

COBOTS MAXIMISE RETURN ON INVESTMENT

Cobots hold the promise of increasing the efficiency and quality of human work, bringing greater reliability, consistency and precision to a variety of manufacturing and assembly operations. However, do these potential benefits hold true for all users?

Introduced only relatively recently, collaborative robots (cobots) today represent the fastest growing area of robotics. By eliminating the need for protective fences, cobots offer space-saving installation alongside people – a key consideration on many brownfield sites where floor space is at a premium. Simple programming and easy system configuration make them easy to deploy and redeploy. And there is the potential to handle not only the simple and repetitive tasks to increase production efficiency, but also the flexibility and adjustability to tackle more specialist tasks.



Different industries such as packaging, food & beverage, fast moving consumer goods and pharmaceuticals all make stringent demands on automation systems. For cobots, that can mean a requirement for some very specific features. This raises the question, 'is it always possible to combine the simplicity of programming and set-up that many cobots purport to offer with the requirements for precision that many applications demand?'

It was not unusual for end users to find that the answer to the questions was 'no'. This can limit the cobot's applicability to a narrow range of tasks, potentially also limiting opportunities for redeployment, and ultimately impacting on the return on investment.

With the MELFA ASSISTA cobots, Mitsubishi Electric has built on its experience in industrial robots to develop a cobot range that addresses the real world challenges of different applications and sectors. It recognises that simple control and ease of programming must be taken as a given, but without impacting on precision.

Mitsubishi Electric has developed a new hand-guided teaching strategy, where the cobot arm is simply moved to the desired position. Operators then press a single button on the teaching panel on the arm, and the position is added to the robot program. Combining this with an intuitive, touch-enabled, graphical programming tool – RT VisualBox – makes it easier to build sophisticated applications without any programming knowledge.

What about the requirements of different industries though?



In food & beverage, for example, hygiene is a key consideration. MELFA ASSISTA cobots are constructed with smooth, curved surfaces that are easy to clean and prevent dirt traps, while a food-safe H1 grease is an option on all joints, including the gear.

For delicate and precise tasks in pharmaceutical production, MELFA AssistA cobots offer a repeat accuracy of $\pm 0.03\text{mm}$, close to that of Mitsubishi Electric's industrial robots ($\pm 0.02\text{mm}$). They can easily be combined with vision technology, making them ideal for use in applications covering everything from dosing, mixing and counting to dispensing, inspecting and marking medications.

This level of accuracy is important in many assembly applications across different industrial sectors, yet the figure quoted for most cobot designs in the order of $\pm 0.1\text{mm}$. The higher accuracy of the MELFA ASSISTA robots is already proving useful in many applications, including within the automotive sector.

Some end users have also reported that the speed limitations of cobots, although an important safety feature, narrows the range of their usefulness. It makes it harder to redeploy the technology in other areas of a plant to maximise the return on investment. This is something Mitsubishi Electric has addressed with the MELFA ASSISTA, which offers a high-speed operation mode for when it is not working alongside humans – meaning it can be used as a standard industrial robot.



Both the initial set-up and any subsequent redeployment of the cobot is aided by the inclusion of a Digital Twin within the Mitsubishi Electric offering. With RT VisualBox and RT Toolbox3 software, users can simulate and prove the cobot operation will deliver on expectations, without having the live system available. Even when a Cobot has been in operation for some time after SAT (side acceptance test), using the Digital Twin the operation, performance and precision of the MELFA Assista can continue to be tuned, offline. And if the Digital Twin confirms the improvements made on the parameters and the program, the changes can be uploaded and used in the real factory operation. All this can be done without long downtimes or any risk to the production in the factory.

With all of these features, Mitsubishi Electric's MELFA ASSISTA cobots offer not only optimised assistance for the human workforce, but also the greatest possible return on investment.