

Designing cable management systems for collaborative robots

David Sandiland | Automotive and Robotics Industry Manager, igus® Inc.

Collaborative robots, or cobots, work side by side with human workers to complete a wide range of tasks, including welding, quality inspection, and component insertion/fastening. They were introduced in the mid 1990's, but took until 2008 to make it to the industrial marketplace (Engineering.com).

With anticipated global compound annual growth of more than 60% over the next 5 years to an expected \$3.3 billion by 2022 (Markets and Markets), collaborative robots are definitely here to stay. As collaborative robots become more relied upon, more attention must be paid to extending the service life and reliability of these systems, especially designing and protecting their energy supply system.

Collaborative robotic technology

Cobots are integrated with a number of sensors which detect humans and other objects, allowing the robot's speed and force to be immediately reduced. They are also designed without any exposed motors, and with a reduced number of pinch points and sharp edges to reduce possibility of injury if contact is made with a human coworker. These added safety features mean that cobots are truly able to work alongside people, without the need to add safety guards or light curtains.

The robotic systems are much smaller than traditional industrial robots, often tabletop scale for small, light tasks. A range of models are available from manufacturers like Universal Robots, who started with smaller scale robots, and Kuka, which made its name in large industrial robots before branching out to develop cobots.



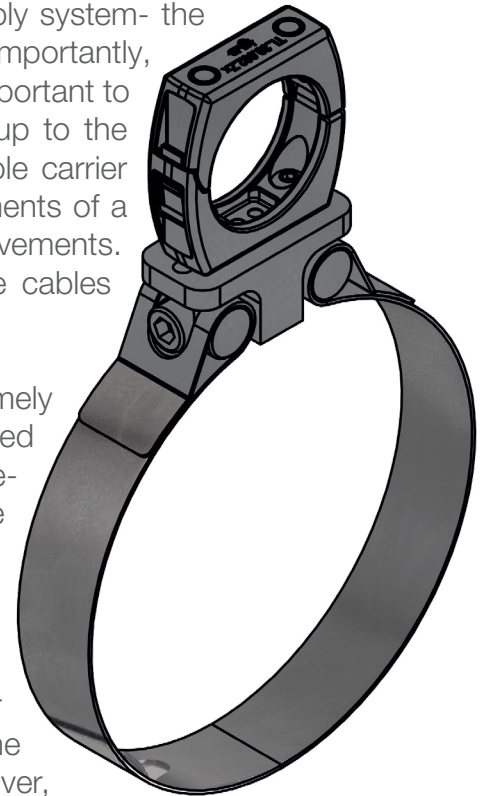
Pictured: A collaborative robot,
manufactured by Universal Robots

Energy supply for collaborative robots

Many cobots do not come with their own energy supply systems. This means that all cable management must be run external to the robot by the integrator or end user. There are two major factors to consider when selecting and installing the energy supply system- the cables themselves, and even more importantly, the cable management system. It is important to select cables that are able to stand up to the constant movement, as well as a cable carrier with the flexibility to match the movements of a robotic arm making high-precision movements, while not constricting or damaging the cables inside.



The triflex® R multi-axis cable carrier from igus® allows for extremely flexible movement around all robotic axes, even when in restricted spaces. The ball-and-socket link design moves in a snake-like fashion, with integrated slits for easy cable installation. Unlike stiff corrugated tubing which can slow or even stop a robot's sensitive movements, triflex's flexibility does not impede with the robotic program. Available in a number of sizes to suit all robots, igus® has also partnered with Universal Robots and Kuka to develop special easy-open/close clamping brackets to quickly and easily mount the triflex® system to their cobots (right). These brackets offer easy connection with screw clips, so the full installation can be done with only an Allen key and a flathead screwdriver, and are available in a range of sizes to suit all sizes of cobot systems. They are also specially designed to allow for easy adjustment after initial installation, and will not damage the robotic arm.



To learn more about triflex® multi-axis cable carriers and brackets, visit www.igus.com/triflexR.