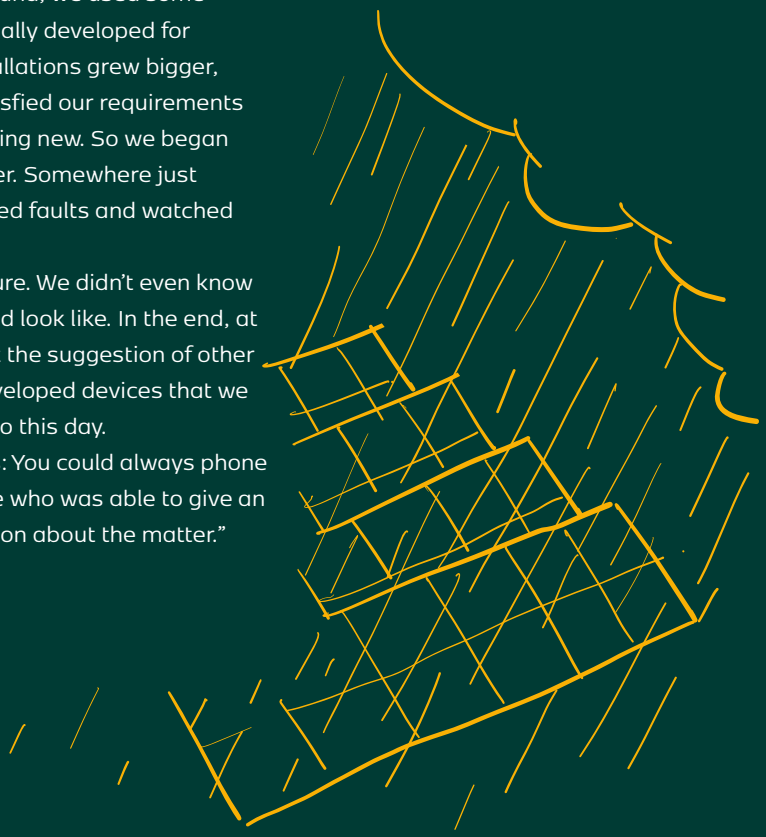
Mojtaba Akbari
Trainee Electronics Technician
for Industrial Engineering

"Two years ago, a trainee came to me shortly before his examinations. All business administration trainees practise for their exams by presenting the oral part of the exam to senior management. He was so nervous, he had to make his presentation no fewer than three times. But in the real exam, he achieved a really outstanding grade. We were both so delighted – after the exam, the two of us danced right through the company."

Marc Ebert,
Department Head,
Business Administration Training,
Grünberg Site

"20 years ago, solar power was uncharted territory. No one knew exactly what the insulation properties were. How big can solar fields be before something goes wrong, and how often do faults occur? Against this background, we used some Bender devices that were really developed for other purposes. As our installations grew bigger, these devices no longer satisfied our requirements – we needed to find something new. So we began conducting tests with Bender. Somewhere just outside Munich, we measured faults and watched the effects of snow and rain.
That was a bit of an adventure. We didn't even know exactly what the result would look like. In the end, at our suggestion – possibly at the suggestion of other parties as well – Bender developed devices that we still use in our installations to this day.
The great thing about it was: You could always phone Bender and talk to someone who was able to give an informed, professional opinion about the matter."

Andreas Falk,
System Architect,
SMA Solar Technology AG



Steve Mason,
Vice President Bender America

Gunnar Bellof,
Production Department Head, Grünberg/
Series Production

"I was about 25 years old when I joined Bender. My boss sent me directly to Germany to get training on the products. I didn't speak German, so I hoped people would speak English. In Frankfurt I was picked up by a taxi driver who took me to a small hotel in Grünberg. The next thing that happened was that someone knocked on my hotel door. A Bender employee stood there saying: "Hey, Steve, I'm Bernard. I don't speak very good English. I'm supposed to pick you up tomorrow morning, but I didn't like the idea of you being here on your own on your first trip to Germany. My wife's in the car. Perhaps you'd like to join us for dinner?" I was just one week with the company and I felt I was joining a family. And that has stayed with me. Even now."

"There was one time, one of the managing directors wanted to ban alcohol at events. Mr Bender came rushing up and said: 'As long as I have any say in these things, there will be beer here!'"

"Over 30 years ago now, we in the Test Bay Department took it upon ourselves to remodel the department. This involved moving entire partition walls, adapting the electrical installation, splitting offices, fitting suspended ceilings, and much more. The work was carried out in such a great atmosphere, and our colleagues were so relaxed about it, I still remember that time with great affection! These days it would undoubtedly be classed as a team-building event."

"In 2013, Bender was a competitor and we had won the business in the solar technology sector from them. But we knew: If we worked together, we could bring new developments to market faster and make our mark against other competitors. So we got to know each other, and in time even to appreciate each other.
I had had bad experiences with cooperations in the past, and at first I was very sceptical. But the prospect of enhancing our skills and expertise was very enticing. The start was not easy, and there was considerable resistance within both companies. However, I stayed true to the principle: 1 plus 1 is more than 2. And in this cooperation, that has turned out to be true.
If you look at the first years of this business development, it is considerably more positive than anything we achieved before. It is very comforting to me that even during difficult meetings, I always have the feeling that my counterpart is invested in the solution. The stakes are high for both sides, and of course there will be different points of view. And it is always resolved with deep trust and a minimum of bureaucracy."

Frank Hofmann,
Incoming Goods Management,
Grünberg

Ralf Koch,
Vice President
Research & Development
VACUUMSCHMELZE GmbH & Co. KG

During your time at Bender, what moments did you find most challenging?

Michael Breuer,
Managing Director
Eetarp

"The first year-and-a-half here in Singapore was a roller coaster ride. I knew that everything would be fine the moment I realised: The people at Eetarp are placing their trust in me.
How a piece of equipment works, how processes run, or who the most important customers are – all these things can be learned. But when it comes to people and their faith in the future, things get unimaginably complex. Because at that point, it is no longer just about a job, but about individual human beings with their own problems and needs.
A great deal went through my mind beforehand: Restructuring, workforce reduction, a new boss who perhaps might not be familiar with the structures and the business – I imagine these are the first thoughts that occur to anyone when talking about buying a business. These obstacles and concerns had to be dismantled one step at a time.
We had finally reached a good operating temperature and we had defined our direction and projects, then came the first COVID wave. We were taken by surprise but not crippled. In less than a week, we prepared a pandemic plan for the company – I had never learned so much about crisis management as I did then. Singapore is small and the government acts unbelievably fast. Decisions by the government are communicated via WhatsApp and you must be in compliance with them 24 hours later. So we were compelled to build agility into our plans. This also meant allowing the employees a degree of agility and mistakes. The entire team was already extremely strong by this time. Everyone felt it: Now we have to come to grips with this situation together and make the best we can of it. So my colleague Wong and I were able to concentrate exclusively on strategy, scenario planning and the next steps. We knew that everyone was looking at the big picture and contributing to the best of their abilities. I was able to trust the people to work as a team, exchange ideas and talk to each other – that helped immensely. And it showed me what 'team' really means in a corporate context, and what we can accomplish when we work together."

Time for ***celebrations.***

Would you have liked to be interviewed too? Share your moment here: **75bender.com/en/send-greetings/**

Robert Weyrauch,
CTO & General Manager ebee smart technologies GmbH/Berlin

"At the end of March 2020, we got to a situation where the country just ground to a halt and locked down. This announcement made me the most concerned that I have ever been. I had some sleepless nights thinking about how we were going to get through this and keep all our 60 staff safe, well, and employed. How were we going to get through this? Thankfully, we did incredibly well. In fact, 2020 was the best year ever for Bender UK and was testament to the calibre of people that we have in the team. Without them, we would have failed."

Gareth Brunton,
Managing Director Bender UK Ltd

"We have been developing charging infrastructure for electric cars since 2011. Only now it says in the news that '2020 was the breakthrough year'. We were nine years too early – or exactly on time. Because we have made good use of the years. But it was a long dry spell. How is it that our courage never failed us over such a long period? Celebrate small successes, state your vision boldly for all to see, and say: The breakthrough will come next year! We did that several times, but nothing works without bare-knuckle optimism."

"I have yet to face my most difficult moment: when I retire. This has been a second family, a second home for me."

Frank Hofmann,
Incoming Goods Management, Grünberg

"The Estates Managers are in charge of running the hospital and they'll have a fault on their system. They call you up and (at times) this can be not a very pleasant conversation. And then you organize everything to be sorted out for them. Usually within the day you get a phone call or an e-mail from the Estates Manager thanking you for the great work that we've done. They usually thank us for calming the situation down and getting things resolved in a timely manner. That's what we're all about at Bender."

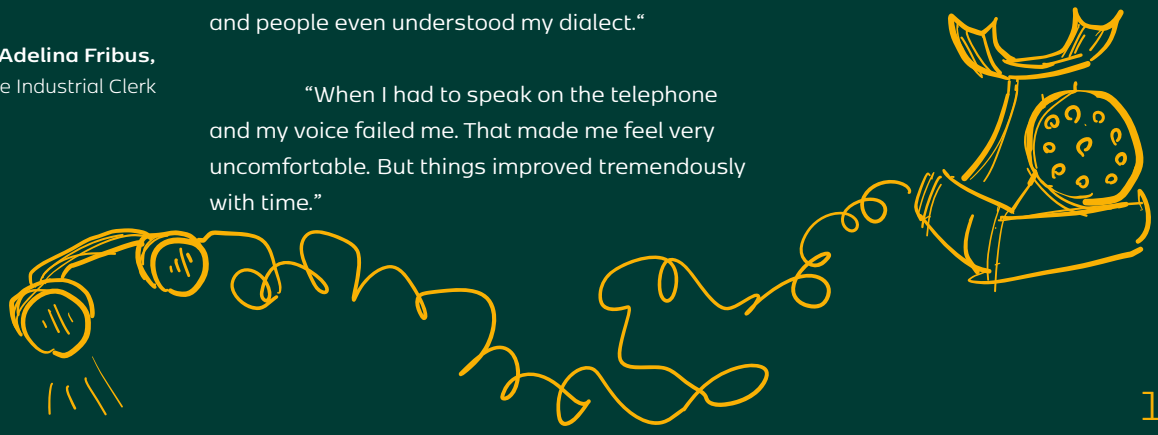
Grahame Evans,
Service Technical Sales Bender UK Ltd

"Without doubt the early days here and finding my feet. Before Bender, I worked in a large corporation in the automotive industry for over 20 years. Everything was just completely different, and the stress was 1,000 times greater. My one advantage was that I could work in my home region and people even understood my dialect."

Winfried Möll,
CTO Bender Group

Adelina Fribus,
Trainee Industrial Clerk

"When I had to speak on the telephone and my voice failed me. That made me feel very uncomfortable. But things improved tremendously with time."



Bender's roots *are in mining*

Diplom-Ingenieur Walther Hans Bender invents the ISOMETER® and patents his idea.

It was discovered early on that with the introduction of electrical engineering in mining, the unearthed system is ideally suited to this branch of industry. As early as 1903, the regulations for the erection of power installations were dealing with insulation resistance. The first application with which Bender ensured the safety of miners was already available in the 1940s. It was also at this time that the A-ISOMETER® was first presented to the world.

In the mine pits, Bender technology provides continuous monitoring of current and therefore electrical safety.

How it all began

In 1936, the man who would go on to found Bender, Dipl.-Ing. Walther Hans Bender, was still working as an inspection engineer for TÜV Frankfurt/Oder, responsible for monitoring and ensuring electrical safety in the mines of the Niederlausitz lignite mining district. Then in 1937, the problem of unearthed 500 V three-phase systems and their regular inspection encouraged him to develop activities dealing with earth fault monitoring. Two years later, Walther Hans Bender patented an "insulation monitoring and earth fault detection device for three-phase systems" under today's well-known name ISOMETER®. With this, installations no longer had to be actively shut down, they could continue operating.

In 1939, Walther Hans Bender's work was interrupted by the Second World War. In 1946, he opened an engineering office in Grünberg, where he and his family had wound up at the end of the war; here he started production of the ISOMETER®. The first devices were produced in a cellar, later in a summerhouse, and were intended for use in potash mining, iron ore and coal mines.

Less mining in Germany

By the end of the 1950s, the German mining industry had descended into a stage of prolonged crisis. Gradually, the pits started closing. The recession prompted Bender to expand the basic idea of "maximum electrical safety for people in sensitive areas" beyond mining. Hospitals also evinced interest in this protection technology because of the risk of explosion of the anaesthesia gas in operating theatres.

Today, a hospital without it is unimaginable

Accordingly, in 1968 Bender began development of the world's first electronic ISOMETER® for mass production designed to satisfy safety needs beyond the mining industry as well. The continuously growing demand for safety in hospitals was followed by others. Wherever there was a need for personal protection and enhanced operational, fire and explosion protection, as well as preventative maintenance, Bender devices were being

Photo: Depositphotos.com

used. They ensure early reporting of faults in electrical installations, thus preventing expensive failures and accidents that could have serious consequences - to this date.

Bender offers solutions all over the world

Even regardless of the respective earthing, whether unearthed, earthed or resistance earthed, there are products that ensure sufficient protection and maintain availability. Bender offers advanced solutions for all relevant system types with global experience according to country-specific standards and regulations.

Different countries, different requirements

In North and South America, Australia, South Africa and other regions all over the world, there are more and more industrial companies involved in the exploration, development, extraction and processing of mineral resources.

The earthing of these industrial facilities has evolved differently over time. In many sectors, for reasons of safety and to guarantee availability, resistance grounding is increasingly preferred because it shares the advantages of unearthed systems without the disadvantages of earthed systems.

