

Enabling Productivity, Precision and Energy Efficiency



75
years of
experience



4 million
motors



10,000
servo solutions



30,000
gearless
machines
for elevators



Editor's Note

In the last issue of Velocity, our Motor Division Head Sunil V Mistry wrote about the challenges the COVID lock-down has confronted us with, and how we have adjusted to them in serving our customers.

I write now to update you on recent developments in our Magnet Technology Machines (MTM) Division, and also to thank you for your support during this pandemic we are battling even after a year. We appreciate your trust in BB.

As the pandemic intensifies and the Government introduces fresh containment measures, we have reviewed and renewed the safety protocols established at our factory a year ago. We continue to place the highest priority on the safety and health of our people. At the same time we must provide our domestic and global customers with the service they have come to expect of us.

We understand that our customers need quick response; to shorten our delivery times we have leveraged the distribution infrastructure of our Motor Division. We are now stocking and supplying gearless elevator machines from our warehouses at Bhiwandi, Bangalore and Delhi.

We remain committed to technology upgrades, and will be announcing some new product launches over the next few months. These include new gearless machines as well as application specific magnet technology machines in partnership with our Drives & Automation Division.

In April, after a pandemic-inflicted delay, we have commenced work for expansion of our gearless machines plant at Airoli. This will double our capacity and include new processes and quality systems. The expanded facility will come on stream by the end of this calendar year.

Physical trade fairs have been one of the pandemic's casualties but we were happy to participate in the virtual GLE Expo from 18th to 20th March 2021. This online event platform enabled us to exhibit our products and engage with prospective customers through live chat and video. There are two marque physical Expos scheduled during the next twelve months, and I hope that they can take place as planned. At the least this would signal the long awaited return to normalcy.

We value our relationship with you, and look forward to your continuing support in the months and years to come. I look forward to your feedback on my updates; please mail me if you would like any further information.

R Rajaraman

VP - Magnet Technology Machines

**We need your
feedback!**

Please fill in the short feedback form [here](#) to tell us what you think of Velocity. We're all ears!

Five randomly selected forms will get BB branded giveaways as a token of appreciation.

Bharat Bijlee is synonymous with electrical engineering in India. Our key business lines are Power Systems (Power Transformers, EPC Projects) and Industrial Systems (Motors, Drives & Automation, Magnet Technology Machines). Headquartered in Mumbai, we have sales and service network across India. The company's manufacturing facilities are located in Airoli, Navi Mumbai on a 1,70,321 sqm. campus.

Case Study

Advantages and Application Fits for SCL Motor Control

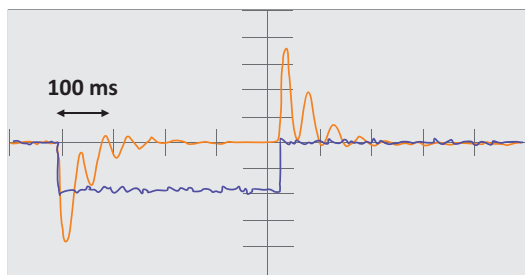
Our case study in this issue of Velocity is reproduced from the Technology Blog of our partners **KEB Automation**. It features their unique Sensorless Closed Loop (SCL) motor control functionality that allows precise positioning in several applications without any encoder feedback. This is a theme that we will be developing in the coming weeks and months as we announce new products and solutions.

Written by Mike Keefe of KEB America, the complete case study was originally published here:

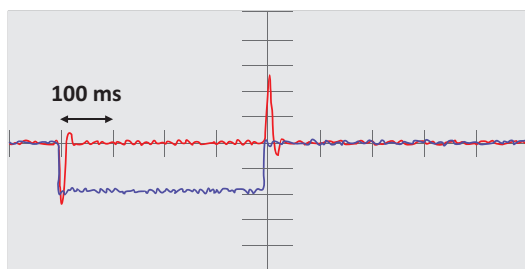
<https://www.kebamerica.com/blog/advantages-scl-motor-control/>

Advantages of SCL motor control

The advantages of SCL are most obvious when comparing it to other permanent magnet motor control options. The first and most basic of these is the standard open loop, Volts/Hertz control. This has a linear relationship between frequency (Hertz) and voltage. It works by increasing the voltage (and in turn the power) and proportionally increasing the drive's output frequency/speed. The V/Hz mode will have a constant torque until the rated frequency is reached, at that point it will decrease with an inversely proportional relationship to the frequency. V/Hz allows for a very quick and easy startup, but offers none of the advantages of SCL such as speed/torque control or a dynamic operation. An example of this can be seen in the image below.



