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LÜTZE-REPORT

The international magazine of the Lütze Group

LÜTZE
Systematic Technology

EDITORIAL

Udo Lütze
CEO Friedrich Lütze
International Group

Innovation, a component part of our corporate culture

48 years ago, my father laid the foundation stone for a company that was known for its innovation from day one. Right from the start, the customer and his/her requirements took centre stage, so my father was always on the look out for innovative solutions for our customers.

Nothing has changed in that respect today. The concerns of our customers, as well as our customers themselves, have changed over the years. However, now as before, we are aware of a strong desire for innovative solutions in the market.

We tackle these customer concerns on a daily basis. In this edition of Lütze Report, we again introduce you to many innovative solutions from our company. The products and systems you see here have been developed in close co-operation with our customers and tailored to their individual requirements.

Lütze has a long tradition as regards innovation and proximity to its customers. My father built the company up over a period of many years' hard work. It is now my job to continue managing the Lütze Group and to carry on this tradition. I would therefore like to thank my father for the trust he has placed in me. He has created a strong foundation, upon which our family business can continue to develop.

The generations may have changed, but the values remain the same. Now as always, the requirements of our customers remain at the centre of our work and encourage innovation in our business. I therefore look forward to co-operating closely with you and trust you will put your trust in my colleagues and myself. Many thanks in advance, and here's looking forward to healthy growth for both of us as business partners in a dynamic market.

Yours sincerely,

Udo Lütze

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Anniversary in France

30 YEARS OF LÜTZE EN FRANCE

Armand Patte, France

In 1976, the **Lütze SA** branch opened in France. How quickly time flies! **For over 30 years, Lütze has been at its customers' sides with practical advice and help.** First in our thoughts are all of our customers, who have placed their confidence in us during this period and to whom we have been able to offer **innovative and efficient solutions.** I would like to thank them for their many years of co-operation, which has formed the basis for our growth and further development.

Together with Mr. Udo Lütze, we celebrated this joyous occasion on the river Seine in the heart of Paris. Our staff were able to discover one of the most beautiful cities in the world whilst enjoying a fine evening meal on the fly-boat in convivial company.

Now I would like to invite all of our customers to the **SCS Automation & Control** trade fair at the beginning of December in Paris. Lütze will again be taking the opportunity to present various new products, so a visit will be well worthwhile.

TRADE FAIRS

Lütze goes around the world

Exhibition	Date	Place
Vienna Tec	10 – 13 October	Vienna
Matelec	24 – 28 October	Madrid
SPS	28 – 30 November	Nuremberg
SCS Automation & Control	05 – 08 December	Paris
HMI 2007	16 – 20 April 07	Hanover
AM-EXPO	24 – 27 April 07	Atlanta, USA

LÜTZE AUSTRIA STRENGTHENED

Eduard Tanzer, Austria

Since June 2006, Lütze Elektrotechnische Erzeugnisse GmbH in Vienna has been strengthened by the appointment of Konrad Gnigler as Sales Manager. Konrad Gnigler can look back on over 15 years of experience in the sales and marketing of automation components and systems in Austria.

With his specialist knowledge based on both theory and practice in the field of switchgear construction, machines and system installation technology, as well as automation technology, even greater emphasis will be put on the company mission of **«Expertise through proficiency».** Alongside the sales of Lütze systems to machinery and plant customers, it is also planned to build up co-operative partnerships with distributors.

The company in Austria is intent upon further growth and, along with Konrad Gnigler, in line with our motto will be at the disposal of our customers as a problem solver that has many customer benefits to offer.

Konrad Gnigler, Engineer

Lamp control device for exterior rail vehicle lighting

A LIGHT GOES ON!

At the InnoTrans 06 trade fair, Lütze presented its new LSG3 lamp control device. Apart from standard lighting media, Xenon, Halogen and LED luminaires can also be energised and monitored.

