Issue 24

impulse

Murrelektronik Customer Magazine

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A Specialist for Precision Solutions

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BEST PRACTICE

"We Found the Perfect Solution for Us"

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Power Supply for Applications in Extreme Environments

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EDITORIAL

Dear Customer,

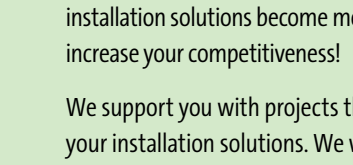
Did you know that it takes about two minutes per terminal point when connecting cables to terminal blocks? At first glance, this doesn't seem to be much. But after considering how many terminal points a small system has, you will definitely agree with me: this adds up to quite a lot of time!

That's why we're asking you to fight against the installation costs! Our principle is: plug & play. With pre-wired cables or custom-made value added assemblies you can avoid wiring efforts. You reduce your installation time. And save money! And you benefit from teamwork, for example in purchasing and logistics. Your installation solutions become more cost-effective – and this will increase your competitiveness!

We support you with projects that are designed to optimize your installation solutions. We won't decide upon a certain concept right from the beginning and push it as the ideal solution. Instead, we will look for the right solution for your application together with you! In this issue we will show you how this process works by looking at the customer Schuster Maschinenbau GmbH that uses an interesting installation concept with passive distribution boxes.

Many machine tool manufacturers have to face the question: where and how can we best place the control cabinet in a machine? Many companies are already considering a zero-cabinet strategy. We think this is the next step in the decentralization approach. With Emparro67, we show you a switch mode power supply unit that is especially designed for installation outside the cabinet. You'll find more about this subject and other interesting information in this new edition of Impulse – have fun!

Stay connected!



Jürgen Zeltwanger

Chief Marketing & Sales Officer

SIMPLIFY YOUR CONNECTIONS

FIGHT AGAINST THE INSTALLATION COSTS

COVER STORY

FIGHT AGAINST THE INSTALLATION COSTS

A company that wants to be competitive has to produce cost-effectively. The installation costs of many machines and systems are a big pool of costs. We, at Murrelektronik, are experts in finding solutions that help you reduce your installations costs. With our plug & play principle, we offer a promising approach to considerably reduce the costs of connecting your systems.

When electrical engineers hear “save money”, some think of the material costs. They change components and ask their colleagues from purchasing to negotiate discounts with the suppliers. They are happy when the figure at the bottom line is a bit smaller and the installation still works.

But Murrelektronik knows: you can do better! We do not analyze singular aspects of the installation but analyze all processes: starting from the machine and system planning, to purchasing, logistics, production and assembly, setup, all the way to follow-up processes like service and diagnostics.

Our solutions help change your view from looking at single measures to considering the complete installation solution. This creates synergy – and this is what saves money in the end.

One prime example of this is our connection technology.
We recommend: pluggable connections instead of having to tighten them.

The immediate effect: the installation time is reduced. Conventional wiring of single wires requires a lot of patience. Stripping wire, crimping ferrule ends and connecting the single wires to terminal boxes takes a lot of time. With passive distribution boxes this can be done much faster! Pre-wired valve connectors and connection cables reduce the work that has to be done. If you go one step further and install a fieldbus solution, even the last terminal points are eliminated – the solution is connected all the way through. Experience from shows that the installation time is reduced by up to 80%!

The synergy coming from plug & play is very beneficial. Until now, you had to buy a whole range of small parts. With Murrelektronik, a few components are all you need. Some examples? Fieldbus modules with multifunctional ports, pre-wired cables, transformers with wide voltage input or distribution boxes with integrated ports for safe outputs – all these components replace a lot of small parts. This slims down your ordering processes, the number of different models needed and it will facilitate your inventory.

EXPERIENCE SHOWS: EACH ELIMINATED TERMINAL POINT SAVES UP TO 2 MINUTES

We call this the CONNECTIVITY approach by Murrelektronik. Our Connectivity specialists optimize our customer’s machine and system installations together with them. They find the direct and hidden costs. The integrated approach opens new options across all processes. Plug & Play is the first big step in the right direction!

NEW ONLINE SHOP

“MAKE YOUR WORK PROCESSES SIMPLER!”

The new Murrelektronik shop is online since December 2013. And ordering is now much easier! The users have already noticed and more and more people register every day to the great joy of Janko Strauß, marketing manager at Murrelektronik.

