JVL News

JVL...integration in motion

Number 22

A newsletter from
JVL Industri Elektronik A/S

MAC400 – JVL's latest development in integrated servo motors

Throughout the past 10 years, JVL has developed servo motors with integrated controllers. Already back in 2000, JVL launched the first MAC motor series with rated torques of 0.1 to 0.5 Nm. This product range has demonstrated quality on a par with, if not better than, traditional servo systems.

Initially there was some scepticism among customers about combining the controller and motor in a single housing and mounting this directly on machines. But experience has shown that through proper selection of components that are suited to the harsh requirements of machine environments, users have gained significant benefits: from design, purchase and commissioning to final operation of machinery.

JVL has continued development of integrated servo motors, and with the launch of the MAC800 we combined yet another component stage by adding the power supply to the motor, so that supplies of 230/115 VAC could be directly applied to the unit. The led however to more stringent design requirements since JVL required that the MAC800 could deliver a peak torque 3 times the nominal rated torque and that the motor complied with standards for UL-approved components, where special temperature requirements and distance between PCBs and the housing are decisive
Today, JVL is the only supplier that offers a UL-approved integrated servo motor.

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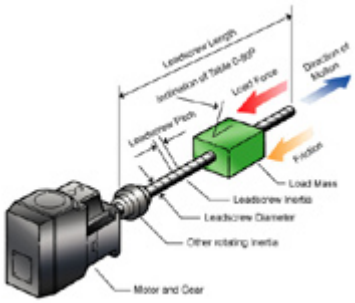
MotorSizer.com

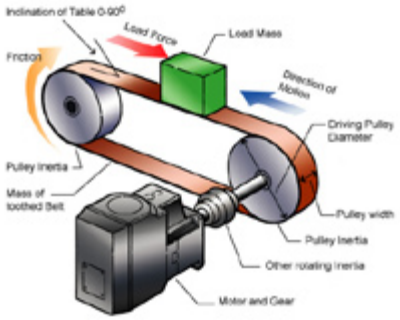
New Web-based dimensioning software from JVL

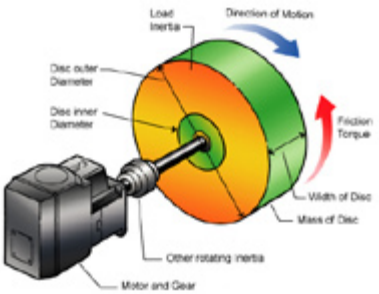
MotorSizer.com is a newly released program from JVL which makes it very simple to determine the required motor and gear sizes for a specific application in machine construction, education and research.



MotorSizer makes it possible to key in all commonly occurring parameters that influence motor torque or required power in order to achieve the required movement.

MotorSizer can be used to calculate the correct motor and gear sizes for AC-Servo, DC-Servo and Step Motors.





MotorSizer is very simple to use. A single screen is used to display all parameters. Once the known parameters are keyed in, CALCULATE is selected to display the configuration result. Go to motorsizer.com and see how easily and quickly motor and gear sizes can be calculated.

Process Control Expansions Modul

New industrial module specifically for process control applications – and master/slave

The new expansion modules MAC00-P4 and MAC00-P5 for JVL's MAC motors are intended for use in applications that require a 4-20mA analogue interface to control motor movement.

The interface consists of a 4-20mA input to control motor movement and a 4-20mA output to indicate actual motor position.

4-20mA can also be used to specify speed, torque or another selectable motor parameter. Both offer full galvanic isolation from other circuitry, both within the motor and externally. An output is also included to indicate whether an error has occurred that prevents the motor from performing the required operation. This output is also galvanically isolated.

The MAC00-P4/P5 modules also provide the facility for another motor to act as a slave. A high-speed communications interface makes it possible

to control a secondary motor configured as a slave, which means that the communication protocol always ensures that the slave motor follows the master. If an error occurs in either the master or slave motor, both are stopped.

