JVL News

JVL ...when motors must be controlled

Number 10

A newsletter from
JVL Industri Elektronik A/S

New AC Servo Motor with integrated controller

JVL has developed a brand new AC servo motor with built-in encoder, driver and position controller

JVL has now developed a completely new concept in motor control: the MAC motor. The MAC motor is an AC servo motor and controller combined in a single unit, offering previously unseen low price. Integrating electronics in a motor has been achieved previously, but never before using an AC servo in such a compact unit that offers true servo performance. In the MAC motor, the servo motor, hall sensor, encoder and controller circuitry have been especially designed by JVL to provide a self-contained, integrated unit in which the driver and controller are mounted behind the motor in a sealed housing.

Numerous advantages

The advantages of this solution are that system "intelligence" is decentralised and there is no cabling between the motor and driver, thus making installation simple. The compact MAC unit does not take up space in a control cabinet and with industry-standard 24-48VDC powering, operational costs are low.
Interface options are numerous too:

- From a PC/PLC using operating commands via RS232/RS485 .
- Pulse/direction or incremental in/outputs. Gear-mode.
- 10 bit ±10V input for velocity or torque control.
- Module for Register mode via 8 inputs and 4 outputs.
- Module for µPLC built-in with THEN ELSE commands.
- Module for Fieldbus. Profibus, Canbus, Devicenet, Ethernet, etc.

Controller and electronic gearing

The MAC motor can be speed or torque controlled using ±10V, with encoder feedback to the overall motion controller. The MAC motor can be used as a direct replacement in any step or servo system based on pulse/direction signals, without modifying PLC/PC control software.
Electronic gearing is built in so that the MAC motor offers any conceivable step resolution.
Re-setting the motor can be achieved using sensors or mechanically by torque limiting.
The MAC motor is available in 3 models: 50, 95 or 140W. NEMA23 flange is standard so the MAC can directly replace a step motor without mechanical modification. Motor parameters are set-up via an RS232 port using Windows software MacTalk.

Adjust 1 parameter – achieve 5 benefits

A common feature of all JVL regulators is that a user need only adjust 1 parameter. This is called the "load factor" since it is only dependent on the inertia of the system. The greater the inertia, the greater the load factor. For the expert, it is still possible to tune very complex and undamped systems via a mathematical model. The MAC motor's 4th-order regulator giver the user the following benefits:

- Shorter installation and commissioning times.
- A stiffer system with shorter positioning times.
- Inexperienced users can readily set-up the servo system.
- Oscillations due to non-linear mechanical systems are avoided.
- Minimum positioning error during operation and halt.

Five modular solutions

Since no two customers' requirements are exactly the same, JVL provides several modules that offer the following:

- Low cost solutions with cable out, so the motor can be controlled via ±10V, pulse/direction or serial commands.
- Nano PLC, which via 8 in- and 4 outputs enables simple positioning determined by inputs (so-called register mode).
- Positioning, register mode and speed control via Field bus, Profibus, CANbus, Ethernet, and more
- All modules available with IP55/67 or std. D-Sub connector (IP42)

All motors offer provision for mounting a planetary gear with ratios of 3, 5, 10 , 20 or 100:1.

Punch Grinder controlled by JVL controller

The company Sorenco produces advanced machinery for grinding punches and dies

A Punch Grinder is specially constructed to grind punches and dies for revolving punch machines. Despite the Punch Grinder's apparently simple exterior and a relatively limited number of functions, it was necessary to use an advanced JVL controller.
The Punch Grinder incorporates a controller consisting of JVL Indexer SMI31 together with Step Motor Driver SMD41 and Step Motor MST232. The controller system enables the Punch Grinder to perform a smooth vertical displacement of 0.1mm/8min., in which the load is a turntable of approximately 70kg. This very slow vertical movement is necessary to grind HSS materials up to 150mm in diameter. Grinding of the tools occurs using an oil-cooled CBN grinding wheel.
Mechanical movement of the turntable is achieved using hydraulics with a ratio of 1:25 between the step motor and the turntable spindle.
The process itself consists of surface-grinding/finishing a die or punch. The tools are gripped in a 3-jaw chuck at the centre of the turntable. The turntable is positioned under a grinding wheel so that the periphery of the grinding wheel is centred on the turntable. The turntable and grinding wheel are rotated relative to each other