The **Lütze lamp control device** is a compact module that meets all the stipulations of the UIC (International Union of Railways), the StVo (German Road Traffic Law) and the operators, as well as the design requirements for exterior vehicle lighting. The microprocessor-controlled module accepts inputs from the vehicle control system via CANopen or parallel signals. From this a signal image is generated that is then sent via the power drivers directly to the lighting medium. At the same time the LSG3 monitors the outputs for any short circuits, open circuits or failure of the lighting medium. This diagnostic information is then sent back to the control system, also via CANopen or parallel signals.

In order to increase the service life of the connected lighting medium, a soft start is used to switch this on. In addition, the lighting medium's output power is limited to its rated value by means of PWM (pulse-width modulation). Accurate quartz control of the blinkers ensures extremely long synchronous blinking in the vehicle interconnection. As the project-specific configuration can be set up locally, adaptations that need to be undertaken at short notice are not a problem. The newly available third generation of the Lütze LSG3 offers connections for up to 49 lighting media.

Signal and exterior lighting of rail vehicles

The control of rail vehicle signal and exterior lighting presents in many cases a highly complex task. For long-distance intercity traffic it is the **UIC regulations** that apply; these include special stipulations for almost all the networks throughout the rest of Europe. For local commuter systems in Germany, it is the **StVo regulations** that have to be observed. The individual wishes of the operators also have to be taken into consideration. In the design of modern rail vehicles the element of exterior lighting has an increasingly important role to play

New cable generation from Lütze

PVC-FREE, THIN, LIGHTWEIGHT, FLEXIBLE

Lütze presents a new, PVC-free cable generation with improved electrical and mechanical properties.

Given the great success of the PVC/halogen-free SUPERFLEX PLUS PUR cables, with immediate effect Lütze is also replacing the PVC conductor insulation used previously in other cables with a **technically superior** and **environmentally friendly elastomer:**
Lütze SUPERFLEX® N(C) PUR
Lütze SUPERFLEX® N PUR
Lütze-SILFLEX N(C) PUR
Lütze-SILERFLEX N PUR

The new generation of PVC-free and halogen-free cables from Lütze is characterised by significantly **improved electrical** and **mechanical properties,** as well as a **smaller diameter and reduced weight.** Apart from the low dielectric constant which ensures smaller switching capacities and therefore **better transmission properties** with increasing frequencies, what stands out most is the reduced cable diameter, which is made possible by its improved dielectric strength.

However, the insulation material used, which replaces the previous PVC, not only allows thin insulation wall thicknesses, but also **increases the oil stability** and above all makes the cable **consistently flexible in cold regions.** Added to this are the **outstanding antifriction properties,** which also have a positive influence on the flexibility of the conductors used.

THREE IN ONE!

Also presented at InnoTrans 06 was the further developed DIORAILPC Rail Vehicle Control System which is ideal for control and communication tasks in line with the EN50128 standard, both SIL0 and SIL3.

The new **C**ontrol System is based on the **DIORAIL family,** well-proven in the market over many years, and allows for the implementation of control and communication concepts according to EN 50128. As the vast majority of all the signals on the vehicle are classed as SIL0, **Lütze is focussing on a modular design.** The new DIORAILPC forms the basis for this and makes control applications in line with SIL0 possible. Taken together with the proven DIORAIL I/O modules and the powerful programming environment to IEC 61131, it constitutes a **cost-effective solution** to all SIL0 level control and communication tasks.
Thanks to high-performance processors and a wide variety of available interfaces, it is also ideal for substantial **control and communication applications** on **complex vehicles.** If the control technology has additional signals that have to be handled in accordance with SIL3, then the basic device can be equipped with a further processor card. This communicates with safe and secure I/O modules via its own CAN-based bus. Thanks to the seamless integration into the SIL0 system, the process data is available on both sides, allowing for **clearly laid-out design and configuration.** As a further option, the SIL3 control system can be supplied as a compact stand-alone unit. In this version it is ideally suited for adapting vehicle designs with existing control technology to current requirements with regard to functional safety.

LESS INSTALLATION SPACE

The third new product presented by Lütze at InnoTrans 06 was its LSC wiring system with new layout options for electrical installation planning.