Author:
Michaela Heck
Freelance Journalist

Find out how a resistance-grounded system works on our **YouTube channel**

Innovation takes no rest
75 years in the service of electrical safety

In essence, it sounds quite simple, this new vision of Bender GmbH und Co. KG, from the picturesque town of Grünberg in Hesse: ***"Electricity is dangerous. So is no electricity. That's why we make electricity intelligent and safe. Every day. All over the world."*** These days, electricity is ubiquitous. Effectively, nothing functions any more without electricity. So Bender's future is assured. At least for the next 75 years, say the people in charge at the medium-sized company with a slight twinkle in their eyes.

Intelligent solutions for electrical safety

But this is not as straightforward as it first sounds. Because the corporation, whose beginnings can be traced back to a laundry room, does not make simple childproof socket-outlet covers for the living room. ***When Bender talk about "safe electricity", they mean high technology.*** Above all else, electricity must be reliable, i.e. always available, and people must be protected from the hazards of electrical current. These days, this demands intelligent solutions. Because we depend on electricity, always and everywhere. Not only at home, but also at the charging stations for our new electric cars, and even more so in hospitals, in railway transport, in data centres and other facilities considered to be part of our critical infrastructures.

A revolutionary idea

This is precisely where the origins of today's global player took root. In the 1930s, the company's founder, Walther Hans Bender, was looking for ways to operate the electrical installations and machinery used in opencast lignite mining more safely and more reliably. Long shut-down phases or lengthy fault location were to be avoided. This was when he struck upon the revolutionary idea of the insulation measuring device. It was able to detect even small insulation faults in machines and installations long before a failure occurred, without even having to de-energise the installations. His invention yielded two crucial advantages: Firstly, electrical accidents due to insulation faults were prevented. Secondly, machines and installations could operate more reliably and for longer.

Nothing works without electricity any more

Nowadays, electric current is immeasurably more indispensable than in those early times. Power plants, data centres or machines must not fail, in hospitals and other critical infrastructure, an uninterrupted electricity supply is imperative. 24 hours a day, 365 days a year. Always! Therefore, it is essential to detect insulation faults in electrical installations as early as possible. The possibility that the power might fail in the middle of a complicated medical operation

VISION

Electricity is dangerous.
So is the lack of it.
This is why we create
intelligent solutions
to make electricity safe
for everyone.
Everyday.
Everywhere.

MISSION

Where there is electricity,
there is Bender.
That's why at Bender,
we develop intelligent solutions
that allow you to use it safely.
Reducing the risks
and trying to predict
the unpredictable
is our way of having a
positive impact on the world.

because of an insulation fault in an electrical device is unthinkable. In the worst case, human lives are at stake. If the power supply in the data centre of a bank should fail with the loss of untold quantities of data, the consequences would also be unimaginable.

Higher requirements

That first insulation measuring device created by the inventor Walther Hans Bender would undoubtedly still work today, but it would not be equal to the demands imposed on modern measuring technology. Today, monitoring devices must be able to display much more than just insulation resistance. They must detect and report faults, and determine exactly where the fault is lurking in the electrical installation. And in the modern age, solutions must be networked, so that electrical installations can also be monitored centrally, at a single location. This is impossible without advanced technology.

Bender can do it

It is Bender's decades of experience that make the company's ideas and products so unique. "We are the experts," says Winfried Möll, Bender CTO. But in future, the company intends not just to sell devices, but to intensify its activities as a solutions provider. Today, for example, work is ongoing to find intelligent solutions in the field of energy management. Simply put: A sufficient amount of electricity must be available at the place where it is currently needed. In this context, the role of interfaces as well as software and cloud solutions is becoming increasingly vital. Artificial intelligence is another issue that cannot be ignored. It is of the utmost importance to keep a close watch on the market, and to listen to what the customers need and want, says CSO Heinz Nowicki, and to be able to offer the right solutions rapidly.

Ready for the next 75 years

The people in charge at Bender have a clear idea of where development is heading, and of what will be needed in future. Those who have followed the trends of the last 20 years can imagine all the possibilities. A company must be able to respond to trends with agility and continue to advance with innovations. This is why the new Customer Solutions Business Unit was just set up in April and Bender has taken on 75 software developers from Technisat Dresden in the last year. The company is well positioned to meet the challenges of the future. "Where there's electricity, there's Bender." Bring on the next 75 years.

Author:
Heiko Brattig
Content editor

ISOMETER®
iso415R

Simple operation
via rotary switch

Monitoring the insulation resistance
in unearthed 3(N)AC, AC and DC systems

Supply voltage
DC 24 V or AC/DC 100 - 240 V
Two response values: 5 - 1000 kΩ
(Adjustable in 1 kΩ steps)

Automatic **device self test**
with connection monitoring

N/C or N/O operation
of the relay selectable

Start-up delay,
response delay
and **delay on release**
adjustable

Insulation monitoring for control circuits and more:
Simple, safe and compact

Insulation monitoring is the basis for electrical safety, and Bender has specialised in it for 75 years. The ISOMETER® iso415R is the first product of the new SmartDetect device series. It is easy to parameterise and extremely compact. With Modbus RTU interface, configuration via app and other features.

Simple integration in machines and installations
The ISOMETER® iso415R was developed to become part of your machines and installations and is compliant with the requirements of the European Machinery Directive. It is a simple solution for control circuits (DC 24 V - AC 230 V) with communication in mechanical and plant engineering, in the food industry and many other branches of industry. The iso415R can also be used in main circuits up to 400 V in smaller IT systems with no frequency inverter and a small number of loads.

new

1 TE width
can be used in
confined spaces

Communication with Modbus RTU and NFC
The new iso415R is equipped with a hardwired Modbus RTU interface. In addition to the classic relay contact for alarm signalling, the Modbus protocol has proven to be a highly reliable interface for secure data exchange. The interface enables bus communication, the relay enables compatibility with existing installations.
A further highlight is the smartphone coupling capability, which in turn enables operation using the Bender Connect app via Near Field Communication (NFC). This works even in de-energised state. (More about this on the next page).

Big performance, little space requirement
Limited space is a tiresome and never-ending issue for control cabinet and machine builders. New installations must accommodate more and more components in less and less space. In order to satisfy the increasingly stringent requirements, it is also becoming more and more important for the components used to be both smaller and more powerful. The iso415R is particularly compact, and only 18 mm wide – 1 TE – the width of a circuit breaker. This makes it much smaller than other products and ideal for limited space conditions. Despite its small size, it has a dual earth connection which is monitored; an alarm is triggered if the connection is interrupted. This also applies to the connection to the monitored system.

With the iso415R, basic applications in mechanical and plant engineering benefit from proven Bender measuring technology. The integrated interfaces enable easy networking and convenient setup.

Simply impressive, impressively simple.

User friendly right from the start
One strength of the iso415R is its simple installation and operation. Settings can be configured easily with the rotary switch on the front panel. With the switch in the “Ext” position, individual values can be set via the interface or using the app. A combined Test/Reset button is also located on the front. Of course, the ISOMETER® meets the requirements of the currently applicable IEC 61557-8 standard for insulation monitoring devices.

Author:
Peter Neumann
Industrial Solutions
Business Unit,
Product Management

Go to product page

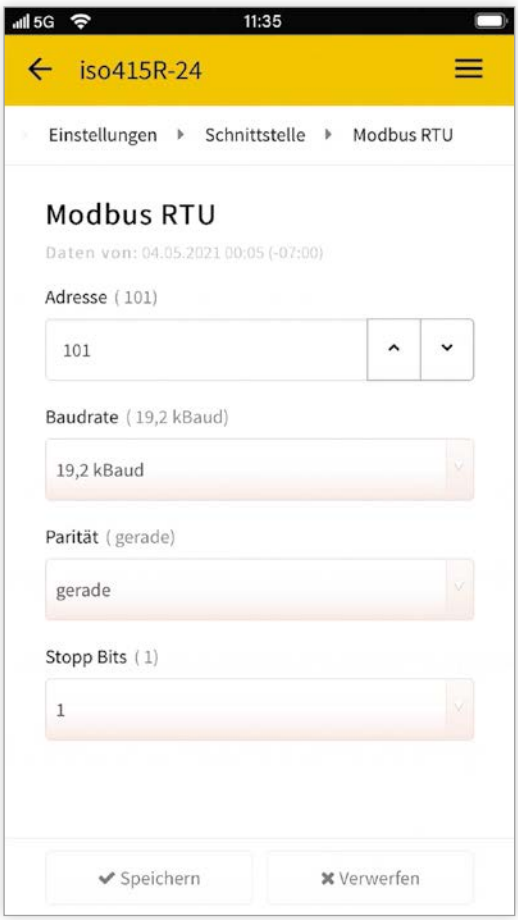
iso415R + Bender Connect

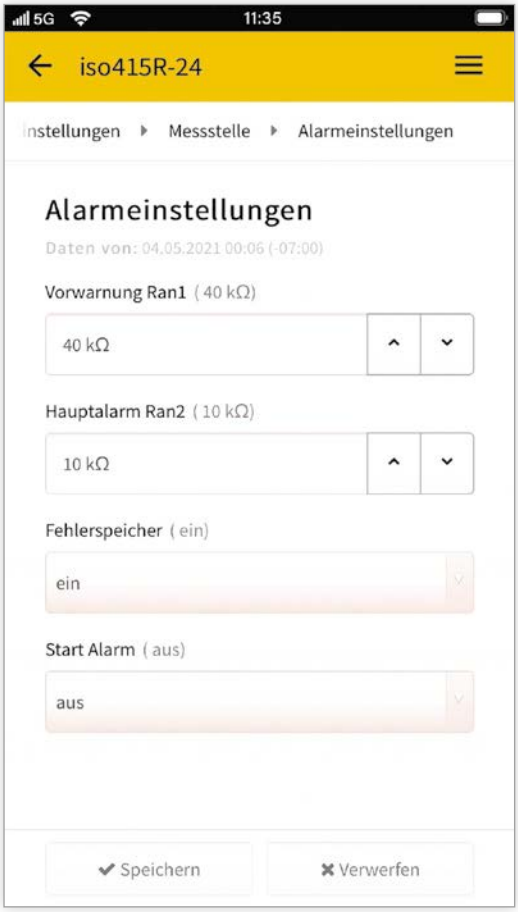
Quelle: Depositphotos.com

Easily configurable using the **app**

Parameterising without having to decrypt codes on a small display: With the NFC function and the Bender Connect app, the iso415R can be set easily using a smartphone.

new





Individual response value, Modbus address, time delay, relay function and further settings can be set when de-energised before commissioning or even before installation. The serial and item numbers, device name and other information can be read out using the Bender app and used for the installation documentation.

Cloning made easy: For recurring configurations, a template can be created the first time and then downloaded to any number of devices.

ISOMETER® iso685

The ISOMETER® iso685 is our TOP device, *complete with web browser and open to the world of communication among insulation monitors – and who invented it?*

The ISOMETER® iso685 is especially popular with our customers. For CTO *Winfried Möll*, it was his first project at Bender in 2010. Conceptually, the device was developed by *Oliver Schäfer*, *Tobias Groh*, *Uli v. Waldow* and *Jan Braun*.
Three colleagues have developed the project further and we asked them about it:

The iso685 is something of a "jack-of-all-trades" in the insulation monitor family. For the customer, this means that just one device is used for many different purposes. This in turn helps significantly to simplify internal processes – purchasing, material management, warehousing. Being able to satisfy the broad spectrum of complex requirements consisting of standards or stringent customer-specific needs with a single device – that is truly revolutionary.

Dieter Hackl
Head of
Standards & Innovations

"One fits all" was a slogan which was often quoted during development of the iso685 family. This means that this device can be used for monitoring practically any application up to 690 V AC and 1,000 V DC from simple to highly complex installations. The main applications are: DC-coupled systems in power plants and medium-voltage switchgear, shipboard switchgear, monitoring of large installations with frequency inverters, monitoring of large battery storage devices – and all this can be combined with automatic insulation fault location which helps maintenance to find faults quickly and precisely.

Jörg Irzinger
Product Manager
Business Development
Business Unit Industrial Solutions

Karl Schepp
Head of
Innovations Department

The device represents a solution for "practically" all requirements in the field of insulation monitoring, and it can be adapted to many new requirements through customer-specific profiles.

iso685
To the product

iso685
Read the interview in full.

6mm-thick anti-reflective, anti-glare and anti-fingerprint glass screen with dust free cleaning properties that stays cleaner for longer. IP65 rated.

Separate backbox incorporating PC technology with fan-less cooling - reducing the turbulence of potentially harmful bacteria in the theatre. Low voltage boards consume less power and emit less heat.

Consoles can be pre-set for DICOM, connect seamlessly with Merivaara operating lights and a variety of medical imaging input devices and systems.

Sizes from 21 to 55 inch

Comply with **EM60601** and relevant healthcare OR displays standards

Customised options include RFiD readers, barcode scanners, Wi-Fi and Bluetooth connectivity.

The design compliments **Bender CP9 glass touchscreen control panel** for theatre design symmetry.

Advanced **PACS display** *launched by* **Bender UK**

This new display complements turnkey and integrated theatre solutions already supplied by Bender UK throughout the UK and Ireland. Bender has launched a new, premium PACS Console (Picture Archiving and Communication System) for use in operating rooms and critical care areas. The PACS Console employs proven display technology to deliver superior quality images to clinicians viewing scans, images and hospital records.