Ordering online has been established for a long time in the consumer sector. In the B2B sector, however, there are reservations from the purchasing departments. How did you eliminate them?
We were certain: our customers would use the online shop as long as it made ordering easier than it was before. The bar was set high. Most of the companies are working with established ERP systems. This makes it difficult just to order online. However, we found excellent solutions for all problems that may have turned out to be an obstacle for online orders. For example: registered users will see their individual prices and not the list prices. The shop shows the availability and calculates the expected delivery time – in real time! This way it is no longer necessary to gather information from different documents, calculate individual prices or ask for delivery times. This simplifies the work processes.

Is the new online shop especially designed for the requirements of purchasers (purchase departments?) – or also for other target groups?
The interface between technical and purchasing department is especially interesting. In the online shop, the technicians can select the parts they’ll need for an installation solution. They can save their order in the cart and then email the cart to their purchasing department who can directly place the order with Murrelektronik. It’s no longer necessary to enter the order data a second time, which prevents typos. Another interesting feature for the technicians is the data cart: product documentation such as data sheets or construction files can be temporarily saved there and then be downloaded with one click.

Many companies are working with approval lists...
They can also be stored in Murrelektronik’s online shop and be shared with colleagues and suppliers. This way everybody knows which products are approved for a project and can then order them. This reduces the coordination efforts.

How was your customers’ feedback to the new online shop?
It was very positive! Some of the customers reorganized their ordering processes. Furthermore, we were able to get new customers. The excellent search and filter functions are highly appreciated. It’s been so fun for us to create this new tool to help our customers simplify their daily business!

shop.murrelektronik.de

Shop

VIDEO-TUTORIAL

SAVE ENERGY AND COSTS

MAXIMUM ENERGY EFFICIENCY EFFECTS

MURRELEKTRONIK MAKES IT POSSIBLE: SIMPLE MEANS FOR REDUCED ENERGY CONSUMPTION

Energy efficiency in machine tools is a cutting-edge topic. The time of power guzzlers is over. "Blue competence" is required in machines and systems. This is one of Murrelektronik's specialties! Murrelektronik products and solutions help to achieve energy efficiency.

When buying a new car, refrigerator or an air conditioner, energy efficiency is an important issue to consider. A look at the European Union energy label clearly shows the relation between energy expended and performance achieved. Class A+++ means the highest energy efficiency.

These same energy efficiency standards are also very important to all of us in the machine tool industry. The ISO/DIS 14955-1 standard provides a valuable framework for companies that prioritize efficiency. Putting machines and systems to the test can help to save a lot of energy. This does not only refer to the production stage. The focus must also be on the time of standby, simulation and implementation ("ready for operation"): This can be seen in power supply units that run continuously or lamps that are always on.

Murrelektronik, with their products and solutions, is the right partner to help achieve these maximum energy efficiency standards. Murrelektronik offers easy to implement solutions that can immediately increase the energy efficiency while also reducing energy consumption.

Murrelektronik's focus is on two approaches:

- Integrating highly energy efficient components and/or replacing obsolete loads in existing machines and systems.
- Conceptual approaches targeting those machine groups that are not involved in production processes and are temporarily switched to a resting state.

Murrelektronik's power supply units help to achieve higher energy efficiency. One example is **Emparro**. Emparro power supplies have a remarkable efficiency rating of about 95%. This means Emparro significantly reduces the energy costs. Moreover, Emparro emits only little heat energy - no chance to fry eggs. The components next to Emparro are exposed to less thermal stress which has a positive effect on their lifetime.

Murrelektronik's **MB Redundancy Balance** works hand in hand with Emparro to create an even more energy efficient solution. This intelligent control cabinet module puts both power supply units under an equal load, which is the best operating mode for energy efficiency. But this isn't all! MB Redundancy Balance operates using MOSFET technology so the internal consumption of the modules is up to 87% lower than conventional diode modules.

Choosing the right lighting systems can also help with energy savings. To help in this area, Murrelektronik offers **Modlight signal towers**. They indicate operating conditions using extremely bright LEDs. Besides being maintenance-free for over 100,000 operating hours, the decisive benefit regarding energy consumption is that the output features an excellent relation to the power input.

Murrelektronik's **Modlight XTREME 440** machine lights are another example of this technology. They also feature LEDs that illuminate machine rooms in daylight quality, instead of power guzzling fluorescent lamps that often give up the ghost when exposed to vibrations. Modlight XTREME 440 can be continuously dimmed, which increases the energy efficiency.