The steadily rising proportion of electric and electronic components used in railway rolling stock presents more and more new challenges to the installation planners. As the interior of carriages should provide as much space as possible for seating to make their operation more cost-effective, it is important to make the best possible use of available space for building in equipment. The **Lütze LSC system** helps to solve this problem in an innovative way. Less installation space is needed thanks to the high packing density of components. At the same time, using the **LSC system** results in a more service-friendly rack layout. Additional potential for savings comes as a result of the use of aluminium, which is a lightweight material. Lighter equipment racks make lighter rolling stock possible, which in turn leads to more reasonable operating costs.

The most important elements in the structure of an **LSC wiring frame** are the aluminium rack profiles. A wide selection of different profiles makes possible the **space-saving installation** of all currently available switching equipment. Thanks to individually adaptable racks made from different profiles, even small and awkwardly shaped installation spaces can be used to their best advantage. The wiring follows ducting consisting of snap-on plastic profiles on the rear of the frames. This means the cable ducting can be moved from between the switchgear to the rear. On the one hand, **this saves space,** but on the other it also enables **improved air circulation** between the items of equipment, thus **improving heat dissipation.**

Machines down – up and running again within 24 hours!

LÜTZE SAVES THE DAY IN AN EMERGENCY SITUATION

Sari Gregson / Stefan Grunwald, USA

This emergency situation took place during the summer 2006. Find out what Lütze can do for your company.

Friday, 4:00 p.m., East Coast

Manufacturing representative calls Lütze in Charlotte, NC, to ask about availability of several items needed for a plant emergency. Steel plant on fire, part of the plant needs rebuilding.

5:00 p.m.

Regular business hours are over at Lütze. No bill of material has been received.

5:45 – 6:30 p.m.

Last Lütze employee leaves the building for the weekend.
Lütze employee receives a phone call on the emergency cell phone that the bill of material is complete. Goal is for the customer to receive the product by noon the next day, which is a Saturday. Customer is 610 miles and a 10-hour drive away.

5:00 p.m.

Two dedicated Lütze employees return back to work from their Friday night activities. Task is to complete paperwork and enter customer purchase order of 12 line items in the system to start the process.

7:15 p.m.

Lütze employee searches and locates a courier service ready and available to deliver the cable in time, by noon next day, ten hours away from Charlotte.

7:45 p.m.

In the warehouse, the team effort of two Lütze employees is to set up the materials to process and complete the order. Cable has to be retrieved from the warehouse locations, cut and respooled and packaged properly for shipment.

9:00 p.m.

Courier arrives at Lütze Inc. Courier waits as the processing time for the order is longer than anticipated.

10:25 p.m.

Order materials are picked, packed and ready to ship. Cable leaves Lütze, Inc., and starts its long overnight journey.

Saturday noon

Cable arrives at customer site as promised in time to minimise machine down time. Machines are up and running again with minimal delays and a huge amount of money was saved due to Lütze's quick response time.

Detailed view of a system in Valencia

ESPAÑA – EVERYTHING UNDER THE SUN

Martin Brinkmann, Spain

This slogan, which has been in use by the tourist industry for 20 years, is now also taking on significance for the energy generation sector.

According to a study conducted by the European Press Service (EPS) in Bonn, apart from Italy and Portugal, Spain in particular has all the right conditions to become a future solar power paradise. This investigation, entitled «The Spanish photovoltaic market 2005/06» provides for the first time extensive primary data about the solar power market on the Iberian peninsula. The EPS forecasts a growth for the Spanish market from 38.7 MWp to 637.3 MWp in the period from 2004 to 2010, which is an increase of more than 16 times. The local photovoltaic association, ASIF, even forecasts a cumulative overall output of 1,100 megawatts (MWp) by 2010.

As a result of Spain's renewable energy plan (Plan de energías renovables en España 2005-2010), by the year 2010 more than 12% of the energy consumed in Spain should be generated locally using renewable resources. In order to reach this goal, generating premiums are being paid. In the case of photovoltaic plants, these amount to up to 575% of the current electricity price during the first 20 years of operation. Consequently, this type of energy production is especially interesting to investors.

