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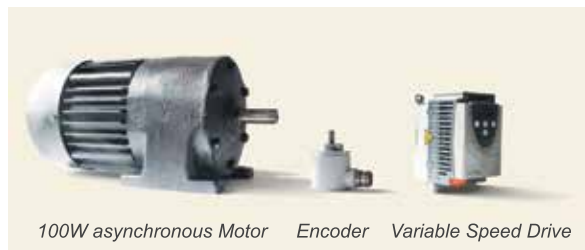


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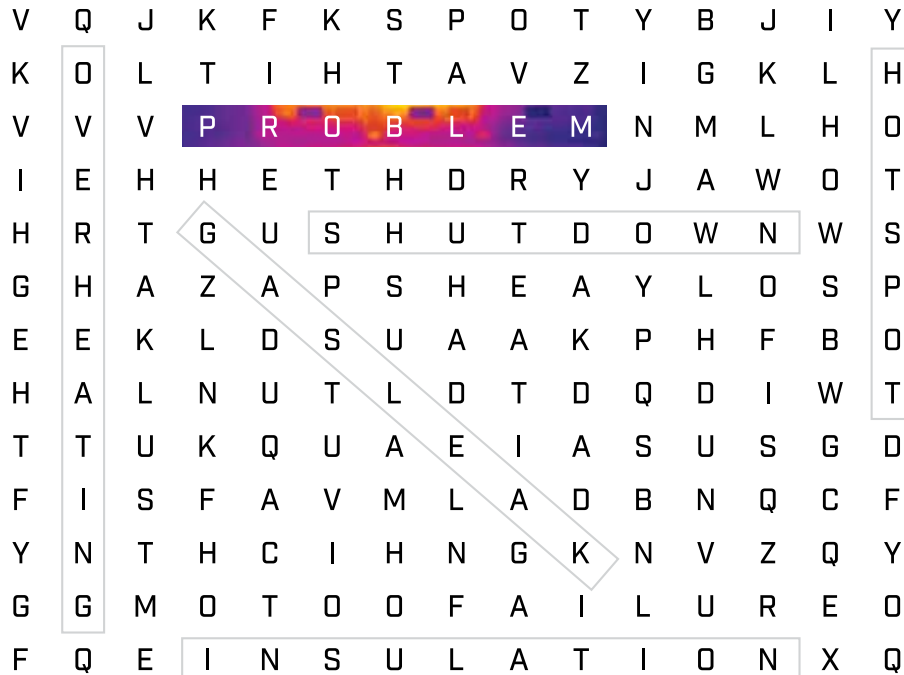
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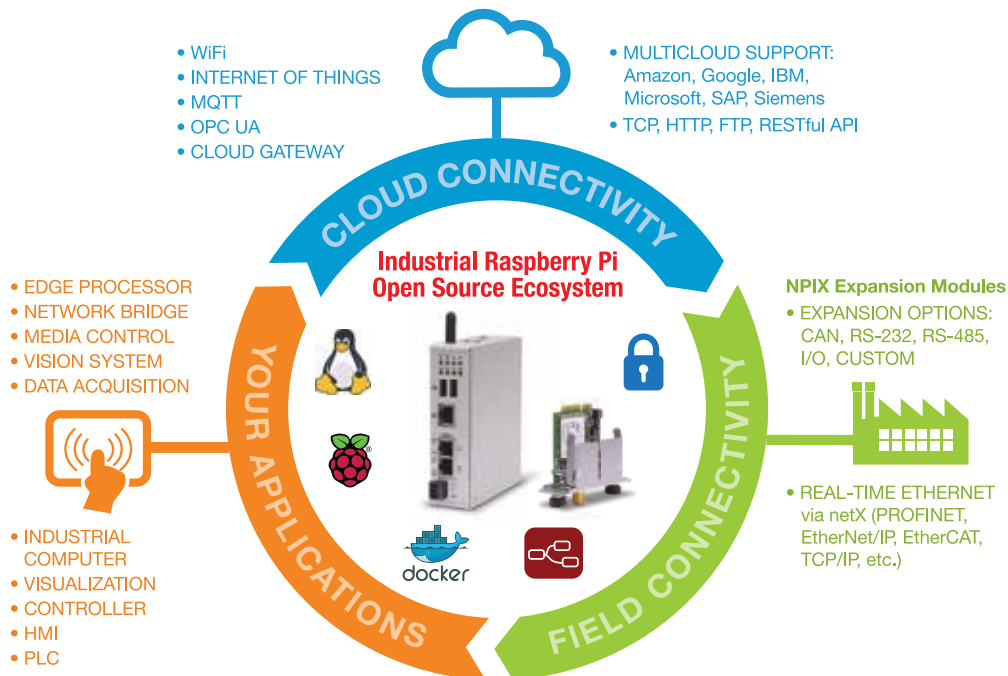
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CEO CORNER



Skill India: The need for today & tomorrow

The benefits of a growing economy are often reflected in the growing number of well-paid jobs in a country. Consequently, any policy that stimulates the economy to grow, has an impact on job creation and the overall employability of the country's workforce. India finds itself in a context today where young people are entering the workforce every year. To make the most of the demographic dividend, it is critical to improve the employability of the youth. For this, the newly set up Ministry of Skill Development and Entrepreneurship had taken up the task of coordinating all skill development efforts across the country. This includes the removal of the disconnect between demand and supply of skilled manpower, building a vocational and technical training framework, building new skills and innovative thinking, not only for existing jobs but also jobs that are to be created.

The Skill India initiative was to ensure that the millions who enter the job market untrained, receive formal skill-building opportunities. Many hoped to be an improvement over previous skilling and vocational training programs. A much-welcomed move, the policy still seems to be a nascent stage of implementation and as a result, has had a limited impact.

Skill development starts with identifying future job prospects and segmenting it according to the need and feasibility of training candidates. The PPP model of operation of SSCs presents a great chance of bringing industry best practices in learning and development into such training modules. Private players can use technology to automate, improve and scale training and certification approach of skill-based training. By creating better linkages between the many stakeholders in the process and establishing key deliverables and a clear chain of accountability would help make such training programs more effective. Working towards increasing the accessibility of such training programs, in parallel, should also be looked at. A recently proposed move of making such training more district centric is a step towards that direction.

As India aims to have one of the strongest economic growth stories in the 21st century, it becomes vital for it ensure its growing workforce is capable to handle the incoming disruptions and find suitable jobs. And a core part of this is to tackle the problem of unskilled labor in India and fix its skilling initiatives, today rather than tomorrow.

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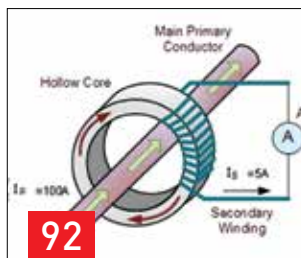
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BMW to source global supply of industrial PCs and control panels from Beckhoff

Beckhoff Automation, based in Verl, Germany, will supply the BMW Group with Industrial PC (IPC) technology for use in car manufacturing through 2030. According to the terms of the recently signed agreement, Beckhoff will supply the production facilities worldwide.

This means that Beckhoff IPC technology will become a global standard for the BMW Group. The Industrial PCs and multi-touch Control Panels will be used – both in new automotive manufacturing facilities and for retrofits – for machine connectivity, access control,

data acquisition, visualization and other PC-based tasks. All product categories from the wide Industrial PC portfolio offered by Beckhoff will be used: IP65-rated CP32xx Panel PCs, C6030 ultra-compact IPCs, C5240 19-inch slide-in IPCs and CP29xx multi-touch built-in Control Panels.

Standard Beckhoff products will be used that have been adapted to some extent to ensure optimum retrofitting in existing plants and to include customer-specific key extensions. The comprehensive

Beckhoff product portfolio offers the BMW Group

the ability to use the latest Intel® Core™ I processor series in a wide range of

IPC form factors. On account of the rapid innovation cycles and interoperability within the portfolio, upcoming processor generations will be simple to integrate in the future as well. The bundling of all product development steps at Beckhoff, from IPC motherboard and BIOS development to mechanical adaptations, enables optimal answers to customer-specific requirements.

In combination with full control over the added-value chain based on in-house



Panel PCs, Control Panels and Industrial PCs from Beckhoff are used all over the world in car manufacturing.

assembly and production in Verl, Beckhoff offers the ideal infrastructure for a long-term partnership. In addition, the globally available services provided by Beckhoff ensure optimum support of customers' manufacturing facilities distributed all over the world.

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Schmersal presents smallest electronic solenoid interlock in the world

The new AZM40: strong interlocking force and compact design

At SPS 2019 in Nuremberg, the Schmersal Group is presenting a new RFID-based compact solenoid interlock. With dimensions of 119.5 x 40 x 20 mm, the AZM40 is the smallest electronic solenoid interlock in the world. This makes it especially suitable for small safety doors and flaps. Thanks to the 180° angle flexibility of the actuator, it can approach the AZM40 on a stepless basis, making the interlock also suitable for flaps which do not close at 90° or those that open upwards to a 45° angle. This means the angle flexibility helps the interlock easily fit into compact spaces and those which are difficult to access. The AZM40 can also be fitted to standard 40 mm profiles without projecting.

“The solenoid interlock meets the requirements of many users looking for space-saving solutions, as space required is a decisive cost factor in production,” explains Stephan Frick, Product Manager at Schmersal.

Despite its compact size, the AZM40 has an amazing 2000 Newton interlocking force. “An interlock must be selected to withstand the anticipated forces. With interlocking force of 2000 Newtons, users are on the



The AZM40 solenoid interlock has an interlocking force of 2000 Newtons

safe side with respect to the recommendations in the standard,” explains Stephan Frick.

The integrated RFID technology allows a coding level of “high”. This means the interlock offers increased tamper protection in accordance with the requirements of DIN ISO 14119. The AZM40 works on the bistable principle: In the event of a power cut, it retains the current position. This ensures safe operation, whatever the status of the machine. Even if there are hazardous run-on movements, the safety door remains safely locked in the event of a power failure. Another advantage of the bistable principle is the consistently low energy consumption, as

the interlock only requires power when the door is to be locked or unlocked.

For applications with personnel protection (interlock monitored), the safety outputs are switched on when the safety door is closed and the interlock locked.

The AZM40B model (actuator monitored) can be used for applications with process protection. In this variant, the safety outputs are actuated as soon as the safety door is closed. With this device, locking the interlock is not absolutely necessary.

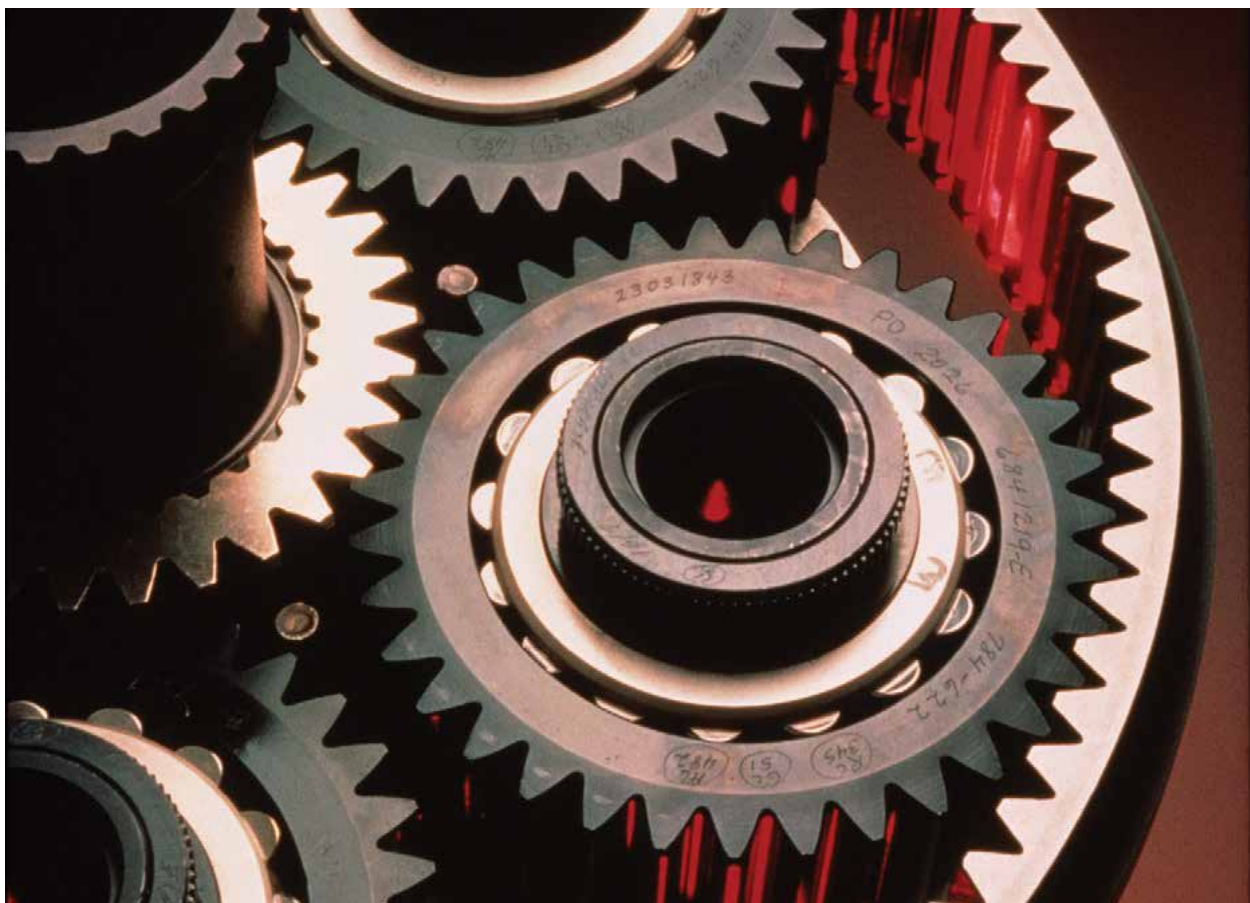
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Founded in 1945, the company is represented by seven manufacturing sites on three continents with its own companies and sales partners in more than 60 countries. The Schmersal Group employs some 1,850 people worldwide and generated a group turnover of around €240 million in 2018.

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ELGi Equipments conferred the 2019 Deming Prize in Tokyo

ELGi Equipments (BSE: 522074 NSE: ELGIEQUIP), is now the first globally established industrial air compressor manufacturer to be awarded the Deming Prize for excellence in Total Quality Management, in over 60 years. Dr. Jairam Varadaraj, Managing Director, ELGi Equipments received the coveted medal from Mr. Hiroaki Nakanishi, Chairman Deming Prize Committee at the award ceremony in Tokyo, Japan.

In his acceptance speech, Dr. Jairam Varadaraj, Managing Director ELGi Equipments dedicated this award to all the employees at ELGi saying, "On paper, the path to success is pretty straight forward. But realizing it requires a secret sauce. An envelope that rigorously enables, executes and continuously improves the organization through a process orientation. TQM has been our secret sauce. We have a long way to go but TQM has helped us become a better company for all of our stakeholders. I would like to dedicate this award to our employees, who are the key stakeholders in our company."

ELGi's TQM journey began in 2008, and gained momentum starting 2014. ELGi's TQM system - EBS (ELGi Business System), implemented as a means to achieve ELGi's goal of becoming the world's

second largest air compressor manufacturer by 2027, comprise diverse improvement activities and human resource development initiatives. Some of the indigenous improvement activities included the development of Gemba prowess and staff improvement activities that suitably use problem-solving activities by Cross Functional Teams (CFTs). In addition, ELGi built out a robust employee training system investing 400 hours of training per person for every shop floor employee, employing both in-house and external classroom quality education and the establishment of an in-

house vocational training school. ELGi's TQM focus also extended to the standardization of all sales activities (the GTM go-to-market process) for sales expansion as well as the creation and promotion of various mechanisms using ICT.

Also present at the award function were R. Jayakanthan, Director, People, Systems and Strategy, Sundarrajan Pattabiraman, Vice President, ELGi Business System, Ramesh Ponnuswami, Executive Director, Sriram Srinivas, Director-Operations, Anvar Jay Varadaraj, Global Brand Head and Dr. K. Venu Madhav, Director, Technol-

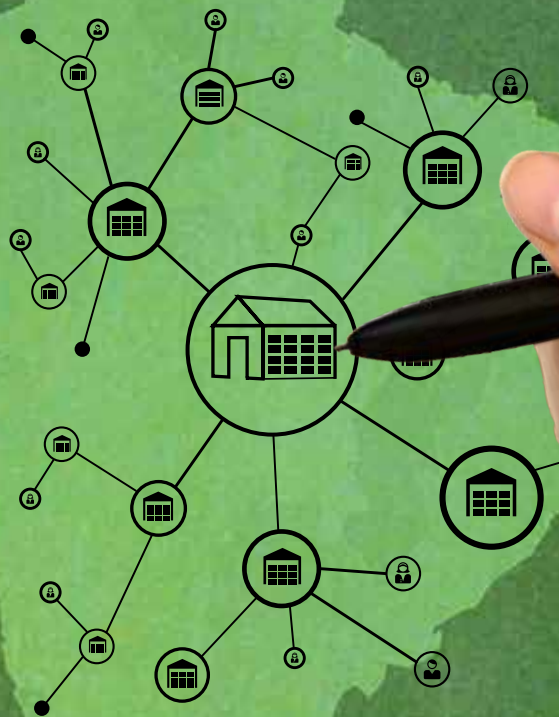
ogy. ELGi, is a pioneer in cutting edge compressed air technology, offering a complete range of compressed air solutions from oil-lubricated and oil-free rotary screw compressors, oil-lubricated and oil-free reciprocating compressors and centrifugal compressors to dryers, filters and downstream accessories. With state-of-the-art manufacturing units and a product portfolio of 400+ compressed air systems, ELGi redefines reliability, efficiency and cost-effectiveness across installations all over the world.

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Distribution Redefined

LMW to make latest VMC for machine tool major DMG Mori

The dominant name in the Indian machine tool scene, Lakshmi Machine Works has commenced manufacture of a Vertical Machine Center of special design, CMX 600 Vi for machine tool major, DMG Mori. To start with, LMW will produce 10 units a month for DMG Mori for the Indian market. The production volume will increase in stages. Outsourcing to LMW in India would reduce the lead time for delivery as compared to supplies from Japan.

"India is a market with great potential for DMG Mori," Masahiko Mori, President, DMG Mori said. The company has a capacity to produce 12,000 machines a year and it has 14 factories spread across 7 countries. "We want to expand the customer base in India in collaboration with LMW," he added.

Sanjay Jayavarthanavelu,

Chairman & Managing Director, LMW said the entire machine will be assembled here and supplied. While the critical components will be imported from Japan, gradually the import content will be reduced to 80%. LMW would do value addition. The existing facilities have been upgraded in some areas."

"We have the capability to increase the volumes," he said. The demand came from a product gap which is filled by the competitors. We realized we could fill it together with the product CMX 600 Vi. So we came together to provide the latest technology to the Indian customer," he elucidated.

CMX 600 Vi is a standard vertical milling machine for a broad range of manufacture. High rigidity and largest Y-axis travel in its class of 560 mm, and a highly reliable spindle



Dr. Masahiko Mori, President, DMG Mori and Mr. Sanjay Jayavarthanavelu, Chairman & Managing Director, LMW Machine Works, cutting the ribbon at the launch ceremony of CMX 600 Vi at LMW on 29th Oct. 2019.

for a variety of machining applications are some of its unique features. The machine is highly versatile and it can handle a wide range of workpieces including round-shaped large workpieces such as gear box housings which are difficult to cut on the machines in the same class. Because of its wide work envelope, interference can be reduced even when workpieces are rotated on the rotary table during manufacturing.

CMX 600 Vi is meticulously designed for details with a thorough focus on workability, maintainability and reliability from the operator's perspective.

LMW makes a wide range of CNC turning centres, machining centres and machine subsystems like toolposts and a variety of spindles for

the domestic and export markets. It makes 3,200 machines a year. "The entire machining shop is supported with AHUs with positive pressure system. All castings for building machines come from LMW's own foundry. We have a wide array of precision production machines which are world's best brands. We make our own spindles. The assembly cell is fully temperature controlled. And every component going into the machines is tested for process capability," explains K.S. Murthy, President – Operations, LMW. The Machine Tool Division of LMW was started in 1988. It has a total workforce of 3,250 employees. LMW is exporting its products to 23 countries and has a global presence.

- P. K. Balasubbramanian



Dr. Masahiko Mori & Mr. Sanjay Jayavarthanavelu shaking hands during the ceremony

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Han® 1A: Versatile lightweight

New range of rectangular plastic connectors – ideal for motors and smaller loads in machine engineering and automation

The industrial sector is using ever smaller machines at the same time as the modularisation of plants and systems continues to progress. What is needed are compact, modular and robust connections for connecting small loads. HARTING is responding to this trend with the Han® 1A. The rectangular connector has a whole host of advantages: the connector is suitable for the transmission of data, signals and power, and provides an ideal solution for e.g. control systems, smaller drives and switch cabinet installations.

The housings, inserts and cable glands of the new series are made of high-performance plastic, which makes the connector a lightweight. The Han® 1A is smaller than all previous Han® solutions. In comparison to the Han® 3A – the smallest rectangular connector portfolio yet – the space requirement is reduced by about one third. The modular design of the Han® 1A offers maximum



The modular design of the Han® 1A offers maximum flexibility for the respective application.

flexibility for the respective application. Solutions for a wide variety of tasks can be developed from just a small number of elements. Power ratings up to 16 A / 400 V, signals with up to 12 contacts per insert, and data at a rate of 10 Gbps (Cat. 6A) can all be transmitted.

Depending on the customer's requirements, the new connector series offers the right solution. Users can thus decide between a classic metal clamp lock and a latched lock already integrated into the housing. There are also two

options with regard to the connection technology: screw and crimp connection.

In addition, flexibility is enhanced by a wide range of useful accessories. Using e.g. cable glands or single-wire seals, within seconds the Han® 1A system can be transformed from an IP20 solution into an IP65 connector for harsh industrial environments.

Overview of the Han® 1A:

- **Low overall weight:** Thanks to plastic elements, the Han® 1A has a low overall weight, especially compared to metallic connectors.
- **Versatility:** “Custom” solutions for a variety of applications due to the modular concept. Han® 1A offers inserts for the transmission of data, signal and power, as well as a wide range of accessories.
- **Time savings:** The simple “Mate & Click” design of all individual components allows the connector to be

assembled in just a few seconds.

- **Space-saving:** Han® 1A components conform to the trend towards miniaturisation. At the same time, they enable the construction of robust Han® connectors – even for harsh industrial environments.
- **Cost savings:** The modular system consists of a small number of individual components. Virtually an unlimited number of solutions can be created from just a few different parts, which leads to a reduction of storage costs.
- **Data transmission up to Cat. 6A:** The Han® 1A is extremely versatile. In addition to power and signal transmission, it also enables high-speed data transmission.
- **IP-protected, if necessary:** An IP65 solution can be easily achieved by using housing elements or single-wire seals.

For more information
Web: www.HARTING.in

Elgama-Elektronika to design electricity meters with Analog Devices' mSure® diagnostics technology

Analog Devices, Inc. (ADI) recently announced a collaboration with Elgama-Elektronika, a Lithuania-based manufacturer

of static electricity meters. Elgama will design electricity meters enabled by ADI's mSure® diagnostics technology to help utilities

remotely monitor accuracy of meters in the field. This allows meters to have greater useful life while reducing overall costs of

meter sample testing. In addition, meter tampering accounts for 10% of stolen energy worldwide – a nearly \$100 billion revenue

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- Suitable for mobile generators and DC charging stations
- Universal application in nonearthed and earthed AC, DC, AC/DC networks
- Increased rate of return on the installation due to reduced downtimes

Products and Solutions in the field of insulation and earth fault monitoring for power generation plants using renewable energy. Only by means of proper system solutions for the control and monitoring of power generation can competitive efficiency be achieved.



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loss for utilities in Europe alone and ADI's mSure technology can provide actionable intelligence to identify many different types of meter tamperers. Elgama plans to bring these meters to market by the end of 2020.