How small improvements can result in big energy savings can be seen when relays are replaced by **optocouplers** from Murrelektronik. Thanks to their low inrush current the input power is substantially reduced. And the hold current is more than 50% lower. This adds up to impressive savings in large systems and machines.

The **MSUD valve plugs** with capacitor reducers were designed according to a similar approach. These pre-wired form A valve connectors supply 100% power when starting up. When a system is on hold, the consumption is reduced by 40 up to 60 percent. In machines where many valves are controlled, this significantly contributes to low energy efficienciency.

Murrelektronik's conceptual approach makes it possible to completely shut down machine components when they are not needed. Murrelektronik's intelligent control cabinet component and electrical current monitoring system, **MICO+**, is designed for these installations. It enables energy savings in a simple way. Murrelektronik's Cube67 bus modules work in a similar way.

↘ All of these options show there are many ways to improve the energy efficiency in machine tools and systems. It also clearly shows how easily they can be implemented. And for any of your systems, **Murrelektronik can help you find the right solution!**

suze/photocase.com

WESKO GMBH

A SPECIALIST FOR PRECISION SOLUTIONS

WESKO GMBH IS A FIRST-CLASS SUPPLIER
TO MURRELEKTRONIK

Excellent cooperation with suppliers guarantees high quality of Murrelektronik's products. Wesko GmbH provides first class cooperation and is part of the Murrelektronik group of companies. The company focuses on tool and mold construction, injection molding and the producing test adapters.

It is very important for Murrelektronik to work together with suppliers that are specialists in their industry. Producing high quality final products is only possible if all the individual components work together perfectly! Wesko GmbH completely fulfills these requirements.

The company's expertise is in precision mold construction. They recently moved to a new building in Stollberg, Saxony, Germany, in January 2014. About 65 employees – and continually growing – produce molds for connector molding, the optical industry and for micro injection molding. Furthermore, round table tools for molding contacts, ports or inserts, as well as mounting units for fast tool changes, are part of the company's product range.

For many companies, the specialists at Wesko GmbH do not only produce the molds, but they also mold the components. This is done in a cutting edge machine park.

The company's third field of activity is especially innovative: Wesko GmbH develops and produces testing adapters for monitoring electronic standard products. This means that many European automotive and components manufacturers are directly or indirectly among the company's customers. They purchase test connectors for ABS systems, airbags, engine bench testings or air conditioning systems.

Murrelektronik buys plastic components to produce connectors from Wesko GmbH, for example different contact carriers. The R&D departments of both companies work together closely. Murrelektronik's production uses assembly and pressing systems that are produced by Wesko GmbH.

And Murrelektronik plays a pioneering role for the test engineering of Wesko GmbH. Andreas Hildebrandt, managing director, explains: "Murrelektronik is the first company in this industry we are cooperating with that does not come from the automotive industry. The test adapters guarantee that Murrelektronik's electronic components leave the plant working perfectly - this is one of the examples how a first class supplier like Wesko GmbH contributes to making sure all Murrelektronik products are produced in the highest quality.

**Are you interested in precision solutions of Wesko GmbH?
For more information visit: www.wesko-gmbh.de**

NEW MURRELEKTRONIK CATALOG

PRESENTING OUR NEW CATALOG

The new Murrelektronik catalog is out now. Our committed project team proudly got together for a souvenir photo. On over 700 pages you'll find a lot of drawings and information on Murrelektronik products. An interesting feature about how it's organized: all technical pages were generated from our data base. This provides high data convergence, for example with Murrelektronik's online shop. In the first step, the new catalog was created in eight languages at the same time: German, English, French, Spanish, Italian, Portuguese, Chinese, and Japanese. We used only PEFC paper and printed according to PEFC criteria – this is especially environmentally friendly.

ABB SCHWEIZ

MAXIMUM SYSTEM AVAILABILITY WITHOUT SIDE EFFECTS

IN THE EXCITATION SYSTEMS OF ABB SCHWEIZ AG, MB REDUNDANCY BALANCE ENSURES THAT REDUNDANTLY DESIGNED POWER SUPPLY SYSTEMS ARE NOT EXPOSED TO UNEVEN STRESS

Redundantly designed power supply systems are used to ensure operational reliability in machines and systems. ABB Schweiz AG also uses this deisgn in their excitation systems. ABB's power supply system engineers decided to regulate redundancy using Murrelektronik's MB Redundancy Balance. These power supplies provide two advantages: a significantly lower power loss and an equal load on both units.