Power generation using solar energy in Spain is substantially more advantageous than in Germany, for example, because the best possible conditions for the use of solar modules exist, due to more intensive sunshine and very few rainy days. In addition, the use of moving equipment means an optimal angle to the sun can be guaranteed.

Lütze is helping people keep on course for sunshine and the local 24 V DC supply to the alignment units comes from **Lütze «Delta Series» power supply units.** Thanks to them, the photovoltaic panels mounted on masts are always adjusted so they face the sun. The activation of the individual axle drives takes place using **relay interface modules from Lütze's «Micro-plug» product family.**

This first systems incorporating **Lütze components** were put into operation last August and represent a pilot project for one that will be about 20 times bigger and will be capable of generating 2 MWp power.

Each of the 3 x 5 m islands shown in the picture generates 5 kWp power. In this set-up, 20 of these islands will be networked together to form a complete unit generating 100 kWp. Current is fed into the network via a common power inverter.

Each island is individually aligned with the sun. A central PLC is used for control purposes.

Solar park in Valencia

Hybrid relay combines mechanical and electronic components

LONG SERVICE LIFE THANKS TO SOFT SWITCHING

Dipl.-Ing. Ralf Coors, Germany

Lütze HYS series hybrid relay

Everywhere, where there is a low switching rate and only medium-sized loads have to be switched, electromechanical relays have proved themselves in practice. It's a different matter when switching highly inductive or capacitive loads. In this environment, it is principally semi-conductor switches that are used, as switching is possible without creating sparks or chatter, but with the disadvantage of a high level of self-heating. The solution is a combination of mechanical and electronic components. The hybrid relay which came into being in this way reliably switches all loads without heating up and without a reduction in service life.

It is because of their properties, such as potential-free switching, reliable electrical isolation and low transfer resistances that relays are used in their millions. In spite of these strengths, there are also negative influences that must be taken into account. When switching a relay there is so-called «contact chatter». The cause is the electromechanical contact, which is basically a case of sprung masses. Voltage peaks occur which bring about noise emissions in the HF range and can interfere with other sensitive devices in the periphery via interference in cables. Far more serious, however, are the sparks that occur during switching off. This can result in the vaporisation or even destruction of the contact materials. In the case of semiconductor switches, such as thyristors, triacs or transistors, such effects as chatter or sparking and the problems linked with them do not arise. In addition, they work completely noiselessly and are not subject to wear, therefore making them capable of handling a virtually unlimited number of switching processes. They are not sensitive to voltage or current peaks, but have a considerably higher conducting state voltage of 1–2 V, which requires forced cooling, something that becomes noticeable in the size of the equipment and heavily increased costs.

Hybrid relay combines mechanical and electronic components

If you now combine a relay with a semiconductor switch, it is possible to eliminate the interference properties of current units. This technology has been incorporated into Lütze's hybrid relays, the HYS series. At the input end, energisation takes place like a standard module, using 24 V DC. However, load switching takes place electronically using a triac, and wattless in the zero passage phases. After a defined time, the switched triac is then bridged by a conventional relay contact.

Contact chatter, sparking or other interference no longer occurs in the case of the HYS series. Quite the opposite. As the relays are switched without power, the switching current increases significantly whilst maintaining the same size and service life of the relay.

Switching of highly inductive or capacitive loads becomes possible

Thanks to this technology, hybrid relays in the HYS series are suitable for switching loads with a high inductive or capacitive portion, as is the case with motors or energy-saving light bulbs. The maximum switching capacity possible without any cooling is 4,000 VA in the case of the HYS series. The device itself is fitted into a compact 35 mm housing that can be used both in the industrial sector and in control panels in building service engineering.

The use of a microcontroller means other control or service functionalities can be added to the pure switching function. This includes, for example, monitoring the control signal for plausibility, so that interference or chatter at the input does not lead to faulty switching. Furthermore, apart from the existing monostable surge control, time functions can be implemented by means of adapting the software.