"Intelligence based on the direct measurement of electric meter health will help utilities make quick and confident decisions by identifying out-of-specification meters, detecting meter malfunction, and confirming and quantifying more tamper events. mSure is a promising

solution towards achieving these goals and optimizing meter reverification costs," said Dr. Nerijus Kruopis, Chief Technology Officer, Elgama-Elektronika. "ADI has rich expertise here and they understand our challenges. In-field accuracy verification is costlier and inconvenient to customers. An mSure-enabled meter checks the accuracy of the entire metrology function, while in the field and in full operation, leading to direct cost savings and customer service improvements. We have eagerly begun having technical

conversations with several utilities in our market to help facilitate the implementation of mSure technology as a standard practice for ensuring greater meter accuracy."

mSure, when combined with an analytics service, directly monitors meter accuracy and reports data back on individual meter health, helping to identify both malfunctioning meters and more electricity tamper cases. Raw data generated by mSure-enabled meters is provided to and processed by a cloud-based analytics service,

allowing utilities to run reports on their entire meter population at desired intervals.

"Analog Devices' edge-to-cloud meter analytics solution gives electrical utilities actionable intelligence to decrease operational expenses and capital spending, reduce risk, protect revenue, and enhance trust in their brand," said Vitaly Goltsberg, Director of the Energy business unit at Analog Devices.

*For more information
Web: www.analog.com*

Autodesk BIM 360 Design offers cloud collaboration on projects with infrastructure and building features

Autodesk, Inc. announces the expansion of Autodesk BIM 360 Design, Autodesk's fastest-growing cloud solution, to include Autodesk Civil 3D. With this announcement, Autodesk now offers one of the most comprehensive solutions enabling teams to collaborate on complex projects with horizontal and vertical structures, nearly anytime, anywhere in a single connected cloud platform.

Collaboration for Civil 3D, now included with a BIM 360 Design subscription, allows subscribers of BIM 360 Design and Civil 3D to work collaboratively with project partners at anytime and from anywhere, regardless of team

locations and disciplines, including architects, engineers, and contractors. With the existing Revit Cloud Worksharing capabilities and the addition of Collaboration for Civil 3D to the same platform, designing airports, rail stations, and other complex projects with vertical and horizontal structures is simpler and more efficient.

Not only can customers collaborate using streamlined workflows on a unified platform, they can also perform their day-to-day data management activities in the same place.

"Complex projects often require similarly complex teams spread across offices, multiple companies,

and perhaps across time zones, and include both horizontal and vertical features," said Nicolas Mangon, vice president, Autodesk AEC Business Strategy and Marketing. "Adding Civil 3D to BIM 360 Design responds to the cross-discipline challenges our customers are facing on projects which include building and infrastructure features. Autodesk strives to meet our customers' changing needs, and this is a major shift in how they will be able to get their work done and hopefully win more business."

The 2018 launch of BIM 360 Design for Revit brought Autodesk customers a compelling new way to work on Revit building design

projects by allowing them to collaborate in real-time and co-author Revit models, and then connect design data downstream to the jobsite because all project information is centralized on the BIM 360 project delivery platform. Customers are already experiencing extraordinary return on investment using BIM 360 Design for Revit.



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- RO-RV bevel/helical gearboxes: 180 to 3300 Nm. Three stages.
- RG precision planetary gearboxes: 10 to 230 Nm.
One and two stages.
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Digisol unveils a new series of structured cabling solution



In a bid to empower enterprises digitally, DIGISOL Systems Ltd., a leading provider of IT networking solutions, recently launched 'ConvergeX', a series of enterprise structured cabling solution during the launch event held in Pune on 15th November, 2019.

The name ConvergeX refers to the term 'Converge' that stands for a single network that unifies and carries a combination of data, voice and video traffic, while X stands for the Xtreme speed. ConvergeX enterprise structured cabling series aims to enhance the way enterprises work and unlocks opportunities for the future.

Digisol's newly announced ConvergeX series is designed to support the high performance needs of

the present and next generation data communications services, applications and technologies like 5G, IoT, Wi-Fi 6, Cloud, AI etc. The series holds UL & ETL certification and is perfect structured cabling solution that would help enterprises accelerate their business and boost productivity by speeding secure access to information by unifying data over a single network.

"In today's tech driven age, enterprises are growing as digital businesses and consumption of voice, video, and data has increased thus, there is a need for a future ready solution that converges traffic over a single network and offers seamless connectivity," said Devendra Kamtekar, CEO, DIGISOL Systems during the launch event. He further



added, "We are thrilled to introduce ConvergeX series that offers the Xtreme speed and performance and digitally empowers enterprises to create paths for their future growth."

Commenting on the launch, Pradosh Nadkarni, Product Manager, Digisol Systems said, "Being an organization that has laid a lot of emphasis on design, quality and manufacturing

capabilities, it was only natural for us to come out with future ready products in today's bandwidth hungry ICT industry in general, and data centres in particular. ConvergeX mirrors our aspirations as a brand to bring faster, better and innovative products to our clients."

*For more information
Web: www.digisol.com*

Kjellberg Finsterwalde wins innovation award



The participation in the international trade fair Blechexpo at the beginning of November 2019 in

A successful exhibition appearance with the industry 4.0-compatible plasma cutting system "Q" – Kjellberg is focusing highly on the topics of digitization and networking.

Stuttgart proved successful for Kjellberg Finsterwalde. The stand concept with its focus on digitization and networking won "Award for Blechexpo".

"It is a very special moment when a product,



whose development has accompanied for years, is appreciated in this way. This prize is also something special, because our development team was facing a completely new

The proud award winners at the ceremony for the "Award for Blechexpo 2019" – Kjellberg Development Manager Volker Krink, Managing Director Sales Thomas Kagemann and Managing Director of the Kjellberg holding company Dr. Michael Schnick

challenge with the digitization topic that had to be mastered," said the

Kjellberg Development Manager Volker Krink

Photo courtesy : Shinkansen 700T train
Taiwan High Speed Rail

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holding the" Award for Blechexpo "in his hands. Kjellberg Finsterwalde has invested several million euros and years of research in the latest generation of the plasma power source. The winner's trophy for the "Q" in the category of separation technology proves that all efforts are paying off.

The new industry 4.0-compatible inverter

power source "Q" combines precision plasma cutting at an exceptional level with the complex requirements of digitized production. In the future, systems can communicate between all stages of the value chain in a smart factory. With the slogan "Always on", the "Q" series was officially launched less than two months ago by Kjellberg Finsterwalde.

A message that has been the motto of the pioneer of plasma cutting technology ever since. The real-time communication between the plant components and the process data exchange of networked

machines are just two of the many noteworthy innovations that visitors were able to experience at the trade fair via a live broadcast from the Com-

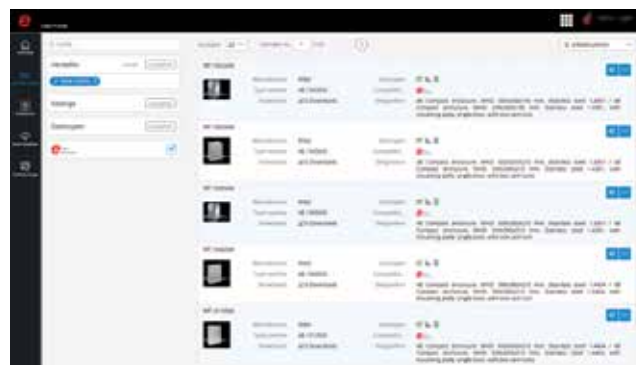
petence Center Plasma 4.0 from Kjellberg's headquarter in Finsterwalde directly to Stuttgart. Thanks to the unique browser-based Q-Desk operator interface visitors were able to take a look at information such as FAQs or video tutorials directly on site as well.

*For more information
<http://www.kjellberg.de/>*

EPLAN sets new data standard in control and switchgear construction

By implementing a new data standard, software solutions provider EPLAN is contributing to further simplifying control and switchgear construction. As per the company, the new standard increases the quality of article and device data in EPLAN Data Portal, a web service offering product catalogues from numerous component manufacturers. Several thousand data sets – for instance from Rittal, leading provider of enclosure systems and IT infrastructure – are already available at this premium level, and additional well-known component manufacturers are working on providing data in line with this new standard.

When control cabinets or switchgear systems are being designed in 3D, wire lengths automatically calculated, or mounting panels processed by machines, standardized component



EPLAN Data Standard.jpg: The new EPLAN Data Standard based on eCl@ss Advanced ensures optimized, standardized device data in EPLAN Data Portal – the examples shown here are Rittal components.

data are required. These data are also the foundation for the digital twin, which is becoming increasingly indispensable in the product life cycle. The new EPLAN Data Standard defines the type of component data required to automate and simplify processes in (pre)planning, engineering, manufacturing and maintenance. Users of EPLAN's engineering software solutions benefit from a significant increase

in quality in EPLAN Data Portal, which gives them direct online access to the product catalogues from numerous component manufacturers.

Currently, EPLAN Data Portal has more than 239.000 users and offers data of more than 913.00 products from 286 manufacturers. All of the software solutions embedded in the EPLAN Platform can access this web service. The simple transfer of the

available component data into EPLAN documentation is via drag and

drop, which reduces the effort required in design and increases the quality of machine and plant documentation. Manufacturers are also being optimally supported – the Data Creation Tool based on eCl@ss Advanced offers them an import option that significantly simplifies data provision.

Renowned component manufacturers including ABB, IFM, LAPP, Phoenix Contact, Puls, SEW-Eurodrive, Siemens, Schneider Electric, Wago, Weidmüller, Wieland and others are already implementing the standard.



*For more information
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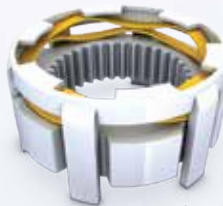
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Legrand India flags off retail roadshow across 50 cities

Legrand India recently flagged off its four-month-long roadshow in New Delhi. The roadshow will showcase the new range of Lyncus switches and Duo Boxx, enabling the brand to create awareness about the product portfolio amongst the stakeholders. Through this roadshow, Legrand has firmed up plans to expand across geographies in the retail segment.

Legrand's retail roadshow will showcase the range of switches and sockets like Arteor, Myrius, Mylinc and Britzy s, and Protection Devices like RX3. A total of 5 vans with Legrand's switches and protection devices product portfolio will cover close to 49 cities, targeting over 1500 retail counters in the span of four months. It will help enable active engagement amongst the retailers and electricians familiarizing them with touch switch-



Mr. Samir Kakkar, Director Sales, Legrand India at the launch of retail roadshow in New Delhi

es, innovative electronic products which are true to the Legrand's philosophy of ease of installation and ease of use. The presence of these vans across cities will facilitate a deeper engagement with the customer, retail network and electricians. The vans will cross Orissa Madhya Pradesh, Chhattisgarh, Bihar, Jharkhand, Delhi, Punjab, Rajasthan, UP,

Uttarakhand, Karnataka, Gujarat, Maharashtra, and Assam.

Sameer Saxena, Director, Marketing (Group), Legrand India said, "Our focus for the retail roadshow is to spread awareness about Legrand's wide range of product offering and introduce the new range of Lyncus switches and Duo Boxx distribution boards. We also intend to

strengthen our footprint across the tier-2 regions in India by making our products available across geographies. We at Legrand have a vast range of highly technical product offerings and through this initiative we intend to reach out to our customers and retailers giving us an opportunity to interact with them closely." He further added, "Being a market leader in premium segment with presence of over two decades in the retail segment, our responsibility is to ensure that consumers get the best products according to their requirement. We hope this initiative will increase our connection with our stakeholders and will create learnings on the need and availability of new-age energy-efficient solutions."

*For more information
<https://www.legrand.co.in/>*

Nord Drivesystems displays new products at FMB 2019

Nord Drivesystems participated in FMB at Bad Sakzufen from November 6 to 8, 2019. The Supplier Show for Mechanical Engineering, FMB addresses the entire spectrum of machinery and plant engineering, where drive technology plays a central

role.

Product highlights presented by NORD include a new synchronous motor that achieves a significant improvement in energy efficiency, a new generation of control cabinet inverters and a PROFIsafe module for the functional safety of

plant and machinery.

The energy-efficient latest generation permanent magnet synchronous motor has considerably lower losses than the current IE4 series. The unventilated smooth motor achieves its high efficiency that, at times, is significantly

above efficiency class IE5 via a wide torque range – and is optimally suitable for the operation in the partial load range. The compact IE5+ motor offers a high power density with less installation space and will be initially launched in a size for power ranges

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from 0.25 to 1.1 kW with a continuous torque from 1.6 to 4.8 Nm.

The motor concept will be gradually extended with more sizes and powers. It is ideal for use in hygiene-sensitive and harsh environments because it is easy to clean, corrosion-resistant and wash-down capable. The nsd tupH surface treatment and IP69K protection class are available. As standard, an encoder is installed in a damage-proof housing; a mechanical brake is optionally integrated. The new IE5+ motor can be combined with NORD gear



The new IE5+ motor from NORD offers a high power density and was initially launched in a size for power ranges from 0.25 to 1.1 kW.

units and drive electronics as a modular system and will be available from the second quarter of 2020.

The Nordac PRO SK 500P frequency inverter is the first device of the new generation of

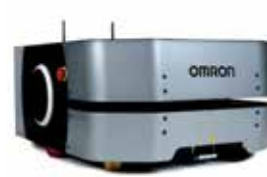
Nord Drivesystems frequency inverters. It uses the latest component technology and features ultimate levels of functionality, connectivity and modularity. As well as the standard CANopen interface, a multi-chip for Industrial Ethernet enables the use of the most important real-time Ethernet standards via a single interface. The new NORDAC PRO is available as a fully featured application inverter (SK 530P and SK 550P) and as a machine inverter (SK 500P) with a reduced number of interfaces.

OMRON launches mobile robot to move payloads up to 250kg

OMRON Corporation announced that it will globally start selling a new mobile robot called the LD-250 on November 15, 2019. With a payload capacity of 250kg, the LD-250 is the strongest and newest addition to the company's LD series of mobile robots. Together with the Fleet Manager, which for the first time in the industry enables the control of multiple mobile robots with different payloads through one system, it will contribute to realizing a more flexible and optimized autonomous material transport system.

The new LD-250 mobile robot has a 250kg

payload capacity and almost double the surface area, so it can be used to transport large automobile components such as transmission blocks and voluminous packaging materials – things that would traditionally be moved by human workers using carts. To optimize the autonomous material transport system, customers will use OMRON's industry-first Fleet Manager, which can control a diverse fleet of up to 100 of OMRON's mobile robots that can consist of different payloads and capabilities, by conducting traffic management, battery management, and navigation of vehicles.



Motohiro Yamanishi, Senior General Manager of the Robotics Business Development Project at OMRON's Industrial Automation Company said, "The new LD-250 will be key in advancing that initiative a step further, by giving customers more choice when automating their material transport operation, an area rapidly being enhanced with mobile robots in industries worldwide."

"Onsite logistics, the movement of products and material within the factory and warehouse, is becoming a real bottleneck for many companies due to the frequency and tediousness of the job, compound-

ed by rising labor costs. OMRON's mobile robots can help companies solve this issue because they can work 24 hours a day tirelessly, punctually, and safely in the same environment as people," said Tom Mathias, President and CEO of OMRON Robotics and Safety Technologies, Inc, a leading provider of robotics and safety solutions for manufacturing industries and part of OMRON's Industrial Automation Business. OMRON will be exhibiting the new LD-250 at the International Robot Exhibition 2019 to be held in Tokyo, Japan, on Dec. 18-21, 2019.

For more information <https://www.omron.com/>.

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Prima Equipment bags award for Industrial Excellence



A premier manufacturer, exporter and supplier of gas detection and air monitoring systems, Prima Equipment recently won the award in the 'Industrial Excellence 2019' category at the prestigious Indian Business Awards 2019. The company won the award after overall evaluation of financial parameters amongst

44,776 nominations.

Indian Business Awards 2019 is India's most prestigious honor that recognizes and celebrates the best business brands and visionaries. This year, the award ceremony was held at Clark's Exotica Convention Resorts & Spa, Bengaluru, between November 9 and 10th. The Annual

Indian Business Awards honored the achievements and shared the success stories of organizations, enterprises, and individuals that are actively involved in boosting economic growth and achieving milestones in this sector.

Sharing his thoughts on the win, Pritesh M. Shah, Chairman, Prima Equipment said, "We are honored to receive the Industrial Excellence 2019 award. This award is another addition to our list of accolades and recognizes our commitment to quality and excellence. We will continue to deliver the best products and services our customers, as per our vision."

Established in the year 1992, Prima Equipment has



increased its turnover by multifold since inception. It is dedicated to drive growth through usage of innovative technology and efficient after-sales service support.



For more information
www.primaequipment.com/

Wire and Tube 2020 to bring together industry experts and showcase latest innovation

The new edition of two leading international events Wire - International Wire and Cable Trade Fair, and Tube - International Tube and Pipe Trade Fair, is scheduled to be held in Düsseldorf from 30 Mar to 3 April 2020.

International Wire and Cable Trade Fair

Wire 2020 is expected to attract 42,000 international trade visitors from over 80 countries and more than 1,400 exhibitors from

over 53 countries in an exhibition space of 64,850 sq. mtrs.

Experience the latest technologies and production components, state-of-the-art machinery for the production of fibre optic cables and ultrafine wires, high-end wire sheathings and winding and rewinding live in action. From mega trends to nano innovations, at Wire look into the future.

Wire 2018 will showcase innovation

in manufacturing technology, including Wire manufacturing and finishing machinery, process technology tools, auxiliary process technology materials, glass fiber, measuring and control technology, test engineering, to name a few.

The expo will attract visitors from leading industries, including wire, cable, automotive supply, iron, steel and non-ferrous metal, electrical, construction, chemical,

measuring and control technology, etc.

Tube 2020

At Tube 2018 in Düsseldorf, meet more than 29,800 international trade visitors from over 134 countries and more than 1,250 exhibitors from over 48 countries in an exhibition space of 52,200 sq. mtrs.

Main product categories include raw materials, tubes and accessories, tube manufacturing



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tube, automotive supply industry, chemical, iron, steel and non-ferrous metal, energy, oil, gas and water supply, construction and electrical industries.

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Fluke Corporation launches compact 417D laser distance meter

Fluke Corporation, one of the global leaders in compact, professional electronic test tools and software for measuring and condition monitoring, has recently launched its most compact laser distance meter yet, the 417D. This speeds up layouts with instant, one-button measurements up to 131 feet (40 meters) and an accuracy of 0.08 inches (± 2 mm). This ultra-portable meter increases measurement efficiency while maximizing the reliability of measurements by reducing estimation errors, saving time and money.

It is designed for indoor



and outdoor applications. The palm-sized device features a bright laser for clearly tracking targets, even at long distances or in hard-to-reach spots. The 417D can survive a one-meter drop and is rated IP54 for dust and water resistance, making it ideal for even the harshest work sites.

Tracy Montanez, Product Manager, Fluke Corporation, said, "Our customers who have seen the 417D laser distance meter, love it. It has the necessary features to get the job done right, the first time. When your tool belt is already loaded with essential tools, the 417D takes up

minimal space and can easily fit into your pocket."

The 417D features a large two-line illuminated LCD screen for easy viewing of measurements and can deliver continuous measurements as well as quick calculations of area (square footage). Due to the automatic shut-off feature, the meter lasts up to 3,000 measurements.

For more information, visit: <https://www.fluke.com/en-in/product/building-infrastructure/laser-distance-meters/417d>

Fluke Corporation

For information on Fluke tools and applications, or

to find the location of a distributor, contact Fluke India e-mail info.india@fluke.com, call toll free 1-800-419-3001 or visit the Fluke Web site at www.fluke.com/india

About Fluke

Founded in 1948, Fluke Corporation is the world leader in compact, professional electronic test tools and software for measuring and condition monitoring. Fluke customers are technicians, engineers, electricians, maintenance managers, and metrologists who install, troubleshoot, and maintain industrial, electrical, and electronic equipment and calibration processes.



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SHIV OM BRASS : Embedding value driven culture

Q. What's the standing of SHIV OM BRASS?

The expression “what a company stands for” relates to its core values and brand. These go back to the mission and objectives. In the second example, in which customer service is a clear priority in the mission and objectives, the company's culture would likely include emphasis on friendliness, customer care and a helpful attitude. This contributes to the development of the company's brand, which is the image or perception customers have about it. A brand image may include traits, such as high-quality products, excellent products, environmentally-friendly operations and low-priced products.

Q. What's your product portfolio?

Shiv-Om Brass Industries is a pioneer in manufacturing of Precision Brass Turned Components and assemblies for Engineering, Aerospace, Medical, Agricultural and Machine Tool Industries. We are well-known in the market for Brass Components which are used

in different sectors. Shiv Om Brass Industries is located at Jamnagar, Gujarat, India. Our division is accredited with the honor of ISO 9001: 2015 certification

Q. What are the design features of your products?

Modernization and technology up-gradation is always on the top priority of the management and has added a number of modern High Technology Machines and equipment's which has helped us to a great extent in enhancing and providing an outstanding product satisfaction of best Quality parts to all our esteemed clients to meet their specific industrial requirements. It is needless to mention that technology is fast changing and we are having a huge business inquiries related to Precision Brass Turned Parts, Turned brass Importers from USA, UK, Europe, Australia, Middle East countries, etc.

Q. What are the unique advantages of your products?

It features heavy tensile strength to get shape quickly and this is one of the main reasons where brass is used in different industrial applications. Brass is highly flexible in nature and it is durable too, Brass feature minimum frictional content and thus used for making doorknobs, locks, keys, gears and other components, Low melting point of brass alloy enables to





Mr. Snehal M. Gohel
Founder & Managing Director
SHIV OM BRASS INDUSTRIES

quickly mold the components into different shapes and accurately without the need for extra thermal force, Brass components can be molded into any complex shapes easily and with uniformity, The non-ferromagnetic properties of brass components further makes it easy to separate scrap metals and recycle quickly, Brass components have good corrosion resistivity,

therefore they become suitable to install in any places where corrosion is high.

Q. What's the common thread in infusing quality in all your products?

We believe in Quality rather than profit gained. All our manufactured brass parts meet the ISO 9001: 2015 standard and we guarantee 100%

quality inspection before shipment. Quality neither is or not just about having procedures in place. Services starts from when we receive an enquiry through to the delivery of that item. It is also about having the right tools to do the work, and that our staff is quality cognizant. We examine the material constituents of all brass products using optical continuum analyzers. With the CAD

drawing and 3D printers, we make our internal tooling based on our customers' sample when there is no CAD drawing provided.

Q. What's your single most contribution towards enhancing automation & productivity in the industry?

In Business if you do not enhance Automation, we cannot grow our business and we have invested in ERP System, New software, which has made my business run smoothly & even has helped in increasing our productivity, and that has helped me in growing my business to a different level.

Q. Who are your major customers.

As per our Company Policy & Signed NDA we are unable to disclose the Customer Names.

Q. What are your growth plans?

My Business Plans are to double the manufacturing facility and each & every customer globally &



has a dream to see Shiv Om Brass Industries as a No: 1 Exporter from India.

Q. And are your future thrusts to make the most of the opportunities brought by a burgeoning economy?

As per the opportunities given by

the Government policy for small scale industries in enhancing & expanding the business internationally, we see the growth of metal users in European countries & USA, hence we are focused in growing our Export & be a helping hand in growing our Economy. ■





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Creating awareness of bright future in **WELDING INDUSTRY**

Q. As a prominent player in the welding space, what trends and innovations are you observing that will continue to shape the future of the welding?

The welding or, joining technologies are fundamental to manufacturing.

There has been a great broadening of process types for joining of metals over the last 40 years, and therefore the range of products available.

From conventional forms of arc welding to cold metal transfer(CMT), CMT-Twin, CMT Advanced, high performance welding processes like laser hybrid-Twin, Twin Wire tandem welding, Aluminum spot welding (DeltaSpot) etc. techniques have been added, to increase the range of materials to be joined, the strength and aspect ratio of the joint, the speed of joining, the reduction in any collateral damage etc.

Power sources has become smart and intelligent to face various challenges in welding and provide the complete process solution through high Speed communication and by processing a huge amount of data in the shortest possible time.

The future trend of welding sector is hidden in the challenges the manufacturing industry is facing today- like environmental sustainability including the global warming, development of newer alloys towards light weighting and



**Mr. Vishwanath V. Kamath - Managing Director
Fronius India Private Limited**

the inherent difficulties in joining technologies owing to thin and light weight material joining techniques.

