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BJB ASSEMBLY CONCEPT

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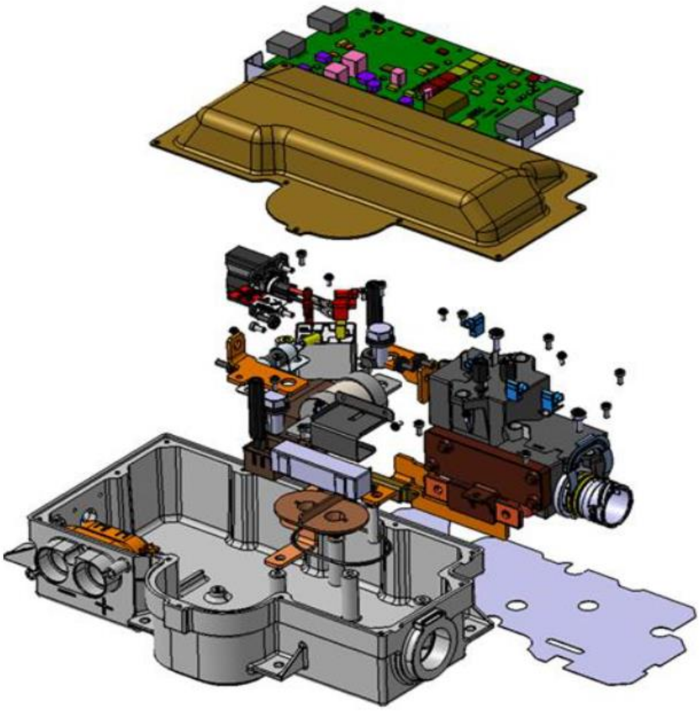
Technical Task:
According to the current state of the art, the manufacturing of a BJB is only possible by means of complex, manual assembly processes. These processes are necessary due to insufficient standardization of the individual components and the connection processes between the components (LV-HV components). Due to the also lacking standartisation of the BJB outer geometry, it is often necessary to adapt the inner components with regard to the mounting position, the geometry, as well as adjusting the associated production processes.

Initial Situation:
This results in a high error rate and huge costs due to complex, manual processes. Furthermore, there is a high variety of variants of the total component and the inner sub-components.

Solution:
The technical innovation includes the implementation of an ideal BJB overall assembly concept with regard to various areas.

On the one hand, this implementation includes automated processes, more precisely automated bonding of busbars and high-current-PCBs, plugs and contractors, for instance through bond wire processes as well as top-down production through completely insertable modules, such as injection coated busbars as module and combined HV-/LV-electronic modules. Next, the implementation relates to a universally applicable BJB module geometry, in which BJB is integrated into the battery, BJB has the space of a standardized cell model and attachments, which cover all known attachment points. Another point of implementation is the busbar/conductor rail guidance, in which busbars are injection coated in BJB and inserted with electronics. The fourth point of implementation concerns the attachment of electrical HV components. This does not happen like in the current state of the art by screwing, but by an attachment via latching or gluing, so that the top-down process is possible. Furthermore, it should come to a connection of current-carrying components with each other. A next point of implementation includes the EMC shielding. This is achieved from the outside or through LV electrical components through PCB screen layer, conductive plastics or fuming without complex, additional shroud. Furthermore, the cooling of BJB components is done via battery cooling plates, so that all critical components are directly connected (screwed, injection coated,…) so that no indirect cooling needs to take place (as in the current state of the art). The last point is scalable performance. Here, BJBs are easily scalable in their performance, e.g. through different numbers of bonding wires and modular fuse holders for fuse, contactors etc. so that the designed BJB is suitable for the full power bandwidth (e.g., for all PHEVs with similar power ratings).



Advantages:

- Cost reduction at component and sub-component level through standardization
- Cost reduction manufacturing processes
- Reduction of variant diversity and component numbers
- Individual components reusable by standardization
- Low susceptibility to errors due to simple assembly processes
- Secure connection processes through standardized bonding process
- Easy automation through standard top-down manufacturing processes