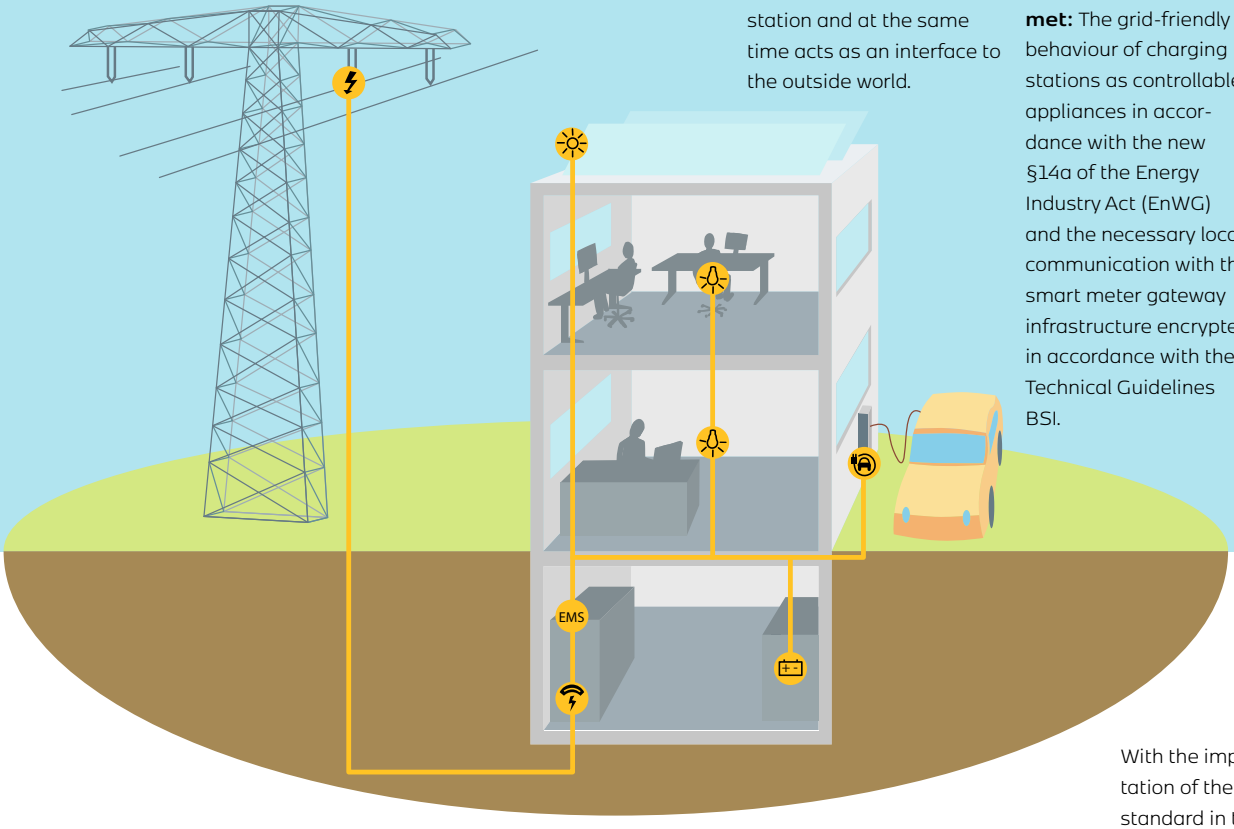
Modular in design the new PACS has a separate display screen and backbox configuration meaning any maintenance updates can be carried out away from the front panel, without compromising theatre availability or hygiene.

www.bender-uk.com
The PACS Console

With **EEBUS**, the charging station communicates with the **energy management system (EMS).**

The intelligence of a charging station or wallbox is based on the charge controller installed in the charging point. The charge controller is "the brain" of the charging station and at the same time acts as an interface to the outside world.

With EEBUS, the requirement of the KfW (Credit Institute for Reconstruction) promotional programme 440 is met: The grid-friendly behaviour of charging stations as controllable appliances in accordance with the new §14a of the Energy Industry Act (EnWG) and the necessary local communication with the smart meter gateway infrastructure encrypted in accordance with the Technical Guidelines BSI.



Bender charge controllers *now speak* EEBUS

Sustainable and independent interconnection of loads in energy management systems.

As a manufacturer of intelligent and future-proof charge controllers, Bender now offers its customers the EEBUS communication standard for the entire charge controller portfolio as a standard feature and is thus the first controller manufacturer to offer EEBUS out of the box.

The EEBUS standard

Due to the global climate goal of CO2 reduction and the resulting need to use the available energy in an efficient and effective way, energy management systems (EMS) are increasingly coming into focus.

The challenge is to make communication between the areas of electricity, heat and mobility interoperable with each other.

It is precisely this problem that the EEBUS Initiative e. V. has addressed and developed a cross-industry, standardised communication protocol that enables interconnection from the grid level to the device level.

With the implementation of the EEBUS standard in the charge controller portfolio, another step has been taken towards the future of safe and networked charging.

Thanks to EEBUS, for example, it is possible to choose and use electricity tariffs that are cheaper at certain times for charging.

www.eebus.org
More on the **EEBUS communication standard**

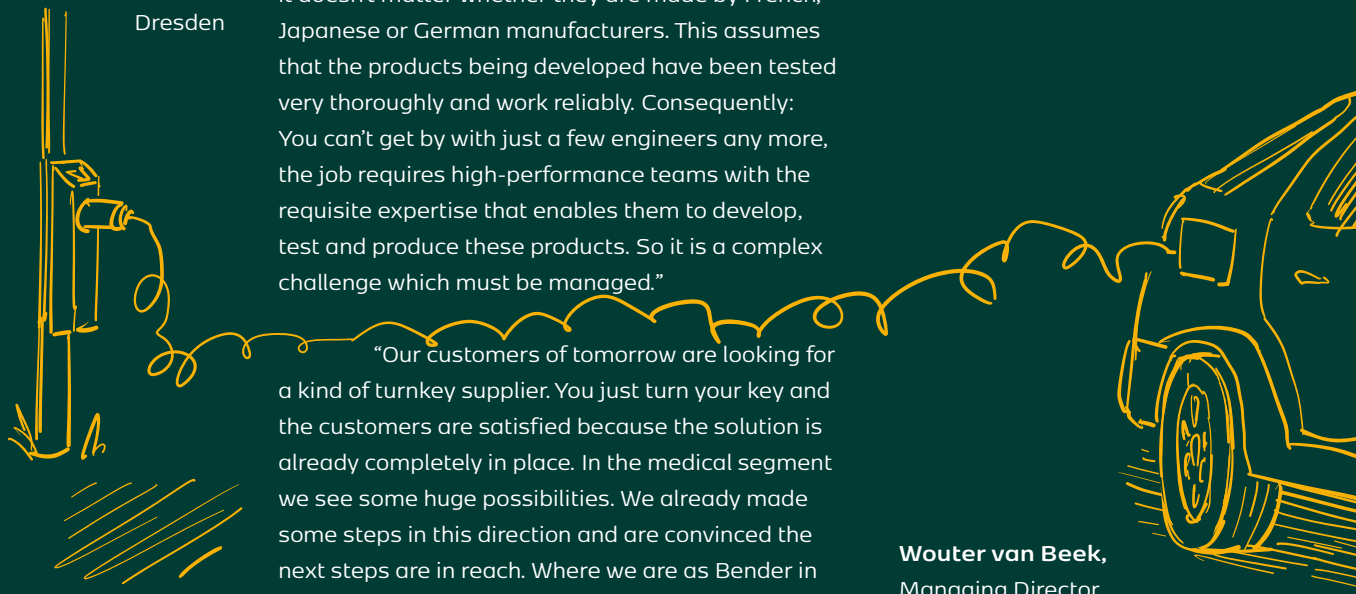
Would you have liked to be interviewed too? Share your vision here: **75bender.com/en/send-greetings/**

Photo: Depositphotos.com

How will tomorrow's customer be different?

Hans-Joachim Baer,
CTO ebee Engineering GmbH
Dresden

"The customer will want things that are easy to operate and function faultlessly. The difficulty is: It is precisely those systems that are enormously complex. For example, the wallboxes in e-mobility. The wallbox must be capable of charging all cars – it doesn't matter whether they are made by French, Japanese or German manufacturers. This assumes that the products being developed have been tested very thoroughly and work reliably. Consequently: You can't get by with just a few engineers any more, the job requires high-performance teams with the requisite expertise that enables them to develop, test and produce these products. So it is a complex challenge which must be managed."

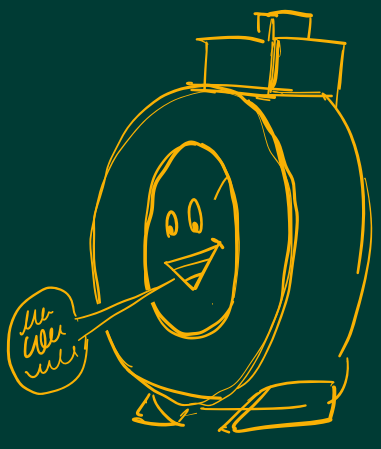


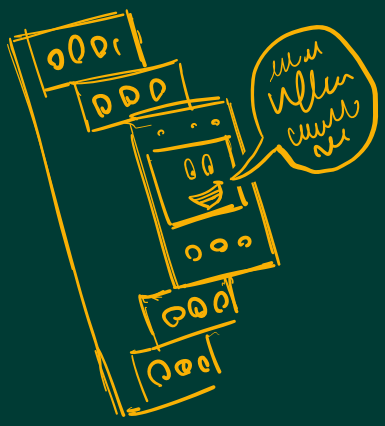
"Our customers of tomorrow are looking for a kind of turnkey supplier. You just turn your key and the customers are satisfied because the solution is already completely in place. In the medical segment we see some huge possibilities. We already made some steps in this direction and are convinced the next steps are in reach. Where we are as Bender in the industrial market, becoming a turnkey supplier using intelligent solutions, is a big step. We have, however, the technology in the Bender Group. It is important to gather and use this knowledge together."

Wouter van Beek,
Managing Director
Bender Benelux BV

"Today's customers often don't know exactly how our devices work in detail. When customers buy a system from us in Singapore or Malaysia today, they trust us to make the important decisions and to make them right. We are expected to provide a complete solution to the problem, not just the software or the product. This also includes advice, service, contracts with suppliers and so on. Without flexibility, also with regard to our own portfolio, this is not possible. We will be surprised how often we will be forced in the future to deal with things that are neither part of our core business nor our portfolio."

Michael Breuer,
Managing Director, Eetarp





"In the past, we presented the customer with individual solutions. Today, these customers want complete solutions. Our devices must be capable of being integrated in their systems and must be able to communicate with each other. This means: In future, communication between the most disparate devices will become enormously important. This is how we will create competitive advantages for the customer's own installations."

Dirk Christian Bender,
Founder and
Managing Partner

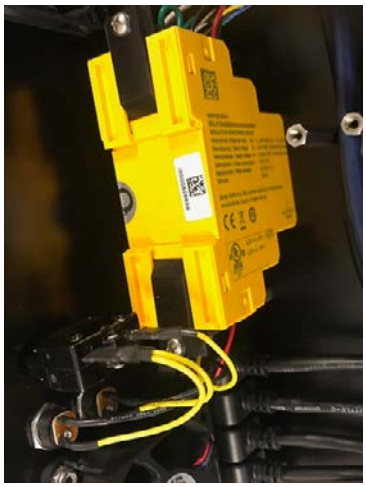
Video Ray's technology is the most advanced *on the market.*

VideoRay is a world leader in inspection-class remotely operated underwater vehicles (ROVs) used by the Navy, Coast Guards and first responders.

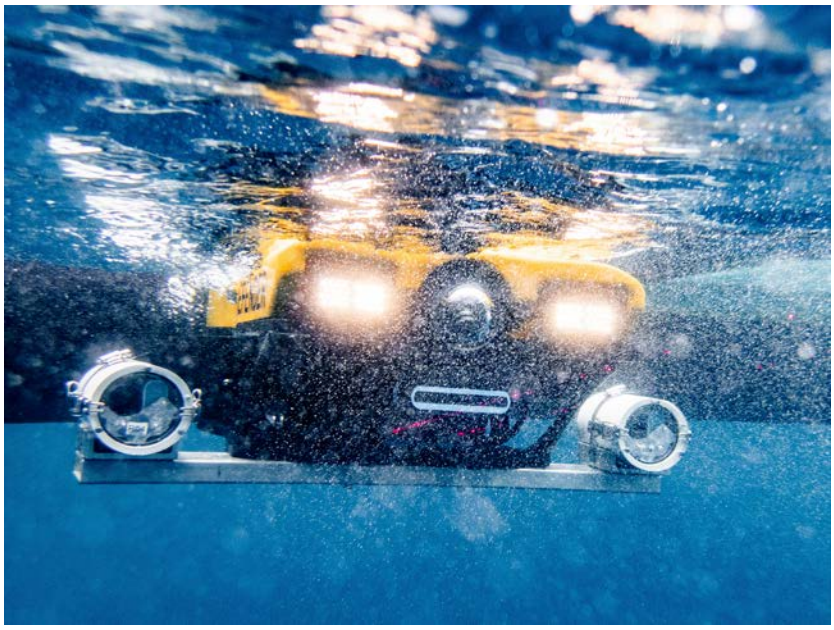
The applications of these underwater robots are very diverse. At home and abroad, for example, they help to prevent terrorism, find and recover objects, inspect locks, dams, reservoirs or bridges and protect divers in hazardous situations. VideoRay's technology is the most advanced on the market.

Customers, from the US Navy to aquaculture farms in the most remote areas of the world, know they can depend on the durability and reliability of the ROVs.

As the ROVs are supplied via an unearthed system and are also mostly used underwater, VideoRay opted for insulation monitoring devices from Bender. To ensure continuous monitoring of the ROV's power supply system and to meet the high demands placed on the safety and reliability of ROV systems, the *ISOMETER® isoRW425* was chosen. This device is designed for use in extremely harsh environments and therefore meets the special requirements with regard to climate, mechanics, shock and vibration.



Another advantage of the **isoRW425** is that it is able to proactively monitor the de-energised, unearthed supply cable leading to the ROV.