Innovations trend in welding in the coming future will be focussed towards the development of advanced technologies for joining Al, Al alloys and High strength steels, without much of the post welding operations by adopting to low heat high performance welding techniques.

Q. How are technology trends like robotics and automation influencing the welding industry?

Robotics have become much more popular in the last 20 years as they can significantly reduce labour costs and operate in hazardous environments such as welding. Automotive sector has been the key driving force for the robotics market which is growing steadily over last 2 decades. We must mention that the understanding and opinion of this sector has seen a sea change –

conventionally this segment used to believe that robot is the saviour and welding machine was never given the due attention. But over the years the manufacturing sector has understood well that the key performer in robotic welding is the welding technology adopted and the easy integration of the robot with the welding system for seamless communication and possibilities.

Welding Automation though aspire to grow faster but due to the input material inconsistency and need for the high initial capital investment, has put this on a slow track. Another bigger opportunity / challenges is lack of integrators for providing high precision welding automation solutions.

To catch up with the growing demand of robotics and automation for welding, welding fraternity must come forward to share and upgrade integrators with welding knowledges to rise them to the level of total solution provider.



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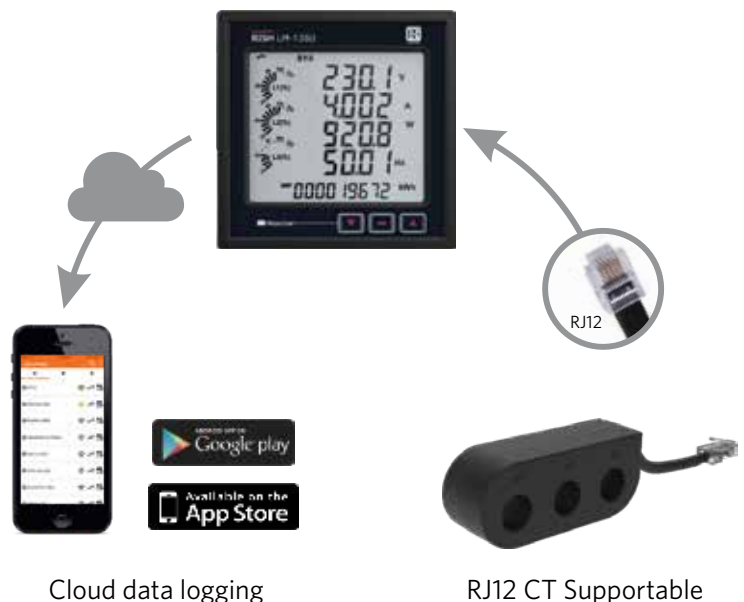


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Q. What kind of opportunities are you expecting from International Congress 2020 (IC2020) being organized by The Indian Institute of Welding?

International Congress 2020 (IC2020) is a global platform for welding companies to showcase the latest developments in the field of welding. The event is attended by welding enthusiasts from across the country and people from all segments of manufacturing industry.

Fronius is known for its strong research & development (R&D) and product development. There will be two international paper presentation in the IC 2020 from Fronius International GmbH.

Q. What products do you plan to showcase at IC2020?

We may showcase our latest technologies and developments in light weight material joining technologies and some high performance technologies for metal fabrication industry.

Fronius India showcase the latest developments and new products for high performance welding and welding automation and robotic solutions to the Indian Industry and

delegates.

Q. Comment on the challenges and opportunities in Indian welding industry?

The most common challenges is the perception of the young generation about this industry. There is huge number of young workforce getting ready to join industry but very few of them wants to join welding or, metal fabrication industry as they are lured by the comfort and glare of the IT and other so called white collar job.

This is leading to a huge manpower and skilled man power shortage in the manufacturing especially welding industry.

Welding Industry must work on improving the impression and attracting the young generations to join this sector. This can be done by adopting latest technologies as the new generation is going to be tech savvy. Welding stalwarts' must take the time out and reach out to the institutions to share their experiences and life story as a welding professionals.

Q. Comment on the present status of the Indian Welding sector vis-à-vis global peers.

Indian welding sector has huge opportunities for growth as the global majors are eyeing India as the most safe, profitable and reliable destination for manufacturing & investment. Govt policies like "Make in India", "Skill India" has undoubtedly have given required impetus to this sector.

In order to reduce cost of welding products many has started adopting cheaper products, techniques but in long remained vulnerable. Where the global welding industry is looking at the Total Cost of Production (TCoP) but Indian industry is still considering the ownership cost overlooking the total cost of operation.

Q. What are the future growth prospects and opportunities in welding in India?

Joining of metals would remain important for all sectors of the industry as metals like steel and aluminium etc. are needed in every sectors be it infrastructure, heavy engineering, automotive, defence and aerospace etc. As Indian GDP growth rate, even after the slowdown, remains among the toppers globally, India will continue to remain the preferred destination for foreign investors. This will keep boosting the manufacturing sector and definitely welding industry as well.

Productivity, profitability and sustainable growth will be key factors for the survival of any industry in this volatile market. Adoption of advanced welding knowledge, technology, skill and optimization of overall cost of production will be key to success. ■





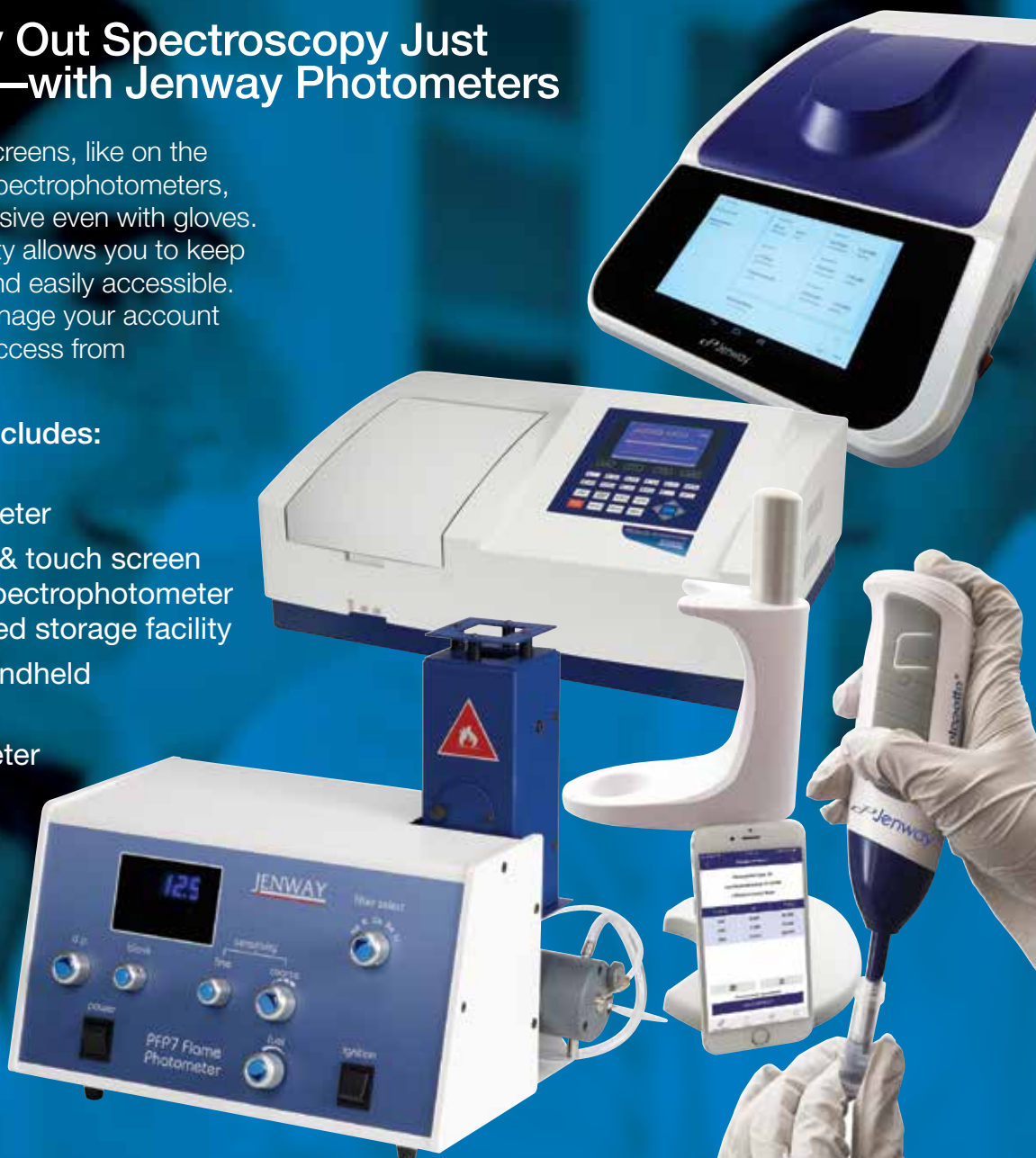
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The total exports supported by ECGC during the FY 2018-19 is around Rs.6,60,000 crores. It is notable to mention that from the large number of exporters benefited by ECGC's covers; more than 92% are MSME exporters.

The major coverage has been to USA, UK, GERMANY and UAE. Major sectors covered were employment intensive sectors like Engineering Goods, Textiles and Allied products, Chemical and Pharma and Agro Products.

Further, ECGC provides cover on 239 countries including high risk markets.

The systemic role of ECGC in the context of Working Capital lending to exporters has never been more pertinent than in the present stress scenario in the banking industry. Under ST Export Credit Insurance for Banks (ECIB) lending risk in extending pre and post shipment advances are covered. The total claims paid during the year to both banks and exporters Rs.1013 crores. The company's contribution in the last decade by way of claim settlements of around Rs.8300 crores has provided the much needed support to exporters and relief to

banking system in ensuring adequate lending to exporters. Despite this huge stress, a profit of Rs.314 crore before tax with a dividend of Rs.60 crores to Government of India (GoI) has been concluded during FY 2018-19.

In all, there are 19 products for exporters, 11 Products for banks and 12 products for Medium and Long-term Exporters/Banks. Further, ECGC also provides Customized Covers to make it cost effective and administrative comfort for exporters and banks. It has also introduced Factoring facility to MSME Sector and cover in foreign currency to Special Economic Zone Exporters.

ECGC being one of the oldest ECAs in the world has been playing a crucial role in insuring the export receivables and lending to exports. The exemplary service rendered has been validated by the best ECA award won in 2017 against competition from older and larger ECAs. Further, Company has been awarded by Council for Fair Business Practices under Service Sector for practicing, promoting and committing to fair business practices and also received Best Performance in General Category from Ministry of Micro, Small & Medium Enterprises, Government of India for Exemplary Work under Public Procurement Policy for Promotion of SC/ST Entrepreneurs. It has been receiving first or second price in "Indira Gandhi Award" (Now renamed to "Rajbhasha Kirti Puraskar") from since 20 years and winning first price in "Rajbhasha Puraskar" from Ministry of Commerce" from the last 7 years and received awards at various centers in India through Town Official Language Implementation Committee (TOLIC).

*For more information
Web: www.ecgc.in*



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Yes. Apart from hydraulic performance tests and calibration, FCRI also evaluates and certifies flow products in our Special Purpose Test facilities. The world-class facilities where products are tested for performance in arduous operating conditions.

Our Special Assignments & Projects Group also undertakes sponsored projects for study & assessment of flow related problems. Backed by a dozen well equipped and NABL accredited test labs at FCRI including the Water Flow Lab, India's leading facility for calibration & testing of flow products like flow meters, valves, pumps and fire fighting equipment with water as the flow medium. And the Large Water Flow Lab, one of the largest flow measurement facilities in the world, designed for a maximum pipe diameter of 2000 mm with a flow rate of 15,000 m³/hr.

So, whatever be the challenging assignments akin to flow, FCRI has the expertise, engineering acumen and resources to accomplish them eminently and cost-effectively within the shortest possible time.

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The Bettinelli advantage



Over the years, Bettinelli Group and CDS Indexers have become synonymous with high quality automation products and technologies.

Rupesh Paparaju,
Director, Bettinelli Automation
Components, India

Bettinelli S.p.A, established in 1953, specializes in the development and manufacturing of precision motion control components and systems. In 1996 a separate division named CDS Cam Driven Systems was created for engineering solutions in automation and motion technology.

CDS produces the widest range of mechanical Cam Driven Units, commonly known as rotary / indexing tables for precision motion control applications, requiring rotary or linear transfer, positioning and handling. The products range includes, cam indexing and servo-driven tables, ring positioning drives, intermittent and oscillating drives with parallel or right angle configuration, rotary & linear part handlers, precision link transfer systems, and epicycloidal servo reducers.

Wide ranging products

The broad product spectrum covers

IP parallel shaft indexers, IT roller dial indexing tables, TR roller dial indexing tables, HP roller dial indexing tables, IG/IGA roller gear indexer, TL precision link conveyors, MHP/LHP part handlers, FT-HT open center ring tables and packages of rotary indexing tables. Bettinelli has a wide range of standard

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“Our design and manufacturing systems have furnished competitive and strategic advantages to numerous industries in pharmaceutical, automobile, manufacturing, packaging and a plethora of other sectors. And for automation functions, our solutions are invariably preferred by companies,”

**Rupesh Paparaju, Director,
Bettinelli Automation Components, India.**

then assembly, painting and shipment. In order to ensure quality, all components are machined internally, including the cam hardening by a proprietary CNC controlled induction hardening equipment. For better finish, the products are also subjected to chemical nickel plating, blasting and painting. The manufacturing process is constantly controlled to conform to international standards. The company's quality systems are ISO-9001-2008 certified.

Strategic advantages

Over the years, Bettinelli Group and CDS Indexers have become synonymous with high quality automation products and technologies. “Our design and manufacturing systems have furnished competitive and strategic advantages to numerous industries in pharmaceutical, automom-

bile, manufacturing, packaging and a plethora of other sectors. And for automation functions, our solutions are invariably preferred by companies,” says Rupesh Paparaju, Director, Bettinelli Automation Components, India. The Indian subsidiary, headquartered in Pune, serves its customers in India by providing installation, commissioning, and after-sales support. It also offers technical consultation. In the pharmaceutical industry cam driven systems are used in filling, blister pack, tablet making and packaging machines. In automobile industry, they are used in pallet transfer tables, assembly machines, painting applications and test rigs, just to mention a few. In machining industry, they are used with advantage in deburring, lapping and pressing machines and in transfer lines. In SPM & robotics, they find

applications in transfer lines, station loading, sequential operations and so on. Inwelding, these indexers are inevitable in positioners, synchronous welding, robotic welding and component transfer.

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Closer to the customer

The Indian arm of Bettinelli, based in Pune, Bettinelli Automation Components Pvt. Ltd., is highly customer-centric. “Our presence in India means quite something in fostering a symbiotic relationship with our customers. It helps us to match our world-class products with our eminent customer support,” underlines Paparaju, Director, who has built up a team to improve Bettinelli's response time. “CDS are high-tech products which lend themselves to enhance the operational efficiency and productivity at the customer's end. We stay close to the customer to understand his needs and offer customized solutions within the shortest possible time to ensure peak uptime of his equipment and operations”, he adds.

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Our vision is to be a globally renowned and reliable service provider in fluid flow technology: Dr. Jacob Chandapillai



**Dr. Jacob Chandapillai, Director,
Fluid Control Research Institute,
Palakkad**



Q. What's FCRI's role in Flow Measurement and Calibration?

The accuracy of fluid flow plays a very vital role in the industry and in fact it is the single largest measurement parameter which is decisive in the quality and quantity of products. Hence having a measurement standard of International acceptance is of high priority. The very purpose of establishing FCRI by Govt. of India was to create a facility that would provide a standard for flow measurement in air, water and oil flow medium. Government has invested more than Rs. 75 crores to establish the flow standards of FCRI and has developed it to a world-class fluid flow laboratory.

Practically FCRI has been main-

taining the fluid flow standard in Water, Air and Oil medium for the country since last 25 years and is holding accreditation from National Accreditation Board for testing and calibration Laboratories (NABL) or equivalent throughout this period. FCRI is also regularly participating in inter-laboratory comparisons with National Metrology Institutes of other countries like NEL United Kingdom and NMI Netherlands and has proved its International credentials.

In a nutshell, FCRI provides services equivalent to International standards to Indian Industry and, to some extent, to overseas clients.

Q. What are the different flow media you handle today?

We at FCRI handle Water, Oil with different viscosities, Air at atmospheric pressure, Air at 20 bar, and Natural Gas.

Q. Could you give a ringside view of the facilities you have recently added?

- Testing facility for Special nozzles used in Launch vehicles for LPSC: The high flow high pressure test requirement for LPSC injection valve which controls Injection Thrust Vector Control System by injecting an aqueous solution of strontium perchlorate into the nozzle to produce asymmetric thrust in PSLV. A facility was made to test these valves.
- Endurance testing of safety relief valve at elevated temperature: Product validation of safety relief valve screening, analysis,

and optimization activities have entered a new phase where the emphasis is shifting from doing just what is necessary to doing what is necessary and sufficient to build a knowledge base for future evaluations to identify performance trends. A Special Valve Flow Test Facility was suitably created to perform this reliability test.

- Simulation of severe accident test facility (LOCA and MSLB): Severe Accident (SA, EDBE) refers to an event causing significant damage to reactor fuel and resulting from more or less complete core meltdown. Such accidents are highly unlikely in the light of the preventive measures implemented by operators. In this facility, along with steam temperature and water flow, air pressure in the chamber is also required to be controlled for achieving the required profile simulation. The facility is provided with steam and electrical heating supplemented by steam jacket heating. The chamber has provision for admitting dry air and steam. The electrical heater and steam jacket will provide the required degree of superheating needed for the Loss of Coolant Accident (LOCA) and Main Steam Leakage Breakdown (MSLB) tests. Water spray provision is also made for sudden cooling of the chamber to meet the LOCA / MSLB test requirements.

Apart from the above test facilities, FCRI has facilities for:

- Fugitive Emission testing
- Cryogenic testing

APPLICATIONS

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 Dust Emission Monitoring
 Effluent Water Monitoring
 Safety & Occupation Health Monitoring
 Quality Control Monitoring
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Q. What's your contribution to quality assurance in the core sector?

The right infrastructure and well experienced manpower available, give FCRI the supremacy in the field for fluid flow parameters in air, oil and water medium.

FCRI's vision is 'To be a globally renowned and reliable service provider in fluid flow technology'.

Core activities of FCRI include:

- Quality evaluation of Flow products as per International standards
- Execution of projects sponsored by Private, Public and Government Agencies.
- Standardization and "Model Approval" Evaluation of flow elements as per OIML R-117 (Legal Metrology) Standards on behalf of legal metrology
- Site testing and auditing of flow metering skids and large pipe-line flow
- Consultancy activities in Water, Oil & Gas Sector

We must also mention that the



design, development and execution of all the facilities in FCRI were done by FCRI engineers (with the guidance of UNDP experts in the beginning).

Later FCRI has independently developed

- One of the largest water flow laboratories in the world
- Oil flow laboratory with multi-viscous oils
- Centre for water management
- High pressure Air flow facility
- Multiphase flow laboratory
- CNG test facilities
- A variety of test facilities for special tests
- FCRI is also in the business of design and supply of customized flow facilities for the customers

What makes FCRI unique is:

- Its best uncertainties in flow measurement in our country whether it is oil / air / water medium. Flow laboratories are with uncertainties comparable and in some cases better than International facilities. The uncertainties begin from 0.02%.
- More than 30 years of experience in the flow measurement and control arena
- Well experienced and expert manpower
- FCRI has played a pivotal role for the quality improvement of flow

measurement and control in India

- For all practical purposes, FCRI's world renowned facilities serve our nation as a National standard for flow measurement
- Constant up-gradation of facilities to keep FCRI at par with other world-class facilities and by proving its International reliability through Inter-comparisons with other similar facilities. Continuous International inter-comparisons with National Engineering Laboratory -UK, CMI-Czech Republic, NIST-USA, Delft Hydraulics Netherlands, etc. and publication of the results in global conferences have helped FCRI to gain International credibility.
- The user industry has developed confidence in their flow measurement by constant monitoring of their flow parameters through FCRI's standard facilities and expertise.
- FCRI is doing Site auditing of gas and oil metering skids. Considering the fact that Government of India is focusing towards the installation of gas and oil pipelines across the country covering all states, FCRI's role as a third-party auditor is expected to gain prominence.
- It is also working with reputed educational institutions in the country for improving research outputs. Recently, FCRI has joined hands

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with IIT Mumbai and IIT Guwahati and is doing a project funded by European Union and DST for the enhancement of water distribution in our country.

- It has recently developed a unique Valve Cavitation Research Centre for the use of process industry where you can test valves for its performance and effectiveness under cavitating conditions.
- In situ flow measurement is very difficult to do in large pipe lines at site. FCRI is focusing on this area using various methods like tracer dilution method with non-radioactive dye- injection, clamp on ultrasonic flow meter, Insertion type flow meters, etc.
- FCRI has close working relations with Czech Metrology Institute (CMI)
- FCRI has been conducting International courses. More than 1000 participants from 90 different countries have attended FCRI's courses so far.

Maintaining and constantly improving flow measurement standards

to the best uncertainty is a colossal task, considering the complexity involved in the flow measurement standards. FCRI has been doing this task commendably well.

Q. What are the different training programs / courses you conduct and how do they help in skill development in the country?

International Training Program for foreign nationals through Government of India's various Sponsored programs. More than 1000 participants from 90 different countries have participated in these programs so far.

International courses include topics such as:

- Oil & Gas Flow Measurement & Control
- Flow Measurement & Control Techniques/software in Industrial process & Water Distribution System
- Instrumentation & Control & Data Acquisition System were organized.
- National bi-monthly courses
- Customised Courses covering

topics on

- Dispensers for Diesel/Petrol/CNG/LPG
- Concepts of LNG and Natural gas metering & custody transfer
- Flow Metering in Gas Business
- ISO/IEC 17025 and NABL Accreditation
- Oil and gas Flow measurements and CTMS
- Water Transmission & Distribution Engineering
- Flow Metering in Gas Business (for GAIL Engineers)

Q. Could you quantify the foreign exchange you may have saved for the country through indigenous flow testing, calibration & training of foreign students?

About 50 to 60 lakhs Rupees per annum and growing steadily.





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Manufacturing processes adopting green to combat climate challenges



We are facing a climate emergency and the environmental challenges are far worse than what we had thought them to be. Against this backdrop it has become imperative that manufacturers, an integral part of the industrial world, initiate measures to combat the environmental challenges. In this article we take a look at the green initiatives of the manufacturing world.

Article by Arijit Nag

Lately, we have realised that the climate situation is far worse than what we earlier thought it was. Green manufacturing, an emerging industrial trend with an achievable, long-term future for sustainability, addresses the environmental challenges at a systemic level. With stark difference in opinion among governments across the world it has become imperative that a common platform is found to combat the climate crisis.

Manufacturing activities have been one of the major polluters of the environment. Here is where green manufacturing trends come into play. Green manufacturing is primarily

about changing the existing business and manufacturing practices, as well as the mindset of stakeholders, to mitigate the industrial contribution to climate change and other environmental concerns. Incidentally, green is not a hollow word. There are tangible ways to drive sustainable practices both within manufacturing facilities, across the supply chain, and through the customer base.

Technological change brought about by Emerging Green Technologies (EGTs) is relevant for the entire world irrespective of countries. Emerging green technologies are those which have already reached a certain technological maturity but have

comparatively low market penetration or technologies that are still in a relatively early stage of technological maturity, albeit in principle already applicable in daily life.

Green manufacturing encompasses the Fourth Industrial Revolution or Industry 4.0 and Industrial Internet of Things (IIOT) present new opportunities for innovations to develop sustainable, environmentally friendly materials; decarbonise energy; tap digital ideas for doing more with less; and extend the life cycle of goods within a “zero waste to landfill” framework.

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footprint, technology advancements optimising efficiency, resilience, and sustainability across the full manufacturing process, including the supply chain and building of a strong foundation for a global circular economy.

The largest payoff of the green manufacturing approach is energy savings. Here, environmental and business benefits go hand-in-hand. We see a bright future for decarbonising energy. The latest Energy Transitions Commission (ETC) report “Mission Possible” declares that reaching net-zero CO₂ emissions by the middle of the century is a very real target.