The status output offers another option, which supplies a voltage in proportion to the current for the analysis and monitoring of the switching current. A standard 0–10 V signal has been defined as the output value, so that quick and easy processing is possible via a master system.

New fields of application are now possible for users

With these devices, completely new fields of application ensue for users. Switching devices that for instance control ballasts in fluorescent lamps have, up to now, been entirely oversized because of the high switch-on currents. With the **Lütze hybrid relay** it is now only the continuous current that has to be taken into consideration. Other aspects include short-circuit protection in the case of timed heating circuits. A normal fuse now suffices here, as basically it is the mechanical contact that conducts the current.

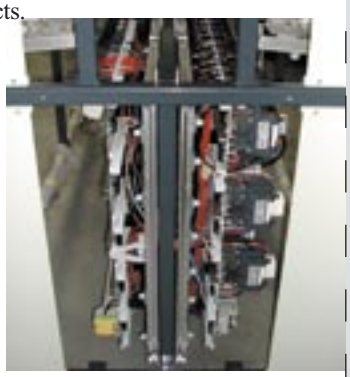
To sum up, you could say: «The Lütze hybrid relay is a perfect pairing».

Partnepship at a high level

SAMB FRANCE

Stéphane Savonnet, France

With a workforce of 20 people, for over 20 years the **SAMB** company has been developing and bringing to fruition projects in the mechanical and automation sectors. The services offered by this company are recognised all over France. The biggest French companies regularly avail themselves of the services of **SAMB** in the completion of implementation, programming, adaptation and conformity projects for their machines. When it comes to the quality and functionality of their systems, the customers of **SAMB** are highly demanding, with the result that **SAMB** is constantly working on the improvement of development projects.



Knowing that our **Lütze LSC wiring system** could be of assistance in their projects, **SAMB** commissioned us with the redevelopment of the electrical installation of a test facility. The end customer is a large French concern whose products are marketed and used worldwide. This test facility is used for checking the operation of magnetothermal motor overload switches up to 15 kW after manufacture. Working in co-operation with **SAMB's** electrical supplier, the DE.MAN company, which specialises in wiring for control cabinets, we drew up a list of all the problems that had already been established within the context of this project:

- Problems regarding the laying of a very large number of 16 mm wires which are essential for the normal and short-circuit testing of the circuit breakers.
- High thermal stressing due to heat transmission during these tests. This problem could possibly have been further exacerbated by the final installation location in Asia.
- Strong electromagnetic interference.
- Electrical housing had to be as rigid as possible in order to facilitate transverse mounting – the machine design would not allow building in at the front.
- Custom-built housing is built into machine frame.

By using the LSC wiring system from Lütze it proved possible to solve all the above-mentioned critical points, and over and above this the original customer requirements were exceeded with the following advantages:

- **Space saved provides new reserves**
- **Shorter wiring times**
- **First-rate equipment accessibility**
- **System aesthetics improved after wiring**

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LÜTZE IN SERVICE FOR WATER TREATMENT

Hans-Jürgen Ehrlinger, Germany

The company SPA GmbH was founded in 1997 and has many years of experience with systems in the water and waste-water management sector.

SPA quickly developed into an innovative and customer-orientated system manufacturer offering its customers complete, ready-to-use solutions from planning via manufacturing to final installation and commissioning. As a rule, its customers are communal or regional water suppliers, in other words, public services and water companies all over Germany.

SPA covers the electrotechnical services and components that are in demand in this sector of industry. In the extensively branched systems, a large number of analogue signals have to be processed for technical measurement purposes. End customers on the spot expect a high level of measurement accuracy and reliable signal transmission.

SPA decided on **Lütze products** when it came to **analogue converters and temperature converters.** Alongside a universal input for different voltage supplies, **Lütze converters** offer a **high level of measurement accuracy and excellent long-term stability of working ranges.** This is achieved by means of range calibration using computer software.