Photos: videoray.com

Ultimately, the **"RW" variant** of the insulation monitoring device was chosen to achieve stable and reliable monitoring. This variant is usually used in railway applications where the unit has to withstand increased shocks, vibrations and oscillations without its performance being impaired. This feature is particularly interesting and desirable for use in the **VideoRay Defender**, as the installation is in a portable control console that is constantly being moved from one ROV deployment to another and used in extremely harsh environments.

The **isoRW425** monitors the ROV's control console, its power supply and the supply cable to ensure reliable detection of insulation faults.

Enhanced safety
in public swimming pools

Bäderland Hamburg GmbH and its predecessor companies have operated the public swimming and leisure pools of the Free and Hanseatic City of Hamburg for more than 150 years. With a water surface of over 46,000 sqm and 28 locations throughout the city, Bäderland is the largest leisure provider of the Hanseatic city in terms of space. More than four million guests visit the small and large facilities every year.

Water and electricity don't mix well. So, the requirements governing electrical safety in swimming pools are particularly strict. Accidents due to electric shock must be prevented at all costs. But how can electrical safety be assured in the more than 6,000 swimming pools in Germany despite mounting financial pressure?
Bäderland Hamburg GmbH has found a good solution. Last year, while most swimming pools had to be closed because of the coronavirus pandemic, Bäderland Hamburg GmbH took advantage of the enforced shutdown to undertake a comprehensive modernisation programme.

Safe even without operational downtime
Attention was mainly focused on two key aspects: Safety and economic efficiency. With regard to the first, the requirements set forth in Regulation 3 by the German Social Accident Insurance Institution (DGUV) had to be satisfied with legal certainty on the basis of periodic verification of the electrical devices and installations. Secondly, it was necessary to find a way to ensure that the verification could be conducted less expensively, without night work or interruption of swimming pool operations.

Besides this, Bäderland Hamburg GmbH also wanted to be able to display and evaluate energy consumption and energy flow transparently in future, as well as be able to detect possible fault sources in the electrical installation, monitor the central earthing point, and properly evaluate, document and eliminate leakage currents.

Continuous monitoring instead of spot checks
In order to be able to satisfy these requirements, a working group within Bäderland Hamburg GmbH decided to implement a system of residual current monitoring in conjunction with Bender's power quality technology. With this technology, the electrical installations in the swimming pools can now be monitored continuously and safely. This solution is associated with considerable organisational and financial advantages. Most importantly, the pools no longer need to be closed temporarily so that the extremely complex verification prescribed by the DGUV can be carried out. Besides, the newly installed technology allows the electrical installations to be monitored simultaneously at multiple sites. The gateway interface can be accessed via the intranet.

Investment in the future
Although many swimming pools had to remain closed in the last year, and for extended periods because of the coronavirus, this was an investment in the future, the managers at Bäderland Hamburg GmbH are convinced of that. *Continuous monitoring is more cost-efficient and safer.* In the last year, two of the 28 swimming pools in Hamburg were equipped with the residual current technology from Bender. More are planned in the next few years.

The Hanseatic City of Hamburg operates a total of 28 indoor and outdoor pool facilities as municipally run businesses. In the time before coronavirus, these pools welcomed 4.4 million visitors every year.

Continued:
Interview with managing specialists on the following pages

Enhanced safety
in public swimming pools

Interview *with managing specialists*

We spoke about the project to the two managers with primary responsibility for its implementation, Thomas Lüdemann and Andreas Kreft. Thomas Lüdemann has over 20 years of experience working for Bäderland Hamburg GmbH, the last five of which as the responsible electrically skilled person(VEFK) with responsibility for the smooth operation of all electrotechnical installations. Andreas Kreft has worked for Bäderland for 30 years and heads up the measurement and control installations division.

What are your demands with regard to electrical safety in swimming pools?

Lüdemann: We don't just have people working at our facilities, we also receive several million visitors every year. For this reason alone, our demands regarding safety are extremely high. Of course, these demands must also be viable in terms of economic efficiency and comply with existing laws and regulations. To achieve all this, you have to be flexible, frank, and hold substantive discussions with other departments.
Kreft: Safety is our primary concern. It starts when you enter the swimming pool premises, continues while you shower and swim, and ends when you finish drying your hair. Electrical equipment is in use almost everywhere, and it is imperative to have a safe electrical installation, particularly where electricity and water are present together.

What aspects were important to you for making your decision about this solution or this continuous residual current measurement?

Lüdemann: The aspects are complex. The primary objectives are to avoid personal injury and damage to property, detect potential faults before they cause failure or damage, detect faults more easily and to conform to laws and regulations. In addition to this, we want to save costs by preventing periods of operational downtime and disturbances, which, in turn, reduces personnel costs for maintenance.
Kreft: Manual measurement and inspection of the electrical installations, some of which are only mandated once a year according to the standard, is nothing more than a spot check and harbours the possibility of gaps in monitoring.
Whereas manual measurement is consistent with technical policy and satisfies the requirements of the standards, it was found that for Bäderland, continuous monitoring is more cost-efficient and safer than manual measurement. This is also why we are implementing residual current measurement.

What motivated you to set up a continuous RCM system?

*Lüdem*ann: Our installations are in constant operation, and a complete verification of those electrical installations in accordance with DGUV V3 would either entail shutting it down for several days or it would have to be carried out at night, with involvement of many personnel in a very short time frame. Both options are less than ideal in terms of economic efficiency and personnel deployment. We wanted to find a solution that would enable us to satisfy a stringent safety standard and comply with laws and regulations despite that.
Kreft: There are no monitoring gaps with continuous residual current measurement. Manual measurement ties up capacities in our maintenance operations, which then have less availability for other tasks. It would also be possible to outsource the measurements, and in some cases, it would even make sense. But it should also be considered for each installation individually how much of these costs might otherwise be used to invest in continuous residual current measurement, to yield added value. Encouragement from our master technicians confirmed our belief that we had chosen the right course. The decision to implement continuous residual current measurement in our facilities was made in our work group, which is composed of managing engineers, occupational safety experts, responsible electrically skilled persons (VEFK) and me as the measurement and control installations expert.

What experience have you been able to gather so far?

Lüdemann: We discovered faults in our installation. In fact, in one of our subdistributions we found a connection between N and PE. And now we can also see clearly how control technology generates an undesirable (but probably unavoidable) current on the PE.
Kreft: We had the chance to integrate residual current measurement in the existing measurement and control switching installations, and also in a measurement and control project which had just begun.
We were very satisfied with both variants. In new measurement and control projects, you can take residual current monitoring into account from the outset. This makes implementation easier.

The installations that are to be monitored have been integrated in our in-house IT network. This enables us to access every site in our company from anywhere. The residual current monitoring functions stably. Some other interesting things we have observed include leakage currents from frequency converters that can be detected using historical data.
Residual current monitoring was also helpful when commissioning new measurement and control switching installations.

How did you experience the cooperation and customer support on the part of Bender? Were your expectations met?

Kreft: From the initial contact until project completion, the cooperation was very good. Our cooperation with Bender was topped off by specific contact partners, good reachability and fast response times.
Lüdemann: The initial suggestion that we investigate such a system came from Mr Kreft. We then asked Bender to present the system to us in a technical forum. After further technical discussions in-house and having completed our market research, we chose the system from Bender. From that point on, Bender assisted us with practical and helpful advice in the planning, implementation and operation of the residual current measurement system.

Author:
Oliver Schultz,
Application Engineer,
Northern Region

Signalling instead of shutting down–
Residual current monitoring in earthed systems

Sengkang General Hospital
SingHealth

A top-notch clinic *with tried-and-tested technology for* electrical safety

Around 5.6 million people live in the island and city-state of Singapore, one of the richest countries of the world. In order to be able to offer top-quality medical services, Singapore is undertaking huge modernisation projects in healthcare – and raising the level of building protection technology at the same time.

One of the largest public hospitals in Singapore, with a total of 1,000 beds, was constructed as part of the hospital building project under the control of the Ministry of Health (MOH). The Sengkang General Hospital had been officially in use since August 2018. However, work carried on in the background and was finally completed towards the end of 2020.

Graphene is a modular and scalable management system for various applications. It not only assists the user in detecting potential failure but also enables to diagnose and analyse the potential issue in order to increase the overall system reliability and efficiency. At the same time, it presents meaningful information with a highly customizable report function. This enables Graphene to work as a centralised solution to combine and transfer data from multiple locations through intranet or internet, from systems like Building Management Systems, Lighting Management Systems, Solar Systems, and Chiller Monitoring Systems.

The Sengkang General Hospital is only one of the large projects undertaken in Singapore by Bender GmbH & Co. KG and Bender Solutions GmbH & Co. KG. For instance, Bender had already brought its expertise to the Mount Alvernia Hospital (see article in MONITOR 2-2018) and numerous other projects in Singapore. This hospital employed the latest supply and grid protection technology, reliably ensuring the safety of people and devices, even in an extremely complex electronic environment. While doing so, both the associated safety standards for power supplies and the demands of highly complex electronic medical equipment and devices had to be met.

Continued
on the following pages

Sengkang General Hospital
SingHealth

[1] **HMI** – Acronym for Human Machine Interface, referring to a dashboard that allows users to communicate with machines, computer programs and systems.

Sustainable partnership

Employing German companies and German technology to build medical facilities has now become a tradition in Singapore. This is because of the good experiences that the country has had with German engineering, German planning quality and German know-how, as well as the local expertise of Eetarp Engineering Pte Ltd, which has been a Bender Group Member (BGM) since 2019. Transferring our previous representation to a Bender subsidiary has brought, and keeps on bringing, new, sustainable stimuli for growth, which have been key in strengthening our market position and for our expansion into the Asian market.

At the end of 2020, a further, extremely modern hospital with a total of 39 operating theatres was opened in Singapore, having taken only four years to build. The newly constructed surgical block offers the latest diagnostic and treatment facilities for various medical disciplines.

In addition to the use of the latest architectural, building services and medical technologies supplied by well-known, internationally active companies, such as Steris Corporation (American medical devices company based in Ireland), the HT Group, etc., the BENDER Group is involved in building services through its IT systems for protection and monitoring solutions. Many insulation monitoring devices from the isoMED427P-2 series and IT system transformers from the ES710/8000S and ES710/3150S series were used, as well as several hundred insulation fault locators from the EDS151 series and over a thousand power meters. All Bender components were planned and designed as a complete switching installation solution, which was delivered as a turnkey product to the end customer by our local BGM, Eetarp Engineering Pte Ltd.

One of the main aims, in addition to high quality and electrical safety pursuant to IEC 60364-7-710, was to achieve maximum efficiency of the system.

This is why an Isolated Power Monitoring System (IPMS) and a Power Quality Monitoring System (PQMS), known as Graphene, was supplied alongside the existing systems and sensors. Graphene refers to a management system developed by Eetarp Engineering Pte Ltd that allows optimal access to individual measured values and the status of the installation thanks to a centralised, intelligent system.

Surgical Control Panel (SCP) –
The technical monitoring centre

The 39 operating theatres were equipped with SCPs (SCP ... Surgical Control Panel) developed by Bender Solutions GmbH & Co. KG; these offer diagnostic capabilities through a complete system overview from a central location via a web browser, supported by data loggers and history memories. The hygienic design of the panels is based on a touch-sensitive surface solution. Complex information for a user can be displayed simply and clearly on the interfaces between human, medical device, building services and electrical safety technology, especially in the event of critical operating situations.
Moreover, parameter settings (the definition of limit values, entry of individual customer texts, editing of the system configuration, etc.) are possible.
In addition, the panels allow for the integration of external hardware, such as time display and timer, nurse paging system and light controllers in the operating theatre, as well as the monitoring, operation and display of the IT systems.
The user interface of the operating panel (HMI[1]) was developed and designed in collaboration with the customer, taking into account their special requirements.

The Sengkang General Hospital is just one example of how Bender uses modern technology to ensure electrical safety, even with the complex requirements of building services. By applying the engineering expertise of the BENDER Group, which is always focused on its customers' demands, there is a solution for every challenge – not only in the healthcare sector.

Author:
Thomas Gans,
Regional Management for Hospital Projects (CIR)

More about Graphene

OEM partner

Walther Werke GmbH

The two medium-sized companies, WALTHER-WERKE Ferdinand Walther GmbH and Bender GmbH & Co. KG, are pooling their expertise in charging infrastructure for e-mobility in the form of a technology partnership. The new smartEVO wallbox series from WALTHER-WERKE, equipped with the new CC613 charge controller from Bender including integrated DC 6 mA residual current detection, lays the foundation stone for a joint cooperation in developing intelligent charging solutions.

The two companies first came into contact with each other in 2018. WALTHER-WERKE was particularly interested in the safe, economical residual current sensor technology (DC 6 mA) in Bender's charge controller technology for AC charging stations. In the course of the following year, the two companies increased their contact with each other and the development of a first prototype of the new smartEVO wallbox began. The next step saw the creation of the new wallbox series, with the product variants smartEVO 11, smartEVO 22 and smartEVO 22 Pro.

Photos: walther-werke.de

For both companies, the technology partnership is an absolute win-win situation. WALTHER benefits from Bender's many years of expertise in controller technology.

In return, Bender gains from WALTHER's extensive market and application experience in charging point technology and complex charging systems. Through this cooperation, in addition to the pioneering development of a product portfolio specifically for the industrial sector and other targeted product solutions, the two partners are committed to cultivating a close partnership in which they will tackle future requirements in e-mobility together.

Continued on the following pages

www.walther-werke.de

OEM partner Walther Werke GmbH

Professional. Experienced. Ground-breaking. *Intelligent solutions for* low-voltage distribution applications.

As acknowledged experts in the field of system solutions for low-voltage distribution applications, the WALTHER-WERKE company based in Eisenberg in the Palatinate has enjoyed the respect and trust of its customers for more than a century. The business is founded on complete professionalism, experience, and above all a passion for ground-breaking solutions with superior design quality – ever since 1897.