F5-V/Hz



F5-SCL

SCL provides better response to a torque impulse

Using the Scope function in Combivis 6, the changes in the output current (red) can be seen when taking an identical load step (blue) in both modes. SCL responds to the load step and returns back to a static output nearly 200ms faster, with far fewer current ripples. This in turn leads to a far more efficient operation of the motor and also leads to decreased motor heating when compared to V/Hz.

The other available option is to run the motor in a closed loop mode using a speed feedback device like a resolver or encoder. In this case, the encoder provides direct position feedback that allows for positioning, such as when aligning for a tool change in a CNC spindle motor. However, SCL does offer limited positioning for applications with lower current overload requirements without requiring this feedback. The closed loop mode with an encoder then offers similar benefits as SCL over that of the V/Hz model, such as a highly dynamic operation.

While they have many of the same benefits, using an encoder does have some downsides when compared with SCL. One of the biggest of these downsides is cost. SCL will fit into most applications where an encoder could be used, without the added cost of the encoder and encoder cabling. The other downside of using an encoder can be due to concerns over the operational environment. Sometimes due to long cabling runs, high electrical noise, vibration, or other concerns, using encoder feedback is either not practical or reliable. Due to the limitations of the other permanent magnet motor control options, SCL is the ideal choice for many different applications.

Case Study

Ideal Applications

Looking to Replace the Feedback Device or Wiring

Since its release in 2005 and over the course of its development, a few applications have arisen that are particularly well suited to take advantage of SCL. The first, and most general of these, is any application that is looking to avoid or replace an encoder. Sometimes it's the encoder that is looking to be replaced because it is expensive or has a chance of being damaged due to a tough environment. Other times it is the encoder wiring that is looking to be avoided due to noise or long, costly cable runs. And in other cases it is the encoder and cable combination that lead to slow update rates that actually lead to better performance when switching to SCL.

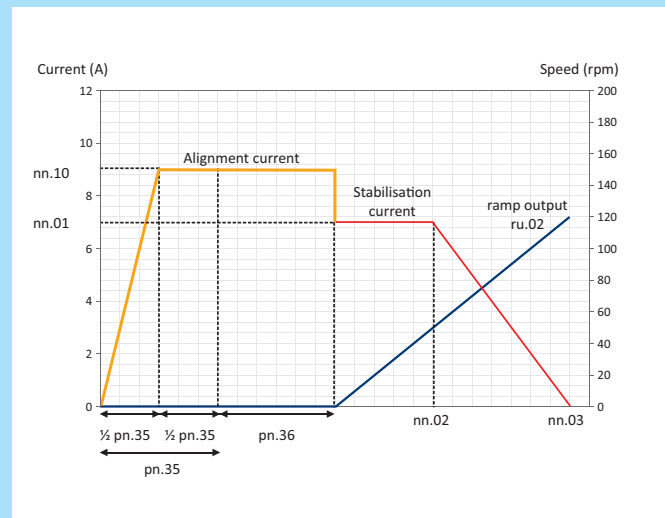
Torque and Speed Control

Other ideal applications are when high torque operations are required, such as in extruders or injection molders for the plastic industry. This is because using the motor identification and model allows for the SCL to provide a very precise torque control compared to other motor control options. Similarly to this, high speed applications are also ideal fits for SCL. Examples for this include compressors, blowers, and spindle motors for CNC machines. All of these applications take advantage of the precise speed control provided by SCL to reach speeds of up to 64,000 rpm.