- Standard M12 and Harting connectors. (MAC00-P5) for maximum reliability.
- Standard M12 connectors (MAC00-P4).
- 4-20mA analogue input. Resolution: 16-bit (65535 steps). Galvanically isolated.
- 4-20mA analogue output. Resolution: 16-bit (65535 steps). Galvanically isolated
- Error output. Galvanically isolated
- Communication interface for slave motor (includes +24V supply for slave motor).
- Optically isolated communication which covers RS232, RS485.
- Full RS232 protocol support for use with standard serial cable.
- RS232 communication interface to PC for set-up and monitoring.
- Supply input to control stage of the motor. Also used for slave motor if present.

YET now directly available in Denmark.

Yaskawa Europe Technology now supplied by JVL Industri Elektronik A/S

YET is a company which was formed in 1996 as a joint venture between Yaskawa Electric Group and Robo-Group with the goal of developing advanced and unique control technology and products

YET is a large, major company in Israel that throughout the years has produced advanced software for Yaskawa's drivers and motion controllers, and brought Yaskawa to the fore in these areas.

YET now has the opportunity to make direct sales to a number of companies throughout the world, and their drivers, XtraDrive, are 100% compatible with Yaskawa drivers, providing even better versions of software

XtraDrive is additionally designed in such a way that there is no dependence on a specific motor manufacturer and can be used with motors with traditional incremental encoders, serial encoders and motors with or without Hall-sensors. XtraDrive can be used with traditional rotational motors but also with linear motors.

XtraDrive is available in the following power ratings:

30W – 200W (1-phase, 100-115 VAC)
30W – 750W, 1.5kW (1-phase, 200-230 VAC)
1kW, 2kW, 3kW (3-phase, 200-230 VAC)
0.5kW – 5.0kW (3-phase, 380-480 VAC)

XtraDrive is available with:

- Standard driver: +/-10V, Pulse and direction, RS232/485 (Daisy chain max. 15 drivers)
- Embedded Profibus
- Module for CANopen – DS 4.02
- Module with 8 digital inputs and 8 digital outputs

YET is also currently developing a very compact, small motion controller which can control up to 16 axes, interpolate 3 axes, and has update times from 0.5 – 4ms.

Communication with the drivers can be achieved via Yaskawa's Mechatrolink I and II, CANopen, or RS422/485. Overall control can be achieved either via RS232 or Ethernet. A future edition of JVL News will include more detailed information.

JVL has supplied Yaskawa servo drivers since 1994 with excellent results and we now see great opportunities to lead these newest products. We greatly look forward to begin sales of YET products

Continued from front page

MAC400, pushing the boundaries

The MAC800 was a huge step forward in the development of integrated servo motors. Customers from many segments were now aware of the advantages offered by this technology

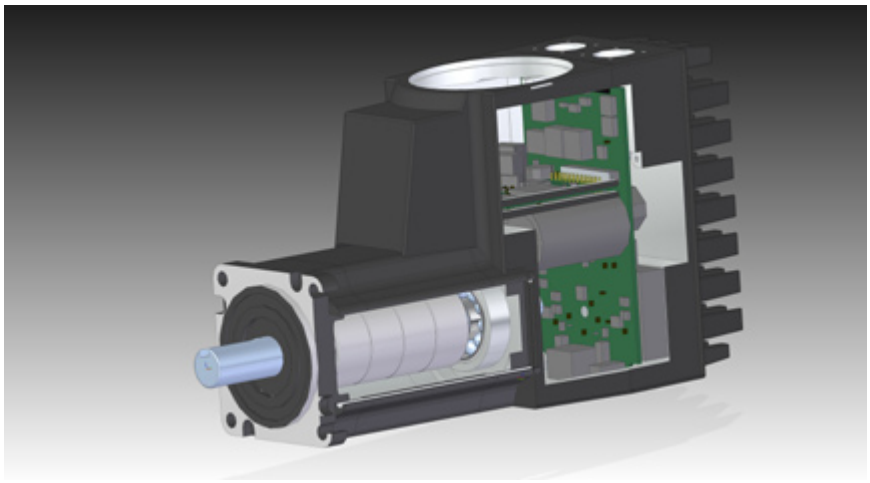
At the same time, our customers were met by requests from end-users for machines that were smaller and more compact and for complete solutions that were less expensive. With these factors in mind, JVL set about increasing capacity in the form of additional inputs and outputs, 'fast input', faster updating times, increased interfaces for using bus protocols, and we developed a new kernel for a new MAC400, 400W motor.