The complete Punch Grinder

to achieve a completely uniform grinding of tools - a decisive factor for punching holes in sheet metal and aluminium. In addition, it is possible to angle the jaw chuck for angled and roof-top grinding.
The very precise control of the turntable is alone due to the fact that the step motor - despite a rotational speed of 1 revolution per 8 minutes - is able to maintain full torque.
JVL's Step Motor Indexer SMI31 performs many tasks in the controller system. In addition to advancing the step motor at a very accurate rate, it checks various sensors for positioning the turntable, a microswitch that controls the end-of-travel on the spindle, as well as alarm contacts that are monitored so that the process can be interrupted if necessary. It also ensures that the door to the grinding chamber is closed throughout the process and amongst other things it monitors an analogue sensor for correct measurement of the height of the tool in relation to the grinding wheel.

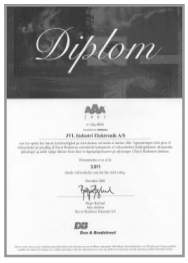
Part of the control system, with Indexer SMI31

Resolver to Digital Converter

New converter emulates an encoder from a resolver

n many automation tasks, it is desirable to have both the robustness of a resolver and the simplicity of an incremental encoder. JVL´s Resolver to Digital Converter type PA0095 is an easy way to satisfy both requirements. It can be used with almost any type of resolver or motor with resolver. The Converter emulates en encoder and yields A-quad-B (1024 lines) and index outputs. It also generates HALL signals for initialisation of AC servo motors. This DIN-rail mounted module enables the use of JVL´s servo controllers, e.g. DMC10, AMC1x and AMC2x, with motors with resolver feedback. The module is powered by the Controller.

JVL award



JVL has been awarded an AAA diploma from Dun & Bradstreet, having achieved the highest D&B credit rating on the triple-A scale. The top AAA rating is awarded on the basis of an overall evaluation of a company's payment history, financial data and other important factors. D&B has the world's largest commercial database, with information on more than 63 million companies.

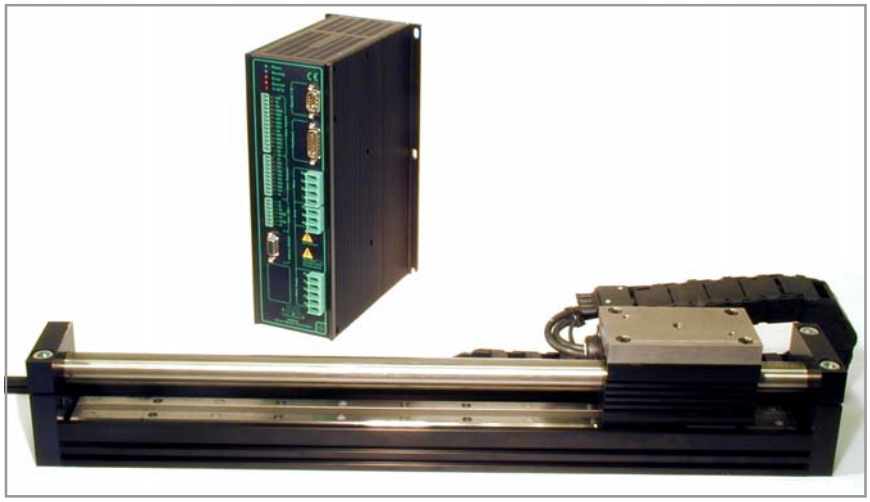
Servo Controller for linear motors

JVL AC Servo controls linear motors

JVL has now completed further development of our AMC20 servo controller so that it can be used with the market's various linear motors with encoder feedback. A need for simple and programmable servo controllers for linear motors has arisen since many motor manufacturers do not themselves produce drivers, but supply a standard driver together with the motors.

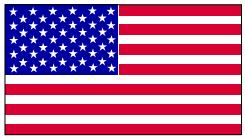
JVL now offers a programmable or analogue velocity-driver that can be adapted to the market's linear motors. The servo controller is powered from 115-400VAC and can be controlled via RS-232/485, 6 digital inputs, +/-10V, or be programmed and function as a µ-PLC, since it also has 11 inputs and 8 outputs.