Sustainable concepts for reliable power distribution

A particular challenge in these times: The global demand for energy is increasing at breakneck speed. Sustainable concepts based on renewable energies and energy management are coming under increasingly intense scrutiny. The visionary aim of WALTHER-WERKE is therefore to digitalise the entirety of low-voltage distribution applications and so to actively help smooth the path to the future. In pursuit of these objectives, the team of experts at WALTHER is constantly developing innovative solutions and comprehensive systems in selected application fields. The intelligent distribution systems produced by WALTHER charge electric cars and supply electrical power for data centres, construction firms, events and industrial customers. Its very high vertical range of manufacture guarantees exceptional flexibility, quality and technological know-how.

The appropriate operational framework for this is derived from the company's value system, for example a positive outlook, active customer orientation, responsibility and initiative and the pursuit of continuous improvements.

Holistic management processes, digitalisation and skilled employees

Integrated management processes and quality management as a holistic management approach form the basis for customer-orientated processes and quality assurance along the entire length of the value-added chain. All corporate activities are directed in pursuit of high standards with strict certifications for all product areas and lean management systems for the continuous improvement of internal processes.

The “Digital Transformation” department concerns itself exclusively with matters and requirements associated with all aspects of digitalisation. Particular attention is placed on work areas of process digitalisation, digital organisation development and digital innovation IPD (Intelligent Power Distribution) – a cloud-based software solution for planning power consumed on building sites. Digital transformation is thus a firmly established, pioneering component of the company’s structure.

The employees are another major factor in the success of WALTHER-WERKE – with skill, commitment and enthusiasm. The corporate culture is characterised by expansive design freedoms for employees who are keen to take on responsibility and put their ideas into effect. In addition, there are a range of offers open to employees (such as e-bike and electric vehicle leasing, occupational health management and much more), as well as training and personal development programmes.

The right charging solution for every need

The market for e-mobility is growing at breakneck speed in Germany. And the need for a nationwide expansion of the charging infrastructure is growing with it. With its integrated charging systems and solutions, WALTHER-WERKE has contributed substantially to advancing this urgently needed expansion since 2008. The product range offered is adapted to reflect specific market requirements and customer needs, and WALTHER will remain an active co-creator of the mobile future.

Whether for private users or for requirements governing charging in the public and semi-public sectors, WALTHER offers a suitable solution for all current electric vehicles. In all cases, the primary concern is simple, convenient charging. And the product range also scores high marks in terms of quality: All products are compliant with the latest normative standards. For example, the new smartEVO wallbox series is equipped with the latest charge controller technology, the CC613 from Bender. The product concept is perfected with high quality, sturdy materials and an elegant design.

Photos: walther-werke.de

CC613 With the latest charge controller generation, Bender is offering a charge controller that is specially designed for use in private charging points or wallboxes.

More safety for **resistance grounding**

Bender ensures error-free use, high performance and safe monitoring in the mining industry

Mines can be one of the harshest environments to operate since equipment is often installed in remote locations where the ore or material being extracted is found in large deposits. The equipment is frequently mounted outdoors and is exposed to the elements. Miners know very well that they need high-quality equipment, which must also function perfectly and safely over a long period of time despite heavy use.

The supply of construction materials is the main focus of the Vulcan Materials Company. It is the nation's largest producer of raw construction aggregates – primarily crushed stone, sand and gravel – and is also a major producer of aggregates-based construction materials, including asphalt and ready-mixed concrete. The company's coast-to-coast footprint and strategic distribution network align with and serve growth centres throughout the US.

Recently, Bender partnered with Vulcan to provide solutions for their mining environments. The aim was to provide operators with reliable equipment that offers both the possibility of continuous monitoring of the electrical components and provides information on the status of the electrical installations and their function. This enables not only improved uptime but also increased operational efficiency.

Many globally operating companies in the mining industry have been using resistance grounding on portable and stationary applications in medium-voltage and low-voltage systems for many years. The control of ground-fault current and the capability to restrict the touch potential on portable loads are primary reasons for the implementation of resistance grounding in the mining industry.

Remote **dredge site** for slurry mining silica sand

[1] **NGR** (neutral grounding resistor)

This integrated product solution not only displays the status of the electrical system on site, but also provides staff with information that can be both collected on site and communicated decentrally. This increases safety even at the most remote sites.

In refining and processing areas, alarm-only systems are often used for their ability to improve continuity of service. Bender's range includes the grounding concept as well as its monitoring, including devices for ground fault and grounding resistance as well as devices that monitor the continuity of the ground conductor [ground continuity].

The cabinet below was installed at a Vulcan sand and gravel plant in Texas and is an all-in-one solution for protecting the plant-critical grounding resistance.

Without the resistor, the system's ground-fault protection would fail to function, and system operation would be unsafe. The smaller enclosure on the side of the NGR houses the control equipment including a state-of-the-art NGR monitoring relay from Bender's NGRM series. After initial design reviews, Vulcan Materials has specified Bender grounding solutions for their mining needs.

"The Bender MV HRG/NGR recently installed at our Dredge Site near Simonton, Texas has already revealed its value in identification of leakage currents within the power delivery system to the Dredge. Easily accessed stored data is available to our electricians, in turn significantly enhancing effective troubleshooting and mitigating losses due to plant down-time." – Andy Anderson, PE Principal Electrical Engineer

Another advantage of Bender technology is enhanced protection of non-linear loads, such as adjustable frequency converters (AFDs, VFDs, ASDs), used on equipment such as submersible pumps or conveyor systems. The US Mine Safety and Health Administration (MSHA) has been aware of the inadequacies of 60 Hz relays on such drive applications and has been promoting the application of AC/DC-sensitive protection relays for many years.

Authors:
Bryan Hadley
Regional Sales Manager
Midwest, Bender Inc

Jeff Glenney
Head of HRG Sales,
Bender Inc

More about **electrical safety for high resistance grounded systems**

Current topic:

Business Unit
Customer Service Solutions

The Bender corporation opened a new business unit on 1 April 2021. The primary mission of the Customer Service Solutions Business Unit is to offer our customers an even more comprehensive service. The intention is to strengthen customer loyalty and enhance Bender's already strong future sustainability.

What does Bender plan to achieve with the new business unit? *Heiko Brattig* discussed this question with CSO *Heinz Nowicki* and the new head of the business unit, *Michael Faust*.

Until now, there have been three business units at Bender. Why a fourth one now?

Heinz Nowicki: Quite simply because the three business units, *Industrial*, *Hospital* and *eMobility* are so specialised that they are unable to offer certain services in their branches. The *Customer Service Solutions* Business Unit is intended to serve a sort of liaison function which ties everything together.

What kind of vision do you associate with the new business unit?

Michel Faust: Our objective is to become a solutions provider. This means departing from the notion of just the product towards a comprehensive solution. This includes planning, maintenance and service. This process is already well advanced in many areas, in our hospitals business, for example. We want to place this on a more professional footing and expand it to other areas.

How should the Customer Service Solutions Business Unit set about its business in future?

Heinz Nowicki: Well, that is actually quite clear for us. We want to be closer to the customer to learn what his wishes and needs are for the future. I was recently at VW, for example. There they have a visualisation of the production line. The site is enormous. There are many, many production halls. I asked: *What do you want?* They answered: *We don't want any cryptic files or paths with abbreviations, we want to know exactly where the problem is, what kind of a problem it is, which motor has failed at what location. We want that to be displayed.* - So ultimately, I want to be in a position where we can send in our people to implement that.
Of course, we cannot fulfil every customer wish. We always have to work out how many devices are involved, what we have to invest and see if the whole thing pays off.

Michael Faust
Head of Business Unit
Customer Service Solutions
(BU-CS)

Continued
on the following pages

Heinz Nowicki
talks to
Michael Faust

When you as a company set out on a path like we did with the new *Customer Service Solutions* Business Unit, you sometimes go the wrong way. Are occasional failures permitted on this path?

Heinz Nowicki: Of course. Failure is a part of life. The only thing that matters is that you stand up once more than you fall down. But when you lose, you must also ask yourself, why did I lose, what were my tactics, what did I do wrong and where must I improve in order to maybe win at the next attempt. Because nobody is error-free.

Bender intends to transform itself from a device manufacturer to a solutions provider. The establishment of the new business unit is a crucial key to this process. At the same time, there must be a click point, a switch must be made. How can the switch succeed?

Michael Faust: Benjamin Franklin said: *"An investment in knowledge pays the best interest."* It is precisely for this reason that we intend to train four trainees every year. That is the right path. Because this is the way to retain the skills we need in the long term.

Heinz Nowicki: We always need a fresh influx of young people. That's why we train these engineers. They will lead us into the future with their new ideas and skills. But we also need the older and more experienced ones. They can tell us what works and what doesn't. It is precisely this sort of mixture in the team that makes a company successful.

Click here for the full interview on the new Business Unit
Read **Customer Service Solutions.**

1980
Electronics test setup of
Line Isolation Monitor LIM
for the American market.

Dorothea Bender-Fernández has had various responsibilities within the Bender Group. She was on the Board of Directors at Bender Inc in the USA and is currently the Chair of the Board for the entire group. She has a bachelor of science in electrical engineering from Widener University, where she was president of the IEEE student chapter. She is also a member of the Young Presidents' Organization.

"Tomorrow's customer doesn't care about our yellow boxes. **It's all about the intelligence inside."**

An interview with Dorothea Bender-Fernández, Chair of Bender Group Supervisory Board

What is your job at Bender?

Bender's mission has remained unchanged for 75 years: To protect people and machines from the hazards of electricity. Therefore, it's my task to ask: *How can we fulfill our mission today and tomorrow? And what changes do we have to implement today to get to tomorrow.*
I want to establish a peak performance culture and am extremely curious to see how the changes that we make today will impact the company in the next 25 years to come. One day I want to send out an invite to my team with the subject *"100 years of Bender – jubilee planning."*

Was it always clear to you that you would join the family business?

To be honest, no. But when I think back, there were a lot of things pointing in that direction all through my life. My childhood bedroom, for example, was the old office of my grandfather, Walter Bender. And a soldering iron was definitely one of my favorite toys. I was always fascinated by technology and I absolutely loved studying electrical engineering. But taking on an active role at Bender? That wasn't my plan. I believe that in life, we don't always see the path we're on until later, but I'm very happy that my path led me here.

What does your job look like?

I set the course for the future of our company together with the other members of the Supervisory Board. With *Carsten Hoff* and *Matthias Händle*, we establish strategic guidelines and support management so that we head in the same direction, both culturally and operationally. We as the company can't sit back and rely on what we have accomplished so far. We want to continue to shape the future of electrical safety.

“We carry a great responsibility. It’s not our job to make sure people can open their front door with their phone. Our job is to detect electrical faults that can have farreaching consequences, from the loss of human life in a hospital to property damage at a beer bottling plant. This requires a high level of expertise and that is our specialty.”

You’ve been on the Supervisory Board for 2 years now – what have been your biggest achievements so far?

Having a Supervisory Board was completely new for Bender. We had to establish and set up a new management team consisting of the Supervisory and the Executive Boards. Implementing new ways to work together and take Bender to a new level. And we managed to do that! The collaboration between the new team is characterised by incredible openness and mutual respect. Everyone brings their unique skills and is an expert in their own field. It is a highly motivating environment that leads to great results.

We are also proud to welcome 74 new employees in Dresden and a company in Singapore to the Bender Group.
As managing partners we now have the fourth generation of our family on board – this is a crucial moment to ask ourselves: What is Bender’s vision? What values should define our corporation in the future? And what corporate culture do we strive for?

What is the main challenge for Bender?

Today, we’re a global business. We need to move closer together and combine our experiences and know-how globally. We live in a very fast and highly complex market. The better we work as a global team the faster we will deliver the best results to our customers. It is a delicate balance of providing the products needed today and not being too fast with the solutions of tomorrow.

What does the customer of tomorrow need?

Tomorrow’s customer doesn’t care about our yellow boxes. It’s all about the intelligence inside. Customers aren’t looking for a single product, they expect complete solutions. And for every customer, solution can mean something completely different. We need strong partners and cooperations worldwide to be able to provide these solutions and services.

Where do you see Bender in 10 years?

We’re currently present in all future markets – from e-mobility to industry to hospital technology. These markets are steadily growing, so there will be a lot of opportunities for us to grow our business.
It may still sound strange to some, but we are a tech company. It is no longer only the hardware that makes the difference, it’s the software that is the most important part of our solutions. And that will guide us in the next years to come.
We carry a great responsibility. It’s not our job to make sure people can open their front door with their phone. Our job is to detect electrical faults that can lead to extremely dangerous situations which can have far-reaching consequences, from the loss of human life in a hospital to property damage at a beer bottling plant. This requires a high level of expertise and that is our specialty. And this will remain the focus of our operations.

What drives you personally?

I want to make an impact – like our jubilee motto says. I want our solutions to make a difference in the world. For me, this is not just about change, but about constant improvement. There is still so much for us to discover that we don’t even know about today. That’s what makes Bender so exciting and what drives me every day.

Safety at Sea!

Residual current monitoring on board

Electrical safety for both man and machine is extremely important on board a ship. Ideally, all the different aspects of safety should be included in the planning stage of a new construction. Where it isn't possible to plan ahead, optimal residual current monitoring can also be installed on board at a later date. The following summarises the elements that should be considered in planning.

Earthed or unearthed system?

The most significant difference between an unearthed (IT) and an earthed system can be seen in the impact of a failure. The IT system essentially differentiates itself from the earthed TN system by a conductive connection between the star point of the generator or transformer supplying the system and earth. This connection is present in the earthed system, but not in the unearthed system.