The benefits of incorporating eco-friendly initiatives into manufacturing processes are becoming increasingly apparent; not only can this lead to cost reduction and higher efficiency, it also boosts your reputation, positioning your company as a responsible corporate citizen as more and more consumers seek environmentally friendly products and packaging.

Moreover, the reality is resources and raw materials are dwindling, and the need for sustainable, renewable materials and methodologies is the way forward for all industries. Companies are now seeking ways to become a part of the circular economy — a “take, make, and dispose” alternative to the traditional economy. In the circular economy, companies keep resources as long as they can extract maximum value from them, then recover and restore materials wherever possible — minimising waste and emphasising on renewable resources.

Industry will be deriving the biggest benefits from investments into green manufacturing practices. Businesses that take a forward thinking approach towards their manufacturing processes can see unbelievable cost savings. Machines and equipment are

becoming much more energy-efficient and can have a lasting impact on a manufacturer's bottom line. Much of the equipment found on the average shop floor largely consists of legacy equipment that may be holding a business back from reaching its green manufacturing goals.

Beyond the actual manufacturing process, there are also other ways a manufacturer can reduce their energy costs. Smart lights are available that can sense the amount of natural light throughout a facility and only illuminate those areas that need it most. Even something as simple as ensuring all your air hoses and compressors are sealed properly can result in a large reduction to a manufacturer's overall energy consumption.

Putting Reverse Logistics plan in place also helps reduce the amount of raw materials needed to produce new components or products. Reverse Logistics is a process that ensures once a product reaches the end of its lifecycle it will be returned to the manufacturer.

Once the manufacturer takes possession of the used product, they can breakdown those used products and secure the remaining raw materials. Making use of materials that would normally be thrown away can mitigate what the manufacturer needs to spend on making new products.

Reverse Logistics strategy isn't just beneficial to manufacturers; it can have a great impact on the amount of waste that they produce. Instead of products ending up in land-fills, manufacturers can ensure all the materials that can be used again, will be used again. This is especially important in industrial sectors. Steel is one of the most recyclable materials in the world and these manufacturers work on slim margins.

The more raw materials they can reuse, the better chance they will have

to turn a profit.

Focusing on green manufacturing and business practices will lead to a reduction in carbon footprints left behind by businesses. This can have important tax implications and even result in receiving incentives from the federal government. Manufacturers can even receive additional incentives for investing into renewable energy infrastructure like wind turbines or rooftop solar panels. So not only will a manufacturer be producing their own energy, they will be paid for any energy they put back into the grid (in many US states).

It isn't just manufacturers that have been focusing on the importance of going green. The public has shown that they would rather do business with a company that takes the environment into consideration throughout their manufacturing process. A manufacturer that is making a large investment in both time, energy and money to make sure their products are manufactured with the environment in mind can strike a chord with the public.

A manufacturer's commitment to creating a green business can greatly improve their marketing effort. Explaining exactly what they're doing to ensure they reduce waste and their energy consumption can make them much more attractive to buyers.

A completely sustainable large-scale manufacturing operation may still be a few years away but this does not mean manufacturers can't limit their environmental impact. As manufacturers continue to invest into new technology that can streamline processes, machines that help reduce energy consumption and a continued focus on lean manufacturing, the manufacturing industry continues to become greener every day. This focus on green practices isn't just a huge bonus for the environment, the manufacturing industry benefits as well. ■



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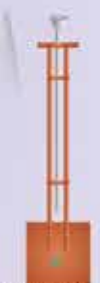


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Manufacturing Industry: Enabling way towards sustainability

Since the industrial revolution, factories have been among the world's biggest consumers of energy due to the mass scale and high volume of processes centralized in one location. Here's an insight into how rooftop solar energy can be used by manufacturing industry to reduce their operating costs

With the 'Make in India' program creating a lot of waves, the manufacturing industry can easily be touted as one of the most profitable sectors in India. While the foothold of this industry is quite strong already, it is truly the potential that looks quite uphill as well. As per the India Brand Equity Foundation, it is reported that the investments in this industry (both foreign and domestic) have seen a rise of 10% between FY 16 and FY 18 alone.

But here is the real challenge. The resources in the country are not sufficient or even affordable for many manufacturers. Usual electricity cuts and the costs of substitute non-renewable electricity

can cut deep holes in pockets of manufacturers. There is no denying that a solution for a growing industry that ensures more sustainability is ideally the way to go for a sector like this. To that effect, here is an insight into how rooftop solar energy can serve as a future beneficial source for the manufacturing world:

Manufacturers embracing solar energy: Current scenario

Since the industrial revolution, factories have been among the world's biggest consumers of energy due to the mass scale and high volume of processes centralized in one location. Factories call for high energy intensive processes. To name a few, manufacturing,

assembling, repairing and processing which is supported by very high energy consumption devices like motors, compressors and chillers. As a result, multiple manufacturing companies are adapting to on-site solar power as the perfect way to reduce their operating costs. Factories are known for having large commercially unutilized roofs which is an ideal installation site for solar panels. Not only factory roofs, but the parking lots and other carports can also be used to install solar system.

For example, if manufacturing unit has 1 Lakh sq. ft. commercially unutilized roof space, it can accommodate 1 MWp capacity solar power plant costs around INR 4

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Solar energy, radiation from the Sun capable of producing heat, causing chemical reactions, or generating electricity.

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in stark contrast to the finite fossil fuels coal, petroleum, and natural gas.



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Cr. customer can avail INR 1 Cr of tax benefit from the government. Therefore, the effective capital investment in solar power plant installation would be INR 3 Cr. 1 MWp rooftop solar power plant generates 14-15 Lakh units of electricity annually. Considering 7-8 rupees / unit Discom tariff, customer can yield INR 1.1 to 1.2 Cr worth of electricity every year. So, the investment payback period would be of 2.5 to 3 years. Life of solar power plant is a minimum of 25 years and with Discom tariff escalations the savings are only going to increase year on year. Ultimately 'Every penny saved is penny earned.'

Recently, the world's leading Swiss textile machinery manufacturing brand Rieter; has taken a step towards sustainability at their manufacturing unit located near Pune, Maharashtra with the installation of 2 MWp capacity rooftop solar power plant. This power plant is expected to generate around 29 Lakh units of electricity annually and will contribute to the environment by reducing 2500 Tons of CO2 every year.

Why choose solar power energy for the manufacturing industry

Here are some of the important reasons for manufacturing companies to embrace rooftop solar power.

• Utilization of unused space:

Companies can use commercially unutilized vacant roofs to generate electricity at the lower tariff with a payback between 2.5 – 3.5 years depending upon tariff of the Distribution Company.

• Accelerated depreciation tax benefit:

Today, according to central government policies, investment (Capex) in solar power plants is

eligible for an Accelerated Tax Depreciation of 60%. This implies that you can allow 60% of the total project cost as depreciation in the first year, and 40% of the remaining project cost in the subsequent years.

• Hassle-free maintenance:

The solar plant comprises of no complex mechanical arrangements and moving parts thus, requires minimal maintenance. The routine maintenance of solar plant includes regular cleaning of the PV modules over a 10 -15 days' time and monthly checkups of inverters and PV modules. The solar inverters and PV modules come with 5 and 25 years of warranty respectively.

• Zero Investment Plans (Opex):

With Zero Investment option, companies can sign Power Purchase Agreement (PPA - Contract) with an investor who can offer less expensive energy at zero upfront cost. This eliminates Capex investment in solar energy.

• Modularity:

Rooftop solar PV system designs can be highly customized. System sizes can be specifically tailored to meet company's energy, space and budget requirements.

• Reduced dependency on diesel backup:

Most factories depend heavily on diesel generators to ensure continuous power. Solar power can reduce the dependence on diesel power; if not eliminate the need for it. Solar power comes at a levelized cost of around a quarter of diesel power. Hence it makes more sense to depend on solar power, subject to the time of usage.

Become an environment friendly business:

Generating electricity from solar energy means your company uses less fossil fuel which reduces pollution and greenhouse gas emissions. By switching to solar power, companies can contribute to fight climate change and to reduce our country's dependence on foreign energy sources. It also helps in creating positive public relations as an environmentally responsible company.

To put it in a nutshell, the solar rooftop has significant potential in terms of contributing to renewable energy targets. India currently has a target of 40 gigawatts of solar rooftop capacity, which it aims to achieve by the year 2022. In the meanwhile, the solar photovoltaic industry has got a lot more acceptance on a global level. Even so, the potential remains unharnessed and there is a lot of scope for adopting this in India, in the manufacturing segment.



*The author of the article is **Rahul Dasari**. He is the Chief Executive Officer of Sunshot Technologies. He has over 11 years' experience in the Indian clean-tech industry and is an executive committee member of Distributed Solar Power Association (DiSPA).*

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Policy lacunae yield patchy success for Make In India project

India has achieved significant success in the Ease of Doing Business World Bank rankings over the past couple of years which was one of the primary aims Make In India. The country has, however, not accomplished the goal it had set out to achieve through the ambitious project. In this article we try to analyse where we have gone haywire in realising the goal of Make In India.

Article by Arijit Nag

Make In India is one of the pet projects of the Indian Prime Minister, Mr Narendra Damodardas Modi. Just a few months after the Bharatiya Janata Party-led NDA came to power in 2014, Modi announced a slew of projects to fulfil his dream of ushering in a New India which included Make in India, Jan Dhan Yojana, Swaachh Bharat to name a few.

The 'Make in India' programme was launched on September 25, 2014 with the express aim to make India a global hub for manufacturing, research and innovation and integral part of the global supply chain. It has been a perennial heart burn for India that China made huge strides in manufacturing while India lagged far behind.

However, the success rate of the scheme can be said patchy at best. There have been huge plans but implementation has left a lot to be desired. The scheme has not really been backed by either infrastructure or cost benefit analysis.

Thousands of crores were allocated for these projects. The promises made by the government were sky-high and the sleeping tiger, that India was, seemed to be waking up. In 2014, the Modi-I regime came to power promising millions of new and higher-paying jobs, greater business investment opportunities, greater privatisation and diminished corruption. But these milestones were not realised to a great extent.

The Make in India project required India to climb up significantly on

the "Ease of Doing Business" ranking of the World Bank. The country has climbed to the 63rd rank among 190 countries in the World Bank's ease-of-doing-business ranking. The leap of 14 places from 2018 puts India among the top 10 improvers in rank yet again, according to the World Bank report. This has indeed been a credible achievement of the government.

In 2014, Modi's favourite slogan was "Minimum government, Maximum governance". However, what we subsequently saw was a bigger government trying to be more efficient, i.e. in terms of increasing relative access to some public goods and welfare schemes at local levels. We have actually seen the Modi government function as a large



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monopolistic behemoth -- spending more on public relations campaigns and marketing, with a servile bureaucracy.

Recently, Union Defence Minister Rajnath Singh while addressing India Rising, a business seminar organised by the Indian Chamber of Commerce at the Defence & Security Exhibition 2019, said that India was committed to achieving \$26 billion defence industry by 2025 through Make in India. But many experts differed from him.

Even as the government draws a roadmap to give a significant fillip to Make in India, country's top bureaucrats and multinational companies feel a lot needs to be done still to make it a success such that more and more companies are willing to set up manufacturing base here.

"Lot still needs to be done in Make in India and focus on defence manufacturing will go a long way in doing that," NITI Aayog CEO Amitabh Kant said.

Kant, who has been the man behind the Make in India programme, was speaking at a session on Make in India at the Economic Times Global Business Summit recently.

Samsung, the largest television brand in India, is a very relevant case study as far as the lacuna in the

implementation of Make in India is concerned.

Samsung's Chennai plant was shut in October last year after the government imposed duty on open cell television panels. The company then started importing finished television sets from its plant in Vietnam through the free trade agreement (FTA) route.

In September, the Centre scrapped the five per cent import duty on open cell panels. The display accounts for almost 65-70 per cent of the production cost of LED televisions. There are currently no domestic manufacturers of television panels even though the government has been trying to push local production of this component.

Consumer demand and spending have witnessed an alarming plunge in recent times. The Indian television industry has been going through one of its worst phases with sales remaining mostly flat through 2019 despite the cricket World Cup and Diwali. Consumers are increasingly buying Chinese and online value brands such as Xiaomi, TCL, Kodak and Thomson in screen sizes up to 43 inches, which forced Samsung, Sony and LG to drop prices by 20-40 per cent.

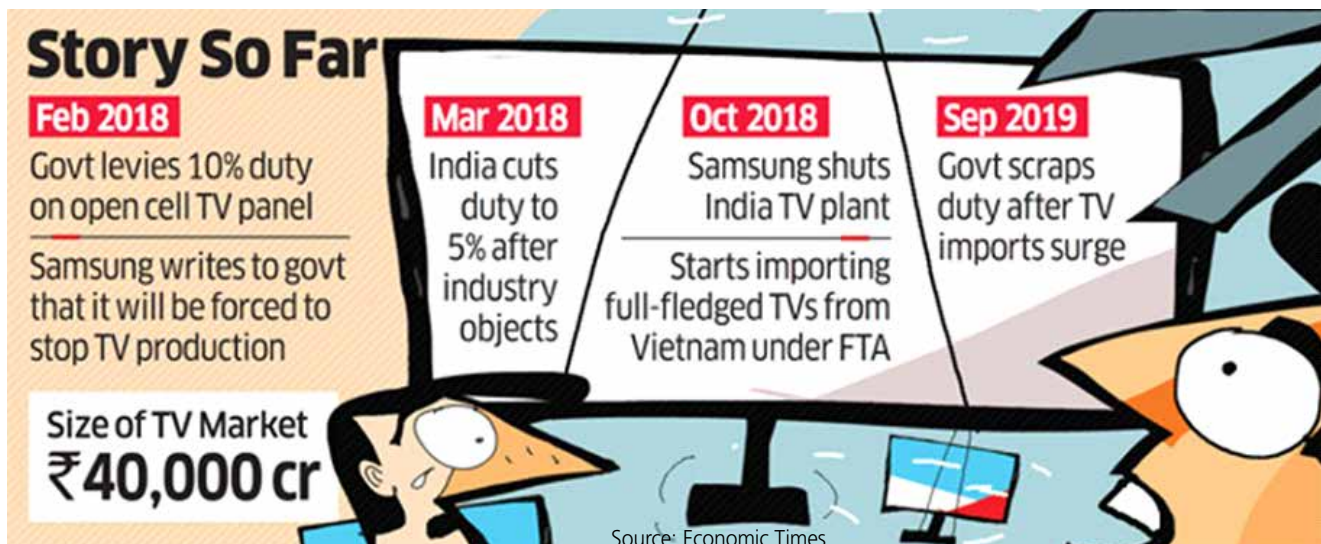
Against this backdrop, the

government applied intense pressure on Samsung to restart production since its exit was a blot on the flagship Make in India programme. This is also expected to help Samsung since it can better manage its supply chain and save on logistic costs now that there is no cost difference between local manufacturing and FTA imports," added one of them.

Hence, Samsung India has decided to bring back television production to India after a year with the government scrapping import duty on the biggest component open cell panel, or displays, according to several news reports.

The South Korean electronics company is about to sign a deal with homegrown contract manufacturer Dixon Technologies to manufacture television sets of up to 55 inches in screen size. These account for more than 85 per cent of the Indian market. The company is evaluating options with other contract manufacturers to further expand local TV production in India.

Samsung may also start the TV line in its Chennai plant provided the government assures the company that the nil duty on open cell TV panels will continue for a few more years till local production of it begins.



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According to Kant, enforcement of contracts is one of the weak areas of doing business in India and this needs to be improved.

“India has shown significant improvement in nine out of 10 parameters of ‘ease of doing business’. The only place where we need to improve is the enforcement of contracts in which judiciary and not the executive has a major role to play,” Kant said, adding that all of us have to work around it.

Anil Swarup, secretary in the ministry of human and resource and development said India needs to bring in consistency in innovation in existing institution/systems to improve quality of education.

“By aping the West we are not making in India. We need to look inwards and come up with ideas that are politically acceptable, financially viable and administratively doable,” Swarup added.

The government is striving to make

India a better place to do business with the aim to be in the top 50 nations in the World Bank’s ease of doing business report. For the first time in 2017, India moved up 30 positions to be among top 100 nations after persistent efforts over the last three years to improve upon the ease of doing parameters.

The government has recently launched Make in India 2.0 with renewed emphasis on 10 sectors, including capital goods, auto, defence, pharmaceutical and renewable energy to push growth in manufacturing and generate job opportunities.

According to Bloomberg news, India is planning to offer 324 companies including Tesla Inc. and GlaxoSmithKline Plc incentives to set up factories in a bid to capitalise from the trade war between China and the U.S.

This time around the government proposes to provide

the manufacturers land to set up plants along with power, water and road access, according to a draft of the document prepared by the Department for Promotion of Industry and Internal Trade and Invest India.

While the Sino-US trade war has benefited countries like Vietnam and Malaysia into becoming manufacturing hubs through relocation of multiple manufacturing units, rigid land acquisition rules and labour laws have prompted investors to largely ignore India when looking for alternatives to China. However, Make in India 2.0 may reduce red tape, and set the nation, which expanded at the slowest pace in six years last quarter, on a path to double its gross domestic product to \$5 trillion by 2025 -- a goal set Prime Minister Narendra Modi.

Arijit Nag is a industry journalist who writes on various aspects of the economy and current affairs.

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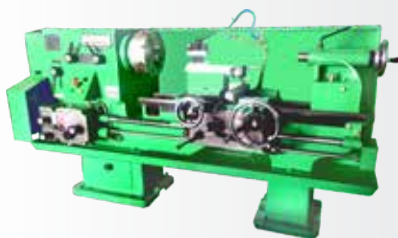
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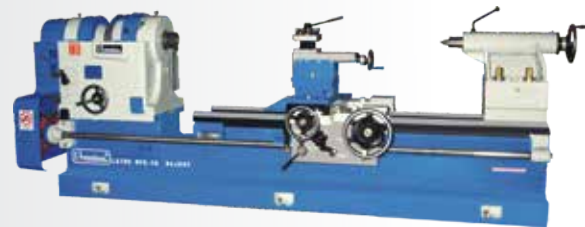
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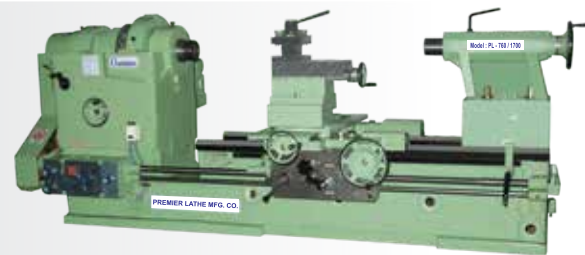
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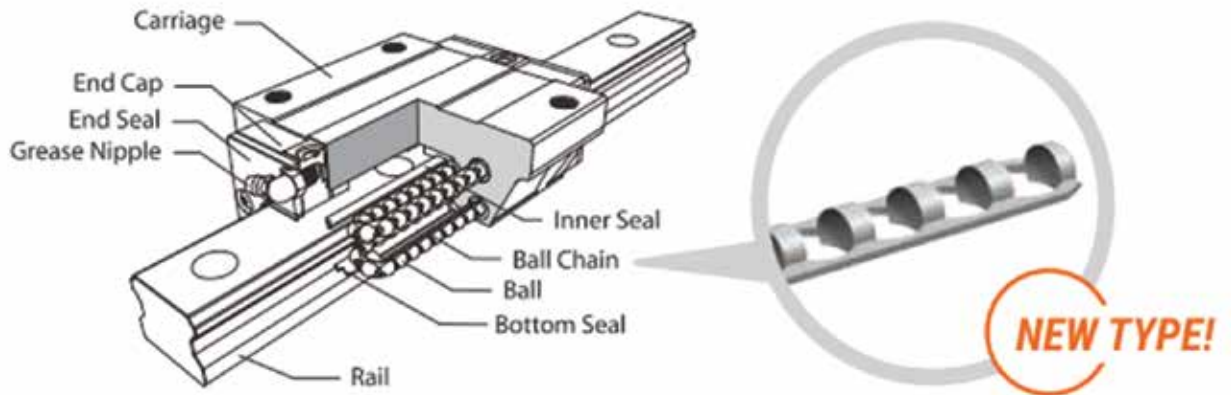
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Compact design of the carriage with the four trains of balls are allocated to a circular contact angle at 45°, thus each train of balls can take up an equal rated load in all four directions. Moreover, sufficient preload can be achieved to increase rigidity, and this makes it suitable for any kind of installation.

- **Self Alignment Capability**

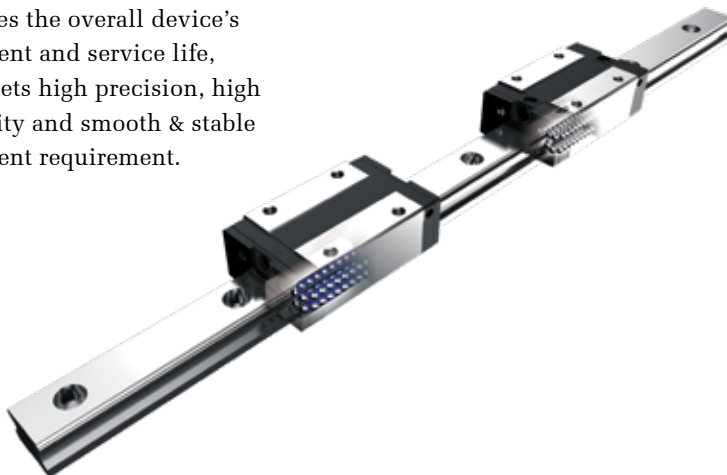
With self alignment capability, it can absorb the installation error. The self adjustment is performed spontaneously as the design of face-to-face (DF) circular arc groove. Therefore, the installation error could be compensated even under a preload, which results in precise and smooth linear motion.

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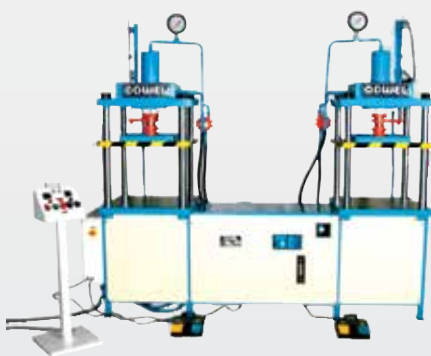
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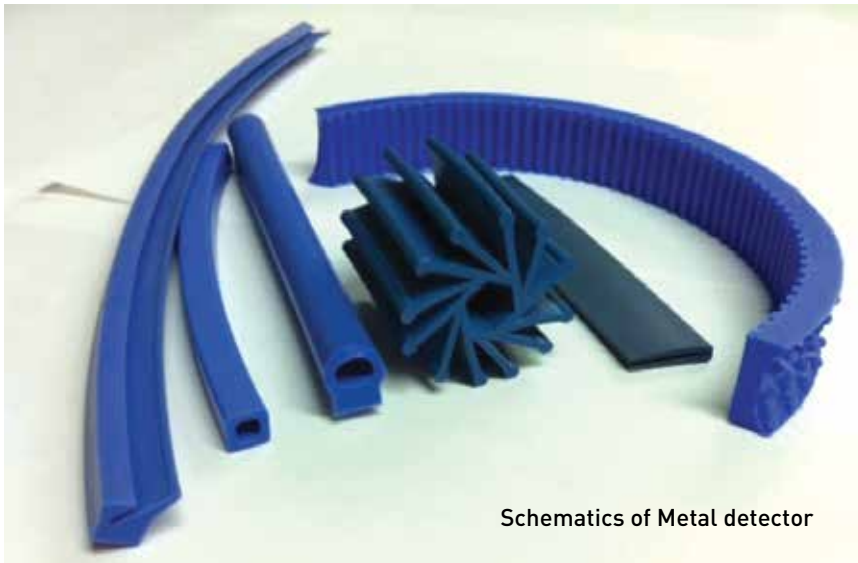
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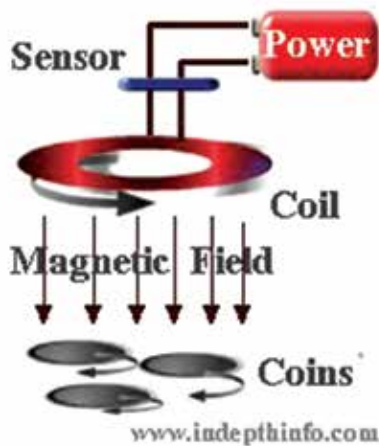
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Metal detector silicone rubber



Schematics of Metal detector



Metal detector silicone

Silicone elastomer based on polydialkyl siloxane is one of most curtail material use in most critical application like medical industry, food industry, pharmaceuticals, biotechnology, microbiological research and as well as in prosthetic application owing to its biocompatibility. Silicone elastomers are used as hose, tube, diaphragm, gasket of different machineries in those field. So concerns within the food and beverage industry of eroded silicone elastomeric by-products originating from processing equipment entering the process lines is widespread and that cannot be detectable. In response to the commercial problems of downtime and large quantities of waste being produced from such contamination

To reduce that problem metal detectable silicone composite have

been established. If any contaminated particle is fragile to the online stream product it would be detachable by metal detector. A metal detectable silicone elastomer composite that can be detected by integrated metal detectors fitted along the processing lines. In the event of eroding particles from a silicone seal entering the process line, such particles will be identified. The production process can then be quickly stopped, contaminated products segregated and the process modified to overcome the problem. The commercial benefit for the manufacturer is that the risk of production downtime and probability of waste being produced will be greatly reduced due to the properties of metal detector silicone composite enabling early detection of contamination.