Power supply systems are often designed redundantly so that systems and machines continue working even during failures. However, when entire systems are redundant, including the load, they are are expensive. Therefore, partially redundant systems offer a much more cost-effective solution, where the power supply units are the only part designed redundantly.

Partially redundant power supply systems are often designed with two power supply units of the same size. Each of the units can supply the total nominal current of the loads. Such a design requires that both units are decoupled. If the units are not decoupled, there is the risk that if one power supply unit has a short circuit in the output, the other one that will have the same failure.

In conventional systems, partially redundant systems are created with diode modules that decouple the power supply units. If one of the two power supply units fail, the other can continue to work unimpaired and continue supplying the load with power. However, when decoupling using diodes, power loss is high. With a load current of 20 A, a 0.7 V diode causes a power loss of 14 W. This reduces the system's efficiency, causes additional costs for cooling the cabinets and reduces the life of other components in the cabinet because of the high temperatures. Another disadvantage of this system is that the two power supply units are under uneven stress. If the load current is not regulated by a diode module, one of the power supply units delivers the complete load current while the other is idle. This can significantly reduce the life of the thermally stressed unit.

Murrelektronik's active redundancy module MB Redundancy Balance is able to solve these problems! It operates based on innovative MOSFET technology which considerably reduces the power loss. With a load of 2 x 10 A and a perfect balance between the two power supplies, the power loss will only reach 1.3 W. Compared to a power loss of 14 W with conventional diode modules, this is a huge savings!

MB Redundancy Balance's integrated regulation feature makes sure that each of the power supplies delivers half of the load current so that both components are working with equal loads. If, for example, an output current of 10 A is required, both units deliver 5 A each. This increases their life considerably and makes it possible to significantly reduce the maintenance. If one of the units fails, MB Redundancy Balance ensures that the power required for operation is delivered by the unit that is still working. And the component also sends a message to the control and enables fast troubleshooting.

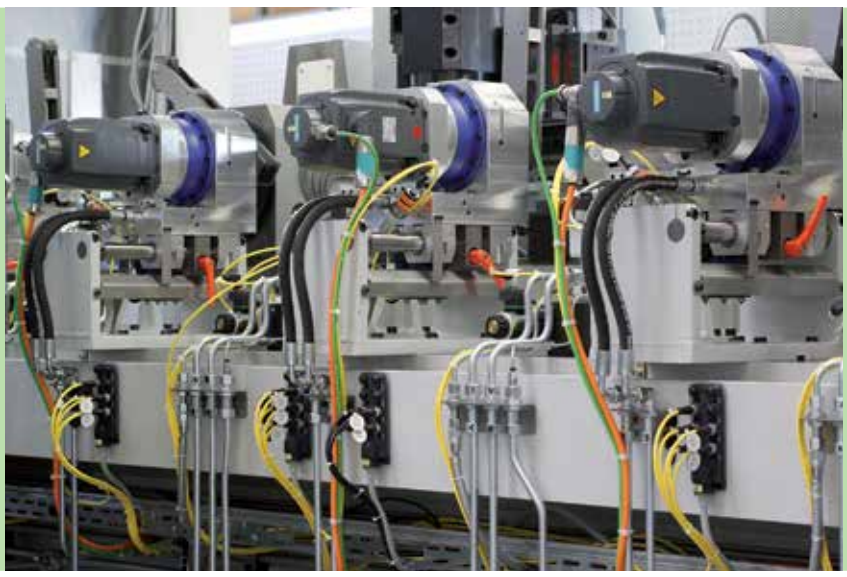
ABB Schweiz AG is a company of the ABB group which operates in about 100 countries and is a leading manufacturer of power and automation technologies. Many of ABB's customers are energy supply companies who improve their performance thanks to collaboration with ABB and, at the same time, reduce environmental pollution. The excitation systems product line from ABB Schweiz AG now relies on Murrelektronik's MB Redundancy Balance. All power plants designed with this product line feature redundant power supply systems (24 V DC) because it increases the operational reliability in power plants during generator excitation. This is very important because if the control voltage in a power plant fails, it can have severe consequences. For example, it may be necessary to decommission or shut down the plant. This would cause losses running into the millions. MB Redundancy Balance enables ABB's excitation systems to make sure that the redundantly designed power supply units are working with equal and consistent loads. This increases the unit's life and makes maintenance work easier to schedule. The fact that the internal consumption of MB Redundancy Balance is considerably lower than conventional diode modules is proven by lower energy costs in the long run.

