

次世代ロボットの創出を加速するアクチュエータパッケージ TUAKE

TUAKE - Actuator Packages to Accelerate Creation of Next-generation Robots -

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1 BACKGROUND OF THE DEVELOPMENT - ISSUE

There is a consolidated market for industrial robots and cobots -the customer can choose between multiple vendors. But still we can see many new robot companies rising in the start up world as well as the big players to follow the innovation level of these companies. The innovations are now mostly happening in software development (PLC) and usage of new and advance sensors. Two main directions can be observed :

- (1) ease of use (nontechnical people must be able to use robotics for any issue)
- (2) dedicated robots (for a specific issue that can not be solved with "of the shelf" 6 or 7 -Axis Robot)

The new makers must start up with limited knowledge about mechanics of a robot joint. Anyway, they need to develop hardware to offer a product -so they will go this hard way. In a perfect world they'd rather prefer to focus on development of their software.

2 TUAKE PRODUCT PORTFOLIO - SOLUTION

With our TUAKE product portfolio we present a solution that enables fast development to our customers. It is not a single product -it is a configurable portfolio that offers everything needed to achieve targets in both mentioned trend directions. Particular highlight for this is our gearbox integrated torque sensor. The torque signal will not only be provided to the customers PLC, in fact it is used directly inside the driver and fine tuned for the fully integrated robot joint. This very high -quality force feedback e.g. is an

enabler for "ease of use" robotics. The robot will be very responsive and sensitive in case a hand guidance mode is enabled. Next to this many other force feedback-based features can be implemented.

It is not only interesting to the mentioned start up companies -the very high performance -density does offer benefits to well established big makers as well. We are confident that we can offer the hardware on a budget level where a 'make or buy' decision for a fully integrated robot joint can be decided for us.

Finally, due to the configurable options, our customers can find the perfect combination of component as they need it. It highly depends on the customers system architecture which solution will give them the biggest benefit. In case they use drivers that they are familiar and happy with they might not be able to order our DRIVE solution. → They can go for a SERVO solution and choose the encoder protocol that is mating their existing drivers. In case they do not need a closed loop control or they need to use a very special sensor that shall be merged with out TUAKE unit they will select the ACTIVE solution.

Independent to each of the base structure parts they can order as an option e.g an integrated brake, IPxx protection housings, different connectors , ...

Our most inflexible and expansive part will always be the same to profit by economy of scale while customization is happening on optional or cheaper parts. Due to this we hope to be able to maintain attractive price levels towards our customers.

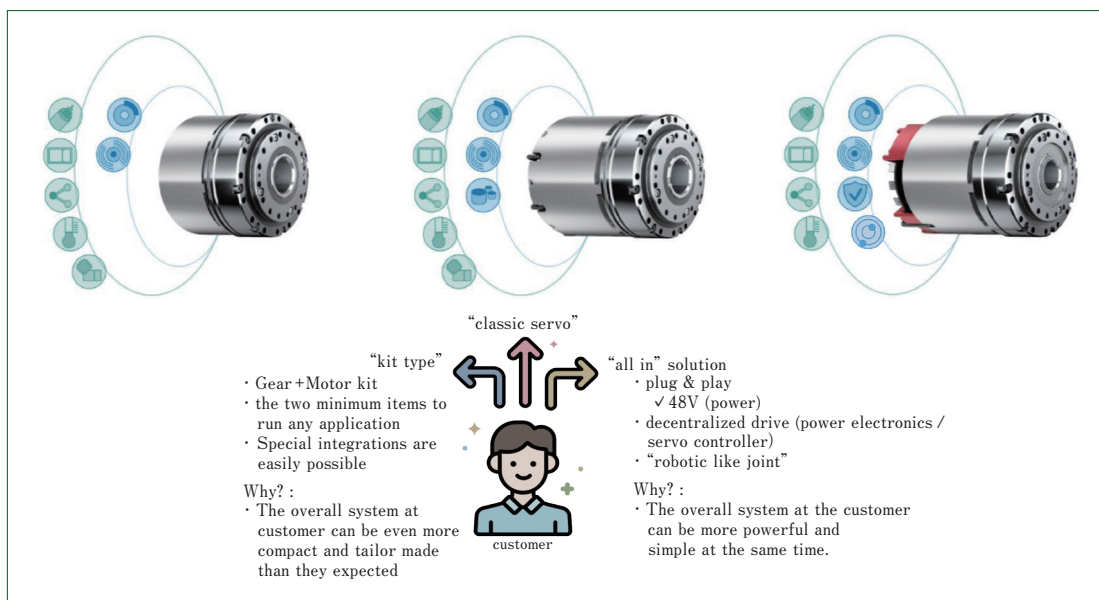


Figure 1 Package solution

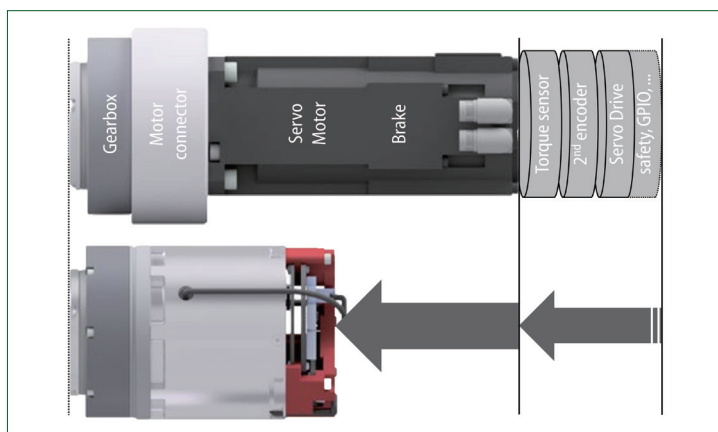


Figure 2 TUAKA vs Classical servo actuator

3 TECHNOLOGY INSIDE

ECY -Gearbox (introduced in SHI report No.200 -Dec. 2019) does give the basis to each unit. In first step only Framesize 103 & 107 are developed. To achieve high level compactness some parts are slightly modified. Motorhousing does provide input side bearing support of the gearbox at the same time as supporting the motor, brake and encoder or driver. There is only a single shaft that we call “backbone” of TUAKA. By this we can make sure of very low tolerance issues on all the rotating parts. Additionally, it increases the overall stiffness (compliance) from motor to output of gear. All components are designed to match perfectly together while maintaining good thermal management. In comparison to traditional solutions TUAKA can be significantly more compact :

4 SUCCESS STORIES

We hope to file this section by next report as TUAKA is

not yet officially introduced to the market -it is scheduled for November 2023. However, we are discussing highly interesting projects with potential customers and our pipeline for very attractive opportunities is well filled.

Keep your fingers crossed together with us for a great success stories next year !

5 CONCLUSION

TUAKA is a precision gearbox portfolio which comprises gearbox, motor, brake, driver, encoder(s), torque sensor and many other features. It is configurable by our customers while machined parts themselves are not meant to be customized. It is mandatory to offer competitive prices in a challenging environment but still put customer in # 1 priority. We are confident that the integrated solutions will enable many new developments / projects by our customers and take away efforts that they don't want to waste time with.

※ TUAKA is a registered trade mark of Sumitomo Heavy Industries, Ltd.