Metal detector principally based on electromagnetism phenomenon. Different metal detectors work in various different ways, but here's the science behind one of the simpler kinds.

So to make a material metal detectable should be a metal or a composite by contain metal. Metal detectable silicone elastomer have been prepared by incorporating metal powder into it at the stage of mixing. This metal particles response to metal detector.



By: Pritam Adhikary
(Executive-R&D)

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Designing the right shaft for an application is not easy without CAD software and in-depth technical knowledge. igus has now developed a new, free-of-charge and freely accessible online tool with the drylin shaft configurator. In just three steps, the user is given the opportunity to select the right shaft in the required length from seven materials, machine the main body and the machined ends with standard elements such as chamfers and grooves and order the configuration. In addition, the user receives the STEP files of their configuration as well as a dimension drawing for downloading, free of charge.

Designing shafts without a CAD programme? igus is now making this possible with its new free online tool: the drylin shaft configurator. This expands the wide range of practical online services. In this way, the user gets to their desired product even faster, without any necessary technical knowledge or CAD software. In the new online configurator, the user can choose between seven different shaft materials with diameters from 6 to 50 millimetres and machine the main body and machined end as they like. Meanwhile, the user gets the price of their configuration and can order it directly. Another advantage: igus provides the STEP file for the shaft and the technical dimension drawing as a PDF download. This allows the user to further design the application directly with the configured shaft.

Fast and simple configuration in just three steps



Just design and order shafts in seconds with the new drylin shaft configurator from igus. (Source: igus GmbH)

In the first step of the drylin shaft configurator, the user determines the diameter, the length and the number of required shafts. Then they can choose the right material with the ideal surface treatment. In addition to hard-coated aluminium shafts, hardened or chrome-plated steel shafts, several hardened stainless steel materials and VA shafts are also offered. Stainless steel shafts are very suitable for the food processing industry, while aluminium shafts are a lightweight and cost-effective alternative suitable for mechanical engineering. In the second step, the user can machine the shaft body and optionally the machined ends, and add different machining stages as well as 14 standard elements such as bevels, holes, threads or grooves. An intelligent system gives the user maximum and minimum values which prevents faulty design. The clear surface of the tool, hints and tips make the configuration of the shaft

much easier for the user. In the last step, the customer gets an overview of the configuration including the price as well as bulk pricing and the delivery time. Here they can order the shaft or request a quote, download the dimension drawing and the CAD data of the product. There is also a possibility to save the configuration or to share it with colleagues via a link, which is very practical, especially when designing large projects. After receiving the order, it will be sent digitally to the factory, where the shaft will be manufactured by igus within 3-6 days and then shipped.

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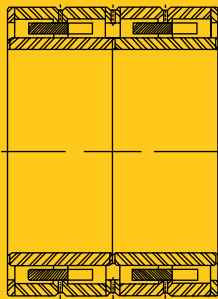
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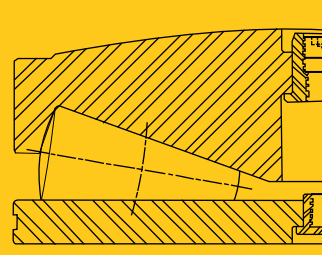
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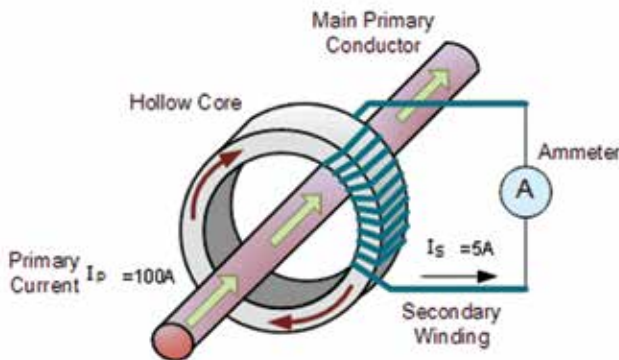


Fig:- 1 CT (1*)

As per IEEE

$$\frac{I_1}{I_2} = \frac{N_2}{N_1} = \frac{V_2}{V_1} = K \quad \dots \text{Transformation ratio}$$

Just like other transformers, there will be load on CT secondary and that load is called Burden.

Why Load on CT is called Burden?

The reason why we called load on CT as a burden is that, like a normal Transformer, CT secondary can't be kept open. As high current is stepped down to lower value, open CT secondary will cause 0A current in secondary, which will ultimately lead to a high voltage which may burn the CT secondary winding and can damage the system. So it is necessary to load the CT secondary continuously and ultimately it acts a burden on CT, and that's why the load on CT is named as a burden.

In Fig 2. circuit, CT secondary is short-circuited when a no-load condition occurs. Due to this 5A current, flows through the loop but the voltage is zero because of the shorting of CT terminals.

In Fig3. Circuit CT secondary is kept open with no load condition, causing the Voltage to rise up to 1000V and making CT secondary current zero due to open circuit condition. This high voltage will lead to insulation failure or permanently damage the insulation causing in-



Fig 2:- CT secondary Closed

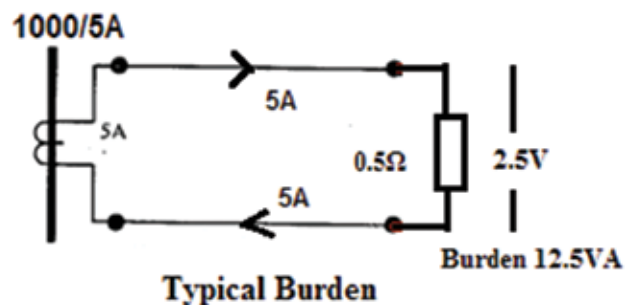


Fig 3:- CT secondary Open

accurate reading after connecting to the instrument and in the worst case, it can lead to burning of the CT coil. The load connected to CT secondary is mentioned in VA (normally), as in a Transformer, the connected load is of Resistive, capacitive or inductive type.

Burden of CT can be specified as Volt-Ampere absorbed at certain Power Factor i.e the VA that can be consumed by the load. The burden can also be expressed as total Impedance in terms of ohms connected on secondary of CT i.e pilot conductor and instrument burden ($I_2 \times R = VA$). To simplify the above point, let us take an example: for a 100/5A CT with a Burden of 0.4ohm impedance, the burden can be expressed as 10VA at 5A secondary current " $I_2 \times R = 5 \times 2 = 10VA$ ". In industries, VA is more commonly used unit for CT burden

Burdens on CT

There are 2 types of CT.

1. Metering Type and 2. Protection Type.

Burden for Metering type CT = Total Burden of Meters(Digital/Analog Ammeter, Voltmeter, Power Meter, MFM, Transducer) which are in series with CT + The total VA of the Cables connecting CT and the Meters. Burden of Cable can be calculated as "Current Square x Resistance of cable per length x 2 times the length of cable" i.e

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Cable VA = $(2L \times R \times I^2)$.

Example: If a 250/5A CT is connected to a load of 0.02 ohm resistance through a cable 2-meters long, then the VA burden of Cable will be

$$\text{Cable VA} = 5^2 \times 0.02 \times 2 \times 2 = 2\text{VA}.$$

The cable burden will be as per its cross-section area and length. Resistance of Cable depends on the Gauge & Length of cable. Burden of different meters are mentioned in their respective datasheet and catalog provided by the manufactures.

For better understanding burden of various meters is mentioned in table 1.

Meters	Burden
Analog Meters	1VA
Digital Meters	0.5VA
Current Coil of Watt Meter /VAR Meter	1.5VA
Current coil of energy Meter	2VA
Current coil of PF Meter	2.5VA
Current coil of Tri- Vector Meter	5VA

Table.1

So if you are using an analog meter with 2 m cable then the total burden on CT will be 1VA+ 2VA= 3VA. Burden for Protection class CT will be similar to Metering type only instead of meters the burden will be of individual relays. Burden of Protection class CT = "Total VA burden of cables connecting CT to relay + Total VA of Individual Relays". Burden of various Relays or protective system is mentioned in table 2

Effect Of Burden on CT Accuracy and ISF

Protective System	I_2	VA	Class
Per-current for phase & Earth Fault Relay	1A	2.5	10P20/5P20
	5A	7.5	10P20/5P20
Unrestricted Earth Fault Relay	1A	2.5	10P20/5P20
	5A	7.5	10P20/5P20
Motor Protection Relay	1A/ 5A	5	5P10
IDMT Earth Fault Relay	1A/ 5A	15	10P10

Table.2

For any CT, Instrument Security Factor(ISF) is nothing but the ratio of Maximum limited Primary current to rated Primary Current.

$$\text{ISF} = \frac{\text{Limited Primary Current}}{\text{Primary rated Current}}$$

Basically, the ISF is used to protect the load connected in the secondary side of the metering CT i.e meters etc. The core of CT will get saturated at higher current i.e 5 to 10 times(depends on ISF) higher than the rated primary current.

If ISF of a 100/5 CT is 5 then at 500A CT will provide equivalent 25A in the secondary side but once the current cross beyond that i.e 600A or 1000A the core will get saturated and the meter will get protected.

If CT Burden is chosen much higher than required, then the CT accuracy decreases for less than 100% load and increases for more than 120% of load or we can say the accuracy of CT get out of phase and also the ISF of CT gets an increase (refer to table 3&4). Designing CT for higher burden increases the saturation characteristic of core causing the risk for the load connected in CT secondary and also lead to CT failure. If a CT with 10 VA design against the required Burden 2.5VA will lead to increase ISF by 4 times i.e if ISF for 10VA is claimed as 5 that means saturation Voltage will be 10Volts

$$\left(\text{i.e. } V_{\text{sat}} = \frac{VA}{I_2} \times \text{ISF} \right) \text{ but if operated at 2.5VA}$$

then Saturation voltage will be 2.5Volts against 10Volts which leads the increase in ISF up to 20. So if high current flows then CT will provide 20 times secondary output current leading a meter or circuit connected on secondary to fail or get damaged it. Let's check the accuracy of 100/5A CT 10VA class 1 tested at full rated burden 10VA and tested at rated burden of 2.5VA.

Error Measurement:-

Rated I_1	Ratio Error	E Phase Error	Accuracy Class
120%	-0.07	+ 21 min	0.5
100%	-0.05	+ 19 min	0.5
20%	-1.47	+ 65 min	1.0
5%	-3	+ 134 min	1.0

Table.3

100/5A CT 10V Class 1 tested at Burden of 2.5VA



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Error Measurement:-

Rated I_1	Ratio Error	Phase Error or	Accuracy Class
120%	2.77	+ 37 min	OUT
100%	2.75	+ 43 min	OUT
20%	2.59	+ 69 min	OUT
5%	2.4	+ 102 min	1.0

Table.4

From the above Test it is clear that the CT design with a higher burden if used at a lower burden then that will leads to higher error in measurement even if CT is at 100% of rated Primary Current and also that CT accuracy

gets even better when operated at nearly rated Burden even at 50% of rated primary current.

It is often seen that load on CT is majorly only Meters and Cable (max. It can be 10VA for metering CT), so we suggest that the rated Burden for the metering CT shall be a standard value and as close to the connected Burden as possible.

The Core thickness of CT depends on the VA. Therefore for higher VA and for smaller rating CT, core thickness will increase, which leads to difficulties in mounting of CT in respective applications.

Reference for Images

1. electronics-tutorials.ws/ for Fig 1.



For more information

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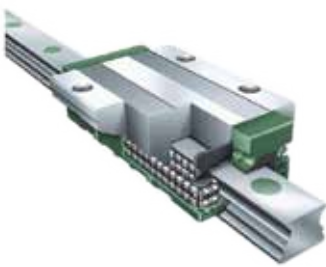
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Seventh Axis: The advantages of extruded aluminum profiles

When we consider solutions made of aluminum, the first word that comes to mind is lightness. Nothing could be truer with a specific weight of 2.7 g/cm³, but if we dig a little deeper, we can discover several other strong points, such as versatility, ductility and resistance to corrosion. We can also find surprising results when we compare the load capacity to that of steel!

Introduction

The anthropomorphic robot market is growing steadily year after year in several different applications, and the need to expand the range of action of these machines with a seventh axis is also growing. Having the option of moving the robot along a new axis allows us to increase productivity and efficiency. For this reason, Rollon has developed a complete range of seven models in various sizes and with different capacities. All these machines can work with anthropomorphic robots in a



range of factories, handling loads of up to 2000 kg. Rollon's Seventh Axis solutions are all made with extruded aluminum profiles, assembled with connecting crosspieces that endow the system with maximum rigidity. They use rails with recirculating ball bearings and drives that run either with a ground rack with inclined teeth or a toothed belt.

Aluminum, steel, and the load capacity

Aluminum is the distinctive material of Rollon's solutions, in a market where many solutions are made of steel. It's perfectly natural to ask: "In terms of load capacity, how do seventh axis systems with aluminum profiles compare to steel systems?". Obviously, steel offers greater mechanical resistance overall, but aluminum, being extremely malleable and flexible, can be extruded to make highly elaborate geometries, which are excellent for guaranteeing the greatest moment of inertia and the least weight possible. On the other hand, steel drawing – or steel processing in general – does not allow the construction of sufficiently complex pieces to guarantee comparable results. This is why aluminum seventh axis systems can quickly gain ground on steel solutions with regard to load capacity, but with an important extra feature: they weigh two and a half times less. The Seventh Axis range from Rollon can manage loads of up to 2000 kg.



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Now, let's look at the other advantages of aluminum profiles.

Lightness

As we said before, lightness is undoubtedly the most important plus: a light seventh axis offers several application-specific advantages, starting with lower transport costs. Moreover, the assembly of a solution weighing almost one third less than a steel solution is inevitably faster, easier, and most importantly, safer. Lastly, lightness is an important competitive advantage in all applications that involve a ceiling or wall mounted system instead of a floor-standing seventh axis system. In these cases, it is not necessary to add a heavy seventh axis in steel to the weight of the robot. Ceiling and wall mounted configurations are very common in painting and welding applications, in the automotive industry, and in other industrial areas.

Resistance to corrosion:

Steel in its most common form, carbon steel, corrodes on contact with water or in a humid atmosphere. This is why steel solutions destined for harsh environments require surface treatments that make them resistant to corrosion. These treatments offer different degrees of protection and, naturally, affect the costs of the finish solution and the delivery times. Aluminum oxidizes naturally on contact with air, and is not altered by humidity: it is resistant to corrosion and does not require any other treatment. A simple neutral anodizing treatment is usually done, purely for aesthetic reasons.

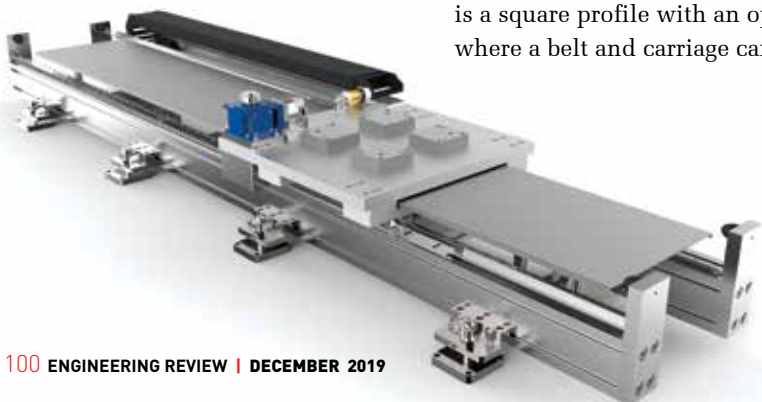
Solutions with protected profiles

The malleability of aluminum makes it possible to create different geometries through extrusion. The "C" profile is extremely functional. This is a square profile with an opening where a belt and carriage can slide.

This shape makes it possible to place the rail inside the profile. The final result is a completely closed unit that contains all the elements of the system. This solution is particularly interesting when it is necessary to isolate the seventh axis from the environment (to protect it from dust, residue, liquids or other contaminants), or on the contrary, when the environment must be isolated from the seventh axis in clean rooms or sterile environments where it is crucial to avoid dispersing particles. Obviously, constructions of this level of complexity cannot be made with the drawing process used to make steel profiles.

Are you curious about the advantages of aluminum seventh axis systems?

Learn more about Rollon's Seventh Axis range on www.rollon.com



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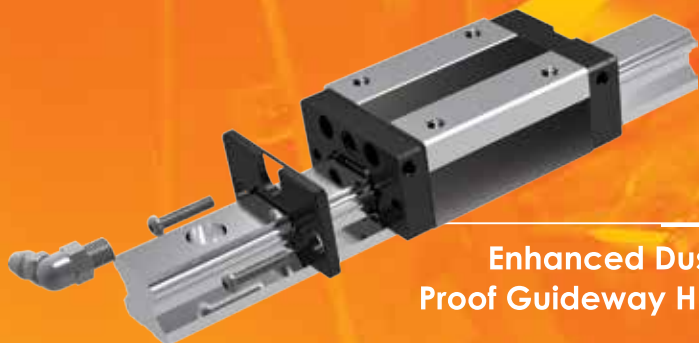
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The Hyperturn series has been designed to achieve further productivity increases in series production. Complex and sophisticated turning, drilling, milling and gear cutting operations can be carried out in only one work process; there is no need for re-clamping or temporary storage. The workpiece precision has been enormously improved, whereas it is possible to reduce the overall production times, the space requirements, the tooling expenses and the personnel costs to a significant extent.

In contrast to comparable models, the Hyperturn 65 Powermill features a spindle distance of 1400 mm, which results in significantly more space for simultaneous machining on the main and counter spindle. With

29 kW and 250 Nm on the main and counter spindle, the machine has enough power to machine one workpiece simultaneously with two tools. This so-called “4-axis machining” is another advantage when it comes to increased productivity. Another “top performer” is the milling spindle. With 22 kW, 60 Nm and

12000 rpm, it stands for high productivity in the complete machining



The Hyperturn 65 Powermill in its new design



New control panel with touch screen and EMCONNECT

of complex workpieces. Thanks to its directly driven B-axis, the Hyperturn 65 PM achieves high dynamics and contour accuracy in simultaneous 5-axis machining. The non-productive times related to tool changes are reduced as well. Thanks to the additional Y-axis on the lower turret, it is possible to perform comprehensive milling operations in parallel with the milling spindle's machining operations.

The 40-, 80- or 120-station tool magazines with HSK-T63 offer more options for complex complete machining □ with low set-up requirements in the manufacture of individual parts and high stability in turning and milling operations. The integrated tool magazine does not need to be disassembled for transport purposes, which results in shorter commissioning times and reduced transport costs. The frontal arrangement simplifies the set-up process and ensures ergonomic working conditions.

A new generation of tool turrets with BMT interface and direct drive offer increased stability and precision.

The performance data, which are similar to those of a milling machine, allow for the complete machining of turned and milled parts.

With automatic bar machining and/or piece goods loading using a robot solution or an EMCO gantry loader, the potentials for increased efficiency in automation can be exploited very well.

A machine tool's performance is not only determined by its mechanical and electrical performance values. In this regard, both the control technology and the software are becoming increasingly important as well. That is why EMCO equips the Hyperturn with the SINUMERIK 840D sl control by Siemens. The new user interface allows for intuitive and thus significantly easier machine programming.

EMCONNECT, the new assistant for control and production processes, is included in the machine's standard equipment. EMCONNECT is a digital process assistant for the comprehensive integration of customer- and system-specific applications for controlling the machine and the production flow. As the operating sequences focus on the user and their requirements, it is possible to create more efficient work processes without losing sight of the machines' outstanding reliability in all operating modes.

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on their machining projects, because they can use this software to plan, programme, simulate and optimise the production process with a 3-D picture of the machine displayed on their PC. By combining the HYPERTURN with the new EMCO CPS Pilot, it is possible to create extremely positive multiplier effects: the perfect interplay between CPS Pilot and HYPERTURN results in significantly reduced costs and efforts.

The HYPERTURN 65 Powermill is particularly interesting for the serial production of workpieces, e.g. in the automotive, aircraft and engineering industries or the area of fastening technology.

A new machine design reinforces the EMCO brand: The repositioning of the brand – which is also reflected in the claim and commitment “beyond standard” – is now also being implemented in the machine design. As central brand ambassadors, the machines now feature a new look, a look that constitutes a functional and visual upgrade. This upgrade is reflected in a variety of design changes: In order to ensure efficient processes,



Integrated mini gantry with 2 axes

user-friendliness and a clear arrangement, the machines' main interaction areas (such as the work area) have been highlighted in both colour and shape. The operating panel comes with homogeneous aluminium surfaces, ergonomically adjustable controls and an intuitive user interface. The housing features a reduced and precise design. Clean contours and precise joint patterns convey superior product quality. The recognition value of the technically sophisticated and ergonomic machines is fully guaranteed by the new design of the EMCO product family.

Technical Details / The HYPERTURN Machine Concept

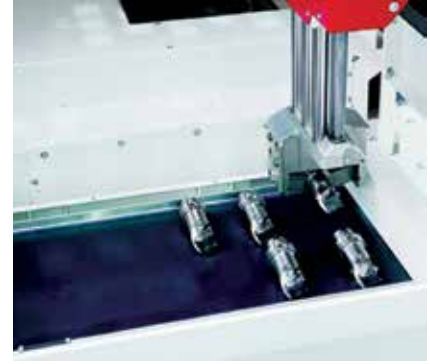
Construction

The machine bed constitutes the core of the HYPERTURN. The extremely rigid and compact welded steel construction is filled with a special, vibration-absorbing concrete material (HYDROPOL®). Additional reinforcements enhance the rigidity in more highly stressed areas. Thus, it is possible to use the high drive power of the main, counter or milling spindle without any restrictions. The result: better surface qualities, narrower production tolerances and longer tool lives.

Main Spindle and Drive Technology

The main spindle is available in two sizes. The standard bar capacity is 65 mm. It provides a maximum output of 29 kW at a torque of up to 290 Nm. A SuperBigBore spindle (102 mm) is available as an option. Resting on large precision bearings, the built-in, highly dynamic spindle motors (ISM) allow for a very wide speed range teamed with excellent smooth running characteristics. Thermostability is achieved with a symmetrically designed headstock, temperature sensors on the bearing points and liquid cooling.

All linear movements occur on



Parts placement

pre-tensioned, highly precise roller guides. The result: crucial advantages with regard to traverse speeds, zero backlash, service life, lubricant quantities and positioning accuracy.

Thanks to the unique sealing system on the guide shoe, there is nothing that speaks against using the machine in heavily soiled environments. In order to achieve a closed sealing surface, the guide rails are additionally protected with spring steel cover plates.

C-Axis

From a technological point of view, each spindle is also an axis. It can be moved into any position with a defined feed rate. Complex contours on the periphery or even on the front surface are thus easily feasible. The software for programming these movements (cylinder interpolation and/or TRANSMIT) is included in the scope of supply. Synchronised thread cutting and polygonal turning are included in the standard equipment.