For many years, ABB Schweiz AG's excitation systems product line has been relying on MICO, Murrelektronik's intelligent load circuit control that monitors the 24 V DC control voltage. These modules are perfectly matched to MB Redundancy Balance. The redundancy modules can be integrated into an existing MICO power distribution system using a practical bridge system, without requiring much wiring work or risking wiring errors - nothing could be easier! MICO is an essential component of power supply systems at ABB because it increased the reliability and fault tolerance of the excitation systems in power plants designed by ABB. "Since we have been using MICO, 24 V earth faults and short circuits no longer cause total system failures", says Tobias Keller, Vice President Excitation Products and Technology at ABB Schweiz AG. And MICO also does well on the financial side. Keller explains: "When changing over from conventional circuit breakers to MICO, product costs rose for a short time. However, thanks to the considerably lower total operation costs, the initial increase was more than compensated." Now you know: an integrated and strategic approach pays off.

SCHUSTER MASCHINENBAU GMBH

“WE FOUND THE PERFECT SOLUTION FOR US”

IN INSTALLATION TECHNOLOGY, PASSIVE DISTRIBUTION BOXES ARE THE TOP CHOICE FOR SCHUSTER MASCHINENBAU GMBH



Single wire connection? Passive distribution boxes? Fieldbus? This question sparks intense discussions in the electrical departments of many companies. Schuster Maschinenbau GmbH from Denklingen, Germany has an excellent solution for solving the problem of finding the ideal installation concept. They found that passive distribution boxes are the most practical solution for most of the machines. A universal pluggable design based on Murrelektronik’s Exact12 distribution boxes simplifies installation also in the cabinet.

Schuster Maschinenbau GmbH is headquartered in Denklingen, Germany, about 60 kilometers from Munich in beautiful Bavaria. The company was founded 1979 and presently has 65 employees.

Currently, the company has four main pillars: it produces and develops vertical turning machines, impact cutting systems, automation solutions and custom machines. Schuster Maschinenbau GmbH delivers about 35 machines and systems a year. The majority of them – about 30 machines – are vertical turning machines. The company distinguishes three different types of turning machines: flexible turning cells (F series), pick-up lathes (P series) and vertical turning cells with integrated fast handling systems (V series).

Schuster Maschinenbau GmbH is a mid-sized company with strong customer orientation: many machines are designed according to customer requirements. These customers are often mid-sized companies in the automotive supply industry.

Herbert Assner is the manager of the electrical department at Schuster Maschinenbau GmbH. One of his tasks is installing and connecting the I/O points of the machines and systems in a very simple, reliable and cost-effective manner into the cabinet and connecting them to the control.

Three different concepts are established in the market: conventional parallel wiring, passive distribution technology and fieldbus technology. An important criteria for selecting the right installation concept is the relationship between the I/O points and their distance to the machine. With a very small number of I/O points, conventional 1-to-1 wiring may be the most cost-effective solution. However, this requires a lot of installation time, even when the number of I/O points is small. This makes the installation with passive distribution technology a more cost-effective solution. Pluggable or molded homerun cables of distribution boxes are quickly installed and they prevent wiring errors in the field. LED displays show the status of operating voltage and signals. The time required for installation, commissioning and service is significantly shorter, because the I/O level is designed in a pluggable way which results in lower total costs. In case of extensive installations with a high I/O density that also require comprehensive diagnostic options, an active fieldbus system may be the right solution.

Schuster Maschinenbau GmbH also uses fieldbus technology, that is Murrelektronik’s modular fieldbus system Cube67. This system is used in impact cutting machines, because it’s the most cost-effective solution. Mr. Herbert Assner and his colleagues have worked out, however, that passive distribution is the best solution for many other machines that Schuster GmbH produces. The reason is that about 50 I/O points is the typical number for a Schuster machine, and they are located in a rather compact space. Passive distributors gather the I/O signals directly in the field into the cabinet and connect them to the control.