Usually, if someone touches a live conductive enclosure in a faulty unearthed system, nothing happens. Although there is a current, it is dependent on leakage capacitances and is therefore very low. An earthed system, on the other hand, would produce a closed fault current circuit and faults can – depending on severity – have serious consequences:

Photo: Jeanette Dietl – stock.adobe.com

- With a low-resistance fault, high currents flow through the fault location and cause local damage, which leads to an increased need for repairs or even to a system failure – even if the fuse is rapidly tripped.

- If the fault is at the level of the load current, the latter will not be interrupted. This can lead to local increases in temperature, which, above 60 W (e.g. 300 mA at 230 V), could cause a fire at the fault location.

- If a low-resistance fault occurs in an earthed system whilst a person is touching the live enclosure, a residual current will flow through the person despite the low-resistance connection to the supply transformer. This is measured and should be switched off by the overcurrent protective device within 30 ms. It is necessary to check the required protective technology at regular intervals in order to ensure it will work at a given moment.

Risks in earthed systems

In earthed systems, earth – at sea, it is the ship's hull – is connected to the neutral conductor of the central earth fault monitoring system (CEP). It is commonly accepted that this potential bonding means that earth and neutral conductors are the same. In consequence, earth on various loads is often directly connected to the N conductor in the sub-distributions. This produces yet more – but no longer central – earthing points.

In the traditional systems of older ships, these additional earthing points would have had little effect. In modern ship installations, however, various connections with good conductivity have been added. The data cables, whose shields are made from copper braiding or aluminium foil, conduct the current but have a low current carrying capacity. This means, for instance, leakage currents with double-digit amperage have been measured over parallel data cables in data centres – a fire-hazardous situation in the truest sense of the word. In addition to the effect on data quality and bandwidth and the unplanned system crashes (blue screen), leakage currents can lead to charred cables and even fires.

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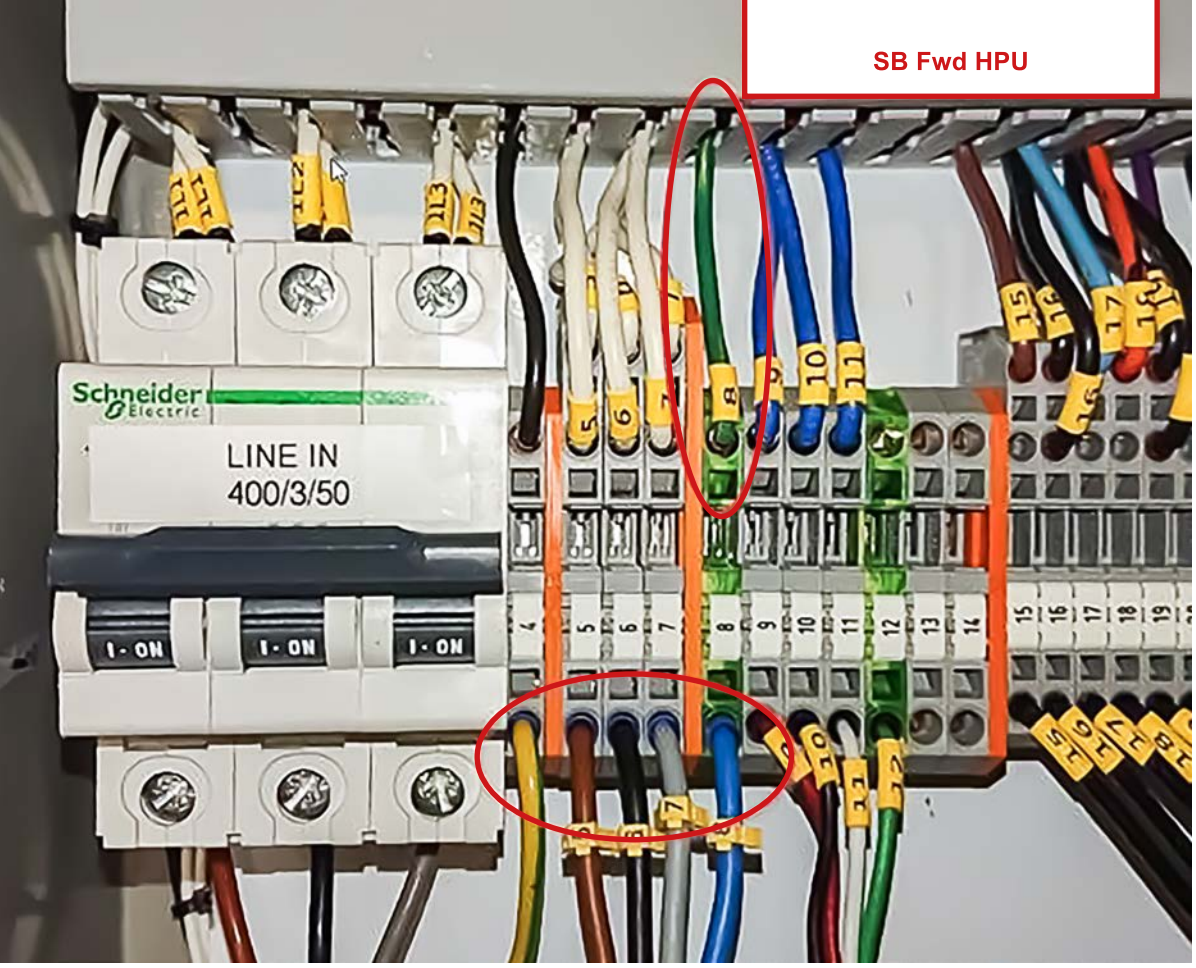

Faulty installation located – extra earthing point of the neutral conductor at terminal 8

DC residual current in an AC system?
Until today, energy on board is mainly provided as an AC power supply system. However, modern loads, such as LEDs, power supplies etc. operate with direct current. Usually, high-value components have integrated power supplies and can be used with the traditional AC power supply. However, if a fault occurs in the loads downstream the power supply unit, it becomes a DC fault. It is also essential to recognise and differentiate these faults. Indeed, a DC fault of this kind can disable an upstream type A (pulse current sensitive) residual current device (RCD) through magnetic saturation. This is called "blinding" in technical jargon. In this way, DC residual currents of 6 mA can stop RCDs from tripping even in the event of residual currents exceeding AC 30 mA, which leads to serious incidents.

Standard: Central earthing point
Consequently, DIN EN 50174-2, VDE 0800-174-2:2018-10 and IEC 60364-1 "Information technology – Cabling installation" prescribe exactly one central earthing point as standard. The result is convincing: No stray currents can flow in accordance with Kirchhoff's Voltage Law.

Additional earthing points need to be identified and removed as quickly as possible. Thanks to the residual current measurements taken at the CEP, the distribution systems and the loads, sudden changes due to another earthing point can be identified quickly and restricted, as, in this scenario, any currents will split in a demonstrably different way.

Peter Eckert, Market Segment Manager for Critical Infrastructure at Bender, explains: "Thanks to residual current monitoring, ship operators can immediately identify incorrectly installed PEN bridges (see left picture above) on loads and direct the service personnel to remedy them promptly as part of maintenance. This avoids any further impact on the whole system and prevents hazardous currents from flowing through the data cable shields. Stray currents (see right picture above, measuring clamp) are particularly dangerous at sea as currents flow through the path with lowest electrical resistance, which could be the shield of a data cable or the copper core of an N conductor."

Live measurement of dangerous stray currents

Monitoring all outgoing circuits individually: also possible for refitting

The RCMB132 AC/DC-sensitive residual current monitoring module product range enables the complete, continuous monitoring of each individual outgoing circuit. It has been tested in data centres and is also ideal for continual use in final circuits on board. This module can be refitted and cabling can be laid locally on board during operation. It is installed on the circuit breakers in the sub-distribution and monitors the individual outgoing circuits. Evaluation takes place digitally via Modbus protocol, either to the next automatic sub-distribution or to a local operating panel. In addition to digital recording, LEDs are available to show the crew where a fault has occurred. Thanks to the comprehensive residual current monitoring on board, stray currents and incidents that endanger human life and installations can be avoided, even in complex systems.

Authors:
Benjamin Greiff,
Market Segment Manager Industrial Solutions, Harbours & Vessels

Hedda Precht,
specialist journalist

Standardisation Bender Group

Smart protection concept *for AC charging infrastructure modelled on* **charging mode 3**

Following the Federal Government's undertaking to reduce greenhouse gas emissions in Germany by a total of 55 % compared with 1990 by 2030, not a day goes by without discussing the electrification of road traffic and the comprehensive, reliable charging infrastructure which is essential for it.

As the value of subsidies for developing such a charging infrastructure increases, more and more players and products enter the market, making it harder for users to understand the situation clearly and compounding their uncertainty.

But amid the confusion of the race to set this undertaking on its feet and in the face of ever more complex requirements combined with shorter time-to-market, it is imperative not to neglect the question of "electrical safety". In essence, the following applies: Particularly in the realm of cable-based AC charging, the requirements governing a safe yet interoperable charging infrastructure are already thoroughly described in the national, European and international standards and have proven themselves in practice.

But at the same time, misunderstandings arise repeatedly regarding certain formulations and requirements of the standards. One misunderstanding that occurs very often on the subject of cable-bound AC charging modelled on charging mode 3 – referred to in the following as mode 3 charging for short – is that a type B residual current device (RCD) must be installed for each charging point. Meanwhile, the solution described as equivalent in the pertinent standards, a type A RCD combined with 6 mA DC fault current monitoring and a disconnecting device (RDC-MD for short according to IEC 62955:2018), is overlooked without reason in many cases, and is even characterised as unsafe.

The purpose of this article is to address this view, which is unsupported by facts. In so doing, this article will also explain the combination of a type A RCD and RDC-MD, which is superior in many ways, as part of the total safety concept of a standard-compliant mode 3 charging device.

Smart protection concept for mode 3 charging infrastructure

At bottom, the argument regarding electrical safety is based on the mistaken belief that when a DC fault current > 6 mA occurs, it is imperative to separate safely from the power source. This, in turn, begs the conclusion that the requirement can only be satisfied with a type B RCD.

In response to this, the existing standard situation must first be explained. The standards considered most significant for the electrical safety of a mode 3 charging infrastructure are the installation standard

DIN VDE 0100-722 (VDE 0100-722) which deals with connection to the low-voltage installation, and the product standard DIN EN IEC 61851-1 (VDE 0122-1) which concerns the AC charging infrastructure, both of which were formulated by the German Commission for Electrical, Electronic & Information Technologies of DIN and VDE (DKE). For the point at issue, the relevant committees are DKE/K221 “Electrical installations and protection against electric shock” and DKE/K353 “Electric vehicles”.

Both of these bodies are in agreement regarding the safety of using the constellation of type A RCD and RDC-MD, as is evidenced in VDE 0100-722:2019-06 section 722.531.3.101 and DIN EN IEC 61851-1:2019-12 section 8.5. In both documents, it is stated unequivocally that

1. the use of a type A RCD in combination with a RDC-MD is unreservedly equivalent to the use of a type B RCD and

2. disconnection following the occurrence and detection of a DC fault current > 6 mA is sufficient, and is not to be confused with safe separation of the power source.

It is most important to draw a clear distinction between the protection function for personal protection and raising the level of protection in order to guarantee performance of the protection function.

The defining issue is:

- The protection function against electric shock is assured at all times by the protective device (type A RCD) which is required in the installation for each charging point and is used explicitly for the safe separation of the AC circuit when a residual current > 30 mA occurs.

- The function of the RDC-MD described in the standardisation community as raising the protection level ensures that the protective function of the type A RCD is maintained in case of a DC fault current > 6 mA, which must be complied with in the field of e-mobility.

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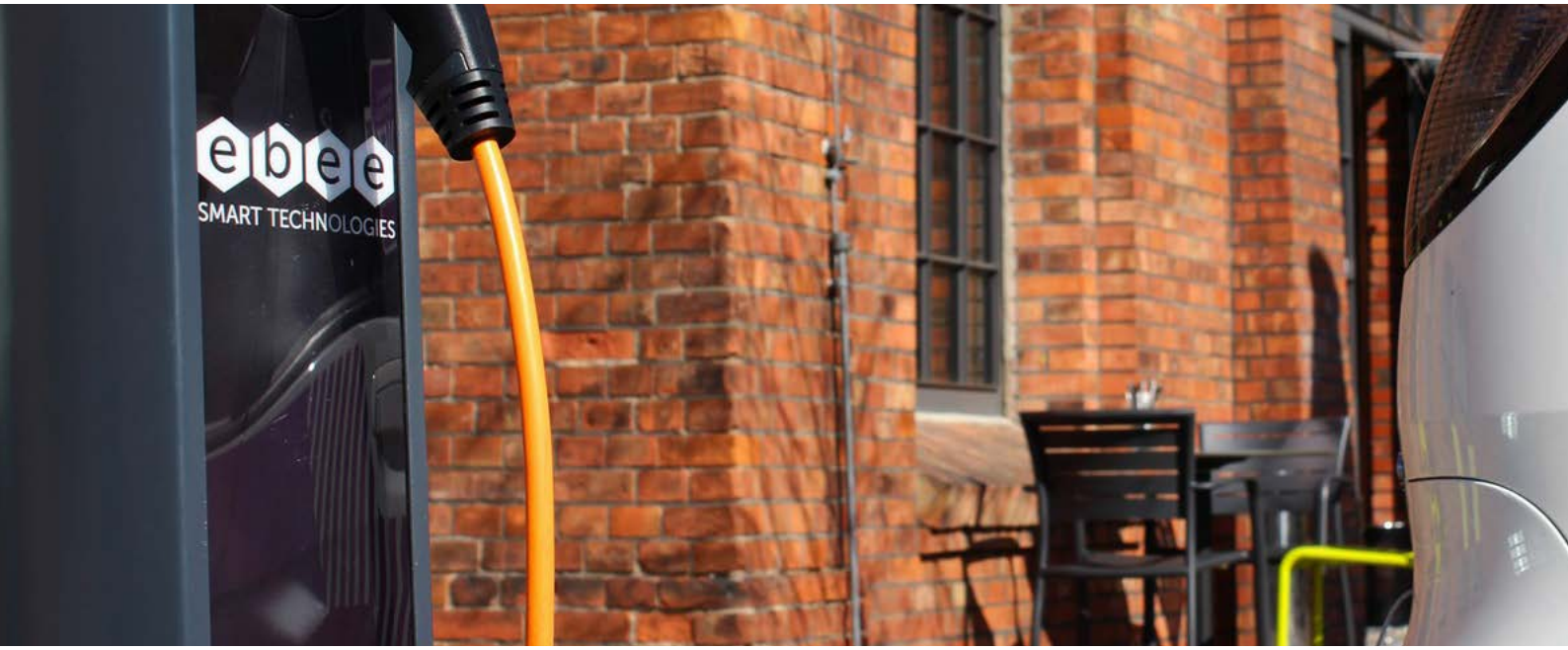


The two committees mentioned above consider that the risk of a dangerous AC residual current > 30 mA occurring together with a DC fault current > 6 mA and at the same time direct contact by the user is sufficiently low, in view of the total safety concept of a mode 3 charging infrastructure, as will be explained below. Therefore, a safe separation of the power supply following detection of a 6 mA DC fault current is explicitly not required.