JVL already knew that the market for 400W servo motors is where the greatest competition lies and therefore the following requirements were to be met:

- Reduction in the number of PCBs compared to MAC800
- Upgrade of processor power
- Inclusion of 230/115 VAC power supply as in the MAC800
- Handling absolute multi-turn encoder
- Extra inputs and outputs compared with the MAC800
- Fulfil the requirements of UL-products
- General focus on cost in the selection of components and production processes

On this basis, JVL presented a prototype at the SPS fair in Nuremberg in 2008 and initial feedback from the first tests in customers' applications demonstrated that all of the above requirements were fulfilled.

JVL can now present a product that is unique in that the MAC400 only has 2 PCBs, compared to the 5 of the



MAC800. For compliance with UL requirements, this has only been possible through the use of completely new technology by embedding the entire power supply to ensure UL temperature and spacing requirements.

Utilising a new processor which will become the common platform for all future MAC motors, the

requirements for improved processor speed, handling 'fast input' and absolute multi-turn encoders have been fulfilled. In addition, there is now the facility for handling nanoPLC functionality directly via the processor, and not as currently the case with other motors which require a MAC00-Rx expansion module. Furthermore it is also possible to use an external encoder signal either as a master or slave at the same time as executing bus communications.

It was clear from the start of development of the MAC400 and the new platform, that JVL wanted a solution which would support the new Ethernet-based protocols such as EtherCat, PowerLink and ProfiNet, to mention but a few. The only change required to use the MAC400 in a network is to download the correct software to support the desired protocol.

The MAC400 is JVL's response to how latest technology can be used to give the user a solution which provides:

- Savings by in-design, since only a single component is incorporated
- Savings in procurement and fewer component orders.
- Savings in cabinet space, which in some cases can be omitted entirely
- Savings in installation and reduced cabling
- Savings in commissioning: the product is already burn-in tested, both the motor and controller together
- A complete servo solution with user-friendly software for commissioning and adjustment
- One of the market's most compact products, without loss of performance.

For further details of the MAC400 or other JVL products, contact us on +45 4582 4440 or via jvl@jvl.dk

MAC motors control antenna

2 MAC800 motors position a parabolic antenna for Dutch TV.

For TV transmission of moving events, such as cycle racing (Tour de France, etc.) the most common method of transmitting the signals from cameras to the stationary control room is by sending the signals from a helicopter or small plane.

An antenna mounted on the stationary control room must thus follow the aircraft in order to prevent loss of signal due to the aircraft's movement. Until recently this was done manually, by a person who constantly adjusted the antenna according to the aircraft's position.

A Dutch TV company has now developed a tracking control system for the antenna, using 2 MAC800 motors and 2 Spinea backlash-free gears that adjust the antenna position depending on signal strength. JVL MAC motors were selected for the application due to their built-in circuitry (which results in very few cables to the motor) and the facility for communication directly via RS485. This made it very easy to synchronise control of the motors with the PC that processes changes in antenna signal strength. Furthermore, JVL's user-friendly MacTalk software made it very easy to adjust the motors to ambient conditions such as wind velocity, etc.

The complete antenna

Mounting of the motors in the unit

New module for MAC servo motors

The MAC00-B41 is a new module for use with integrated MAC servo motors types MAC400 and MAC800. The module offers the following extended I/O functions:

- 6 digital I/O (24V tolerant)
- 2 analogue 12-bit inputs
- 2 multifunction RS422 channels
- Double supply-feature for safe motor stop
- Galvanically isolated RS232 and RS485
- New, simple and robust internal connector
- M12 industrial connectors for simple and secure connection

The module is primarily intended for applications where there is a need for very rapid motor start and stop functions. Start and stop jitter is less than 50µs and synchronisation with an external encoder is possible.
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New agent in Mexico

JVL is pleased to announce that we have entered into agreement with a representative in Mexico: JVL MX. The office is located in the town of Hermosillo, Sonora and is headed by Lic. Victor Armando Infante Symonds and engineer Roberto Figueroa Valenzuela. The office provides a wide range of motion control products and we have great expectations for this newly founded cooperation.

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