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PERFORMANCE UP
COST DOWN



“Powermill” Turning/Milling Spindle

The powerful milling spindle with HSK-T63 tool interface can be used for turning, drilling and milling operations. The milling spindle is infinitely rotatable by $\pm 120^\circ$ and can be clamped in any position. With a usable Y-stroke of $+120/-120$ mm, it is possible to perform even the most complex machining processes, such as gear cutting operations, turning/milling of crankpins, 5-axis machining and much more. Depending on the customer's wishes, the tools will be provided by a 40-station pick-up magazine or by an 80- and/or

120-station chain magazine.

Workroom

The workroom guarantees superior ergonomics, i.e. it offers excellent access to the individual components. Large clearances ensure an ideal chip flow, also when critical materials are being machined. To prevent damages, all guides are covered with stainless steel.

Machine Cladding – New Design

The cladding of the Hyperturn 65 PM offers comprehensive protection against flying chips. It is 100% coolant-tight. A large safety glass door offers an unobstructed view into the workroom. The ergonomically arranged operating panel can be moved horizontally towards the centre of the machine door. The brand-new control panel is vertically adjustable by 90° and within 200 mm.

Control

Equipped with a Sinumerik 840D sl, the Hyperturn comes with one of the most advanced control units available on the market. The fully digital drive and control package handles up to 10 channels and up to 31 axes. ShopTurn/Mill and technology cycles simplify both turning and milling operations. Coordinate transformations (TRANS, ROT, SCALE, MIRROR) make it possible to realise any machining process. Complex machining requirements can be quickly imple-



mented. The Sinumerik 840D sl is reflected in the high precision of each workpiece. The alphanumeric keyboard simplifies programming.

Technical Key Data:

HYPERTURN 65 Powermill

Max. bar capacity [mm] ± 65 (102)

Max. speed [rpm]

Main spindle : 0 - 5000

Counter spindle : 0 - 5000

Milling spindle : 0 - 12000

Driven tools : 0 - 12000

Max. drive power [kW]

Main spindle power : 21 / 29

Counter spindle power : 21 / 29

Milling spindle : 16.5 / 22

Tool system : 10

Max. travel [mm]

Travel in X1/X2 : 530 / 210

Travel in Z1/Z2 : 1170 / 1135

Travel in Y1 : ± 120

Rapid traverse speed in X/Y/Z [m/min]: 30 / 12 / 30

Number of tools in the magazine: 40 (80 / 120)

Number of driven stations: 12

Machine Versions:

HYPERTURN 65 PM – SYB: with main and counter spindles, milling spindle, B- and Y-axes and 40-tool station magazine

HYPERTURN 65 PM – SMYB: with main and counter spindles, lower tool system including direct drive for milling, milling spindle, B- and Y-axis and 40-tool station magazine

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2K Packaging

CLA lubrication system for chain drives

iwis has come out with a new CLA lubrication system, which permanently delivers lubricant to the chain drive and other components – and in this way ensures a long chain service life economically, cleanly and with absolute precision



Regular maintenance and lubrication are essential to ensure low wear and extend the service life of a chain drive. More than two thirds of all chain failures can be avoided with proper relubrication. Which was reason enough for Munich-based chain manufacturer iwis to extend its chain-related portfolio to include a new, service-oriented product: Thanks to the use of a special applicator, the new CLA lubrication system from iwis (CLA = Chain Lubrication Application)



Valuable lubricant savings due to the particularly resistant iwis-applicator



dual composition of the CLA lubrication system from iwis

permanently delivers lubricant to the chain drive and other components – and in this way ensures a long chain service life economically, cleanly and with absolute precision.

When developing the new lubrication system for chain drives, iwis Engineering, the in-house R&D department, concentrated on maintenance – The objective was to extend the service life of the chain by ensuring that the chain is lubricated properly. And the result is a highly efficient minimum quantity lubrication system. The special applicator, which is made from a high-performance material, acts as a reservoir via which small quantities of lubricant are continuously delivered to the employed chain drive at the precise locations where it is actually needed. This prevents the operating roller chain from not being

supplied with enough lubricant and also prevents unnecessarily large volumes of oil from being dispensed onto the chain and its environment. An environmentally friendly, “green” solution that also lowers costs and reduces the risk of contamination of plant equipment.

The CLA pumps can be operated separately with time control or can be simply integrated in the machine’s PLC. The compact size simplifies the task of retrofitting the device in existing plant and machinery. Thanks to a pump pressure of up to 70 bar, the distributors are able to supply as many as 16 lubrication points with sufficient oil without contaminating the environment and wasting valuable lubricant. The special applicators, which are made from PU foam, are extremely robust and are available in many variants, including custom designs.

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Protection devices

Compact, high-performance disk varistors



TDK Corporation (TSE:6762) presents the EPCOS Compact S14 AdvanceD-MP series of metal oxide disk varistors that feature smaller dimensions with the same excellent performance as comparable S14 AdvanceD-MP types. The disk diameters of the new B72214P2* varistors range from 13 mm to 14 mm, a reduction of approximately 3 mm. Like their current S14 counterparts, these components offer a maximum surge current capability of 6 kA at 8/20 μ s according to IEC 62368-1. The Compact S14 series covers a wide operating voltage range from 130 to 460 VRMS. The multiple pulse varistors are designed to be used in power supplies as the primary protection against low-level repetitive surge currents. Their optimized design results in an improved derating performance over time. All types have UL, CSA, VDE and IEC approval.

Thanks to their compact dimensions and outstanding electrical characteristics, the Compact S14 varistors help design engineers reduce the size of their products and are suitable for a wide range of applications. These include switch-mode power supplies, drivers for LED lighting, home appliances and smart meters.

Main applications

- Primary protection against low-level repetitive surge currents
- Switch-mode power supplies, drivers for LED lighting, home appliances and smart meters

Main features and benefits

- Compact disk diameters of 13 mm

to 14 mm

- Surge current capability of 6 kA at 8/20 μ s
- Multiple pulse capability against low-level repetitive surge currents

About TDK Corporation

TDK Corporation is a leading electronics company based in Tokyo, Japan. It was established in 1935 to commercialize ferrite, a key material in electronic and magnetic products. TDK's comprehensive portfolio features passive components such as ceramic, aluminum electrolytic and film capacitors, as well as magnetics, high-frequency, and piezo and protection devices. The product spectrum also includes sensors and sensor systems such as temperature and pressure, magnetic, and MEMS sensors. In addition, TDK provides power supplies and energy devices, magnetic heads and more. These products are marketed under the product brands TDK, EPCOS, InvenSense, Micronas, Tronics and TDK-Lambda. TDK focuses on demanding markets in the areas of information and communication technology and automotive, industrial and consumer electronics. The company has a network of design and manufacturing locations and sales offices in Asia, Europe, and in North and South America. In fiscal 2019, TDK posted total sales of USD 12.5 billion and employed about 105,000 people worldwide.



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Geissel India, started in 1994, as a turned parts manufacturer, branched out into cable glands and electrical wiring accessories from 2009, to serve the vast and yet fully untapped Indian market. In just 8 years and over 100+ satisfied customers, it has earned a name for itself among the users of its products, some of them being large International Companies.

The sections of industry served by Geissel India are aerospace, automation & robotics, power, hydraulics, material handling, and pneumatics, to name just a few.

Ablly assisted by its R & D centre at its mother plant in Germany, Geissel is first in manufacturing the IP 68 Double Compression gland for armoured cables in India. Besides this, it has diverse products like standard IP 68 & 69, multisealing cable glands, plugs,

reducers, enlargements, lock nuts, conduits, etc., made in brass, polyamide & stainless steel S.S 303 (1.4305), S.S 316 Ti (1.4571), and all according to ROHS standards.

Geissel India is now compliant with the latest standards of ISO 9001:2015, ISO 14001:2015 & OHSAS 18001:2007, thus totally committing itself to Quality Management Systems, Environment and Health & Safety.

From using recycled water, to harnessing its self-produced solar energy for 100% of its own consumption at its German plant, the Group is committed to protect natural resources and implementing sustainability for this generation and the ones to come.

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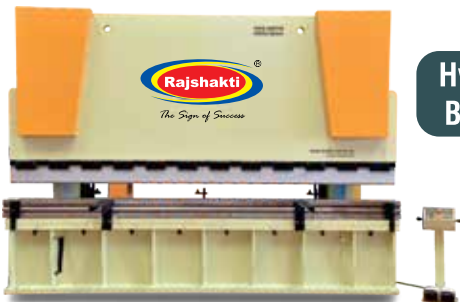
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Enhance efficiency and accuracy by 25% precision Work Holding solution

BPT is the first standard and custom-build Work Holding devices manufacturer in Asia – Pacific in addition to AT3 class Rotating Tool Holder since more than 3 decades. Erstwhile ‘Birla Kennametal’, Joint Venture with Kennametal, a USD 4 billion company, giving world class Work Holding devices and Tool Holding devices at one third of the cost of which is being supplied globally.

With the help of BPT Work Holding devices there is a reduction in set-up time, manpower cost, machine hours as well as rejection percentage; all together around 10 to 25% saving on non value added activity is the additional benefit to the customer.

Whether it's a small or large manufacturing shop, one thing they are constantly seeking is solutions to enhance productivity while keeping constant the quality requirements. After all, more efficiency and productivity with quality guarantees them not only better profit margins but also gives them an edge over the competition.

The constant need for increased efficiency calls for a special chucking system. One such solution that is designed specifically to meet the twin goals of productivity with quality is Birla Precision's Outer Diameter Clamping Chucks (ODCC). The unique solution has primary application in CNC Turning and CNC Grinding machines, as well as boring, milling, measuring and inspection. BPT's Collets in ODCC are designed and tested to get better gripping actions, higher concentricity and minimum distortion. Special Collets can be designed based on configuration of the customer component and can be customized as per customer require-



ment.

BPT's ODCC are a perfect fit for clamping OD Round, as well as profile any uneven OD for any secondary operations, including grinding, facing and boring where high degree of concentricity control is required with respect to OD and profile. The solution also helps to save NVA set ups of jaw borings and reduces the internal NVA cost.

BPT's ODCC have simple loading and unloading mechanism and require no indicating or adjusting. They have automatic self-centering capabilities and offer uniform, adjustable holding pressure. To meet the customer requirements, they are designed to support both automatic or manual operation. ODCC are completely sealed from harsh environments.

BPT's ODCC are highly reliable as they come with flexible Collets for extremely long life. They are counterbalanced to operate at high speeds and come with built-in, self-contained air cylinder. Further, they are packed with built-in safety features. They are also easy to maintain as no lubrication is required.

BPT's ODCC's CONSTRUCTION

BPT is a leading provider of precision Work Holding solutions. Its solutions promise accuracy, reliability, repeatability,

concentricity and productivity. It guarantees a competitive price for a complete Work Holding solution, which are engineered and manufactured to adhere to the customer's work piece tolerance. BPT standard Work Holding that is OD Collet Chuck models are available as under, according to bore diameter, DA100/ DA 200/ DA 400/ DA600/ DA 800. Standard chucks are adaptable to CNC's various spindle nose sizes i.e. A2-5"//A2-6"// A2-8"// A2-10"// & A2-12.

The specialty of the BPT OD Collet Chuck is they have a built in facility to set the accuracy of the bore to perfect zero run out, to nullify the run out on machine spindle assembly within a fraction of second, it means tremendous reduction in setup time. Special ODCC are available with up to flange outer diameter of 450 mm. Its top tooling is custom designed with special profile collets and back stops.

Unique advantages of the Double Angle system are:-

1. A stronger uniform body.
2. Uniform DA Collet wall section for even expansion.
3. Self releasing Actuating Angles.
4. Wear to continuous gauge fit.
5. Full 360 degree contact.
6. Self releasing for fast load and unload.
7. Parallel expansion supports work piece for entire length.
8. Accuracy 0.008 mm TIR on nose of master gauge piece, maximum collapse 0.80 mm to 1.6 mm standard based on clamping diameter.

*For more information
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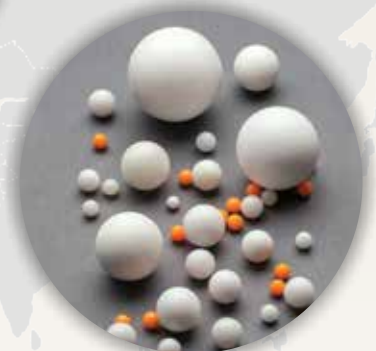
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The company has broadened its product base over the years to include Grinding media and Rollers along with metallic and non-metallic balls including ceramic, glass & plastic. The long standing commitment to excellence and dedication to our customers has earned us advanced expertise and a thorough understanding of hundreds of

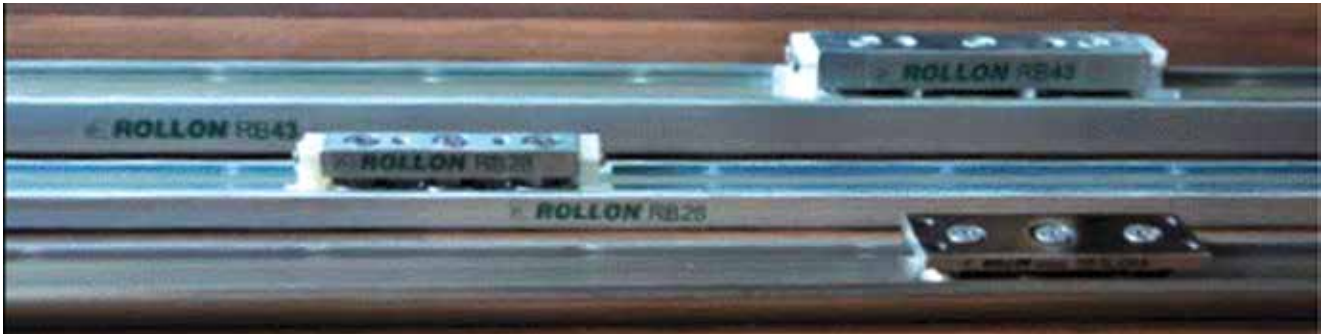
very specific applications and processes in industries which has helped us in providing customized solutions in all materials, sizes and tolerances.

All the balls we provide are produced in accordance with the standards required by the (DIN), (ABMA) and (ISO). Our quality assurance is also certified by the International Organization of Standardization, Standard 9001 : 2015 by Bureau Veritas.

The company's commitment to its customers and business integrity reflects in its widespread popularity - with a client base that's not only spread all across India but also in other parts of the world.

An efficient solution for your linear guide applications

Rollon Bearings is offering standard rails for multiple sliding applications, covering light, medium and heavy load industrial applications



Stainless Steel Linear Slide Rails are simple functional & cost effective solution for linear motion with optimum load capacity and corrosion resistance. Rails are roll formed in Stainless Steel SS304, has no coatings that could flake or chip.

Slider consists of rollers which are lubricated for life and sealed against contamination. Rollers have eccentric pivots that allow adjusting the preload when mounted inside the rail.

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■ AVAILABLE IN TWO SIZES RB 28 & RB 43

Heavy Duty Rail is a robust linear bearing system that is easy and inexpensive to mount on all surfaces even on unmachined surfaces. The system consists of slider with radial bearings which slide on the internal raceways of the carbon steel rail profile which

is cold drawn zinc plated. It is a low-cost solution for sliding doors, packaging, guides for any linear movements and anywhere corrosion resistant linear motion is required.

The system is recommended for high processing speeds, long service life & high load specifications and noiseless running. This system is easy to mount, align & use.

Radial Load Bearing Capacity:

RB28: 220 Kgs/Slider

RB43: 550 Kgs/Slider

APPLICATIONS

- Machine Tools
- Transportation
- Automation
- Medical Equipment
- Packing Machinery
- Defense Equipment
- Material Handling
- Robotics
- Mobile Equipment
- Assembly



Radial Load Bearing capacity: 40 Kg / Slider Speed: 1.5 m/s

ADVANTAGES

Low Co-efficient of Friction
Very Smooth Movements with Low Noise Level
Extremely Compact
High Performance
Lower Product Cost
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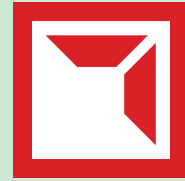
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SHT - Hypoid
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Improve speed and productivity in electronics manufacturing with new jet valve

The TS9800 Jet Valve utilizes Piezo, non-contact jetting technology for increased speed and reduced scrap during the dispensing process

Techcon, a leader in precision fluid dispensing technologies, recently announced the launch of its new TS9800 Series Jet Valve Dispensing System that includes the TS9800 Piezo-actuated jet valve and TS980 Smart Controller. Unlike pneumatic jet valves and other contact dispensing solutions, the TS9800 Jet Valve utilizes Piezo, non-contact jetting technology for increased speed and reduced scrap during the dispensing process.

The Techcon TS9800 Jet Valve provides ultra-fast dispensing speeds and the capability to dispense dots and lines as small as 0.5nL at up to 1500 Hz continuous and 2000 Hz max bursts for higher throughput on a wide range of fluid types and viscosities.

Typical applications include:

- Edge sealing, end sealing of LCDs and OLEDs
- Die bonding, frame bonding for camera module assembly
- Jetting silicone phosphor in the LED assembly process
- Jetting underfill in micro-electronic package applications on PCBAs
- Jetting micro dots of UV adhesive in medical device



applications

“The TS9800 Jet Valve dispensing system is a perfect solution for electronic and medical device machine integrators and builders who need to dispense ultra-small amounts of adhesives and fluids efficiently and consistently to meet high-production and high-quality requirements,” said Can La, Techcon Product Manager. “Manufacturers that are looking to increase productivity, improve product quality and reduce manufacturing cost will benefit from this technology.”

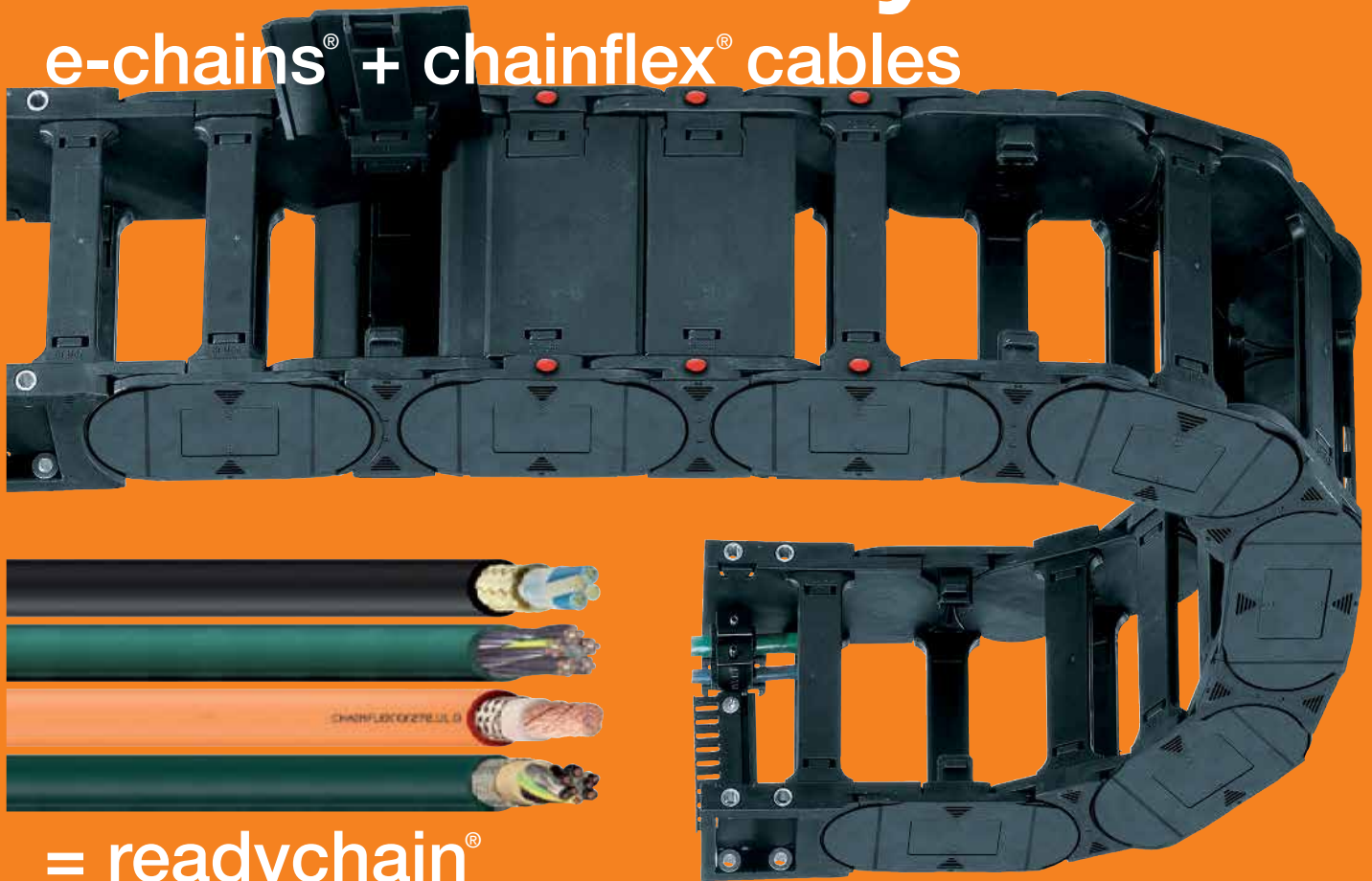
Modular design characteristics such as an external power source provide lower maintenance costs of the system. The TS980 Smart Controller offers a friendly user-interface and touchscreen for faster setup, and is Industry 4.0 compliant for remote access and control over ethernet networks.



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Automation in sheet metal cutting and welding

The paper examines welding and cutting process trends in the sheet metal and plates used in various industries like automobiles, infrastructure, ship building, aerospace industries, wind tower manufacturing etc. Productivity gains in arc welding are reviewed, and the increasing use of laser cutting and welding, as well as laser-arc hybrid welding, particularly in Europe, is discussed and explained. Some friction technologies are already widely adopted, but they could make more impact with further development. Electron beam welding could also be used with economic benefit in some situations, but as with all non-arc processes, it will only be adopted if significant gains in productivity and cost reduction can be created to justify the more specialist welding equipment required. Many productivity improvements can come from non-welding activities in the fabrication process.

1. Introduction

Leadership in manufacturing (welding and Cutting) can come from addressing the factors of QUALITY, COST, PRODUCTIVITY, SAFETY and CONTINUAL UPGRADATION OF TECHNOLOGY. Inflection in Metal Fabrication Technology has taken place in the Manual / Semi-Automatic Welding Power Sources - (Digital control inverters), Welding Automation - (Developments in HNG SAW, HNG MIG, Tandem MIG / SAW, Friction Stir, Electron Beam, Saddle Welding Automation, Robotics, Laser spot welding, Hot wire TIG, Orbital systems, automation with hybrid welding systems like Plasma – MIG, Laser - MIG) and major advances in the cutting processes (Precision Plasma, Laser Cutting, Water-jet cutting etc.). This paper reviews current trends in arc welding and cutting processes used for Sheet metal processing and will discuss some of the newer processes which are beginning to replace arc welding for such steels, or have potential to do so in the next 10 years.

2. Advantages Of Automation

Consistency in weld result - Error Proofing: A welding supervisor

can limit the amount of changes an operator can make during a program, preventing him from accessing the override screen through the use of a key switch or password.

Multiple parameters for multiple weld-run: In addition to the ability to adjust parameters between weld passes, operators of microprocessor-based welding machines can also program changes to weld parameters during each pass, which offers distinct advantages for certain applications.

Store parameter for sharing on other machines with same applications: A microprocessor-based power source can store programmed welding procedures on data cards. This allows the operator to easily transfer programs developed on one machine to other machines being used either in the same facility doing the same type of work.

Quality control: Microprocessor-based machines can immediately alert the operator if weld parameters fall outside pre-selected limits. Parameters can be directly to a quality-control computer program for storage or statistical analysis. This eliminates time-consuming radiography in many applications.

Date storage and records: It is now very easy to display a set of welding parameters and operator or supervisor can observe the welding procedure. Moreover, the data can be printed in the form of reports, which can be presented to the customer as quality assurance procedure.

Quicker Weld-Fault diagnostics lower repair time: The system can be stopped if the measured values cross a certain preset variation limit. It is possible to stop the machine in out-of-tolerance conditions. This enables the operator to perform timely functions and take necessary steps to prevent the deposit of faulty welds.