Pursuant to the opinion from both committees as described earlier, the option exists to use the switching elements which are installed in the charging infrastructure anyway to perform normal operational switching to carry out disconnection upon the occurrence of a 6 mA DC fault current.

Regarding the total safety concept of a mode 3 charging device with a type 2 plug connector conforming to DIN EN 62196-2 (VDE 0623-5-2):2017-11, the following points must be kept in mind:

- In principle, a locking system for the charging plug and the vehicle coupling (case: detachable charging cable) or the vehicle coupling (case: non-detachable charging cable) is always present during the charging process, and consequently while the energy is flowing there is no danger of touching hazardous, live parts.

- For the unlikely event of a defective locking system, IPXXB class contact protection is provided. In keeping with the protection concept of earthed socket-outlets used in residential installations, IPXXB is a suitable basic protection measure compliant with DIN EN 61140:2016-11 which prevents direct contact with live parts. Fault protection is assured by automatic disconnection of the power supply via the protective devices required for the installation.

- Furthermore, a 30 mA RCD is required as additional protection for each charging point to allow operability by members of the public. As explained previously, when a type A RCD is used, measures must be implemented for testing and disconnecting if a DC fault current exceeds 6 mA.

- Besides the normative minimum requirements, the self-test function implemented in the 6 mA DC fault current sensors produced by the Bender company offers a further safety gain, in that the 6 mA DC fault current solution is tested before every charging process. At this point, it is worth nothing that in order for the DC fault current detection to work in the type B RCD that corresponds to the RDC-MD, a voltage-dependent electronic system is used that is not designed to satisfy any higher quality requirements in terms of failure safety and typically does not provide a self-test function.

In summary, the constellation of a type A residual current device (RCD) with RDC-MD is to be recommended for use in mode 3 charging infrastructure in preference to a type B RCD for the following technical and financial reasons:

It is most important to draw a clear distinction between the protection function for personal protection and raising the level of protection in order to guarantee performance of the protection function.

- Lower installation costs (particularly if a type A residual current device (RCD) is already fitted in the existing installation);
- Automatic restart capability after elimination of the DC fault current without a service intervention and the associated loss of availability in the field (manual reset of the protective device by an electrically skilled person or trained electrical engineering personnel is not necessary);
- Cost-efficient use of the switching elements of the charging infrastructure designed for normal operational switching. (Note: Protective devices such as the RCD must not be used for normal operational switching and are only permitted to perform a specific number of switching cycles; this number would undoubtedly be far exceeded in the routine operation of a charging point);
- If a type B RCD is put into operation, any and all type A RCDs in the higher-level associated circuit would have to be replaced with type B RCDs to comply with the normative requirements for coordination as set forth in DIN VDE 0100-530:2018-06;
- The level of safety required according to the standards is raised by the provision of a self-test function of the 6 mA DC fault current detection before every charging process.

Author:
Dennis Haub
e-Mobility Standardisation Manager | Bender Group

UAB *“Elektros Iranga”*

Together with Bender, we are innovation leaders in Lithuania!

Exactly 27 years ago, UAB Elektros Iranga became the largest international representative of automation technology in Lithuania within a short period of time. The company works with a variety of automation and control system integrators and manufacturers. Since 2004, UAB Elektros Iranga has represented Bender GmbH & Co. KG and joined the international Fegime Group, an association of medium-sized electrical wholesalers, in 2019.

Support from Spain

Elektros Iranga also represents the Spanish manufacturer Salicru, whose UPS systems are often used in hospital power grids. This cooperation makes it possible to offer an even larger portfolio and to integrate Bender products in the Group 2 rooms.

“The recipe for our success is that we do not sell the product to the customer, but a solution. Our customers receive not only comprehensive advice with detailed information on the products, but also professional installation and regular maintenance,” explains Vilmantas Gaspariūnas, product manager at Elektros Iranga. He adds: “We provide our customers with support in the use and set-up of the system, as well as with product training.”

„Complex customised system solutions from Elektros Iranga mean that we don‘t just sell the customer a specific product, but offer customised solutions that create added value both for us and especially for our customers,” adds Darius Peškys, also a product manager at Elektros Iranga, “This allows us to prove our competitiveness compared to our competitors.“

Training courses and online seminars

For training purposes, a “school of automation” has been set up in the company, where planners and developers as well as specialists can systematically get acquainted with new technologies, share experiences and test new products in existing technical setups to acquire not only theoretical but also practical skills. This year, on-site training had to be suspended due to the COVID-19 pandemic, but new digital options were found and used to work with customers remotely. This is also shown by the significant increase in online seminars.

Both product managers agree: “We highly appreciate the good cooperation with Bender. Their support is the best example of good cooperation between manufacturer and representative. In regular meetings (exclusively online for now), we discuss common strategies and plans, solve problems and share news.“

Photos: eliranga.lt

During the transformation of the Lithuanian electricity grid and the connection to the interconnected European grid, products for insulation monitoring and insulation fault location were specified for the Lithuanian grid operators and are now used throughout the country. The teams responsible for maintenance are also using the possibilities of mobile fault location. Through one of the largest switchgear manufacturers in Lithuania, it was also possible to install Bender insulation monitoring devices in Lithuanian electricity grids.

The company currently has 31 employees and four branches in the largest cities of Lithuania. All employees are experts in the field of electrical engineering and sales. Bender products have a high priority wihtin the company. Two product managers, who are exclusively responsible for Bender products, constantly provide the entire sales staff with the latest information.
This ensures that every employee of UAB Elektros Iranga is always up to date regarding Bender's customised solutions in the fields of energy supply, railway technology and medical projects. At the beginning of the representative activity for Bender in Lithuania, numerous discussions and meetings were held with decision-makers such as planners, technical service personnel and customers. Participation in all local electrical engineering trade fairs was and still is a matter of course.

Bender ensures safe power

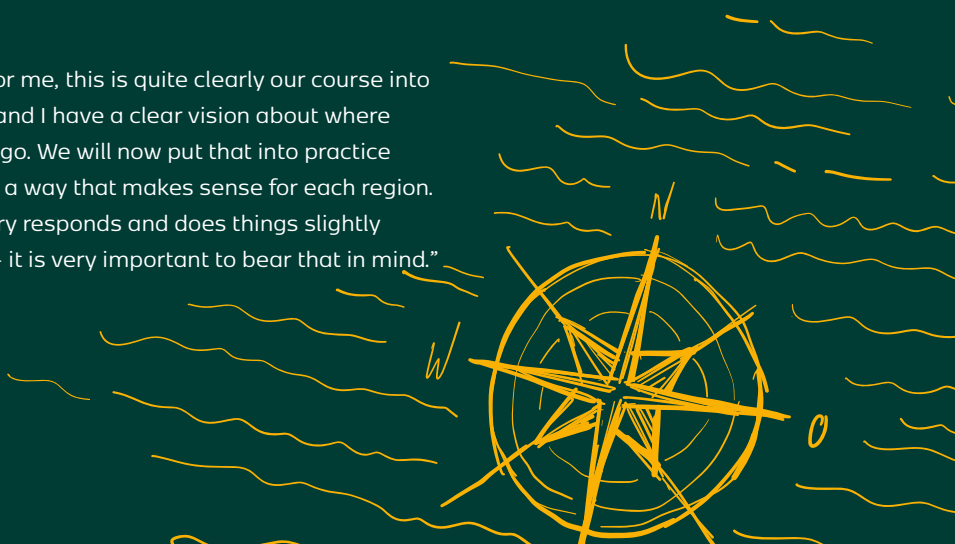
UAB Elektros Iranga was able to offer the Lithuanian electricity supplier Litgrid insulation fault locators for the localisation of insulation faults in addition to insulation monitoring devices for the monitoring of their unearthed systems. In the meantime, numerous portable insulation fault locators of the EDS309x series are in use there, in addition to the permanently installed devices. In the power supply of new Lithuanian hospitals and the associated Group 2 rooms (operating theatres and intensive care units), IT isolation transformers and insulation monitoring devices were used for the first time.

MAKE AN IMPACT!

"Make an Impact!" is the motto for the 75-year jubilee. What might that mean for you and your work?

Heinz Nowicki,
CSO Bender Group

"For me, this is quite clearly our course into the future, and I have a clear vision about where we want to go. We will now put that into practice together, in a way that makes sense for each region. Each country responds and does things slightly differently – it is very important to bear that in mind."



Anne Katrin Römer,
Managing Partner

"For me, it means that I must leave my comfort zone and state my point of view loud and clear, regardless of how many feathers it ruffles and even if it means I occasionally encounter rejection. It also means exploring new territory and taking responsibility for it, and being prepared to be open to new ideas, because it is important to find the best idea for everyone's benefit."

"That's really a message that I take personally and try to build into the team. You can always find someone who will pay you more money; but it's about the overall experience, paying a fair rate, but also giving people a feeling of satisfaction and achievement in their roles. That isn't just the job. I want everybody to wake up in the morning and look forward to going into work. I want everybody when they leave to feel great, because they did something that's rewarding and good for the world, as well as individually. We all want to make an impact."

Gareth Brunton,
Managing Director
Bender UK Ltd

Stefan Möller,
Plant Management,
Siersleben

"It means having the courage to make progress together.
At the same time, it is not only the environment that provides us with the opportunities.
We must go and actively seize them."

"For me, it means that we really intend to set something in motion. And not just start it moving – but really offer our customers and colleagues something of value. Impact doesn't sound like something that flares briefly and then vanishes like a spark. It sounds like something that endures and exists for a longer period."

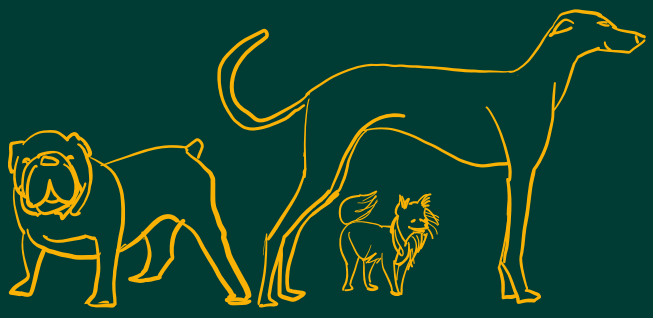
Verena Dick,
Internal Communications
Coordinator

Steve Mason,
Vice President
Bender America

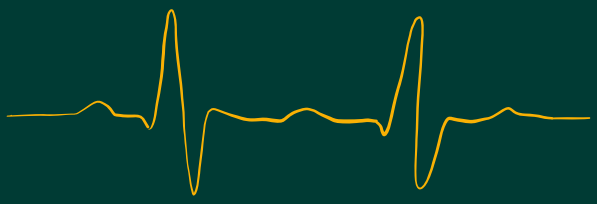
"Making an impact, to me, means that we make it perfectly clear to the global market: Bender is serious about being the leader in this electrical safety space. And I think we can do this. We have the opportunity and the potential to do it but we're not quite doing it yet. So let's show the world who we are and why we're the best at what we do."

"For me, Bender's philosophy is community. My aim is to reinforce that – particularly in the time of the coronavirus. This is a very exciting task for me, because we have a really diverse human portfolio. Let me put it this way: We have a very mixed bag."

Karsten Rinkleib
Occupational Safety Expert



If Bender were a person, what would you give as a birthday present?



Frank Hofmann,
Incoming Goods Management,
Grünberg

"No question: Health."

Ralf Koch,
Vice President,
Research & Development
VACUUMSCHMELZE GmbH & Co. KG

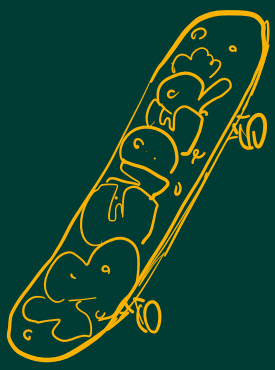
Michael Breuer,
Managing Director Eetarp

"A modern e-car. By the time the 100th birthday came around it would then be a vintage model and a wonderful memory of the 75th jubilee."

"An iPad. An iPad is a bit of a gateway to everything. For example, for keeping communication channels open with everyone and to be able to keep informed about everything; to be a participant and stay current wherever you are."

"I would treat Bender the person as I would a good friend.
I imagine Bender the person as an old-school engineer in a rather elderly knitted cardigan. So to challenge him a little, my present to him would be a skateboard. Then we would skate off into the future together – even if it meant we had to learn to stand on the thing first."