Poor Fits

While many applications are able to use the benefits of SCL to their advantage, not all applications are ideally suited to use it. These applications would offer better performance while using KEB inverters with encoder feedback. The first of these are applications that require high torque at low speeds or a holding torque at zero speed, such as Elevator or hoisting applications. This is because with each SCL switch-on of the modulation, the rotor aligns to a defined position. Because of this, a low torque load is required at startup. The SCL startup procedure can be seen in the image alongside. The drive first outputs an alignment current to align the rotor with

its starting position. Once that is complete, it then ramps up to its command speed.



Other applications that would not be ideally suited to use SCL would be those that consistently run at less than 1% of the motor's rated speed. While the motor model is very precise at most speeds, it does have instabilities when running at less than 1% of the rated speed because it relies on rotor speed for feedback. Finally, while SCL does have limited positioning functionality, if an application requires positioning and high current overload requirements, it would be better suited to use encoder feedback.

Partner Spotlight



Paritosh Shah
Proprietor
M/S Technokraft Marketing LLP
Ahmedabad

Ahmedabad-based Technokraft Marketing LLP, was incorporated in 2017, but the company had been operating under the name Akshay Enterprises prior to it.

According to Founder Paritosh Shah, although the company had three decades of extensive industry experience and strong footprint in the region, the decision to rebrand was prompted by the need to put in place a structure that would enable faster growth.

Technokraft Marketing (then Akshay Enterprises) began its journey with Bharat Bijlee in 1995, and it has been a long and fruitful one since. Paritosh says that during this association of over two decades, he has closely witnessed the transformation of Bharat Bijlee and seen it evolve into a formidable industry player. This transformation has in turn played a key role in Technokraft's growth.

Electric motors are a necessity in almost all industries. Technokraft works closely with customers from different industrial segments. Some of its major customers belong to industries like Material Handling, Textile Machinery Manufacturing, Dyes & Chemicals, Steel, HVAC and Pump Manufacturing. Apart from these, the company also supplies to OEMs who cater to a wide range of industries.

Technokraft works closely with three divisions of Bharat Bijlee- Motors, Drives & Automation and Magnet Technology Machines. The company appreciates the whole team at Bharat Bijlee for the commendable way in which they have managed to not just run the show, but also grow under the current difficult and trying situation of the pandemic.

The company's future plans include increasing its customer base geographically and further strengthening its relationship with existing customers. It aims to be the preferred supplier for its customers by catering to their needs in a timely and professional manner. Technokraft hopes to achieve these goals and more, and looks forward to a long and mutually beneficial association with Bharat Bijlee.



P. Kanakaraj
Managing Director
M/S Kay Arr Engineering Agency
Coimbatore

Backed with tremendous experience in industrial transmissions, P Kanakaraj decided to incorporate Kay Arr Engineering Agency in 1997, with a focus on small OEMs and the various processing industries of Coimbatore, Erode, Nilgiri and Namakkal regions.

Bharat Bijlee's association with Kay Arr Engineering Agency began in 2000. In Kanakaraj's words, "By partnering with a big brand like Bharat Bijlee, our business and prominence in the market has improved. We are a multi products dealer, selling BB Motors and Gear Boxes at present."

Kar Arr Engineering Agency caters to OEMs belonging to industries like Metallurgy (foundry equipment), Food (sugar, sago), Plastic (extruders), Animal Feed, Textile Processing and SPMs (paper industry). Their end customers include process industries like Rubber, Food, Cement, Steel, Paper and Chemical.

With a dedicated team of ten, Kay Arr Engineering Agency is consistent in its efforts to reach every related segment in the region and strengthen its brand presence in small and medium scale industries. The company has been maintaining adequate stock of motors to respond to immediate requirements from their customers.

Kanakaraj appreciates Bharat Bijlee's trust in his company throughout the long association. Talking about future plans, he says, "Our focus is to promote the Bharat Bijlee brand in the market; expand the network of customers and uphold the brand image in the market. We look forward to mutual growth in the region."