Murrelektronik’s unique, new distributor concept with passive distribution boxes from the Exact12 series allow Schuster Maschinenbau GmbH to engineer installations in their machines with overall pluggable connection from the control cabinet into the field. If the I/O points are farther away from the cabinet, they are connected with a

EMPARRO67

POWER SUPPLY IN THE FIELD

EMPARRO67 POWER SUPPLY UNITS:
DESIGNED FOR APPLICATIONS IN EXTREME ENVIRONMENTS

Emparro67 power supply units are specially designed for applications outside the control cabinet. They withstand extreme environmental conditions and can be installed directly in the field, next to the loads. This makes them the ideal solution for decentralized installation concepts. Power loss is reduced to a minimum.

Such losses occur if power supply units are used with an output voltage of 24 V DC and the power is supplied to the loads with cables that are too long. By using Emparro67, the voltage is converted from 230 V AC to 24 V DC directly at the load. By doing this, the power loss is much lower and the energy costs are reduced.

Installing the power supply units outside the cabinet by using Emparro67 offers many more benefits: Smaller cabinets can be used, in some applications it may even be possible to completely get rid of the cabinets.

distributor cap with pre-wired or molded cables. Distributors for rear mounting are used for I/O signals that are located near the cabinet.

For safety applications, Mr. Assner and his colleagues use Exact12 safety distribution boxes. Additionally to eight standard sensors, up to eight actuators for safe shut-off can be connected to these boxes. The relevant ports are marked by yellow rings (360° marking). These yellow rings make it easy for the workers in the production and the machine operators to clearly recognize the safety ports. Safety distribution boxes of the Exact12 series are approved according to EN ISO 13849-2. Up to performance level d can be achieved with safety distributors. This standard refers to fault exclusion in case of short circuits of adjacent conductors, terminals and multipole connections. Herbert Assner explains: "Most of all in the field of hydraulics, for example with main drain valves, we use a two-channel switch off for safety reasons."

By implementing the well-engineered distribution concept based on Exact12, Schuster GmbH can do completely without terminal boxes that take a lot of space in the machine and require time-consuming, error-prone and expensive installation.

The system offers even more benefits: eleven- and twelve-pole power strips have been pre-wired to the homerun cables of the distribution boxes to simplify installation. "In the cabinet, they are transferred with a transfer module with spring clamp terminals," says Herbert Assner. "This goes very fast, because it's no longer necessary to connect up to 23 terminal points to terminal blocks by hand." When installing the distribution boxes it is not necessary to connect the ferrule ends. And implying the solution with pre-wired terminals, Schuster Maschinenbau GmbH can be certain that the components used are already 100% tested. This is a huge relief especially for safety applications. "This way, one possible error source is already eliminated, when the machine is commissioned.", Herbert Assner explains. A service adapter offers an additional option to visually check all I/O signals. If all connections are error-free, the test LED on this control component light up and directly show the signal states. "This installation concept creates a clear separation between control cabinet and machine peripherals", Herbert Assner continues and he explains another advantage: "With this system of transfer adapters in the cabinet we also have a simple separation for transport that facilitates on-site commissioning. The additional connectors that otherwise are used to separate the machine are also no longer required." The manager of the electrical department says: "With this distribution system, we have found the optimum solution."

The Torque Wrench: A Clever Tool

Herbert Assner appreciates installations based on M12 connectors, because they have proved to be very durable and they are easy to handle by the operators.

EXACT12 – DURABLE BECAUSE COMPLETELY MOLDED

- **Highly resistant and durable with TPU molding**
- **Vibration resistant up to 50 g, tested with vibrations and free fall**
- **IP65 and IP67 tested**
- **Approvals according to multi-norm standard (RoHS, UL, CSA, Gost)**
- **With two cables that are suitable for C-track applications: PUR/PVC (with 2 million bending cycles) and only PUR (5 million bending cycles)**

"And the torque wrench is also an additional help", the manager of the electrical department explains, "especially with fully populated distribution boxes we can be sure that really all connections are made with the correct torque – and therefore IP67 sealed. Tightly connected, no wobbling."

And if space is extremely scarce, Schuster Maschinenbau GmbH also uses M8 distribution boxes. This is often the case in robotic applications or in the field of handling and assembly. "Murrelektronik's M8 distribution boxes feature different mounting holes that allow horizontal and vertical mounting, this is another advantage for us", says Herbert Assner and he is very pleased about this additional flexibility.

And talking about flexibility: When integrating hydraulic power units that are often separately delivered to the end customers, Schuster Maschinenbau GmbH also relies on a distribution solution from Murrelektronik. "Here we prefer the cap models of the Exact12 series," explains Herbert Assner, "this solution helps us to create a simple and quick transport separation."

www.schuster-maschinenbau.de

To make power supply units suitable for extreme environmental conditions, their components have to be protected from mechanical stress. That's why Emparro67's compact and rugged metal housing is fully potted and IP67 sealed. Dirt, humidity, and cooling lubricants cannot damage the components. This makes Emparro67 a universal unit for many different applications.

