

SW Preparing Manufacturers to Meet the Demands of the EV Industry

Electric vehicles will dominate the market within a matter of years. Competitive factors such as pricing, mileage and selection are improving to the point where EVs will soon present equally attractive – if not outright better – alternatives to traditional combustion-powered vehicles. Further, governments worldwide have sought to mitigate the infrastructural roadblocks to widespread adoption of EVs by addressing the dearth of charging-stations and by implementing perks such as priority parking and tax rebates. An additional requirement for this shift to take place is the preparedness of the manufacturers themselves.

Supporting the shift

The demands of the EV industry are not one in the same as the needs of traditional gas-vehicle production. Machining large structural components made of light metal such as battery housings is one of the biggest EV manufacturing challenges. This type of machining can be complicated and time consuming – two things that can hold manufacturers back from meeting increasing production goals. Machine, automation and system solutions supplier, SW, recently released the BA space3 specifically for machining in the electric vehicle industry that meets these needs today and into the future.

The BA space3 is differentiated in equal parts by its size and speed. With an installation of footprint of 25.3m², the machine is the largest in SW's repertoire. It features a working range of 3,000 x 1,800 x 875 mm on the X-, Y- and Z-axes respectively. On each of these axes, the HSK 63 spindle is able to reach a rapid traverse of 120 m/min, with a chip to chip time of 4-4.25s (depending on which optional features a customer selects). So not only is the machine capable of machining large structural components made of light metal material such as battery housings and car chassis bodies that are in such high demand in the industry – but it does so at speeds much faster than anything offered by the competition. The remarkable speed is due in large part to the linear drives in all feed axes. The resulting high dynamism and positioning accuracy reduces idle time and ups productivity—both of which are indispensable when it comes to meeting such high demand for high-volume and bulky components.

Flexibility

Further setting the BA space3 ahead is its flexibility. SW designed a swivel head specifically for the five-axis version of the machine (two axes — the A- and C-axes — are in the head itself). This enables machining from all angles while cutting down on the need to purchase further rotary tables. The other variant features an HSK63 spindle, enabling straightforward correction in all axes, thus increasing quality.

The Q-axis contributes greatly to the dynamism of the 3-axis, rigid spindle variant. It can be turned for greater access to the workpiece. The Q-axis interference circle is Ø2,200mm x 3,480mm. The distance to the rotary table is 425-1,3000mm for the rigid spindle variant, and 165-1,040 mm for the swivel head. In both variants, the table can accommodate more than just large parts. It is flexible and precise enough to machine subparts to be mounted together

and brought to back to the machine to be processed into main part as a whole. After the machining process is finished, parts are rinsed out with coolant in the loading area. So, when all is said and done, what customers are left with is a completely finished component, ready to be packaged for shipping.

The tool magazine has been designed as a chain and can hold 40-80 tools including special tools in unique shapes and sizes.

Automation

Demand for EV parts is increasing rapidly and will continue to do so moving forward. Automation that simplifies the machining processes while supporting traceability is important for success. The BA space3 can be interfaced with automation from SW, which is also world renowned for their automation solutions. Loading is possible via robot or other lifting aid such as a crane. Robot loading is enabled with either a portal solution in front of and above the machine or a floor solution. The machine is accessible either through the open top or the automatic L-shaped door. There is a drip tray to enable clean workpiece transport. Manual loading is possible from the front; however, it is limited by the size and weight of the component being loaded.

Industry 4.0

The BA space3 user experience is intuitive for operators due to the Clone control panel. The Clone is SW's latest HMI and has been designed specifically for their machines. Among its many benefits is its interface for further software (e.g. the SW Core Portal). The 24-inch display is a multi-touch panel with force feedback to mitigate the risk of unintentional input. Tool management is intuitive, and dashboards are clearly delineated into application / service commissioning. The machine is also capable of holding unique and specially shaped tools. Users can monitor the service life status of tools, retrieve details of same, filter tools by process, cutting layers and indicates when a space is blocked due to an especially large tool. Additionally, the machine can be fitted with a portable HMI. Status can be monitored cable-free, and it provides a plant overview with remote capabilities, provided that then HMI is connected to the company network. The BA space3 comes with SW Core software integrated. It is secured with chip authorization needed for access.

The IO-Link is another invaluable asset with regard to Industry 4.0. It acts as a standardized interface for communication between sensors and actuators. It enables straightforward parameter management, performance data monitoring, access to device and diagnostic information. With SW life Services, data evaluation is significantly enhanced. The central data is stored in the PLC. It enables simple component replacement in the plug and play solution. The I/O link enables more data acquisition, simplifies component exchange for plug and play and enables remote diagnosis up to the sensor / actuator. This improves data evaluation via the cloud, saves on service through faster detection of malfunctions and reduces downtime and necessitates fewer and shorter service calls.

The right tool

The BA space3 was released at just the right time for the EV industry. In order for electric vehicles to become viable for the average consumer, producing the right parts on the manufacturing side needs to be straightforward and cost effective. SW is playing its role to support the shift. When it comes to the machining of large-volume workpieces made of light metal such as battery housings, support frames and structural components, there is no better option on the market. If EVs are to become the more attractive option for consumers, manufacturers must first choose the right equipment.

For more information on the full spectrum of machines, automation, and engineering services, including technology demonstrations at the new SW North American headquarters and technology center, contact **SW North America, Inc.** at 30160 Lyon Industrial Court, New Hudson, MI 48165, (248) 617-3800, or contact.na@sw-machines.com.