BB in the News



In the last issue of Velocity, we had reported that our SynchroVERT® IE5 motors have been selected for Technology Demonstration in the '2020 Innovation Challenge' held under the **Facility for Low Carbon Technology Deployment (FLCTD)** programme. FLCTD is jointly implemented by the Bureau of Energy Efficiency (BEE) and the United Nations Industrial Development Organization (UNIDO).

In the month of April, UNIDO has received endorsement from BEE to proceed with the funding of our innovation for technology demonstration and validation! This is a strong endorsement of our LSPM IE5 motors.



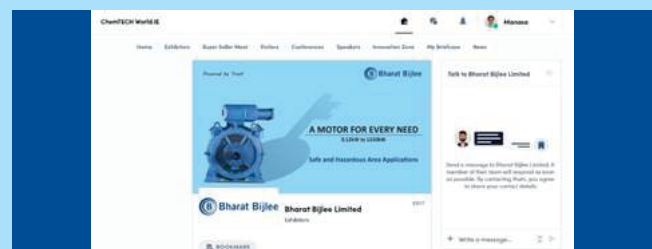
We recently conducted our Drives & Automation Annual Partner Conference virtually. True to the spirit of the theme 'Bounce Back Win Big', we strategized with our partners on achieving high growth in the coming year despite challenges.

Partners were taken through our roadmap for success in FY 21-22, vertical-wise strategy and new product information. It was a day of intense interaction, which culminated with felicitation of our high-performing partners in the last FY.



Our Managing Director Nakul Mehta, was invited to be one of the panelists at a webinar organized by IEEMA on **Perceived Challenges of the Indian Rotating Machines and Drives Industry**. The session was attended by over 340 participants! The panelists termed as "Industry Captains" by IEEMA, shared their views on the current state of the Rotating Machines & Drives industry to help attendees make informed decisions in the current times.

In the same month, our Mahesh Gorwadkar and Salil Kumar from Motors Division and our consultant Ajay Bhalerao co-authored an article **The Role of Application-Based Selection in the Use of Energy Efficient Motors**, which was published in the March 2021 issue of the IEEMA Journal.



In the last week of February, our Motors Division participated in the four-day ChemTECH World.IE exhibition organised by Jasubhai Media Pvt. Ltd.

This online exhibition saw attendance from sectors like Oil & Gas, Chemical, Bio-Gas, Pharmaceuticals and Water Technologies, among others. We showcased our range of motors for safe and hazardous area applications for the Pharmaceutical and Chemical industries at the exhibition.

BB in the News



Recently, our SynchroVERT® range of motors were endorsed by two of our partners.

- C Gheewala & Company have shared the success story of 10-15% energy saving in any textile machine that is run by our SynchroVERT® motor. In association with the company we have supplied IE4 motors up to 45kW for applications like Ring Frame, Blowers and Humidification Plants to several sites of the National Textile Corporation Limited. [Read their LinkedIn post here.](#)
- Sunrise Efficient Marketing Ltd., with whom we have supplied more than 1000 IE4 motors to textile mills in and around Surat, have also spoken of business transformation with the help of our SynchroVERT® motors. [Read their LinkedIn post here.](#)



In May 2021, we participated in and were the associate sponsors of Green CemenTech, a virtual conference and exhibition organised by the Confederation of Indian Industry (CII). Our booth focused on SynchroVERT® range of energy efficient motors and medium voltage motors for the Cement industry. Anil Naik, AVP - Motors (New Business Initiatives), spoke on the advantages of energy efficient motors at the conference.



We participated in the three-day virtual Global Lift & Escalator Expo held in March 2021. At our booth, we presented our GreenStar range of gearless elevator machines. Through voice and video calls and personalised chat sessions, our MTM team answered visitor queries. Our belt machines and single-phase home lift machines generated a lot of interest.



Our MTM Division donated educational posters to Lalji Mehrotra Technical Institute (LMTI), a vocational training institute based in Mumbai. The posters have been put up at the Lift laboratory of the college. Designed especially for the students of the institute, these posters will help them understand the components of a gearless elevator machine, various layers that comprise the machine automation pyramid and electrical safety precautions. A few years ago, we had donated gearless machines and controllers to the lab.