Also vital for the application purposes of SPA is what is known as «3-way isolation», in other words, the isolation of input, output and power supply, and therefore all connected devices.

The **free selectability of measuring** ranges at the input and the selection of the necessary standard signals at the output are further outstanding features. By using Lütze measuring-range converters, **SPA manages to reduce the large number of converter types in use to a minimum.**

For the end customer, this means **a high level of process reliability** whilst simultaneously **lowering repair and maintenance costs.**

ON THE TRAIL OF «ELECTROMAGNETIC COMPATIBILITY»!

Karl Heberle, Switzerland

These days, electromagnetic compatibility (EMC) affects all areas of industrial equipment, from system planning, selection of components and installation to servicing.

A **basic knowledge of EMC** is crucial for technical buyers, designers, control system builders, plant installation engineers, as well as test and service engineers. Given this situation, **Lütze AG, Switzerland,** working together with **Moeller-Electric, also from Switzerland,** organised and advertised three seminars under the above-mentioned title.

In Mr. François Trotti, EMC Engineer ETH (Zurich Technical University), from Montena EMC SA, Rossens (CH), a highly skilled and experienced specialist in the field of «electromagnetic compatibility» was found as speaker.

Many things well worth knowing about the interference resistance of systems, the role of terminal equipment, as well as data lines and screened cable systems **(Lütze range)** and electrical isolation elements **(Lütze interface equipment)** were learned. Detailed information and practical demonstrations about protective measures and filtering **(Lütze anti-interference equipment)** in systems were also delivered. Interesting experiments relating to the practical prevention of internal disturbance and emitted interference **(Lütze anti-interference equipment)** contributed a great deal to the understanding of the audiences.
Thanks to his practical lecture, with lots of spectacular and interesting demonstrations, the speaker captured the imagination of in excess of 70 participants and made them aware of the tasks in this sector that will become more and more important in future.

FLEXIBLE ENERGY-CONDUCTING SYSTEMS

Rob Fearnett, Great Britain

For any machine manufacturer, production time is critical and if specialist machines have to be developed then lead times can become extended causing considerable extra cost. This is a problem constantly faced by the engineers of **Agena, the specialist machine production unit of Albon Engineering plc.**

Albon are a **specialist supplier** to the automotive industry, supplying components to many leading manufacturers including **Ford, Daimler-Chrysler and JCB.** The machines they use are all produced by their own in-house design and manufacturing unit, Agena, ensuring that the machines do exactly what is required. The very close liaison between the engineering facilities of the two companies means that very cost-effective solutions can be produced.

But what about support suppliers? They need to be able to react quickly and have a good understanding of what is required. They need to be able to translate the requirements into product solutions that will fit straight into the machine design.

This is why Agena chose **NUM for the supply of the CNC servomotors and control system, backed up by Lütze custom designed Superflex cable assemblies.**

The NUM system is supplied as a **complete solution,** from drive motor back to the CNC controls. The specialist nature of the machine design meant that «off the shelf» cable assemblies were not appropriate. The solution had to fit into the design of the machine but not at any cost. The proposed solution would still have to stand up to a price/benefit assessment just like all the other components.

Most of the machine cabling is run through cable chains, meaning that high-performance dynamic cables were required. **The Lütze SUPERFLEX range was chosen due to the excellent dynamic performance coupled with a very high resistance to machine oils provided by the polyurethane (PUR) outer jacket.**

Lütze have worked with the NUM engineers and the machine manufacturers to produce complete tailored cable assemblies for the NUM servosystems that are essentially taken from the box and fitted straight on to the machine. Steve Moore of NUM (UK) Limited says: **«Working together with Lütze to provide this solution has allowed Agena to produce complex machines in short timescales. The cables are individually labeled to the customers' exacting specification, which saves installation time».**

Recognising that standard products are not always right for every application, **Lütze has developed similar solutions** for a wide range of leading servoproducts, based on its wide range of power and feedback cables, in **both standard and SUPERFLEX types.** These are just part of the whole **«Engineered Interconnectivity» solutions that can be provided by Lütze Limited.**