3. TANDEM MIG and Robotic Welding

Significant improvements in productivity are nowadays hard to gain in this mature process. In gas-shielded MIG/MAG processes, the growth of tubular wire over solid wire is still slow despite the deposition and bead shape benefits of the former although tubular wire usage is higher in the USA and Japan compared to other parts of the world. The lower price of solid filler wire, particularly in Europe, is still a dominant factor that continues to

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The Geissel Group, a German family operated company since 1920, is one of the worldwide leading manufacturers of cable glands, accessories and precision turned parts. With modern machinery we produce and provide various applications in all divisions of industry. Geissel India, a 100% daughter of Geissel Germany, is with its international high class products an established supplier for the Indian electrical market since many years. The Geissel own brand of cable glands ---- is well known and accepted worldwide.

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Constant high quality standard
Technical know-How and competent service

Our Full Program

- ◆ Single Compression Cable Glands
- ◆ Double Compression Cable Glands
- ◆ Conduit Cable Glands and Conduits
- ◆ Reductions/Enlargments
- ◆ Lock Nuts
- ◆ Plugs
- ◆ Adapters
- ◆ Twisting Steeves



Thread

- PG, metric, BSP, BSC, NPT

Material

- Brass, Polymide,
Stainless Steel (SS 303/1.4305
and SS 316 Ti/1.4571)

Cable-Ø

- upto 116 mm

Protection Class

- IP 54, IP 68, IP 69k EMC



favour their use. Self-shielded cored wires are still widely used in the USA but less so in Europe because of the fall-off in fabrication of large offshore installations. Care is always needed in selecting self-shielded wires if weld metal toughness is a critical design factor.

Schematic of Equipment for TANDEM MIG

Advantages of TANDEM MIG:

- Exceptional welding speeds
- High weld metal deposition rate

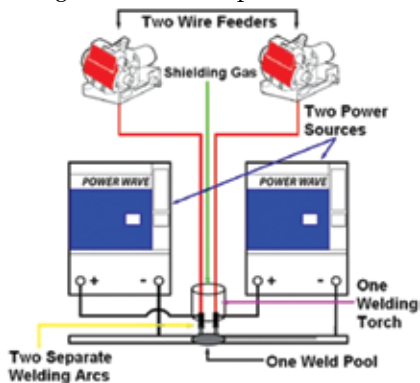


Fig. 1: TANDEM MIG

- Superior weld quality:
- Reduced heat input
- Resists burn-through on thin materials
- Maintains low spatter levels
- Produces good penetration on thick materials
- Improves bead wetting at weld toes
- Resists undercut
- Bead profile control
- Lowers production costs
- Increases productivity

The greatest potential for productiv-

ity improvements comes from using robots. Japan still leads the work in new robot installations per annum, but generally robot take-up for welding is still majorly for the automobile sectors. Robots are being employed in situations where product repetition and/or tonnage throughput are high, combined with relatively standardised designs. Robot profile cutting is increasing in usage and in Japan, some building frames are now being welded on robot lines and agile robots are also used for site welding building column joints at height. The applications most suited to robot use involve butt and fillet welds in the fabrication of beams, welding of stiffeners to beams, welding of end plates and the assembly of panels or decking.

A likely trend is to 'take robots to the work' and use them for large part and sub-assembly manufacture in cells which house autonomous vehicular robots. These robots, mounted on moving platforms are manoeuvred around the parts to be welded and are capable of all-positional welding using the MAG process with tubular wires, (Fig.2).



Fig.2. Schematic diagram showing autonomous robot vehicle navigated by vision system, being used for all positional MIG / MAG welding

4. Narrow Gap Saw

In submerged arc welding, multi-wire, iron powder additions and narrow gaps are common ways to increase productivity. However, the use of tubular wires is increasing in popularity and can offer better weld quality compared to solid wires in some situations, e.g. when submerged arc welding of

primed plate. In building and bridge construction MIG/MAG welding is more suited to automation and is now beginning to replace submerged arc welding, reducing costs and distortion significantly.

5 . Laser – In Cutting And Welding

Low power CO₂ lasers were originally developed in the late 60s for cutting and welding operations, while Nd:YAG lasers entered the market only in the early 1980s. In the shipbuilding and off-road vehicle sectors, higher power lasers (3-10kW CO₂ and 2-4kW Nd:YAG) have become popular in the last decade because their use brings more precision in dimensional control, and greater accuracy in assembly, as well as the additional advantages of high cutting and welding speeds, and cleaner working.

Laser cutting is now an essential route to accurate assembly in steel fabrication. Parts can be cut to a precision of $\pm 0.3\text{mm}$ in 10 metres compared to $\pm 1\text{-}2\text{mm}$ for conventional plasma cutting. Sub assemblies can then be arc welded to tolerances of a few millimetres in 15 metres, with the same lasers being used for marking and hole drilling on the cutting table. Even though arc welding is still regularly used for assembly of laser cut parts, cost reductions can be dramatic because of the improved accuracy of assembly and the potential for eliminating distortion correction and other processing operations downstream from welding. Direct costs have been cut by up to 50% using lasers for cutting in many shipyards, and this shows the extent of benefit which could follow from more widespread use of laser cutting



Fig.3. A typical laser welded sandwich panel and advantages over conventionally stiffened panels

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in building, bridge and public infrastructure construction.



Fig.4a. Nd:YAG laser - MAG hybrid process being developed for land pipeline girth welding. Picture of the welding head



Fig.4b. macro section showing MAG root and cap beads & central hybrid weld bead

6. Laser-Arc Hybrid Welding

There is tremendous interest in the use of CO₂ laser-arc or Nd: YAG laser-arc for steel construction at the present time. The concept has been around since 1978 and was actively developed in Aachen in the late 90s using high power CO₂ lasers in combination with one or two MAG torches directed into the same weld pool in series with the laser. Already one shipyard in Germany has such a system in production on a panel line, the process replacing submerged arc welding. The advantages of moving from simple arc processes to a hybrid laser-arc system include higher

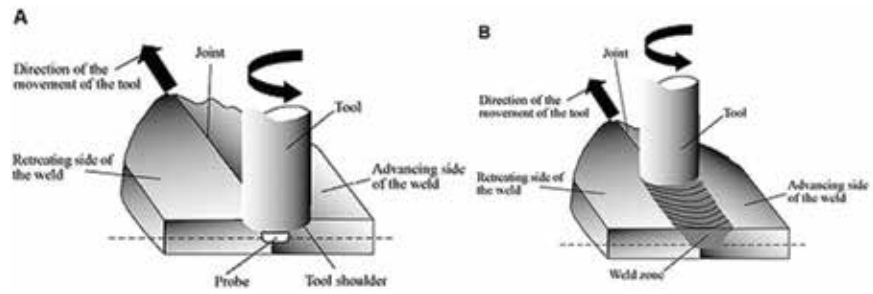


Fig. 5. Schematic diagram of the FSW process: (A) Two discrete metal work-pieces butted together, along with the tool (with a probe). (B) The progress of the tool through the joint, also showing the weld zone and the region affected by the tool shoulder.

joint completion rates and associated control of distortion. As noted above, laser systems alone are usually not sufficient to cope with variations in joint gap in large structures. However, where plates are thin, it is possible to produce stiffened panels successfully by laser welding.

7. Friction Technologies

There have been many exciting developments in friction welding and probably more process innovation in the last decade than in the previous 40 years when friction welding first came on the scene. In the context of metal joining and construction, friction stud, radial friction and friction stir welding are good examples of more recent approaches, with friction stud already being used in the production of sandwich structures comprising steel skins and a concrete core and for welding attachments in high volume such as shear connectors and reinforcing bars to end plates. Attachment of anodes under water to offshore installations using steel studs and electrical connections to railway lines are other applications of friction stud welding.



Applications

Shipbuilding and Offshore, Aerospace, Automotive, Railway Rolling Stock, Fabrication

8. Electron Beam Technology

There have been several key improvements in this process in the last decade which have made EB welding increasingly attractive for large-scale fabrication of steel structures such as buildings and bridges. The two main areas of improvement are in gun development and reduced pressure technology.

Reduced pressure electron beam welding system



Reduced pressure EB welding using chamber pressures of around 1mbar has been another major step forward in simplifying EB welding operations. The beam shape and beam penetration at, say 5mbar, is identical to that at the more conventional pressure for EB welding of 5×10^{-3} mbar. This reduced pressure option does away with the need for large vacuum chambers and worries about leaks and seals. Simple mechanical pumps and local

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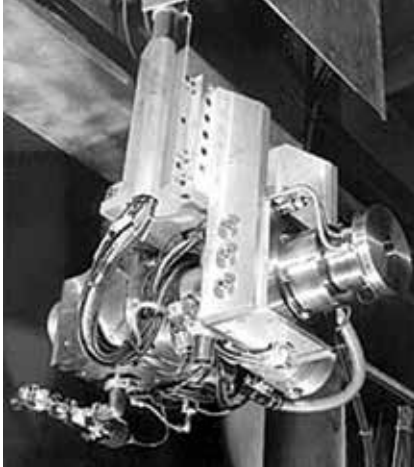
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seals are sufficient to achieve ~1 mbar. These systems are also more tolerant to fluctuations in working vacuum pressure, gun to work distance and work-piece cleanliness.



9. Wind Tower Manufacturing – Specialized Cutting And Welding Process Applications

Wind Tower fabrication employs extremely precision applications of metal cutting and welding processes like gas cutting triple torch, with Single pass three torch cutting Automatic setup which provides High accuracy, Capacitive height adjustment, Infinite rotation of cutting head, Automatic angle adjustment 20 - 50° (Option for 30 - 60°). In addition, plasma cutting system is used with Automatic Setup, Highest Accuracy, and Bevel angle adjustment: +/- 52°, Initial height set-



ting with tactile sensor, Cutting height adjustment via automatic arc voltage sensing process.

Precision High end CNC Plasma cutting process is utilized with high degree of automation needed to guarantee consistent quality. Programming software, Numerical control and Automatic rotating bevel tools are used to dispense with manual tasks. Automated SAW systems with Twin Wire, Tandem, Tandem – Twin and Multi – wire systems are used along with customized welding heads, wire feed systems, joint tracking systems, Column and Booms, TELBO systems, Rotators and Positioners. In addition, Tractors and Fit – up units are all used for this application and also for many other welding applications.

10. Concluding Remarks

Where will engineering construction be in five years time? Productivity improvements can come from many different areas in the total fabrication

process, e.g. general design, detailed design, contract drawings, CNC instructions, cutting and profiling, welding, inspection, finishing etc. It needs to be realised that optimising the welding process and procedure in isolation may have only a small effect on overall productivity. As an example, fabricators in the bridge and building sector continue to make big improvements in reducing the cost per tonne of steel fabricated by focussing on efficiency improvements in non-welding operations.

These non-welding areas will continue to receive much attention in the next few years. For example, 3D solid modelling is expected to be at the heart of the improvement process enabling virtual assembly, direct instruction of cutting and welding machines, computer modelling of metal processing and welding operations and optimising of welding sequences. In addition automated inspection and data gathering will increase in usage to give more comprehensive Quality Assurance. Productivity improvements could also come from greater standardisation in steel specifications and in joint details and from modularisation of large structures to reduce the time spent on site fabrication and erection. Use of new welding processes and an increased use of automation and robots will take place slowly and gradually, only being justified where the introduction creates significant gains in productivity or cost reduction. As such, these changes can be expected particularly in situations where skilled labour is short, where welding cells can be kept fully occupied or where customised, made to order components are needed.

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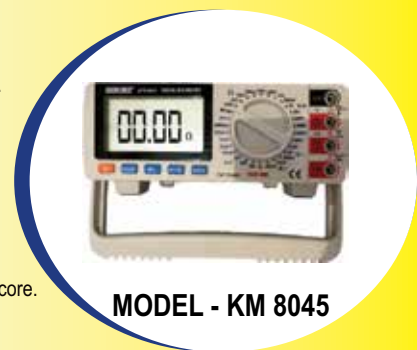
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Induction Heating for Pre Weld / Post Weld applications

Thanks to the Induction Cookware, the concept of Induction is now fairly well known. Induction is a method by which heat is generated directly inside the metal, it is not radiated or conducted but Inducted. What this means is that you can heat a specific part of the object without affecting the surroundings too much.

Efficiency



Heating with Gas Flame.

Advantages of Induction heating are too many, for one it is one of the most efficient method of heating. According to a study conducted by American Department of Energy (US DOE) heating with gas, electric heating and Induction for the same object, the efficiency of heat transfer and heating was 44%, 74% and 84% respectively. Which means heating with Induction compared to Gas is almost 40% more efficient.

Quicker heating

Safety is another major advantage with Induction, the heat is produced into the metal using eddy currents, so the operator and the surrounding do not get heated as much. The coil applicators which generate the magnetic fields and carry the currents are well insulated. The Job can be at 100 degrees while the coil is still at room temperature. Chances of accidents are greatly reduced. Imagine trying to heat a 1 meter dia shell upto 55mm thick with multiple gas burners on for

hours.

The gas burners in the shop floor need special safety precautions and are prone to accidents. As they can be hot even after heating is off. The same is shown below using an Induction System, well insulated coil or blanket coil can be used. Operators can work around the area safely. Also storing and managing Gas Cylinders in shop floor environments needs a lot of safety precautions and leaky cylinders can cause major accidents. Induction works on basic electricity supply which is safety ensured using MCCBs and ELCBs.



Induction Heating.

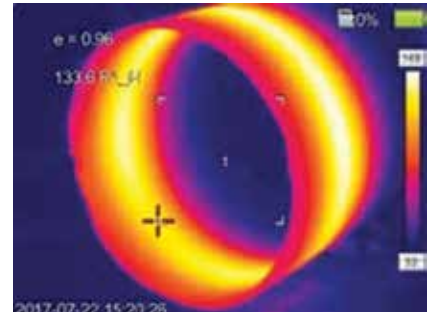
Quality

Heating with Induction ensures heating all across the heating zone with equal heat. The heat zone from surface to center can be controlled well within 5 degrees.

Similarly over a large length or long seam of up to 12 meters we have found heating to remain within 10 degrees across the surface and thickness. Obtaining the same with the help of Gas can be a challenge.

For critical materials such as P91 and others the Induction Heating process also helps with achieving the pre-programmed heating cycle with temperature feedback.

It can heat with a settable ramp rate say 60 Degrees / Hr or 100 Degrees / Hr and similarly it can help hold the job at the soaking temperature for as long as required. Advantage of Induction heating is that if you want a controlled



Uniform Heating.

cooling off rate after the heating, that also is possible.

Cost

Running cost of induction heating is way lower than resistance or gas heating. With higher efficiency and lower time taken to achieve the temperature, it is fast becoming the preferred method of pre / post Weld heat treatment.

In Conclusion

With the use of more thin-wall steel alloy pipes in today's oil and gas pipelines, Manufacturers and installers are turning to the fast, accurate and uniform heating of induction heating systems. During the process of butt welding, induction heating is commonly used to preheat the joint area to 150-200 °C to prepare the area for a consistent quality weld. After welding, the joint area is heated to 600-650 °C for thermal stress relief of the weld area. Traditional gas flame and resistance Heating systems are often impractical when these higher temperatures are required. Not only are they too slow to meet the cycle times demanded by the industry, but also the heating can be inaccurate and can lack uniformity around the full circumference and bandwidth of the weld joint.

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Renishaw Equator™ gauge enables production growth at major aerospace manufacturer

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When Senior Aerospace Weston wanted to become more efficient in the inspection of critical machined aerostructure parts, the company turned to Renishaw and its class-leading Equator™ gauging system. The Equator gauge has cut inspection times per part by around 75% and introduced more comprehensive component traceability.

Background

Senior Aerospace Weston is a leading supplier of a wide range of complex precision machined components and subassemblies, predominantly for the commercial aviation market. At the company's machine shop in Earby, UK, 95% of output is for use in Airbus aircraft, mainly A320 and A321, but also A330, A380 and A350 models.

Most of the components are aerostructure (wing and mainframe) components; everything from small items measuring 50 mm, to large engine pylon brackets and landing gear fittings.

Challenge

Some of the more complex aerostructure parts were taking

up to 10 minutes to inspect using Senior Aerospace Weston's existing coordinate measuring machines (CMMs). This would often cause bottlenecks and capacity limitations around the CMMs. To address the problem, the company introduced various manual inspection methods using traditional measuring equipment and hard gauging, but to limited effect.

With build-rates increasing, Senior Aerospace Weston recognised its responsibility to become even more efficient with in-cycle measurement without compromising quality.

Solution

"We spoke with Renishaw and they proposed the Equator gauge, which is another level up from a traditional

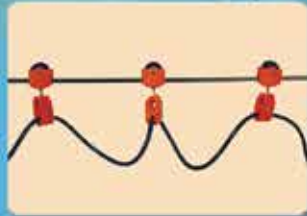


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*Senior Aerospace Weston
(UK)*

3-axis CMM in terms of speed,” explains CMM Programmer Andy Wright.

The thermally-insensitive Equator system is a flexible gauge that is designed to provide speed, repeatability and ease of use. Installed at Earby during January 2018, Senior Aerospace Weston has already programmed eight parts.

“We have 70 parts that could fit on the gauging system, so there is high potential,” states Mr Wright, who is also impressed with the system’s ease of use. “No special skills are required; the operator simply loads the part into the fixture, lets the cycle run and receives an easy-to-read report.”

Another factor behind the success of the project has been the sales and applications support from Renishaw:

“The support we receive is first class,” says Mr Wright. “Renishaw is very quick to answer any queries, and it almost feels like we’ve been assigned our own special support team.”

A key part of the support team for Senior Aerospace Weston is Renishaw Applications Engineer, Ed Clarke, who comments: “For any customer with a turnkey project we will provide ongoing support for all stages of their project. If there are any queries, the customer can come directly to us for the support they require.”

Results

Among the parts inspected at Senior Aerospace Weston using the Equator gauge is a titanium wing flap track component for Airbus aircraft.

“Over the years we have gone through several process iterations and various equipment solutions trying to measure this part quicker with the required accuracy, but inspection would regularly fail due to component complexity and tight datum tolerances,” concedes Mr Wright. “However, using the Equator gauge we have been able to achieve a process that delivers accurate gauging and repeatability. The Equator gauge measures around 25 different features on this particular part, taking just 90 seconds in total.”

“The in-cycle measurement time has been significantly reduced, with our operators now just reviewing an electronic report,” says Mr Wright. “Inspection cycle time has been cut by 75%. Previously a manual measurement would be taken and recorded on paper. Now, we have fully electronic reports with every dimension recorded. We can also use trend data to help identify potential areas for improvement in our manufacturing process.”

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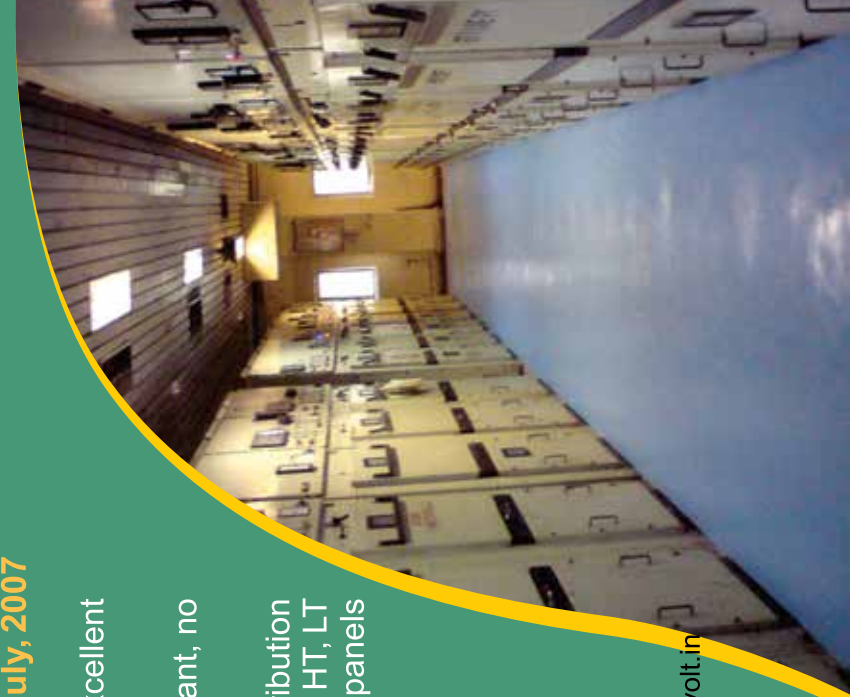
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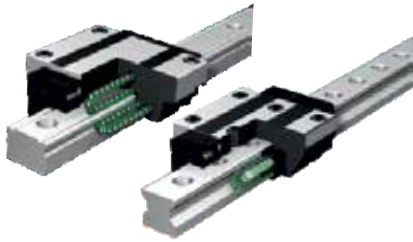


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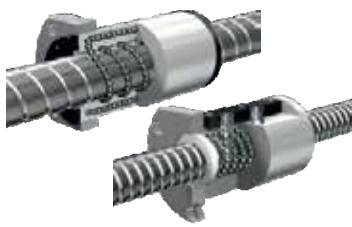
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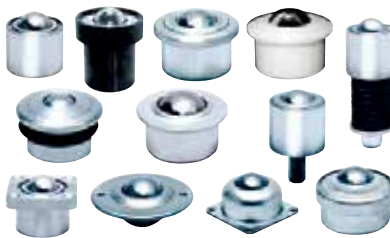
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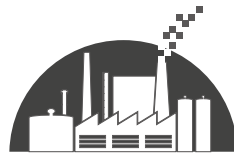
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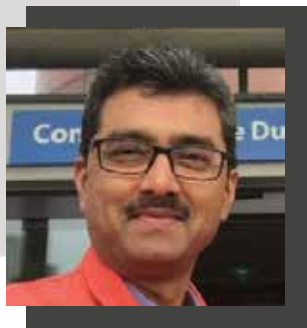
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NORTH INDIA

EV CHARGING INFRASTRUCTURE

Plans to set up charging stations for electric vehicles along the Noida-Greater Noida Metro Corridor. The scope of work includes the installation, operation, and maintenance of public charging stations (PCs), fast charging stations, battery charging stations (BCs), or battery swapping facilities (BsF) along the noida-Greater noida Metro Corridor. Bids were recently

invited in this regard.”

Place: Uttar Pradesh

*Noida Metro Rail Corporation (NMRC) Ltd
“Manoj Vajpayee, General Manager (Technical),
Block-III, 3rd Floor, Ganga shopping Complex,
sector-29, noida 201301, Uttar
Pradesh. T: 0120-4344483/84/85,
nmrcnoida@gmail.com www. nmrcnoida.com*

HOUSING

The authority has invited selection of consultants for preparation of project report for proposed slum rehabilitation and redevelopment of in-situ J. J. Cluster at (1) Indira Camp Part-II Okhla Taimoor nagar new Delhi, (2) Indira Camp Pahari-II, Taimoor nagar, new Delhi. The work is likely to start by January 2020.

Place: Delhi

*Delhi Development Authority
Vikas Ahlawat, Deputy Director (IsR),
Housing Department, InA Vikas sadan,
New Delhi-110063, Delhi.
T: 011-24661938,
E: dda.pmay@gmail.com*

HYDRO POWER

Plans to set up small hydro electric projects upto 5.00 MW capacity for 11 identified Project sites. The proposed projects includes: A) 2.20 MW Nati Hydel Project; 3 MW Macchad-I, 4 MW Basari, 2.80 MW Basari-I, and 3.80 MW Sechi Gad project in Shimla district. B) 2 MW Khared, 3 MW Hared, and 3 MW Joiner-II in Chamba district. C) 0.50 MW Kyali Hydel Project in Kullu district. D) 5 MW Upper neogal project in Kangra

district. E) 4.50 MW Rupri Tikada project in Kinnaur.

Place: Shimla Himachal Pradesh

HIMURJA

*Kritika Kulhari IAs, Chief Executive Officer,
8-A, sDA Complex, Kasumpti, Shimla - 171009.*

T: 0177-2620365, E: himurja-hp@nic.in

SOLAR POWER

The joint venture of the Indian Railways and RITES Ltd, has issued a request for qualification (RfQ) to set up approximately 32.56 MW of rooftop solar photovoltaic (PV) systems at various railway establishments and stations across the zonal railways in India. The scope of work includes the design, engineering, procurement, erection, installation, testing, and commissioning of the solar PV systems, including operation and maintenance (o&M) of the systems for a period of 25 years.