Matthias Händle,
Supervisory Board Member,
Bender Group



Doris Hirrick and Sabrina Lewis,
Reception, Grünberg

"Lots of chocolate as comfort food."

"I would love a band room. A room where people come together to create, design, simply try something new, and not limit themselves."

Anne Katrin Römer,
Managing Partner

Time for
celebrations.

Would you have liked to be interviewed too? Share your gift idea here: **75bender.com/en/send-greetings/**

Heinz Nowicki,
CSO Bender Group

"A bag full of luck. Because Bender is lucky to have someone like me who really enjoys bringing the company onwards."

Alfredo Quezada,
Sales Manager Bender Peru

„A book of Peru. We are in 70 countries around the world and Bender Peru just started last year. That's why I would love to share more information about my country."

Marie Meyreiß,
Yearly intern, Electronics Technician for Industrial Engineering

"A gift certificate for an adventure. When they reach 75, many people think: It's all downhill from here. But there is still so much more to experience! Bungee jumping for example."

Andreas Falk,
System Architect,
SMA Solar Technology AG

"My impression of the Bender corporate culture is that it is aware of its respectable status but also entertains a hint of the environmental activist. So: an e-bike."

Dirk Christian Bender,
Founder and Managing Partner

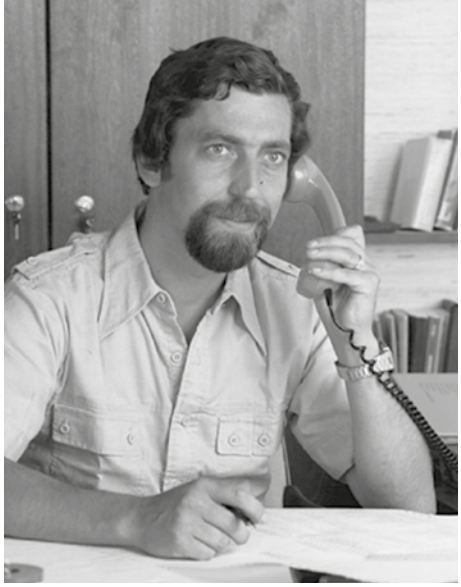
"A ship. Because the ship is like your company. Go to it, and set sail with a good crew in wind and all kinds of weather to reach your destination safely in stormy times as well."

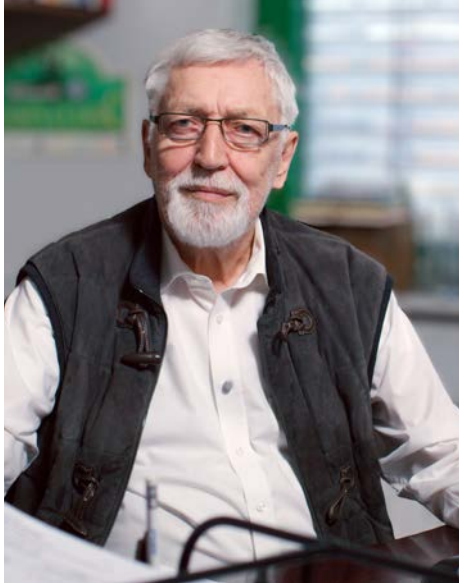
Steve Mason,
Vice President Bender America

„Spectacles to provide the focus and clarity that the human being requires to allow it to continue in a happy and successful manner."

Left: **July 1972**
Dirk Christian Bender takes over responsibility for operations and the then 18 employees.

Right: **April 2021**
Dirk Christian Bender relinquishes operational management at the end of 2006 and is presently a Managing Partner of the company.



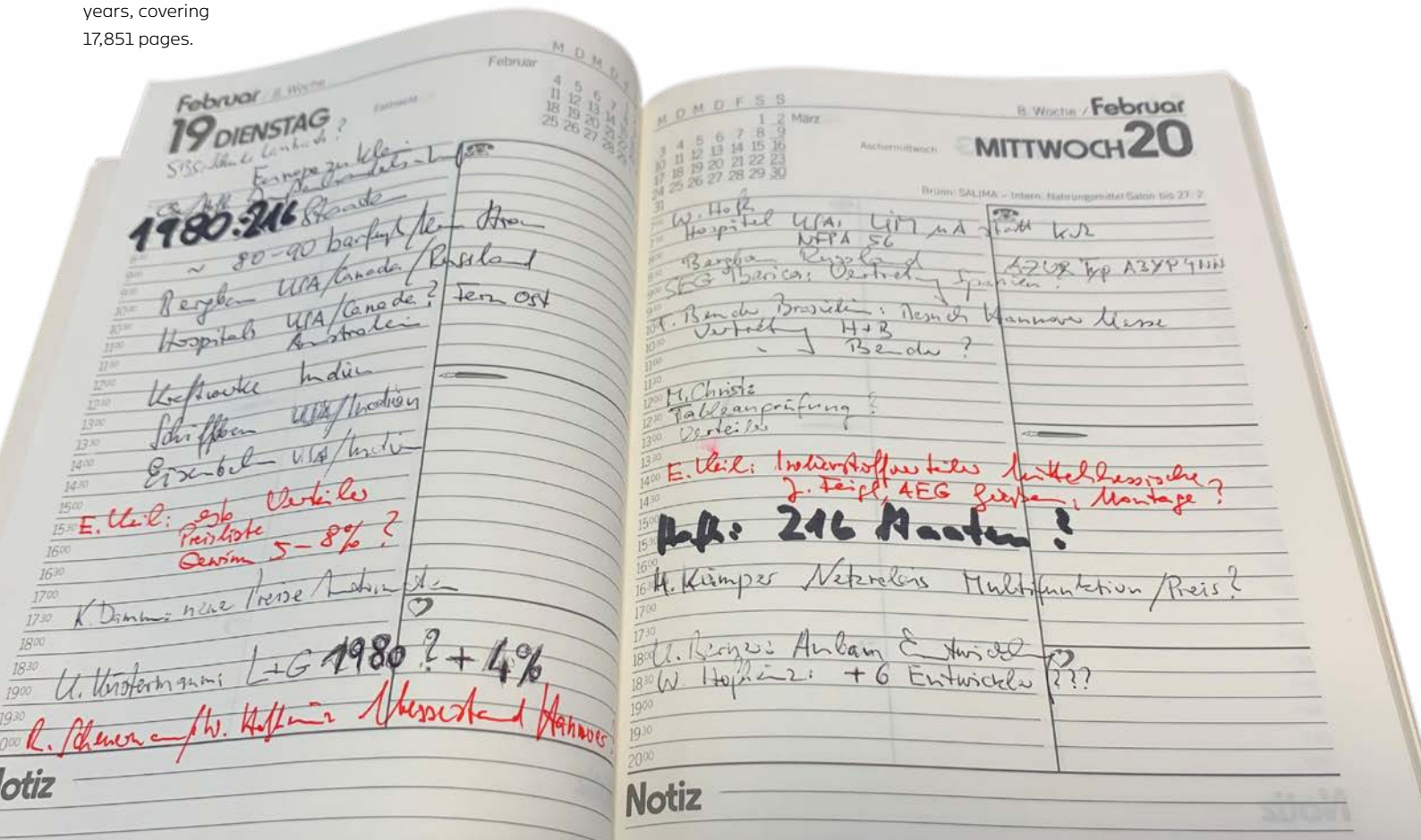


The start of a **global company**

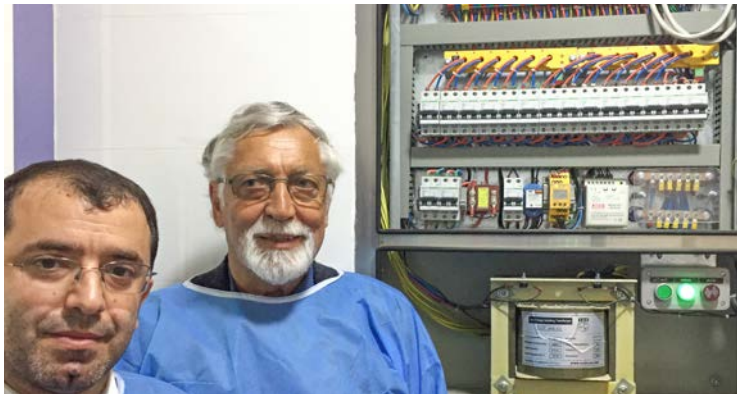
It was clear from the start for Dirk Christian Bender: electrical safety is a topic on the global stage.

Already in the early 1970s, he was packing his "Bender" suitcase, climbing into his BMW and travelling across Europe. His luggage always contained the most important vocabulary of the national languages.
He jotted down all the important notes and dates in his calendars: That was the case on 19 February 1980: On that morning, he researched the country list of the German Ministry of Economics to see how the journey would proceed. He wrote down 216 countries. At first glance, this is a routine note. But on closer inspection, it is clear that this was a historical moment for Bender: the start of a global direction.

From 1972 to the present day, the senior boss has charted history over 49 calendar years, covering 17,851 pages.



“I carried my father’s message of electrical safety for man and machine out into the world. I met people of many nationalities with whom I still have contact. It is these personal relationships that are helping us to become market leader today.”
Dirk Christian Bender



Dirk Christian Bender international

Left:
Exco meeting
India
Brazil
Dubai
Chicago
Switzerland

Right:
Iran
Start in the USA
Columbia
University of Tehran

“You can only prove your ability by doing and that has an impact in itself. It’s that simple.”
Dirk Christian

Dirk Christian Bender | 2nd generation
Electrical engineer, inventor, visionary, founder and member of many national and international committees in the world of electrical engineering. Living in active retirement.

Hanna Suhr-Bunt | 4th generation
Studied business and industrial engineering and works as a team leader in a technology company in Frankfurt.

“We should definitely not rest on the laurels of my grandfather and great-grandfather. There’s still so much to do!”
Hanna

“When we manage to live out our values of appreciating others and being open towards them, whilst still making our position clear, the impact is tangible!”
Anne Katrin

Anne Katrin Römer | 3rd generation
Studied business administration, loves music and all creative things. Led Marketing and Communications at Bender for many years.

Christian Bender | 3rd generation
Managing Director of elektro Systembau Bender and visionary for industrial digital printing.

"Make an impact – what does that mean for me – my first thought is how we are remembered. People associate my grandfather with the invention of the ISOMETER® and with his kind, open-hearted and modest character."
Christian

MAKE AN IMPACT!

Walther Hans Bender | 1st generation

"Our knowledge, combined with the innovative spirit of our employees, means that we can continue to bring intelligent and ingenious solutions to the market. That's how we make a difference in the world and protect people!"
Dorothea

Dorothea Bender-Fernández | 3rd generation
Studied electrical engineering in the USA. She worked for Bender in the USA, Germany and Spain. She has been Chair of the Supervisory Board of the Bender Group since 2019.

Bender@SELAM

SELAM
Hilfswerk in Äthiopien

True to our jubilee motto, we want to make a big impact with this project: A professional future for 20 people. To accomplish this, we have teamed up with the relief organisation SELAM to give life to our first social electrical project.

This is what it's all about:
We want to enable 20 young people in Ethiopia to be trained as electricians and electronics technicians. In this way, we want to support them in building their professional future.

Our undertaking:
We will cover the costs of the 3-year training for the whole class. And because we are so excited by these apprentices, we want to share the project with you and drive it forward together.

Become part of our **motto**, *become part of our* **project**.

The three-year training costs €90,000 in total for all the apprentices. We have already financed the first year of training. We're now onto the second and third! **So, let's do it together.** Because, as we all know, a professional future is, and always will be, priceless.

We are grateful for your donations, for example for:

One week's training for one apprentice	€30.00
One month's training for one apprentice	€125.00
One year's training for one apprentice	€1,500.00

MAKE AN IMPACT!

75bender.com/en/5-minute-impact/

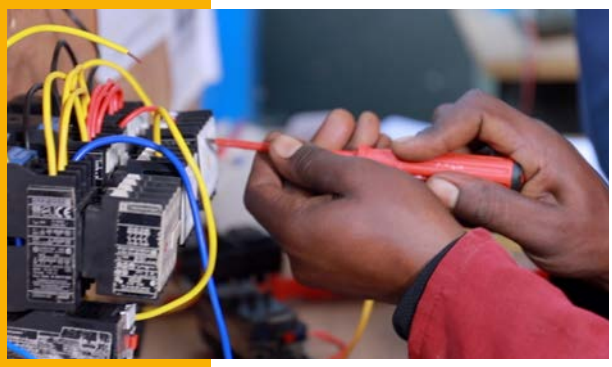
What is **SELAM***?*

Accept - Train - Give a future.
The **child welfare organisation SELAM** has been working from these principles since 1986, striving to fight poverty through training and support.

Learning a profession enables SELAM children, and many other young people, to stand on their own feet and find employment in the local economy.
On average, SELAM supports a child for nearly 20 years.

SELAM has been offering training at the "Selam Technical Vocational College" since 1991. At first, this was just training in metal construction. Today, in addition to metal construction and electrics, they also provide training in general mechanics, automotive engineering, carpentry, IT, office work, cooking, home economics, sewing, agriculture, lorry and bus driver training. Since the first apprenticeship certificates were issued in 1995, the rate of employment/self-employment three months after graduation has always been over 90 %.

Training in electrical installations began in the year 2000. The first apprenticeship certificates were issued in 2003. By 2019, 438 apprentices (370 men and 68 women) in electrical installations and industry electrics had successfully completed their training and been integrated into the labour market.



Photos: selam.ch

www.selam.ch/
berufsbildungszentren

How to **Make an Impact** *in 5 Minutes:*

75bender.com/en/5-minute-impact/

With its headquarters in Grünberg/Hessen, the BENDER Group has over 70 representative offices and 16 subsidiaries with over 1000 employees worldwide. Find your regional contact partner at www.bender.de.

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