The single phase Emparro power supplies for IP20 applications have proven how energy efficient they are in various applications. Their reliable active PFC technology is also used in Emparro67. This way, up to 92.4% of the energy applied can be used.

Emparro67 converts almost no energy into heat, therefore it's always possible to touch the units, even when under full load and in high ambient temperatures. The units work reliably up to ambient temperatures of 85 °C, which is exceptional for power supplies.

Another excellent feature of Emparro67 is its power boost function. The units supply up to 150% of the nominal current for a period of up to 4 seconds. High capacitive loads can be started without causing voltage drops. An integrated primary fuse provides additional protection of the unit.

Emparro67 is available in two models with output current of 4 and 8 A – so you can select the model corresponding to the number of loads connected.

AN IMPRESSIVE RIDE OVER WINTER LANDSCAPES

Murrelektronik's green hot air balloon participated in the balloon festival in the Tannheimer Valley in Austria. 70 teams from all over Europe came to the Austrian valley. In wintry conditions, they floated to the northern border of the Alps. Andrew Kaye and Neil Ivison, Murrelektronik's balloon pilots, and their passengers enjoyed majestic views, such as the snow covered mountain peaks or the Neuschwanstein Castle. The highlight of the evening was when the balloons were aglow, Murrelektronik's balloon shining the brightest with it's green hot air balloon.

MURRELEKTRONIK SUPPORTS A TOP-RANKING HANDBALL TEAM

For more than 30 years, Murrelektronik has been the main sponsor of the local handball team, TV Oppenweiler. During this time, the club has become established in the sport of handball in Southern Germany. This past season, the team won the state Württemberg championship! Currently, the team is playing one division higher, in the upper third of the 1st Baden-Württemberg division. Soon, the club aspires to be moved up to the third division of the Bundesliga. The handball team is very popular in Oppenweiler and the region. An average of about 600 fans come to the home games. The club is committed to supporting children and adolescents. And of course, they always proudly play in the green shirt with the Murrelektronik logo on the chest. Murrelektronik is present at handball games representing an attractive employer for the people from this region and as an interesting contact for young people looking for a training position or want to take up a work/study degree.

www.tv-oppenweiler.de

CONNECTIVITY APP

MURRELEKTRONIK WINS AUTOMATION APP AWARD

OUR CONNECTIVITY APP WON FIRST PLACE IN TRADE JOURNAL "ELEKTROTECHNIK'S" CORPORATE APP COMPETITION

Murrelektronik's connectivity app is amazing! Now this statement has been confirmed in black and white because Murrelektronik's connectivity app placed first in the corporate category of the Automation App Award from the "Elektrotechnik" trade journal.

All apps were judged on the following criteria: How useful is the app? Is it easy to use? Is the concept behind the app original? The apps were judged by an expert panel of five people and by users that voted on the "Elektrotechnik" homepage. These two results made up one third each of the total result, the third criteria was based on the user ratings in the app store. Murrelektronik scored the highest!

The connectivity app won first place in the corporate category. The Murrelektronik app shows in elaborately produced and very realistic 3D simulations which installation concepts open the doors to maximum cost-effectiveness in different industries, such as logistics and materials handling technology, in the machine tool industry or in automation technology. The differences between the various installation concepts are explained beautifully – starting from point-to-point wiring as a very simple installation concept up to complex fieldbus installations that offer comprehensive diagnostic options.

Connectivity App

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4	3			8			7	
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		4	3	9	6			
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		3			5	9		4

EPISODE 24

MURRPHY

SUDOKU FUN WITH MURRPHY

At the beginning it seems very tricky – but then you get the hang of it!

I hope you enjoy the puzzle ...

Sincerely, Murrphy

Solution:

6	9	8	7	5	3	4	2	1
4	3	2	1	8	9	6	7	5
1	5	7	2	4	6	3	9	8
9	4	6	5	3	1	2	8	7
3	8	5	4	2	7	1	6	9
7	2	1	9	6	8	5	4	3
8	1	4	3	9	6	7	5	2
5	7	9	2	1	4	8	3	6
2	6	3	8	7	5	9	1	4

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