Place: Nationwide

*Railway Energy Management Company Ltd
Abhishek, sr. DGM,
Ground floor, Central wing,
Gurgaon-122001, Haryana.*

T: 0124-2818850/793, M: 9205135581,

E: abhishek@rites.com, remcl@rites.com



WEST INDIA

AIRPORT/ AVIATION

The authority plans to setup a 100 kW grid-connected flexible solar PV power plant on the terminal building of the Pune Airport under the CAPEX model. Bids are currently invited in this regard. The scope of work includes site survey, complete design for optimal uses of space, engineering, manufacture, supply, storage, insurance, civil work, erection, testing and commissioning of the solar PV project. The completion is targeted in 4 months.

Place: Pune Maharashtra

*Airports Authority of India (AAI)
Ajay Kumar, Civil Enclave Pune Airport,
Lohegaon, Pune, Maharashtra.
T: 020-26683232, E: apdpune@aai.aero*

WIND ENERGY

Bagged a new deal to set up 50 MW wind power plant for Adani Green. The project would come up at Dayapur in the Kutch region of Gujarat. The deal was awarded by solar Energy Corporation of India (sECI) in an auction. The project consists of 25 numbers of 2 MW wind turbines.

Place: Kutch District Gujarat

*Inox Wind Ltd
Atul Soni, Head (Investor Relations),
Plot No 17, Sector 16 A,
noida-201301, Uttar Pradesh.
T: 0120-6149881, 61496000,
E: atul.soni@inoxwind.com*

SOLAR POWER

The company has tendered a 90 MW balance of system package for the Anta Solar Power Project at Baran district in Rajasthan. The scope of work includes the design, engineering, manufacturing, supply, packing, forwarding, transportation, unloading storage, installation, testing, and commissioning of the solar project, excluding the supply of solar PV modules.

Place: Baran District Rajasthan

NTPC Ltd

*A K Gupta, Addl. General Manager
(Renewable Energy-Contract services),
Room no. 220, R&D Building, Engineering Office
Complex (EOC) Annexe A-8A,
sector-24, noida, Distt.
Gautam Budh nagar-201301, Uttar Pradesh.
T: 0120-2410722, 2410880,
E: akgupta01@ntpc.co.in*

ROADS/ HIGHWAYS/ BRIDGES

The University plans to construct a skywalk bridge connecting the building of the Institute of Fashion

Technology (IFT) to the Department of Clothing and Textile.

Place: Vadodara Gujarat

M S University

*Dr. P. Madhava soma sundaram, Director (P&D),
Abishekapatti, Tirunelveli-627012, Tamil Nadu.*

T: 0462-2321614, 620, 2333741, 9442272280

*(Dr. s. santhosh Baboo, Registrar,
registrarooffice@msuniv.ac.in)"*

WATER SECTOR

The department plans to take up the construction of Bhadbhut barrage, flood protection embankments and associated works across River narmada near village Bhadbhut of Bharuch district.

Place: Bharuch District Gujarat

Narmada, Water Resources,

Water Supply & Kalpsar Department

*A M Barve, Chief Engineer (K2) & Addl. Secretary,
Block No. 11/7, New Sachivalay, Sector 10,*

Gandhinagar-382010, Gujarat.

T: 079-23252299, M: 9978405569



SOUTH INDIA

AIRPORT/ AVIATION

Shivamoga airport is a proposed greenfield airport to be built at sogane Village, 8.8 km from shivamoga and 8.2 km from Bhadravathi in Karnataka. The airport development would be implemented under Public-private partnership with the Government of Karnataka. The construction is likely to start soon. The completion is targeted in 10 months.

Place: Karnataka

*Karnataka State Industrial & Infrastructure
Development Corporation Ltd
Ravishankar, AGM, Khanija Bhavan,
4th Floor, East Wing, no 49, Race Course, Road,
Bangalore – 560001, Karnataka.
T: 080-22258123, 22269495, 22258131 / 33,
E: ravishankar@ksiidc.com*

CANAL / DAM / IRRIGATION

Plans to implement 1,300 irrigation projects in Shikaripur and Sorab taluks in the district. Tender process is already completed and the works would start soon. The government has already released the grant of Rs 1,300 crore for the project implementation.

Place: Shivamogga Karnataka

Karnataka Neeravari nigam Ltd

*Mallikarjun B Ginge, KEs, Managing Director,
Coffee Board Building, 4th floor, Dr B. R. Ambedkar
Veedhi, Bangalore-560001, Karnataka.*

T: 080-22283074, 22386016, M: 9481169126,

E: knnl@knnlindia.com, www.knnlindia.com

EDUCATION

The construction work of the proposed government medical college in Wayanad

will begin in December. 50-acres identified at Chelod Estate near Vythiri for the medical college. the land acquisition would be completed by mid-november. The state govern- ment has already given administra- tive sanction for the project estimated at Rs 615 crore and funds will be made available through KIIFB after the DPR is approved.”

Place: Wayanad Kerala

*Department of Health and Family Welfare,
Government of Kerala
K Nandkumar, Joint Secretary,
Room No. SBT 6, Fourth Floor, South Block,
Secretariat, Thiruvananthapuram, Kerala.
T: 0471- 2337087, 2518255, M: 9447009726,
E: nanda104444@kerala.gov.in*

PHARMA

Hyderabad Pharma City is a pharmaceuticals industrial park being established near Hyderabad. The project is one of the priority node of the proposed Hyderabad- Warangal Industrial Corridor project. TheTelangana government has urged the Centre to provide financial assistance of `3,418 crore for the project implementation.

Place: Hyderabad Telangana

*Industries and Commerce Department,
Govt. of Telangana” Chandrasekhar Babu, Deputy
Director, Chirag Ali Lane, Abids, Hyderabad-500001,
Telangana. M: 9908077333 (Jayesh Ranjan, IAS,
Principal Secretary,
T:040-23452985, E: prlsecy-inds@telangana.gov.in*



EAST INDIA

MINES AND MINERALS

The company is implementing the Kapuria underground mine project in the state of Jharkhand. M/s AMR- BBB Consortium is the contractor. As of March 2019, the work has not progressed due to protest by the local villagers on land issue. CMPDI has submitted a report on ‘Integrated Economics of Kapuria Project with Washery’ on 12.03.2019 taking into account the subsidence study report of CIMFR. In this report it is mentioned that in view of the variation in geological structures revealed in revised GR, re-planning of the property may be required. The report is under examination.

Place: Dhanbad District Jharkhand

*Bharat Coking Coal Ltd
A K Dutta, GM (MIn), Koyla Bhawan,
Koyla nagar, Dhanbad-826005, Jharkhand.
T: 0326-2230028, 2230155, M: 9470596002,
E: cgmcoord.bccl@coalindia.in*

MINES AND MINERALS

The company is implementing Monidh XV seam Underground mine project in Dhanbad, Jharkhand. CMPDI has submitted a comprehensive Mining Plan of Moonidih Colliery taking into account Revised Mine Plan of XV seam, submitted by M/s InDU consortium,

incorporating recommendations of CIMFR concerning relocation of panels to avoid subsidence on surface. The Mine Plan has been approved by BCCL Board in its 348th meeting held on 29.01.2019. As of March 2019, M/s InDU has been instructed to expedite the work and to submit revised time schedule for all activities.

Place: Dhanbad District Jharkhand

*Bharat Coking Coal Ltd
A K Dutta, GM (MIn), Koyla Bhawan, Koyla nagar,
Dhanbad-826005, Jharkhand.
T: 0326-2230028, 2230133-149, M: 9470596002,
E: cgmcoord.bccl@coalindia.in*

HYDRO POWER

Plans to undertake the construction of balance civil works package lot-II for underground power house & transformer cavern, part of HRT-I and HRT-II, surge shafts, pressure shafts and Adits, TRT and other associated structures etc of Teesta-VI HE Project, Sikkim.

Place: Sikkim

*NHPC Ltd
J. n. Maggo, Chief General Manager (Corp Comm),
NHPC Office Complex, sector-33,
Faridabad - 121003, Haryana.
T: 0129-2277790, M: 9810473005,
E: nhpc.cc@gmail.com, dir-per@nhpc.nic.in*

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Email: mktg@amipolymer.com /

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For more information

Unity Controls Pvt. Ltd.

405, Sapphire Arcade, 42 M.G. Road,
Ghatkopar (E), Mumbai 400 077

Phone: 022- 2501 3832 / 33

E-mail: sales@unitycontrols.in

Web: www.unitycontrols.in

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For heavy duty applications, for example, try hinge GN 237.3, a compact, heavy duty hinge of Stainless Steel. With a 180° range of motion, these hinges can stand up to even high dynamic wear – regardless of the mounting orientation – thanks to special shim washers. Depending on the selected type, the hinge bands also have centering extensions that ensure a tighter fit – preventing sliding and eliminating the transverse forces that otherwise place extremely heavy loads on the screws. The hinge pin is secured against loss by a recess and supplied with lifetime lubrication. An asymmetrical band arrangement and the associated possibility of a third fastening hole proves its value especially when mounted in areas with lower material cross-sections.

The hinge series GN 235, on the other hand, can be

mounted with cylinder head screws and – thanks to the offset axis – still swivels by 180° without collision. Horizontal and vertical slots simplify adjustment, and the hole pattern corresponds to existing hole arrangements, making it easier to replace existing hinges.

Additional functionality is offered by hinges with variable friction, and in another Elesa+Ganter part, an integrated spring ensures independent return of the hinge. This special product range, which also includes integrated damping, indexing and locking functions, is being continually expanded by Elesa+Ganter.

One kinematic highlight is already available from: the multiple-joint hinge with 4x, 7x or 10x joint mechanism, which opens flaps and shifts their position at the same time. 180° is also standard here, and the internal installation once again makes use of slots.

With its design hinges GN 138, Elesa+Ganter offers solutions for appearance-sensitive applications: The closed hinge body of die-cast zinc hides the fastening screws and is available in various sizes – soon also in Stainless Steel.

For more information

Elesa and Ganter India Pvt. Ltd.

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Web: www.innovistasensors.com

Genset Controllers



A genset, acts as a backup or an alternate power source. It provides power output to the loads as and when required. Genset Controller is used to control the functioning of the GENSET system. A genset controller provides various monitoring functions of a genset, Monitoring of various electrical parameter like voltage, current, frequency, power etc. It also has capability to measure the temperature, oil level/pressure etc.

Rishabh Instruments, known for its innovations & pursuing customer needs provides unique advantage of offering all the necessary devices to DG OEMs right from APM, CT's, CAM Switches, Dual source energy meters, battery chargers, data loggers, transmitters and now the DG set controllers.

Few of the key characteristic features are listed:

Features

- Three variants for different applications & requirement;

AMF - Auto Mains Failure Controller (RI 303 AMF)

The AMF controller is a kind of module used in generator control panel when you have to control a generator that is connected in standby configuration. It is about a system that is waiting for a failure of the power utility. The product is recommended for High End offering

DGC - Genset Controller (RI 302 G)

A Genset Controller provides an auto switch when the mains supply fails and provides back up to load as a temporary arrangement. After retaining of mains supply, the genset switches the load back on mains supply. The product is recommended for standard requirements.

ATS - Automatic Transfer Switch (RI 301 ATS)

A transfer switch is an electrical switch that switches a load between two sources. An Automatic Transfer Switch (ATS) is often installed where a backup generator is located, so that

the generator may provide temporary electrical power if the utility source fails.

The product is recommended for upgradation or retrofitting solutions.

- Fuel Level and Oil Temperature
- Voltage Drop Immunity
- Smart auto setup systems with Events log with up to 250 events
- Remote start with closure of the generator contactor even with mains present
- Easy programming & navigation with display on same page for Current & Voltage

- Digital / Analog inputs & outputs programmable from keyboard
- Help service page with visualization of inputs & outputs status
- Fast and easy updating of the maintenance hours along with & Timer Start / Stop for programmed work cycles
- RS232 - RS485 independent serial interfaces
- Engine CANBUS Communication J1939
- Gasoline engines support with automatic management of the choke valve

For more information

Rishabh Instruments Pvt. Ltd.

Phone : 0253-2202099

E-mail: marketing@rishabh.co.in

Website: www.rishabh.co.in

ITI-160(P) Portable Digital METAL Hardness Tester

Advantages

- Largest screen 3 inch , showing all functions and parameters.it is the largest screen of leeb hardness tester , easy read and operate.



Main Application

- Die cavity of molds
- Bearings and other parts
- Failure analysis of pressure vessel, steam generator and other equipment
- Heavy work piece
- The installed machinery and permanently assembled parts
- Testing surface of a small hollow space

- Material identification in the warehouse of metallic materials
- Rapid testing in large range and multi-measuring areas for large-scale work piece

Technical Specifications

- Measuring range: HLD (170~960) HLD
- Measuring direction: 360°

- Hardness Scale: HL、HB、 HRB、 HRC、 HRA、 HV、 HS
- Display: 3 inch screen,
- Data memory: 600 groups max.(relative to impact times 32~1)
- Printing paper: width is (57.5±0.5)mm, diameter is 30mm
- Battery pack: 6V NI-MH
- Battery charger:

9V/500mA

- Continuous working period: about 150 hours (With backlight off, no printing)
- Communication interface: USB1.1
- Outline dimensions: 210mm×85mm×35mm (Instruments weight : 350 Gram)

For more information

India Tools & Instruments Co. – BOMBAY - INDIA

Tel: 022-23428862 / 9819345050

E-mail: ojus_itico@hotmail.com

web:www.indiatool.net

Criss Cross Gloves

Features & Benefits

These gloves are made from Poly/Acrylic or Poly/Cotton in 7 Gauge Knitting. The Criss Cross pattern PVC Coating on both sides allows excellent grip & good mechanical protection to the wearer & the gloves are reversible.

The main users for these gloves are Construction, Fishing, General Handling, Gardening purpose, Shipping & Receiving, Bottling Industries .



Application

- General maintenance

- Shipping & receiving
- Food processing
- Light fabrication
- Shipping & Port Handling
- Drilling Rigs & Offshore companies
- Packaging
- Automotive Industries
- Material Handling

For more information

Marvel Gloves Industries

Manufacturers, Exporters & Importers of Gloves & PPEs

187/188, 2nd Floor, Ashoka Shopping Centre,

G.T. Hospital Complex, L. T. Marg, Mumbai 400 001 INDIA

Phone : +91 22 2262 6546 / 2262 6876

Email : marvelgloves@gmail.com

www.marvelgloves.com

SDTRONICS: Leading Manufacturer of Encoder/Feedback/ Resolver Cables



SDTRONICS is in field of automation cables for the past 25 years. We are supporting many MNCs dealing in SERVO, ENCODER, CNC, ROBOT and PLC for import substitute cables. Let us discuss about Encoder/ feedback/ resolver cables. These cables are used for data transmission for servo motors in various length and wattage as well. We proudly support more than 250 companies including the ones like Mitsubishi, Schneider, Delta, Omron, Fanuc, Siemens OEM, Pan-India for various automation accessories.

In the encoder cable category, we have a wide range as per data sensitivity and application. While selecting cable, we consider application, wattage, distance between servos drive and motor. When we talk about application, we determine whether it is standard (i.e. stationed) or drag chain (i.e. movable). All cables

used for this segment are shielded, twisted as a basic specification and compatible with CE and ROHS norms. As per site condition, we add drag chain duty cable which have bending capacity in million while functioning. This is possible due to our experienced technical team.

Our customers provide us only the part number of motor, servo and our technical team takes care of the other parameters. The quality of our cable is as per the standards that are defined by the parent company. We test all cables functionally on servo and motor set-up with a special program. We are providing practical solutions to our customers from available product range. This avoids cost hike due to special cables i.e. hybrid cables. We support these types of cables up to 75 m. We provide total plug and play solution for automation cable.



For more information
SDTRONICS PVT. LTD.

Gat No. 76, Talawade-Chikhali Road,
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Email: sales@sdtronics.com | manoj@sdtronics.com

Web: www.sdtronics.com

Architectural Lighting



K-LITE INDUSTRIES an ISO company, manufacturing indoor and outdoor luminaires have launched a new series of LED Architectural Lighting. Being the trend setters in outdoor lighting and inspired by the "Make in India" vision, K-LITE, through their innovative outlook, have showcased an all new product portfolio under Architectural Lighting. The application includes Facade Lighting, Pathway Lighting, In-ground Luminaire, Uplighter, Up-down Lighting, Billboard Lighting, Vertical Light Bars, Wall Washers, Area Lighting poles and above all popular sleek polar



lighting solutions.

The solutions offered are backed by extensive understanding of illumination in urban spaces and the expertise gained over a period of three decades. The fixture are designed to provide value technology, ideally suited to Indian Conditions. The LEDs used comply to LM 80 testing requirements and from Internationally reputed makes such as Nichia / CREE. The luminaires are RoHS, LM 79 and CE certification compliant. The luminaire efficacy (lumens/ per watt) is much above 100 for all luminaires. Varied optical options for lighting distribution



and correlated colour temperature (CCT) for cool white, neutral white or warm white are available to suit specific requirements.

The outstanding item of the series viz., the Sleek Polar Lighting Solutions is a contemporary design that is both timeless and unique in its impression.

Compact without visible mounting equipment and optimised integration, Polar Lighting is in perfect continuity with the geometric lines of the square column. These assemblies are ideal for surroundings of contemporary architectural constructions.

For more information

K-LITE INDUSTRIES

D-10, Ambattur Industrial Estate, Chennai-58

Tel: 26257710, 48581950, Fax : 26257866

Cell: 95000 79797, 95000 85511

E-mail: info@klite.in / Web: www.klite.in

Corvina Cloud 1.0



Corvina Cloud 1.0 is the EXOR International system for Remote Control and Teleassistance, based on secure VPN and Web access.

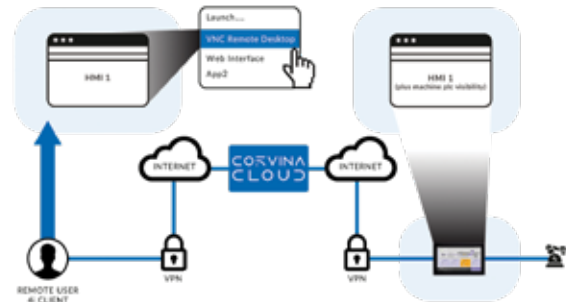
The user interface is incredibly clean and easy to use. Web-based it allows all your remote devices, networks and users to be able to communicate securely.

Corvina Cloud 1.0 can be offered as an on-premise cloud infrastructure that delivers the uptime and performance needed for

industrial applications and control services at any scale.

A powerful and highly scalable system that offers advanced VPN capabilities with a simple web-based interface allowing all your remote devices, networks and users to be able to communicate seamlessly.

Industry standard encryption technology ensures your data stays protected in transit for complete IoT security. Security is further enhanced with granular role-based access



permissions that allow users to only gain access to required resources and nothing else.

As well as security one of the most common challenges industrial networks are faced with is the problem whereby multiple locations have the same subnet,

making it impossible to implement a central VPN management tool without significant intervention. Yet Corvina Cloud 1.0 is the only solution on the market that can seamlessly resolve this routing nightmare, allowing your deployment to go smoothly.

For more information

Exor India Pvt Ltd

Office No.1904, 19th Floor,

Ambience Court, Plot No.02, Sector No. 19D, Vashi,

Navi Mumbai, India, 400703

Tel: +91 022 27840422 M: +91 9664077992

Web: exorint.com

testo 868 – Thermal Imager



The testo 868 thermal imager is characterized by its professional measuring performance

and its easy handling. It has the best thermal image quality in its class, an integrated digital



camera and impressive smart functions. The case supplied with the thermal imager means it can be conveniently transported, so it is always there for you when needed.

- Very good image quality: IR resolution of 160 x 120 pixels, via integrated testo Super Resolution Technology 320 x 240 pixels
- Large temperature measuring ranges from

-30°C to +650°C

- Smart and networked: the free testo Thermography App enables you to write and send reports on site, as well as saving them online, and lots more.
- Integrated digital camera
- Automatic setting of emissivity using the testo ϵ -Assist feature

For more information
Testo India Pvt. Ltd.
E-mail: info@testo.in /
Web: www.testo.com

CEM DT-9897H

DT-9897 is high-Performance Thermal Imager with 384x288 pixels High Performance & high-resolution Thermal Imager with TFT colour LCD display, helps you to find the potential problems with innovative features and functionality, you can perform infrared inspections faster and more efficiently and

thoroughly document problem areas for additional information. Professional IR-optical focus system ensures that images are in good focus for optimum image clarity and scanning convenience. Has Revolutionary Auto Fusion Mode. Thermview App analysis system—quickly identify

and keep track of inspection locations by adding digital images of important information and surrounding areas. Finds problems faster and easier by accurately identifying potential issues by combining digital and IR images. Picture in Picture function Displays Thermal Image super-imposed over a digital image. LED Flashlight allows the visual camera and fusion to be used in poorly lit environments. Has Wide Temperature Range from -20 to +1200°C targeting electrical and industrial applications. Confirms $\pm 2\%$ Accuracy for reliable temperature measurement.

The image rotation facility allows to automatically rotate the active image. Audio and Text annotation. The capacitive touch screen is easier, productive and efficient to operate it. Lithium polymer Rechargeable Battery lasts > 4hrs continuous use; and is replaceable. An easy-to-access thumbnail image gallery helps you to quickly review and find your thermal images. Area (Min/Max) mode shows

the Minimum or the Maximum Temperature reading in the selected area. A conveniently located button activates the laser pointer that will help you associate the hot or cold spot in the thermal image with the real physical target in the field. In order to adapt the device to every situation both wide-angle and telephoto lenses are available Equipped with HDMI, USB, SD card



and WiFi output. With WiFi data transfer of live videos . With laser distance meter having a range up to 30m.

For more information
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METRAVI DT-115A



The Metravi DT-115A is a 3-5/6 Digit 6000 Count, T-RMS, Auto Scanning, pocket-Sized Digital Clamp Meter. The unique feature of this meter is that it is fully automatic and does not even require a dial to select a function. This is an intelligent meter that will automatically recognize and measure based on the input voltage /current/resistance/ capacitance. Along with its automatic recognition feature, it is very stable and precise testing and measurement instrument with high reliability, large and clear display and overload protection. It can also detect Non-Contact Voltage and comes with a built-in bright flashlight.

Even at the edge of 2.3V low battery, it can ensure the high brightness of backlight and flashlight. The meter is easy to carry and is very popular among users. The instrument's backlight can be turned on and off automatically after 15 seconds. This series of instruments can be used to measure AC/DC Voltage, AC Current 600A, Resistance, Capacitance, Diode and Continuity. No switching is required. Parameters such as capacitance, diode and on/off test can be measured by manual switching. It is a superior tool and an ideal tool for Laboratories, Factories, Radio Enthusiasts, Hobbyists, Students and Professionals.

For more information

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Email: info@metravi.com ; Web: www.metravi.com

Phone: 033-22151376 / 22159759.

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gle-element transducers to provide the thinnest range and highest degree of accuracy possible. Common applications include metals and a variety of non-metals (i.e. glass, ceramic, plastic, etc.).

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Specifications:

Measuring Range	0.65 mm – 400mm (upto 500mm) (in steel)
Sound Velocity	1000~9999 m/s
Resolution	0.01mm/0.1mm or 0.001/0.01” selectable
Units	mm/inch (selectable)
Memory	Upto 2000 Groups (up to 99 Values for each file)
Accuracy	± (0.5% Thickness+0.04) mm
Alarm	preset upper and lower limit
Work voltage	3V(2 AA alkaline batteries)
Work mode	Single point and scan
Interface port	USB
Dimensions	136 x 72 x 20mm
Weight	177 g
Display	3.5 digit LCD with EL backlight
Continuous working period	280 hours (with EL backlight off)

For more information

India Tools & Instruments Co. – BOMBAY - INDIA

Tel: 022-23428862 / 9819345050

E-mail: ojus_itico@hotmail.com

web:www.indiatool.net

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tachyon¹

/tæki.on/ or tachyonic

noun

is a hypothetical particle that always moves faster than light. Conceptualized by a team of scientists Which includes Indian scientists Mr. V.K. Deshpande and Mr. E.C.G Sudarshan in 1962.



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