As a user of JVL's Servo Controller for your linear motors, you achieve the following benefits:



- Greater flexibility.
- Compact unit with integrated EMC filter.
- Direct powering.
- Decentral program execution.
- Rapid and simple set-up (Software Oscilloscope, etc.)
- 7th-order filter for extremely rapid settling time.
- High-dynamic, noise-free operation
- Stand-alone system.
- Very economic investment.

JVL now represented in USA



JVL can now announce that we have made an agreement with Trumation Inc. in Burnsville, Minnesota. Trumation Inc., headed by David Trudeau, is from 1 may 2002 our representative in USA, and is planning tosell our products throughout all the states via representatives in each state. The Main Office in Burnsvlle, Minnesota will handle all enquiries, offers, stock and service, while the distributors will take care of the direct customer contact. At the moment agreements have been made with distributors in Winsconsin, Arizona, Minnesota,Washington and Ohio. The companies are:
(Full adresses can be obtained on www.jvl.dk or www.trumation.com)

Main Office
Trumation Inc.
10808 Cedarbridge Ave.
Burnsville, MN 55337
Tel: 952-882-7878

Distributors:
Winsconsin
Doig Corp.
Tel: 262-376-3644

Arizona/New Mexico
Hei-Tek Automation
Tel: 602-269-7931

Minnesota/Iowa/North and South Dakota
Air Automation Engineering
Tel: 763-571-4970

Washington/Oregon/Idaho/ Montana
Northwest Motion
Tel: 425-837-9150

Ohio/Indiana/Kentucky
Cincinnati Controls
Tel: 513-530-0044

Trumation Inc.
"The Fulcrum of Automation"

New representatives in Sweden

It is with great pleasure that we can announce the introduction of two new sales channels in Sweden. At the beginning of 2001, JVL established agreements with **All Motion Technology AB** in Stockholm and **Sigbi System AB** in Höganäs.

These new representatives enable JVL to provide a wider and improved service throughout the Swedish market. Both companies have broad knowledge and experience of the market and also offer complementary products.
Addresses and contact information for these companies are:

all motion technology

SIGBI System AB

All Motion Technology AB
Mallslingan 13
S-187 66 Täby
Tel:(+46) 8 732 68 30
Web: www.allmotion.se

Sigbi System AB
Wärdshusvägen 20
S-263 93 Höganäs
Tel: (+46) 42 65 400
Web: www.sigbi.se

New Mini-step Driver

New 160V driver for highly dynamic applications

JVL has developed a new driver that is physically similar to the popular SMD41 mini-step driver, but is intended for high-velocity, high-torque applications. The new SMD42 can be powered by a 160VDC supply (compared to 80VDC for the SMD41). This yields up to double the torque at velocities over 500RPM. Heat generation is kept to an absolute minimum through the use of the latest MOSFET technology.
The SMD42/41 series is now available in 13 different models, with supply voltages from 15VDC to 160VDC, 3, 6 and 9 Amp models, full- half-, mini- and micro-step resolutions that can be changed by dipswitch, up to 25000 step/revolution, and more.
The SMD42 is fully compatible with the SMD41 and can therefore be used directly in applications where the SMD41 has been used previously.
Together with JVL step motor MST 340-342, the SMD42 achieves a remarkable torque of 7-8Nm even at high velocities.

New employees

On the 1st of April 2001, Dennis William Johansen joined JVL as a software developer. He is currently working on further development of JVL's MotoWare software and we look forward to continued ventures in our development department.
On the 1st of September 2001, Finn Hansen joined JVL as logistics and production manager. Finn holds an engineering degree from the Technical University of Denmark and has previously worked in production management. At JVL he will be working on development and maintenance of logistics and the implementation of a new production control system from Navision Attain. Together with Finn, we look forward to providing an even better level of service to our customers.

Dennis William Johansen

Finn Hansen

JVL at the Herning Fair 2001

As usual, JVL took part in the major Danish Trade Fair in Herning in September 2001. We had 2 stands at the fair, a large stand in hall E and a smaller stand in hall F. There were many many visitors at both stands and we were happy to spend a few busy days making and renewing acquaintances with new and "old" customers. Our new MAC motor, in which the driver and controller are integrated into the motor, was of particular interest to visitors.

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